COSEL

参考資料

TEST DATA OF MGW301215

Regulated DC Power Supply
December 4, 2010

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Sho Saito Design Engineer

COSEL CO.,LTD.

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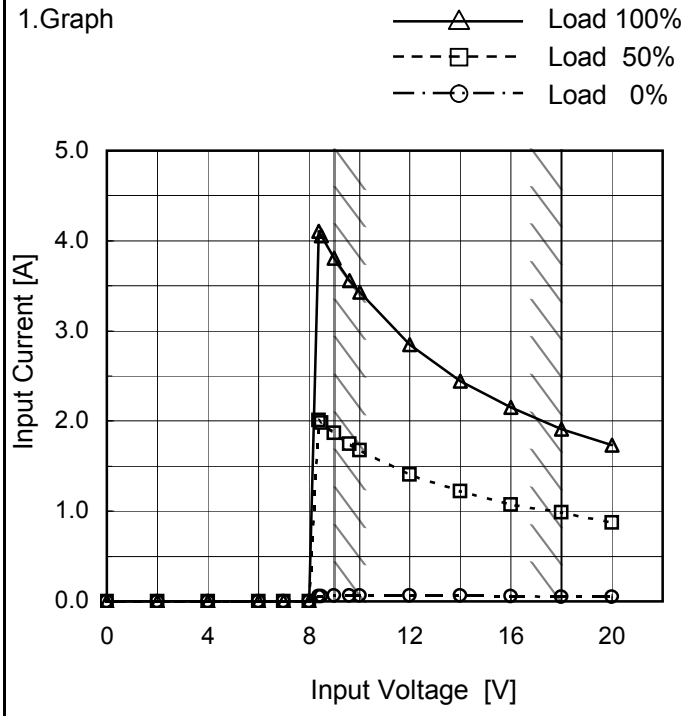
Model	MGW301215
Item	Input Current (by Input Voltage)
Object	————————

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
2.0	0.000	0.000	0.000
4.0	0.000	0.000	0.000
6.0	0.002	0.000	0.002
7.0	0.002	0.002	0.002
8.0	0.002	0.002	0.002
8.4	0.059	2.009	4.102
8.5	0.060	1.984	4.053
9.0	0.061	1.866	3.804
9.6	0.062	1.745	3.561
10.0	0.063	1.674	3.430
12.0	0.065	1.409	2.848
14.0	0.061	1.220	2.446
16.0	0.055	1.074	2.150
18.0	0.052	0.988	1.910
20.0	0.050	0.875	1.730
--	-	-	-
--	-	-	-

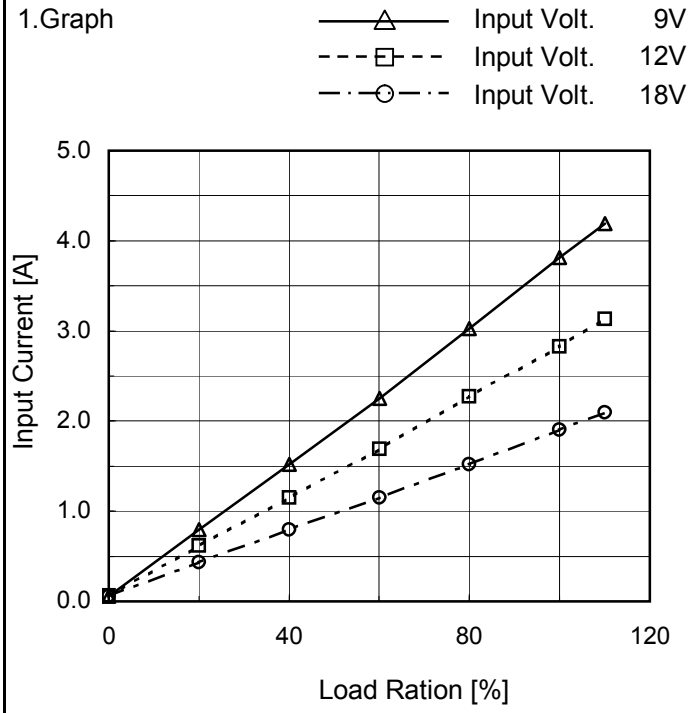
BC-10523

COSEL

Model	MGW301215
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

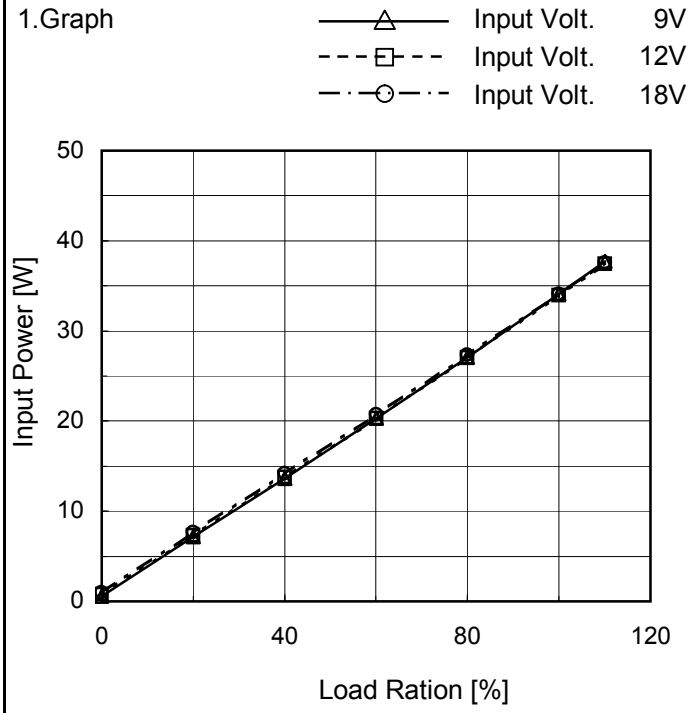
Load Ration [%]	Input Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	0.060	0.063	0.054
20	0.797	0.615	0.430
40	1.522	1.154	0.793
60	2.252	1.690	1.154
80	3.028	2.270	1.521
100	3.817	2.826	1.906
110	4.188	3.134	2.092
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW301215
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Input Power [W]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	0.54	0.76	0.97
20	7.17	7.35	7.70
40	13.63	13.76	14.22
60	20.28	20.33	20.71
80	27.09	27.06	27.34
100	34.10	33.93	34.10
110	37.71	37.44	37.60
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

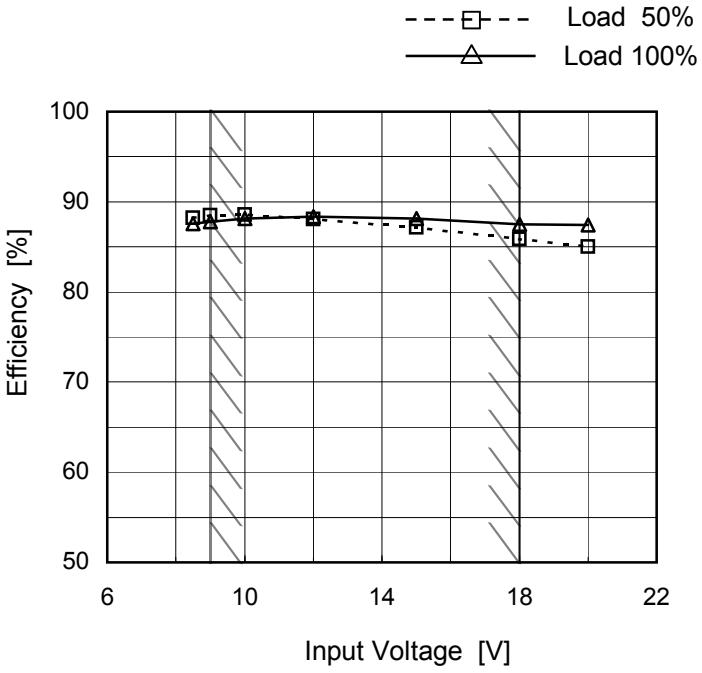
BC-10523

COSEL

Model	MGW301215
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%
8.5	88.2	87.5
9.0	88.5	87.8
10.0	88.6	88.2
12.0	88.1	88.3
15.0	87.2	88.2
18.0	85.9	87.5
20.0	85.0	87.5
--	-	-
--	-	-

