

# TEST DATA OF MGS154805

Regulated DC Power Supply  
September 7, 2010

Approved by : Kazunari Asano  
Kazunari Asano Design Manager

Prepared by : Hidetaka Kobayashi  
Hidetaka Kobayashi 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.Figure of Testing Circuitry . . . . .	18

(Final Page 18)



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<p>1.Graph</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> </div> <div style="width: 35%;"> <p>—△— Load 100%</p> <p>---□--- Load 50%</p> <p>-·-○-·- Load 0%</p> </div> </div>		<p>2.Values</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Load 0%</th> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>8.0</td><td>0.002</td><td>0.002</td><td>0.003</td></tr> <tr><td>16.0</td><td>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>24.0</td><td>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>28.0</td><td>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>32.0</td><td>0.003</td><td>0.003</td><td>0.003</td></tr> <tr><td>32.8</td><td>0.019</td><td>0.263</td><td>0.534</td></tr> <tr><td>33.6</td><td>0.019</td><td>0.258</td><td>0.522</td></tr> <tr><td>34.0</td><td>0.019</td><td>0.254</td><td>0.516</td></tr> <tr><td>36.0</td><td>0.018</td><td>0.241</td><td>0.486</td></tr> <tr><td>40.0</td><td>0.018</td><td>0.216</td><td>0.435</td></tr> <tr><td>48.0</td><td>0.016</td><td>0.181</td><td>0.361</td></tr> <tr><td>60.0</td><td>0.015</td><td>0.145</td><td>0.288</td></tr> <tr><td>70.0</td><td>0.014</td><td>0.126</td><td>0.247</td></tr> <tr><td>76.0</td><td>0.013</td><td>0.116</td><td>0.228</td></tr> <tr><td>80.0</td><td>0.013</td><td>0.111</td><td>0.217</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0.0	0.000	0.000	0.000	8.0	0.002	0.002	0.003	16.0	0.003	0.003	0.003	24.0	0.003	0.003	0.003	28.0	0.003	0.003	0.003	32.0	0.003	0.003	0.003	32.8	0.019	0.263	0.534	33.6	0.019	0.258	0.522	34.0	0.019	0.254	0.516	36.0	0.018	0.241	0.486	40.0	0.018	0.216	0.435	48.0	0.016	0.181	0.361	60.0	0.015	0.145	0.288	70.0	0.014	0.126	0.247	76.0	0.013	0.116	0.228	80.0	0.013	0.111	0.217	--	-	-	-	--	-	-	-
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<p>The graph plots Input Current [A] on the y-axis (0.0 to 1.0) against Load Current [A] on the x-axis (0.0 to 3.0). Three data series are shown: 36V (solid line with triangles), 48V (dashed line with squares), and 76V (dash-dot line with circles). A vertical slanted line is drawn at approximately 3.3A on the x-axis, indicating the rated load current range.</p>			<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <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>0.019</td><td>0.016</td><td>0.014</td></tr> <tr><td>0.6</td><td>0.105</td><td>0.081</td><td>0.054</td></tr> <tr><td>1.2</td><td>0.194</td><td>0.147</td><td>0.095</td></tr> <tr><td>1.8</td><td>0.288</td><td>0.216</td><td>0.138</td></tr> <tr><td>2.4</td><td>0.386</td><td>0.287</td><td>0.182</td></tr> <tr><td>3.0</td><td>0.485</td><td>0.359</td><td>0.227</td></tr> <tr><td>3.3</td><td>0.537</td><td>0.397</td><td>0.250</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 Current [A]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	0.0	0.019	0.016	0.014	0.6	0.105	0.081	0.054	1.2	0.194	0.147	0.095	1.8	0.288	0.216	0.138	2.4	0.386	0.287	0.182	3.0	0.485	0.359	0.227	3.3	0.537	0.397	0.250	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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<p>Note: Slanted line shows the range of the rated load current.</p>																																																						

