



TEST DATA OF MGS62412

Regulated DC Power Supply
July 29, 2016

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Takayuki Fukuda

Design Manager

Prepared by : Ryosuke Nakao
Ryosuke Nakao

Design Engineer

COSEL CO.,LTD.



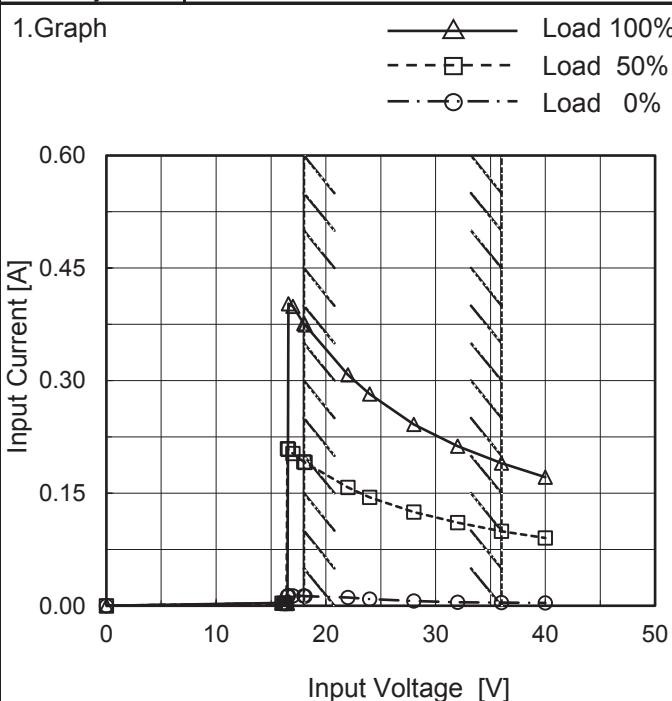
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(Final Page 19)

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Model	MGS62412
Item	Input Current (by Input Voltage)
Object	_____



