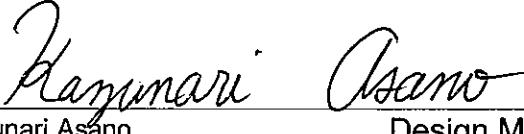


TEST DATA OF MGFS302412

Regulated DC Power Supply

December 24, 2010

Approved by :


Kazunari Asano
Design Manager

Prepared by :


Masashi Ueda
Design Engineer

COSEL CO.,LTD.

CONTENTS

1. Input Current (by Input Voltage)	1
2. Input Current (by Load Current)	2
3. Input Power (by Load Current)	3
4. Efficiency (by Input Voltage)	4
5. Efficiency (by Load Current)	5
6. Line Regulation	6
7. Load Regulation	7
8. Dynamic Load Response	8
9. Ripple Voltage (by Load Current)	9
10. Ripple-Noise	10
11. Ripple Voltage (by Ambient Temperature)	11
12. Ambient Temperature Drift	12
13. Output Voltage Accuracy	13
14. Time Lapse Drift	14
15. Rise and Fall Time	15
16. Minimum Input Voltage for Regulated Output Voltage	16
17. Overcurrent Protection	17
18. Overvoltage Protection	18
19. Figure of Testing Circuitry	19

(Final Page 19)

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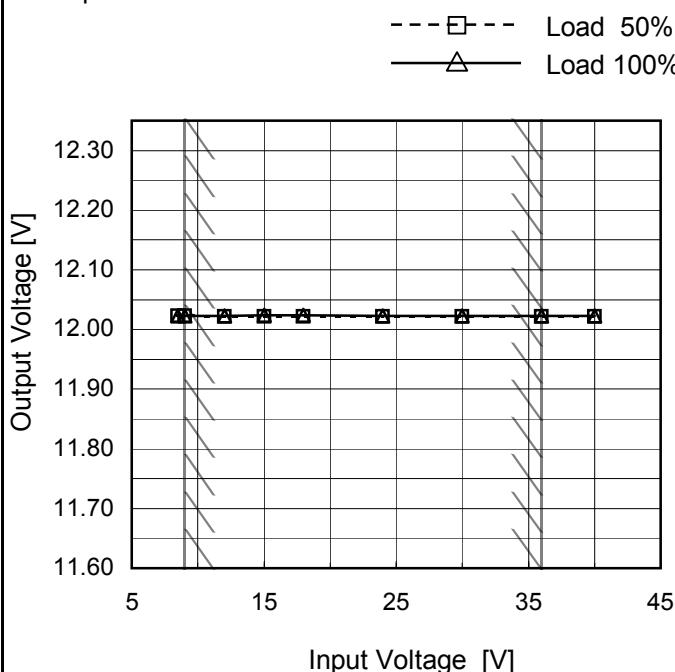
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<p>The graph plots Efficiency [%] on the y-axis (50 to 100) against Input Voltage [V] on the x-axis (5 to 45). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show a general downward trend as input voltage increases. A slanted line on the graph indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>8.5</td><td>91.1</td><td>90.1</td></tr> <tr><td>9.0</td><td>91.0</td><td>90.1</td></tr> <tr><td>12.0</td><td>90.4</td><td>89.9</td></tr> <tr><td>15.0</td><td>89.6</td><td>89.4</td></tr> <tr><td>18.0</td><td>88.7</td><td>88.6</td></tr> <tr><td>24.0</td><td>86.8</td><td>87.7</td></tr> <tr><td>30.0</td><td>84.9</td><td>86.2</td></tr> <tr><td>36.0</td><td>82.7</td><td>84.6</td></tr> <tr><td>40.0</td><td>81.3</td><td>83.5</td></tr> </tbody> </table>			Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	8.5	91.1	90.1	9.0	91.0	90.1	12.0	90.4	89.9	15.0	89.6	89.4	18.0	88.7	88.6	24.0	86.8	87.7	30.0	84.9	86.2	36.0	82.7	84.6	40.0	81.3	83.5		
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Model	MGFS302412
Item	Line Regulation
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



