参考資料

COSEL

TEST DATA OF MGS1R50512

Regulated DC Power Supply
March 31, 2016

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Shohei Mukaide Design Engineer

COSEL CO.,LTD.

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Object	————————

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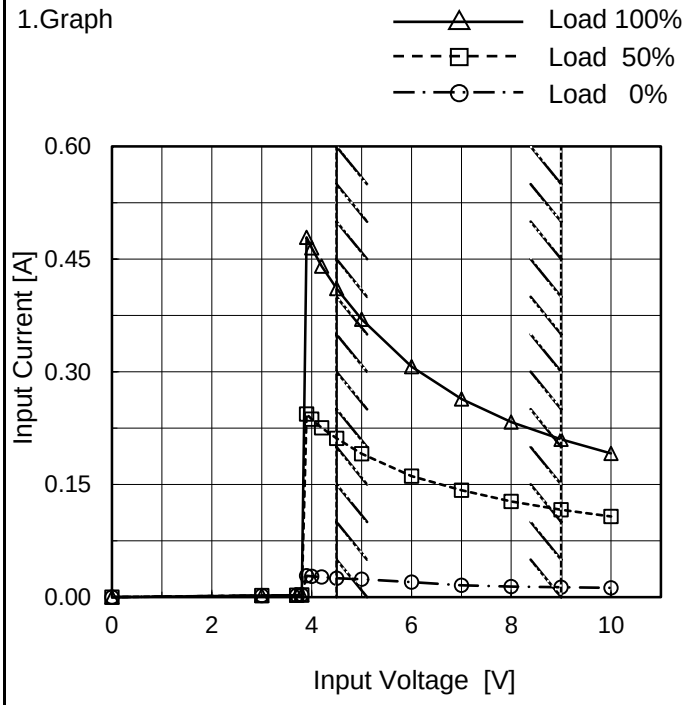

Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
3.0	0.002	0.002	0.002
3.7	0.003	0.003	0.003
3.8	0.003	0.003	0.003
3.9	0.028	0.244	0.479
4.0	0.028	0.237	0.465
4.2	0.027	0.225	0.441
4.5	0.025	0.211	0.411
5.0	0.024	0.191	0.370
6.0	0.020	0.161	0.307
7.0	0.016	0.142	0.264
8.0	0.014	0.127	0.233
9.0	0.013	0.116	0.210
10.0	0.012	0.107	0.191
--	-	-	-
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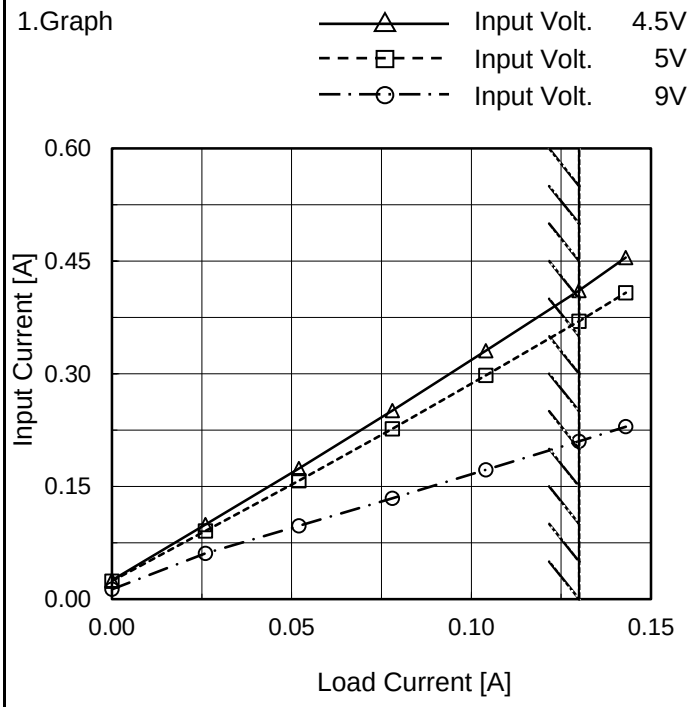
BC-10940

COSEL

Model	MGS1R50512
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]
0.000	0.025	0.024	0.013
0.026	0.099	0.091	0.061
0.052	0.174	0.158	0.097
0.078	0.251	0.227	0.134
0.104	0.331	0.298	0.172
0.130	0.411	0.370	0.210
0.143	0.455	0.408	0.230
--	-	-	-
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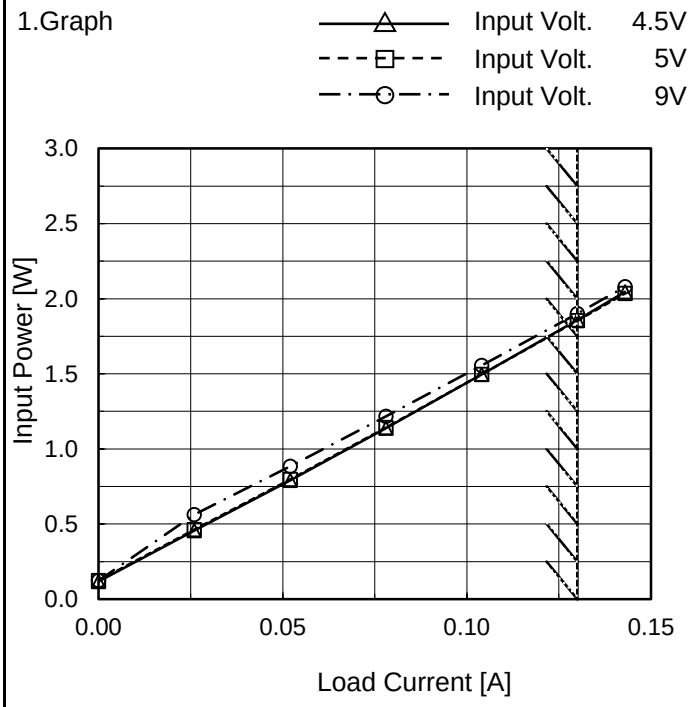
--	-	-	-
--	-	-	-