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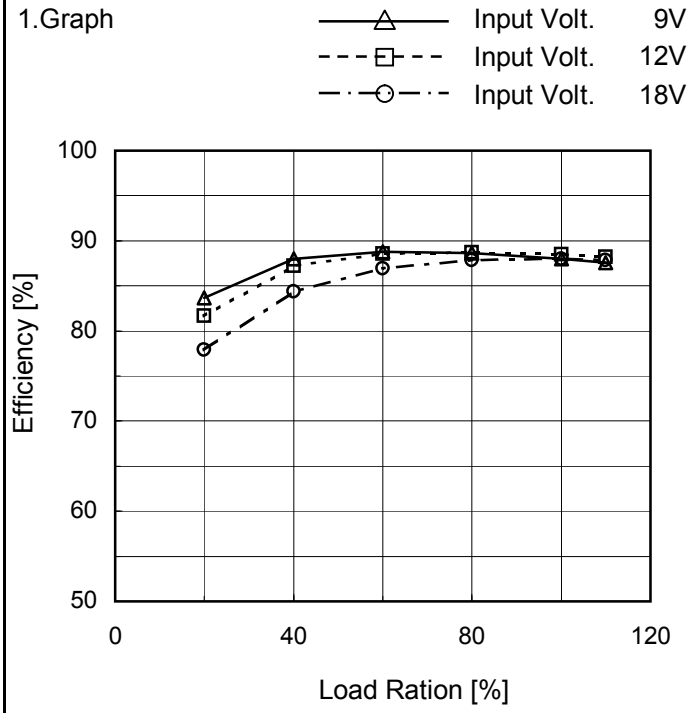
Model	MGW301215
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	-	-	-
20	83.7	81.7	77.9
40	88.0	87.2	84.4
60	88.8	88.5	86.9
80	88.6	88.7	87.8
100	88.0	88.5	88.0
110	87.6	88.2	87.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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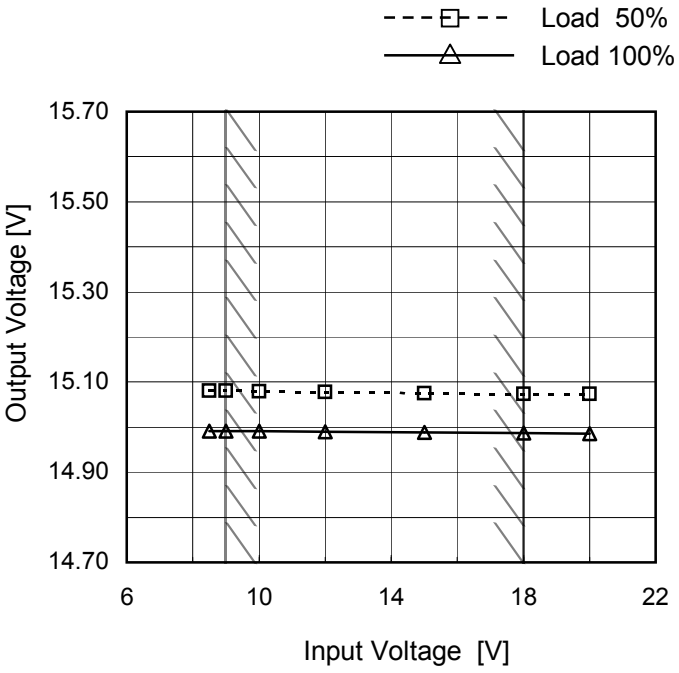
Model	MGW301215
Item	Line Regulation
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



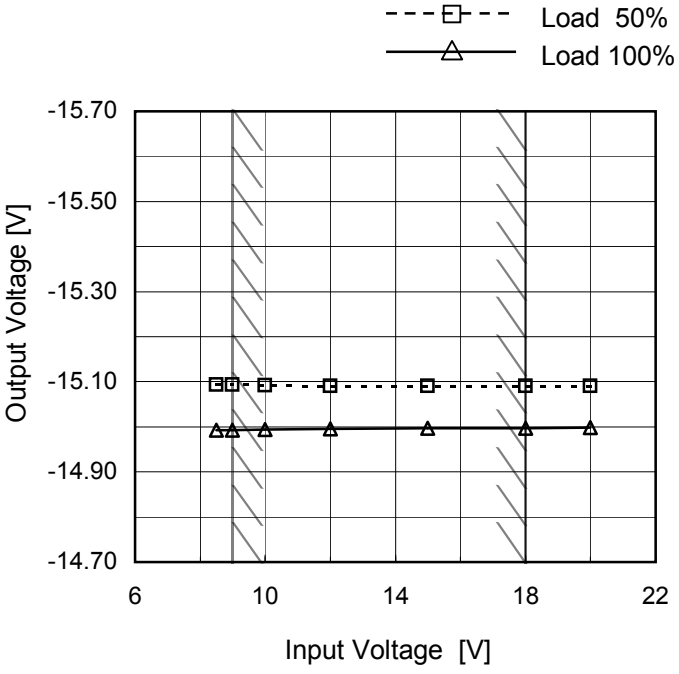
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	15.081	14.991
9.0	15.081	14.991
10.0	15.080	14.991
12.0	15.078	14.989
15.0	15.075	14.988
18.0	15.074	14.987
20.0	15.074	14.986
--	-	-
--	-	-

-15V: Rated output current

Object	-15V1A

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%
8.5	-15.094	-14.992
9.0	-15.093	-14.993
10.0	-15.092	-14.994
12.0	-15.091	-14.995
15.0	-15.091	-14.997
18.0	-15.091	-14.998
20.0	-15.091	-14.998
--	-	-
--	-	-

+15V: Rated output current

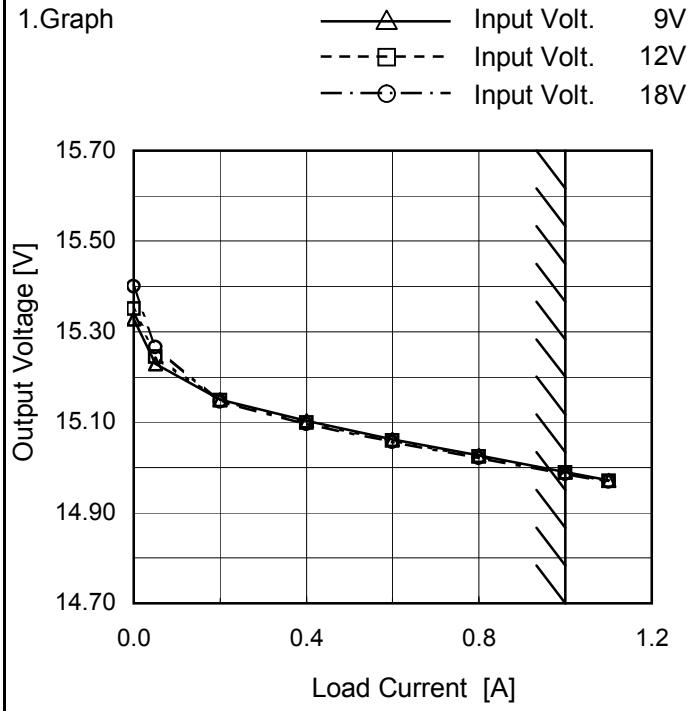
COSEL

Model	MGW301215
Item	Load Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +15V1A

1.Graph



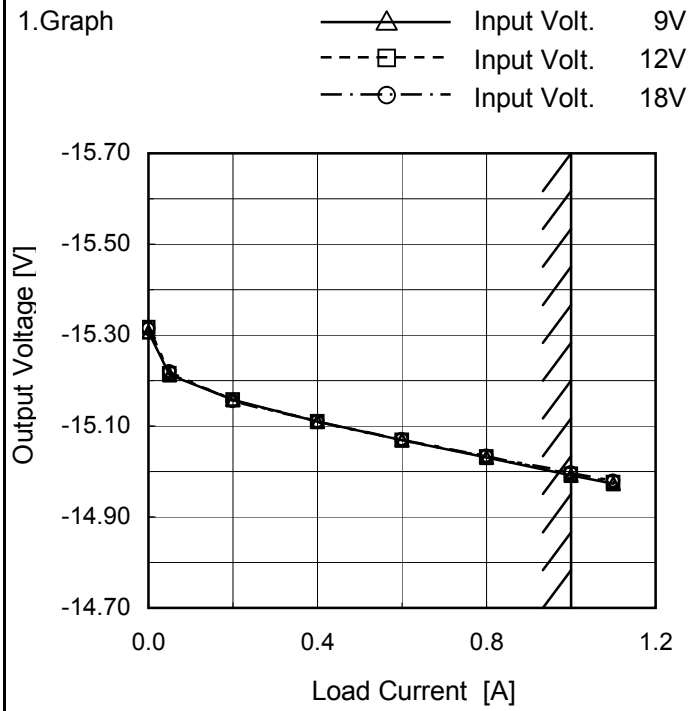
2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	15.327	15.350	15.401
0.05	15.229	15.245	15.265
0.20	15.150	15.148	15.145
0.40	15.103	15.100	15.096
0.60	15.062	15.060	15.057
0.80	15.027	15.024	15.021
1.00	14.990	14.988	14.986
1.10	14.972	14.970	14.968
--	-	-	-
--	-	-	-
--	-	-	-

