COSEL

参考資料

TEST DATA OF MGW104812

Regulated DC Power Supply
November 7, 2016

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

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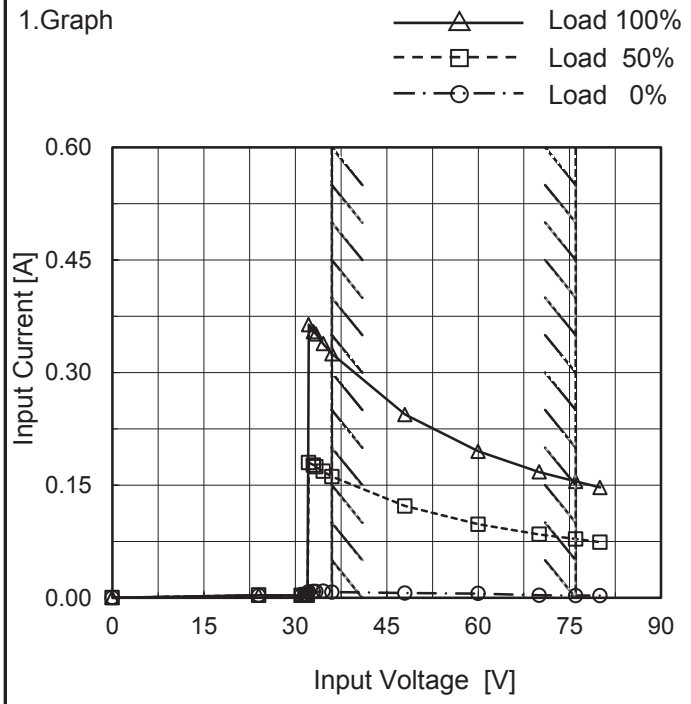
Model	MGW104812
Item	Input Current (by Input Voltage)
Object	――――――――

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	0.004	0.003
31.0	0.003	0.003	0.003
31.6	0.003	0.003	0.003
31.8	0.003	0.004	0.004
32.0	0.004	0.004	0.003
32.2	0.008	0.180	0.364
33.0	0.008	0.177	0.355
33.4	0.008	0.174	0.351
34.6	0.009	0.169	0.339
36.0	0.008	0.161	0.325
48.0	0.006	0.122	0.244
60.0	0.006	0.098	0.195
70.0	0.003	0.084	0.168
76.0	0.003	0.078	0.155
80.0	0.003	0.074	0.147
--	-	-	-
--	-	-	-

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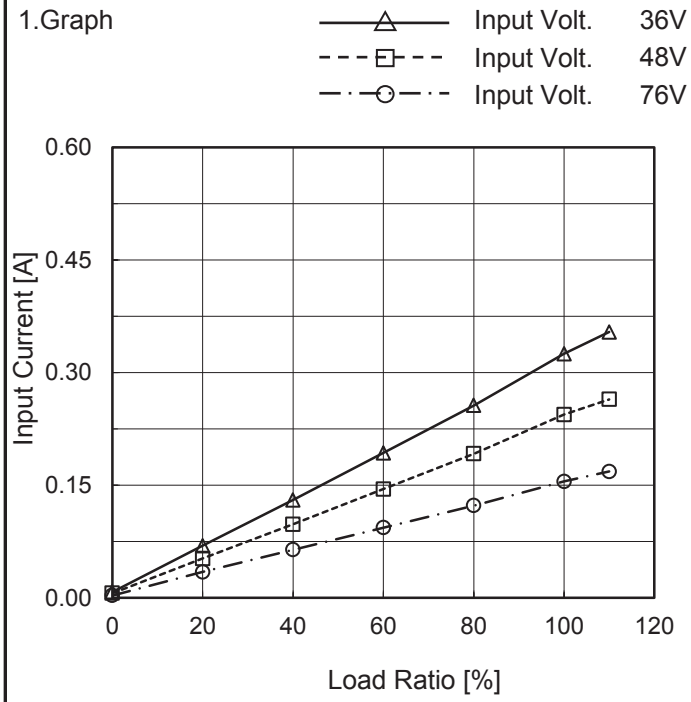
COSEL

Model	MGW104812
Item	Input Current (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

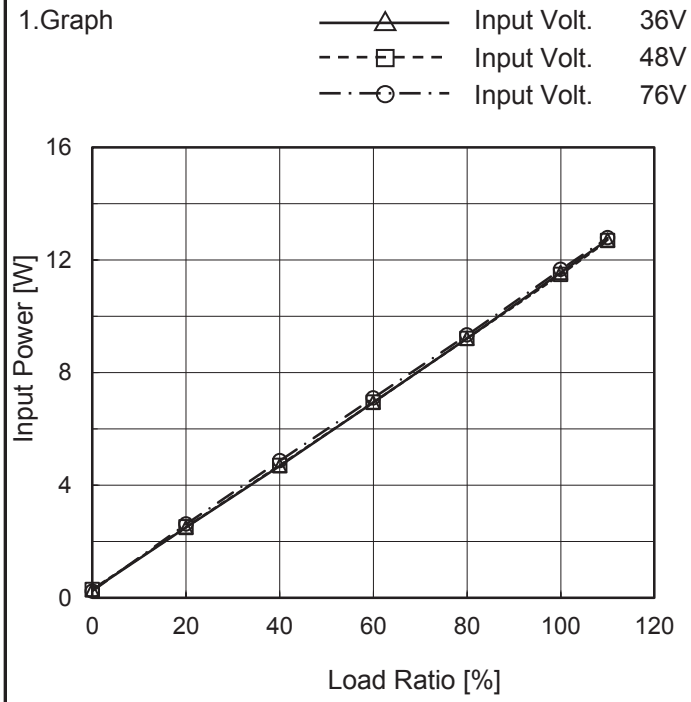
Load Ratio [%]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.008	0.006	0.003
20	0.069	0.052	0.034
40	0.130	0.098	0.064
60	0.193	0.145	0.093
80	0.256	0.192	0.123
100	0.325	0.244	0.155
110	0.354	0.264	0.168
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW104812
Item	Input Power (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

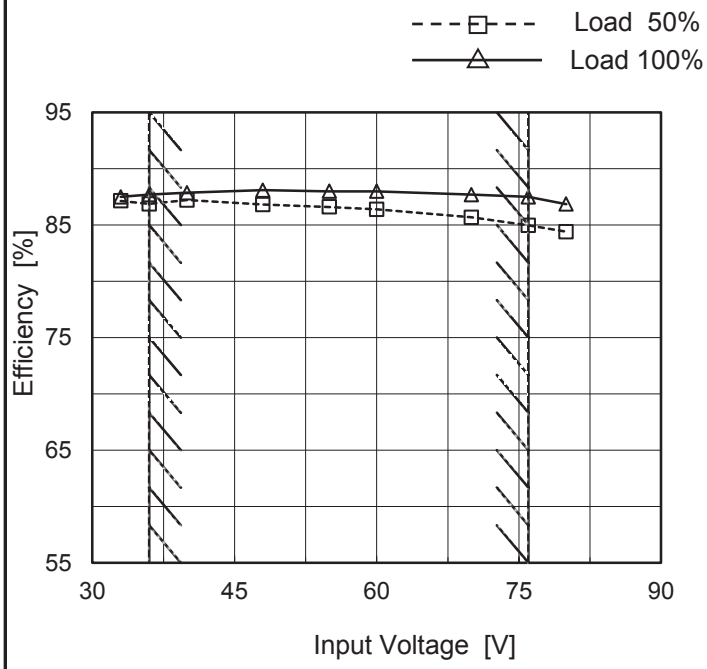
Load Ratio [%]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.27	0.29	0.23
20	2.50	2.51	2.62
40	4.69	4.70	4.87
60	6.94	6.95	7.10
80	9.22	9.22	9.33
100	11.56	11.49	11.66
110	12.72	12.69	12.79
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW104812
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