COSEL

Model	MGS1R50512
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]
0.000	0.12	0.12	0.12
0.026	0.46	0.46	0.56
0.052	0.79	0.80	0.88
0.078	1.14	1.14	1.22
0.104	1.50	1.50	1.56
0.130	1.86	1.85	1.90
0.143	2.05	2.04	2.08
--	-	-	-
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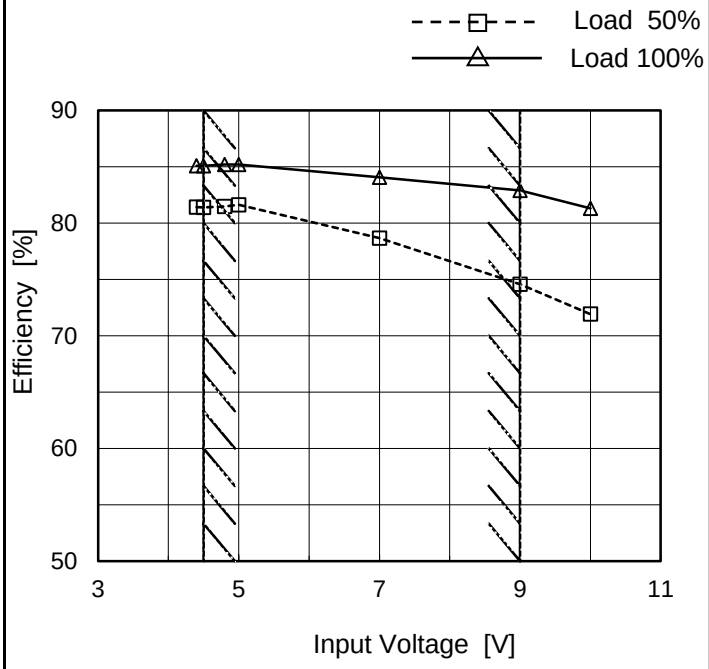
--	-	-	-
--	-	-	-

COSEL

Model	MGS1R50512
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	81.4	85.1
4.5	81.4	85.1
4.8	81.5	85.2
5.0	81.6	85.2
7.0	78.7	84.1
9.0	74.6	82.9
10.0	71.9	81.3
--	-	-
--	-	-

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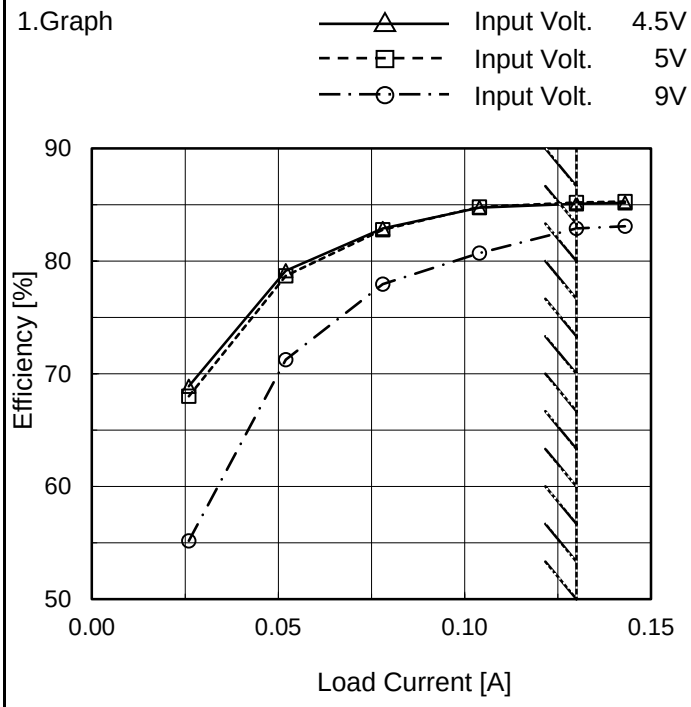
Model	MGS1R50512
Item	Efficiency (by Load Current)
Object	———————

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]
0.000	-	-	-
0.026	68.9	68.0	55.2
0.052	79.2	78.7	71.3
0.078	82.9	82.8	77.9
0.104	84.8	84.8	80.7
0.130	85.1	85.2	82.9
0.143	85.2	85.3	83.1
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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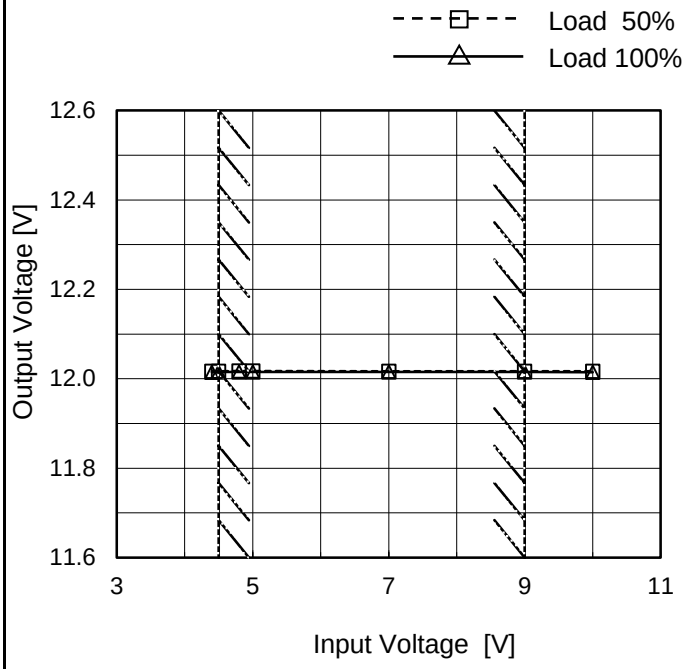
Model	MGS1R50512
Item	Line Regulation
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

