



# TEST DATA OF MGS60505

Regulated DC Power Supply  
August 3, 2016

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**COSEL CO.,LTD.**

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Model		MGS60505		Temperature 25°C																																																																																
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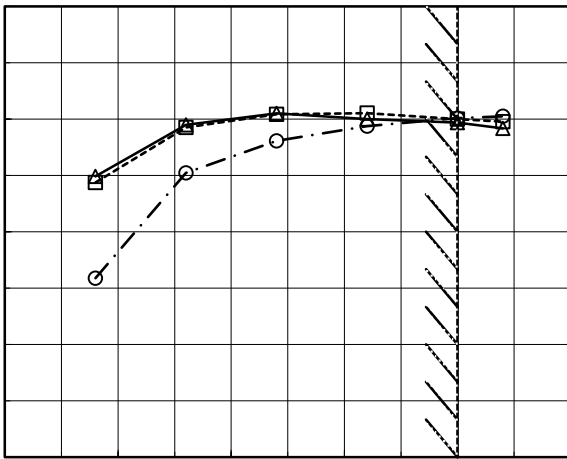
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<div><div>Input Power [W]</div><div>10</div><div>8</div><div>6</div><div>4</div><div>2</div><div>0</div></div> <div><div>0.0</div><div>0.3</div><div>0.6</div><div>0.9</div><div>1.2</div><div>1.5</div></div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</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>0.00</td><td>0.06</td><td>0.06</td><td>0.06</td></tr><tr><td>0.24</td><td>1.52</td><td>1.53</td><td>1.72</td></tr><tr><td>0.48</td><td>2.88</td><td>2.89</td><td>3.03</td></tr><tr><td>0.72</td><td>4.27</td><td>4.27</td><td>4.39</td></tr><tr><td>0.96</td><td>5.72</td><td>5.69</td><td>5.77</td></tr><tr><td>1.20</td><td>7.20</td><td>7.17</td><td>7.16</td></tr><tr><td>1.32</td><td>7.95</td><td>7.89</td><td>7.85</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></table>			Load Current [A]	Input Power [W]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	0.00	0.06	0.06	0.06	0.24	1.52	1.53	1.72	0.48	2.88	2.89	3.03	0.72	4.27	4.27	4.39	0.96	5.72	5.69	5.77	1.20	7.20	7.17	7.16	1.32	7.95	7.89	7.85	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model		MGS60505	Temperature		25°C																																																		
Item		Efficiency (by Load Current)	Testing Circuitry		Figure A																																																		
Object																																																							
1.Graph		<div><div>—△—</div><div>Input Volt.</div><div>4.5V</div></div> <div><div>---□---</div><div>Input Volt.</div><div>5V</div></div> <div><div>---○---</div><div>Input Volt.</div><div>9V</div></div>	2.Values																																																				
<div><div>Efficiency [%]</div><div><div>95</div><div>85</div><div>75</div><div>65</div><div>55</div></div><div><div>0.0</div><div>0.3</div><div>0.6</div><div>0.9</div><div>1.2</div><div>1.5</div></div><div>Load Current [A]</div></div> 		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</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>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.24</td><td>79.9</td><td>79.4</td><td>70.9</td></tr><tr><td>0.48</td><td>84.5</td><td>84.3</td><td>80.2</td></tr><tr><td>0.72</td><td>85.5</td><td>85.4</td><td>83.1</td></tr><tr><td>0.96</td><td>85.0</td><td>85.5</td><td>84.4</td></tr><tr><td>1.20</td><td>84.7</td><td>85.0</td><td>85.1</td></tr><tr><td>1.32</td><td>84.2</td><td>84.8</td><td>85.3</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></table>			Load Current [A]	Efficiency [%]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	0.00	-	-	-	0.24	79.9	79.4	70.9	0.48	84.5	84.3	80.2	0.72	85.5	85.4	83.1	0.96	85.0	85.5	84.4	1.20	84.7	85.0	85.1	1.32	84.2	84.8	85.3	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																						
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Note: Slanted line shows the range of the rated load current.																																																							



