

**COSEL**

**TEST DATA OF MMB50A-2**  
(100V INPUT)

Regulated DC Power Supply

Date : Feb. 16. 1999

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Design Manager

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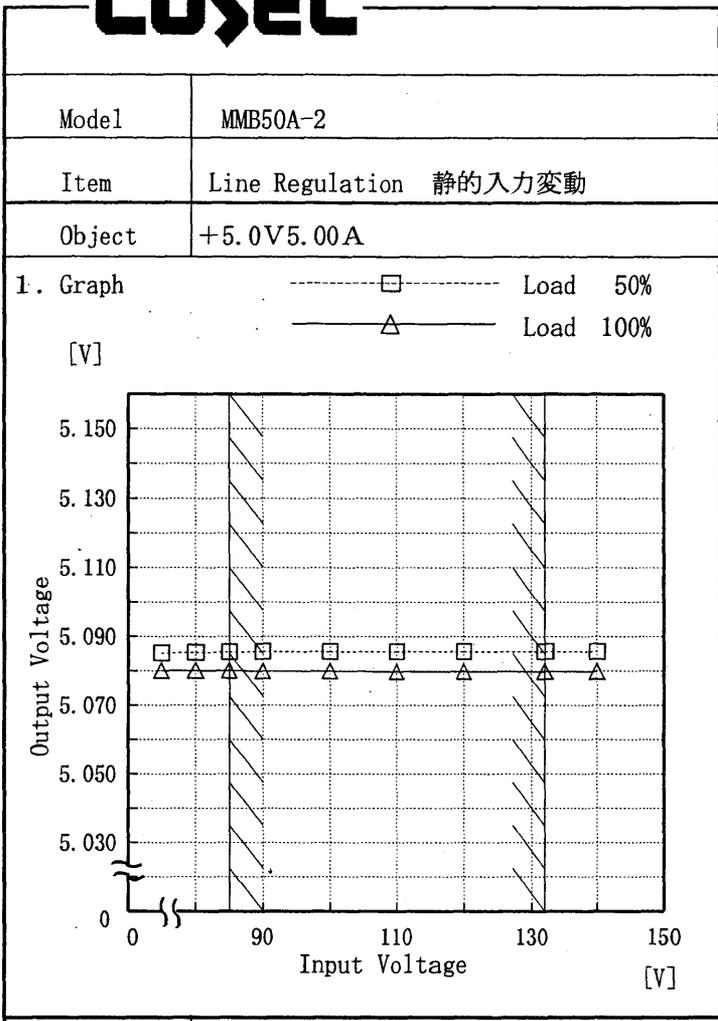
**コーセル株式会社**

**COSEL CO., LTD.**

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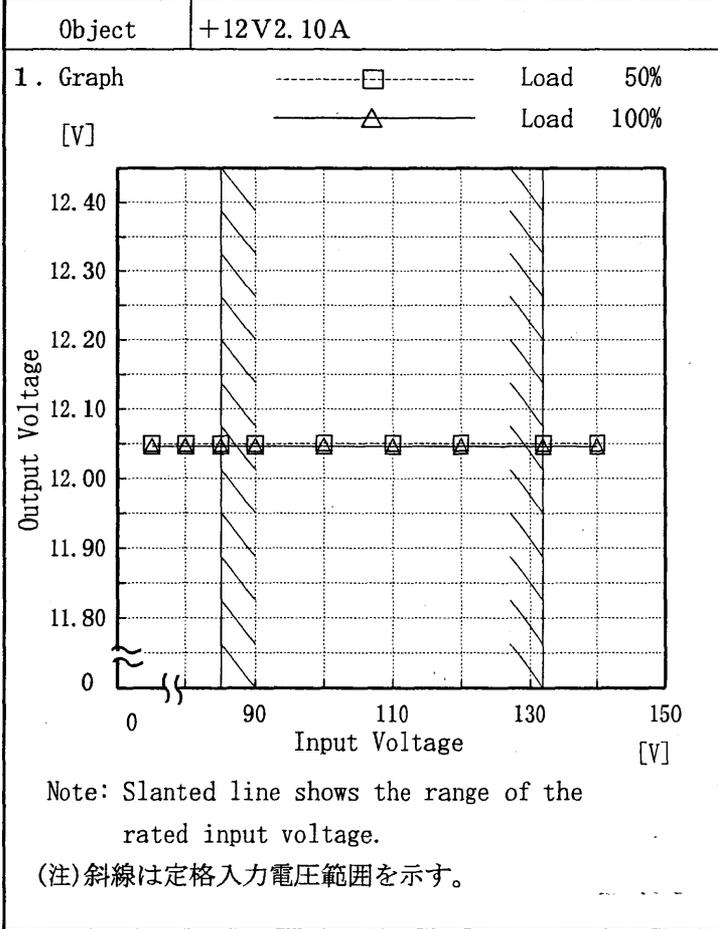
(Final Page 30)



Temperature 25°C  
 Testing Circuitry Figure A

2. Values

| Input Voltage [V] | Load 50%         | Load 100%        |
|-------------------|------------------|------------------|
|                   | Output Volt. [V] | Output Volt. [V] |
| 75                | 5.085            | 5.080            |
| 80                | 5.085            | 5.080            |
| 85                | 5.086            | 5.080            |
| 90                | 5.086            | 5.080            |
| 100               | 5.086            | 5.080            |
| 110               | 5.086            | 5.080            |
| 120               | 5.086            | 5.080            |
| 132               | 5.086            | 5.080            |
| 140               | 5.086            | 5.080            |
| —                 | —                | —                |
| —                 | —                | —                |
| —                 | —                | —                |



2. Values

| Input Voltage [V] | Load 50%         | Load 100%        |
|-------------------|------------------|------------------|
|                   | Output Volt. [V] | Output Volt. [V] |
| 75                | 12.050           | 12.047           |
| 80                | 12.050           | 12.047           |
| 85                | 12.050           | 12.047           |
| 90                | 12.050           | 12.047           |
| 100               | 12.051           | 12.047           |
| 110               | 12.051           | 12.047           |
| 120               | 12.051           | 12.047           |
| 132               | 12.051           | 12.047           |
| 140               | 12.051           | 12.047           |
| —                 | —                | —                |
| —                 | —                | —                |
| —                 | —                | —                |

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| Model                                                                                                |                | MMB50A-2                                     |  | Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | 25°C     |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
|------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|--|-------------------|----------|-----------|----------------|----------------|----|------|------|----|------|------|----|------|------|----|------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|------|
| Item                                                                                                 |                | Efficiency (by Input Voltage)<br>効率 (入力電圧特性) |  | Testing Circuitry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Figure A |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| Object                                                                                               |                |                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 1. Graph                                                                                             |                |                                              |  | 2. Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| <p>-----□----- Load 50%<br/>-----△----- Load 100%</p> <p>Efficiency [%]</p> <p>Input Voltage [V]</p> |                |                                              |  | <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th>Load 50%</th> <th>Load 100%</th> </tr> <tr> <th>Efficiency [%]</th> <th>Efficiency [%]</th> </tr> </thead> <tbody> <tr><td>75</td><td>69.7</td><td>71.0</td></tr> <tr><td>80</td><td>69.3</td><td>71.6</td></tr> <tr><td>85</td><td>68.9</td><td>72.3</td></tr> <tr><td>90</td><td>68.4</td><td>72.4</td></tr> <tr><td>100</td><td>67.1</td><td>72.5</td></tr> <tr><td>110</td><td>65.8</td><td>72.2</td></tr> <tr><td>120</td><td>64.1</td><td>71.8</td></tr> <tr><td>132</td><td>62.0</td><td>71.1</td></tr> <tr><td>140</td><td>60.6</td><td>70.6</td></tr> </tbody> </table> |  |          |  | Input Voltage [V] | Load 50% | Load 100% | Efficiency [%] | Efficiency [%] | 75 | 69.7 | 71.0 | 80 | 69.3 | 71.6 | 85 | 68.9 | 72.3 | 90 | 68.4 | 72.4 | 100 | 67.1 | 72.5 | 110 | 65.8 | 72.2 | 120 | 64.1 | 71.8 | 132 | 62.0 | 71.1 | 140 | 60.6 | 70.6 |
| Input Voltage [V]                                                                                    | Load 50%       | Load 100%                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
|                                                                                                      | Efficiency [%] | Efficiency [%]                               |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 75                                                                                                   | 69.7           | 71.0                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 80                                                                                                   | 69.3           | 71.6                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 85                                                                                                   | 68.9           | 72.3                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 90                                                                                                   | 68.4           | 72.4                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 100                                                                                                  | 67.1           | 72.5                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 110                                                                                                  | 65.8           | 72.2                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 120                                                                                                  | 64.1           | 71.8                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 132                                                                                                  | 62.0           | 71.1                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 140                                                                                                  | 60.6           | 70.6                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>(注) 斜線は定格入力電圧範囲を示す。</p>     |                |                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                   |          |           |                |                |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |

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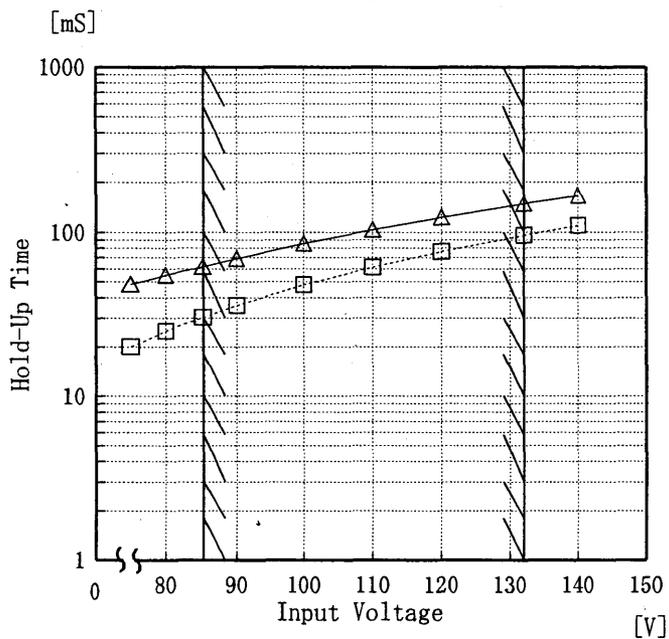
| Model                                                                                           | MMB50A-2                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Temperature       | 25°C     |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|-------------------|----------|-----------|--------------|--------------|----|------|------|----|------|------|----|------|------|----|------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|------|
| Item                                                                                            | Power Factor (by Input Voltage)<br>力率 (入力電圧特性)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Testing Circuitry | Figure A |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| Object                                                                                          | _____                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 1. Graph                                                                                        | <p>-----□----- load 50%</p> <p>-----△----- load 100%</p> | 2. Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
|                                                                                                 |                                                          | <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th>load 50%</th> <th>load 100%</th> </tr> <tr> <th>Power Factor</th> <th>Power Factor</th> </tr> </thead> <tbody> <tr><td>75</td><td>0.59</td><td>0.63</td></tr> <tr><td>80</td><td>0.59</td><td>0.61</td></tr> <tr><td>85</td><td>0.58</td><td>0.60</td></tr> <tr><td>90</td><td>0.57</td><td>0.59</td></tr> <tr><td>100</td><td>0.56</td><td>0.58</td></tr> <tr><td>110</td><td>0.55</td><td>0.56</td></tr> <tr><td>120</td><td>0.54</td><td>0.55</td></tr> <tr><td>132</td><td>0.53</td><td>0.54</td></tr> <tr><td>140</td><td>0.52</td><td>0.53</td></tr> </tbody> </table> |                   |          | Input Voltage [V] | load 50% | load 100% | Power Factor | Power Factor | 75 | 0.59 | 0.63 | 80 | 0.59 | 0.61 | 85 | 0.58 | 0.60 | 90 | 0.57 | 0.59 | 100 | 0.56 | 0.58 | 110 | 0.55 | 0.56 | 120 | 0.54 | 0.55 | 132 | 0.53 | 0.54 | 140 | 0.52 | 0.53 |
| Input Voltage [V]                                                                               | load 50%                                                 | load 100%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
|                                                                                                 | Power Factor                                             | Power Factor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 75                                                                                              | 0.59                                                     | 0.63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 80                                                                                              | 0.59                                                     | 0.61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 85                                                                                              | 0.58                                                     | 0.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 90                                                                                              | 0.57                                                     | 0.59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 100                                                                                             | 0.56                                                     | 0.58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 110                                                                                             | 0.55                                                     | 0.56                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 120                                                                                             | 0.54                                                     | 0.55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 132                                                                                             | 0.53                                                     | 0.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| 140                                                                                             | 0.52                                                     | 0.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |
| <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>(注)斜線は定格入力電圧範囲を示す。</p> |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |          |                   |          |           |              |              |    |      |      |    |      |      |    |      |      |    |      |      |     |      |      |     |      |      |     |      |      |     |      |      |     |      |      |



|        |                     |
|--------|---------------------|
| Model  | MMB50A-2            |
| Item   | Hold-Up Time 出力保持時間 |
| Object | +5.0V5A             |

Temperature 25°C  
Testing Circuitry Figure A

1. Graph —△— Load 50%  
- -□- - Load 100%



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

Note: Slanted line shows the range of the rated input voltage.

