

TEST DATA OF MGFS104805

Regulated DC Power Supply
December 28, 2016

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Takaaki Sekiguchi
Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

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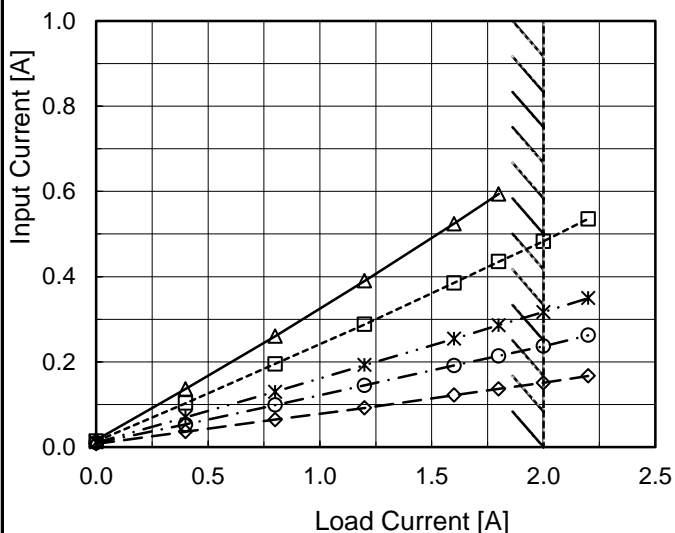
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Model	MGFS104805
Item	Input Current (by Load Current)
Object	_____

Temperature 25°C
Testing Circuitry Figure A

- 1.Graph
- △— Input Volt. 18V
 - - - □ - - - Input Volt. 24V
 - · · * · · - · - Input Volt. 36V
 - · · ○ · · - · - Input Volt. 48V
 - - ◇ - - Input Volt. 76V



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

2.Values

Load Current [A]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	0.017	0.014	0.011	0.010	0.008
0.4	0.137	0.103	0.070	0.053	0.036
0.8	0.260	0.195	0.130	0.099	0.065
1.2	0.390	0.288	0.192	0.145	0.092
1.6	0.524	0.385	0.254	0.191	0.122
1.8	0.594	0.435	0.286	0.214	0.137
2.0	- ※	0.483	0.317	0.237	0.151
2.2	- ※	0.535	0.349	0.262	0.167
--	-	-	-	-	-
--	-	-	-	-	-
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※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.



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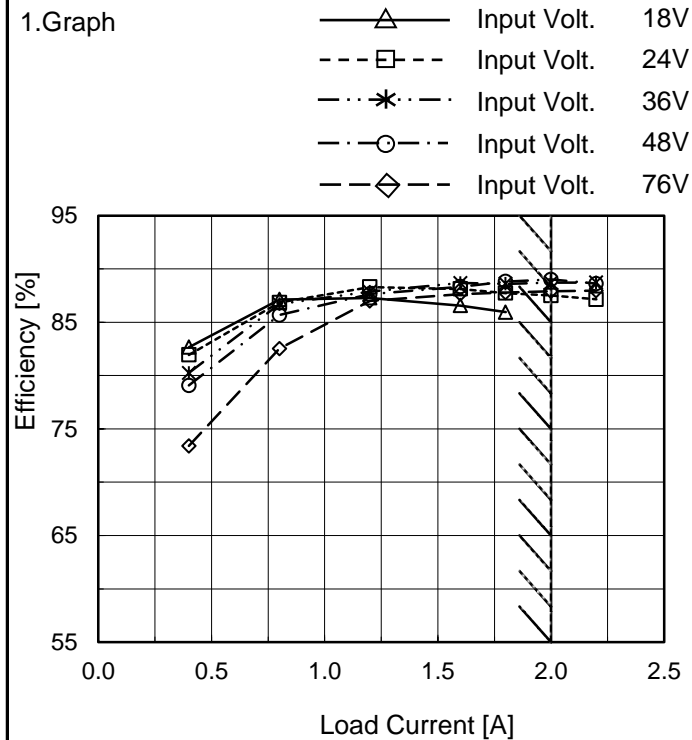


