

TEST DATA OF MGFS302415

Regulated DC Power Supply
December 24, 2010

Approved by : *Kazunari Asano*
Kazunari Asano Design Manager

Prepared by : *Masashi Ueda*
Masashi Ueda Design Engineer

COSEL CO.,LTD.

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<p>1.Graph</p> <div style="text-align: right;"> <p>---□--- Load 50%</p> <p>—△— Load 100%</p> </div> <p style="text-align: center;">Output Voltage [V]</p> <p style="text-align: center;">Input Voltage [V]</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Output Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>8.5</td><td>15.036</td><td>15.034</td></tr> <tr><td>9.0</td><td>15.035</td><td>15.034</td></tr> <tr><td>12.0</td><td>15.035</td><td>15.034</td></tr> <tr><td>15.0</td><td>15.034</td><td>15.034</td></tr> <tr><td>18.0</td><td>15.034</td><td>15.034</td></tr> <tr><td>24.0</td><td>15.033</td><td>15.034</td></tr> <tr><td>30.0</td><td>15.033</td><td>15.033</td></tr> <tr><td>36.0</td><td>15.033</td><td>15.033</td></tr> <tr><td>40.0</td><td>15.032</td><td>15.033</td></tr> </tbody> </table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	8.5	15.036	15.034	9.0	15.035	15.034	12.0	15.035	15.034	15.0	15.034	15.034	18.0	15.034	15.034	24.0	15.033	15.034	30.0	15.033	15.033	36.0	15.033	15.033	40.0	15.032	15.033
Input Voltage [V]	Output Voltage [V]																																		
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30.0	15.033	15.033																																	
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40.0	15.032	15.033																																	

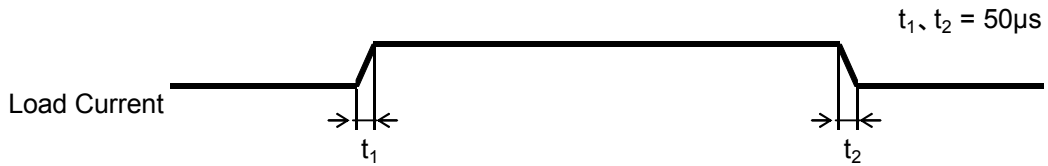


COSEL																																																																																		
Model	MGFS302415	Temperature	25°C																																																																															
Item	Load Regulation	Testing Circuitry	Figure A																																																																															
Object	+15V2A																																																																																	
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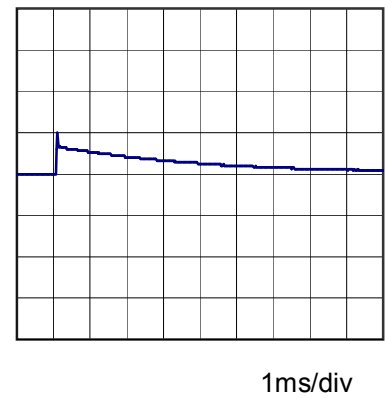
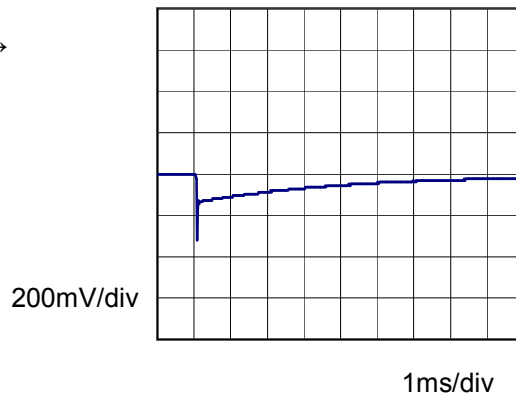


