参考資料

COSEL

TEST DATA OF MGS6053R3

Regulated DC Power Supply
August 3, 2016

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Ryosuke Nakao Design Engineer

COSEL CO.,LTD.

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CONTENTS

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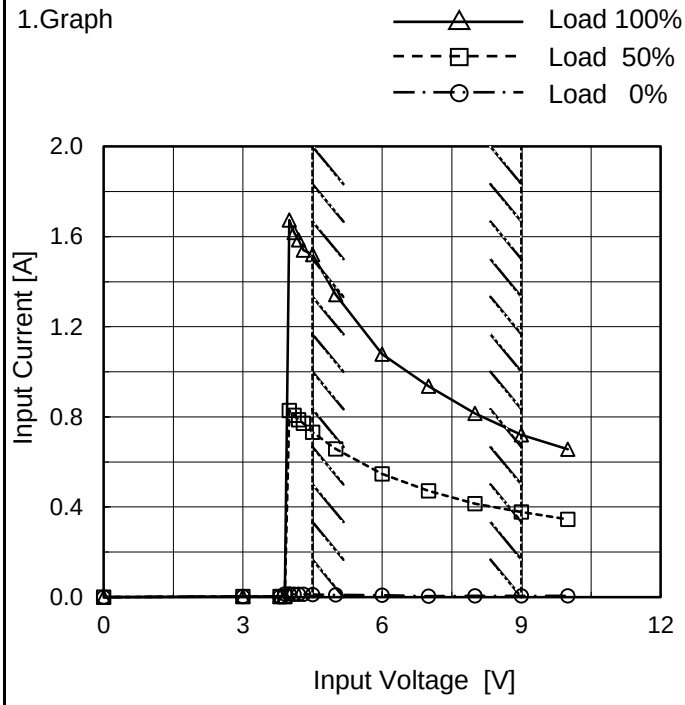
Model	MGS6053R3
Item	Input Current (by Input Voltage)
Object	————————

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
3.0	0.002	0.002	0.002
3.8	0.003	0.003	0.003
3.9	0.014	0.002	0.003
4.0	0.014	0.828	1.674
4.1	0.013	0.807	1.618
4.2	0.013	0.787	1.585
4.3	0.012	0.772	1.540
4.5	0.012	0.732	1.520
5.0	0.010	0.657	1.342
6.0	0.008	0.547	1.079
7.0	0.004	0.472	0.937
8.0	0.006	0.415	0.816
9.0	0.006	0.378	0.720
10.0	0.006	0.345	0.656
--	-	-	-
--	-	-	-
--	-	-	-

BC-11010

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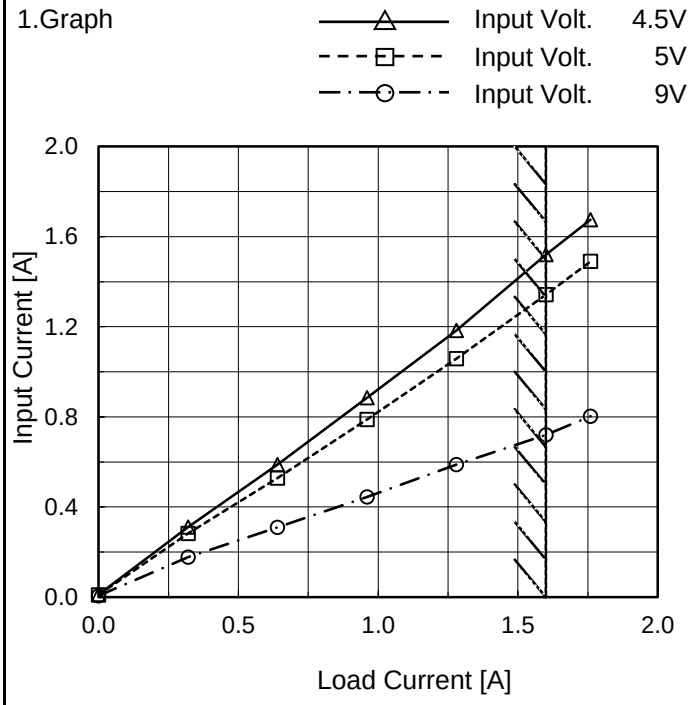
Model	MGS6053R3
Item	Input Current (by Load Current)
Object	————————

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	0.012	0.010	0.006
0.32	0.310	0.282	0.177
0.64	0.589	0.529	0.309
0.96	0.885	0.789	0.445
1.28	1.184	1.059	0.588
1.60	1.520	1.342	0.720
1.76	1.675	1.490	0.803
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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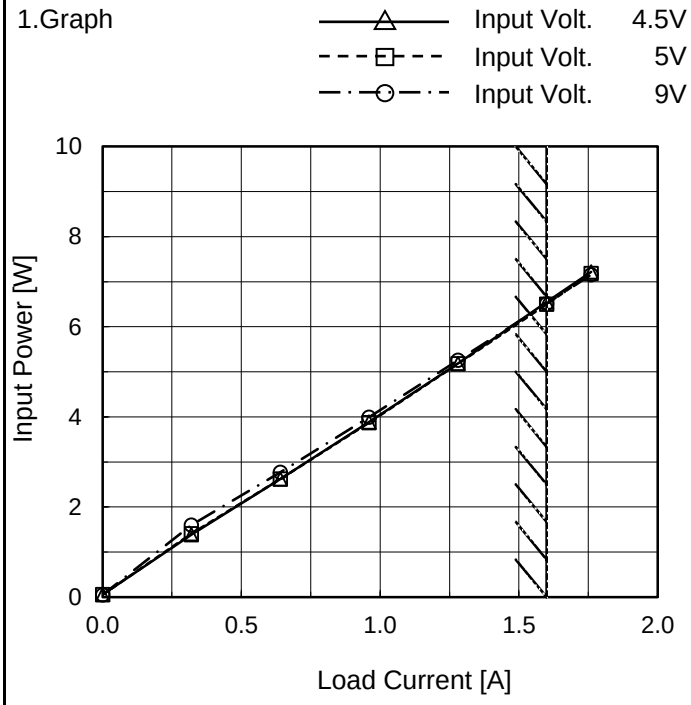
Model	MGS6053R3
Item	Input Power (by Load Current)
Object	————————

