COSEL

参考資料

TEST DATA OF MGW64812

Regulated DC Power Supply
November 2, 2016

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

参考資料

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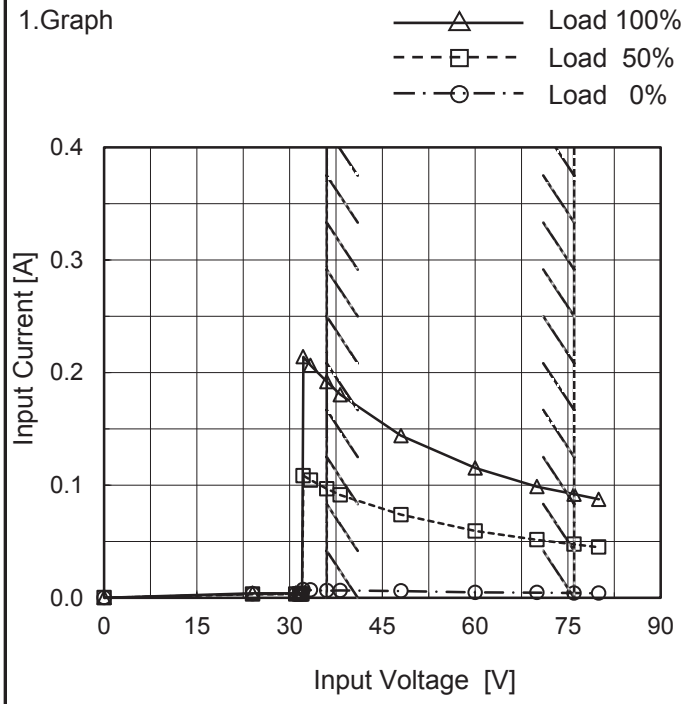
Model	MGW64812
Item	Input Current (by Input Voltage)
Object	――――――――

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
24.0	0.003	0.003	0.004
31.0	0.003	0.003	0.004
31.6	0.003	0.003	0.004
31.8	0.003	0.003	0.004
32.0	0.003	0.003	0.004
32.2	0.007	0.109	0.214
33.4	0.007	0.105	0.206
36.0	0.006	0.097	0.192
38.2	0.006	0.091	0.180
48.0	0.006	0.074	0.144
60.0	0.005	0.059	0.115
70.0	0.005	0.051	0.099
76.0	0.004	0.048	0.092
80.0	0.004	0.045	0.087
--	-	-	-
--	-	-	-
--	-	-	-

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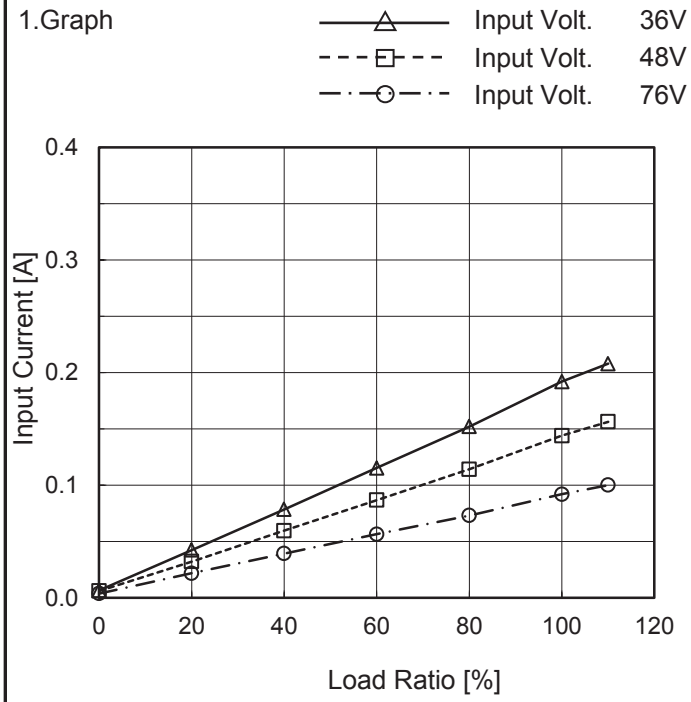
COSEL

Model	MGW64812
Item	Input Current (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

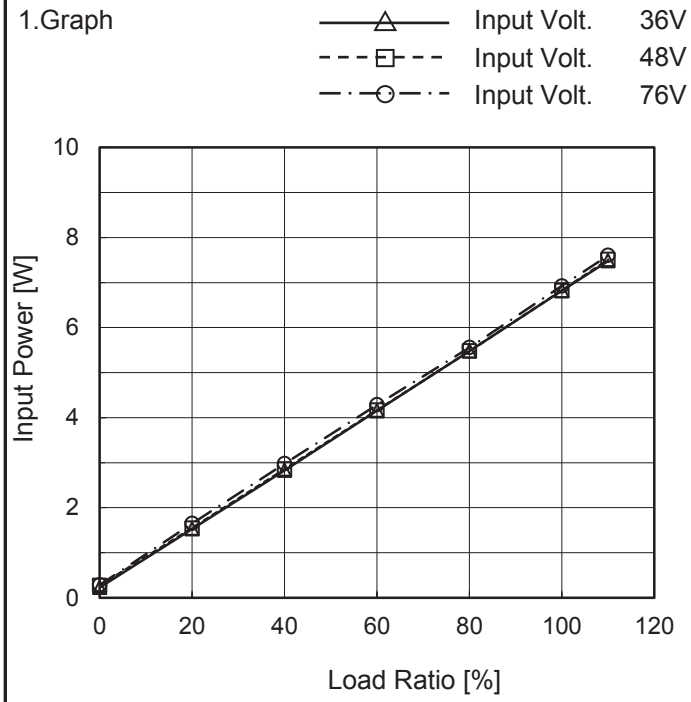
Load Ratio [%]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.006	0.006	0.004
20	0.042	0.032	0.022
40	0.079	0.060	0.039
60	0.115	0.087	0.056
80	0.152	0.114	0.073
100	0.192	0.144	0.092
110	0.208	0.156	0.100
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW64812
Item	Input Power (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

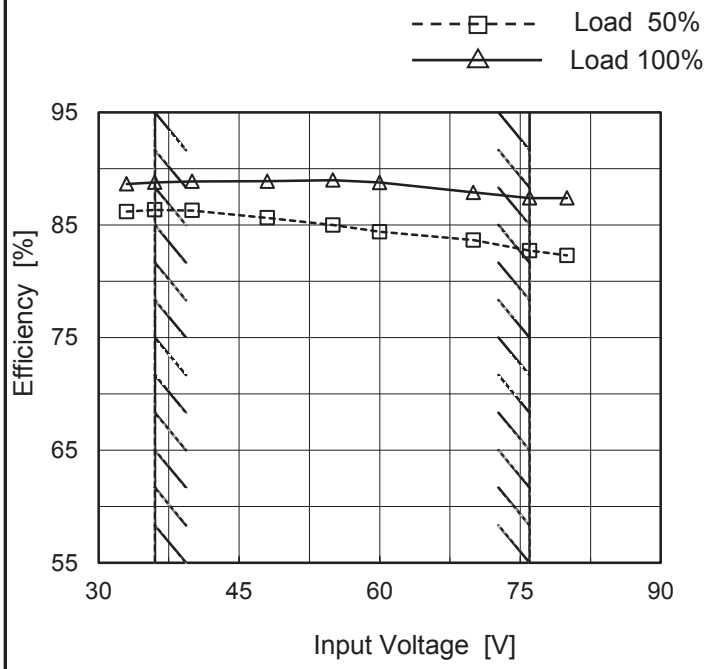
Load Ratio [%]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.23	0.27	0.28
20	1.53	1.55	1.65
40	2.83	2.86	2.98
60	4.15	4.16	4.29
80	5.48	5.48	5.56
100	6.82	6.82	6.92
110	7.48	7.51	7.60
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW64812
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%
33	86.2	88.7
36	86.3	88.8
40	86.3	88.9
48	85.6	88.9
55	85.0	89.0
60	84.4	88.8
70	83.7	87.9
76	82.7	87.4
80	82.3	87.4

