



TEST DATA OF MGS1R50505

Regulated DC Power Supply
March 31, 2016

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Shohei Mukaide
Shohei Mukaide Design Engineer

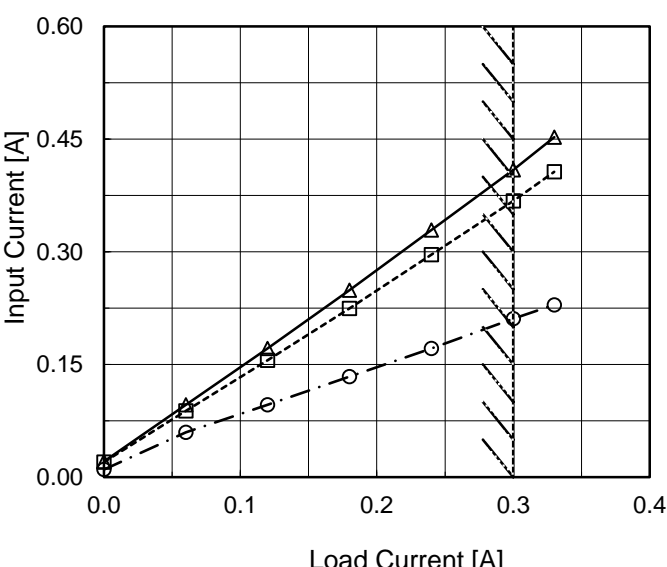
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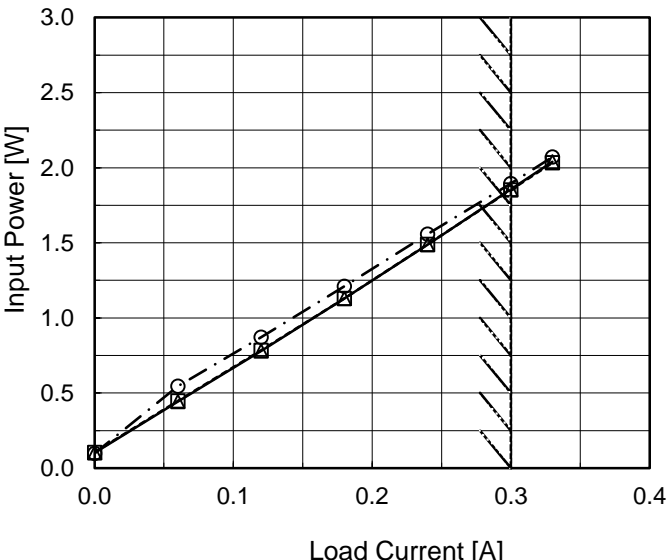
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Model		MGS1R50505																																																																																
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Model		MGS1R50505	Temperature		25°C																																
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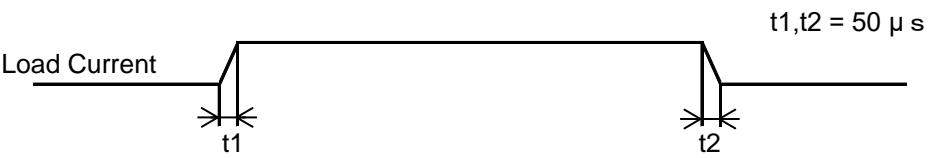
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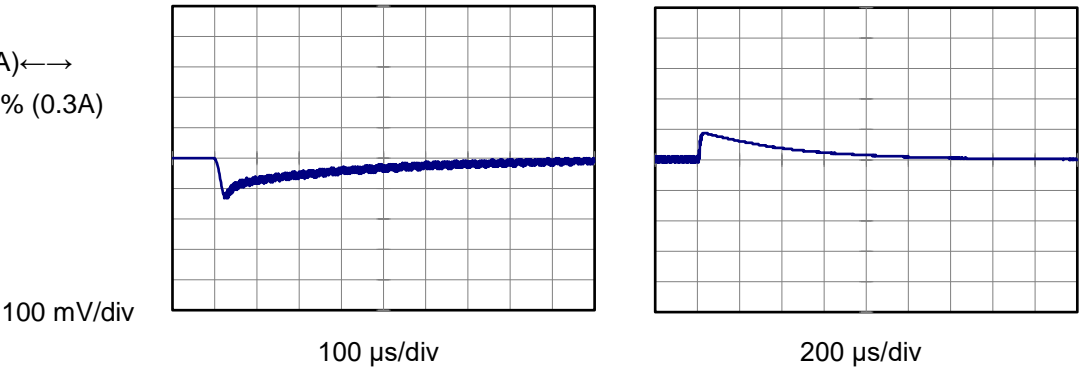


