COSEL

参考資料

TEST DATA OF MGW154815

Regulated DC Power Supply

Approved by : Kazunari Asano
Kazunari Asano Design Manager

Prepared by : Hidetaka Kobayashi
Hidetaka Kobayashi Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

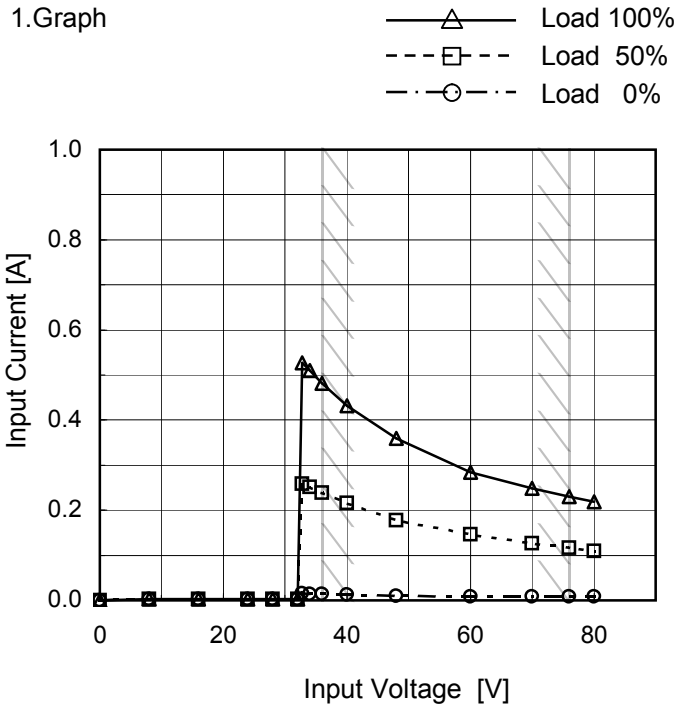
1.Input Current (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Ripple Voltage (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・ 10
10.Ripple-Noise ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 12
11.Ripple Voltage (by Ambient Temperature) ・・・・・・・・・・・・・・・・・ 14
12.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・ 15
13.Output Voltage Accuracy ・・・・・・・・・・・・・・・・・・・・・・・・・・ 16
14.Time Lapse Drift ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 17
15.Rise and Fall Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 18
16.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・ 20
17.Overcurrent Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・ 21
18.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・ 22
(Final Page 22)

COSEL

Model	MGW154815
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
8.0	0.003	0.003	0.003
16.0	0.003	0.003	0.003
24.0	0.003	0.003	0.003
28.0	0.003	0.003	0.003
32.0	0.003	0.003	0.003
32.8	0.015	0.259	0.527
34.0	0.014	0.251	0.510
36.0	0.014	0.239	0.482
40.0	0.012	0.216	0.432
48.0	0.010	0.178	0.360
60.0	0.009	0.146	0.285
70.0	0.008	0.127	0.248
76.0	0.008	0.116	0.230
80.0	0.008	0.110	0.219
--	-	-	-
--	-	-	-
--	-	-	-

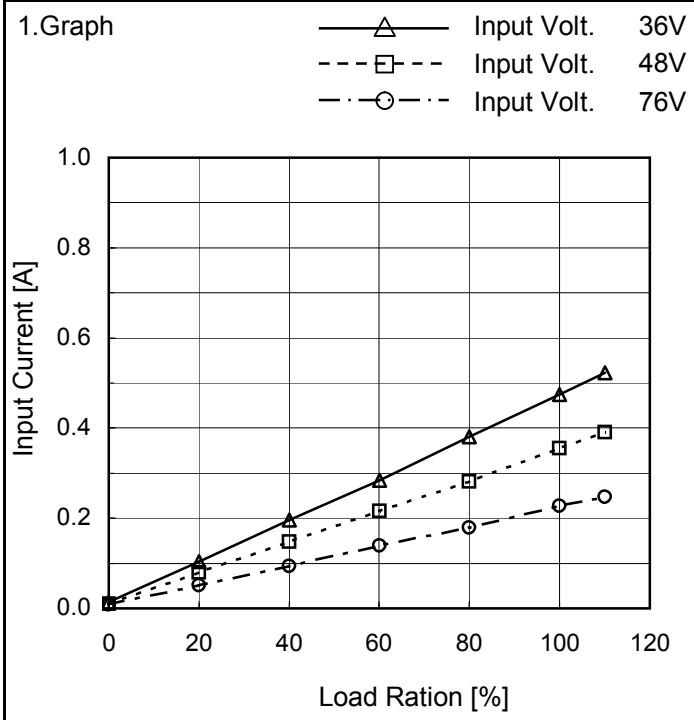
BC-10467

COSEL

Model	MGW154815
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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.014	0.010	0.008
20	0.104	0.080	0.051
40	0.195	0.148	0.094
60	0.284	0.217	0.140
80	0.380	0.281	0.179
100	0.475	0.355	0.227
110	0.523	0.390	0.247
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

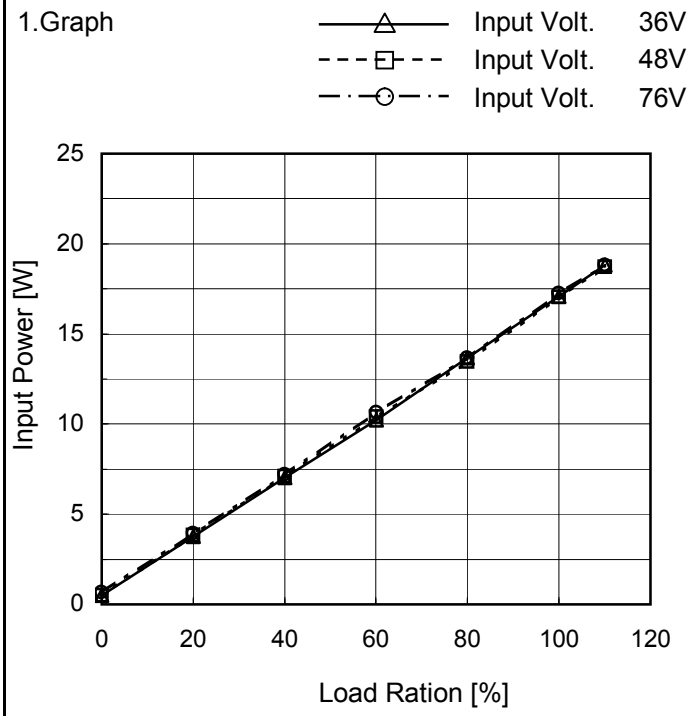
BC-10467

COSEL

Model	MGW154815
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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.50	0.50	0.66
20	3.76	3.83	3.93
40	7.04	7.11	7.20
60	10.21	10.40	10.65
80	13.67	13.47	13.67
100	17.09	17.03	17.25
110	18.82	18.71	18.81
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

