



# TEST DATA OF MGS61212

Regulated DC Power Supply  
July 28, 2016

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Takayuki Fukuda

Design Manager

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Ryosuke Nakao

Design Engineer

**COSEL CO.,LTD.**



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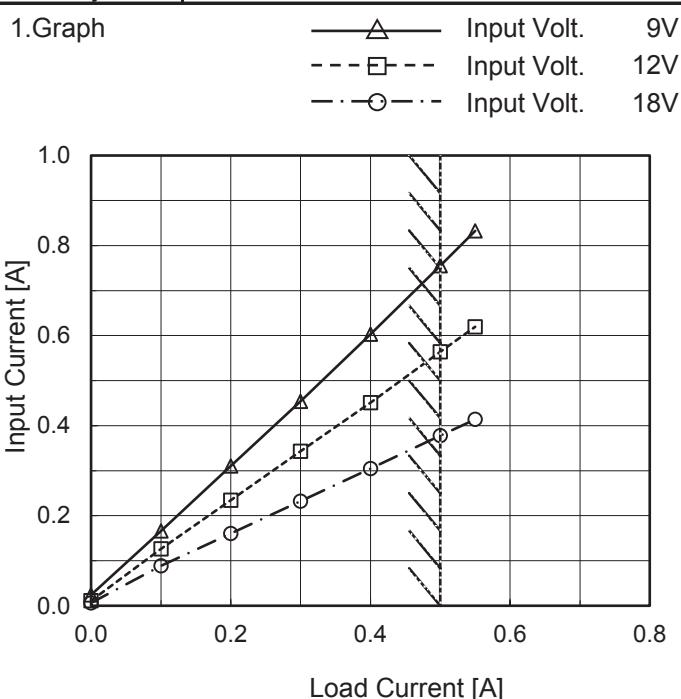
**COSEL**

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

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Model	MGS61212
Item	Input Current (by Load Current)
Object	_____


 Temperature 25°C  
 Testing Circuitry Figure A

## 2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	0.024	0.011	0.006
0.10	0.166	0.127	0.088
0.20	0.311	0.234	0.161
0.30	0.454	0.343	0.232
0.40	0.603	0.451	0.305
0.50	0.755	0.564	0.378
0.55	0.833	0.620	0.414
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Note: Slanted line shows the range of the rated load current.

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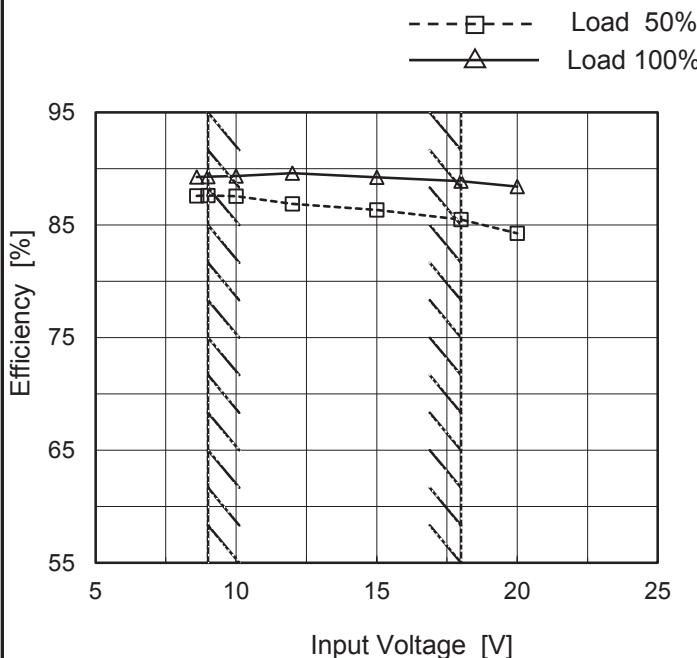
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<p>The graph plots Input Power [W] on the Y-axis (0 to 10) against Load Current [A] on the X-axis (0.0 to 0.8). Three data series are shown for different input voltages: 9V (solid line with open triangle markers), 12V (dashed line with open square markers), and 18V (dash-dot line with open circle markers). All three lines show a positive linear relationship. A slanted line is drawn across the graph, intersecting the 12V and 18V lines at approximately 0.55A, which is labeled as the rated load current.</p>																																																						
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Model	MGS61212
Item	Efficiency (by Input Voltage)
Object	_____

