参考資料

TEST DATA OF MGXS1R52415

Regulated DC Power Supply
February 19, 2018

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Masumi Kitamura
Masumi Kitamura Design Engineer

COSEL CO.,LTD.

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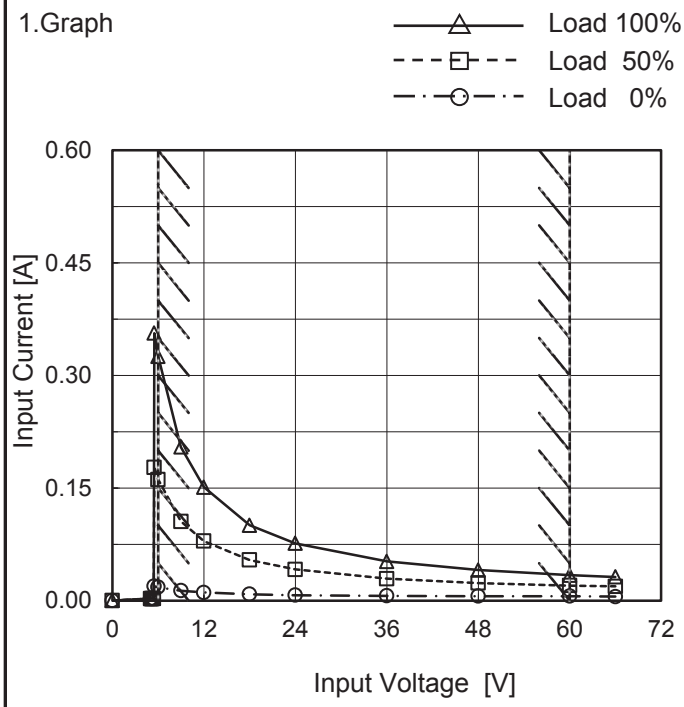

Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
5.0	0.003	0.003	0.003
5.2	0.003	0.003	0.003
5.4	0.003	0.003	0.003
5.5	0.019	0.178	0.356
6.0	0.018	0.161	0.326
9.0	0.013	0.106	0.205
12.0	0.011	0.079	0.151
18.0	0.009	0.054	0.101
24.0	0.007	0.042	0.076
36.0	0.006	0.029	0.052
48.0	0.006	0.023	0.041
60.0	0.006	0.020	0.034
66.0	0.005	0.019	0.032
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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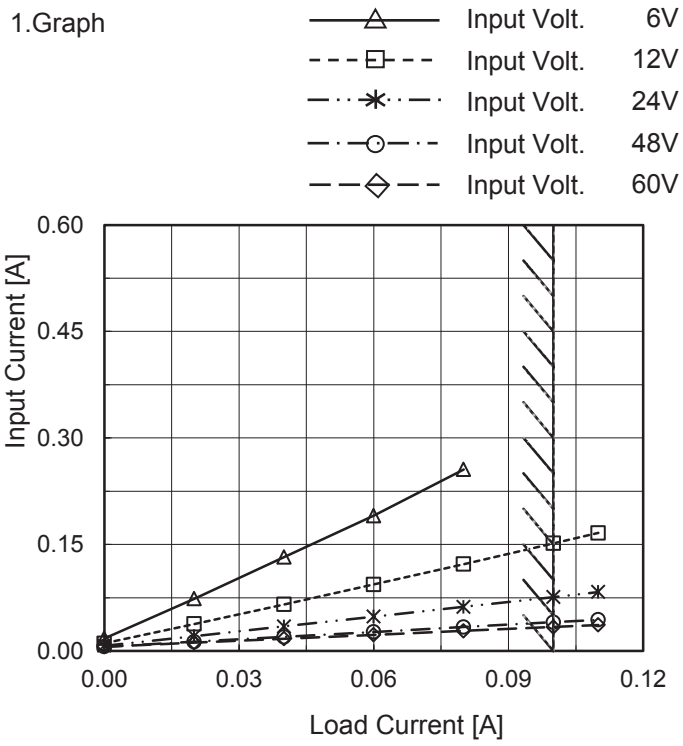
Model	MGXS1R52415
Item	Input Current (by Load Current)
Object	————————

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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.00	0.018	0.011	0.007	0.006	0.006
0.02	0.074	0.038	0.021	0.013	0.012
0.04	0.132	0.066	0.035	0.020	0.017
0.06	0.191	0.094	0.048	0.027	0.023
0.08	0.256	0.122	0.062	0.034	0.028
0.10	- ※	0.152	0.076	0.041	0.034
0.11	- ※	0.166	0.083	0.044	0.037
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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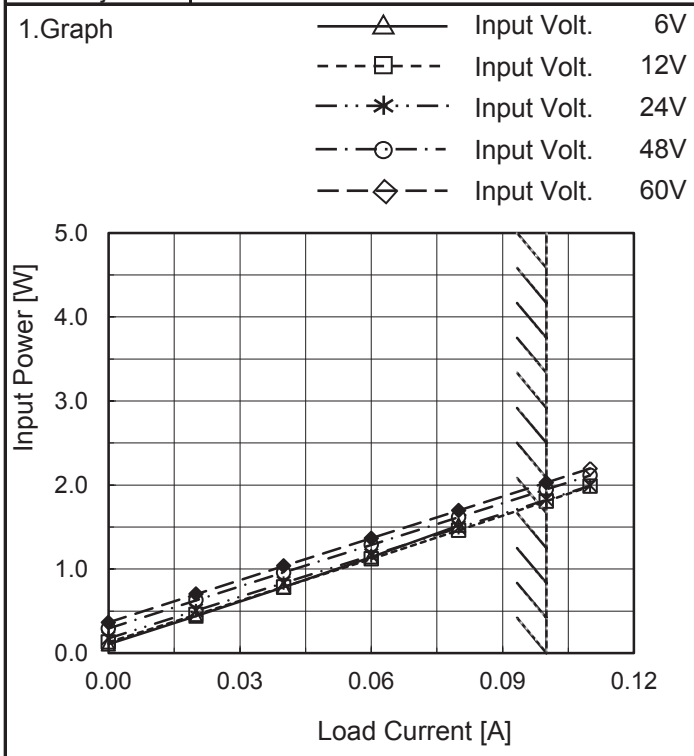
Model	MGXS1R52415
Item	Input Power (by Load Current)
Object	———————

