参考資料

TEST DATA OF MGFS102415

Regulated DC Power Supply
December 13, 2016

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COSEL CO.,LTD.

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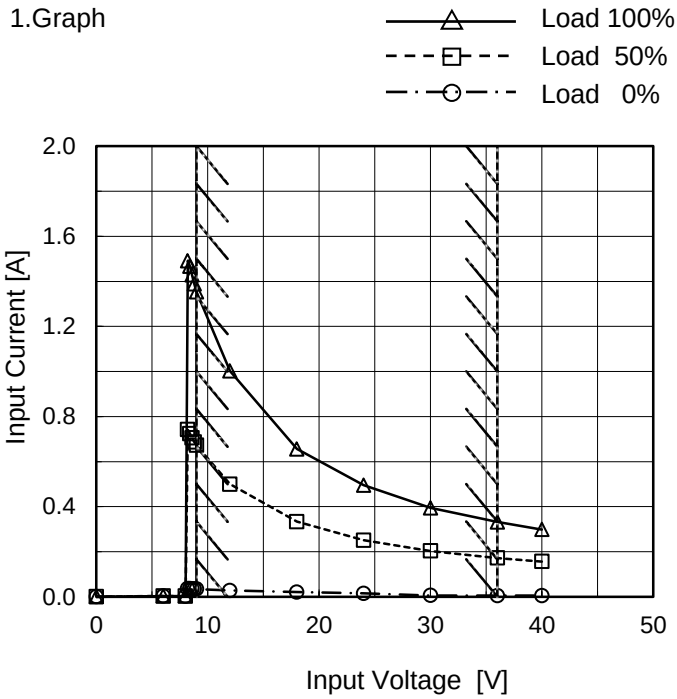
Model	MGFS102415
Item	Input Current (by Input Voltage)
Object	————————

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	0.004	0.003
8.0	0.003	0.003	0.003
8.2	0.036	0.742	1.492
8.4	0.036	0.724	1.467
8.6	0.035	0.705	1.429
8.8	0.034	0.688	1.389
9.0	0.034	0.673	1.354
12.0	0.028	0.500	1.002
18.0	0.021	0.334	0.656
24.0	0.015	0.251	0.495
30.0	0.006	0.203	0.394
36.0	0.005	0.172	0.332
40.0	0.005	0.157	0.299
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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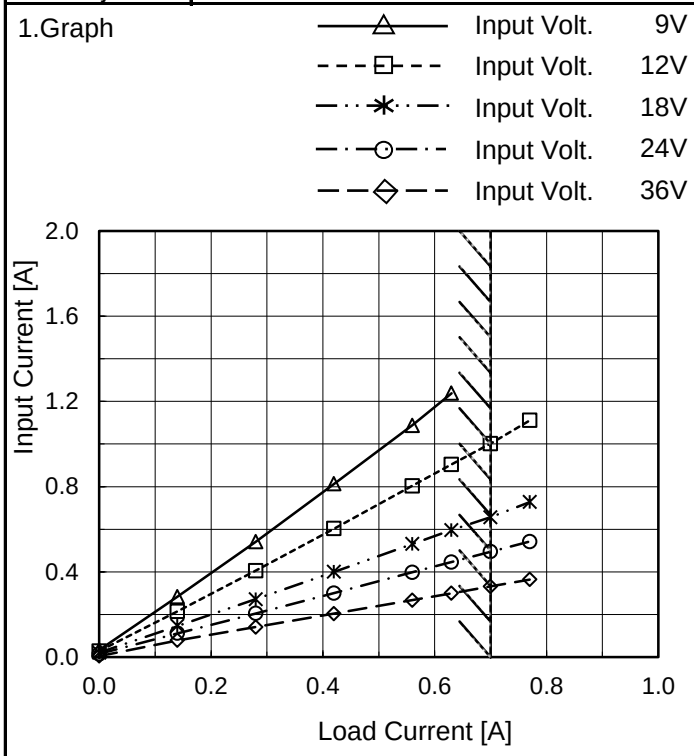
Model	MGFS102415
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	0.034	0.028	0.021	0.015	0.005
0.14	0.284	0.215	0.146	0.112	0.079
0.28	0.542	0.405	0.272	0.205	0.141
0.42	0.813	0.603	0.400	0.300	0.204
0.56	1.087	0.803	0.531	0.398	0.267
0.63	1.238	0.904	0.596	0.446	0.300
0.70	- ※	1.002	0.656	0.495	0.332
0.77	- ※	1.111	0.728	0.542	0.364
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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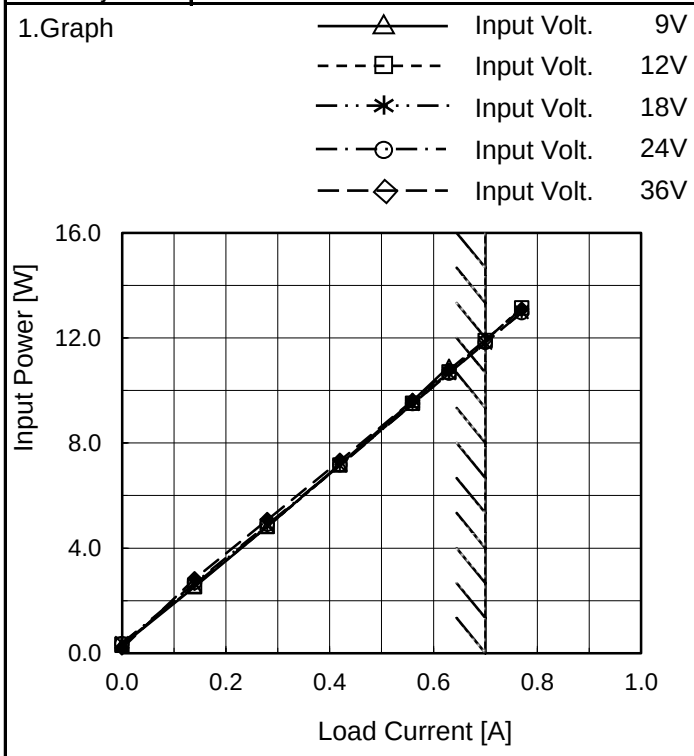
Model	MGFS102415
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Power [W]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	0.30	0.34	0.38	0.36	0.19
0.14	2.53	2.56	2.62	2.68	2.84
0.28	4.82	4.83	4.86	4.90	5.08
0.42	7.20	7.16	7.15	7.17	7.34
0.56	9.61	9.51	9.48	9.49	9.62
0.63	10.92	10.70	10.65	10.65	10.78
0.70	- ※	11.90	11.81	11.82	11.93
0.77	- ※	13.14	12.97	12.96	13.09
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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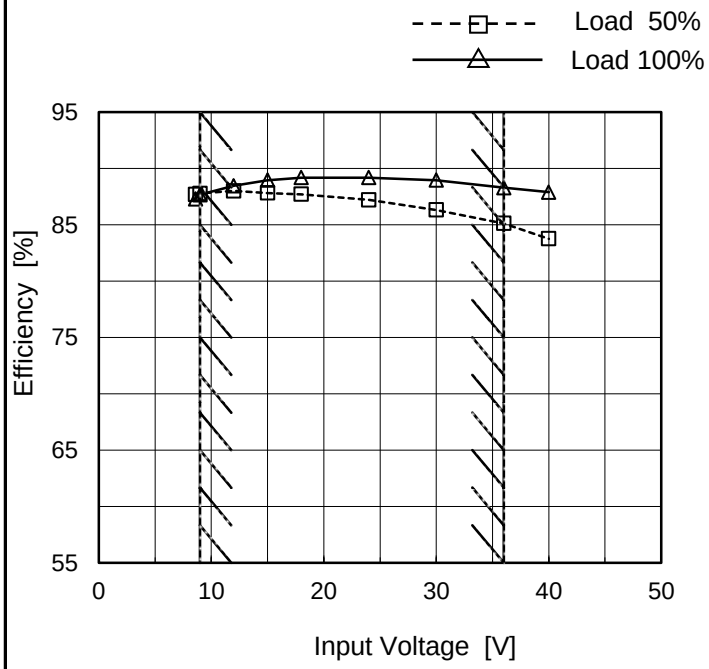
Model	MGFS102415
Item	Efficiency (by Input Voltage)
Object	――――――――――