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	0.05	0.05	0.05
0.32	1.39	1.40	1.59
0.64	2.62	2.62	2.77
0.96	3.88	3.87	4.00
1.28	5.19	5.18	5.26
1.60	6.55	6.50	6.52
1.76	7.22	7.18	7.15
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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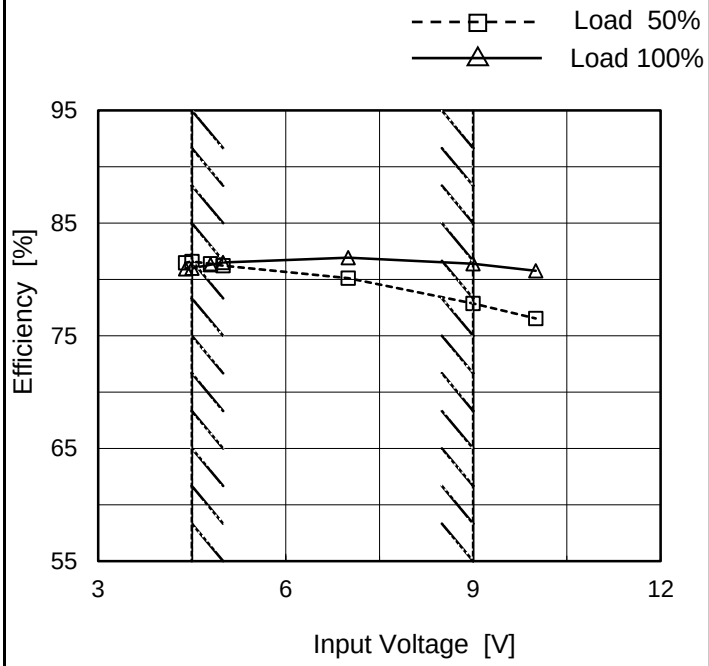
Model	MGS6053R3
Item	Efficiency (by Input Voltage)
Object	———————————

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%
4.4	81.5	80.9
4.5	81.6	81.0
4.8	81.4	81.3
5.0	81.2	81.5
7.0	80.1	81.9
9.0	77.9	81.4
10.0	76.5	80.8
--	-	-
--	-	-

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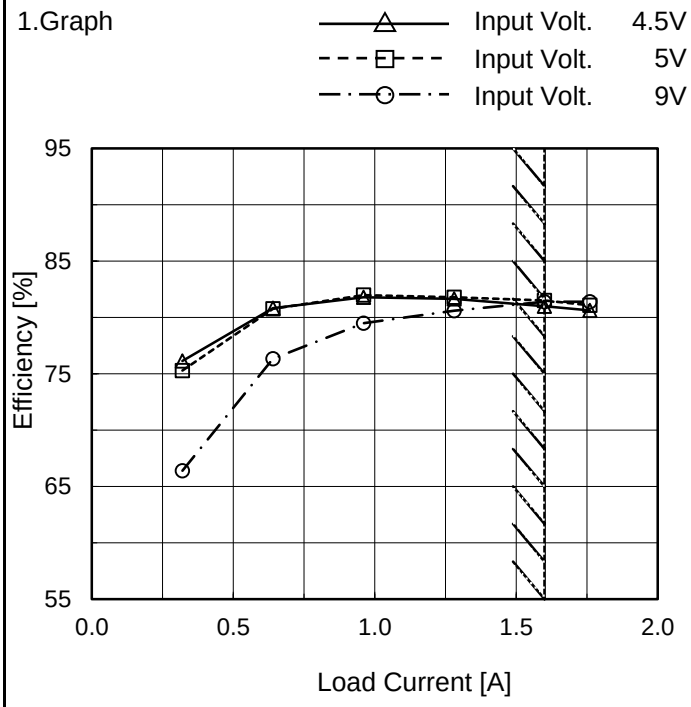
Model	MGS6053R3
Item	Efficiency (by Load Current)
Object	————————

