



TEST DATA OF MGS100512

Regulated DC Power Supply
August 5, 2016

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COSEL CO.,LTD.

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(Final Page 19)

Model

MGS100512

Item

Input Current (by Input Voltage)

Object

1.Graph

—△—

Load 100%

---□---

Load 50%

-○-

Load 0%

Input Current [A]

4

3

2

1

0

0

3

6

9

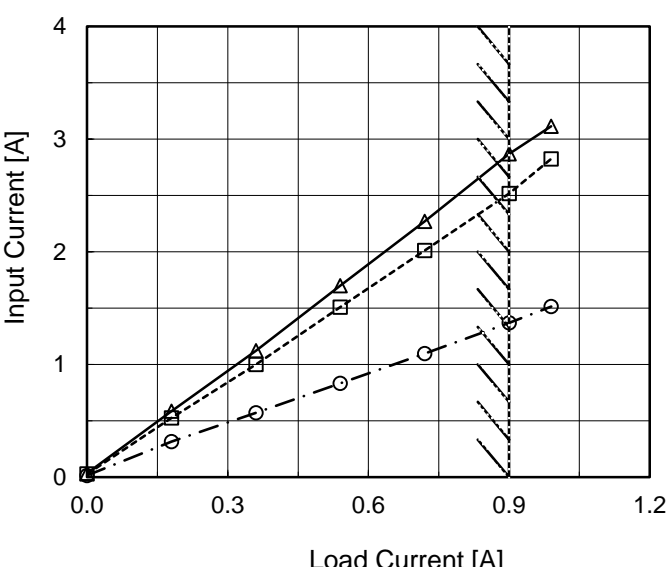
12

Input Voltage [V]

Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
3.0	0.002	0.002	0.001
3.8	0.001	0.002	0.003
3.9	0.003	0.003	0.002
4.0	0.045	1.555	2.036
4.1	0.041	1.509	3.099
4.2	0.039	1.470	3.019
4.3	0.038	1.432	2.937
4.5	0.033	1.369	2.870
5.0	0.027	1.225	2.519
6.0	0.021	1.030	2.042
7.0	0.017	0.885	1.758
8.0	0.016	0.775	1.531
9.0	0.015	0.696	1.368
10.0	0.012	0.632	1.217
--	-	-	-
--	-	-	-
--	-	-	-

Model		MGS100512		Temperature 25°C																																																				
Item		Input Current (by Load Current)		Testing Circuitry Figure A																																																				
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1.Graph		<div><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></div> 		2.Values																																																				
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Object	+12V0.9A	Testing Circuitry	Figure A																				
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Output Voltage [V]

12.6

12.4

12.2

12.0

11.8

11.6

3

6

9

12

Input Voltage [V]

Note: Slanted line shows the range of the rated input voltage.

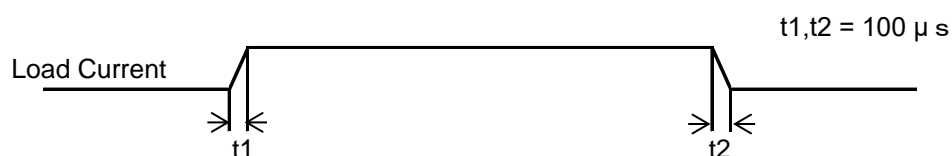


Model		MGS100512		Temperature 25°C																																																						
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COSEL

Model	MGS100512	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+12V0.9A	

Input Volt. 5 V
Cycle 100 ms



Min.Load (0A) ←→
Load 100% (0.9A)

500 mV/div

2 ms/div

2 ms/div

Min.Load (0A) ←→
Load 50% (0.45A)

500 mV/div

2 ms/div

2 ms/div

Load 50% (0.45A) ←→
Load 100% (0.9A)