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

Temperature 25°C
Testing Circuitry Figure A

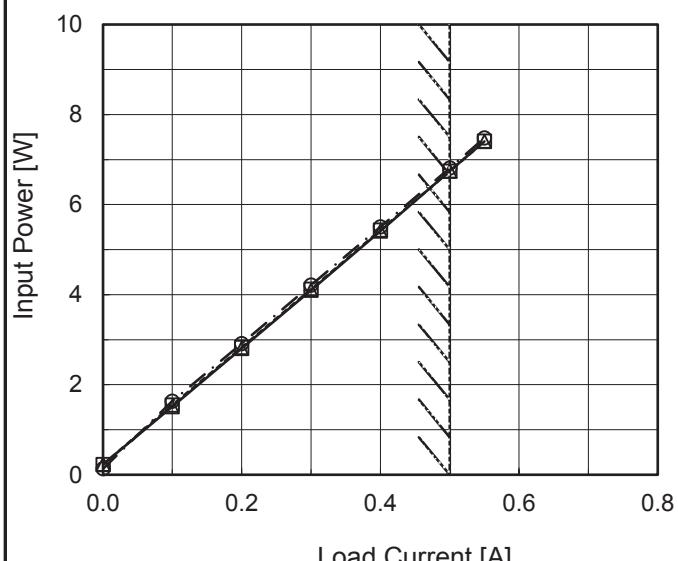
2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
16.0	0.003	0.003	0.004
16.2	0.003	0.003	0.003
16.4	0.003	0.003	0.003
16.5	0.013	0.209	0.003
16.6	0.014	0.208	0.403
17.0	0.013	0.203	0.399
18.0	0.013	0.192	0.376
18.1	0.013	0.191	0.374
22.0	0.011	0.158	0.308
24.0	0.009	0.145	0.282
28.0	0.006	0.125	0.242
32.0	0.005	0.111	0.213
36.0	0.004	0.099	0.190
40.0	0.004	0.090	0.171
--	-	-	-
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Model	MGS62412																																																					
Item	Input Current (by Load Current)																																																					
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1.Graph	—△— Input Volt. 18V - - □- - Input Volt. 24V - - ○- - Input Volt. 36V																																																					
	<p>The graph shows the relationship between Input Current [A] on the Y-axis (0.00 to 0.60) and Load Current [A] on the X-axis (0.0 to 0.8). Three curves are plotted for different input voltages: 18V (solid line with open triangles), 24V (dashed line with open squares), and 36V (dash-dot line with open circles). All curves start at (0,0) and increase monotonically. A vertical dashed line is drawn at approximately 0.55A, representing the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>0.013</td><td>0.009</td><td>0.004</td></tr> <tr><td>0.10</td><td>0.084</td><td>0.064</td><td>0.045</td></tr> <tr><td>0.20</td><td>0.157</td><td>0.118</td><td>0.081</td></tr> <tr><td>0.30</td><td>0.228</td><td>0.172</td><td>0.117</td></tr> <tr><td>0.40</td><td>0.303</td><td>0.227</td><td>0.153</td></tr> <tr><td>0.50</td><td>0.376</td><td>0.282</td><td>0.190</td></tr> <tr><td>0.55</td><td>0.414</td><td>0.310</td><td>0.208</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]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.00	0.013	0.009	0.004	0.10	0.084	0.064	0.045	0.20	0.157	0.118	0.081	0.30	0.228	0.172	0.117	0.40	0.303	0.227	0.153	0.50	0.376	0.282	0.190	0.55	0.414	0.310	0.208	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	Temperature 25°C Testing Circuitry Figure A				
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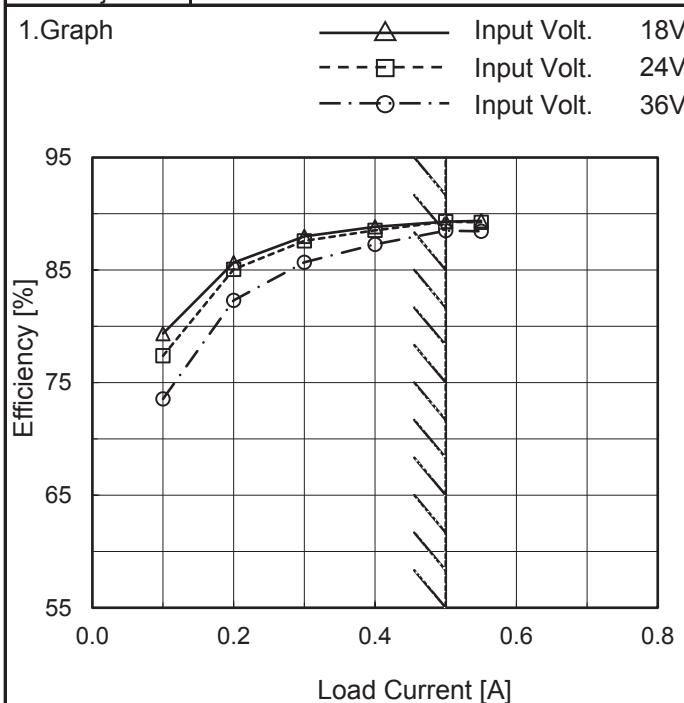
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Item	Efficiency (by Input Voltage)	Temperature 25°C Testing Circuitry Figure A																																
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<p>Efficiency [%]</p> <p>Input Voltage [V]</p> <p>Legend: Load 50% (dashed line with squares), Load 100% (solid line with triangles)</p>																																		
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Model	MGS62412
Item	Efficiency (by Load Current)
Object	_____