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Item	Efficiency (by Load Current)
Object	_____

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]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	-	-	-	-	-
0.4	82.7	81.9	80.2	79.1	73.4
0.8	87.1	86.8	86.7	85.7	82.5
1.2	87.3	88.3	87.9	87.6	87.0
1.6	86.6	88.1	88.7	88.3	87.6
1.8	85.9	87.7	88.6	88.8	87.8
2.0	- ※	87.5	88.7	89.0	87.9
2.2	- ※	87.1	88.7	88.6	88.0
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Item		Temperature	25°C
Object		Testing Circuitry	Figure A
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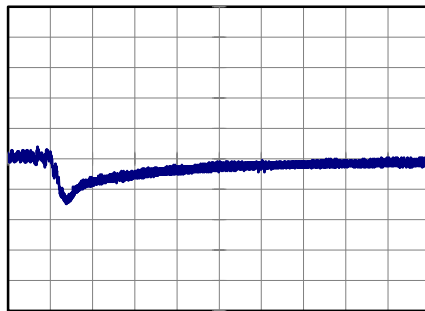
Input Volt. 48 V
Cycle 100 ms

t1,t2 = 100 μs

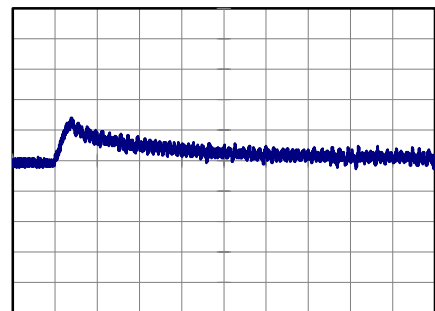


Min.Load (0A) ←→
Load 100% (2A)

200 mV/div



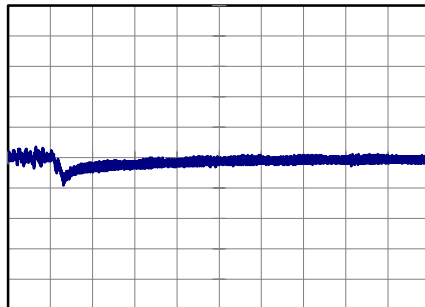
200 μs/div



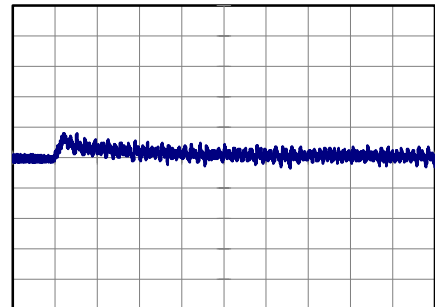
200 μs/div

Min.Load (0A) ←→
Load 50% (1A)

200 mV/div



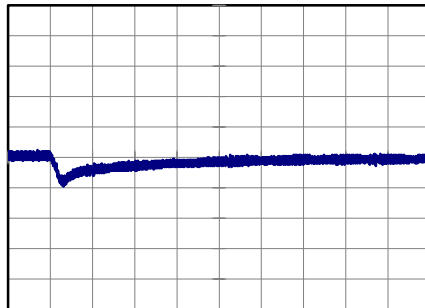
200 μs/div



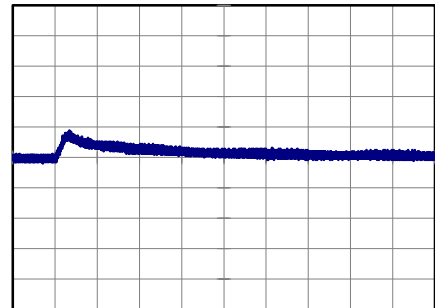
200 μs/div

Load 50% (1A) ←→
Load 100% (2A)