Temperature 25°C  
Testing Circuitry Figure A

## 1.Graph



## 2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.6	87.6	89.3
9.0	87.6	89.3
10.0	87.6	89.3
12.0	86.9	89.6
15.0	86.4	89.3
18.0	85.5	88.9
20.0	84.3	88.4
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Note: Slanted line shows the range of the rated input voltage.

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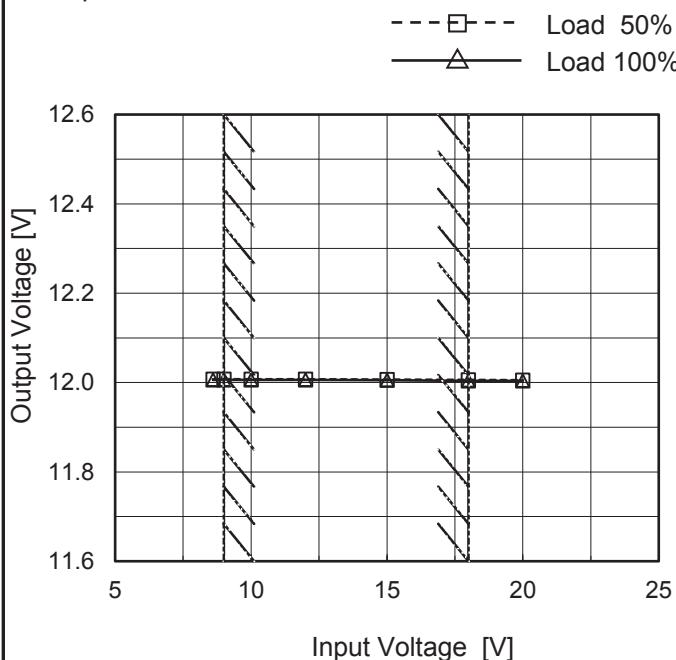
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1.Graph	<p>Graph showing Efficiency [%] vs Load Current [A]. The Y-axis ranges from 55 to 95 in increments of 10. The X-axis ranges from 0.0 to 0.8 in increments of 0.2. Three curves are plotted for different input voltages: 9V (solid line with triangle markers), 12V (dashed line with square markers), and 18V (dash-dot line with circle markers). All curves show efficiency increasing with load current. A vertical slanted line is drawn through the curves, indicating the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>9V [%]</th> <th>12V [%]</th> <th>18V [%]</th> </tr> </thead> <tbody> <tr><td>0.10</td><td>80.5</td><td>78.8</td><td>75.1</td></tr> <tr><td>0.20</td><td>86.3</td><td>85.8</td><td>83.0</td></tr> <tr><td>0.30</td><td>88.4</td><td>87.9</td><td>86.3</td></tr> <tr><td>0.40</td><td>89.1</td><td>89.1</td><td>88.1</td></tr> <tr><td>0.50</td><td>89.3</td><td>89.6</td><td>88.9</td></tr> <tr><td>0.55</td><td>89.2</td><td>89.6</td><td>89.0</td></tr> </tbody> </table>			Load Current [A]	9V [%]	12V [%]	18V [%]	0.10	80.5	78.8	75.1	0.20	86.3	85.8	83.0	0.30	88.4	87.9	86.3	0.40	89.1	89.1	88.1	0.50	89.3	89.6	88.9	0.55	89.2	89.6	89.0																							
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**COSEL**

Model	MGS61212
Item	Line Regulation
Object	+12V0.5A

 Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



## 2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	12.007	12.006
9.0	12.007	12.006
10.0	12.007	12.006
12.0	12.007	12.006
15.0	12.007	12.005
18.0	12.006	12.004
20.0	12.005	12.004
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Note: Slanted line shows the range of the rated input voltage.

