参考資料

COSEL

# TEST DATA OF MMC50A-2

(100V INPUT)

Regulated DC Power Supply

Date : July 7, 1999

Approved by : Design Manager

Prepared by : Design Engineer

コーセル株式会社

COSEL CO., LTD.

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# CONTENTS



(Final Page 44 )

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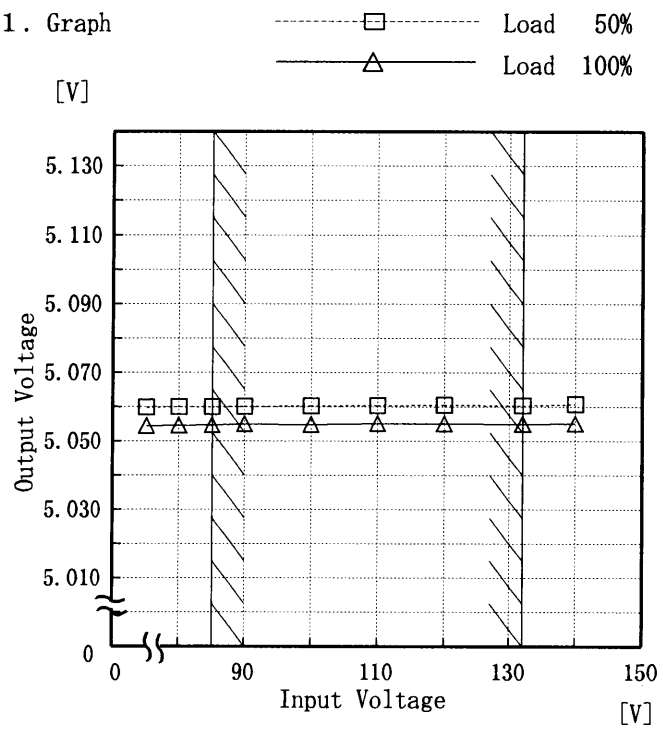
| Model | MMC50A-2 |
|---|---|
| Item | Line Regulation 静的入力変動 |

Temperature 25℃
Testing Circuitry Figure A

Object +5.0V5.00A

1. Graph

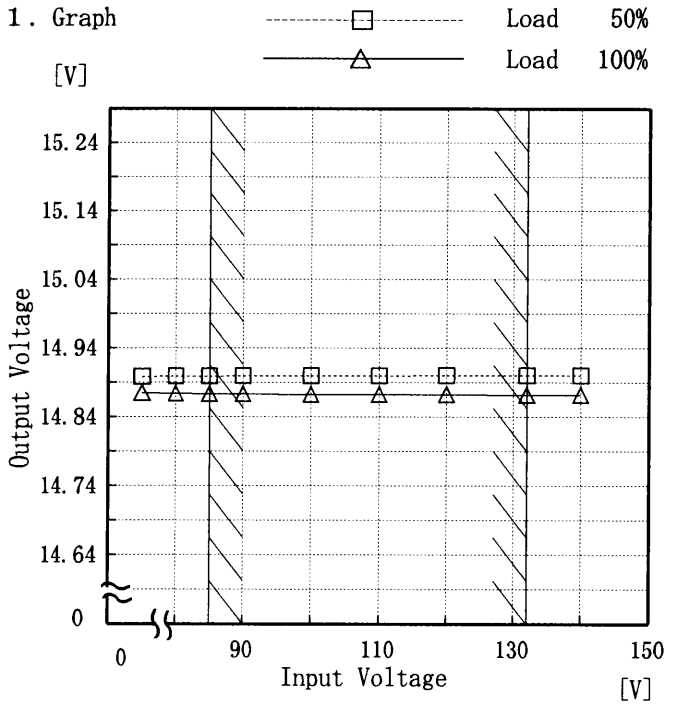



2. Values

| Input Voltage [V] | Load 50% Output Volt. [V] | Load 100% Output Volt. [V] |
|---|---|---|
| 75 | 5.060 | 5.054 |
| 80 | 5.060 | 5.055 |
| 85 | 5.060 | 5.055 |
| 90 | 5.060 | 5.055 |
| 100 | 5.060 | 5.055 |
| 110 | 5.060 | 5.055 |
| 120 | 5.061 | 5.055 |
| 132 | 5.060 | 5.055 |
| 140 | 5.061 | 5.055 |
| — | — | — |
| — | — | — |
| — | — | — |

Object +15.0V1.20A

1. Graph




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。

2. Values

| Input Voltage [V] | Load 50% Output Volt. [V] | Load 100% Output Volt. [V] |
|---|---|---|
| 75 | 14.898 | 14.875 |
| 80 | 14.899 | 14.874 |
| 85 | 14.900 | 14.874 |
| 90 | 14.900 | 14.873 |
| 100 | 14.900 | 14.873 |
| 110 | 14.900 | 14.873 |
| 120 | 14.900 | 14.873 |
| 132 | 14.900 | 14.872 |
| 140 | 14.900 | 14.872 |
| — | — | — |
| — | — | — |
| — | — | — |



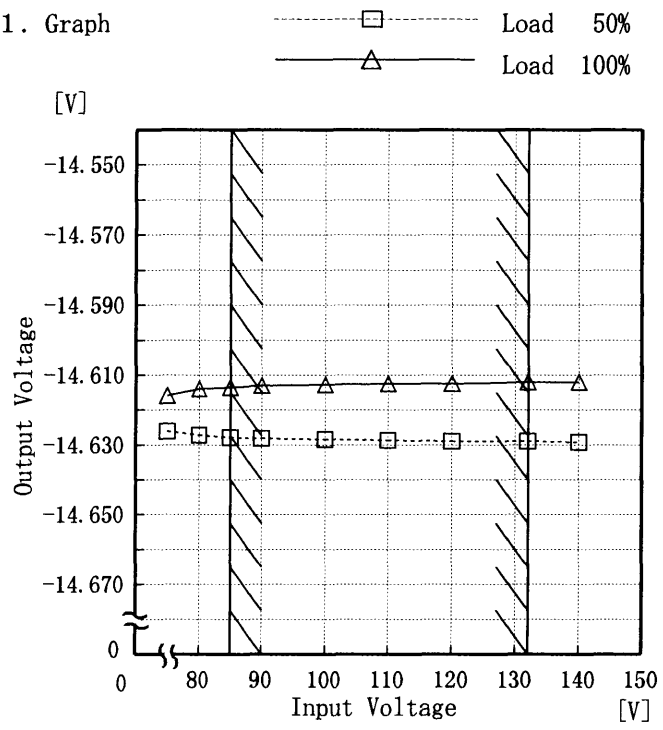
BC−3245

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Line Regulation 静的入力変動 |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

2. Values

| Input Voltage [V] | Load 50% Output Volt. [V] | Load 100% Output Volt. [V] |
|---|---|---|
| 75 | -14.626 | -14.616 |
| 80 | -14.627 | -14.614 |
| 85 | -14.628 | -14.614 |
| 90 | -14.628 | -14.613 |
| 100 | -14.628 | -14.613 |
| 110 | -14.629 | -14.612 |
| 120 | -14.629 | -14.612 |
| 132 | -14.629 | -14.612 |
| 140 | -14.629 | -14.612 |



BC-3245

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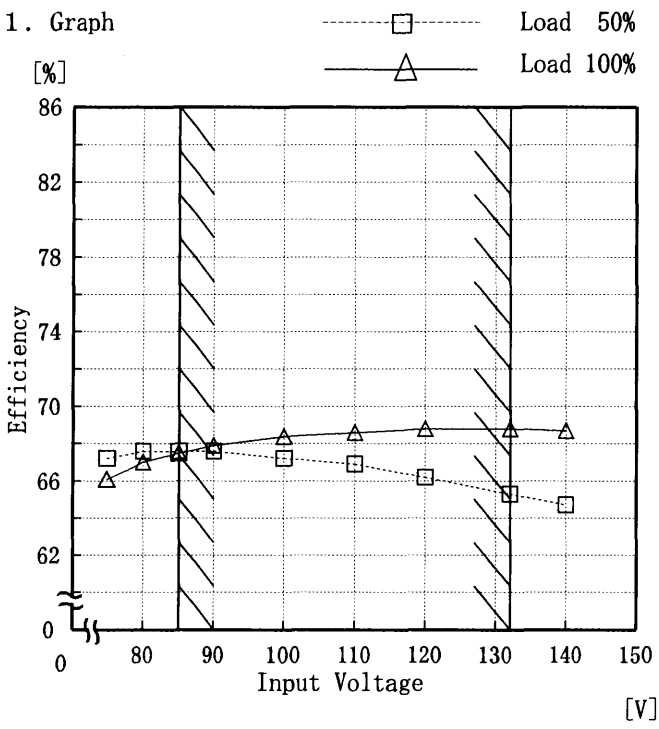
| Model | MMC50A-2 |
|---|---|
| Item | Efficiency 効率 |
| Object | ——————————— |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

2. Values

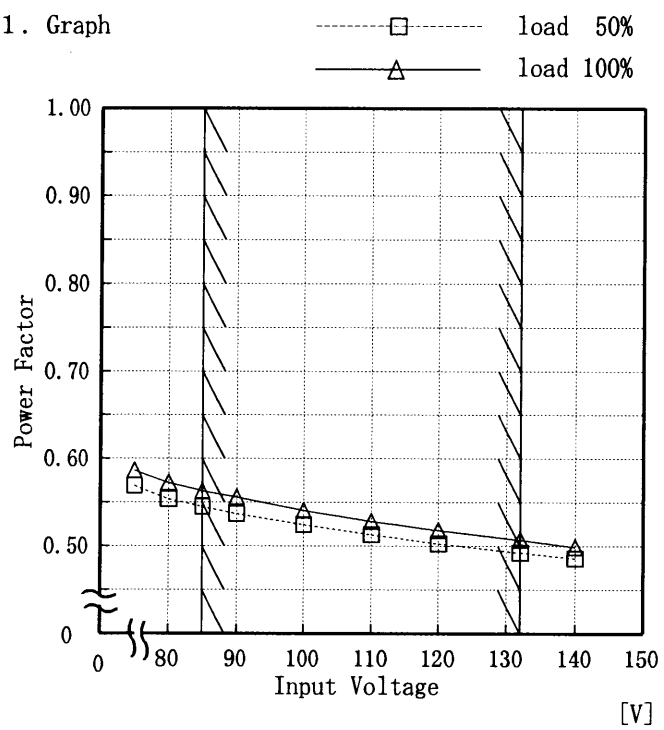
| Input Voltage [V] | Load 50% Efficiency [%] | Load 100% Efficiency [%] |
|---|---|---|
| 75 | 67.2 | 66.1 |
| 80 | 67.6 | 67.0 |
| 85 | 67.6 | 67.5 |
| 90 | 67.6 | 67.9 |
| 100 | 67.2 | 68.4 |
| 110 | 66.9 | 68.6 |
| 120 | 66.2 | 68.8 |
| 132 | 65.3 | 68.8 |
| 140 | 64.7 | 68.7 |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Power Factor (by Input Voltage)<br>力率（入力電圧特性） |
| Object | ———————————— |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

2. Values

| Input Voltage [V] | load 50% Power Factor | load 100% Power Factor |
|---|---|---|
| 75 | 0.57 | 0.59 |
| 80 | 0.55 | 0.57 |
| 85 | 0.54 | 0.56 |
| 90 | 0.54 | 0.56 |
| 100 | 0.52 | 0.54 |
| 110 | 0.51 | 0.53 |
| 120 | 0.50 | 0.52 |
| 132 | 0.49 | 0.51 |
| 140 | 0.49 | 0.50 |

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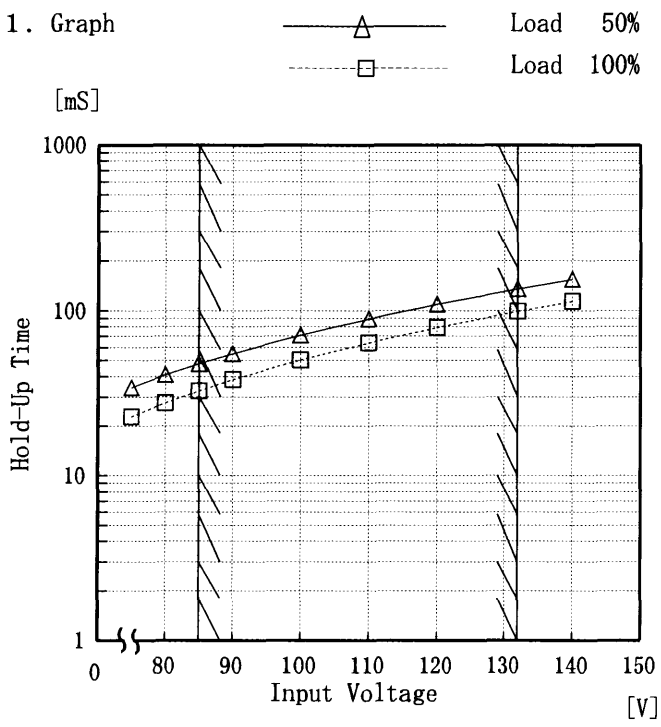
| | |
|---|---|
| Model | MMC50A-2 |
| Item | Hold-Up Time 出力保持時間 |
| Object | +5.0V5.00A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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% Hold-Up Time [mS] | Load 100% Hold-Up Time [mS] |
|---|---|---|
| 75 | 34 | 23 |
| 80 | 41 | 28 |
| 85 | 48 | 33 |
| 90 | 55 | 38 |
| 100 | 71 | 50 |
| 110 | 89 | 64 |
| 120 | 109 | 79 |
| 132 | 136 | 99 |
| 140 | 155 | 114 |

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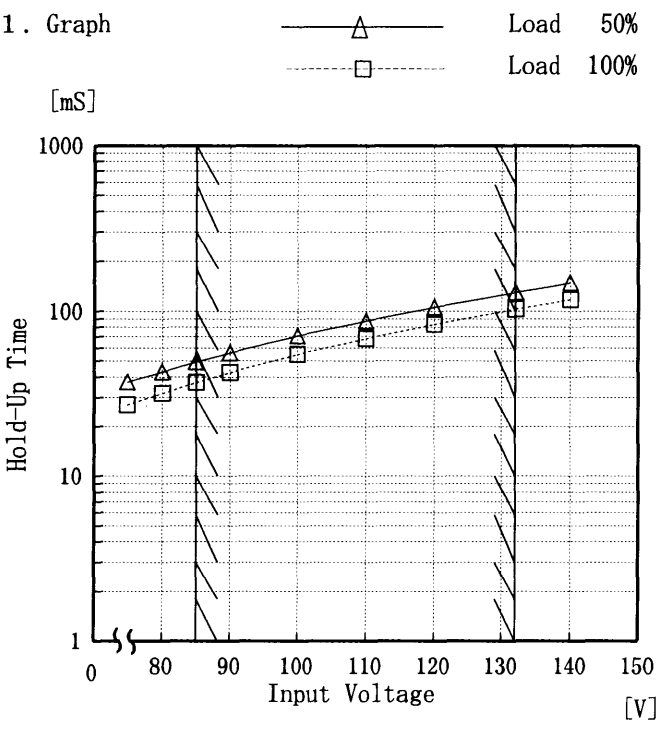
| Model | MMC50A-2 |
|---|---|
| Item | Hold-Up Time　出力保持時間 |
| Object | +15.0V1.20A |