出力保持時間とは、入力電圧断から出力電圧が、定電圧精度の規格範囲を保持しているところまでの時間。

(注)斜線は定格入力電圧範囲を示す。

2. Values

| Input Voltage [V] | Load 50%          | Load 100%         |
|-------------------|-------------------|-------------------|
|                   | Hold-Up Time [mS] | Hold-Up Time [mS] |
| 75                | 48                | 20                |
| 80                | 55                | 25                |
| 85                | 62                | 30                |
| 90                | 69                | 36                |
| 100               | 85                | 48                |
| 110               | 104               | 62                |
| 120               | 123               | 76                |
| 132               | 149               | 96                |
| 140               | 168               | 110               |



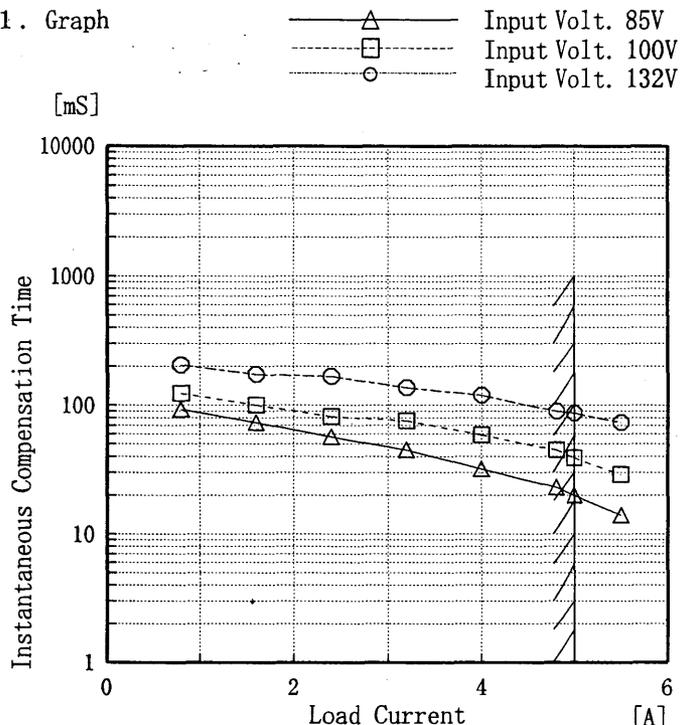
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   | MMB50A-2            |                   | Temperature       | 25°C     |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|-------------------|-------------------|----------|-------------------|----------|-----------|-------------------|-------------------|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|-----|
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   | Hold-Up Time 出力保持時間 |                   | Testing Circuitry | Figure A |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| Object                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   | +12.0V2.1A          |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 1. Graph                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                     | —△— Load 50%      | 2. Values         |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                     | - -□- - Load 100% |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                     |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| <p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>出力保持時間とは、入力電圧断から出力電圧が、定電圧精度の規格範囲を保持しているところまでの時間。</p> <p>(注)斜線は定格入力電圧範囲を示す。</p>                                                                                                                                                                                                                                                                                                                              |                   |                     |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th>Load 50%</th> <th>Load 100%</th> </tr> <tr> <th>Hold-Up Time [mS]</th> <th>Hold-Up Time [mS]</th> </tr> </thead> <tbody> <tr><td>75</td><td>49</td><td>22</td></tr> <tr><td>80</td><td>56</td><td>27</td></tr> <tr><td>85</td><td>62</td><td>32</td></tr> <tr><td>90</td><td>70</td><td>37</td></tr> <tr><td>100</td><td>85</td><td>50</td></tr> <tr><td>110</td><td>103</td><td>63</td></tr> <tr><td>120</td><td>122</td><td>78</td></tr> <tr><td>132</td><td>147</td><td>98</td></tr> <tr><td>140</td><td>165</td><td>112</td></tr> </tbody> </table> |                   |                     |                   |                   |          | Input Voltage [V] | Load 50% | Load 100% | Hold-Up Time [mS] | Hold-Up Time [mS] | 75 | 49 | 22 | 80 | 56 | 27 | 85 | 62 | 32 | 90 | 70 | 37 | 100 | 85 | 50 | 110 | 103 | 63 | 120 | 122 | 78 | 132 | 147 | 98 | 140 | 165 | 112 |
| Input Voltage [V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Load 50%          | Load 100%           |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hold-Up Time [mS] | Hold-Up Time [mS]   |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 49                | 22                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 56                | 27                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 62                | 32                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 70                | 37                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 85                | 50                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 103               | 63                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 122               | 78                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 132                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 147               | 98                  |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |
| 140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 165               | 112                 |                   |                   |          |                   |          |           |                   |                   |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |     |    |     |     |    |     |     |    |     |     |     |



|        |                                                   |
|--------|---------------------------------------------------|
| Model  | MMB50A-2                                          |
| Item   | Instantaneous Interruption Compensation<br>瞬時停電保障 |
| Object | +5.0V5.00A                                        |

Testing Circuitry Figure A

1. Graph



2. Values

| Load Current [A] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
|------------------|-------------------|--------------------|--------------------|
|                  | Time [mS]         |                    |                    |
| 0.0              | —                 | —                  | —                  |
| 0.8              | 93                | 124                | 205                |
| 1.6              | 73                | 100                | 173                |
| 2.4              | 57                | 82                 | 168                |
| 3.2              | 45                | 76                 | 137                |
| 4.0              | 32                | 59                 | 120                |
| 4.8              | 23                | 45                 | 90                 |
| 5.0              | 20                | 39                 | 87                 |
| 5.5              | 14                | 29                 | 73                 |
| —                | —                 | —                  | —                  |
| —                | —                 | —                  | —                  |

This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

Note: Slanted line shows the range of the rated load current.

瞬時停電保障時間とは、出力電圧が定電圧精度の規格範囲を保持している瞬時停電時間をいう。

(注) 斜線は定格負荷電流範囲を示す。



| Model                                                                                                                                                                                                                                                                                       |                   | MMB50A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    | Testing Circuitry Figure A |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|------------------|-------------------|--------------------|--------------------|-----------|--|--|-----|---|---|---|------|----|-----|-----|------|----|----|-----|------|----|----|-----|------|----|----|-----|------|----|----|-----|------|----|----|----|------|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|
| Item                                                                                                                                                                                                                                                                                        |                   | Instantaneous Interruption Compensation<br>瞬時停電保障                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| Object                                                                                                                                                                                                                                                                                      |                   | +12.0V2.10A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 1. Graph                                                                                                                                                                                                                                                                                    |                   | <p> <input type="checkbox"/>—△— Input Volt. 85V<br/> <input type="checkbox"/>---□--- Input Volt. 100V<br/> <input type="checkbox"/>---○--- Input Volt. 132V                 </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    | 2. Values                  |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                             |                   | <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th>Input Volt. 85[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> <tr> <th colspan="3">Time [mS]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>0.40</td><td>93</td><td>123</td><td>196</td></tr> <tr><td>0.80</td><td>67</td><td>98</td><td>176</td></tr> <tr><td>1.20</td><td>54</td><td>83</td><td>161</td></tr> <tr><td>1.60</td><td>38</td><td>72</td><td>140</td></tr> <tr><td>2.00</td><td>24</td><td>50</td><td>108</td></tr> <tr><td>2.10</td><td>22</td><td>45</td><td>92</td></tr> <tr><td>2.31</td><td>17</td><td>35</td><td>86</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> |                    |                            | Load Current [A] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] | Time [mS] |  |  | 0.0 | — | — | — | 0.40 | 93 | 123 | 196 | 0.80 | 67 | 98 | 176 | 1.20 | 54 | 83 | 161 | 1.60 | 38 | 72 | 140 | 2.00 | 24 | 50 | 108 | 2.10 | 22 | 45 | 92 | 2.31 | 17 | 35 | 86 | — | — | — | — | — | — | — | — | — | — | — | — |
| Load Current [A]                                                                                                                                                                                                                                                                            | Input Volt. 85[V] | Input Volt. 100[V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Input Volt. 132[V] |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                             | Time [mS]         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 0.0                                                                                                                                                                                                                                                                                         | —                 | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | —                  |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 0.40                                                                                                                                                                                                                                                                                        | 93                | 123                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 196                |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 0.80                                                                                                                                                                                                                                                                                        | 67                | 98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 176                |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.20                                                                                                                                                                                                                                                                                        | 54                | 83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 161                |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.60                                                                                                                                                                                                                                                                                        | 38                | 72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 140                |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.00                                                                                                                                                                                                                                                                                        | 24                | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 108                |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.10                                                                                                                                                                                                                                                                                        | 22                | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 92                 |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.31                                                                                                                                                                                                                                                                                        | 17                | 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 86                 |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                           | —                 | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | —                  |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                           | —                 | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | —                  |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                           | —                 | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | —                  |                            |                  |                   |                    |                    |           |  |  |     |   |   |   |      |    |     |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |     |      |    |    |    |      |    |    |    |   |   |   |   |   |   |   |   |   |   |   |   |
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| <b>Model</b> MMB50A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     | Temperature      25°C         |                         |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------|-------------------------|-------------------------|---------------------|---------------------|---------------------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|-------|-------|-------|---|---|---|---|
| <b>Item</b> Load Regulation  静的負荷変動                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     | Testing Circuitry    Figure A |                         |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| <b>Object</b> +5.0V5.00A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                               |                         |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| <p>1. Graph</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>2. Values</p> <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Load Current<br/>[A]</th> <th>Input Volt.<br/>85.0[V]</th> <th>Input Volt.<br/>100.0[V]</th> <th>Input Volt.<br/>132.0[V]</th> </tr> <tr> <th>Output<br/>Volt. [V]</th> <th>Output<br/>Volt. [V]</th> <th>Output<br/>Volt. [V]</th> </tr> </thead> <tbody> <tr><td>0.000</td><td>5.091</td><td>5.092</td><td>5.092</td></tr> <tr><td>0.800</td><td>5.089</td><td>5.089</td><td>5.089</td></tr> <tr><td>1.600</td><td>5.087</td><td>5.087</td><td>5.088</td></tr> <tr><td>2.400</td><td>5.086</td><td>5.086</td><td>5.086</td></tr> <tr><td>3.200</td><td>5.084</td><td>5.084</td><td>5.084</td></tr> <tr><td>4.000</td><td>5.082</td><td>5.082</td><td>5.082</td></tr> <tr><td>4.800</td><td>5.080</td><td>5.081</td><td>5.081</td></tr> <tr><td>5.000</td><td>5.080</td><td>5.080</td><td>5.080</td></tr> <tr><td>5.500</td><td>5.079</td><td>5.079</td><td>5.079</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> </div> </div>         | Load Current<br>[A] | Input Volt.<br>85.0[V]        | Input Volt.<br>100.0[V] | Input Volt.<br>132.0[V] | Output<br>Volt. [V] | Output<br>Volt. [V] | Output<br>Volt. [V] | 0.000 | 5.091  | 5.092  | 5.092  | 0.800 | 5.089  | 5.089  | 5.089  | 1.600 | 5.087  | 5.087  | 5.088  | 2.400 | 5.086  | 5.086  | 5.086  | 3.200 | 5.084  | 5.084  | 5.084  | 4.000 | 5.082  | 5.082  | 5.082  | 4.800 | 5.080  | 5.081  | 5.081  | 5.000 | 5.080  | 5.080  | 5.080  | 5.500 | 5.079 | 5.079 | 5.079 | — | — | — | — |
| Load Current<br>[A]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     | Input Volt.<br>85.0[V]        | Input Volt.<br>100.0[V] | Input Volt.<br>132.0[V] |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Output<br>Volt. [V] | Output<br>Volt. [V]           | Output<br>Volt. [V]     |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.091               | 5.092                         | 5.092                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.089               | 5.089                         | 5.089                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 1.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.087               | 5.087                         | 5.088                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 2.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.086               | 5.086                         | 5.086                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 3.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.084               | 5.084                         | 5.084                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 4.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.082               | 5.082                         | 5.082                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 4.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.080               | 5.081                         | 5.081                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 5.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.080               | 5.080                         | 5.080                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 5.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.079               | 5.079                         | 5.079                   |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | —                   | —                             | —                       |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| <b>Object</b> +12V2.10A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                               |                         |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| <p>1. Graph</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>2. Values</p> <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Load Current<br/>[A]</th> <th>Input Volt.<br/>85.0[V]</th> <th>Input Volt.<br/>100.0[V]</th> <th>Input Volt.<br/>132.0[V]</th> </tr> <tr> <th>Output<br/>Volt. [V]</th> <th>Output<br/>Volt. [V]</th> <th>Output<br/>Volt. [V]</th> </tr> </thead> <tbody> <tr><td>0.000</td><td>12.056</td><td>12.056</td><td>12.056</td></tr> <tr><td>0.400</td><td>12.053</td><td>12.053</td><td>12.053</td></tr> <tr><td>0.800</td><td>12.051</td><td>12.051</td><td>12.052</td></tr> <tr><td>1.200</td><td>12.050</td><td>12.050</td><td>12.050</td></tr> <tr><td>1.600</td><td>12.049</td><td>12.049</td><td>12.049</td></tr> <tr><td>2.000</td><td>12.047</td><td>12.047</td><td>12.047</td></tr> <tr><td>2.100</td><td>12.047</td><td>12.047</td><td>12.047</td></tr> <tr><td>2.310</td><td>12.046</td><td>12.046</td><td>12.046</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> </div> </div> | Load Current<br>[A] | Input Volt.<br>85.0[V]        | Input Volt.<br>100.0[V] | Input Volt.<br>132.0[V] | Output<br>Volt. [V] | Output<br>Volt. [V] | Output<br>Volt. [V] | 0.000 | 12.056 | 12.056 | 12.056 | 0.400 | 12.053 | 12.053 | 12.053 | 0.800 | 12.051 | 12.051 | 12.052 | 1.200 | 12.050 | 12.050 | 12.050 | 1.600 | 12.049 | 12.049 | 12.049 | 2.000 | 12.047 | 12.047 | 12.047 | 2.100 | 12.047 | 12.047 | 12.047 | 2.310 | 12.046 | 12.046 | 12.046 | —     | —     | —     | —     | — | — | — | — |
| Load Current<br>[A]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     | Input Volt.<br>85.0[V]        | Input Volt.<br>100.0[V] | Input Volt.<br>132.0[V] |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Output<br>Volt. [V] | Output<br>Volt. [V]           | Output<br>Volt. [V]     |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.056              | 12.056                        | 12.056                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.053              | 12.053                        | 12.053                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.051              | 12.051                        | 12.052                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 1.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.050              | 12.050                        | 12.050                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 1.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.049              | 12.049                        | 12.049                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 2.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.047              | 12.047                        | 12.047                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 2.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.047              | 12.047                        | 12.047                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| 2.310                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12.046              | 12.046                        | 12.046                  |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | —                   | —                             | —                       |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | —                   | —                             | —                       |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |
| <p>Note: Slanted line shows the range of the rated load current.<br/>         (注)斜線は定格負荷電流範囲を示す。</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                               |                         |                         |                     |                     |                     |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |        |        |        |       |       |       |       |   |   |   |   |

