

**COSEL**

**TEST DATA OF R15A-24  
(100V INPUT)**

Regulated DC Power Supply

Date : May 18. 1998

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Design Manager

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Design Engineer

**コーセル株式会社  
COSEL CO., LTD.**

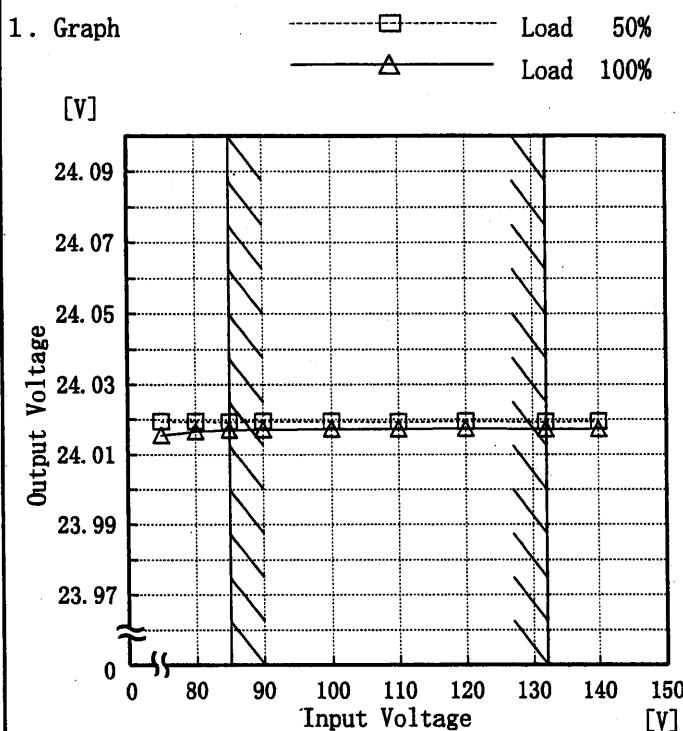
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|        |                        |
|--------|------------------------|
| Model  | R15A-24                |
| Item   | Line Regulation 静的入力変動 |
| Object | +24V 0.7A              |



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

(注)斜線は定格入力電圧範囲を示す。

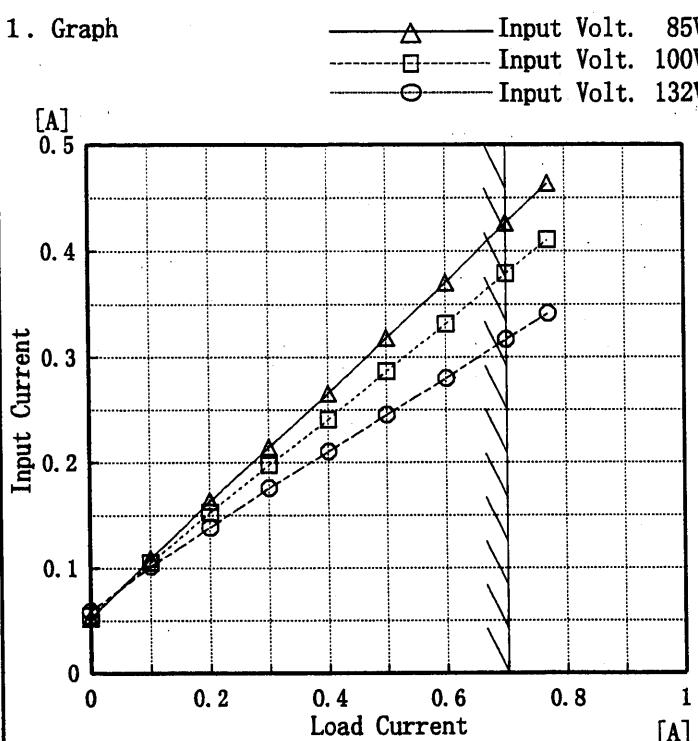
Temperature  
Testing Circuitry      25°C  
Figure A

**COSSEL**

|        |   |
|--------|---|
| Model  | R15A-24                                       |
| Item   | Input Current (by Load Current)<br>入力電流（負荷特性） |
| Output | —   |

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

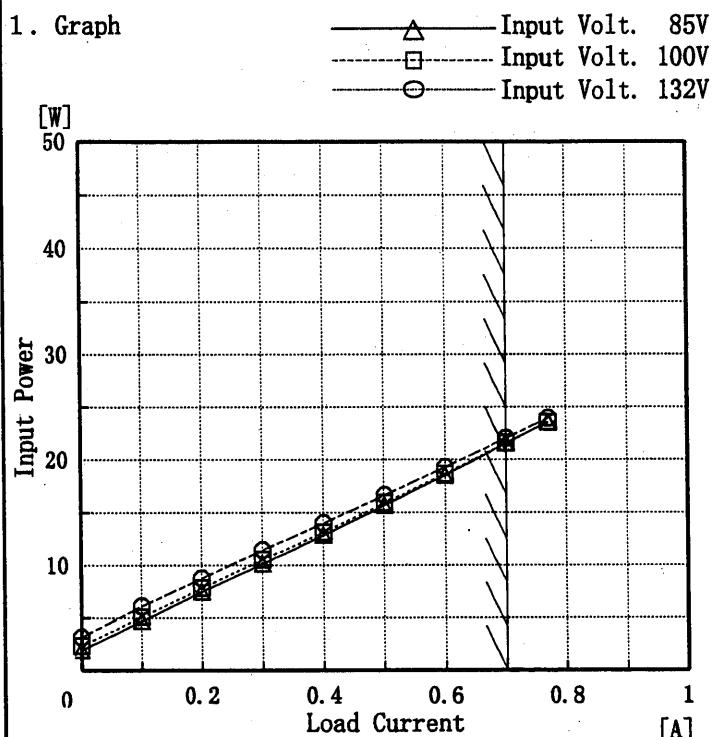
| Load Current [A] | Input Current [A] |                    |                    |
|------------------|-------------------|--------------------|--------------------|
|                  | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0.00             | 0.052             | 0.055              | 0.059              |
| 0.10             | 0.109             | 0.105              | 0.102              |
| 0.20             | 0.163             | 0.153              | 0.139              |
| 0.30             | 0.215             | 0.198              | 0.176              |
| 0.40             | 0.266             | 0.241              | 0.210              |
| 0.50             | 0.319             | 0.287              | 0.245              |
| 0.60             | 0.370             | 0.331              | 0.280              |
| 0.70             | 0.426             | 0.379              | 0.317              |
| 0.77             | 0.463             | 0.411              | 0.342              |

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

(注)斜線は定格負荷電流範囲を示す。

**COSEL**

|        |  |
|--------|--|
| Model  | R15A-24                                      |
| Item   | Input Power (by Load Current)<br>入力電力 (負荷特性) |
| Output | —  |



Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

| Load Current<br>[A] | Input Power [W]      |                       |                       |
|---------------------|----------------------|-----------------------|-----------------------|
|                     | Input Volt.<br>85[V] | Input Volt.<br>100[V] | Input Volt.<br>132[V] |
| 0.00                | 1.90                 | 2.29                  | 3.11                  |
| 0.10                | 4.67                 | 5.07                  | 6.12                  |
| 0.20                | 7.51                 | 7.84                  | 8.75                  |
| 0.30                | 10.15                | 10.52                 | 11.45                 |
| 0.40                | 12.86                | 13.14                 | 14.00                 |
| 0.50                | 15.69                | 15.91                 | 16.65                 |
| 0.60                | 18.50                | 18.63                 | 19.26                 |
| 0.70                | 21.55                | 21.59                 | 22.06                 |
| 0.77                | 23.59                | 23.57                 | 23.95                 |

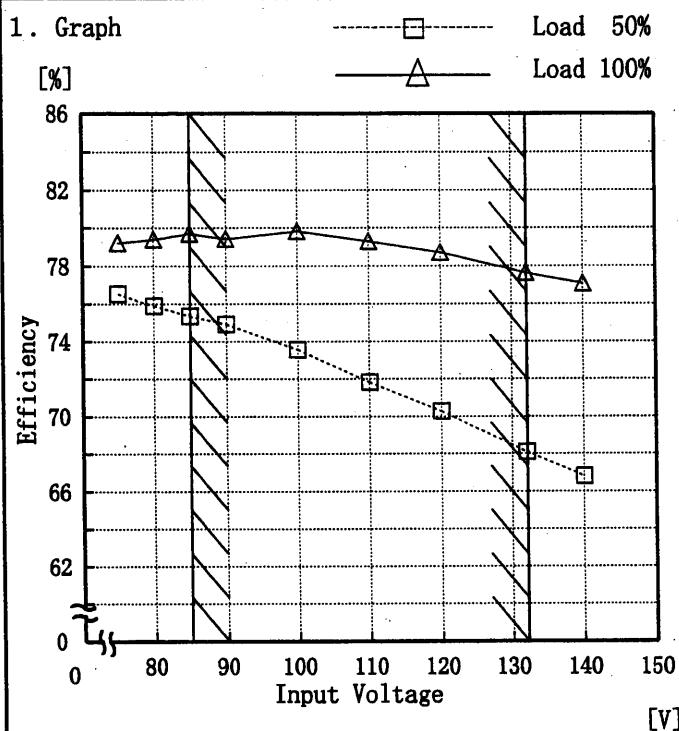
Note: Slanted line shows the range of the rated load current

(注) 斜線は定格負荷電流範囲を示す。

**COSEL**

|        |               |
|--------|---------------|
| Model  | R15A-24       |
| Item   | Efficiency 効率 |
| Object | —             |