500 mV/div

2 ms/div

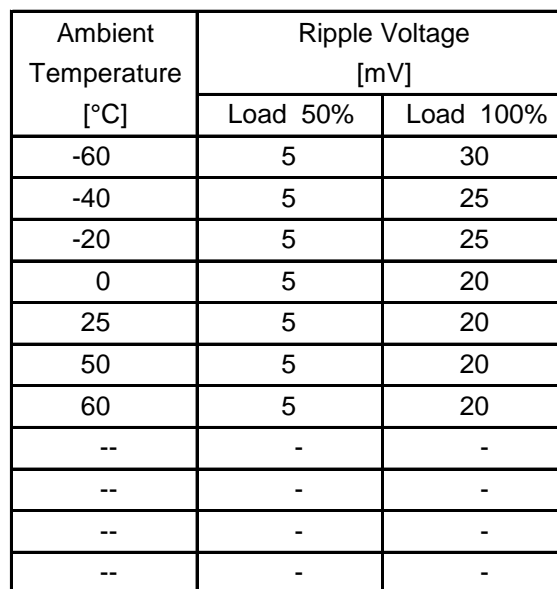
2 ms/div

Model		MGS100512		Temperature 25°C																																							
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Object		+12V0.9A																																									
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<p>Measured by 100 MHz Oscilloscope.</p> <p>Ripple Voltage 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>Ripple [mVp-p]</div><div></div></div><div>Fig.Complex Ripple Wave Form</div></div>																																											

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Object		+12V0.9A																																							
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 4.5V</div><div>- -○- - Input Volt. 9V</div></div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div> <div><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><p>Ripple Noise[mVp-p]</p><p>Fig.Complex Ripple Noise Wave Form</p></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>20</td><td>55</td></tr><tr><td>0.18</td><td>10</td><td>20</td></tr><tr><td>0.36</td><td>10</td><td>15</td></tr><tr><td>0.54</td><td>15</td><td>20</td></tr><tr><td>0.72</td><td>20</td><td>20</td></tr><tr><td>0.90</td><td>30</td><td>20</td></tr><tr><td>0.99</td><td>40</td><td>20</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	20	55	0.18	10	20	0.36	10	15	0.54	15	20	0.72	20	20	0.90	30	20	0.99	40	20	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 4.5 [V]	Input Volt. 9 [V]																																							
0.00	20	55																																							
0.18	10	20																																							
0.36	10	15																																							
0.54	15	20																																							
0.72	20	20																																							
0.90	30	20																																							
0.99	40	20																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
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Testing Circuitry Figure B

2.Values



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

Model		MGS100512																																																			
Item		Ambient Temperature Drift																																																			
Object		+12V0.9A																																																			
1.Graph		<div><div><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></div><p>Output Voltage [V]</p><p>Ambient Temperature [°C]</p><p>Load 100%</p><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div>																																																			
2.Values		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</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>-60</td><td>11.965</td><td>11.968</td><td>11.967</td></tr><tr><td>-40</td><td>12.001</td><td>12.003</td><td>12.003</td></tr><tr><td>-20</td><td>12.026</td><td>12.027</td><td>12.028</td></tr><tr><td>0</td><td>12.045</td><td>12.046</td><td>12.046</td></tr><tr><td>25</td><td>12.062</td><td>12.062</td><td>12.061</td></tr><tr><td>50</td><td>12.066</td><td>12.066</td><td>12.067</td></tr><tr><td>60</td><td>12.066</td><td>12.066</td><td>12.067</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>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	-60	11.965	11.968	11.967	-40	12.001	12.003	12.003	-20	12.026	12.027	12.028	0	12.045	12.046	12.046	25	12.062	12.062	12.061	50	12.066	12.066	12.067	60	12.066	12.066	12.067	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																				
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]																																																		
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0	12.045	12.046	12.046																																																		
25	12.062	12.062	12.061																																																		
50	12.066	12.066	12.067																																																		
60	12.066	12.066	12.067																																																		
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		Testing Circuitry Figure A
Model	MGS100512	
Item	Output Voltage Accuracy	
Object	+12V0.9A	

