参考資料

TEST DATA OF MGFS32412

Regulated DC Power Supply
January 6, 2017

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COSEL CO.,LTD.

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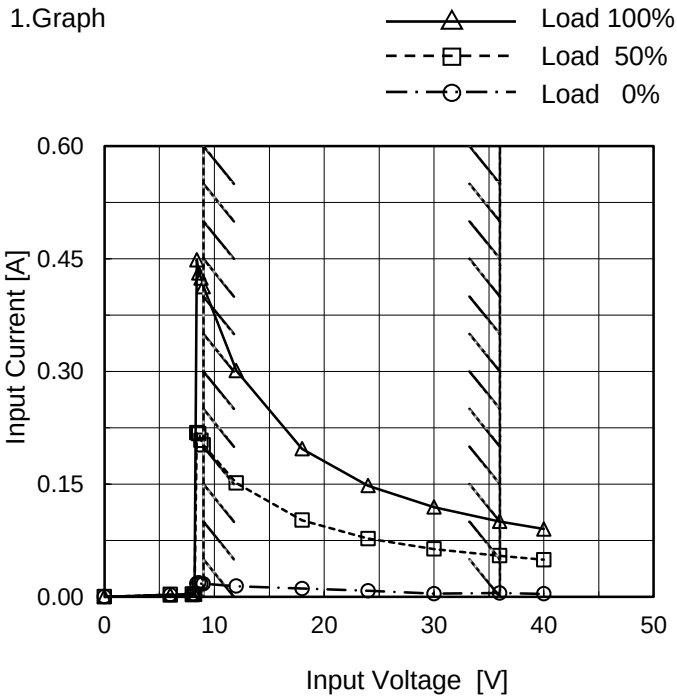
Model	MGFS32412
Item	Input Current (by Input Voltage)
Object	————————

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	0.002
8.0	0.004	0.004	0.003
8.2	0.003	0.003	0.004
8.4	0.018	0.218	0.449
8.6	0.019	0.217	0.431
8.8	0.017	0.208	0.424
9.0	0.017	0.202	0.413
12.0	0.014	0.151	0.301
18.0	0.011	0.102	0.197
24.0	0.008	0.078	0.148
30.0	0.004	0.064	0.119
36.0	0.005	0.055	0.100
40.0	0.004	0.049	0.090
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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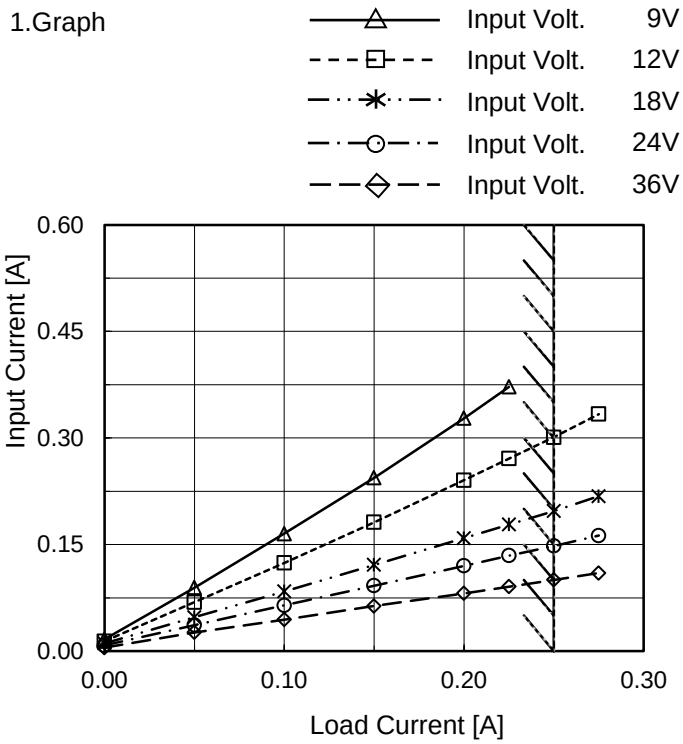
Model	MGFS32412
Item	Input Current (by Load Current)
Object	———————

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]
0.000	0.017	0.014	0.011	0.008	0.005
0.050	0.089	0.069	0.048	0.037	0.026
0.100	0.165	0.124	0.084	0.064	0.044
0.150	0.244	0.181	0.122	0.092	0.064
0.200	0.328	0.241	0.159	0.120	0.081
0.225	0.372	0.271	0.178	0.135	0.091
0.250	- ※	0.301	0.197	0.148	0.100
0.275	- ※	0.334	0.218	0.163	0.110
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ 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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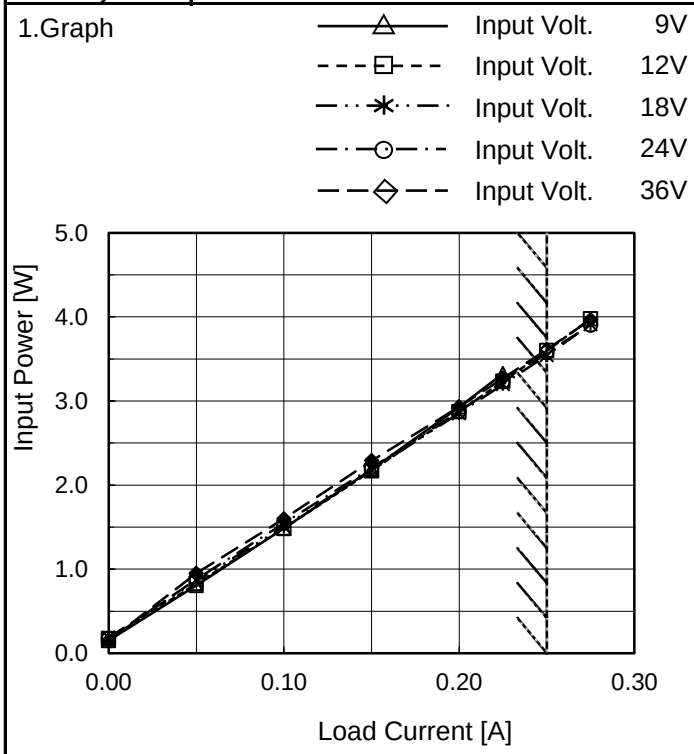
Model	MGFS32412
Item	Input Power (by Load Current)
Object	————————