-15V: Rated output current

Object -15V1A

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	-15.308	-15.317	-15.314
0.05	-15.212	-15.216	-15.220
0.20	-15.158	-15.157	-15.156
0.40	-15.111	-15.110	-15.110
0.60	-15.069	-15.070	-15.070
0.80	-15.030	-15.032	-15.033
1.00	-14.992	-14.995	-14.997
1.10	-14.974	-14.976	-14.979
--	-	-	-
--	-	-	-
--	-	-	-

+15V: Rated output current

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Model	MGW301215
Item	Dynamic Load Response
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

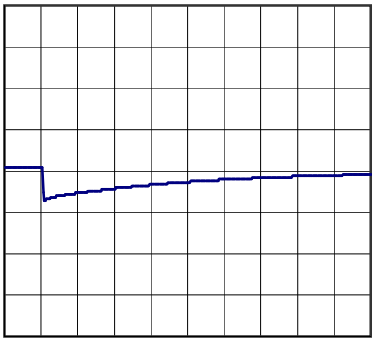
Input Volt. 12 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

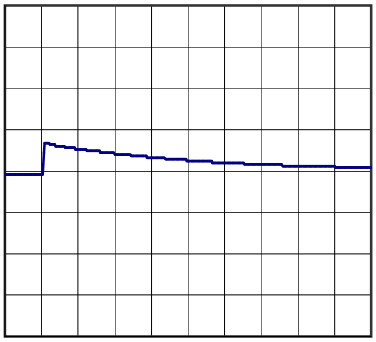
Load Current

Min. Load (0A) ←→
Load 100% (1A)

500mV/div



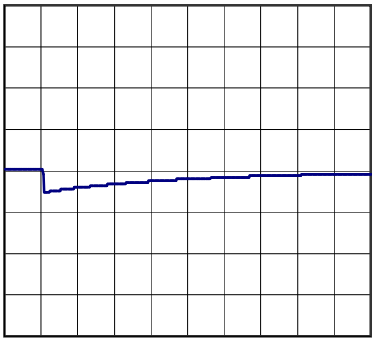
50ms/div



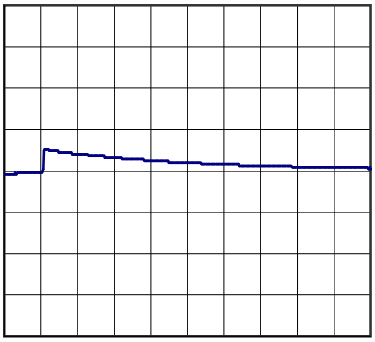
50ms/div

Min. Load (0A) ←→
Load 50% (0.5A)

500mV/div



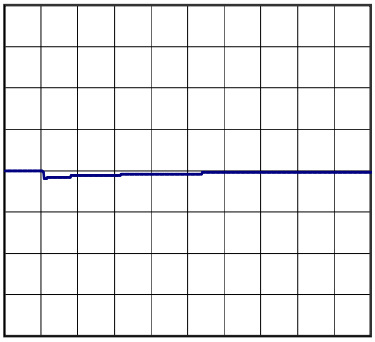
50ms/div



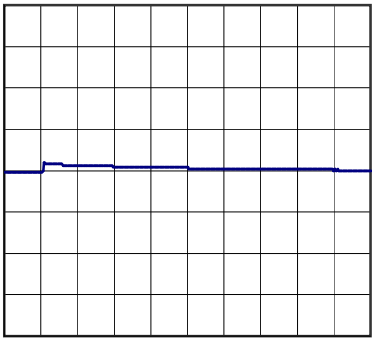
50ms/div

Load 50% (0.5A) ←→
Load 100% (1A)

500mV/div



50ms/div



50ms/div

COSEL

Model	MGW301215
Item	Dynamic Load Response
Object	-15V1A

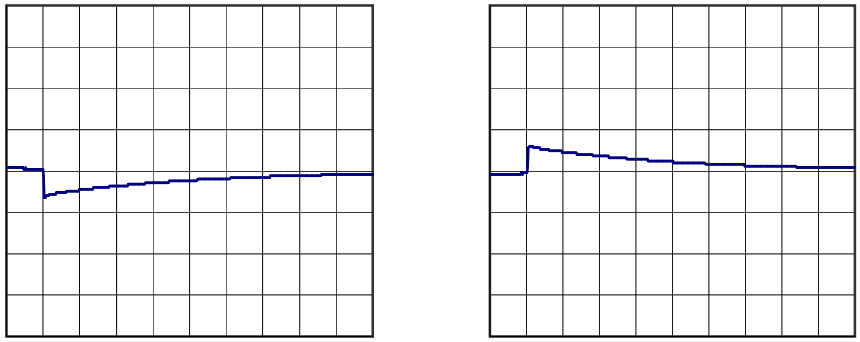
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 12 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

Load Current

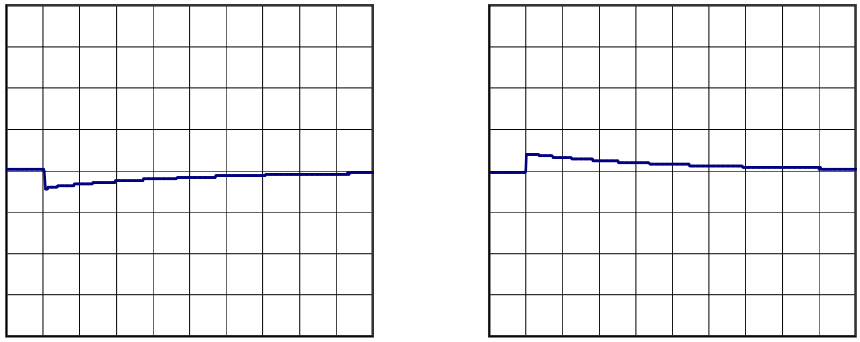
Min. Load (0A) ←→
Load 100% (1A)



500mV/div

50ms/div 50ms/div

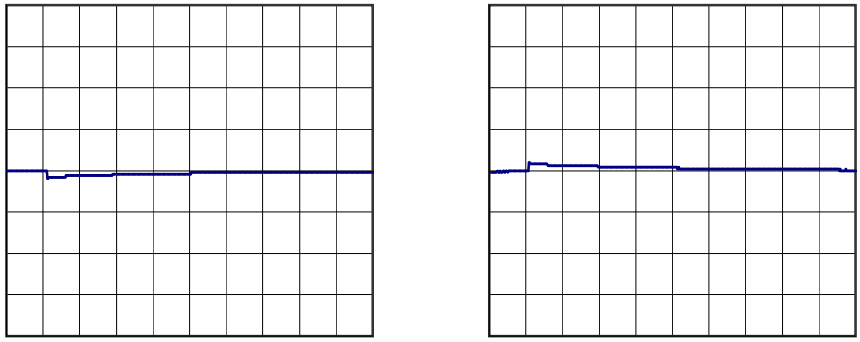
Min. Load (0A) ←→
Load 50% (0.5A)



500mV/div

50ms/div 50ms/div

Load 50% (0.5A) ←→
Load 100% (1A)



500mV/div

50ms/div 50ms/div

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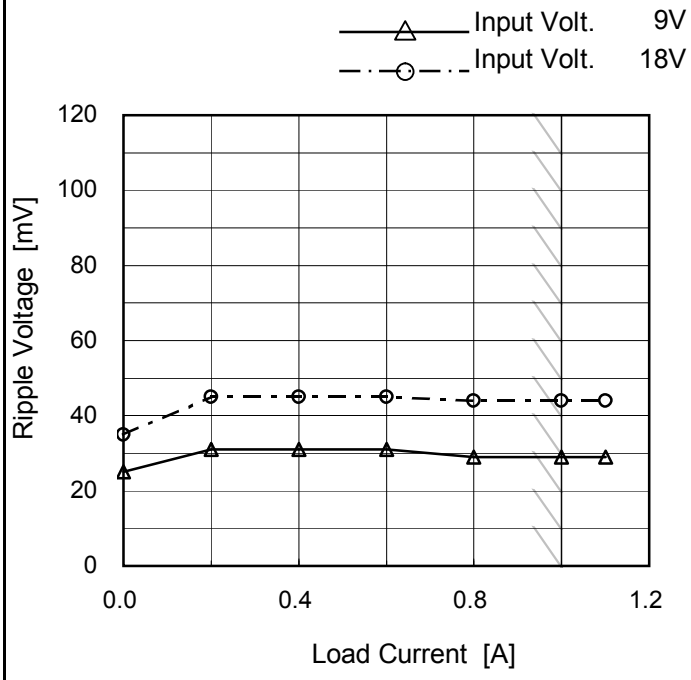
Model	MGW301215
Item	Ripple Voltage (by Load Current)
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