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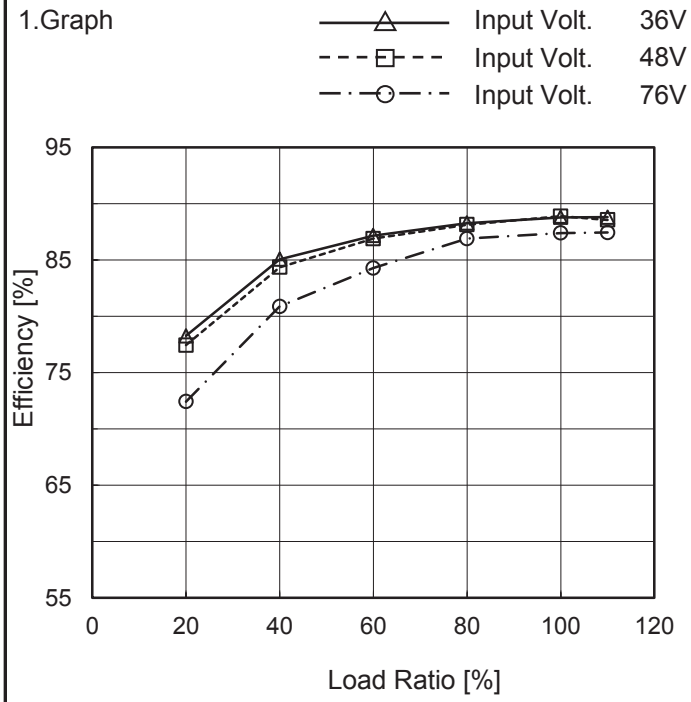
Model	MGW64812
Item	Efficiency (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	-	-	-
20	78.3	77.4	72.4
40	85.1	84.4	80.9
60	87.2	86.9	84.3
80	88.3	88.1	86.9
100	88.8	88.9	87.4
110	88.8	88.6	87.5
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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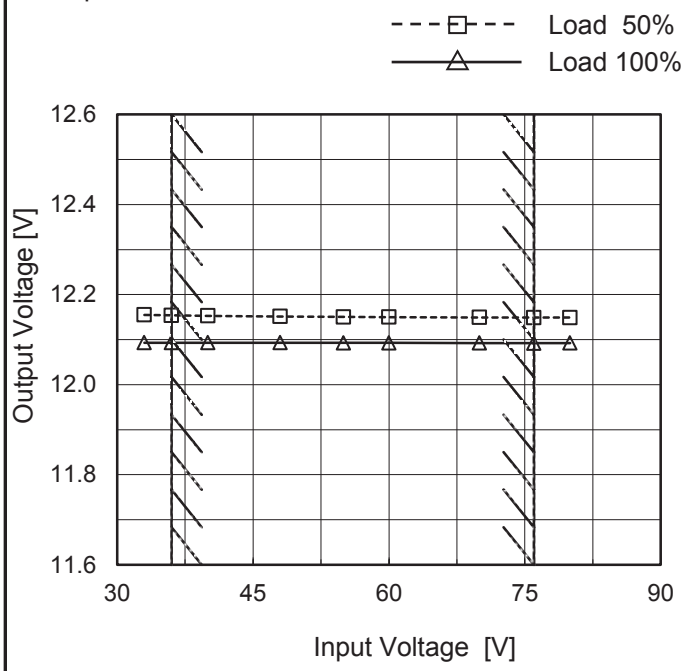
Model	MGW64812
Item	Line Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



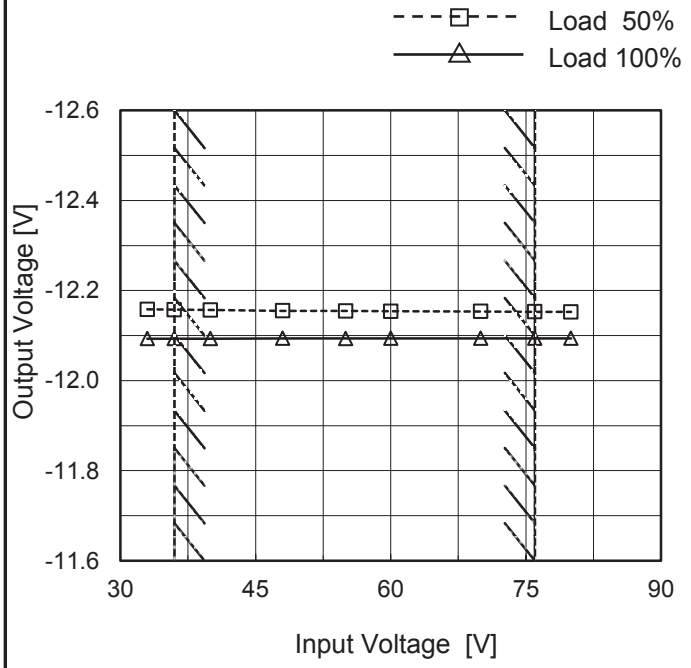
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
33	12.155	12.093
36	12.154	12.093
40	12.153	12.093
48	12.151	12.093
55	12.150	12.093
60	12.150	12.093
70	12.149	12.092
76	12.149	12.092
80	12.149	12.092

-12V: Rated Load Current

Object	-12V0.25A

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%
33	-12.158	-12.093
36	-12.158	-12.093
40	-12.157	-12.093
48	-12.155	-12.094
55	-12.155	-12.094
60	-12.154	-12.094
70	-12.153	-12.094
76	-12.153	-12.094
80	-12.153	-12.094

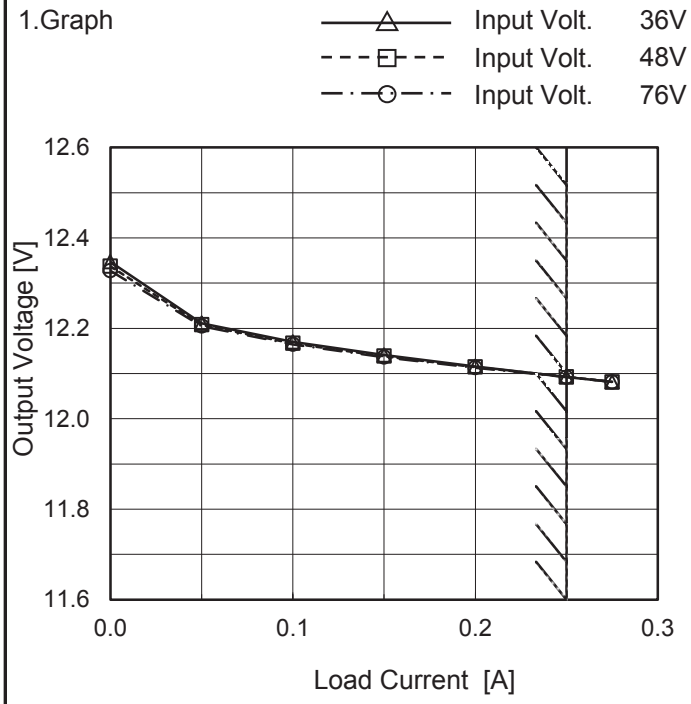
+12V: Rated Load Current

COSEL

Model	MGW64812
Item	Load Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



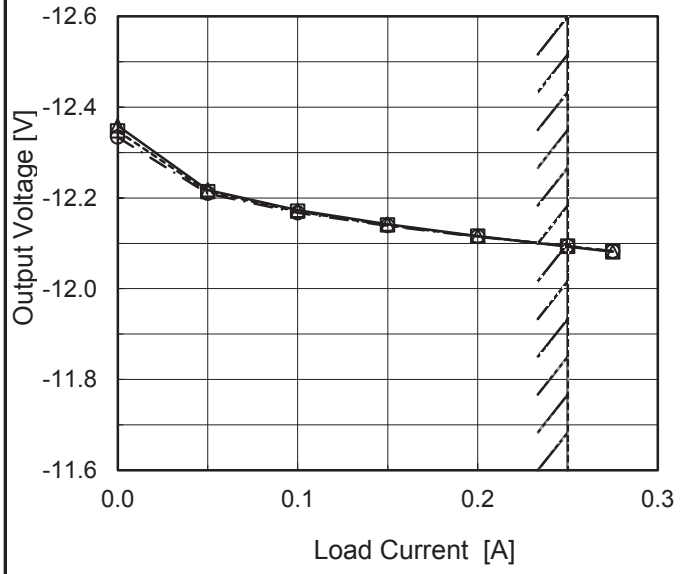
2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	12.347	12.337	12.327
0.050	12.211	12.208	12.205
0.100	12.170	12.167	12.165
0.150	12.141	12.138	12.137
0.200	12.116	12.114	12.113
0.250	12.093	12.093	12.092
0.275	12.081	12.082	12.082
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-12V: Rated Load Current

