COSEL

参考資料

TEST DATA OF MGW102412

Regulated DC Power Supply
November 7, 2016

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

参考資料

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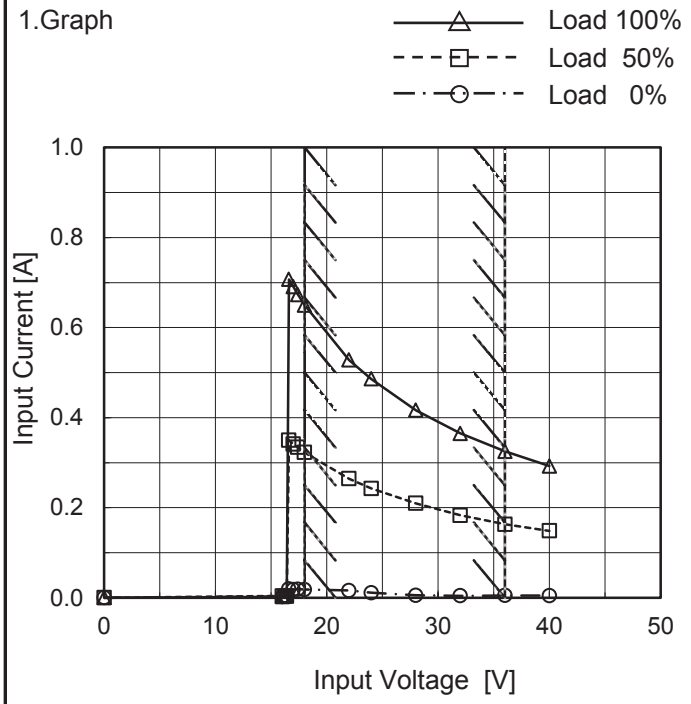
COSEL

Model	MGW102412
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
16.0	0.003	0.004	0.002
16.2	0.005	0.003	0.003
16.4	0.004	0.004	0.004
16.6	0.020	0.350	0.707
17.0	0.018	0.341	0.691
17.4	0.019	0.334	0.673
18.0	0.018	0.323	0.650
22.0	0.016	0.264	0.528
24.0	0.011	0.243	0.486
28.0	0.005	0.210	0.416
32.0	0.004	0.183	0.365
36.0	0.005	0.163	0.325
40.0	0.005	0.149	0.292
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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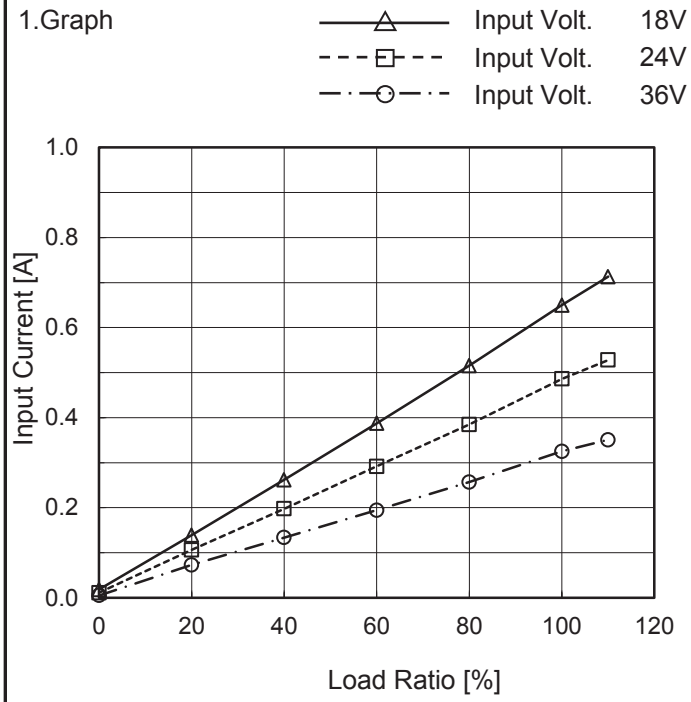
COSEL

Model	MGW102412
Item	Input Current (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

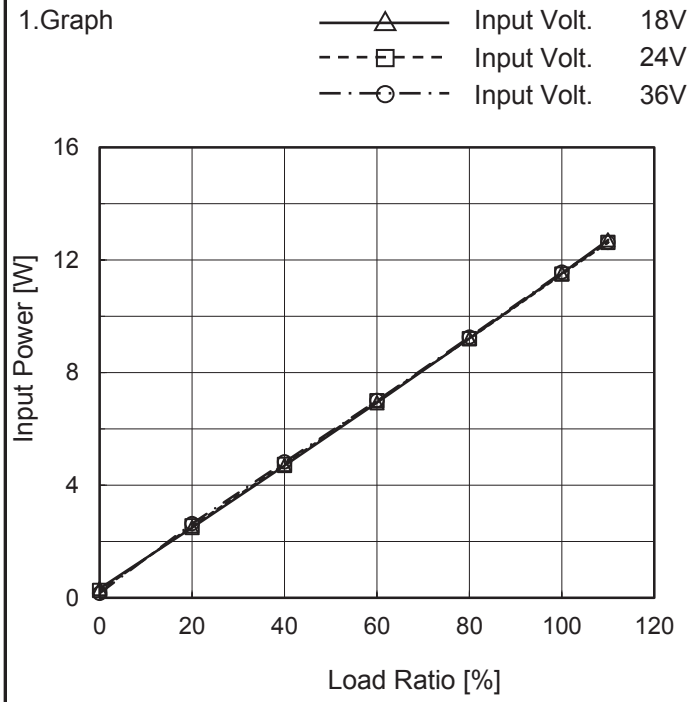
Load Ratio [%]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.018	0.011	0.005
20	0.139	0.106	0.073
40	0.262	0.198	0.134
60	0.387	0.292	0.194
80	0.515	0.385	0.257
100	0.650	0.486	0.325
110	0.713	0.528	0.351
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW102412
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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.32	0.25	0.16
20	2.49	2.55	2.63
40	4.70	4.74	4.82
60	6.93	6.99	7.01
80	9.22	9.21	9.26
100	11.52	11.50	11.56
110	12.71	12.62	12.63
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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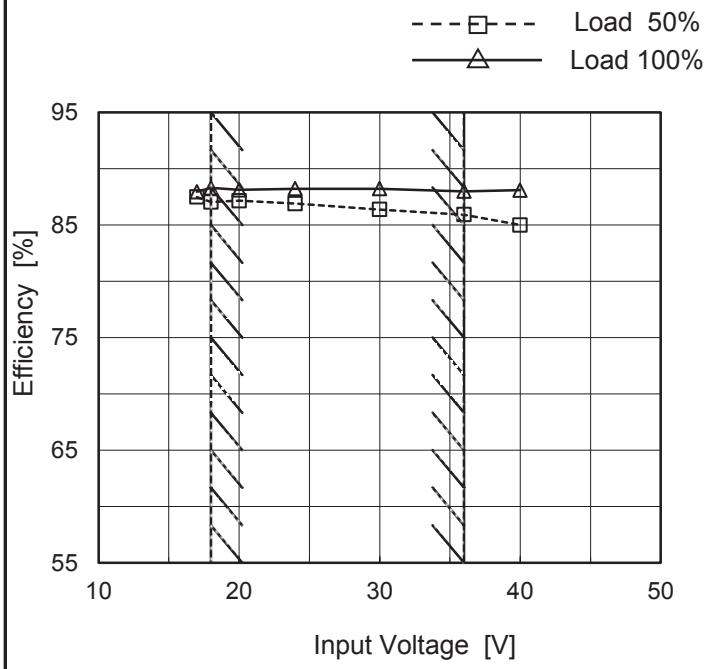
Model	MGW102412
Item	Efficiency (by Input Voltage)
Object	――――――――――

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%
17	87.5	88.0
18	87.0	88.3
20	87.2	88.1
24	86.9	88.2
30	86.4	88.2
36	85.9	88.0
40	85.0	88.1
--	-	-
--	-	-