Model	MGS1R50505	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+5V0.3A	

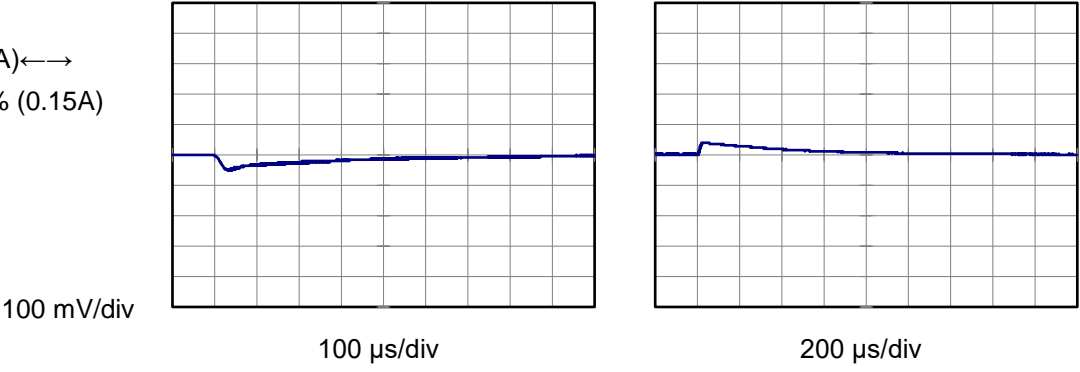
Input Volt. 5 V
Cycle 1000 ms



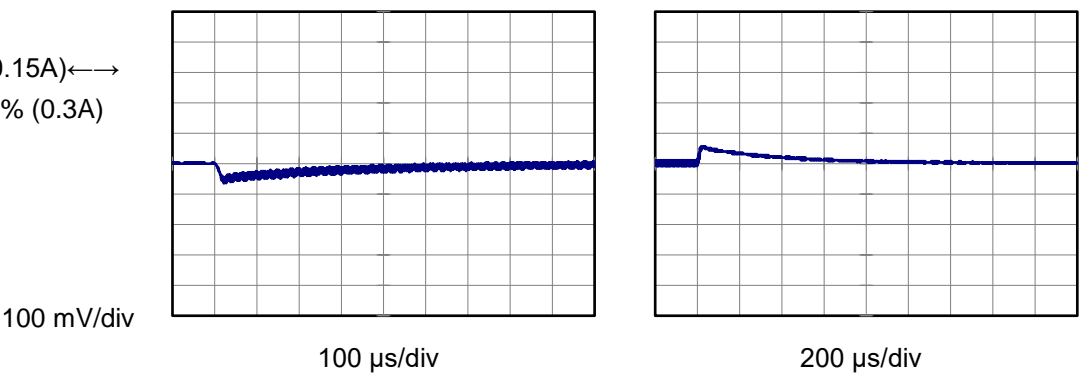
Min.Load (0A) ←→
Load 100% (0.3A)