200 mV/div



200 μs/div



200 μs/div

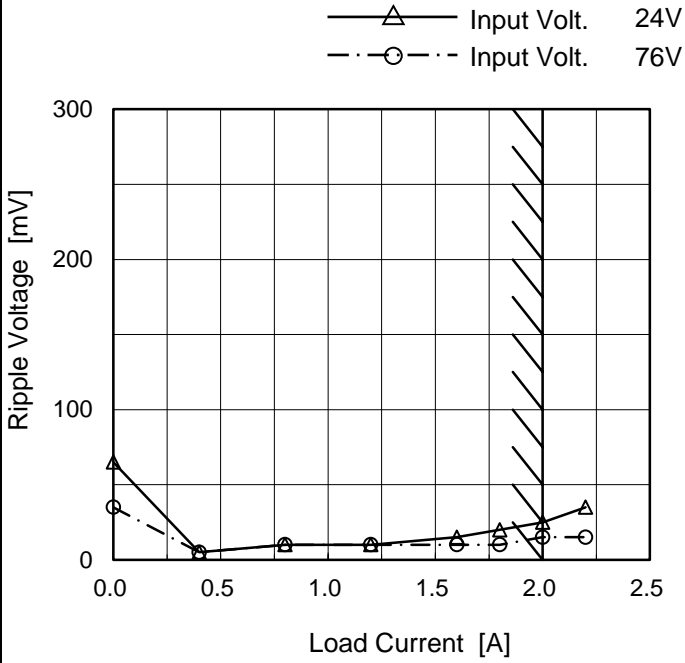


<p>Model MGFS104805</p> <p>Item Ripple Voltage (by Load Current)</p> <p>Object +5V2A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure B</p>																																						
<p>1.Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 24V</p> <p>-·-○-·- Input Volt. 76V</p> </div> <p>Measured 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>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 24 [V]</th> <th>Input Volt. 76 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>65</td><td>35</td></tr> <tr><td>0.4</td><td>5</td><td>5</td></tr> <tr><td>0.8</td><td>5</td><td>5</td></tr> <tr><td>1.2</td><td>5</td><td>5</td></tr> <tr><td>1.6</td><td>15</td><td>5</td></tr> <tr><td>1.8</td><td>20</td><td>5</td></tr> <tr><td>2.0</td><td>25</td><td>5</td></tr> <tr><td>2.2</td><td>30</td><td>5</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. 24 [V]	Input Volt. 76 [V]	0.0	65	35	0.4	5	5	0.8	5	5	1.2	5	5	1.6	15	5	1.8	20	5	2.0	25	5	2.2	30	5	--	-	-	--	-	-	--	-	-
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								



Model	MGFS104805	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	+5V2A		

1.Graph



2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 24 [V]	Input Volt. 76 [V]
0.0	65	35
0.4	5	5
0.8	10	10
1.2	10	10
1.6	15	10
1.8	20	10
2.0	25	15
2.2	35	15
--	-	-
--	-	-
--	-	-

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.

Ripple Noise[mVp-p]

