COSEL

参考資料

TEST DATA OF MGW61215

Regulated DC Power Supply
November 1, 2016

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

参考資料

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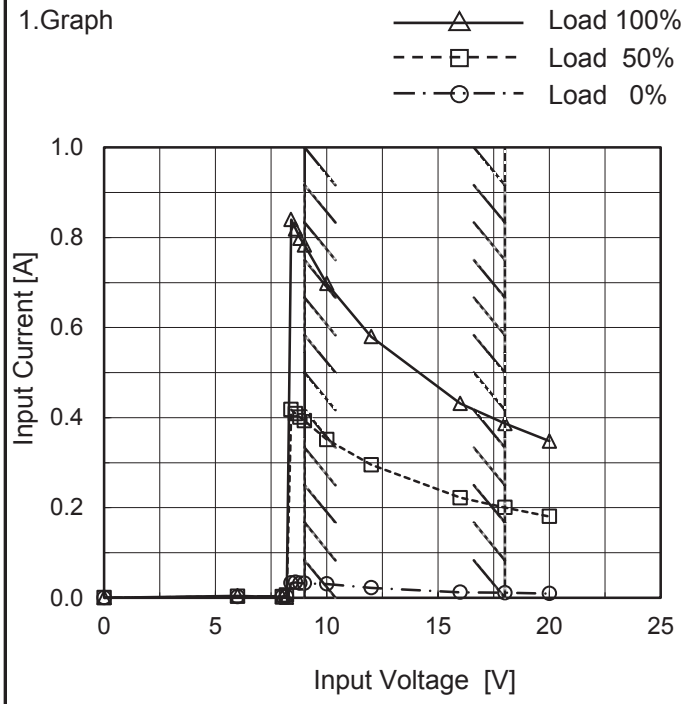
COSEL

Model	MGW61215
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
6.0	0.003	0.003	0.004
8.0	0.003	0.003	0.001
8.2	0.003	0.006	0.001
8.4	0.033	0.418	0.840
8.6	0.034	0.409	0.819
8.8	0.033	0.401	0.798
9.0	0.032	0.393	0.783
10.0	0.031	0.352	0.698
12.0	0.022	0.295	0.580
16.0	0.012	0.222	0.431
18.0	0.011	0.201	0.387
20.0	0.009	0.181	0.348
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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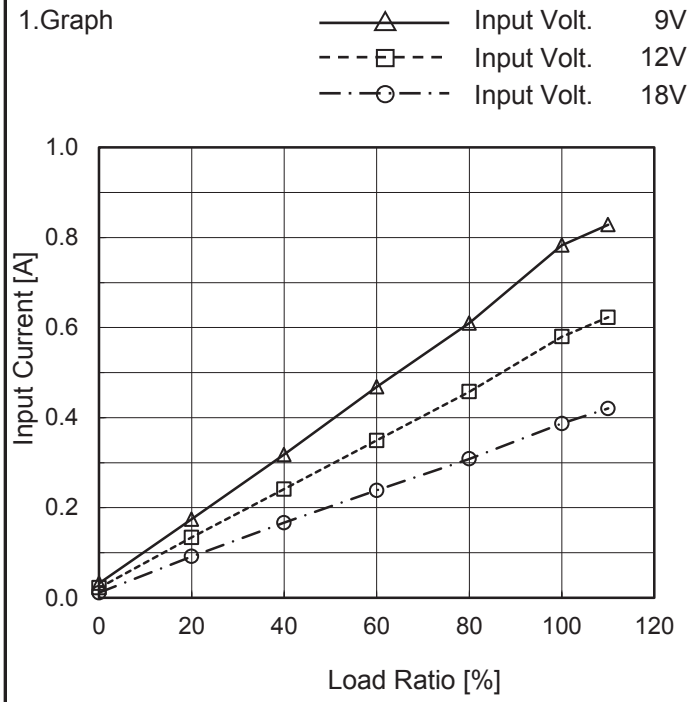
COSEL

Model	MGW61215
Item	Input Current (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

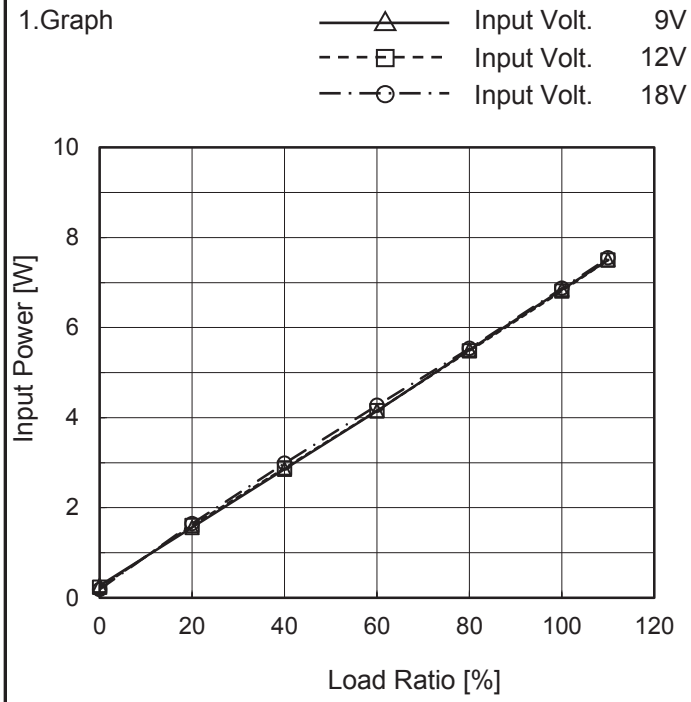
Load Ratio [%]	Input Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	0.032	0.022	0.011
20	0.175	0.134	0.092
40	0.318	0.241	0.167
60	0.468	0.349	0.239
80	0.610	0.458	0.308
100	0.783	0.580	0.387
110	0.828	0.623	0.420
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW61215
Item	Input Power (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

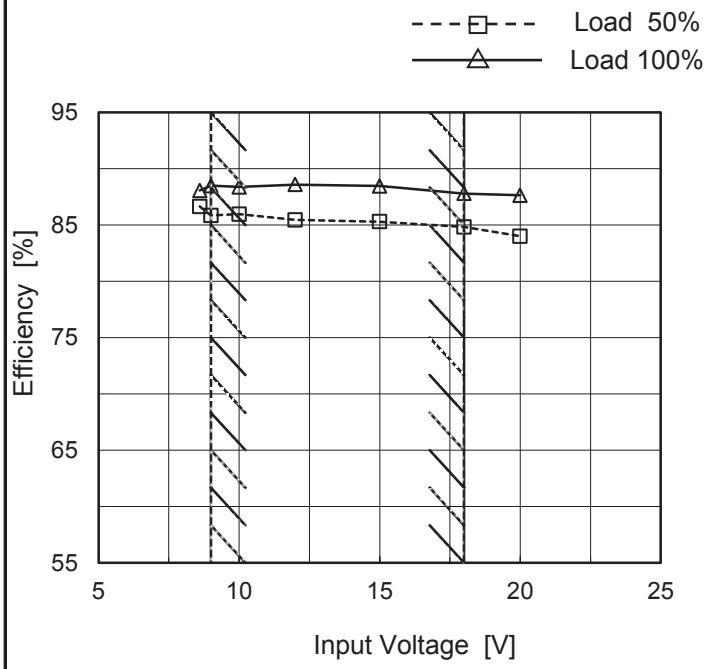
Load Ratio [%]	Input Power [W]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	0.27	0.23	0.18
20	1.56	1.60	1.65
40	2.85	2.88	2.98
60	4.15	4.15	4.27
80	5.51	5.48	5.54
100	6.84	6.81	6.87
110	7.50	7.50	7.55
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW61215
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%
8.6	86.6	88.1
9.0	85.9	88.5
10.0	86.0	88.4
12.0	85.5	88.6
15.0	85.3	88.5
18.0	84.8	87.8
20.0	84.0	87.6
--	-	-
--	-	-