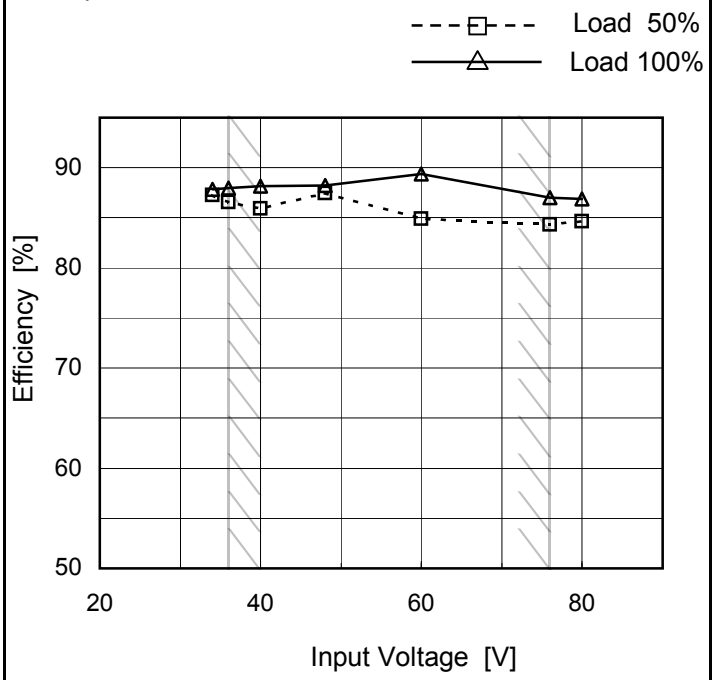
BC-10467

COSEL

Model	MGW154815
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

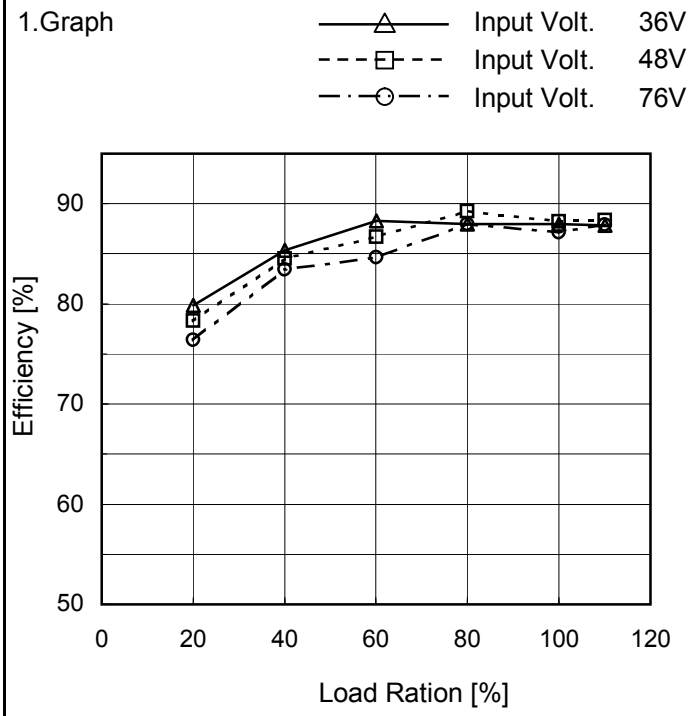
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
34	87.2	87.8
36	86.6	88.0
40	85.9	88.2
48	87.5	88.2
60	84.9	89.4
76	84.3	87.0
80	84.6	86.9
--	-	-
--	-	-

COSEL

Model	MGW154815
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	-	-	-
20	79.8	78.3	76.4
40	85.3	84.5	83.4
60	88.3	86.7	84.6
80	87.9	89.2	87.9
100	87.9	88.3	87.1
110	87.9	88.4	87.9
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

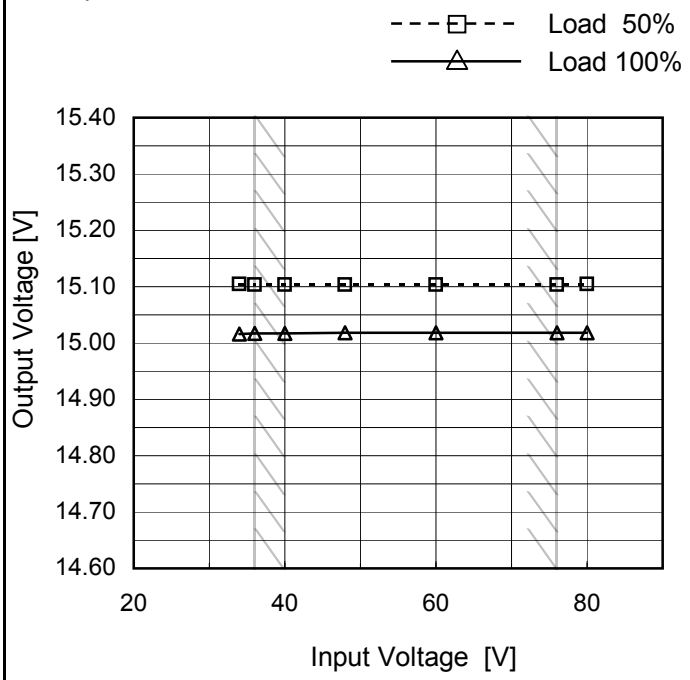
BC-10467

COSEL

Model	MGW154815
Item	Line Regulation
Object	+15V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



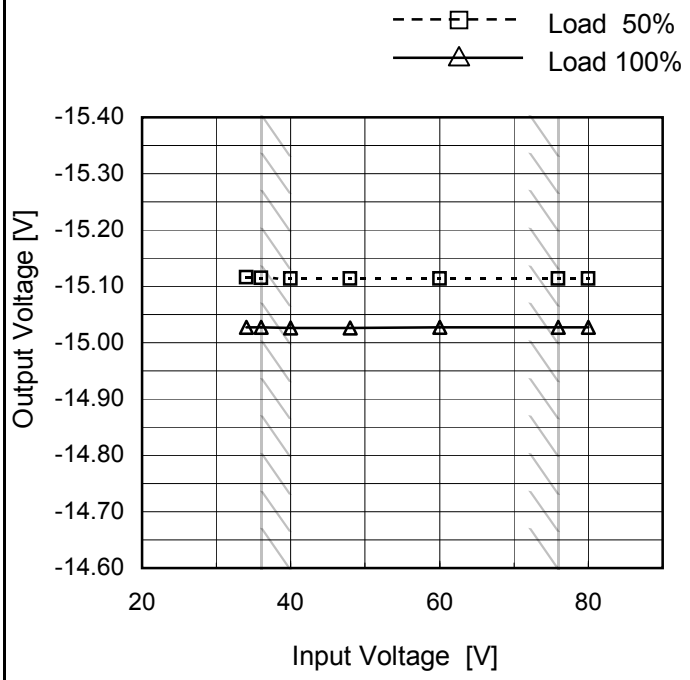
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
34	15.105	15.016
36	15.103	15.017
40	15.103	15.017
48	15.104	15.018
60	15.104	15.018
76	15.104	15.018
80	15.104	15.018
--	-	-
--	-	-

-15V: Rated output current

Object	-15V0.5A

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%
34	-15.116	-15.027
36	-15.115	-15.027
40	-15.114	-15.027
48	-15.114	-15.027
60	-15.114	-15.027
76	-15.114	-15.027
80	-15.114	-15.027
--	-	-
--	-	-

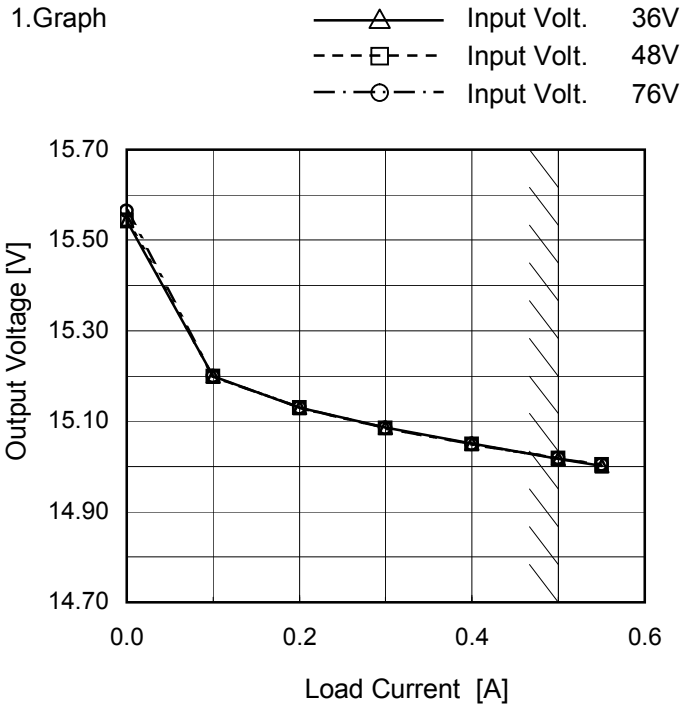
+15V: Rated output current

COSEL

Model	MGW154815
Item	Load Regulation
Object	+15V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