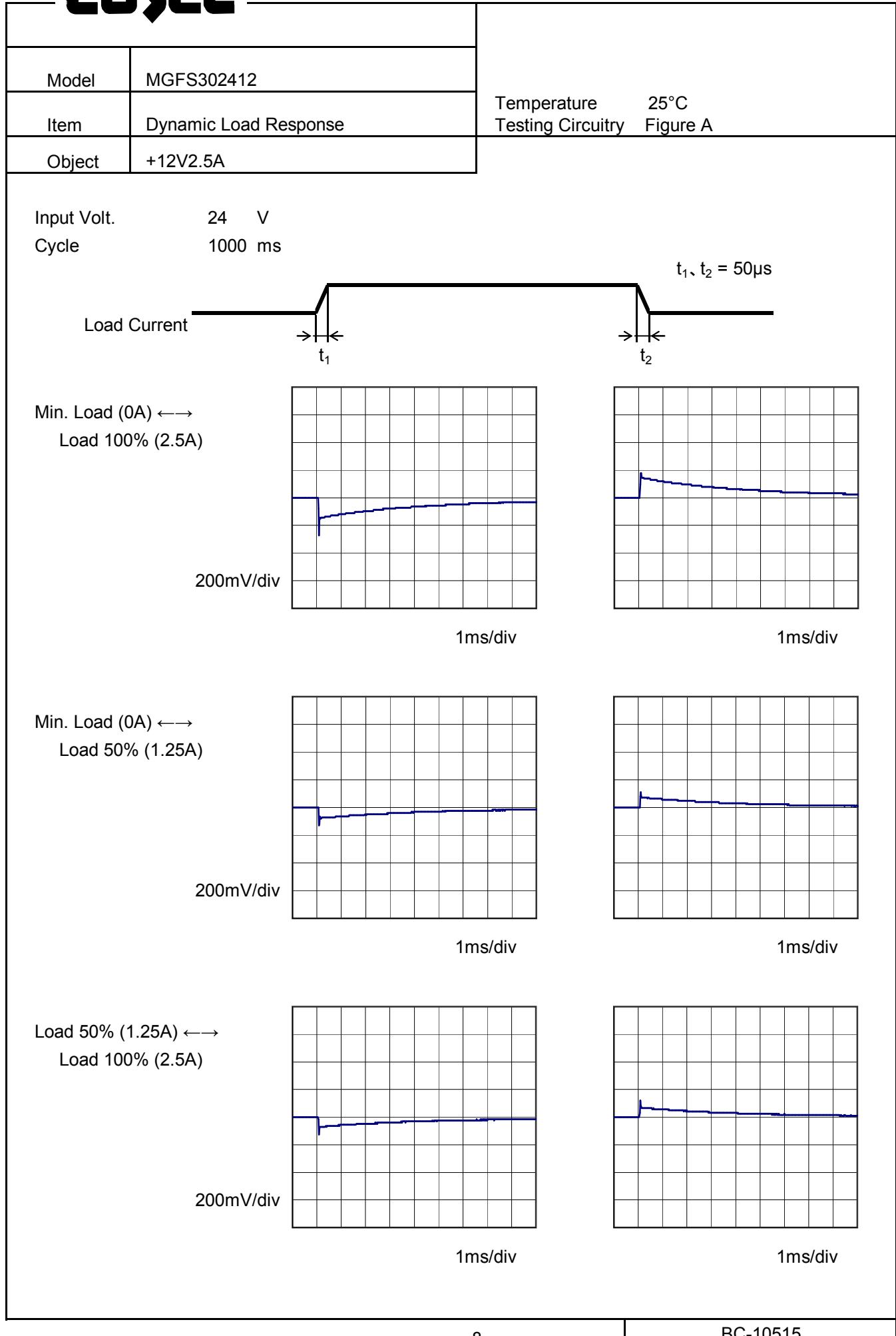
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	12.023	12.023
9.0	12.022	12.023
12.0	12.022	12.023
15.0	12.022	12.023
18.0	12.022	12.023
24.0	12.022	12.023
30.0	12.022	12.023
36.0	12.021	12.023
40.0	12.021	12.023

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

Model	MGFS302412																																																																																	
Item	Load Regulation																																																																																	
Object	+12V2.5A																																																																																	
1.Graph	<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 9V Input Volt. 12V Input Volt. 18V Input Volt. 24V Input Volt. 36V 																																																																																	
Temperature Testing Circuitry	25°C Figure A																																																																																	
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Load Current [A]	Output Voltage [V]																																																																																	
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Note: Slanted line shows the range of the rated load current.