Model		MGS60505	Temperature		25°C																																
Item		Line Regulation	Testing Circuitry		Figure A																																
Object		+5V1.2A																																			
1.Graph			2.Values																																		
<div><div><div><div><div></div><div></div></div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>Load 50%</div><div>Load 100%</div></div> <table><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>4.4</td><td>5.061</td><td>5.060</td></tr><tr><td>4.5</td><td>5.061</td><td>5.060</td></tr><tr><td>4.8</td><td>5.061</td><td>5.060</td></tr><tr><td>5.0</td><td>5.061</td><td>5.060</td></tr><tr><td>7.0</td><td>5.060</td><td>5.060</td></tr><tr><td>9.0</td><td>5.060</td><td>5.059</td></tr><tr><td>10.0</td><td>5.060</td><td>5.059</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>			Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	4.4	5.061	5.060	4.5	5.061	5.060	4.8	5.061	5.060	5.0	5.061	5.060	7.0	5.060	5.060	9.0	5.060	5.059	10.0	5.060	5.059	--	-	-	--	-	-			
Input Voltage [V]	Output Voltage [V]																																				
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Item	Load Regulation	Temperature	25°C																																																			
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Load Current [A]	Output Voltage [V]																																																					
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**COSEL**

Model	MGS60505	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+5V1.2A	

Input Volt. 5 V  
Cycle 100 ms

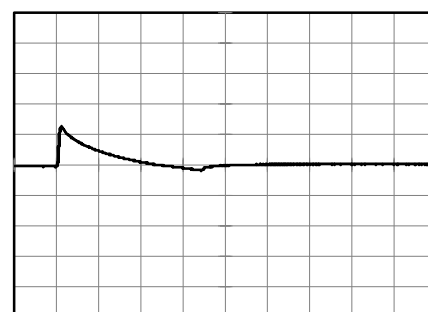
$t_1, t_2 = 100 \mu s$



Min.Load (0A) ←→  
Load 100% (1.2A)

200 mV/div

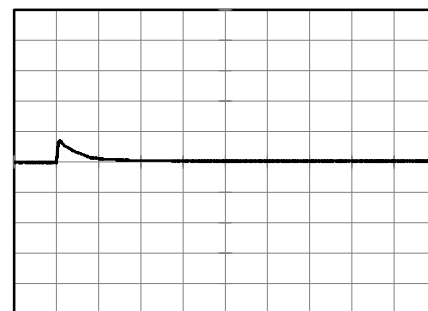
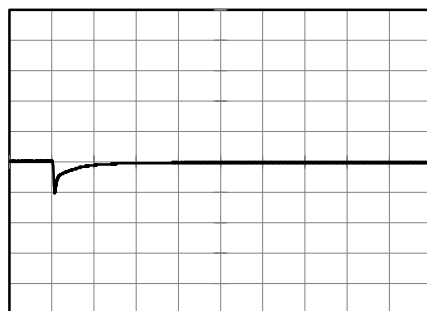
1 ms/div



Min.Load (0A) ←→  
Load 50% (0.6A)

200 mV/div

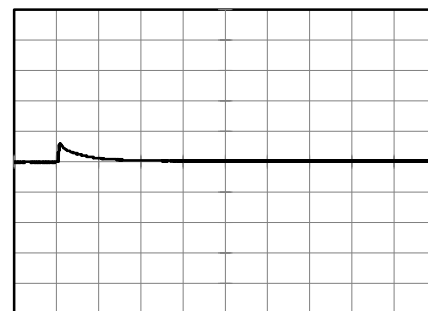
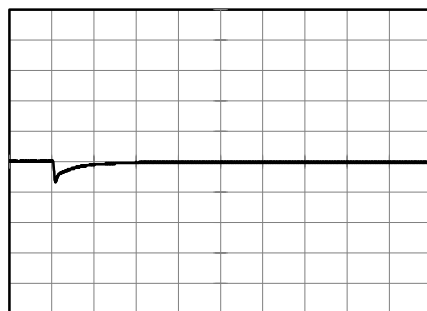
1 ms/div



Load 50% (0.6A) ←→  
Load 100% (1.2A)