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	87.7	87.3 ※1
9.0	87.8	87.7 ※1
12.0	88.0	88.5
15.0	87.8	89.0
18.0	87.7	89.2
24.0	87.2	89.2
30.0	86.3	89.0
36.0	85.1	88.3
40.0	83.8	87.9

※1:Load 80%

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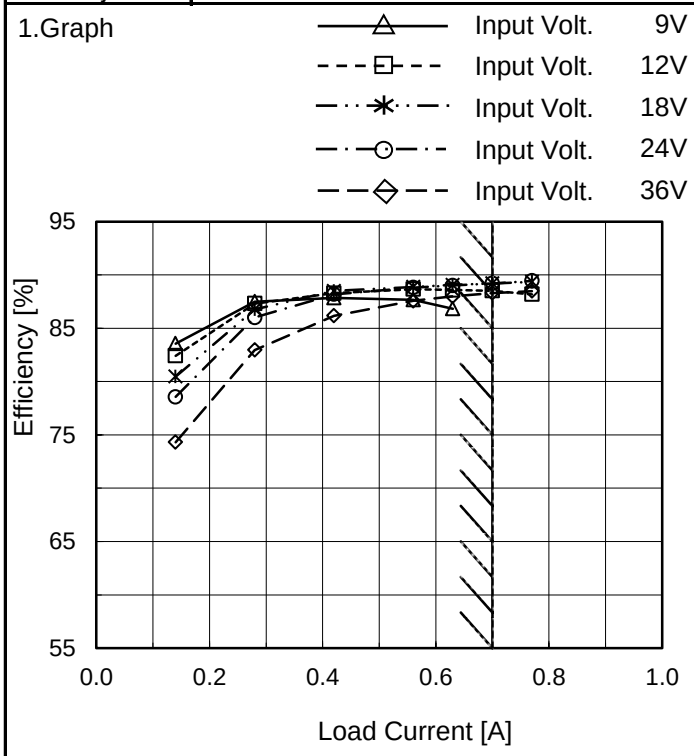
Model	MGFS102415
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	-	-	-	-	-
0.14	83.6	82.4	80.5	78.6	74.3
0.28	87.5	87.3	86.8	86.0	83.0
0.42	87.8	88.3	88.5	88.2	86.2
0.56	87.7	88.7	88.9	88.8	87.6
0.63	86.8	88.6	89.1	89.0	88.0
0.70	- ※	88.5	89.2	89.2	88.3
0.77	- ※	88.2	89.3	89.4	88.5
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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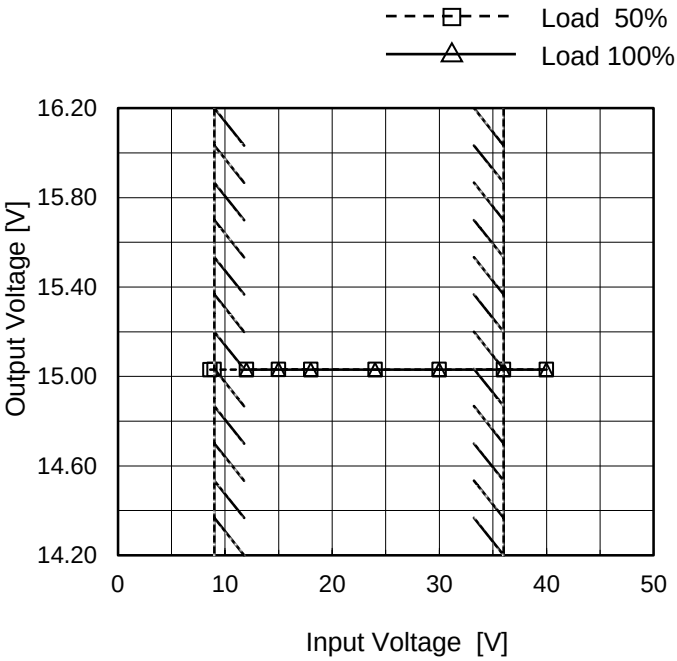
Model	MGFS102415
Item	Line Regulation
Object	+15V0.7A