Temperature 25°C  
Testing Circuitry Figure A



## 2. Values

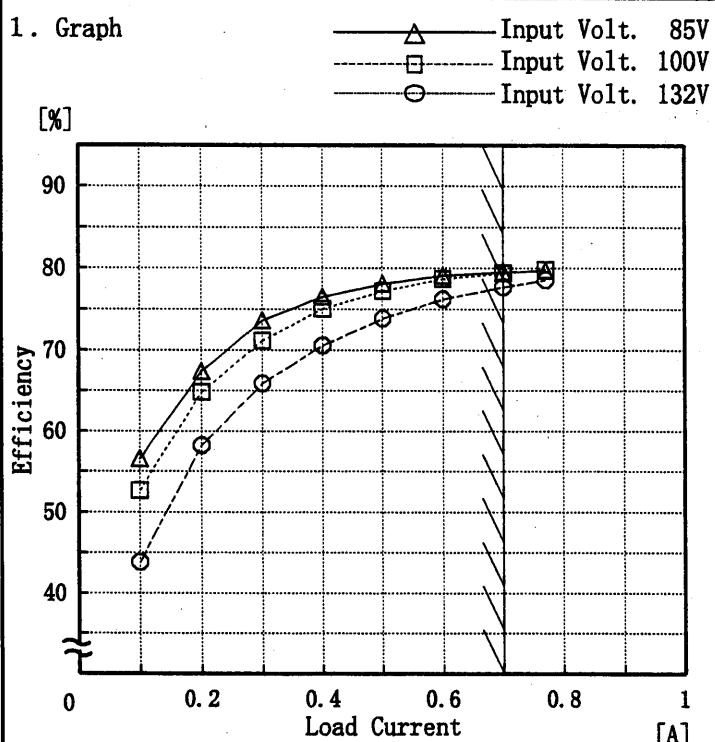
| Input Voltage [V] | Load 50%       | Load 100%      |
|-------------------|----------------|----------------|
|                   | Efficiency [%] | Efficiency [%] |
| 75                | 76.5           | 79.2           |
| 80                | 75.9           | 79.4           |
| 85                | 75.4           | 79.7           |
| 90                | 74.9           | 79.4           |
| 100               | 73.6           | 79.8           |
| 110               | 71.8           | 79.3           |
| 120               | 70.3           | 78.7           |
| 132               | 68.1           | 77.6           |
| 140               | 66.8           | 77.1           |

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

(注) 斜線は定格入力電圧範囲を示す。

**COSEL**

|        |  |
|--------|--|
| Model  | R15A-24                                    |
| Item   | Efficiency (by Load Current)<br>効率(負荷電流特性) |
| Output | —  |



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

(注)斜線は定格負荷電流範囲を示す。

Temperature 25°C  
Testing Circuitry Figure A

2. Values

| Load Current [A] | Efficiency [%]    |                    |                    |
|------------------|-------------------|--------------------|--------------------|
|                  | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0.10             | 56.6              | 52.6               | 43.8               |
| 0.20             | 67.3              | 64.8               | 58.2               |
| 0.30             | 73.6              | 71.1               | 65.9               |
| 0.40             | 76.5              | 75.1               | 70.5               |
| 0.50             | 78.1              | 77.2               | 73.9               |
| 0.60             | 79.1              | 78.7               | 76.2               |
| 0.70             | 79.6              | 79.4               | 77.7               |
| 0.77             | 79.7              | 79.8               | 78.6               |

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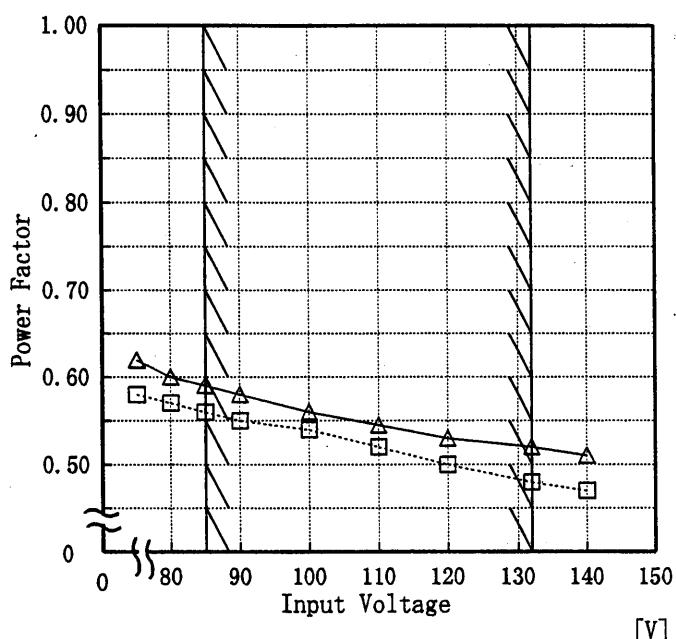
Model R15A-24

Item Power Factor (by Input Voltage)  
力率 (入力電圧特性)

Object \_\_\_\_\_

## 1. Graph

-----□----- load 50%  
 -----△----- load 100%



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

(注)斜線は定格入力電圧範囲を示す。

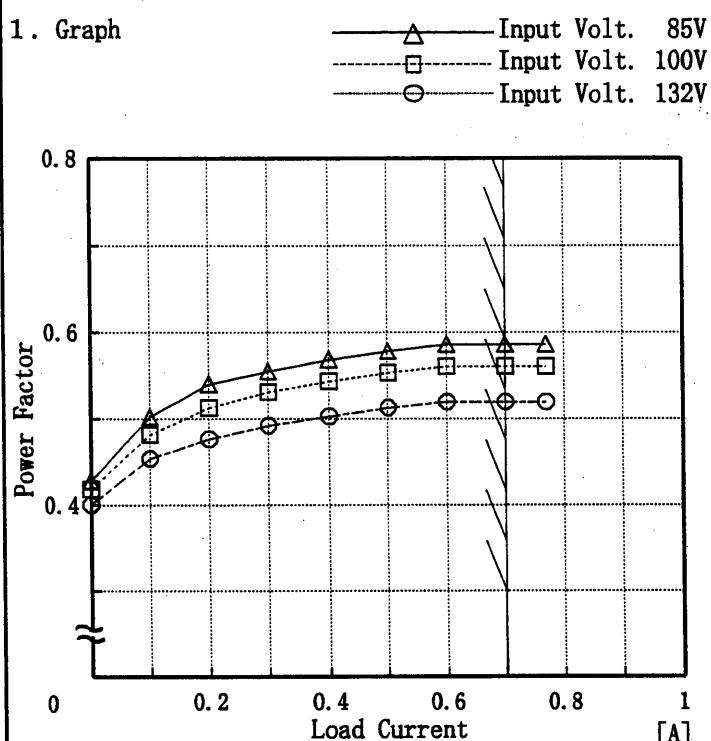
Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

| Input Voltage [V] | load 50%     | load 100%    |
|-------------------|--------------|--------------|
|                   | Power Factor | Power Factor |
| 75                | 0.58         | 0.62         |
| 80                | 0.57         | 0.60         |
| 85                | 0.56         | 0.59         |
| 90                | 0.55         | 0.58         |
| 100               | 0.54         | 0.56         |
| 110               | 0.52         | 0.55         |
| 120               | 0.50         | 0.53         |
| 132               | 0.48         | 0.52         |
| 140               | 0.47         | 0.51         |

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|        |   |
|--------|---|
| Model  | R15A-24                                       |
| Item   | Power Factor (by Load Current)<br>力率 (負荷電流特性) |
| Output | —   |



Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

| Load Current<br>[A] | Power Factor         |                       |                       |
|---------------------|----------------------|-----------------------|-----------------------|
|                     | Input Volt.<br>85[V] | Input Volt.<br>100[V] | Input Volt.<br>132[V] |
| —                   | 0.43                 | 0.42                  | 0.40                  |
| 0.10                | 0.50                 | 0.48                  | 0.45                  |
| 0.20                | 0.54                 | 0.51                  | 0.48                  |
| 0.30                | 0.55                 | 0.53                  | 0.49                  |
| 0.40                | 0.57                 | 0.54                  | 0.50                  |
| 0.50                | 0.58                 | 0.55                  | 0.51                  |
| 0.60                | 0.59                 | 0.56                  | 0.52                  |
| 0.70                | 0.59                 | 0.56                  | 0.52                  |
| 0.77                | 0.59                 | 0.56                  | 0.52                  |

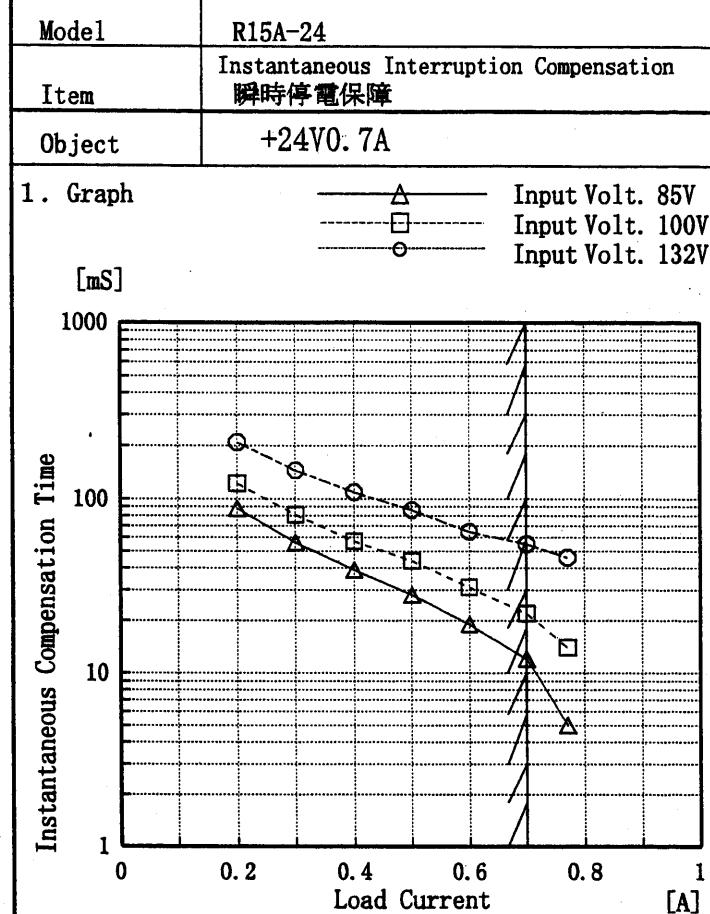
Note: Slanted line shows the range of the rated load current