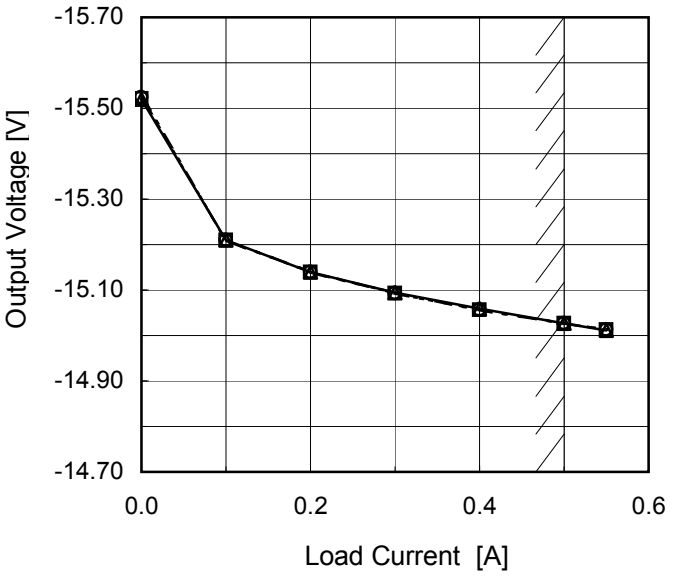
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	15.543	15.545	15.564
0.100	15.199	15.199	15.199
0.200	15.130	15.131	15.131
0.300	15.086	15.085	15.085
0.400	15.050	15.049	15.049
0.500	15.017	15.018	15.018
0.550	15.001	15.003	15.004
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-15V: Rated output current

Object	-15V0.5A

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	-15.520	-15.521	-15.523
0.100	-15.210	-15.210	-15.210
0.200	-15.139	-15.140	-15.139
0.300	-15.094	-15.093	-15.093
0.400	-15.060	-15.057	-15.057
0.500	-15.027	-15.026	-15.027
0.550	-15.011	-15.012	-15.013
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+15V: Rated output current

COSEL

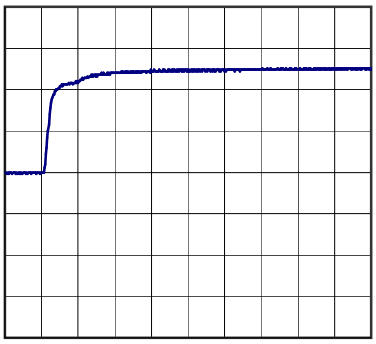
Model	MGW154815	Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	+15V0.5A	

Input Volt. 48 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

Load Current

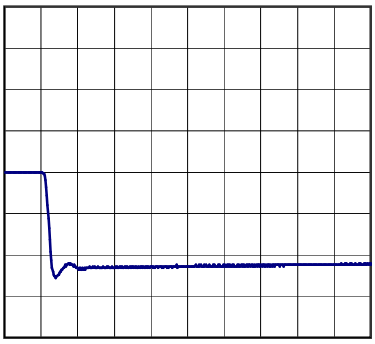
Min. Load (0A) ←→
Load 100% (0.5A)

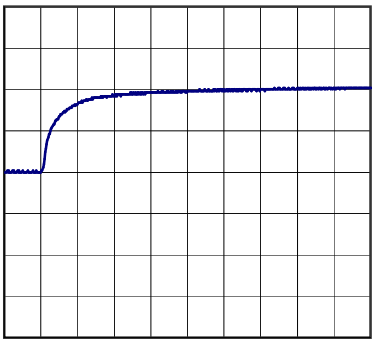


200mV/div

200μs/div 200μs/div

Min. Load (0A) ←→
Load 50% (0.25A)

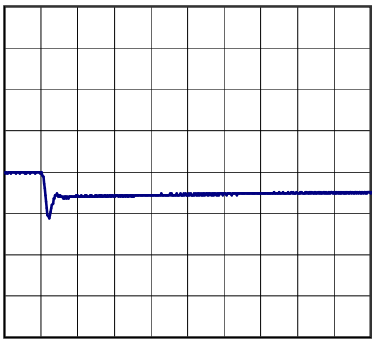


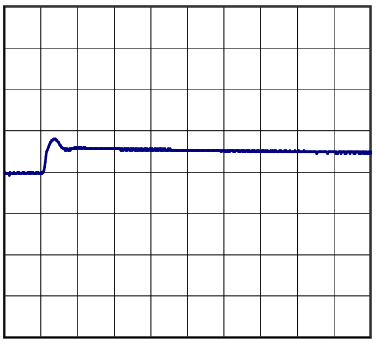


200mV/div

200μs/div 200μs/div

Load 50% (0.25A) ←→
Load 100% (0.5A)





200mV/div

200μs/div 200μs/div

COSEL

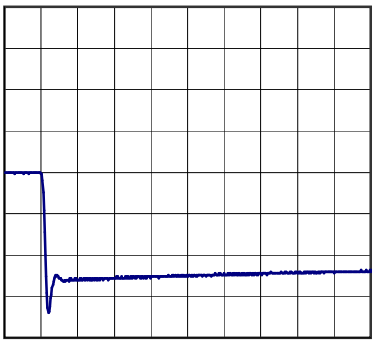
Model	MGW154815	Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	-15V0.5A	

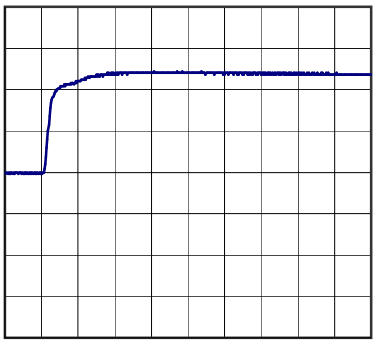
Input Volt. 48 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

Load Current

Min. Load (0A) ←→
Load 100% (0.5A)

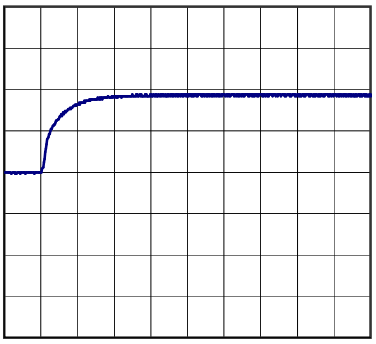




200mV/div

200μs/div 200μs/div

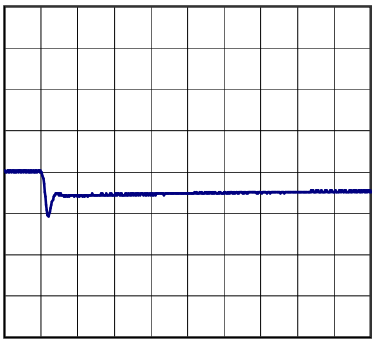
Min. Load (0A) ←→
Load 50% (0.25A)

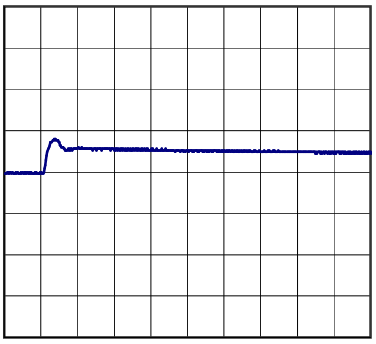


200mV/div

200μs/div 200μs/div

Load 50% (0.25A) ←→
Load 100% (0.5A)





200mV/div

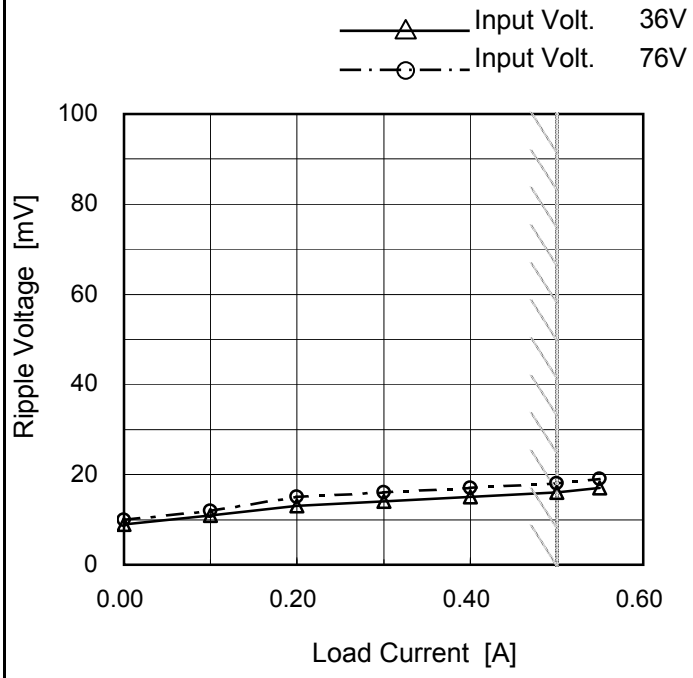
200μs/div 200μs/div

COSEL

Model	MGW154815
Item	Ripple Voltage (by Load Current)
Object	+15V0.5A

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]