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]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	15.030	- ※
9.0	15.031	- ※
12.0	15.031	15.030
15.0	15.032	15.031
18.0	15.031	15.030
24.0	15.031	15.030
30.0	15.031	15.030
36.0	15.031	15.030
40.0	15.031	15.030

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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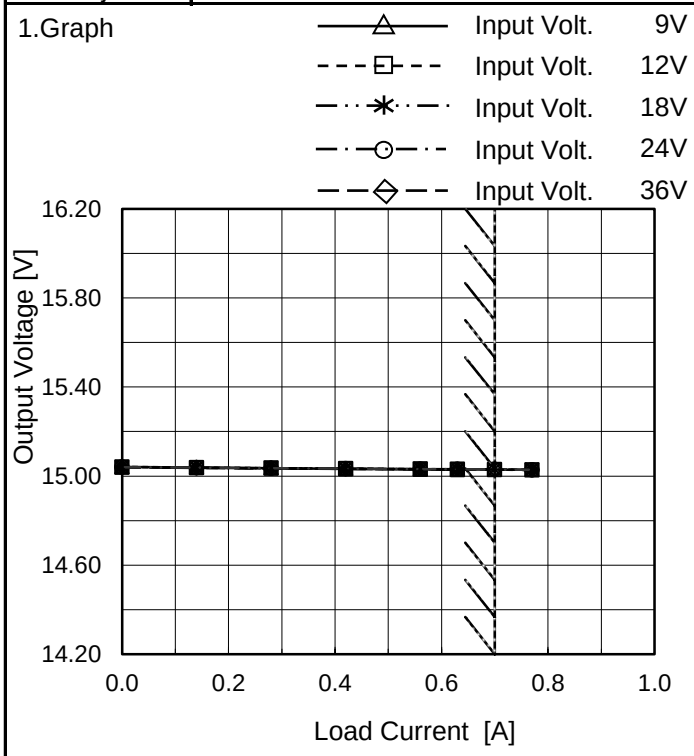
Model	MGFS102415
Item	Load Regulation
Object	+15V0.7A

Temperature 25°C
Testing Circuitry Figure A

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]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	15.041	15.040	15.040	15.040	15.040
0.14	15.038	15.038	15.038	15.037	15.036
0.28	15.036	15.036	15.036	15.035	15.034
0.42	15.033	15.034	15.034	15.033	15.032
0.56	15.030	15.031	15.032	15.031	15.030
0.63	15.028	15.030	15.031	15.030	15.030
0.70	- ※	15.029	15.030	15.030	15.030
0.77	- ※	15.028	15.029	15.028	15.027
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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Model	MGFS102415	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.7A	

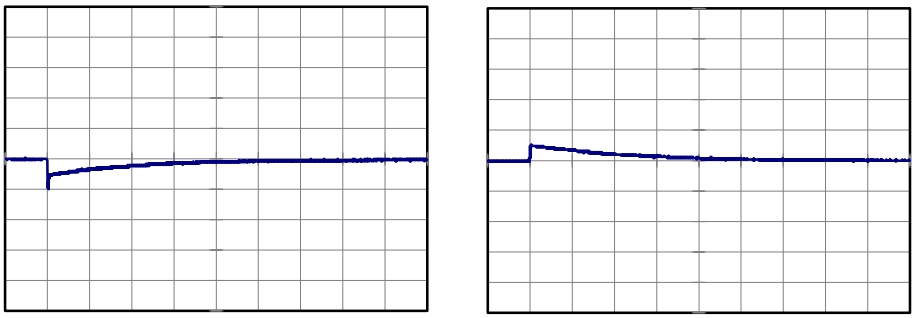
Input Volt. 24 V
Cycle 100 ms

t1,t2 = 100 μs

Load Current

t1 t2

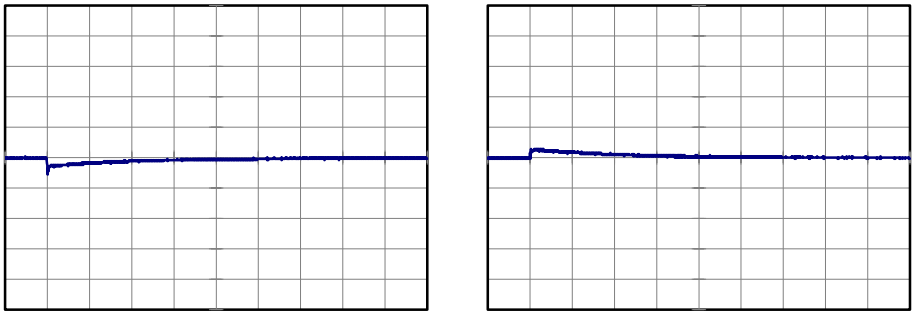
Min.Load (0A)←→
Load 100% (0.7A)