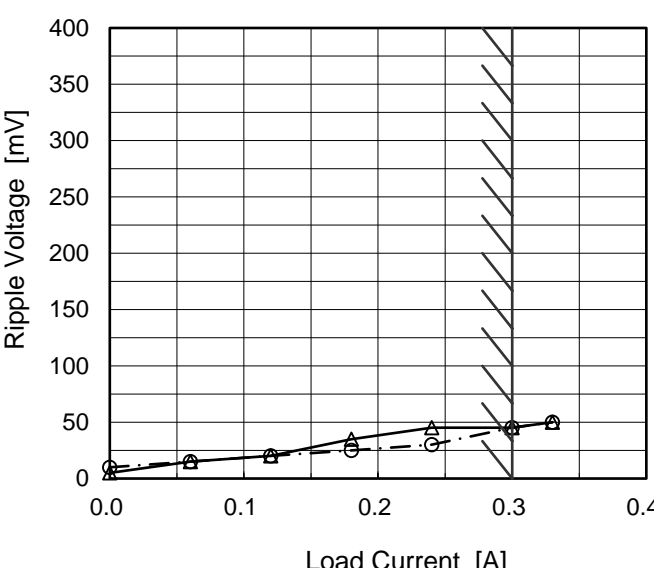
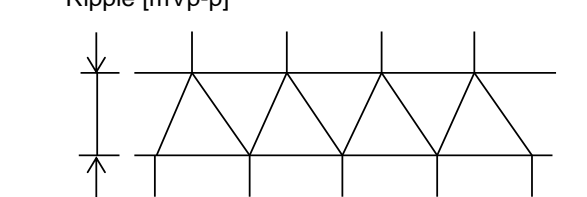


Min.Load (0A) ←→
Load 50% (0.15A)



Load 50% (0.15A) ←→
Load 100% (0.3A)

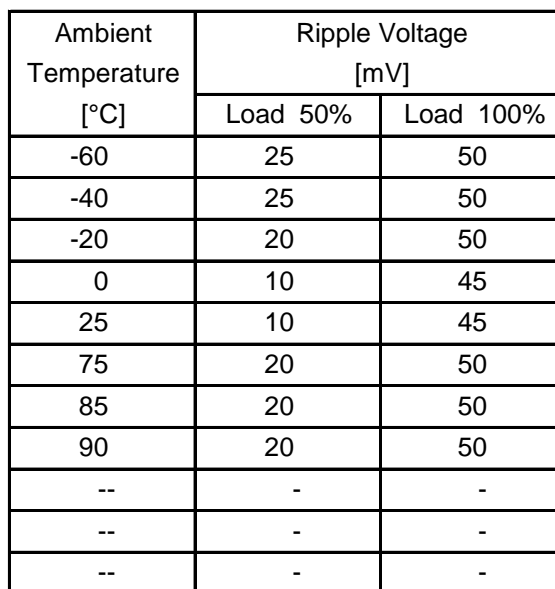


COSEL																																									
Model	MGS1R50505																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure B																																						
Object	+5V0.3A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>4.5V</div></div><div><div>- - -○- - -</div><div>Input Volt.</div><div>9V</div></div></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>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 4.5 [V]</th><th>Input Volt. 9 [V]</th></tr><tr><td>0.00</td><td>5</td><td>10</td></tr><tr><td>0.06</td><td>15</td><td>15</td></tr><tr><td>0.12</td><td>20</td><td>20</td></tr><tr><td>0.18</td><td>35</td><td>25</td></tr><tr><td>0.24</td><td>45</td><td>30</td></tr><tr><td>0.30</td><td>45</td><td>45</td></tr><tr><td>0.33</td><td>50</td><td>50</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></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 4.5 [V]	Input Volt. 9 [V]	0.00	5	10	0.06	15	15	0.12	20	20	0.18	35	25	0.24	45	30	0.30	45	45	0.33	50	50	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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<p>Ripple [mVp-p]</p>  <p>Fig.Complex Ripple Wave Form</p>																																									

Model		MGS1R50505	Temperature Testing Circuitry	25°C Figure B																																						
Item		Ripple-Noise																																								
Object		+5V0.3A																																								
1.Graph			2.Values																																							
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>Input Volt.</div><div>4.5V</div></div><div><div>Input Volt.</div><div>9V</div></div></div><div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div></div>			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 4.5 [V]</th><th>Input Volt. 9 [V]</th></tr><tr><td>0.00</td><td>10</td><td>10</td></tr><tr><td>0.06</td><td>20</td><td>20</td></tr><tr><td>0.12</td><td>30</td><td>25</td></tr><tr><td>0.18</td><td>40</td><td>30</td></tr><tr><td>0.24</td><td>50</td><td>35</td></tr><tr><td>0.30</td><td>50</td><td>50</td></tr><tr><td>0.33</td><td>55</td><td>55</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></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 4.5 [V]	Input Volt. 9 [V]	0.00	10	10	0.06	20	20	0.12	30	25	0.18	40	30	0.24	50	35	0.30	50	50	0.33	55	55	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																									
	Input Volt. 4.5 [V]	Input Volt. 9 [V]																																								
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<p>Measured by 100 MHz Oscilloscope.</p> <p>Ripple-Noise is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p>																																										
<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><p>Ripple Noise[mVp-p]</p><p>Fig.Complex Ripple Noise Wave Form</p></div></div>																																										

Testing Circuitry Figure B

2.Values



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

Model		MGS1R50505
Item		Ambient Temperature Drift
Object		+5V0.3A

1.Graph

—△—

Input Volt.