Temperature　25℃
Testing Circuitry　Figure A

1. Graph




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

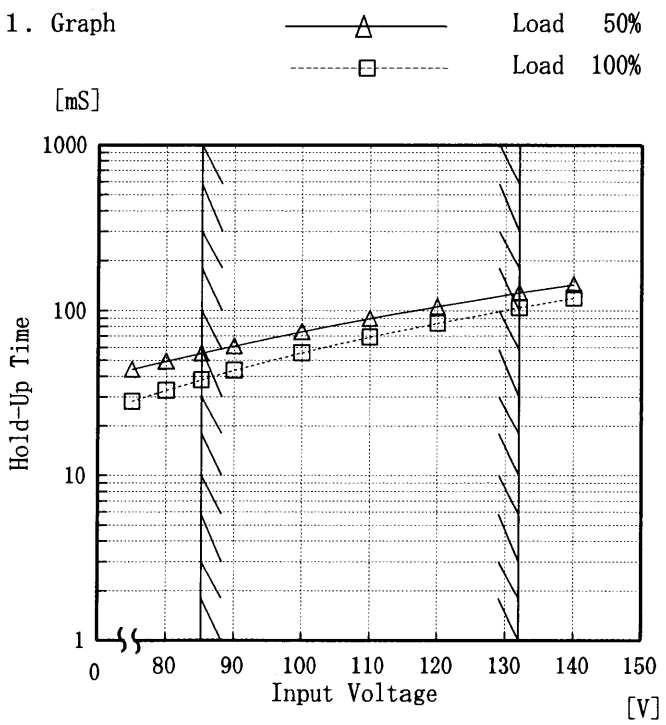
| Input Voltage [V] | Load 50% Hold-Up Time [mS] | Load 100% Hold-Up Time [mS] |
|---|---|---|
| 75 | 37 | 27 |
| 80 | 43 | 32 |
| 85 | 49 | 37 |
| 90 | 56 | 43 |
| 100 | 71 | 55 |
| 110 | 87 | 68 |
| 120 | 106 | 83 |
| 132 | 131 | 103 |
| 140 | 148 | 118 |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Hold-Up Time 出力保持時間 |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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

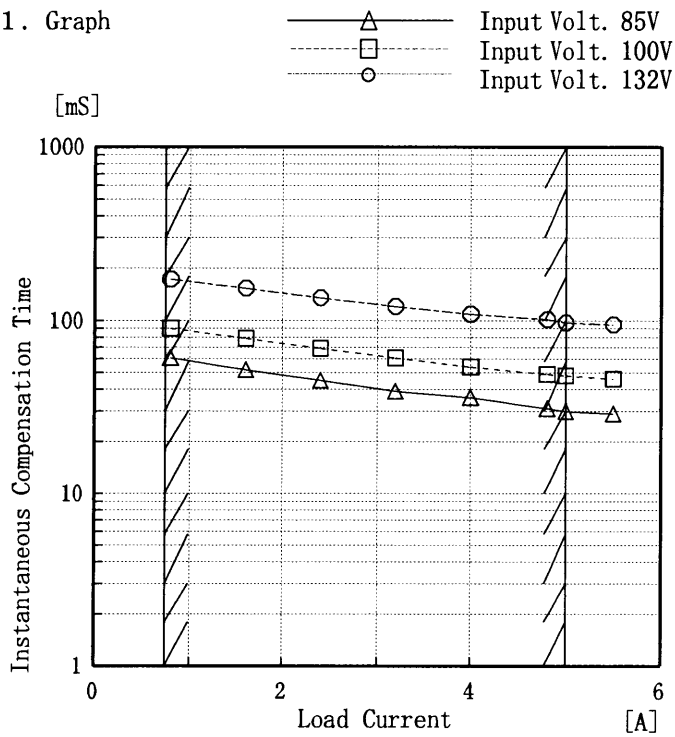
| Input Voltage [V] | Load 50% Hold-Up Time [mS] | Load 100% Hold-Up Time [mS] |
|---|---|---|
| 75 | 44 | 28 |
| 80 | 49 | 33 |
| 85 | 55 | 38 |
| 90 | 61 | 44 |
| 100 | 75 | 56 |
| 110 | 90 | 69 |
| 120 | 106 | 84 |
| 132 | 128 | 105 |
| 140 | 144 | 119 |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Instantaneous Interruption Compensation<br>瞬時停電保障 |
| Object | +5.0V5.00A |

Testing Circuitry Figure A

1. Graph




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。

2. Values

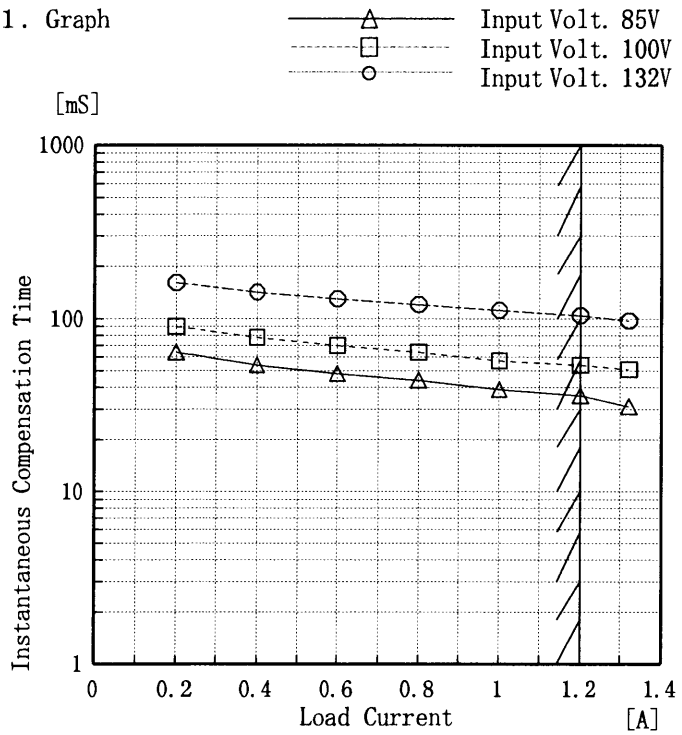
| Load Current [A] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
|---|---|---|---|
| | Time [mS] | | |
| 0.0 | — | — | — |
| 0.8 | 61 | 90 | 173 |
| 1.6 | 52 | 79 | 153 |
| 2.4 | 45 | 69 | 135 |
| 3.2 | 39 | 61 | 121 |
| 4.0 | 36 | 54 | 109 |
| 4.8 | 31 | 49 | 102 |
| 5.0 | 30 | 48 | 97 |
| 5.5 | 29 | 46 | 95 |
| — | — | — | — |
| — | — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Instantaneous Interruption Compensation<br>瞬時停電保障 |
| Object | +15.0V1.20A |

Testing Circuitry Figure A

1. Graph




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。

2. Values

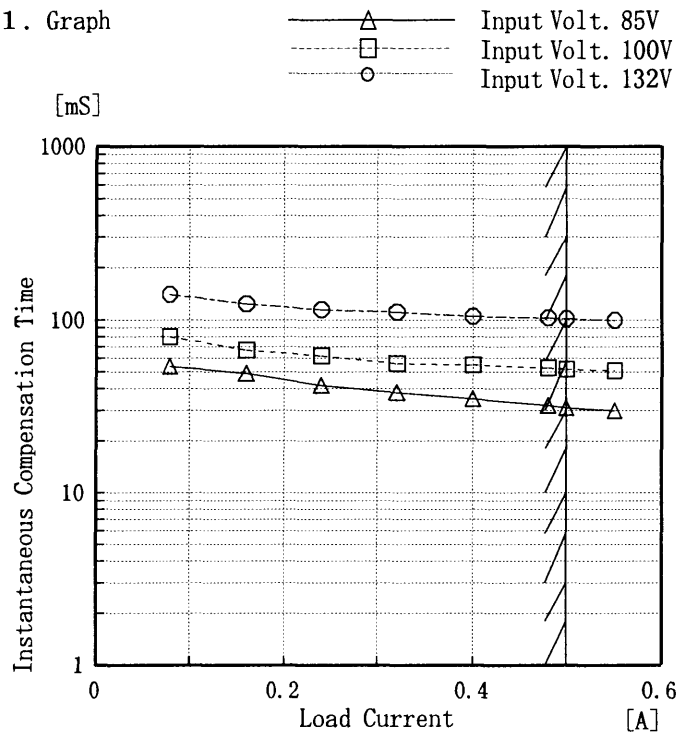
| Load Current [A] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
|---|---|---|---|
| | Time [mS] | | |
| 0.00 | — | — | — |
| 0.20 | 64 | 90 | 162 |
| 0.40 | 54 | 78 | 142 |
| 0.60 | 48 | 70 | 130 |
| 0.80 | 44 | 64 | 121 |
| 1.00 | 39 | 57 | 112 |
| 1.20 | 36 | 54 | 104 |
| 1.32 | 31 | 51 | 97 |
| — | — | — | — |
| — | — | — | — |
| — | — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Instantaneous Interruption Compensation<br>瞬時停電保障 |
| Object | −15.0V0.50A |

Testing Circuitry Figure A

1. Graph




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。

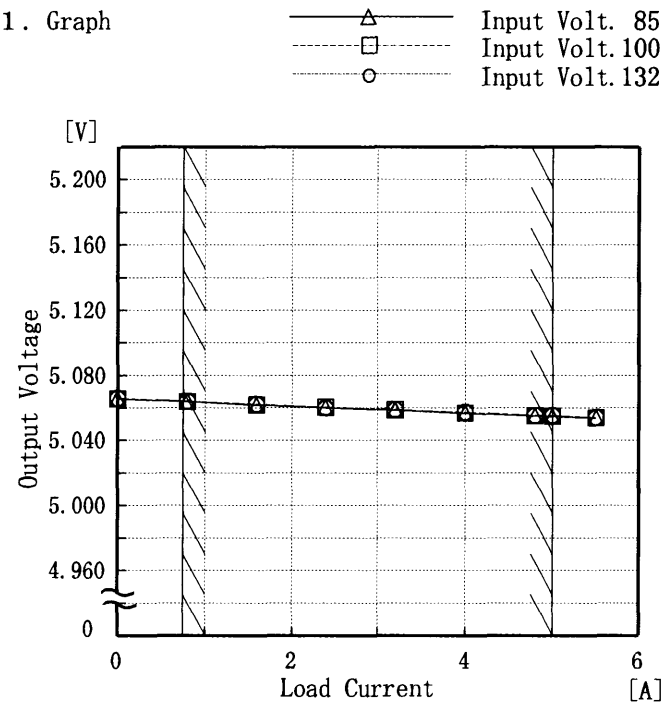
2. Values

| Load Current [A] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
|---|---|---|---|
| | Time [mS] | | |
| 0.00 | — | — | — |
| 0.08 | 54 | 80 | 140 |
| 0.16 | 49 | 67 | 124 |
| 0.24 | 42 | 62 | 115 |
| 0.32 | 38 | 56 | 111 |
| 0.40 | 35 | 55 | 105 |
| 0.48 | 32 | 53 | 103 |
| 0.50 | 31 | 52 | 102 |
| 0.55 | 30 | 51 | 100 |
| — | — | — | — |
| — | — | — | — |

COSEL

| Model | MMC50A-2 | Temperature | 25℃ |
|---|---|---|---|
| Item | Load Regulation 静的負荷変動 | Testing Circuitry | Figure A |
| Object | +5.0V5.00A | | |

1. Graph

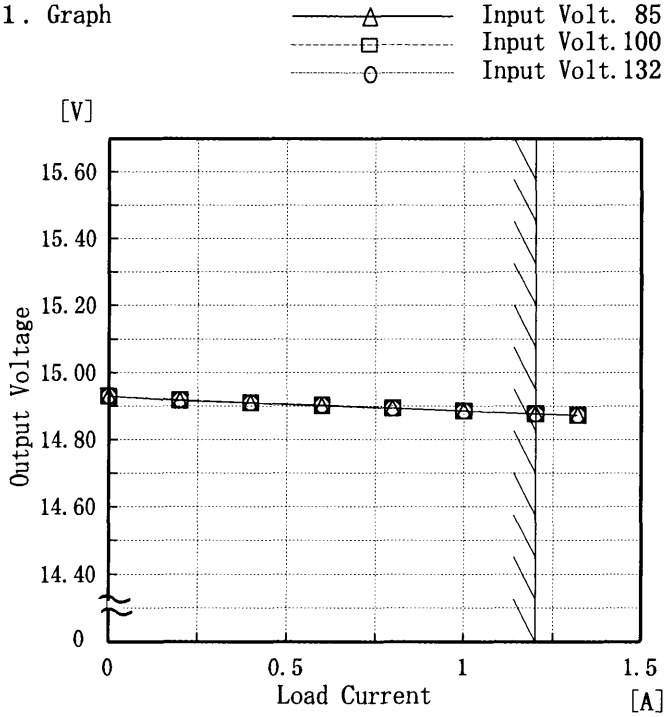



2. Values

| Load Current [A] | Input Volt. 85[V] Output Volt. [V] | Input Volt. 100[V] Output Volt. [V] | Input Volt. 132[V] Output Volt. [V] |
|---|---|---|---|
| 0.00 | 5.065 | 5.066 | 5.066 |
| 0.80 | 5.064 | 5.064 | 5.064 |
| 1.60 | 5.062 | 5.062 | 5.062 |
| 2.40 | 5.060 | 5.061 | 5.060 |
| 3.20 | 5.059 | 5.059 | 5.059 |
| 4.00 | 5.057 | 5.057 | 5.057 |
| 4.80 | 5.055 | 5.055 | 5.055 |
| 5.00 | 5.055 | 5.055 | 5.055 |
| 5.50 | 5.054 | 5.054 | 5.054 |
| — | — | — | — |

| Object | +15.0V1.20A |
|---|---|

1. Graph




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。

2. Values

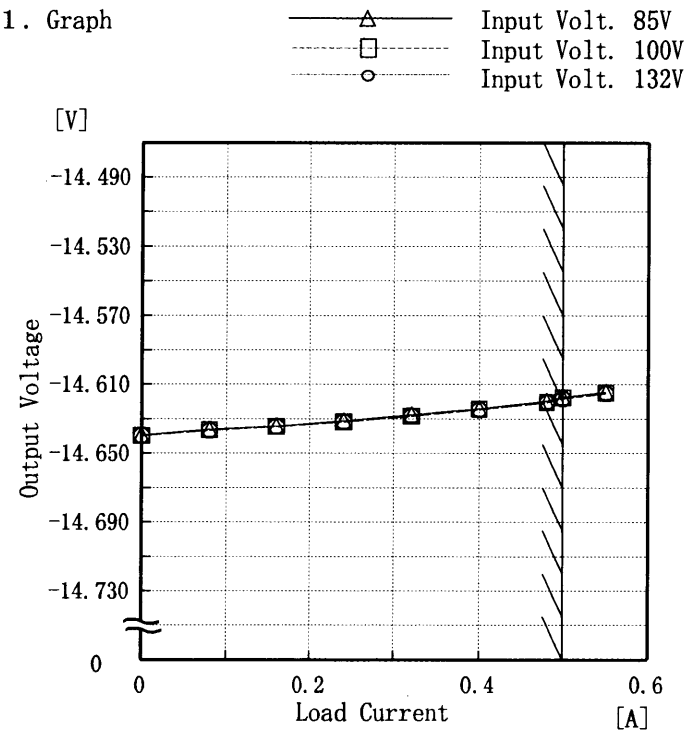
| Load Current [A] | Input Volt. 85[V] Output Volt. [V] | Input Volt. 100[V] Output Volt. [V] | Input Volt. 132[V] Output Volt. [V] |
|---|---|---|---|
| 0.00 | 14.929 | 14.930 | 14.930 |
| 0.20 | 14.917 | 14.918 | 14.918 |
| 0.40 | 14.909 | 14.910 | 14.910 |
| 0.60 | 14.902 | 14.902 | 14.902 |
| 0.80 | 14.894 | 14.894 | 14.894 |
| 1.00 | 14.885 | 14.886 | 14.886 |
| 1.20 | 14.877 | 14.878 | 14.878 |
| 1.32 | 14.872 | 14.872 | 14.873 |
| — | — | — | — |
| — | — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Load Regulation 静的負荷変動 |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

