参考資料

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# TEST DATA OF MGW154812

Regulated DC Power Supply
September 11, 2010

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Kazunari Asano Design Manager

Prepared by : Hidetaka Kobayashi
Hidetaka Kobayashi Design Engineer

**COSEL CO.,LTD.**

参考資料

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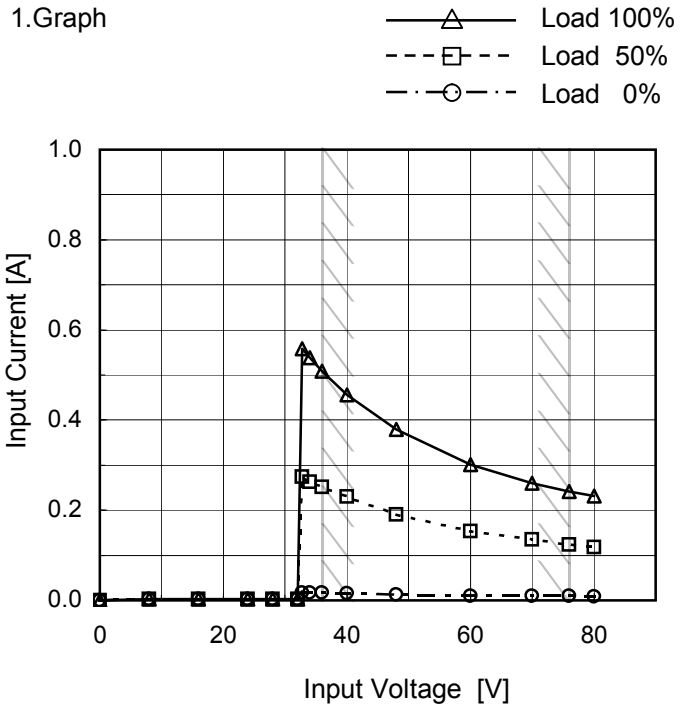
COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Input Current (by Input Voltage) |
| Object | ―――――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

| Input Voltage [V] | Input Current [A] | | |
|---|---|---|---|
| | Load 0% | Load 50% | Load 100% |
| 0.0 | 0.000 | 0.000 | 0.000 |
| 8.0 | 0.002 | 0.003 | 0.003 |
| 16.0 | 0.003 | 0.003 | 0.003 |
| 24.0 | 0.003 | 0.003 | 0.003 |
| 28.0 | 0.003 | 0.003 | 0.003 |
| 32.0 | 0.003 | 0.003 | 0.003 |
| 32.8 | 0.017 | 0.274 | 0.558 |
| 34.0 | 0.017 | 0.263 | 0.538 |
| 36.0 | 0.017 | 0.252 | 0.508 |
| 40.0 | 0.016 | 0.230 | 0.456 |
| 48.0 | 0.013 | 0.190 | 0.379 |
| 60.0 | 0.011 | 0.154 | 0.301 |
| 70.0 | 0.010 | 0.135 | 0.260 |
| 76.0 | 0.009 | 0.124 | 0.242 |
| 80.0 | 0.009 | 0.118 | 0.231 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



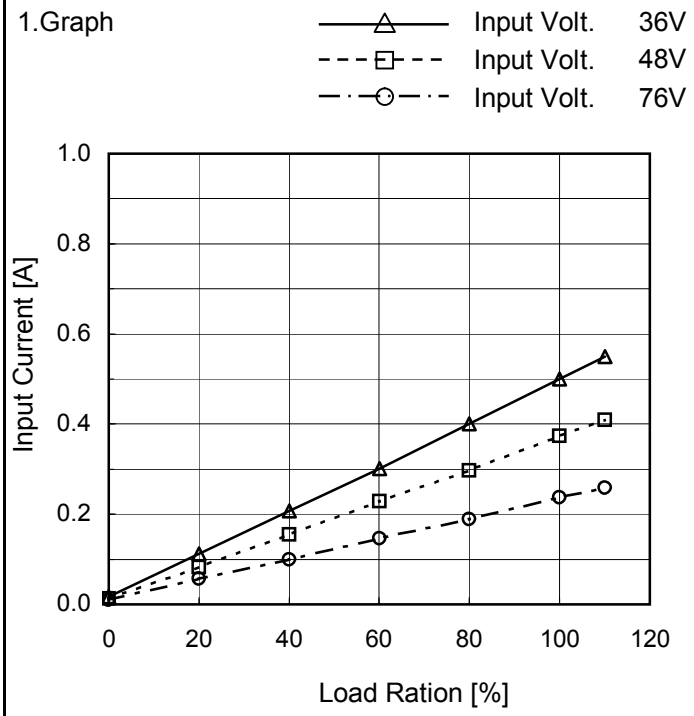
BC-10466

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Input Current (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

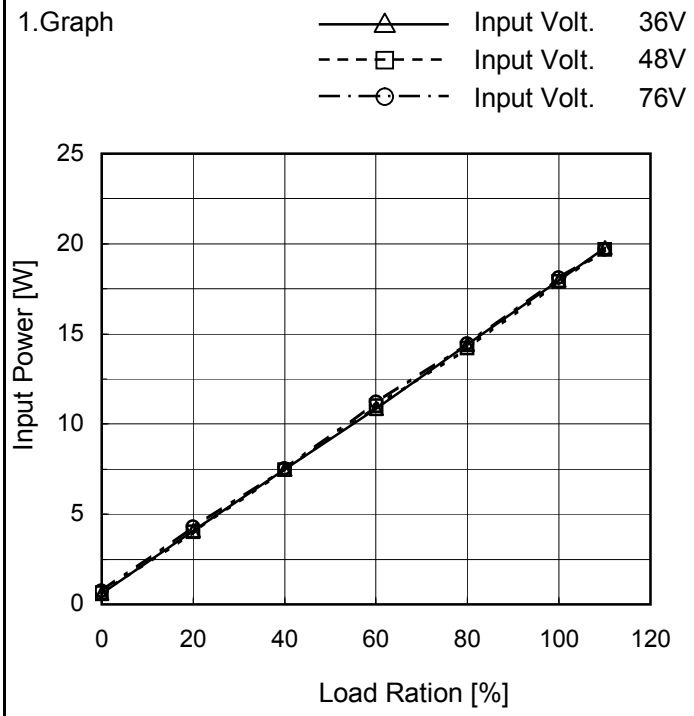
| Load Ration [%] | Input Current [A] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0 | 0.017 | 0.013 | 0.009 |
| 20 | 0.113 | 0.083 | 0.056 |
| 40 | 0.208 | 0.155 | 0.099 |
| 60 | 0.301 | 0.229 | 0.147 |
| 80 | 0.401 | 0.296 | 0.190 |
| 100 | 0.500 | 0.373 | 0.238 |
| 110 | 0.550 | 0.410 | 0.258 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Input Power (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

| Load Ration [%] | Input Power [W] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0 | 0.61 | 0.65 | 0.74 |
| 20 | 4.07 | 4.00 | 4.29 |
| 40 | 7.49 | 7.46 | 7.53 |
| 60 | 10.85 | 11.00 | 11.21 |
| 80 | 14.41 | 14.22 | 14.45 |
| 100 | 17.98 | 17.90 | 18.12 |
| 110 | 19.77 | 19.66 | 19.68 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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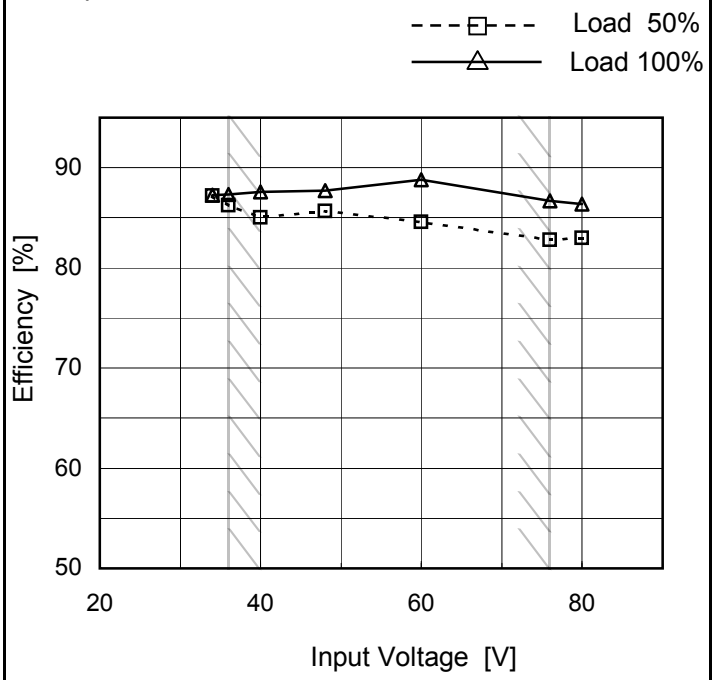
COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Efficiency (by Input Voltage) |
| Object | ―――――――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

| Input Voltage [V] | Efficiency [%] | |
|---|---|---|
| | Load 50% | Load 100% |
| 34 | 87.2 | 87.3 |
| 36 | 86.2 | 87.4 |
| 40 | 85.0 | 87.6 |
| 48 | 85.7 | 87.7 |
| 60 | 84.6 | 88.8 |
| 76 | 82.8 | 86.7 |
| 80 | 83.0 | 86.4 |
| -- | - | - |
| -- | - | - |