Object	-12V0.25A

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	-12.359	-12.347	-12.334
0.050	-12.218	-12.214	-12.210
0.100	-12.173	-12.171	-12.167
0.150	-12.142	-12.140	-12.139
0.200	-12.116	-12.115	-12.115
0.250	-12.093	-12.094	-12.094
0.275	-12.081	-12.082	-12.083
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+12V: Rated Load Current

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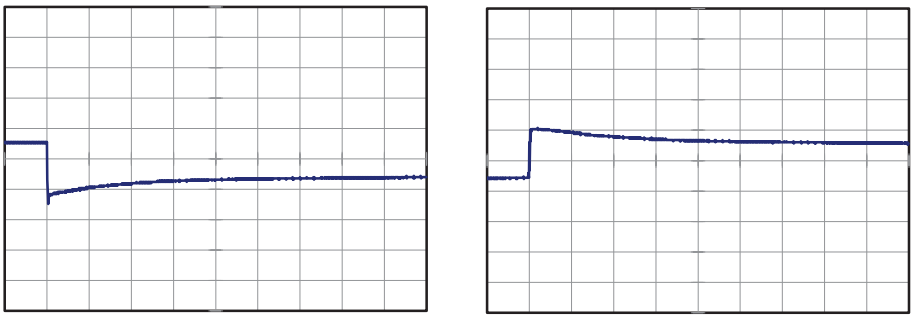
Model	MGW64812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.25A	

Input Volt. 48 V
-12V:rated load current.
Cycle 100 ms

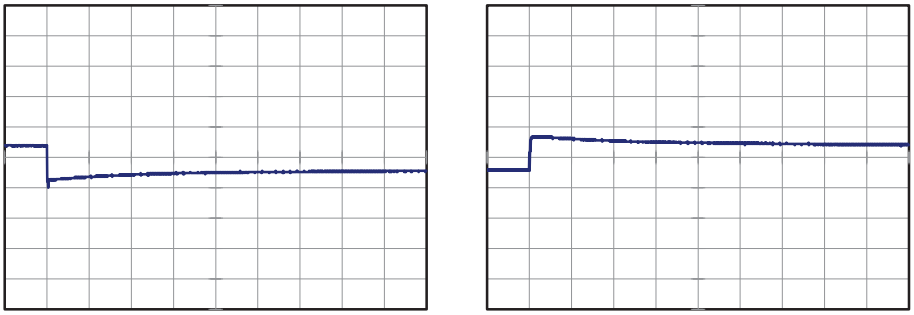
Min.Load (0A)←→
Load 100% (0.25A)



200 mV/div

4 ms/div 4 ms/div

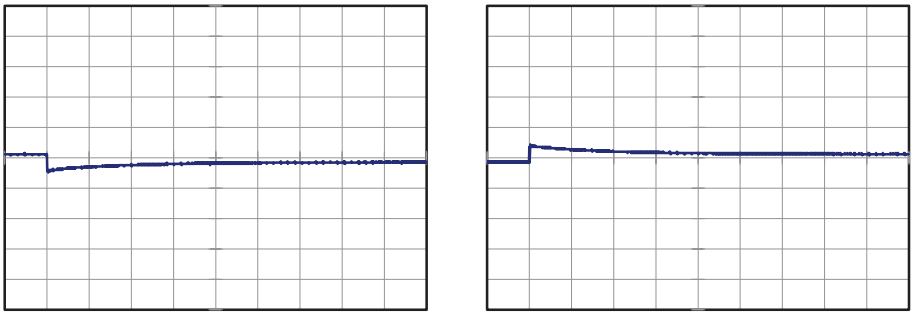
Min.Load (0A)←→
Load 50% (0.125A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)



200 mV/div

4 ms/div 4 ms/div

COSEL

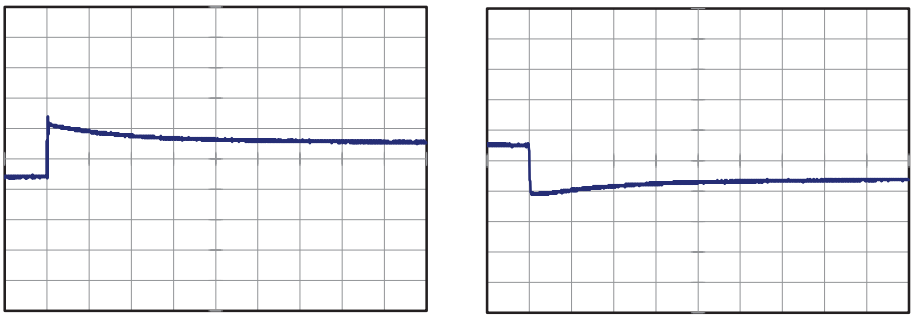
Model	MGW64812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.25A	

Input Volt. 48 V

+12V:rated load current.

Cycle 100 ms

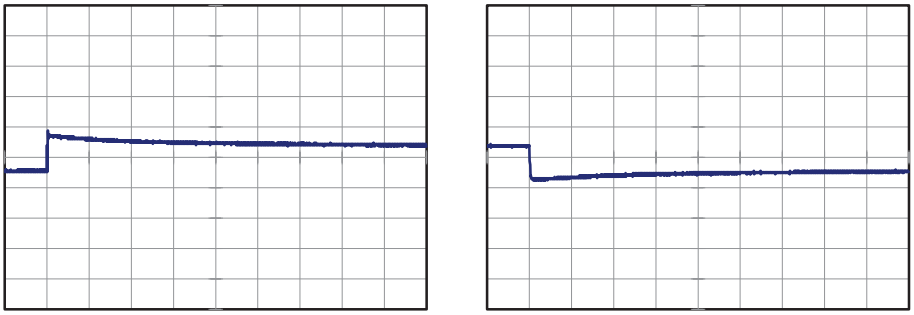
Min.Load (0A)←→
Load 100% (0.25A)



200 mV/div

4 ms/div 4 ms/div

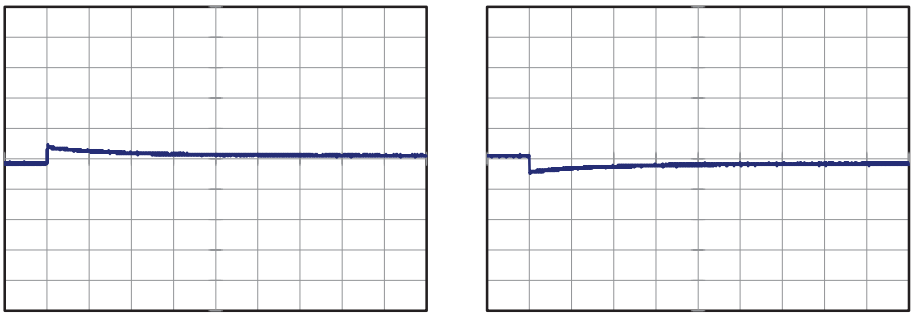
Min.Load (0A)←→
Load 50% (0.125A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)



200 mV/div

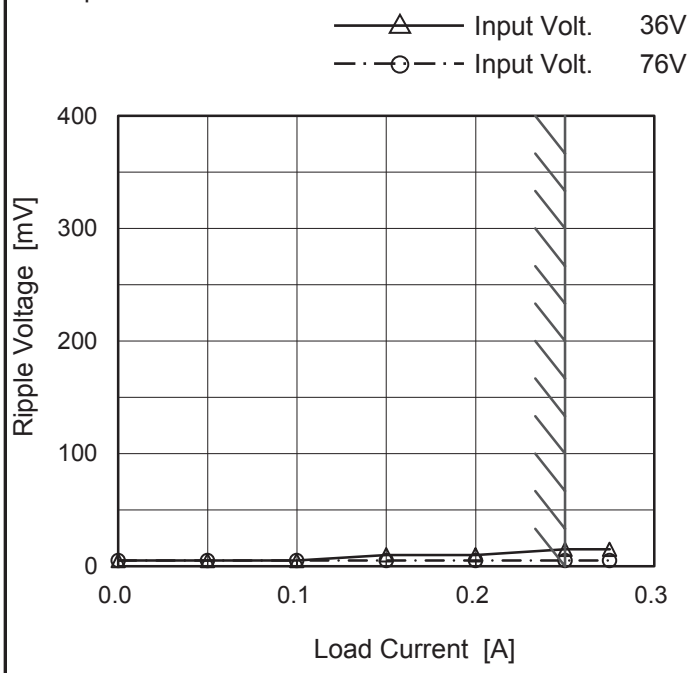
4 ms/div 4 ms/div

COSEL

Model	MGW64812
Item	Ripple Voltage (by Load Current)
Object	+12V0.25A

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]