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	-	-	-
0.32	76.2	75.3	66.4
0.64	80.8	80.8	76.3
0.96	81.8	82.0	79.5
1.28	81.7	81.8	80.6
1.60	81.0	81.5	81.4
1.76	80.6	81.1	81.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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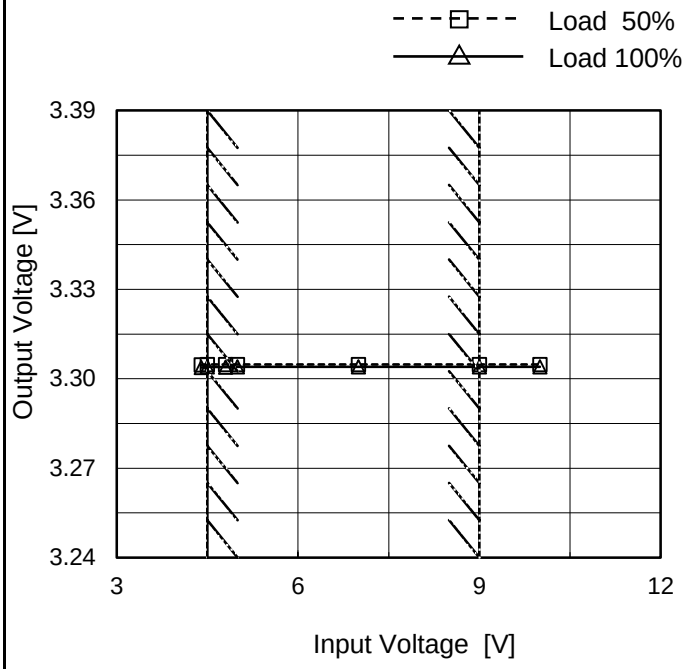
Model	MGS6053R3
Item	Line Regulation
Object	+3.3V1.6A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

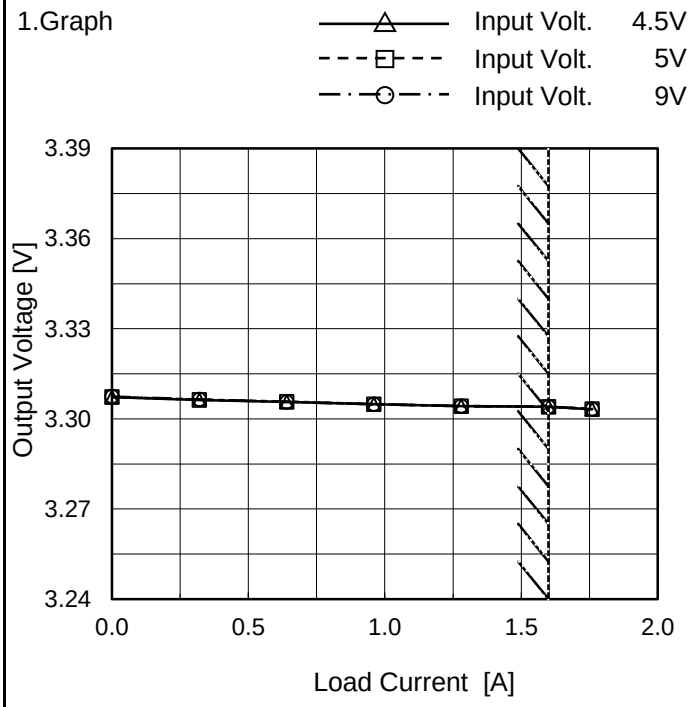
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.4	3.305	3.304
4.5	3.305	3.304
4.8	3.305	3.304
5.0	3.305	3.304
7.0	3.305	3.304
9.0	3.305	3.304
10.0	3.305	3.304
--	-	-
--	-	-

COSEL

Model	MGS6053R3
Item	Load Regulation
Object	+3.3V1.6A

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	3.307	3.307	3.307
0.32	3.306	3.306	3.307
0.64	3.306	3.306	3.306
0.96	3.305	3.305	3.305
1.28	3.304	3.304	3.304
1.60	3.304	3.304	3.304
1.76	3.303	3.303	3.303
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS6053R3
Item	Dynamic Load Response
Object	+3.3V1.6A

Temperature 25°C
Testing Circuitry Figure A

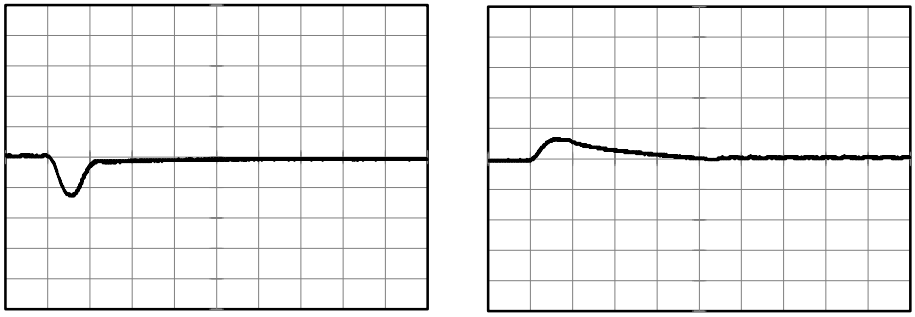
Input Volt. 5 V
Cycle 100 ms

t1,t2 = 100 μs

Load Current

t1 t2

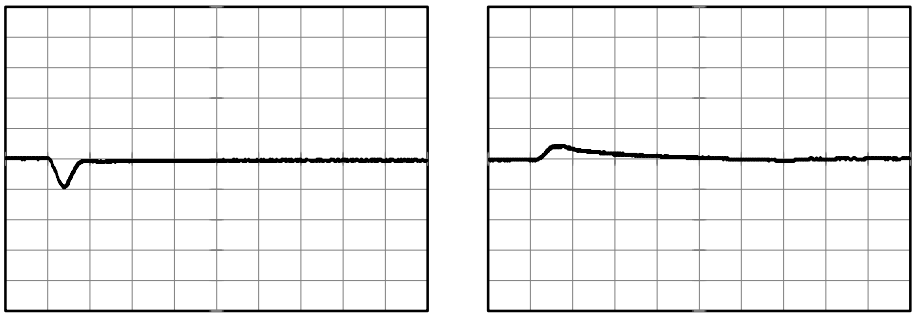
Min.Load (0A)←→
Load 100% (1.6A)