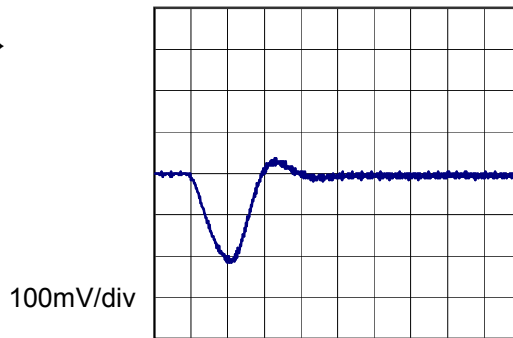


Model	MGS154805	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+5V3A	

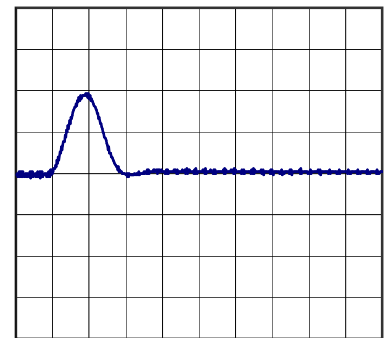
Input Volt. 48 V  
Cycle 1000 ms



Min. Load (0A)  $\longleftrightarrow$   
Load 100% (3A)

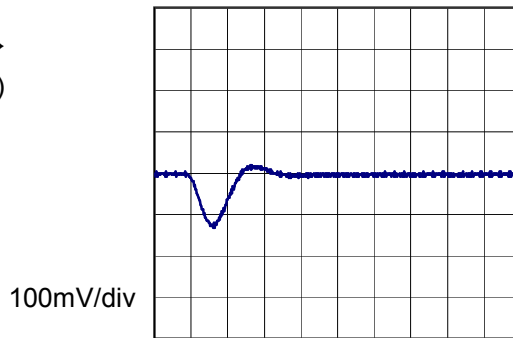


50µs/div

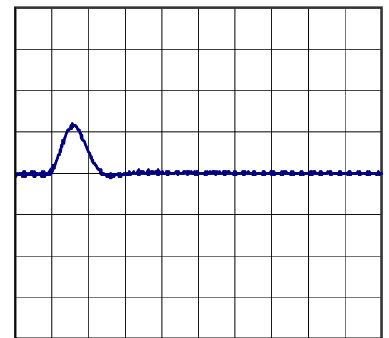


50µs/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (1.5A)

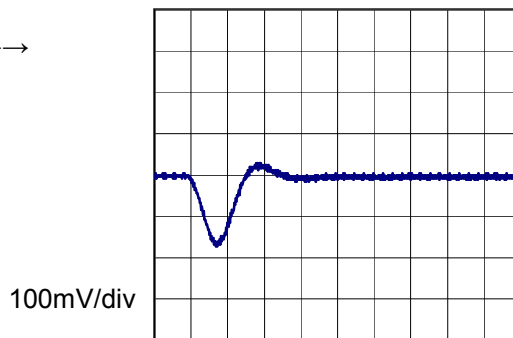


50µs/div

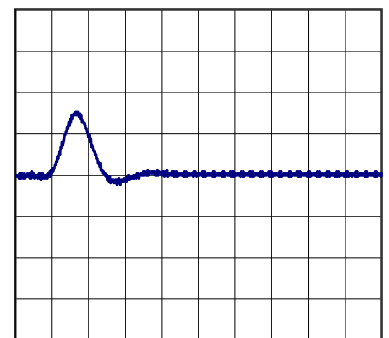


50µs/div

Load 50% (1.5A)  $\longleftrightarrow$   
Load 100% (3A)