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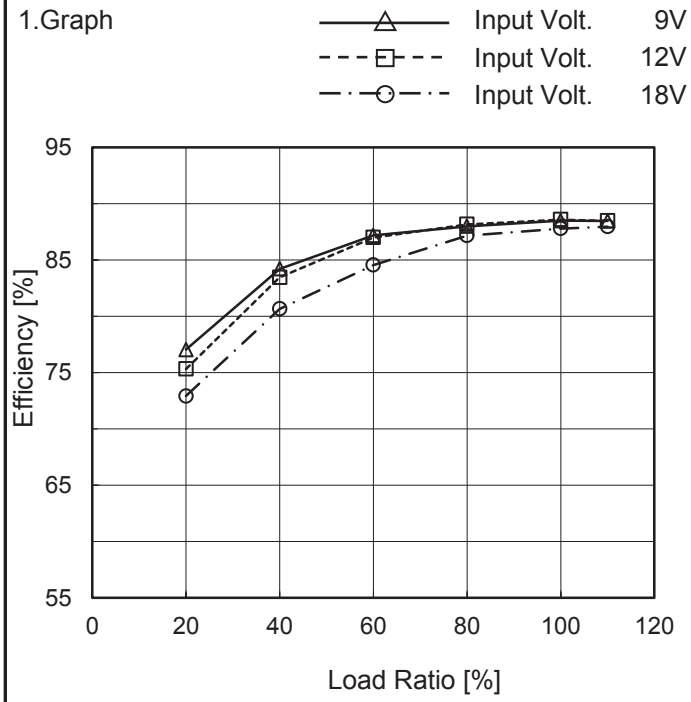
COSEL

Model	MGW61215
Item	Efficiency (by Load Ratio)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	-	-	-
20	77.0	75.3	72.9
40	84.2	83.5	80.7
60	87.2	87.0	84.6
80	88.0	88.2	87.2
100	88.5	88.6	87.8
110	88.5	88.5	88.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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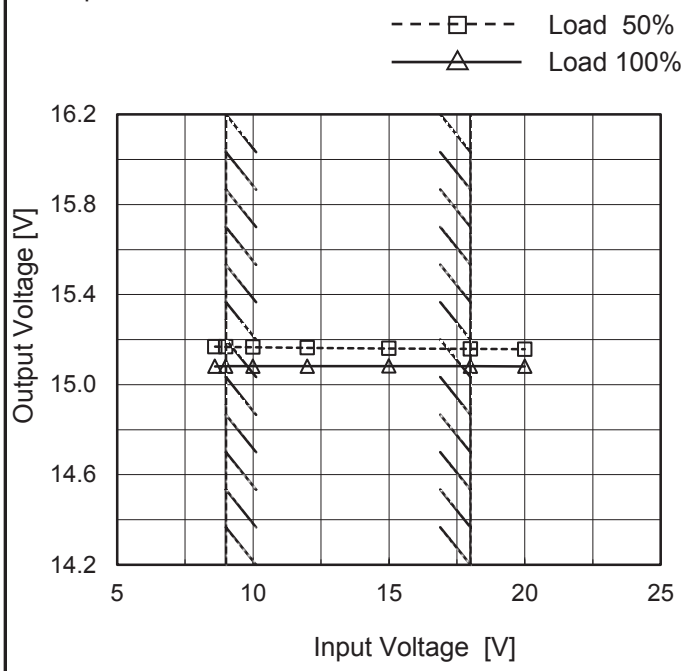
Model	MGW61215
Item	Line Regulation
Object	+15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



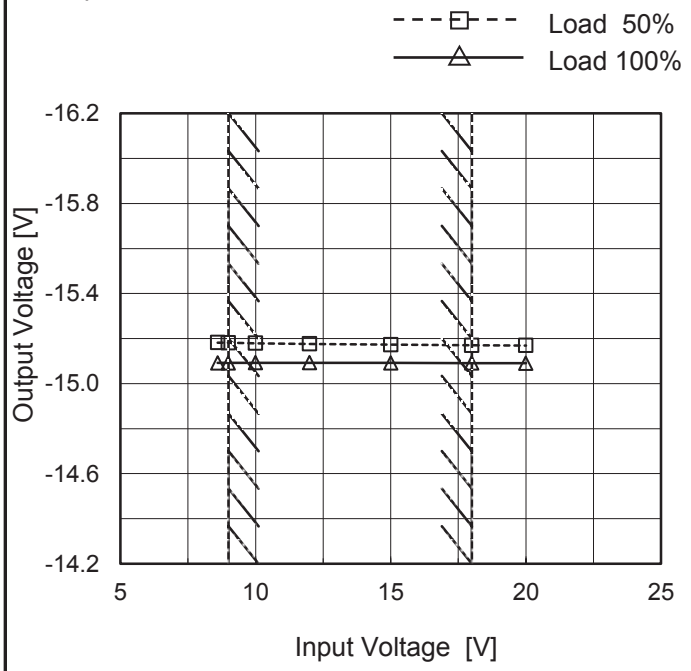
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	15.169	15.081
9.0	15.168	15.082
10.0	15.167	15.082
12.0	15.164	15.082
15.0	15.161	15.083
18.0	15.159	15.082
20.0	15.157	15.081
--	-	-
--	-	-

-15V: Rated Load Current

Object	-15V0.2A

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%
8.6	-15.182	-15.092
9.0	-15.182	-15.092
10.0	-15.179	-15.092
12.0	-15.176	-15.092
15.0	-15.173	-15.092
18.0	-15.170	-15.091
20.0	-15.169	-15.090
--	-	-
--	-	-

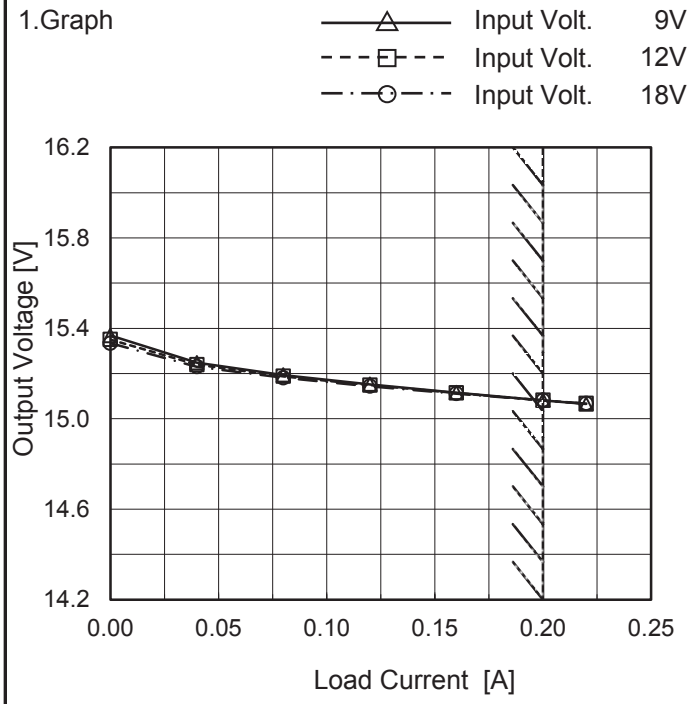
+15V: Rated Load Current

COSEL

Model	MGW61215
Item	Load Regulation
Object	+15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



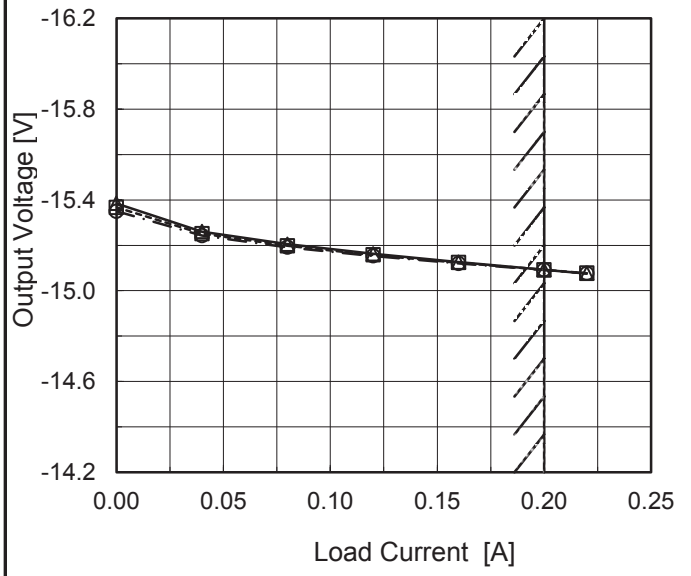
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	15.368	15.351	15.334
0.04	15.248	15.239	15.230
0.08	15.194	15.188	15.181
0.12	15.152	15.149	15.144
0.16	15.116	15.114	15.112
0.20	15.082	15.082	15.082
0.22	15.065	15.067	15.067
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-15V: Rated Load Current