200 mV/div

1 ms/div

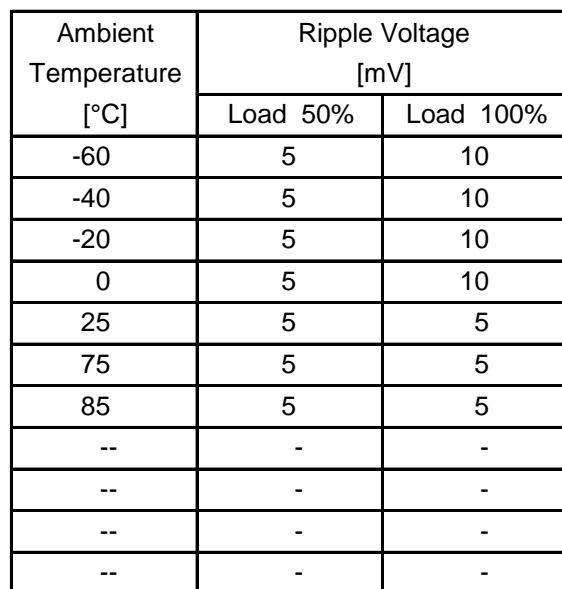


BC-11011

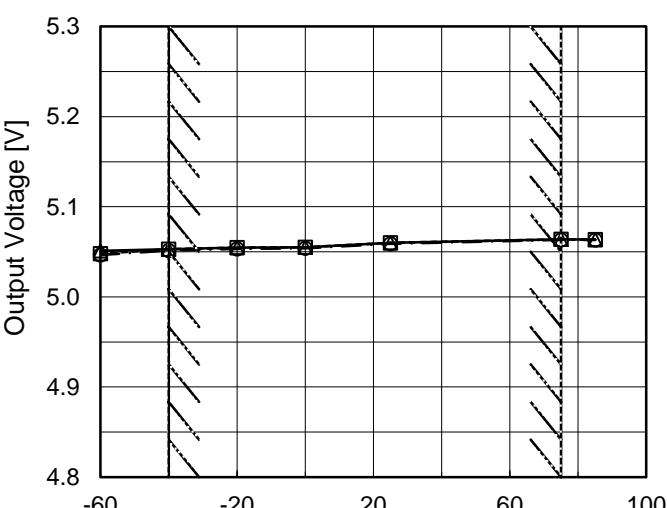
Model		MGS60505																																							
Item		Ripple-Noise																																							
Object		+5V1.2A																																							
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>4.5V</div></div><div><div>-.-○-.-</div><div>Input Volt.</div><div>9V</div></div></div> <p>Measured by 100 MHz Oscilloscope. Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p> <p>Ripple Noise[mVp-p]</p>		<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>25</td></tr><tr><td>0.24</td><td>5</td><td>5</td></tr><tr><td>0.48</td><td>5</td><td>5</td></tr><tr><td>0.72</td><td>5</td><td>5</td></tr><tr><td>0.96</td><td>10</td><td>5</td></tr><tr><td>1.20</td><td>10</td><td>5</td></tr><tr><td>1.32</td><td>10</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><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	25	0.24	5	5	0.48	5	5	0.72	5	5	0.96	10	5	1.20	10	5	1.32	10	5	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
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0.96	10	5																																							
1.20	10	5																																							
1.32	10	5																																							
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Fig.Complex Ripple Noise Wave Form																																									

Testing Circuitry    Figure B

## 2.Values



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

Model		MGS60505		
Item		Ambient Temperature Drift	Testing Circuitry    Figure A	
Object		+5V1.2A		
1.Graph				
		—△—	Input Volt.	4.5V
		---□---	Input Volt.	5V
		---○---	Input Volt.	9V
				
Output Voltage [V]				
Ambient Temperature [°C]				
Load 100%				
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	5.051	5.048	5.047
-40	5.053	5.053	5.052
-20	5.055	5.055	5.053
0	5.055	5.055	5.054
25	5.060	5.060	5.059
75	5.064	5.064	5.063
85	5.064	5.064	5.063
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

**COSEL**

		Testing Circuitry Figure A
Model	MGS60505	
Item	Output Voltage Accuracy	
Object	+5V1.2A	

### 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 - 75°C

Input Voltage : 4.5 - 9V

Load Current : 0 - 1.2A

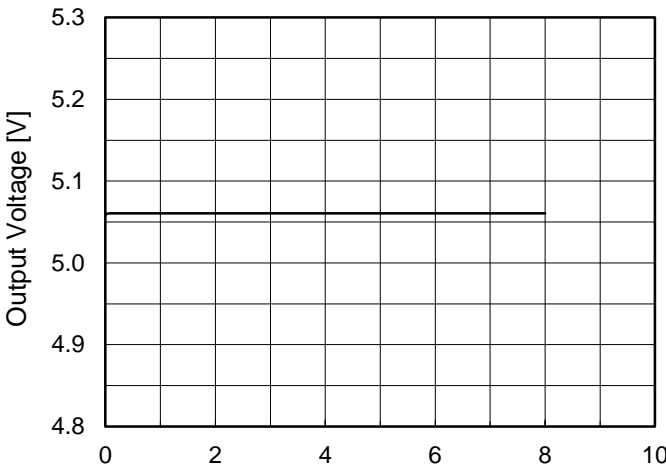
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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	75	9	0	5.069	±9	±0.2
Minimum Voltage	-40	9	1.2	5.052		