Model	MGFS302415	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V2A		

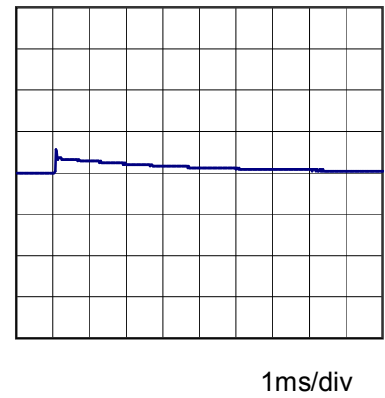
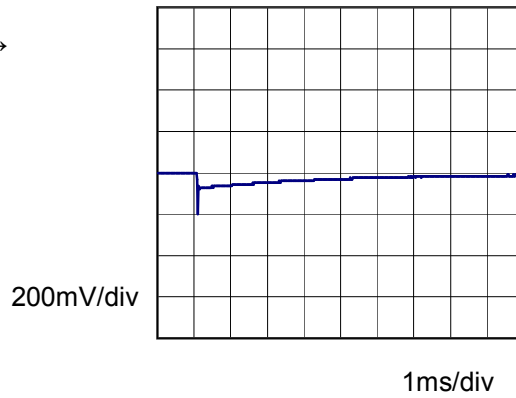
Input Volt. 24 V
 Cycle 1000 ms



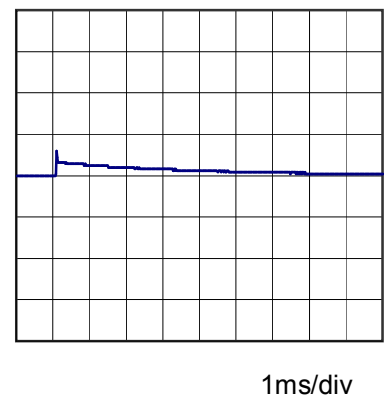
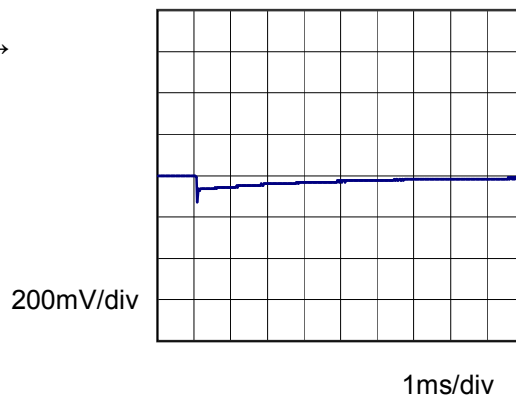
Min. Load (0A) ←→
 Load 100% (2A)



Min. Load (0A) ←→
 Load 50% (1A)



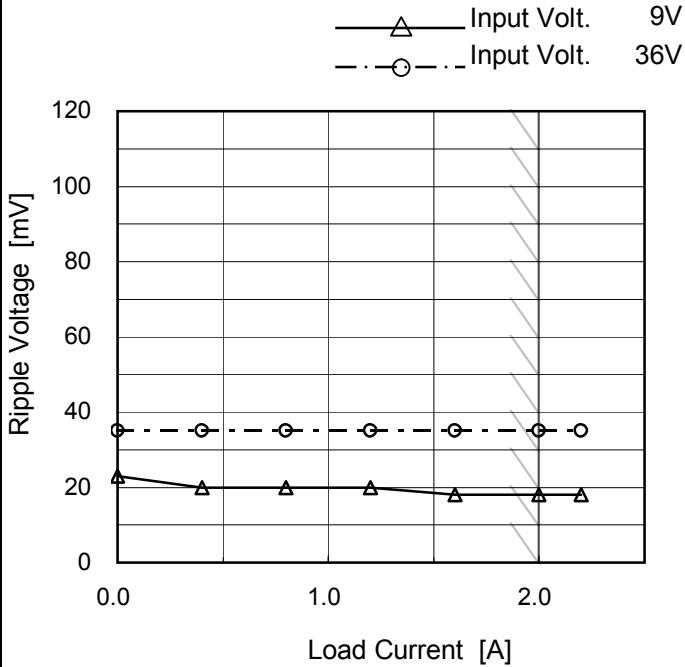
Load 50% (1A) ←→
 Load 100% (2A)





Model	MGFS302415	Temperature	25°C
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure B
Object	+15V2A		

1. Graph



2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	23	35
0.4	20	35
0.8	20	35
1.2	20	35
1.6	18	35
2.0	18	35
2.2	18	35
--	-	-
--	-	-
--	-	-
--	-	-

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]