Object	-15V0.2A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V] Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	-15.385	-15.367	-15.350
0.04	-15.260	-15.252	-15.243
0.08	-15.205	-15.198	-15.191
0.12	-15.162	-15.158	-15.153
0.16	-15.126	-15.124	-15.120
0.20	-15.092	-15.092	-15.091
0.22	-15.076	-15.077	-15.077
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+15V: Rated Load Current

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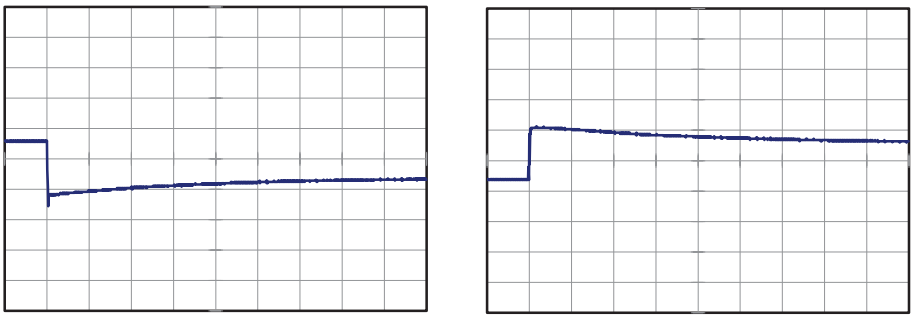
Model	MGW61215	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.2A	

Input Volt. 12 V

-15V:rated load current.

Cycle 100 ms

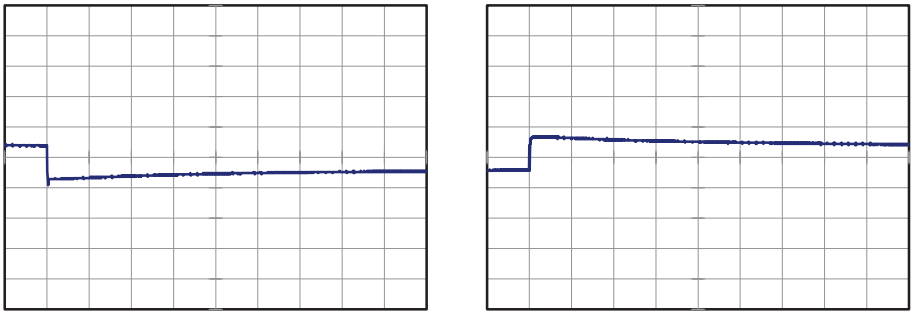
Min.Load (0A)←→
Load 100% (0.2A)



200 mV/div

4 ms/div 4 ms/div

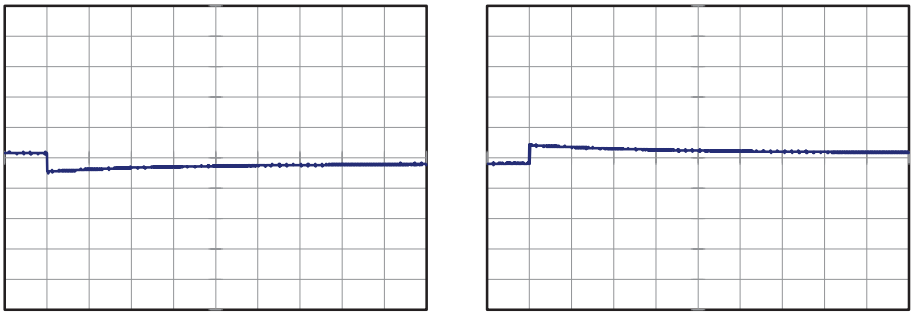
Min.Load (0A)←→
Load 50% (0.1A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.1A)←→
Load 100% (0.2A)



200 mV/div

4 ms/div 4 ms/div

COSEL

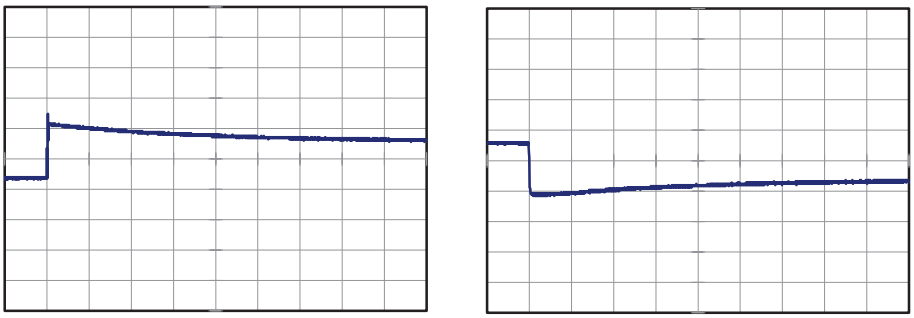
Model	MGW61215	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-15V0.2A	

Input Volt. 12 V

+15V:rated load current.

Cycle 100 ms

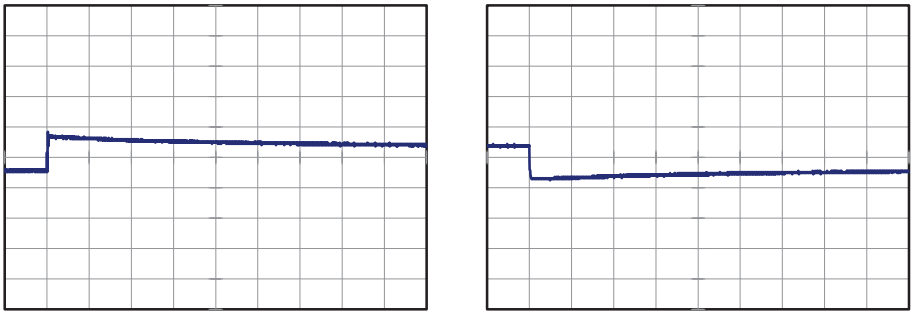
Min.Load (0A)←→
Load 100% (0.2A)



200 mV/div

4 ms/div 4 ms/div

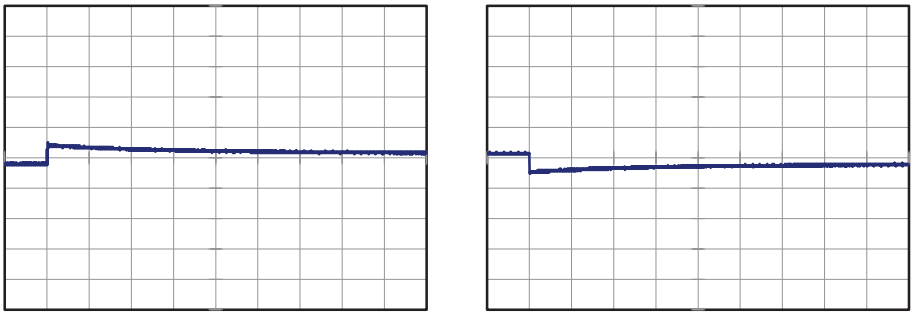
Min.Load (0A)←→
Load 50% (0.1A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.1A)←→
Load 100% (0.2A)



200 mV/div

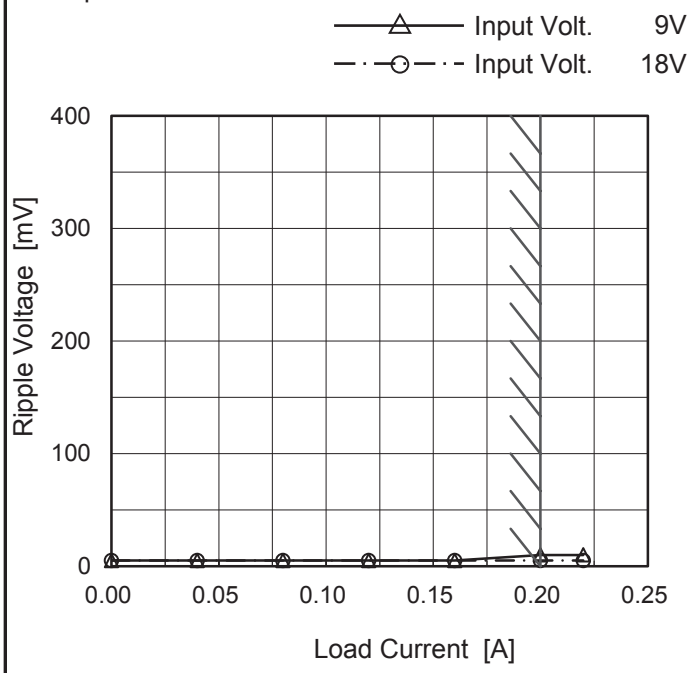
4 ms/div 4 ms/div

COSEL

Model	MGW61215
Item	Ripple Voltage (by Load Current)
Object	+15V0.2A

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]