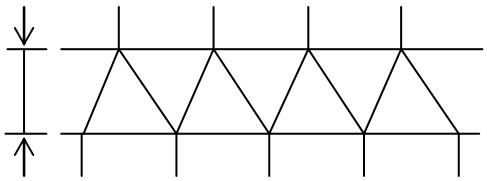


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	9	10
0.10	11	12
0.20	13	15
0.30	14	16
0.40	15	17
0.50	16	18
0.55	17	19
--	-	-
--	-	-
--	-	-
--	-	-

−15V: Rated output current

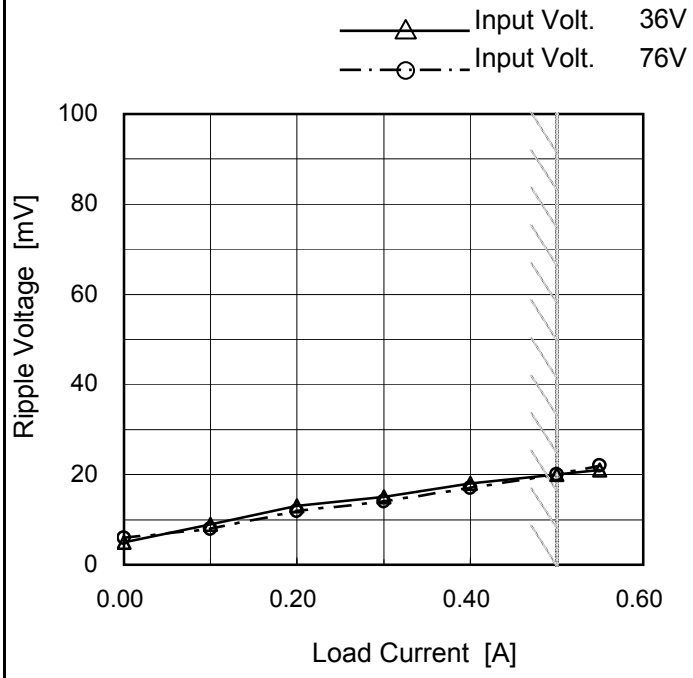
BC-10467

COSEL

Model	MGW154815
Item	Ripple Voltage (by Load Current)
Object	-15V0.5A

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]

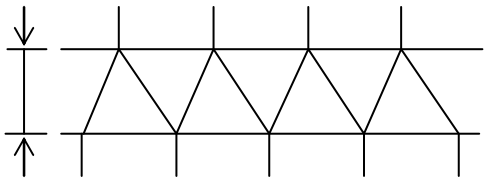


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	5	6
0.10	9	8
0.20	13	12
0.30	15	14
0.40	18	17
0.50	20	20
0.55	21	22
--	-	-
--	-	-
--	-	-
--	-	-

+15V: Rated output current

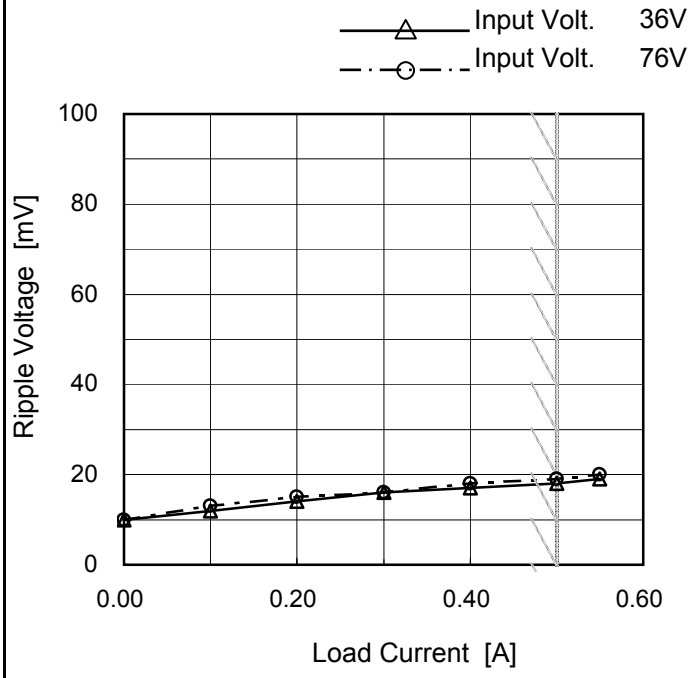
BC-10467

COSEL

Model	MGW154815
Item	Ripple-Noise
Object	+15V0.5A

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.

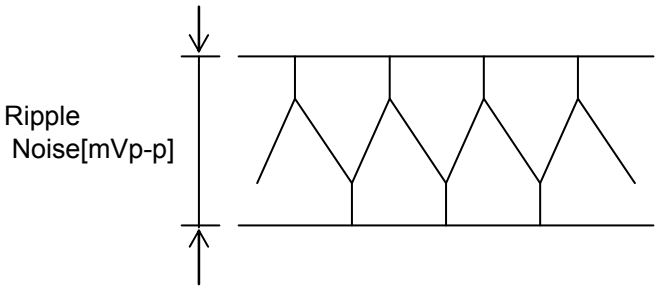


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	10	10
0.10	12	13
0.20	14	15
0.30	16	16
0.40	17	18
0.50	18	19
0.55	19	20
--	-	-
--	-	-
--	-	-
--	-	-

−15V: Rated output current

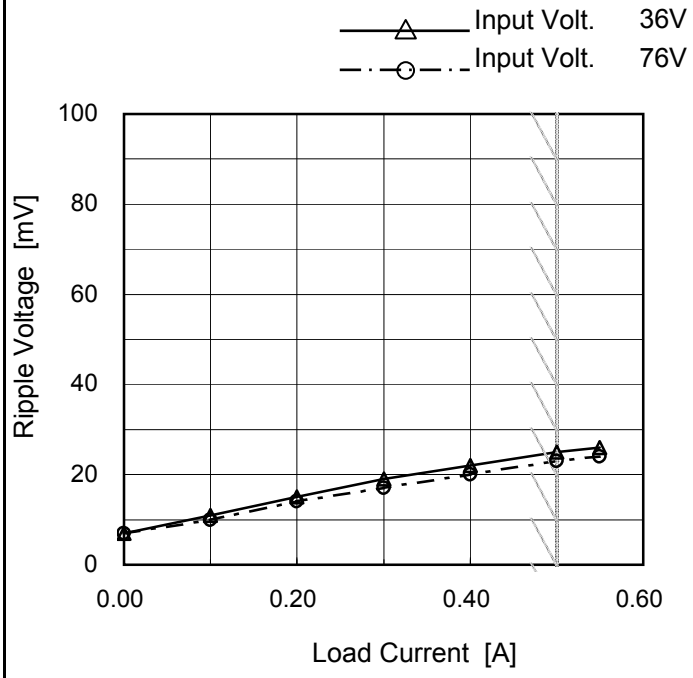
BC-10467

COSEL

Model	MGW154815
Item	Ripple-Noise
Object	-15V0.5A

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.