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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.00	0.11	0.13	0.18	0.29	0.36
0.02	0.44	0.46	0.50	0.63	0.70
0.04	0.78	0.79	0.83	0.96	1.04
0.06	1.14	1.12	1.16	1.29	1.37
0.08	1.52	1.46	1.49	1.62	1.70
0.10	- ※	1.81	1.82	1.95	2.03
0.11	- ※	1.98	1.99	2.11	2.20
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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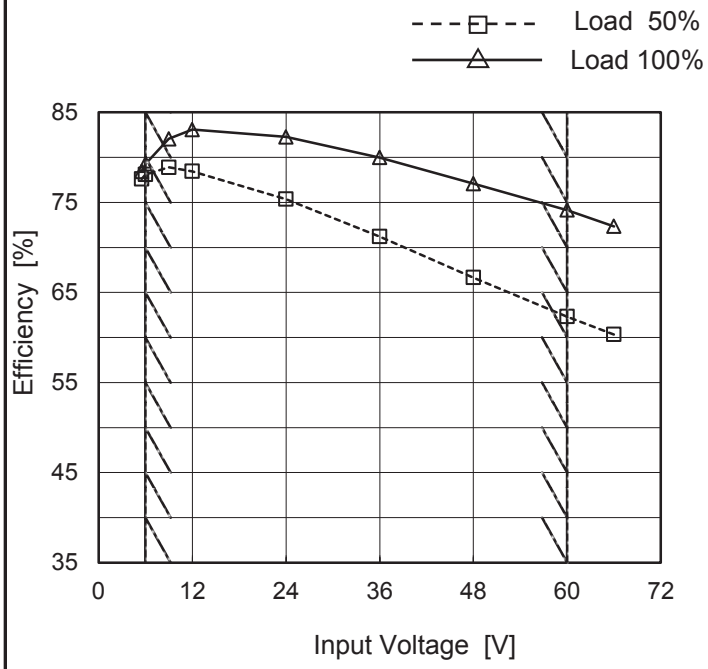
Model	MGXS1R52415
Item	Efficiency (by Input Voltage)
Object	―――――――――――

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%
5.5	77.6	78.4 ※1
6.0	78.1	79.3 ※1
9.0	78.9	82.1
12.0	78.4	83.1
24.0	75.4	82.3
36.0	71.2	80.0
48.0	66.7	77.1
60.0	62.3	74.2
66.0	60.3	72.3

※1:Load 70%

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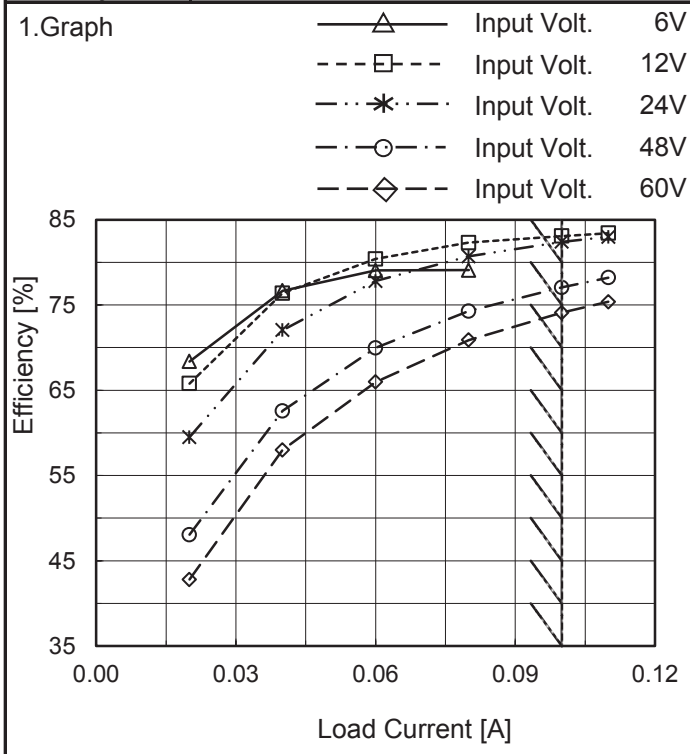
Model	MGXS1R52415
Item	Efficiency (by Load Current)
Object	————————