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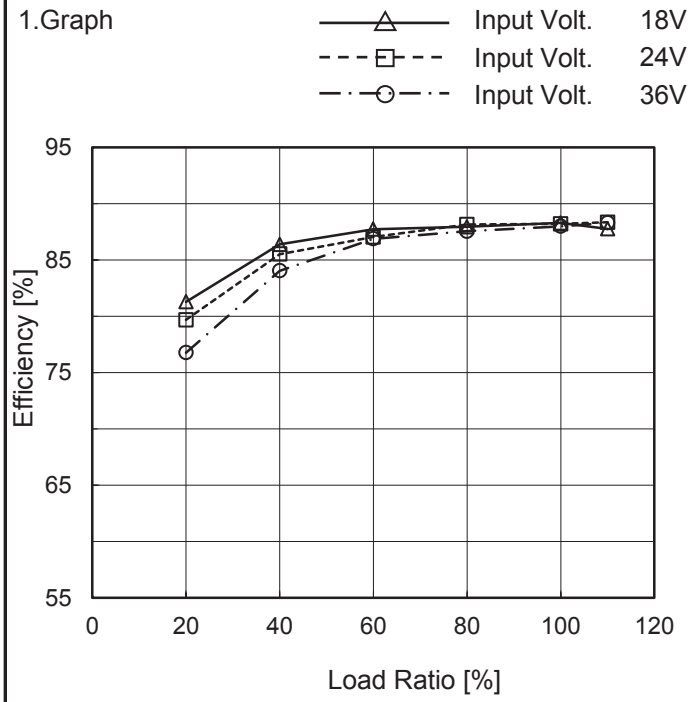
COSEL

Model	MGW102412
Item	Efficiency (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	81.3	79.7	76.8
40	86.4	85.5	84.0
60	87.7	87.1	86.9
80	88.0	88.2	87.6
100	88.3	88.2	88.0
110	87.8	88.4	88.3
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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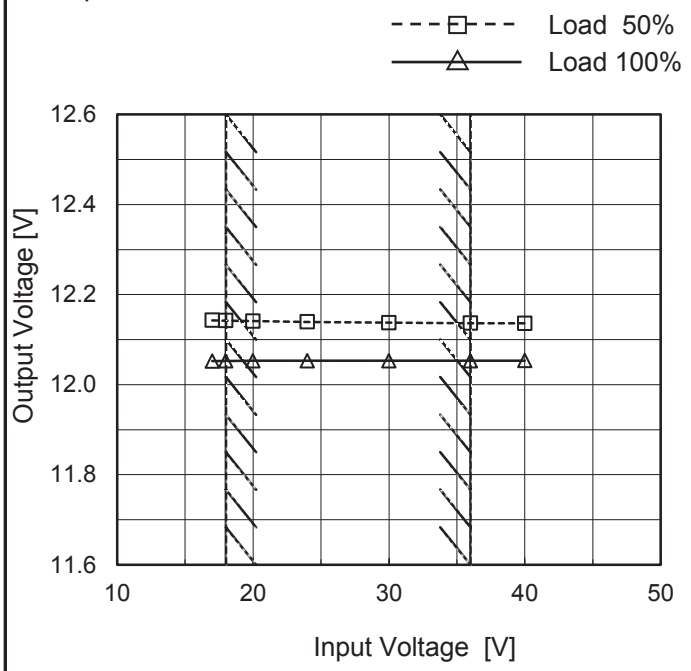
Model	MGW102412
Item	Line Regulation
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



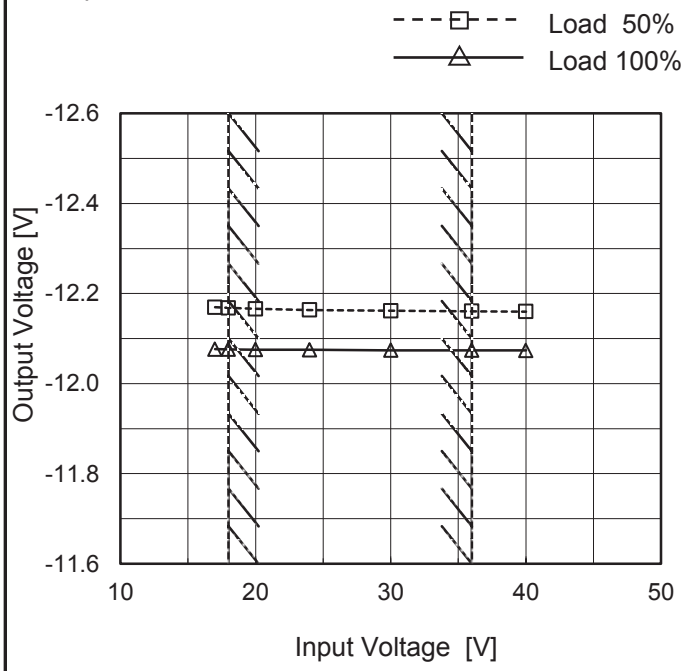
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.143	12.052
18	12.142	12.053
20	12.141	12.053
24	12.139	12.053
30	12.138	12.053
36	12.137	12.053
40	12.136	12.053
--	-	-
--	-	-

-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%
17	-12.169	-12.076
18	-12.168	-12.076
20	-12.166	-12.075
24	-12.164	-12.075
30	-12.162	-12.074
36	-12.161	-12.074
40	-12.160	-12.074
--	-	-
--	-	-

+12V: Rated Load Current

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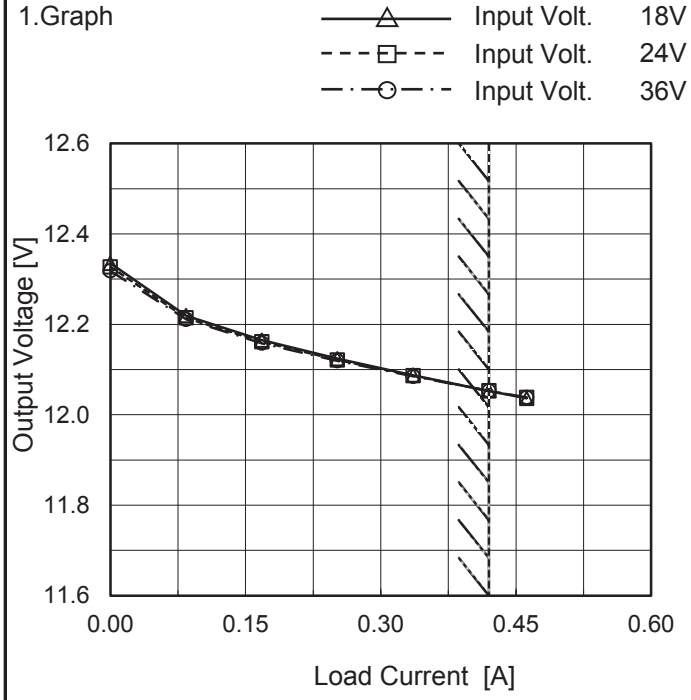
Model	MGW102412
Item	Load Regulation
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



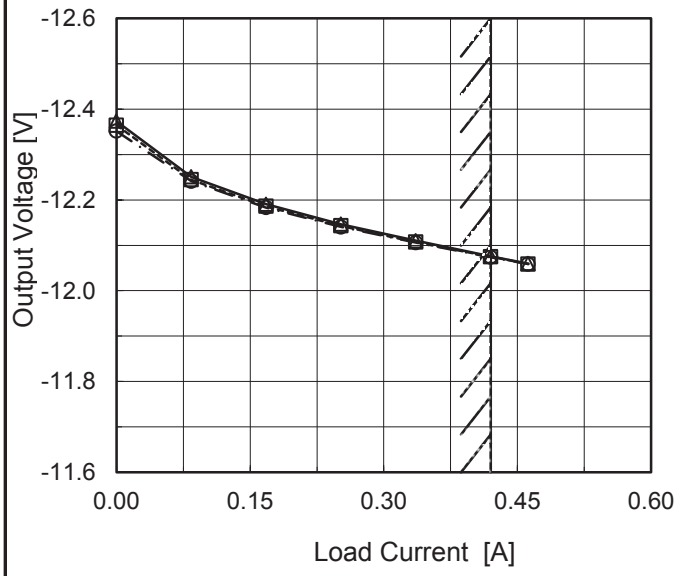
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	12.335	12.327	12.318
0.084	12.219	12.214	12.211
0.168	12.165	12.161	12.158
0.252	12.124	12.121	12.119
0.336	12.088	12.086	12.085
0.420	12.053	12.053	12.053
0.462	12.036	12.038	12.038
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	-12.374	-12.365	-12.352
0.084	-12.251	-12.245	-12.241
0.168	-12.191	-12.186	-12.183
0.252	-12.147	-12.143	-12.141
0.336	-12.110	-12.107	-12.106
0.420	-12.076	-12.075	-12.074
0.462	-12.060	-12.059	-12.059
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+12V: Rated Load Current