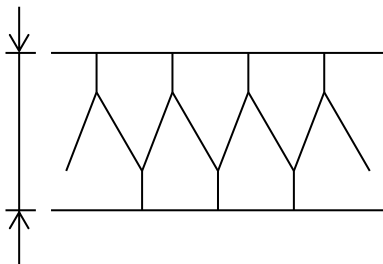


Fig.Complex Ripple Noise Wave Form

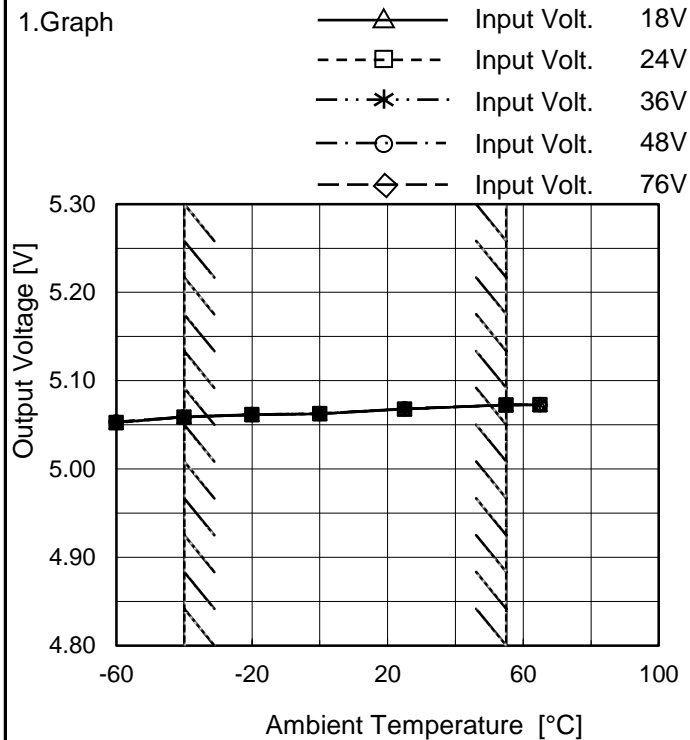


COSEL																																								
Model	MGFS104805																																							
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure B																																						
Object	+5V2A																																							
<p>1.Graph</p> <p style="text-align: center;">Ambient Temperature [°C] Input Volt. 48V</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-60</td><td>5</td><td>10</td></tr> <tr><td>-40</td><td>5</td><td>10</td></tr> <tr><td>-20</td><td>5</td><td>10</td></tr> <tr><td>0</td><td>5</td><td>10</td></tr> <tr><td>25</td><td>5</td><td>10</td></tr> <tr><td>55</td><td>5</td><td>10</td></tr> <tr><td>65</td><td>5</td><td>10</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]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	5	10	-40	5	10	-20	5	10	0	5	10	25	5	10	55	5	10	65	5	10	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																							
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<p>Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>																																								



Model	MGFS104805
Item	Ambient Temperature Drift
Object	+5V2A

Testing Circuitry Figure A



2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	5.053	5.052	5.053	5.053	5.053
-40	5.059	5.059	5.059	5.059	5.059
-20	5.061	5.061	5.062	5.062	5.061
0	5.063	5.063	5.063	5.063	5.063
25	5.068	5.068	5.068	5.068	5.068
55	5.073	5.072	5.073	5.073	5.073
65	5.073	5.073	5.073	5.073	5.073
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of Input Volt. 18V, Load 80%.
Other case Load 100%.



COSEL		Testing Circuitry Figure A
Model	MGFS104805	
Item	Output Voltage Accuracy	
Object	+5V2A	

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 - 55°C

Input Voltage : 24 - 76V

Load Current : 0 - 2A

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

* 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	55	76	0	5.079	±10	±0.2
Minimum Voltage	-40	24	2	5.059		