2. Values

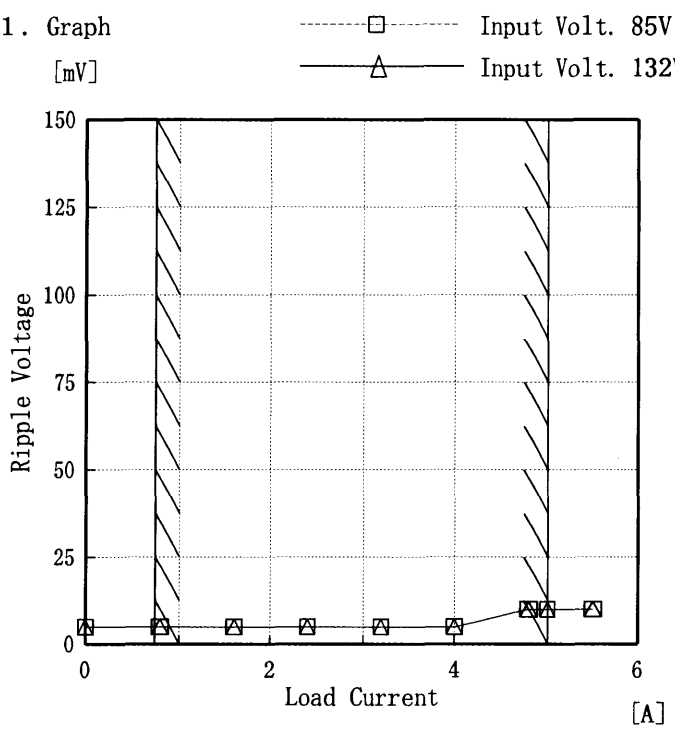
| Load Current [A] | Input Volt. 85[V] Output Volt. [V] | Input Volt. 100[V] Output Volt. [V] | Input Volt. 132[V] Output Volt. [V] |
|---|---|---|---|
| 0.00 | -14.639 | -14.640 | -14.640 |
| 0.08 | -14.636 | -14.637 | -14.637 |
| 0.16 | -14.634 | -14.634 | -14.635 |
| 0.24 | -14.631 | -14.632 | -14.632 |
| 0.32 | -14.628 | -14.628 | -14.628 |
| 0.40 | -14.624 | -14.624 | -14.624 |
| 0.48 | -14.620 | -14.620 | -14.620 |
| 0.50 | -14.617 | -14.618 | -14.618 |
| 0.55 | -14.614 | -14.615 | -14.615 |
| — | — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ripple Voltage(by Load Current)<br>リップル電圧(負荷電流特性) |
| Object | +5.0V5.00A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

(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
ｽｲｯﾁﾝｸﾞ周期

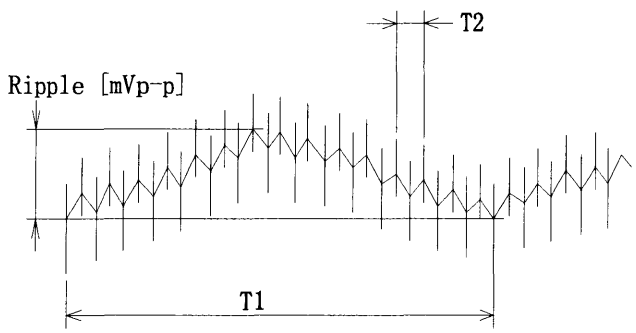



Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

| Load Current [A] | Input Volt. 85 [V] Ripple Output Volt. [mV] | Input Volt. 132 [V] 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 | 5 | 5 |
| 4.8 | 10 | 10 |
| 5.0 | 10 | 10 |
| 5.5 | 10 | 10 |
| — | — | — |
| — | — | — |



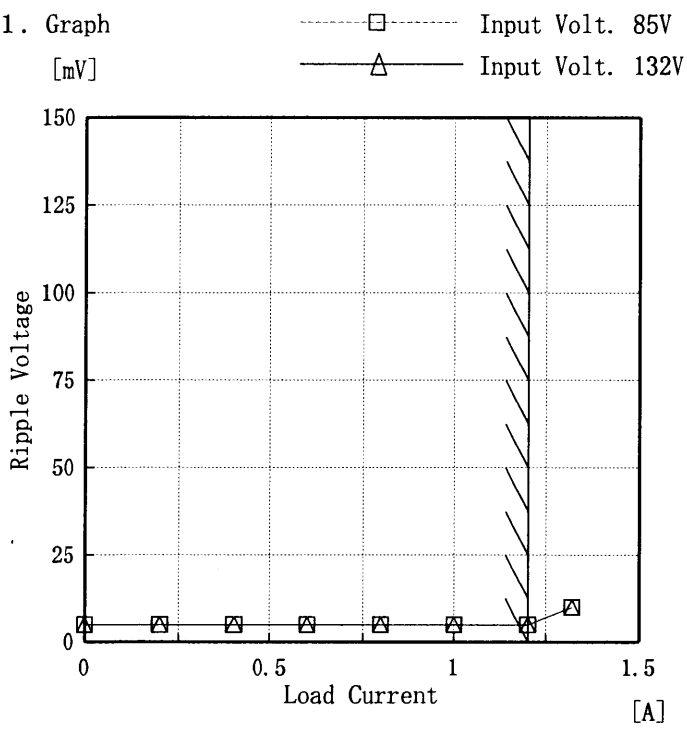
BC－3245

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ripple Voltage(by Load Current)<br>リップル電圧(負荷電流特性) |
| Object | +15.0V1.20A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

(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
ｽｲｯﾁﾝｸﾞ周期

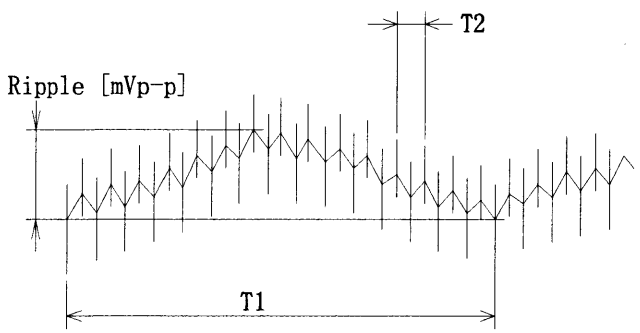



Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

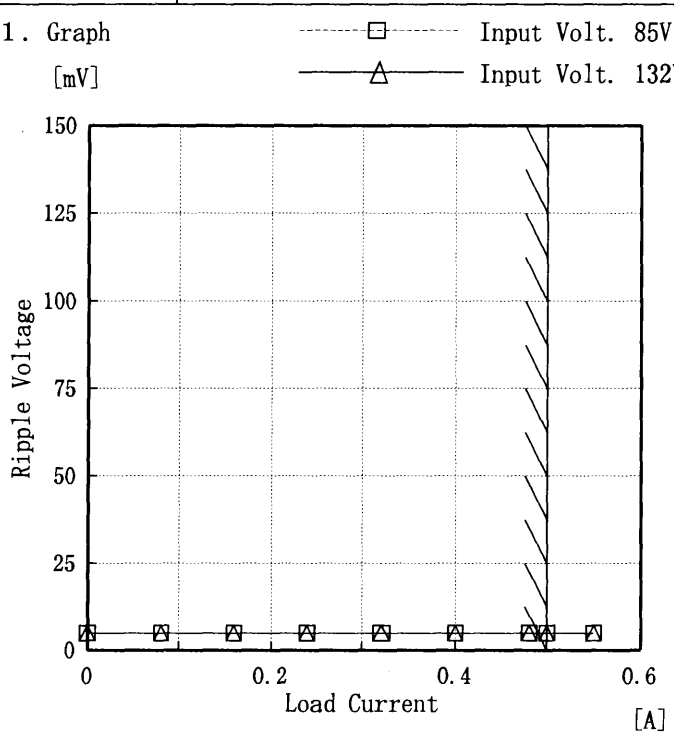
| Load Current [A] | Input Volt. 85 [V]<br>Ripple Output Volt. [mV] | Input Volt. 132 [V]<br>Ripple Output Volt. [mV] |
|---|---|---|
| 0.00 | 5 | 5 |
| 0.20 | 5 | 5 |
| 0.40 | 5 | 5 |
| 0.60 | 5 | 5 |
| 0.80 | 5 | 5 |
| 1.00 | 5 | 5 |
| 1.20 | 5 | 5 |
| 1.32 | 10 | 10 |
| — | — | — |
| — | — | — |
| — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ripple Voltage(by Load Current)<br>リップル電圧(負荷電流特性) |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

(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
ｽｲｯﾁﾝｸﾞ周期

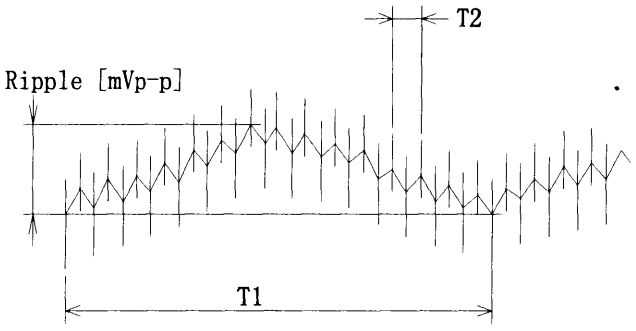



Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

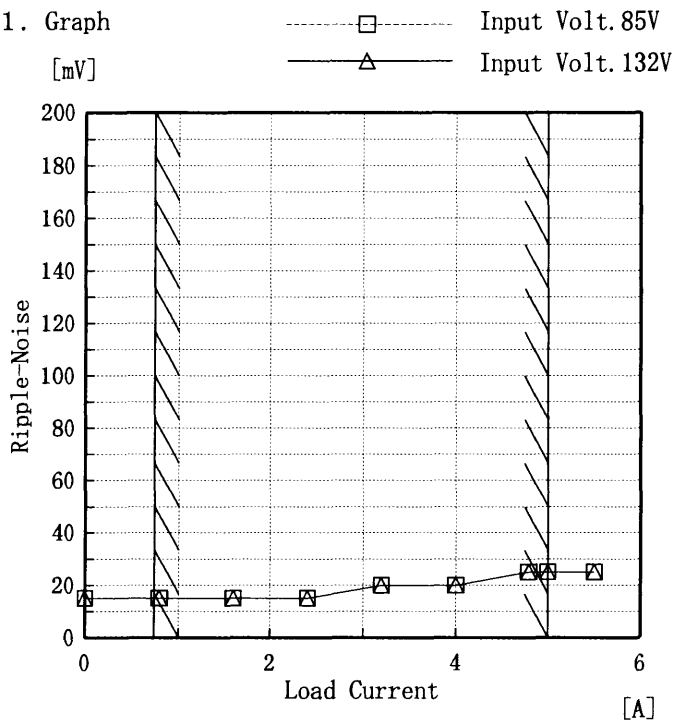
| Load Current [A] | Input Volt. 85 [V]<br>Ripple Output Volt. [mV] | Input Volt. 132 [V]<br>Ripple Output Volt. [mV] |
|---|---|---|
| 0.00 | 5 | 5 |
| 0.08 | 5 | 5 |
| 0.16 | 5 | 5 |
| 0.24 | 5 | 5 |
| 0.32 | 5 | 5 |
| 0.40 | 5 | 5 |
| 0.48 | 5 | 5 |
| 0.50 | 5 | 5 |
| 0.55 | 5 | 5 |
| — | — | — |
| — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ripple-Noise リップルノイズ |
| Object | +5.0V5.00A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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
ｽｲｯﾁﾝｸﾞ周期

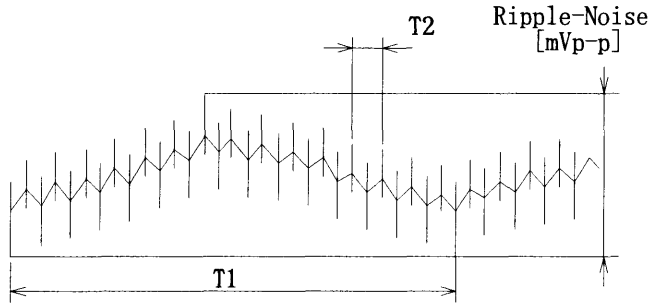



Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

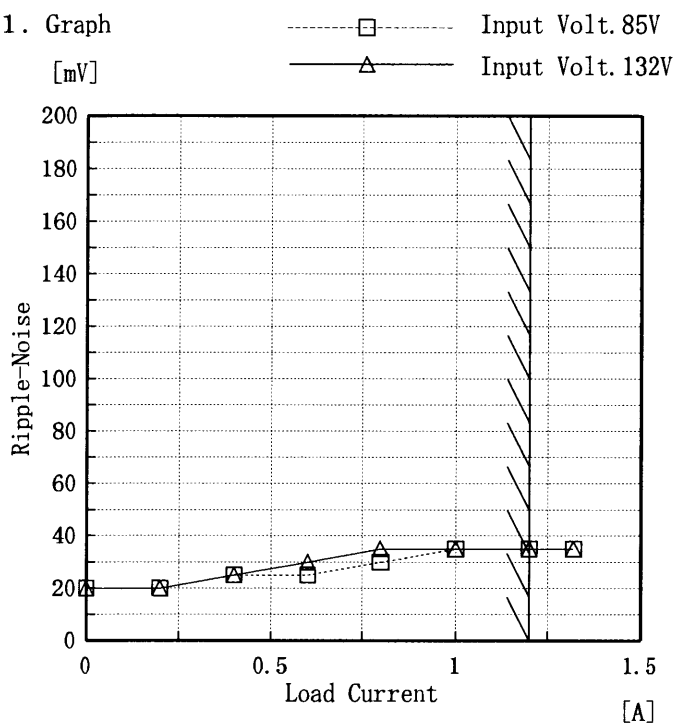
| Load current [A] | Input Volt. 85 [V] Ripple-Noise [mV] | Input Volt. 132 [V] Ripple-Noise [mV] |
|---|---|---|
| 0.00 | 15 | 15 |
| 0.80 | 15 | 15 |
| 1.60 | 15 | 15 |
| 2.40 | 15 | 15 |
| 3.20 | 20 | 20 |
| 4.00 | 20 | 20 |
| 4.80 | 25 | 25 |
| 5.00 | 25 | 25 |
| 5.50 | 25 | 25 |
| — | — | — |
| — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ripple-Noise　リップルノイズ |
| Object | +15.0V1.20A |

Temperature　25℃
Testing Circuitry　Figure A

1. Graph




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
ｽｲｯﾁﾝｸﾞ周期

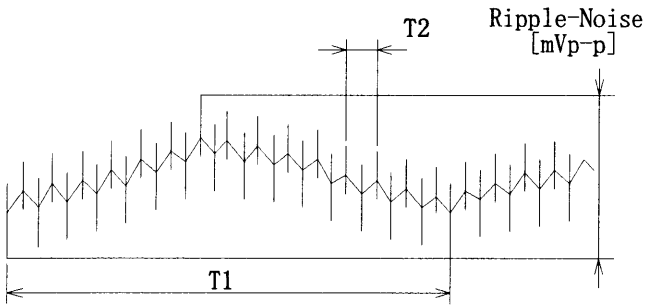



Fig. Complex Ripple Wave Form
図　リップル波形詳細図

2. Values

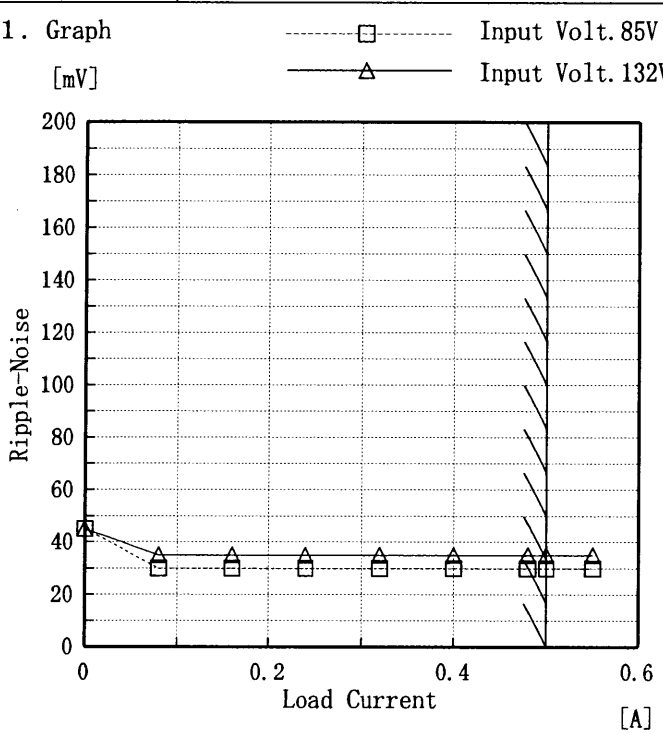
| Load current [A] | Input Volt. 85 [V] Ripple-Noise [mV] | Input Volt. 132 [V] Ripple-Noise [mV] |
|---|---|---|
| 0.00 | 20 | 20 |
| 0.20 | 20 | 20 |
| 0.40 | 25 | 25 |
| 0.60 | 25 | 30 |
| 0.80 | 30 | 35 |
| 1.00 | 35 | 35 |
| 1.20 | 35 | 35 |
| 1.32 | 35 | 35 |
| — | — | — |
| — | — | — |
| — | — | — |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ripple-Noise リップルノイズ |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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
ｽｲｯﾁﾝｸﾞ周期