COSEL

COSSEL

Model	MGFS302412																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+12V2.5A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A] for MGFS302412 at 25°C. The graph shows two curves: one for Input Volt. 9V (solid line with triangles) and one for Input Volt. 36V (dashed line with circles). Both curves show a slight decrease in ripple voltage as load current increases from 0.0 to 2.5A. A slanted line indicates the rated load current range.</p>																																								
2.Values																																								
<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 9 [V]</th> <th>Input Volt. 36 [V]</th> </tr> </thead> <tbody> <tr> <td>0.00</td><td>24</td><td>35</td></tr> <tr> <td>0.50</td><td>22</td><td>35</td></tr> <tr> <td>1.00</td><td>22</td><td>35</td></tr> <tr> <td>1.50</td><td>22</td><td>35</td></tr> <tr> <td>2.00</td><td>18</td><td>35</td></tr> <tr> <td>2.50</td><td>18</td><td>35</td></tr> <tr> <td>2.75</td><td>18</td><td>35</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV]		Input Volt. 9 [V]	Input Volt. 36 [V]	0.00	24	35	0.50	22	35	1.00	22	35	1.50	22	35	2.00	18	35	2.50	18	35	2.75	18	35	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																							
	Input Volt. 9 [V]	Input Volt. 36 [V]																																						
0.00	24	35																																						
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<p>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>																																								