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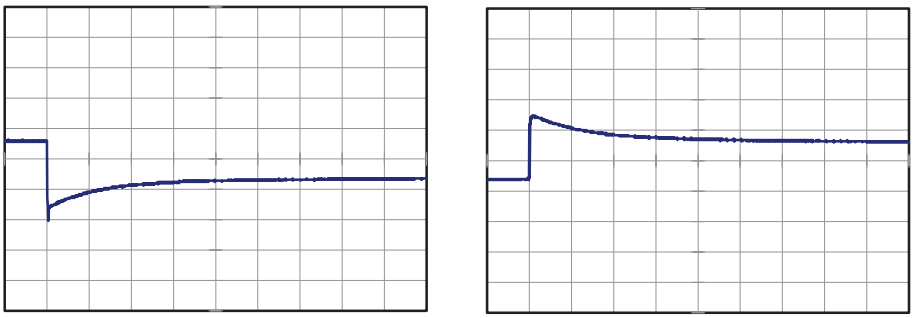
COSEL

Model	MGW102412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.42A	

Input Volt. 24 V
-12V:rated load current.
Cycle 100 ms

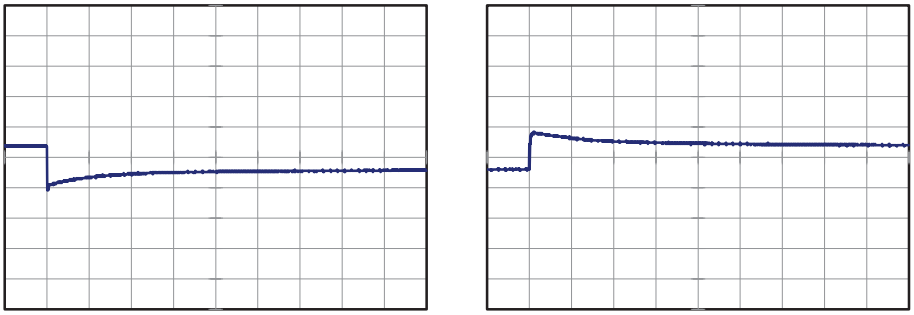
Min.Load (0A)←→
Load 100% (0.42A)



200 mV/div

4 ms/div 4 ms/div

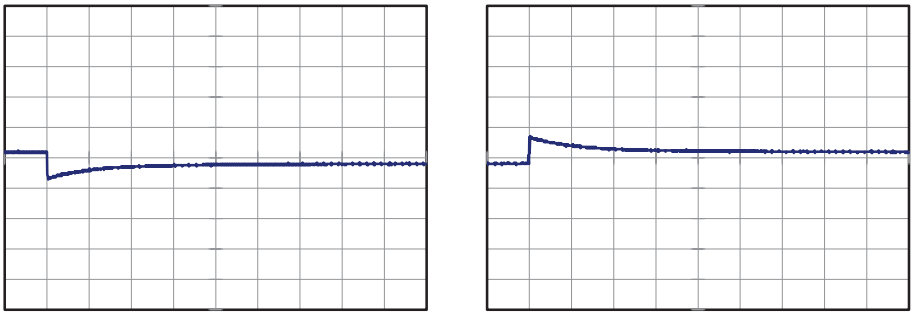
Min.Load (0A)←→
Load 50% (0.21A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.21A)←→
Load 100% (0.42A)



200 mV/div

4 ms/div 4 ms/div

COSEL

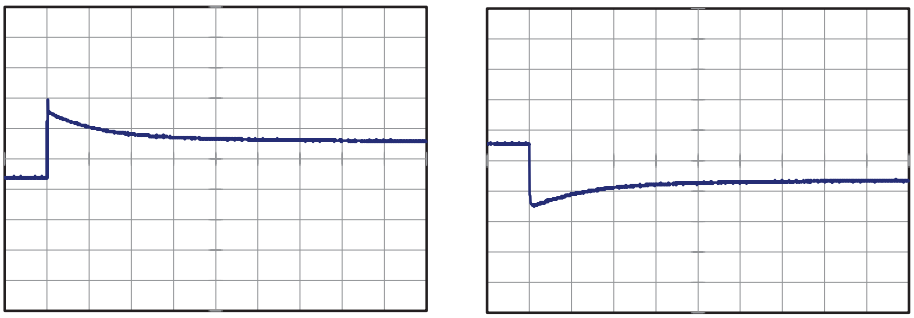
Model	MGW102412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.42A	

Input Volt. 24 V

+12V:rated load current.

Cycle 100 ms

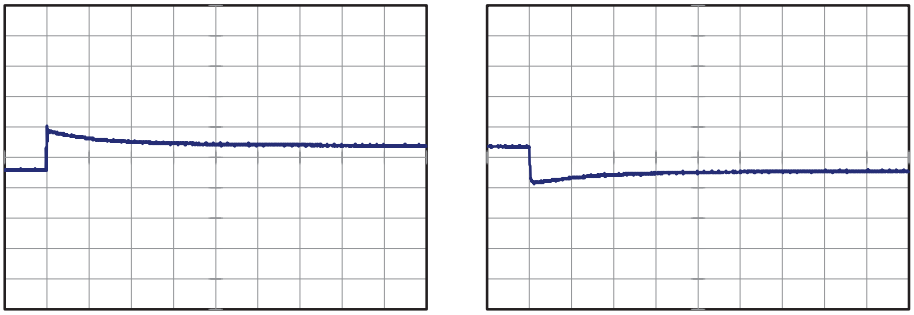
Min.Load (0A)←→
Load 100% (0.42A)



200 mV/div

4 ms/div 4 ms/div

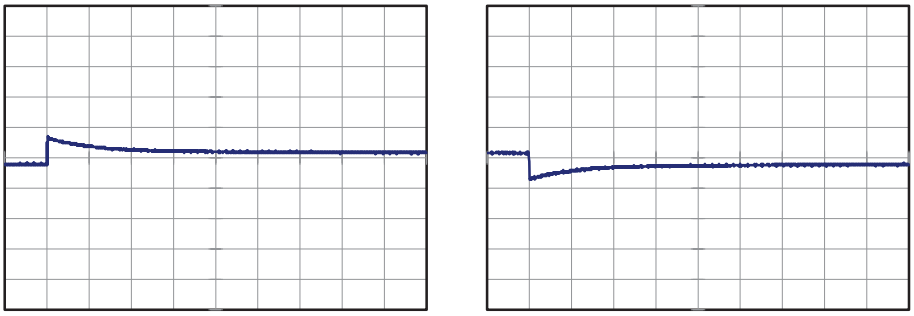
Min.Load (0A)←→
Load 50% (0.21A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.21A)←→
Load 100% (0.42A)



200 mV/div

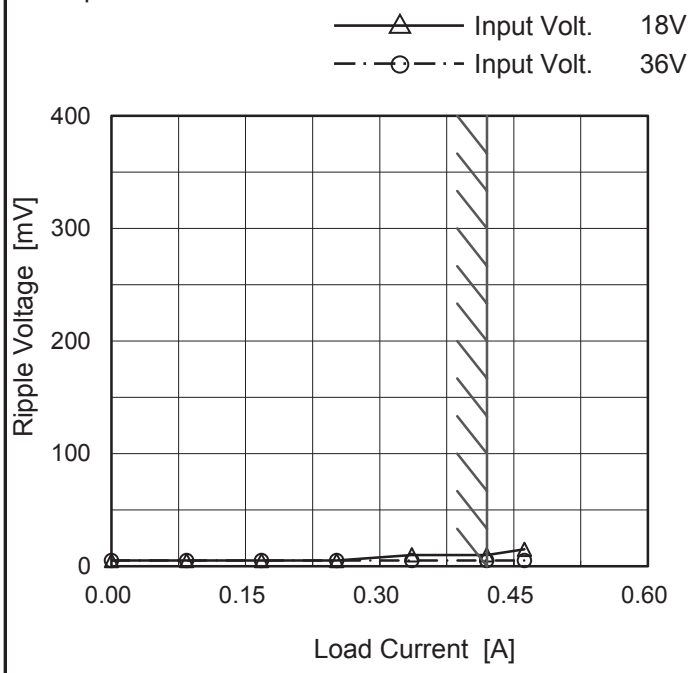
4 ms/div 4 ms/div

COSEL

Model	MGW102412
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]