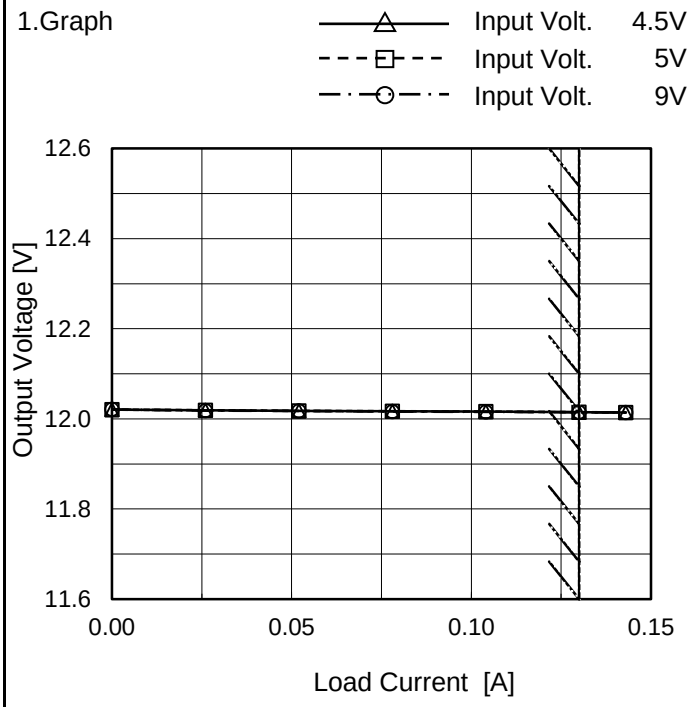
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.4	12.017	12.015
4.5	12.017	12.015
4.8	12.017	12.015
5.0	12.017	12.015
7.0	12.017	12.015
9.0	12.017	12.015
10.0	12.017	12.015
--	-	-
--	-	-

COSEL

Model	MGS1R50512
Item	Load Regulation
Object	+12V0.13A

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]
0.000	12.021	12.021	12.021
0.026	12.019	12.019	12.019
0.052	12.018	12.018	12.018
0.078	12.017	12.017	12.016
0.104	12.016	12.016	12.016
0.130	12.015	12.015	12.015
0.143	12.014	12.014	12.014
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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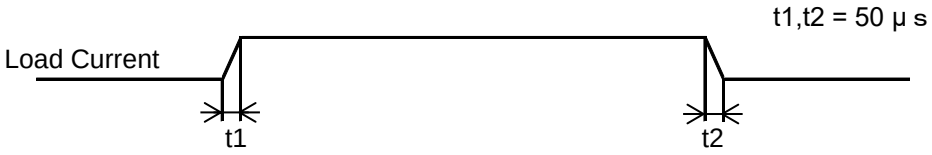
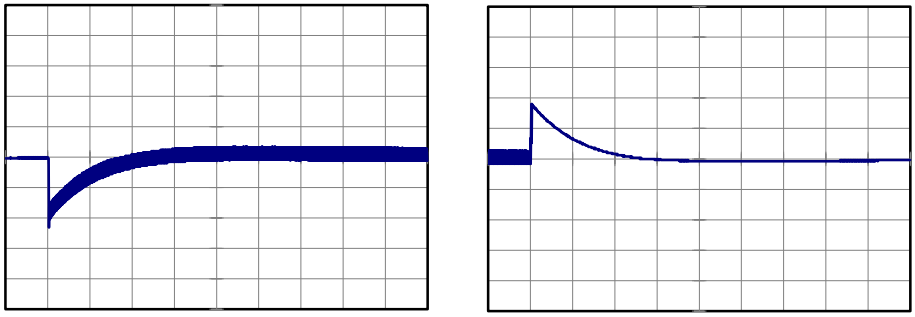
Model	MGS1R50512	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.13A	

Input Volt. 5 V

Cycle 1000 ms



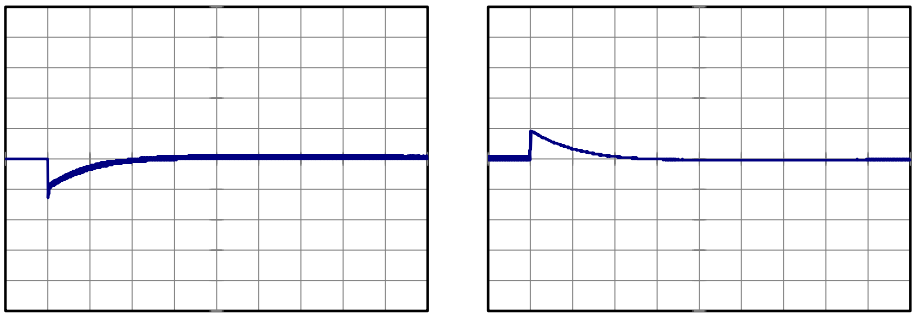
Min.Load (0A)←→
Load 100% (0.13A)