4.5V

---□---

Input Volt.

5V

---○---

Input Volt.

9V

Ambient Temperature [°C]	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	5.011	5.012	5.012
-40	5.021	5.021	5.022
-20	5.029	5.030	5.030
0	5.036	5.036	5.036
25	5.042	5.042	5.042
75	5.041	5.041	5.042
85	5.041	5.041	5.041
90	5.040	5.040	5.041
--	-	-	-
--	-	-	-
--	-	-	-

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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	5.011	5.012	5.012
-40	5.021	5.021	5.022
-20	5.029	5.030	5.030
0	5.036	5.036	5.036
25	5.042	5.042	5.042
75	5.041	5.041	5.042
85	5.041	5.041	5.041
90	5.040	5.040	5.041
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

		Testing Circuitry Figure A
Model	MGS1R50505	
Item	Output Voltage Accuracy	
Object	+5V0.3A	

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 - 85°C

Input Voltage : 4.5 - 9V

Load Current : 0 - 0.3A

* 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	75	9	0	5.043	±11	±0.2
Minimum Voltage	-40	4.5	0.3	5.021		

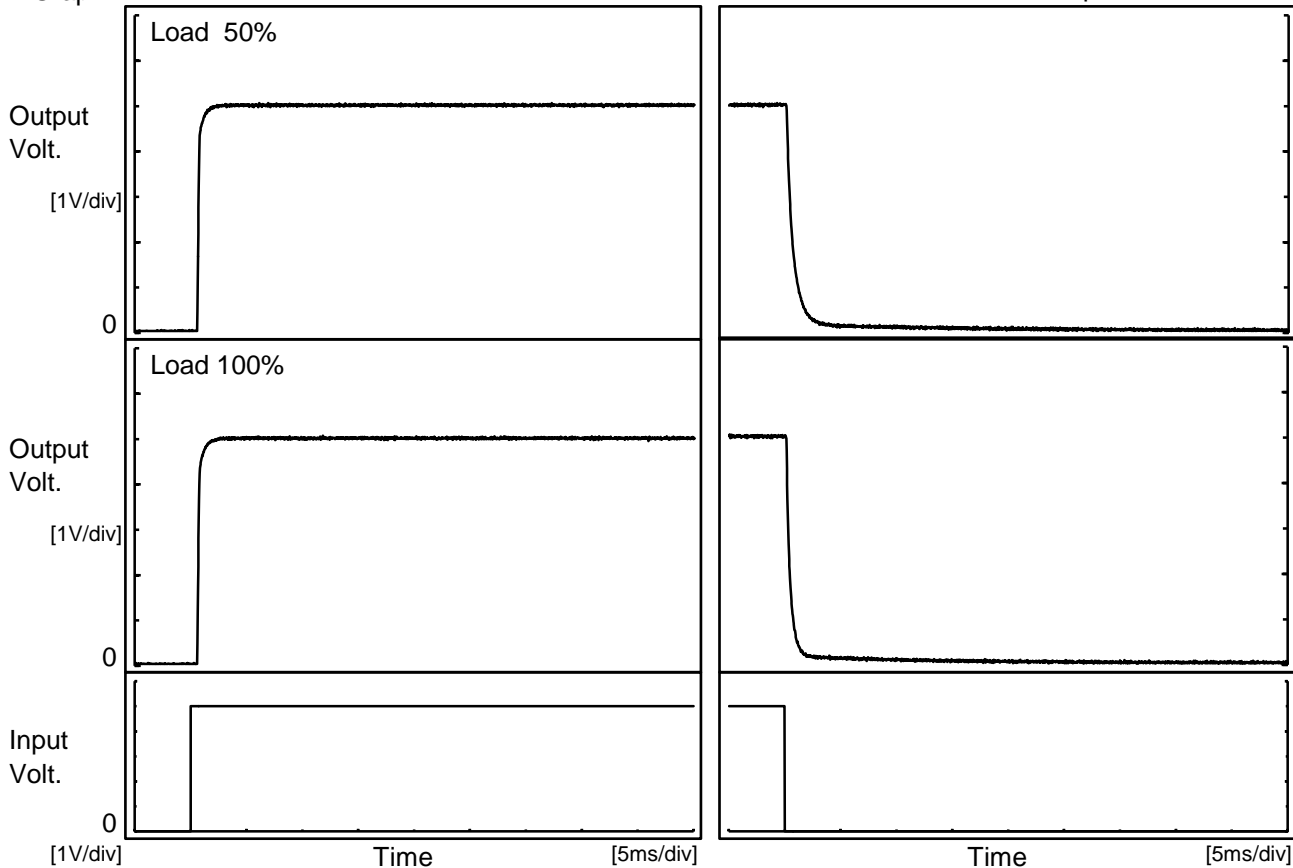


Model	MGS1R50505																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+5V0.3A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 