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参考資料

# TEST DATA OF G1W-12

Regulated DC Power Supply
October 13, 2010

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Satoshi Kinoshita Design Engineer

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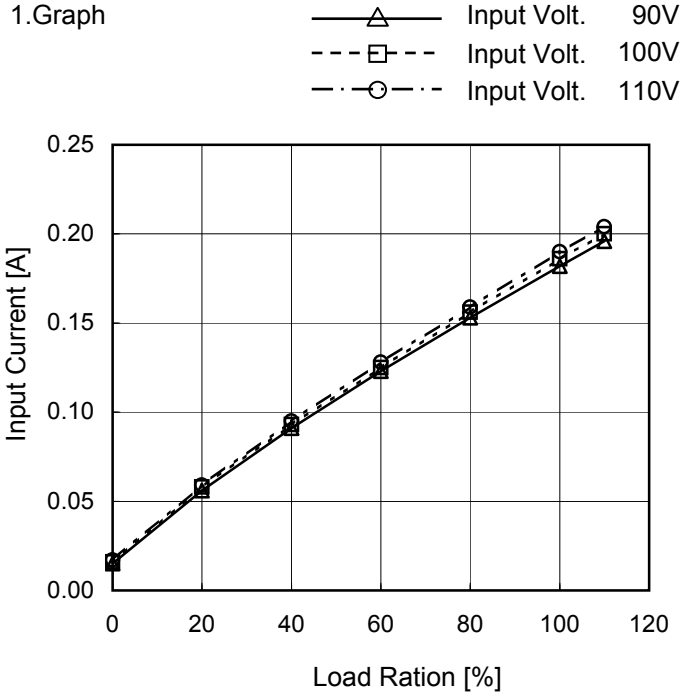
|---|---|
| Model | G1W-12 |
| Item | Input Current (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

| Load Ration [%] | Input Current [A] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 0 | 0.015 | 0.016 | 0.017 |
| 20 | 0.056 | 0.058 | 0.059 |
| 40 | 0.091 | 0.093 | 0.095 |
| 60 | 0.123 | 0.125 | 0.128 |
| 80 | 0.153 | 0.156 | 0.159 |
| 100 | 0.182 | 0.186 | 0.190 |
| 110 | 0.196 | 0.200 | 0.204 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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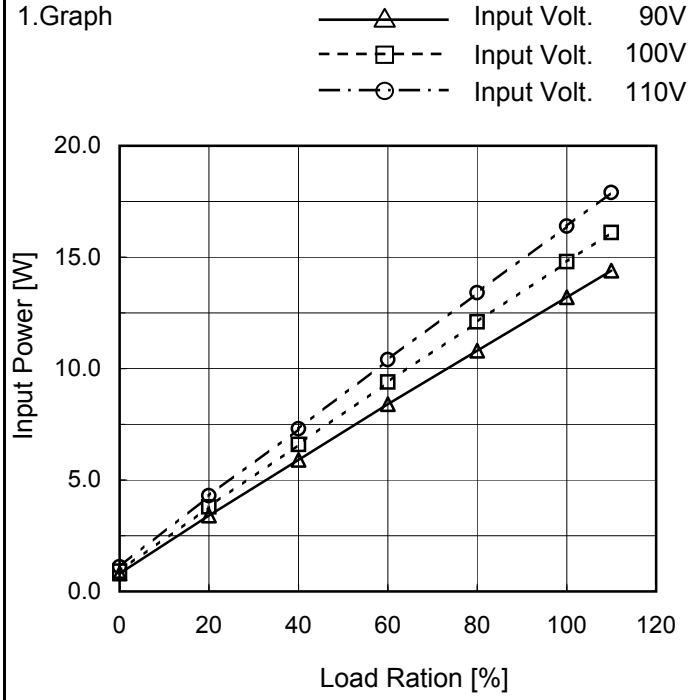
| | |
|---|---|
| Model | G1W-12 |
| Item | Input Power (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

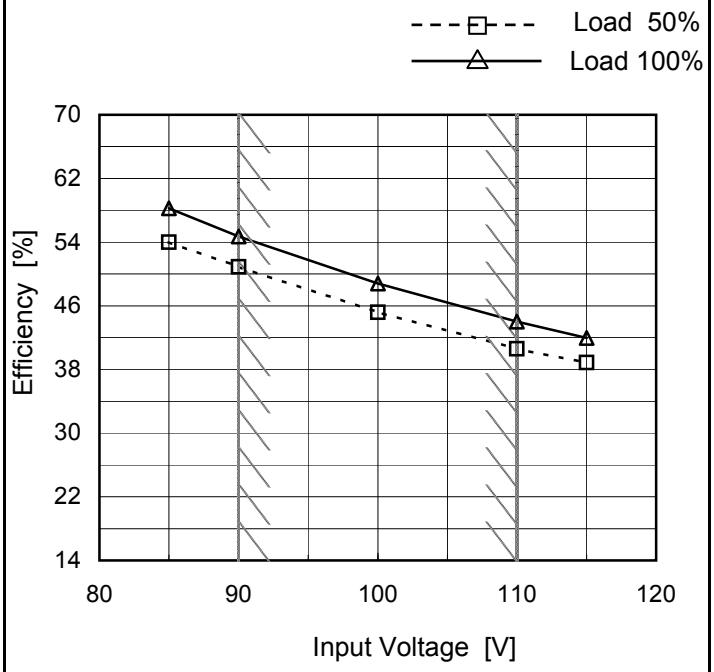
| Load Ration [%] | Input Power [W] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 0 | 0.80 | 0.90 | 1.10 |
| 20 | 3.40 | 3.80 | 4.30 |
| 40 | 5.90 | 6.60 | 7.30 |
| 60 | 8.40 | 9.40 | 10.40 |
| 80 | 10.80 | 12.10 | 13.40 |
| 100 | 13.20 | 14.80 | 16.40 |
| 110 | 14.40 | 16.10 | 17.90 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| 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

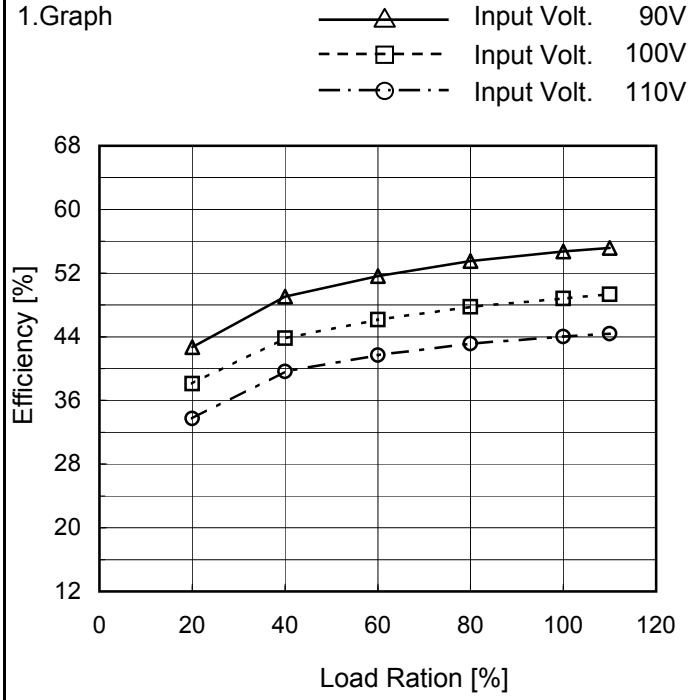
| Input Voltage [V] | Efficiency [%] | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 54.0 | 58.2 |
| 90 | 50.9 | 54.7 |
| 100 | 45.2 | 48.8 |
| 110 | 40.6 | 44.0 |
| 115 | 38.9 | 42.0 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Efficiency (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

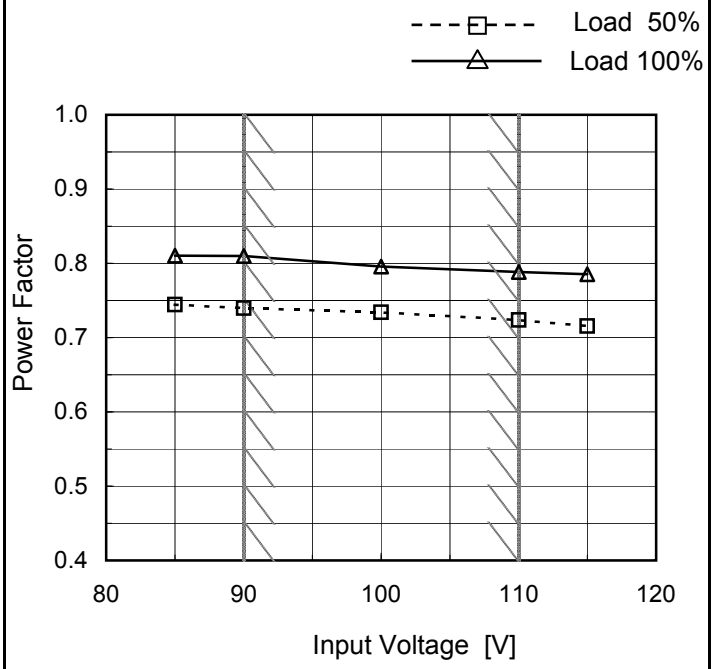
| Load Ration [%] | Efficiency [%] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 0 | - | - | - |
| 20 | 42.7 | 38.1 | 33.7 |
| 40 | 49.0 | 43.8 | 39.6 |
| 60 | 51.6 | 46.1 | 41.7 |
| 80 | 53.5 | 47.8 | 43.1 |
| 100 | 54.7 | 48.8 | 44.0 |
| 110 | 55.2 | 49.3 | 44.4 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Power Factor (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