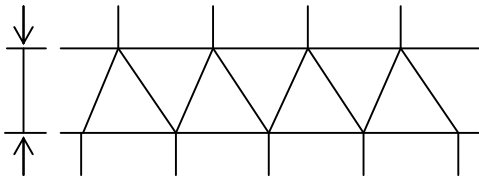
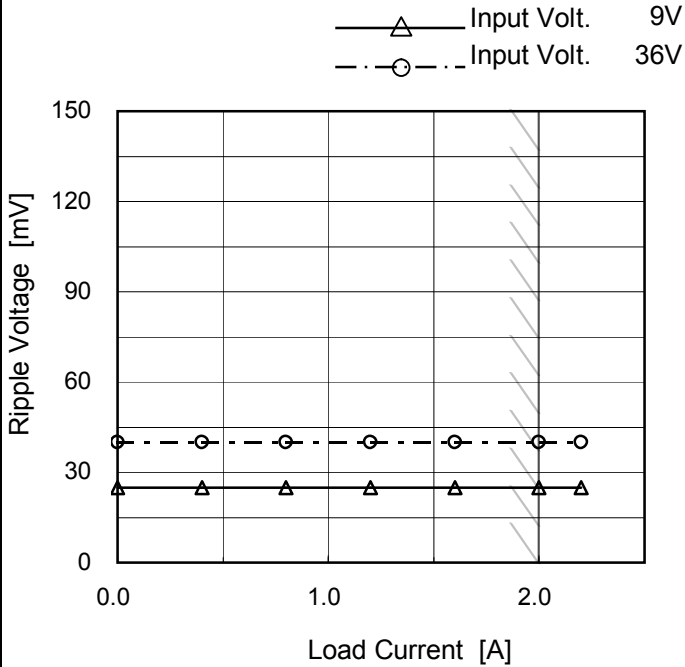


Fig. Complex Ripple Wave Form



Model	MGFS302415	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	+15V2A		

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	25	40
0.4	25	40
0.8	25	40
1.2	25	40
1.6	25	40
2.0	25	40
2.2	25	40
--	-	-
--	-	-
--	-	-
--	-	-

Ripple-Noise is shown as p-p in the figure below.
 Note: Slanted line shows the range of the rated load current.