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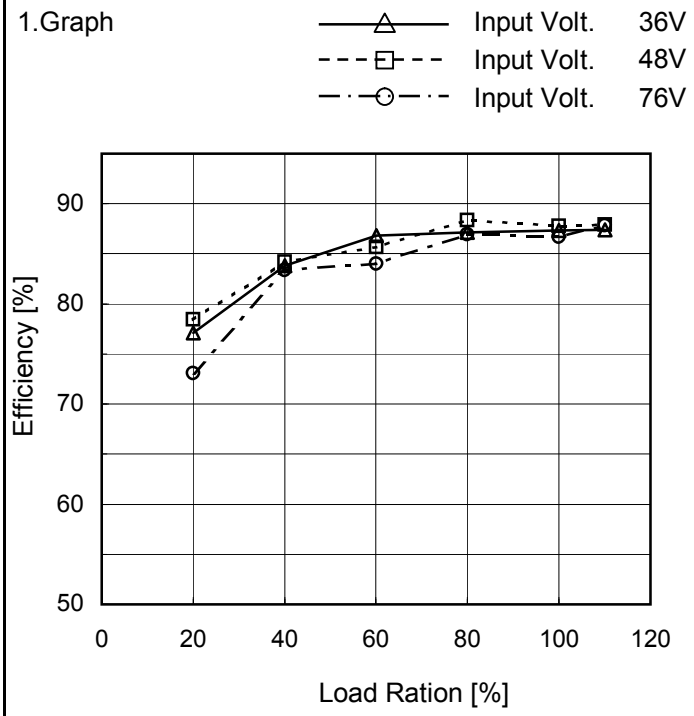
COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Efficiency (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

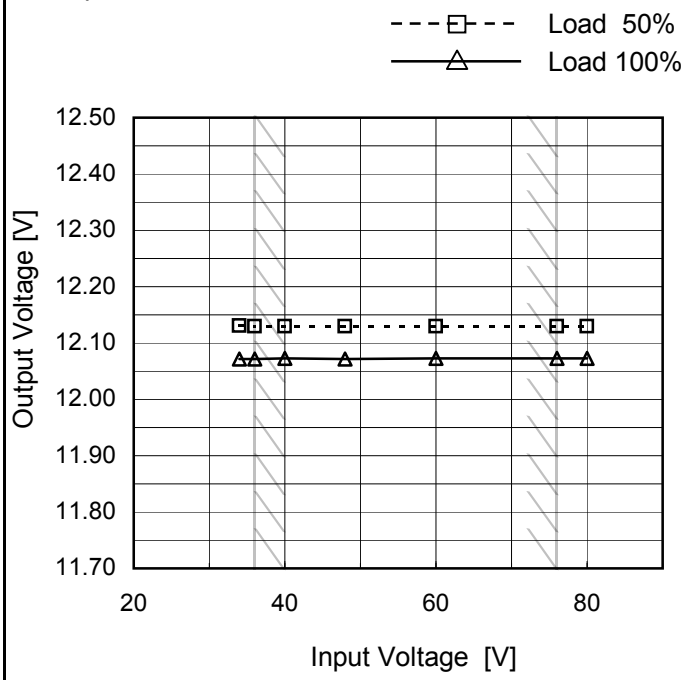
| Load Ration [%] | Efficiency [%] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 0 | - | - | - |
| 20 | 77.1 | 78.4 | 73.1 |
| 40 | 83.8 | 84.2 | 83.4 |
| 60 | 86.8 | 85.6 | 84.0 |
| 80 | 87.2 | 88.3 | 86.9 |
| 100 | 87.3 | 87.7 | 86.7 |
| 110 | 87.4 | 87.9 | 87.8 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Line Regulation |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph



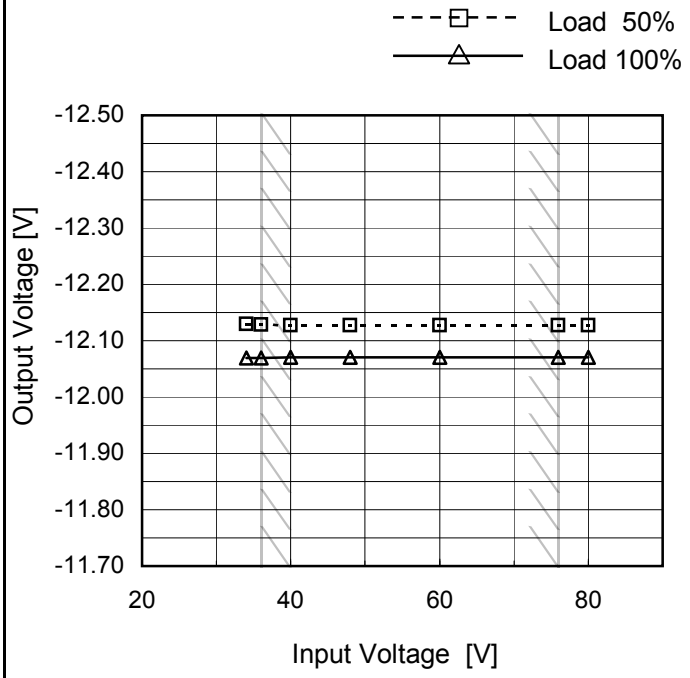

2.Values

| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 34 | 12.131 | 12.072 |
| 36 | 12.130 | 12.072 |
| 40 | 12.129 | 12.072 |
| 48 | 12.129 | 12.072 |
| 60 | 12.129 | 12.072 |
| 76 | 12.129 | 12.072 |
| 80 | 12.129 | 12.072 |
| -- | - | - |
| -- | - | - |

-12V: Rated output current

| | |
|---|---|
| Object | -12V0.65A |

1.Graph




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

2.Values

| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 34 | -12.130 | -12.070 |
| 36 | -12.128 | -12.070 |
| 40 | -12.128 | -12.070 |
| 48 | -12.128 | -12.070 |
| 60 | -12.128 | -12.070 |
| 76 | -12.128 | -12.071 |
| 80 | -12.128 | -12.071 |
| -- | - | - |
| -- | - | - |

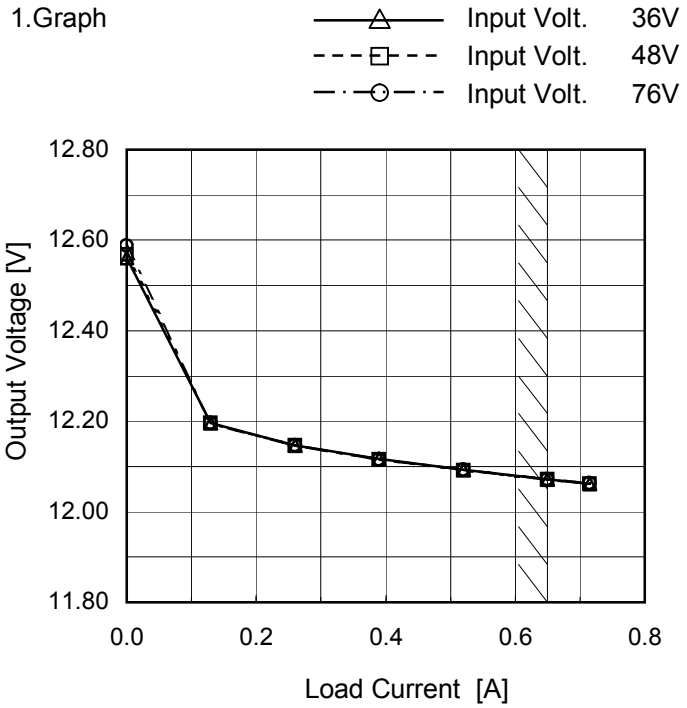
+12V: Rated output current

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Load Regulation |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph