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Model	MGS61212	Temperature	25°C																																																			
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<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Input Volt.</p> <ul style="list-style-type: none"> <li>9V</li> <li>12V</li> <li>18V</li> </ul>		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>9[V]</th> <th>12[V]</th> <th>18[V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>12.013</td><td>12.014</td><td>12.014</td></tr> <tr><td>0.10</td><td>12.012</td><td>12.011</td><td>12.009</td></tr> <tr><td>0.20</td><td>12.010</td><td>12.010</td><td>12.008</td></tr> <tr><td>0.30</td><td>12.009</td><td>12.008</td><td>12.007</td></tr> <tr><td>0.40</td><td>12.007</td><td>12.007</td><td>12.005</td></tr> <tr><td>0.50</td><td>12.006</td><td>12.006</td><td>12.004</td></tr> <tr><td>0.55</td><td>12.005</td><td>12.005</td><td>12.004</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Output Voltage [V]			9[V]	12[V]	18[V]	0.00	12.013	12.014	12.014	0.10	12.012	12.011	12.009	0.20	12.010	12.010	12.008	0.30	12.009	12.008	12.007	0.40	12.007	12.007	12.005	0.50	12.006	12.006	12.004	0.55	12.005	12.005	12.004	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.

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Model	MGS61212	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.5A		

Input Volt. 12 V  
 Cycle 100 ms



Min.Load (0A)↔  
 Load 100% (0.5A)

500 mV/div

2 ms/div

2 ms/div

Min.Load (0A)↔  
 Load 50% (0.25A)

500 mV/div

2 ms/div

2 ms/div

Load 50% (0.25A)↔  
 Load 100% (0.5A)

500 mV/div

2 ms/div

2 ms/div

**COSSEL**

Model	MGS61212																																							
Item	Ripple Voltage (by Load Current)	Temperature      25°C Testing Circuitry      Figure B																																						
Object	+12V0.5A																																							
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<p>Input Volt. 9V Input Volt. 18V</p> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>																																								
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<p>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.</p>																																								
<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								