# COSEL

| Model                                                                                                                                                                                                                                                                                       |                          | MMB50A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------|--------------------|---------------------|--------------------------|--------------------------|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|----|----|-----|----|----|-----|----|----|-----|----|----|---|---|---|---|---|---|
| Item                                                                                                                                                                                                                                                                                        |                          | Ripple Voltage (by Load Current)<br>リップル電圧(負荷電流特性)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| Object                                                                                                                                                                                                                                                                                      |                          | +5.0V 5.00A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| Temperature                                                                                                                                                                                                                                                                                 |                          | 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| Testing Circuitry                                                                                                                                                                                                                                                                           |                          | Figure A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 1. Graph                                                                                                                                                                                                                                                                                    |                          | 2. Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| <p>-----□----- Input Volt. 85V<br/>                 -----△----- Input Volt. 132V</p> <p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>リップル電圧は、下図 p-p 値で示される。<br/>                 (注) 斜線は定格負荷電流範囲を示す。</p> |                          | <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th>Input Volt. 85 [V]</th> <th>Input Volt. 132 [V]</th> </tr> <tr> <th>Ripple Output Volt. [mV]</th> <th>Ripple Output Volt. [mV]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5</td><td>5</td></tr> <tr><td>0.8</td><td>5</td><td>5</td></tr> <tr><td>1.6</td><td>5</td><td>5</td></tr> <tr><td>2.4</td><td>5</td><td>5</td></tr> <tr><td>3.2</td><td>5</td><td>5</td></tr> <tr><td>4.0</td><td>10</td><td>10</td></tr> <tr><td>4.8</td><td>10</td><td>10</td></tr> <tr><td>5.0</td><td>10</td><td>10</td></tr> <tr><td>5.5</td><td>10</td><td>10</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> |  | Load Current [A] | Input Volt. 85 [V] | Input Volt. 132 [V] | Ripple Output Volt. [mV] | Ripple Output Volt. [mV] | 0.0 | 5 | 5 | 0.8 | 5 | 5 | 1.6 | 5 | 5 | 2.4 | 5 | 5 | 3.2 | 5 | 5 | 4.0 | 10 | 10 | 4.8 | 10 | 10 | 5.0 | 10 | 10 | 5.5 | 10 | 10 | — | — | — | — | — | — |
| Load Current [A]                                                                                                                                                                                                                                                                            | Input Volt. 85 [V]       | Input Volt. 132 [V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                             | Ripple Output Volt. [mV] | Ripple Output Volt. [mV]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 0.0                                                                                                                                                                                                                                                                                         | 5                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 0.8                                                                                                                                                                                                                                                                                         | 5                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 1.6                                                                                                                                                                                                                                                                                         | 5                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 2.4                                                                                                                                                                                                                                                                                         | 5                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 3.2                                                                                                                                                                                                                                                                                         | 5                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 4.0                                                                                                                                                                                                                                                                                         | 10                       | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 4.8                                                                                                                                                                                                                                                                                         | 10                       | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 5.0                                                                                                                                                                                                                                                                                         | 10                       | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 5.5                                                                                                                                                                                                                                                                                         | 10                       | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                           | —                        | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                           | —                        | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| <p>T1: Due to AC Input Line<br/>                 入力商用周期</p> <p>T2: Due to Switching<br/>                 スイッチング周期</p> <p>Fig. Complex Ripple Wave Form<br/>                 図 リップル波形詳細図</p>                                                                                                 |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |

# COSEL

| Model                                                                                                                                                                                                                                                                                                               |                          | MMB50A-2                                           |  | Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | 25°C     |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|--|------------------|--------------------|---------------------|--------------------------|--------------------------|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|----|----|-----|----|----|-----|----|----|-----|----|----|---|---|---|---|---|---|---|---|---|
| Item                                                                                                                                                                                                                                                                                                                |                          | Ripple Voltage (by Load Current)<br>リップル電圧(負荷電流特性) |  | Testing Circuitry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Figure A |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| Object                                                                                                                                                                                                                                                                                                              |                          | +12.0V 2.10A                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 1. Graph                                                                                                                                                                                                                                                                                                            |                          |                                                    |  | 2. Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| [mV]                                                                                                                                                                                                                                                                                                                |                          | -----□----- Input Volt. 85V                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                     |                          | -----△----- Input Volt. 132V                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                     |                          |                                                    |  | <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th>Input Volt. 85 [V]</th> <th>Input Volt. 132 [V]</th> </tr> <tr> <th>Ripple Output Volt. [mV]</th> <th>Ripple Output Volt. [mV]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5</td><td>5</td></tr> <tr><td>0.4</td><td>5</td><td>5</td></tr> <tr><td>0.8</td><td>5</td><td>5</td></tr> <tr><td>1.2</td><td>5</td><td>5</td></tr> <tr><td>1.6</td><td>10</td><td>10</td></tr> <tr><td>2.0</td><td>10</td><td>10</td></tr> <tr><td>2.1</td><td>10</td><td>10</td></tr> <tr><td>2.3</td><td>15</td><td>10</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> |  |          |  | Load Current [A] | Input Volt. 85 [V] | Input Volt. 132 [V] | Ripple Output Volt. [mV] | Ripple Output Volt. [mV] | 0.0 | 5 | 5 | 0.4 | 5 | 5 | 0.8 | 5 | 5 | 1.2 | 5 | 5 | 1.6 | 10 | 10 | 2.0 | 10 | 10 | 2.1 | 10 | 10 | 2.3 | 15 | 10 | — | — | — | — | — | — | — | — | — |
| Load Current [A]                                                                                                                                                                                                                                                                                                    | Input Volt. 85 [V]       | Input Volt. 132 [V]                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                     | Ripple Output Volt. [mV] | Ripple Output Volt. [mV]                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 0.0                                                                                                                                                                                                                                                                                                                 | 5                        | 5                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 0.4                                                                                                                                                                                                                                                                                                                 | 5                        | 5                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 0.8                                                                                                                                                                                                                                                                                                                 | 5                        | 5                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 1.2                                                                                                                                                                                                                                                                                                                 | 5                        | 5                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 1.6                                                                                                                                                                                                                                                                                                                 | 10                       | 10                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 2.0                                                                                                                                                                                                                                                                                                                 | 10                       | 10                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 2.1                                                                                                                                                                                                                                                                                                                 | 10                       | 10                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 2.3                                                                                                                                                                                                                                                                                                                 | 15                       | 10                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                   | —                        | —                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                   | —                        | —                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                   | —                        | —                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| <p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>リップル電圧は、下図 p-p 値で示される。<br/>(注) 斜線は定格負荷電流範囲を示す。</p> <p>T1: Due to AC Input Line 入力商用周期<br/>T2: Due to Switching スイッチング周期</p> <p>Fig. Complex Ripple Wave Form<br/>図 リップル波形詳細図</p> |                          |                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |          |  |                  |                    |                     |                          |                          |     |   |   |     |   |   |     |   |   |     |   |   |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |

# COSEL

| Model                                                                                                                                                                                                                                                                               |                    | MMB50A-2             |  | Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | 25°C     |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|--|------------------|--------------------|---------------------|-------------------|-------------------|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|---|---|---|---|---|---|
| Item                                                                                                                                                                                                                                                                                |                    | Ripple-Noise リップルノイズ |  | Testing Circuitry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Figure A |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| Object                                                                                                                                                                                                                                                                              |                    | +5.0V5.00A           |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| <p>1. Graph</p> <p>[mV]</p> <p>-----□----- Input Volt. 85V</p> <p>-----△----- Input Volt. 132V</p> <p>Ripple-Noise is shown as p-p in the figure below.<br/>Note: Slanted line shows the range of the rated load current.</p> <p>リップルノイズは、下図 p-p 値で示される。<br/>(注)斜線は定格負荷電流範囲を示す。</p> |                    |                      |  | <p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load current [A]</th> <th>Input Volt. 85 [V]</th> <th>Input Volt. 132 [V]</th> </tr> <tr> <th>Ripple-Noise [mV]</th> <th>Ripple-Noise [mV]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>20</td><td>20</td></tr> <tr><td>0.8</td><td>20</td><td>20</td></tr> <tr><td>1.6</td><td>20</td><td>20</td></tr> <tr><td>2.4</td><td>20</td><td>20</td></tr> <tr><td>3.2</td><td>20</td><td>20</td></tr> <tr><td>4.0</td><td>20</td><td>20</td></tr> <tr><td>4.8</td><td>25</td><td>20</td></tr> <tr><td>5.0</td><td>25</td><td>20</td></tr> <tr><td>5.5</td><td>25</td><td>20</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> |  |          |  | Load current [A] | Input Volt. 85 [V] | Input Volt. 132 [V] | Ripple-Noise [mV] | Ripple-Noise [mV] | 0.0 | 20 | 20 | 0.8 | 20 | 20 | 1.6 | 20 | 20 | 2.4 | 20 | 20 | 3.2 | 20 | 20 | 4.0 | 20 | 20 | 4.8 | 25 | 20 | 5.0 | 25 | 20 | 5.5 | 25 | 20 | — | — | — | — | — | — |
| Load current [A]                                                                                                                                                                                                                                                                    | Input Volt. 85 [V] | Input Volt. 132 [V]  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                     | Ripple-Noise [mV]  | Ripple-Noise [mV]    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 0.0                                                                                                                                                                                                                                                                                 | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 0.8                                                                                                                                                                                                                                                                                 | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 1.6                                                                                                                                                                                                                                                                                 | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 2.4                                                                                                                                                                                                                                                                                 | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 3.2                                                                                                                                                                                                                                                                                 | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 4.0                                                                                                                                                                                                                                                                                 | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 4.8                                                                                                                                                                                                                                                                                 | 25                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 5.0                                                                                                                                                                                                                                                                                 | 25                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| 5.5                                                                                                                                                                                                                                                                                 | 25                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                   | —                  | —                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                   | —                  | —                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |
| <p>T1: Due to AC Input Line<br/>入力商用周期</p> <p>T2: Due to Switching<br/>スイッチング周期</p> <p>Fig. Complex Ripple Wave Form<br/>図 リップル波形詳細図</p>                                                                                                                                            |                    |                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |

# COSEL

| Model                                                                                                                                                                                                                                                                                                                                                                              |                    | MMB50A-2             |  | Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | 25°C     |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|--|------------------|--------------------|---------------------|-------------------|-------------------|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|----|---|---|---|---|---|---|---|---|---|
| Item                                                                                                                                                                                                                                                                                                                                                                               |                    | Ripple-Noise リップルノイズ |  | Testing Circuitry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | Figure A |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| Object                                                                                                                                                                                                                                                                                                                                                                             |                    | +12.0V2.10A          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| <p>1. Graph</p> <p>[mV]</p> <p>-----□----- Input Volt. 85V<br/>                 -----△----- Input Volt. 132V</p> <p>Ripple-Noise</p> <p>Load Current [A]</p>                                                                                                                                                                                                                       |                    |                      |  | <p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load current [A]</th> <th>Input Volt. 85 [V]</th> <th>Input Volt. 132 [V]</th> </tr> <tr> <th>Ripple-Noise [mV]</th> <th>Ripple-Noise [mV]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>20</td><td>20</td></tr> <tr><td>0.4</td><td>20</td><td>20</td></tr> <tr><td>0.8</td><td>20</td><td>20</td></tr> <tr><td>1.2</td><td>20</td><td>20</td></tr> <tr><td>1.6</td><td>25</td><td>20</td></tr> <tr><td>2.0</td><td>25</td><td>20</td></tr> <tr><td>2.1</td><td>30</td><td>20</td></tr> <tr><td>2.3</td><td>30</td><td>20</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table> |  |          |  | Load current [A] | Input Volt. 85 [V] | Input Volt. 132 [V] | Ripple-Noise [mV] | Ripple-Noise [mV] | 0.0 | 20 | 20 | 0.4 | 20 | 20 | 0.8 | 20 | 20 | 1.2 | 20 | 20 | 1.6 | 25 | 20 | 2.0 | 25 | 20 | 2.1 | 30 | 20 | 2.3 | 30 | 20 | — | — | — | — | — | — | — | — | — |
| Load current [A]                                                                                                                                                                                                                                                                                                                                                                   | Input Volt. 85 [V] | Input Volt. 132 [V]  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                    | Ripple-Noise [mV]  | Ripple-Noise [mV]    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 0.0                                                                                                                                                                                                                                                                                                                                                                                | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 0.4                                                                                                                                                                                                                                                                                                                                                                                | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 0.8                                                                                                                                                                                                                                                                                                                                                                                | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 1.2                                                                                                                                                                                                                                                                                                                                                                                | 20                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 1.6                                                                                                                                                                                                                                                                                                                                                                                | 25                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 2.0                                                                                                                                                                                                                                                                                                                                                                                | 25                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 2.1                                                                                                                                                                                                                                                                                                                                                                                | 30                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| 2.3                                                                                                                                                                                                                                                                                                                                                                                | 30                 | 20                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                                                                                  | —                  | —                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                                                                                  | —                  | —                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| —                                                                                                                                                                                                                                                                                                                                                                                  | —                  | —                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| <p>Ripple-Noise is shown as p-p in the figure below.<br/>                 Note: Slanted line shows the range of the rated load current.</p> <p>リップルノイズは、下図 p-p 値で示される。<br/>                 (注)斜線は定格負荷電流範囲を示す。</p> <p>T1: Due to AC Input Line<br/>                 入力商用周期<br/>                 T2: Due to Switching<br/>                 スイッチング周期</p> <p>Ripple-Noise [mVp-p]</p> |                    |                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |
| <p>Fig. Complex Ripple Wave Form<br/>                 図 リップル波形詳細図</p>                                                                                                                                                                                                                                                                                                              |                    |                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |          |  |                  |                    |                     |                   |                   |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |     |    |    |   |   |   |   |   |   |   |   |   |