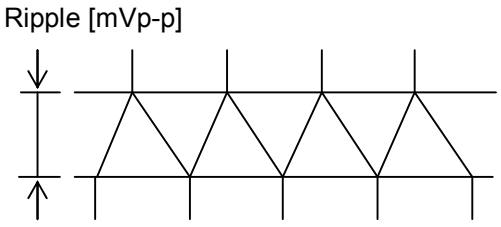


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.0	25	35
0.2	31	45
0.4	31	45
0.6	31	45
0.8	29	44
1.0	29	44
1.1	29	44
--	-	-
--	-	-
--	-	-
--	-	-

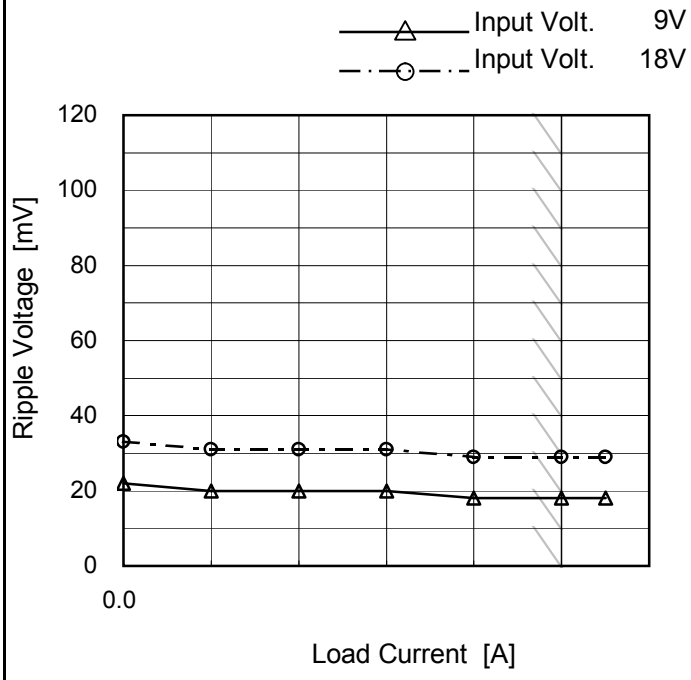
-15V: Rated output current

COSEL

Model	MGW301215
Item	Ripple Voltage (by Load Current)
Object	-15V1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

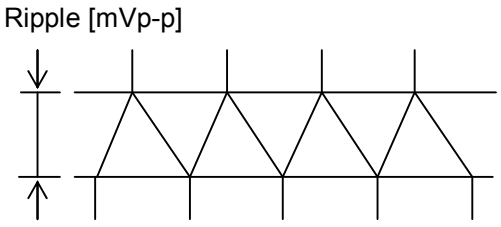


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.0	22	33
0.2	20	31
0.4	20	31
0.6	20	31
0.8	18	29
1.0	18	29
1.1	18	29
--	-	-
--	-	-
--	-	-
--	-	-

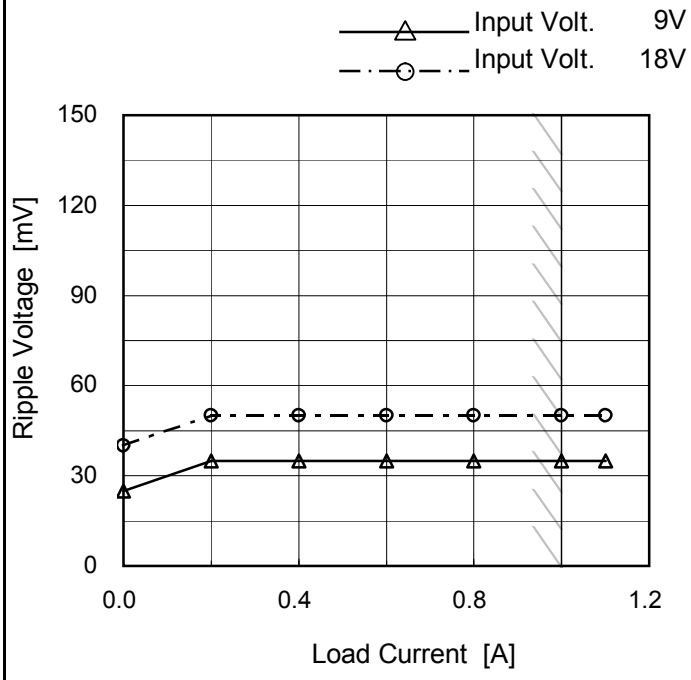
+15V: Rated output current

COSEL

Model	MGW301215
Item	Ripple-Noise
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

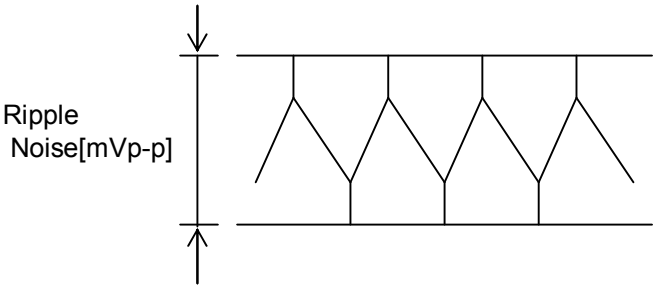


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.0	25	40
0.2	35	50
0.4	35	50
0.6	35	50
0.8	35	50
1.0	35	50
1.1	35	50
--	-	-
--	-	-
--	-	-
--	-	-

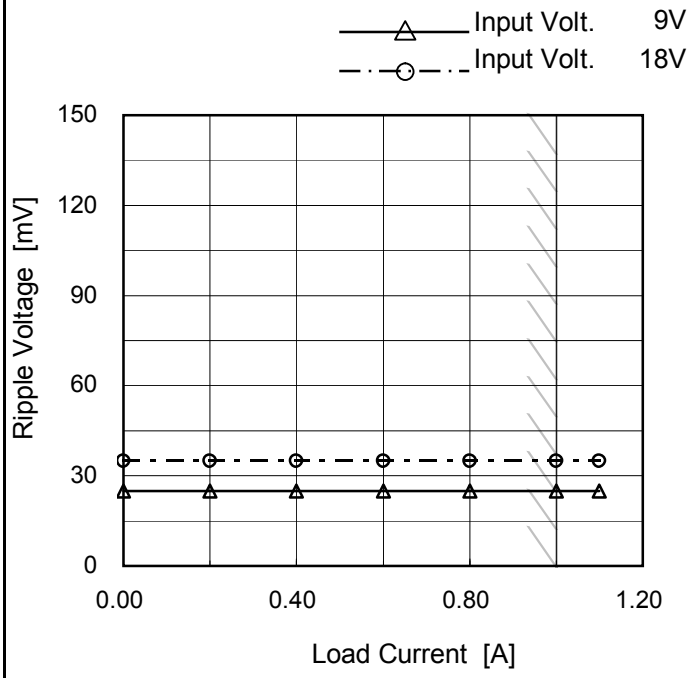
-15V: Rated output current

COSEL

Model	MGW301215
Item	Ripple-Noise
Object	-15V1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

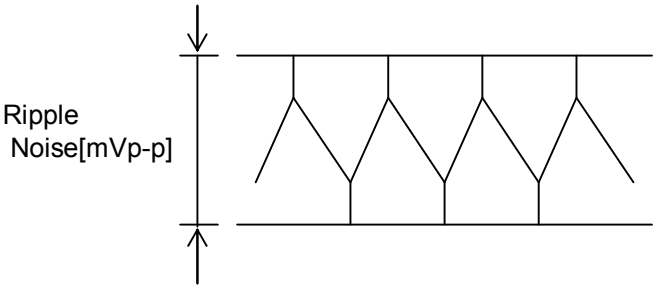


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.0	25	35
0.2	25	35
0.4	25	35
0.6	25	35
0.8	25	35
1.0	25	35
1.1	25	35
--	-	-
--	-	-
--	-	-
--	-	-