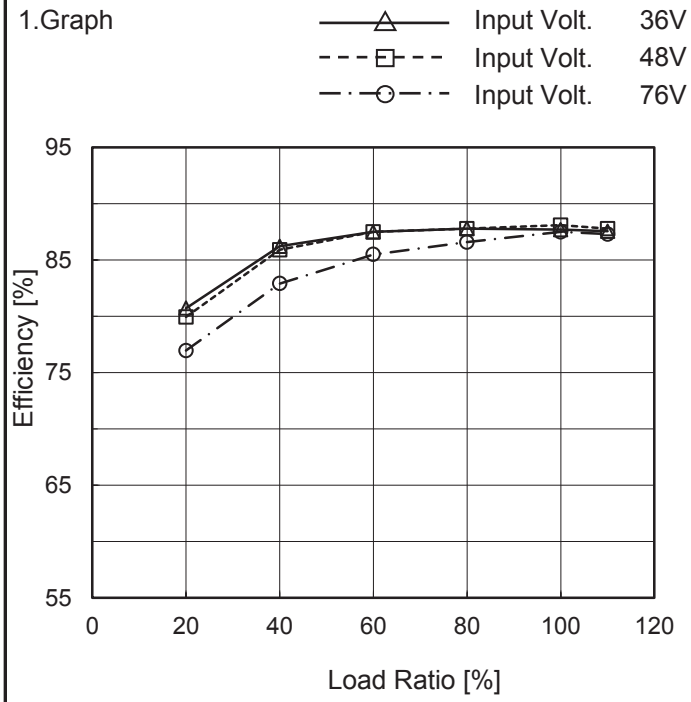
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	87.1	87.5
36	86.9	87.7
40	87.2	87.9
48	86.8	88.1
55	86.6	88.0
60	86.4	88.0
70	85.7	87.7
76	85.0	87.5
80	84.4	86.9

COSEL

Model	MGW104812
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	80.7	79.9	77.0
40	86.2	85.9	82.9
60	87.5	87.5	85.5
80	87.8	87.8	86.6
100	87.7	88.1	87.5
110	87.6	87.8	87.3
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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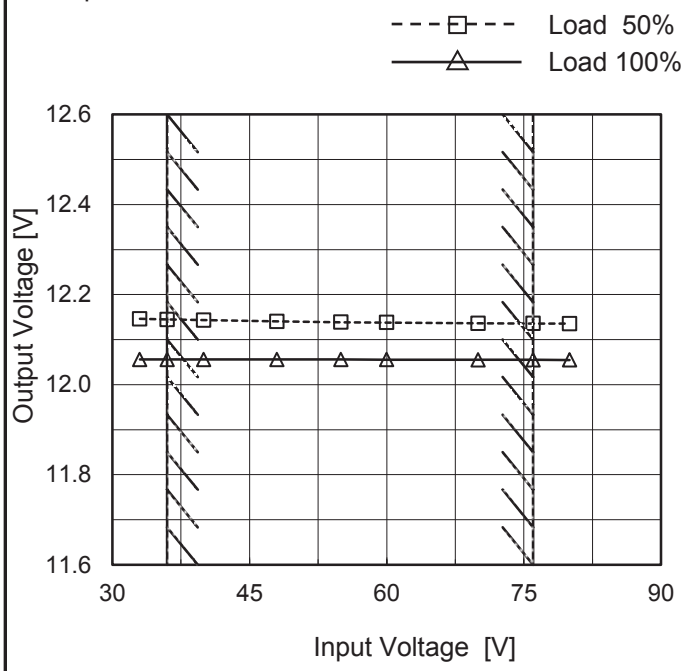
Model	MGW104812
Item	Line Regulation
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



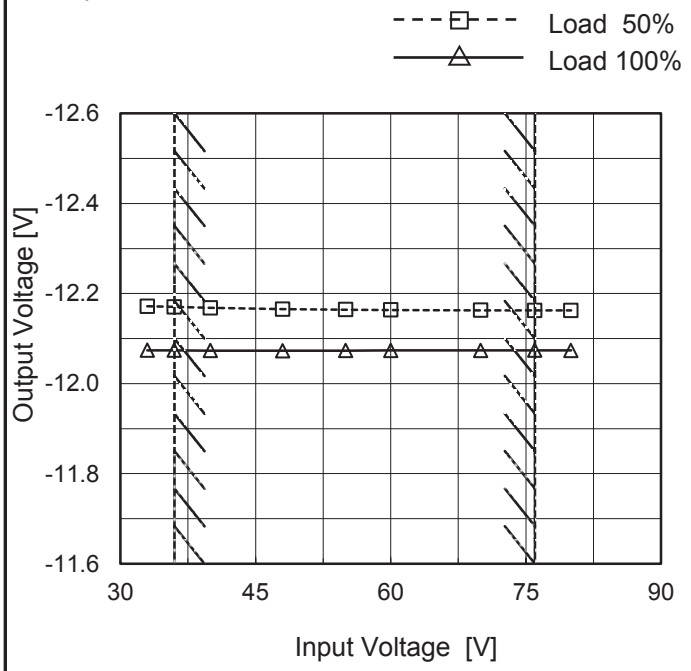
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
33	12.146	12.056
36	12.145	12.056
40	12.143	12.056
48	12.140	12.056
55	12.139	12.056
60	12.138	12.056
70	12.136	12.055
76	12.136	12.055
80	12.135	12.055

-12V: Rated Load Current

Object	-12V0.42A

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	-12.172	-12.074
36	-12.170	-12.074
40	-12.168	-12.073
48	-12.165	-12.073
55	-12.164	-12.073
60	-12.164	-12.074
70	-12.163	-12.074
76	-12.163	-12.074
80	-12.163	-12.074

+12V: Rated Load Current

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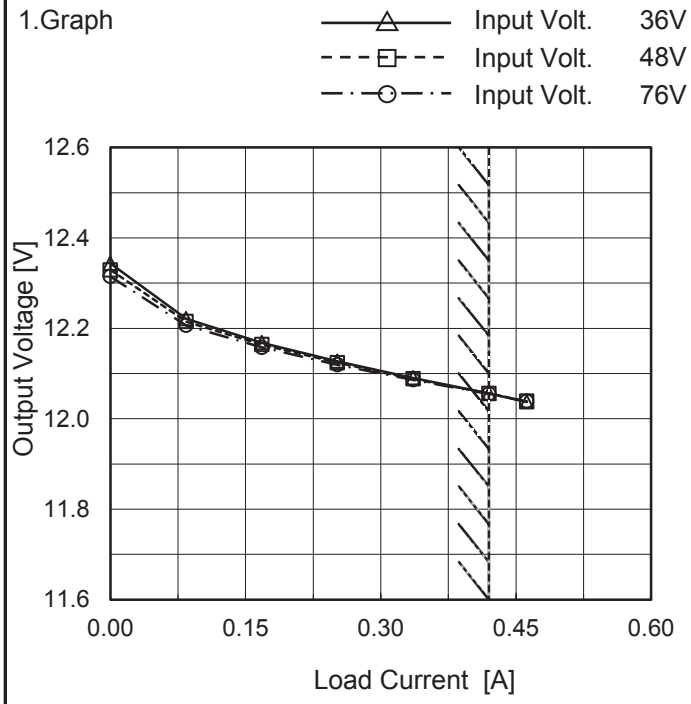
COSEL

Model	MGW104812
Item	Load Regulation
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



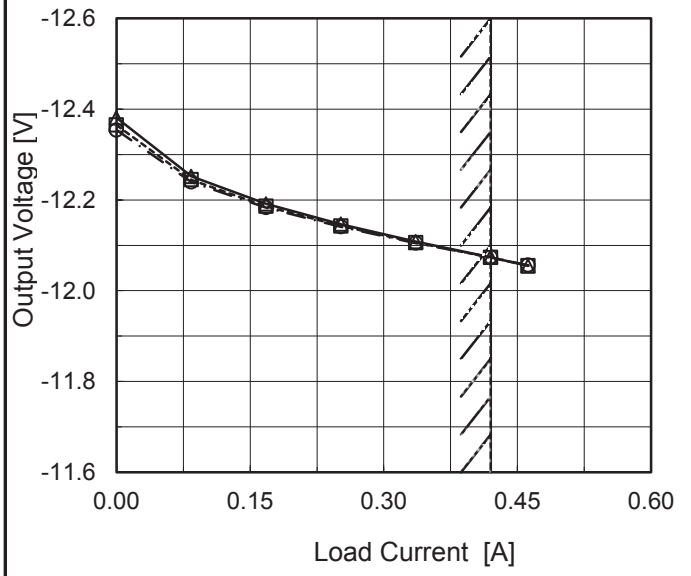
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	12.344	12.329	12.315
0.084	12.221	12.215	12.207
0.168	12.168	12.164	12.158
0.252	12.127	12.124	12.120
0.336	12.090	12.088	12.086
0.420	12.056	12.056	12.055
0.462	12.037	12.039	12.039
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-12V: Rated Load Current