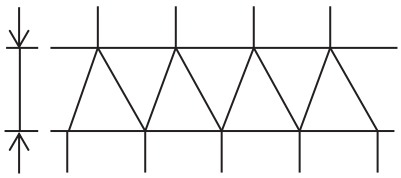


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.00	5	5
0.04	5	5
0.08	5	5
0.12	5	5
0.16	5	5
0.20	10	5
0.22	10	5
--	-	-
--	-	-
--	-	-
--	-	-

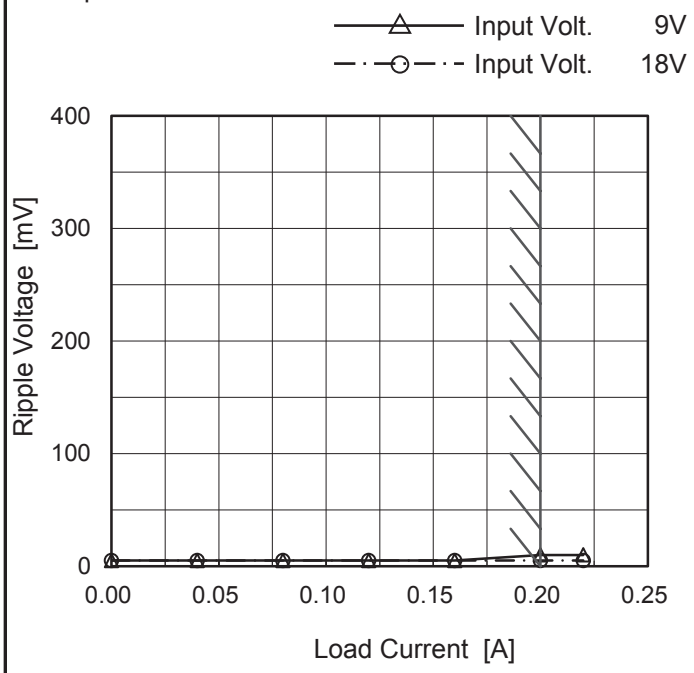
-15V: Rated Load Current

COSEL

Model	MGW61215
Item	Ripple Voltage (by Load Current)
Object	-15V0.2A

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]

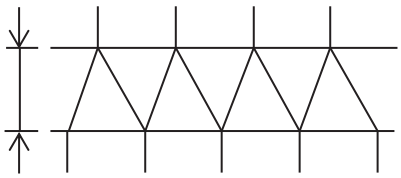


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.00	5	5
0.04	5	5
0.08	5	5
0.12	5	5
0.16	5	5
0.20	10	5
0.22	10	5
--	-	-
--	-	-
--	-	-
--	-	-

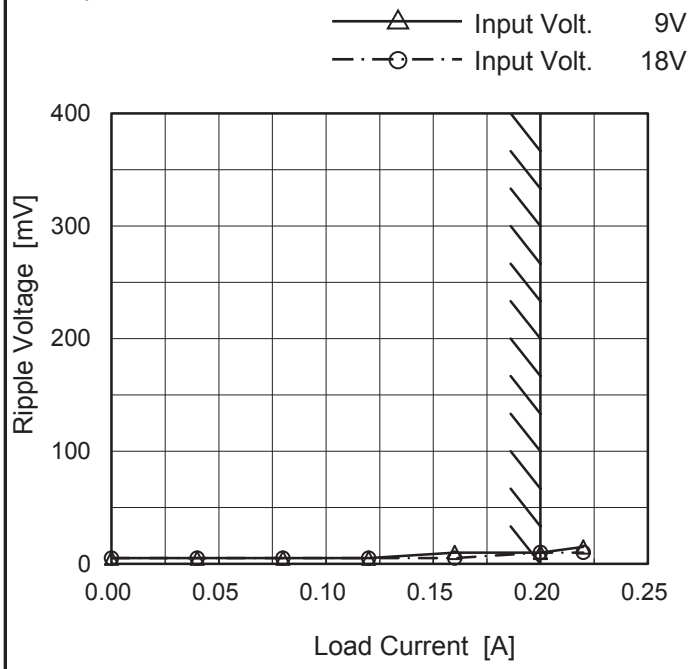
+15V: Rated Load Current

COSEL

Model	MGW61215
Item	Ripple-Noise
Object	+15V0.2A

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]

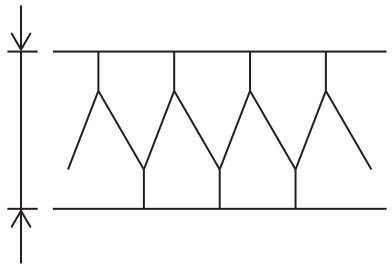


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.00	5	5
0.04	5	5
0.08	5	5
0.12	5	5
0.16	10	5
0.20	10	10
0.22	15	10
--	-	-
--	-	-
--	-	-
--	-	-

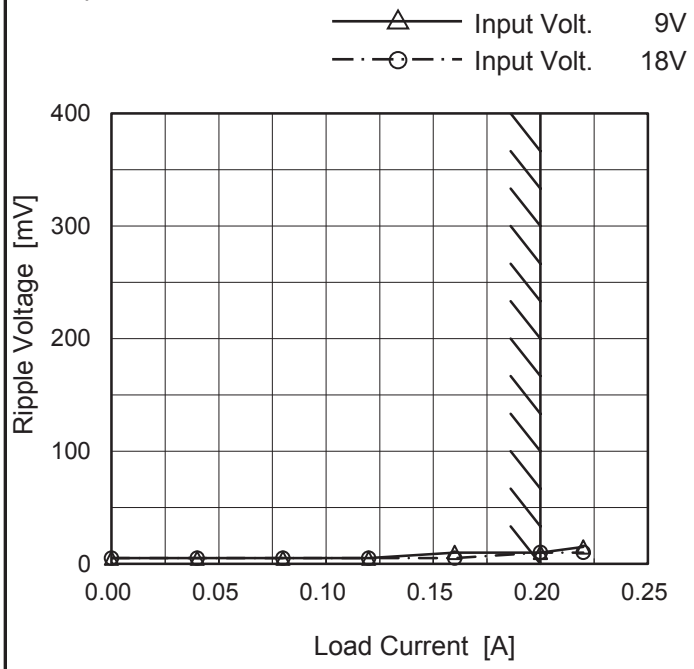
-15V: Rated Load Current

COSEL

Model	MGW61215
Item	Ripple-Noise
Object	-15V0.2A

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]

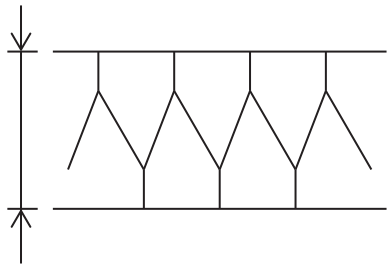


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.00	5	5
0.04	5	5
0.08	5	5
0.12	5	5
0.16	10	5
0.20	10	10
0.22	15	10
--	-	-
--	-	-
--	-	-
--	-	-