 Temperature 25°C
 Testing Circuitry Figure A

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	-	-	-
0.10	79.4	77.4	73.6
0.20	85.7	85.1	82.3
0.30	88.0	87.6	85.7
0.40	88.8	88.5	87.3
0.50	89.3	89.3	88.5
0.55	89.4	89.3	88.4
--	-	-	-
--	-	-	-
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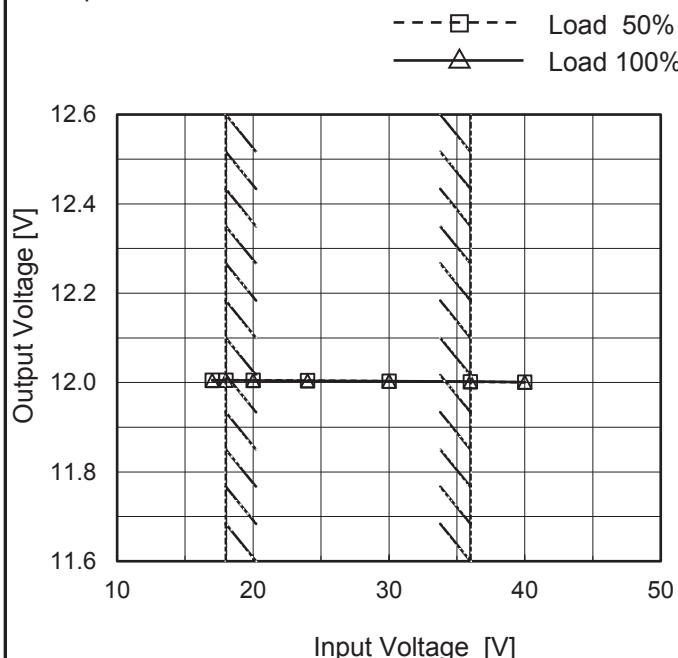
Note: Slanted line shows the range of the rated load current.

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Model	MGS62412
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%
17	12.006	12.005
18	12.005	12.005
20	12.005	12.005
24	12.004	12.004
30	12.003	12.003
36	12.002	12.002
40	12.001	12.001
--	-	-
--	-	-

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

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Model	MGS62412	Temperature	25°C																																																			
Item	Load Regulation	Testing Circuitry	Figure A																																																			
Object	+12V0.5A																																																					
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<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Input Volt.</p> <ul style="list-style-type: none"> 18V 24V 36V 		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>18[V]</th> <th>24[V]</th> <th>36[V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>12.011</td><td>12.011</td><td>12.013</td></tr> <tr><td>0.10</td><td>12.010</td><td>12.008</td><td>12.006</td></tr> <tr><td>0.20</td><td>12.008</td><td>12.008</td><td>12.004</td></tr> <tr><td>0.30</td><td>12.008</td><td>12.006</td><td>12.004</td></tr> <tr><td>0.40</td><td>12.006</td><td>12.005</td><td>12.003</td></tr> <tr><td>0.50</td><td>12.005</td><td>12.004</td><td>12.002</td></tr> <tr><td>0.55</td><td>12.004</td><td>12.004</td><td>12.001</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]			18[V]	24[V]	36[V]	0.00	12.011	12.011	12.013	0.10	12.010	12.008	12.006	0.20	12.008	12.008	12.004	0.30	12.008	12.006	12.004	0.40	12.006	12.005	12.003	0.50	12.005	12.004	12.002	0.55	12.004	12.004	12.001	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.

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Model	MGS62412	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.5A		

Input Volt. 24 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

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Model	MGS62412																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+12V0.5A																																							
1.Graph																																								
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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>Ripple [mVp-p]</p>																																								
<p>Fig.Complex Ripple Wave Form</p>																																								