Object	-12V0.42A

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	-12.381	-12.365	-12.354
0.084	-12.252	-12.244	-12.240
0.168	-12.191	-12.186	-12.183
0.252	-12.147	-12.143	-12.141
0.336	-12.108	-12.106	-12.105
0.420	-12.074	-12.073	-12.074
0.462	-12.055	-12.055	-12.056
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+12V: Rated Load Current

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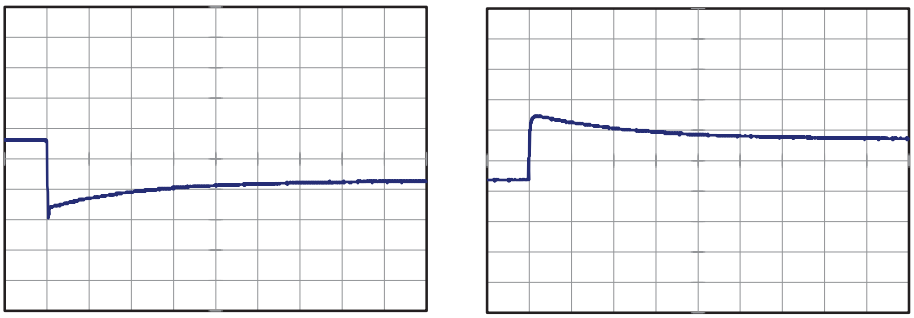
Model	MGW104812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.42A	

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

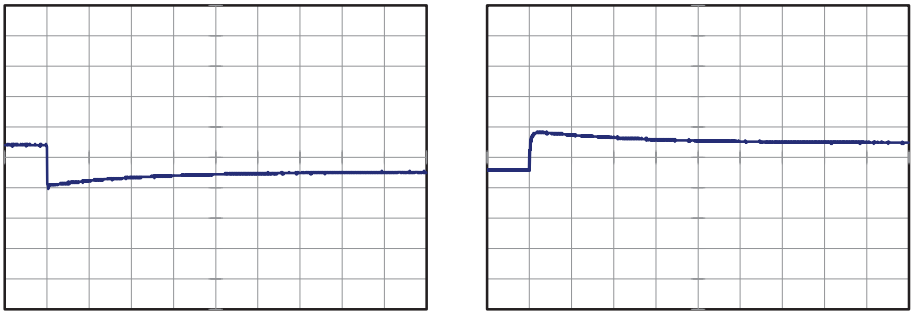
Min.Load (0A)←→
Load 100% (0.42A)



200 mV/div

2 ms/div 2 ms/div

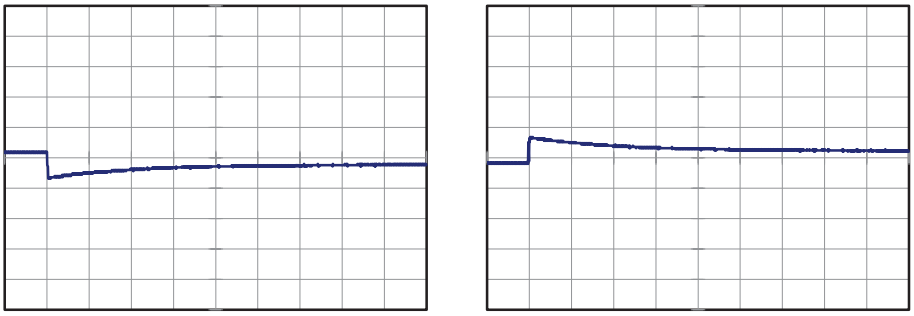
Min.Load (0A)←→
Load 50% (0.21A)



200 mV/div

2 ms/div 2 ms/div

Load 50% (0.21A)←→
Load 100% (0.42A)



200 mV/div

2 ms/div 2 ms/div

COSEL

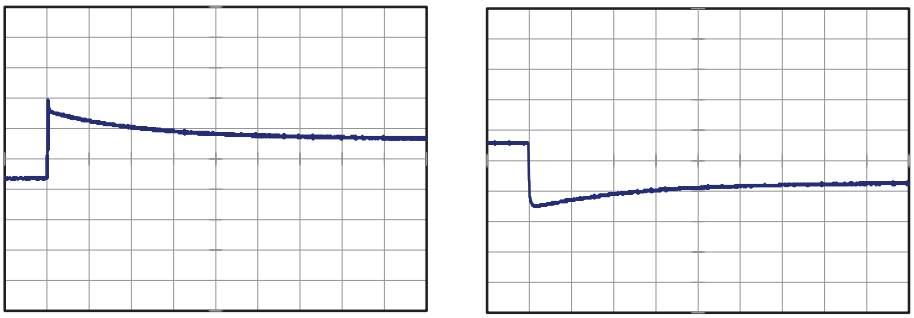
Model	MGW104812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.42A	

Input Volt. 48 V

+12V:rated load current.

Cycle 100 ms

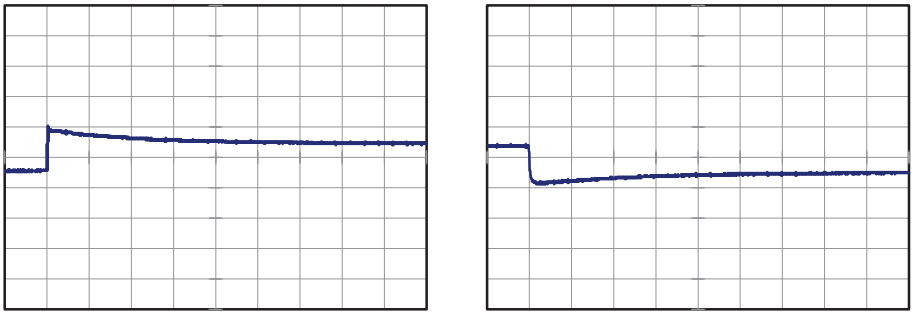
Min.Load (0A)←→
Load 100% (0.42A)



200 mV/div

2 ms/div 2 ms/div

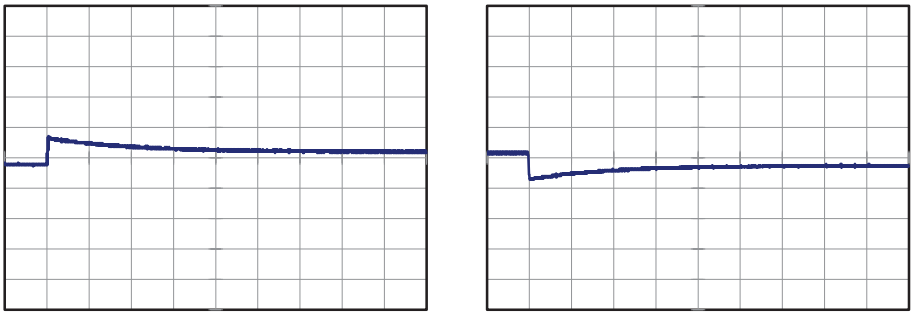
Min.Load (0A)←→
Load 50% (0.21A)



200 mV/div

2 ms/div 2 ms/div

Load 50% (0.21A)←→
Load 100% (0.42A)



200 mV/div

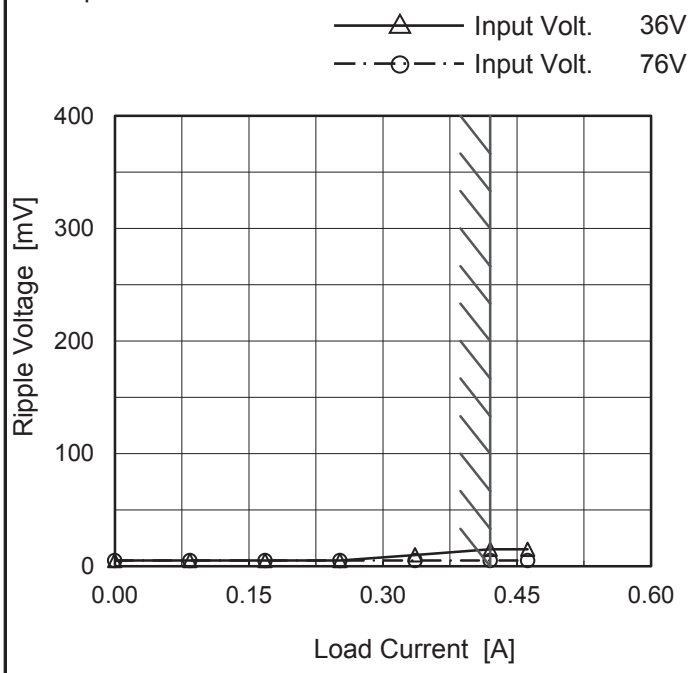
2 ms/div 2 ms/div

COSEL

Model	MGW104812
Item	Ripple Voltage (by Load Current)
Object	+12V0.42A

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]