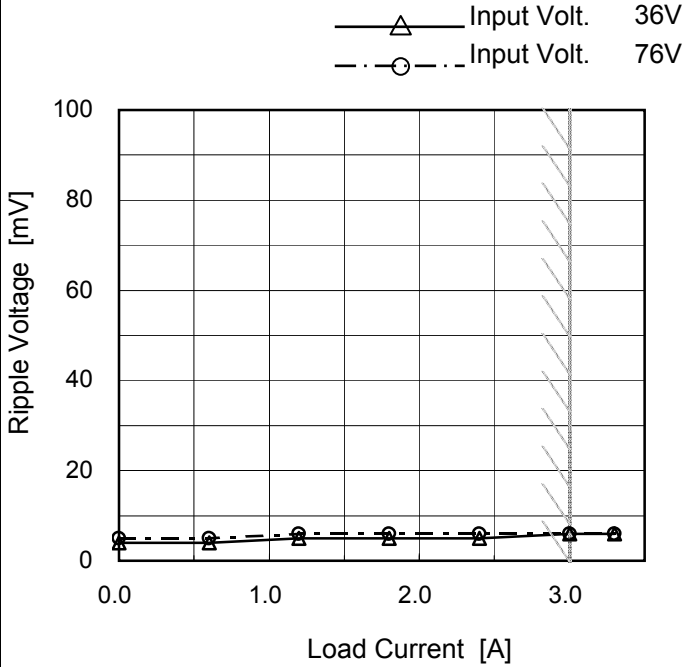
50µs/div



50µs/div

Model	MGS154805	Temperature	25°C
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure B
Object	+5V3A		

1.Graph



2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.0	4	5
0.6	4	5
1.2	5	6
1.8	5	6
2.4	5	6
3.0	6	6
3.3	6	6
--	-	-
--	-	-
--	-	-
--	-	-

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.

Ripple [mVp-p]

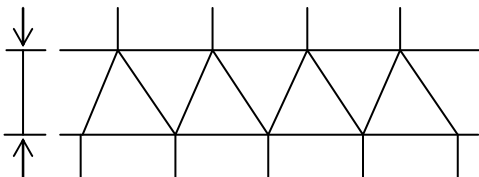
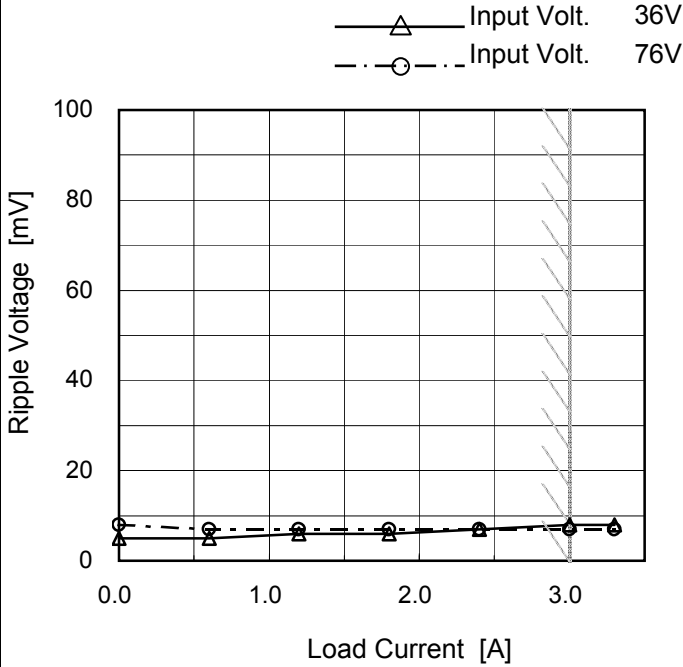


Fig.Complex Ripple Wave Form

Model	MGS154805	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	+5V3A		

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.0	5	8
0.6	5	7
1.2	6	7
1.8	6	7
2.4	7	7
3.0	8	7
3.3	8	7
--	-	-
--	-	-
--	-	-
--	-	-

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.