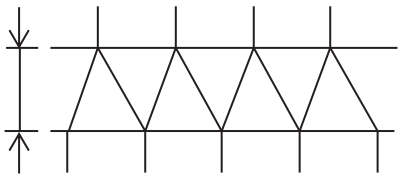


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	10	5
0.250	15	5
0.275	15	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

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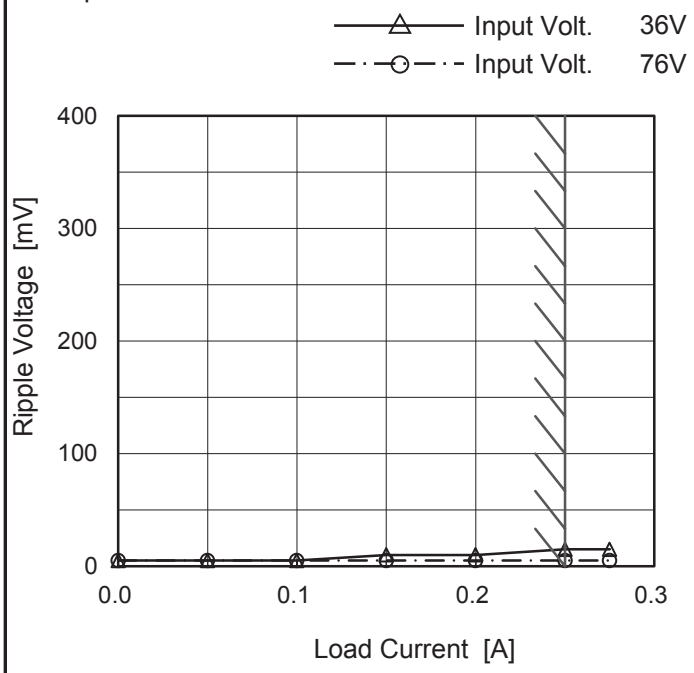
COSEL

Model	MGW64812
Item	Ripple Voltage (by Load Current)
Object	-12V0.25A

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]

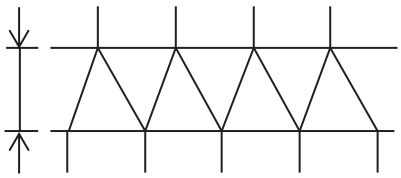


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	10	5
0.250	15	5
0.275	15	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

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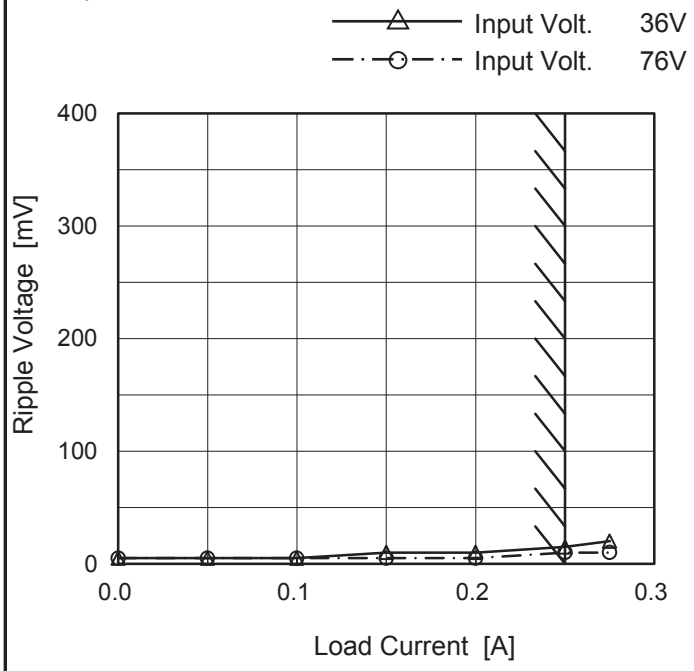
COSEL

Model	MGW64812
Item	Ripple-Noise
Object	+12V0.25A

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.

Ripple Noise[mVp-p]

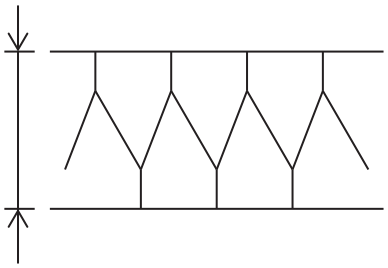


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	10	5
0.250	15	10
0.275	20	10
--	-	-
--	-	-
--	-	-
--	-	-

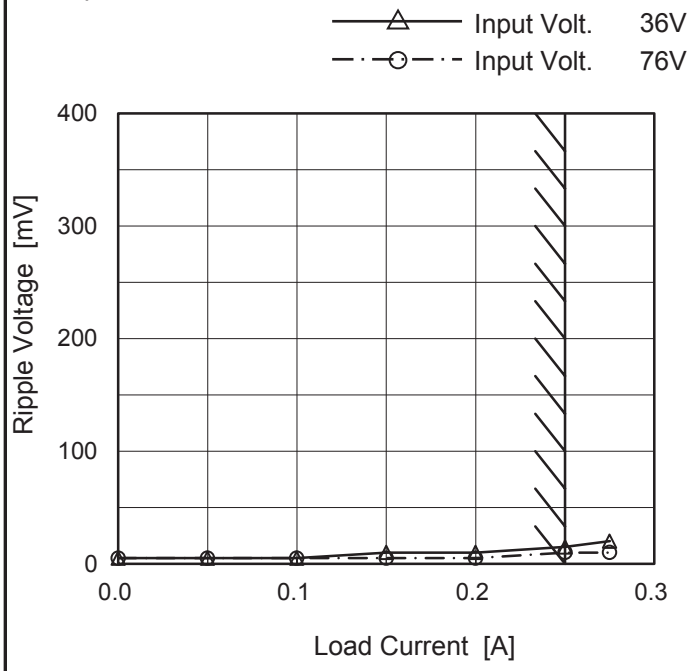
-12V: Rated Load Current

COSEL

Model	MGW64812
Item	Ripple-Noise
Object	-12V0.25A

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.

Ripple Noise[mVp-p]

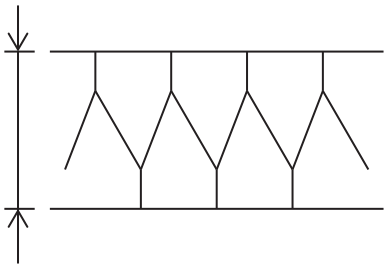


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	10	5
0.250	15	10
0.275	20	10
--	-	-
--	-	-
--	-	-
--	-	-

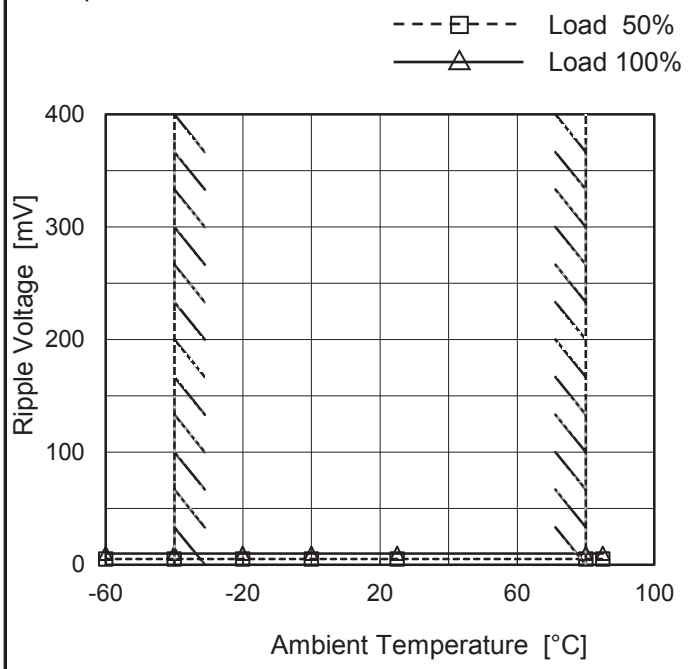
+12V: Rated Load Current

COSEL

Model	MGW64812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.25A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