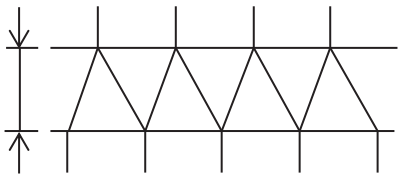


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	5
0.084	5	5
0.168	5	5
0.252	5	5
0.336	10	5
0.420	15	5
0.462	15	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

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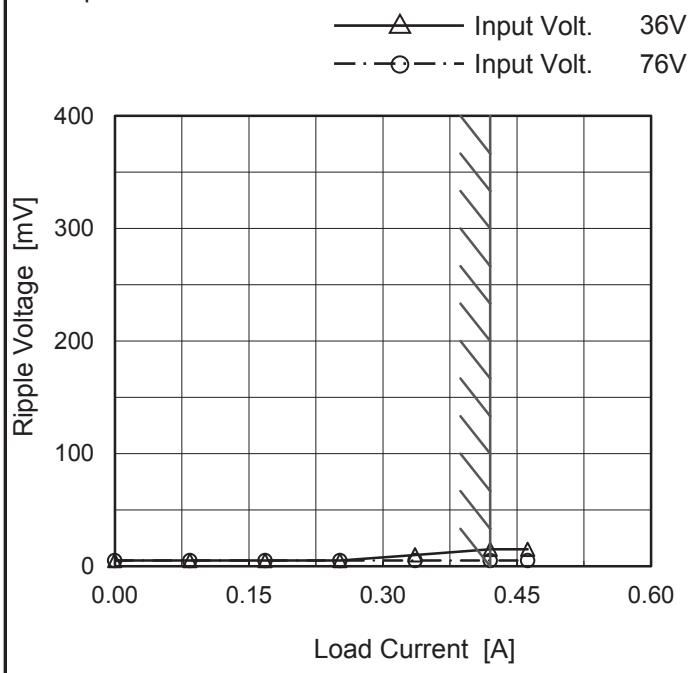
COSEL

Model	MGW104812
Item	Ripple Voltage (by Load Current)
Object	-12V0.42A

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]

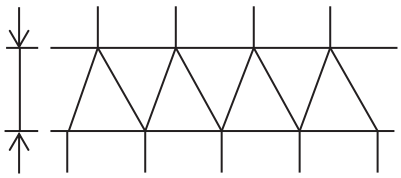


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	5
0.084	5	5
0.168	5	5
0.252	5	5
0.336	10	5
0.420	15	5
0.462	15	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

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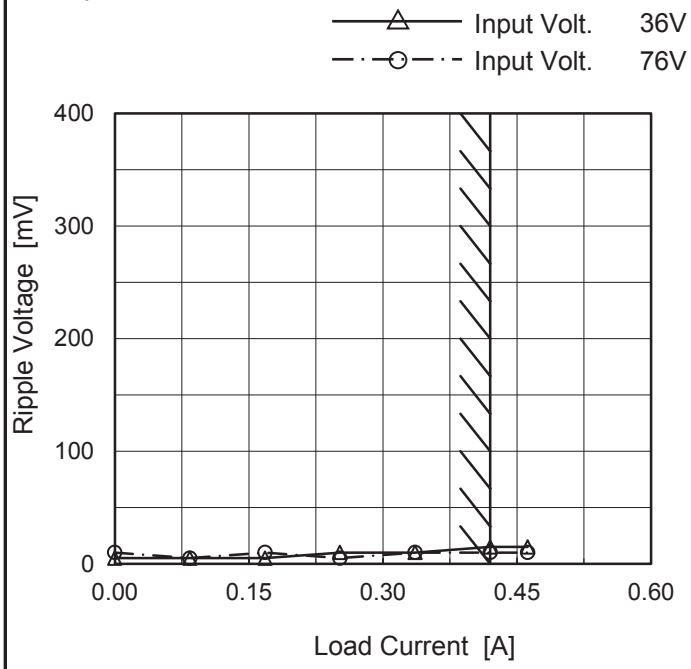
COSEL

Model	MGW104812
Item	Ripple-Noise
Object	+12V0.42A

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]

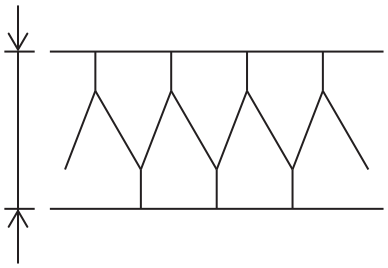


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	10
0.084	5	5
0.168	5	10
0.252	10	5
0.336	10	10
0.420	15	10
0.462	15	10
--	-	-
--	-	-
--	-	-
--	-	-

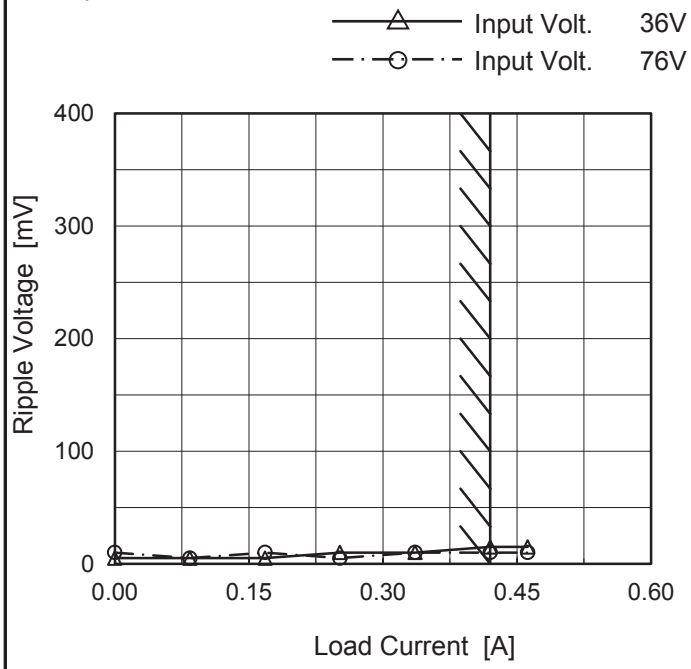
-12V: Rated Load Current

COSEL

Model	MGW104812
Item	Ripple-Noise
Object	-12V0.42A

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]

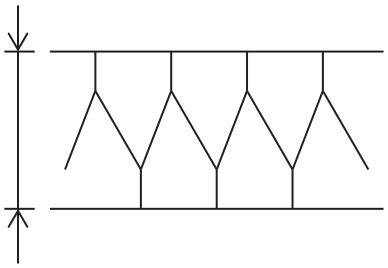


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.000	5	10
0.084	5	5
0.168	5	10
0.252	10	5
0.336	10	10
0.420	15	10
0.462	15	10
--	-	-
--	-	-
--	-	-
--	-	-

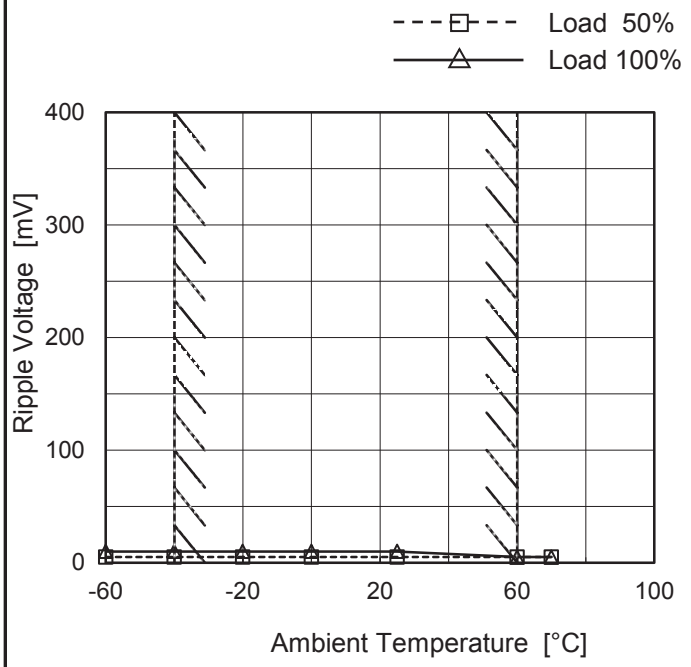
+12V: Rated Load Current

COSEL

Model	MGW104812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.42A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