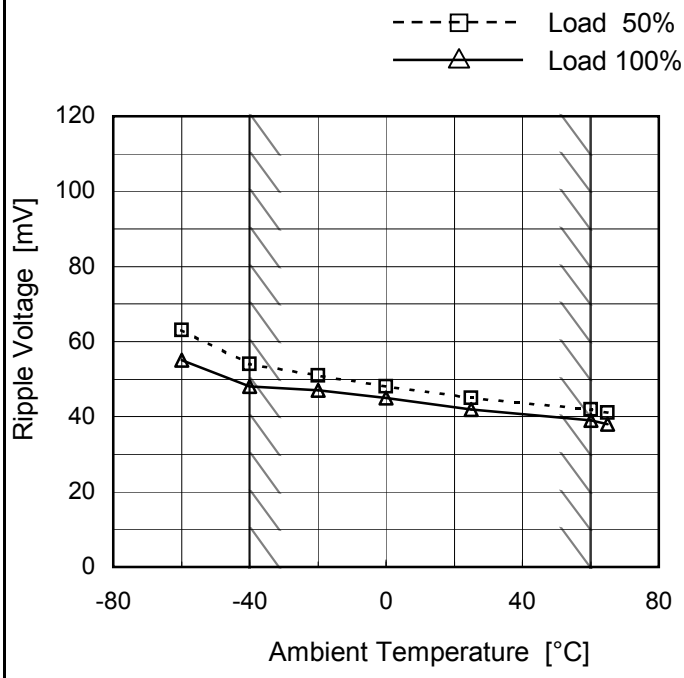
+15V: Rated output current

COSEL

Model	MGW301215
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V1A

Testing Circuitry Figure A

1.Graph



Input Volt. 12V

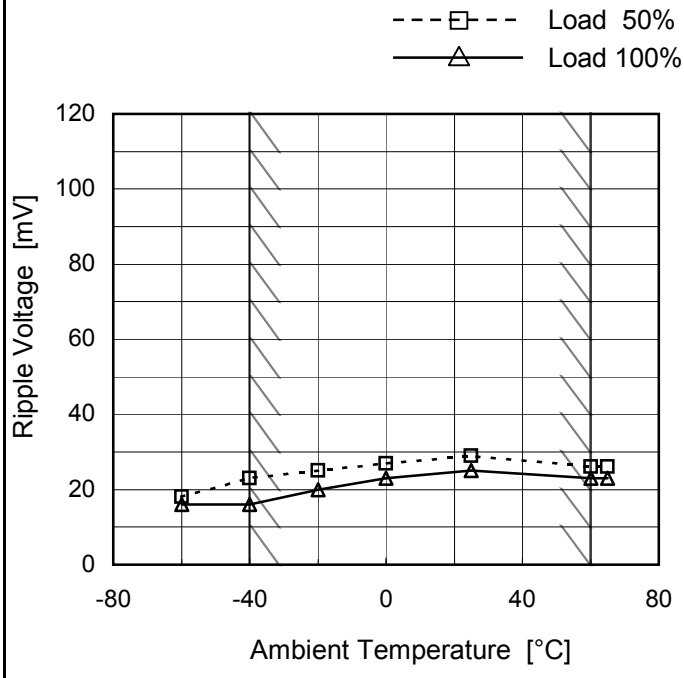
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	63	55
-40	54	48
-20	51	47
0	48	45
25	45	42
60	42	39
65	41	38
--	-	-
--	-	-
--	-	-
--	-	-

-15V: Rated output current

Object	-15V1A

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	18	16
-40	23	16
-20	25	20
0	27	23
25	29	25
60	26	23
65	26	23
--	-	-
--	-	-
--	-	-
--	-	-

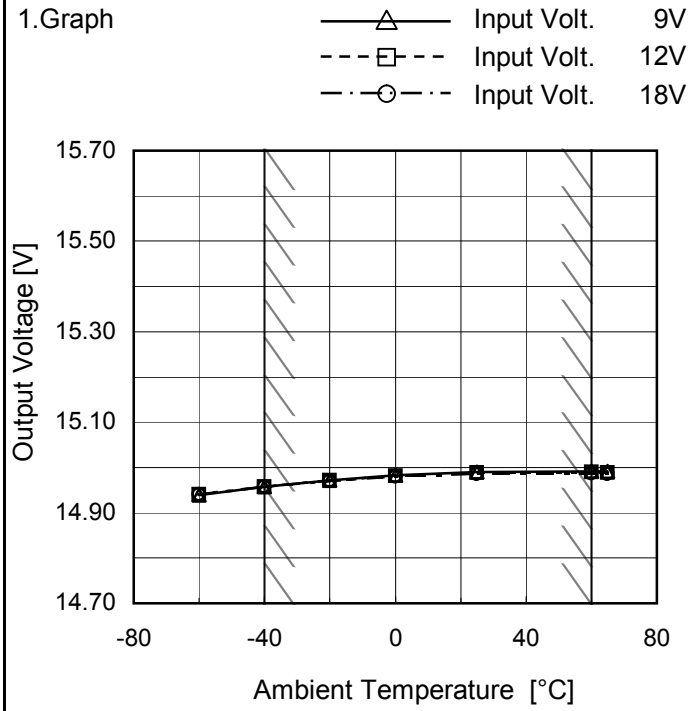
+15V: Rated output current

COSEL

Model	MGW301215
Item	Ambient Temperature Drift
Object	+15V1A

Testing Circuitry Figure A

1.Graph



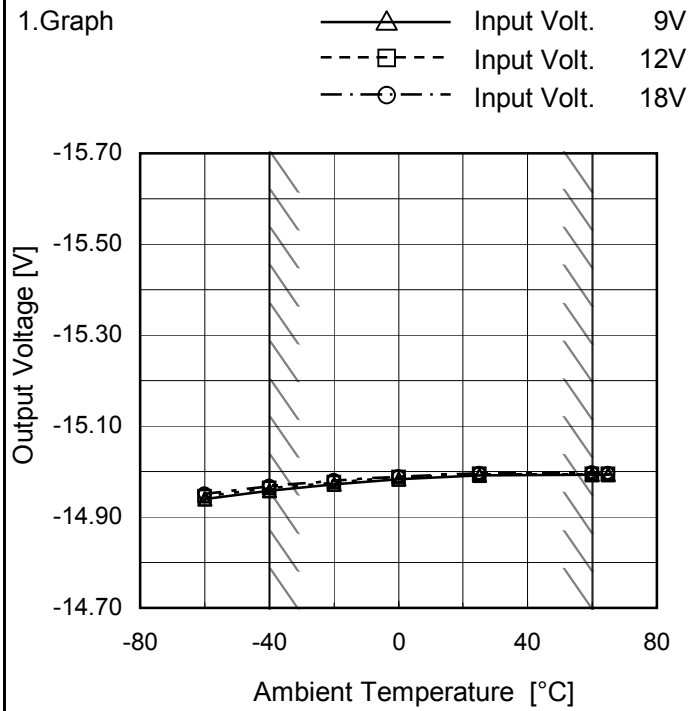
Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	14.940	14.941	14.941
-40	14.958	14.958	14.958
-20	14.972	14.971	14.971
0	14.983	14.981	14.980
25	14.990	14.988	14.986
60	14.991	14.989	14.987
65	14.991	14.989	14.986
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V1A

1.Graph



Load 100%

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	-14.940	-14.945	-14.951
-40	-14.958	-14.963	-14.968
-20	-14.972	-14.977	-14.981
0	-14.984	-14.987	-14.989
25	-14.991	-14.994	-14.996
60	-14.993	-14.995	-14.997
65	-14.993	-14.994	-14.996
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW301215	
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 : 9 - 18V
Load Current (AVR 1) : 0 - 1A (AVR 2) : 0 - 1A

* Other Output : Rated Load

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

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

2.Values

Object	+15V1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	18	0	15.411	±227	±1.5
Minimum Voltage	-40	18	1	14.958		

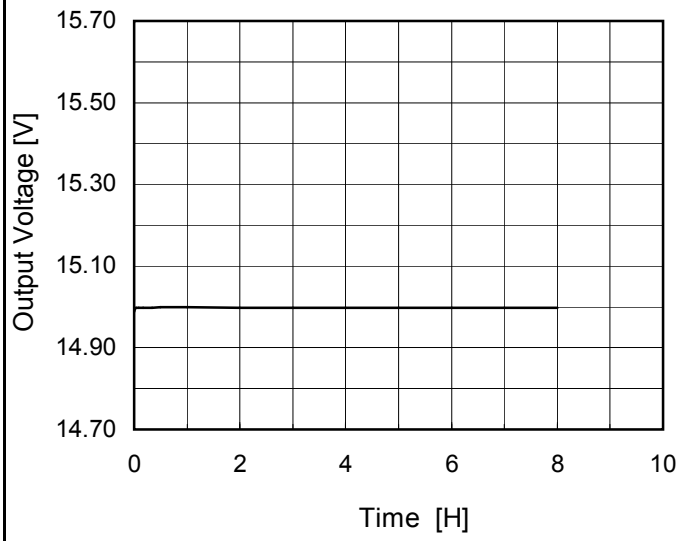
Object	-15V1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	12	0	-15.325	±184	±1.2
Minimum Voltage	-40	18	1	-14.958		

COSEL

Model	MGW301215
Item	Time Lapse Drift
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