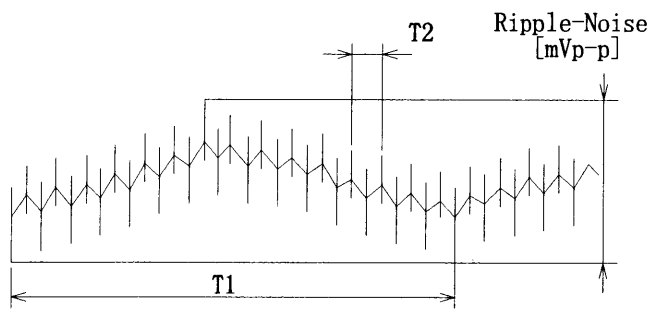



Fig. Complex Ripple Wave Form
図 リップル波形詳細図

2. Values

| Load current [A] | Input Volt. 85 [V] Ripple-Noise [mV] | Input Volt. 132 [V] Ripple-Noise [mV] |
|---|---|---|
| 0.00 | 45 | 45 |
| 0.08 | 30 | 35 |
| 0.16 | 30 | 35 |
| 0.24 | 30 | 35 |
| 0.32 | 30 | 35 |
| 0.40 | 30 | 35 |
| 0.48 | 30 | 35 |
| 0.50 | 30 | 35 |
| 0.55 | 30 | 35 |
| — | — | — |
| — | — | — |

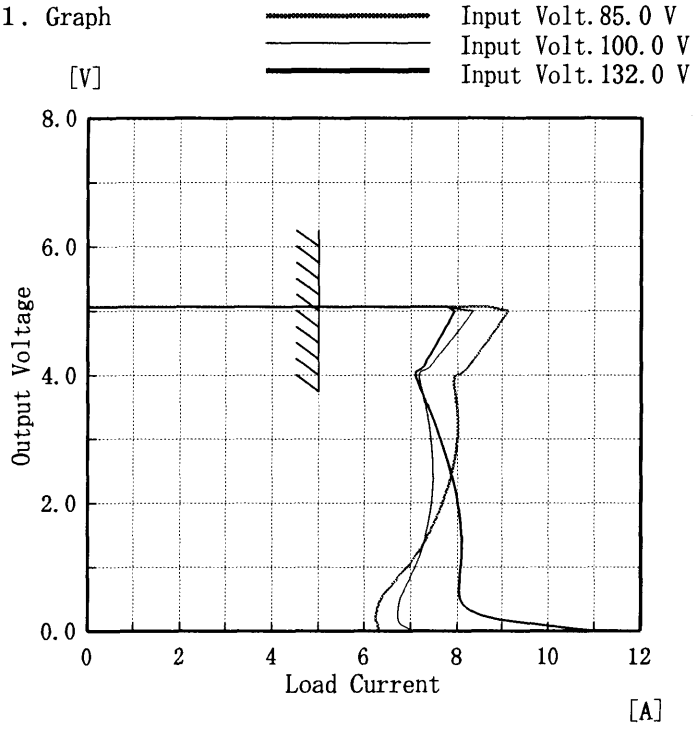
COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Overcurrent Protection<br>過電流保護 |

Temperature 25℃
Testing Circuitry Figure A

Object +5.0V5.00A

1. Graph

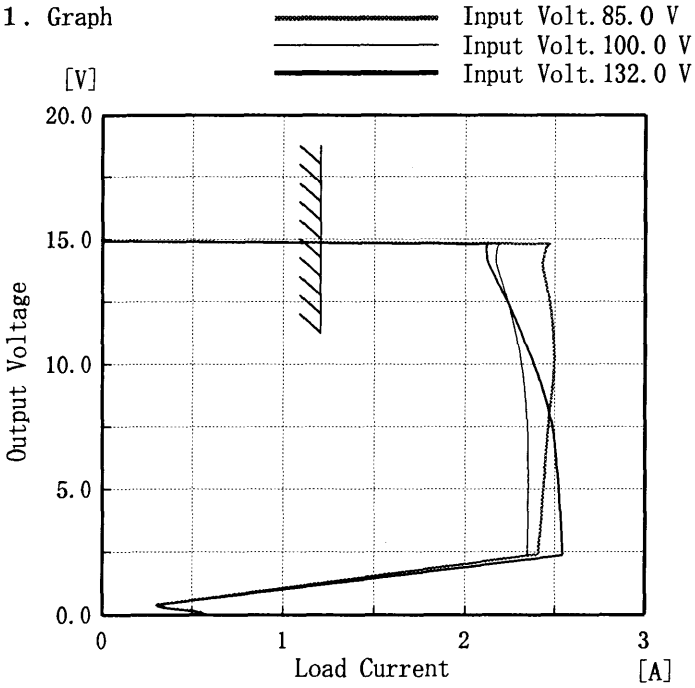



2. Values

| Output Voltage [V] | Input Volt. 85.0[V] Load Current [A] | Input Volt. 100.0[V] Load Current [A] | Input Volt. 132.0[V] Load Current [A] |
|---|---|---|---|
| 5.00 | — | — | — |
| 4.75 | 8.899 | 8.082 | 7.758 |
| 4.50 | 8.666 | 7.832 | 7.580 |
| 4.00 | 8.045 | 7.180 | 7.085 |
| 3.50 | 7.985 | 7.315 | 7.366 |
| 3.00 | 7.996 | 7.433 | 7.632 |
| 2.50 | 7.889 | 7.480 | 7.848 |
| 2.00 | 7.696 | 7.449 | 7.996 |
| 1.50 | 7.401 | 7.334 | 8.082 |
| 1.00 | 6.965 | 7.116 | 8.070 |
| 0.50 | 6.370 | 6.776 | 8.046 |
| 0.00 | 6.312 | 7.060 | 10.888 |

Object +15.0V1.20A

1. Graph




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。

2. Values

| Output Voltage [V] | Input Volt. 85.0[V] Load Current [A] | Input Volt. 100.0[V] Load Current [A] | Input Volt. 132.0[V] Load Current [A] |
|---|---|---|---|
| 15.00 | — | — | — |
| 14.25 | 2.436 | 2.170 | 2.119 |
| 13.50 | 2.444 | 2.194 | 2.164 |
| 12.00 | 2.481 | 2.255 | 2.266 |
| 10.50 | 2.497 | 2.301 | 2.352 |
| 9.00 | 2.488 | 2.334 | 2.428 |
| 7.50 | 2.465 | 2.350 | 2.484 |
| 6.00 | 2.449 | 2.354 | 2.509 |
| 4.50 | 2.433 | 2.354 | 2.526 |
| 3.00 | 2.416 | 2.351 | 2.538 |
| 1.50 | 2.409 | 2.352 | 2.542 |
| 0.00 | 0.572 | 0.569 | 0.574 |



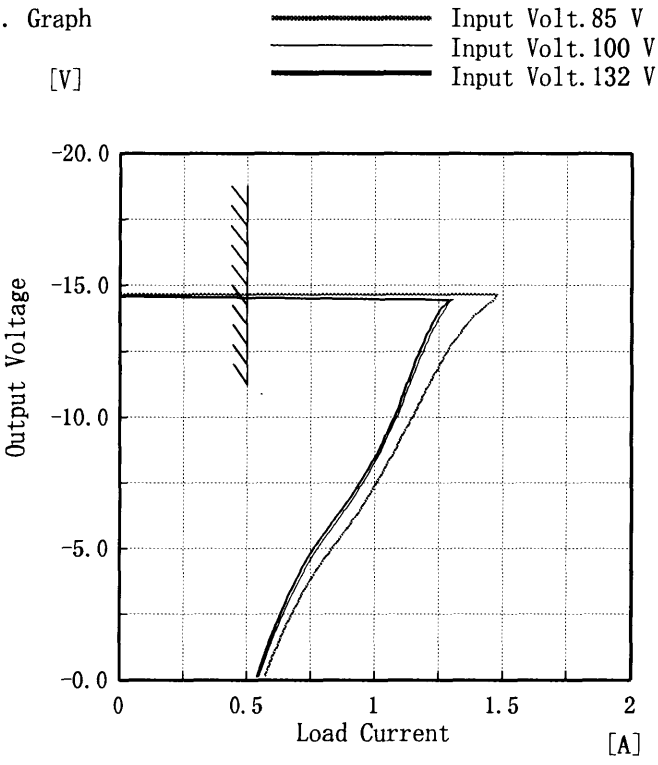
BC−3245

COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Overcurrent Protection<br>過電流保護 |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

1. Graph




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。

2. Values

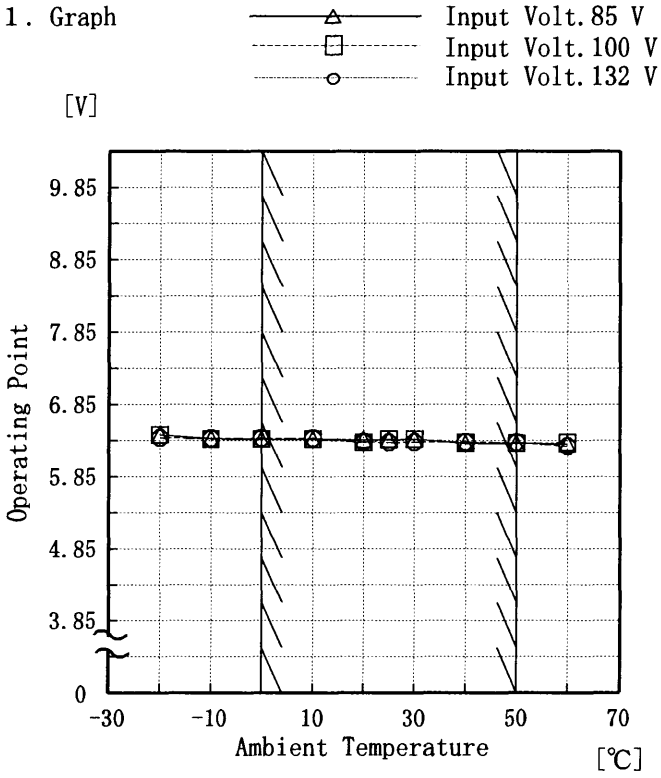
| Output Voltage [V] | Input Volt. 85[V] Load Current [A] | Input Volt. 100[V] Load Current [A] | Input Volt. 132[V] Load Current [A] |
|---|---|---|---|
| -15.00 | — | — | — |
| -14.25 | 1.44 | 1.28 | 1.27 |
| -13.50 | 1.36 | 1.24 | 1.22 |
| -12.00 | 1.26 | 1.17 | 1.16 |
| -10.50 | 1.17 | 1.11 | 1.10 |
| -9.00 | 1.09 | 1.04 | 1.03 |
| -7.50 | 1.01 | 0.96 | 0.94 |
| -6.00 | 0.91 | 0.85 | 0.83 |
| -4.50 | 0.80 | 0.75 | 0.73 |
| -3.00 | 0.70 | 0.67 | 0.65 |
| -1.50 | 0.63 | 0.60 | 0.59 |
| 0.00 | 0.57 | 0.55 | 0.54 |

COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Overvoltage Protection<br>過電圧保護 |
| Object | 5.0V5.00A |

Testing Circuitry Figure A

1. Graph




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

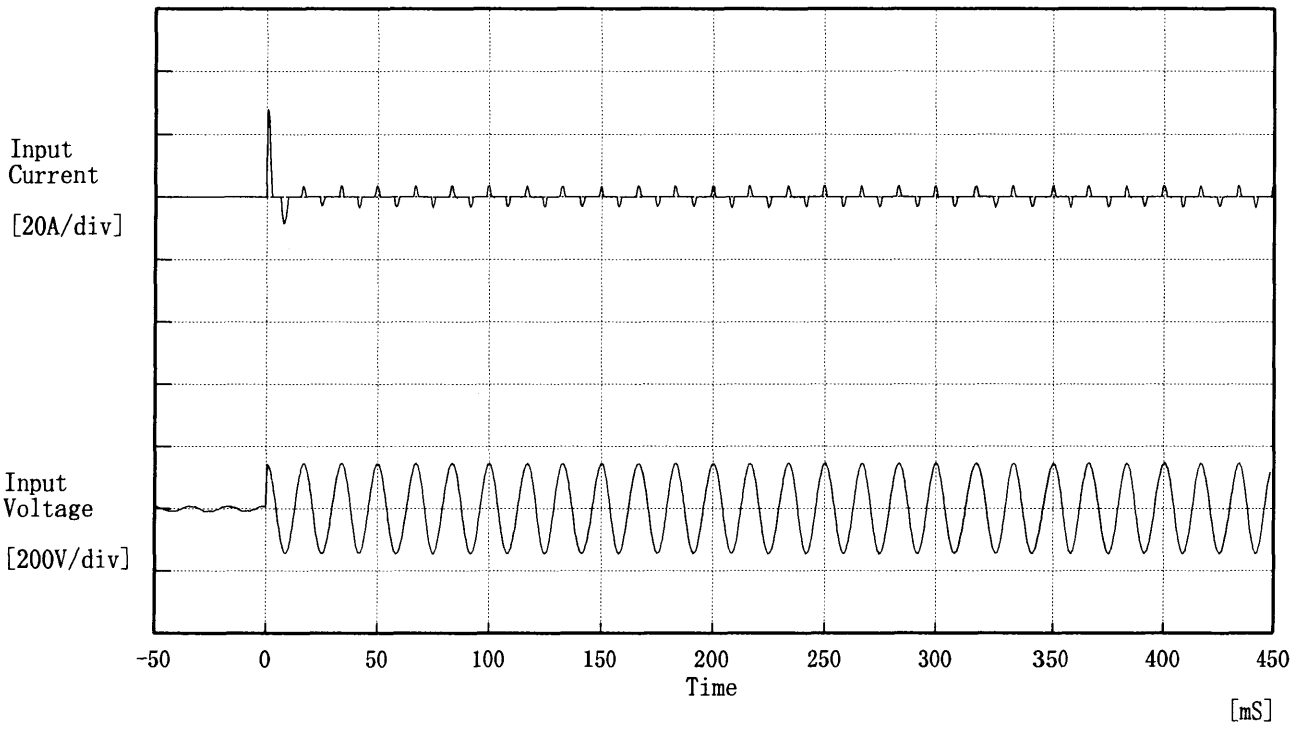
(注)斜線は定格周囲温度範囲を示す。

2. Values

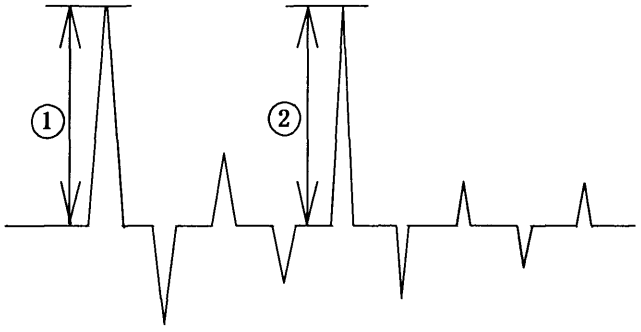
| Ambient Temp. [℃] | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
|---|---|---|---|
| | Operating Point [V] | | |
| -20 | 6.43 | 6.43 | 6.39 |
| -10 | 6.38 | 6.37 | 6.38 |
| 0 | 6.37 | 6.37 | 6.38 |
| 10 | 6.37 | 6.37 | 6.38 |
| 20 | 6.36 | 6.32 | 6.33 |
| 25 | 6.36 | 6.37 | 6.32 |
| 30 | 6.37 | 6.37 | 6.33 |
| 40 | 6.31 | 6.32 | 6.33 |
| 50 | 6.31 | 6.31 | 6.32 |
| 60 | 6.30 | 6.32 | 6.27 |
| — | — | — | — |