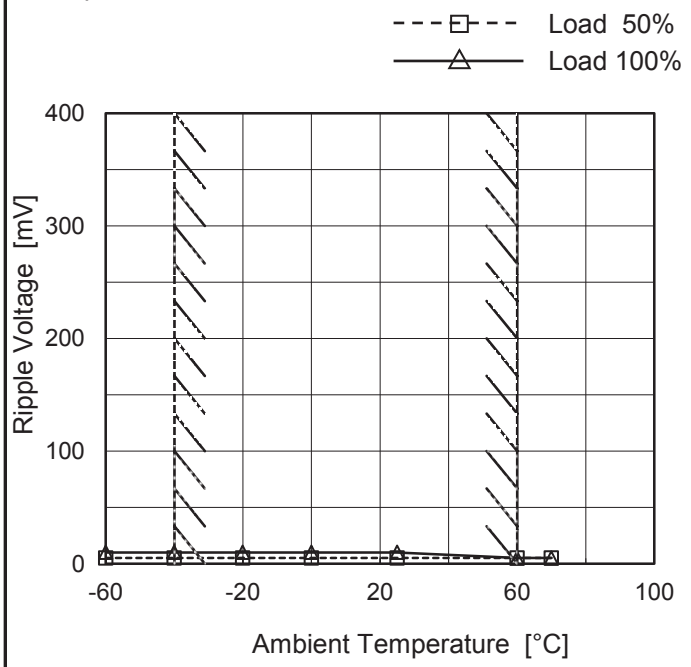
2.Values

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
60	5	5
70	5	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object	-12V0.42A

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
60	5	5
70	5	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

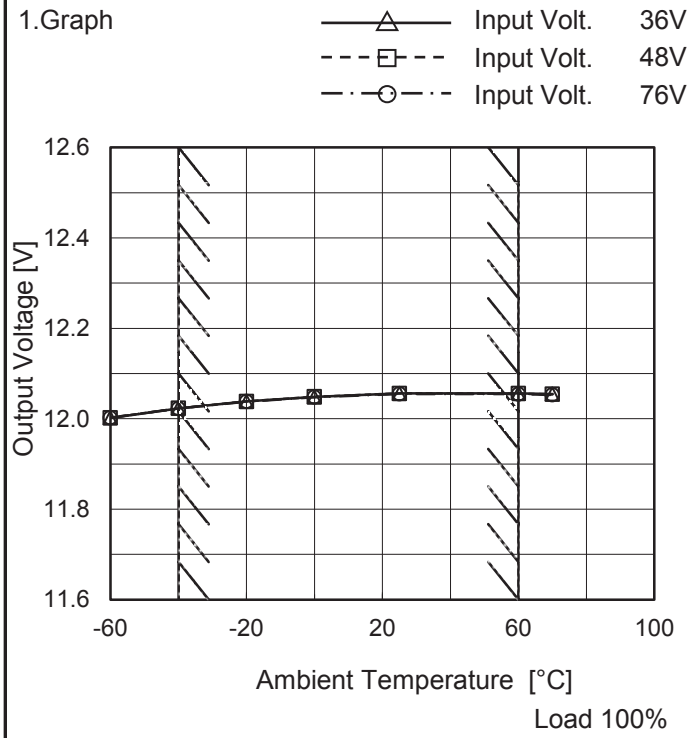
BC-11068

COSEL

Model	MGW104812
Item	Ambient Temperature Drift
Object	+12V0.42A

Testing Circuitry Figure A

1.Graph



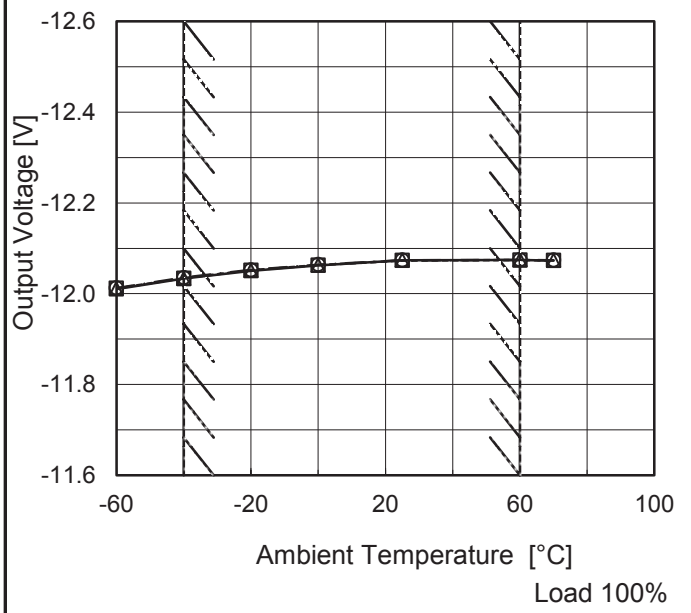
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	12.002	12.002	12.002
-40	12.023	12.023	12.023
-20	12.038	12.039	12.038
0	12.048	12.049	12.048
25	12.056	12.056	12.055
60	12.056	12.056	12.055
70	12.055	12.054	12.053
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-12V: Rated Load Current

Object	-12V0.42A

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	-12.011	-12.012	-12.013
-40	-12.033	-12.034	-12.035
-20	-12.051	-12.052	-12.052
0	-12.063	-12.063	-12.064
25	-12.074	-12.073	-12.074
60	-12.074	-12.074	-12.075
70	-12.073	-12.073	-12.074
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+12V: Rated Load Current

BC-11068

COSEL

Model	MGW104812	
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 - 0.42A (AVR 2) : 0 - 0.42A

* 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	+12V0.42A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	36	0	12.373	±321	±2.7
Minimum Voltage	60	36	0.42	11.731		

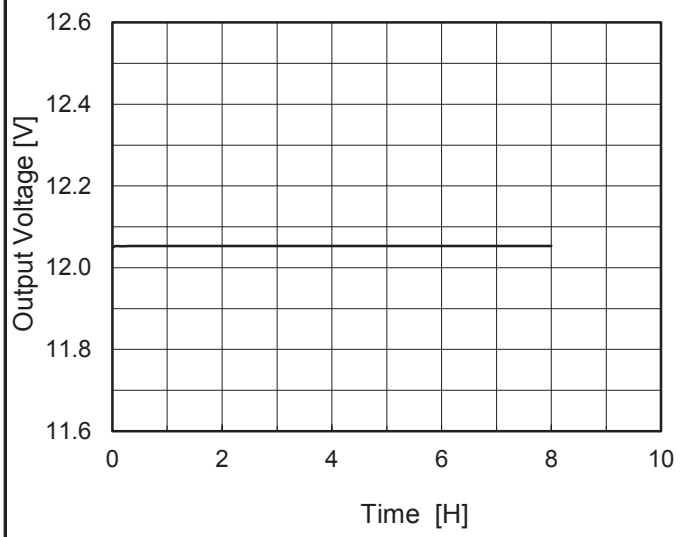
Object	-12V0.42A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	36	0	-12.408	±321	±2.7
Minimum Voltage	60	36	0.42	-11.766		

COSEL

Model	MGW104812
Item	Time Lapse Drift
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 48V
Load 100%

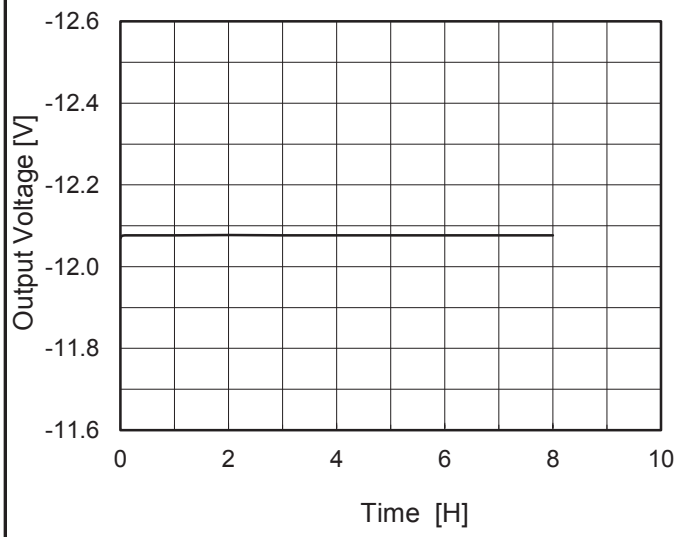
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.048
0.5	12.053
1.0	12.053
2.0	12.053
3.0	12.053
4.0	12.053
5.0	12.054
6.0	12.053
7.0	12.053
8.0	12.053