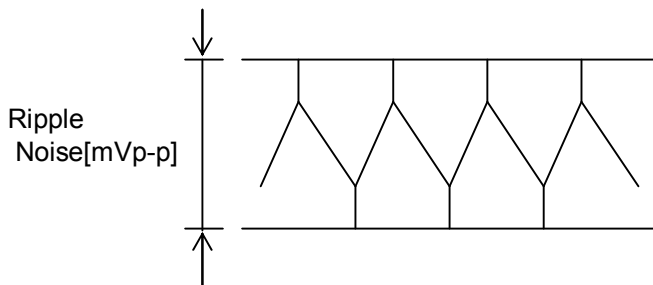


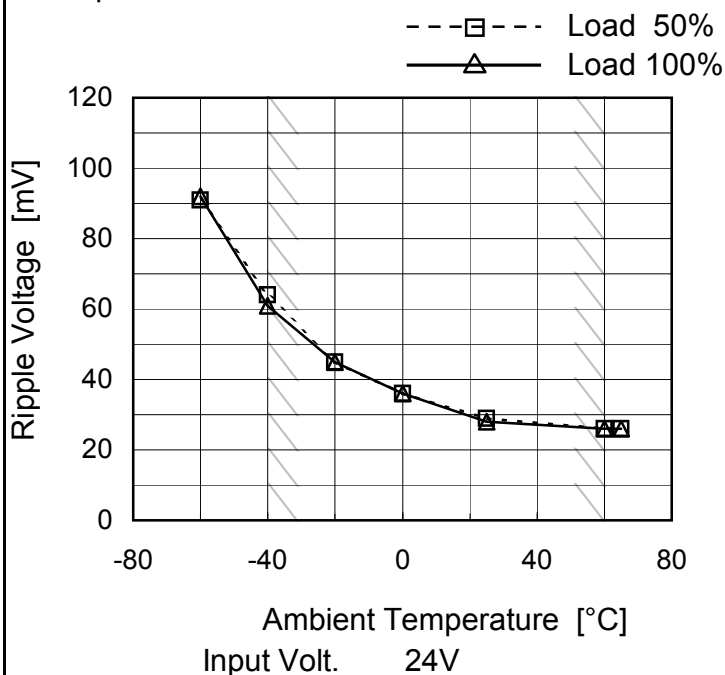
Fig. Complex Ripple Noise Wave Form



Model	MGFS302415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V2A

Testing Circuitry Figure B

1.Graph



2.Values

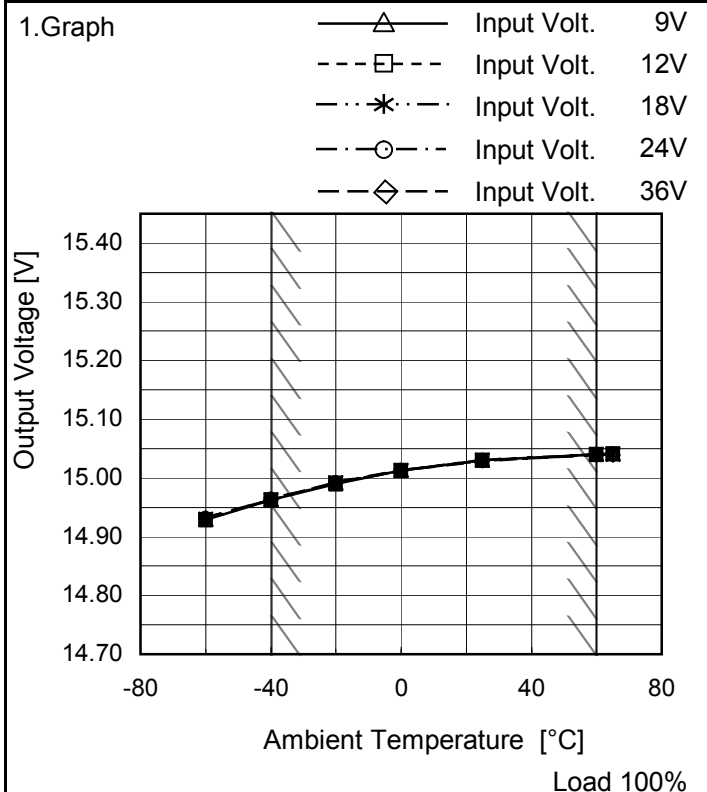
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	91	92
-40	64	61
-20	45	45
0	36	36
25	29	28
60	26	26
65	26	26
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated ambient temperature.



Model	MGFS302415
Item	Ambient Temperature Drift
Object	+15V2A

Testing Circuitry Figure A



2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.929	14.929	14.930	14.931	14.932
-40	14.963	14.963	14.963	14.963	14.964
-20	14.990	14.991	14.992	14.992	14.992
0	15.012	15.013	15.013	15.013	15.013
25	15.030	15.030	15.030	15.030	15.029
60	15.041	15.040	15.040	15.040	15.039
65	15.041	15.041	15.040	15.040	15.039
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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



COSEL		
Model	MGFS302415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V2A	

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 - 2A

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

* 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	15.043	±41	±0.3
Minimum Voltage	-40	36	0	14.961		