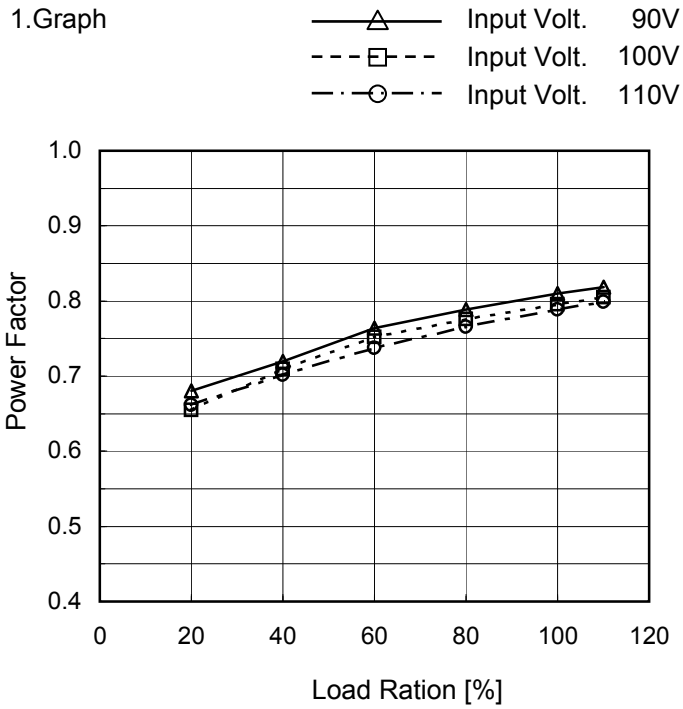
| Input Voltage [V] | Power Factor | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 0.744 | 0.810 |
| 90 | 0.740 | 0.810 |
| 100 | 0.734 | 0.796 |
| 110 | 0.724 | 0.788 |
| 115 | 0.715 | 0.785 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Power Factor (by Load Current) |
| Object | ―――――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




2.Values

| Load Ration [%] | Power Factor | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 0 | - | - | - |
| 20 | 0.680 | 0.655 | 0.662 |
| 40 | 0.720 | 0.710 | 0.702 |
| 60 | 0.764 | 0.752 | 0.738 |
| 80 | 0.788 | 0.776 | 0.766 |
| 100 | 0.810 | 0.796 | 0.788 |
| 110 | 0.818 | 0.805 | 0.799 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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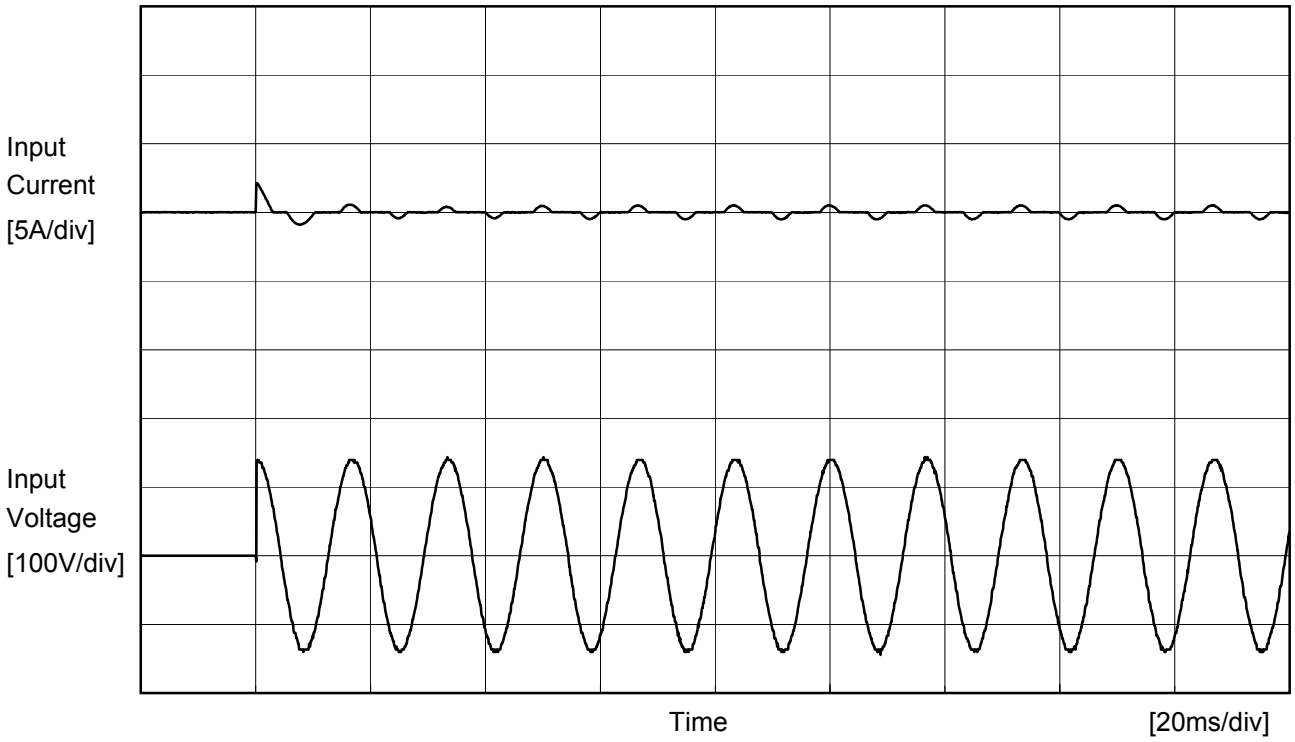
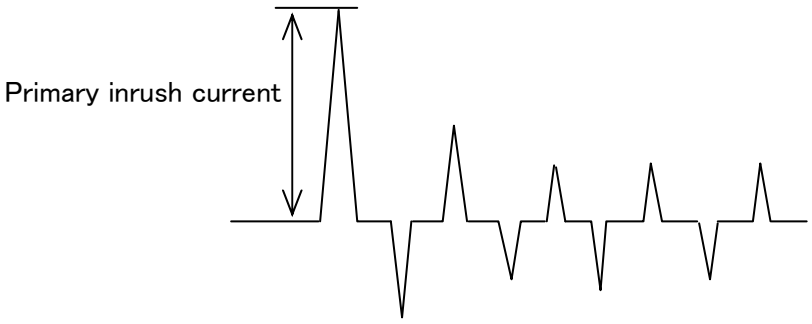
| | | |
|---|---|---|
| Model | G1W-12 | Temperature 25°C |
| Item | Inrush Current | Testing Circuitry Figure A |
| Object | ―――――― | |




| | |
|---|---|
| Input Voltage | 100 V |
| Frequency | 60 Hz |
| Load | 100 % |
| Primary inrush current | 2.1 A |



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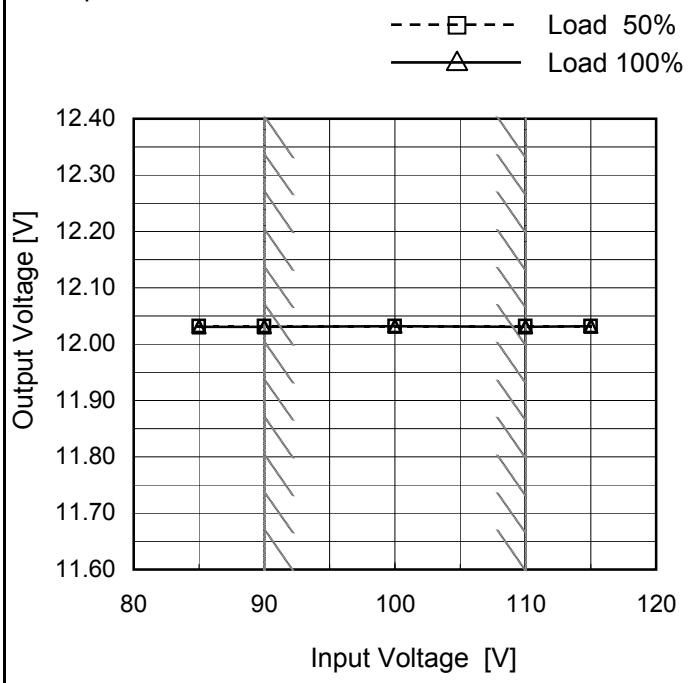
|---|---|
| Model | G1W-12 |
| Item | Line Regulation |
| Object | +12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph