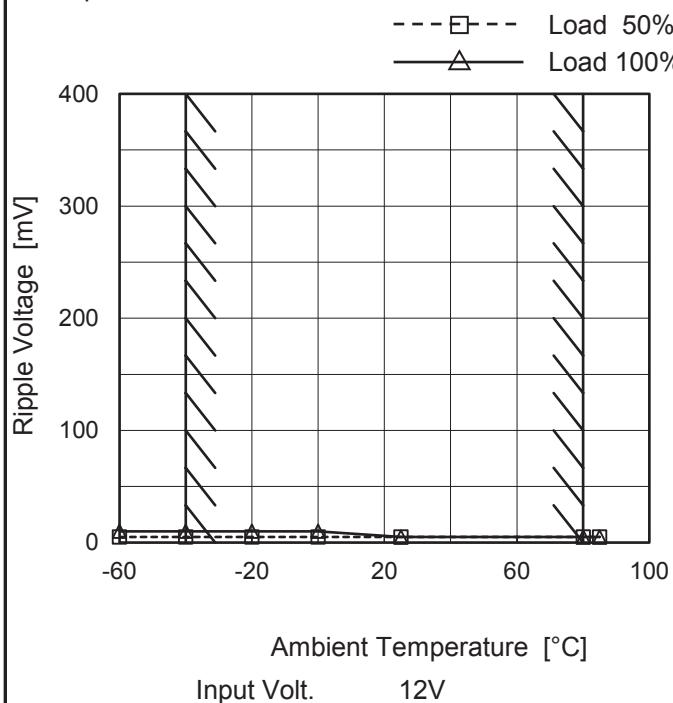
**COSEL**

Model	MGS61212																																							
Item	Ripple-Noise	Temperature      25°C Testing Circuitry      Figure B																																						
Object	+12V0.5A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 400 mV, and the X-axis ranges from 0.0 to 0.8 A. Two curves are shown: one for Input Volt. 9V (solid line with triangle markers) and one for Input Volt. 18V (dashed line with circle markers). Both curves show low noise until ~0.4A, then a sharp increase to ~350mV at 0.55A, indicated by a slanted line.</p>																																								
2.Values																																								
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 9 [V]</th> <th>Input Volt. 18 [V]</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>10</td> <td>25</td> </tr> <tr> <td>0.10</td> <td>10</td> <td>10</td> </tr> <tr> <td>0.20</td> <td>10</td> <td>10</td> </tr> <tr> <td>0.30</td> <td>15</td> <td>10</td> </tr> <tr> <td>0.40</td> <td>15</td> <td>15</td> </tr> <tr> <td>0.50</td> <td>15</td> <td>15</td> </tr> <tr> <td>0.55</td> <td>20</td> <td>15</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>			Load Current [A]	Ripple-Noise [mV]		Input Volt. 9 [V]	Input Volt. 18 [V]	0.00	10	25	0.10	10	10	0.20	10	10	0.30	15	10	0.40	15	15	0.50	15	15	0.55	20	15	--	-	-	--	-	-	--	-	-	--	-	-
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<p>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.</p> <p>Ripple Noise[mVp-p]</p> <p>Fig.Complex Ripple Noise Wave Form</p>																																								

**COSEL**

Model	MGS61212
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.5A

## 1. Graph



Measured by 100 MHz Oscilloscope.

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

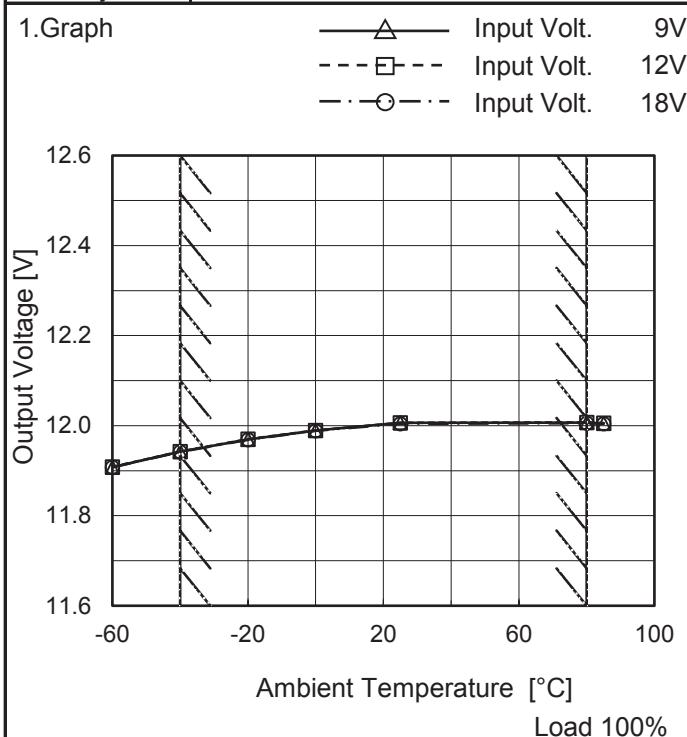
Testing Circuitry Figure B

## 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	5
80	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**

Model	MGS61212
Item	Ambient Temperature Drift
Object	+12V0.5A



Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	11.908	11.908	11.908
-40	11.942	11.943	11.942
-20	11.970	11.970	11.969
0	11.989	11.990	11.988
25	12.006	12.006	12.004
80	12.007	12.007	12.005
85	12.005	12.006	12.004
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model	MGS61212	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+12V0.5A	

### 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 : 9 - 18V

Load Current : 0 - 0.5A

\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

$$\text{* Output Voltage Accuracy (Ratio)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