100 mV/div

4 ms/div 4 ms/div

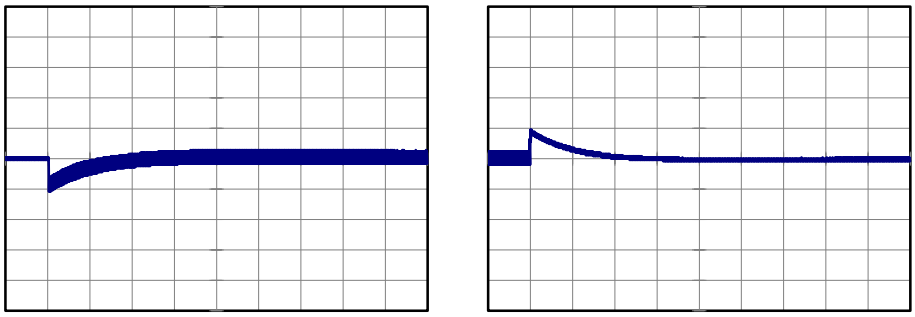
Min.Load (0A)←→
Load 50% (0.065A)



100 mV/div

4 ms/div 4 ms/div

Load 50% (0.065A)←→
Load 100% (0.13A)



100 mV/div

4 ms/div 4 ms/div

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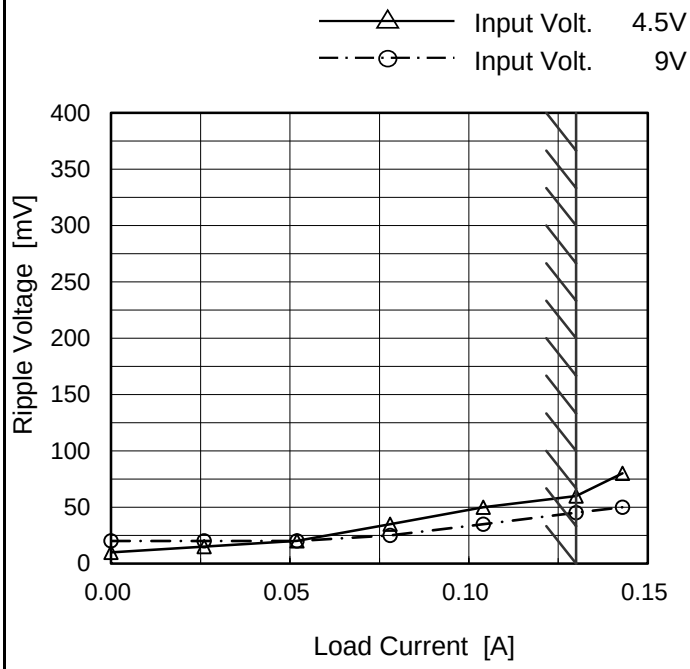
Model	MGS1R50512
Item	Ripple Voltage (by Load Current)
Object	+12V0.13A

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.

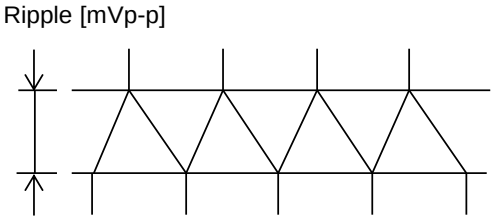


Fig.Complex Ripple Wave Form

2.Values

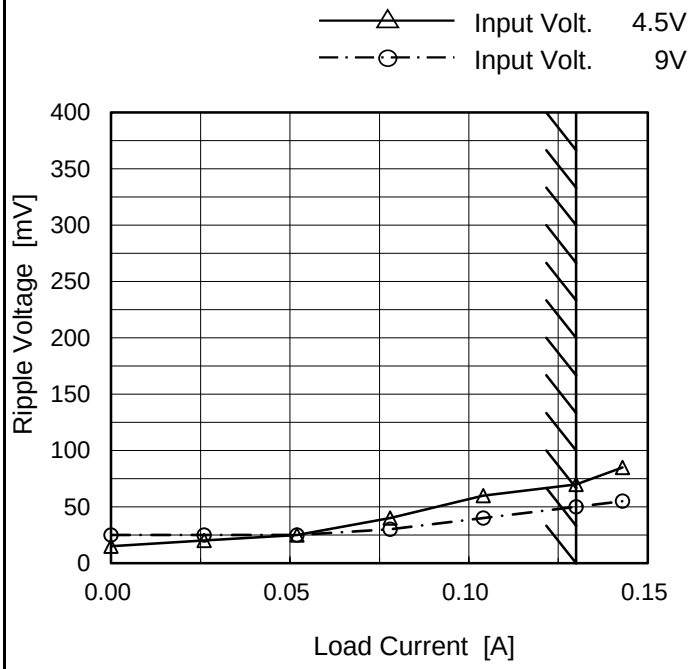
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.000	10	20
0.026	15	20
0.052	20	20
0.078	35	25
0.104	50	35
0.130	60	45
0.143	80	50
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGS1R50512
Item	Ripple-Noise
Object	+12V0.13A

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.