-12V: Rated Load Current

Object	-12V0.42A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.070
0.5	-12.077
1.0	-12.077
2.0	-12.077
3.0	-12.077
4.0	-12.077
5.0	-12.077
6.0	-12.077
7.0	-12.077
8.0	-12.077

+12V: Rated Load Current

BC-11068

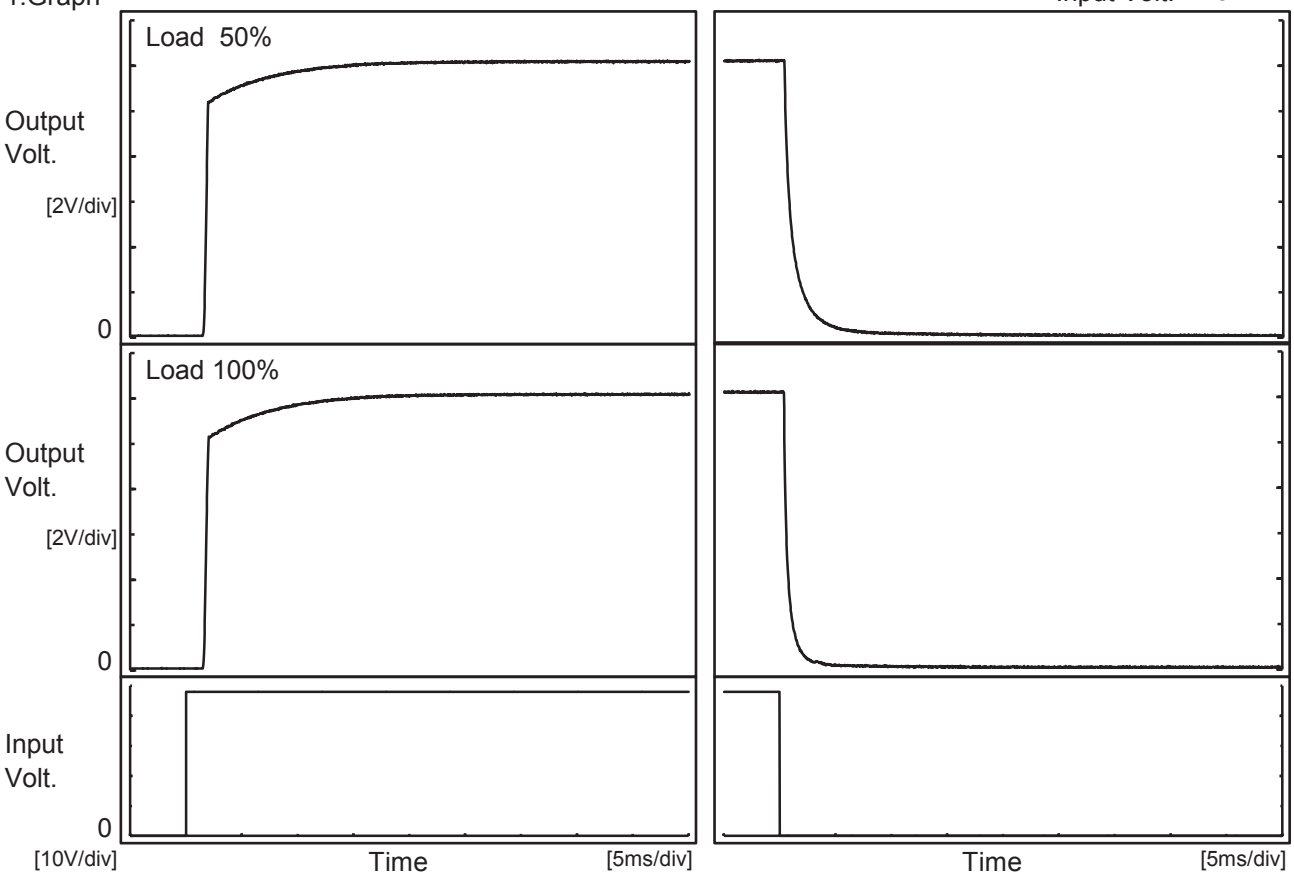
COSEL

Model	MGW104812
Item	Rise and Fall Time
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

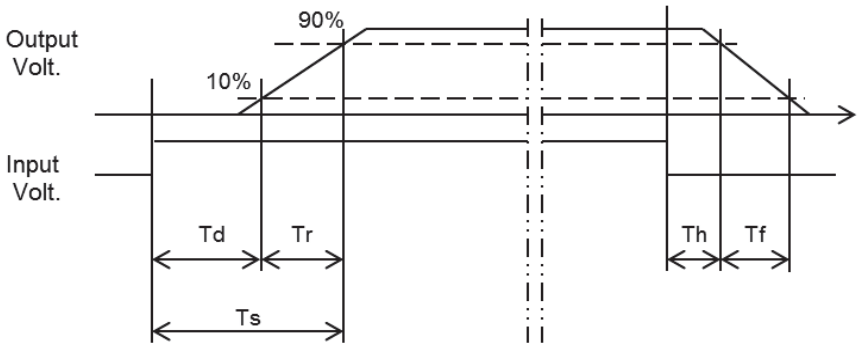
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.7	2.1	3.8	0.5	2.3
100 %	1.7	2.5	4.2	0.4	1.1