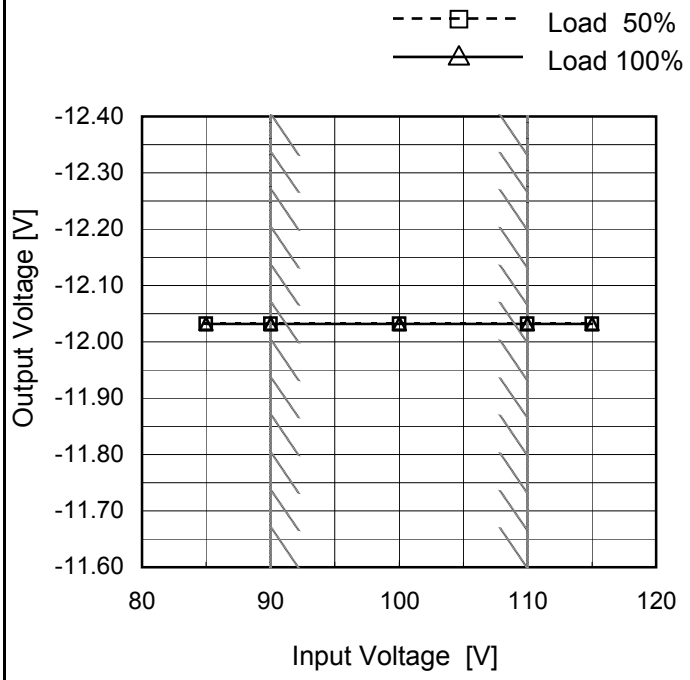



2.Values

| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 12.032 | 12.031 |
| 90 | 12.032 | 12.031 |
| 100 | 12.031 | 12.031 |
| 110 | 12.032 | 12.031 |
| 115 | 12.032 | 12.031 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

| | |
|---|---|
| Object | -12V0.3A |

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% |
| 85 | -12.032 | -12.032 |
| 90 | -12.032 | -12.032 |
| 100 | -12.032 | -12.032 |
| 110 | -12.032 | -12.032 |
| 115 | -12.032 | -12.032 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |



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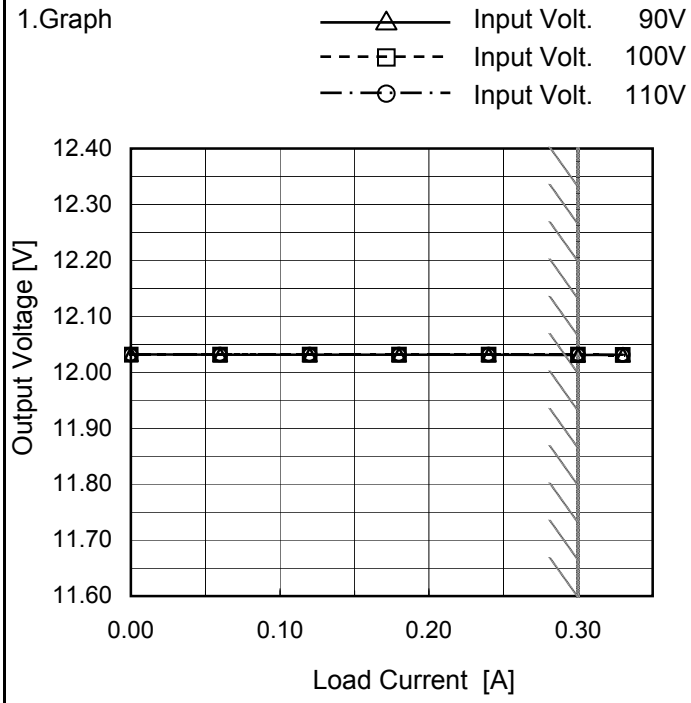
| | |
|---|---|
| Model | G1W-12 |
| Item | Load Regulation |
| Object | +12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph

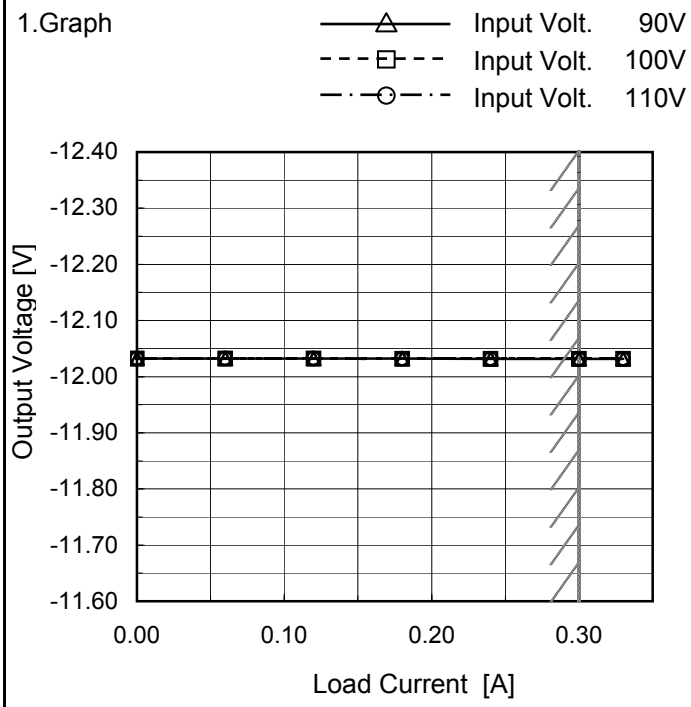



2.Values

| Load Current [A] | Output Voltage [V] Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
|---|---|---|---|
| 0.00 | 12.032 | 12.032 | 12.032 |
| 0.06 | 12.032 | 12.032 | 12.032 |
| 0.12 | 12.031 | 12.032 | 12.031 |
| 0.18 | 12.031 | 12.032 | 12.032 |
| 0.24 | 12.031 | 12.031 | 12.031 |
| 0.30 | 12.031 | 12.031 | 12.031 |
| 0.33 | 12.031 | 12.031 | 12.031 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

| | |
|---|---|
| Object | -12V0.3A |

1.Graph




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

2.Values

| Load Current [A] | Output Voltage [V] Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
|---|---|---|---|
| 0.00 | -12.032 | -12.032 | -12.032 |
| 0.06 | -12.032 | -12.032 | -12.032 |
| 0.12 | -12.032 | -12.032 | -12.032 |
| 0.18 | -12.032 | -12.032 | -12.032 |
| 0.24 | -12.032 | -12.032 | -12.032 |
| 0.30 | -12.032 | -12.032 | -12.032 |
| 0.33 | -12.032 | -12.032 | -12.032 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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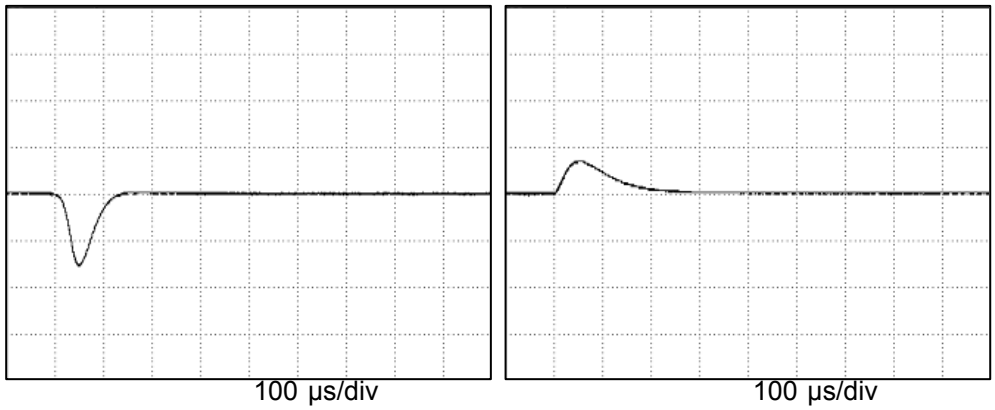
|---|---|---|---|
| Model | G1W-12 | Temperature | 25°C |
| Item | Dynamic Load Response | Testing Circuitry | Figure A |
| Object | +12V0.3A | | |

Input Volt. 100 V
Cycle 1000 ms

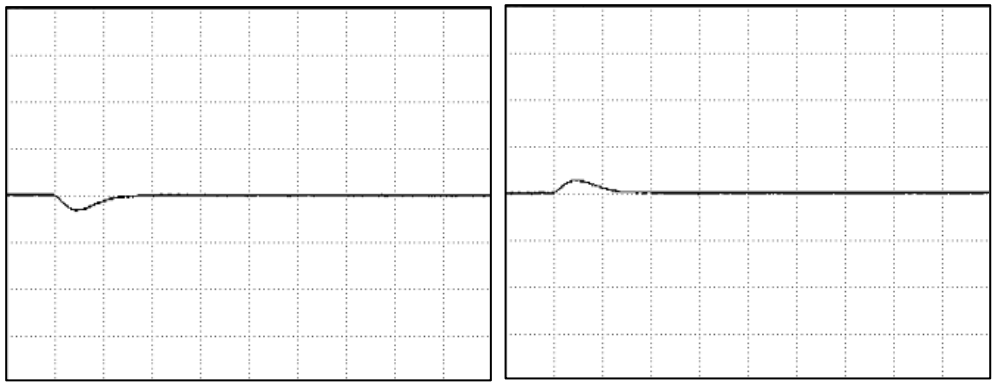
Load Current

Min. Load (0A) ←→
Load 100% (0.3A)



50 mV/div
100 μs/div
100 μs/div

Load 50% (0.15A) ←→
Load 100% (0.3A)