5V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.041</td></tr><tr><td>0.5</td><td>5.042</td></tr><tr><td>1.0</td><td>5.042</td></tr><tr><td>2.0</td><td>5.042</td></tr><tr><td>3.0</td><td>5.041</td></tr><tr><td>4.0</td><td>5.041</td></tr><tr><td>5.0</td><td>5.041</td></tr><tr><td>6.0</td><td>5.041</td></tr><tr><td>7.0</td><td>5.041</td></tr><tr><td>8.0</td><td>5.041</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.041	0.5	5.042	1.0	5.042	2.0	5.042	3.0	5.041	4.0	5.041	5.0	5.041	6.0	5.041	7.0	5.041	8.0	5.041
Time since start [H]	Output Voltage [V]																								
0.0	5.041																								
0.5	5.042																								
1.0	5.042																								
2.0	5.042																								
3.0	5.041																								
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7.0	5.041																								
8.0	5.041																								

COSEL

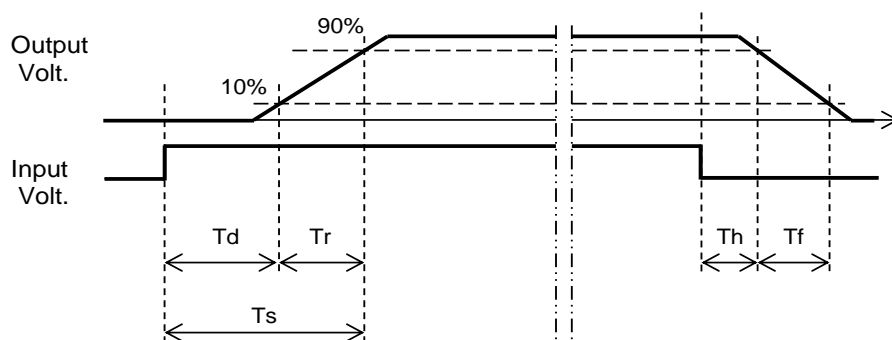
Model	MGS1R50505	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V0.3A		

1.Graph



2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.6	0.3	0.9	0.2	1.5
100 %	0.6	0.3	0.9	0.2	0.9



1. Graph

The graph plots Input Voltage [V] on the Y-axis (0 to 10) against Ambient Temperature [°C] on the X-axis (-60 to 100). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show a constant input voltage of approximately 3.5V across the entire temperature range. Slanted lines at the extremes of the temperature range indicate the rated ambient temperature range.