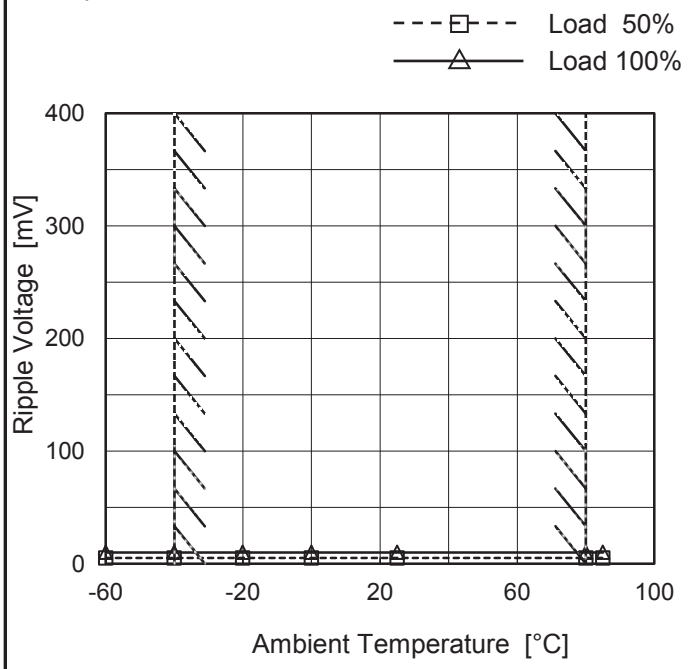
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	10
-40	5	10
-20	5	10
0	5	10
25	5	10
80	5	10
85	5	10
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object	-12V0.25A

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	5	10
-40	5	10
-20	5	10
0	5	10
25	5	10
80	5	10
85	5	10
--	-	-
--	-	-
--	-	-
--	-	-

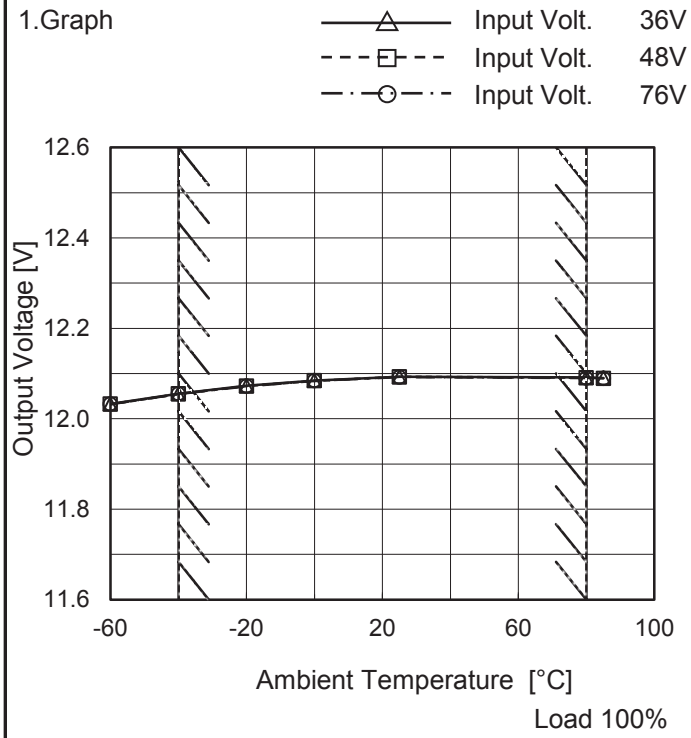
+12V: Rated Load Current

COSEL

Model	MGW64812
Item	Ambient Temperature Drift
Object	+12V0.25A

Testing Circuitry Figure A

1.Graph



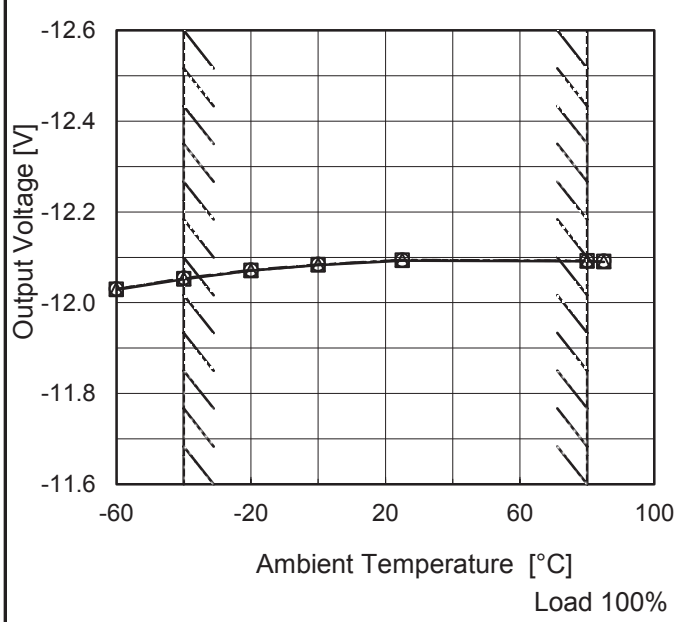
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	12.033	12.032	12.032
-40	12.055	12.055	12.055
-20	12.073	12.072	12.072
0	12.085	12.084	12.084
25	12.093	12.093	12.092
80	12.092	12.091	12.090
85	12.090	12.089	12.089
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-12V: Rated Load Current

Object	-12V0.25A

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	-12.029	-12.030	-12.030
-40	-12.052	-12.053	-12.054
-20	-12.071	-12.071	-12.072
0	-12.083	-12.084	-12.084
25	-12.093	-12.094	-12.094
80	-12.092	-12.092	-12.092
85	-12.090	-12.091	-12.091
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+12V: Rated Load Current

COSEL

Model	MGW64812	
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 - 80°C

Input Voltage : 36 - 76V

Load Current (AVR 1) : 0 - 0.25A (AVR 2) : 0 - 0.25A

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

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

2.Values

Object	+12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	36	0	12.374	±283	±2.4
Minimum Voltage	80	36	0.25	11.808		

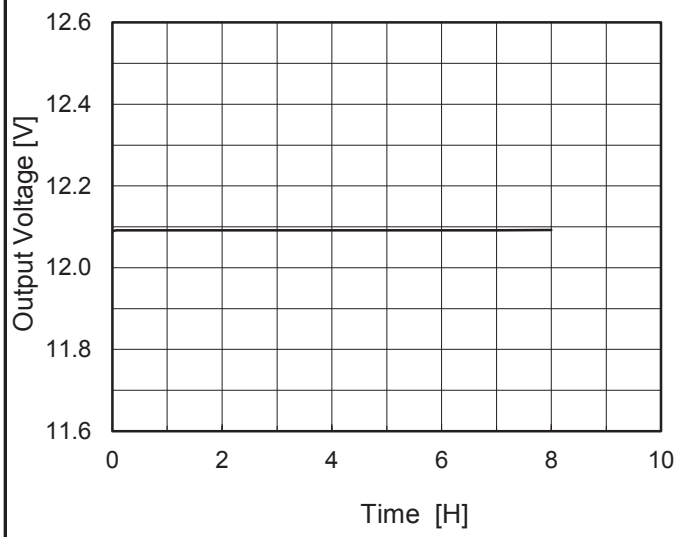
Object	-12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	36	0	-12.384	±283	±2.4
Minimum Voltage	80	36	0.25	-11.818		

COSEL

Model	MGW64812
Item	Time Lapse Drift
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 48V
Load 100%