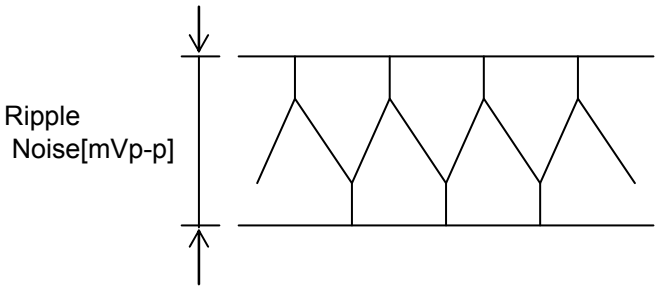


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	7	7
0.10	11	10
0.20	15	14
0.30	19	17
0.40	22	20
0.50	25	23
0.55	26	24
--	-	-
--	-	-
--	-	-
--	-	-

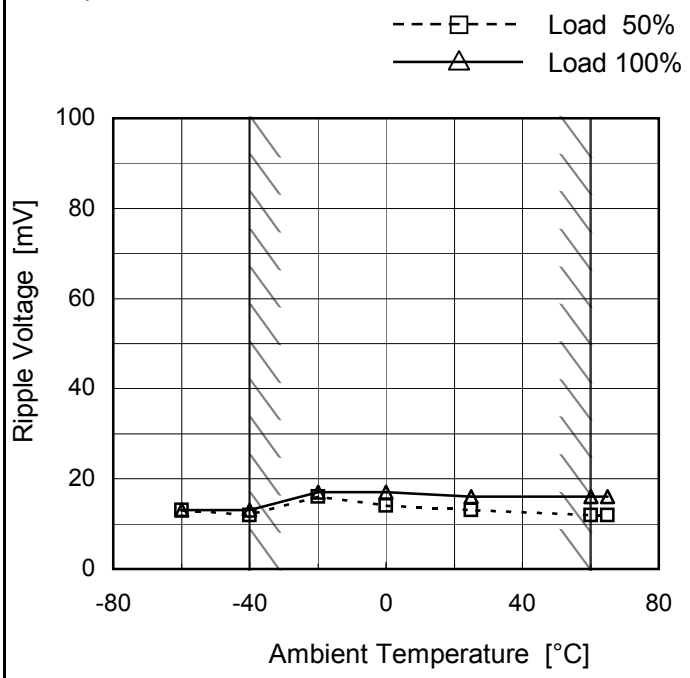
+15V: Rated output current

COSEL

Model	MGW154815
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.5A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

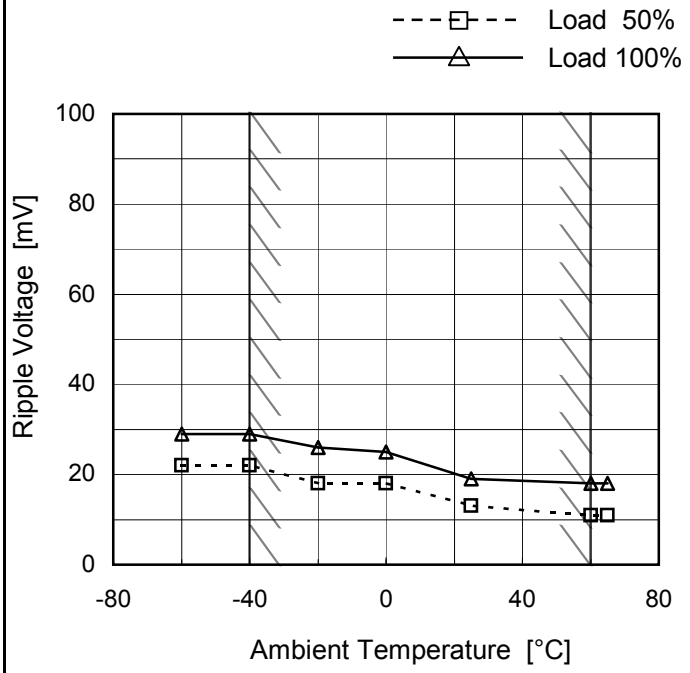
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	13	13
-40	12	13
-20	16	17
0	14	17
25	13	16
60	12	16
65	12	16
--	-	-
--	-	-
--	-	-
--	-	-

-15V: Rated output current

Object	-15V0.5A

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	22	29
-40	22	29
-20	18	26
0	18	25
25	13	19
60	11	18
65	11	18
--	-	-
--	-	-
--	-	-
--	-	-

+15V: Rated output current

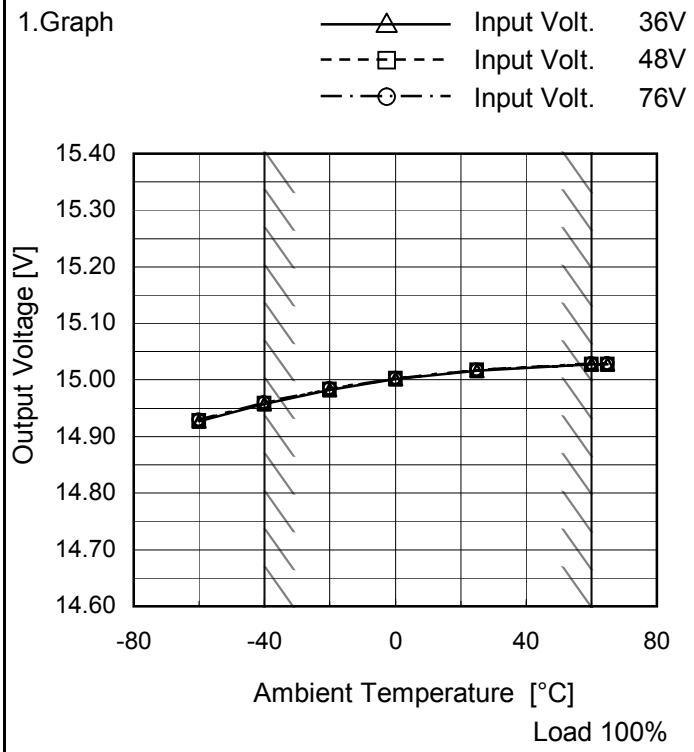
COSEL

Model	MGW154815
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +15V0.5A

1.Graph

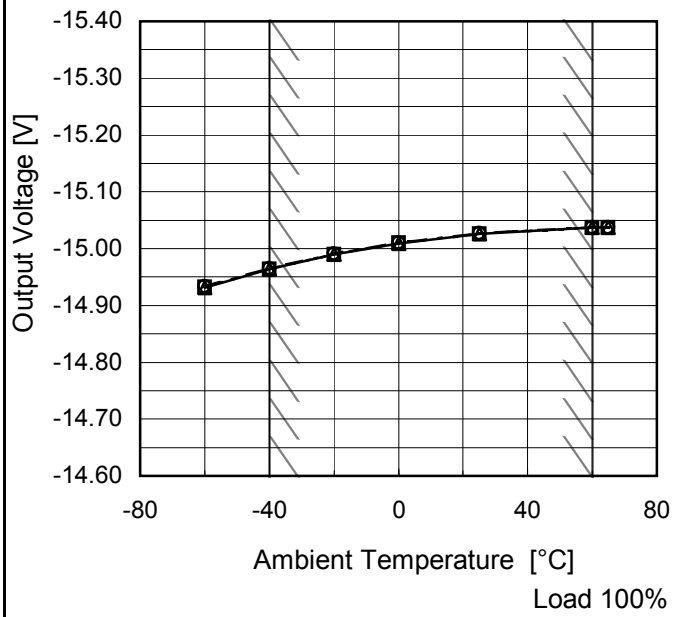


2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	14.927	14.928	14.930
-40	14.957	14.959	14.960
-20	14.982	14.984	14.985
0	15.001	15.002	15.003
25	15.017	15.017	15.018
60	15.027	15.028	15.028
65	15.027	15.028	15.029
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object -15V0.5A

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	-14.931	-14.932	-14.934
-40	-14.964	-14.964	-14.965
-20	-14.989	-14.990	-14.991
0	-15.009	-15.010	-15.010
25	-15.026	-15.026	-15.027
60	-15.037	-15.037	-15.037
65	-15.038	-15.037	-15.037
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW154815
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 - 0.5A (AVR 2) : 0 - 0.5A

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

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

2.Values

Object	+15V0.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	76	0	15.567	±305	±2.0
Minimum Voltage	-40	36	0.5	14.957		

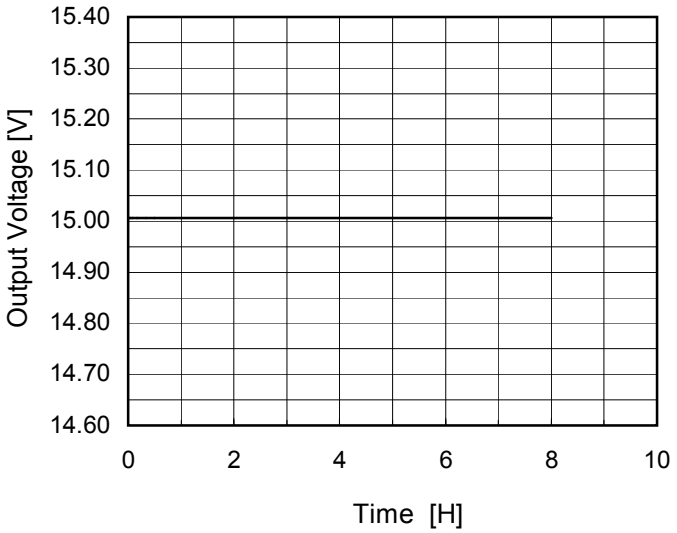
Object	-15V0.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	76	0	-15.542	±289	±1.9
Minimum Voltage	-40	36	0.5	-14.964		