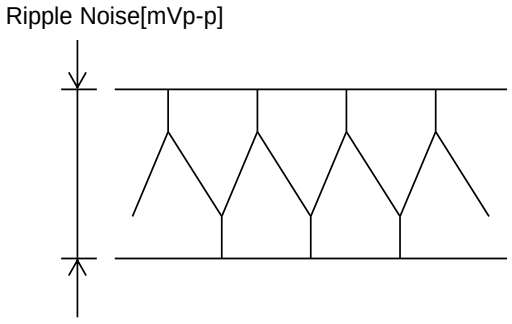


Fig.Complex Ripple Noise Wave Form

2.Values

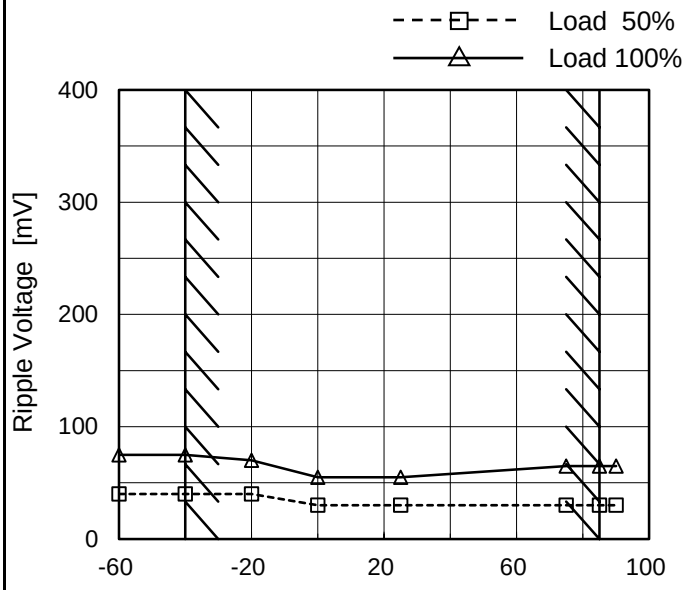
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.000	15	25
0.026	20	25
0.052	25	25
0.078	40	30
0.104	60	40
0.130	70	50
0.143	85	55
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGS1R50512
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.13A

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

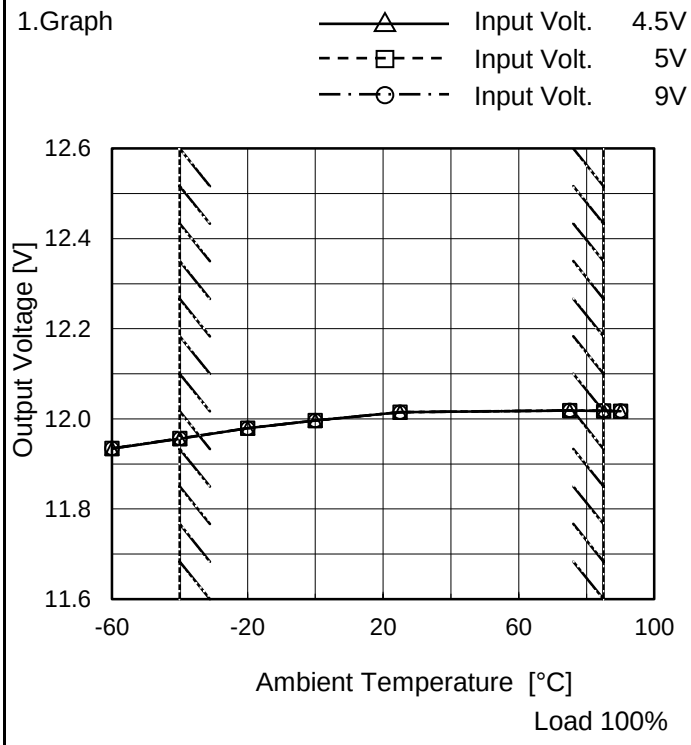
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	40	75
-40	40	75
-20	40	70
0	30	55
25	30	55
75	30	65
85	30	65
90	30	65
--	-	-
--	-	-
--	-	-

COSEL

Model	MGS1R50512
Item	Ambient Temperature Drift
Object	+12V0.13A

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	11.934	11.934	11.934
-40	11.956	11.957	11.957
-20	11.979	11.980	11.980
0	11.996	11.997	11.997
25	12.015	12.015	12.015
75	12.019	12.019	12.019
85	12.018	12.018	12.018
90	12.017	12.017	12.018
--	-	-	-
--	-	-	-
--	-	-	-

Model	MGS1R50512	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V0.13A	

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 : 4.5 - 9V
Load Current : 0 - 0.13A

* 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

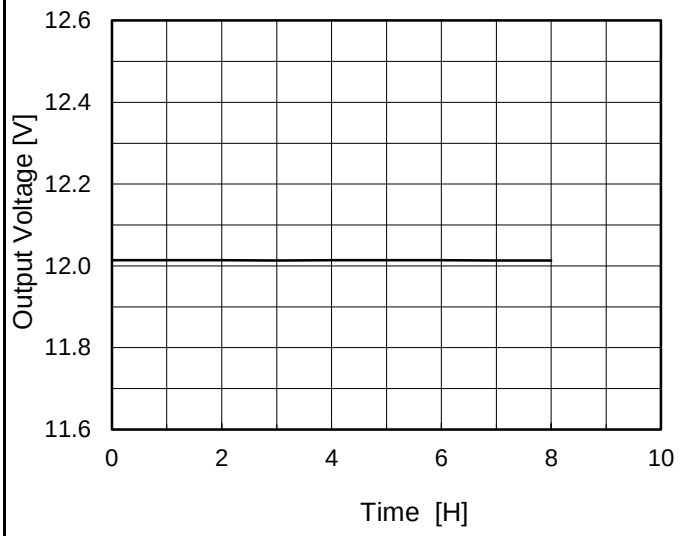
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	75	9	0	12.027	±36	±0.3
Minimum Voltage	-40	4.5	0.13	11.956		