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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.00	-	-	-	-	-
0.02	68.4	65.8	59.5	48.1	42.8
0.04	76.7	76.4	72.1	62.6	58.0
0.06	79.0	80.4	77.8	70.0	66.0
0.08	79.1	82.3	80.7	74.3	70.9
0.10	- ※	83.1	82.4	77.1	74.1
0.11	- ※	83.4	83.0	78.2	75.4
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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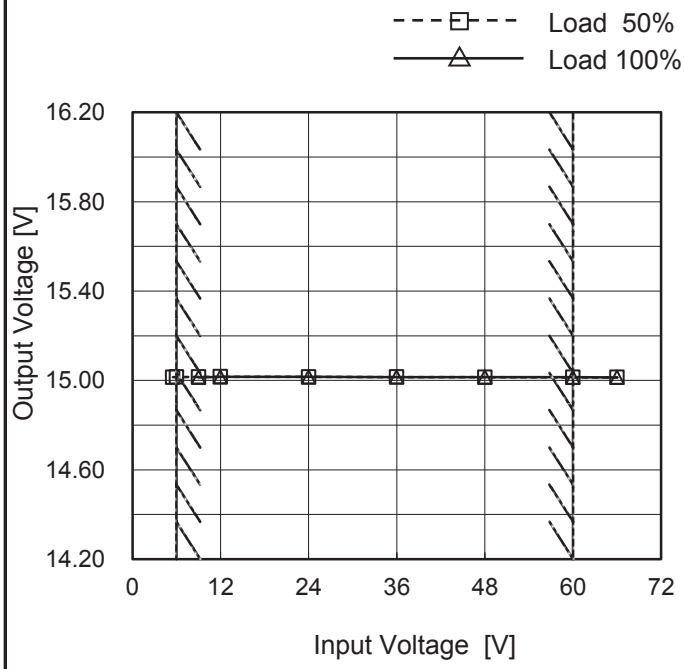
Model	MGXS1R52415
Item	Line Regulation
Object	+15V0.1A

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%
5.5	15.014	- ※
6.0	15.015	- ※
9.0	15.016	15.014
12.0	15.016	15.016
24.0	15.016	15.016
36.0	15.015	15.015
48.0	15.014	15.015
60.0	15.014	15.014
66.0	15.014	15.014

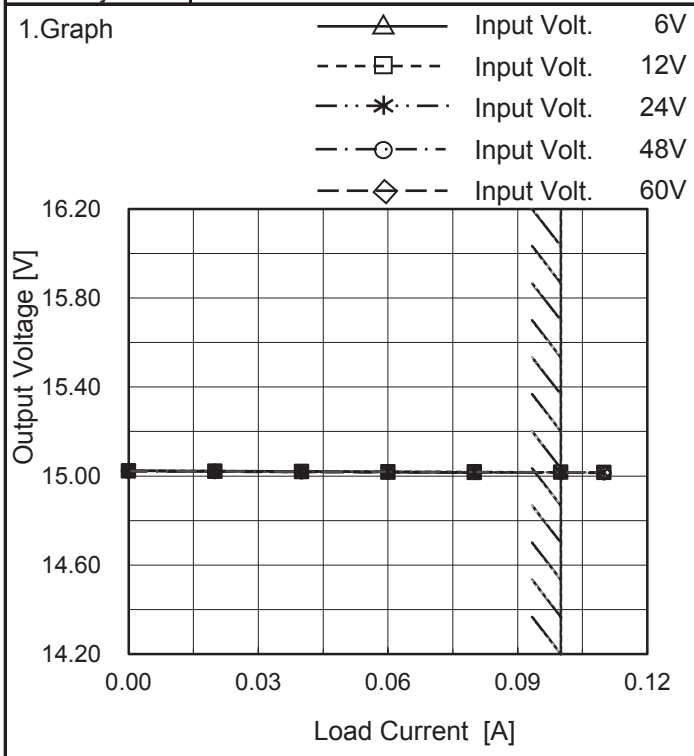
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXS1R52415
Item	Load Regulation
Object	+15V0.1A

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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.00	15.024	15.023	15.022	15.021	15.024
0.02	15.022	15.022	15.021	15.020	15.019
0.04	15.020	15.021	15.020	15.019	15.018
0.06	15.018	15.019	15.019	15.018	15.017
0.08	15.015	15.018	15.018	15.016	15.016
0.10	- ※	15.017	15.016	15.016	15.015
0.11	- ※	15.016	15.016	15.015	15.014
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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Model	MGXS1R52415
Item	Dynamic Load Response
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

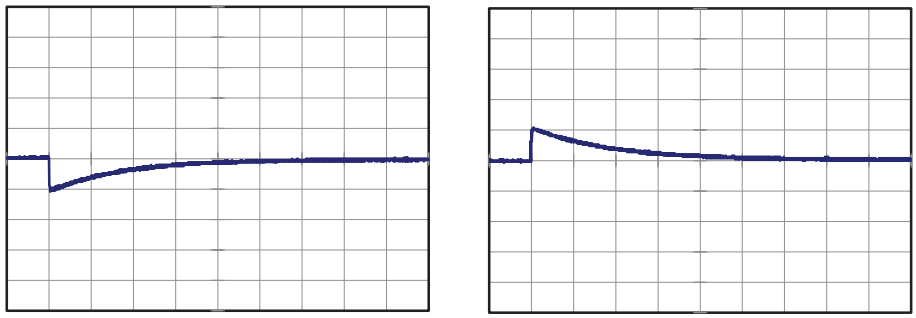
Input Volt. 24 V
Cycle 100 ms

t1,t2 = 100 μ s

Load Current

t1 t2

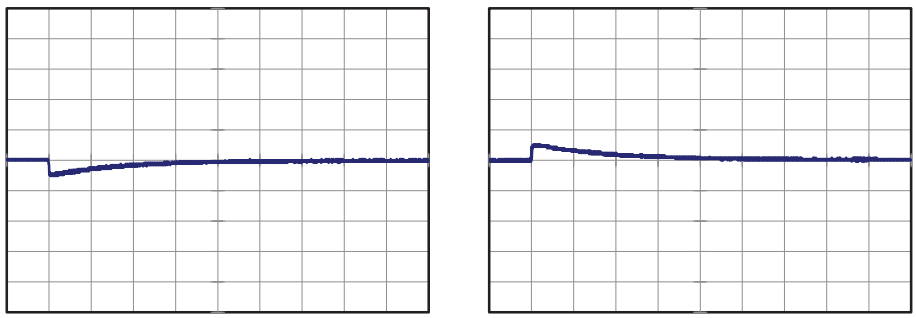
Min.Load (0A)←→
Load 100% (0.1A)