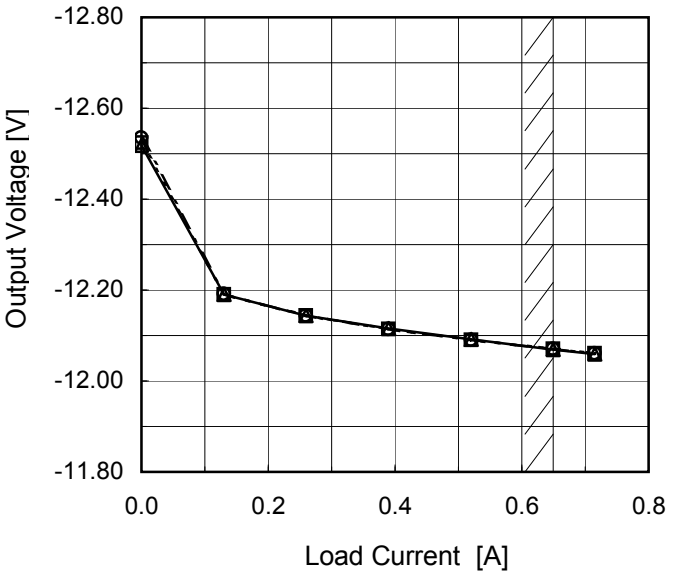

2.Values

| Load Current [A] | Output Voltage [V] Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
|---|---|---|---|
| 0.000 | 12.561 | 12.568 | 12.587 |
| 0.130 | 12.196 | 12.196 | 12.197 |
| 0.260 | 12.146 | 12.146 | 12.146 |
| 0.390 | 12.117 | 12.116 | 12.116 |
| 0.520 | 12.093 | 12.092 | 12.092 |
| 0.650 | 12.072 | 12.071 | 12.072 |
| 0.715 | 12.061 | 12.062 | 12.063 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

-12V: Rated output current

| | |
|---|---|
| Object | -12V0.65A |

1.Graph




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

2.Values

| Load Current [A] | Output Voltage [V] Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
|---|---|---|---|
| 0.000 | -12.519 | -12.524 | -12.536 |
| 0.130 | -12.191 | -12.191 | -12.191 |
| 0.260 | -12.143 | -12.144 | -12.144 |
| 0.390 | -12.115 | -12.114 | -12.114 |
| 0.520 | -12.092 | -12.090 | -12.090 |
| 0.650 | -12.070 | -12.070 | -12.070 |
| 0.715 | -12.059 | -12.061 | -12.061 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

+12V: Rated output current



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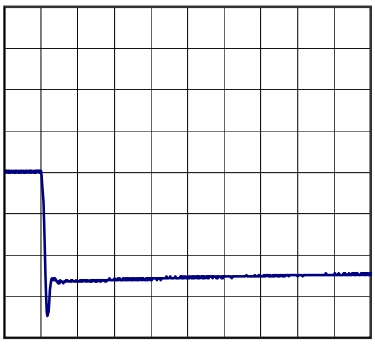
| | | |
|---|---|---|
| Model | MGW154812 | Temperature 25°C |
| Item | Dynamic Load Response | Testing Circuitry Figure A |
| Object | +12V0.65A | |

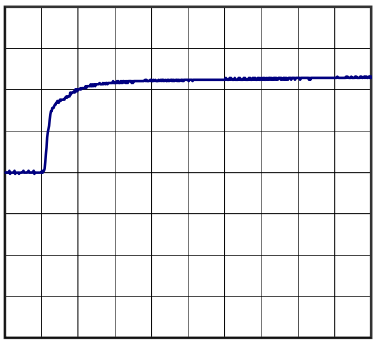
Input Volt. 48 V
Other output current rated
Cycle 1000 ms

$t_1$、$t_2$ = 50μs

Load Current

Min. Load (0A) ←→
Load 100% (0.65A)

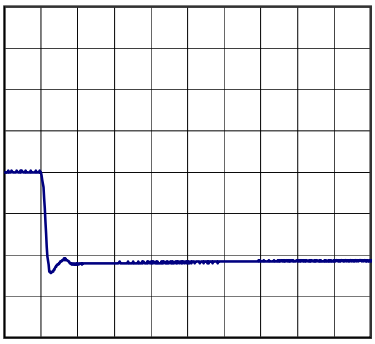


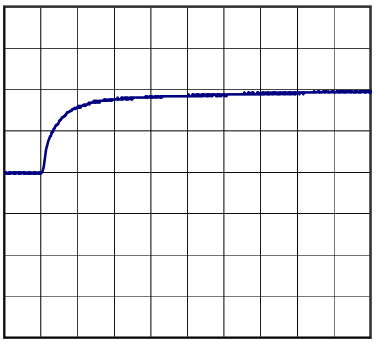


200mV/div

200μs/div 200μs/div

Min. Load (0A) ←→
Load 50% (0.325A)

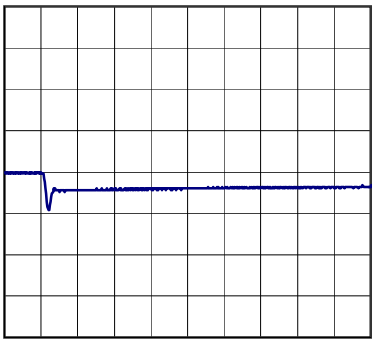


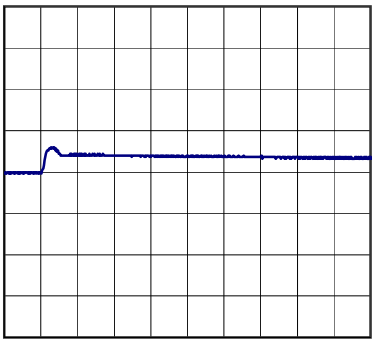


200mV/div

200μs/div 200μs/div

Load 50% (0.325A) ←→
Load 100% (0.65A)





200mV/div

200μs/div 200μs/div

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Dynamic Load Response |
| Object | -12V0.65A |

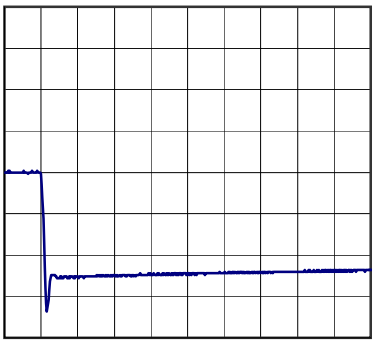
Temperature 25°C
Testing Circuitry Figure A

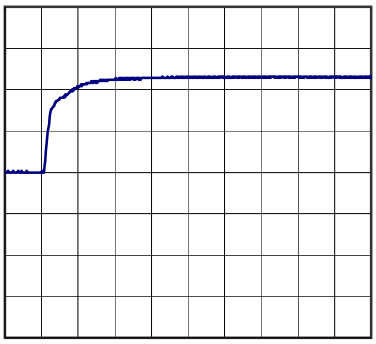
Input Volt. 48 V
Other output current rated
Cycle 1000 ms

$t_1$、$t_2$ = 50μs

Load Current

Min. Load (0A) ←→
Load 100% (0.65A)

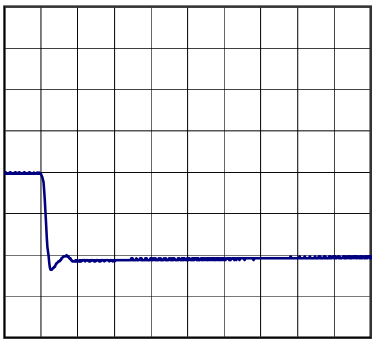


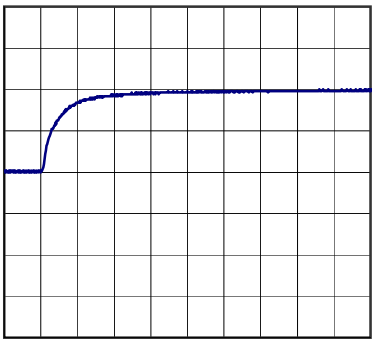


200mV/div

200μs/div 200μs/div

Min. Load (0A) ←→
Load 50% (0.325A)

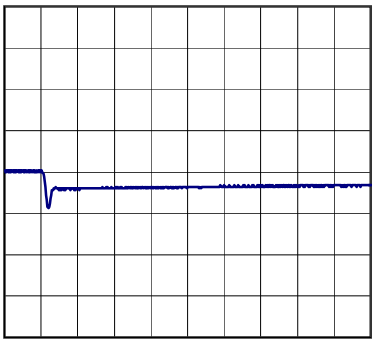


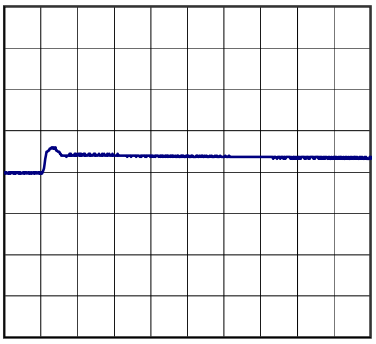


200mV/div

200μs/div 200μs/div

Load 50% (0.325A) ←→
Load 100% (0.65A)