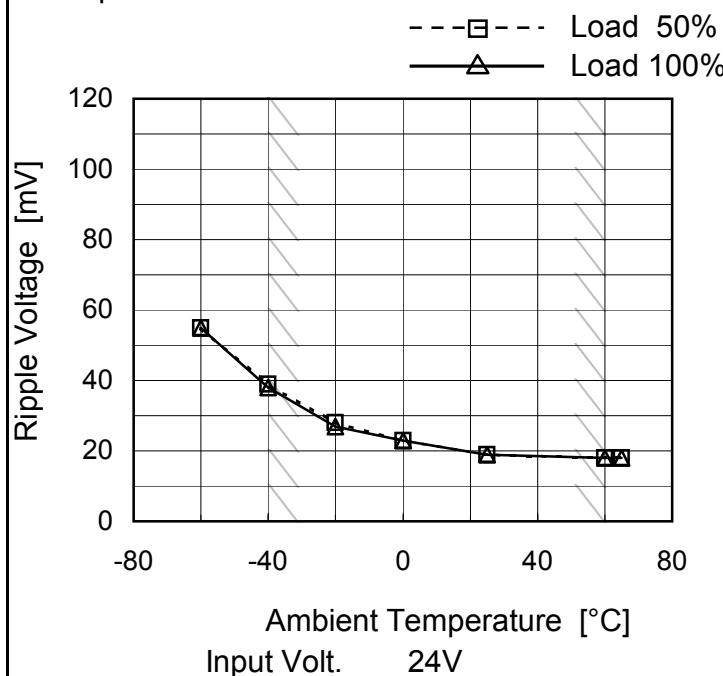
COSEL

Model	MGFS302412																																							
Item	Ripple-Noise	Temperature 25°C Testing Circuitry Figure B																																						
Object	+12V2.5A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 150 mV, and the X-axis ranges from 0.0 to 3.0 A. Two data series are plotted: Input Volt. 9V (solid line with open circles) and Input Volt. 36V (dashed line with open triangles). Both series show a constant ripple voltage of approximately 40 mV across the load current range. A slanted line indicates the rated load current range.</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. 36 [V]</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>25</td> <td>40</td> </tr> <tr> <td>0.50</td> <td>25</td> <td>40</td> </tr> <tr> <td>1.00</td> <td>25</td> <td>40</td> </tr> <tr> <td>1.50</td> <td>25</td> <td>40</td> </tr> <tr> <td>2.00</td> <td>25</td> <td>40</td> </tr> <tr> <td>2.50</td> <td>25</td> <td>40</td> </tr> <tr> <td>2.75</td> <td>25</td> <td>40</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>			Load Current [A]	Ripple-Noise [mV]		Input Volt. 9 [V]	Input Volt. 36 [V]	0.00	25	40	0.50	25	40	1.00	25	40	1.50	25	40	2.00	25	40	2.50	25	40	2.75	25	40	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																							
	Input Volt. 9 [V]	Input Volt. 36 [V]																																						
0.00	25	40																																						
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<p>Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p> <p>Diagram illustrating a Complex Ripple Noise Wave Form. The vertical axis is labeled "Ripple Noise[mVp-p]". The wave form consists of a series of sharp, triangular oscillations superimposed on a constant DC level.</p>																																								
<p>Fig.Complex Ripple Noise Wave Form</p>																																								

COSEL

Model	MGFS302412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V2.5A

1. Graph



Testing Circuitry Figure B

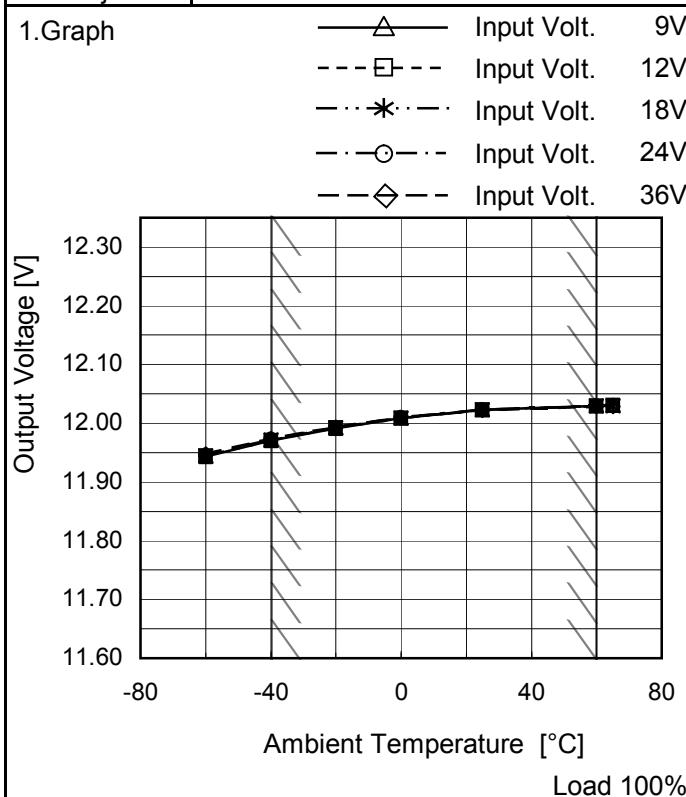
2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	55	55
-40	39	38
-20	28	27
0	23	23
25	19	19
60	18	18
65	18	18
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 100 MHz Oscilloscope.

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

Model	MGFS302412
Item	Ambient Temperature Drift
Object	+12V2.5A



Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	9[V]	12[V]	18[V]	24[V]	36[V]
-60	11.944	11.945	11.945	11.946	11.948
-40	11.970	11.971	11.972	11.973	11.974
-20	11.992	11.992	11.992	11.993	11.993
0	12.009	12.009	12.009	12.009	12.010
25	12.023	12.023	12.023	12.023	12.022
60	12.030	12.030	12.030	12.029	12.028
65	12.030	12.030	12.030	12.030	12.028
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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