100 mV/div

4 ms/div 4 ms/div

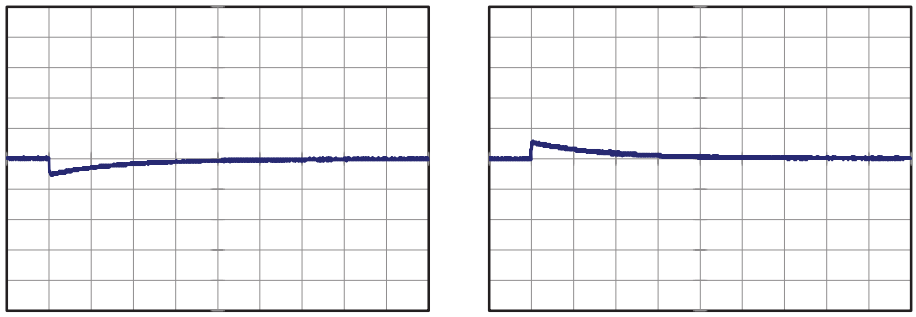
Min.Load (0A)←→
Load 50% (0.05A)



100 mV/div

4 ms/div 4 ms/div

Load 50% (0.05A)←→
Load 100% (0.1A)



100 mV/div

4 ms/div 4 ms/div

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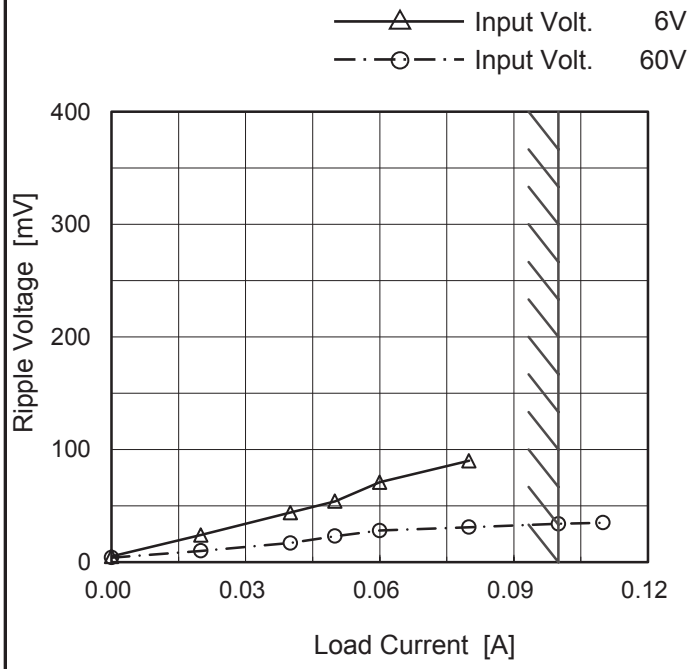
Model	MGXS1R52415
Item	Ripple Voltage (by Load Current)
Object	+15V0.1A

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]

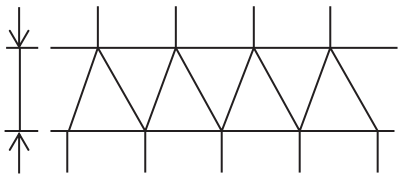


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.00	5	4
0.02	24	10
0.04	44	17
0.05	54	23
0.06	71	28
0.08	90	31
0.10	- ※	34
0.11	- ※	35
--	-	-
--	-	-
--	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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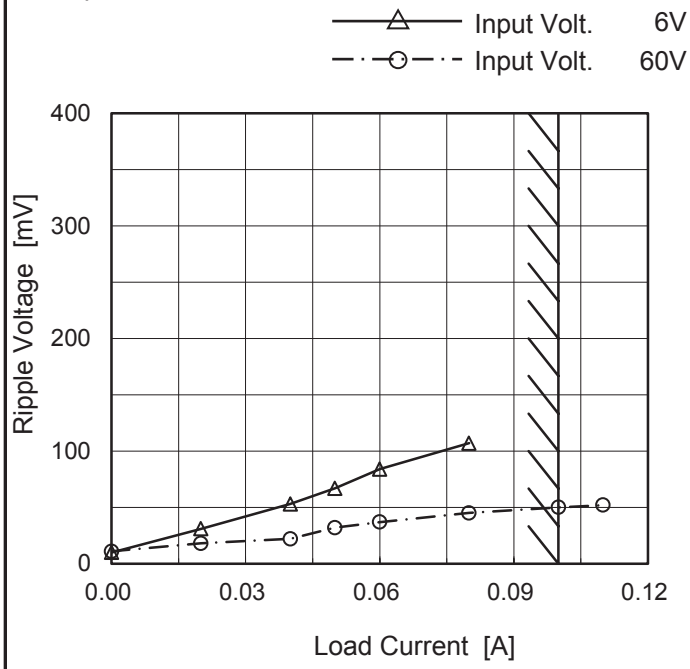
Model	MGXS1R52415
Item	Ripple-Noise
Object	+15V0.1A

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]

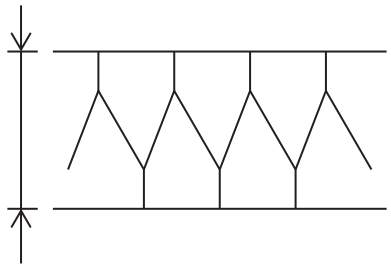


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.00	10	11
0.02	31	18
0.04	53	22
0.05	67	32
0.06	84	37
0.08	107	45
0.10	- ※	50
0.11	- ※	52
--	-	-
--	-	-
--	-	-