COSEL

| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Inrush Current 突入電流 | Temperature | 25℃ |
| | | Testing Circuitry | Figure A |
| Object | ———————— | | |




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



COSEL

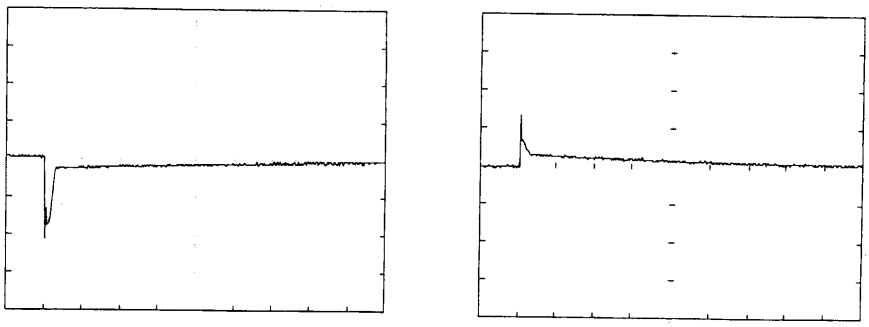
| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Dynamic Load Responce<br>動的負荷変動 | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Object | +5.0V5.00A | | |

Input Volt. 100 V

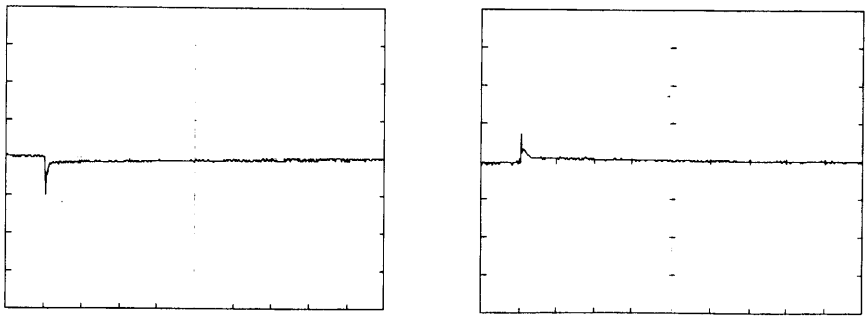
Cycle 200 mS

Load Current

Load 0% ⟷
Load 100 %



Load 0% ⟷
Load 50 %



100 mV/div

10 mS/div

COSEL

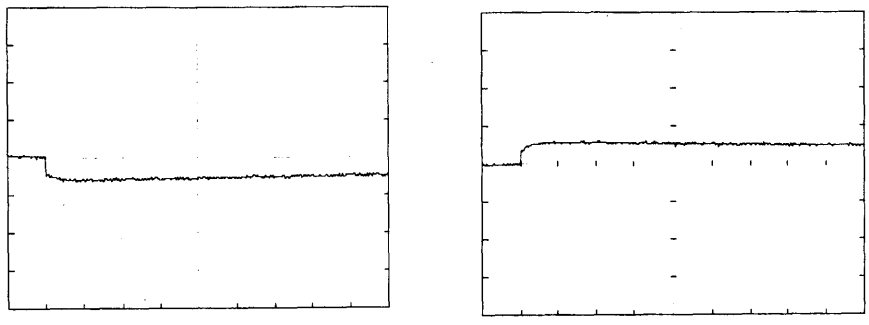
| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Dynamic Load Responce<br>動的負荷変動 | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Object | +15.0V1.20A | | |

Input Volt. 100 V

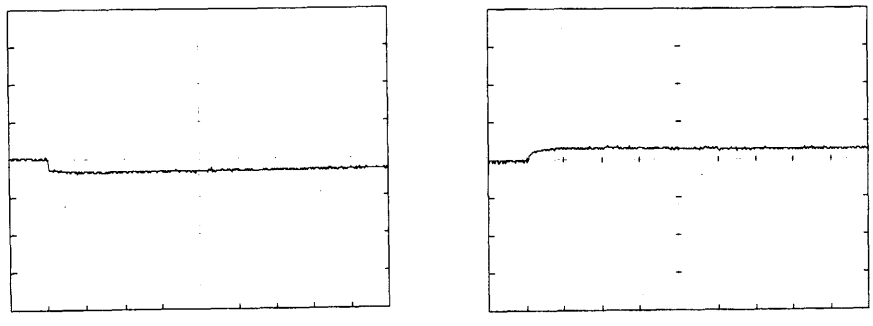
Cycle 200 mS

Load Current

Load 0% ⟷
Load 100 %



Load 0% ⟷
Load 50 %



100 mV/div

10 mS/div

COSEL

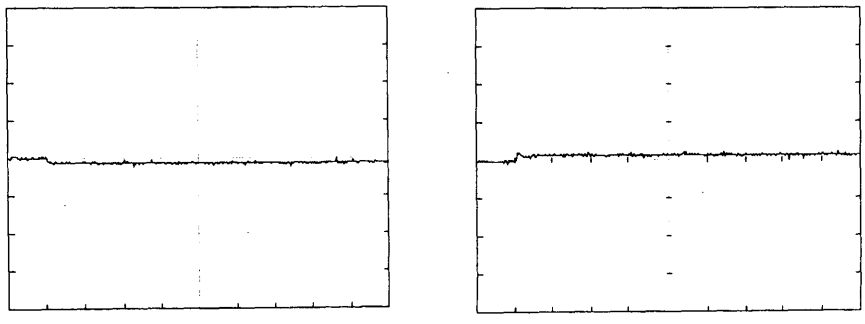
| | |
|---|---|
| Model | MMC50A-2 |
| Item | Dynamic Load Responce<br>動的負荷変動 |
| Object | -15.0V0.50A |

Temperature 25℃
Testing Circuitry Figure A

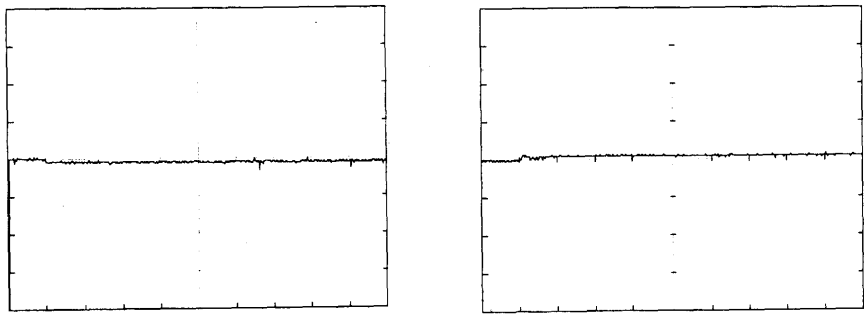
Input Volt. 100 V
Cycle 200 mS

Load Current

Load 0% ⟷
Load 100 %



Load 0% ⟷
Load 50 %



100 mV/div

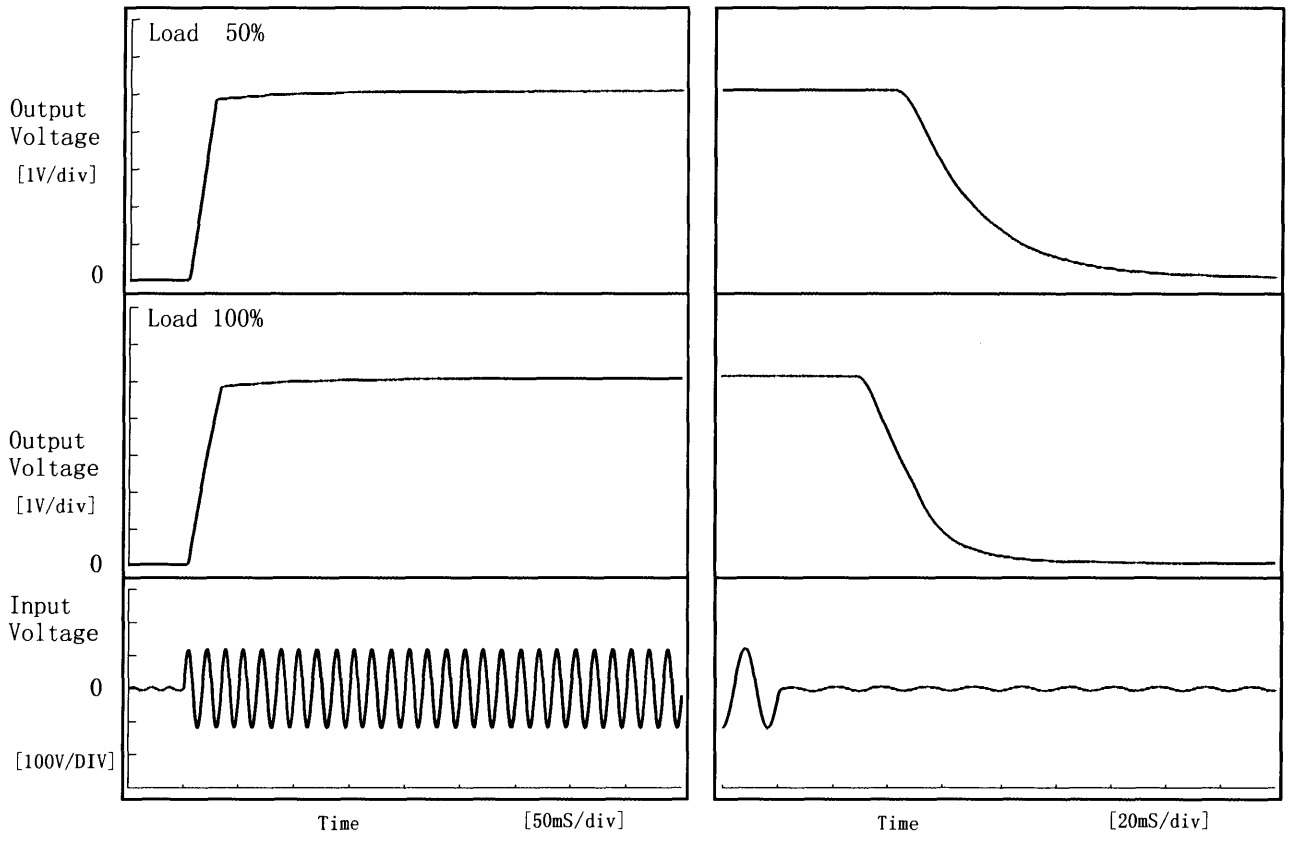
10 mS/div

COSEL

| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Rise and Fall Time 立上り、立下り時間 | Temperature | 25℃ |
| | | Testing Circuitry | Figure A |
| Object | +5.0V5.00A | | |

1. Graph

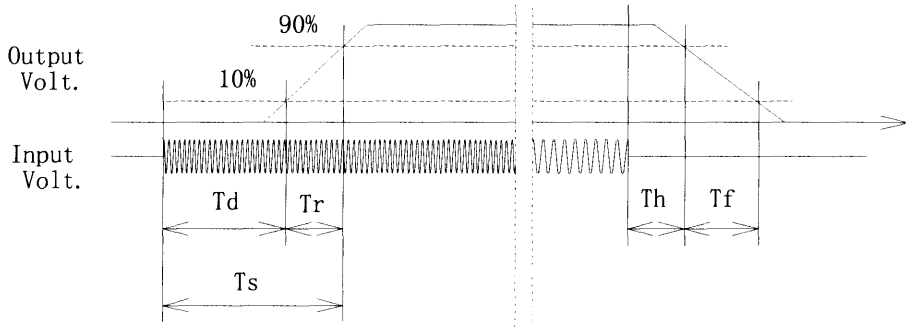
Input Volt. 85 V




2. Values

[mS]

| Load \ Time | T d | T r | T s | T h | T f |
|---|---|---|---|---|---|
| 50 % | 6.8 | 19.3 | 26.0 | 50.3 | 55.3 |
| 100 % | 6.8 | 24.5 | 31.3 | 35.0 | 33.1 |

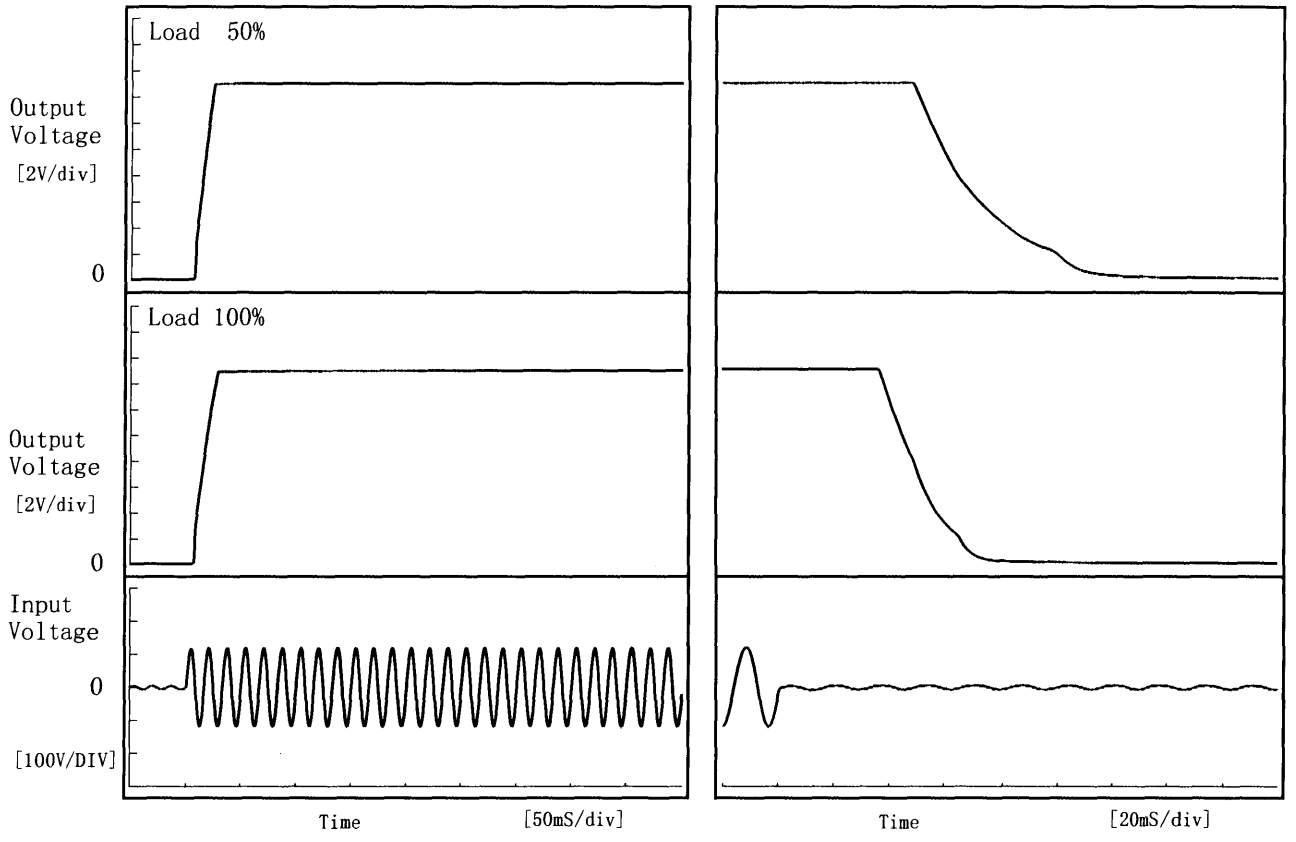


COSEL

| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Rise and Fall Time 立上り、立下り時間 | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Object | +15.0V1.20A | | |