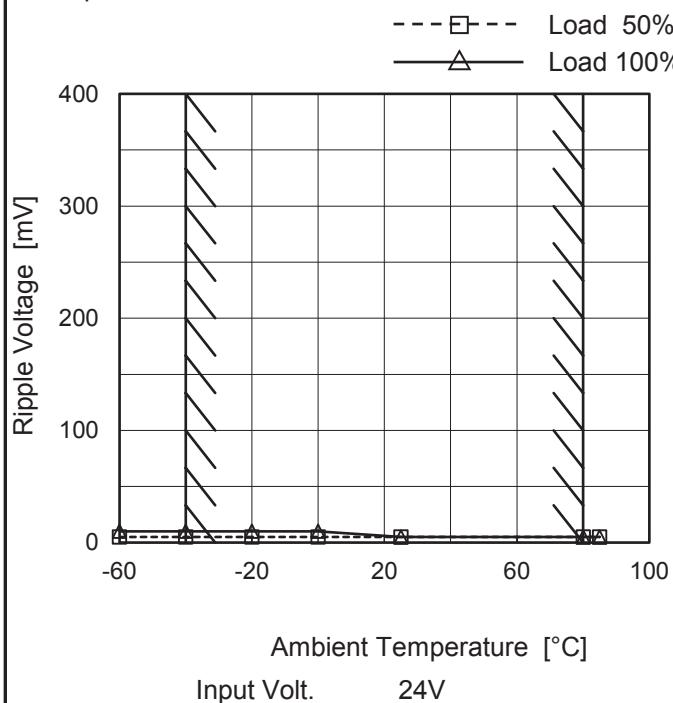
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Item	Ripple-Noise	Temperature 25°C Testing Circuitry Figure B																																						
Object	+12V0.5A																																							
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<p>—△— Input Volt. 18V -·○- Input Volt. 36V</p> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>																																								
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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	MGS62412
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.

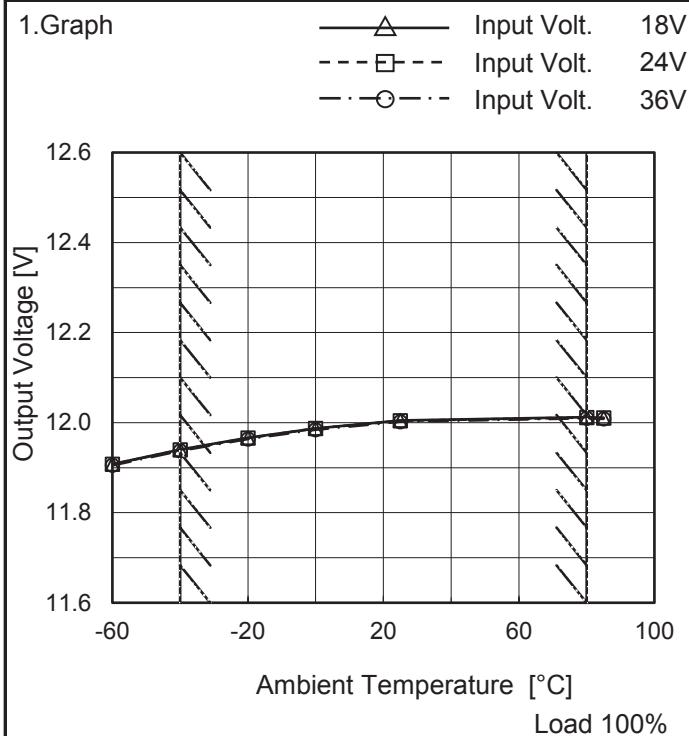
Testing Circuitry Figure B

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	MGS62412
Item	Ambient Temperature Drift
Object	+12V0.5A



Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	11.908	11.907	11.905
-40	11.940	11.940	11.937
-20	11.966	11.966	11.963
0	11.987	11.987	11.984
25	12.005	12.004	12.002
80	12.012	12.012	12.010
85	12.011	12.011	12.008
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model	MGS62412	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 : 18 - 36V