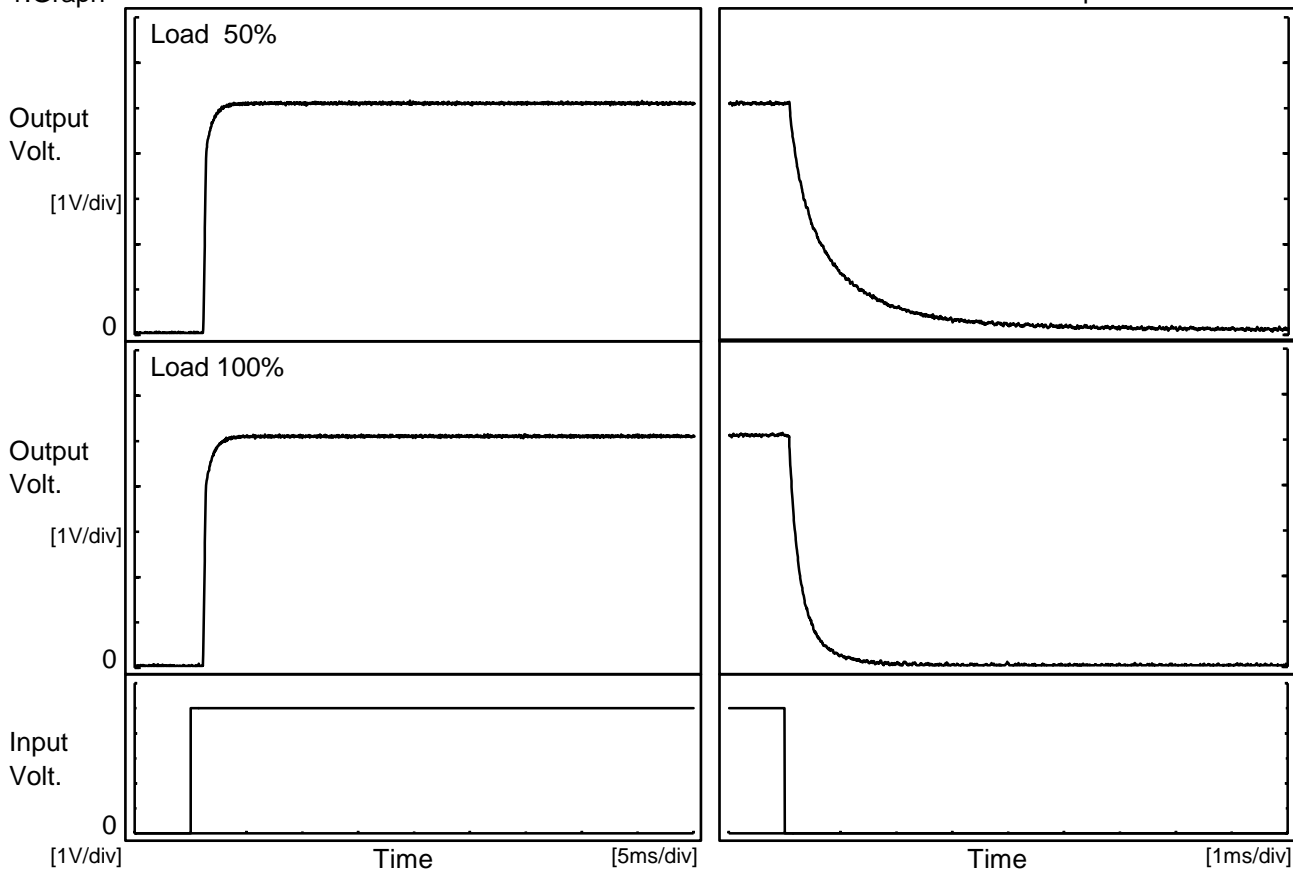
Model	MGS60505																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+5V1.2A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 5V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.058</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></table>		Time since start [H]	Output Voltage [V]	0.0	5.058	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]																								
0.0	5.058																								
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																								