500 mV/div

2 ms/div 2 ms/div

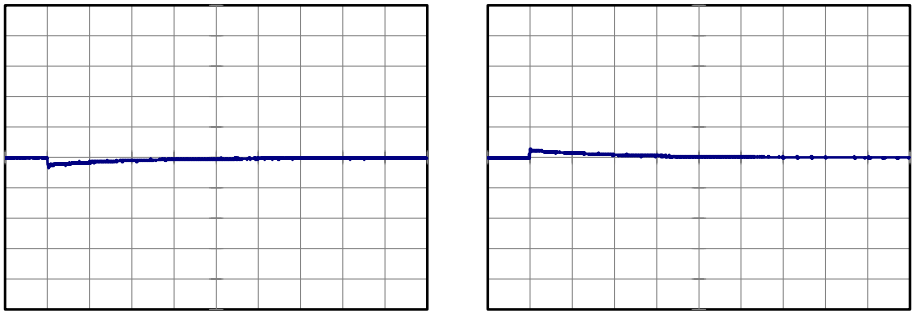
Min.Load (0A)←→
Load 50% (0.35A)



500 mV/div

2 ms/div 2 ms/div

Load 50% (0.35A)←→
Load 100% (0.7A)



500 mV/div

2 ms/div 2 ms/div

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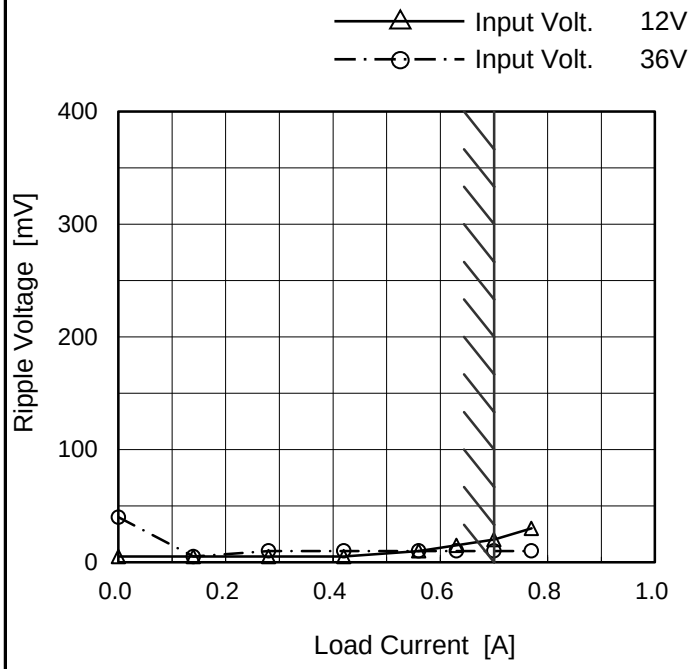
Model	MGFS102415
Item	Ripple Voltage (by Load Current)
Object	+15V0.7A

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]

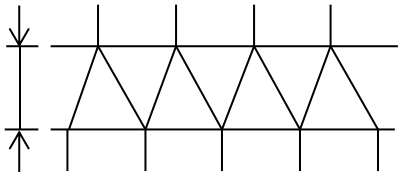


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.00	5	40
0.14	5	5
0.28	5	10
0.42	5	10
0.56	10	10
0.63	15	10
0.70	20	10
0.77	30	10
--	-	-
--	-	-
--	-	-

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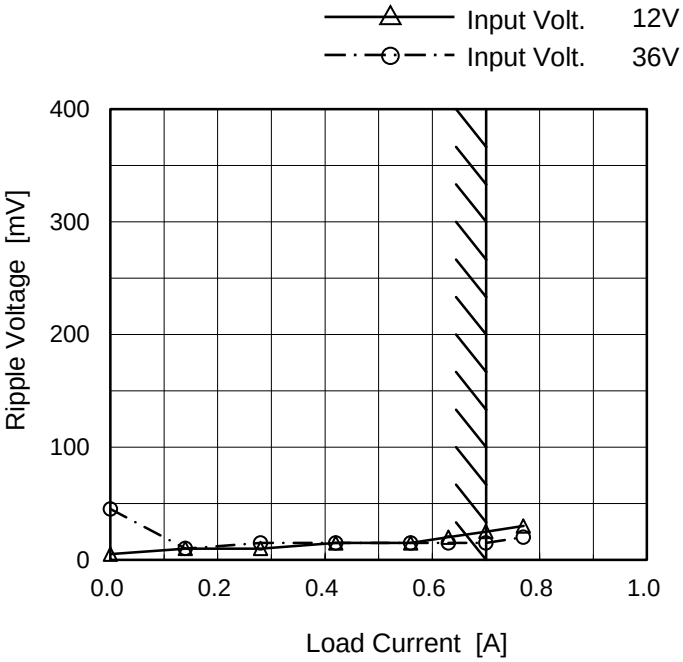
Model	MGFS102415
Item	Ripple-Noise
Object	+15V0.7A

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]