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

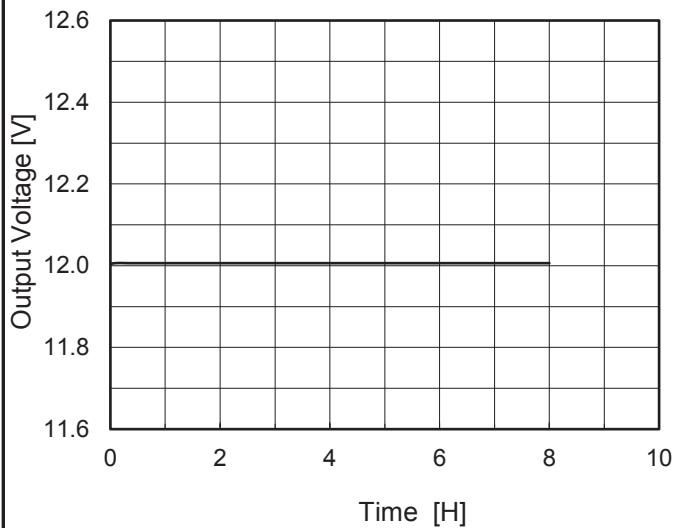
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	36	0	12.022	±43	±0.4
Minimum Voltage	-40	36	0.5	11.937		

COSEL

Model	MGS62412
Item	Time Lapse Drift
Object	+12V0.5A

 Temperature 25°C
 Testing Circuitry Figure A

1.Graph


 Input Volt. 24V
 Load 100%

2.Values

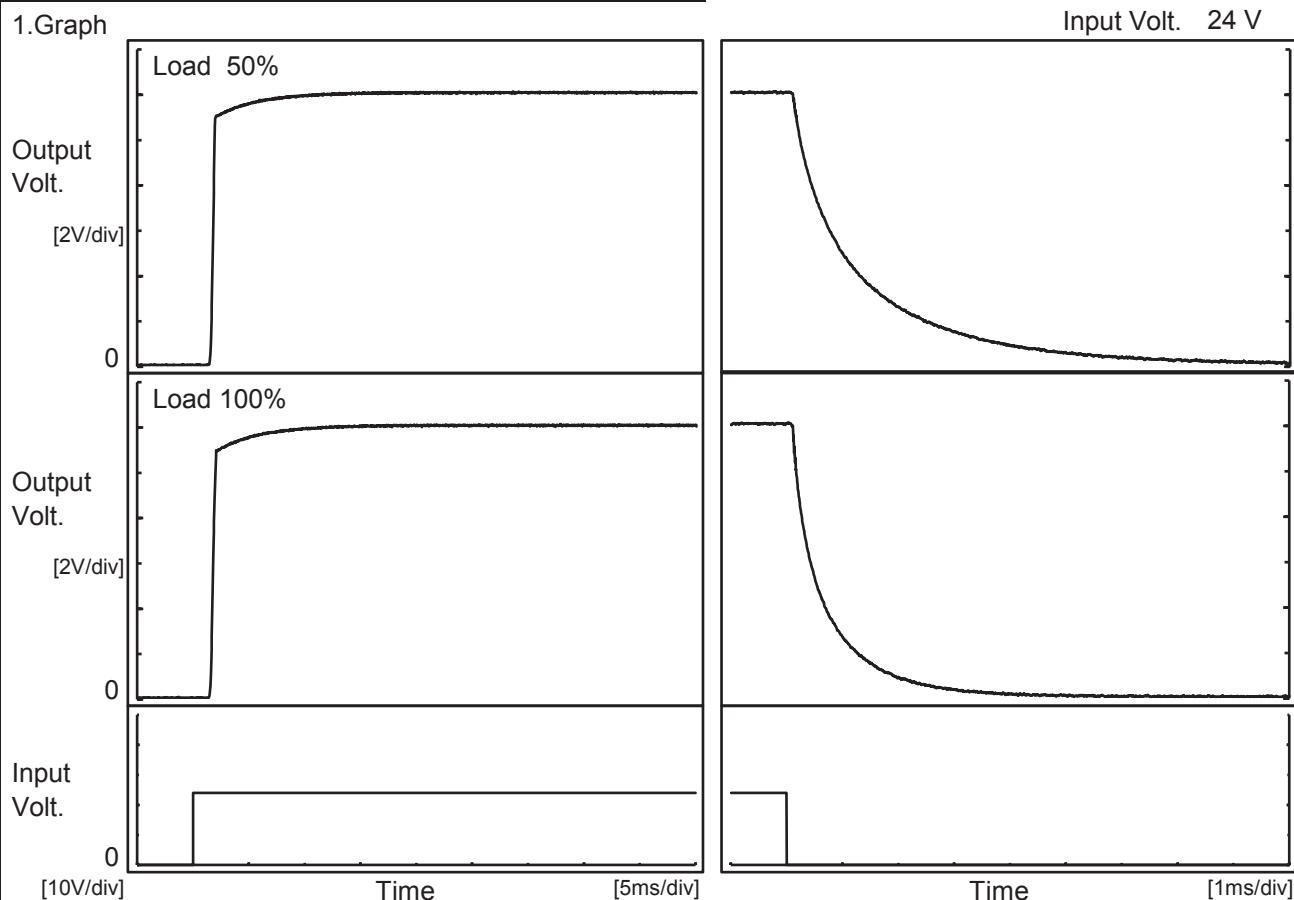
Time since start [H]	Output Voltage [V]
0.0	12.002
0.5	12.006
1.0	12.007
2.0	12.007
3.0	12.006
4.0	12.006
5.0	12.006
6.0	12.006
7.0	12.006
8.0	12.006