1. Graph

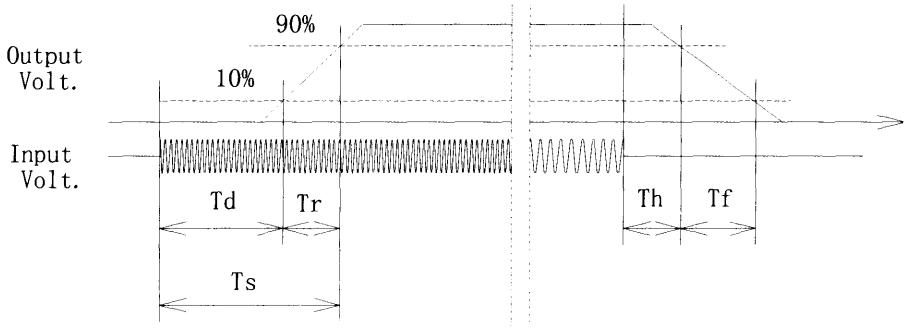
Input Volt. 85 V




2. Values

[mS]

| Load \ Time | T d | T r | T s | T h | T f |
|---|---|---|---|---|---|
| 50 % | 7.8 | 15.0 | 22.8 | 52.4 | 49.9 |
| 100 % | 7.8 | 18.3 | 26.0 | 39.0 | 28.4 |

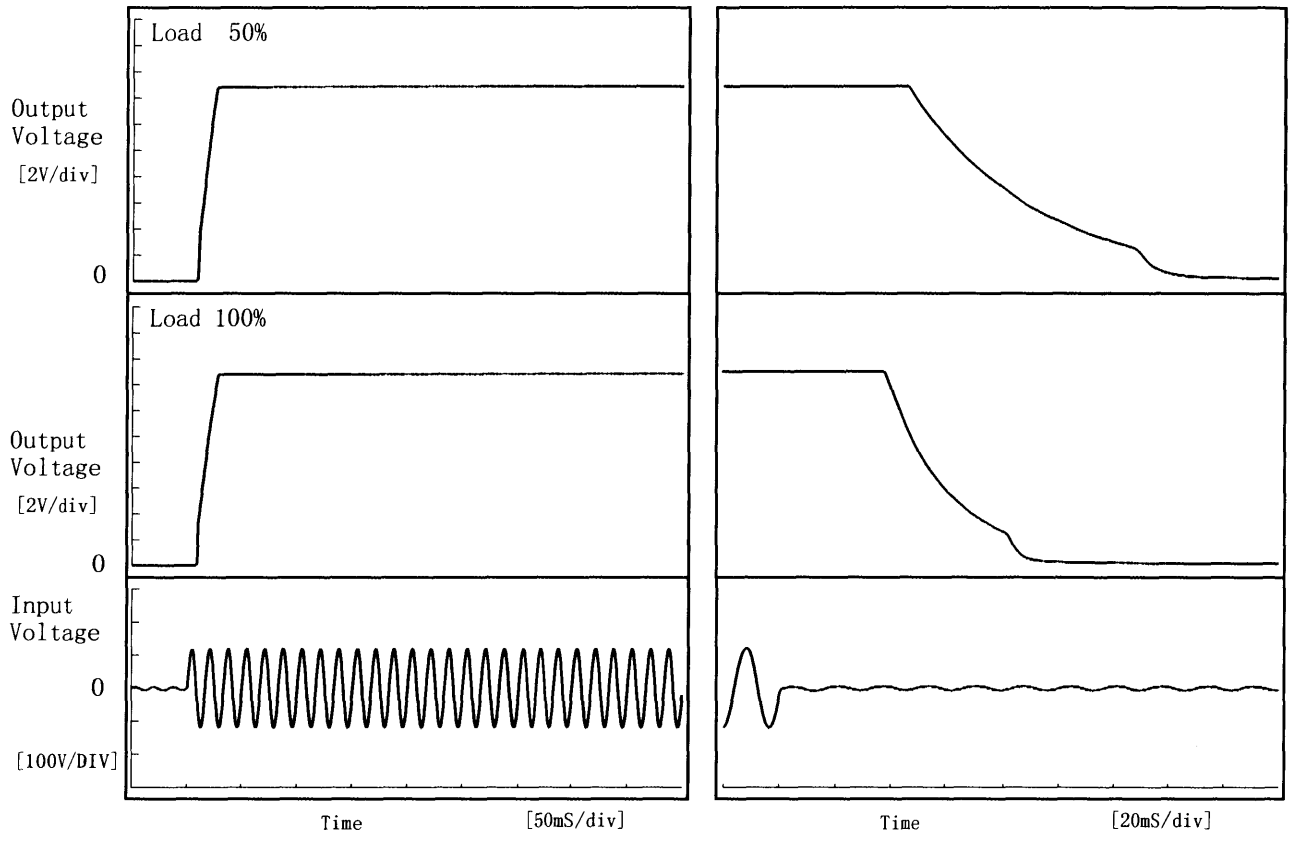


COSEL

| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Rise and Fall Time 立上り、立下り時間 | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Object | −15.0V0.50A | | |

1. Graph

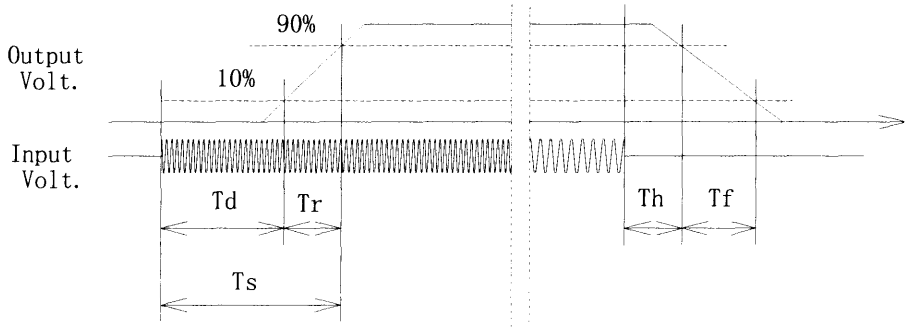
Input Volt. 85 V




2. Values

[mS]

| Load \ Time | T d | T r | T s | T h | T f |
|---|---|---|---|---|---|
| 50 % | 9.3 | 15.0 | 24.3 | 51.6 | 80.9 |
| 100 % | 9.3 | 16.5 | 25.8 | 40.7 | 43.4 |






BC−3245

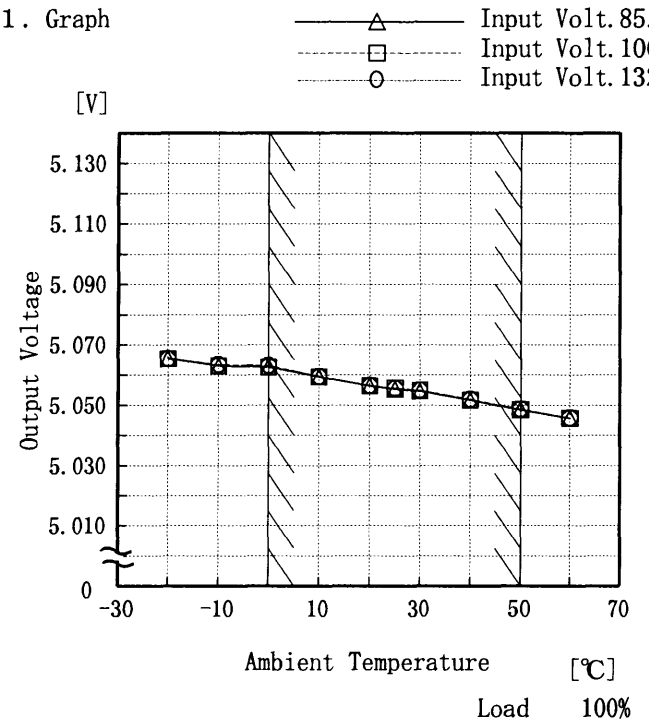
COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Ambient Temperature Drift<br>周囲温度変動 |

Testing Circuitry Figure A

Object +5.0V5.00A

1. Graph

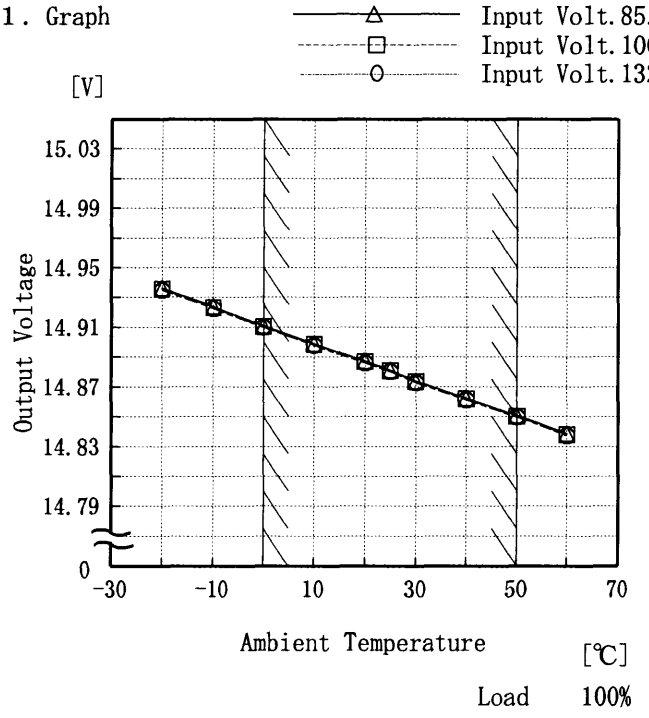



2. Values

| Temperature [℃] | Input Volt. 85.0[V] Output Volt. [V] | Input Volt. 100.0[V] Output Volt. [V] | Input Volt. 132.0[V] Output Volt. [V] |
|---|---|---|---|
| -20 | 5.066 | 5.065 | 5.065 |
| -10 | 5.063 | 5.063 | 5.064 |
| 0 | 5.063 | 5.063 | 5.063 |
| 10 | 5.059 | 5.059 | 5.060 |
| 20 | 5.057 | 5.056 | 5.057 |
| 25 | 5.055 | 5.056 | 5.056 |
| 30 | 5.055 | 5.055 | 5.055 |
| 40 | 5.052 | 5.052 | 5.052 |
| 50 | 5.048 | 5.049 | 5.049 |
| 60 | 5.046 | 5.046 | 5.046 |
| — | — | — | — |

Object +15.0V1.20A

1. Graph




2. Values

| Temperature [℃] | Input Volt. 85.0[V] Output Volt. [V] | Input Volt. 100.0[V] Output Volt. [V] | Input Volt. 132.0[V] Output Volt. [V] |
|---|---|---|---|
| -20 | 14.936 | 14.936 | 14.935 |
| -10 | 14.924 | 14.923 | 14.923 |
| 0 | 14.911 | 14.910 | 14.910 |
| 10 | 14.899 | 14.898 | 14.898 |
| 20 | 14.887 | 14.887 | 14.886 |
| 25 | 14.881 | 14.881 | 14.880 |
| 30 | 14.874 | 14.873 | 14.873 |
| 40 | 14.862 | 14.862 | 14.861 |
| 50 | 14.851 | 14.850 | 14.850 |
| 60 | 14.838 | 14.838 | 14.837 |
| — | — | — | — |

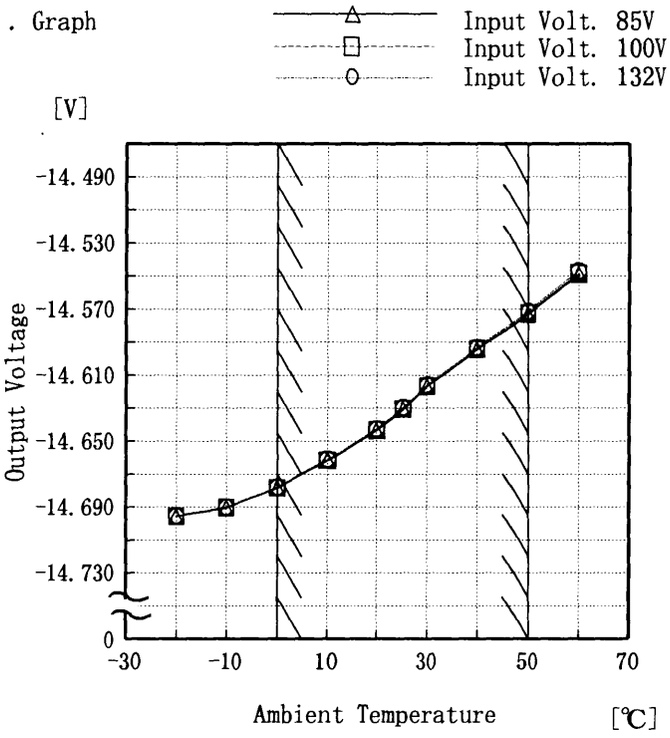
Note: Slanted line shows the range of the rated ambient temperature.
(注)斜線は定格周囲温度範囲を示す。

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Ambient Temperature Drift<br>周囲温度変動 |
| Object | -15.0V0.50A |

Testing Circuitry Figure A

1. Graph




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。

2. Values

| Temperature [℃] | Input Volt. 85[V] Output Volt. [V] | Input Volt. 100[V] Output Volt. [V] | Input Volt. 132[V] Output Volt. [V] |
|---|---|---|---|
| -20 | -14.696 | -14.696 | -14.695 |
| -10 | -14.690 | -14.690 | -14.690 |
| 0 | -14.679 | -14.678 | -14.678 |
| 10 | -14.662 | -14.661 | -14.661 |
| 20 | -14.644 | -14.643 | -14.642 |
| 25 | -14.631 | -14.630 | -14.630 |
| 30 | -14.617 | -14.616 | -14.616 |
| 40 | -14.595 | -14.594 | -14.593 |
| 50 | -14.573 | -14.572 | -14.571 |
| 60 | -14.549 | -14.548 | -14.547 |
| — | — | — | — |

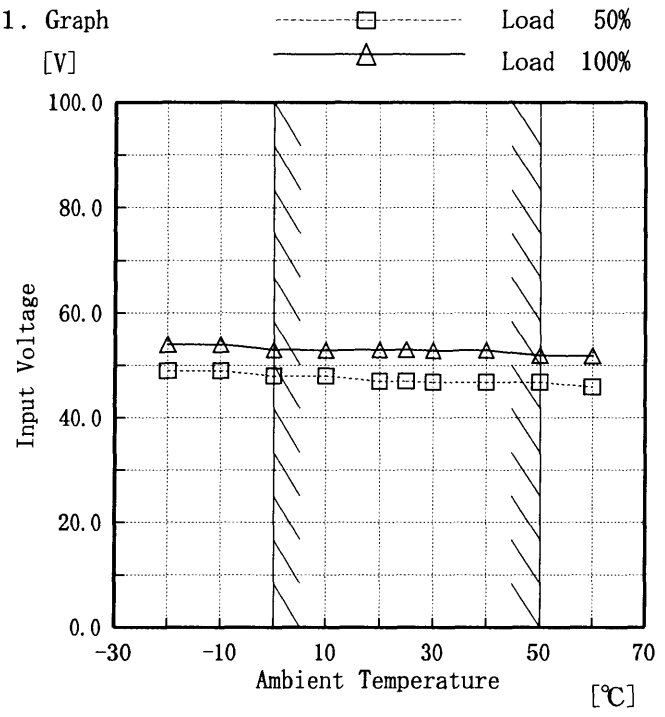
COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Minimum Input Voltage for Regulated Output Voltage<br>最低レギュレーション電圧 |