50 mV/div
100 μs/div
100 μs/div

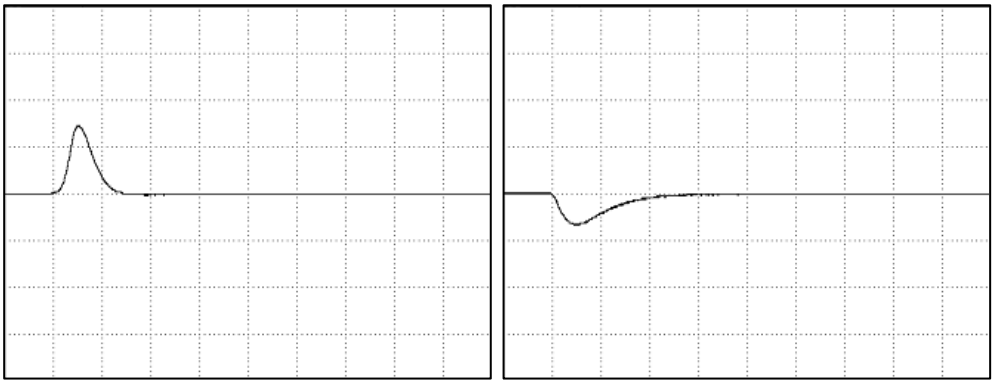
COSEL

| | | | |
|---|---|---|---|
| Model | G1W-12 | Temperature | 25°C |
| Item | Dynamic Load Response | Testing Circuitry | Figure A |
| Object | -12V0.3A | | |

Input Volt. 100 V
Cycle 1000 ms

Load Current

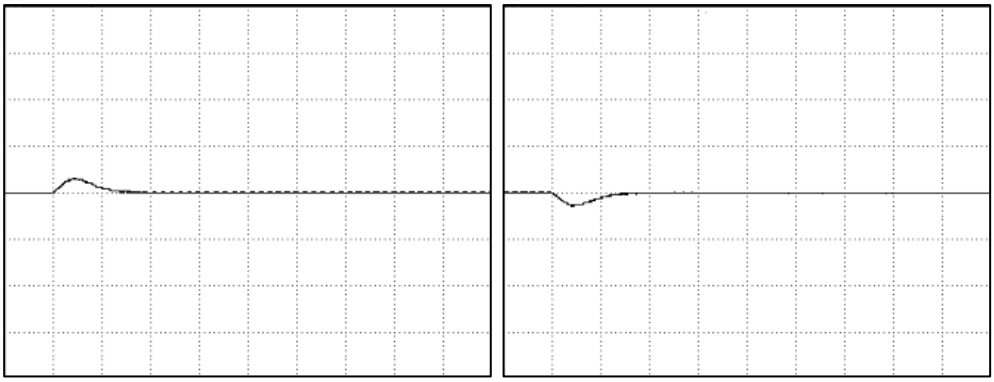
Min. Load (0A) ←→
Load 100% (0.3A)



50 mV/div

100 μs/div 100 μs/div

Load 50% (0.15A) ←→
Load 100% (0.3A)



50 mV/div

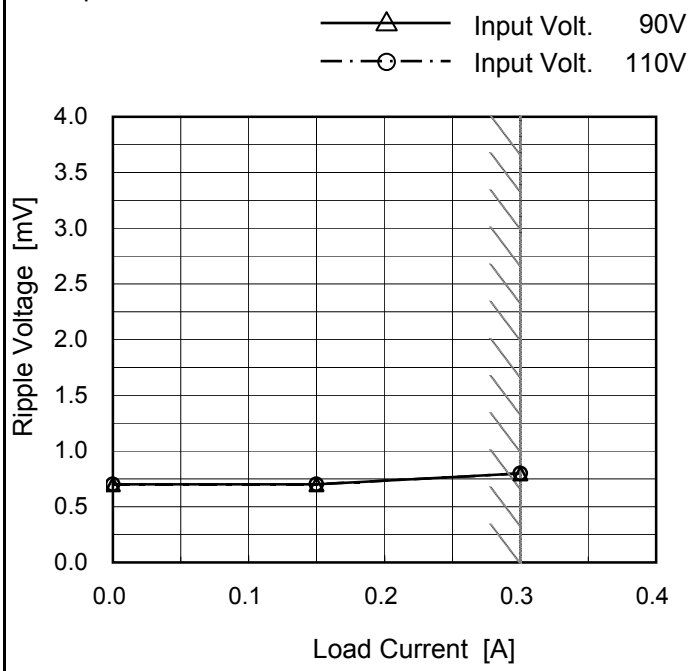
100 μs/div 100 μs/div

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Ripple Voltage (by Load Current) |
| Object | +12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated load current.

2.Values

| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 90 [V] | Input Volt. 110 [V] |
| 0.00 | 0.7 | 0.7 |
| 0.15 | 0.7 | 0.7 |
| 0.30 | 0.8 | 0.8 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |



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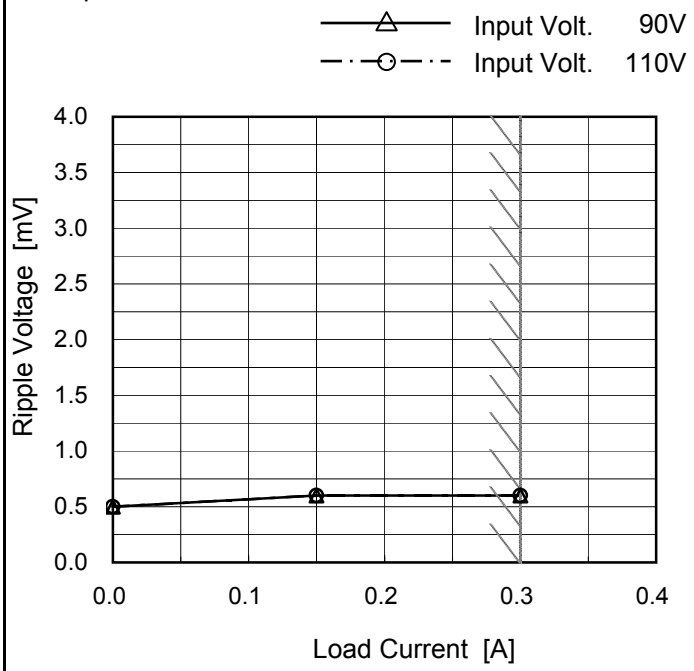
| | |
|---|---|
| Model | G1W-12 |
| Item | Ripple Voltage (by Load Current) |
| Object | -12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated load current.

2.Values

| Load Current [A] | Ripple Voltage [mV] | |
|---|---|---|
| | Input Volt. 90 [V] | Input Volt. 110 [V] |
| 0.00 | 0.5 | 0.5 |
| 0.15 | 0.6 | 0.6 |
| 0.30 | 0.6 | 0.6 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

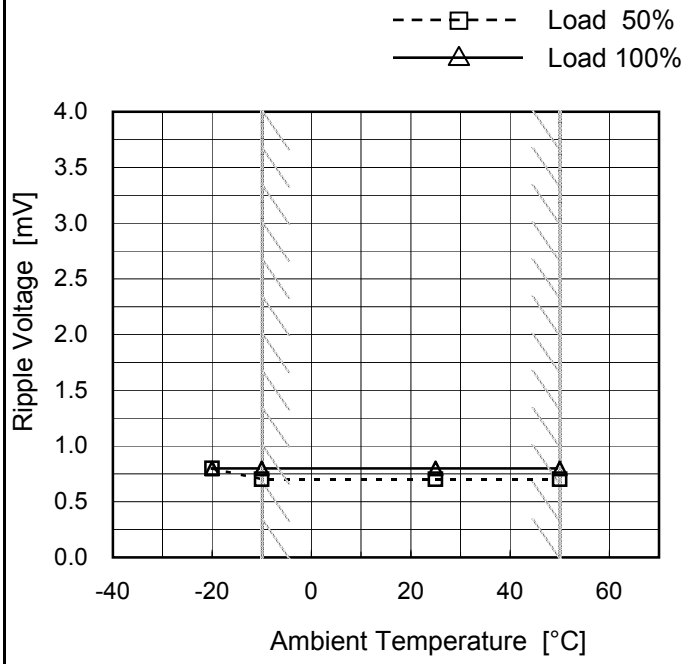
COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Ripple Voltage (by Ambient Temp.) |

Testing Circuitry Figure A

Object +12V0.3A

1.Graph



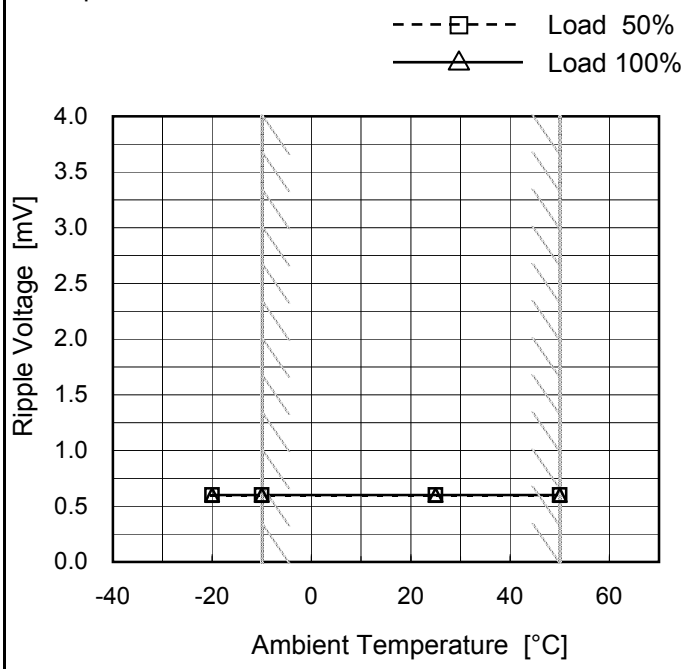

Input Volt. 100V

2.Values

| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -20 | 0.8 | 0.8 |
| -10 | 0.7 | 0.8 |
| 25 | 0.7 | 0.8 |
| 50 | 0.7 | 0.8 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