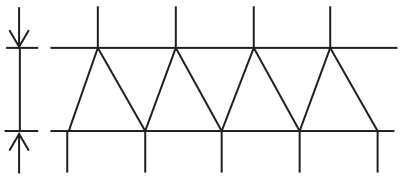


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	5
0.084	5	5
0.168	5	5
0.252	5	5
0.336	10	5
0.420	10	5
0.462	15	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

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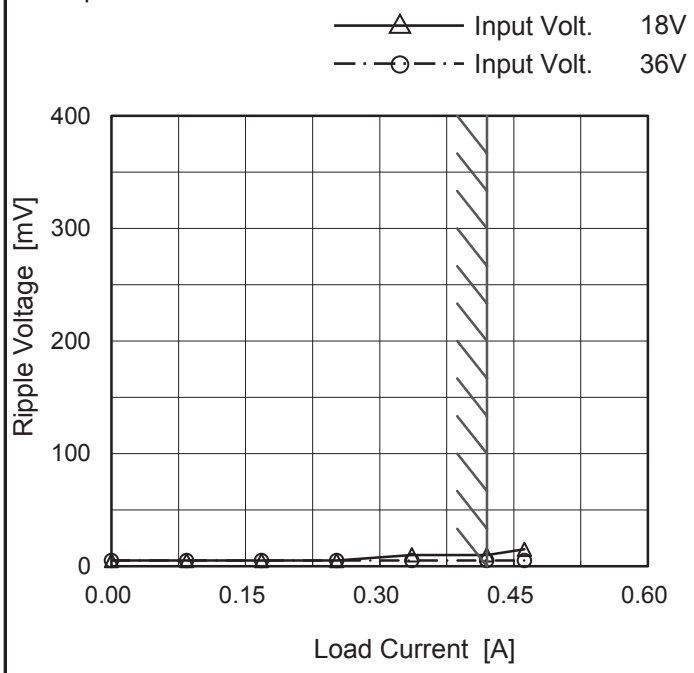
COSEL

Model	MGW102412
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]

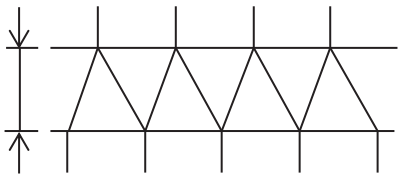


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	5
0.084	5	5
0.168	5	5
0.252	5	5
0.336	10	5
0.420	10	5
0.462	15	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

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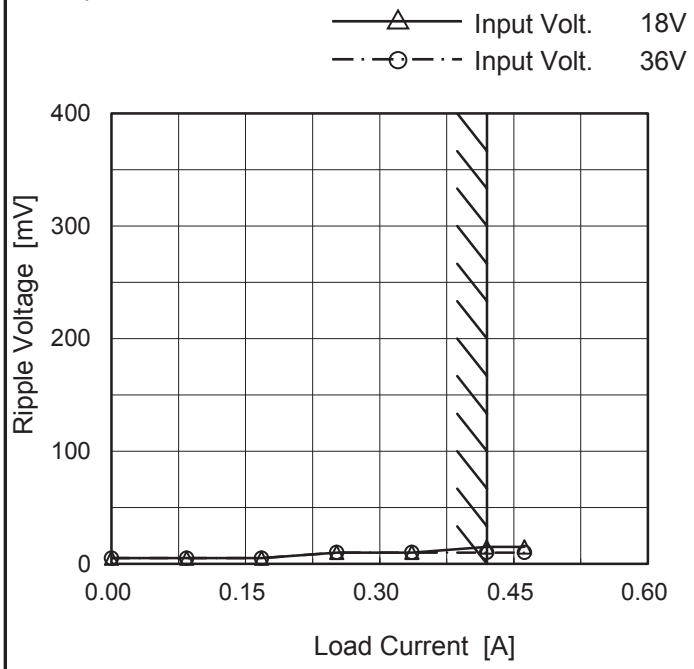
COSEL

Model	MGW102412
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]

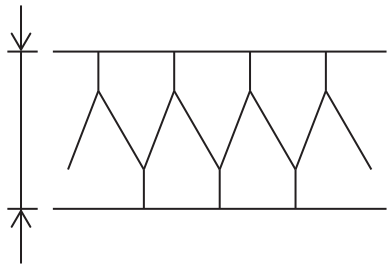


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	5
0.084	5	5
0.168	5	5
0.252	10	10
0.336	10	10
0.420	15	10
0.462	15	10
--	-	-
--	-	-
--	-	-
--	-	-

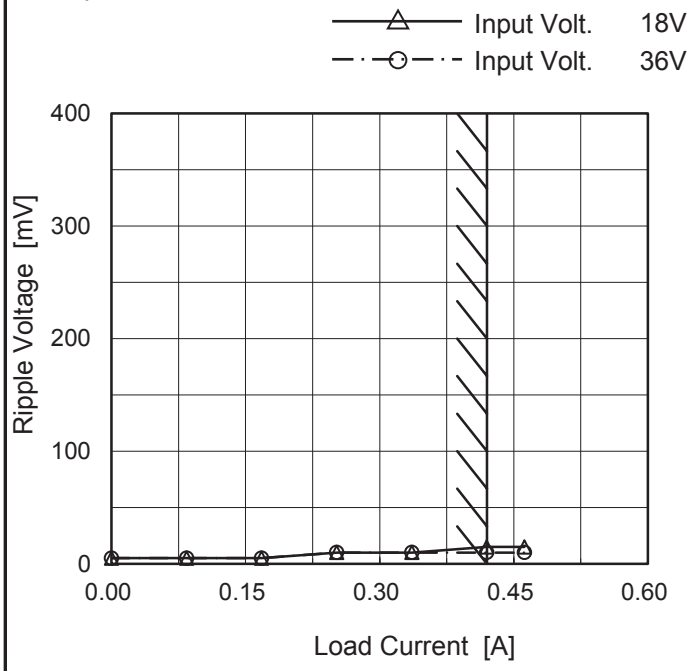
-12V: Rated Load Current

COSEL

Model	MGW102412
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]

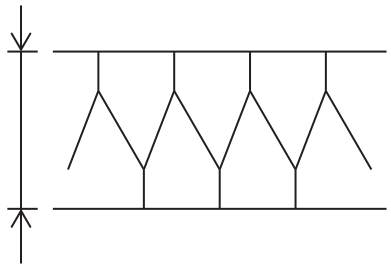


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	5
0.084	5	5
0.168	5	5
0.252	10	10
0.336	10	10
0.420	15	10
0.462	15	10
--	-	-
--	-	-
--	-	-
--	-	-