### 2. Values

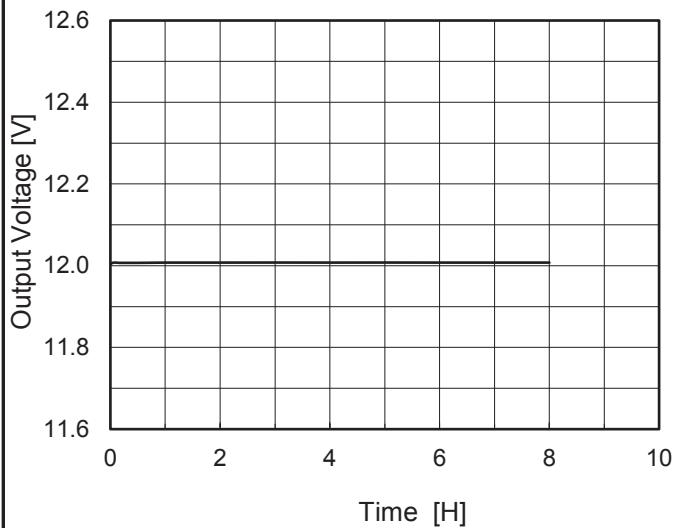
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	12	0	12.018	±38	±0.3
Minimum Voltage	-40	18	0.5	11.942		

**COSEL**

Model	MGS61212
Item	Time Lapse Drift
Object	+12V0.5A

 Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph


 Input Volt. 12V  
 Load 100%

## 2.Values

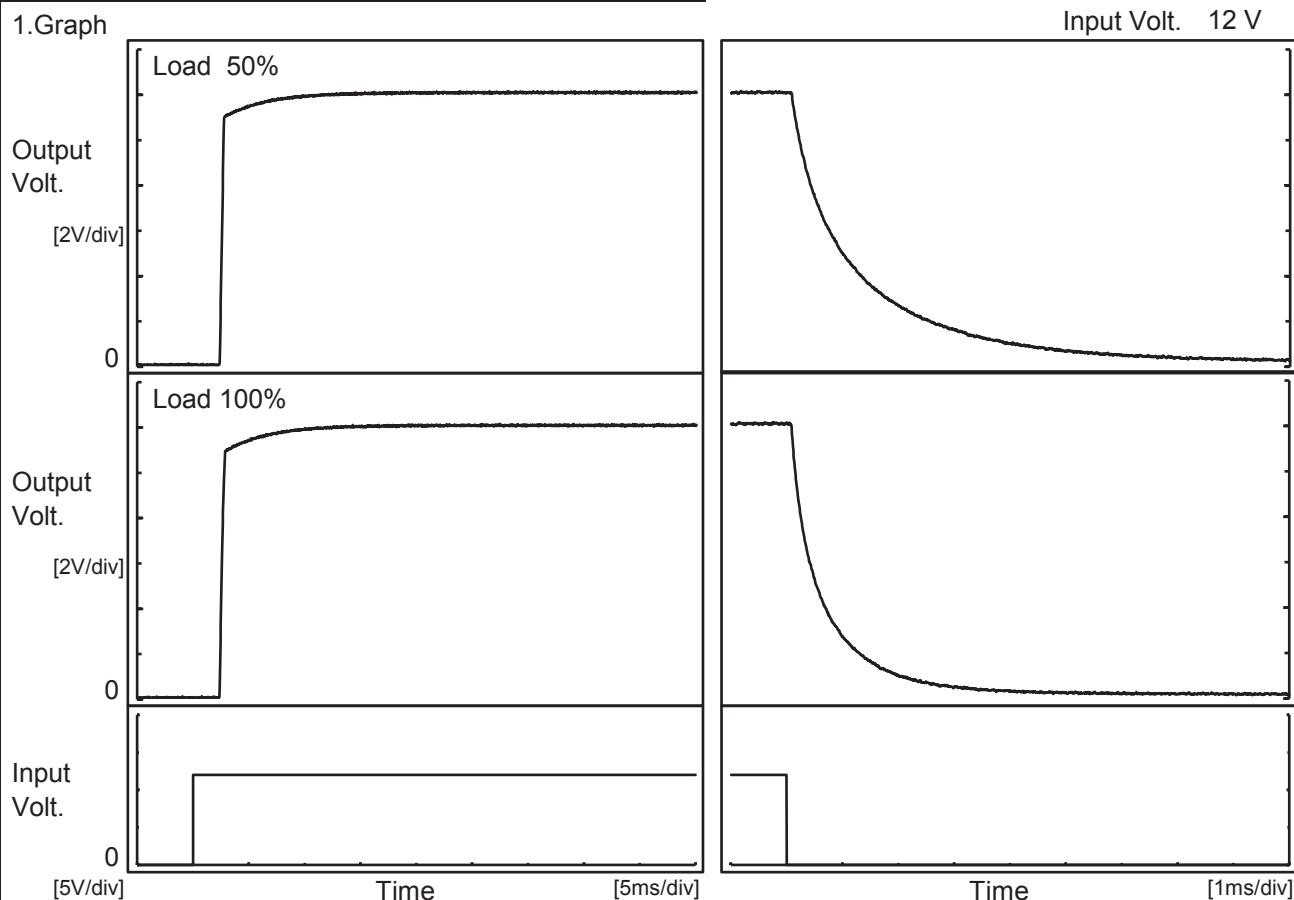
Time since start [H]	Output Voltage [V]
0.0	12.003
0.5	12.007
1.0	12.008
2.0	12.008
3.0	12.008
4.0	12.008
5.0	12.008
6.0	12.008
7.0	12.008
8.0	12.008