COSEL

Model	MGS1R50512
Item	Time Lapse Drift
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 5V
Load 100%

2.Values

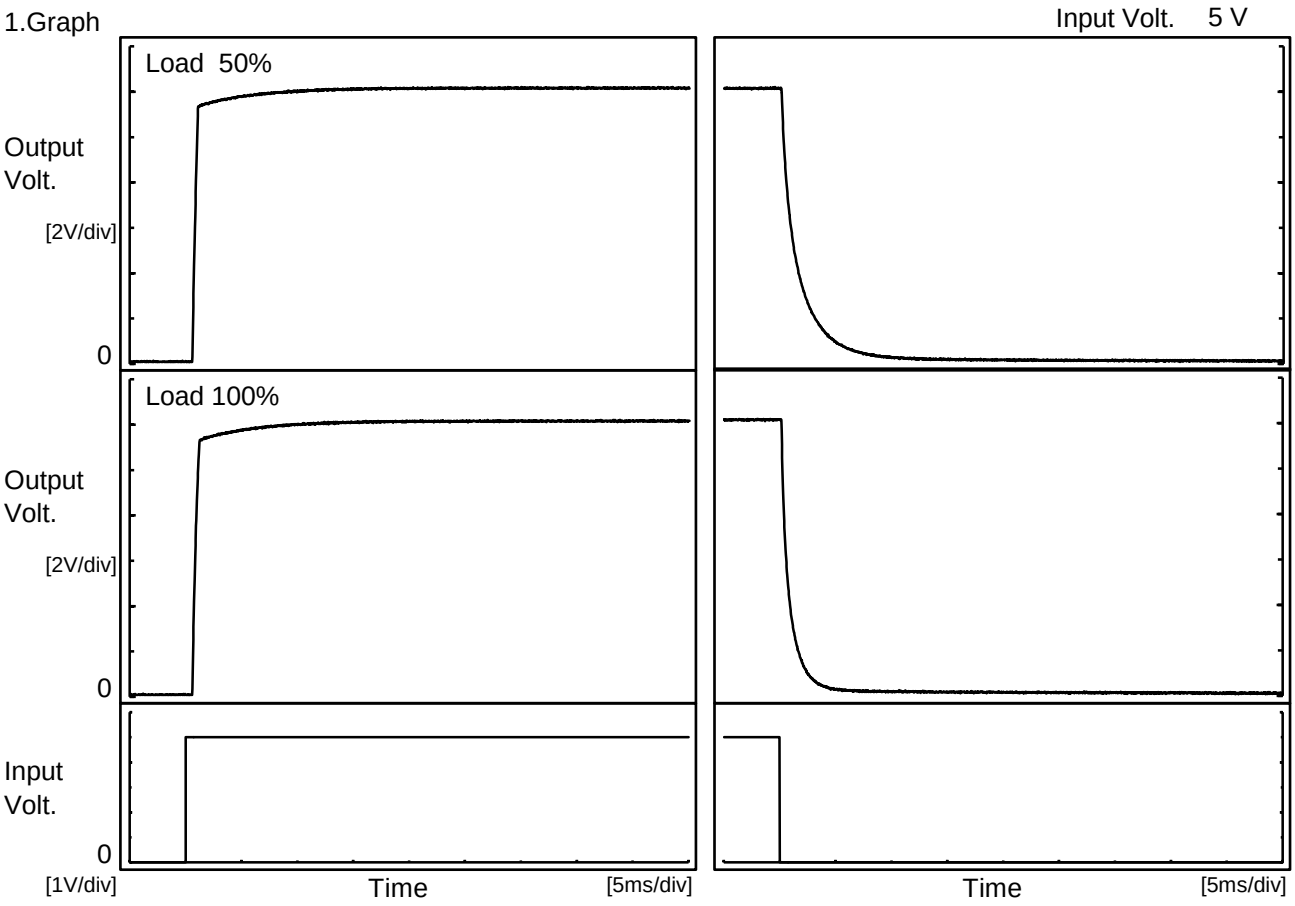
Time since start [H]	Output Voltage [V]
0.0	12.013
0.5	12.014
1.0	12.014
2.0	12.014
3.0	12.014
4.0	12.014
5.0	12.014
6.0	12.014
7.0	12.013
8.0	12.014

COSEL

Model	MGS1R50512
Item	Rise and Fall Time
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

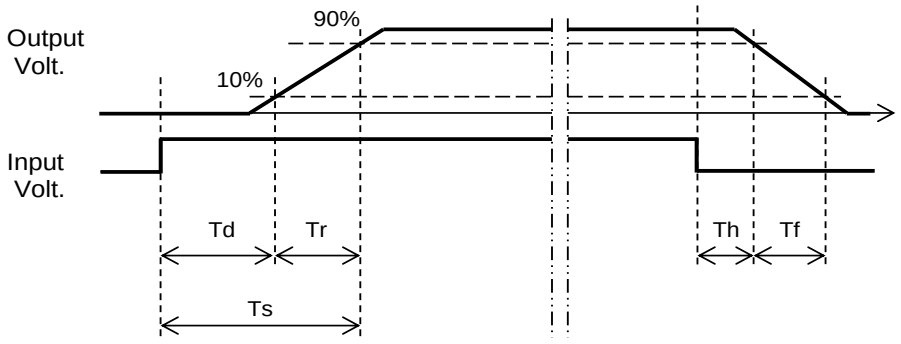
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.7	0.4	1.1	0.3	4.1
100 %	0.7	0.6	1.3	0.2	2.0