200 mV/div

100 μs/div 100 μs/div

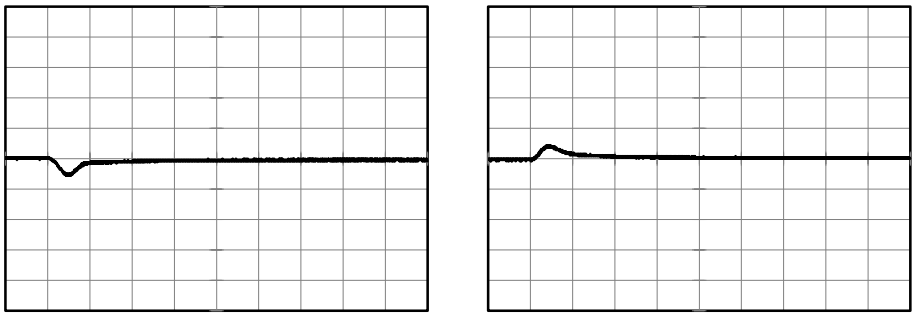
Min.Load (0A)←→
Load 50% (0.8A)



200 mV/div

100 μs/div 100 μs/div

Load 50% (0.8A)←→
Load 100% (1.6A)



200 mV/div

100 μs/div 100 μs/div

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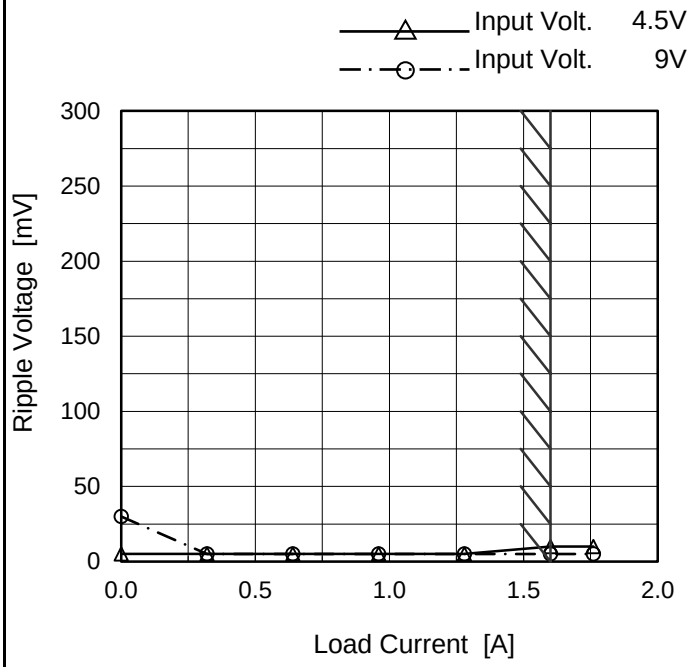
Model	MGS6053R3
Item	Ripple Voltage (by Load Current)
Object	+3.3V1.6A

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]

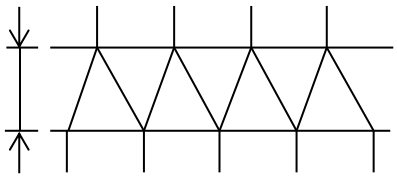


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	5	30
0.32	5	5
0.64	5	5
0.96	5	5
1.28	5	5
1.60	10	5
1.76	10	5
--	-	-
--	-	-
--	-	-
--	-	-

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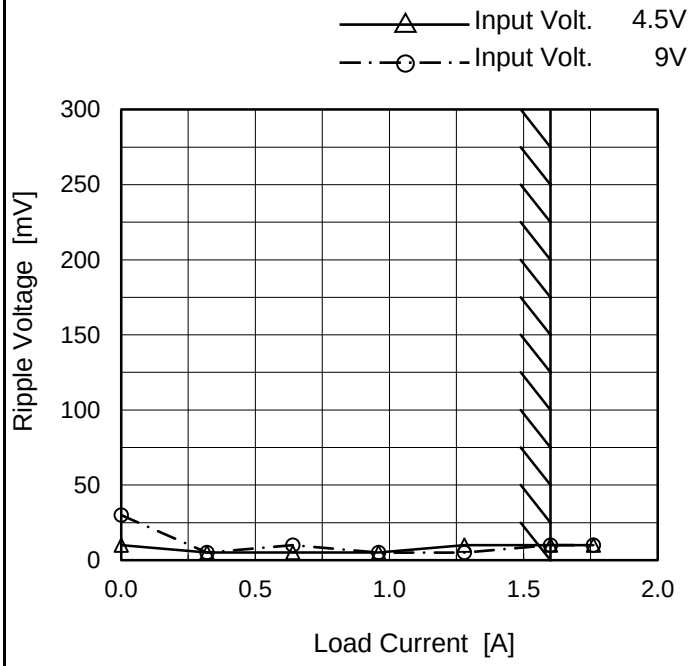
Model	MGS6053R3
Item	Ripple-Noise
Object	+3.3V1.6A

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]

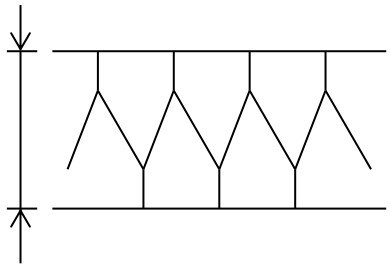


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	10	30
0.32	5	5
0.64	5	10
0.96	5	5
1.28	10	5
1.60	10	10
1.76	10	10
--	-	-
--	-	-
--	-	-
--	-	-