# COSEL

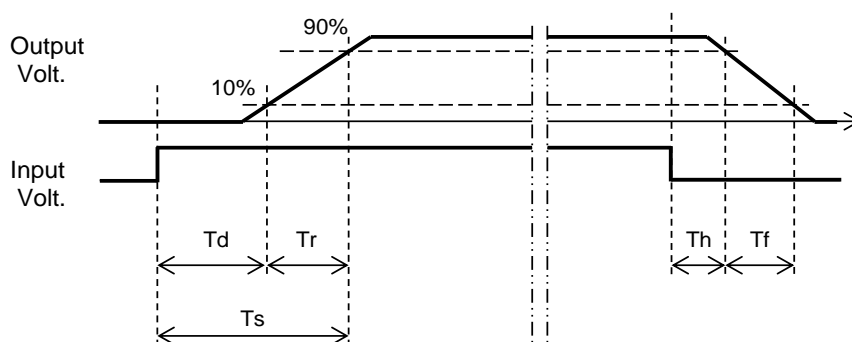
Model	MGS60505	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V1.2A		

## 1.Graph



## 2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.2	0.6	1.8	0.1	2.1
100 %	1.2	0.6	1.8	0.1	0.6



1. Graph

Input Voltage [V]

Ambient Temperature [°C]

Load 50% (dashed line with square markers)

Load 100% (solid line with triangle markers)

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

Testing Circuitry Figure A

## 2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.8	3.8
-40	3.8	3.8
-20	3.8	3.8
0	3.7	3.8
25	3.7	3.8
75	3.7	3.8
85	3.7	3.7
--	-	-
--	-	-
--	-	-
--	-	-

Model		MGS60505		Temperature		25°C																																																								
Item		Overcurrent Protection		Testing Circuitry		Figure A																																																								
Object		+5V1.2A																																																												
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>1.24</td><td>1.24</td><td>1.24</td></tr><tr><td>4.75</td><td>1.55</td><td>1.55</td><td>1.64</td></tr><tr><td>4.50</td><td>1.59</td><td>1.59</td><td>1.66</td></tr><tr><td>4.00</td><td>1.66</td><td>1.66</td><td>1.71</td></tr><tr><td>3.50</td><td>1.74</td><td>1.73</td><td>1.76</td></tr><tr><td>3.00</td><td>1.82</td><td>1.81</td><td>1.82</td></tr><tr><td>2.50</td><td>1.89</td><td>1.87</td><td>1.89</td></tr><tr><td>2.00</td><td>1.96</td><td>1.97</td><td>1.96</td></tr><tr><td>1.50</td><td>2.07</td><td>2.07</td><td>2.03</td></tr><tr><td>1.00</td><td>2.19</td><td>2.19</td><td>2.11</td></tr><tr><td>0.50</td><td>2.29</td><td>2.28</td><td>2.17</td></tr><tr><td>0.00</td><td>2.36</td><td>2.34</td><td>2.08</td></tr></table>				Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	5.00	1.24	1.24	1.24	4.75	1.55	1.55	1.64	4.50	1.59	1.59	1.66	4.00	1.66	1.66	1.71	3.50	1.74	1.73	1.76	3.00	1.82	1.81	1.82	2.50	1.89	1.87	1.89	2.00	1.96	1.97	1.96	1.50	2.07	2.07	2.03	1.00	2.19	2.19	2.11	0.50	2.29	2.28	2.17	0.00	2.36	2.34	2.08
Output Voltage [V]	Load Current [A]																																																													
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]																																																											
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Model

MGS60505

Item

Switching Frequency (by Load Current)

Object

+5V1.2A

1.Graph

—△—

Input Volt.

4.5V

---□---

Input Volt.

5V

-·-○-·-

Input Volt.

9V

Switching Frequency [kHz]

10000

1000

100

0.0

0.3

0.6

0.9

1.2

1.5

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.

2.Values

Load Current [A]	Frequency [kHz]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	1479	1658	1589
0.24	847	888	1087
0.48	559	595	782
0.72	414	447	610
0.96	327	356	502
1.20	269	294	424
1.32	247	271	392
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--	-	-	-