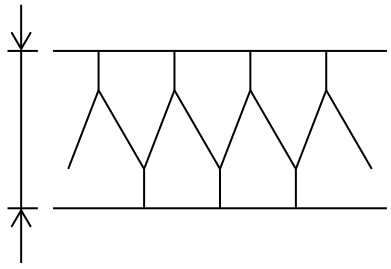


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.00	5	45
0.14	10	10
0.28	10	15
0.42	15	15
0.56	15	15
0.63	20	15
0.70	25	15
0.77	30	20
--	-	-
--	-	-
--	-	-

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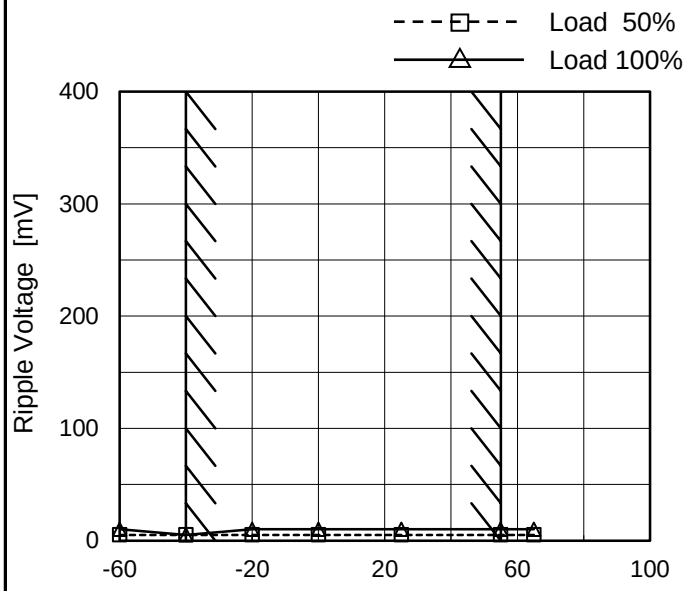
Model	MGFS102415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.7A

Testing Circuitry Figure B

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	5
-20	5	10
0	5	10
25	5	10
55	5	10
65	5	10
--	-	-
--	-	-
--	-	-
--	-	-

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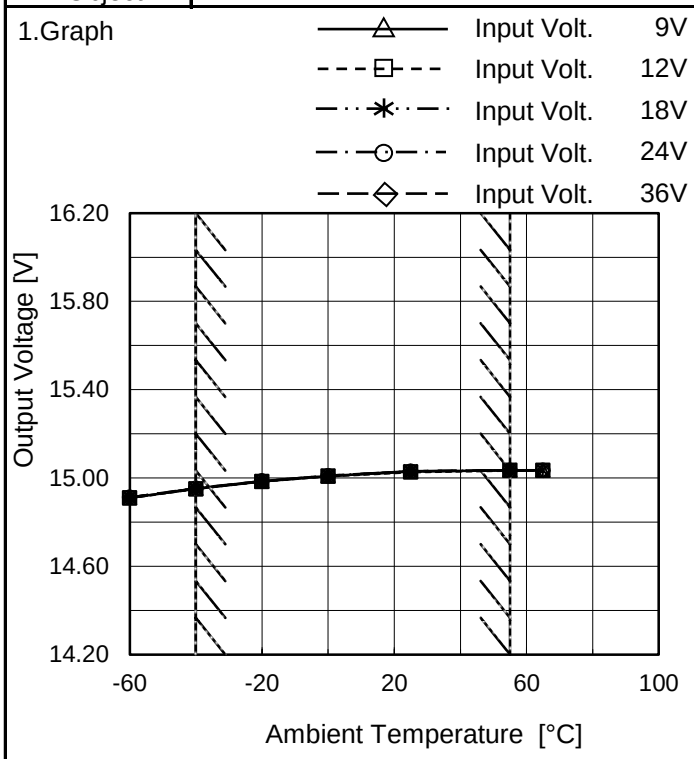
Model	MGFS102415
Item	Ambient Temperature Drift
Object	+15V0.7A

Testing Circuitry Figure A

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]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.910	14.909	14.911	14.912	14.912
-40	14.951	14.950	14.952	14.953	14.953
-20	14.985	14.984	14.986	14.986	14.986
0	15.009	15.008	15.010	15.010	15.010
25	15.028	15.027	15.030	15.030	15.030
55	15.035	15.034	15.035	15.035	15.034
65	15.034	15.034	15.035	15.034	15.034
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of Input Volt. 9V, Load 80%. Other case Load 100%.

Model	MGFS102415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V0.7A	

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 - 55°C
Input Voltage : 12 - 36V
Load Current : 0 - 0.7A

* 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

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	55	36	0	15.046	±48	±0.3
Minimum Voltage	-40	12	0.7	14.950		

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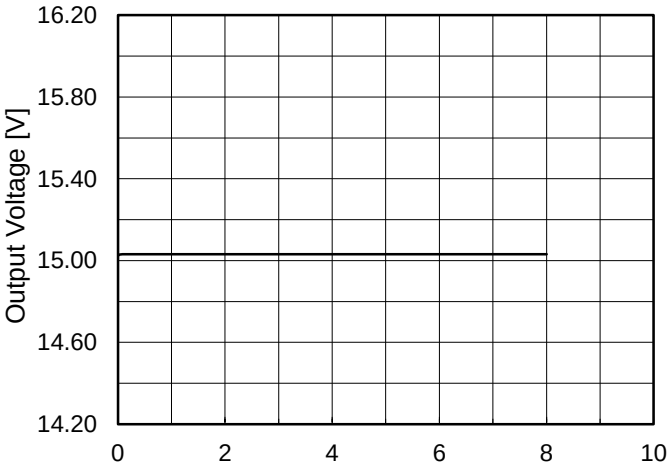
Model	MGFS102415
Item	Time Lapse Drift
Object	+15V0.7A