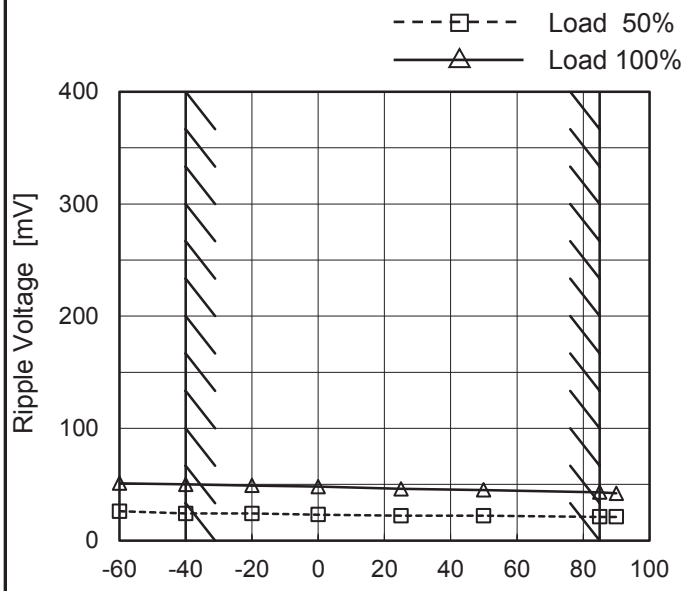
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXS1R52415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.1A

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	26	51
-40	24	50
-20	24	49
0	23	48
25	22	46
50	22	45
85	21	43
90	21	42
--	-	-
--	-	-
--	-	-

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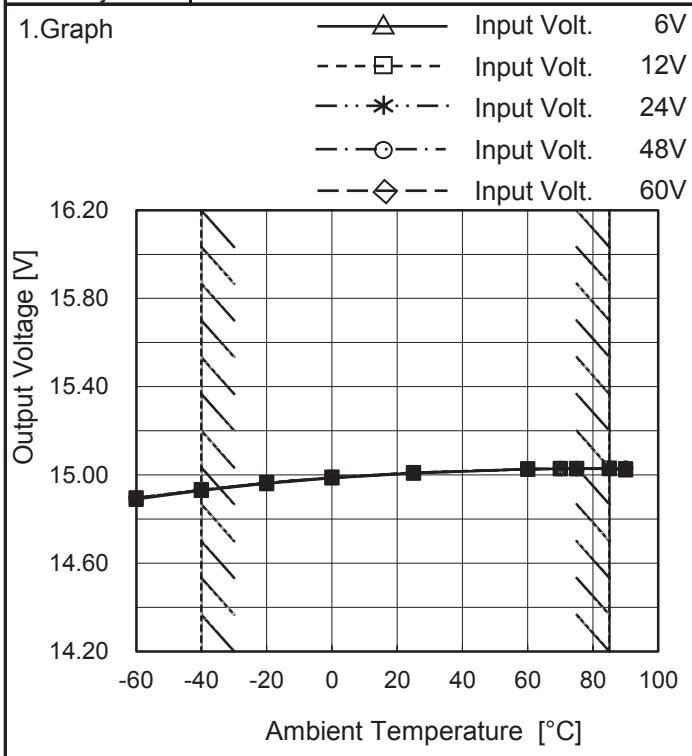
Model	MGXS1R52415
Item	Ambient Temperature Drift
Object	+15V0.1A

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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
-60	14.889	14.895	14.895	14.895	14.895
-40	14.929	14.932	14.932	14.931	14.932
-20	14.960	14.964	14.964	14.963	14.963
0	14.986	14.989	14.989	14.988	14.988
25	15.008	15.010	15.010	15.009	15.009
60	15.026	15.026	15.027	15.026	15.026
70	15.028	15.028	15.029	15.028	15.028
75	15.028	15.029	15.030	15.029	15.029
85	15.028	15.029	15.030	15.029	15.029
90	15.022	15.027	15.028	15.029	15.029
--	-	-	-	-	-

Note: In case of input Volt. 6V, Load 70%.
Other case Load 100%.

COSEL

Model	MGXS1R52415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V0.1A	

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 - 85°C
Input Voltage : 6 - 60V
Load Current : 0 - 0.1A

* 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	85	60	0	15.041	±56	±0.4
Minimum Voltage	-40	60	0.07 ※	14.929		

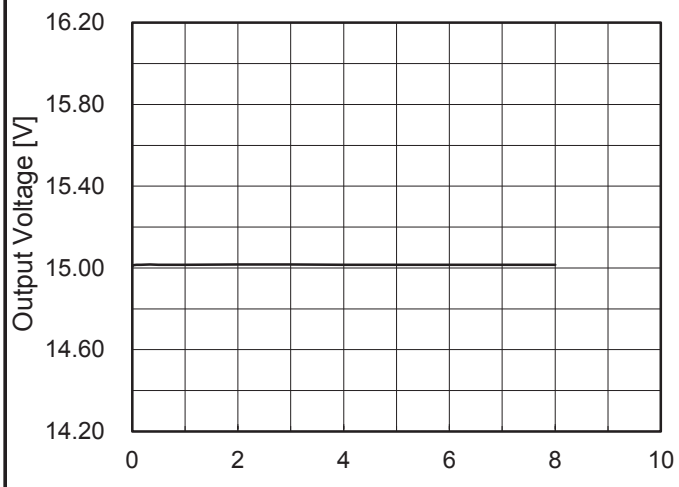
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXS1R52415
Item	Time Lapse Drift
Object	+15V0.1A

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	15.009
0.5	15.016
1.0	15.016
2.0	15.016
3.0	15.016
4.0	15.016
5.0	15.016
6.0	15.016
7.0	15.016
8.0	15.016