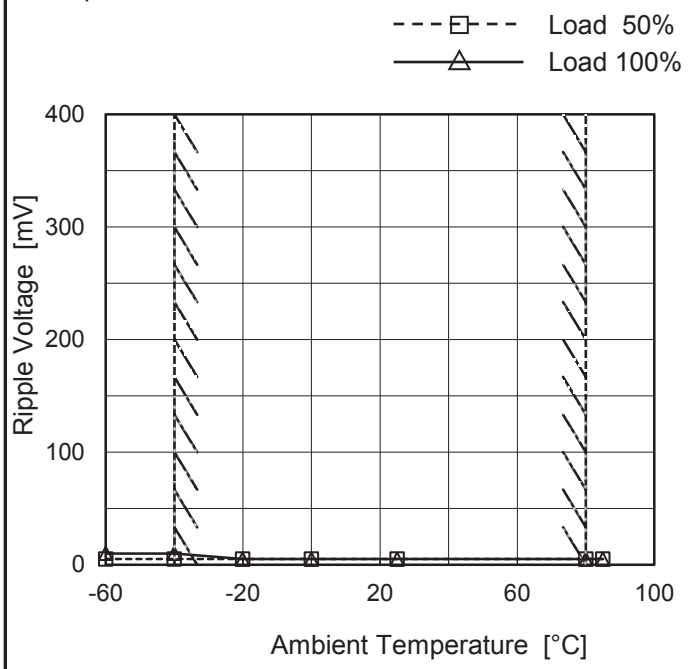
+15V: Rated Load Current

COSEL

Model	MGW61215
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.2A

Testing Circuitry Figure B

1.Graph



Input Volt. 12V

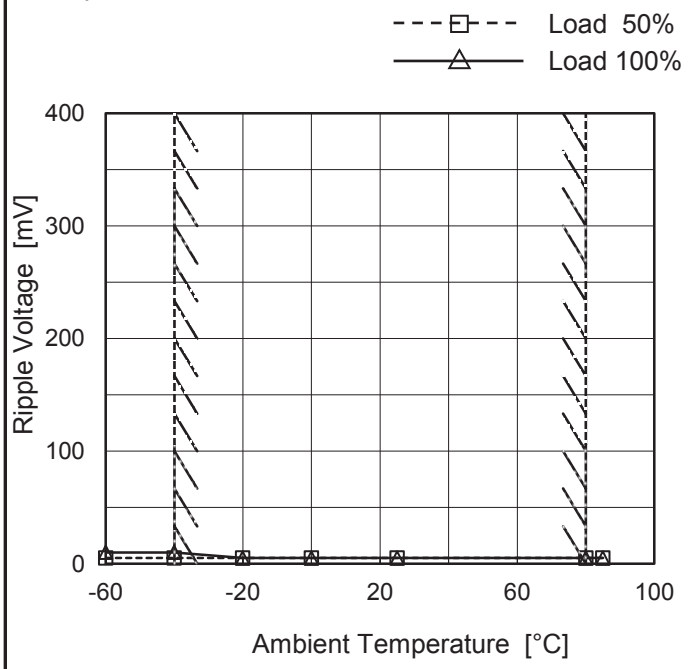
2.Values

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

-15V: Rated Load Current

Object	-15V0.2A

1.Graph



Input Volt. 12V

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	5
0	5	5
25	5	5
80	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

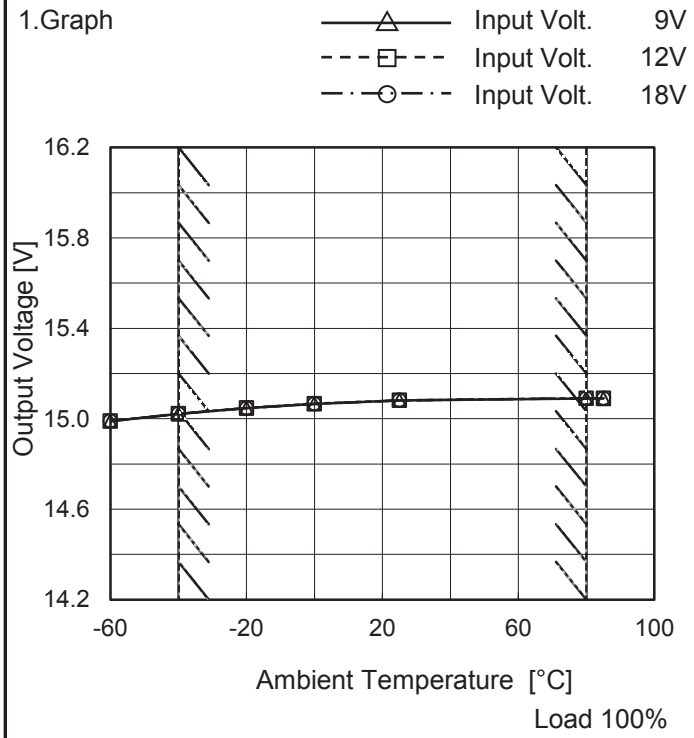
+15V: Rated Load Current

COSEL

Model	MGW61215
Item	Ambient Temperature Drift
Object	+15V0.2A

Testing Circuitry Figure A

1.Graph



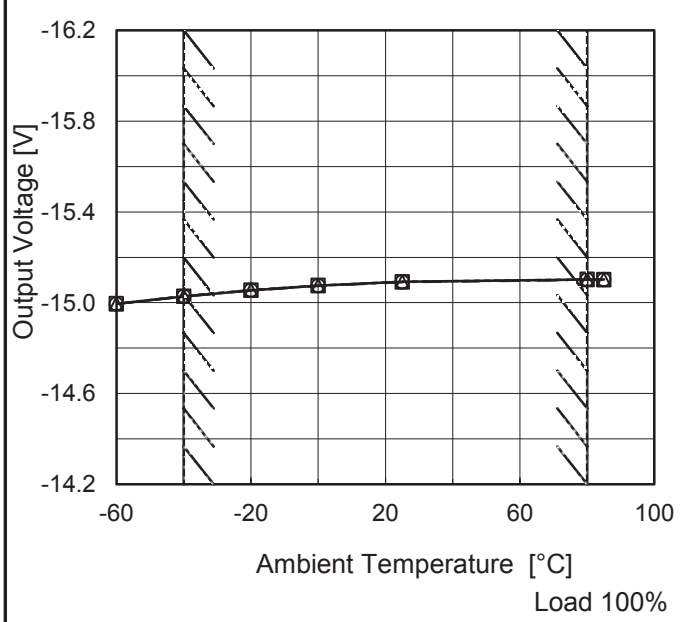
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	14.990	14.991	14.990
-40	15.022	15.022	15.022
-20	15.047	15.048	15.047
0	15.066	15.067	15.066
25	15.082	15.082	15.082
80	15.090	15.091	15.091
85	15.089	15.091	15.090
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-15V: Rated Load Current

Object	-15V0.2A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	-14.995	-14.996	-14.995
-40	-15.028	-15.029	-15.028
-20	-15.055	-15.055	-15.054
0	-15.075	-15.076	-15.074
25	-15.092	-15.092	-15.091
80	-15.102	-15.103	-15.101
85	-15.102	-15.102	-15.101
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+15V: Rated Load Current

COSEL

Model	MGW61215	
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 : 9 - 18V
Load Current (AVR 1) : 0 - 0.2A (AVR 2) : 0 - 0.2A

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

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

2.Values

Object	+15V0.2A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	9	0	15.414	±318	±2.1
Minimum Voltage	80	9	0.2	14.778		

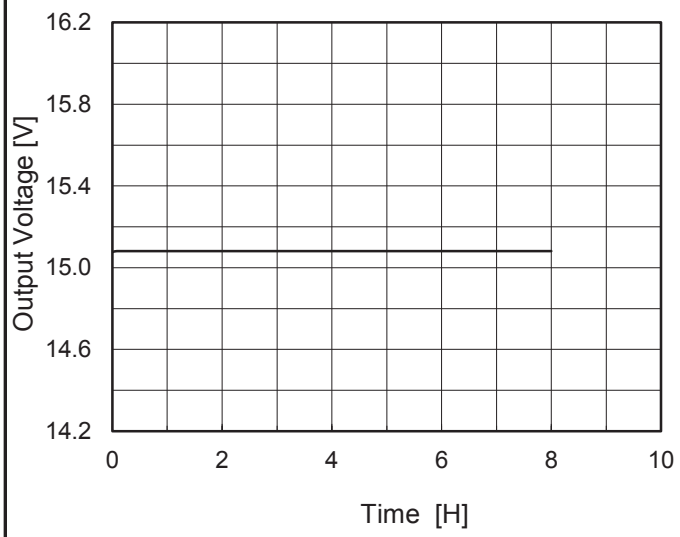
Object	-15V0.2A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	9	0	-15.432	±319	±2.1
Minimum Voltage	80	9	0.2	-14.795		

COSEL

Model	MGW61215
Item	Time Lapse Drift
Object	+15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 12V
Load 100%