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	15.023
0.5	15.031
1.0	15.031
2.0	15.031
3.0	15.031
4.0	15.031
5.0	15.031
6.0	15.031
7.0	15.031
8.0	15.031

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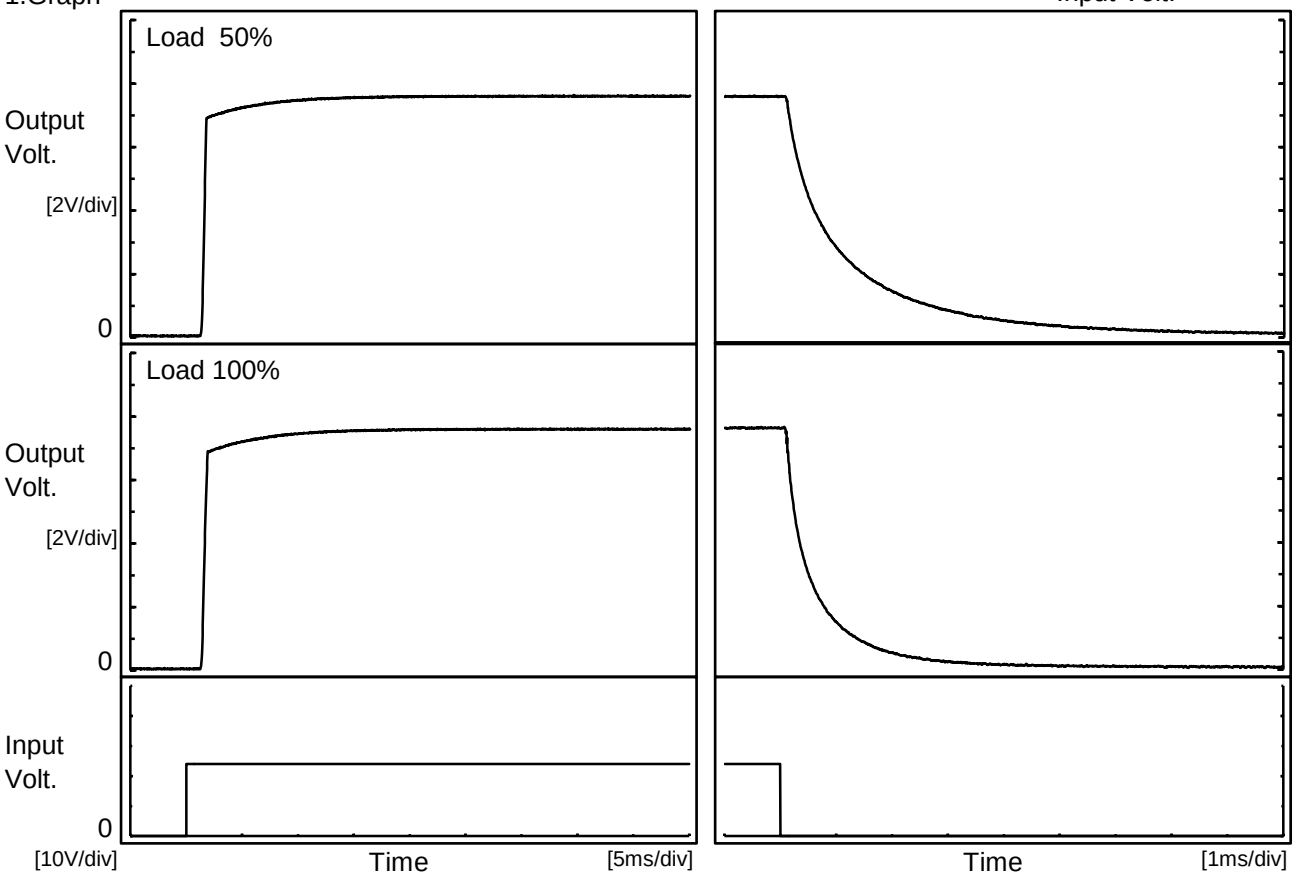
Model	MGFS102415	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.7A	

1.Graph

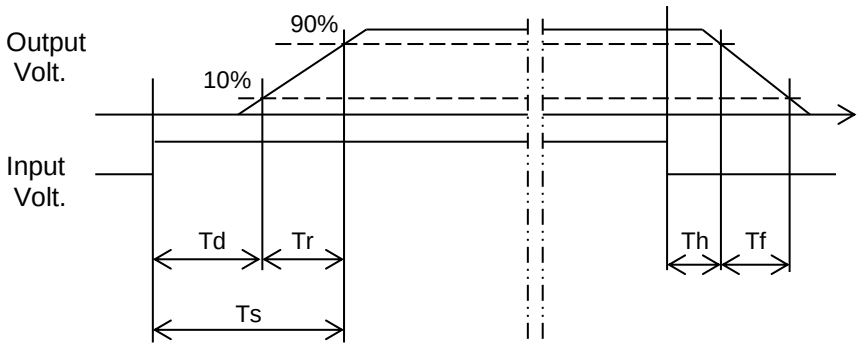
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	0.4	1.8	0.2	3.0
100 %	1.5	0.5	2.0	0.1	1.5