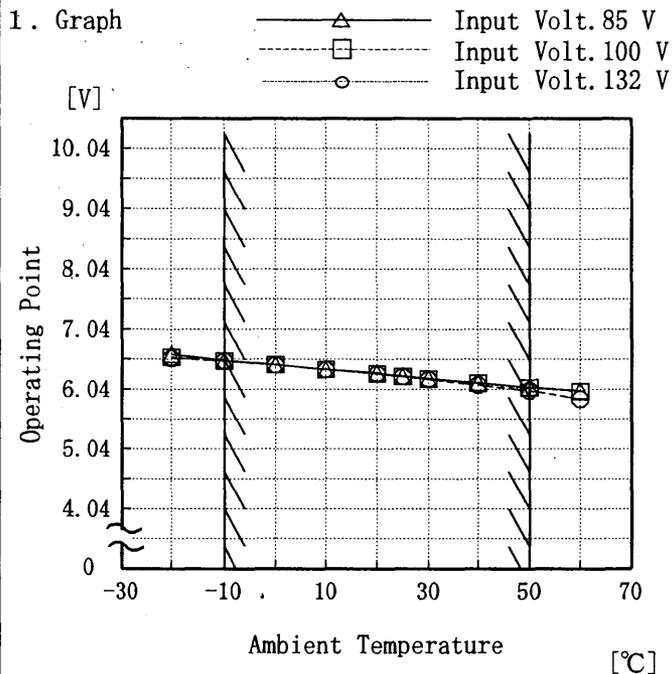
# COSEL

| Model                                                                                          |                     | MMB50A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      | Temperature                |  | 25°C |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
|------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------|--|------|--|--------------------|---------------------|----------------------|----------------------|------------------|------------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|
| Item                                                                                           |                     | Overcurrent Protection<br>過電流保護                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      | Testing Circuitry Figure A |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| Object                                                                                         |                     | +5.0V5.00A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 1. Graph                                                                                       |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      | 2. Values                  |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
|                                                                                                |                     | <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th>Input Volt. 85.0[V]</th> <th>Input Volt. 100.0[V]</th> <th>Input Volt. 132.0[V]</th> </tr> <tr> <th>Load Current [A]</th> <th>Load Current [A]</th> <th>Load Current [A]</th> </tr> </thead> <tbody> <tr><td>5.00</td><td>6.081</td><td>6.449</td><td>6.115</td></tr> <tr><td>4.75</td><td>6.076</td><td>6.417</td><td>6.071</td></tr> <tr><td>4.50</td><td>6.047</td><td>6.352</td><td>5.987</td></tr> <tr><td>4.00</td><td>5.967</td><td>6.221</td><td>5.833</td></tr> <tr><td>3.50</td><td>5.857</td><td>6.068</td><td>5.680</td></tr> <tr><td>3.00</td><td>5.708</td><td>5.882</td><td>5.483</td></tr> <tr><td>2.50</td><td>5.517</td><td>5.655</td><td>5.269</td></tr> <tr><td>2.00</td><td>5.257</td><td>5.365</td><td>5.010</td></tr> <tr><td>1.50</td><td>4.967</td><td>5.035</td><td>4.744</td></tr> <tr><td>1.00</td><td>4.585</td><td>4.662</td><td>4.410</td></tr> <tr><td>0.50</td><td>4.079</td><td>4.151</td><td>3.980</td></tr> <tr><td>0.00</td><td>3.799</td><td>3.873</td><td>3.738</td></tr> </tbody> </table>    |                      |                            |  |      |  | Output Voltage [V] | Input Volt. 85.0[V] | Input Volt. 100.0[V] | Input Volt. 132.0[V] | Load Current [A] | Load Current [A] | Load Current [A] | 5.00  | 6.081 | 6.449 | 6.115 | 4.75  | 6.076 | 6.417 | 6.071 | 4.50  | 6.047 | 6.352 | 5.987 | 4.00 | 5.967 | 6.221 | 5.833 | 3.50 | 5.857 | 6.068 | 5.680 | 3.00 | 5.708 | 5.882 | 5.483 | 2.50 | 5.517 | 5.655 | 5.269 | 2.00 | 5.257 | 5.365 | 5.010 | 1.50 | 4.967 | 5.035 | 4.744 | 1.00 | 4.585 | 4.662 | 4.410 | 0.50 | 4.079 | 4.151 | 3.980 | 0.00 | 3.799 | 3.873 | 3.738 |
| Output Voltage [V]                                                                             | Input Volt. 85.0[V] | Input Volt. 100.0[V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Input Volt. 132.0[V] |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
|                                                                                                | Load Current [A]    | Load Current [A]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Load Current [A]     |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 5.00                                                                                           | 6.081               | 6.449                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6.115                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 4.75                                                                                           | 6.076               | 6.417                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6.071                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 4.50                                                                                           | 6.047               | 6.352                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.987                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 4.00                                                                                           | 5.967               | 6.221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.833                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 3.50                                                                                           | 5.857               | 6.068                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.680                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 3.00                                                                                           | 5.708               | 5.882                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.483                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 2.50                                                                                           | 5.517               | 5.655                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.269                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 2.00                                                                                           | 5.257               | 5.365                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.010                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 1.50                                                                                           | 4.967               | 5.035                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4.744                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 1.00                                                                                           | 4.585               | 4.662                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4.410                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 0.50                                                                                           | 4.079               | 4.151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.980                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 0.00                                                                                           | 3.799               | 3.873                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.738                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| Object                                                                                         |                     | +12V2.10A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                      |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 1. Graph                                                                                       |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      | 2. Values                  |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
|                                                                                                |                     | <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th>Input Volt. 85.0[V]</th> <th>Input Volt. 100.0[V]</th> <th>Input Volt. 132.0[V]</th> </tr> <tr> <th>Load Current [A]</th> <th>Load Current [A]</th> <th>Load Current [A]</th> </tr> </thead> <tbody> <tr><td>12.00</td><td>2.679</td><td>2.796</td><td>2.804</td></tr> <tr><td>11.40</td><td>2.678</td><td>2.779</td><td>2.785</td></tr> <tr><td>10.80</td><td>2.667</td><td>2.755</td><td>2.755</td></tr> <tr><td>9.60</td><td>2.635</td><td>2.705</td><td>2.697</td></tr> <tr><td>8.40</td><td>2.582</td><td>2.639</td><td>2.626</td></tr> <tr><td>7.20</td><td>2.520</td><td>2.562</td><td>2.549</td></tr> <tr><td>6.00</td><td>2.437</td><td>2.473</td><td>2.461</td></tr> <tr><td>4.80</td><td>2.324</td><td>2.353</td><td>2.347</td></tr> <tr><td>3.60</td><td>2.201</td><td>2.224</td><td>2.226</td></tr> <tr><td>2.40</td><td>2.020</td><td>2.051</td><td>2.065</td></tr> <tr><td>1.20</td><td>1.825</td><td>1.858</td><td>1.885</td></tr> <tr><td>0.00</td><td>1.665</td><td>1.701</td><td>1.735</td></tr> </tbody> </table> |                      |                            |  |      |  | Output Voltage [V] | Input Volt. 85.0[V] | Input Volt. 100.0[V] | Input Volt. 132.0[V] | Load Current [A] | Load Current [A] | Load Current [A] | 12.00 | 2.679 | 2.796 | 2.804 | 11.40 | 2.678 | 2.779 | 2.785 | 10.80 | 2.667 | 2.755 | 2.755 | 9.60 | 2.635 | 2.705 | 2.697 | 8.40 | 2.582 | 2.639 | 2.626 | 7.20 | 2.520 | 2.562 | 2.549 | 6.00 | 2.437 | 2.473 | 2.461 | 4.80 | 2.324 | 2.353 | 2.347 | 3.60 | 2.201 | 2.224 | 2.226 | 2.40 | 2.020 | 2.051 | 2.065 | 1.20 | 1.825 | 1.858 | 1.885 | 0.00 | 1.665 | 1.701 | 1.735 |
| Output Voltage [V]                                                                             | Input Volt. 85.0[V] | Input Volt. 100.0[V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Input Volt. 132.0[V] |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
|                                                                                                | Load Current [A]    | Load Current [A]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Load Current [A]     |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 12.00                                                                                          | 2.679               | 2.796                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.804                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 11.40                                                                                          | 2.678               | 2.779                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.785                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 10.80                                                                                          | 2.667               | 2.755                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.755                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 9.60                                                                                           | 2.635               | 2.705                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.697                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 8.40                                                                                           | 2.582               | 2.639                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.626                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 7.20                                                                                           | 2.520               | 2.562                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.549                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 6.00                                                                                           | 2.437               | 2.473                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.461                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 4.80                                                                                           | 2.324               | 2.353                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.347                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 3.60                                                                                           | 2.201               | 2.224                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.226                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 2.40                                                                                           | 2.020               | 2.051                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.065                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 1.20                                                                                           | 1.825               | 1.858                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.885                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| 0.00                                                                                           | 1.665               | 1.701                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.735                |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |
| <p>Note: Slanted line shows the range of the rated load current.</p> <p>(注)斜線は定格負荷電流範囲を示す。</p> |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                            |  |      |  |                    |                     |                      |                      |                  |                  |                  |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |      |       |       |       |



|        |                                 |
|--------|---------------------------------|
| Model  | MMB50A-2                        |
| Item   | Overtoltage Protection<br>過電圧保護 |
| Object | +5.0V5.00A                      |

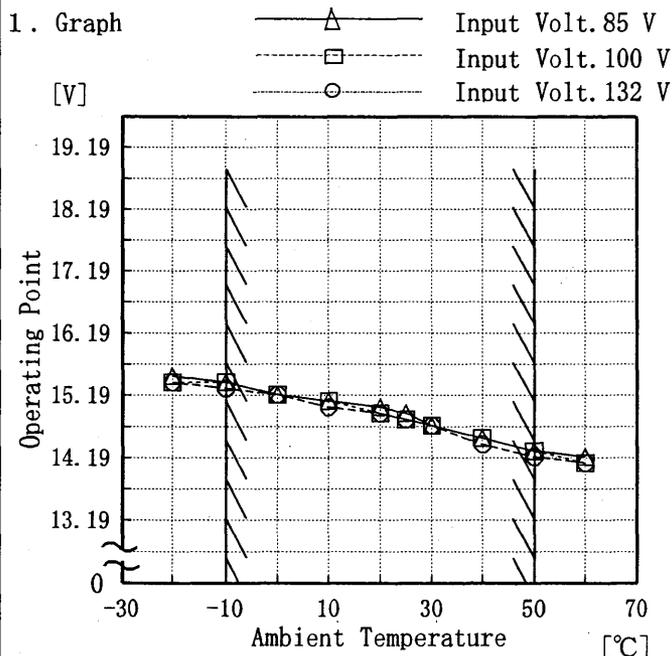
Testing Circuitry Figure A



2. Values

| Ambient Temp.<br>[°C] | Input Volt.<br>85[V] | Input Volt.<br>100[V] | Input Volt.<br>132[V] |
|-----------------------|----------------------|-----------------------|-----------------------|
|                       | Operating Point [V]  |                       |                       |
| -20                   | 6.62                 | 6.57                  | 6.56                  |
| -10                   | 6.52                 | 6.51                  | 6.51                  |
| 0                     | 6.45                 | 6.45                  | 6.45                  |
| 10                    | 6.37                 | 6.37                  | 6.37                  |
| 20                    | 6.31                 | 6.30                  | 6.30                  |
| 25                    | 6.26                 | 6.25                  | 6.25                  |
| 30                    | 6.22                 | 6.21                  | 6.20                  |
| 40                    | 6.15                 | 6.14                  | 6.11                  |
| 50                    | 6.07                 | 6.06                  | 6.01                  |
| 60                    | 6.01                 | 6.00                  | 5.87                  |
| -                     | -                    | -                     | -                     |

|        |           |
|--------|-----------|
| Object | +12V2.10A |
|--------|-----------|