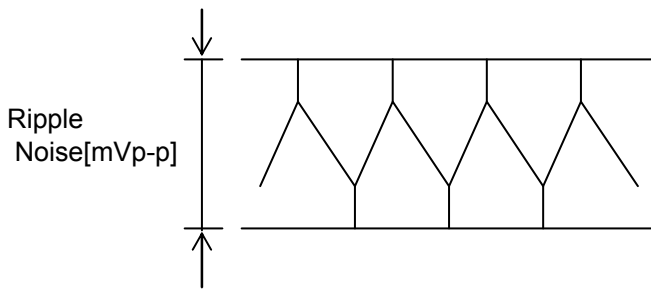
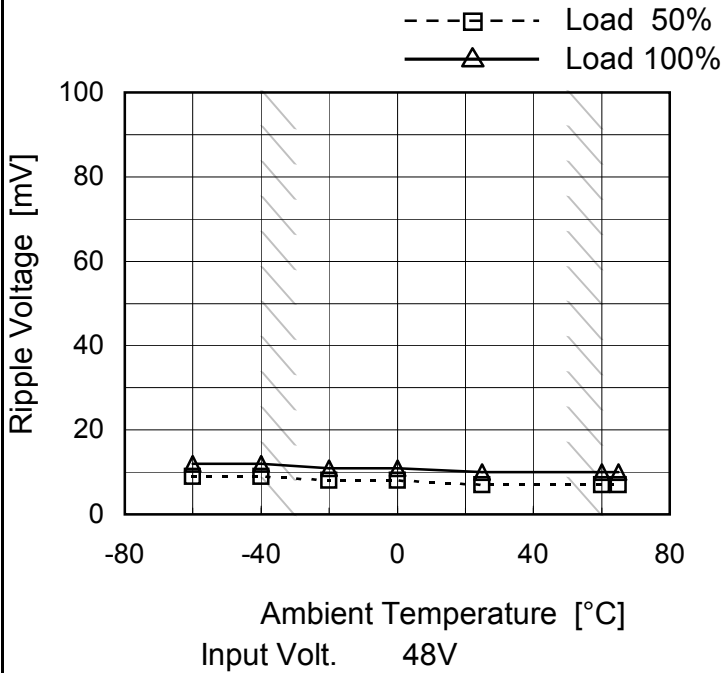


Fig. Complex Ripple Noise Wave Form

Model	MGS154805
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V3A

Testing Circuitry Figure B

1. Graph



2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	9	12
-40	9	12
-20	8	11
0	8	11
25	7	10
60	7	10
65	7	10
--	-	-
--	-	-
--	-	-
--	-	-

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



<b>COSEL</b>																																																					
Model	MGS154805																																																				
Item	Ambient Temperature Drift	Testing Circuitry Figure A																																																			
Object	+5V3A																																																				
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		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 36[V]</th> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr><td>-60</td><td>5.022</td><td>5.023</td><td>5.023</td></tr> <tr><td>-40</td><td>5.036</td><td>5.036</td><td>5.036</td></tr> <tr><td>-20</td><td>5.047</td><td>5.047</td><td>5.048</td></tr> <tr><td>0</td><td>5.056</td><td>5.056</td><td>5.056</td></tr> <tr><td>25</td><td>5.063</td><td>5.063</td><td>5.063</td></tr> <tr><td>60</td><td>5.067</td><td>5.067</td><td>5.068</td></tr> <tr><td>65</td><td>5.067</td><td>5.067</td><td>5.068</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>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-60	5.022	5.023	5.023	-40	5.036	5.036	5.036	-20	5.047	5.047	5.048	0	5.056	5.056	5.056	25	5.063	5.063	5.063	60	5.067	5.067	5.068	65	5.067	5.067	5.068	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																																					



<b>COSEL</b>		
Model	MGS154805	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+5V3A	

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 : 36 - 76V

Load Current : 0 - 3A

\* 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	36	0	5.069	±17	±0.3
Minimum Voltage	-40	36	3	5.036		