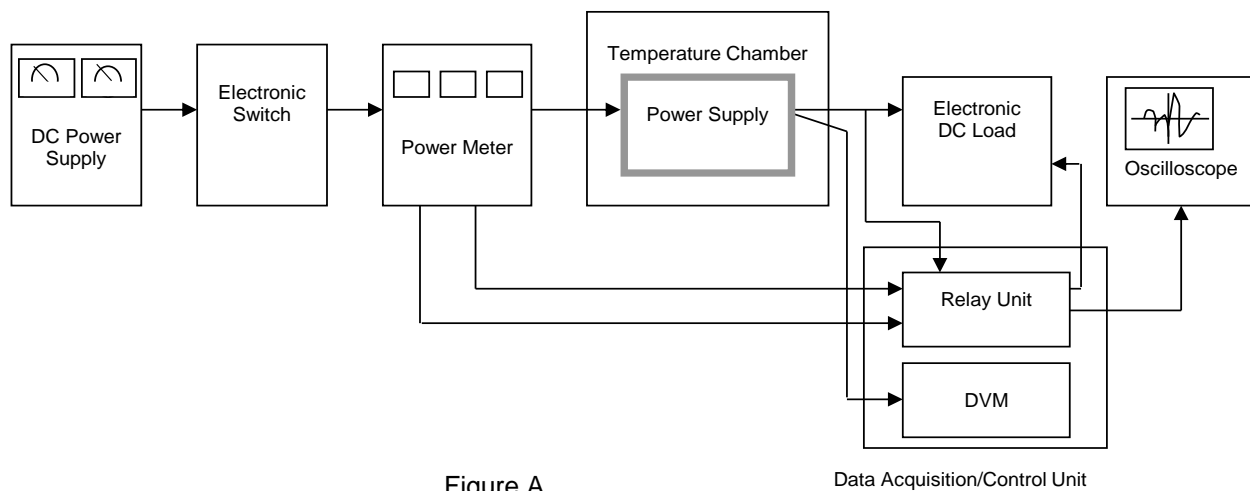


Figure A

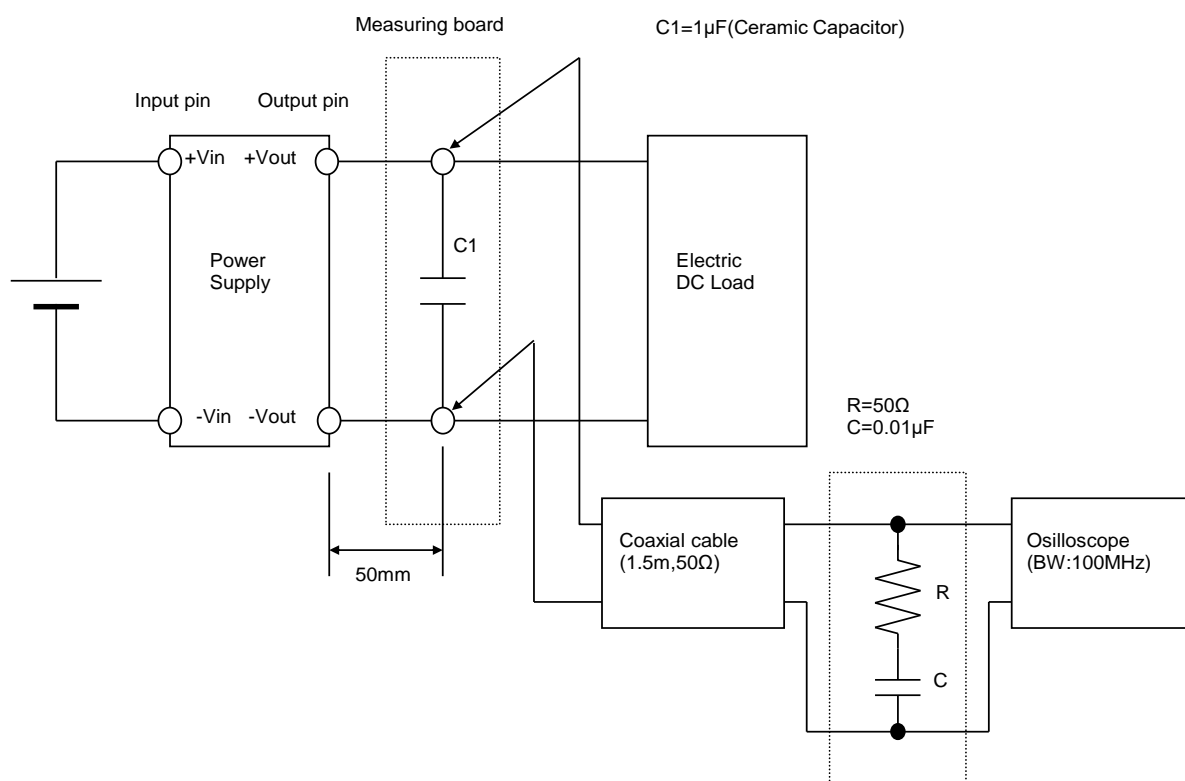


Figure B (Ripple and Ripple noise Characteristic)