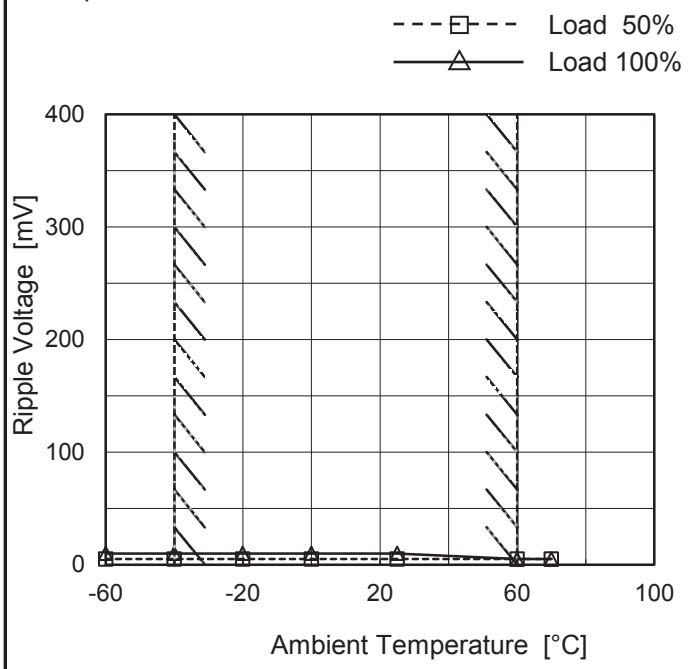
+12V: Rated Load Current

COSEL

Model	MGW102412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.42A

Testing Circuitry Figure B

1.Graph



Input Volt. 24V

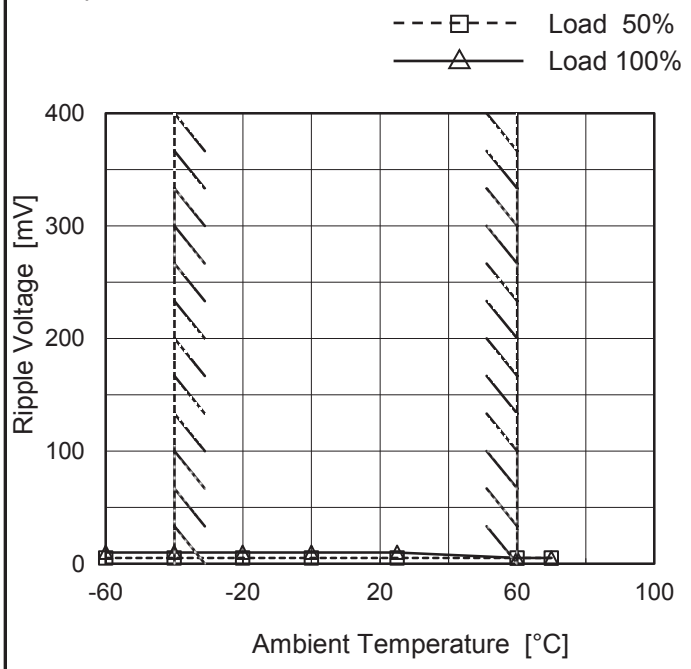
2.Values

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. 24V

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

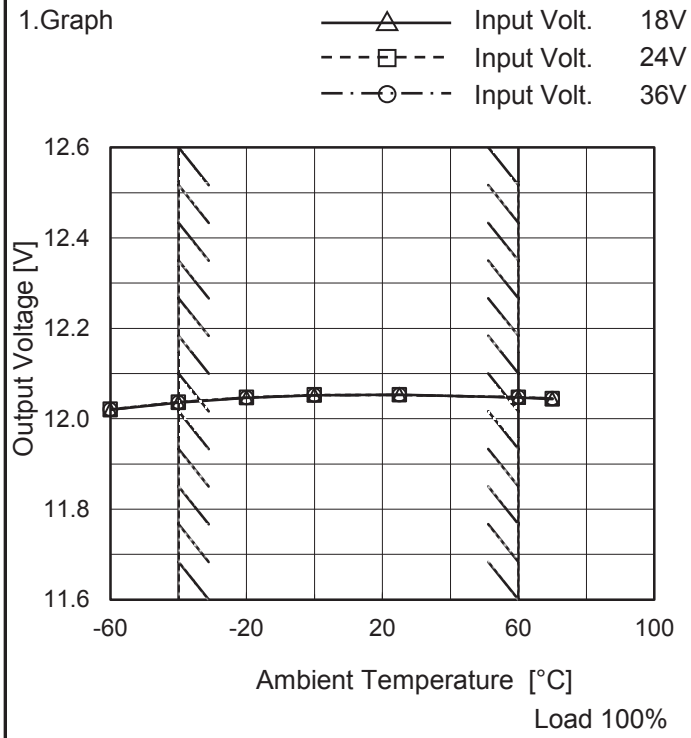
BC-11066

COSEL

Model	MGW102412
Item	Ambient Temperature Drift
Object	+12V0.42A

Testing Circuitry Figure A

1.Graph



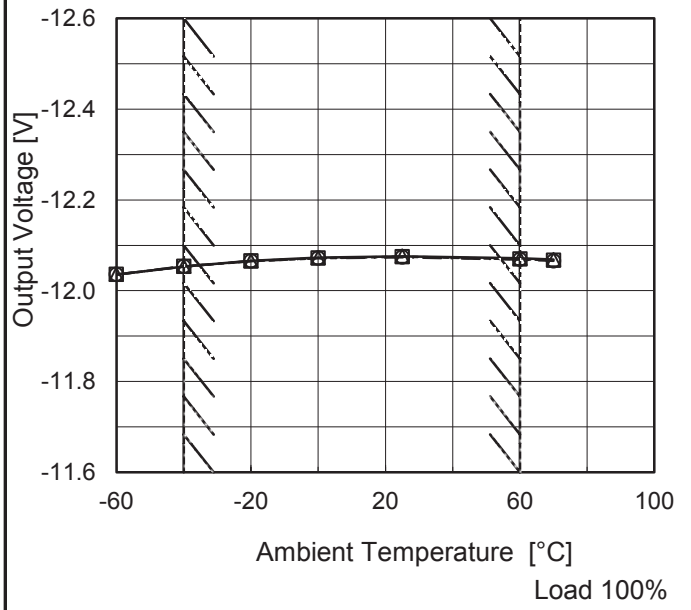
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	12.020	12.021	12.020
-40	12.036	12.037	12.036
-20	12.047	12.047	12.047
0	12.052	12.053	12.052
25	12.053	12.053	12.053
60	12.047	12.048	12.048
70	12.044	12.045	12.045
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	-12.036	-12.036	-12.036
-40	-12.054	-12.053	-12.054
-20	-12.066	-12.065	-12.065
0	-12.073	-12.072	-12.072
25	-12.076	-12.075	-12.074
60	-12.071	-12.070	-12.069
70	-12.069	-12.067	-12.066
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+12V: Rated Load Current

BC-11066

COSEL

Model	MGW102412	
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 : 18 - 36V

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	18	0	12.356	±313	±2.6
Minimum Voltage	60	18	0.42	11.730		

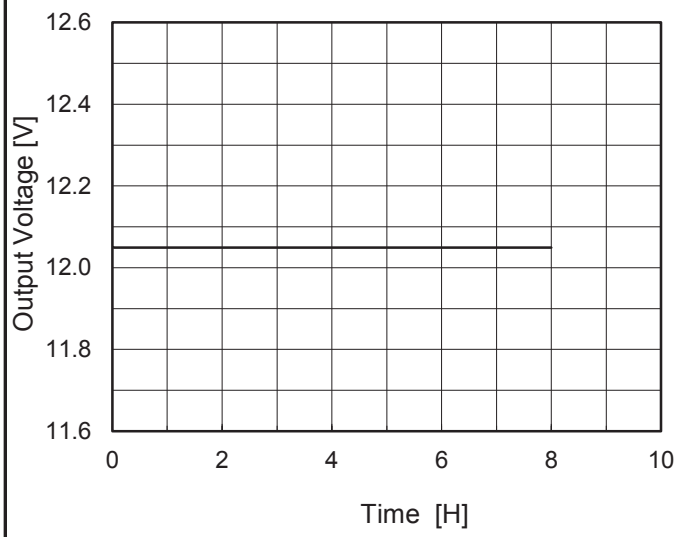
Object	-12V0.42A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	18	0	-12.390	±312	±2.6
Minimum Voltage	60	18	0.42	-11.766		

COSEL

Model	MGW102412
Item	Time Lapse Drift
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 24V
Load 100%

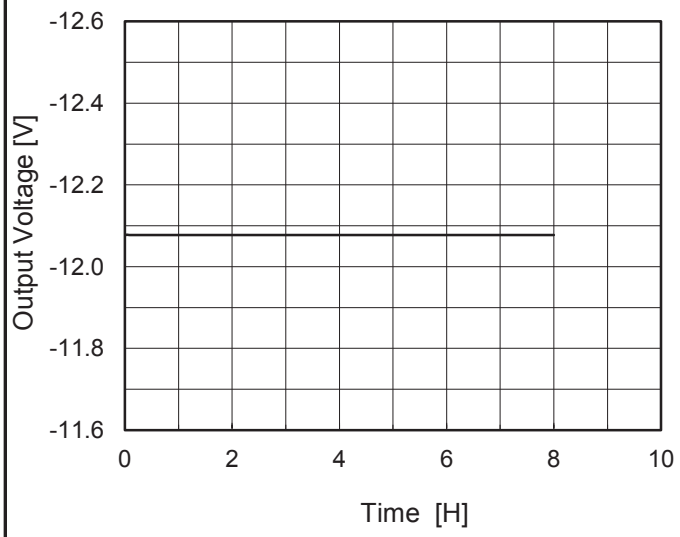
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.050
0.5	12.049
1.0	12.049
2.0	12.049
3.0	12.049
4.0	12.049
5.0	12.049
6.0	12.049
7.0	12.050
8.0	12.049