COSEL

Model	MGW154815
Item	Time Lapse Drift
Object	+15V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



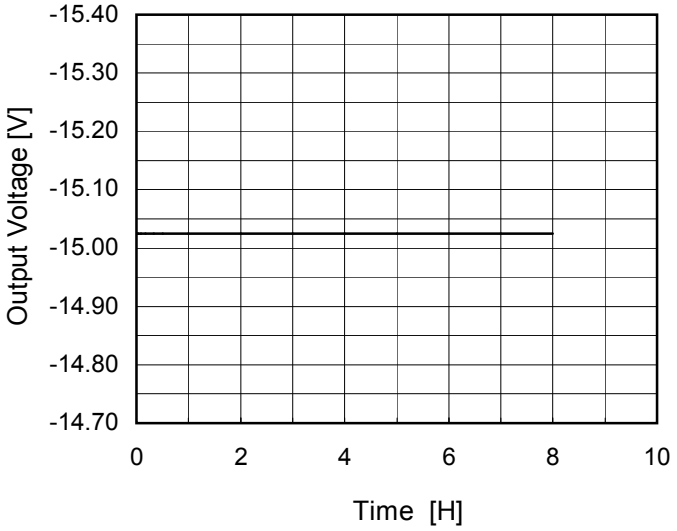
Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.007
0.5	15.007
1.0	15.007
2.0	15.007
3.0	15.007
4.0	15.007
5.0	15.007
6.0	15.007
7.0	15.007
8.0	15.007

Object	-15V0.5A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-15.025
0.5	-15.025
1.0	-15.025
2.0	-15.025
3.0	-15.025
4.0	-15.025
5.0	-15.025
6.0	-15.025
7.0	-15.025
8.0	-15.025

BC-10467

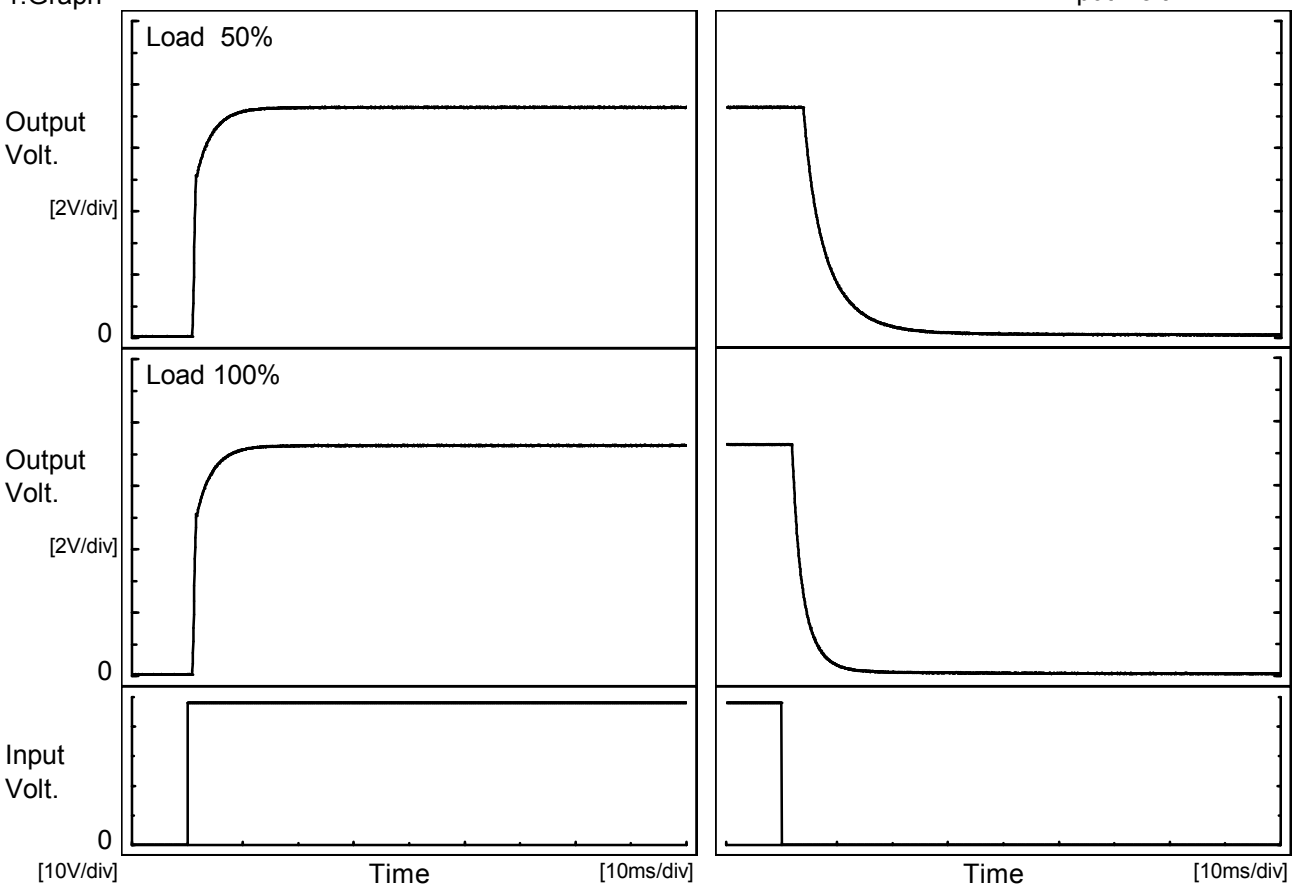
COSEL

Model	MGW154815
Item	Rise and Fall Time
Object	+15V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

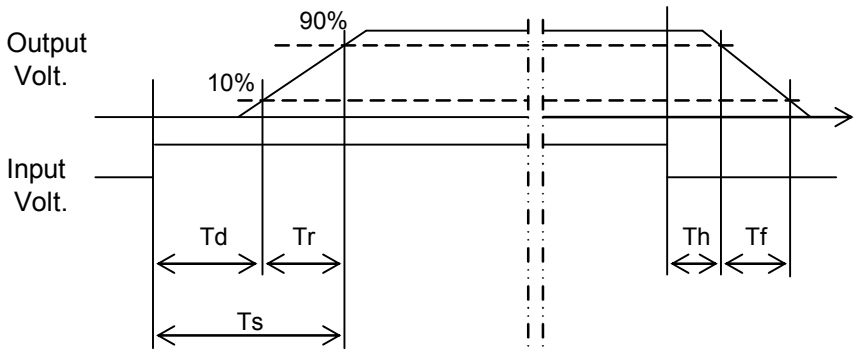
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.1	5.1	6.2	4.0	10.3
100 %	1.1	5.1	6.2	2.0	5.1