<b>COSEL</b>																								
Model	MGS154805																							
Item	Time Lapse Drift	Temperature 25°C Testing Circuitry Figure A																						
Object	+5V3A																							
<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>5.061</td></tr> <tr><td>0.5</td><td>5.061</td></tr> <tr><td>1.0</td><td>5.061</td></tr> <tr><td>2.0</td><td>5.061</td></tr> <tr><td>3.0</td><td>5.061</td></tr> <tr><td>4.0</td><td>5.061</td></tr> <tr><td>5.0</td><td>5.061</td></tr> <tr><td>6.0</td><td>5.061</td></tr> <tr><td>7.0</td><td>5.061</td></tr> <tr><td>8.0</td><td>5.061</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	5.061	0.5	5.061	1.0	5.061	2.0	5.061	3.0	5.061	4.0	5.061	5.0	5.061	6.0	5.061	7.0	5.061	8.0	5.061
Time since start [H]	Output Voltage [V]																							
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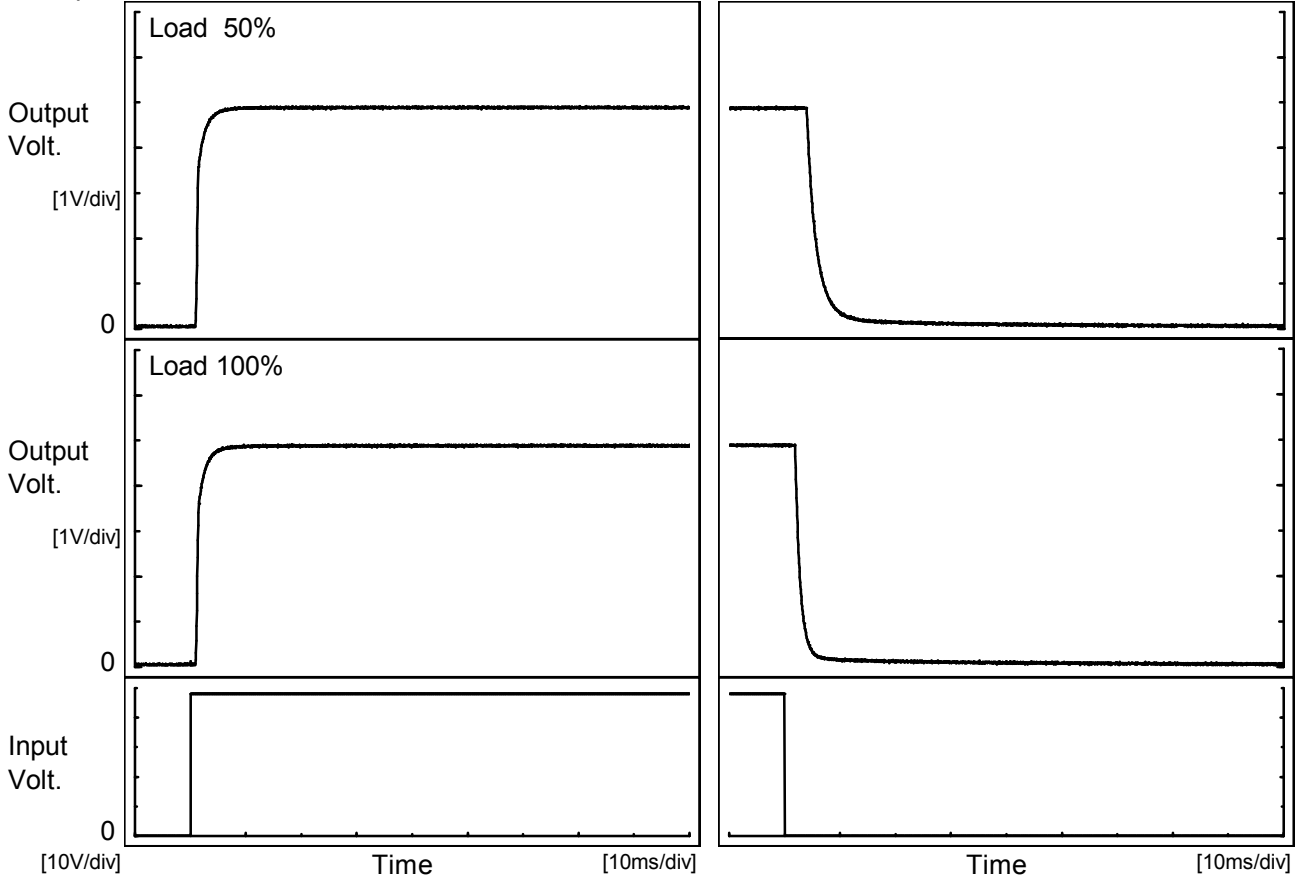




Model		MGS154805	Temperature	25°C
Item		Rise and Fall Time	Testing Circuitry	Figure A
Object		+5V3A		