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]
0.000	0.15	0.17	0.19	0.17	0.15
0.050	0.81	0.83	0.86	0.88	0.95
0.100	1.48	1.48	1.51	1.54	1.60
0.150	2.19	2.17	2.18	2.21	2.29
0.200	2.93	2.87	2.85	2.88	2.93
0.225	3.33	3.24	3.20	3.23	3.27
0.250	- ※	3.60	3.54	3.57	3.61
0.275	- ※	3.98	3.91	3.90	3.97
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ 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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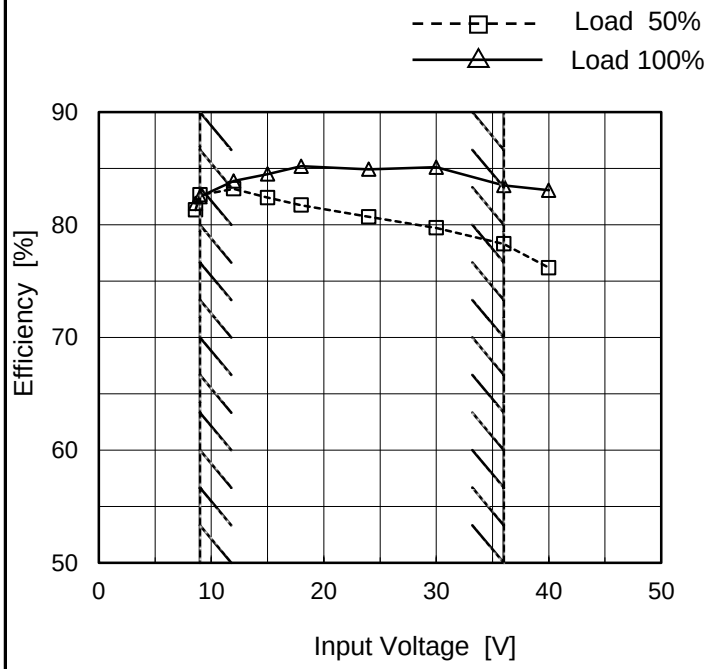
Model	MGFS32412
Item	Efficiency (by Input Voltage)
Object	――――――――――

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	81.3	81.9 ※1
9.0	82.7	82.5 ※1
12.0	83.2	83.9
15.0	82.4	84.5
18.0	81.8	85.2
24.0	80.7	84.9
30.0	79.7	85.1
36.0	78.3	83.5
40.0	76.2	83.1

※1:Load 80%

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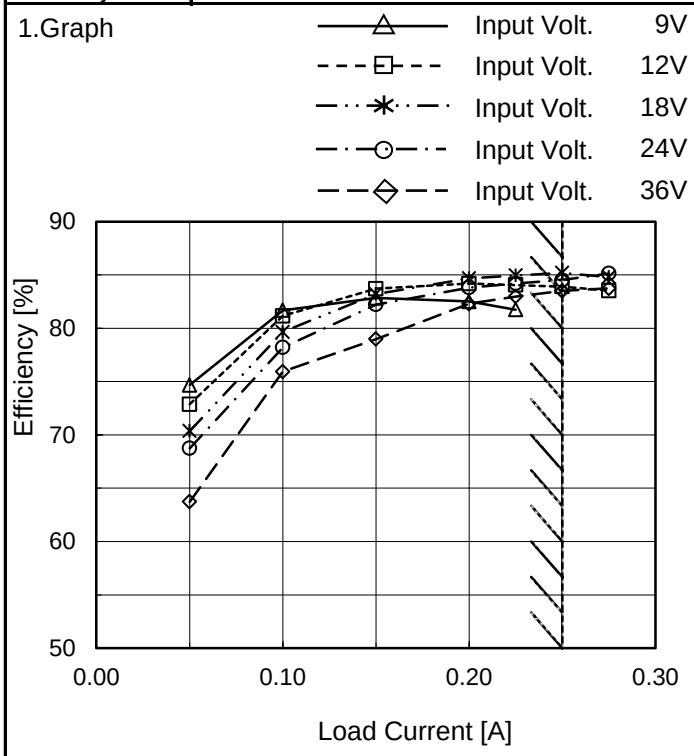
Model	MGFS32412
Item	Efficiency (by Load Current)
Object	――――――