BC-10467

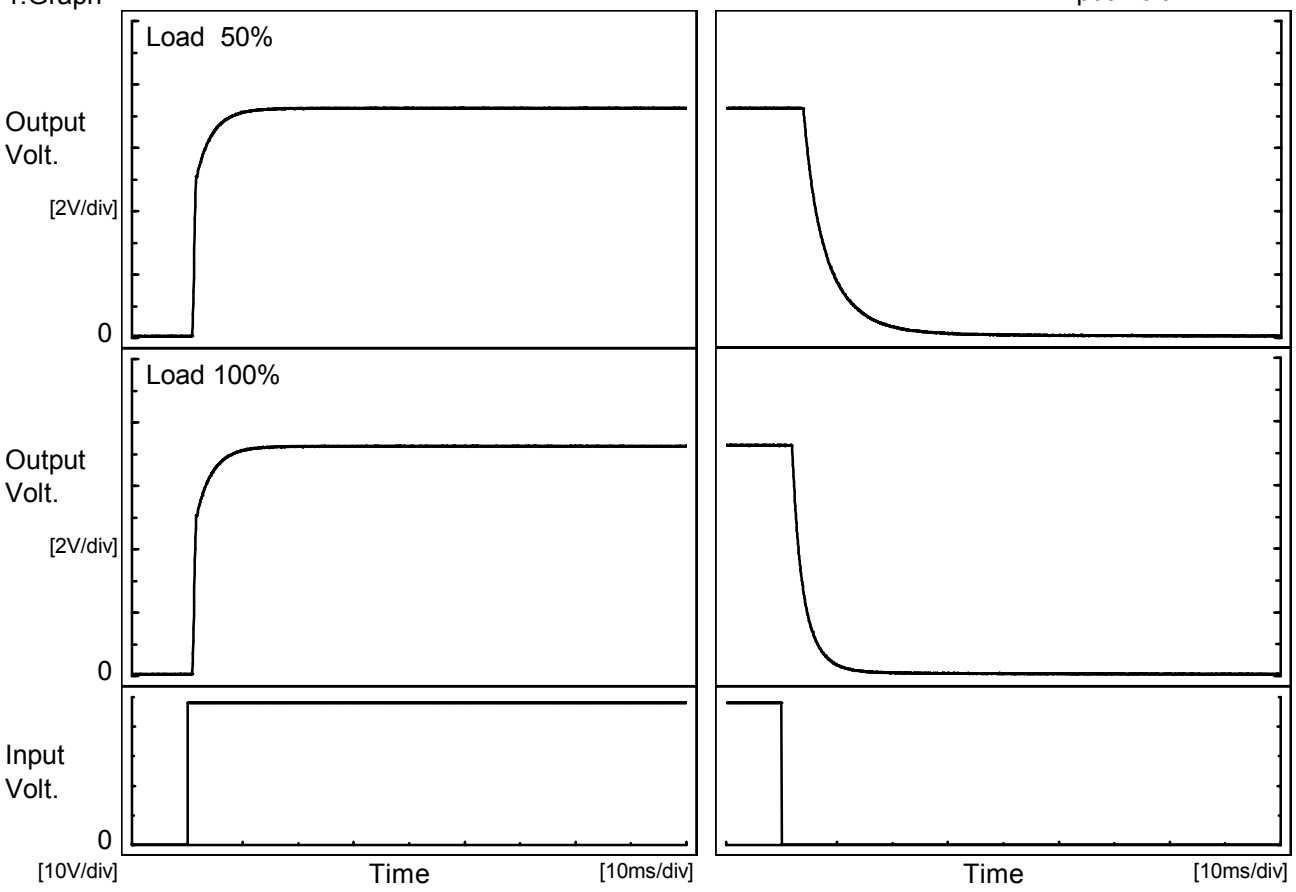
COSEL

Model	MGW154815
Item	Rise and Fall Time
Object	-15V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

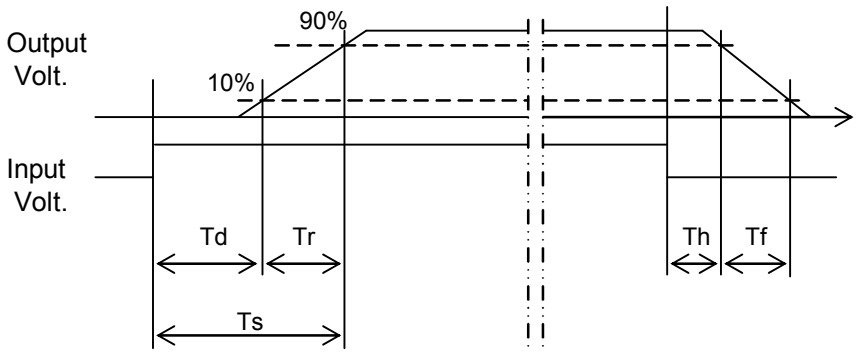
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.1	5.2	6.3	4.0	10.4
100 %	1.1	5.2	6.3	2.0	5.2



BC-10467

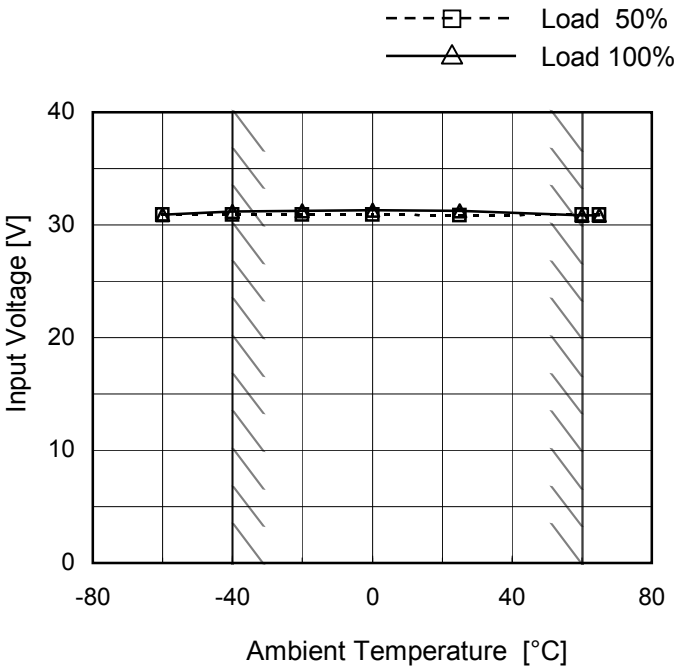
COSEL

Model	MGW154815
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object: +15V0.5A

1.Graph

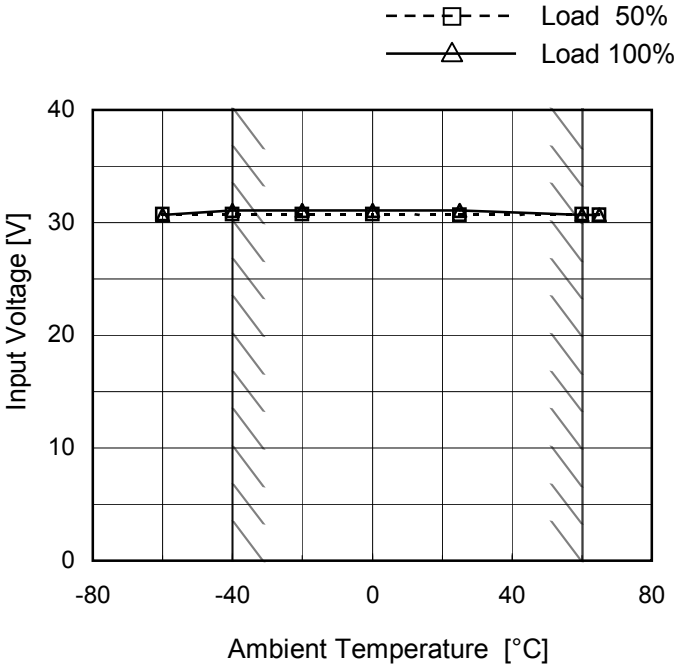


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	31.0	30.9
-40	31.0	31.3
-20	31.0	31.3
0	31.0	31.3
25	30.9	31.3
60	30.9	30.9
65	31.0	30.9
--	-	-
--	-	-
--	-	-
--	-	-

Object: -15V0.5A

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	30.8	30.7
-40	30.8	31.1
-20	30.8	31.1
0	30.8	31.1
25	30.7	31.1
60	30.8	30.7
65	30.8	30.7
--	-	-
--	-	-
--	-	-
--	-	-