-12V: Rated Load Current

Object	-12V0.42A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.076
0.5	-12.077
1.0	-12.077
2.0	-12.078
3.0	-12.078
4.0	-12.077
5.0	-12.078
6.0	-12.077
7.0	-12.077
8.0	-12.077

+12V: Rated Load Current

BC-11066

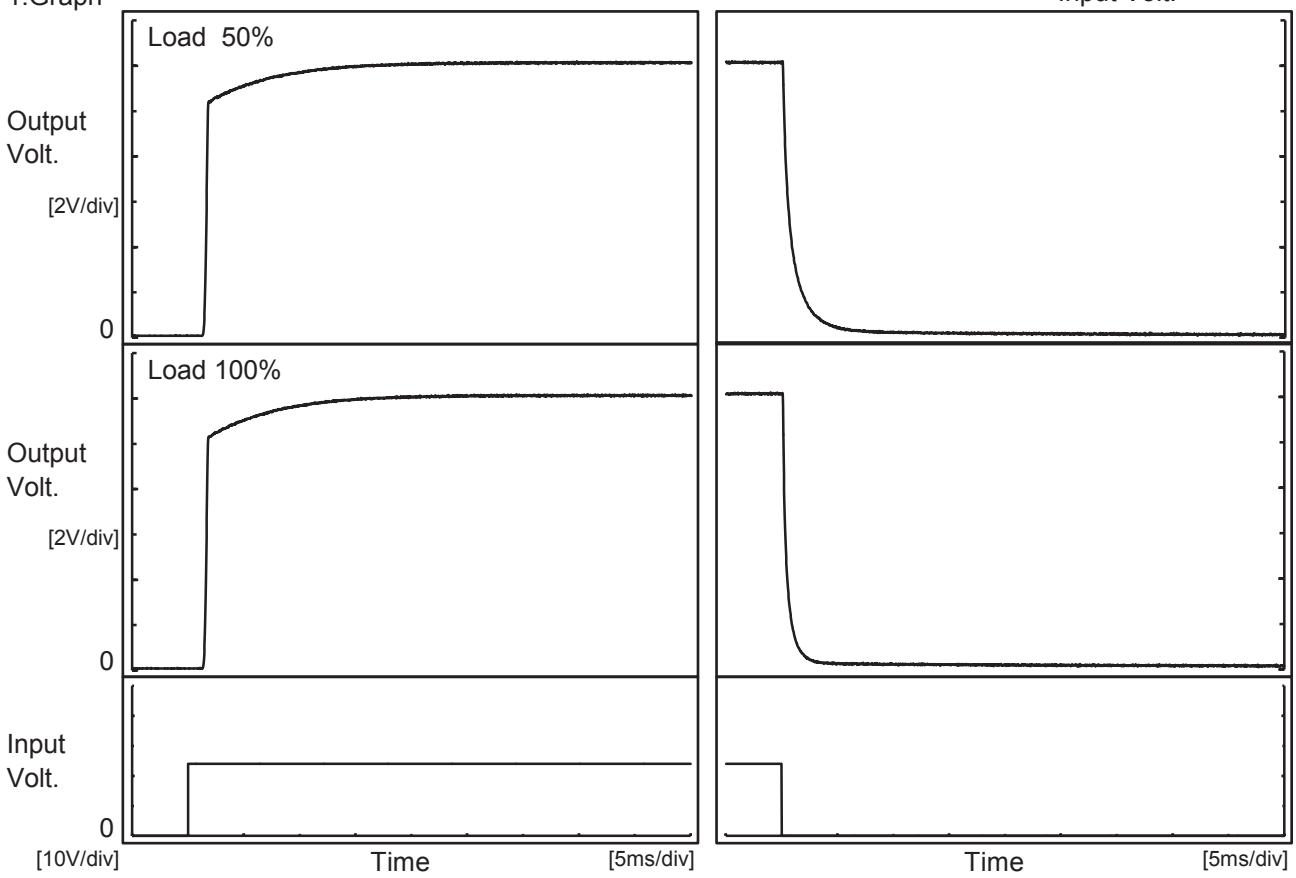
COSEL

Model	MGW102412
Item	Rise and Fall Time
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

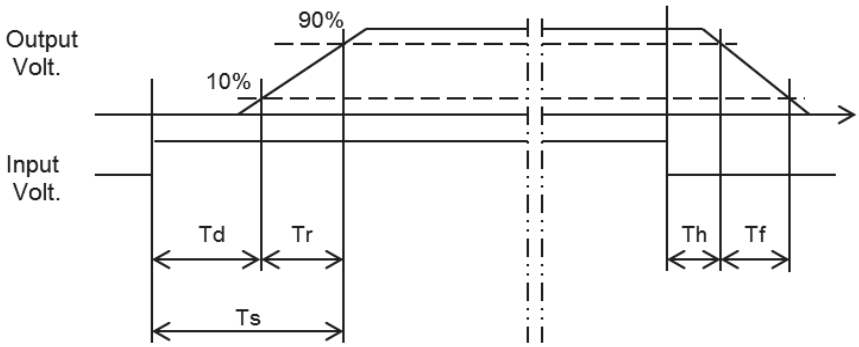
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	2.2	3.7	0.2	2.4
100 %	1.5	2.7	4.2	0.1	1.1



BC-11066

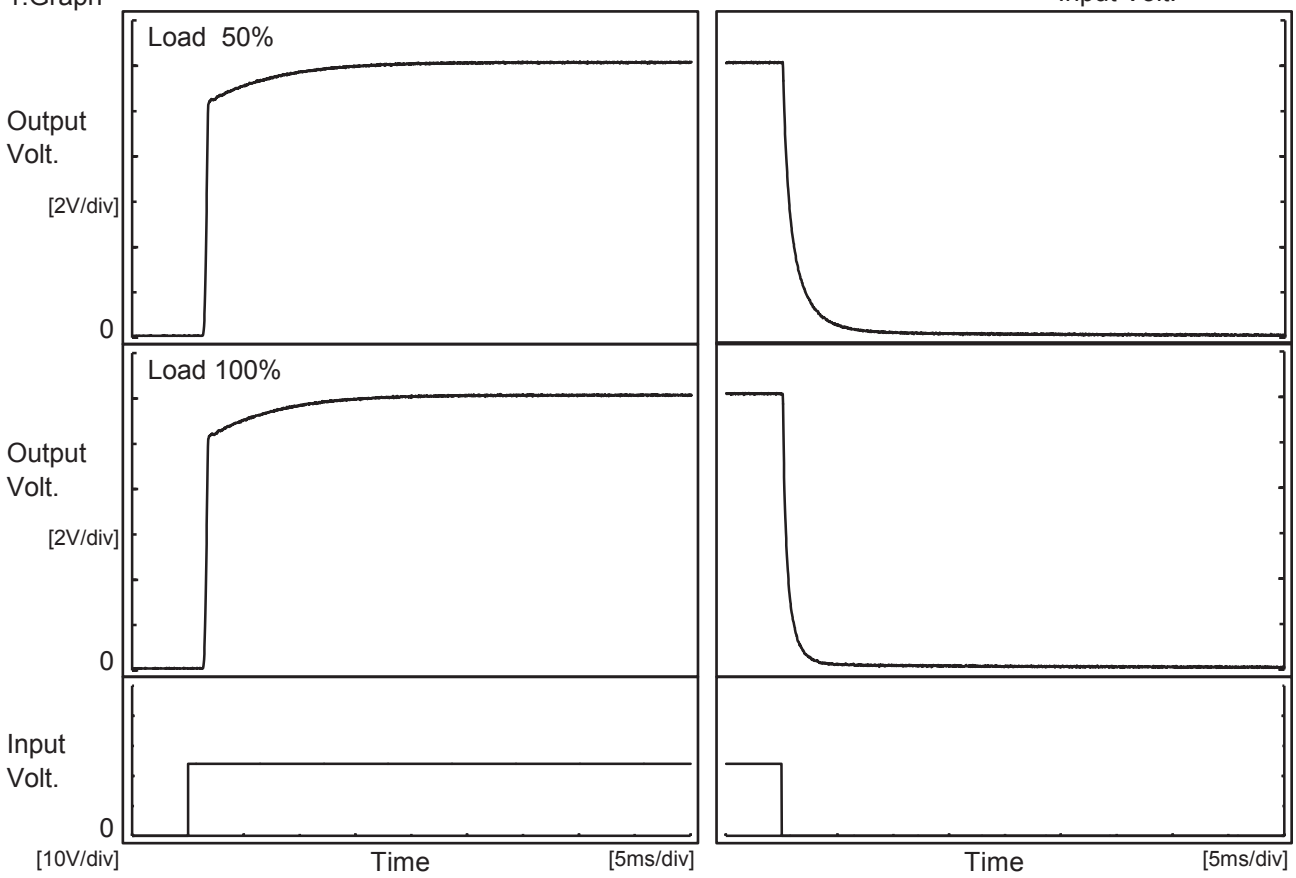
COSEL

Model	MGW102412
Item	Rise and Fall Time
Object	-12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