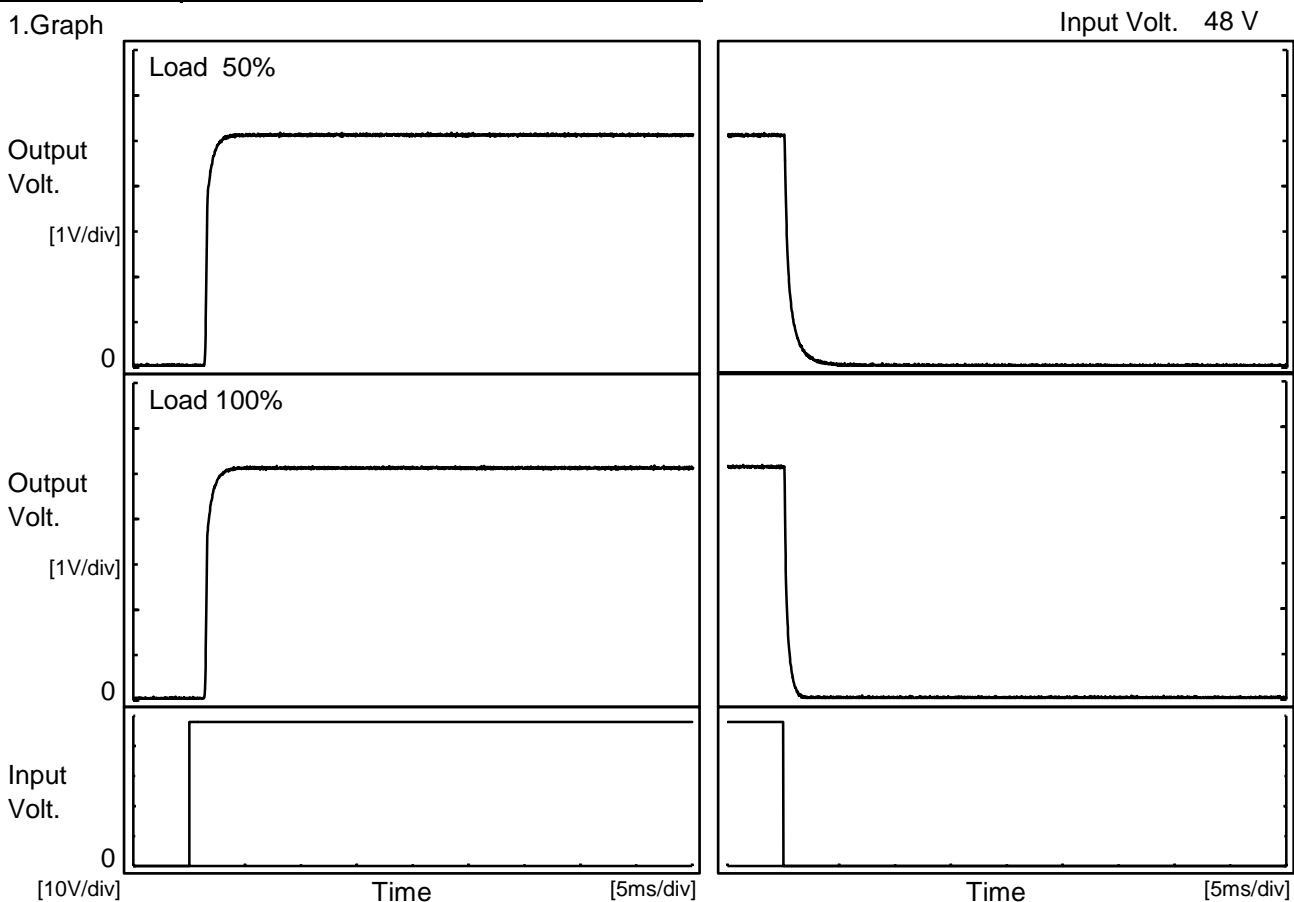


COSEL																									
Model	MGFS104805	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+5V2A																								
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 48V Load 100%</p>		<p>2.Values</p> <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>5.065</td></tr> <tr><td>0.5</td><td>5.069</td></tr> <tr><td>1.0</td><td>5.069</td></tr> <tr><td>2.0</td><td>5.069</td></tr> <tr><td>3.0</td><td>5.069</td></tr> <tr><td>4.0</td><td>5.069</td></tr> <tr><td>5.0</td><td>5.069</td></tr> <tr><td>6.0</td><td>5.069</td></tr> <tr><td>7.0</td><td>5.069</td></tr> <tr><td>8.0</td><td>5.069</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	5.065	0.5	5.069	1.0	5.069	2.0	5.069	3.0	5.069	4.0	5.069	5.0	5.069	6.0	5.069	7.0	5.069	8.0	5.069
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Model	MGFS104805	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V2A		