(注)斜線は定格負荷電流範囲を示す。

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| Model   | R15A-24              | Temperature<br>Testing Circuitry | 25°C<br>Figure A   |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
|---|----------------------|----------------------------------|--|-------------------------|----------|-----------|----------------------|----------------------|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|----|-----|----|----|-----|-----|----|-----|-----|----|-----|-----|----|
| Item  | Hold-Up Time 出力保持時間  |                                  |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| Object  | +24V0.7A             |                                  |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 1. Graph  |                      | 2. Values                        |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
|   |                      |                                  | <table border="1"> <thead> <tr> <th rowspan="2">Input<br/>Voltage<br/>[V]</th> <th>Load 50%</th> <th>Load 100%</th> </tr> <tr> <th>Hold-Up Time<br/>[ms]</th> <th>Hold-Up Time<br/>[ms]</th> </tr> </thead> <tbody> <tr><td>75</td><td>43</td><td>15</td></tr> <tr><td>80</td><td>48</td><td>18</td></tr> <tr><td>85</td><td>55</td><td>21</td></tr> <tr><td>90</td><td>62</td><td>24</td></tr> <tr><td>100</td><td>77</td><td>32</td></tr> <tr><td>110</td><td>93</td><td>41</td></tr> <tr><td>120</td><td>110</td><td>51</td></tr> <tr><td>132</td><td>133</td><td>63</td></tr> <tr><td>140</td><td>149</td><td>72</td></tr> </tbody> </table> | Input<br>Voltage<br>[V] | Load 50% | Load 100% | Hold-Up Time<br>[ms] | Hold-Up Time<br>[ms] | 75 | 43 | 15 | 80 | 48 | 18 | 85 | 55 | 21 | 90 | 62 | 24 | 100 | 77 | 32 | 110 | 93 | 41 | 120 | 110 | 51 | 132 | 133 | 63 | 140 | 149 | 72 |
| Input<br>Voltage<br>[V]   | Load 50%             | Load 100%                        |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
|   | Hold-Up Time<br>[ms] | Hold-Up Time<br>[ms]             |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 75  | 43                   | 15                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 80  | 48                   | 18                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 85  | 55                   | 21                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 90  | 62                   | 24                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 100   | 77                   | 32                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 110   | 93                   | 41                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 120   | 110                  | 51                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 132   | 133                  | 63                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| 140   | 149                  | 72                               |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |
| <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> |                      |                                  |  |                         |          |           |                      |                      |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |     |    |    |     |     |    |     |     |    |     |     |    |

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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。

Testing Circuitry Figure A

## 2. Values

| Load Current [A] | Input Volt. | Input Volt. | Input Volt. |
|------------------|-------------|-------------|-------------|
|                  | 85[V]       | 100[V]      | 132[V]      |
| Time [mS]        |             |             |             |
| 0.00             | —           | —           | —           |
| 0.10             | —           | —           | —           |
| 0.20             | 88          | 122         | 209         |
| 0.30             | 56          | 81          | 145         |
| 0.40             | 39          | 57          | 109         |
| 0.50             | 28          | 44          | 86          |
| 0.60             | 19          | 31          | 65          |
| 0.70             | 12          | 22          | 55          |
| 0.77             | 5           | 14          | 46          |

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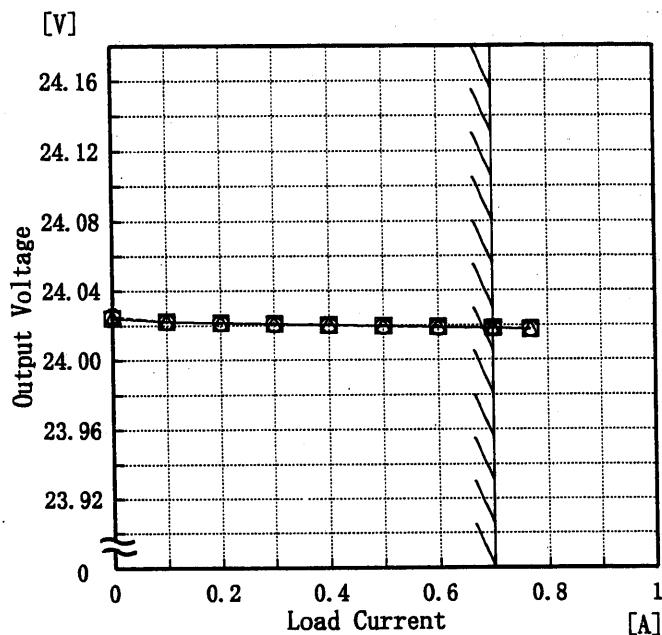
Model R15A-24

Item Load Regulation 靜的負荷変動

Object +24V0.7A

1. Graph

—△— Input Volt. 85V  
 -□--- Input Volt. 100V  
 -○--- Input Volt. 132V



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

(注)斜線は定格負荷電流範囲を示す。

Temperature 25°C  
 Testing Circuitry Figure A

2. Values

| Load Current<br>[A] | Input Volt.<br>85[V] | Input Volt.<br>100[V] | Input Volt.<br>132[V] |
|---------------------|----------------------|-----------------------|-----------------------|
|                     | Output<br>Volt. [V]  | Output<br>Volt. [V]   | Output<br>Volt. [V]   |
| 0.00                | 24.024               | 24.024                | 24.025                |
| 0.10                | 24.023               | 24.022                | 24.022                |
| 0.20                | 24.022               | 24.022                | 24.022                |
| 0.30                | 24.021               | 24.021                | 24.021                |
| 0.40                | 24.020               | 24.020                | 24.020                |
| 0.50                | 24.020               | 24.020                | 24.019                |
| 0.60                | 24.019               | 24.019                | 24.019                |
| 0.70                | 24.018               | 24.018                | 24.018                |
| 0.77                | 24.017               | 24.018                | 24.018                |