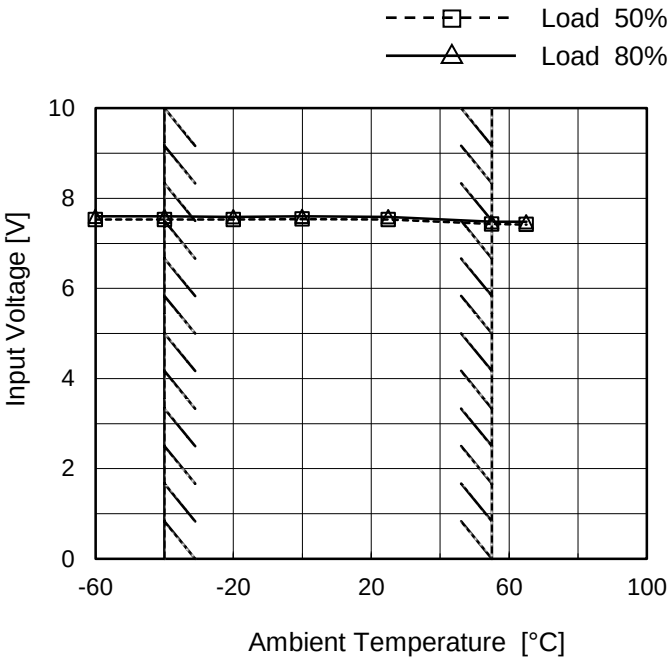


COSEL

Model	MGFS102415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.7A

Testing Circuitry Figure A

1.Graph



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

2.Values

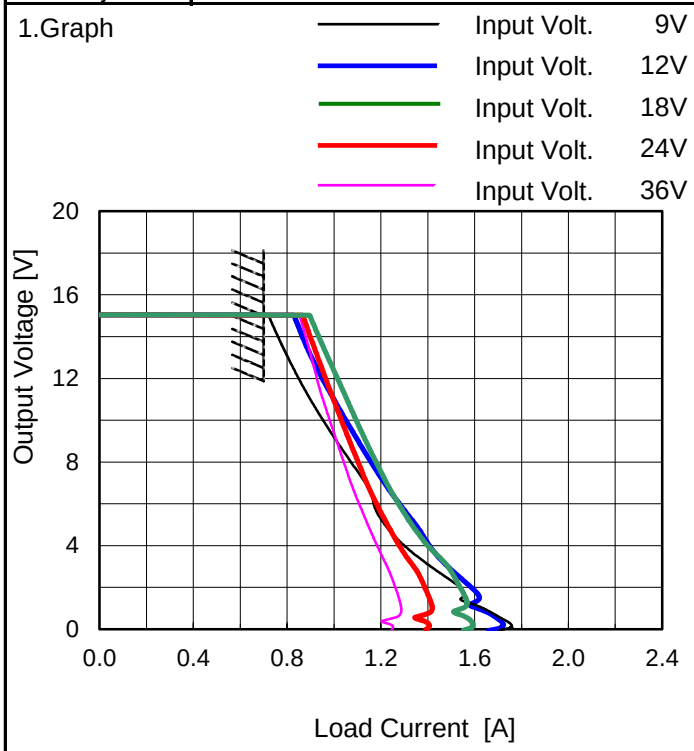
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 80%
-60	7.6	7.6
-40	7.6	7.6
-20	7.6	7.6
0	7.6	7.6
25	7.6	7.6
55	7.5	7.5
65	7.5	7.5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFS102415
Item	Overcurrent Protection
Object	+15V0.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Maximum output current at minimum input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

2.Values

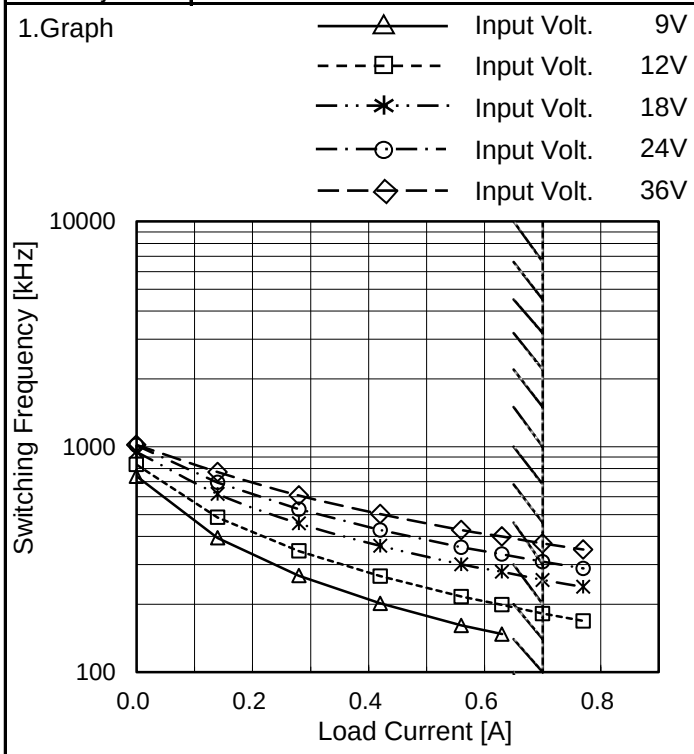
Output Voltage [V]	Load Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
14.3	0.751	0.857	0.926	0.891	0.873
13.5	0.781	0.883	0.953	0.914	0.891
12.0	0.849	0.949	1.013	0.963	0.926
10.5	0.924	1.024	1.074	1.013	0.966
9.0	1.009	1.102	1.134	1.066	1.011
7.5	1.102	1.183	1.200	1.121	1.056
6.0	1.168	1.276	1.273	1.181	1.106
4.5	1.254	1.377	1.364	1.252	1.163
3.0	1.412	1.482	1.483	1.340	1.225
1.5	1.546	1.620	1.562	1.406	1.276
0.0	1.707	1.660	1.552	1.391	1.246
--	-	-	-	-	-