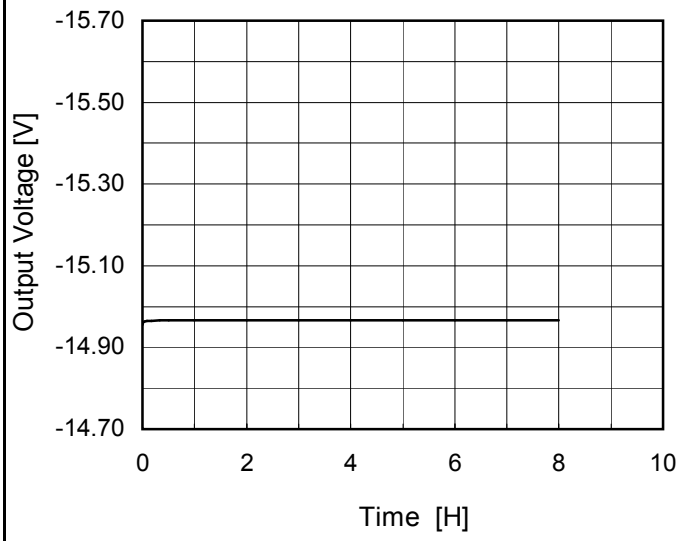
Input Volt. 12V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	14.988
0.5	14.999
1.0	14.999
2.0	14.999
3.0	14.998
4.0	14.998
5.0	14.998
6.0	14.998
7.0	14.998
8.0	14.998

Object	-15V1A

1.Graph



Input Volt. 12V
Load 100%

2.Values

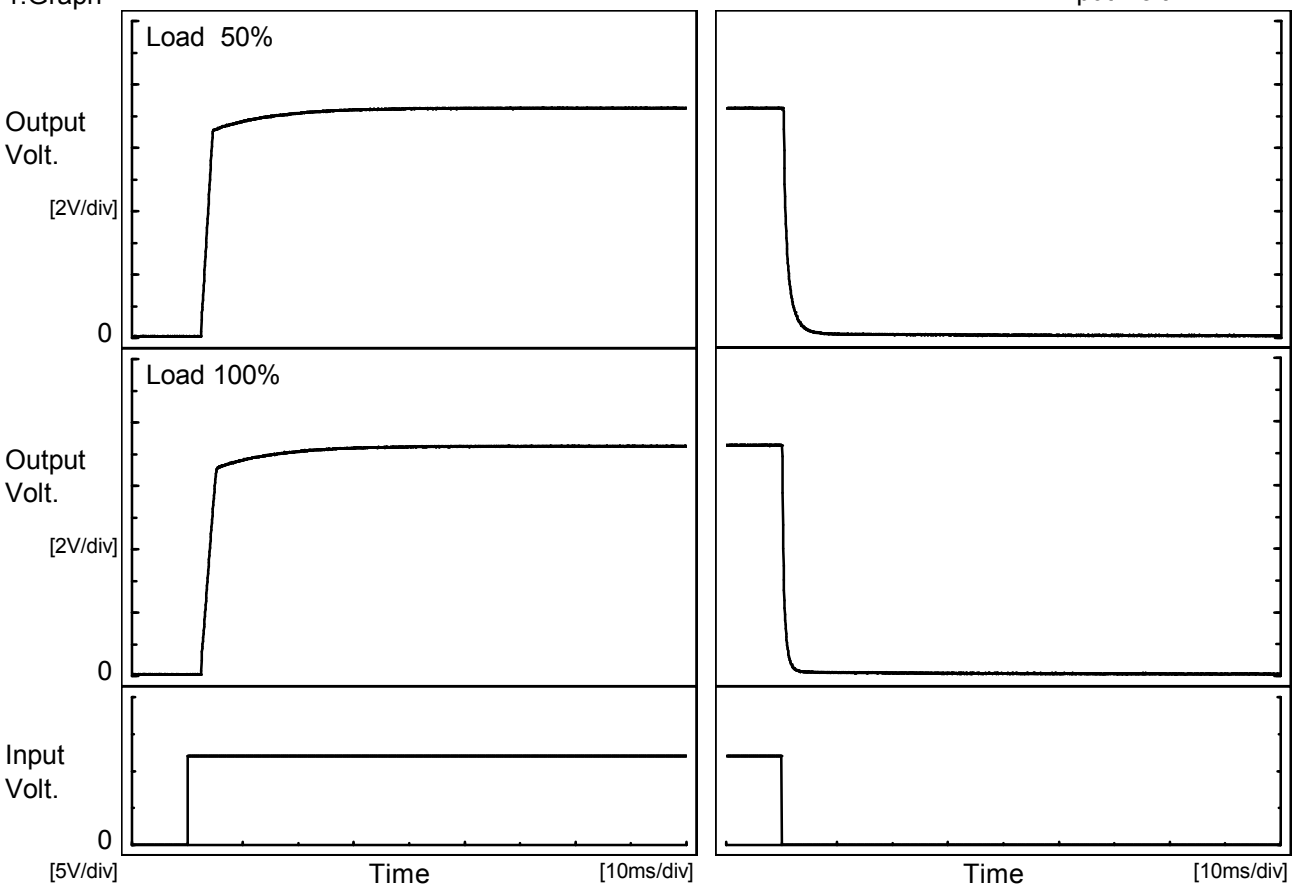
Time since start [H]	Output Voltage [V]
0.0	-14.955
0.5	-14.966
1.0	-14.966
2.0	-14.966
3.0	-14.966
4.0	-14.966
5.0	-14.966
6.0	-14.966
7.0	-14.966
8.0	-14.966

COSEL

Model	MGW301215	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V1A	

1.Graph

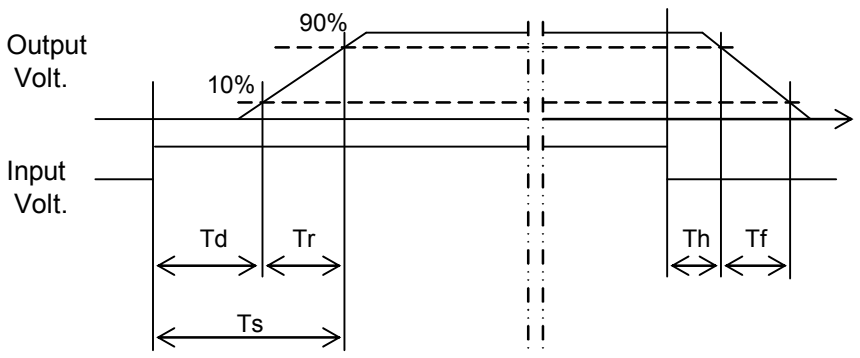
Input Volt. 12 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.6	6.3	8.9	0.3	2.1
100 %	2.7	6.6	9.3	0.2	1.0