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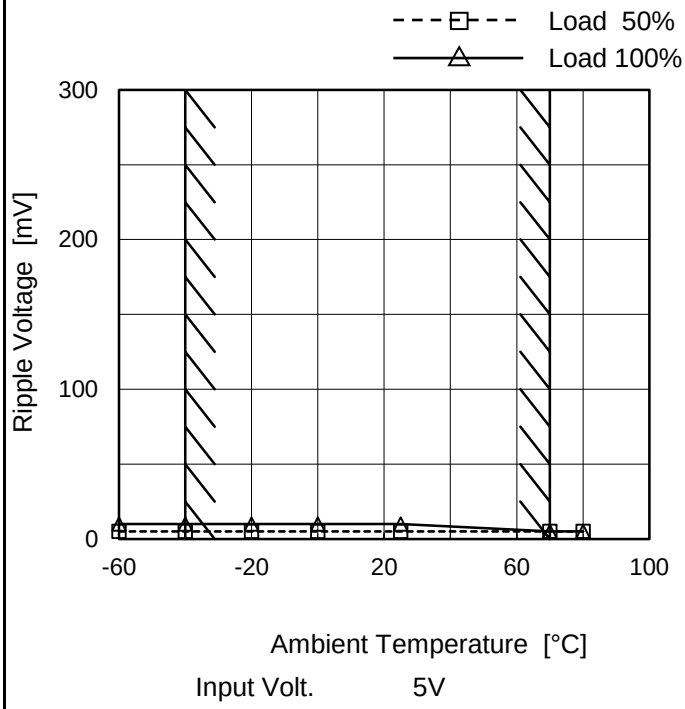
Model	MGS6053R3
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V1.6A

Testing Circuitry Figure B

1.Graph



Input Volt. 5V

Measured by 100 MHz Oscilloscope.

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

2.Values

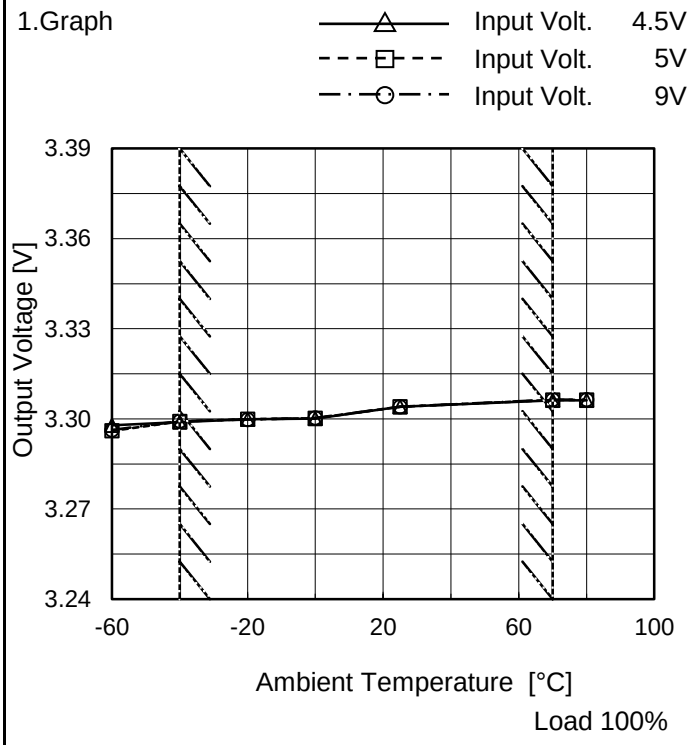
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	10
-40	5	10
-20	5	10
0	5	10
25	5	10
70	5	5
80	5	5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGS6053R3
Item	Ambient Temperature Drift
Object	+3.3V1.6A

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	3.298	3.296	3.296
-40	3.299	3.299	3.299
-20	3.300	3.300	3.300
0	3.300	3.300	3.300
25	3.304	3.304	3.304
70	3.306	3.306	3.306
80	3.306	3.306	3.306
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	MGS6053R3	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+3.3V1.6A	

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 - 70°C
Input Voltage : 4.5 - 9V
Load Current : 0 - 1.6A

* 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

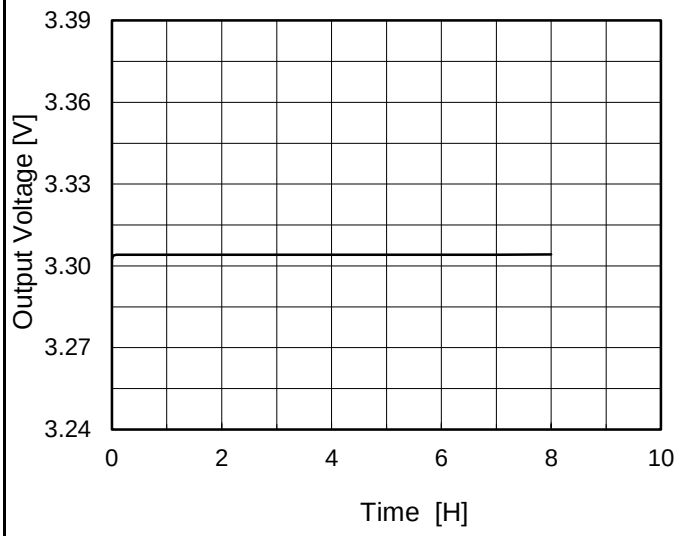
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	70	9	0	3.310	±6	±0.2
Minimum Voltage	-40	4.5	1.6	3.299		