BC-11068

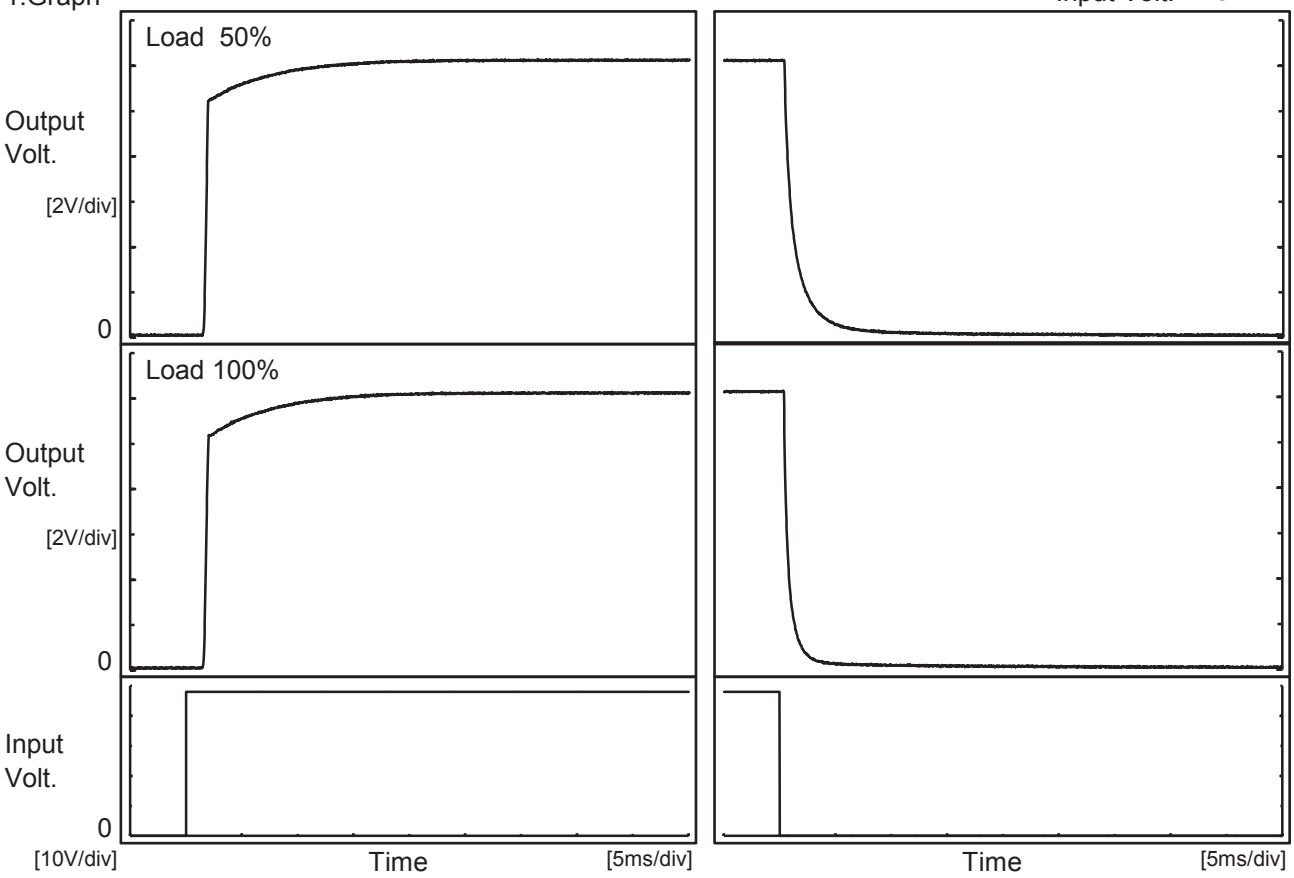
COSEL

Model	MGW104812
Item	Rise and Fall Time
Object	-12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

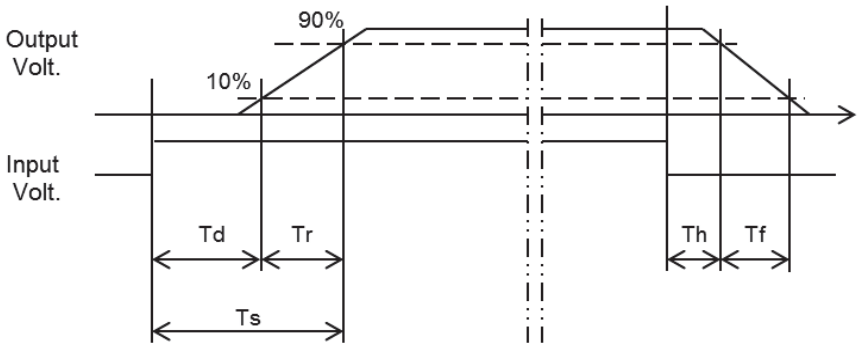
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.7	1.9	3.6	0.5	2.7
100 %	1.7	2.3	4.0	0.4	1.3



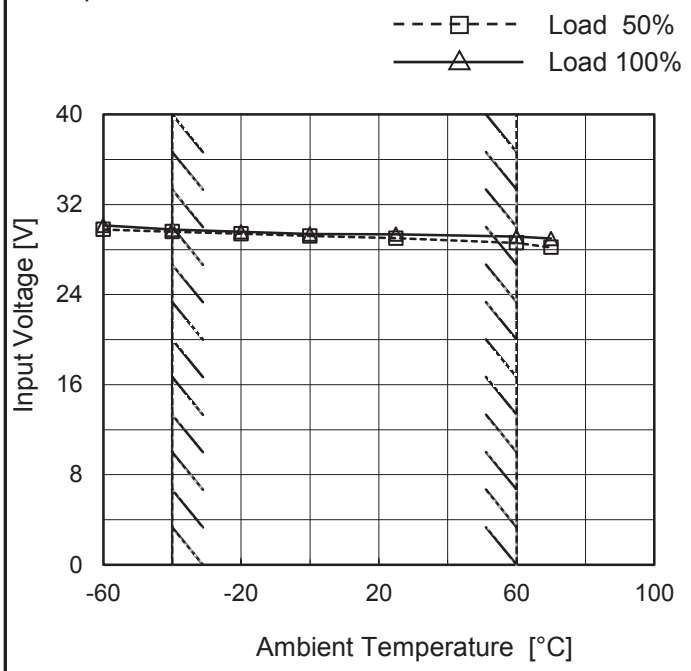
BC-11068

COSEL

Model	MGW104812
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.42A

Testing Circuitry Figure A

1.Graph

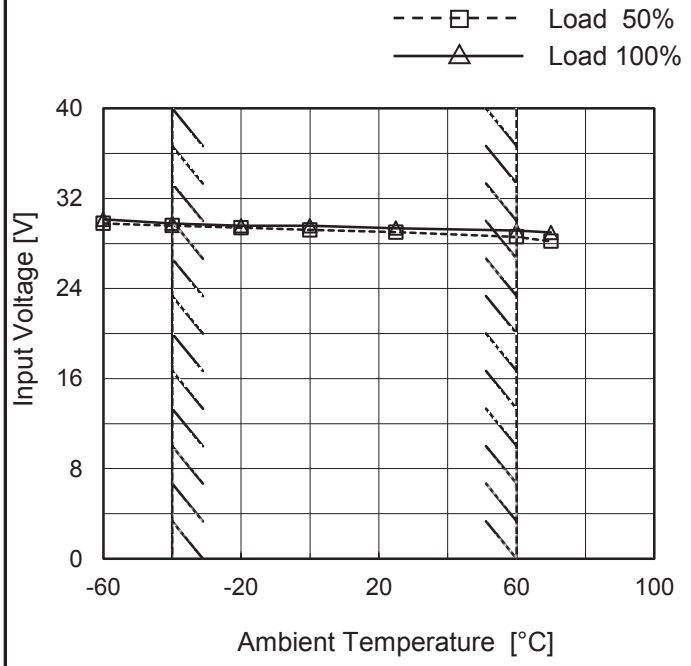


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	29.8	30.2
-40	29.6	29.8
-20	29.5	29.6
0	29.2	29.4
25	29.1	29.4
60	28.6	29.2
70	28.2	29.0
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.42A

1.Graph



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

2.Values

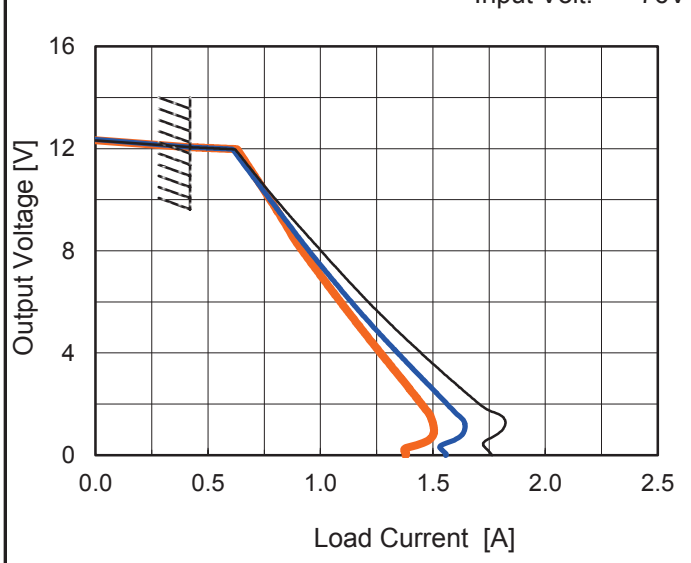
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	29.8	30.2
-40	29.6	29.8
-20	29.5	29.6
0	29.3	29.6
25	29.1	29.4
60	28.6	29.2
70	28.2	29.0
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGW104812
Item	Overcurrent Protection
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



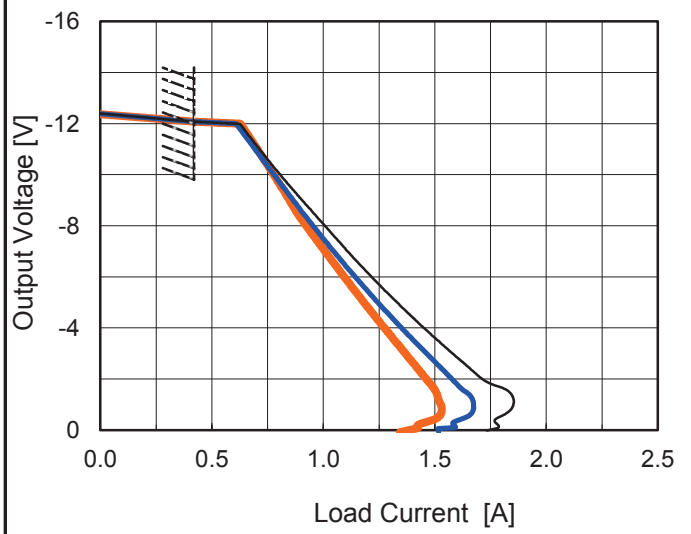
2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
11.4	0.67	0.66	0.67
10.8	0.72	0.71	0.72
9.6	0.84	0.81	0.80
8.4	0.96	0.91	0.89
7.2	1.08	1.02	0.98
6.0	1.21	1.14	1.09
4.8	1.35	1.26	1.19
3.6	1.49	1.38	1.30
2.4	1.65	1.52	1.41
1.2	1.82	1.64	1.50
0.0	1.76	1.56	1.38
--	-	-	-