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]
0.000	-	-	-	-	-
0.050	74.7	72.9	70.4	68.7	63.7
0.100	81.7	81.2	79.6	78.2	75.9
0.150	82.8	83.7	83.2	82.2	79.0
0.200	82.5	84.2	84.7	83.8	82.3
0.225	81.7	84.0	84.9	84.2	83.0
0.250	- ※	83.9	85.2	84.5	83.5
0.275	- ※	83.5	84.8	85.1	83.7
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ 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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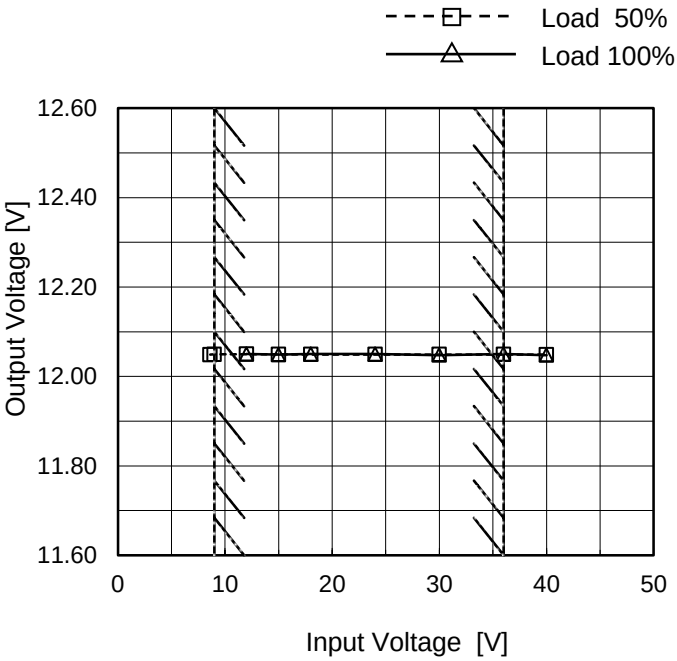
Model	MGFS32412
Item	Line Regulation
Object	+12V0.25A

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	12.049	- ※
9.0	12.049	- ※
12.0	12.050	12.050
15.0	12.050	12.049
18.0	12.049	12.050
24.0	12.049	12.050
30.0	12.049	12.048
36.0	12.049	12.050
40.0	12.049	12.048

※ 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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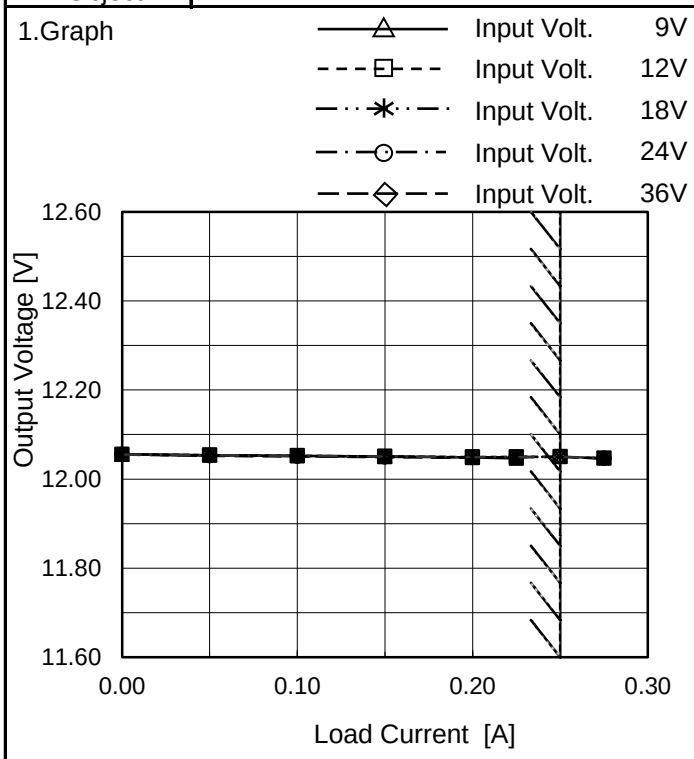
Model	MGFS32412
Item	Load Regulation
Object	+12V0.25A

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]
0.000	12.055	12.055	12.055	12.055	12.055
0.050	12.054	12.054	12.053	12.053	12.052
0.100	12.052	12.052	12.052	12.051	12.051
0.150	12.050	12.051	12.051	12.050	12.049
0.200	12.048	12.050	12.049	12.049	12.048
0.225	12.047	12.050	12.050	12.049	12.049
0.250	- ※	12.050	12.050	12.050	12.050
0.275	- ※	12.047	12.047	12.047	12.046
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ 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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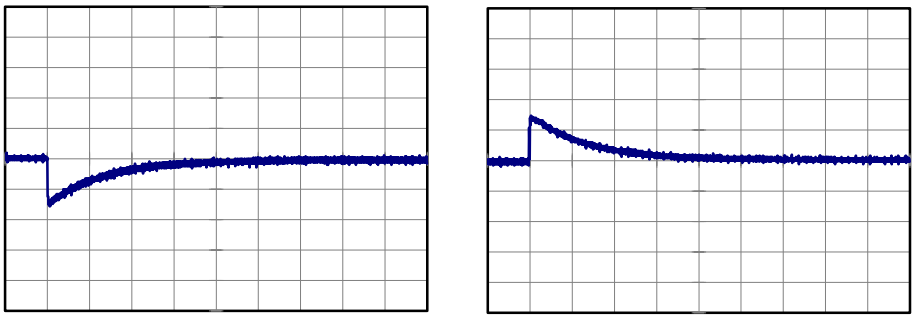
Model	MGFS32412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.25A	