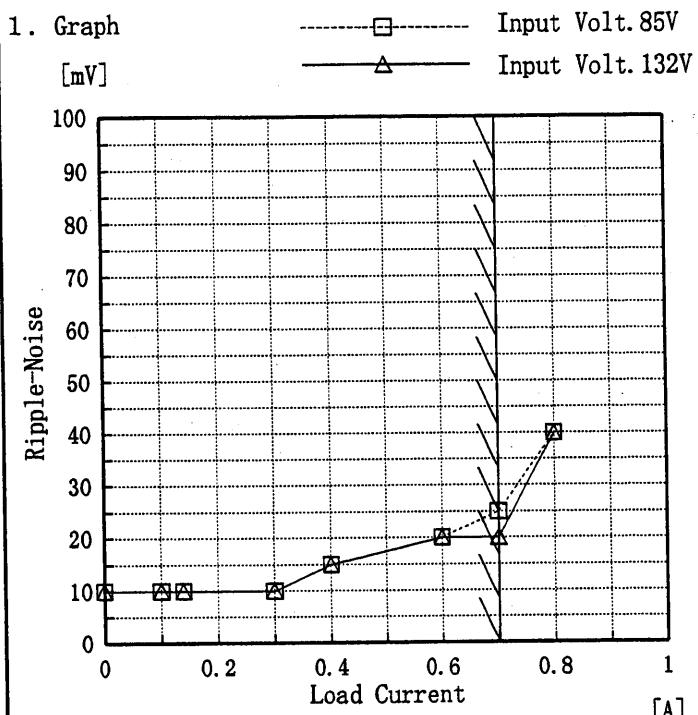
**COSSEL**

| Model   | R15A-24   | Temperature<br>Testing Circuitry | 25°C<br>Figure A             |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
|---|---|----------------------------------|------------------------------|-------------------------------|-----------------------|------------------------|-----------------------------|-----------------------------|------|----|------|------|----|------|------|----|------|------|----|------|------|----|------|------|----|------|------|----|----|------|----|----|
| Item  | Ripple Voltage(by Load Current)<br>リップル電圧(負荷電流特性)   |                                  |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| Object  | +24V0.7A  | 2. Values                        |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 1. Graph  | <p style="text-align: center;">-----□----- Input Volt. 85V<br/>[mV]                            -----△----- Input Volt. 132V</p> <table border="1"> <caption>Data points estimated from Graph 1</caption> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Output Volt. 85V [mV]</th> <th>Ripple Output Volt. 132V [mV]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>5</td><td>5</td></tr> <tr><td>0.07</td><td>10</td><td>10</td></tr> <tr><td>0.14</td><td>10</td><td>10</td></tr> <tr><td>0.28</td><td>10</td><td>10</td></tr> <tr><td>0.42</td><td>10</td><td>10</td></tr> <tr><td>0.56</td><td>10</td><td>10</td></tr> <tr><td>0.70</td><td>15</td><td>15</td></tr> <tr><td>0.80</td><td>25</td><td>15</td></tr> </tbody> </table> | Load Current [A]                 | Ripple Output Volt. 85V [mV] | Ripple Output Volt. 132V [mV] | 0.00                  | 5                      | 5                           | 0.07                        | 10   | 10 | 0.14 | 10   | 10 | 0.28 | 10   | 10 | 0.42 | 10   | 10 | 0.56 | 10   | 10 | 0.70 | 15   | 15 | 0.80 | 25   | 15 |    |      |    |    |
| Load Current [A]  | Ripple Output Volt. 85V [mV]  | Ripple Output Volt. 132V [mV]    |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.00  | 5   | 5                                |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.07  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.14  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.28  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.42  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.56  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.70  | 15  | 15                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.80  | 25  | 15                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 2. Values   | <table border="1"> <thead> <tr> <th rowspan="2">Load Current<br/>[A]</th> <th>Input Volt.<br/>85 [V]</th> <th>Input Volt.<br/>132 [V]</th> </tr> <tr> <th>Ripple Output<br/>Volt. [mV]</th> <th>Ripple Output<br/>Volt. [mV]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>5</td><td>5</td></tr> <tr><td>0.07</td><td>10</td><td>10</td></tr> <tr><td>0.14</td><td>10</td><td>10</td></tr> <tr><td>0.28</td><td>10</td><td>10</td></tr> <tr><td>0.42</td><td>10</td><td>10</td></tr> <tr><td>0.56</td><td>10</td><td>10</td></tr> <tr><td>0.70</td><td>15</td><td>15</td></tr> <tr><td>0.80</td><td>25</td><td>15</td></tr> </tbody> </table>  |                                  |                              | Load Current<br>[A]           | Input Volt.<br>85 [V] | Input Volt.<br>132 [V] | Ripple Output<br>Volt. [mV] | Ripple Output<br>Volt. [mV] | 0.00 | 5  | 5    | 0.07 | 10 | 10   | 0.14 | 10 | 10   | 0.28 | 10 | 10   | 0.42 | 10 | 10   | 0.56 | 10 | 10   | 0.70 | 15 | 15 | 0.80 | 25 | 15 |
| Load Current<br>[A]   | Input Volt.<br>85 [V]   | Input Volt.<br>132 [V]           |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
|   | Ripple Output<br>Volt. [mV]   | Ripple Output<br>Volt. [mV]      |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.00  | 5   | 5                                |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.07  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.14  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.28  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.42  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.56  | 10  | 10                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.70  | 15  | 15                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 0.80  | 25  | 15                               |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| Ripple Voltage is shown as p-p in the figure below.                                 |   |                                  |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| Note: Slanted line shows the range of the rated load current.                       |   |                                  |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| 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>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> |   |                                  |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |
| Fig. Complex Ripple Wave Form<br>図 リップル波形詳細図  |   |                                  |                              |                               |                       |                        |                             |                             |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |      |      |    |    |      |    |    |

**COSEL**

|        |                      |
|--------|----------------------|
| Model  | R15A-24              |
| Item   | Ripple-Noise リップルノイズ |
| Object | +24V 0.7A            |

Temperature 25°C  
Testing Circuitry Figure A



## 2. Values

| Load current<br>[A] | Input Volt.<br>85 [V] | Input Volt.<br>132 [V] |
|---------------------|-----------------------|------------------------|
|                     | Ripple-Noise<br>[mV]  | Ripple-Noise<br>[mV]   |
| 0.00                | 10                    | 10                     |
| 0.10                | 10                    | 10                     |
| 0.14                | 10                    | 10                     |
| 0.30                | 10                    | 10                     |
| 0.40                | 15                    | 15                     |
| 0.60                | 20                    | 20                     |
| 0.70                | 25                    | 25                     |
| 0.80                | 40                    | 40                     |

Ripple-Noise is shown as p-p in the figure below.  
Note: Slanted line shows the range of the rated load current.

リップルノイズは、下図 p - p 値で示される。

(注)斜線は定格負荷電流範囲を示す。

- T1: Due to AC Input Line  
入力商用周期  
T2: Due to Switching  
スイッチング周期

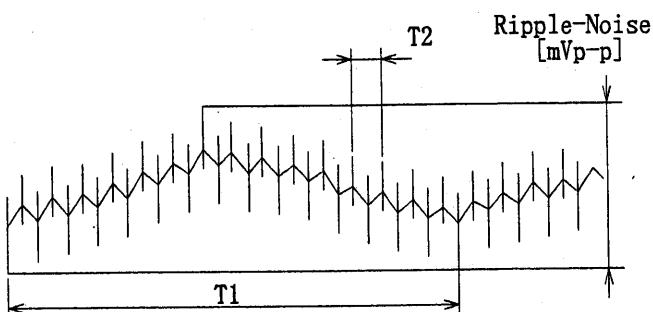


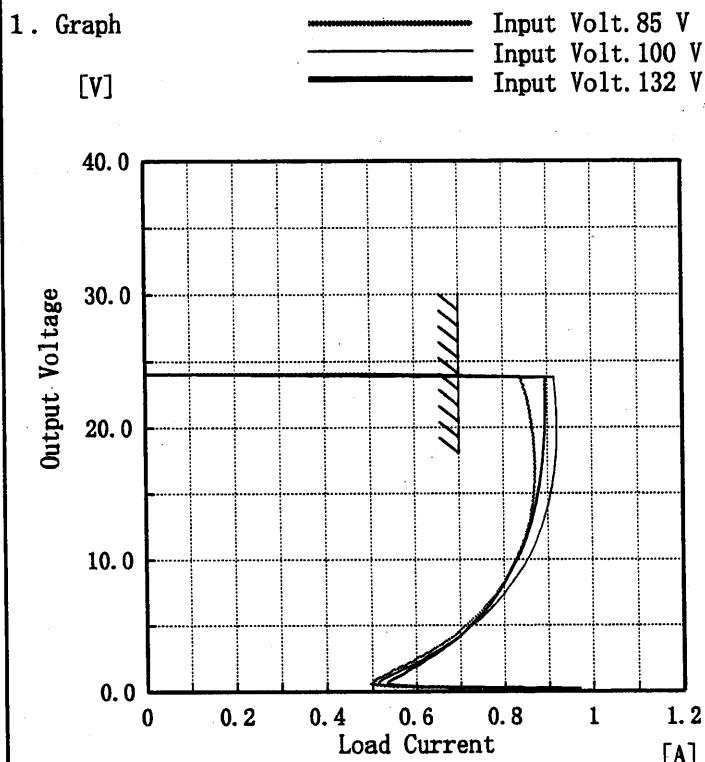
Fig. Complex Ripple Wave Form

図 リップル波形詳細図

**COSEL**

|       |                                 |
|-------|---------------------------------|
| Model | R15A-24                         |
| Item  | Overcurrent Protection<br>過電流保護 |

Object +24V0.7A

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

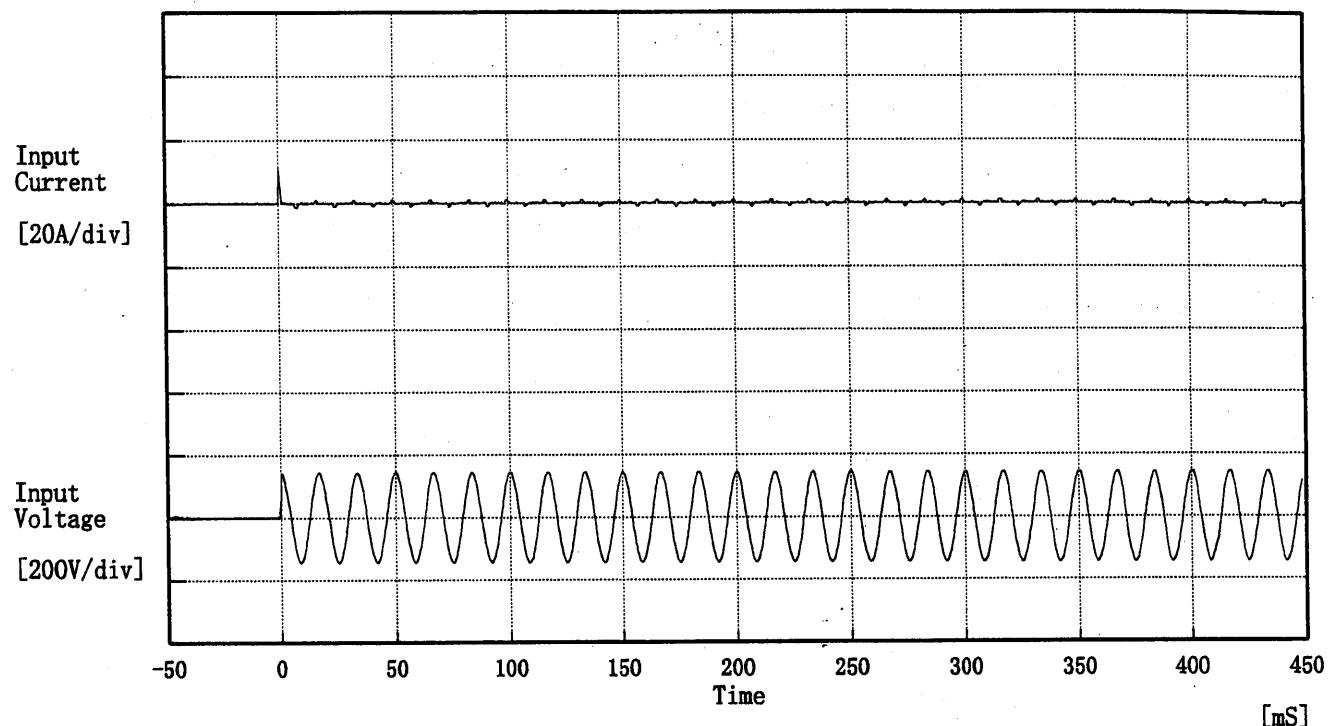
| Output Voltage [V] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
|--------------------|-------------------|--------------------|--------------------|
|                    | Load Current [A]  | Load Current [A]   | Load Current [A]   |
| 24.00              | 0.49              | 0.56               | 0.06               |
| 22.80              | 0.85              | 0.92               | 0.90               |
| 21.60              | 0.86              | 0.92               | 0.89               |
| 19.20              | 0.87              | 0.92               | 0.89               |
| 16.80              | 0.87              | 0.92               | 0.89               |
| 14.40              | 0.87              | 0.90               | 0.87               |
| 12.00              | 0.85              | 0.88               | 0.85               |
| 9.60               | 0.82              | 0.85               | 0.82               |
| 7.20               | 0.78              | 0.80               | 0.78               |
| 4.80               | 0.71              | 0.72               | 0.72               |
| 2.40               | 0.60              | 0.61               | 0.62               |
| 0.00               | 0.87              | 0.91               | 0.97               |