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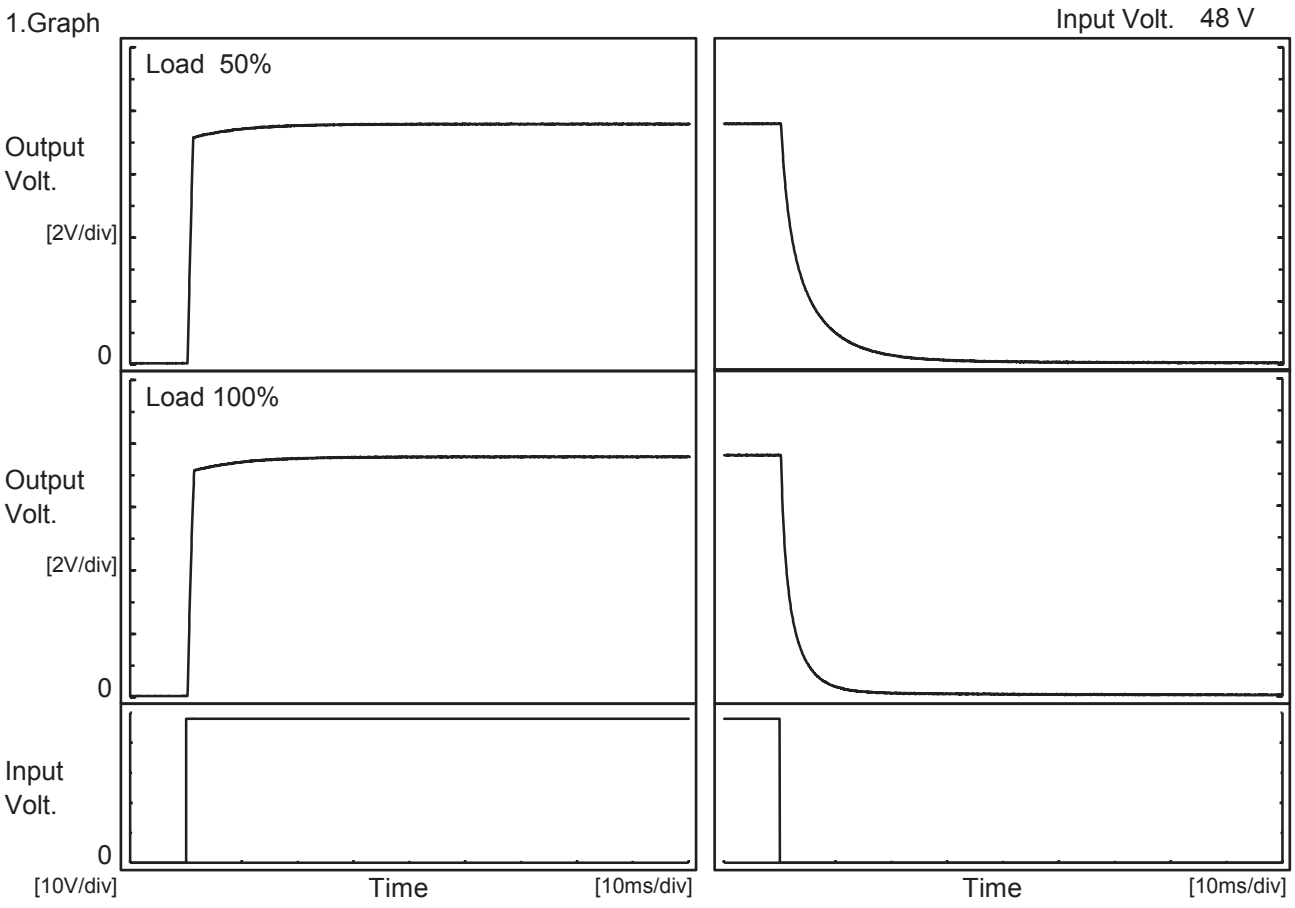
Model	MGXS1R52415
Item	Rise and Fall Time
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

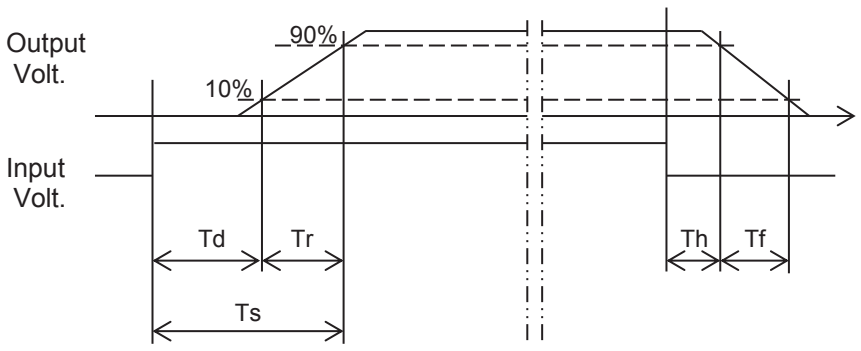
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.4	0.9	1.3	0.5	11.2
100 %	0.4	1.0	1.4	0.4	5.6