Input Volt. 24 V
Cycle 100 ms

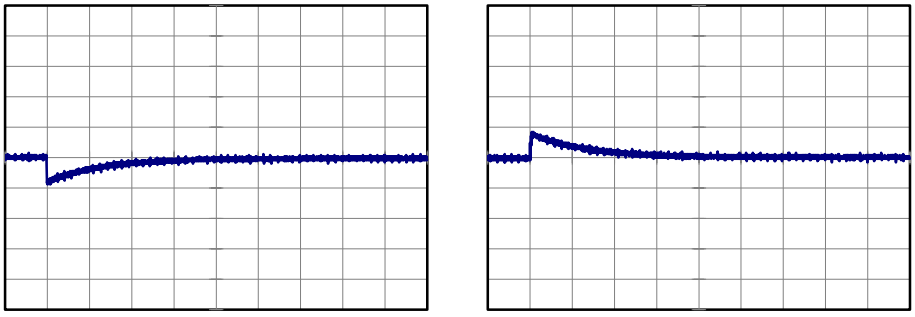
Min.Load (0A)←→
Load 100% (0.25A)



100 mV/div

4 ms/div 4 ms/div

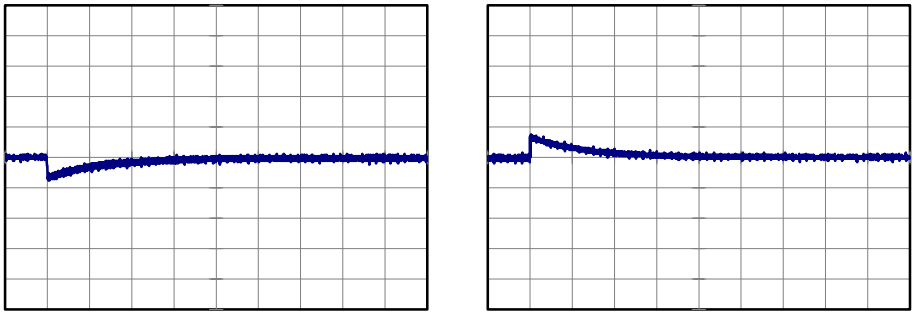
Min.Load (0A)←→
Load 50% (0.125A)



100 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)



100 mV/div

4 ms/div 4 ms/div

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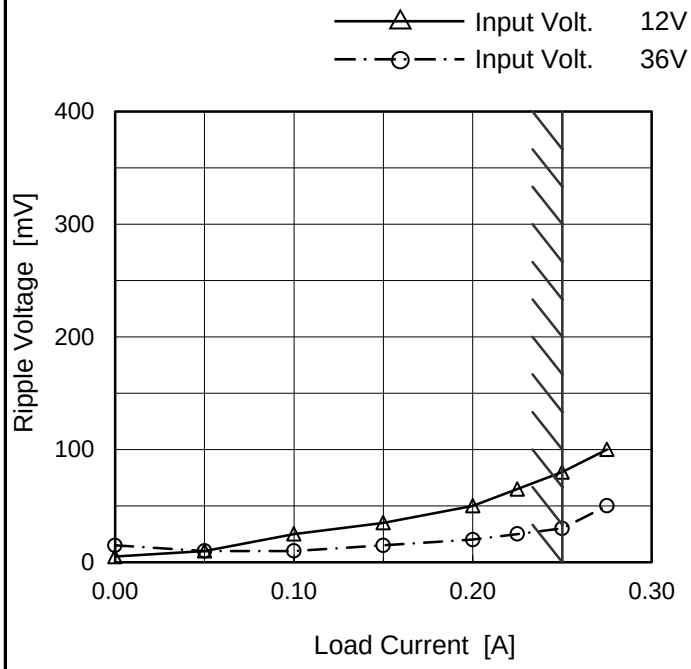
Model	MGFS32412
Item	Ripple Voltage (by Load Current)
Object	+12V0.25A

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]

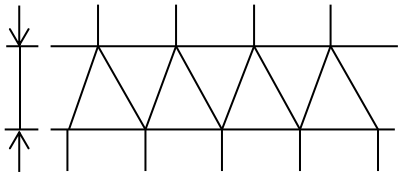


Fig.Complex Ripple Wave Form

2.Values

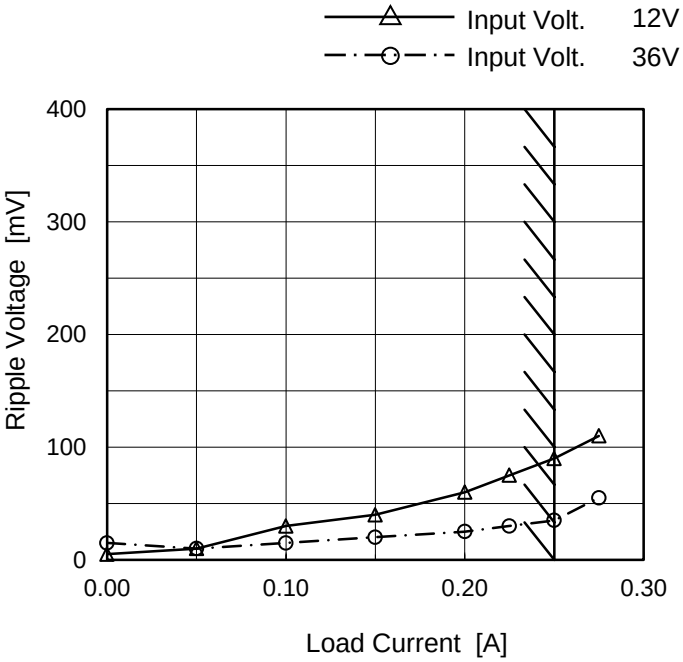
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.000	5	15
0.050	10	10
0.100	25	10
0.150	35	15
0.200	50	20
0.225	65	25
0.250	80	30
0.275	100	50
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFS32412
Item	Ripple-Noise
Object	+12V0.25A