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 - 50°C

Input Voltage : 4.5 - 9V

Load Current : 0 - 0.9A

* 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	50	4.5	0	12.074	±37	±0.3
Minimum Voltage	-40	4.5	0.9	12.001		

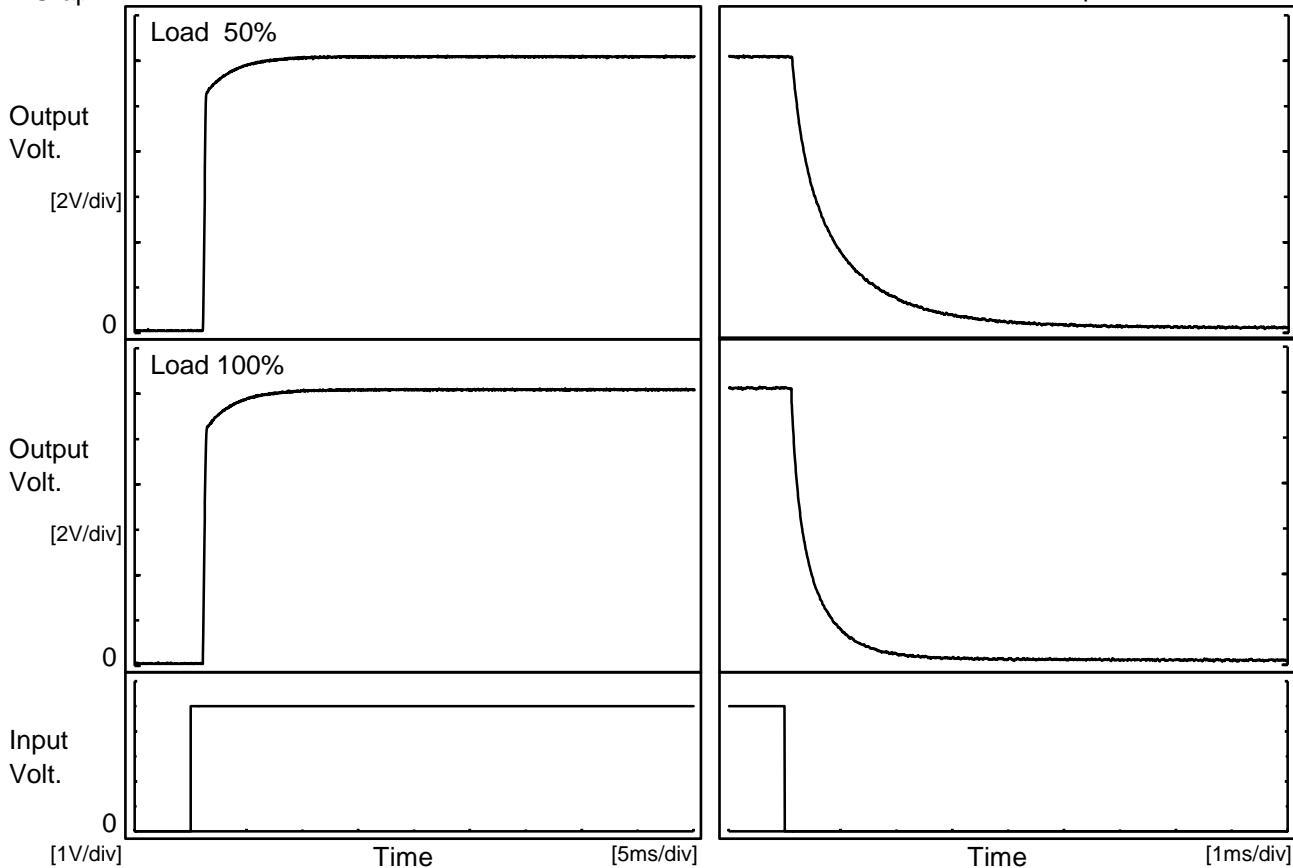


Model		MGS100512	Temperature25°C Testing CircuitryFigure A
Item		Time Lapse Drift	
Object		+12V0.9A	
1.Graph			2.Values
<div><div><div><div><div>12.6</div><div>12.4</div><div>12.2</div><div>12.0</div><div>11.8</div><div>11.6</div></div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></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></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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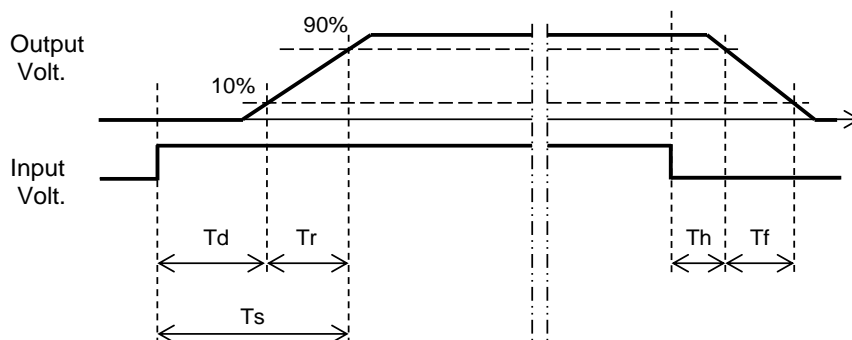
Model	MGS100512	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V0.9A		

1.Graph



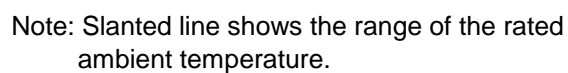
2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.2	0.8	2.0	0.2	2.1
100 %	1.2	0.9	2.1	0.1	1.0