Object -12V0.3A

1.Graph




Input Volt. 100V

Measured by 20 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% |
| -20 | 0.6 | 0.6 |
| -10 | 0.6 | 0.6 |
| 25 | 0.6 | 0.6 |
| 50 | 0.6 | 0.6 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

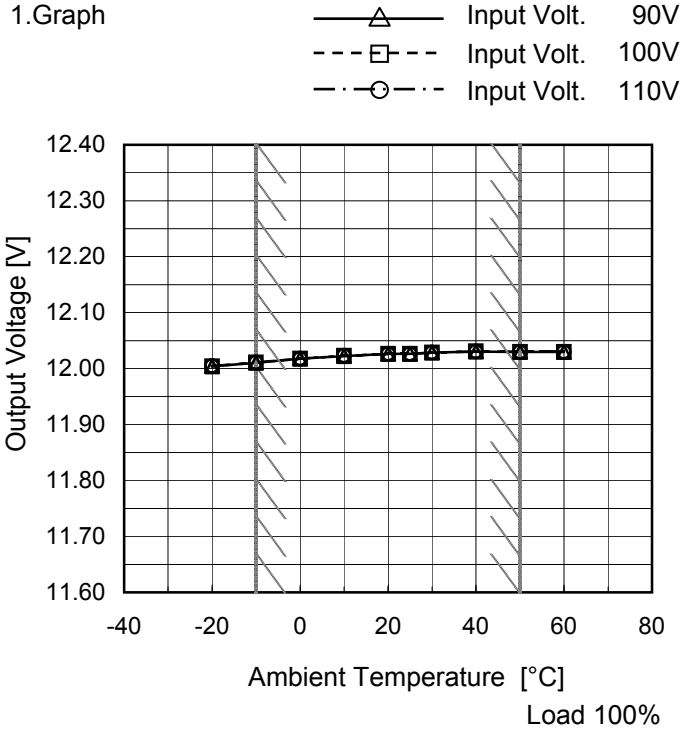
COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Ambient Temperature Drift |

Testing Circuitry Figure A

Object +12V0.3A

1.Graph

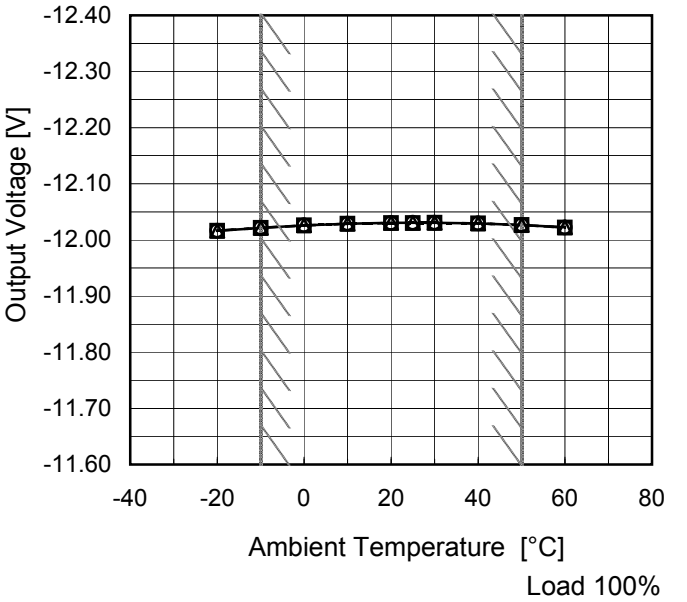



2.Values

| Ambient Temperature [°C] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| -20 | 12.004 | 12.004 | 12.004 |
| -10 | 12.011 | 12.011 | 12.011 |
| 0 | 12.018 | 12.018 | 12.018 |
| 10 | 12.023 | 12.023 | 12.023 |
| 20 | 12.027 | 12.026 | 12.027 |
| 25 | 12.027 | 12.027 | 12.027 |
| 30 | 12.029 | 12.029 | 12.029 |
| 40 | 12.031 | 12.031 | 12.031 |
| 50 | 12.030 | 12.030 | 12.030 |
| 60 | 12.030 | 12.030 | 12.030 |
| -- | - | - | - |

Object -12V0.3A

1.Graph




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

2.Values

| Ambient Temperature [°C] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| -20 | -12.016 | -12.016 | -12.016 |
| -10 | -12.022 | -12.022 | -12.022 |
| 0 | -12.026 | -12.026 | -12.026 |
| 10 | -12.029 | -12.029 | -12.029 |
| 20 | -12.030 | -12.030 | -12.030 |
| 25 | -12.030 | -12.030 | -12.030 |
| 30 | -12.030 | -12.030 | -12.030 |
| 40 | -12.030 | -12.030 | -12.029 |
| 50 | -12.027 | -12.027 | -12.026 |
| 60 | -12.022 | -12.022 | -12.022 |
| -- | - | - | - |

COSEL

| | | |
|---|---|---|
| Model | G1W-12 | |
| 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 : -10 - 50°C

Input Voltage : 90 - 110V

Load Current (AVR 1) : 0 - 0.3A (AVR 2) : 0 - 0.3A

* 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 | +12V0.3A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | 40 | 110 | 0 | 12.031 | ±11 | ±0.1 |
| Minimum Voltage | -10 | 90 | 0 | 12.010 | | |

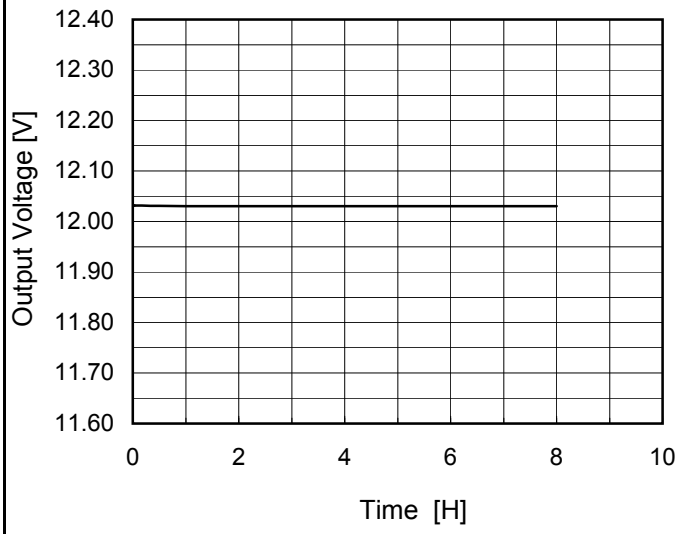
| Object | -12V0.3A | | | | | |
|---|---|---|---|---|---|---|
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | 30 | 90 | 0 | -12.031 | ±5 | ±0.1 |
| Minimum Voltage | -10 | 100 | 0.3 | -12.021 | | |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Time Lapse Drift |
| Object | +12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph



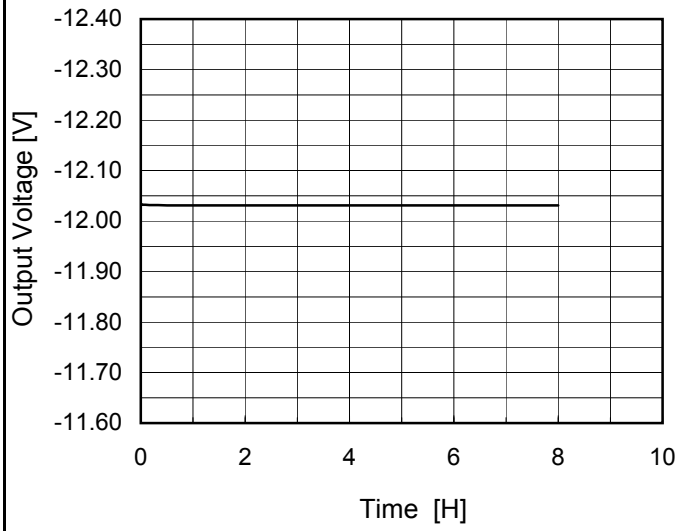

Input Volt. 100V
Load 100%

2.Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 12.032 |
| 0.5 | 12.031 |
| 1.0 | 12.031 |
| 2.0 | 12.031 |
| 3.0 | 12.031 |
| 4.0 | 12.031 |
| 5.0 | 12.031 |
| 6.0 | 12.031 |
| 7.0 | 12.031 |
| 8.0 | 12.031 |

| | |
|---|---|
| Object | -12V0.3A |

1.Graph




Input Volt. 100V
Load 100%

2.Values

| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | -12.032 |
| 0.5 | -12.031 |
| 1.0 | -12.031 |
| 2.0 | -12.031 |
| 3.0 | -12.031 |
| 4.0 | -12.031 |
| 5.0 | -12.031 |
| 6.0 | -12.031 |
| 7.0 | -12.031 |
| 8.0 | -12.031 |