COSEL

Model	MGS6053R3
Item	Time Lapse Drift
Object	+3.3V1.6A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	3.302
0.5	3.304
1.0	3.304
2.0	3.304
3.0	3.304
4.0	3.304
5.0	3.304
6.0	3.304
7.0	3.304
8.0	3.304

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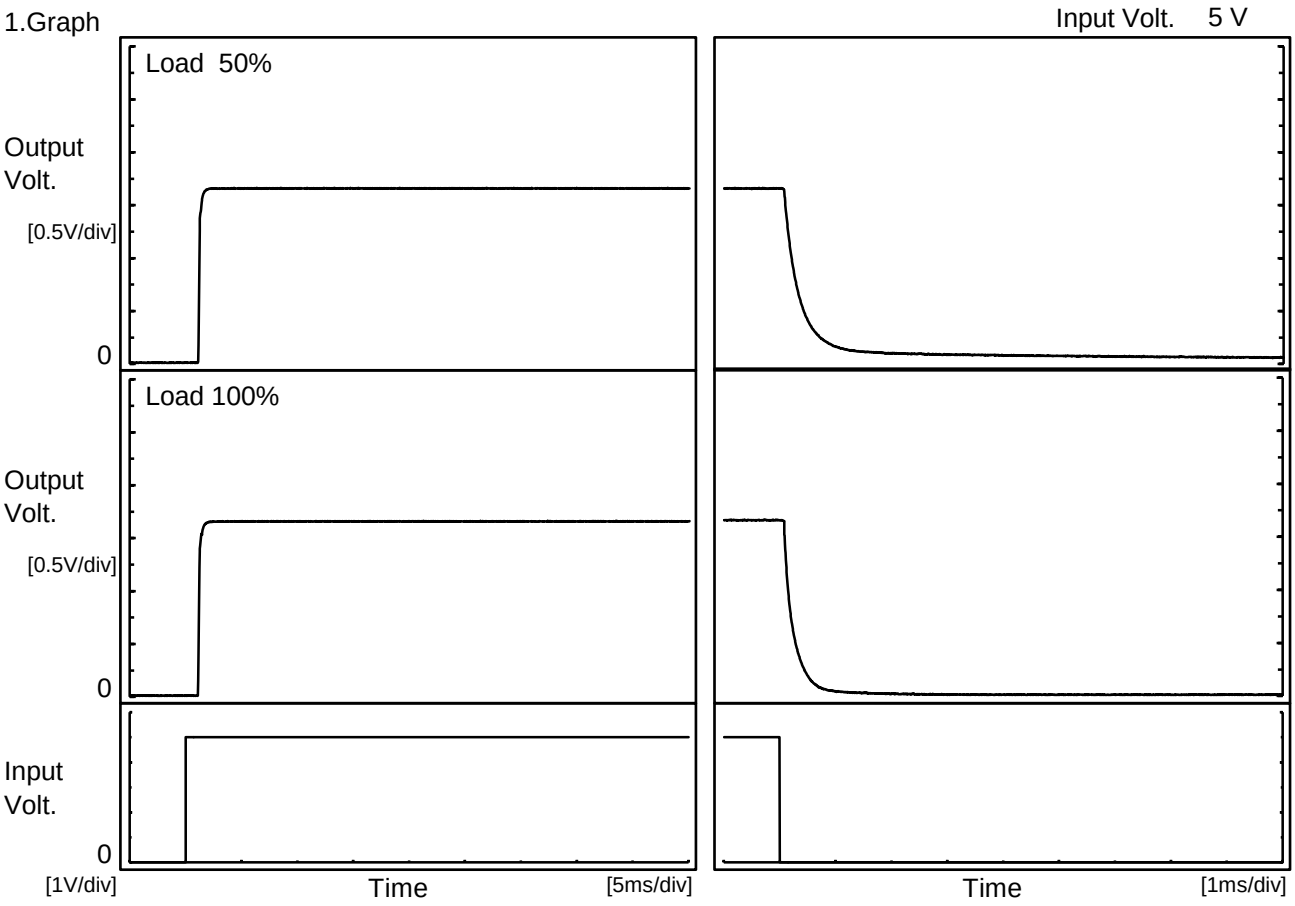
Model	MGS6053R3	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+3.3V1.6A	

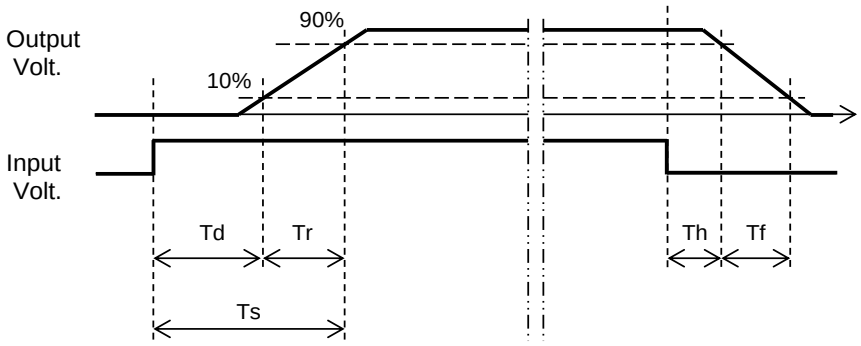
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.2	0.3	1.5	0.1	0.8
100 %	1.2	0.2	1.4	0.1	0.4