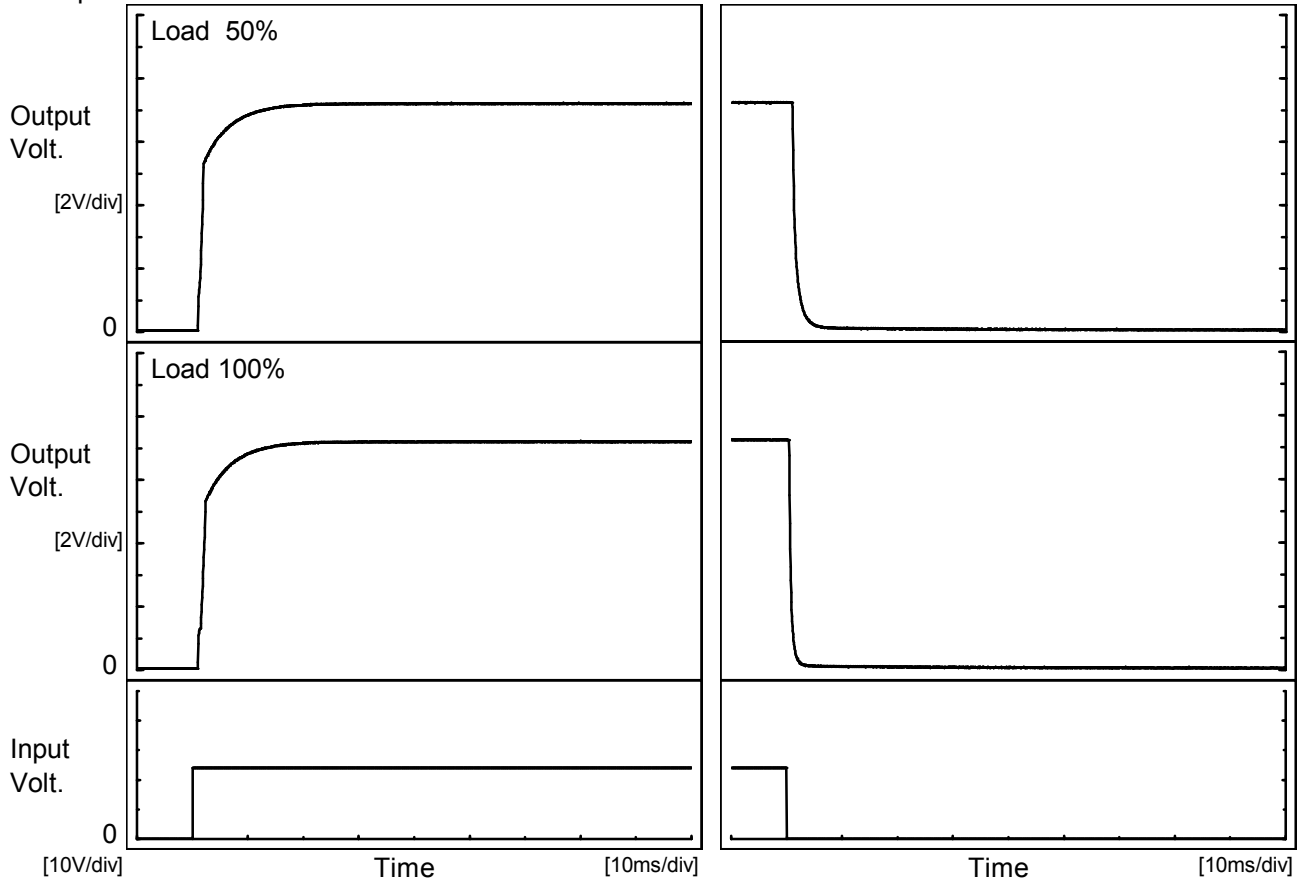
COSEL																								
Model	MGFS302415																							
Item	Time Lapse Drift	Temperature 25°C Testing Circuitry Figure A																						
Object	+15V2A																							
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 24V Load 100%</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15.033</td></tr> <tr><td>0.5</td><td>15.033</td></tr> <tr><td>1.0</td><td>15.034</td></tr> <tr><td>2.0</td><td>15.033</td></tr> <tr><td>3.0</td><td>15.034</td></tr> <tr><td>4.0</td><td>15.033</td></tr> <tr><td>5.0</td><td>15.034</td></tr> <tr><td>6.0</td><td>15.033</td></tr> <tr><td>7.0</td><td>15.033</td></tr> <tr><td>8.0</td><td>15.033</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	15.033	0.5	15.033	1.0	15.034	2.0	15.033	3.0	15.034	4.0	15.033	5.0	15.034	6.0	15.033	7.0	15.033	8.0	15.033
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1.0	15.034																							
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3.0	15.034																							
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5.0	15.034																							
6.0	15.033																							
7.0	15.033																							
8.0	15.033																							



Model		MGFS302415	Temperature	25°C
Item		Rise and Fall Time	Testing Circuitry	Figure A
Object		+15V2A		