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

(注)斜線は定格負荷電流範囲を示す。

COSEL

|        |                     |  |      |
|--------|---------------------|--|------|
| Model  | R15A-24             | Temperature<br>Testing Circuitry<br>Figure A | 25°C |
| Item   | Inrush Current 突入電流 |  |      |
| Object | _____               |  |      |



Input Voltage 100 V

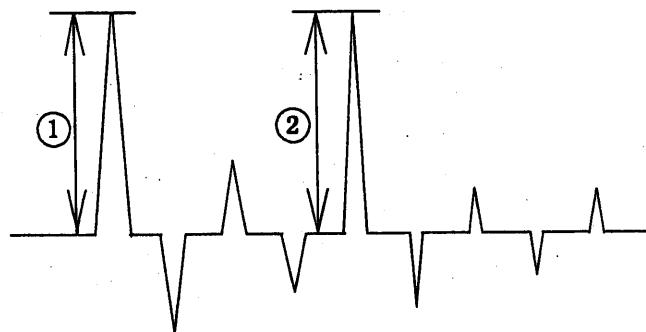
Frequency 60 Hz

Load 100 %

**Inrush Current**

① 11.21 [A]

② 1.21 [A]

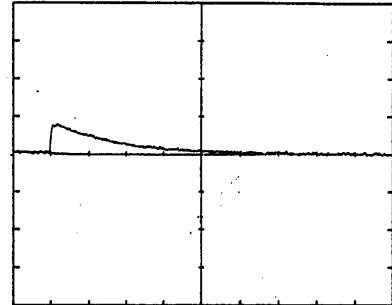
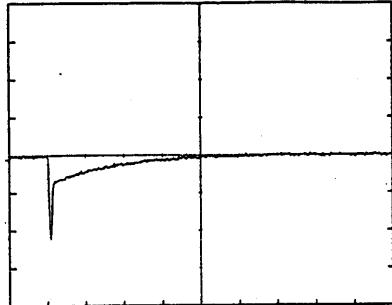
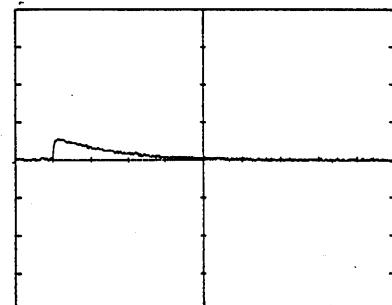
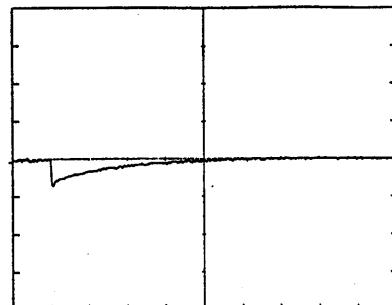


**COSEL**

|        |                                 |
|--------|---------------------------------|
| Model  | R15A-24                         |
| Item   | Dynamic Load Response<br>動的負荷變動 |
| Object | +24V0.7A                        |

Temperature 25°C  
Testing Circuitry Figure AInput Volt. 100 V  
Cycle 1000 mS

Load Current

Load 0% ↔  
Load 100 %Load 0% ↔  
Load 50 %

200 mV/div

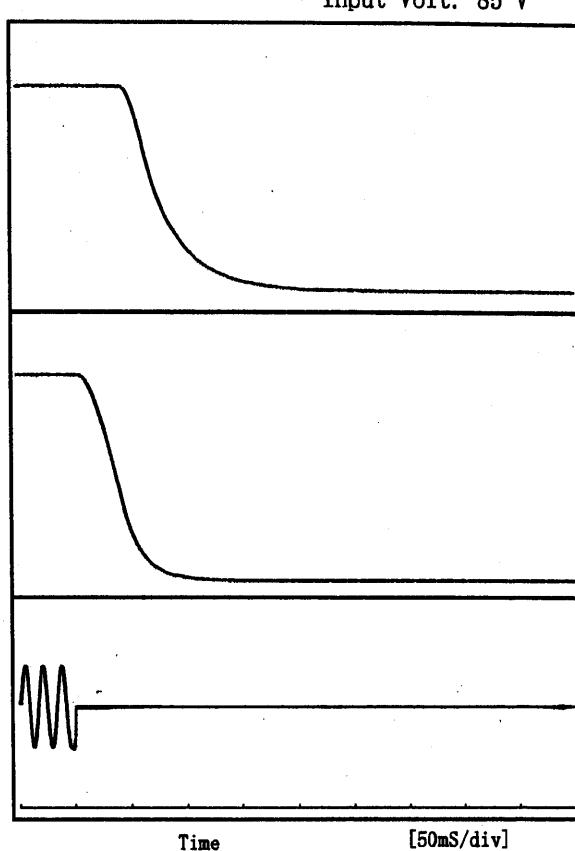
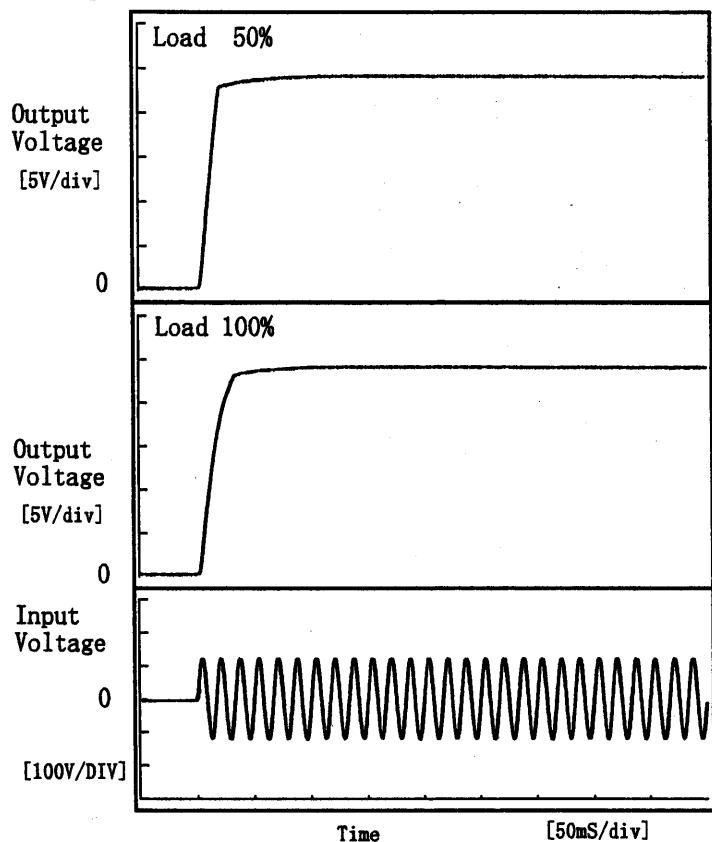
20 mS/div

COSEL

|        |                              |
|--------|------------------------------|
| Model  | R15A-24                      |
| Item   | Rise and Fall Time 立上り、立下り時間 |
| Object | +24V 0.7A                    |

Temperature 25°C  
Testing Circuitry Figure A

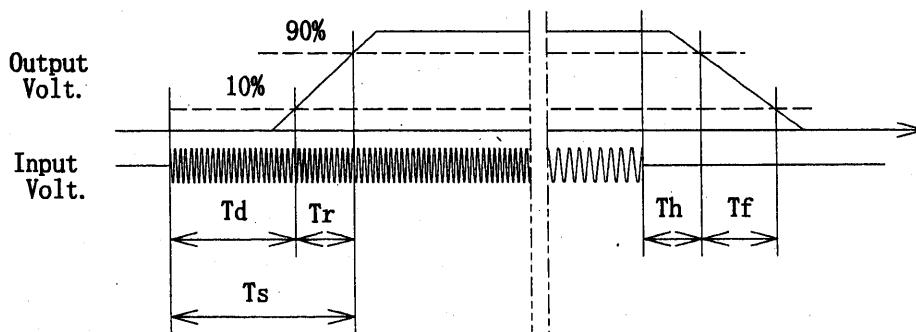
## 1. Graph



## 2. Values

[mS]

| Load \ Time | T d | T r  | T s  | T h  | T f  |
|-------------|-----|------|------|------|------|
| 50 %        | 4.8 | 14.8 | 19.5 | 53.3 | 87.5 |
| 100 %       | 4.5 | 25.0 | 29.5 | 18.3 | 51.8 |