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]

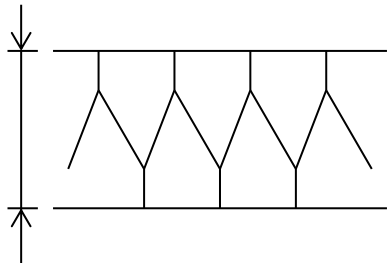


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.000	5	15
0.050	10	10
0.100	30	15
0.150	40	20
0.200	60	25
0.225	75	30
0.250	90	35
0.275	110	55
--	-	-
--	-	-
--	-	-

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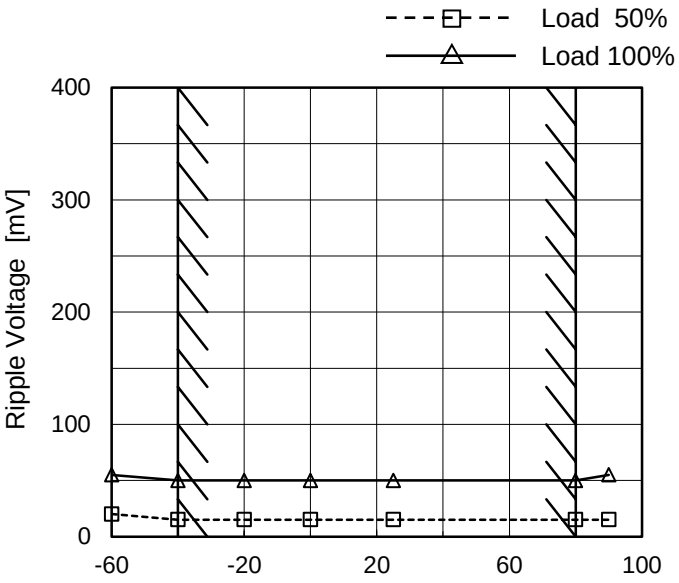
Model	MGFS32412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.25A

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

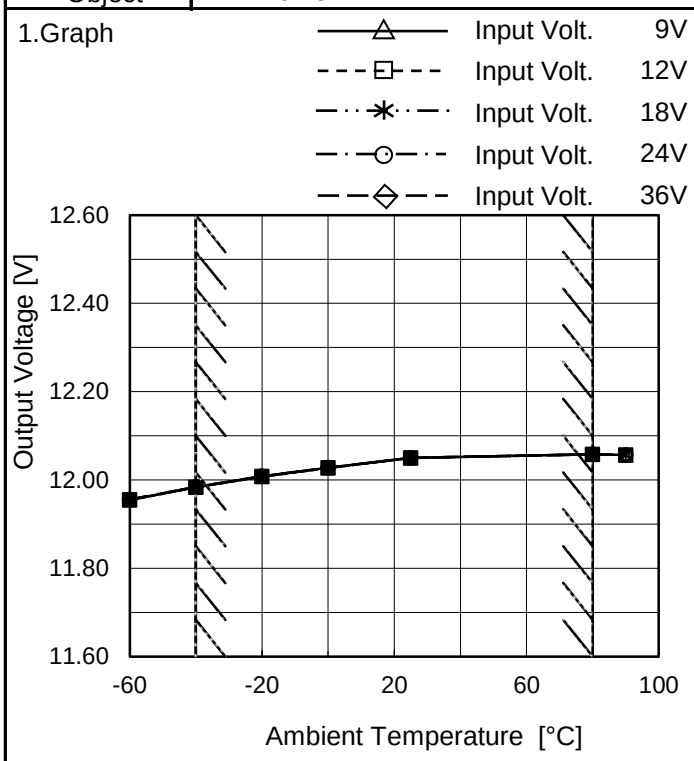
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	20	55
-40	15	50
-20	15	50
0	15	50
25	15	50
80	15	50
90	15	55
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFS32412
Item	Ambient Temperature Drift
Object	+12V0.25A

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	11.955	11.954	11.955	11.956	11.956
-40	11.984	11.983	11.984	11.984	11.984
-20	12.008	12.008	12.008	12.009	12.008
0	12.027	12.027	12.028	12.028	12.027
25	12.050	12.050	12.050	12.050	12.050
80	12.058	12.058	12.058	12.058	12.058
90	12.057	12.056	12.057	12.057	12.056
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

Model	MGFS32412	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V0.25A	

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 : 12 - 36V
Load Current : 0 - 0.25A

* 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	80	36	0	12.068	±43	±0.4
Minimum Voltage	-40	12	0.25	11.983		

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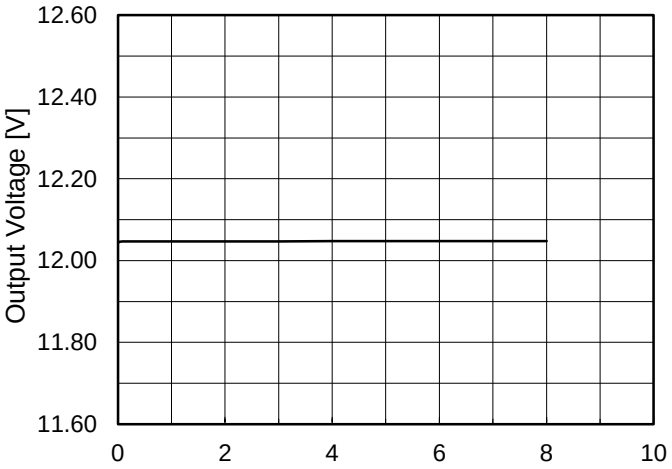
Model	MGFS32412
Item	Time Lapse Drift
Object	+12V0.25A