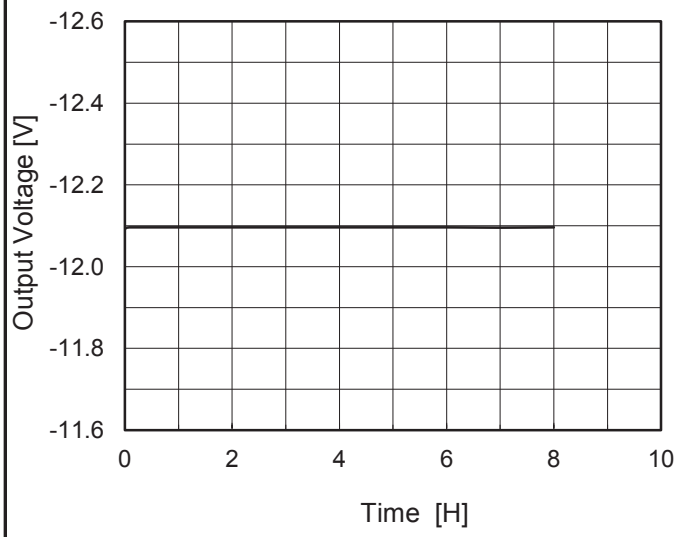
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.088
0.5	12.091
1.0	12.091
2.0	12.092
3.0	12.092
4.0	12.092
5.0	12.092
6.0	12.092
7.0	12.092
8.0	12.092

-12V: Rated Load Current

Object	-12V0.25A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.092
0.5	-12.096
1.0	-12.096
2.0	-12.096
3.0	-12.096
4.0	-12.096
5.0	-12.096
6.0	-12.096
7.0	-12.096
8.0	-12.096

+12V: Rated Load Current

BC-11032

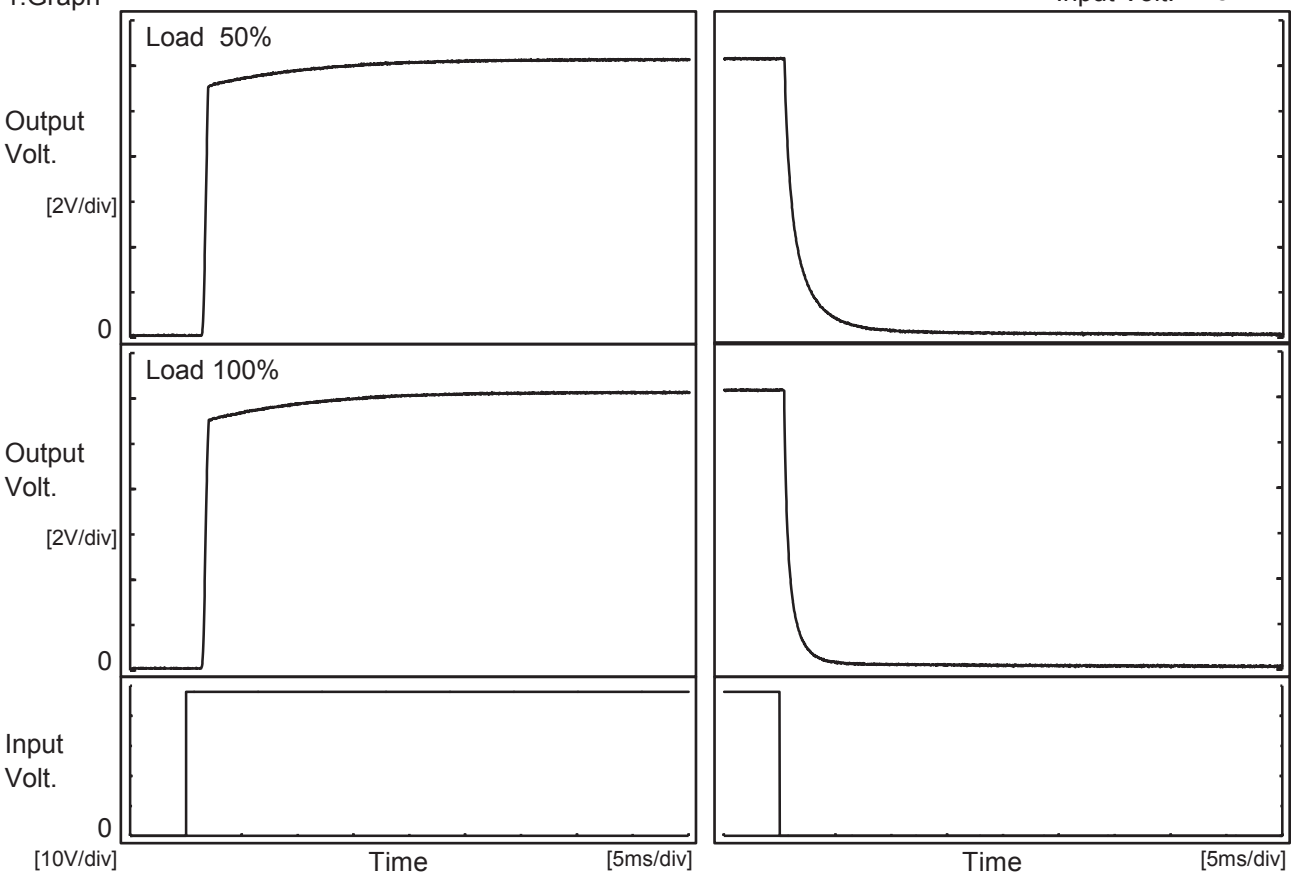
COSEL

Model	MGW64812
Item	Rise and Fall Time
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

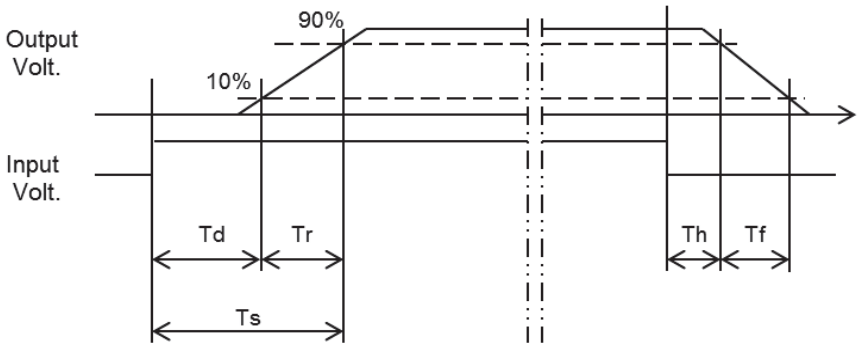
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.6	0.4	2.0	0.5	3.4
100 %	1.6	0.5	2.1	0.4	1.6