**COSEL**

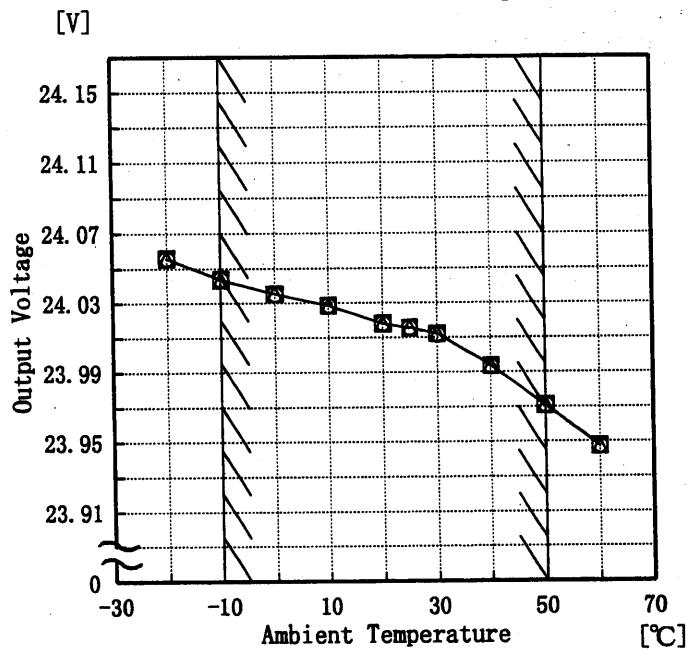
Model R15A-24

Item Ambient Temperature Drift  
周囲温度変動

Object +24V0.7A

## 1. Graph

—△— Input Volt. 85V  
 -□- Input Volt. 100V  
 —○— Input Volt. 132V



Load 100%

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。

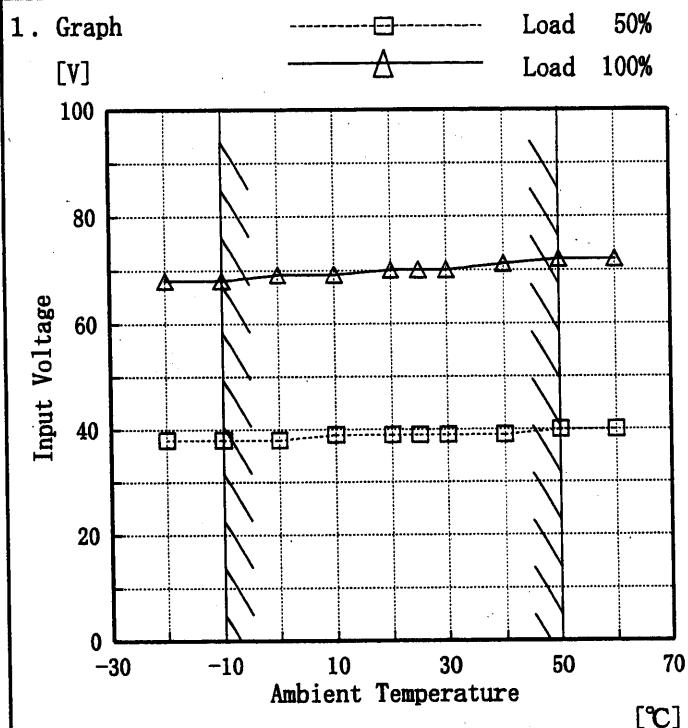
## Testing Circuitry Figure A

## 2. Values

| Temperature<br>[°C] | Input Volt.<br>85[V] | Input Volt.<br>100[V] | Input Volt.<br>132[V] |
|---------------------|----------------------|-----------------------|-----------------------|
|                     | Output<br>Volt. [V]  | Output<br>Volt. [V]   | Output<br>Volt. [V]   |
| -20                 | 24.056               | 24.056                | 24.056                |
| -10                 | 24.043               | 24.044                | 24.044                |
| 0                   | 24.035               | 24.035                | 24.035                |
| 10                  | 24.029               | 24.029                | 24.029                |
| 20                  | 24.018               | 24.018                | 24.018                |
| 25                  | 24.016               | 24.016                | 24.016                |
| 30                  | 24.012               | 24.012                | 24.012                |
| 40                  | 23.993               | 23.994                | 23.993                |
| 50                  | 23.971               | 23.971                | 23.971                |
| 60                  | 23.947               | 23.948                | 23.947                |

COSEL

|        |  |
|--------|--|
| Model  | R15A-24  |
| Item   | Minimum Input Voltage for Regulated Output Voltage<br>最低レギュレーション電圧 |
| Object | +24V 0.7A  |



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.<br>[°C] | Load 50%           | Load 100%          |
|-----------------------|--------------------|--------------------|
|                       | Input Volt.<br>[V] | Input Volt.<br>[V] |
| -20                   | 38                 | 68                 |
| -10                   | 38                 | 68                 |
| 0                     | 38                 | 69                 |
| 10                    | 39                 | 69                 |
| 20                    | 39                 | 70                 |
| 25                    | 39                 | 70                 |
| 30                    | 39                 | 70                 |
| 40                    | 39                 | 71                 |
| 50                    | 40                 | 72                 |
| 60                    | 40                 | 72                 |

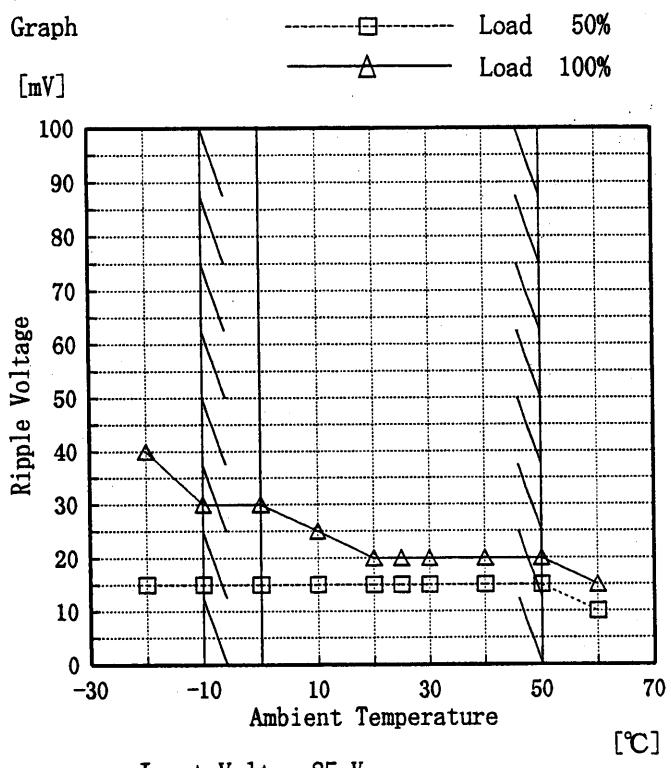
**COSEL**

Model R15A-24

Item Ripple Voltage (by Ambient Temp.)  
リップル電圧 (周囲温度特性)

Object +24V0.7A

## 1. Graph



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

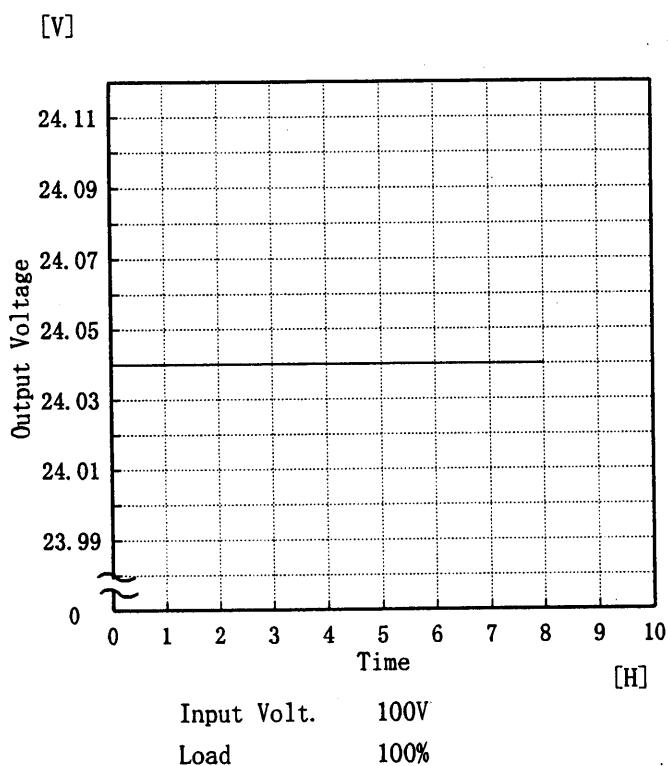
| Ambient Temp. [°C] | Load 50%                 | Load 100%                |
|--------------------|--------------------------|--------------------------|
|                    | Ripple Output Volt. [mV] | Ripple Output Volt. [mV] |
| -20                | 15                       | 40                 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

**COSEL**

|        |                         |
|--------|-------------------------|
| Model  | R15A-24                 |
| Item   | Time Lapse Drift 経時ドリフト |
| Object | +24V 0.7A               |