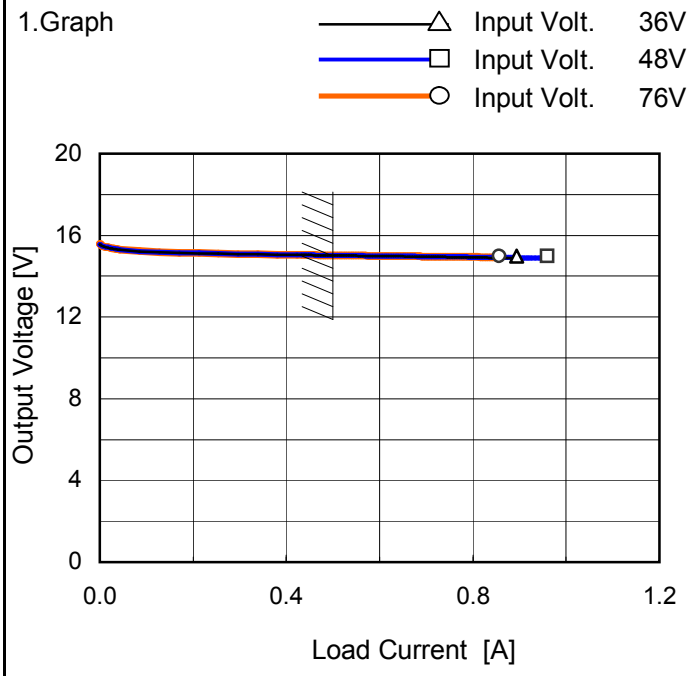
COSEL

Model	MGW154815
Item	Overcurrent Protection

Temperature 25°C
Testing Circuitry Figure A

Object +15V0.5A

1.Graph



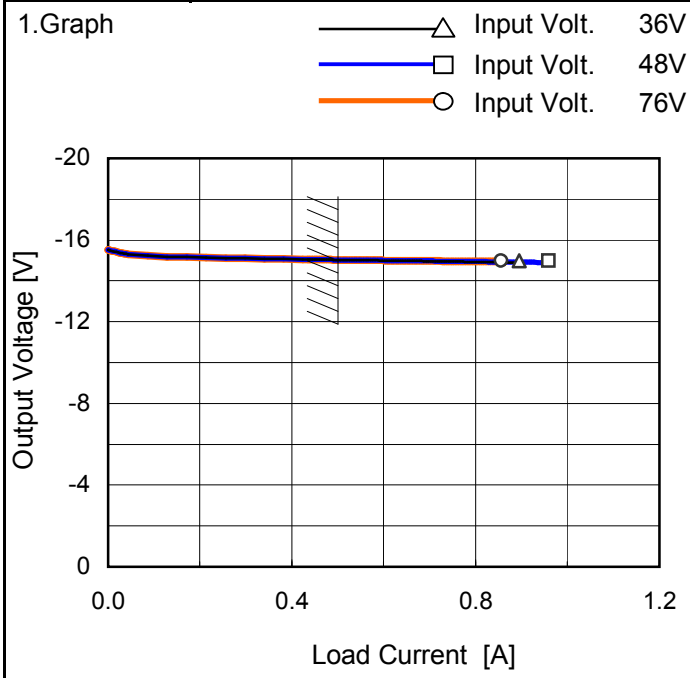
2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
15.00	0.89	0.96	0.86
14.25	-	-	-
13.50	-	-	-
12.00	-	-	-
10.50	-	-	-
9.00	-	-	-
7.50	-	-	-
6.00	-	-	-
4.50	-	-	-
3.00	-	-	-
1.50	-	-	-
0.00	-	-	-

-15V: Rated output current

Object -15V0.5A

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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-15.00	0.89	0.96	0.86
-14.25	-	-	-
-13.50	-	-	-
-12.00	-	-	-
-10.50	-	-	-
-9.00	-	-	-
-7.50	-	-	-
-6.00	-	-	-
-4.50	-	-	-
-3.00	-	-	-
-1.50	-	-	-
0.00	-	-	-

+15V: Rated output current

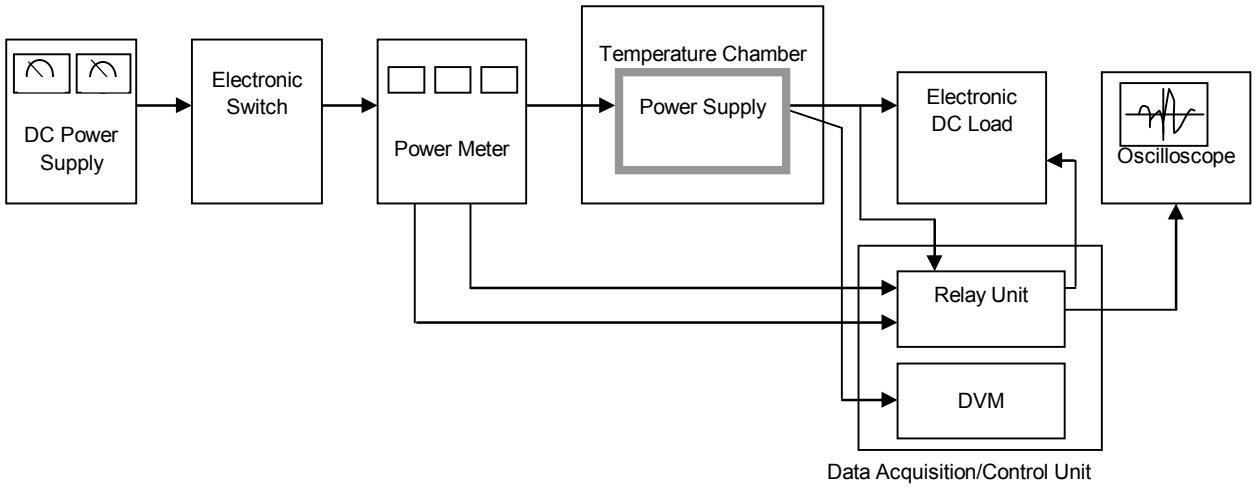


Figure A

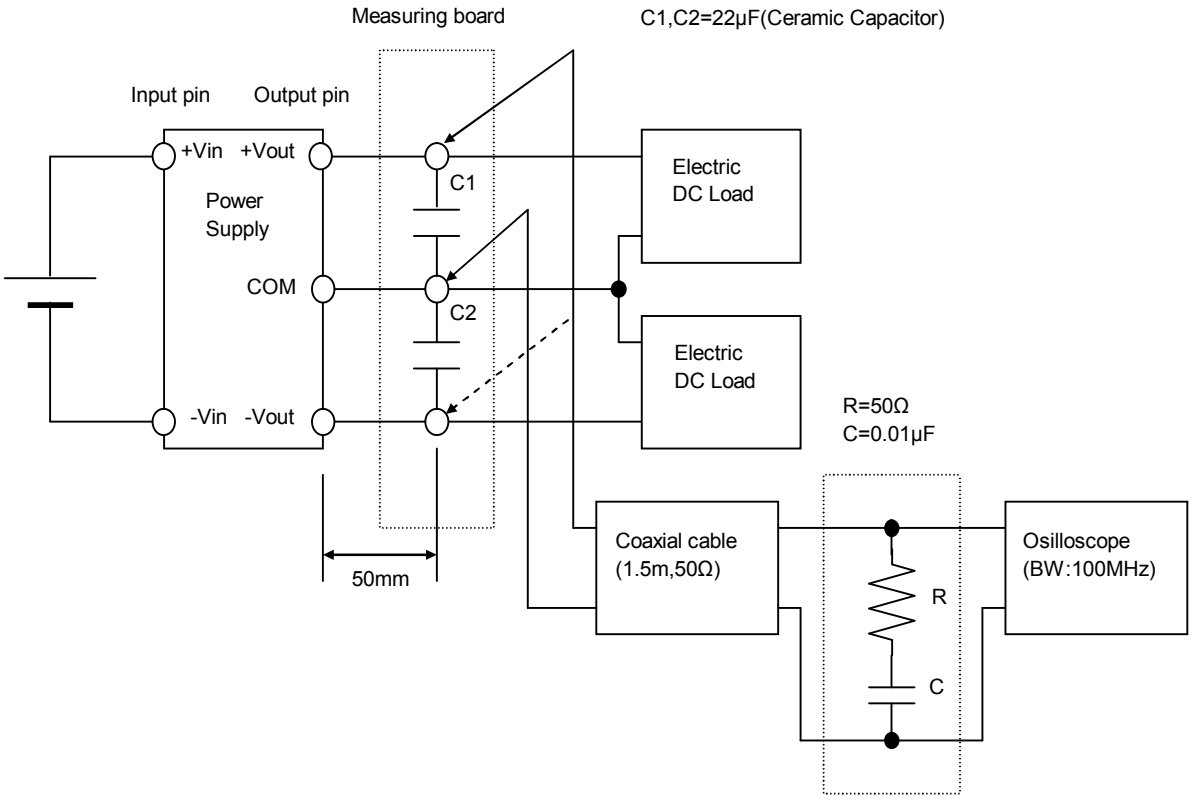


Figure B（Ripple and Ripple noise Characteristic）