Model	MGFS302412	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+12V2.5A	

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 - 60°C

Input Voltage : 9 - 36V

Load Current : 0 - 2.5A

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

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

2. Values

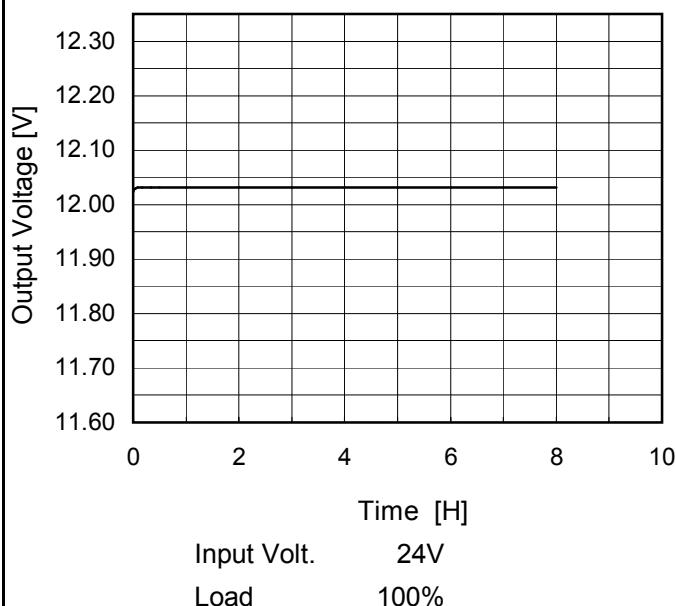
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	12	0	12.032	±31	±0.3
Minimum Voltage	-40	36	0	11.970		

COSEL

Model	MGFS302412
Item	Time Lapse Drift
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

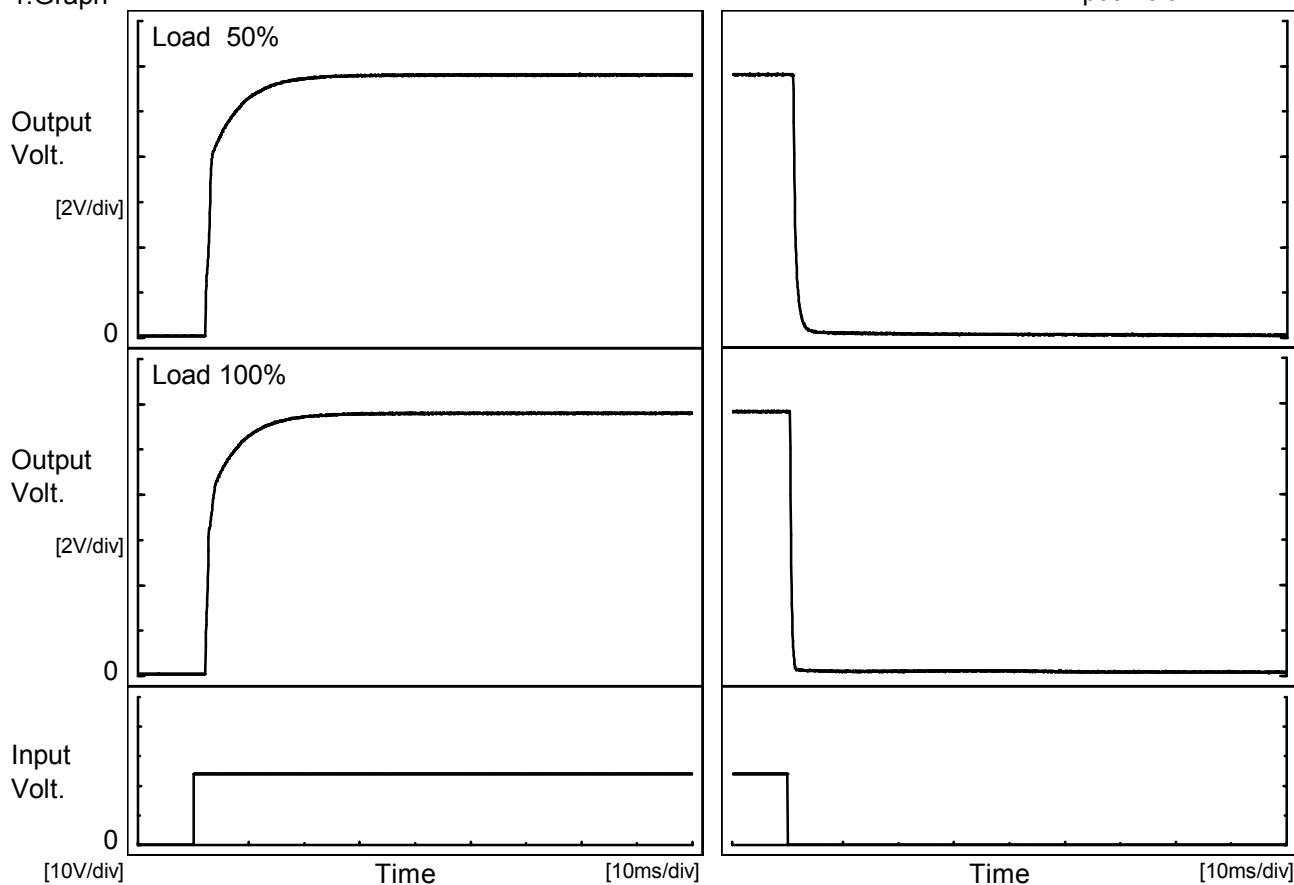
Time since start [H]	Output Voltage [V]
0.0	12.023
0.5	12.032
1.0	12.032
2.0	12.031
3.0	12.031
4.0	12.031
5.0	12.031
6.0	12.031
7.0	12.031
8.0	12.031