**COSEL**

Model	MGS61212
Item	Rise and Fall Time
Object	+12V0.5A

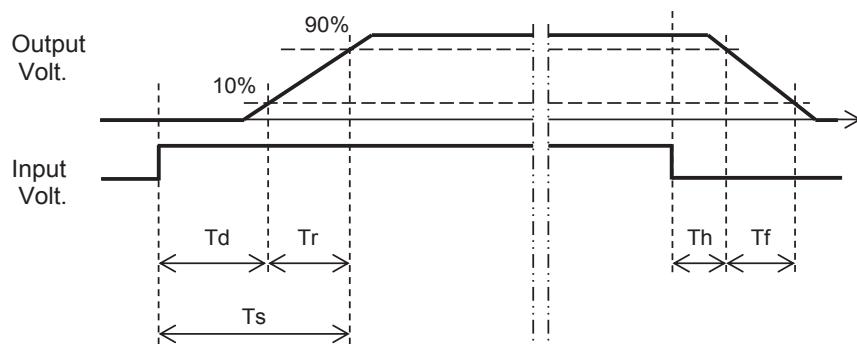
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

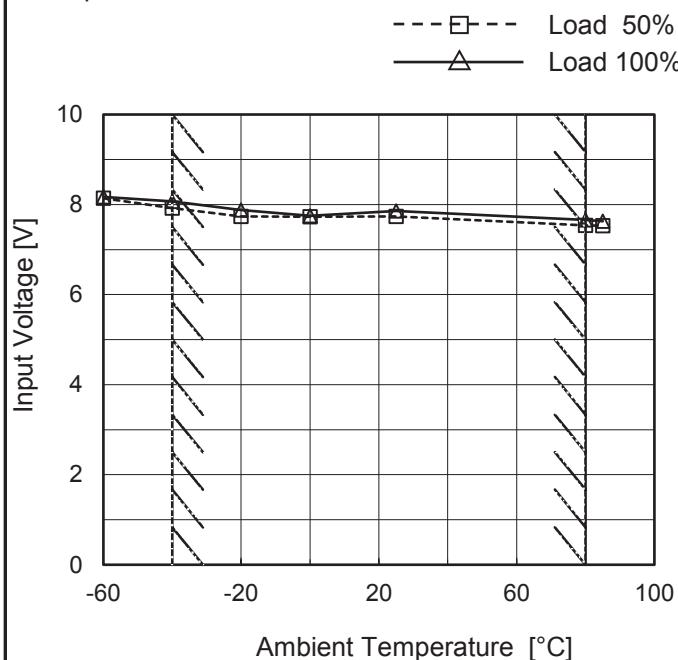
Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		2.4	0.4	2.8	0.2	3.3	
100 %		2.4	0.5	2.9	0.1	1.6	