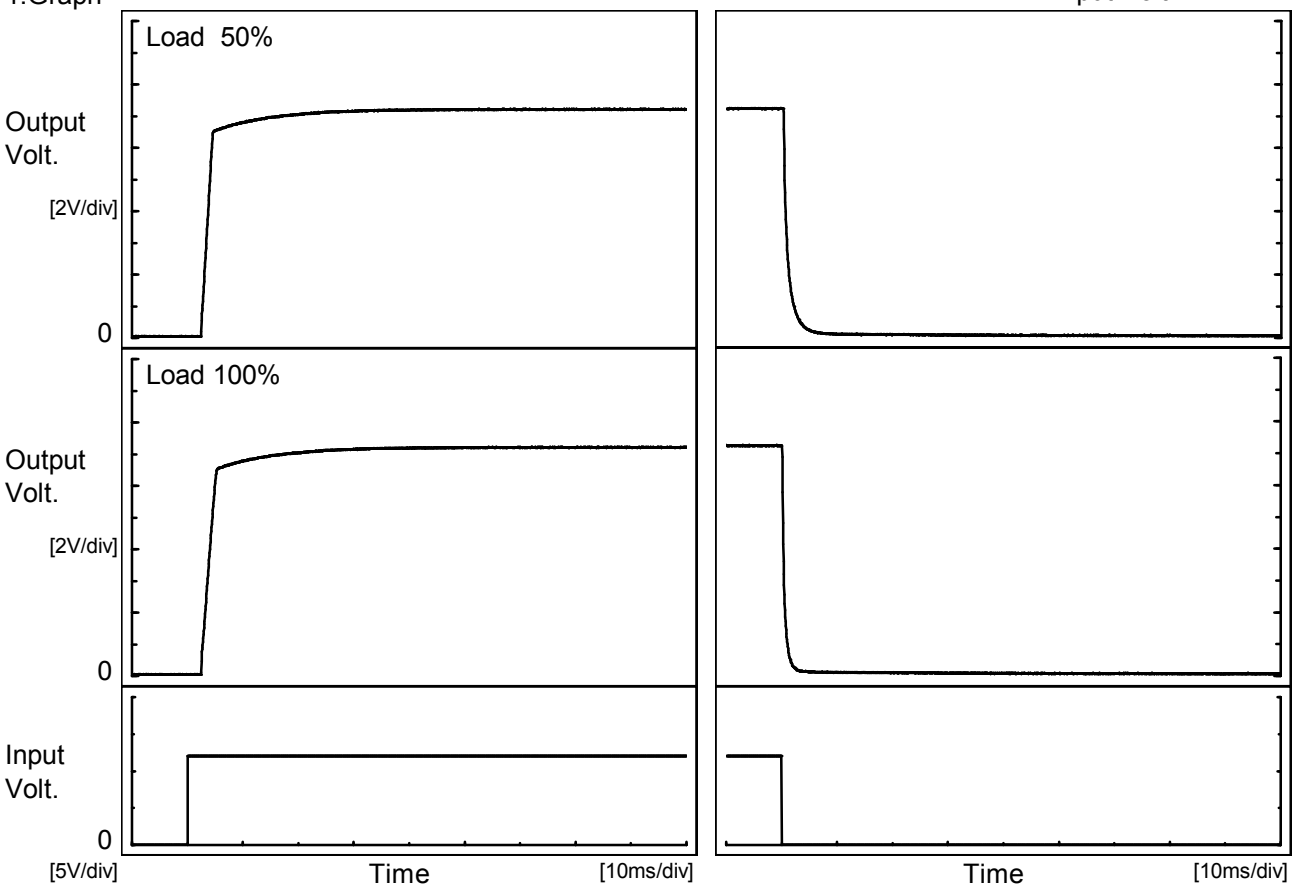


COSEL

Model	MGW301215	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-15V1A	

1.Graph

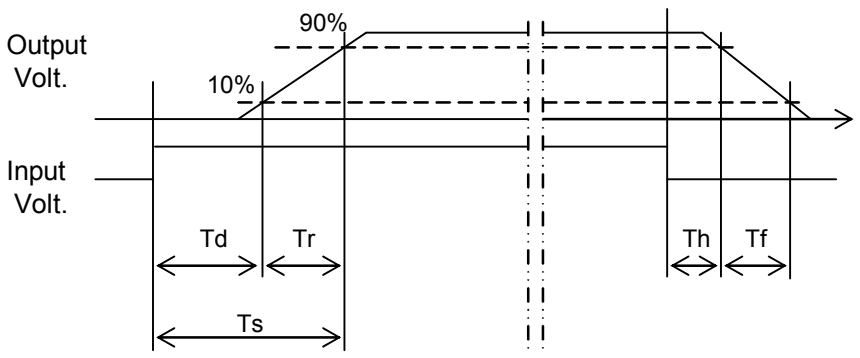
Input Volt. 12 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.7	7.1	9.8	0.3	2.2
100 %	2.7	7.4	10.1	0.2	1.1

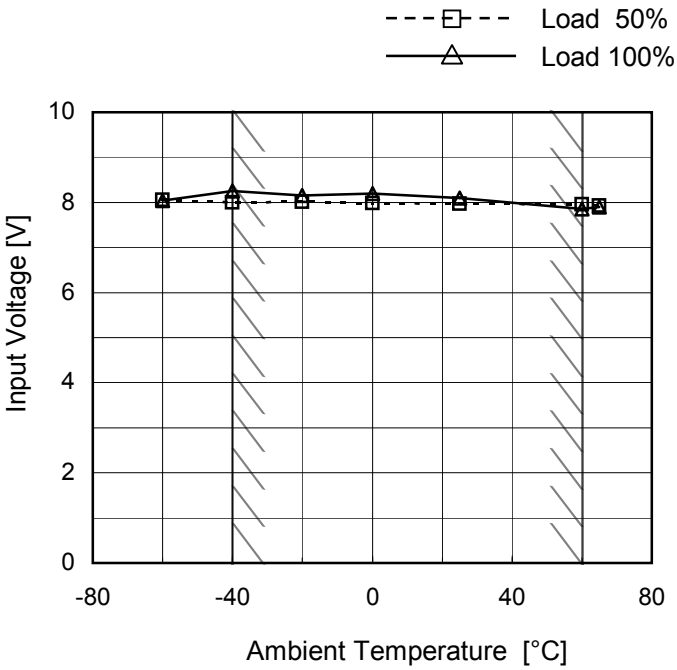


COSEL

Model	MGW301215
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V1A

Testing Circuitry Figure A

1.Graph

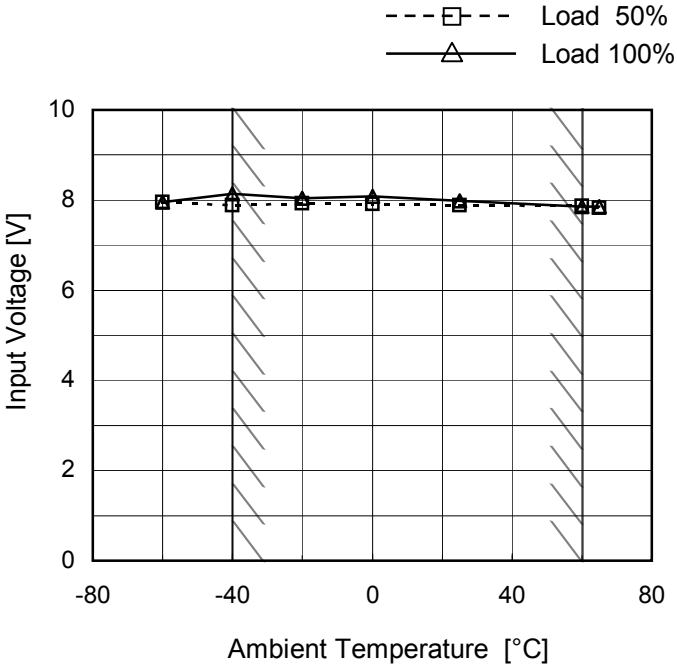


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.1	8.1
-40	8.0	8.3
-20	8.1	8.2
0	8.0	8.2
25	8.0	8.1
60	8.0	7.9
65	8.0	7.9
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V1A

1.Graph



2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.0	8.0
-40	7.9	8.2
-20	8.0	8.1
0	8.0	8.1
25	7.9	8.0
60	7.9	7.9
65	7.9	7.9
--	-	-
--	-	-
--	-	-
--	-	-

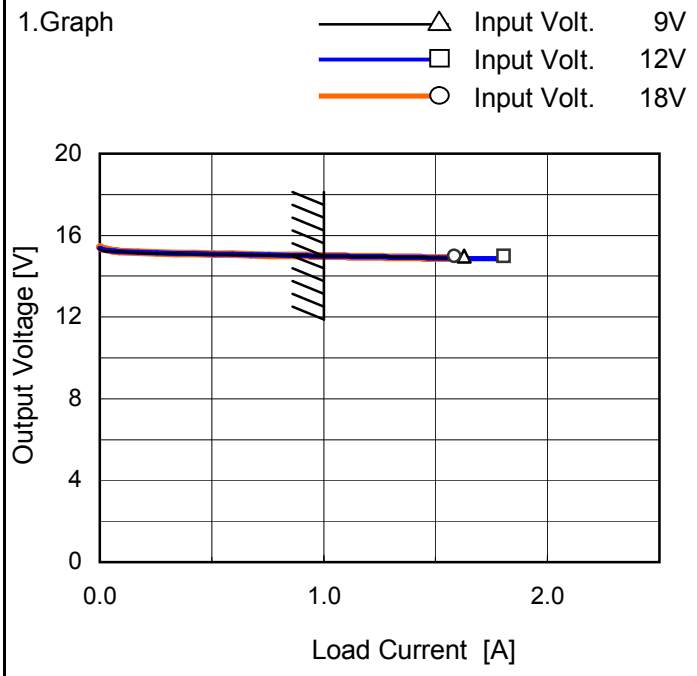
Note: Slanted line shows the range of the rated ambient temperature.