2. Values

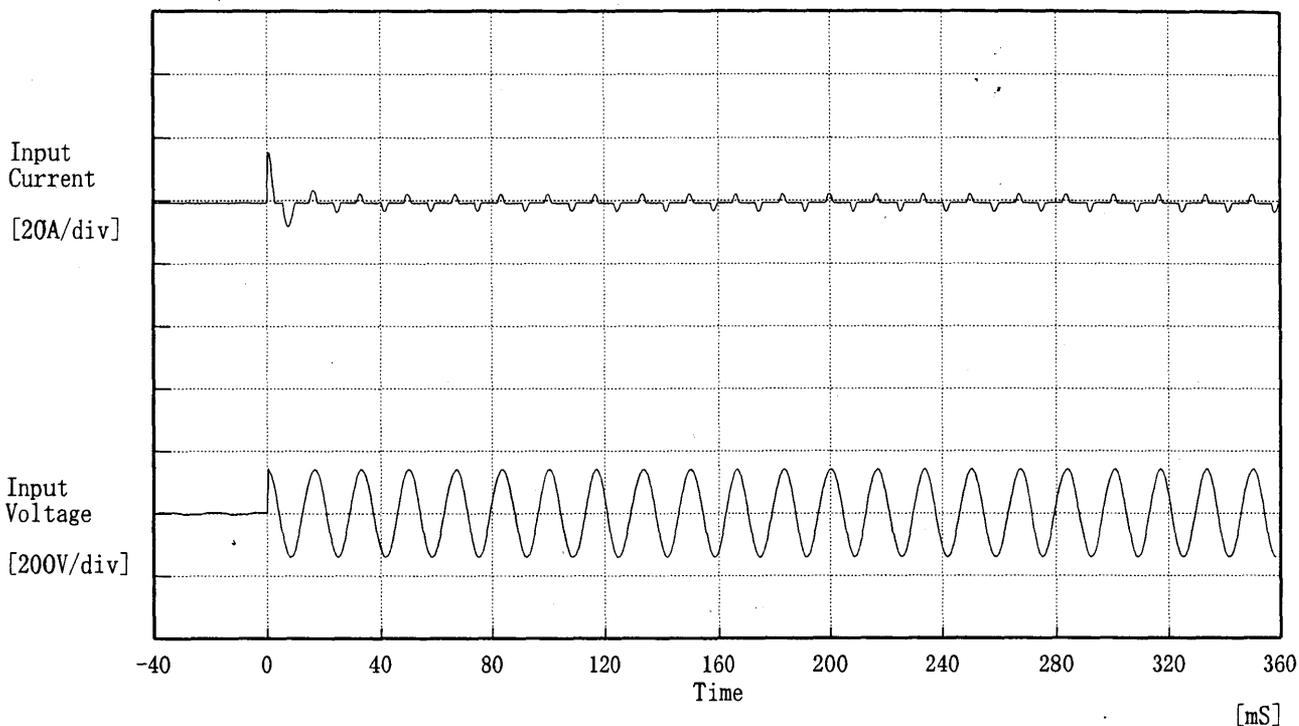
| Ambient Temp.<br>[°C] | Input Volt.<br>85[V] | Input Volt.<br>100[V] | Input Volt.<br>132[V] |
|-----------------------|----------------------|-----------------------|-----------------------|
|                       | Operating Point [V]  |                       |                       |
| -20                   | 15.5                 | 15.4                  | 15.4                  |
| -10                   | 15.4                 | 15.4                  | 15.3                  |
| 0                     | 15.2                 | 15.2                  | 15.2                  |
| 10                    | 15.1                 | 15.1                  | 15.0                  |
| 20                    | 15.0                 | 14.9                  | 14.9                  |
| 25                    | 14.9                 | 14.8                  | 14.8                  |
| 30                    | 14.7                 | 14.7                  | 14.7                  |
| 40                    | 14.5                 | 14.5                  | 14.4                  |
| 50                    | 14.3                 | 14.3                  | 14.2                  |
| 60                    | 14.2                 | 14.1                  | 14.1                  |
| -                     | -                    | -                     | -                     |

Note: Slanted line shows the range of the rated ambient temperature.

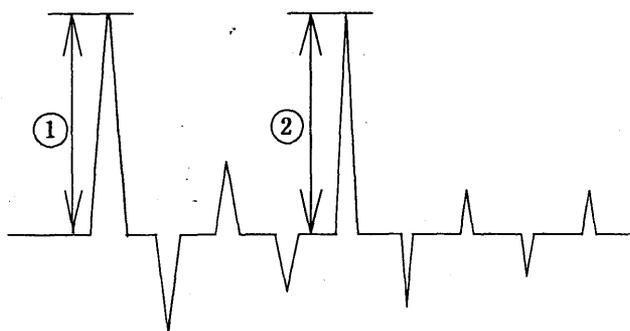
(注) 斜線は定格周囲温度範囲を示す。

# COSEL

|        |                     |                   |          |
|--------|---------------------|-------------------|----------|
| Model  | MMB50A-2            | Temperature       | 25°C     |
| Item   | Inrush Current 突入電流 | Testing Circuitry | Figure A |
| Object | _____               |                   |          |



Input Voltage 100 V  
 Frequency 60 Hz  
 Load 100 %  
 Inrush Current  
 ① 15.33 [A]  
 ② 3.52 [A]



# COSEL

|        |                                 |                                                |
|--------|---------------------------------|------------------------------------------------|
| Model  | MMB50A-2                        |                                                |
| Item   | Dynamic Load Responce<br>動的負荷変動 | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | +5.0V5.00A                      |                                                |

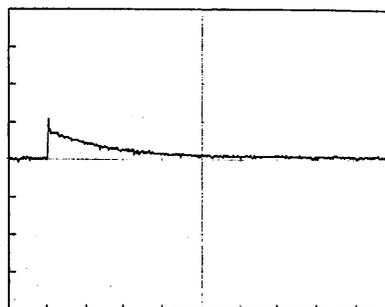
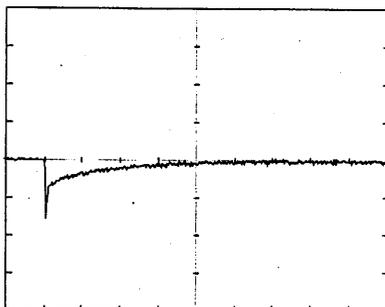
Input Volt. 100 V

Cycle 200 mS

Load Current

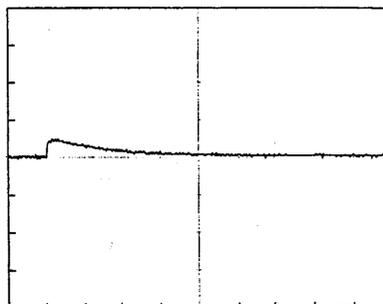
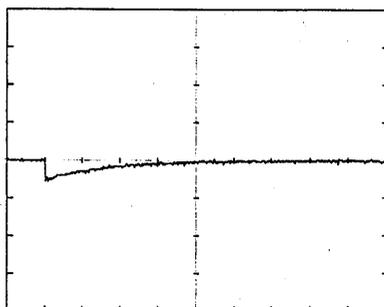
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



100 mV/div

10 mS/div

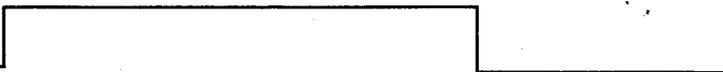
# COSEL

|        |                                 |                   |          |
|--------|---------------------------------|-------------------|----------|
| Model  | MMB50A-2                        | Temperature       | 25°C     |
| Item   | Dynamic Load Responce<br>動的負荷変動 | Testing Circuitry | Figure A |
| Object | +12.0V2.10A                     |                   |          |

Input Volt. 100 V

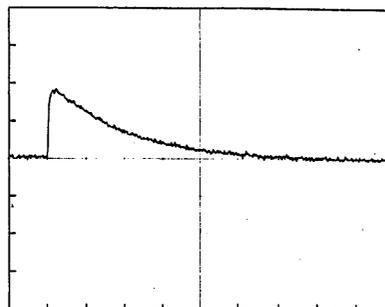
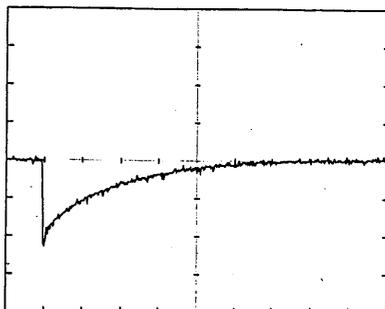
Cycle 200 mS

Load Current



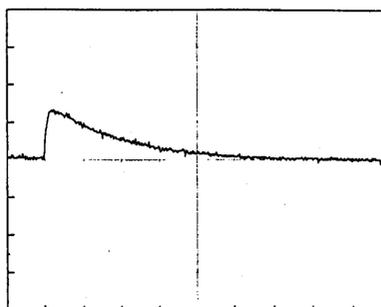
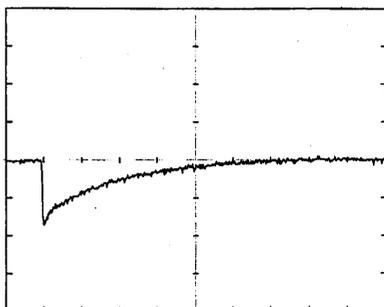
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



100 mV/div

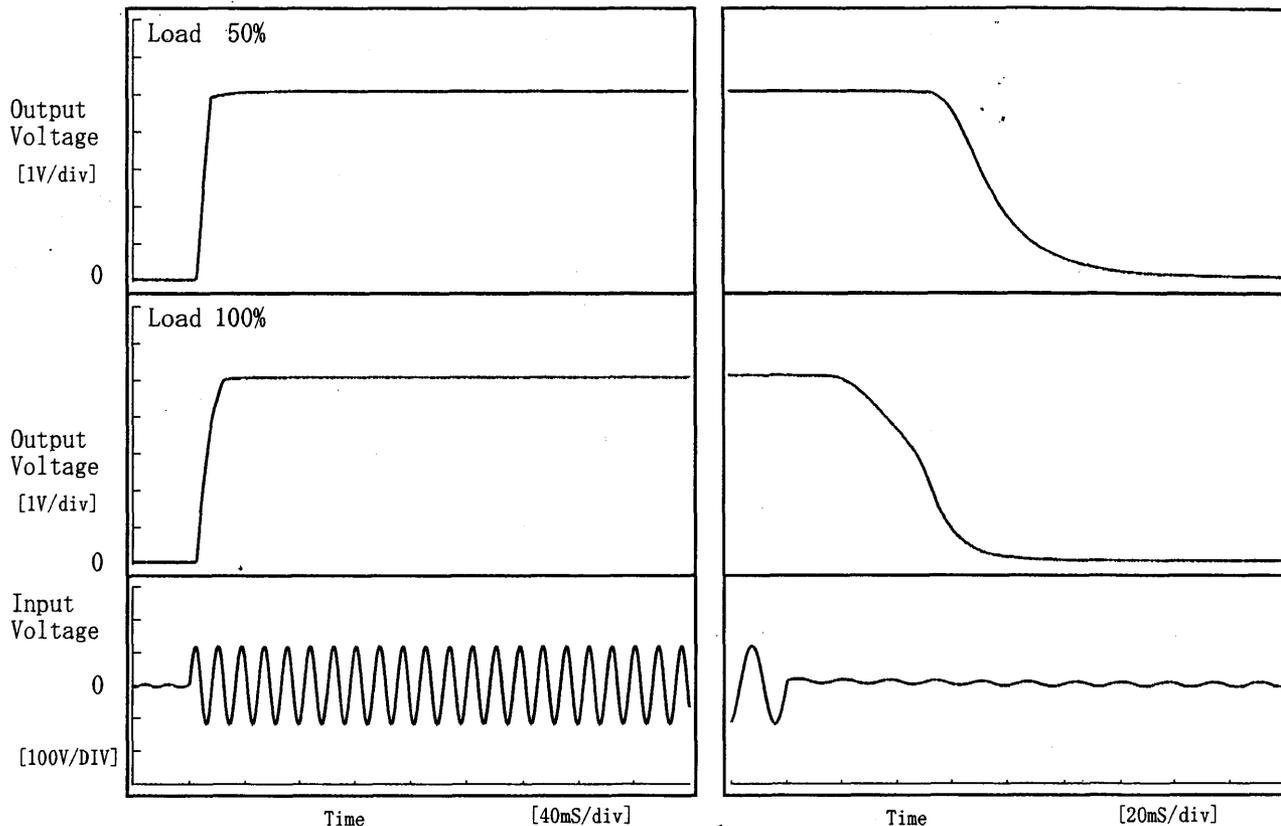
10 mS/div

# COSEL

|        |                              |                   |          |
|--------|------------------------------|-------------------|----------|
| Model  | MMB50A-2                     | Temperature       | 25°C     |
| Item   | Rise and Fall Time 立上り、立下り時間 | Testing Circuitry | Figure A |
| Object | +5.0V5.00A                   |                   |          |

1. Graph

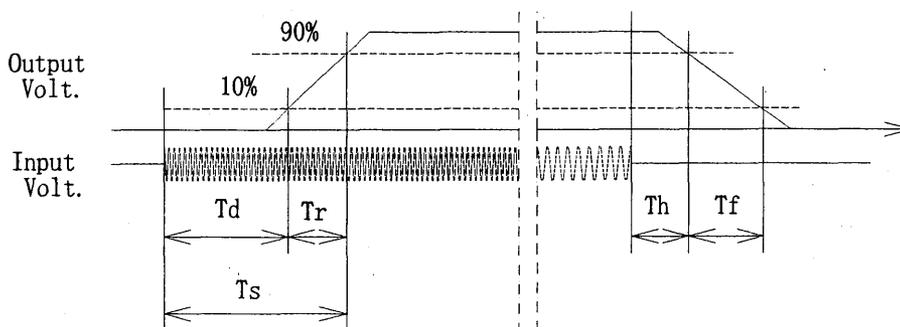
Input Volt. 85 V



2. Values

[mS]

| Load \ Time | T <sub>d</sub> | T <sub>r</sub> | T <sub>s</sub> | T <sub>h</sub> | T <sub>f</sub> |
|-------------|----------------|----------------|----------------|----------------|----------------|
| 50 %        | 5.8            | 8.8            | 14.6           | 60.9           | 42.5           |
| 100 %       | 5.8            | 15.0           | 20.8           | 29.4           | 36.7           |