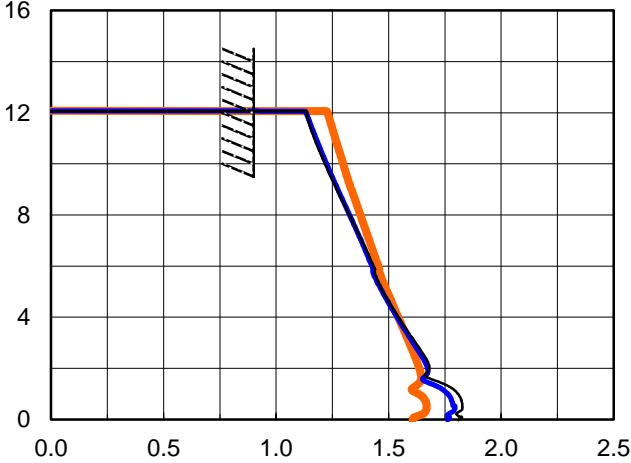


Testing Circuitry Figure A

2.Values



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

Model		MGS100512		Temperature 25°C																																																								
Item		Overcurrent Protection		Testing Circuitry Figure A																																																								
Object		+12V0.9A																																																										
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																																																								
<div><div>Output Voltage [V]</div><div></div><div><div>Load Current [A]</div></div><div>Note: Slanted line shows the range of the rated load current.</div></div>				<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>12.0</td><td>0.92</td><td>0.92</td><td>0.92</td></tr><tr><td>11.4</td><td>1.15</td><td>1.16</td><td>1.25</td></tr><tr><td>10.8</td><td>1.18</td><td>1.19</td><td>1.27</td></tr><tr><td>9.6</td><td>1.24</td><td>1.24</td><td>1.31</td></tr><tr><td>8.4</td><td>1.30</td><td>1.31</td><td>1.36</td></tr><tr><td>7.2</td><td>1.37</td><td>1.37</td><td>1.40</td></tr><tr><td>6.0</td><td>1.43</td><td>1.42</td><td>1.45</td></tr><tr><td>4.8</td><td>1.49</td><td>1.48</td><td>1.50</td></tr><tr><td>3.6</td><td>1.57</td><td>1.56</td><td>1.56</td></tr><tr><td>2.4</td><td>1.67</td><td>1.65</td><td>1.62</td></tr><tr><td>1.2</td><td>1.78</td><td>1.73</td><td>1.60</td></tr><tr><td>0.0</td><td>1.81</td><td>1.76</td><td>1.61</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	12.0	0.92	0.92	0.92	11.4	1.15	1.16	1.25	10.8	1.18	1.19	1.27	9.6	1.24	1.24	1.31	8.4	1.30	1.31	1.36	7.2	1.37	1.37	1.40	6.0	1.43	1.42	1.45	4.8	1.49	1.48	1.50	3.6	1.57	1.56	1.56	2.4	1.67	1.65	1.62	1.2	1.78	1.73	1.60	0.0	1.81	1.76	1.61