-12V: Rated Load Current

Object	-12V0.42A

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	0.68	0.66	0.67
-10.8	0.73	0.71	0.72
-9.6	0.84	0.81	0.80
-8.4	0.96	0.92	0.89
-7.2	1.09	1.03	0.99
-6.0	1.21	1.14	1.09
-4.8	1.35	1.26	1.20
-3.6	1.50	1.39	1.31
-2.4	1.66	1.53	1.42
-1.2	1.85	1.67	1.52
0.0	1.73	1.52	1.34
--	-	-	-

+12V: Rated Load Current

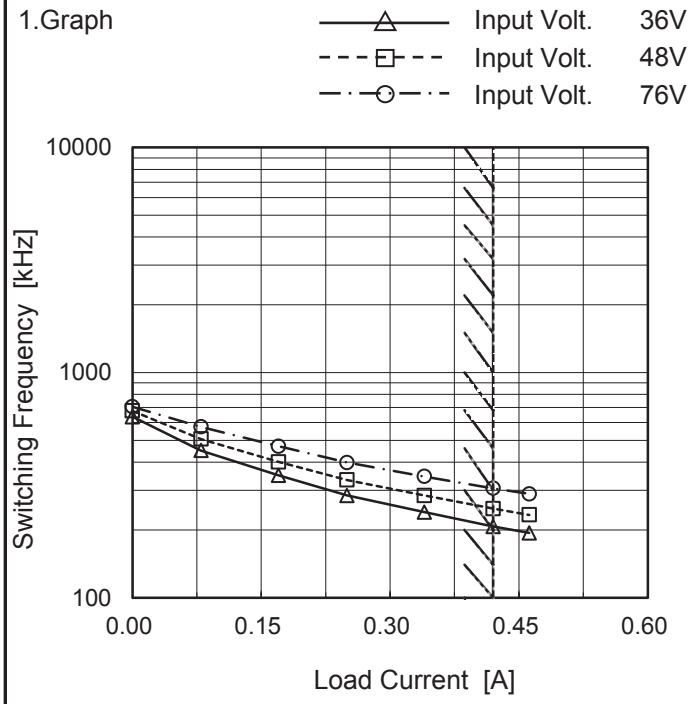
BC-11068

COSEL

Model	MGW104812
Item	Switching Frequency (by Load Current)
Object	+/-12V0.42A

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	636	676	706
0.080	451	507	574
0.170	349	401	471
0.250	284	333	399
0.340	240	284	346
0.420	207	249	306
0.462	194	233	289
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

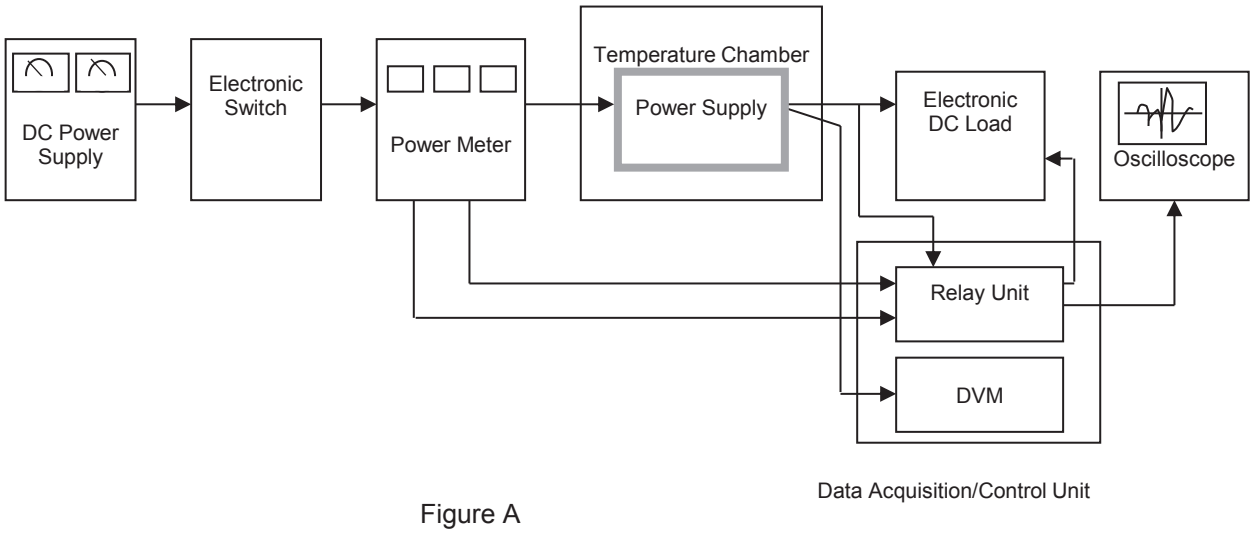


Figure A

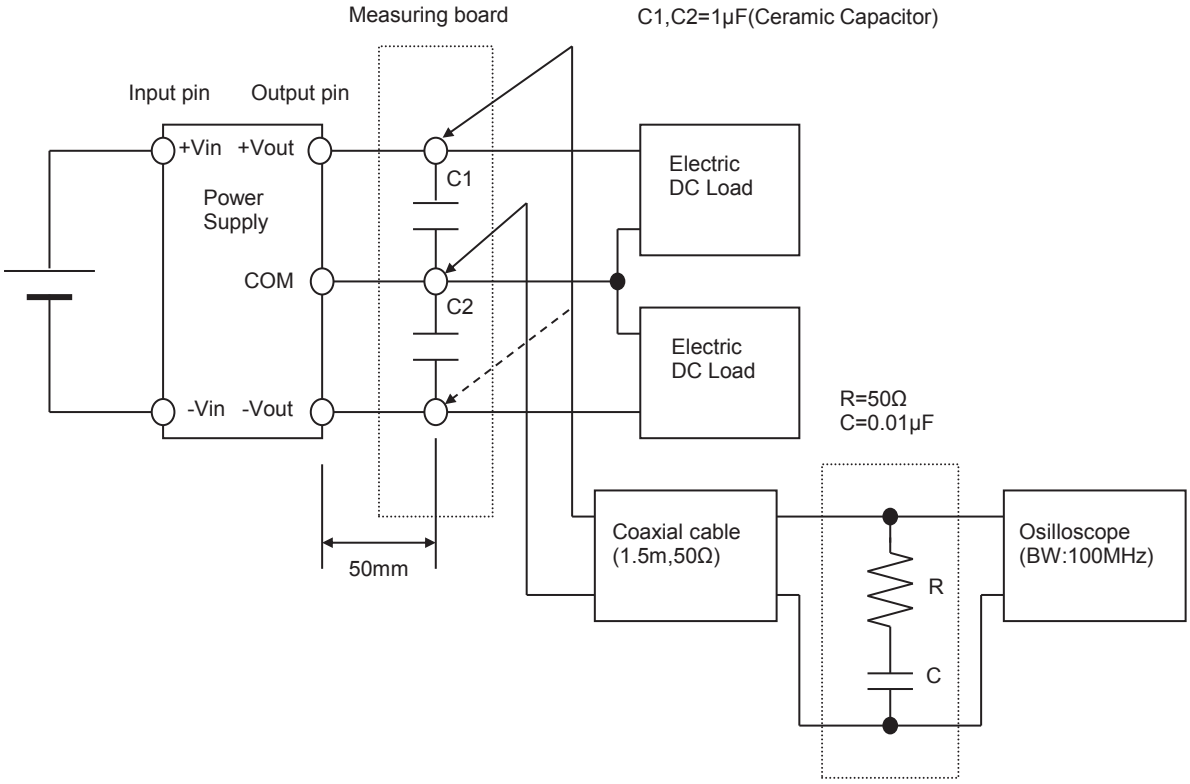


Figure B（Ripple and Ripple noise Characteristic）