Ambient Temperature [°C]	Input Voltage [V] (Load 50%)	Input Voltage [V] (Load 100%)
-60	3.5	3.5
-40	3.5	3.5
-20	3.5	3.5
0	3.5	3.5
20	3.5	3.5
40	3.5	3.5
60	3.5	3.5
80	3.5	3.5
90	3.5	3.5

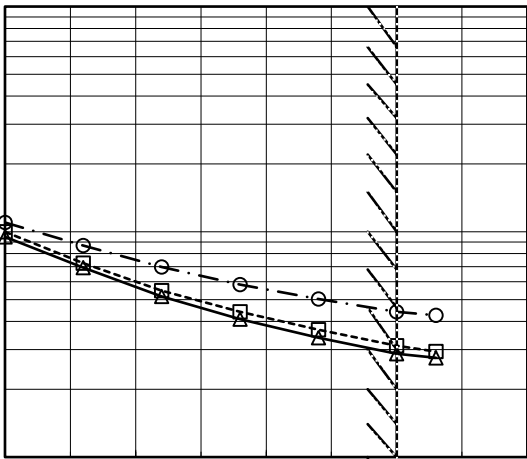
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure A

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.7	3.7
-40	3.6	3.7
-20	3.6	3.6
0	3.6	3.6
25	3.6	3.6
75	3.5	3.6
85	3.5	3.6
90	3.5	3.6
--	-	-
--	-	-
--	-	-

COSEL

Model	MGS1R50505																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+5V0.3A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div><div>Input Volt. 4.5V</div></div><div><div></div><div>Input Volt. 5V</div></div><div><div></div><div>Input Volt. 9V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 4.5[V]</th><th>Input Volt. 5[V]</th><th>Input Volt. 9[V]</th></tr><tr><td>5.00</td><td>0.31</td><td>0.31</td><td>0.31</td></tr><tr><td>4.75</td><td>0.39</td><td>0.39</td><td>0.39</td></tr><tr><td>4.50</td><td>0.40</td><td>0.40</td><td>0.40</td></tr><tr><td>4.00</td><td>0.42</td><td>0.42</td><td>0.42</td></tr><tr><td>3.50</td><td>0.45</td><td>0.45</td><td>0.44</td></tr><tr><td>3.00</td><td>0.48</td><td>0.47</td><td>0.46</td></tr><tr><td>2.50</td><td>0.51</td><td>0.50</td><td>0.49</td></tr><tr><td>2.00</td><td>0.54</td><td>0.54</td><td>0.52</td></tr><tr><td>1.50</td><td>0.59</td><td>0.58</td><td>0.54</td></tr><tr><td>1.00</td><td>0.63</td><td>0.62</td><td>0.57</td></tr><tr><td>0.50</td><td>0.68</td><td>0.67</td><td>0.60</td></tr><tr><td>0.00</td><td>0.70</td><td>0.68</td><td>0.59</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	5.00	0.31	0.31	0.31	4.75	0.39	0.39	0.39	4.50	0.40	0.40	0.40	4.00	0.42	0.42	0.42	3.50	0.45	0.45	0.44	3.00	0.48	0.47	0.46	2.50	0.51	0.50	0.49	2.00	0.54	0.54	0.52	1.50	0.59	0.58	0.54	1.00	0.63	0.62	0.57	0.50	0.68	0.67	0.60	0.00	0.70	0.68	0.59
Output Voltage [V]	Load Current [A]																																																									
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Model		MGS1R50505	Temperature		25°C
Item		Switching Frequency (by Load Current)	Testing Circuitry		Figure A
Object		+5V0.3A			
1.Graph		<div><div>—△—</div>Input Volt. 4.5V</div> <div><div>---□---</div>Input Volt. 5V</div> <div><div>---○---</div>Input Volt. 9V</div>	2.Values		
Switching Frequency [kHz]					
	Load Current [A]				
	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.				