Temperature 25 °C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

| Time since start [H] | Output Voltage [V] |
|----------------------|--------------------|
| 0.0                  | 24.040             |
| 0.5                  | 24.040             |
| 1.0                  | 24.040             |
| 2.0                  | 24.040             |
| 3.0                  | 24.040             |
| 4.0                  | 24.040             |
| 5.0                  | 24.040             |
| 6.0                  | 24.040             |
| 7.0                  | 24.040             |
| 8.0                  | 24.040             |



|        |                               |                            |
|--------|-------------------------------|----------------------------|
| Model  | R15A-24                       | Testing Circuitry Figure A |
| Item   | Output Voltage Accuracy 定電圧精度 |                            |
| Object | +24V0.7A                      |                            |

#### 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 : 85~132 V

Load Current : 0.00~0.70 A

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

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

#### 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 85~132 V

負荷電流 0.00~0.70 A

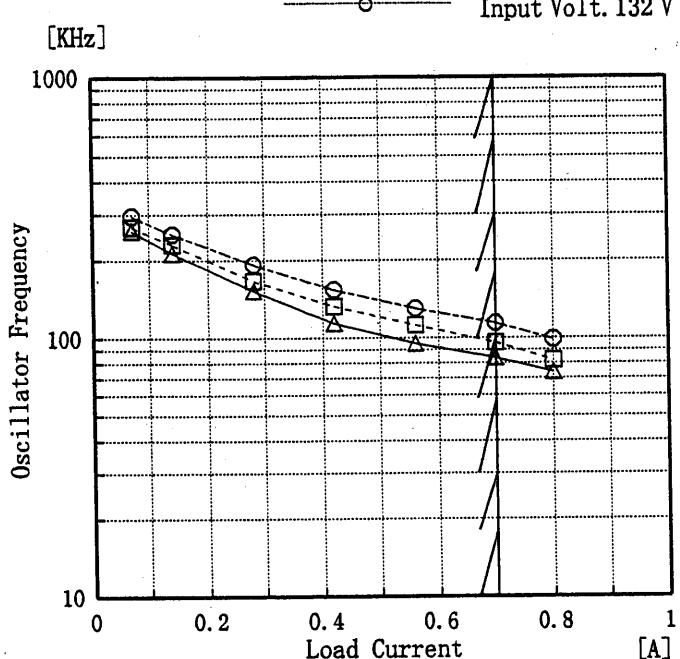
\* 定電圧精度(変動値) =  $\pm (\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

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

| Item            | Temperature [°C] | Input Voltage [V] | Output Current [A] | Output Voltage [V] | Output Voltage Accuracy [mV] | Output Voltage Accuracy (Ration) [%] |
|-----------------|------------------|-------------------|--------------------|--------------------|------------------------------|--------------------------------------|
| Maximum Voltage | -10              | 132               | 0.00               | 24.053             | $\pm 41$                     | $\pm 0.2$                            |
| Minimum Voltage | 50               | 132               | 0.70               | 23.971             |                              |                                      |

**COSEL**

|          |                            |                            |   |
|----------|----------------------------|----------------------------|---|
| Model    | R15A-24                    | Temperature                | 25°C  |
| Item     | Oscillator Frequency 発振周波数 | Testing Circuitry          | Figure A  |
| Object   | +24V 0.7A                  |                            |   |
| 1. Graph |                            | 2. Values                  |   |
|          |                            | Load Current [A]           | Input Volt. 85[V] Input Volt. 100[V] Input Volt. 132[V] |
|          |                            | Oscillator Frequency [KHz] | Oscillator Frequency [KHz]                              |
|          |                            | 0.07                       | 260 269 297   |
|          |                            | 0.14                       | 213 230 252   |
|          |                            | 0.28                       | 153 167 193   |
|          |                            | 0.42                       | 114 133 154   |
|          |                            | 0.56                       | 95 112 130  |
|          |                            | 0.70                       | 84 96 114   |
|          |                            | 0.80                       | 74 82 99  |



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

(注) 斜線は定格負荷電流範囲を示す。



|        |                   |                   |          |
|--------|-------------------|-------------------|----------|
| Model  | R15A-24           |                   |          |
| Item   | Condensation 結露特性 | Testing Circuitry | Figure A |
| Object | +24V0.7A          |                   |          |

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.  
 ④ Repeating ①, ② and ③ three times.

### 1. 結露特性試験

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、その電気的特性の測定を3度行い、異常のないことを確認する。

### 2. Values

|                  | Times | Output Voltage [V] | Ripple Voltage [mV] | Ripple Noise [mV] |
|------------------|-------|--------------------|---------------------|-------------------|
| Load<br>50<br>%  | 1     | 24.060             | 10                  | 20                |
|                  | 2     | 24.060             | 10                  | 20                |
|                  | 3     | 24.060             | 10                  | 20                |
| Load<br>100<br>% | 1     | 24.060             | 15                  | 20                |
|                  | 2     | 24.060             | 15                  | 30                |
|                  | 3     | 24.060             | 15                  | 30                |

Input Volt. 100 V

**COSEL**

|        |                      |                               |
|--------|----------------------|-------------------------------|
| Model  | R15A-24              | Testing Circuitry<br>Figure B |
| 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                  | 0.21                   | 0.26                   |
| (B) UL      | 0.12                  | 0.21                   | 0.26                   |
| (C) CSA     | 0.12                  | 0.21                   | 0.26                   |

| Standards | Leakage Current [mA]   |                        |                        |
|-----------|------------------------|------------------------|------------------------|
|           | Input Volt.<br>170 [V] | Input Volt.<br>220 [V] | Input Volt.<br>264 [V] |
| (D) VDE   | —                      | —                      | —                      |

## 2. Condition

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

交流入力の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  | R15A-24                        | Testing Circuitry<br>Figure C |
| Item   | Line Noise Tolerance<br>入力雑音耐量 |                               |
| Object | +24V0.7A                       |                               |

## 1. Results

| Pulse Width<br>[nS] | MODE   | Operating Point<br>of Overvoltage<br>Protection [V]<br>過電圧保護動作値 | DC-like<br>Regulation of<br>Output Voltage<br>出力電圧の直流的変動 |
|---------------------|--------|---|--|
| 50                  | COMMON | -   | no regulation  |
|                     | NORMAL | -   | no regulation  |
| 1000                | COMMON | -   | no regulation  |
|                     | NORMAL | -   | no regulation  |

## Conditions

Input Voltage : 100 V  
 Pulse Voltage : 2000 V  
 Pulse Cycle : 10 mS  
 Pulse Input Duration: 1 min. or more  
 Load : 100 %

COSEL

|        |                              |
|--------|------------------------------|
| Model  | R15A-24                      |
| Item   | Conducted Emission<br>雜音端子電圧 |
| Object | _____                        |

Testing Circuitry

Figure D

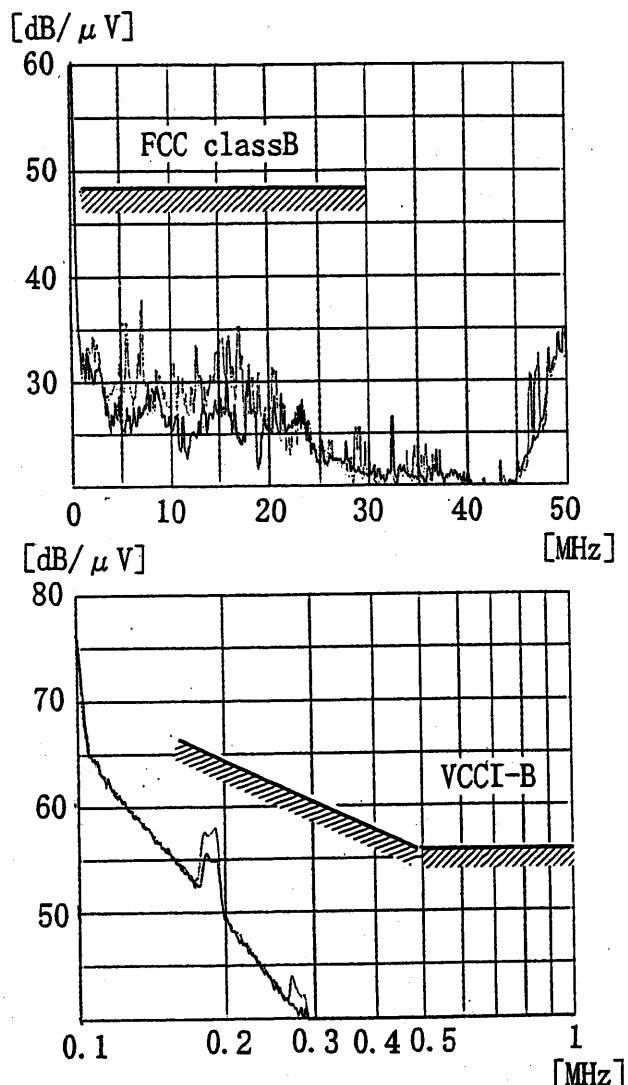
## 1. Graph

## Remarks

Input Volt.      100V (VCCI -B)  
                   120V (FCC classB)  
      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 -A                               |                    | 0.15~0.5        | 79                |
|    |                                       |                    | 0.5~30          | 73                |
| 4  | VCCI -B                               | ○                  | 0.15~0.5        | 66-56             |
|    |                                       |                    | 0.5~5           | 56                |
|    |                                       |                    | 5~30            | 60                |
| 5  | CISPR Pub. 22<br>class A<br>(EN55022) |                    | 0.15~0.5        | 79                |
|    |                                       |                    | 0.5~30          | 73                |
|    |                                       |                    | 30~             | 66-56             |
| 6  | CISPR Pub. 22<br>class B<br>(EN55022) |                    | 0.15~0.5        | 66-56             |
|    |                                       |                    | 0.5~5           | 56                |
|    |                                       |                    | 5~30            | 60                |