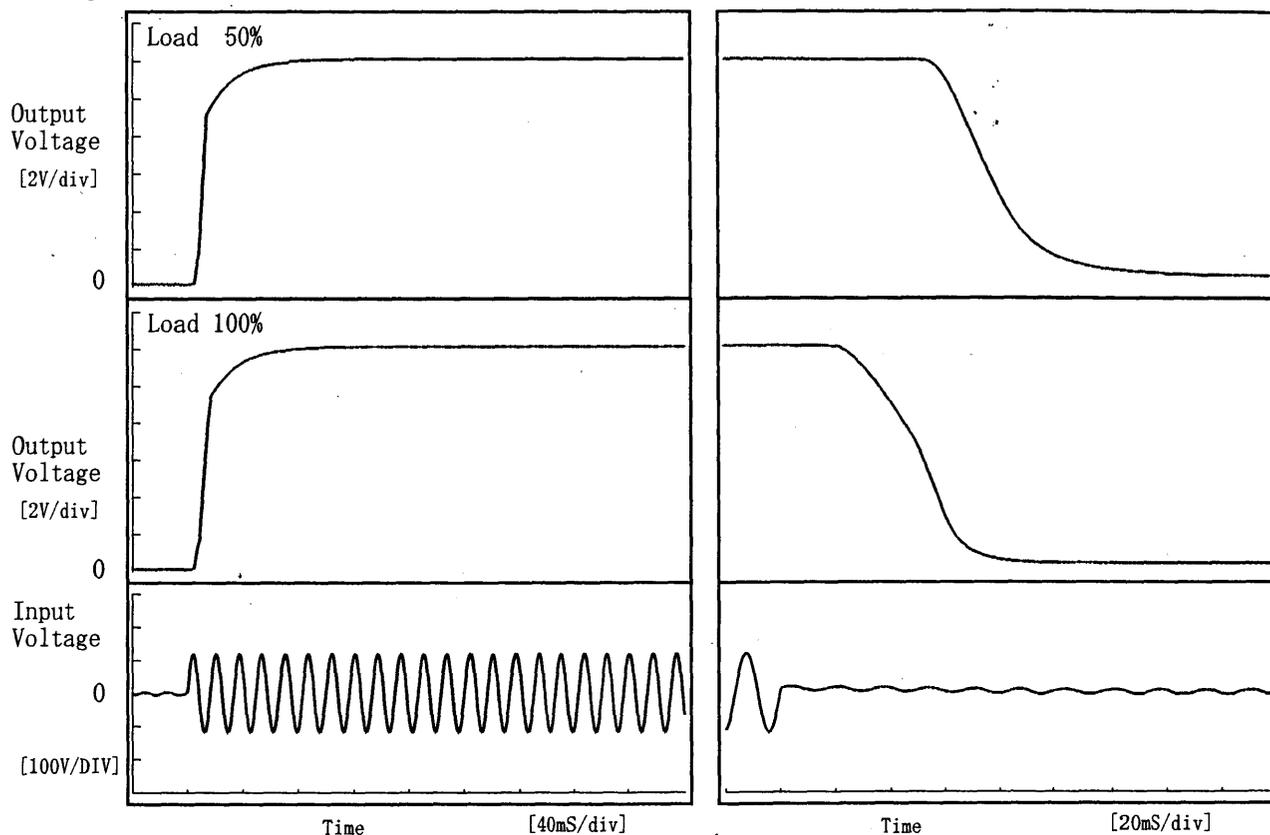


# COSEL

|        |                    |           |                   |          |
|--------|--------------------|-----------|-------------------|----------|
| Model  | MMB50A-2           |           | Temperature       | 25°C     |
| Item   | Rise and Fall Time | 立上り、立下り時間 | Testing Circuitry | Figure A |
| Object | +12.0V 2.10A       |           |                   |          |

1. Graph

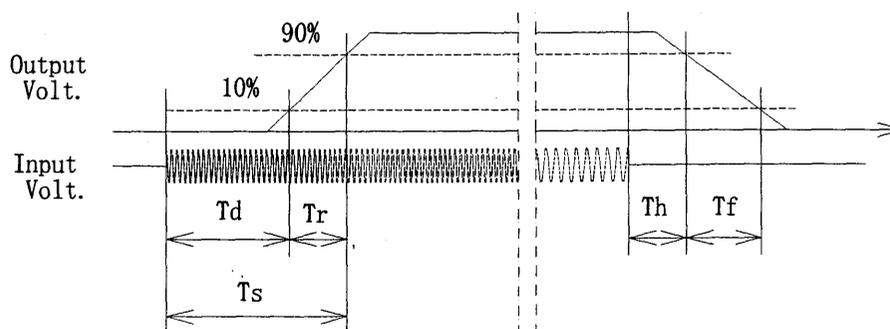
Input Volt. 85 V



2. Values

[mS]

| Load \ Time | T <sub>d</sub> | T <sub>r</sub> | T <sub>s</sub> | T <sub>h</sub> | T <sub>f</sub> |
|-------------|----------------|----------------|----------------|----------------|----------------|
| 50 %        | 6.8            | 24.4           | 31.2           | 61.4           | 46.4           |
| 100 %       | 7.2            | 25.0           | 32.2           | 31.1           | 37.5           |

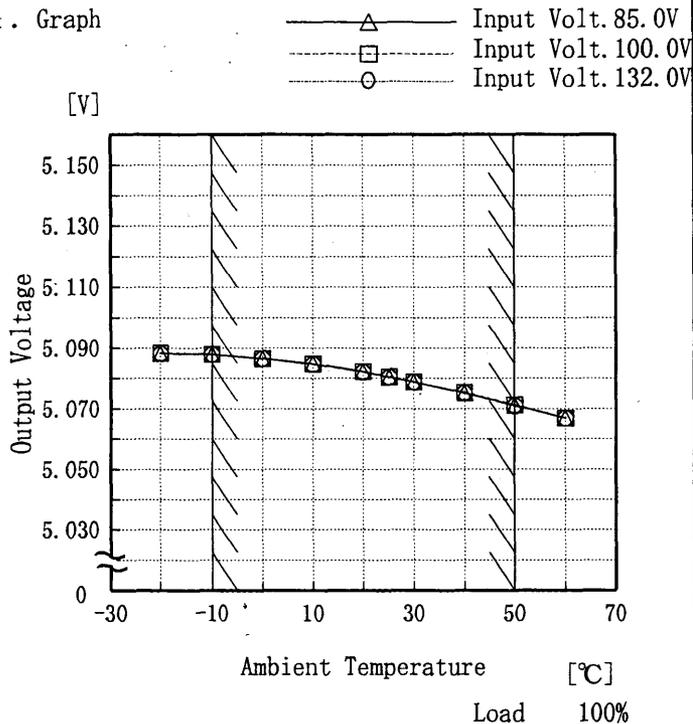




|        |                                     |
|--------|-------------------------------------|
| Model  | MMB50A-2                            |
| Item   | Ambient Temperature Drift<br>周囲温度変動 |
| Object | +5.0V5.00A                          |

Testing Circuitry Figure A

1. Graph

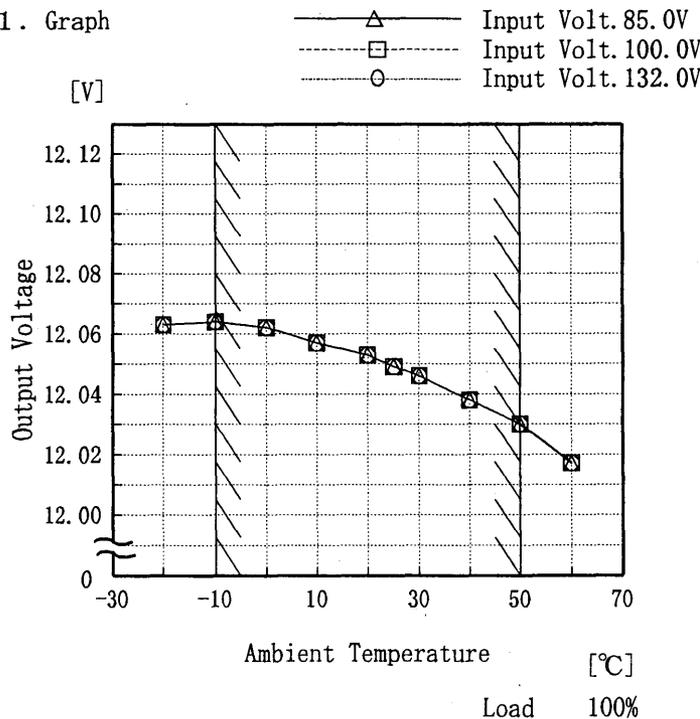


2. Values

| Temperature [°C] | Input Volt. 85.0[V] | Input Volt. 100.0[V] | Input Volt. 132.0[V] |
|------------------|---------------------|----------------------|----------------------|
|                  | Output Volt. [V]    | Output Volt. [V]     | Output Volt. [V]     |
| -20              | 5.088               | 5.088                | 5.088                |
| -10              | 5.088               | 5.088                | 5.088                |
| 0                | 5.087               | 5.087                | 5.087                |
| 10               | 5.085               | 5.085                | 5.085                |
| 20               | 5.082               | 5.082                | 5.082                |
| 25               | 5.080               | 5.081                | 5.080                |
| 30               | 5.079               | 5.079                | 5.079                |
| 40               | 5.075               | 5.075                | 5.075                |
| 50               | 5.071               | 5.071                | 5.071                |
| 60               | 5.067               | 5.067                | 5.067                |
| -                | -                   | -                    | -                    |

|        |           |
|--------|-----------|
| Object | +12V2.10A |
|--------|-----------|

1. Graph



2. Values

| Temperature [°C] | Input Volt. 85.0[V] | Input Volt. 100.0[V] | Input Volt. 132.0[V] |
|------------------|---------------------|----------------------|----------------------|
|                  | Output Volt. [V]    | Output Volt. [V]     | Output Volt. [V]     |
| -20              | 12.063              | 12.063               | 12.063               |
| -10              | 12.064              | 12.064               | 12.064               |
| 0                | 12.062              | 12.062               | 12.062               |
| 10               | 12.057              | 12.057               | 12.057               |
| 20               | 12.053              | 12.053               | 12.053               |
| 25               | 12.049              | 12.049               | 12.049               |
| 30               | 12.046              | 12.046               | 12.046               |
| 40               | 12.038              | 12.038               | 12.038               |
| 50               | 12.030              | 12.030               | 12.030               |
| 60               | 12.017              | 12.017               | 12.017               |
| -                | -                   | -                    | -                    |

Note: Slanted line shows the range of the rated ambient temperature.

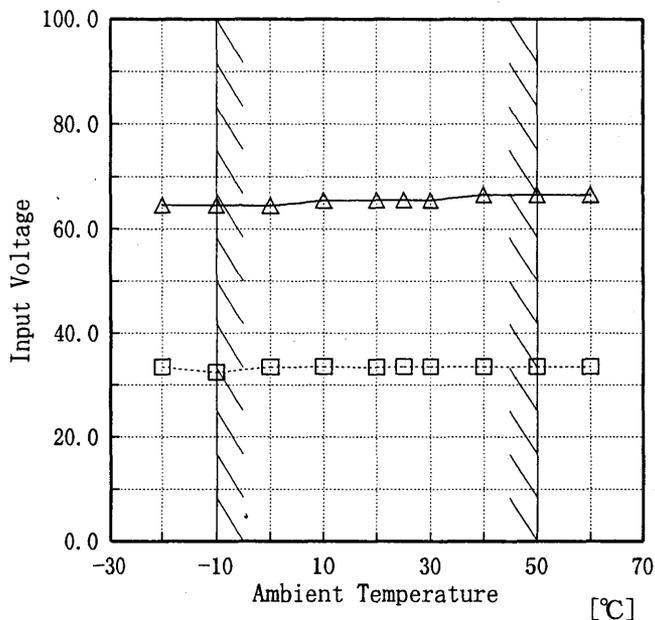
(注)斜線は定格周囲温度範囲を示す。



|        |                                                                    |
|--------|--------------------------------------------------------------------|
| Model  | MMB50A-2                                                           |
| Item   | Minimum Input Voltage for Regulated Output Voltage<br>最低レギュレーション電圧 |
| Object | +5.0V5.00A                                                         |

Testing Circuitry Figure A

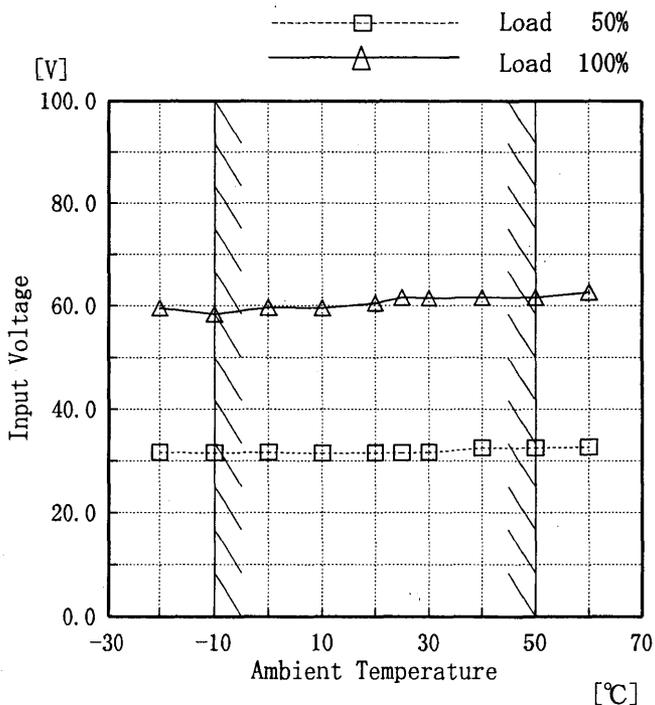
1. Graph  
 [V]  
 -----□----- Load 50%  
 -----△----- Load 100%



2. Values

| Ambient Temp.<br>[°C] | Load 50%           | Load 100%          |
|-----------------------|--------------------|--------------------|
|                       | Input Volt.<br>[V] | Input Volt.<br>[V] |
| -20                   | 33.5               | 64.5               |
| -10                   | 32.5               | 64.5               |
| 0                     | 33.5               | 64.4               |
| 10                    | 33.6               | 65.4               |
| 20                    | 33.5               | 65.5               |
| 25                    | 33.6               | 65.5               |
| 30                    | 33.6               | 65.5               |
| 40                    | 33.6               | 66.5               |
| 50                    | 33.6               | 66.5               |
| 60                    | 33.6               | 66.5               |
| —                     | —                  | —                  |

|        |           |
|--------|-----------|
| Object | +12V2.10A |
|--------|-----------|