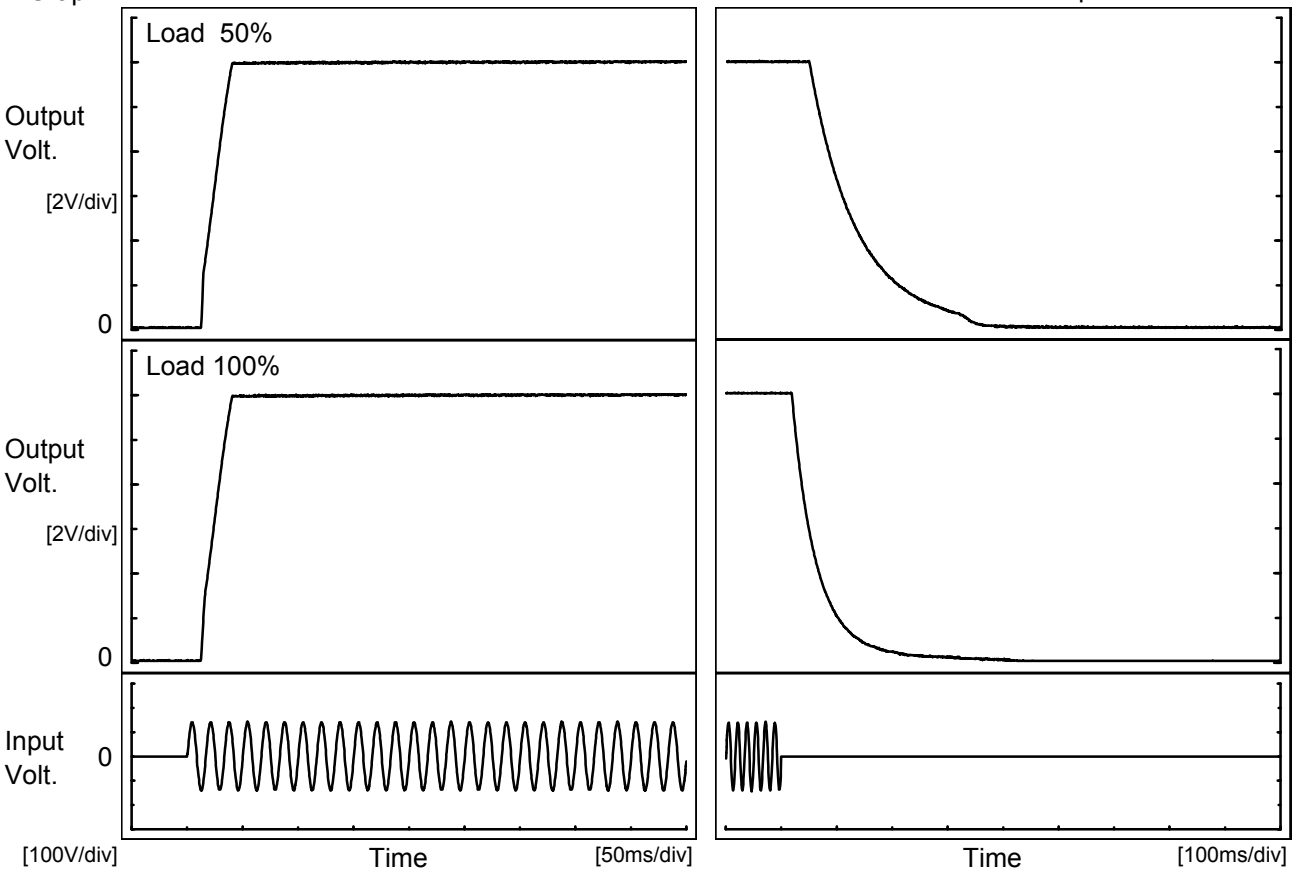
BC-10211

COSEL

| | | |
|---|---|---|
| Model | G1W-12 | |
| Item | Rise and Fall Time | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | +12V0.3A | |

1.Graph

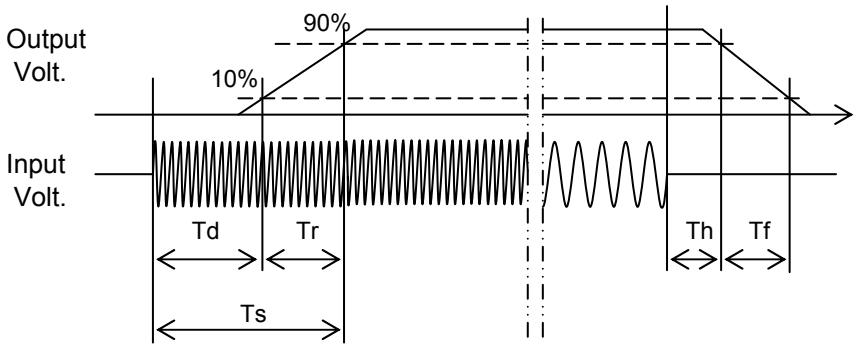
Input Volt. 100 V




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 13.8 | 23.3 | 37.1 | 57.0 | 201.0 |
| 100 % | 14.0 | 23.0 | 37.0 | 23.0 | 104.0 |

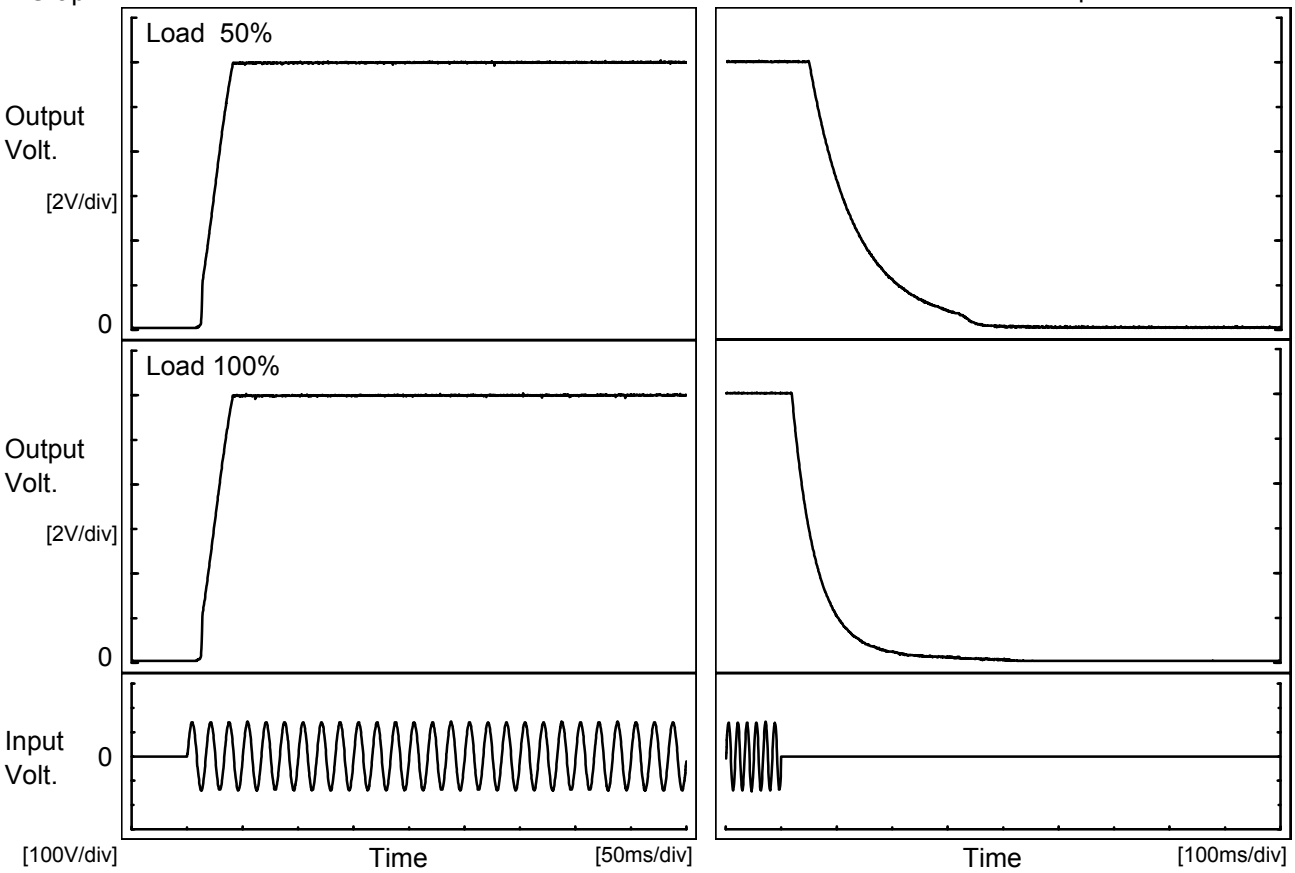


COSEL

| | | |
|---|---|---|
| Model | G1W-12 | |
| Item | Rise and Fall Time | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | -12V0.3A | |

1.Graph

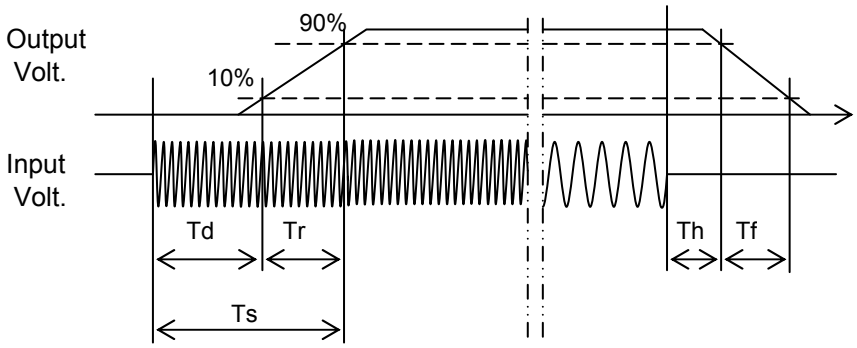
Input Volt. 100 V




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 13.5 | 24.0 | 37.5 | 56.0 | 197.0 |
| 100 % | 13.5 | 24.0 | 37.5 | 22.5 | 103.5 |