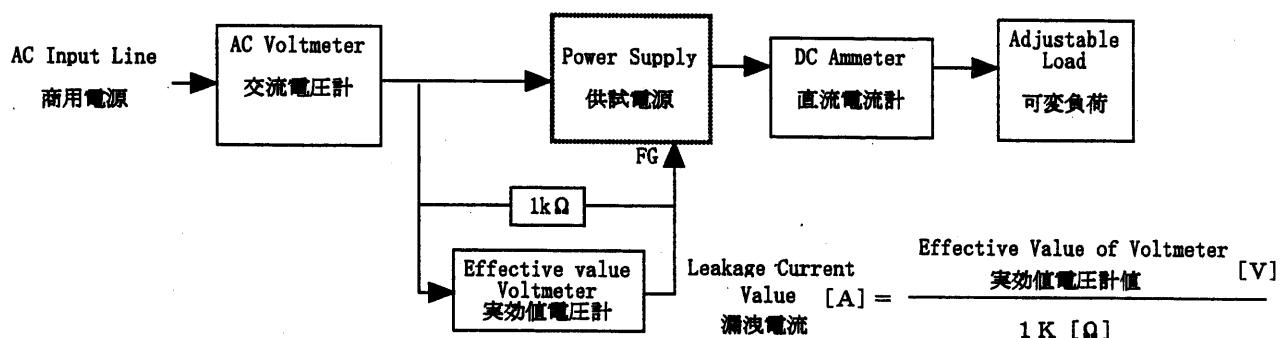
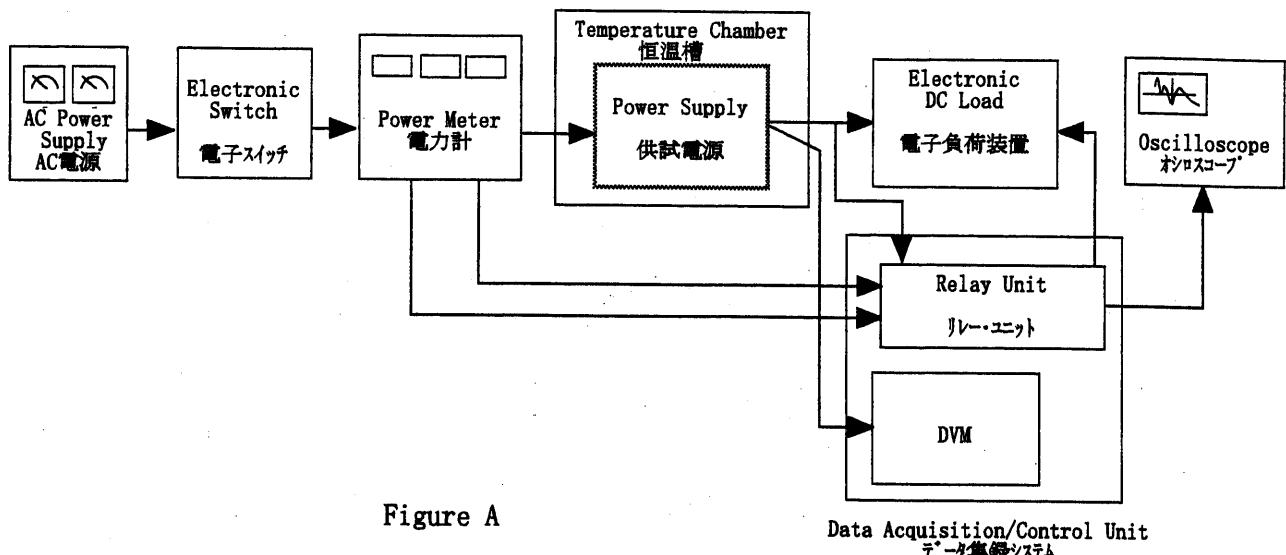


Figure B (DENTORI)

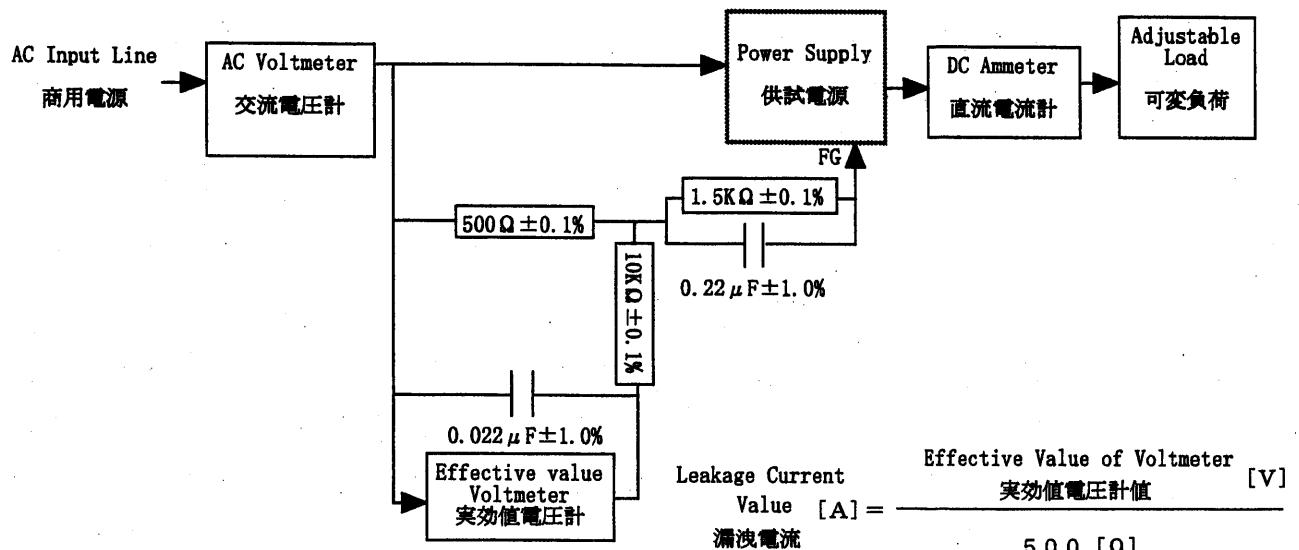


Figure B (UL, CSA, VDE)

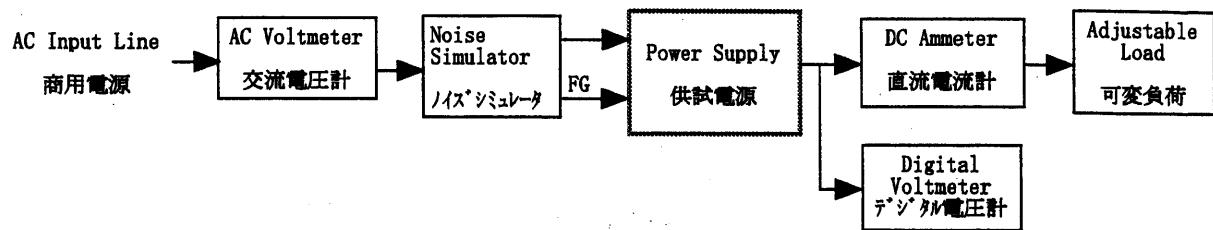


Figure C

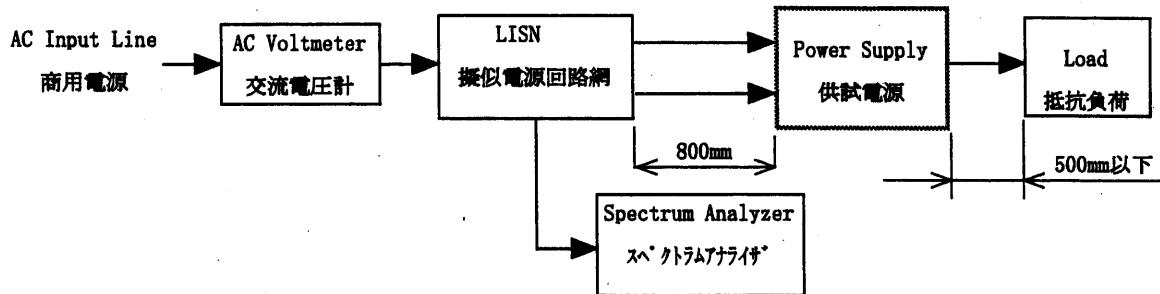


Figure D

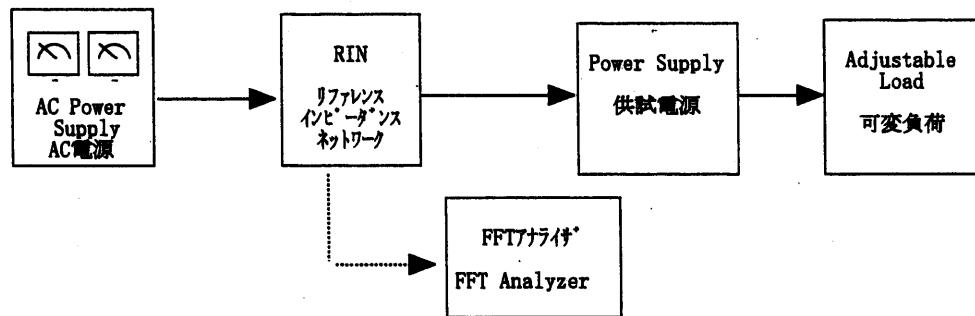


Figure E