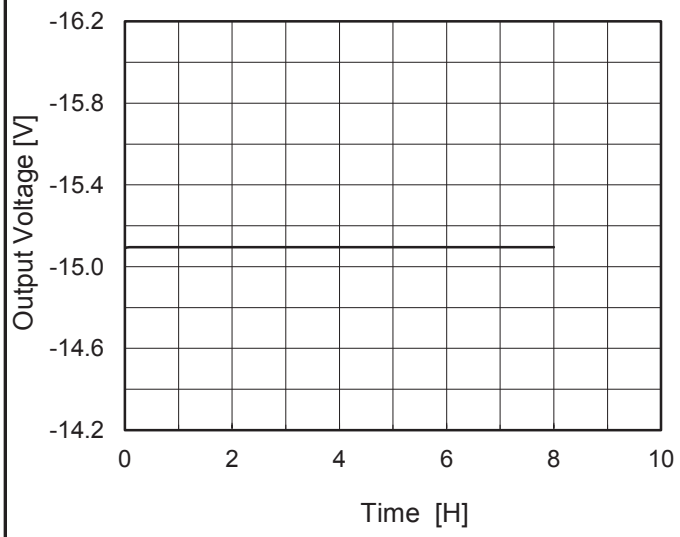
2.Values

Time since start [H]	Output Voltage [V]
0.0	15.076
0.5	15.081
1.0	15.081
2.0	15.081
3.0	15.081
4.0	15.081
5.0	15.081
6.0	15.081
7.0	15.081
8.0	15.081

-15V: Rated Load Current

Object	-15V0.2A

1.Graph



Input Volt. 12V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-15.089
0.5	-15.095
1.0	-15.095
2.0	-15.095
3.0	-15.095
4.0	-15.095
5.0	-15.095
6.0	-15.095
7.0	-15.095
8.0	-15.095

+15V: Rated Load Current

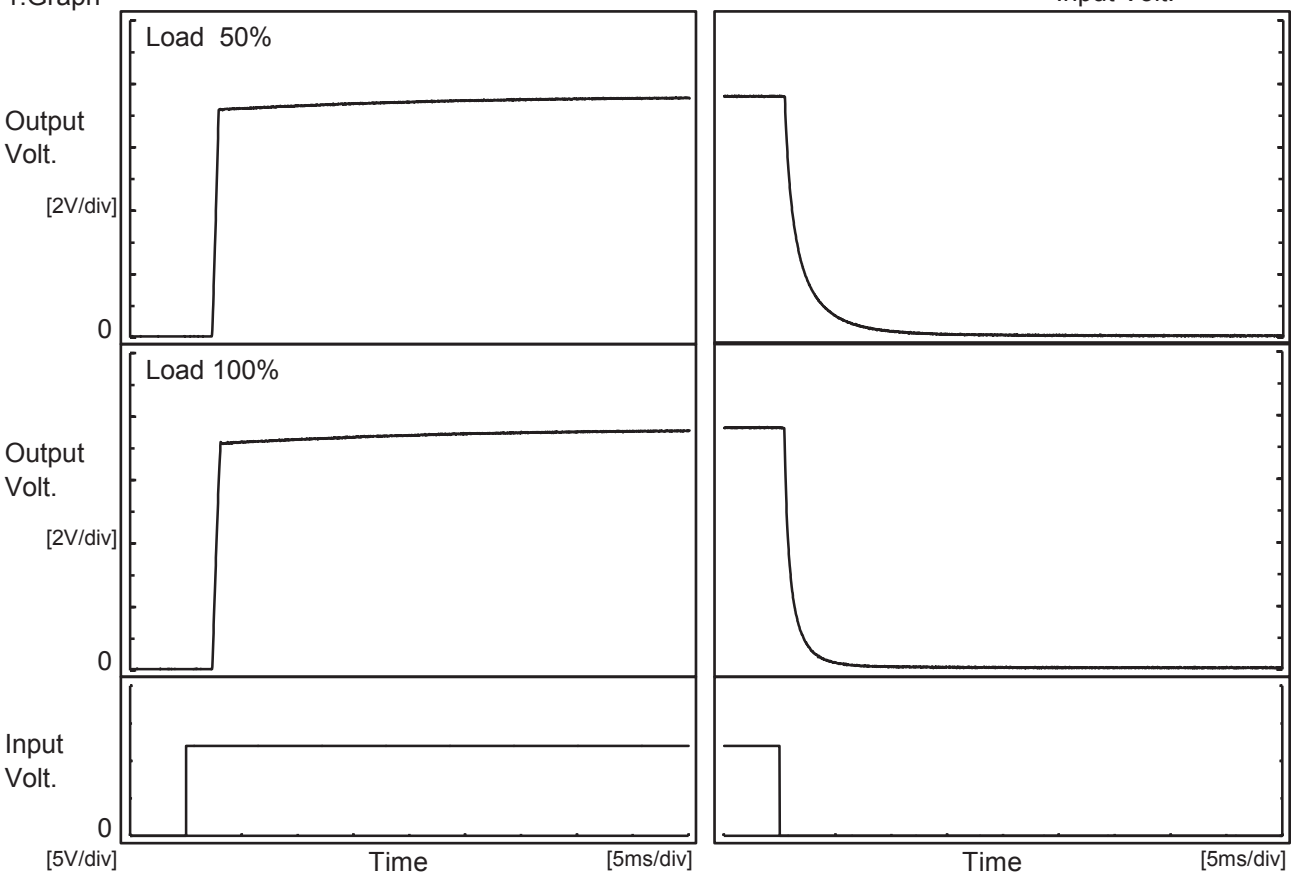
COSEL

Model	MGW61215
Item	Rise and Fall Time
Object	+15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

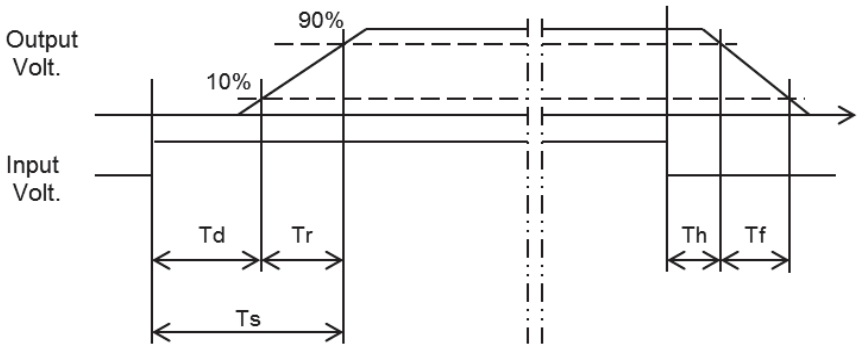
Input Volt. 12 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.4	0.5	2.9	0.5	4.0
100 %	2.4	0.6	3.0	0.5	1.9