COSEL

Model	MGFS302412
Item	Rise and Fall Time
Object	+12V2.5A

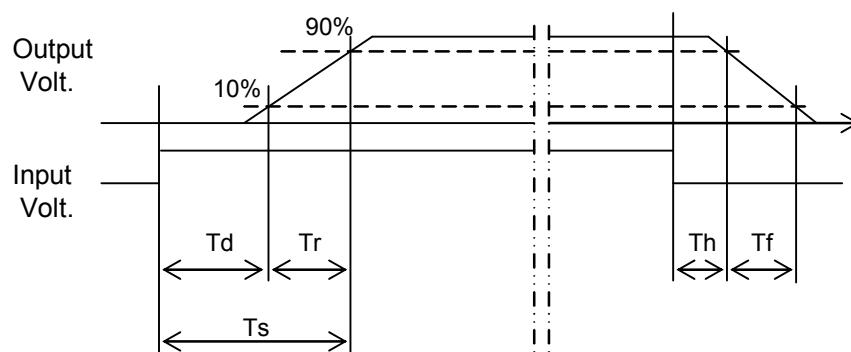
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

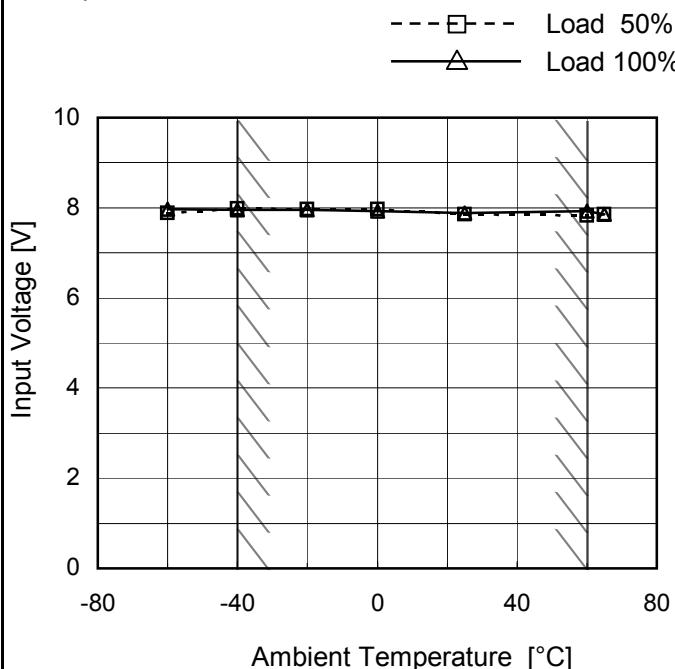
Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		2.2	9.5	11.7	1.0	1.1	
100 %		2.3	9.4	11.7	0.5	0.5	