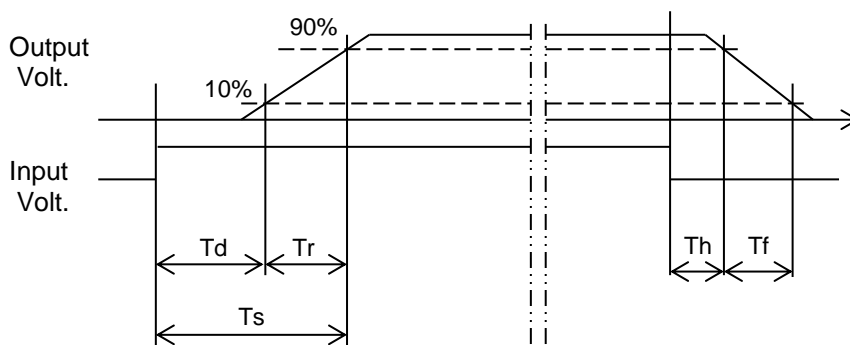
1. Graph



2. Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	0.6	2.1	0.2	1.3
100 %	1.5	0.7	2.2	0.1	0.7

[ms]





COSEL																																								
Model	MGFS104805																																							
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A																																						
Object	+5V2A																																							
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COSEL																																																																																									
Model	MGFS104805																																																																																								
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<p>Model MGFS104805</p>		<p>Temperature 25°C Testing Circuitry Figure A</p>																																																																													
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<p>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.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="5">Input Current [A]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>460</td><td>525</td><td>619</td><td>680</td><td>750</td></tr> <tr><td>0.4</td><td>345</td><td>431</td><td>543</td><td>607</td><td>680</td></tr> <tr><td>0.8</td><td>257</td><td>327</td><td>423</td><td>507</td><td>616</td></tr> <tr><td>1.2</td><td>200</td><td>260</td><td>348</td><td>405</td><td>478</td></tr> <tr><td>1.6</td><td>163</td><td>216</td><td>294</td><td>347</td><td>416</td></tr> <tr><td>1.8</td><td>150</td><td>200</td><td>274</td><td>325</td><td>393</td></tr> <tr><td>2.0</td><td>- ※</td><td>184</td><td>253</td><td>304</td><td>370</td></tr> <tr><td>2.2</td><td>- ※</td><td>172</td><td>240</td><td>285</td><td>350</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table> <p>※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.</p>	Load Current [A]	Input Current [A]					Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	460	525	619	680	750	0.4	345	431	543	607	680	0.8	257	327	423	507	616	1.2	200	260	348	405	478	1.6	163	216	294	347	416	1.8	150	200	274	325	393	2.0	- ※	184	253	304	370	2.2	- ※	172	240	285	350	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
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2.0	- ※	184	253	304	370																																																																										
2.2	- ※	172	240	285	350																																																																										
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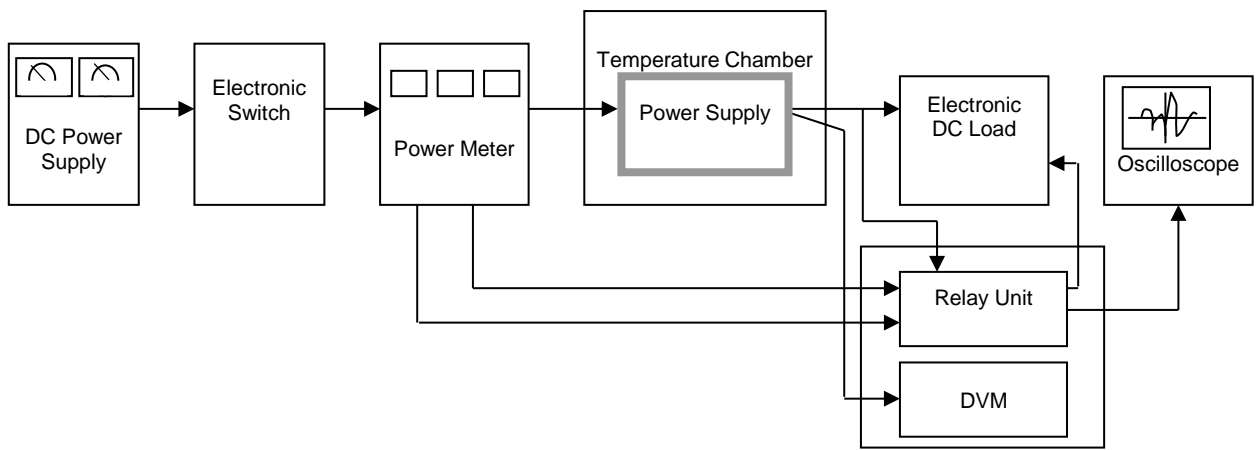