BC-11032

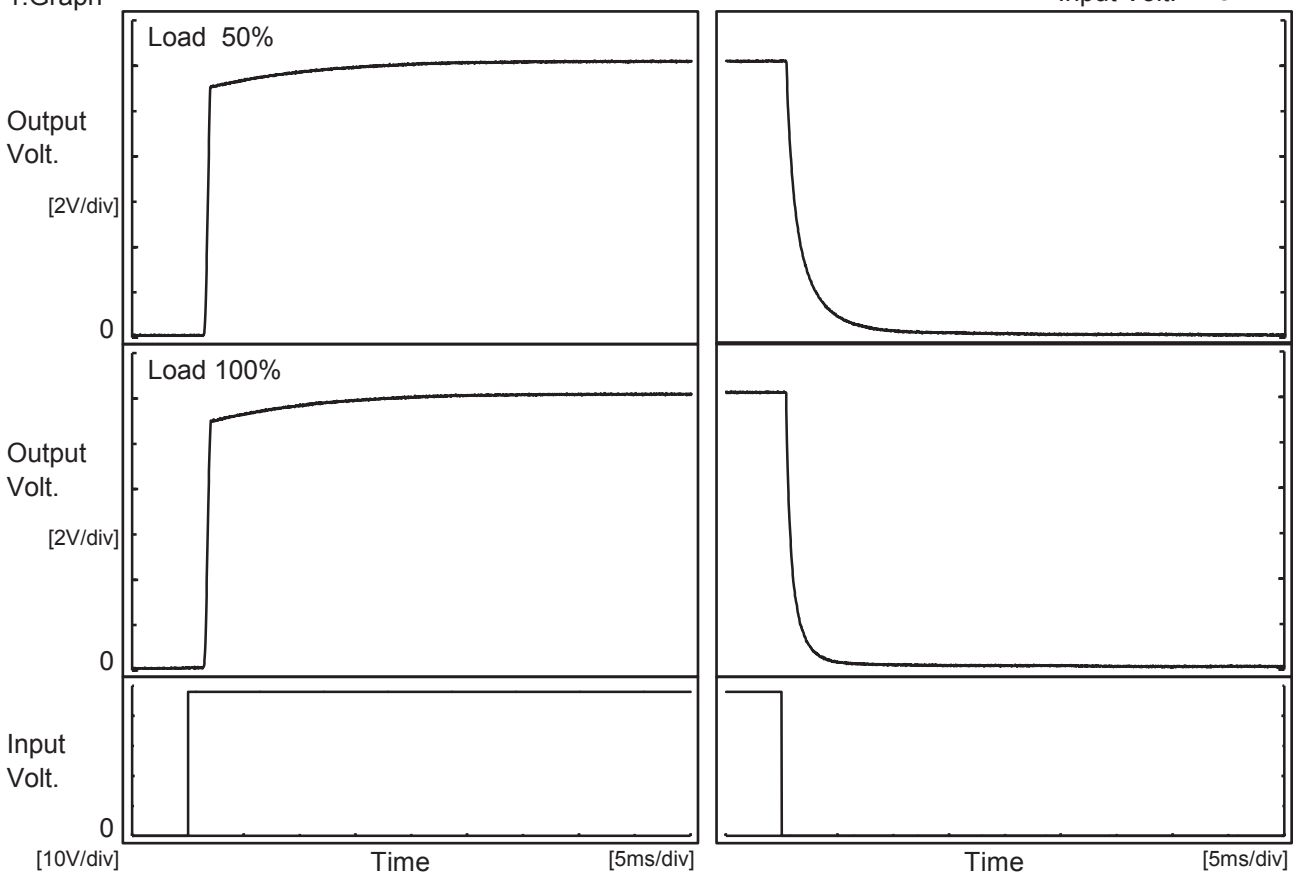
COSEL

Model	MGW64812
Item	Rise and Fall Time
Object	-12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

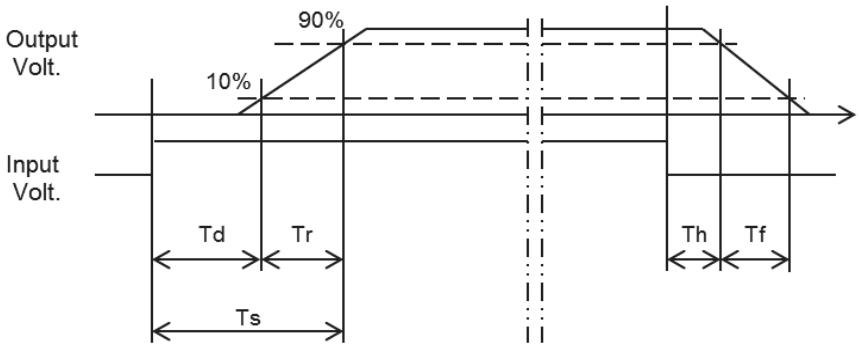
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.6	0.4	2.0	0.5	3.7
100 %	1.6	0.5	2.1	0.4	1.7



BC-11032

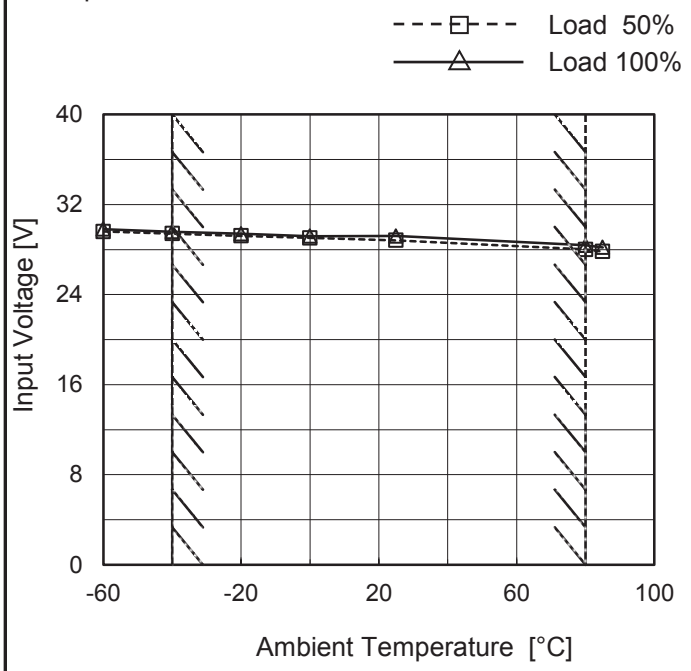
COSEL

Model	MGW64812
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object +12V0.25A

1.Graph

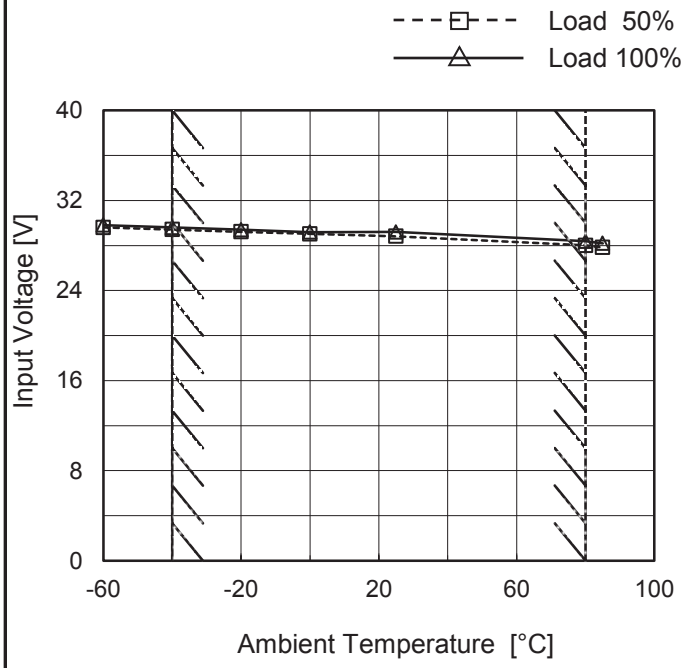


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	29.6	29.9
-40	29.5	29.6
-20	29.3	29.5
0	29.1	29.2
25	28.9	29.2
80	28.1	28.4
85	27.9	28.2
--	-	-
--	-	-
--	-	-
--	-	-

Object -12V0.25A

1.Graph



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

2.Values

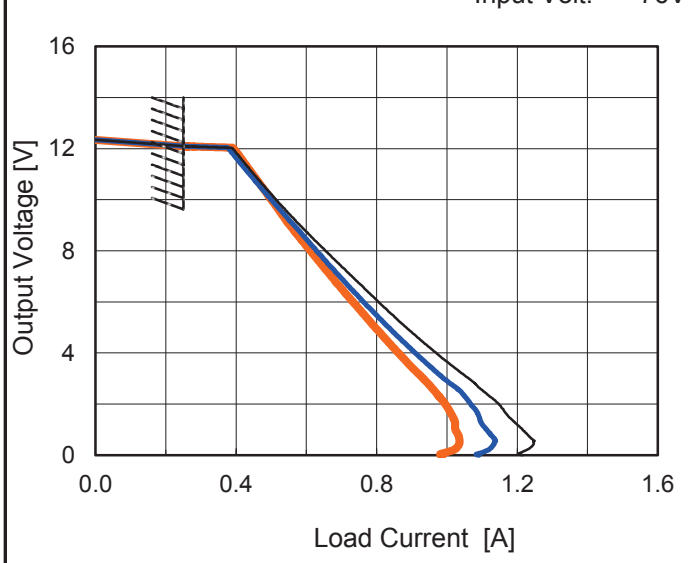
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	29.6	29.9
-40	29.5	29.6
-20	29.3	29.5
0	29.1	29.2
25	28.9	29.2
80	28.1	28.4
85	27.9	28.2
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGW64812
Item	Overcurrent Protection
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