COSEL

Model	MGW301215
Item	Overcurrent Protection
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

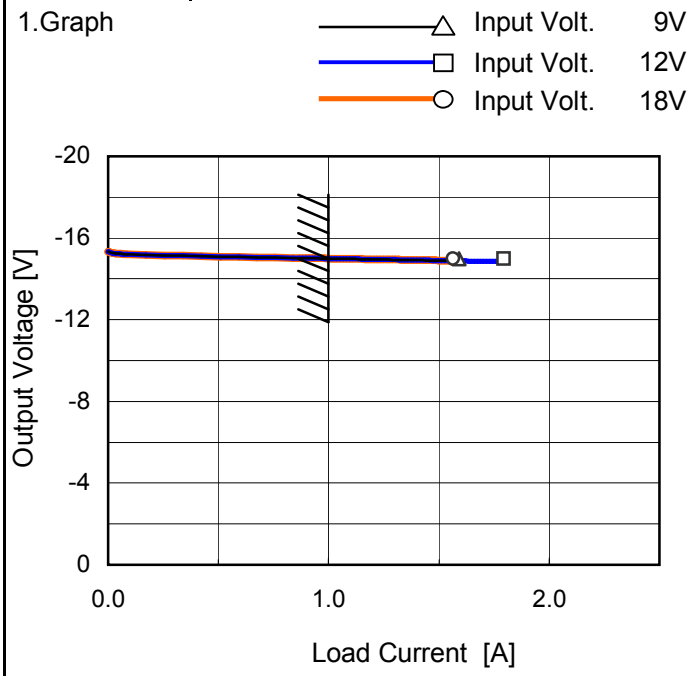


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
15.00	1.63	1.80	1.58
14.25	-	-	-
13.50	-	-	-
12.00	-	-	-
10.50	-	-	-
9.00	-	-	-
7.50	-	-	-
6.00	-	-	-
4.50	-	-	-
3.00	-	-	-
1.50	-	-	-
0.00	-	-	-

Object	-15V1A

1.Graph



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

Intermittent operation occurs when overcurrent protection is activated.

2.Values

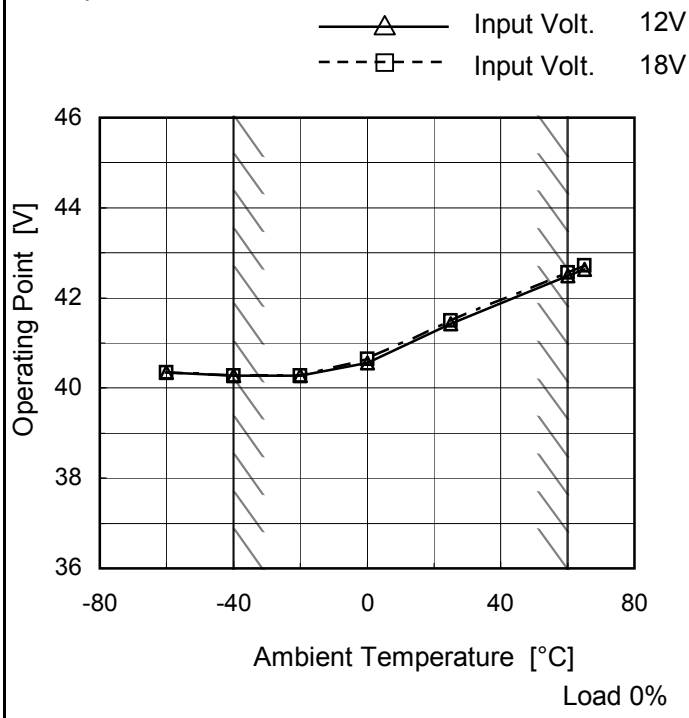
Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-15.00	1.59	1.79	1.57
-14.25	-	-	-
-13.50	-	-	-
-12.00	-	-	-
-10.50	-	-	-
-9.00	-	-	-
-7.50	-	-	-
-6.00	-	-	-
-4.50	-	-	-
-3.00	-	-	-
-1.50	-	-	-
0.00	-	-	-

COSEL

Model	MGW301215
Item	Overvoltage Protection
Object	+30V1A

Testing Circuitry Figure A

1.Graph



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

Measured as a single output(+30V).

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 12[V]	Input Volt. 18[V]
-60	40.34	40.34
-40	40.27	40.27
-20	40.27	40.27
0	40.56	40.64
25	41.43	41.50
60	42.50	42.57
65	42.64	42.72
--	-	-
--	-	-
--	-	-
--	-	-

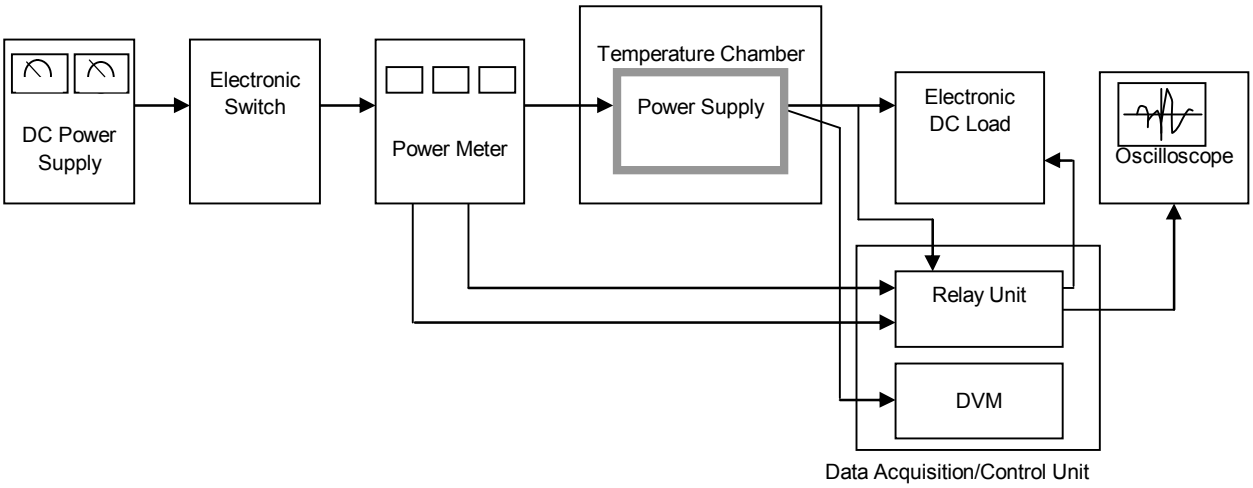


Figure A

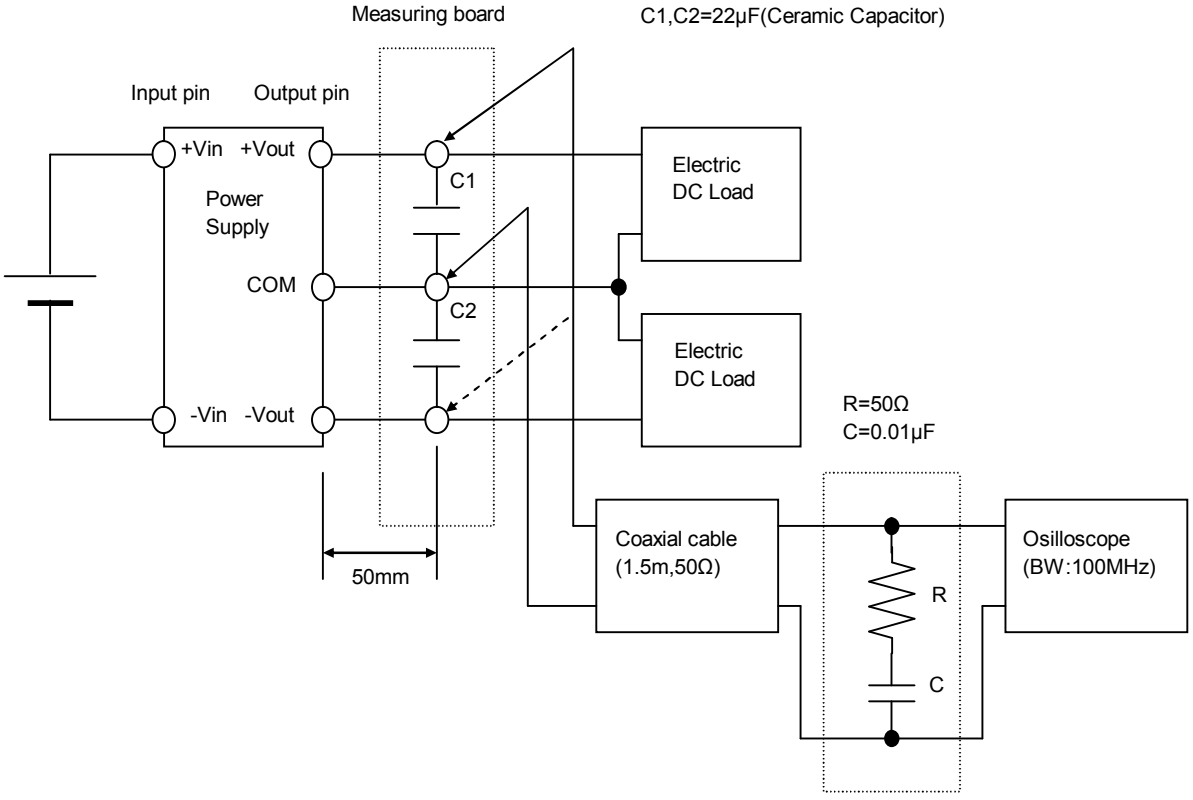


Figure B（Ripple and Ripple noise Characteristic）