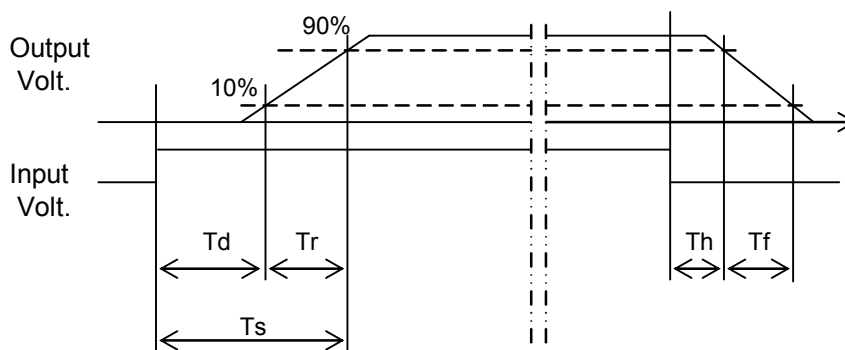
1. Graph

Input Volt. 24 V



2. Values

		[ms]				
Load \ Time	Time	Td	Tr	Ts	Th	Tf
50 %		1.1	8.3	9.4	1.0	1.8
100 %		1.1	8.6	9.7	0.5	0.9





COSEL																																								
Model	MGFS302415																																							
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A																																						
Object	+15V2A																																							
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Ambient Temperature [°C]	Input Voltage [V]																																							
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																								



<p>Model MGFS302415</p> <p>Item Overcurrent Protection</p> <p>Object +15V2A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure A</p>																																																																																			
<p>1.Graph</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <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> </div> </div> <p style="text-align: center;">Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when overcurrent protection is activated.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="5">Load Current [A]</th> </tr> <tr> <th>Input Volt. 9[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>2.670</td> <td>2.828</td> <td>2.942</td> <td>2.907</td> <td>2.706</td> </tr> <tr> <td>14.3</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>13.5</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>12.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>10.5</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>9.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>7.5</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>6.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>4.5</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>3.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1.5</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>0.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Output Voltage [V]	Load Current [A]					Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	15.0	2.670	2.828	2.942	2.907	2.706	14.3	-	-	-	-	-	13.5	-	-	-	-	-	12.0	-	-	-	-	-	10.5	-	-	-	-	-	9.0	-	-	-	-	-	7.5	-	-	-	-	-	6.0	-	-	-	-	-	4.5	-	-	-	-	-	3.0	-	-	-	-	-	1.5	-	-	-	-	-	0.0	-	-	-	-	-
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<p>1. Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 24V</p> <p>---□--- Input Volt. 36V</p> </div> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: right;">Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>-60</td><td>20.57</td><td>20.56</td></tr> <tr><td>-40</td><td>20.80</td><td>20.77</td></tr> <tr><td>-20</td><td>21.03</td><td>21.01</td></tr> <tr><td>0</td><td>21.34</td><td>21.29</td></tr> <tr><td>25</td><td>21.72</td><td>21.67</td></tr> <tr><td>60</td><td>22.23</td><td>22.19</td></tr> <tr><td>65</td><td>22.32</td><td>22.27</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>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 24[V]	Input Volt. 36[V]	-60	20.57	20.56	-40	20.80	20.77	-20	21.03	21.01	0	21.34	21.29	25	21.72	21.67	60	22.23	22.19	65	22.32	22.27	--	-	-	--	-	-	--	-	-	--	-	-
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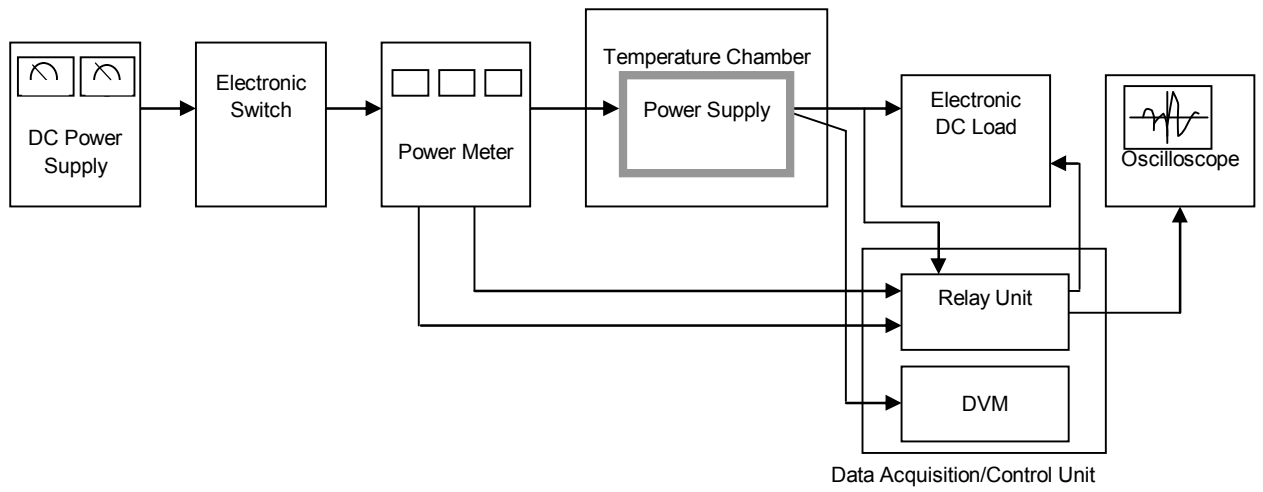