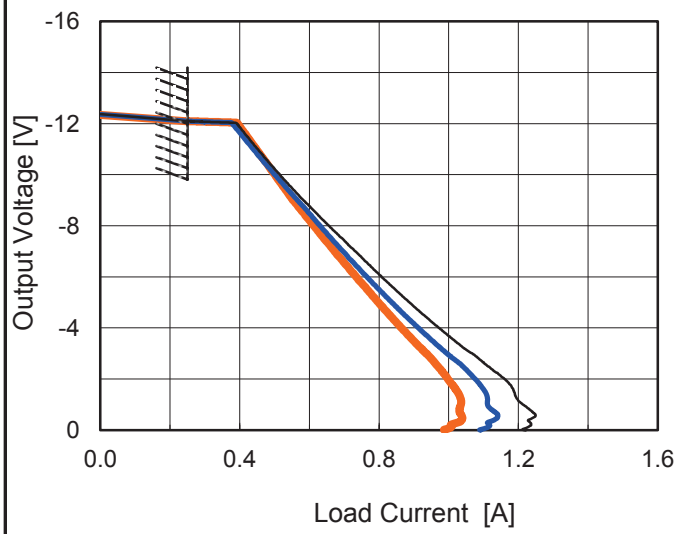
2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
11.4	0.43	0.41	0.43
10.8	0.46	0.45	0.46
9.6	0.54	0.53	0.52
8.4	0.62	0.60	0.59
7.2	0.71	0.68	0.66
6.0	0.80	0.76	0.73
4.8	0.90	0.85	0.81
3.6	1.00	0.94	0.89
2.4	1.11	1.04	0.97
1.2	1.20	1.10	1.02
0.0	1.22	1.09	0.99
--	-	-	-

-12V: Rated Load Current

Object	-12V0.25A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-11.4	0.43	0.42	0.43
-10.8	0.46	0.45	0.46
-9.6	0.54	0.53	0.52
-8.4	0.63	0.61	0.59
-7.2	0.71	0.68	0.66
-6.0	0.81	0.76	0.73
-4.8	0.90	0.85	0.81
-3.6	1.01	0.94	0.89
-2.4	1.12	1.05	0.97
-1.2	1.20	1.11	1.03
0.0	1.22	1.09	0.99
--	-	-	-

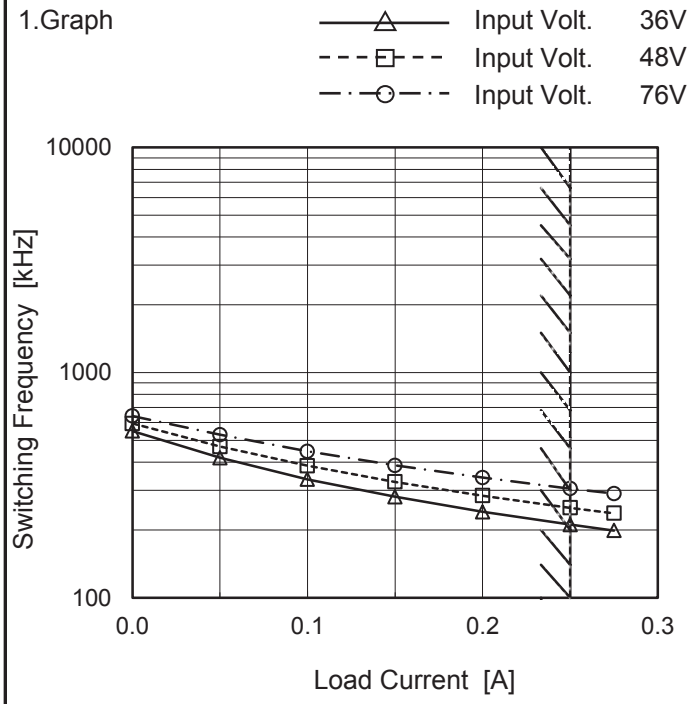
+12V: Rated Load Current

COSEL

Model	MGW64812
Item	Switching Frequency (by Load Current)
Object	+/-12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

-When load current is low, MG operates intermittently, so switching frequency would not become constant.

2.Values

Load Current [A]	Frequency [kHz]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	550	594	642
0.050	418	469	530
0.100	336	386	447
0.150	281	327	387
0.200	241	284	342
0.250	211	251	305
0.275	199	237	290
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

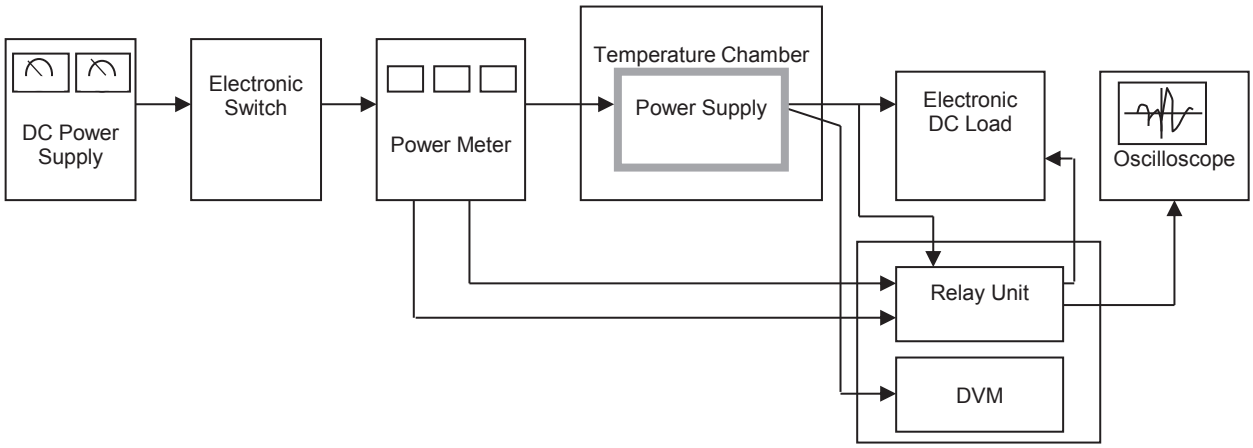


Figure A

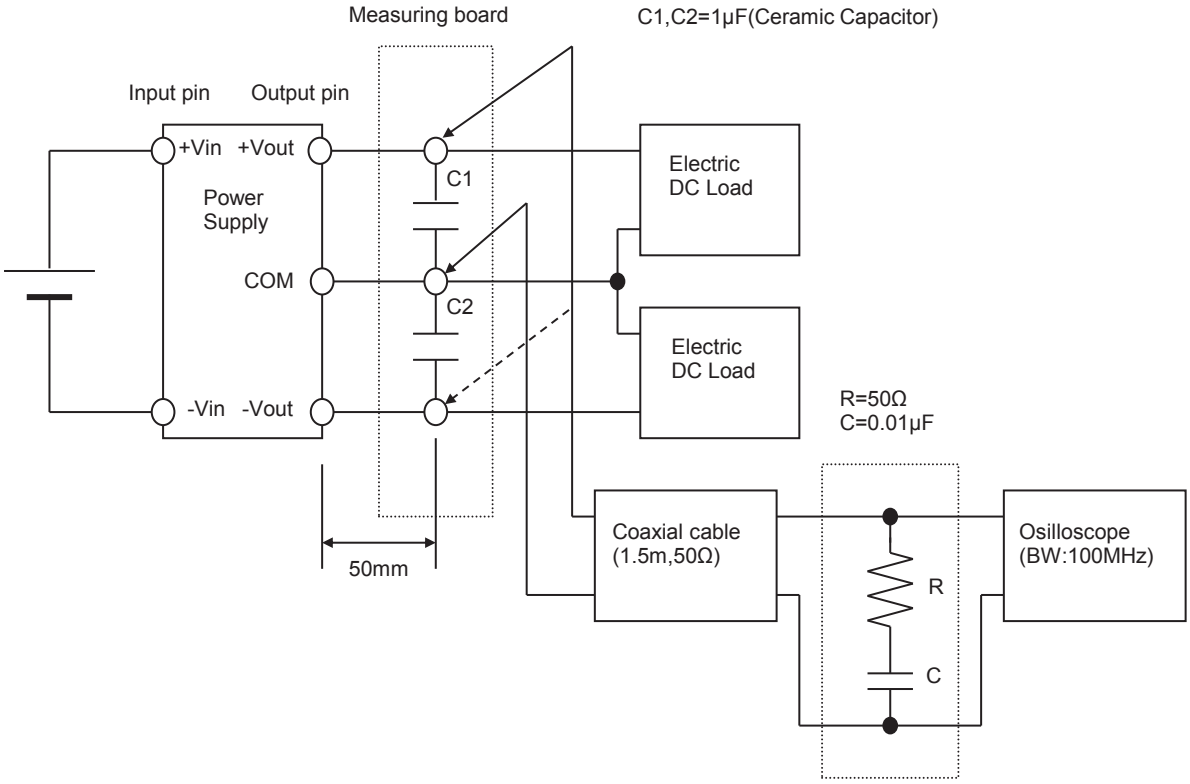


Figure B（Ripple and Ripple noise Characteristic）