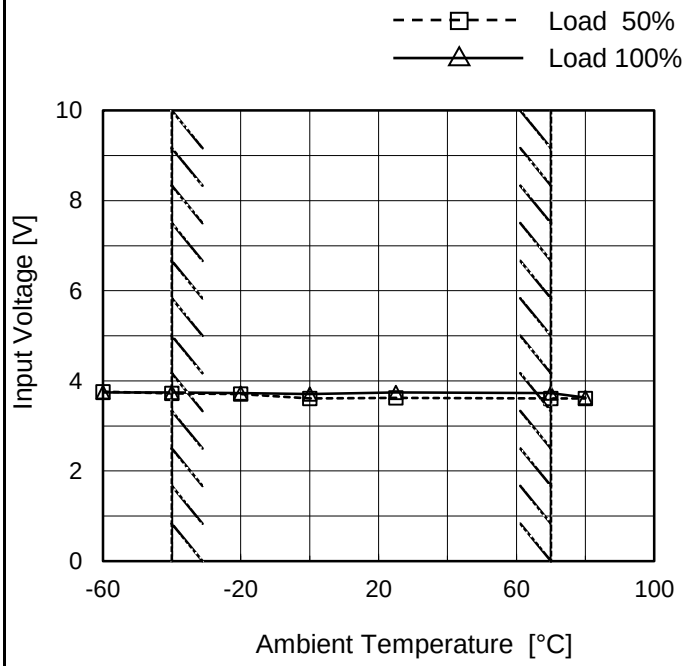


COSEL

Model	MGS6053R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V1.6A

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 100%
-60	3.8	3.8
-40	3.8	3.8
-20	3.8	3.8
0	3.7	3.8
25	3.7	3.8
70	3.7	3.8
80	3.7	3.7
--	-	-
--	-	-
--	-	-
--	-	-

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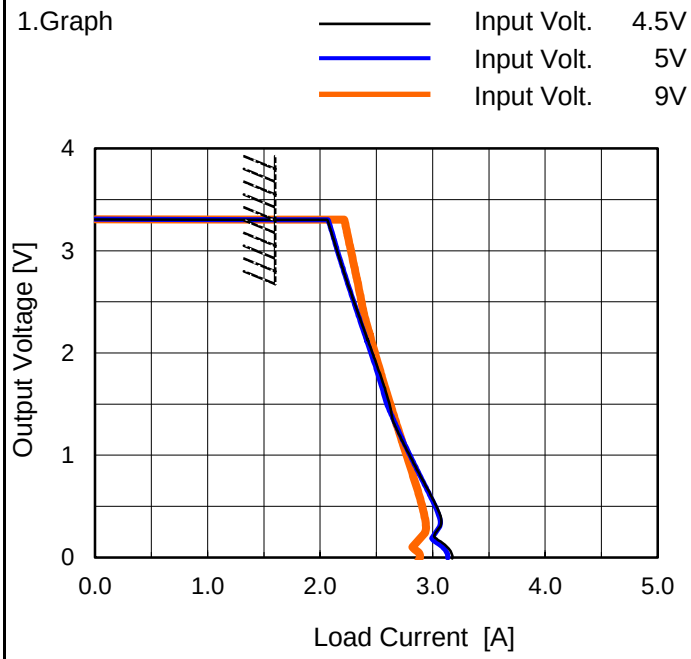
Model	MGS6053R3
Item	Overcurrent Protection
Object	+3.3V1.6A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
3.30	1.64	1.64	1.64
3.14	2.11	2.12	2.25
2.97	2.16	2.16	2.28
2.64	2.26	2.26	2.34
2.31	2.36	2.36	2.40
1.98	2.47	2.46	2.49
1.65	2.58	2.55	2.58
1.32	2.65	2.66	2.67
0.99	2.80	2.80	2.77
0.66	2.95	2.95	2.86
0.33	3.08	3.07	2.94
0.00	3.17	3.13	2.87

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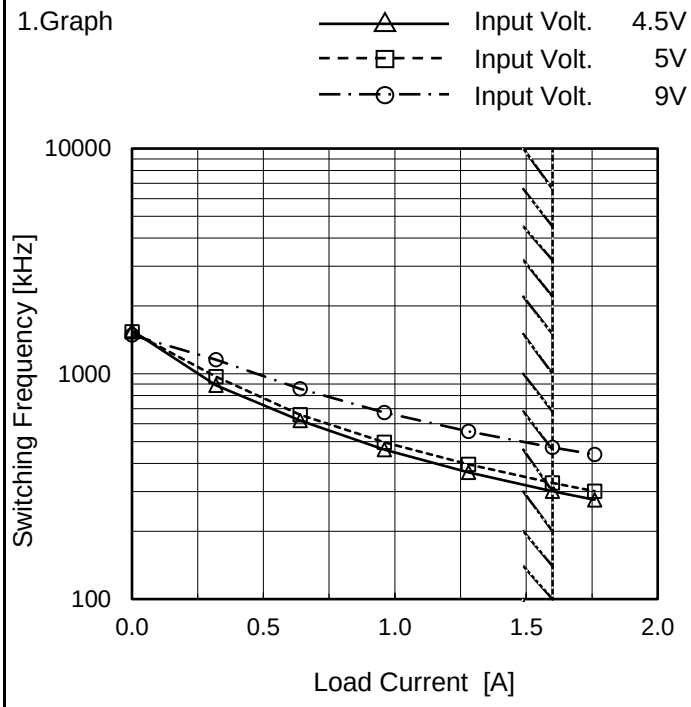
Model	MGS6053R3
Item	Switching Frequency (by Load Current)
Object	+3.3V1.6A