200mV/div

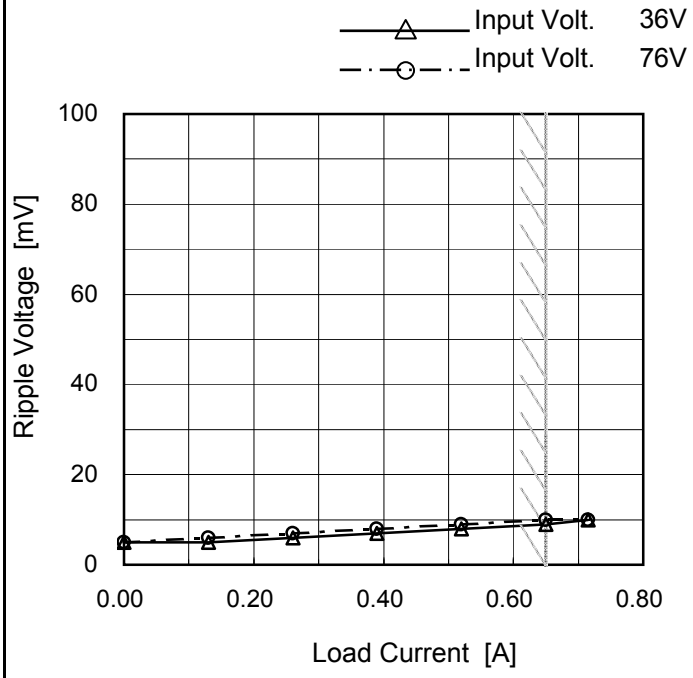
200μs/div 200μs/div

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Ripple Voltage (by Load Current) |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure B

1.Graph




Measured by 100 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

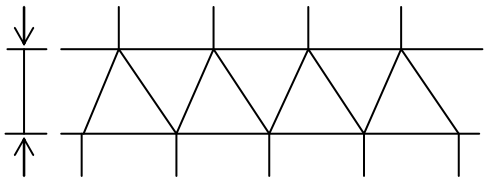


Fig.Complex Ripple Wave Form

2.Values

| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 36 [V] | Input Volt. 76 [V] |
| 0.000 | 5 | 5 |
| 0.130 | 5 | 6 |
| 0.260 | 6 | 7 |
| 0.390 | 7 | 8 |
| 0.520 | 8 | 9 |
| 0.650 | 9 | 10 |
| 0.715 | 10 | 10 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

−12V: Rated output current



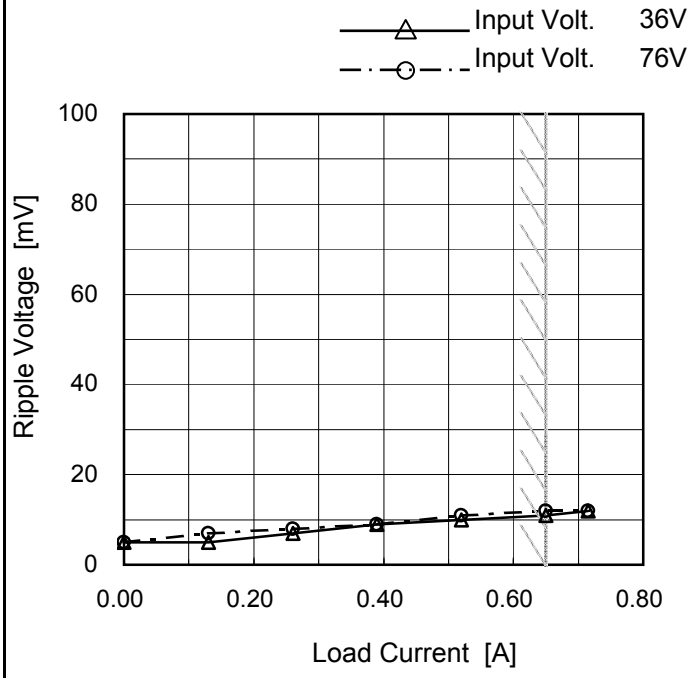
BC-10466

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Ripple Voltage (by Load Current) |
| Object | -12V0.65A |

Temperature 25°C
Testing Circuitry Figure B

1.Graph




Measured by 100 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

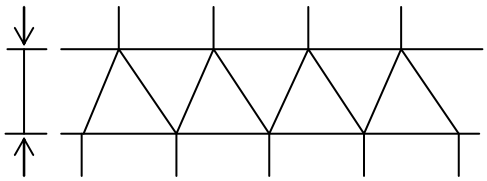


Fig.Complex Ripple Wave Form

2.Values

| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 36 [V] | Input Volt. 76 [V] |
| 0.000 | 5 | 5 |
| 0.130 | 5 | 7 |
| 0.260 | 7 | 8 |
| 0.390 | 9 | 9 |
| 0.520 | 10 | 11 |
| 0.650 | 11 | 12 |
| 0.715 | 12 | 12 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

+12V: Rated output current



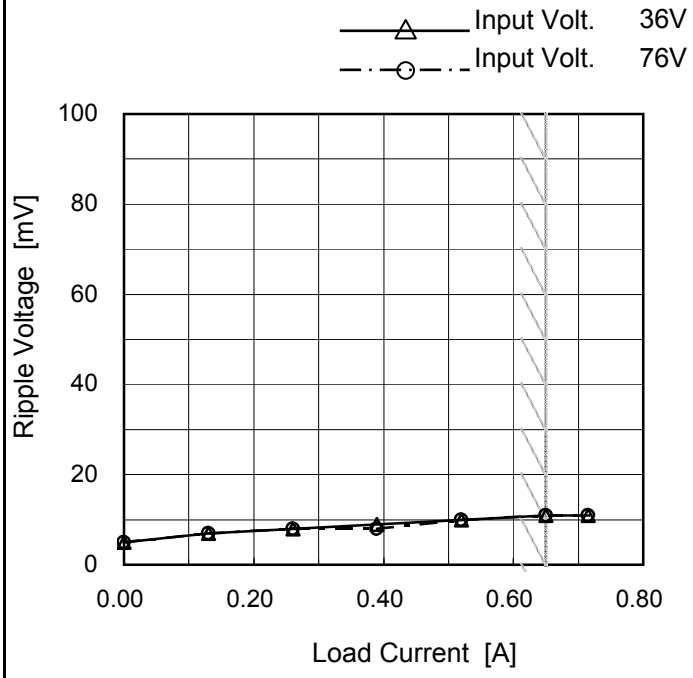
BC-10466

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Ripple-Noise |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure B

1.Graph




Measured by 100 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

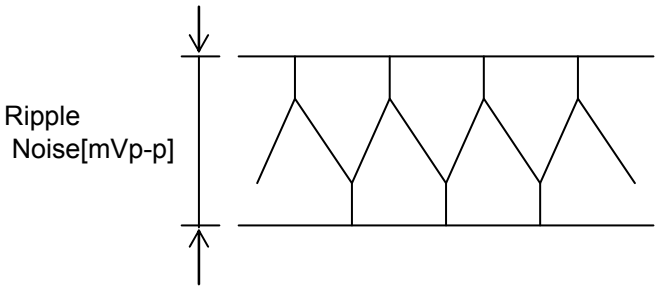



Fig.Complex Ripple Noise Wave Form

2.Values

| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 36 [V] | Input Volt. 76 [V] |
| 0.000 | 5 | 5 |
| 0.130 | 7 | 7 |
| 0.260 | 8 | 8 |
| 0.390 | 9 | 8 |
| 0.520 | 10 | 10 |
| 0.650 | 11 | 11 |
| 0.715 | 11 | 11 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

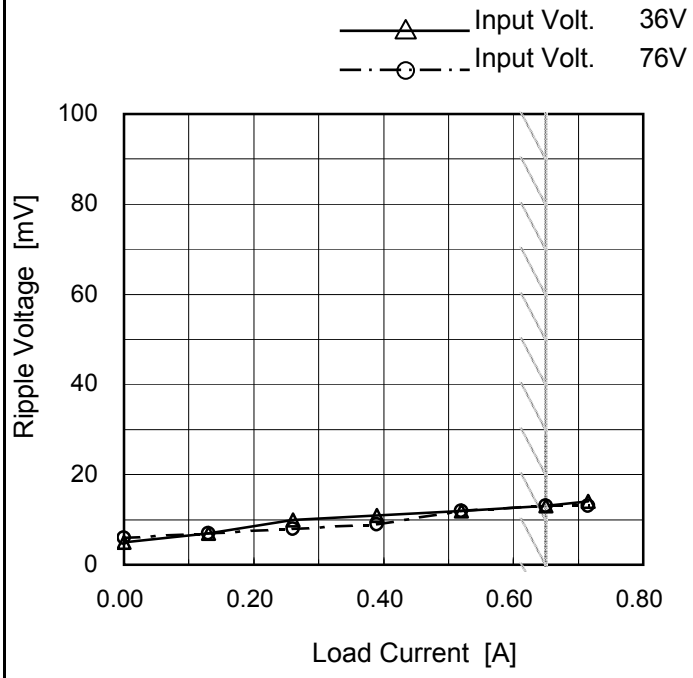
−12V: Rated output current

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Ripple-Noise |
| Object | -12V0.65A |