Figure A

Data Acquisition/Control Unit

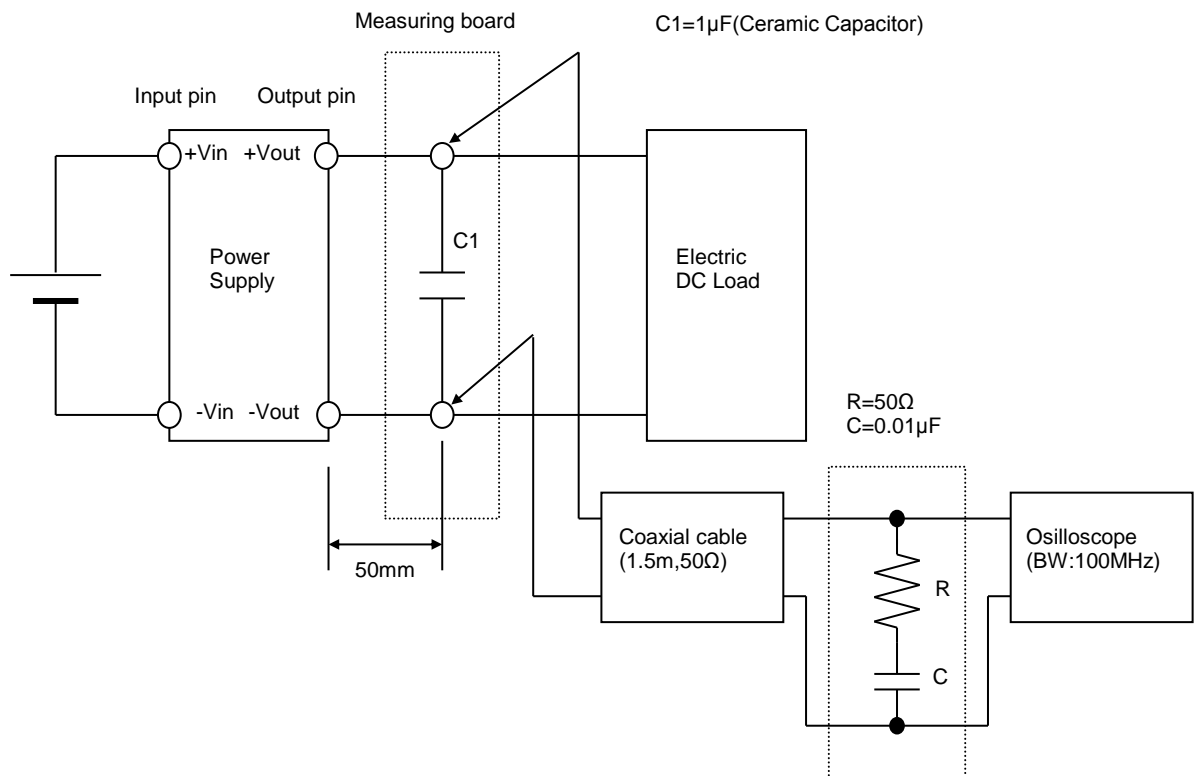


Figure B (Ripple and Ripple noise Characteristic)