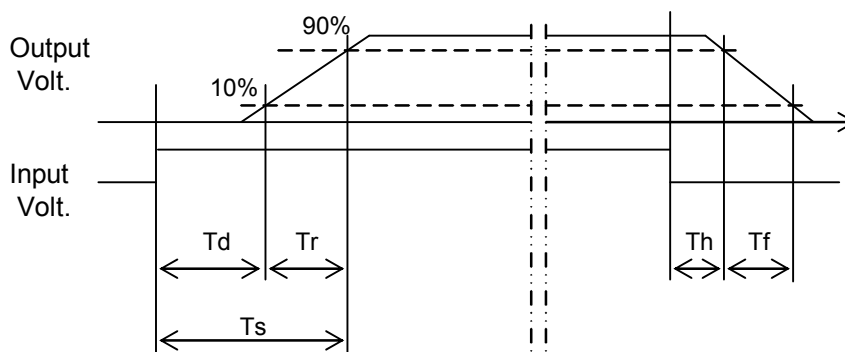
1. Graph

Input Volt. 48 V



2. Values

		[ms]				
Load \ Time	Time	Td	Tr	Ts	Th	Tf
50 %		1.1	2.2	3.3	4.0	4.5
100 %		1.1	2.2	3.3	2.0	2.2





<b>COSEL</b>																																								
Model	MGS154805																																							
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A																																						
Object	+5V3A																																							
<p>1. Graph</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>-60</td> <td>30.3</td> <td>30.5</td> </tr> <tr> <td>-40</td> <td>30.5</td> <td>30.4</td> </tr> <tr> <td>-20</td> <td>30.5</td> <td>30.4</td> </tr> <tr> <td>0</td> <td>30.5</td> <td>30.4</td> </tr> <tr> <td>25</td> <td>30.5</td> <td>30.4</td> </tr> <tr> <td>60</td> <td>30.3</td> <td>30.5</td> </tr> <tr> <td>65</td> <td>30.3</td> <td>30.5</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> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-60	30.3	30.5	-40	30.5	30.4	-20	30.5	30.4	0	30.5	30.4	25	30.5	30.4	60	30.3	30.5	65	30.3	30.5	--	-	-	--	-	-	--	-	-	--	-	-
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																								



<p>Model MGS154805</p> <p>Item Overcurrent Protection</p> <p>Object +5V3A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure A</p>																																																							
<p>1.Graph</p> <p> <span style="color: black;">—△</span> Input Volt. 36V  <span style="color: blue;">—□</span> Input Volt. 48V  <span style="color: orange;">—○</span> Input Volt. 76V                 </p> <p>Output Voltage [V]</p> <p>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="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 36[V]</th> <th>Input Volt. 48[V]</th> <th>Input Volt. 76[V]</th> </tr> </thead> <tbody> <tr> <td>5.00</td> <td>3.99</td> <td>4.14</td> <td>3.78</td> </tr> <tr> <td>4.75</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>4.50</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>4.00</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>3.50</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>3.00</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2.50</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2.00</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1.50</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>1.00</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>0.50</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>0.00</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Output Voltage [V]	Load Current [A]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	5.00	3.99	4.14	3.78	4.75	-	-	-	4.50	-	-	-	4.00	-	-	-	3.50	-	-	-	3.00	-	-	-	2.50	-	-	-	2.00	-	-	-	1.50	-	-	-	1.00	-	-	-	0.50	-	-	-	0.00	-	-	-
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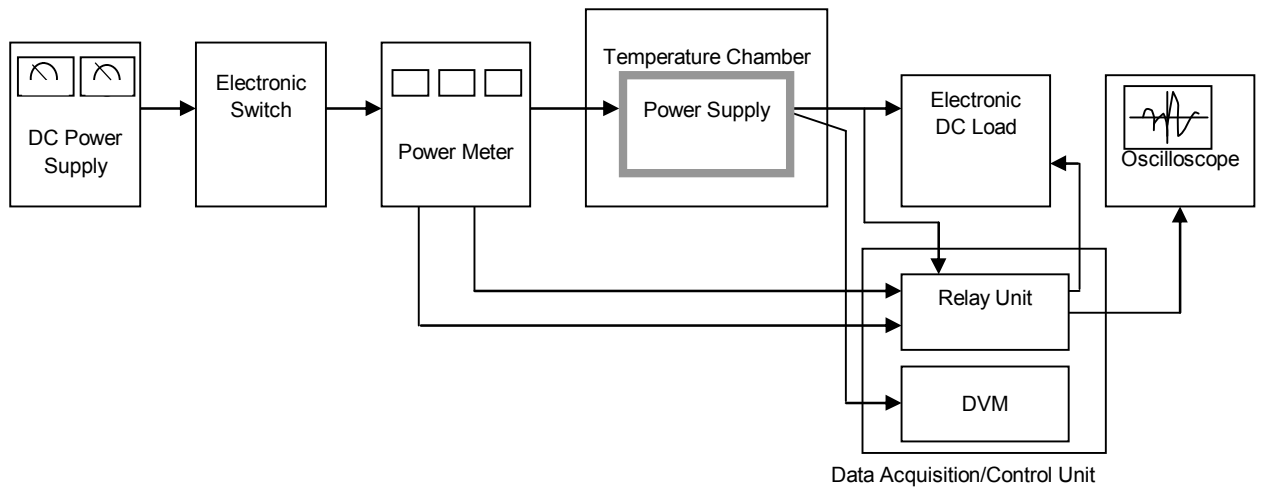