Temperature 25°C
Testing Circuitry Figure B

1.Graph




Measured by 100 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

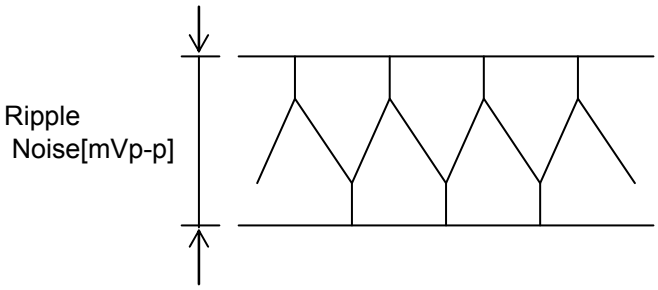



Fig.Complex Ripple Noise Wave Form

2.Values

| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 36 [V] | Input Volt. 76 [V] |
| 0.000 | 5 | 6 |
| 0.130 | 7 | 7 |
| 0.260 | 10 | 8 |
| 0.390 | 11 | 9 |
| 0.520 | 12 | 12 |
| 0.650 | 13 | 13 |
| 0.715 | 14 | 13 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

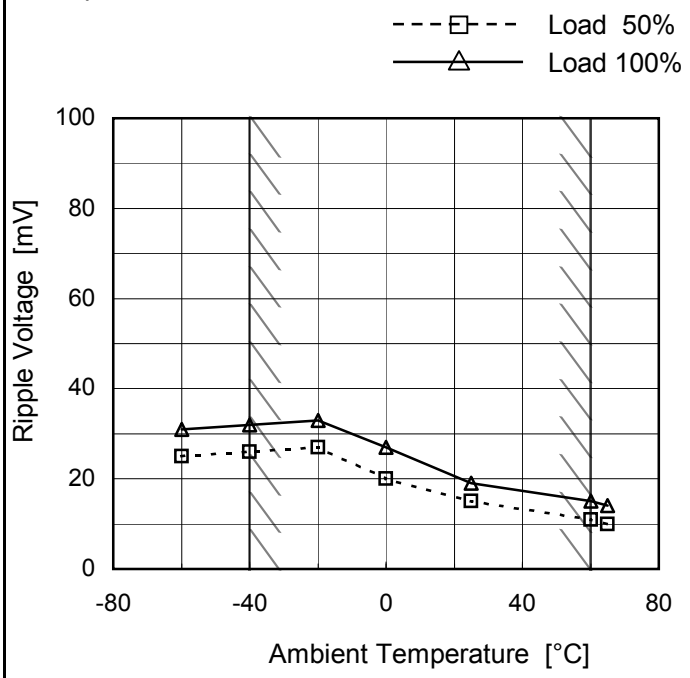
+12V: Rated output current

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +12V0.65A |

Testing Circuitry Figure B

1.Graph




Input Volt. 48V

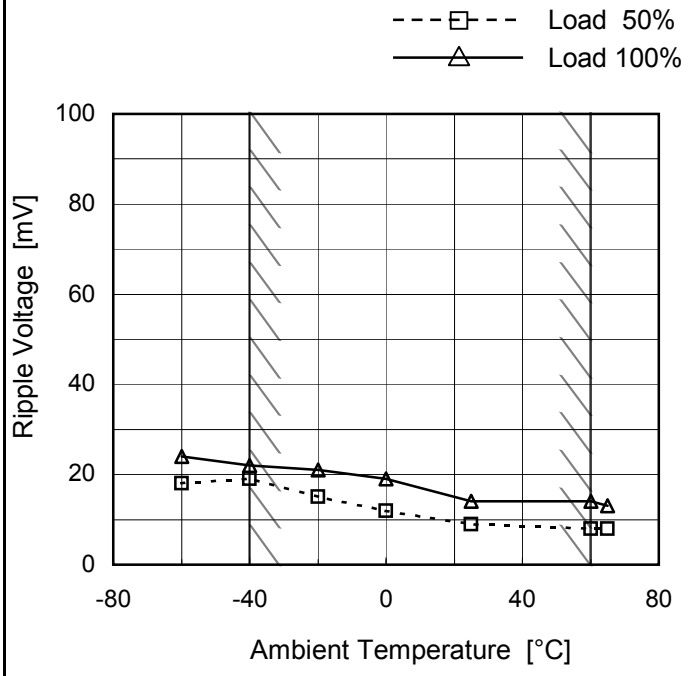
2.Values

| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -60 | 25 | 31 |
| -40 | 26 | 32 |
| -20 | 27 | 33 |
| 0 | 20 | 27 |
| 25 | 15 | 19 |
| 60 | 11 | 15 |
| 65 | 10 | 14 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

-12V: Rated output current

| | |
|---|---|
| Object | -12V0.65A |

1.Graph




Input Volt. 48V

Measured by 100 MHz Oscilloscope.

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

2.Values

| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -60 | 18 | 24 |
| -40 | 19 | 22 |
| -20 | 15 | 21 |
| 0 | 12 | 19 |
| 25 | 9 | 14 |
| 60 | 8 | 14 |
| 65 | 8 | 13 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

+12V: Rated output current

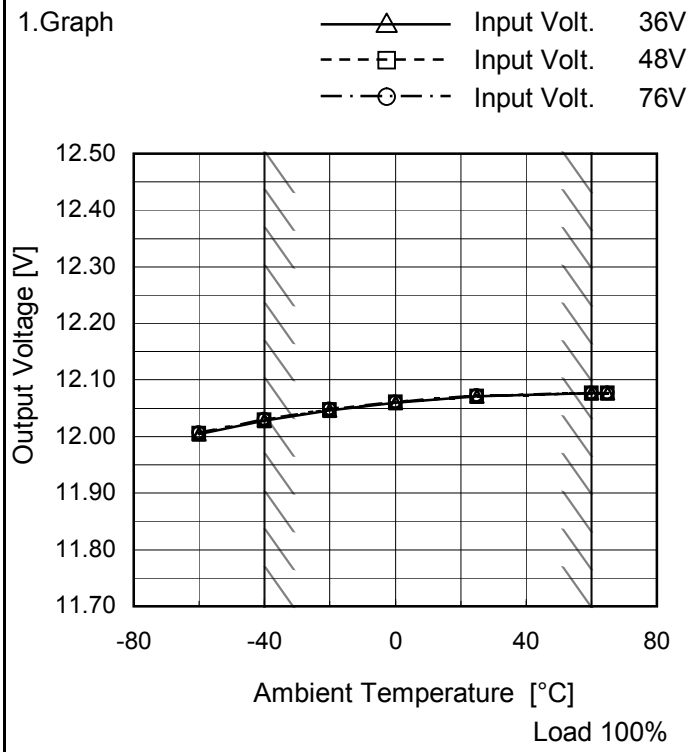
COSEL

| Model | MGW154812 |
|---|---|
| Item | Ambient Temperature Drift |

Testing Circuitry Figure A

Object +12V0.65A

1.Graph

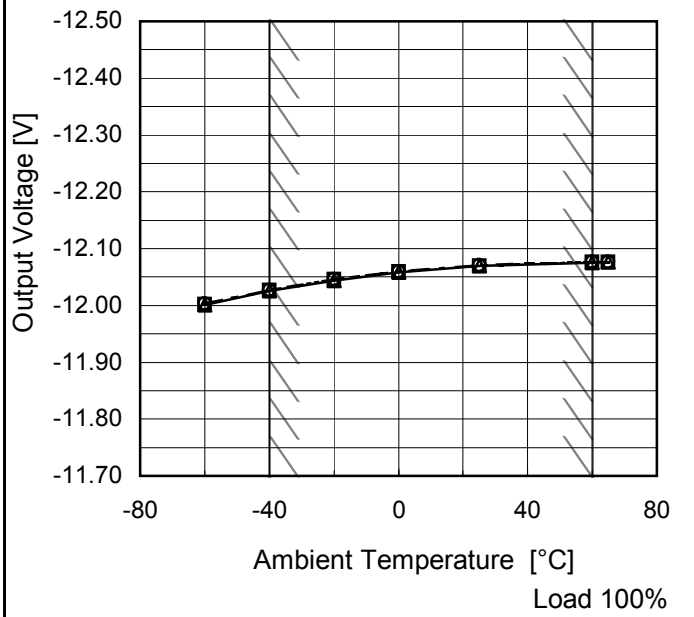



2.Values

| Ambient Temperature [°C] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| -60 | 12.004 | 12.005 | 12.006 |
| -40 | 12.028 | 12.029 | 12.030 |
| -20 | 12.047 | 12.047 | 12.048 |
| 0 | 12.060 | 12.061 | 12.061 |
| 25 | 12.071 | 12.071 | 12.072 |
| 60 | 12.077 | 12.077 | 12.077 |
| 65 | 12.077 | 12.077 | 12.077 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

Object -12V0.65A

1.Graph




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

2.Values

| Ambient Temperature [°C] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| -60 | -12.000 | -12.002 | -12.003 |
| -40 | -12.025 | -12.027 | -12.027 |
| -20 | -12.044 | -12.045 | -12.046 |
| 0 | -12.058 | -12.059 | -12.060 |
| 25 | -12.069 | -12.070 | -12.070 |
| 60 | -12.076 | -12.076 | -12.076 |
| 65 | -12.076 | -12.076 | -12.077 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| Model | MGW154812 |
|---|---|
| Item | Output Voltage Accuracy |