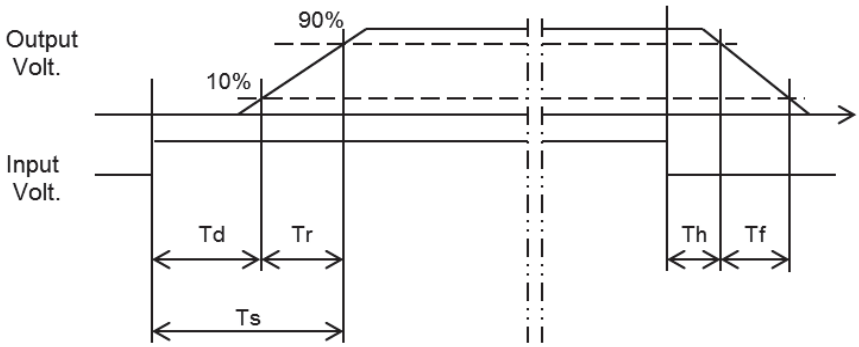
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	2.1	3.6	0.2	2.8
100 %	1.5	2.6	4.1	0.1	1.3



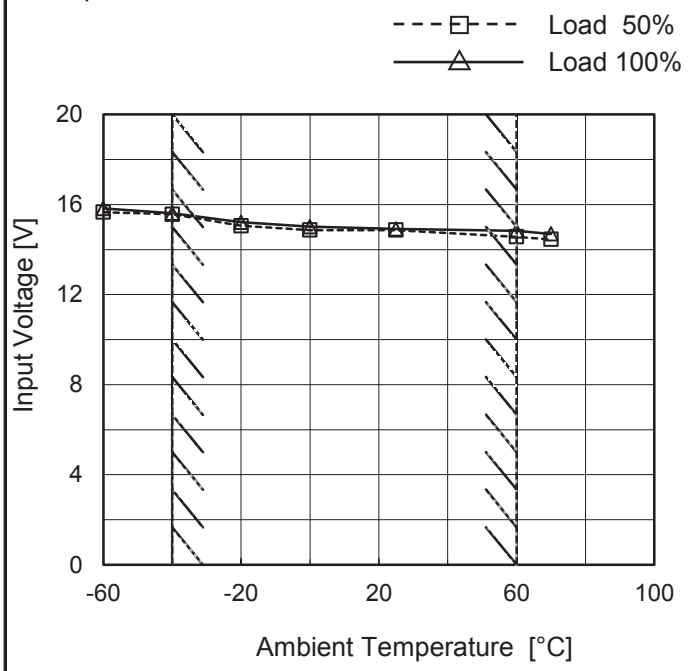
BC-11066

COSEL

Model	MGW102412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.42A

Testing Circuitry Figure A

1.Graph

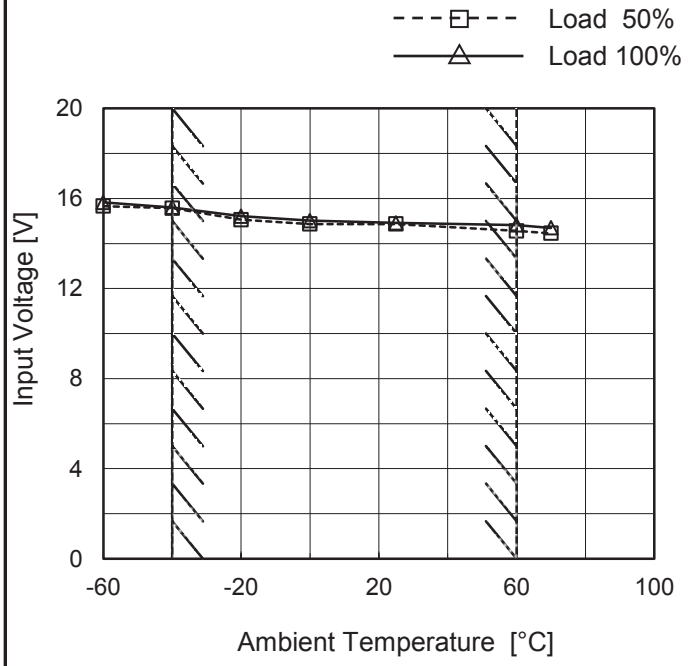


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.7	15.9
-40	15.6	15.6
-20	15.1	15.3
0	14.9	15.1
25	14.9	15.0
60	14.6	14.9
70	14.5	14.7
--	-	-
--	-	-
--	-	-
--	-	-

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	15.7	15.9
-40	15.6	15.6
-20	15.1	15.3
0	14.9	15.1
25	14.9	15.0
60	14.6	14.9
70	14.5	14.7
--	-	-
--	-	-
--	-	-
--	-	-

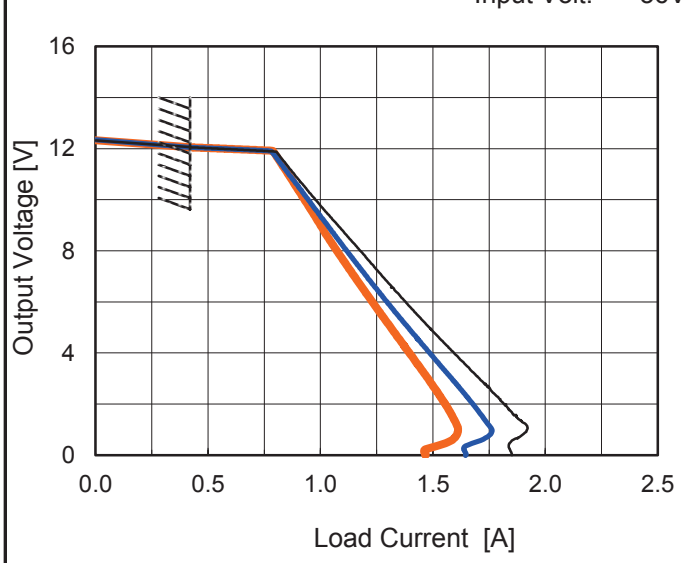
BC-11066

COSEL

Model	MGW102412
Item	Overcurrent Protection
Object	+12V0.42A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



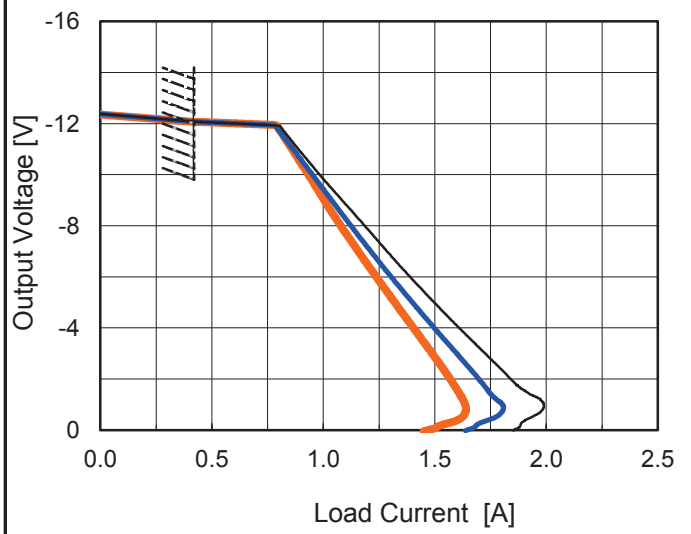
2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
11.4	0.85	0.83	0.83
10.8	0.90	0.87	0.87
9.6	1.01	0.98	0.96
8.4	1.14	1.08	1.04
7.2	1.26	1.19	1.13
6.0	1.37	1.29	1.23
4.8	1.50	1.41	1.33
3.6	1.64	1.52	1.43
2.4	1.77	1.64	1.52
1.2	1.91	1.75	1.60
0.0	1.85	1.65	1.47
--	-	-	-