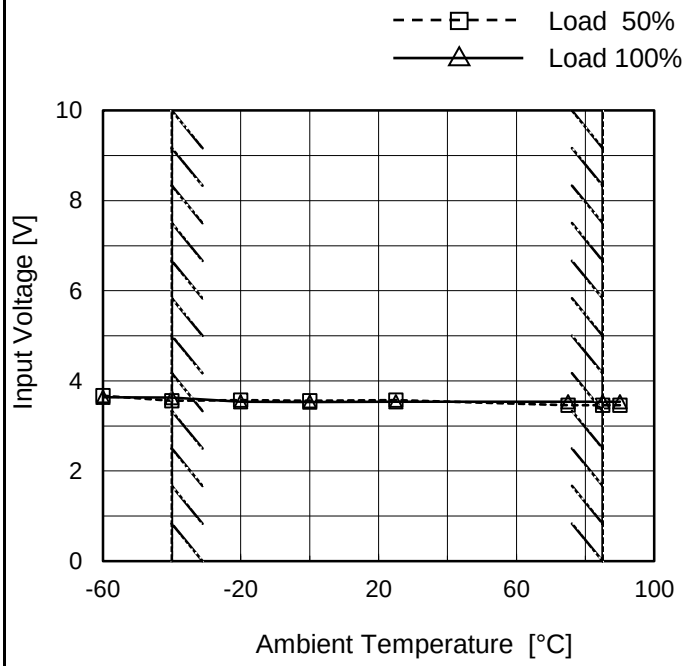


COSEL

Model	MGS1R50512
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.13A

Testing Circuitry Figure A

1.Graph



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

2.Values

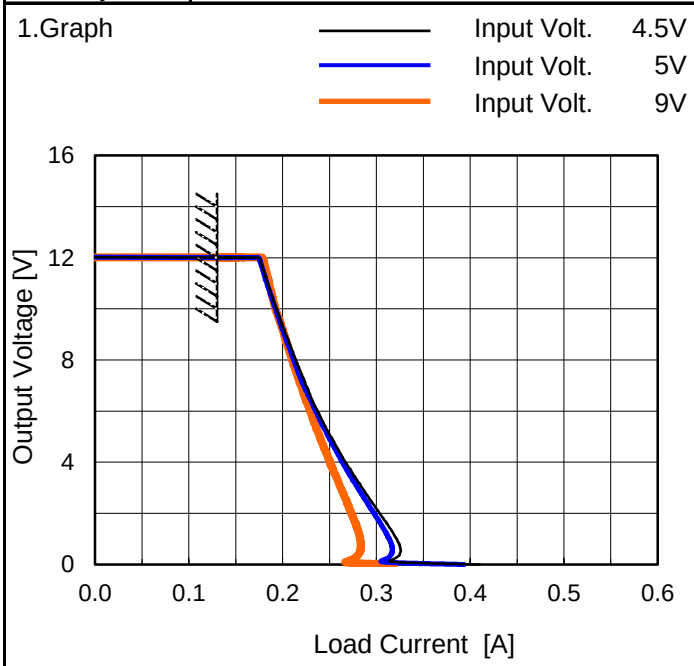
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.7	3.7
-40	3.6	3.7
-20	3.6	3.6
0	3.6	3.6
25	3.6	3.6
75	3.5	3.6
85	3.5	3.6
90	3.5	3.6
--	-	-
--	-	-
--	-	-

COSEL

Model	MGS1R50512
Item	Overcurrent Protection
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

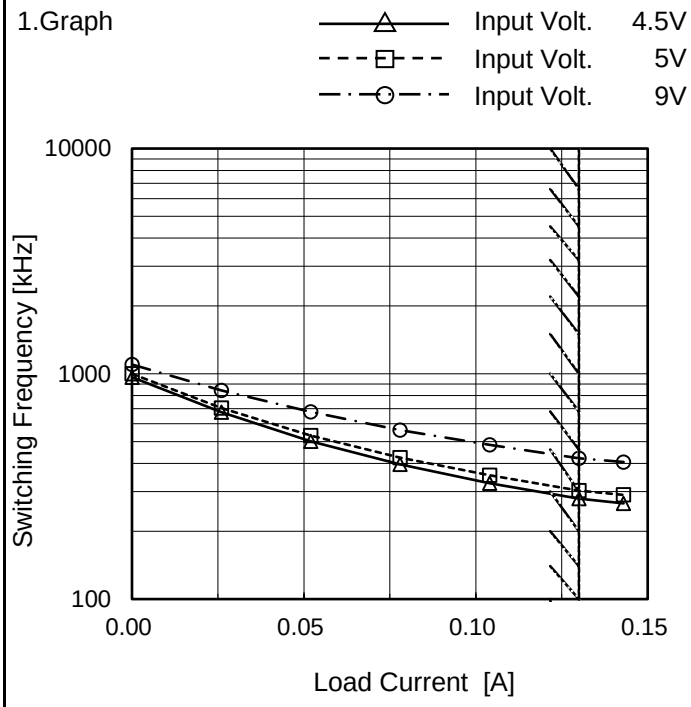
Output Voltage [V]	Load Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
12.0	0.13	0.13	0.13
11.4	0.18	0.18	0.18
10.8	0.19	0.19	0.19
9.6	0.20	0.20	0.20
8.4	0.21	0.21	0.21
7.2	0.22	0.22	0.22
6.0	0.24	0.24	0.23
4.8	0.25	0.25	0.24
3.6	0.27	0.27	0.25
2.4	0.30	0.29	0.27
1.2	0.32	0.31	0.28
0.0	0.41	0.39	0.32