Model	MGFS302412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V2.5A

Testing Circuitry Figure A

1. Graph



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

2. Values

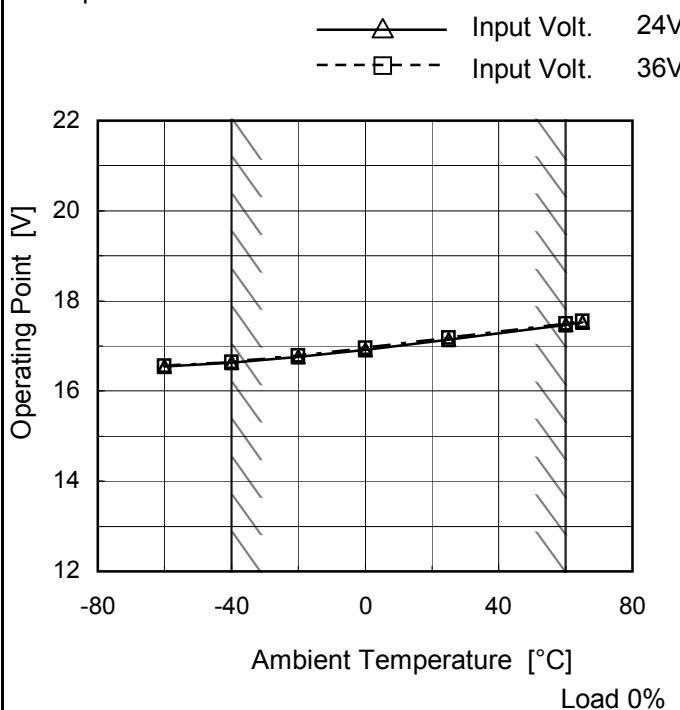
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	7.9	8.0
-40	8.0	8.0
-20	8.0	8.0
0	8.0	8.0
25	7.9	7.9
60	7.9	8.0
65	7.9	7.9
--	-	-
--	-	-
--	-	-
--	-	-

Model	MGFS302412	Temperature Testing Circuitry 25°C Figure A																																																																																							
Item	Overcurrent Protection																																																																																								
Object	+12V2.5A																																																																																								
1.Graph	<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Input Volt. 9V</p> <p>Input Volt. 12V</p> <p>Input Volt. 18V</p> <p>Input Volt. 24V</p> <p>Input Volt. 36V</p>																																																																																								
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Output Voltage [V]	Load Current [A]																																																																																								
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2.4	-	-	-	-	-																																																																																				
1.2	-	-	-	-	-																																																																																				
0.0	-	-	-	-	-																																																																																				
Note:	Slanted line shows the range of the rated load current.																																																																																								
	Intermittent operation occurs when overcurrent protection is activated.																																																																																								

Model	MGFS302412
Item	Oversupply Protection
Object	+12V2.5A

Testing Circuitry Figure A

1. Graph



2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 24[V]	Input Volt. 36[V]
-60	16.54	16.56
-40	16.63	16.65
-20	16.75	16.79
0	16.91	16.95
25	17.15	17.18
60	17.47	17.50
65	17.52	17.56
--	-	-
--	-	-
--	-	-
--	-	-