Testing Circuitry Figure A

1.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 : -40 - 60°C

Input Voltage : 36 - 76V

Load Current (AVR 1) : 0 - 0.65A (AVR 2) : 0 - 0.65A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

| Object | +12V0.65A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | 60 | 76 | 0 | 12.581 | ±277 | ±2.3 |
| Minimum Voltage | -40 | 36 | 0.65 | 12.028 | | |

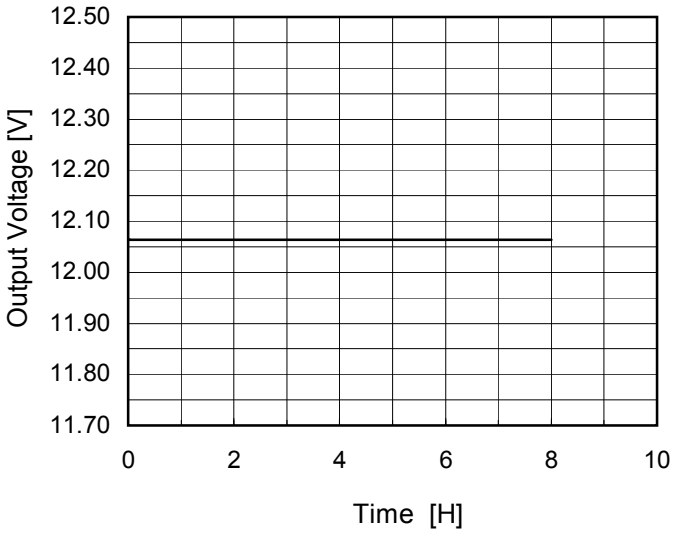
| Object | -12V0.65A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | 60 | 76 | 0 | -12.536 | ±256 | ±2.1 |
| Minimum Voltage | -40 | 36 | 0.65 | -12.025 | | |

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Time Lapse Drift |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph



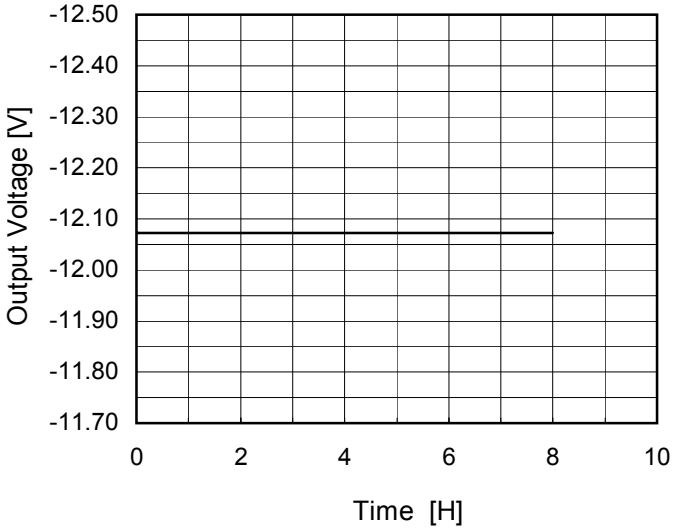

Input Volt. 48V
Load 100%

2.Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 12.063 |
| 0.5 | 12.063 |
| 1.0 | 12.063 |
| 2.0 | 12.063 |
| 3.0 | 12.063 |
| 4.0 | 12.064 |
| 5.0 | 12.064 |
| 6.0 | 12.064 |
| 7.0 | 12.064 |
| 8.0 | 12.064 |

| | |
|---|---|
| Object | -12V0.65A |

1.Graph




Input Volt. 48V
Load 100%

2.Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | -12.073 |
| 0.5 | -12.073 |
| 1.0 | -12.073 |
| 2.0 | -12.073 |
| 3.0 | -12.073 |
| 4.0 | -12.073 |
| 5.0 | -12.073 |
| 6.0 | -12.073 |
| 7.0 | -12.073 |
| 8.0 | -12.073 |



BC-10466

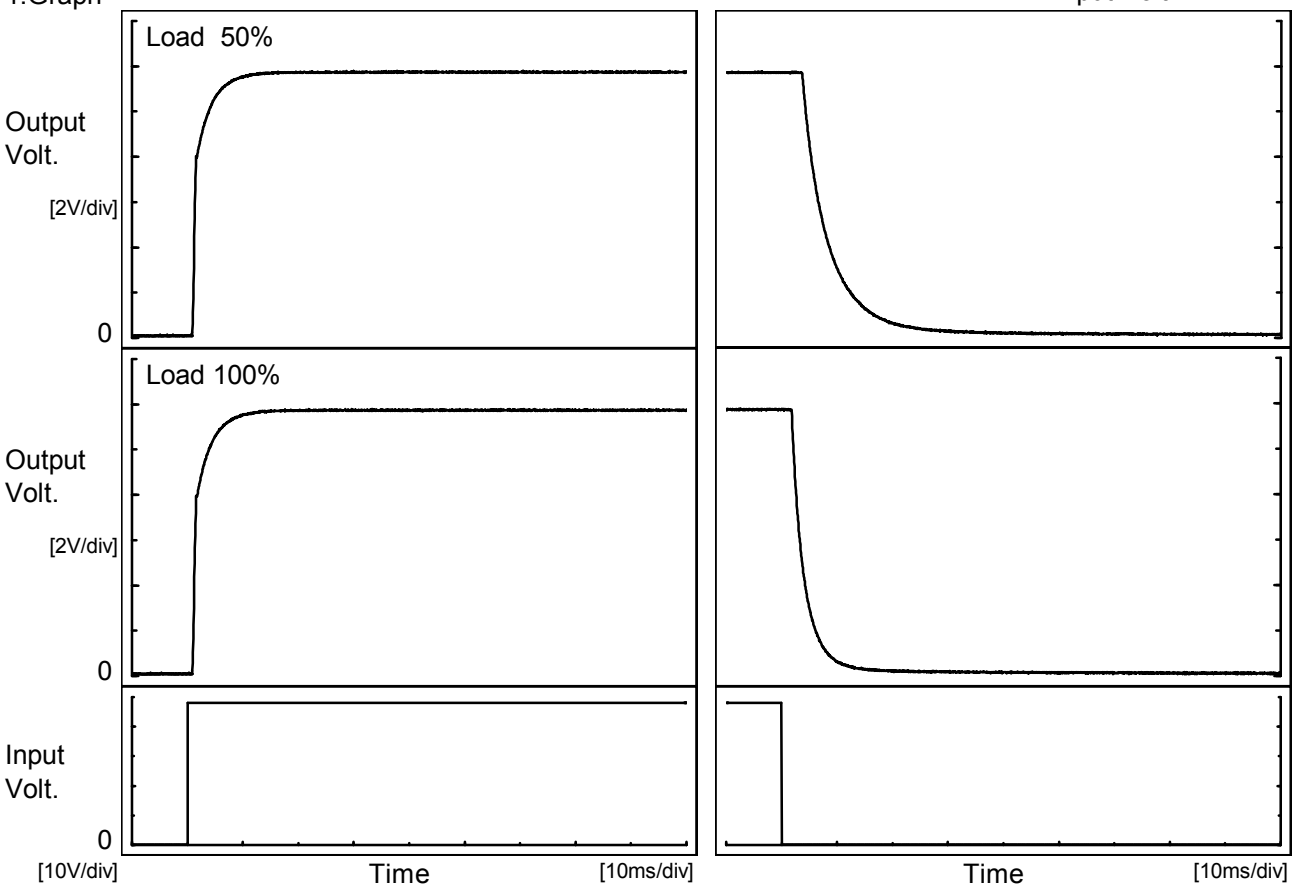
COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Rise and Fall Time |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph

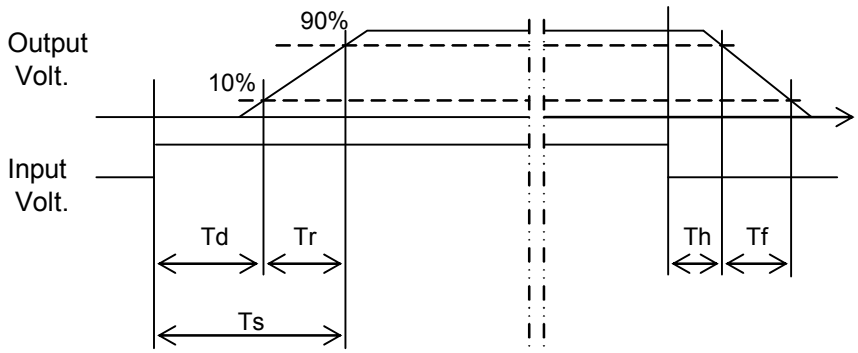
Input Volt. 48 V




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 1.1 | 4.8 | 5.9 | 3.9 | 11.3 |
| 100 % | 1.1 | 4.8 | 5.9 | 2.0 | 5.5 |