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	12.043
0.5	12.047
1.0	12.047
2.0	12.047
3.0	12.047
4.0	12.047
5.0	12.047
6.0	12.048
7.0	12.047
8.0	12.047

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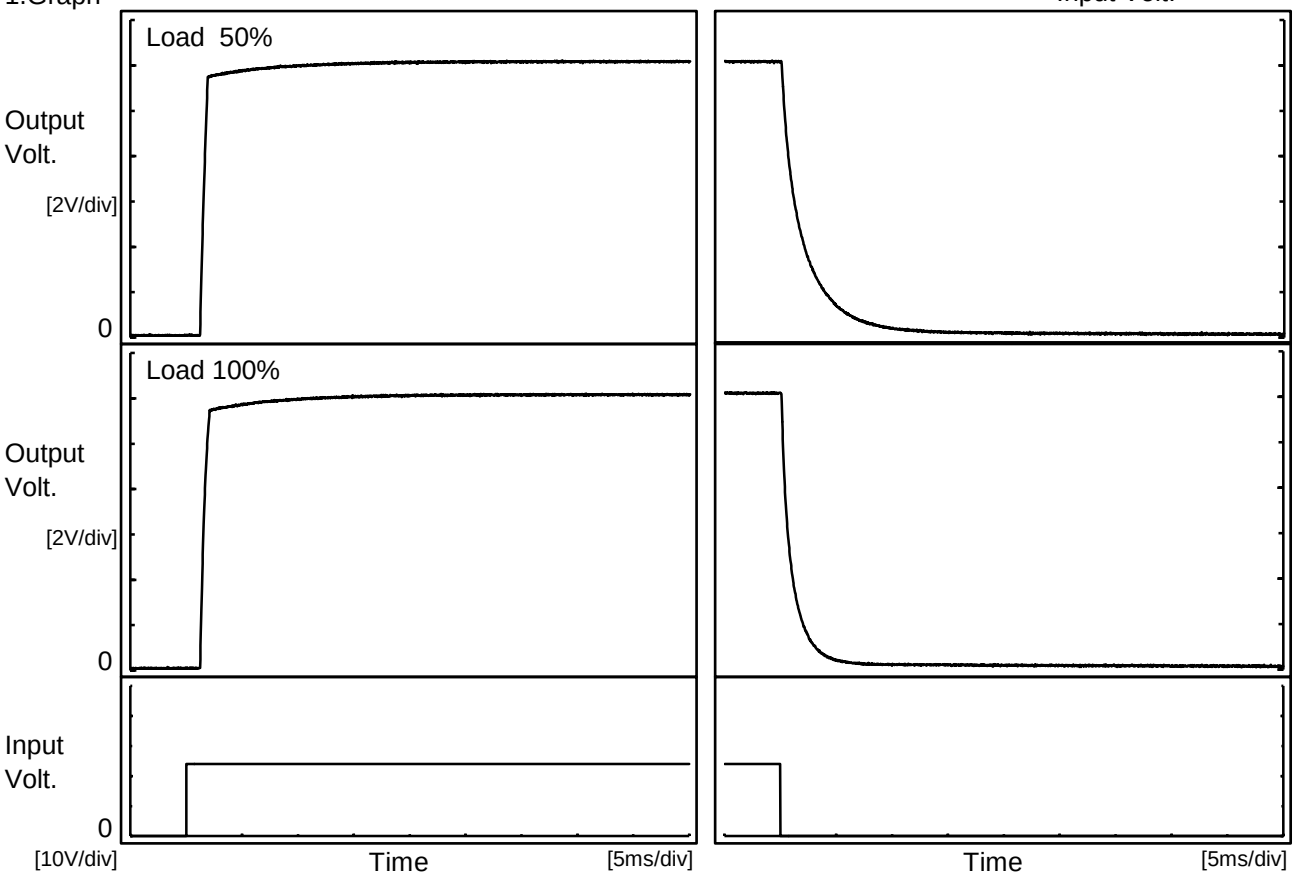
Model	MGFS32412
Item	Rise and Fall Time
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

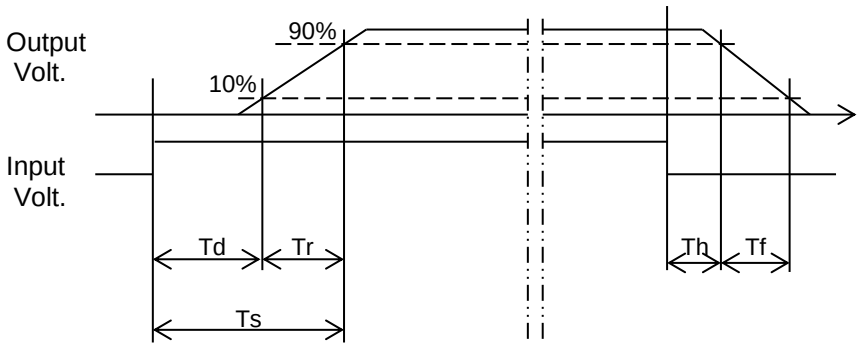
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.3	0.6	1.9	0.2	5.1
100 %	1.3	0.7	2.0	0.2	2.5