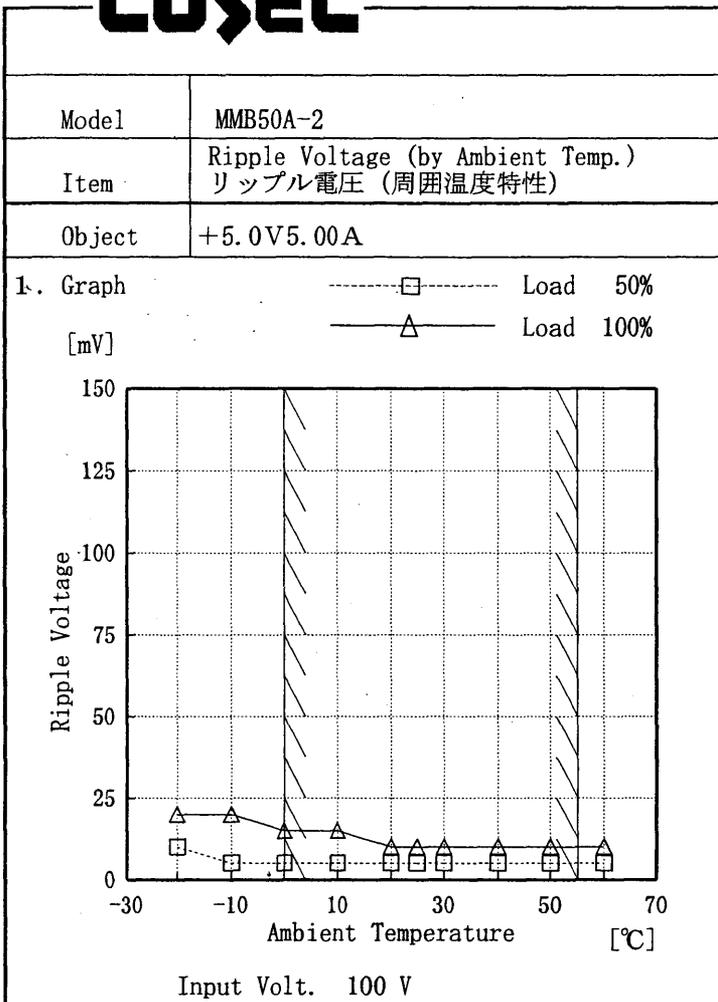


2. Values

| Ambient Temp.<br>[°C] | Load 50%           | Load 100%          |
|-----------------------|--------------------|--------------------|
|                       | Input Volt.<br>[V] | Input Volt.<br>[V] |
| -20                   | 31.7               | 59.6               |
| -10                   | 31.6               | 58.4               |
| 0                     | 31.7               | 59.7               |
| 10                    | 31.5               | 59.6               |
| 20                    | 31.6               | 60.5               |
| 25                    | 31.6               | 61.6               |
| 30                    | 31.7               | 61.5               |
| 40                    | 32.5               | 61.6               |
| 50                    | 32.5               | 61.6               |
| 60                    | 32.7               | 62.6               |
| —                     | —                  | —                  |

Note: Slanted line shows the range of the rated ambient temperature.

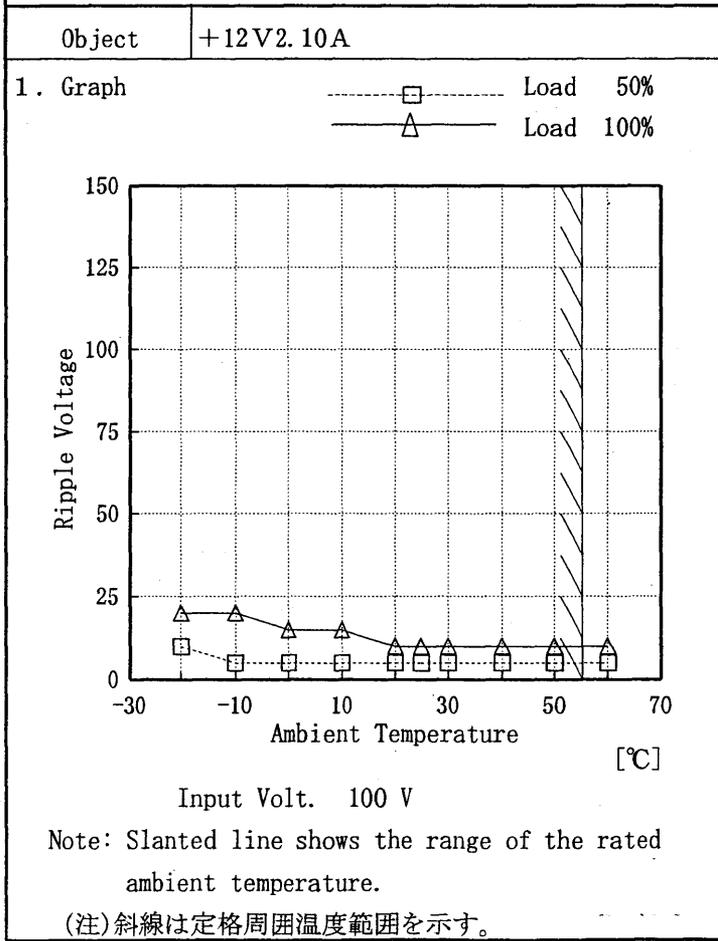
(注)斜線は定格周囲温度範囲を示す。



Testing Circuitry Figure A

2. Values

| Ambient Temp. [°C] | Load 50%<br>Ripple Output Volt. [mV] | Load 100%<br>Ripple Output Volt. [mV] |
|--------------------|--------------------------------------|---------------------------------------|
| -20                | 10                                   | 20                                    |
| -10                | 5                                    | 20                                    |
| 0                  | 5                                    | 15                                    |
| 10                 | 5                                    | 15                                    |
| 20                 | 5                                    | 10                                    |
| 25                 | 5                                    | 10                                    |
| 30                 | 5                                    | 10                                    |
| 40                 | 5                                    | 10                                    |
| 50                 | 5                                    | 10                                    |
| 60                 | 5                                    | 10                                    |
| —                  | —                                    | —                                     |



2. Values

| Ambient Temp. [°C] | Load 50%<br>Ripple Output Volt. [mV] | Load 100%<br>Ripple Output Volt. [mV] |
|--------------------|--------------------------------------|---------------------------------------|
| -20                | 10                                   | 15                                    |
| -10                | 10                                   | 15                                    |
| 0                  | 5                                    | 15                                    |
| 10                 | 5                                    | 15                                    |
| 20                 | 5                                    | 10                                    |
| 25                 | 5                                    | 10                                    |
| 30                 | 5                                    | 10                                    |
| 40                 | 5                                    | 10                                    |
| 50                 | 5                                    | 10                                    |
| 60                 | 5                                    | 10                                    |
| —                  | —                                    | —                                     |



| <p>Model MMB50A-2</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    | <p>Temperature 25 °C<br/>Testing Circuitry Figure A</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| <p>Item Time Lapse Drift 経時ドリフト</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| <p>Object +5.0V5.00A</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| <p>1. Graph</p> <p>Input Volt. 100.0V<br/>Load 100%</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    | <p>2. Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.082</td></tr> <tr><td>0.5</td><td>5.080</td></tr> <tr><td>1.0</td><td>5.080</td></tr> <tr><td>2.0</td><td>5.080</td></tr> <tr><td>3.0</td><td>5.080</td></tr> <tr><td>4.0</td><td>5.080</td></tr> <tr><td>5.0</td><td>5.080</td></tr> <tr><td>6.0</td><td>5.080</td></tr> <tr><td>7.0</td><td>5.080</td></tr> <tr><td>8.0</td><td>5.080</td></tr> </tbody> </table> | Time since start [H] | Output Voltage [V] | 0.0 | 5.082  | 0.5 | 5.080  | 1.0 | 5.080  | 2.0 | 5.080  | 3.0 | 5.080  | 4.0 | 5.080  | 5.0 | 5.080  | 6.0 | 5.080  | 7.0 | 5.080  | 8.0 | 5.080  |
| Time since start [H]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Output Voltage [V] |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.082              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 6.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 7.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 8.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.080              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| <p>Object +12V2.10A</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| <p>1. Graph</p> <p>Input Volt. 100.0V<br/>Load 100%</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| <p>2. Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>12.048</td></tr> <tr><td>0.5</td><td>12.042</td></tr> <tr><td>1.0</td><td>12.042</td></tr> <tr><td>2.0</td><td>12.042</td></tr> <tr><td>3.0</td><td>12.042</td></tr> <tr><td>4.0</td><td>12.042</td></tr> <tr><td>5.0</td><td>12.042</td></tr> <tr><td>6.0</td><td>12.042</td></tr> <tr><td>7.0</td><td>12.042</td></tr> <tr><td>8.0</td><td>12.042</td></tr> </tbody> </table> |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Time since start [H] | Output Voltage [V] | 0.0 | 12.048 | 0.5 | 12.042 | 1.0 | 12.042 | 2.0 | 12.042 | 3.0 | 12.042 | 4.0 | 12.042 | 5.0 | 12.042 | 6.0 | 12.042 | 7.0 | 12.042 | 8.0 | 12.042 |
| Time since start [H]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Output Voltage [V] |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.048             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 6.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 7.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |
| 8.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12.042             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |     |        |



|       |                               |          |                            |
|-------|-------------------------------|----------|----------------------------|
| Model |                               | MMB50A-2 | Testing Circuitry Figure A |
| Item  | Output Voltage Accuracy 定電圧精度 |          |                            |

Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature : -10~50 °C

Input Voltage : 85.0~132.0 V

Load Current ( AVR 1 ) : 0.00~5.00 A

( AVR 2 ) : 0.00~2.10 A

\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* Output Voltage Accuracy (Ration) =  $\frac{\text{Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

定電圧精度

周囲温度、入力電圧、負荷を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

周囲温度 -10~50 °C

入力電圧 85.0~132.0 V

負荷電流 (AVR 1) 0.00~5.00 A

(AVR 2) 0.00~2.10 A

\* 定電圧精度(変動値) =  $\pm(\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

\* 定電圧精度(変動率) =  $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

|        |            |
|--------|------------|
| Object | +5.0V5.00A |
|--------|------------|

| Item            | Temperature [°C] | Input Voltage [V] | Output Current [A] | Output Voltage [V] | Output Voltage Accuracy [mV] | Output Voltage Accuracy (Ration) [%] |
|-----------------|------------------|-------------------|--------------------|--------------------|------------------------------|--------------------------------------|
| Maximum Voltage | -10              | 132.0             | 0.00               | 5.098              | ±14                          | ±0.3                                 |
| Minimum Voltage | 50               | 132.0             | 5.00               | 5.070              |                              |                                      |

|        |             |
|--------|-------------|
| Object | +12.0V2.10A |
|--------|-------------|

| Item            | Temperature [°C] | Input Voltage [V] | Output Current [A] | Output Voltage [V] | Output Voltage Accuracy [mV] | Output Voltage Accuracy (Ration) [%] |
|-----------------|------------------|-------------------|--------------------|--------------------|------------------------------|--------------------------------------|
| Maximum Voltage | -10              | 100.0             | 0.00               | 12.072             | ±22                          | ±0.2                                 |
| Minimum Voltage | 50               | 85.0              | 2.10               | 12.028             |                              |                                      |



| <b>COSEL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                                       |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------|------|------|--------------------|--------------------|-------|------------------------------------|----------------------|---|---------------------------------------|----------------------|---|--------------------------------------|
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | MMB50A-2          |                                       |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Condensation 結露特性 | Testing Circuitry Figure A            |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| Object                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | +5.0V5A           |                                       |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| <p>1. Condensation test</p> <p>Testing procedure is as follows.</p> <p>① Keeping and cooling the unit in a tank at -10°C for an hour with the input off.</p> <p>② Taking it out of the tank and dewing itself in a room where the temperature is 25°C and the humidity is 40%RH.</p> <p>③ Testing electrical characteristics of the unit to confirm there be no fault.</p><br><p>1. 結露特性試験</p> <p>入力を切った状態で、恒温槽で-10°Cに冷却しておき、約1時間後に恒温槽から取り出し、室温25°C、湿度40%RHの状態におき結露させ、その電气的特性の測定を行い、異常のないことを確認する。</p>                                                                                                                                                    |                   |                                       |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| <p>2. Values</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Item</th> <th style="width: 20%;">Data</th> <th style="width: 50%;">Testing Conditions</th> </tr> </thead> <tbody> <tr> <td>Output Voltage [V]</td> <td style="text-align: center;">5.085</td> <td>Input Volt.: 100V, Load Current:5A</td> </tr> <tr> <td>Line Regulation [mV]</td> <td style="text-align: center;">1</td> <td>Input Volt.: 85~132V, Load Current:5A</td> </tr> <tr> <td>Load Regulation [mV]</td> <td style="text-align: center;">7</td> <td>Input Volt.: 100V, Load Current:0~5A</td> </tr> </tbody> </table> |                   |                                       | Item | Data | Testing Conditions | Output Voltage [V] | 5.085 | Input Volt.: 100V, Load Current:5A | Line Regulation [mV] | 1 | Input Volt.: 85~132V, Load Current:5A | Load Regulation [mV] | 7 | Input Volt.: 100V, Load Current:0~5A |
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data              | Testing Conditions                    |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| Output Voltage [V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5.085             | Input Volt.: 100V, Load Current:5A    |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| Line Regulation [mV]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                 | Input Volt.: 85~132V, Load Current:5A |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |
| Load Regulation [mV]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7                 | Input Volt.: 100V, Load Current:0~5A  |      |      |                    |                    |       |                                    |                      |   |                                       |                      |   |                                      |



|        |  |                   |                            |
|--------|--|-------------------|----------------------------|
| Model  |  | MMB50A-2          | Testing Circuitry Figure A |
| Item   |  | Condensation 結露特性 |                            |
| Object |  | +12.0V2.1A        |                            |

1. Condensation test

Testing procedure is as follows.

- ① Keeping and cooling the unit in a tank at -10°C for an hour with the input off.
- ② Taking it out of the tank and dewing itself in a room where the temperature is 25°C and the humidity is 40%RH.
- ③ Testing electrical characteristics of the unit to confirm there be no fault.