COSEL

Model	MGS1R50512
Item	Switching Frequency (by Load Current)
Object	+12V0.13A

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]
0.000	966	1000	1100
0.026	675	706	844
0.052	501	532	677
0.078	396	424	563
0.104	327	355	484
0.130	279	303	422
0.143	266	290	406
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

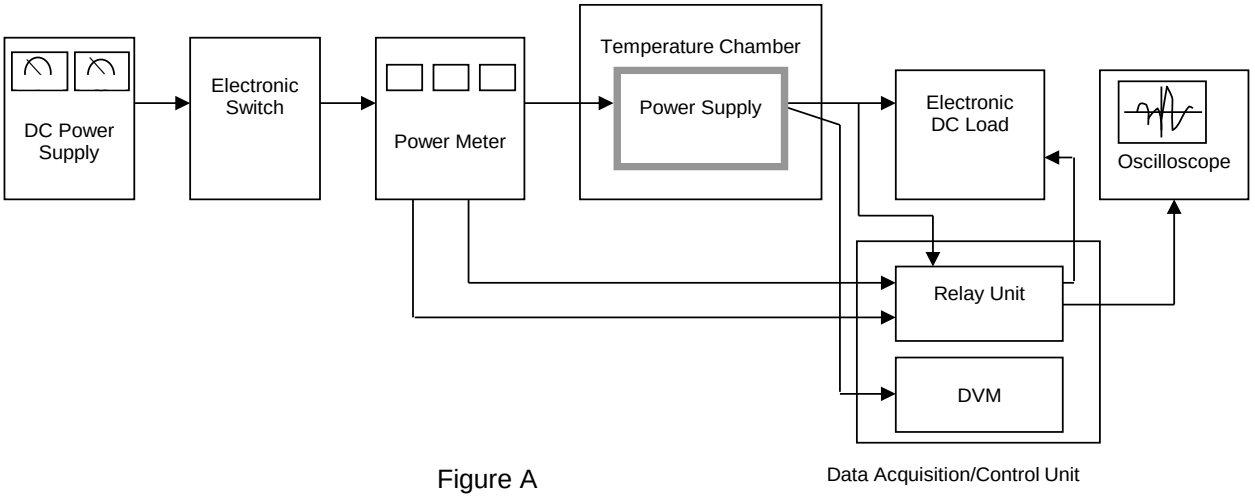


Figure A

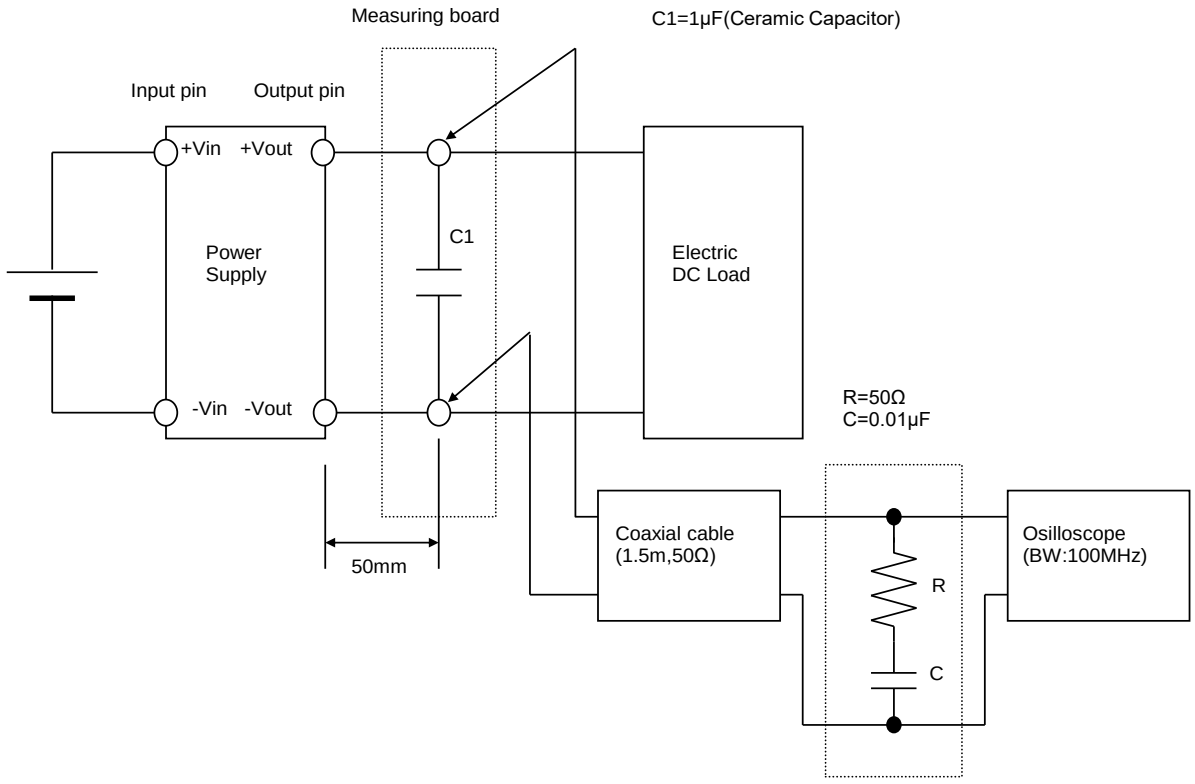


Figure B（Ripple and Ripple noise Characteristic）