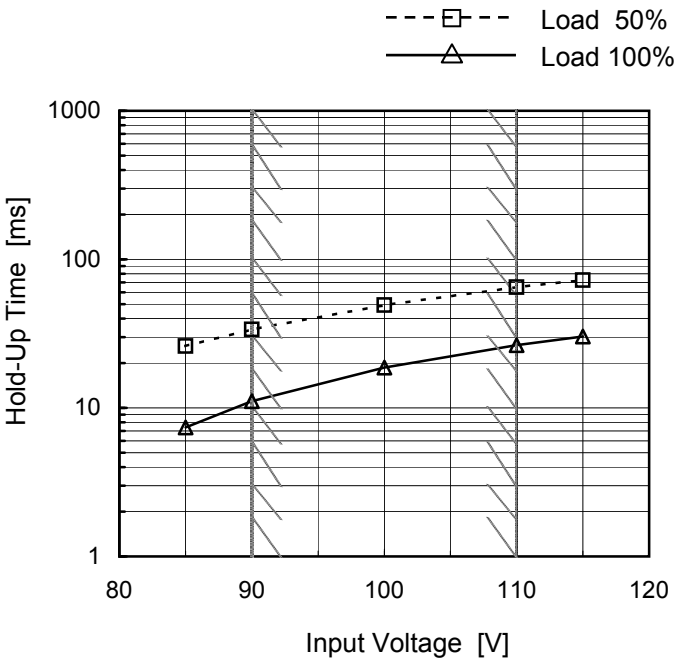


COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Hold-Up Time |
| Object | +12V0.3A |

Temperature 25°C
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.

2.Values

| Input Voltage [V] | Hold-Up Time [ms] | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 26 | 7 |
| 90 | 34 | 11 |
| 100 | 49 | 19 |
| 110 | 65 | 27 |
| 115 | 73 | 30 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |



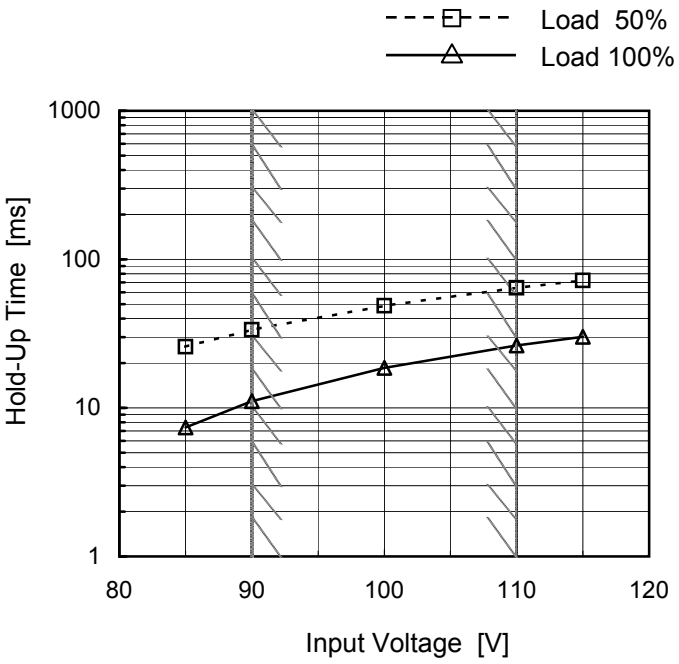
BC-10211

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Hold-Up Time |
| Object | -12V0.3A |

Temperature 25°C
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.

2.Values

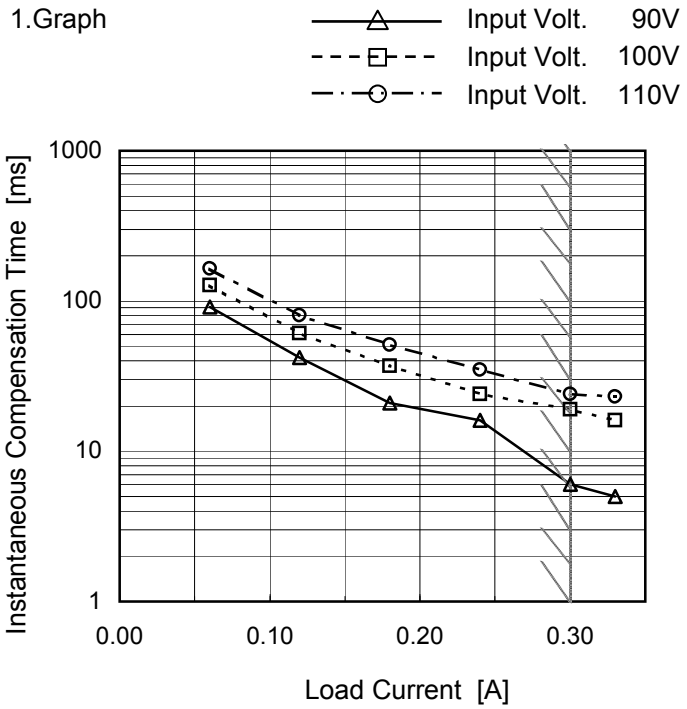
| Input Voltage [V] | Hold-Up Time [ms] | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 26 | 7 |
| 90 | 34 | 11 |
| 100 | 49 | 19 |
| 110 | 64 | 26 |
| 115 | 72 | 30 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Instantaneous Interruption Compensation |
| Object | +12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

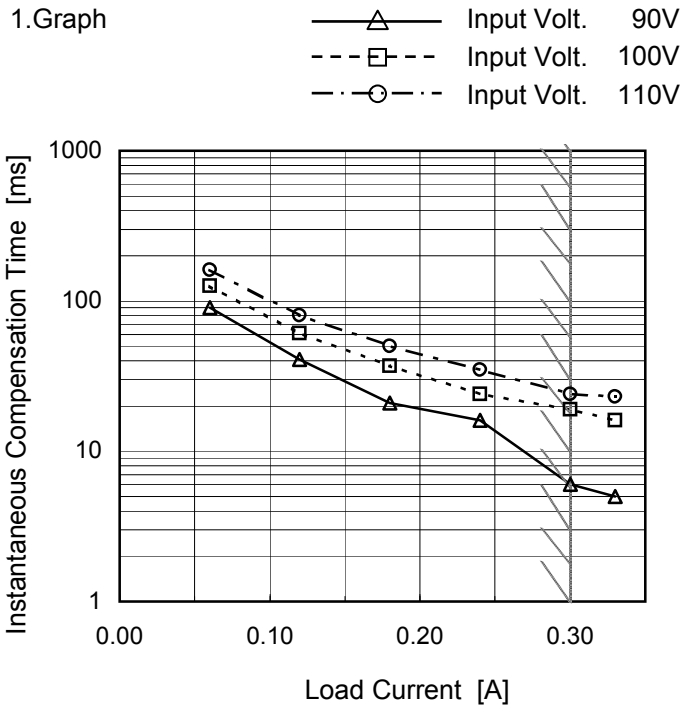
| Load Current [A] | Time [ms] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 0.00 | - | - | - |
| 0.06 | 91 | 128 | 165 |
| 0.12 | 42 | 61 | 80 |
| 0.18 | 21 | 37 | 51 |
| 0.24 | 16 | 24 | 35 |
| 0.30 | 6 | 19 | 24 |
| 0.33 | 5 | 16 | 23 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Instantaneous Interruption Compensation |
| Object | -12V0.3A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

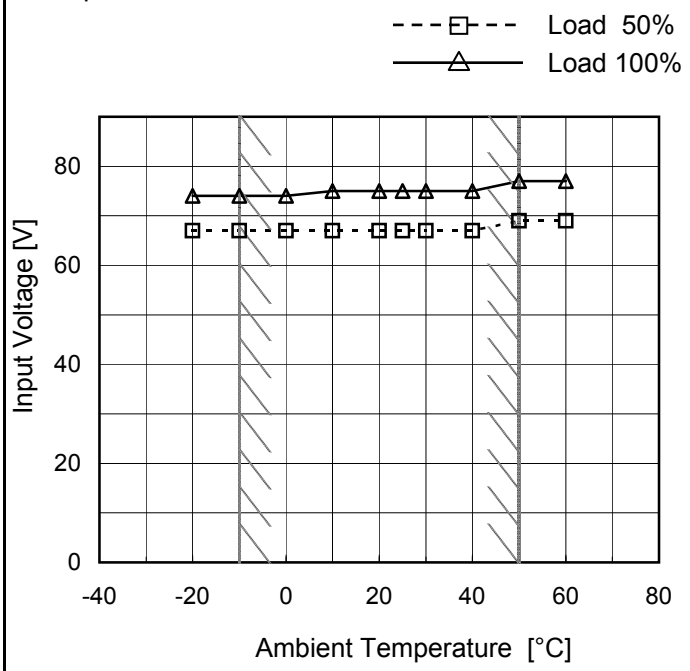
| Load Current [A] | Time [ms] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 0.00 | - | - | - |
| 0.06 | 90 | 126 | 162 |
| 0.12 | 41 | 61 | 80 |
| 0.18 | 21 | 37 | 50 |
| 0.24 | 16 | 24 | 35 |
| 0.30 | 6 | 19 | 24 |
| 0.33 | 5 | 16 | 23 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +12V0.3A |