BC-11000

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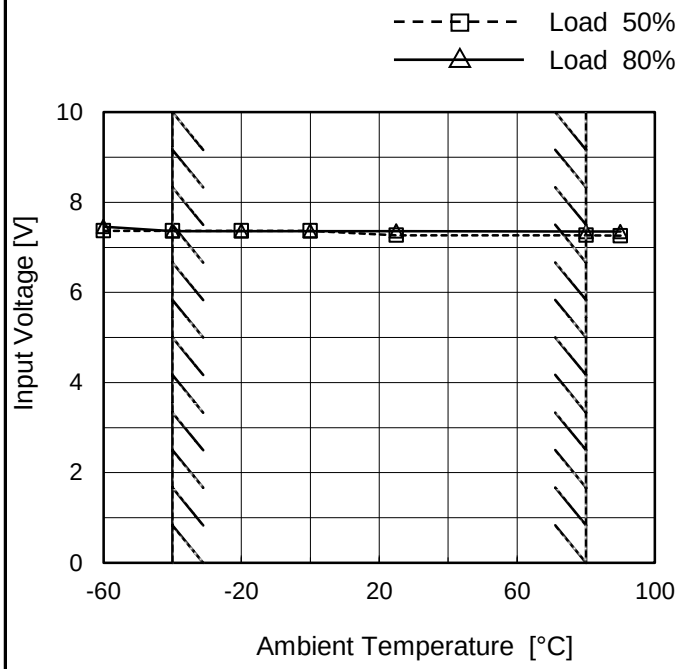
Model	MGFS32412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.25A

Testing Circuitry Figure A

1.Graph



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

2.Values

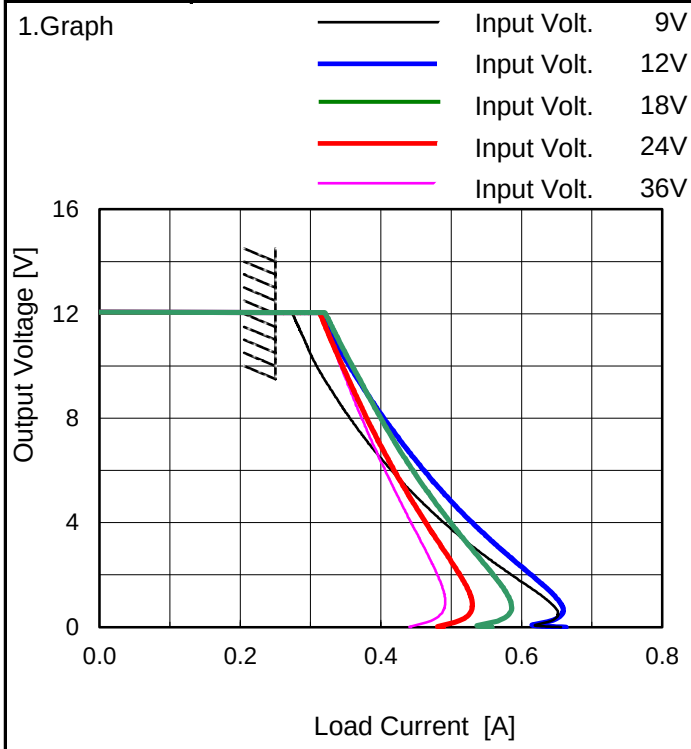
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 80%
-60	7.4	7.5
-40	7.4	7.4
-20	7.4	7.4
0	7.4	7.4
25	7.3	7.4
80	7.3	7.4
90	7.3	7.4
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFS32412
Item	Overcurrent Protection
Object	+12V0.25A

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

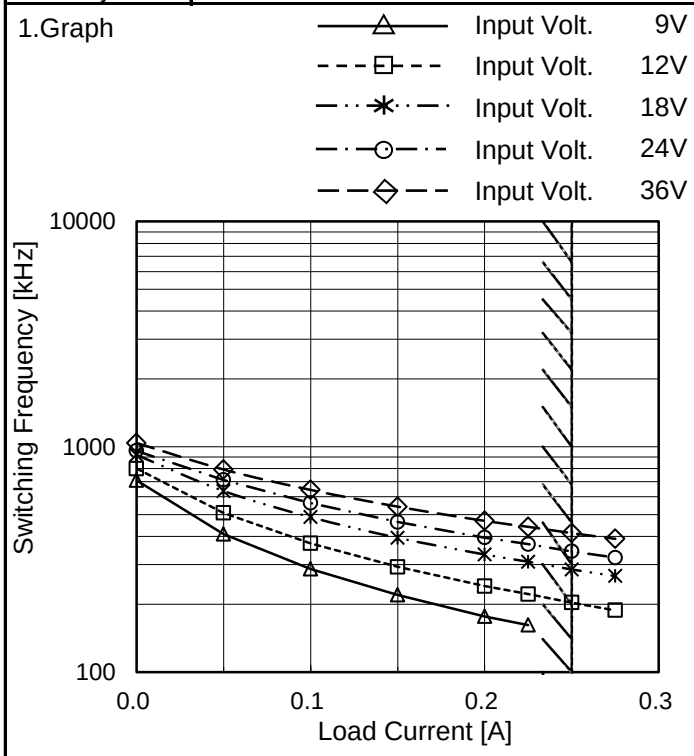
Output Voltage [V]	Load Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
11.4	0.285	0.326	0.333	0.322	0.324
10.8	0.294	0.337	0.343	0.332	0.331
9.6	0.317	0.364	0.367	0.352	0.348
8.4	0.345	0.394	0.391	0.373	0.367
7.2	0.378	0.425	0.416	0.394	0.385
6.0	0.414	0.461	0.445	0.419	0.406
4.8	0.457	0.499	0.476	0.445	0.427
3.6	0.506	0.545	0.510	0.473	0.450
2.4	0.564	0.596	0.547	0.502	0.474
1.2	0.629	0.646	0.580	0.527	0.491
0.0	0.656	0.663	0.558	0.489	0.443
--	-	-	-	-	-