Testing Circuitry Figure A

Object ＋5.0V5.00A

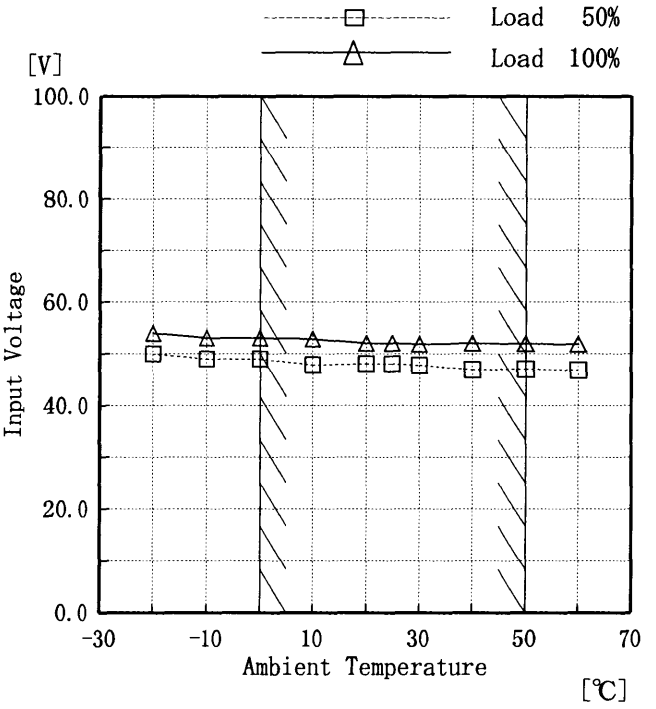
1. Graph




2. Values

| Ambient Temp. [℃] | Load 50% Input Volt. [V] | Load 100% Input Volt. [V] |
|---|---|---|
| -20 | 49.0 | 54.0 |
| -10 | 49.0 | 54.0 |
| 0 | 48.0 | 53.0 |
| 10 | 48.0 | 52.9 |
| 20 | 47.0 | 53.0 |
| 25 | 47.0 | 53.0 |
| 30 | 46.8 | 52.8 |
| 40 | 46.8 | 52.9 |
| 50 | 46.8 | 51.8 |
| 60 | 45.9 | 51.8 |
| — | — | — |

Object ＋15.0V1.20A




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。

2. Values

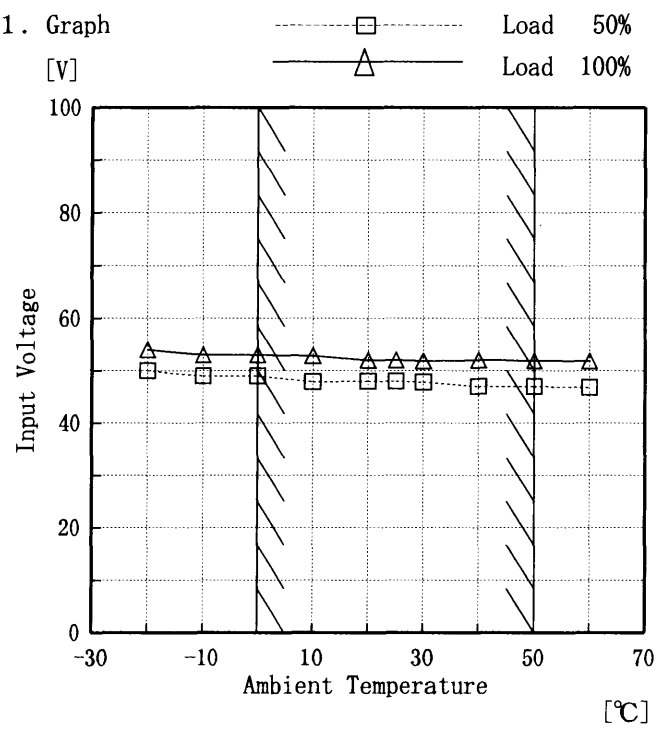
| Ambient Temp. [℃] | Load 50% Input Volt. [V] | Load 100% Input Volt. [V] |
|---|---|---|
| -20 | 50.0 | 54.0 |
| -10 | 49.0 | 53.0 |
| 0 | 49.0 | 53.0 |
| 10 | 47.9 | 52.8 |
| 20 | 48.0 | 52.0 |
| 25 | 48.0 | 52.0 |
| 30 | 47.8 | 51.8 |
| 40 | 47.0 | 52.0 |
| 50 | 47.0 | 51.9 |
| 60 | 46.8 | 51.8 |
| — | — | — |

COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Minimum Input Voltage for Regulated Output Voltage<br>最低レギュレーション電圧 |
| Object | -15.0V0.50A |

Testing Circuitry Figure A

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。

2. Values

| Ambient Temp. [℃] | Load 50% Input Volt. [V] | Load 100% Input Volt. [V] |
|---|---|---|
| -20 | 50.0 | 54.0 |
| -10 | 49.0 | 53.0 |
| 0 | 49.0 | 53.0 |
| 10 | 47.9 | 52.8 |
| 20 | 48.0 | 52.0 |
| 25 | 48.0 | 52.0 |
| 30 | 47.8 | 51.8 |
| 40 | 47.0 | 52.0 |
| 50 | 47.0 | 51.9 |
| 60 | 46.8 | 51.8 |
| — | — | — |

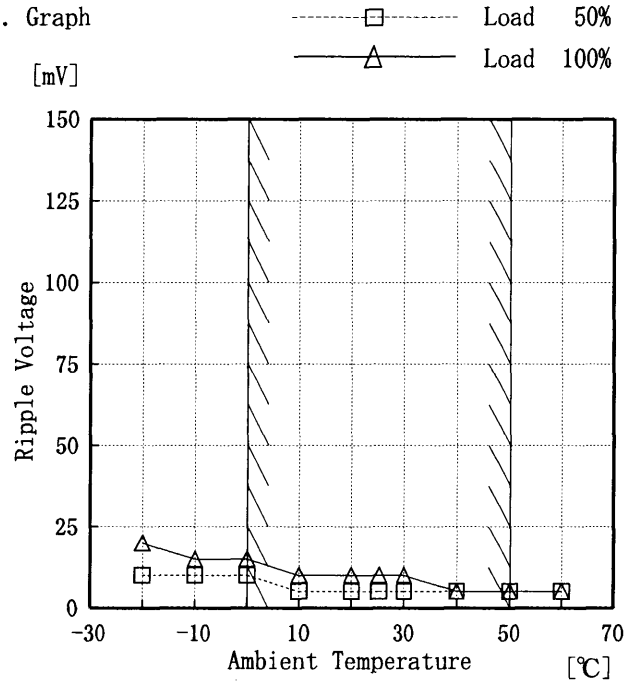
COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Ripple Voltage (by Ambient Temp.)<br>リップル電圧 (周囲温度特性) |

Testing Circuitry Figure A

Object +5.0V5.00A

1. Graph



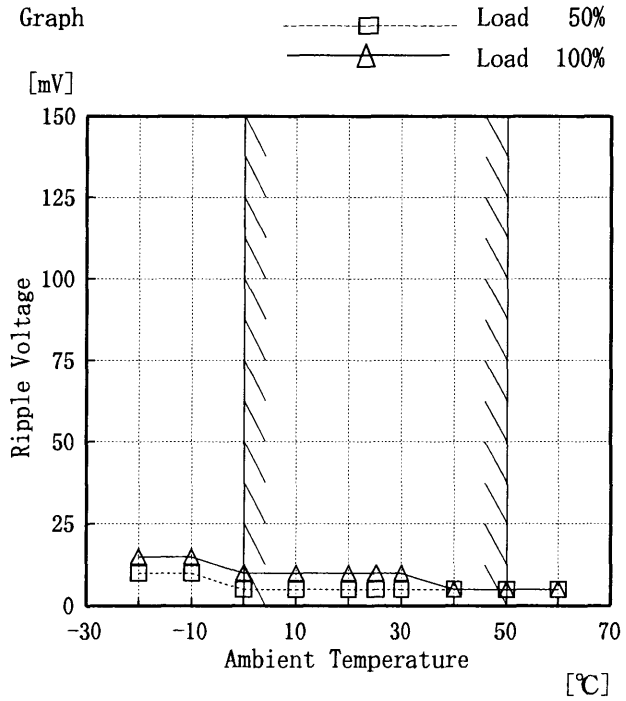

Input Volt. 85 V

2. Values

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

Object +15.0V1.20A

1. Graph




Input Volt. 85 V

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。

2. Values

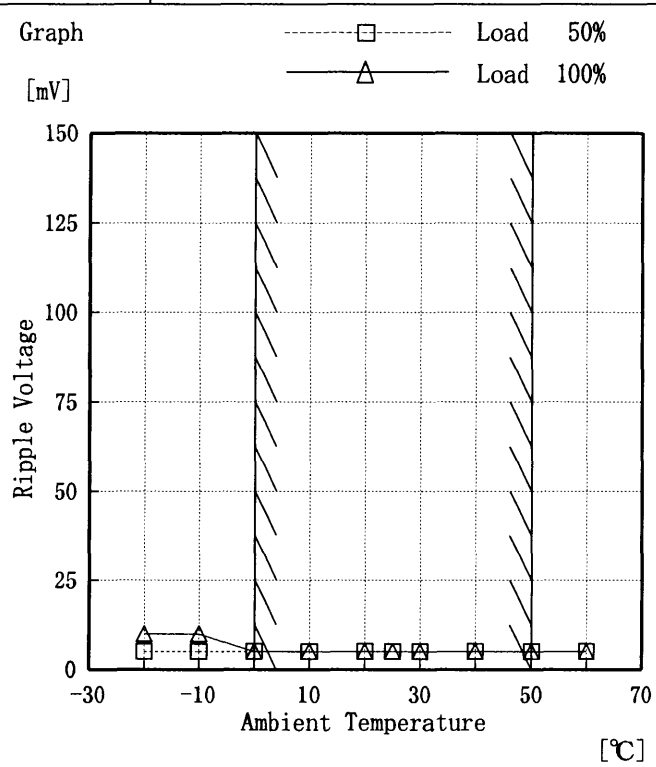
| Ambient Temp. [℃] | Load 50% Ripple Output Volt. [mV] | Load 100% Ripple Output Volt. [mV] |
|---|---|---|
| -20 | 10 | 15 |
| -10 | 10 | 15 |
| 0 | 5 | 10 |
| 10 | 5 | 10 |
| 20 | 5 | 10 |
| 25 | 5 | 10 |
| 30 | 5 | 10 |
| 40 | 5 | 5 |
| 50 | 5 | 5 |
| 60 | 5 | 5 |
| — | — | — |

COSEL

| Model | MMC50A-2 |
|---|---|
| Item | Ripple Voltage (by Ambient Temp.)<br>リップル電圧 (周囲温度特性) |
| Object | -15.0V0.50A |

Testing Circuitry Figure A

1. Graph




Input Volt. 85 V

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。

2. Values

| Ambient Temp. [℃] | Load 50% Ripple Output Volt. [mV] | Load 100% Ripple Output Volt. [mV] |
|---|---|---|
| -20 | 5 | 10 |
| -10 | 5 | 10 |
| 0 | 5 | 5 |
| 10 | 5 | 5 |
| 20 | 5 | 5 |
| 25 | 5 | 5 |
| 30 | 5 | 5 |
| 40 | 5 | 5 |
| 50 | 5 | 5 |
| 60 | 5 | 5 |
| — | — | — |

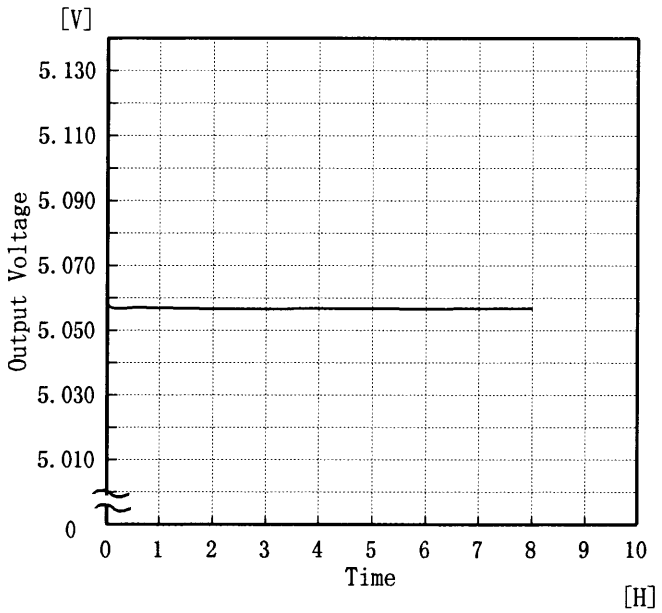
COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Time Lapse Drift 経時ドリフト |

Temperature 25 ℃
Testing Circuitry Figure A

Object +5.0V5.00A

1. Graph



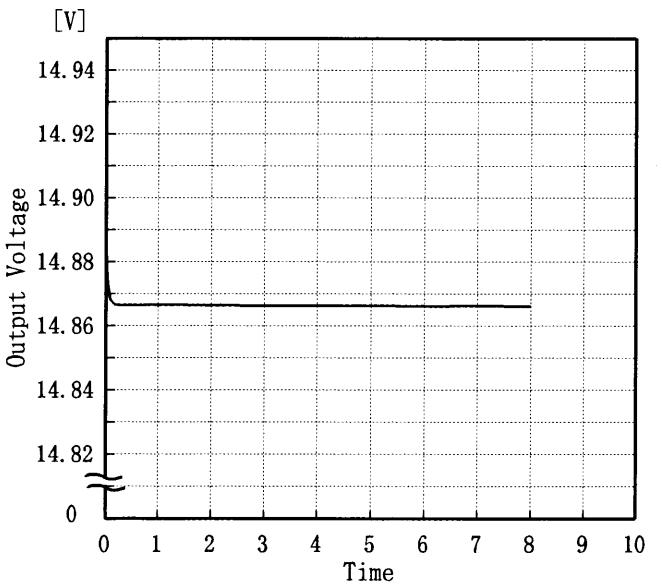

Input Volt. 100.0V
Load 100%

2. Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 5.059 |
| 0.5 | 5.057 |
| 1.0 | 5.057 |
| 2.0 | 5.057 |
| 3.0 | 5.057 |
| 4.0 | 5.057 |
| 5.0 | 5.057 |
| 6.0 | 5.057 |
| 7.0 | 5.057 |
| 8.0 | 5.057 |

Object +15.0V1.20A

1. Graph




Input Volt. 100.0V
Load 100%

2. Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 14.893 |
| 0.5 | 14.866 |
| 1.0 | 14.866 |
| 2.0 | 14.866 |
| 3.0 | 14.866 |
| 4.0 | 14.866 |
| 5.0 | 14.866 |
| 6.0 | 14.866 |
| 7.0 | 14.866 |
| 8.0 | 14.866 |



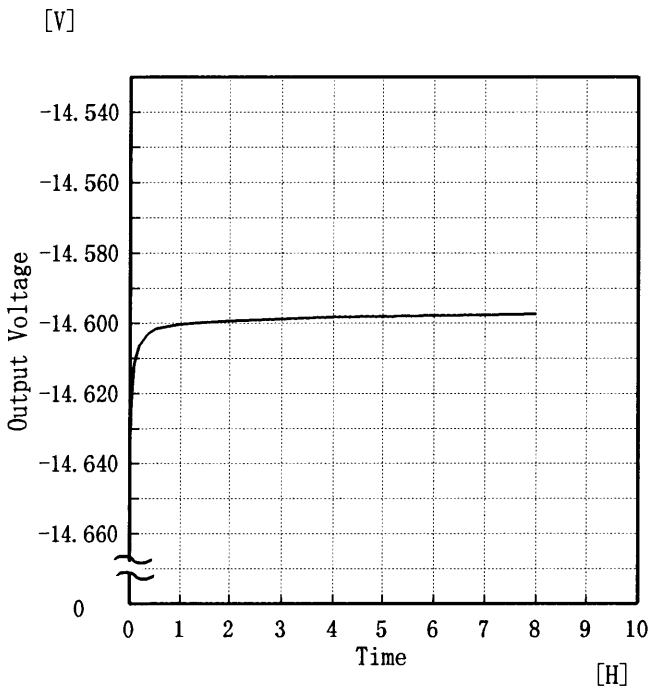
BC－3245

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Time Lapse Drift 経時ドリフト |
| Object | -15.0V0.50A |