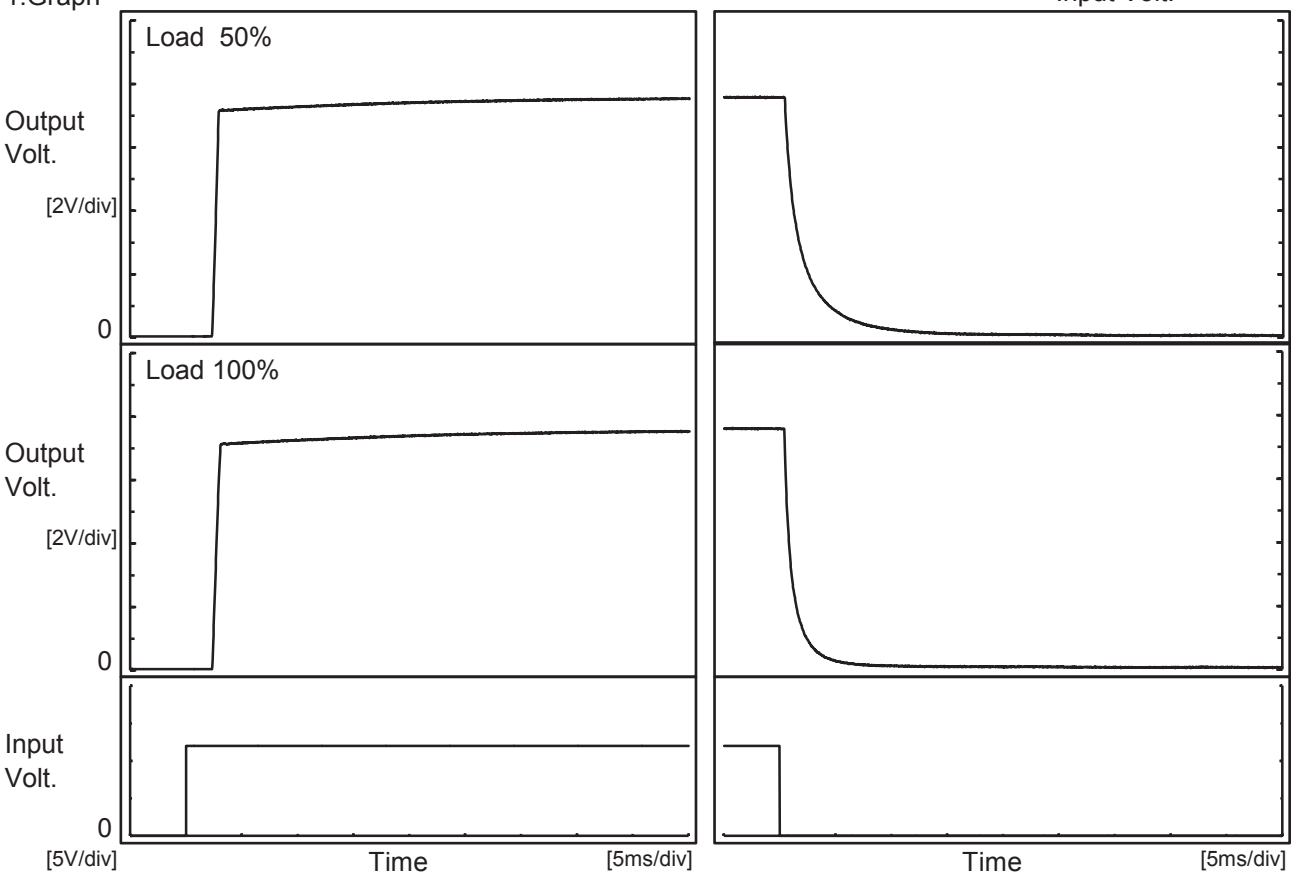
COSEL

Model	MGW61215
Item	Rise and Fall Time
Object	-15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

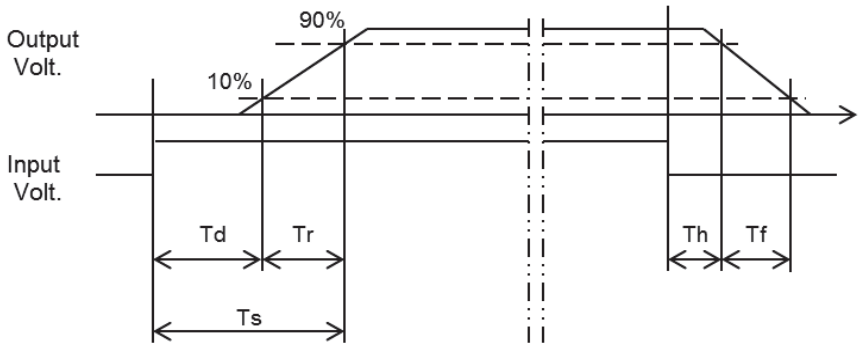
Input Volt. 12 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.4	0.5	2.9	0.6	4.7
100 %	2.4	0.6	3.0	0.5	2.2



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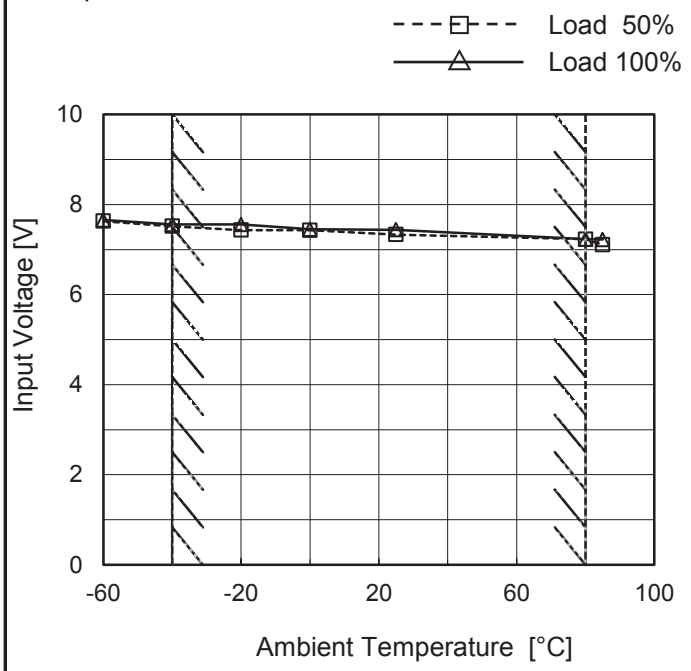
COSEL

Model	MGW61215
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.2A

Testing Circuitry Figure A

1.Graph

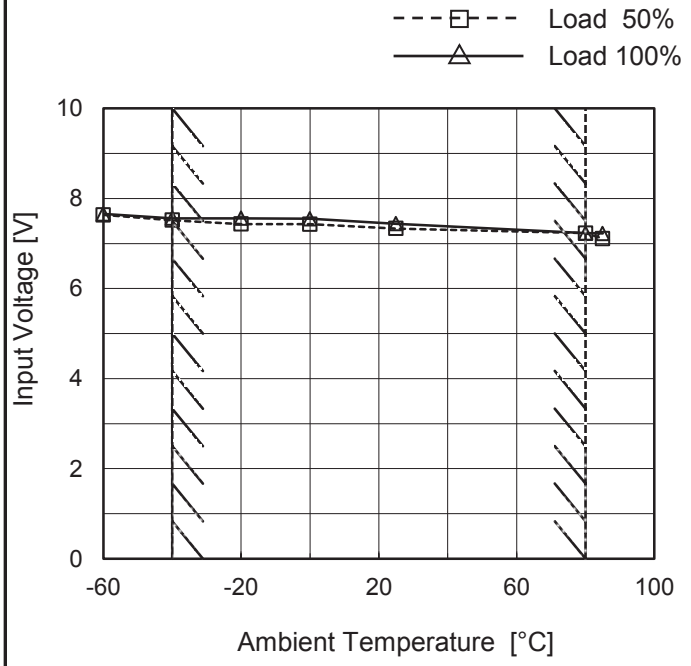


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	7.7	7.7
-40	7.6	7.6
-20	7.5	7.6
0	7.5	7.5
25	7.4	7.5
80	7.3	7.3
85	7.1	7.3
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.2A

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	7.7	7.7
-40	7.6	7.6
-20	7.5	7.6
0	7.5	7.6
25	7.4	7.5
80	7.3	7.3
85	7.1	7.3
--	-	-
--	-	-
--	-	-
--	-	-

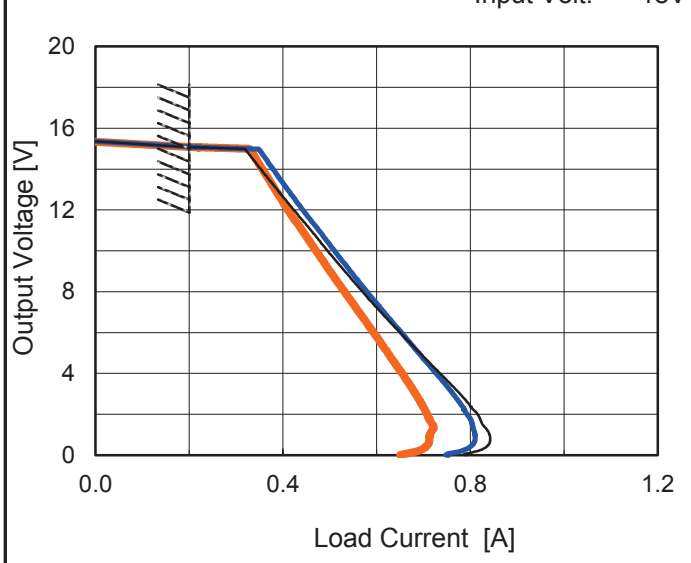
BC-11029

COSEL

Model	MGW61215
Item	Overcurrent Protection
Object	+15V0.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



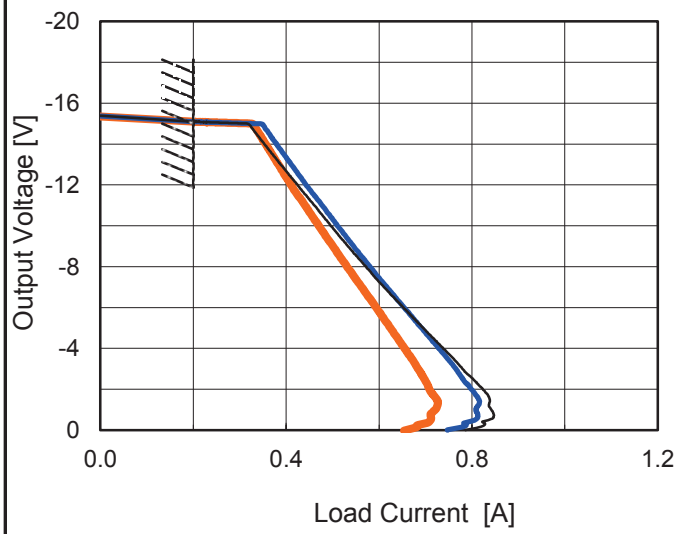
2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
14.25	0.34	0.37	0.35
13.50	0.37	0.39	0.37
12.00	0.42	0.44	0.41
10.50	0.48	0.49	0.46
9.00	0.53	0.54	0.50
7.50	0.59	0.60	0.55
6.00	0.65	0.65	0.59
4.50	0.71	0.71	0.64
3.00	0.78	0.76	0.68
1.50	0.83	0.80	0.72
0.00	0.79	0.75	0.65
--	-	-	-