COSEL

Model	MGFS102415
Item	Switching frequency (by Load Current)
Object	+15V0.7A

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]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	740	833	950	1014	1020
0.14	394	486	617	694	772
0.28	268	345	457	528	608
0.42	202	266	363	427	503
0.56	161	216	301	358	427
0.63	147	199	279	333	400
0.70	- ※	182	256	309	372
0.77	- ※	169	239	288	350
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

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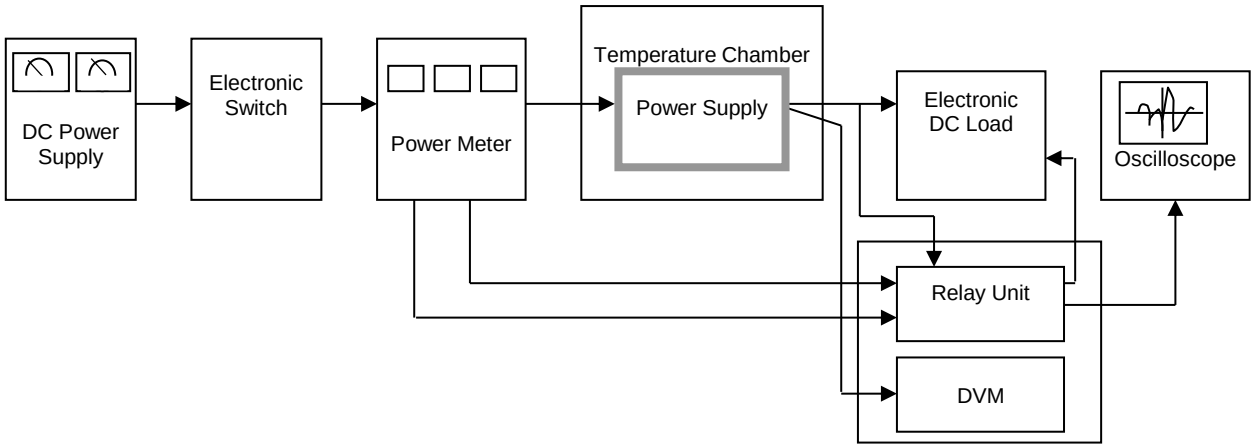

Figure A

Data Acquisition/Control Unit

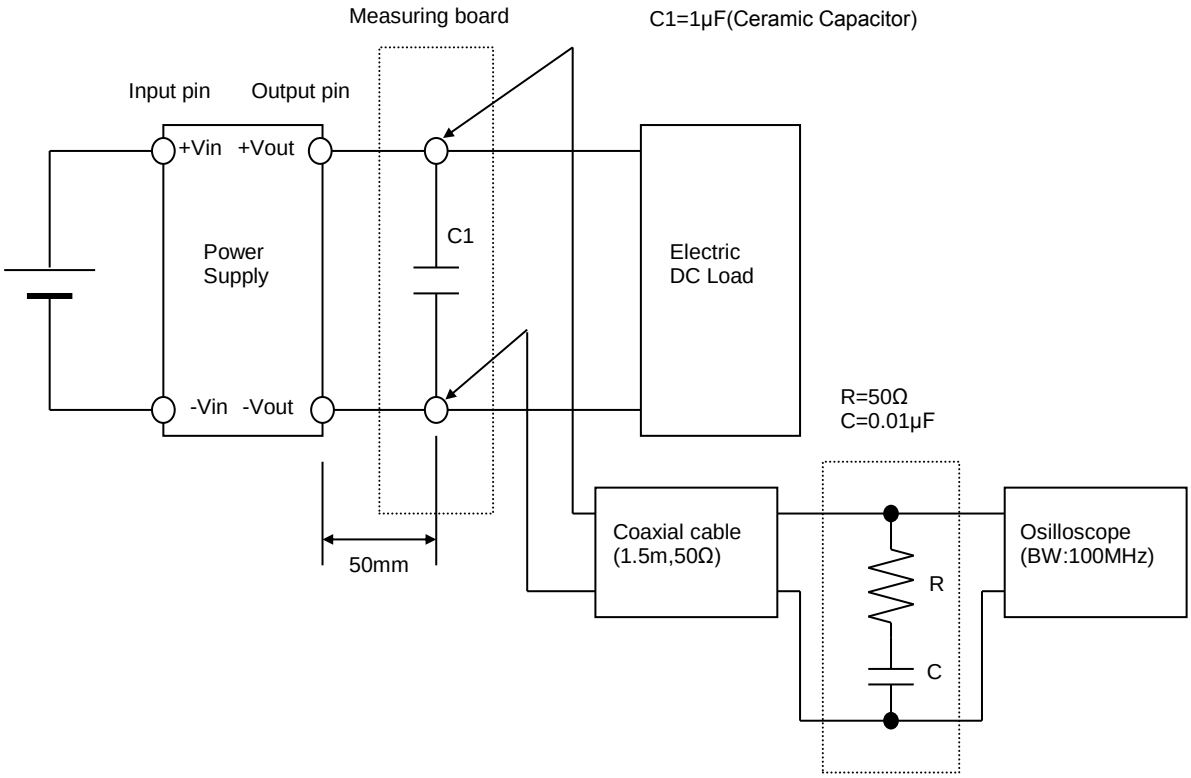

Figure B（Ripple and Ripple noise Characteristic）