Temperature 25 ℃
Testing Circuitry Figure A

1. Graph




Input Volt. 100V
Load 100%

2. Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | -14.640 |
| 0.5 | -14.602 |
| 1.0 | -14.600 |
| 2.0 | -14.599 |
| 3.0 | -14.599 |
| 4.0 | -14.598 |
| 5.0 | -14.598 |
| 6.0 | -14.598 |
| 7.0 | -14.598 |
| 8.0 | -14.597 |

COSEL

| Model | MMC50A-2 | |
|---|---|---|
| Item | Output Voltage Accuracy　定電圧精度 | Testing Circuitry　Figure A |

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　: 0～50 ℃

Input Voltage : 85.0～132.0 V

Load Current (AVR 1) : 0.75～5.00 A　(AVR 2) : 0.00～1.20 A　(AVR 3) : 0.00～0.50 A

* Output Voltage Accuracy = ±(Maximum of Output Voltage － 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、負荷電流を下記仕様内で、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　0～50 ℃

入力電圧　85.0～132.0 V

負荷電流 (AVR 1)　0.75～5.00 A　(AVR 2) : 0.00～1.20 A　(AVR 3) : 0.00～0.50 A

* 定電圧精度(変動値) ＝ ±(出力電圧の最高値－出力電圧の最低値)／2

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

| Object | +5.0V5.00A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [℃] | Input Voltage [V] | Output Current [A] | Output Voltage [V] | Output Voltage Accuracy [mV] | Output Voltage Accuracy (Ration) [%] |
| Maximum Voltage | 0 | 132.0 | 0.750 | 5.072 | ±12 | ±0.3 |
| Minimum Voltage | 50 | 85.0 | 5.000 | 5.048 | | |

| Object | +15.0V1.20A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [℃] | Input Voltage [V] | Output Current [A] | Output Voltage [V] | Output Voltage Accuracy [mV] | Output Voltage Accuracy (Ration) [%] |
| Maximum Voltage | 0 | 100.0 | 0.00 | 14.969 | ±65 | ±0.5 |
| Minimum Voltage | 50 | 132.0 | 1.20 | 14.840 | | |

| Object | −15.0V0.50A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [℃] | Input Voltage [V] | Output Current [A] | Output Voltage [V] | Output Voltage Accuracy [mV] | Output Voltage Accuracy (Ration) [%] |
| Maximum Voltage | 0 | 100.0 | 0.00 | -14.692 | ±72 | ±0.5 |
| Minimum Voltage | 50 | 132.0 | 0.50 | -14.549 | | |

COSEL

| | | |
|---|---|---|
| Model | MMC50A-2 | |
| Item | Condensation 結露特性 | Testing Circuitry Figure A |
| Object | +5.0V5.00A | |

1. Condensation test

Testing procedure is as follows.

① Keeping and cooling the unit in a tank at -10℃ 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℃ 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] | 5.056 | Input Volt.: 100V, Load Current:5A |
| Line Regulation [mV] | 1 | Input Volt.: 85～132V, Load Current:5A |
| Load Regulation [mV] | 9 | Input Volt.: 100V, Load Current:1～5A |

COSEL

| | | |
|---|---|---|
| Model | MMC50A-2 | |
| Item | Condensation 結露特性 | Testing Circuitry Figure A |
| Object | +15.0V1.20A | |

1. Condensation test

Testing procedure is as follows.

① Keeping and cooling the unit in a tank at -10℃ 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℃ 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] | 14.873 | Input Volt.: 100V, Load Current:1.2A |
| Line Regulation [mV] | 1 | Input Volt.: 85～132V, Load Current:1.2A |
| Load Regulation [mV] | 49 | Input Volt.: 100V, Load Current:0.0～1.2A |

COSEL

| | |
|---|---|
| Model | MMC50A-2 |
| Item | Condensation 結露特性 |
| Object | -15.0V0.50A |

Testing Circuitry Figure A

1. Condensation test

Testing procedure is as follows.

① Keeping and cooling the unit in a tank at -10℃ 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℃ 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] | -14.619 | Input Volt.: 100V, Load Current:0.5A |
| Line Regulation [mV] | 1 | Input Volt.: 85～132V, Load Current:0.5A |
| Load Regulation [mV] | 21 | Input Volt.: 100V, Load Current:0.0～0.5A |

COSEL

| | | | |
|---|---|---|---|
| Model | MMC50A-2 | | |
| Item | Leakage Current 漏洩電流 | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Object | ———————— | | |

1. Results

| Standards | Leakage Current [mA] | | |
|---|---|---|---|
| | Input Volt. 85 [V] | Input Volt. 100 [V] | Input Volt. 132 [V] |
| (A) DENTORI | 0.24 | 0.26 | 0.33 |
| (B) IEC60950 | 0.22 | 0.27 | 0.33 |

| Standards | Leakage Current [mA] | | |
|---|---|---|---|
| | Input Volt. 170 [V] | Input Volt. 230 [V] | Input Volt. 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。

COSEL

| | | |
|---|---|---|
| Model | MMC50A-2 | |
| Item | Conducted Emission<br>雑音端子電圧 | Testing Circuitry Figure D |
| Object | ———————— | |

1. Graph

Remarks

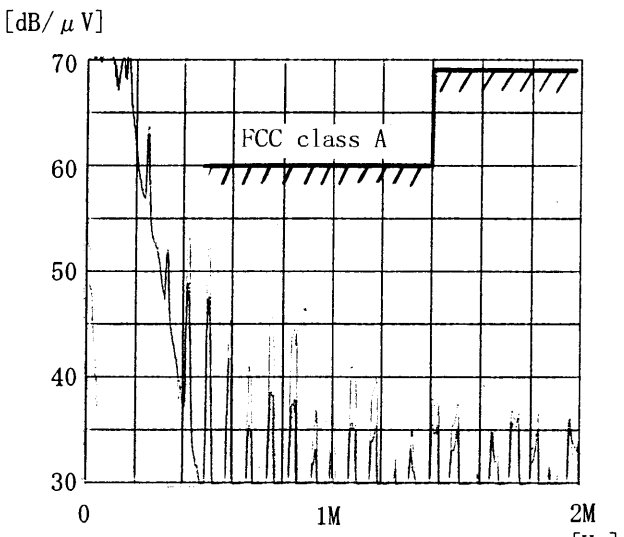
Input Volt. 120 V

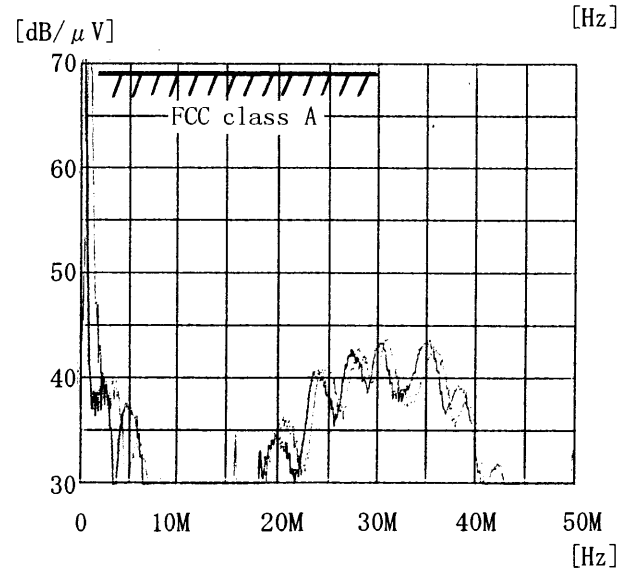
Load 100 %

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 |



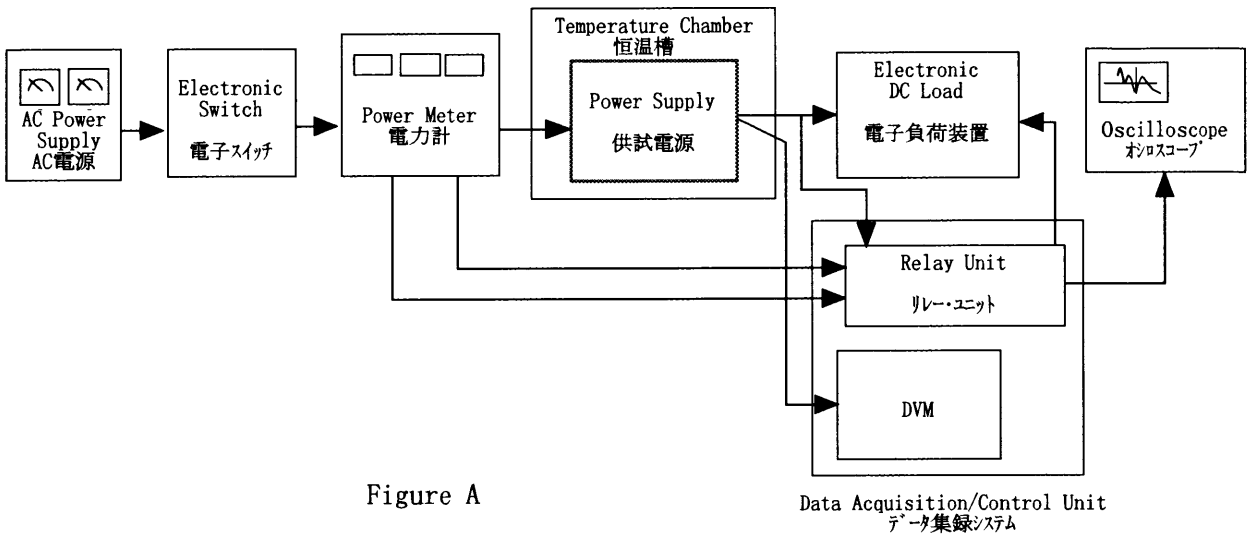



Figure A

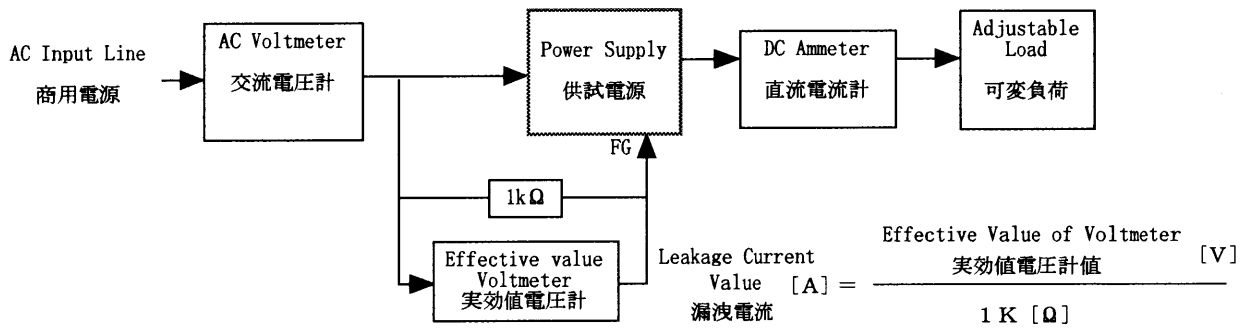



Figure B(DENTORI)

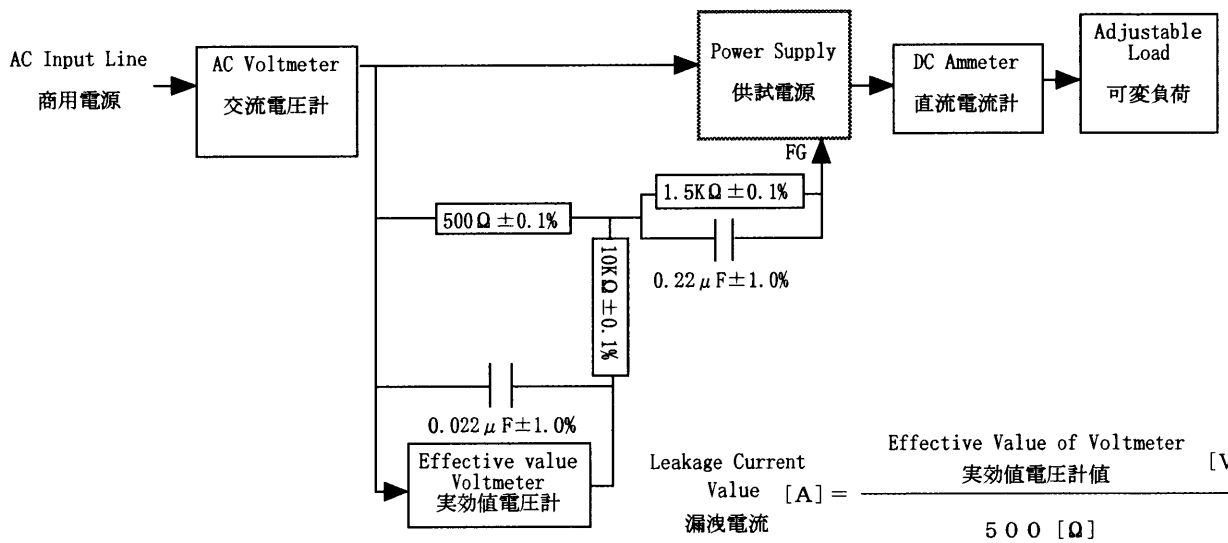



Figure B (IEC60950)

COSEL

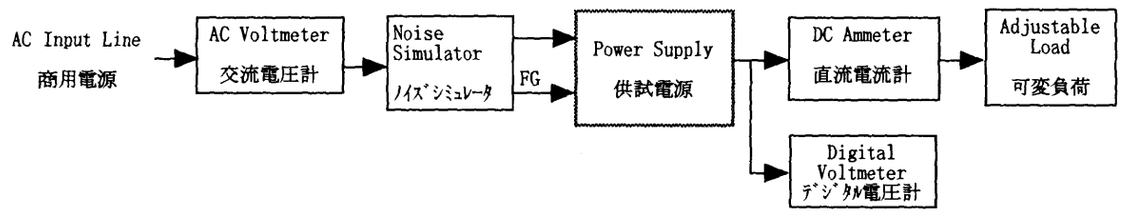



Figure C

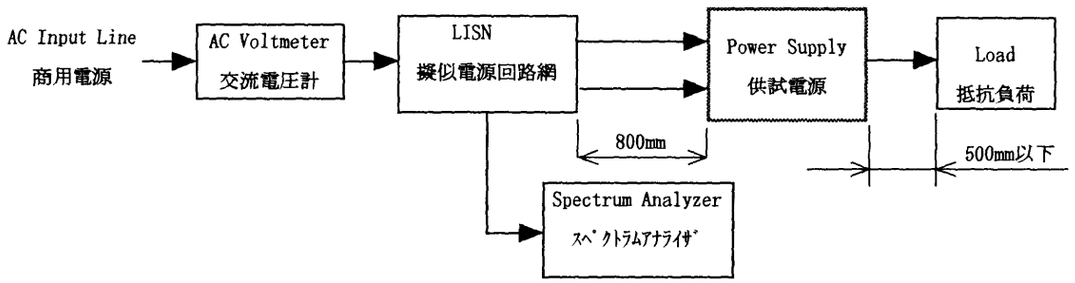



Figure D

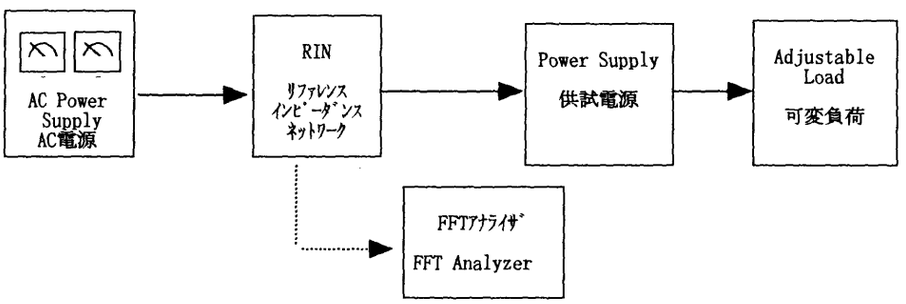



Figure E