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]	Frequency [kHz] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	1557	1534	1485
0.32	889	971	1156
0.64	620	658	857
0.96	461	496	673
1.28	365	397	554
1.60	301	328	471
1.76	276	301	438
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

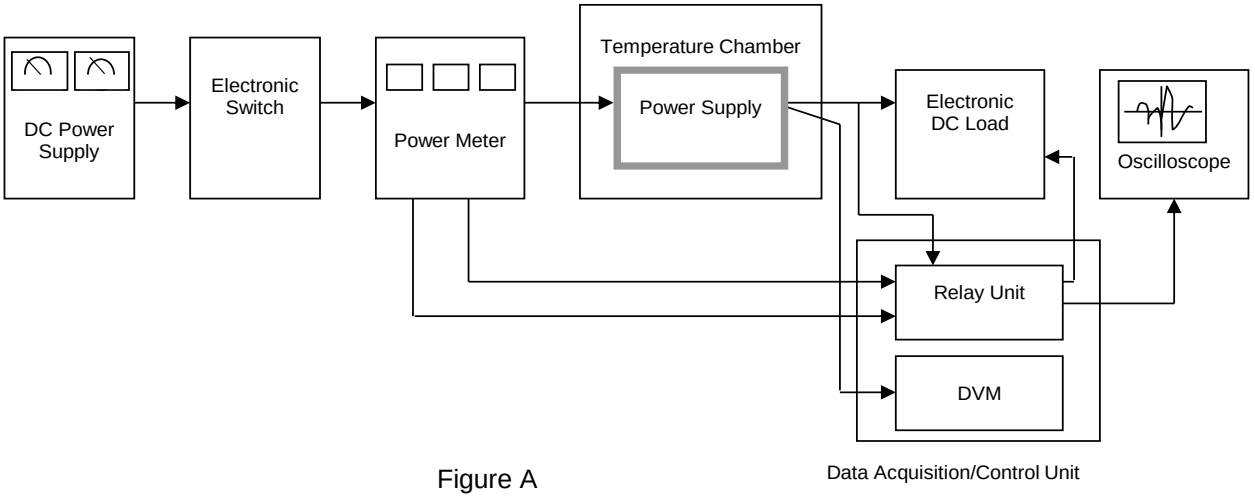


Figure A

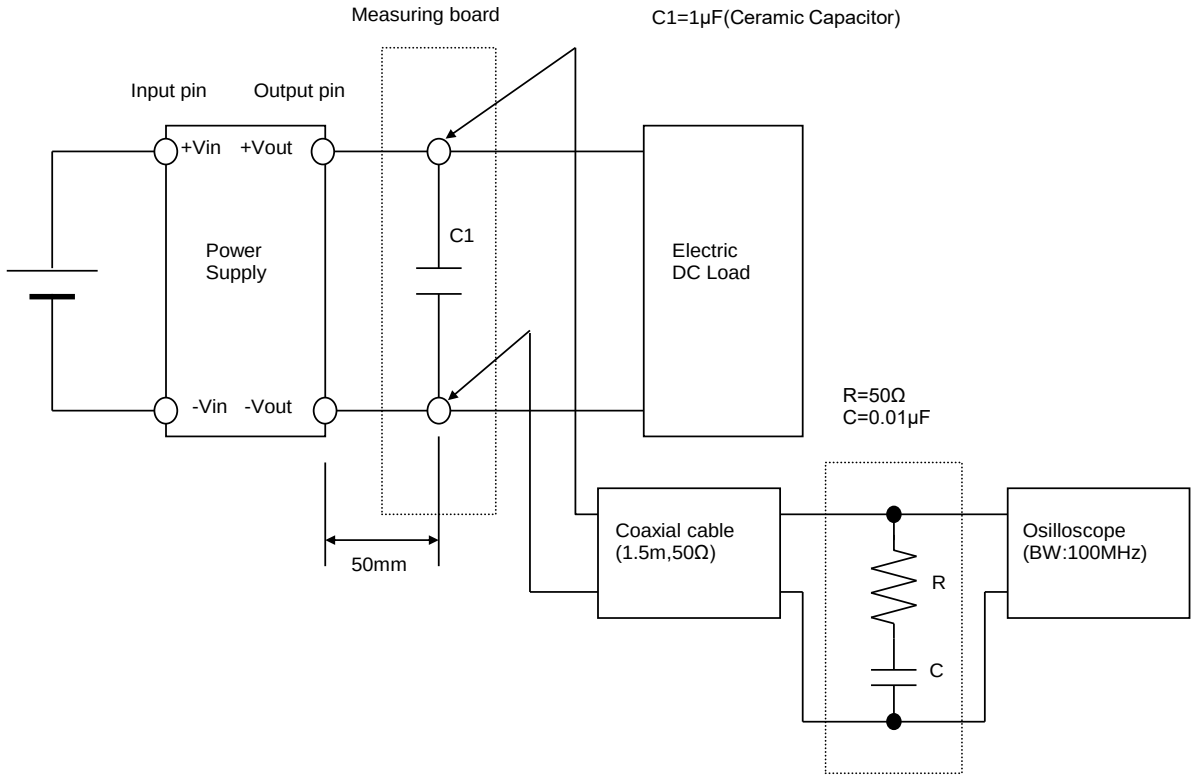


Figure B（Ripple and Ripple noise Characteristic）