COSEL

Model	MGFS32412
Item	Switching frequency (by Load Current)
Object	+12V0.25A

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]
0.000	710	800	920	960	1040
0.050	410	509	637	713	793
0.100	287	373	487	563	644
0.150	220	293	395	464	543
0.200	177	241	333	395	469
0.225	162	222	309	369	441
0.250	- ※	203	285	344	414
0.275	- ※	188	267	322	390
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

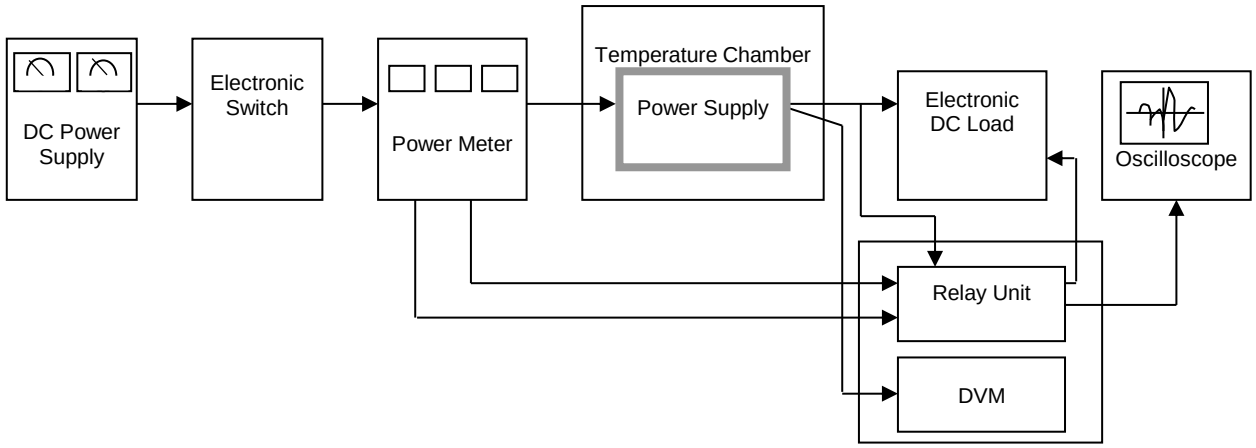


Figure A

Data Acquisition/Control Unit

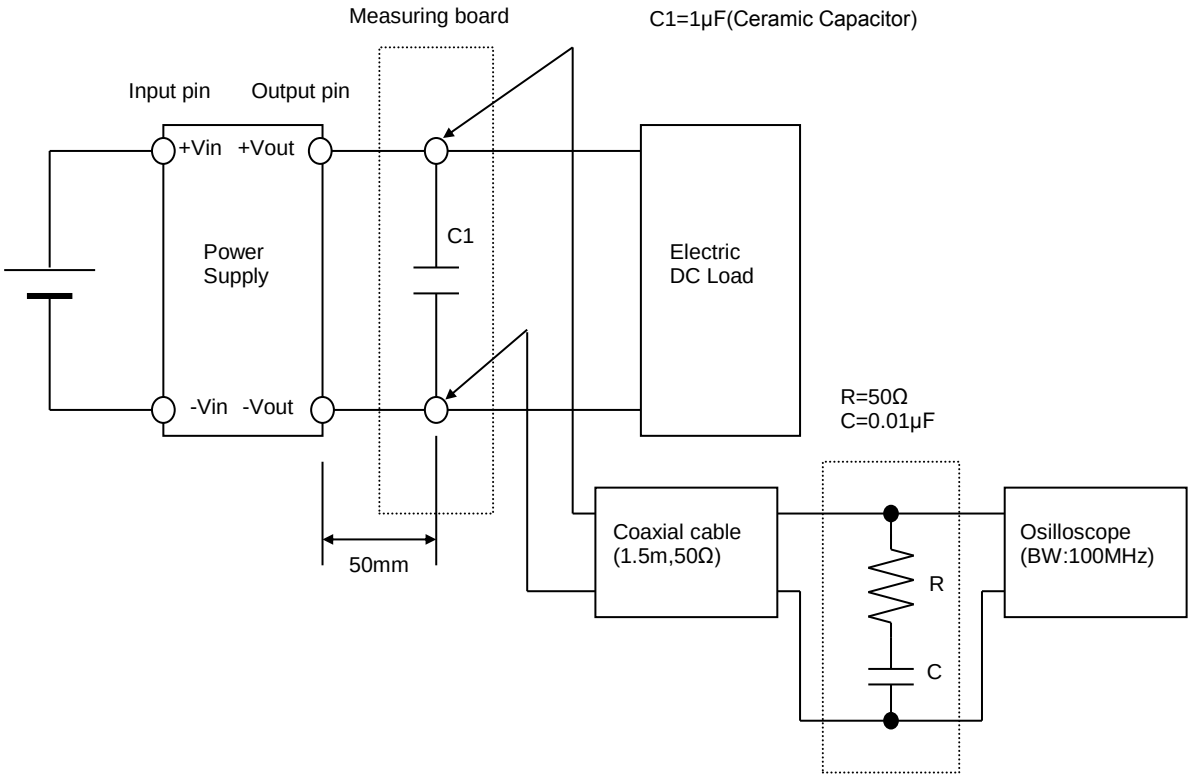


Figure B（Ripple and Ripple noise Characteristic）