1. 結露特性試験

入力を切った状態で、恒温槽で-10℃に冷却しておき、約1時間後に恒温槽から取り出し、室温25℃、湿度40%RHの状態におき結露させ、その電気的特性の測定を行い、異常のないことを確認する。

2. Values

| Item                 | Data  | Testing Conditions                       |
|----------------------|-------|------------------------------------------|
| Output Voltage [V]   | 12.05 | Input Volt.: 100V, Load Current:2.1A     |
| Line Regulation [mV] | 1     | Input Volt.: 85~132V, Load Current:2.1A  |
| Load Regulation [mV] | 8     | Input Volt.: 100V, Load Current:0.0~2.1A |

# COSEL

|        |  |                      |                                                |
|--------|--|----------------------|------------------------------------------------|
| Model  |  | MMB50A-2             | Temperature 25°C<br>Testing Circuitry Figure A |
| Item   |  | Leakage Current 漏洩電流 |                                                |
| Object |  | _____                |                                                |

1. Results

| Standards    | Leakage Current [mA]  |                        |                        |
|--------------|-----------------------|------------------------|------------------------|
|              | Input Volt.<br>85 [V] | Input Volt.<br>100 [V] | Input Volt.<br>132 [V] |
| (A) DENTORI  | 0.12                  | 0.14                   | 0.18                   |
| (B) IEC60950 | 0.11                  | 0.14                   | 0.18                   |

| Standards    | Leakage Current [mA]   |                        |                        |
|--------------|------------------------|------------------------|------------------------|
|              | Input Volt.<br>170 [V] | Input Volt.<br>230 [V] | Input Volt.<br>264 [V] |
| (B) IEC60950 | —                      | —                      | —                      |

2. Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

交流入力 of 両相について測定し、その大きい方を漏洩電流測定値とする。



|        |  |                              |                            |
|--------|--|------------------------------|----------------------------|
| Model  |  | MMB50A-2                     | Testing Circuitry Figure D |
| Item   |  | Conducted Emission<br>雑音端子電圧 |                            |
| Object |  | _____                        |                            |

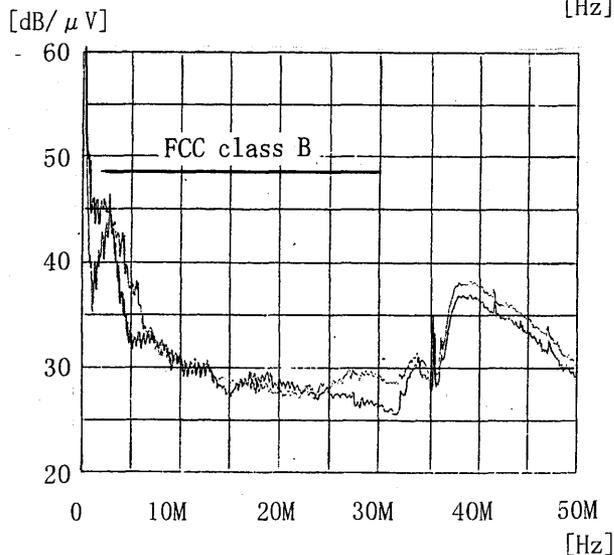
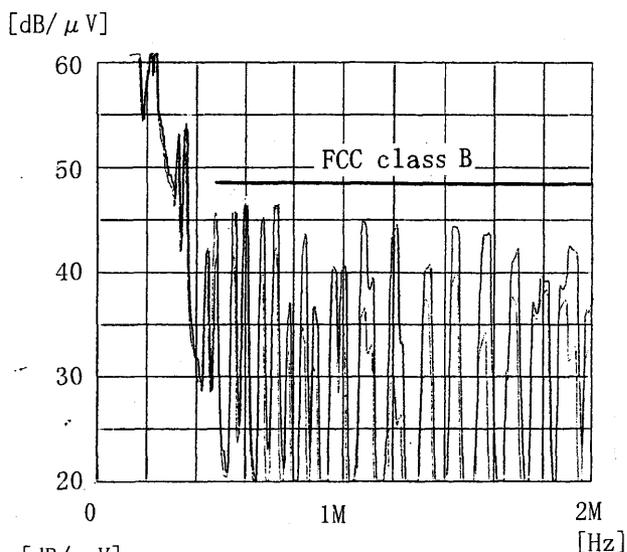
1. Graph

Remarks

Input Volt. 120 V  
Load 100 %

Note: Slanted line shows the range of Tolerance.  
(注)斜線は許容値を示す。

| NO | Standards                       | Standards Complied | Frequency [MHz] | Tolerance [dB/μV] |
|----|---------------------------------|--------------------|-----------------|-------------------|
| 1  | FCC class A                     |                    | 0.45~1.6        | 60                |
|    |                                 |                    | 1.6~30          | 69.5              |
| 2  | FCC class B                     | ○                  | 0.45~30         | 48                |
| 3  | VCCI class A                    |                    | 0.15~0.5        | 79                |
|    |                                 |                    | 0.5~30          | 73                |
| 4  | VCCI class B                    |                    | 0.15~0.5        | 66-56             |
|    |                                 |                    | 0.5~5           | 56                |
|    |                                 |                    | 5~30            | 60                |
| 5  | CISPR Pub. 22 class A (EN55022) |                    | 0.15~0.5        | 79                |
|    |                                 |                    | 0.5~30          | 73                |
|    |                                 |                    | /               |                   |
| 6  | CISPR Pub. 22 class B (EN55022) |                    | 0.15~0.5        | 66-56             |
|    |                                 |                    | 0.5~5           | 56                |
|    |                                 |                    | 5~30            | 60                |



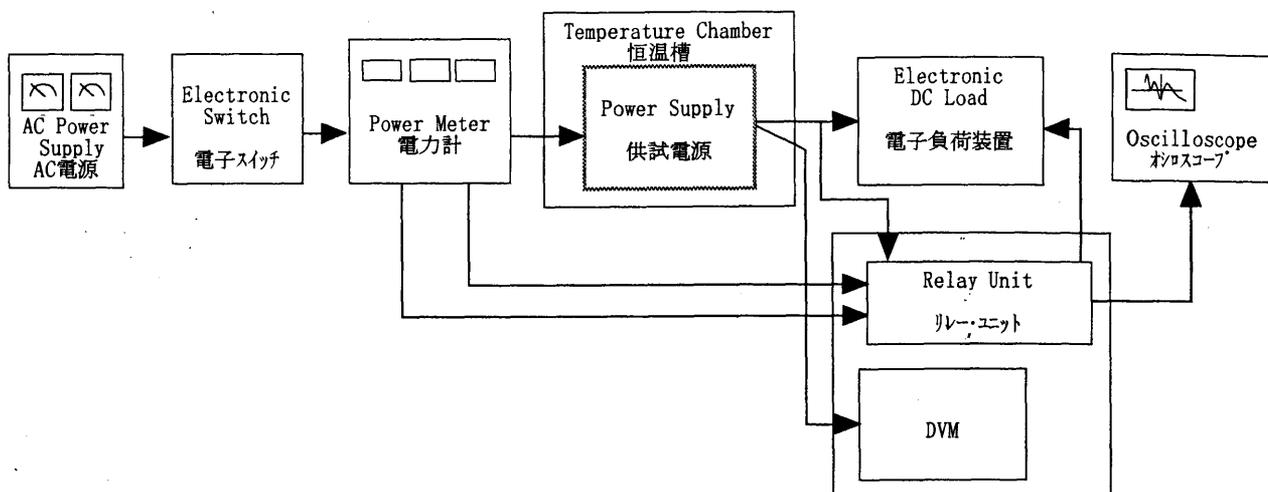


Figure A

Data Acquisition/Control Unit  
データ集録システム

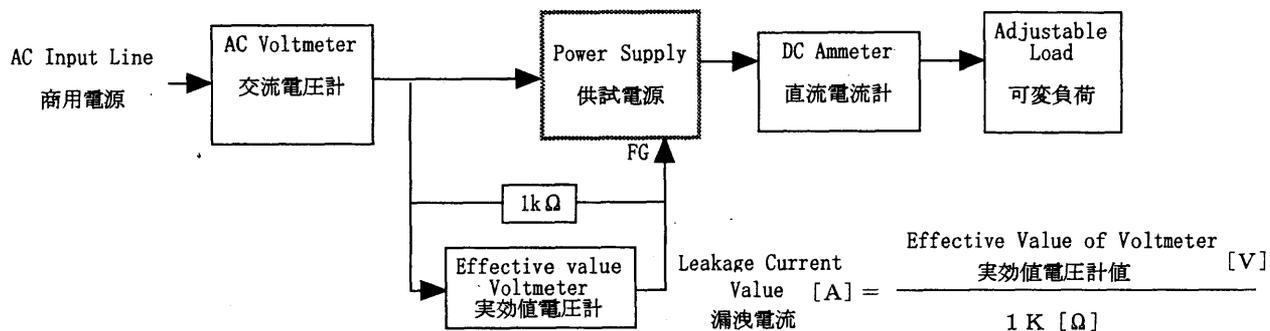


Figure B (DENTORI)

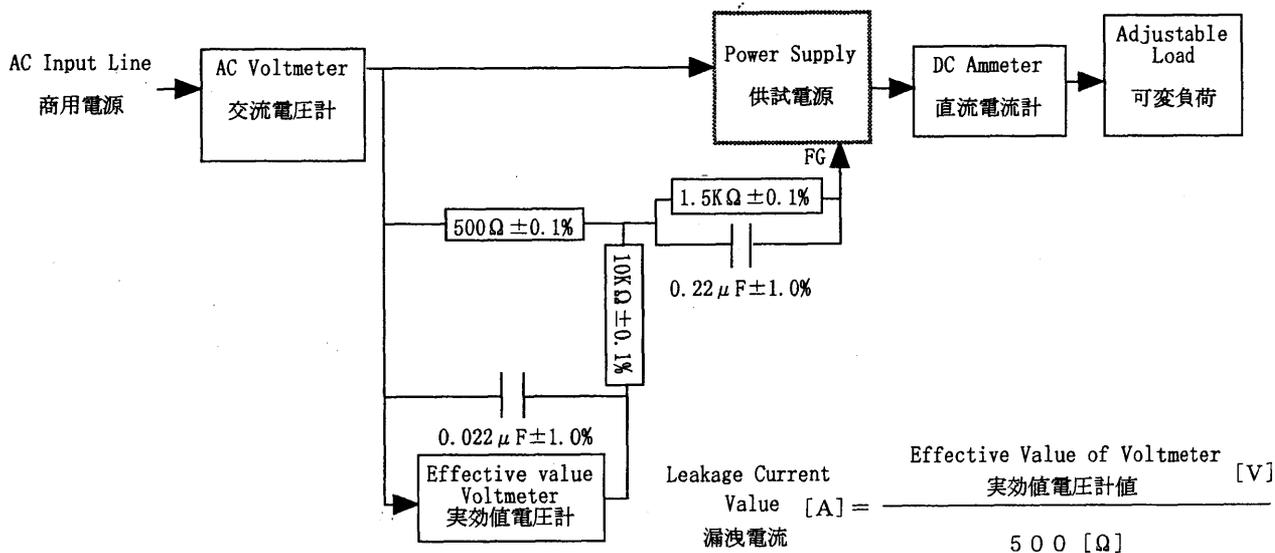


Figure B (IEC 60950)

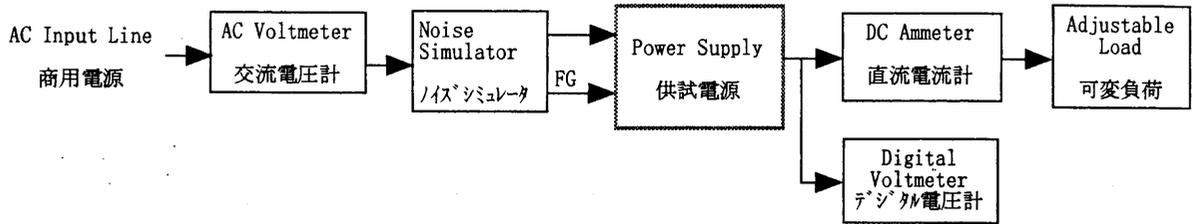


Figure C

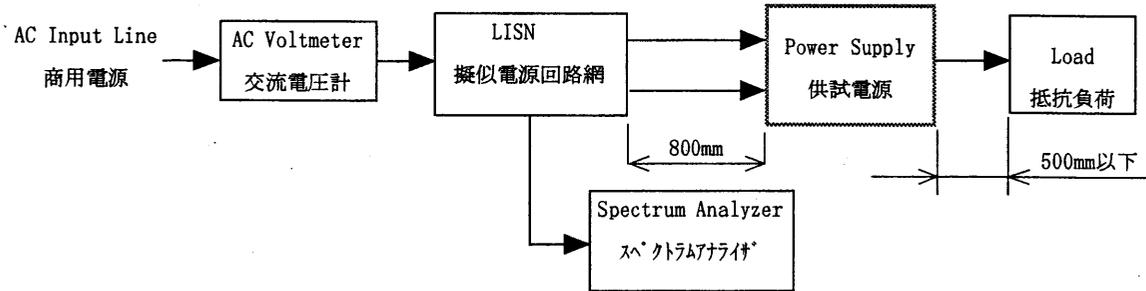


Figure D

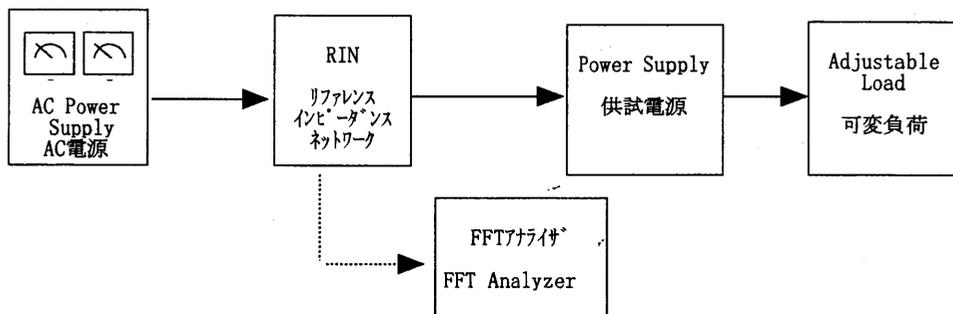


Figure E