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

COSEL

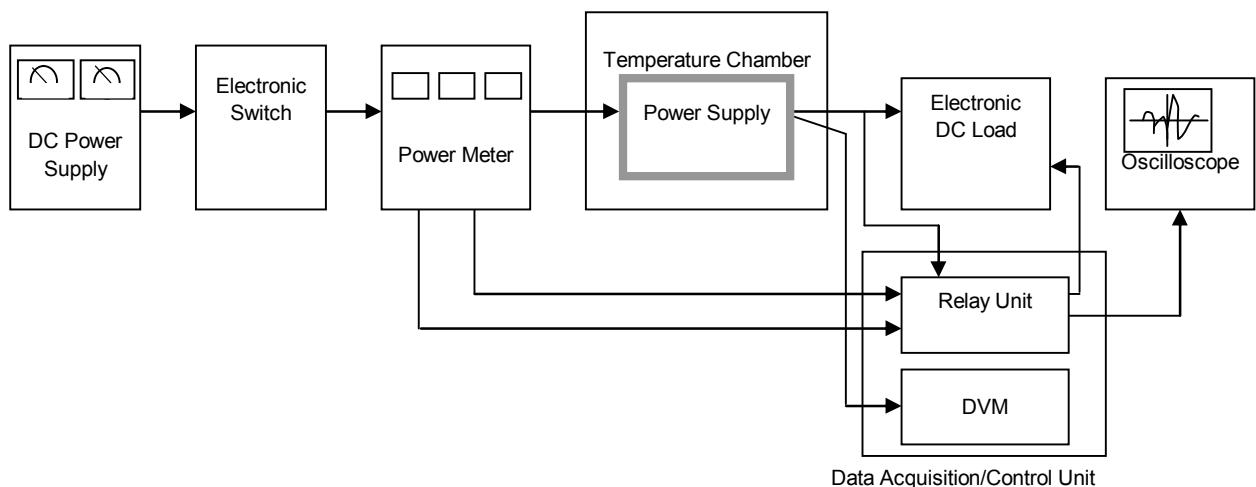


Figure A

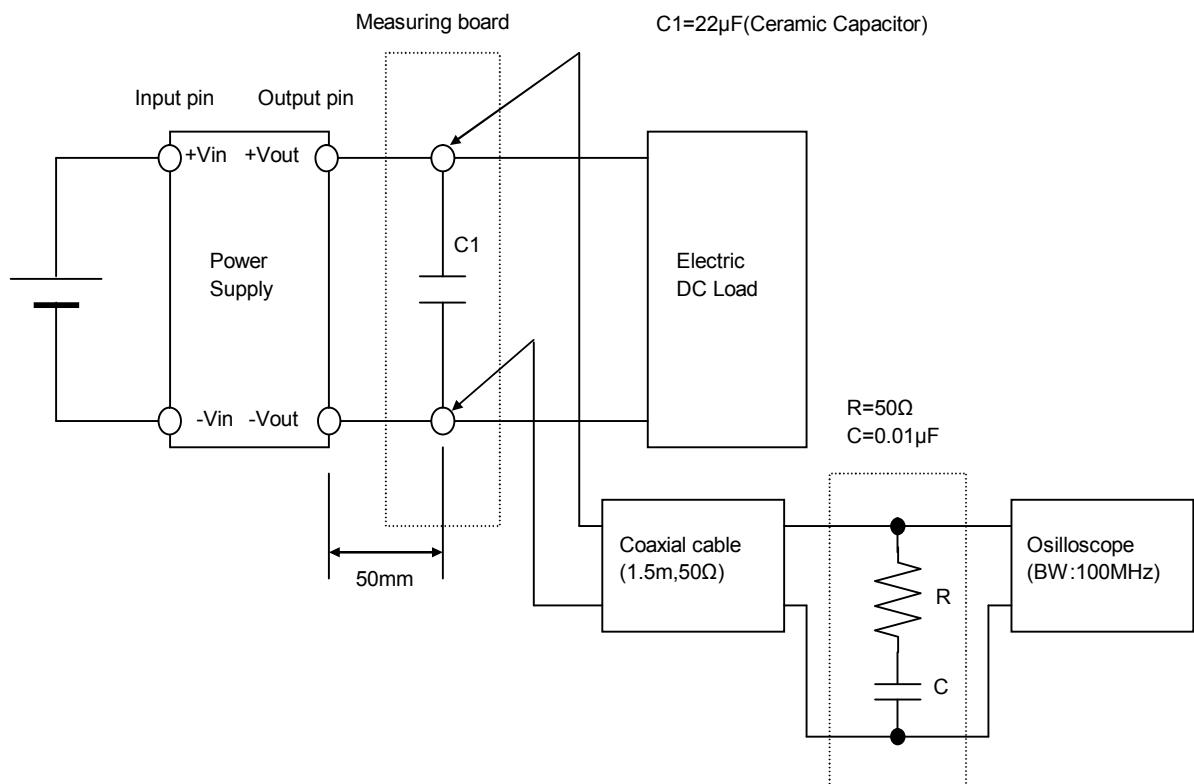


Figure B (Ripple and Ripple noise Characteristic)