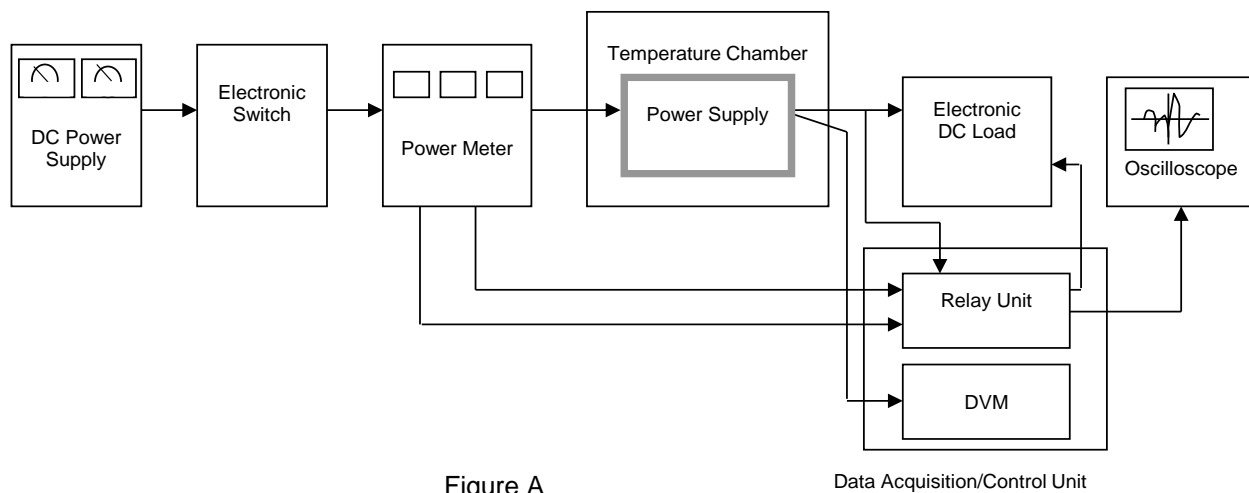


Figure A

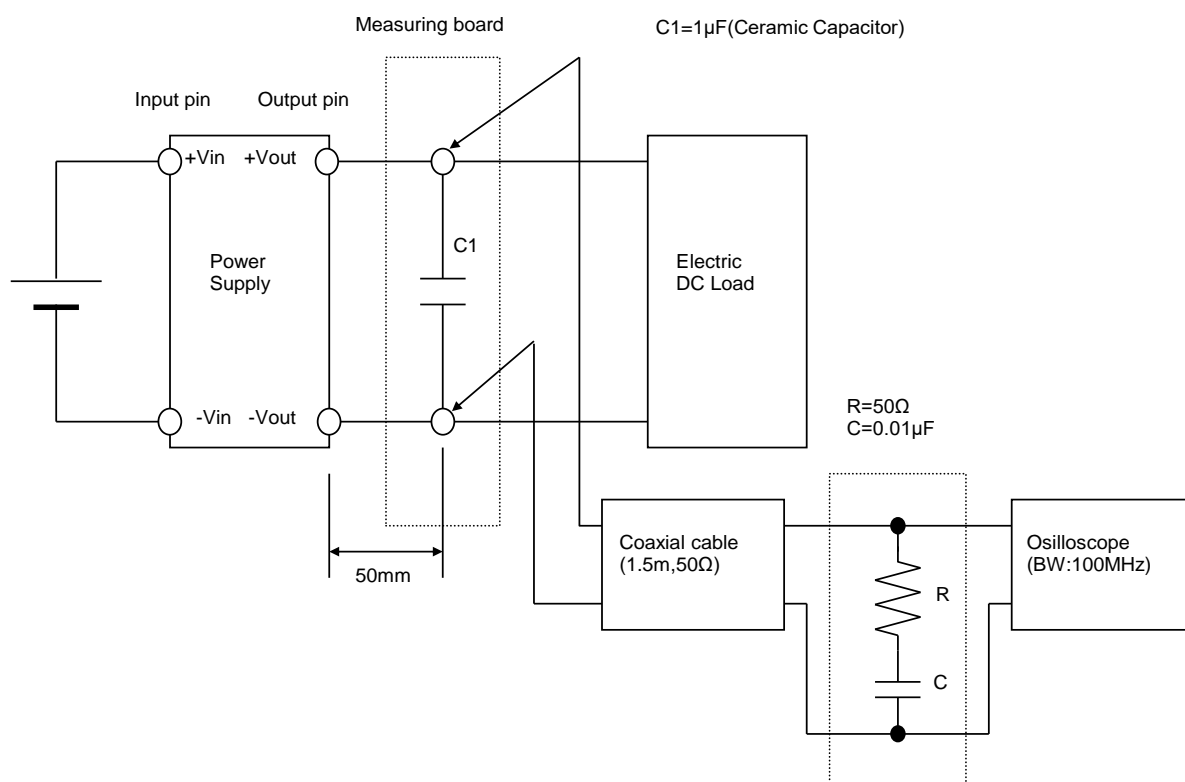


Figure B (Ripple and Ripple noise Characteristic)