Figure A

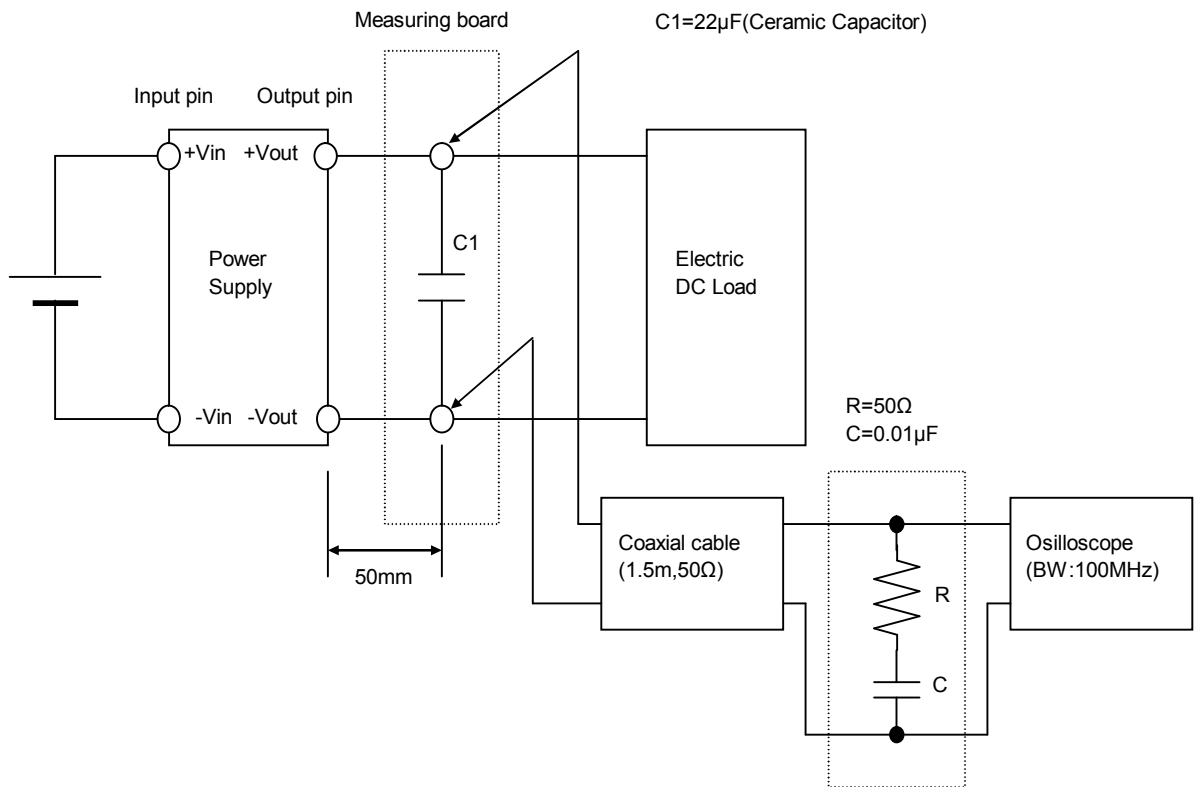


Figure B (Ripple and Ripple noise Characteristic)