Testing Circuitry Figure A

1.Graph

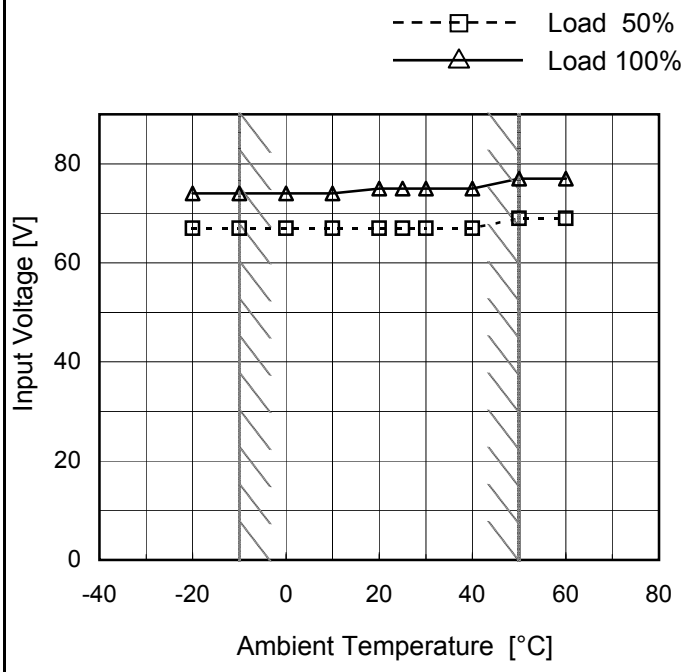



2.Values

| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -20 | 67 | 74 |
| -10 | 67 | 74 |
| 0 | 67 | 74 |
| 10 | 67 | 75 |
| 20 | 67 | 75 |
| 25 | 67 | 75 |
| 30 | 67 | 75 |
| 40 | 67 | 75 |
| 50 | 69 | 77 |
| 60 | 69 | 77 |
| -- | - | - |

| | |
|---|---|
| Object | -12V0.3A |

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% |
| -20 | 67 | 74 |
| -10 | 67 | 74 |
| 0 | 67 | 74 |
| 10 | 67 | 74 |
| 20 | 67 | 75 |
| 25 | 67 | 75 |
| 30 | 67 | 75 |
| 40 | 67 | 75 |
| 50 | 69 | 77 |
| 60 | 69 | 77 |
| -- | - | - |

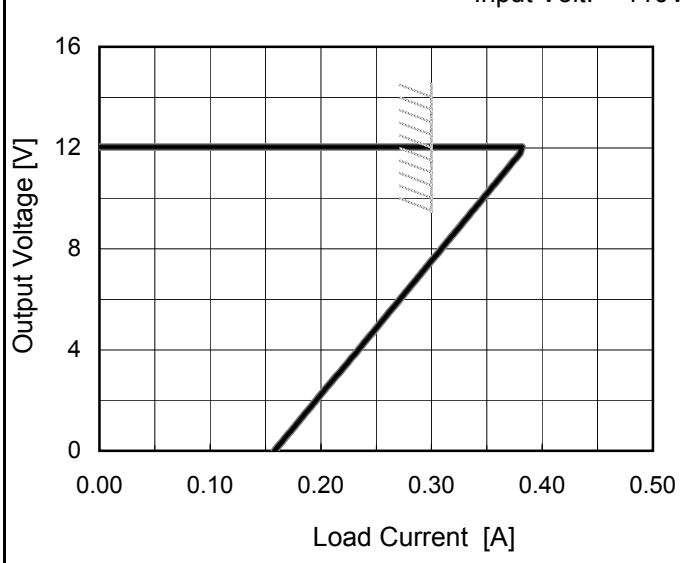
COSEL

| | |
|---|---|
| Model | G1W-12 |
| Item | Overcurrent Protection |

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.3A

1.Graph

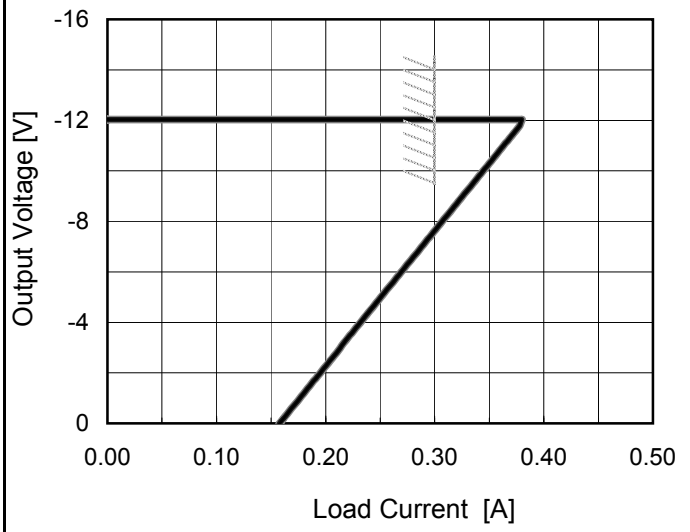



2.Values

| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| 12.0 | 0.38 | 0.38 | 0.38 |
| 11.4 | 0.37 | 0.37 | 0.37 |
| 10.8 | 0.36 | 0.36 | 0.36 |
| 9.6 | 0.34 | 0.34 | 0.34 |
| 8.4 | 0.32 | 0.32 | 0.32 |
| 7.2 | 0.30 | 0.30 | 0.30 |
| 6.0 | 0.27 | 0.27 | 0.27 |
| 4.8 | 0.25 | 0.25 | 0.25 |
| 3.6 | 0.23 | 0.23 | 0.23 |
| 2.4 | 0.20 | 0.20 | 0.20 |
| 1.2 | 0.18 | 0.18 | 0.18 |
| 0.0 | 0.16 | 0.16 | 0.16 |

Object -12V0.3A

1.Graph




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

2.Values

| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 90[V] | Input Volt. 100[V] | Input Volt. 110[V] |
| -12.0 | 0.38 | 0.38 | 0.38 |
| -11.4 | 0.37 | 0.37 | 0.37 |
| -10.8 | 0.36 | 0.36 | 0.36 |
| -9.6 | 0.34 | 0.34 | 0.34 |
| -8.4 | 0.32 | 0.32 | 0.32 |
| -7.2 | 0.29 | 0.29 | 0.29 |
| -6.0 | 0.27 | 0.27 | 0.27 |
| -4.8 | 0.25 | 0.25 | 0.25 |
| -3.6 | 0.23 | 0.23 | 0.23 |
| -2.4 | 0.20 | 0.20 | 0.20 |
| -1.2 | 0.18 | 0.18 | 0.18 |
| 0.0 | 0.16 | 0.16 | 0.16 |

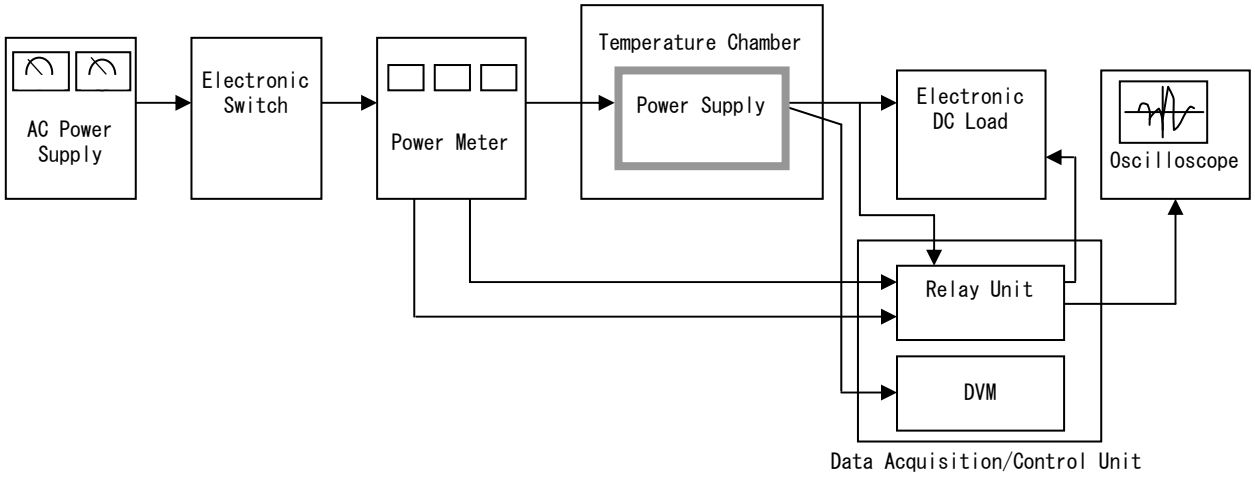

AC Power Supply
Electronic Switch
Power Meter
Temperature Chamber
Power Supply
Electronic DC Load
Oscilloscope
Relay Unit
DVM
Data Acquisition/Control Unit

Figure A