COSEL

Model	MGS62412
Item	Rise and Fall Time
Object	+12V0.5A

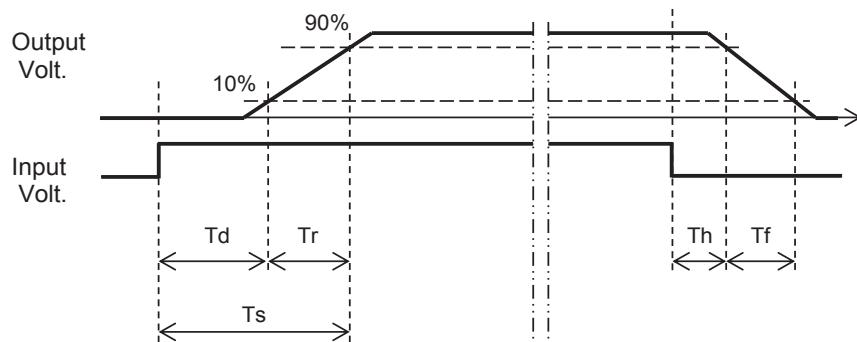
Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

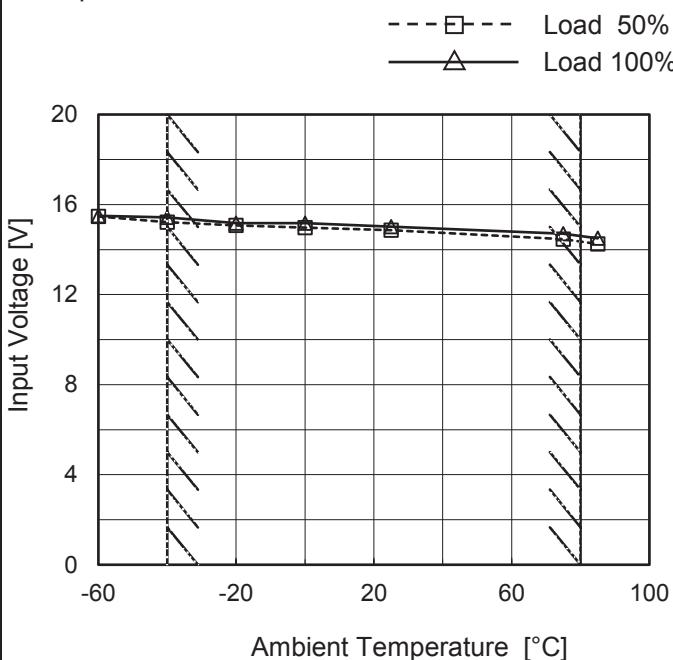
Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		1.6	0.4	2.0	0.2	3.2	
100 %		1.6	0.5	2.1	0.1	1.6	