-15V: Rated Load Current

Object	-15V0.2A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-14.25	0.34	0.37	0.35
-13.50	0.37	0.39	0.37
-12.00	0.42	0.44	0.41
-10.50	0.48	0.49	0.45
-9.00	0.53	0.55	0.50
-7.50	0.59	0.60	0.55
-6.00	0.65	0.65	0.59
-4.50	0.71	0.71	0.64
-3.00	0.78	0.76	0.68
-1.50	0.84	0.81	0.72
0.00	0.79	0.75	0.65
--	-	-	-

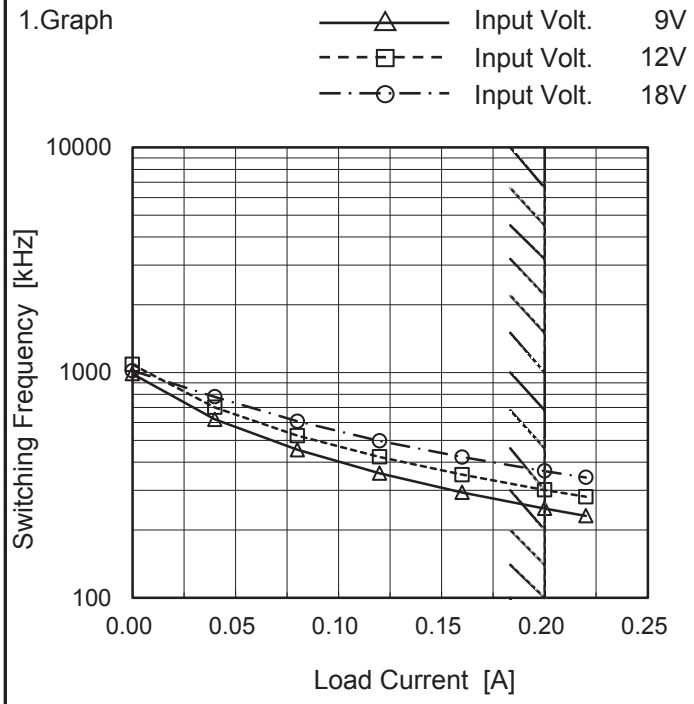
+15V: Rated Load Current

COSEL

Model	MGW61215
Item	Switching Frequency (by Load Current)
Object	+/-15V0.2A

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	989	1087	1020
0.04	620	701	781
0.08	455	525	608
0.12	357	422	497
0.16	294	352	422
0.20	249	301	366
0.22	231	281	343
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11029

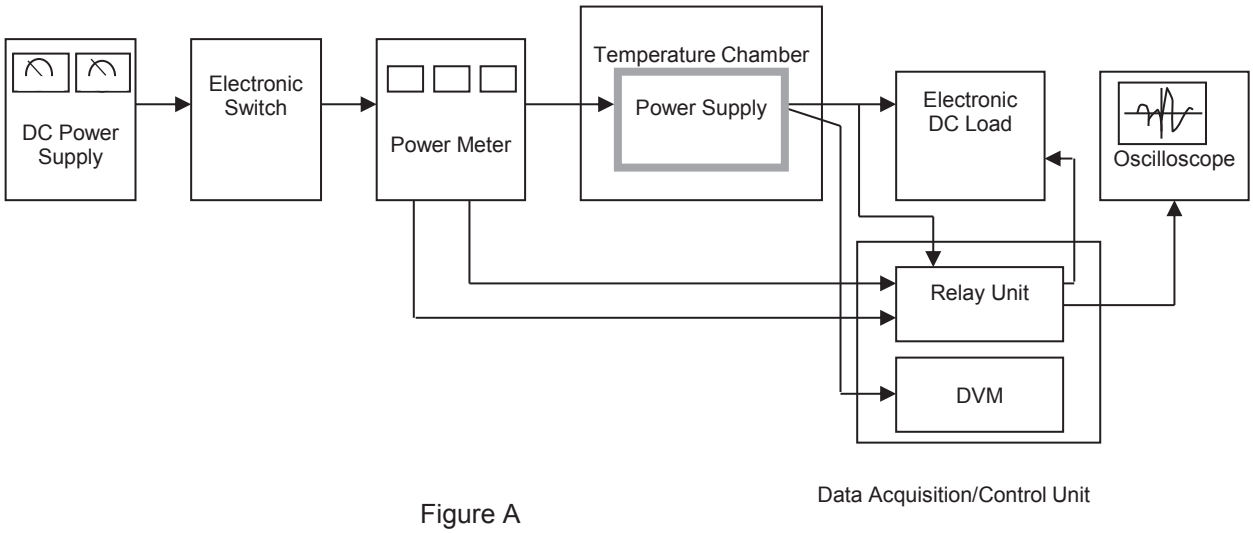


Figure A

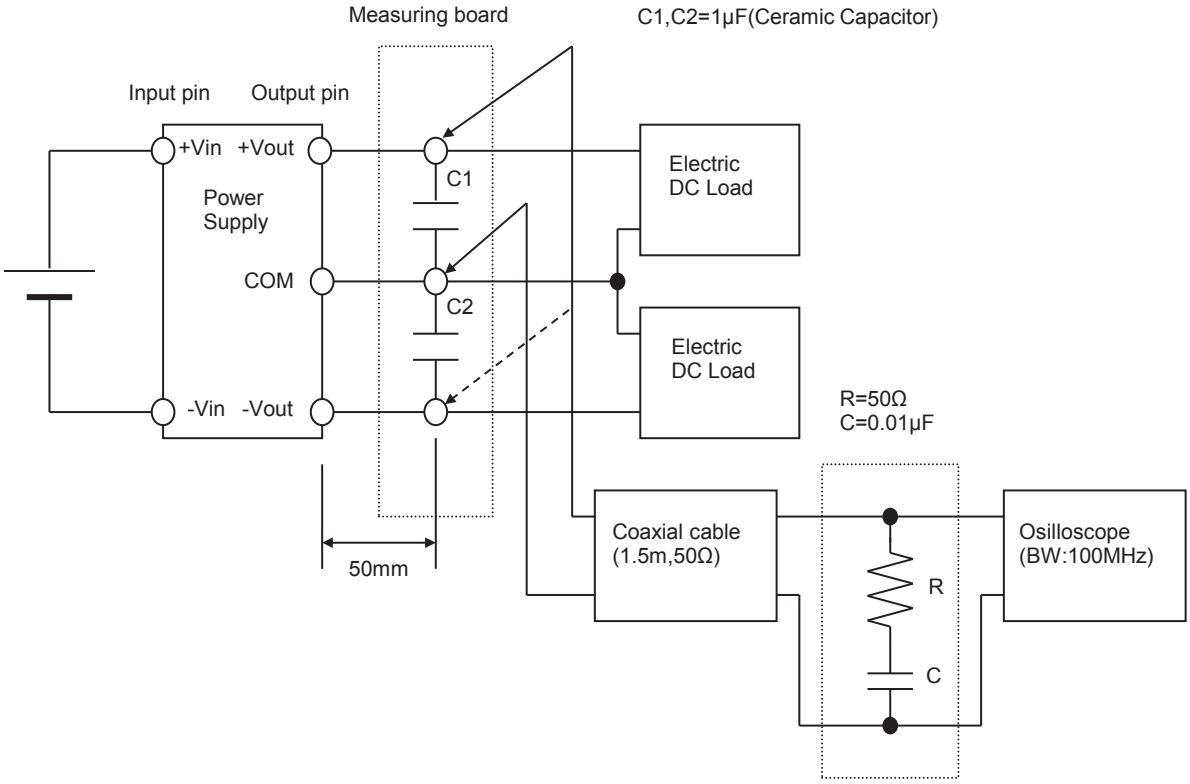


Figure B（Ripple and Ripple noise Characteristic）