BC-10466

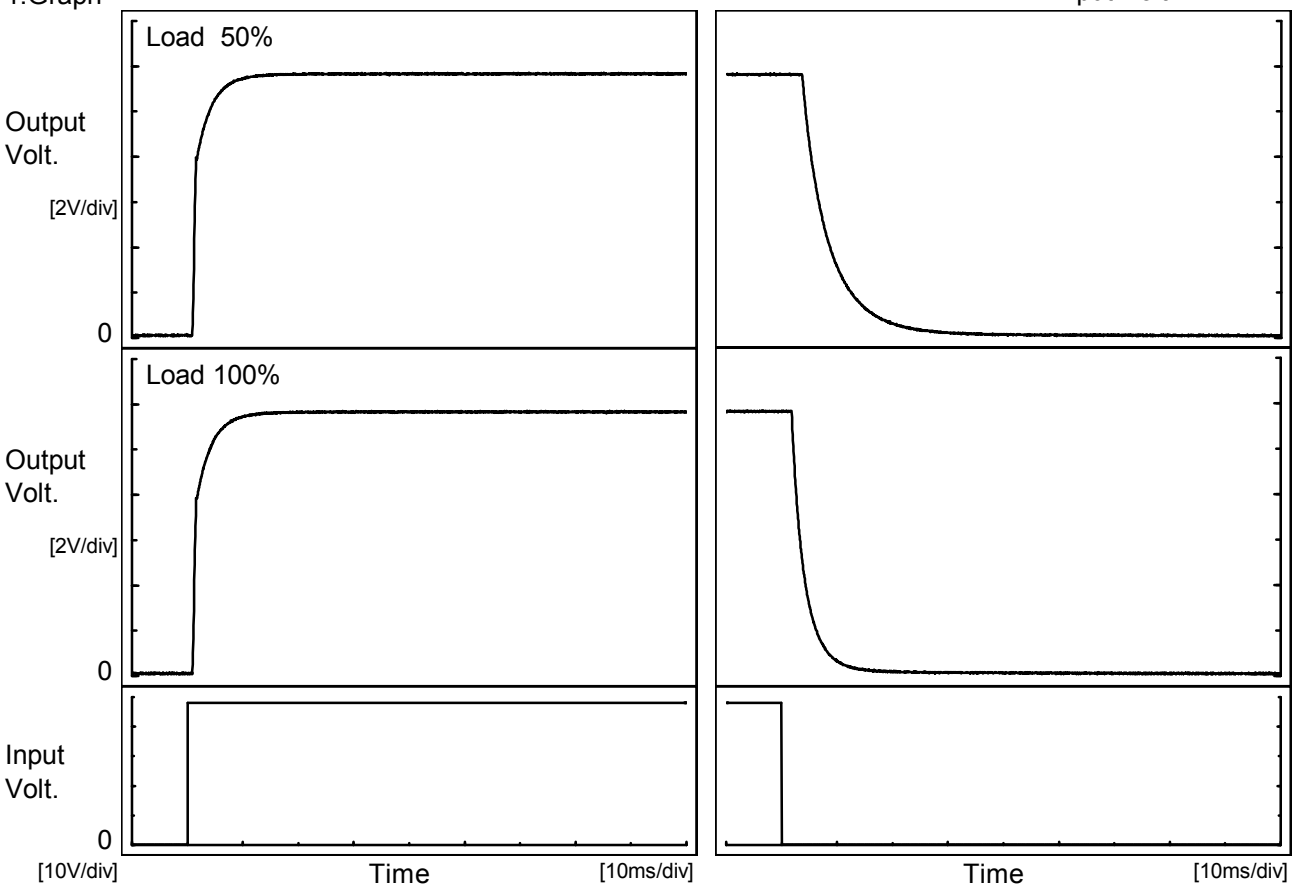
COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Rise and Fall Time |
| Object | -12V0.65A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph

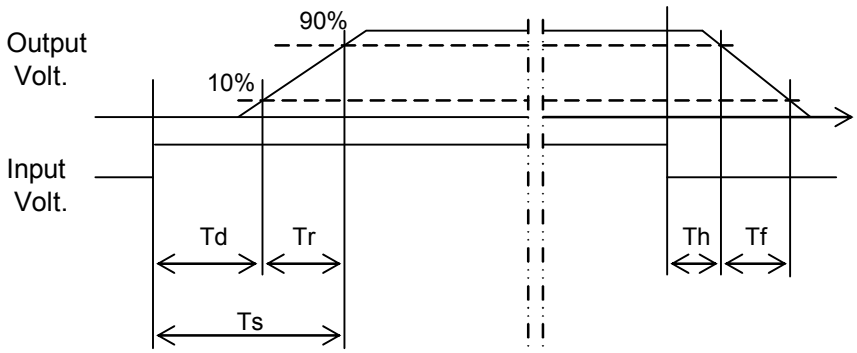
Input Volt. 48 V




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 1.1 | 5.0 | 6.1 | 3.9 | 11.3 |
| 100 % | 1.1 | 5.0 | 6.1 | 1.9 | 5.7 |





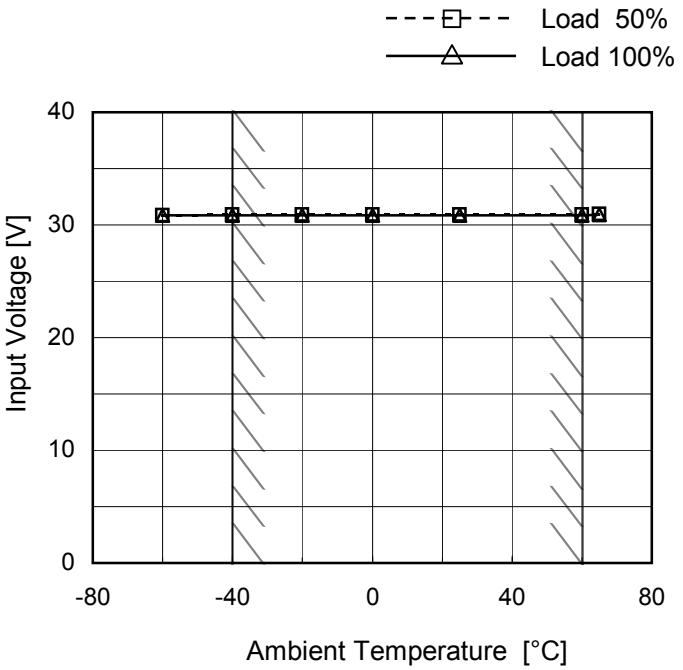

BC-10466

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +12V0.65A |

Testing Circuitry Figure A

1.Graph

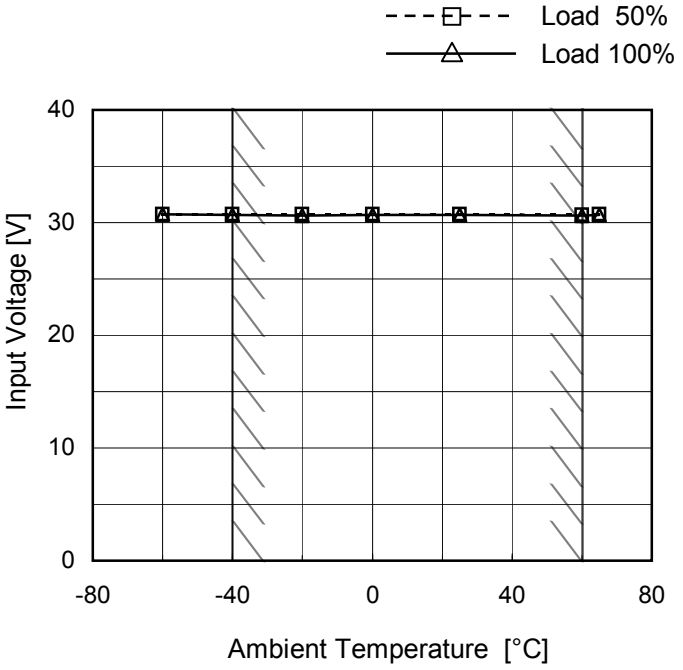



2.Values

| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -60 | 30.9 | 30.9 |
| -40 | 31.0 | 30.9 |
| -20 | 31.0 | 30.9 |
| 0 | 30.9 | 30.9 |
| 25 | 31.0 | 30.9 |
| 60 | 31.0 | 30.9 |
| 65 | 31.0 | 30.9 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

| | |
|---|---|
| Object | -12V0.65A |

1.Graph




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

2.Values

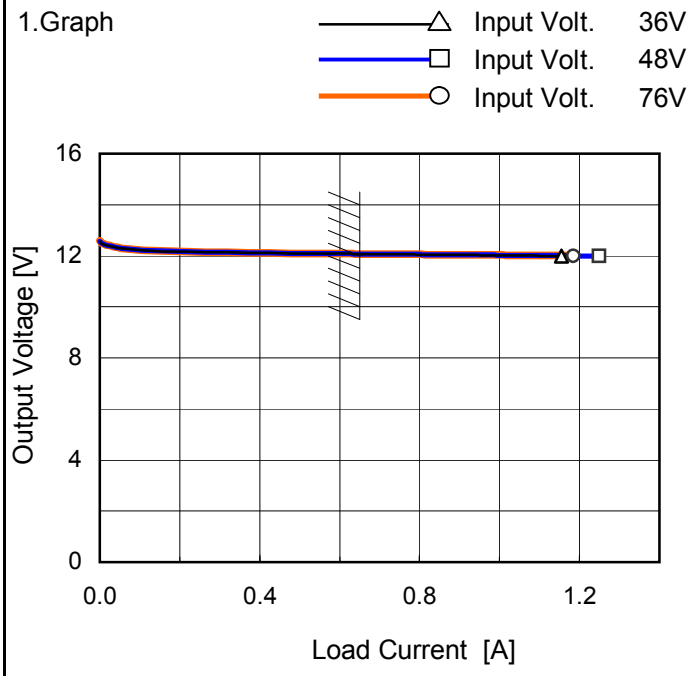
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -60 | 30.8 | 30.8 |
| -40 | 30.8 | 30.7 |
| -20 | 30.8 | 30.7 |
| 0 | 30.8 | 30.8 |
| 25 | 30.8 | 30.7 |
| 60 | 30.7 | 30.7 |
| 65 | 30.8 | 30.7 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | MGW154812 |
| Item | Overcurrent Protection |
| Object | +12V0.65A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph