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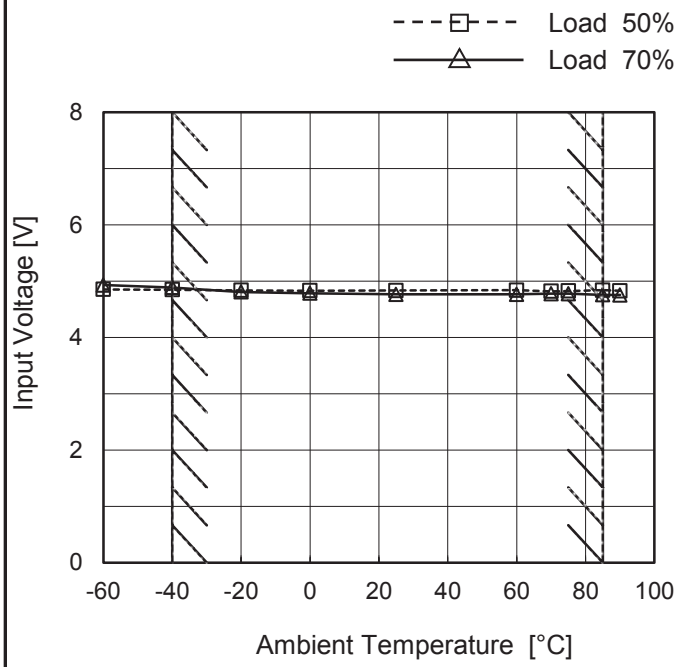
Model	MGXS1R52415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.1A

Testing Circuitry Figure A

1.Graph



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

2.Values

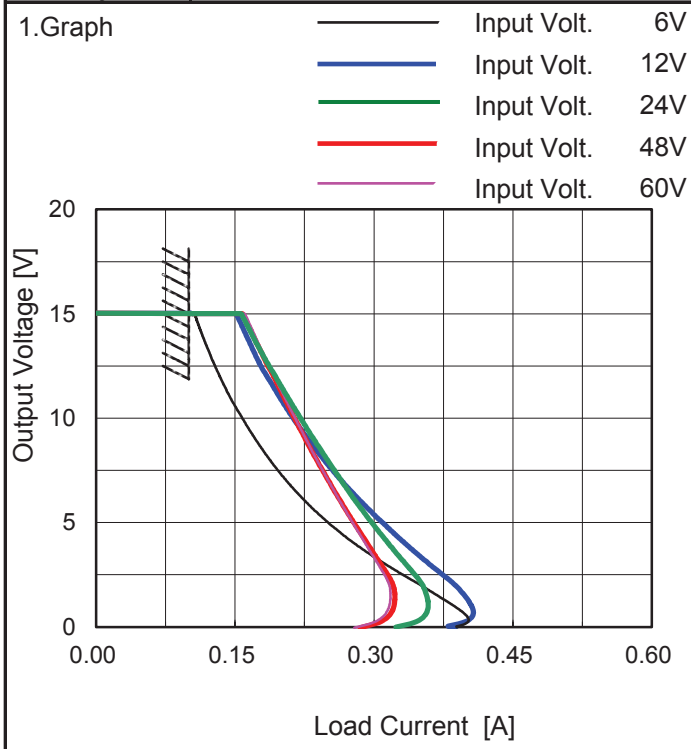
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	4.9	5.0
-40	4.9	4.9
-20	4.9	4.8
0	4.9	4.8
25	4.9	4.8
60	4.9	4.8
70	4.9	4.8
75	4.9	4.8
85	4.9	4.8
90	4.9	4.8
--	-	-

COSEL

Model	MGXS1R52415
Item	Overcurrent Protection
Object	+15V0.1A

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 70% of rated load current.
Refer to instruction manuals for details of input derating.

2.Values

Output Voltage [V]	Load Current [A]				
	Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
14.3	0.112	0.159	0.165	0.167	0.168
13.5	0.119	0.167	0.174	0.174	0.176
12.0	0.134	0.184	0.194	0.191	0.192
10.5	0.151	0.205	0.213	0.208	0.209
9.0	0.172	0.228	0.235	0.226	0.226
7.5	0.196	0.255	0.257	0.244	0.244
6.0	0.226	0.285	0.280	0.264	0.264
4.5	0.264	0.321	0.306	0.285	0.284
3.0	0.312	0.360	0.334	0.307	0.305
1.5	0.368	0.398	0.357	0.323	0.318
0.0	0.391	0.388	0.325	0.285	0.279
--	-	-	-	-	-

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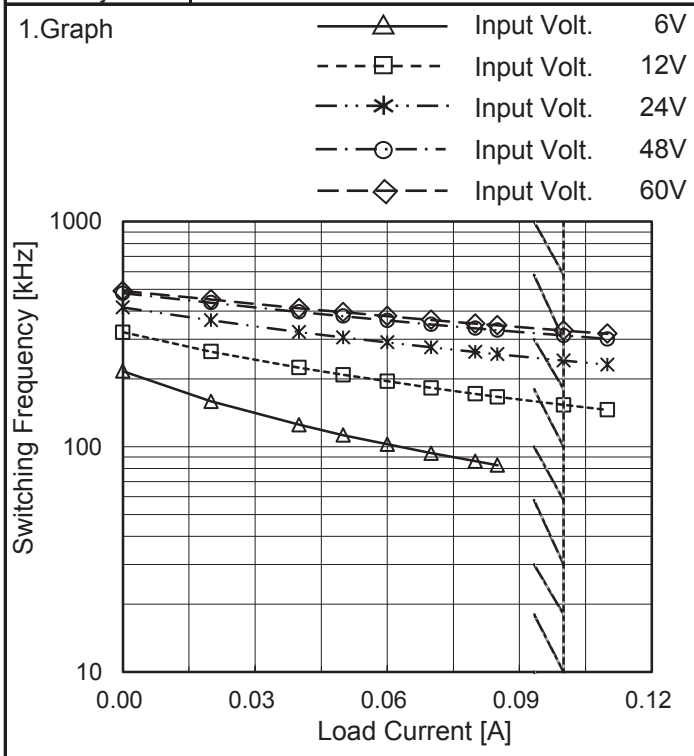
Model	MGXS1R52415
Item	Switching frequency (by Load Current)
Object	+15V0.1A