**COSEL**

Model	MGS61212
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.5A

## 1.Graph



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

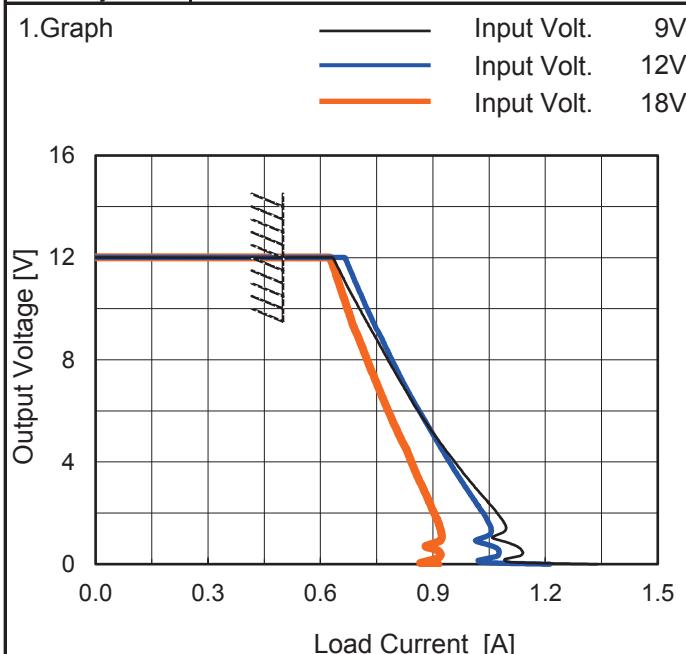
## Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.2	8.2
-40	8.0	8.1
-20	7.8	7.9
0	7.8	7.8
25	7.8	7.9
80	7.6	7.7
85	7.6	7.7
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**

Model	MGS61212
Item	Overcurrent Protection
Object	+12V0.5A



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

Temperature 25°C  
Testing Circuitry Figure A

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
12.0	0.51	0.51	0.51
11.4	0.65	0.68	0.64
10.8	0.67	0.70	0.65
9.6	0.72	0.74	0.68
8.4	0.77	0.78	0.71
7.2	0.81	0.82	0.75
6.0	0.86	0.86	0.78
4.8	0.92	0.91	0.82
3.6	0.98	0.96	0.85
2.4	1.05	1.01	0.89
1.2	1.09	1.05	0.92
0.0	1.34	1.21	0.91

**COSEL**

Model	MGS61212	Temperature	25°C																																																			
Item	Switching Frequency (by Load Current)	Testing Circuitry	Figure A																																																			
Object	+12V0.5A																																																					
1.Graph	<p>Legend:</p> <ul style="list-style-type: none"> <li>Input Volt. 9V</li> <li>Input Volt. 12V</li> <li>Input Volt. 18V</li> </ul> <p>Y-axis: Switching Frequency [kHz]</p> <p>X-axis: Load Current [A]</p>																																																					
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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.