-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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-11.4	0.85	0.83	0.83
-10.8	0.91	0.88	0.87
-9.6	1.02	0.98	0.96
-8.4	1.14	1.09	1.05
-7.2	1.26	1.19	1.14
-6.0	1.39	1.30	1.24
-4.8	1.52	1.42	1.33
-3.6	1.65	1.54	1.44
-2.4	1.79	1.66	1.54
-1.2	1.97	1.78	1.63
0.0	1.85	1.64	1.45
--	-	-	-

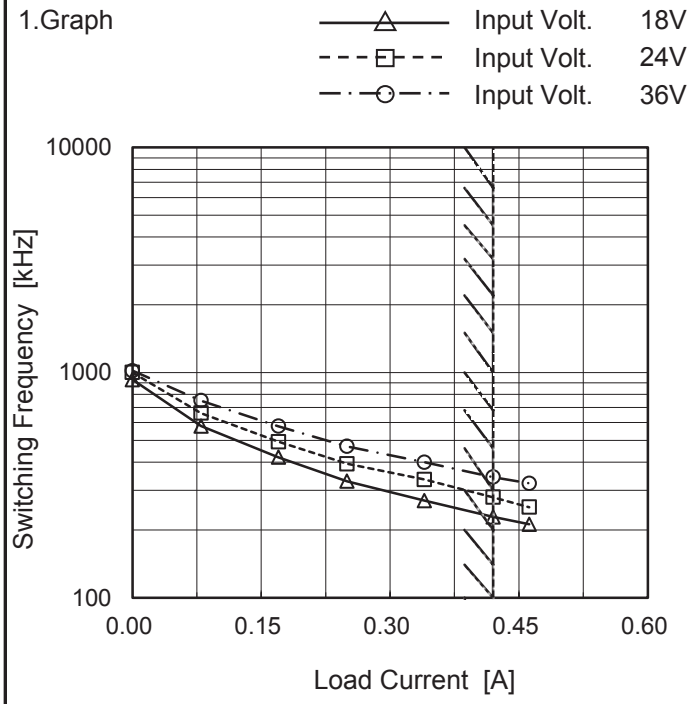
+12V: Rated Load Current

COSEL

Model	MGW102412
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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	930	1002	1020
0.080	579	661	751
0.170	420	493	578
0.250	329	393	470
0.340	270	335	400
0.420	229	279	343
0.462	212	253	322
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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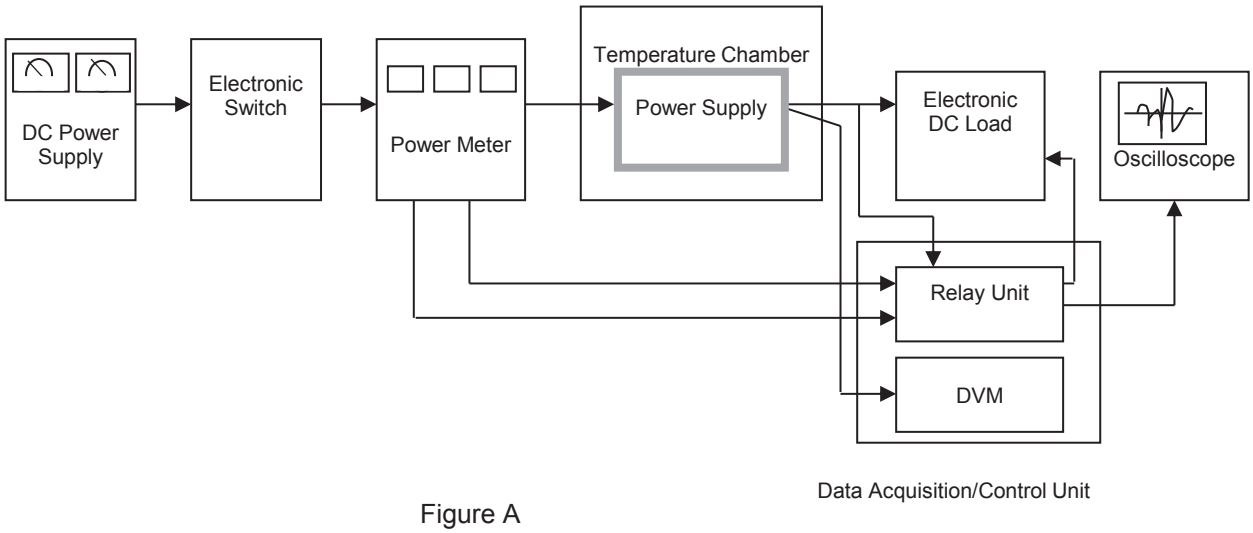

Figure A

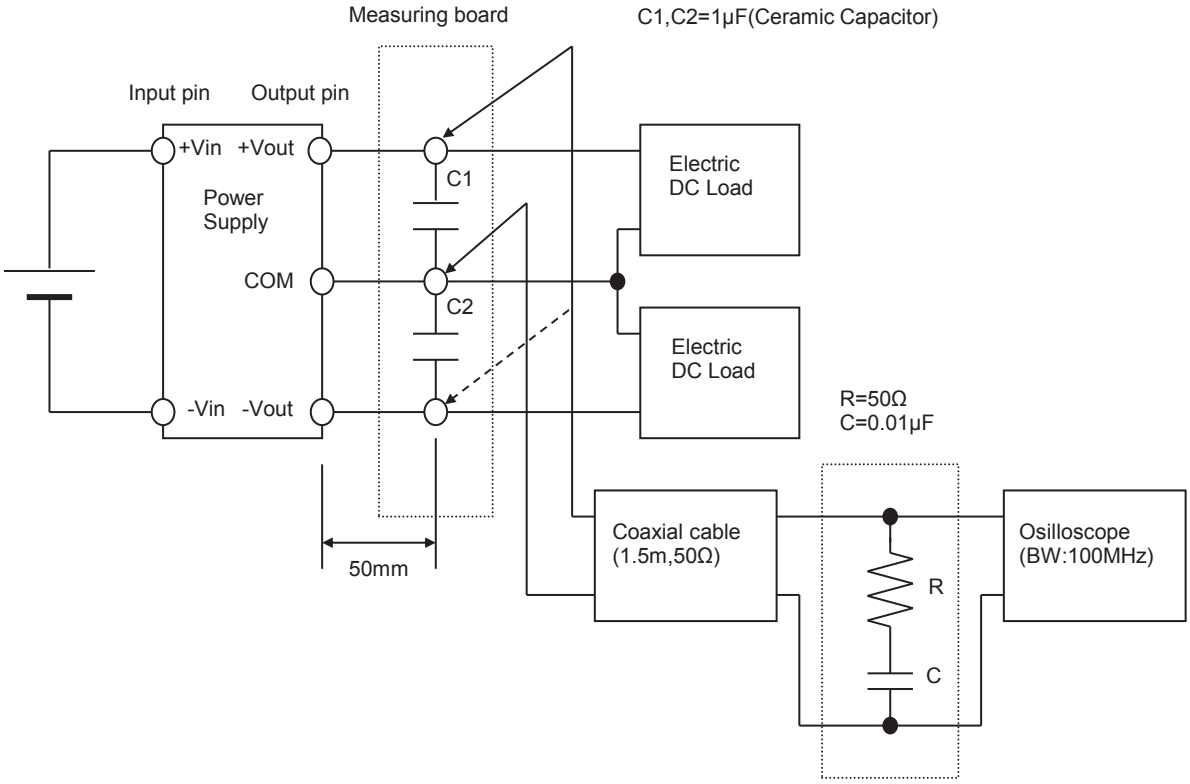

Figure B（Ripple and Ripple noise Characteristic）