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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.000	217	323	416	481	492
0.020	159	264	365	437	451
0.040	125	225	323	397	412
0.050	113	209	306	380	396
0.060	103	195	291	364	380
0.070	94	183	277	350	366
0.080	86	172	264	336	352
0.085	83	166	258	330	346
0.100	- ※	153	242	312	328
0.110	- ※	146	231	301	318
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

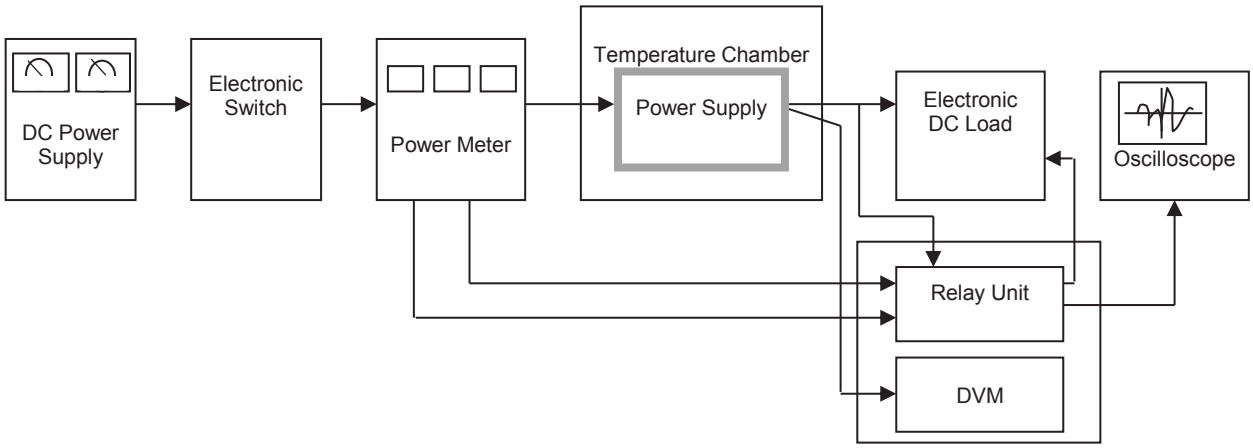


Figure A

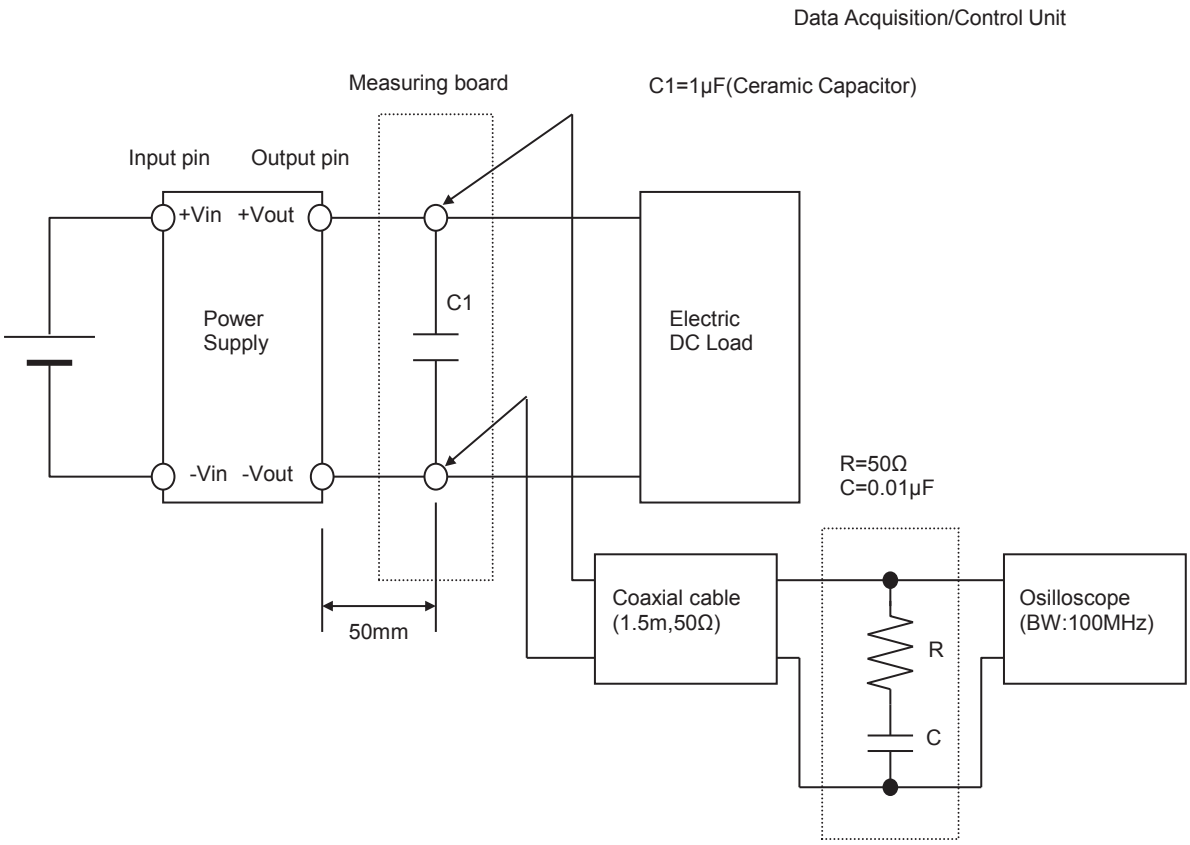


Figure B（Ripple and Ripple noise Characteristic）