COSEL

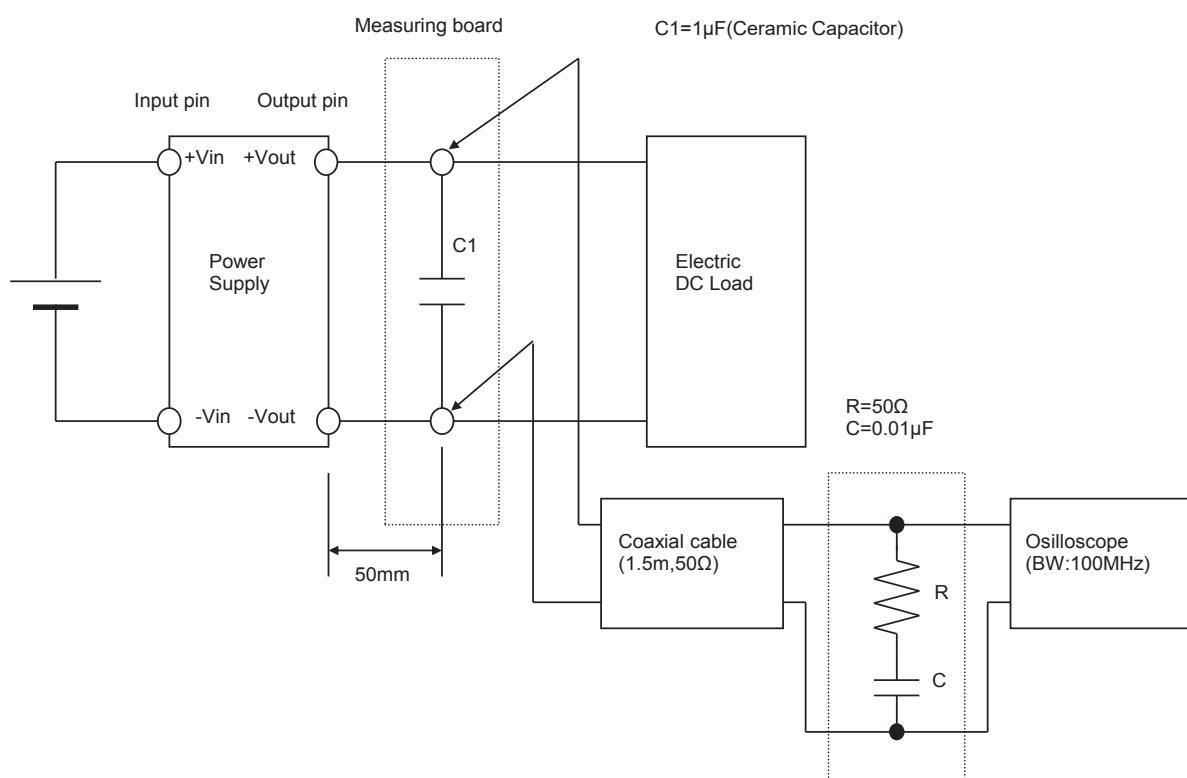
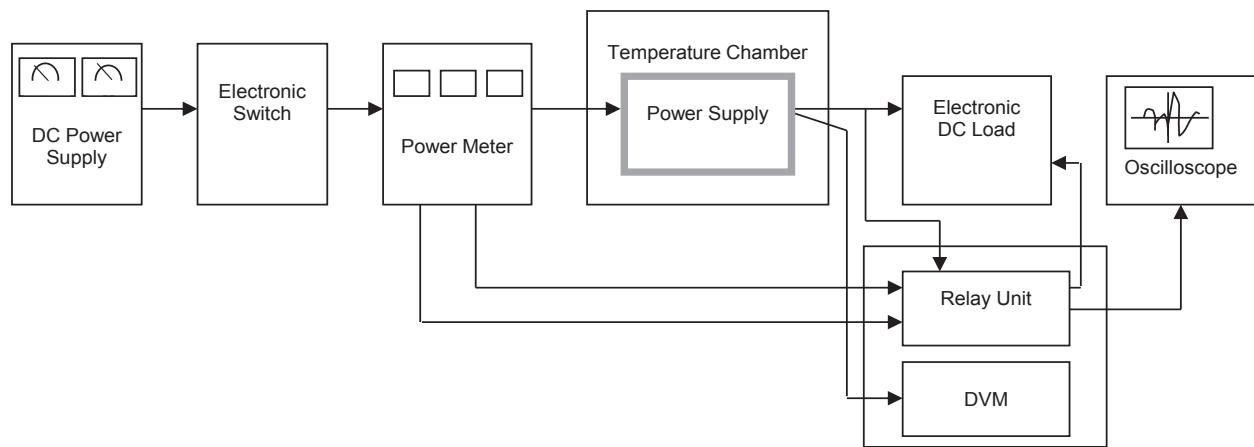


Figure B (Ripple and Ripple noise Characteristic)