Figure A

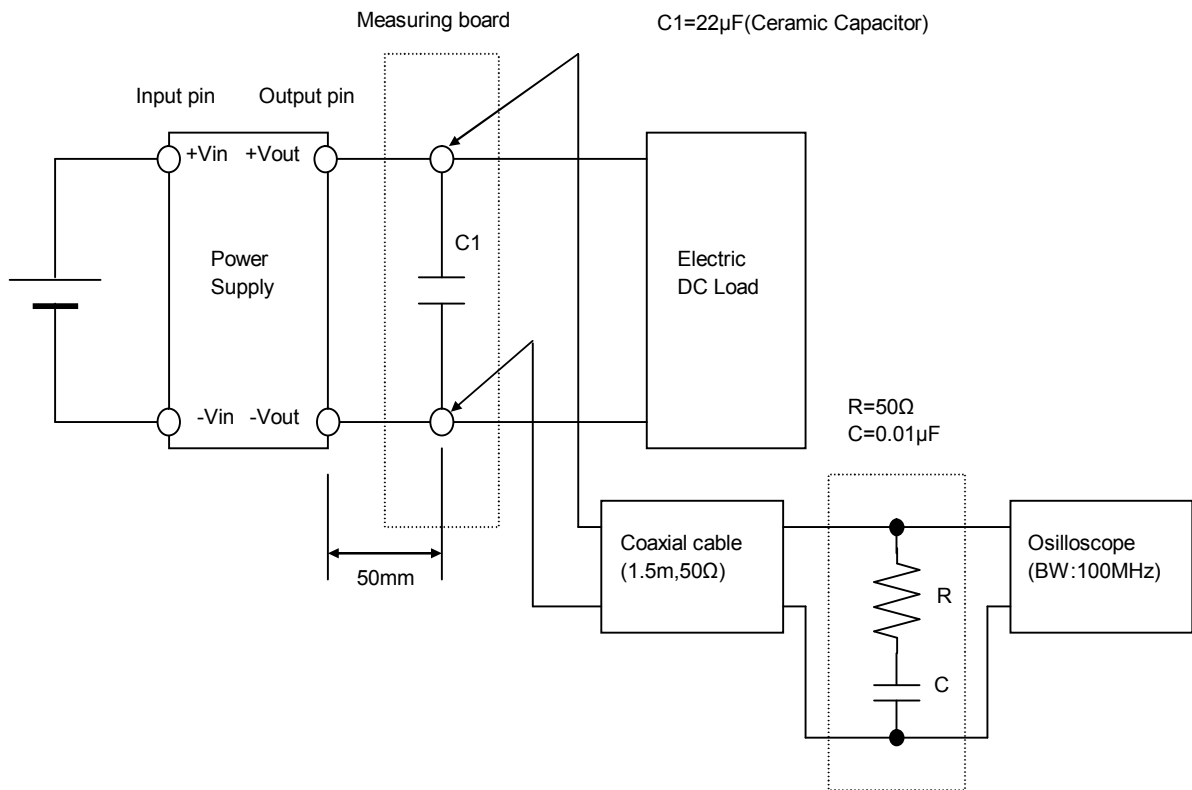


Figure B (Ripple and Ripple noise Characteristic)