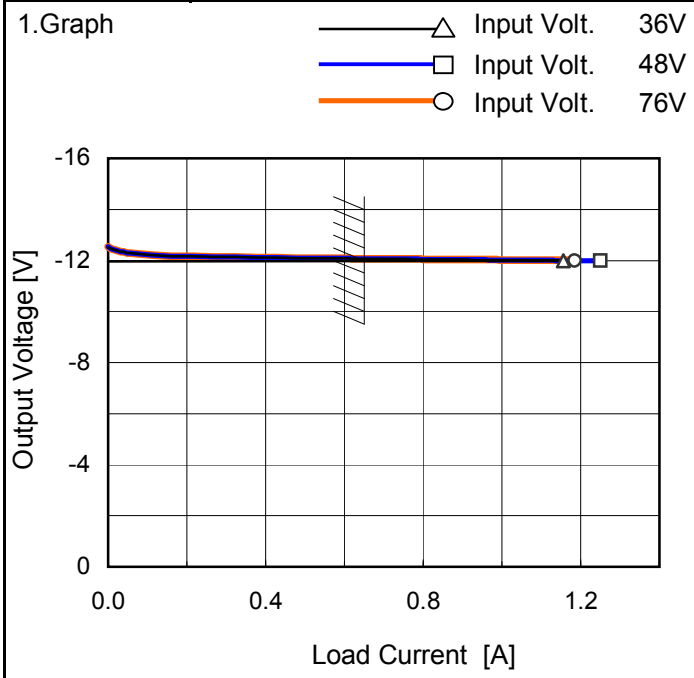

2.Values

| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| 12.00 | 1.16 | 1.25 | 1.19 |
| 11.40 | - | - | - |
| 10.80 | - | - | - |
| 9.60 | - | - | - |
| 8.40 | - | - | - |
| 7.20 | - | - | - |
| 6.00 | - | - | - |
| 4.80 | - | - | - |
| 3.60 | - | - | - |
| 2.40 | - | - | - |
| 1.20 | - | - | - |
| 0.00 | - | - | - |

-12V: Rated output current

| | |
|---|---|
| Object | -12V0.65A |

1.Graph




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

Intermittent operation occurs when overcurrent protection is activated.

2.Values

| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 36[V] | Input Volt. 48[V] | Input Volt. 76[V] |
| -12.00 | 1.16 | 1.25 | 1.19 |
| -11.40 | - | - | - |
| -10.80 | - | - | - |
| -9.60 | - | - | - |
| -8.40 | - | - | - |
| -7.20 | - | - | - |
| -6.00 | - | - | - |
| -4.80 | - | - | - |
| -3.60 | - | - | - |
| -2.40 | - | - | - |
| -1.20 | - | - | - |
| 0.00 | - | - | - |

+12V: Rated output current

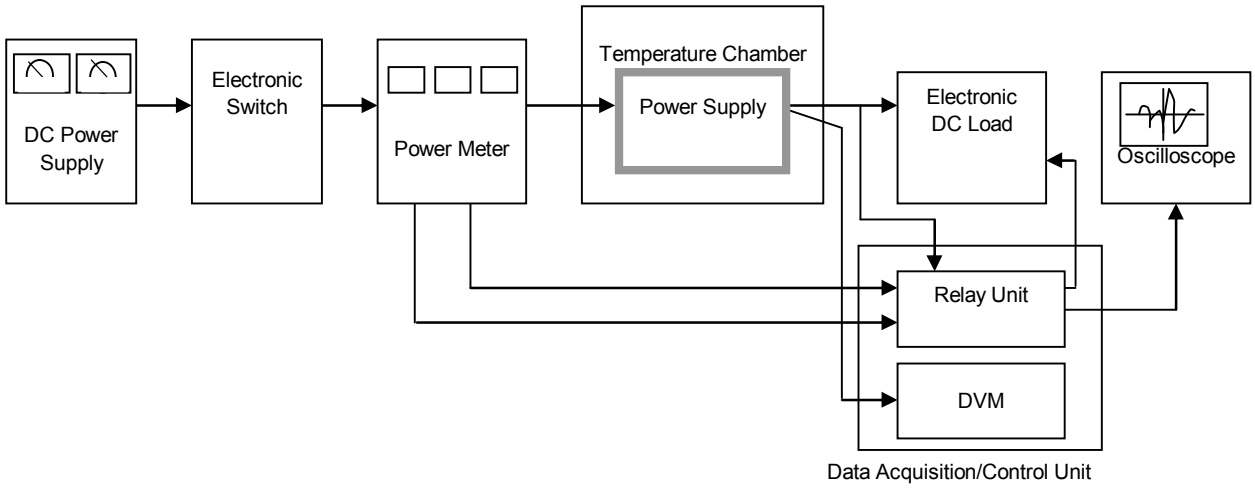



Figure A

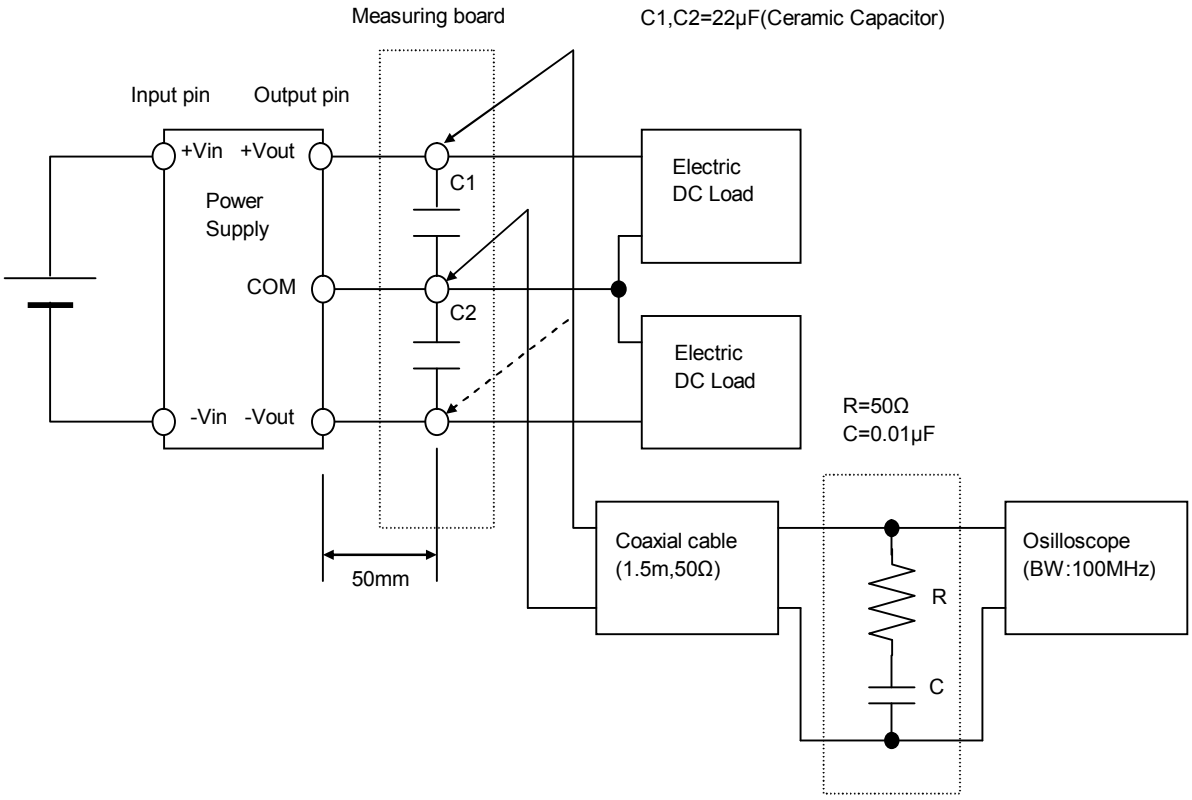



Figure B（Ripple and Ripple noise Characteristic）