COSEL

Model	MGS62412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.5A

1.Graph



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

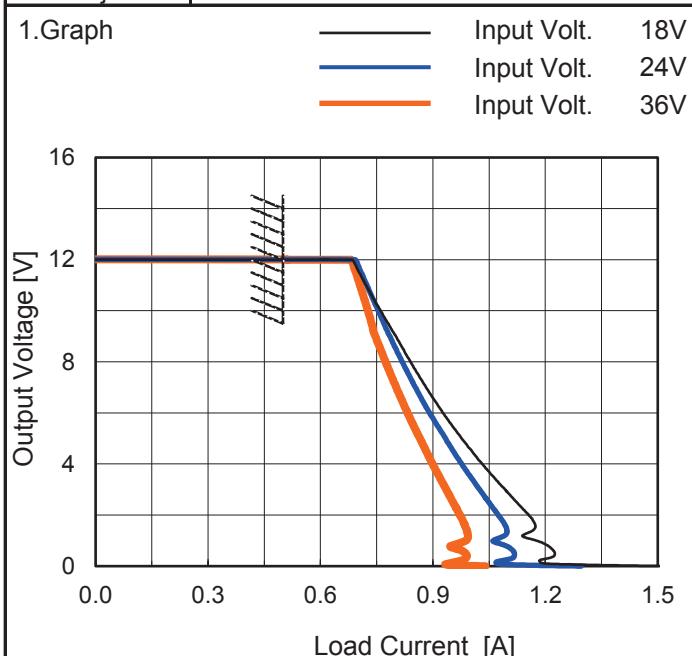
Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.5	15.5
-40	15.3	15.5
-20	15.1	15.2
0	15.0	15.2
25	14.9	15.1
75	14.5	14.7
85	14.3	14.5
--	-	-
--	-	-
--	-	-
--	-	-



Model	MGS62412
Item	Overcurrent Protection
Object	+12V0.5A



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

Intermittent operation occurs when overcurrent protection is activated.

Temperature 25°C
Testing Circuitry Figure A

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
12.0	0.50	0.50	0.50
11.4	0.71	0.71	0.70
10.8	0.73	0.73	0.71
9.6	0.77	0.77	0.73
8.4	0.82	0.80	0.76
7.2	0.87	0.84	0.80
6.0	0.93	0.89	0.83
4.8	0.99	0.94	0.87
3.6	1.05	0.99	0.91
2.4	1.13	1.05	0.96
1.2	1.14	1.09	0.99
0.0	1.53	1.30	1.04

COSEL

Model	MGS62412	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"> Input Volt. 18V Input Volt. 24V Input Volt. 36V 																																																					
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Note:	Slanted line shows the range of the rated load current.																																																					
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COSEL

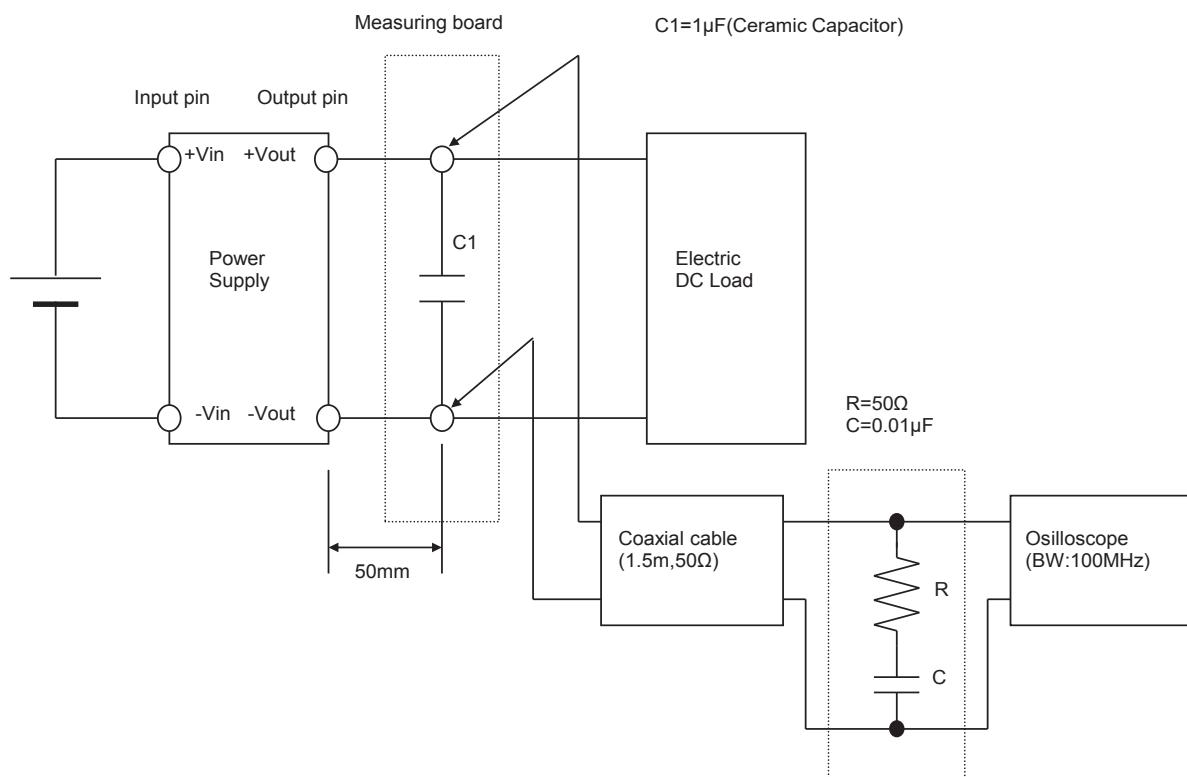
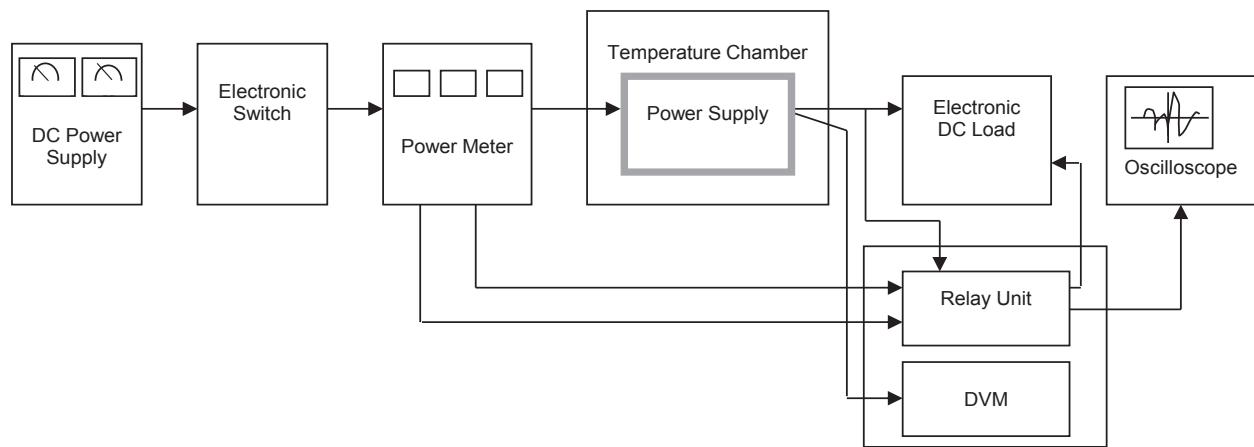


Figure B (Ripple and Ripple noise Characteristic)