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Model		MGS100512	Temperature		25°C																																																			
Item		Switching Frequency (by Load Current)	Testing Circuitry		Figure A																																																			
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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>5V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>9V</div></div></div> <div><div>Switching Frequency [kHz]</div><div><div>10000</div><div>1000</div><div>100</div></div><div><div>0.0</div><div>0.2</div><div>0.4</div><div>0.6</div><div>0.8</div><div>1.0</div><div>1.2</div></div><div>Load Current [A]</div></div> <div><div>Note: Slanted line shows the range of the rated load current.</div><div>When load current is low, MG operates intermittently, so switching frequency would not become constant.</div></div>			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Frequency [kHz]</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>1597</td><td>1289</td><td>1596</td></tr><tr><td>0.18</td><td>712</td><td>751</td><td>923</td></tr><tr><td>0.36</td><td>471</td><td>504</td><td>662</td></tr><tr><td>0.54</td><td>347</td><td>376</td><td>517</td></tr><tr><td>0.72</td><td>271</td><td>297</td><td>423</td></tr><tr><td>0.90</td><td>220</td><td>244</td><td>358</td></tr><tr><td>0.99</td><td>200</td><td>223</td><td>332</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]	Frequency [kHz]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	0.00	1597	1289	1596	0.18	712	751	923	0.36	471	504	662	0.54	347	376	517	0.72	271	297	423	0.90	220	244	358	0.99	200	223	332	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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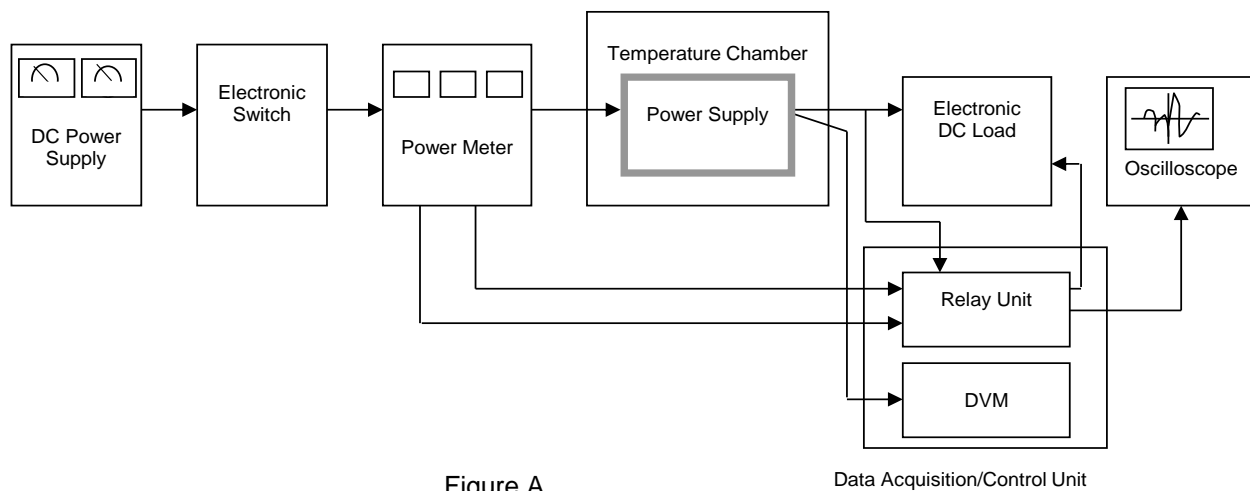


Figure A

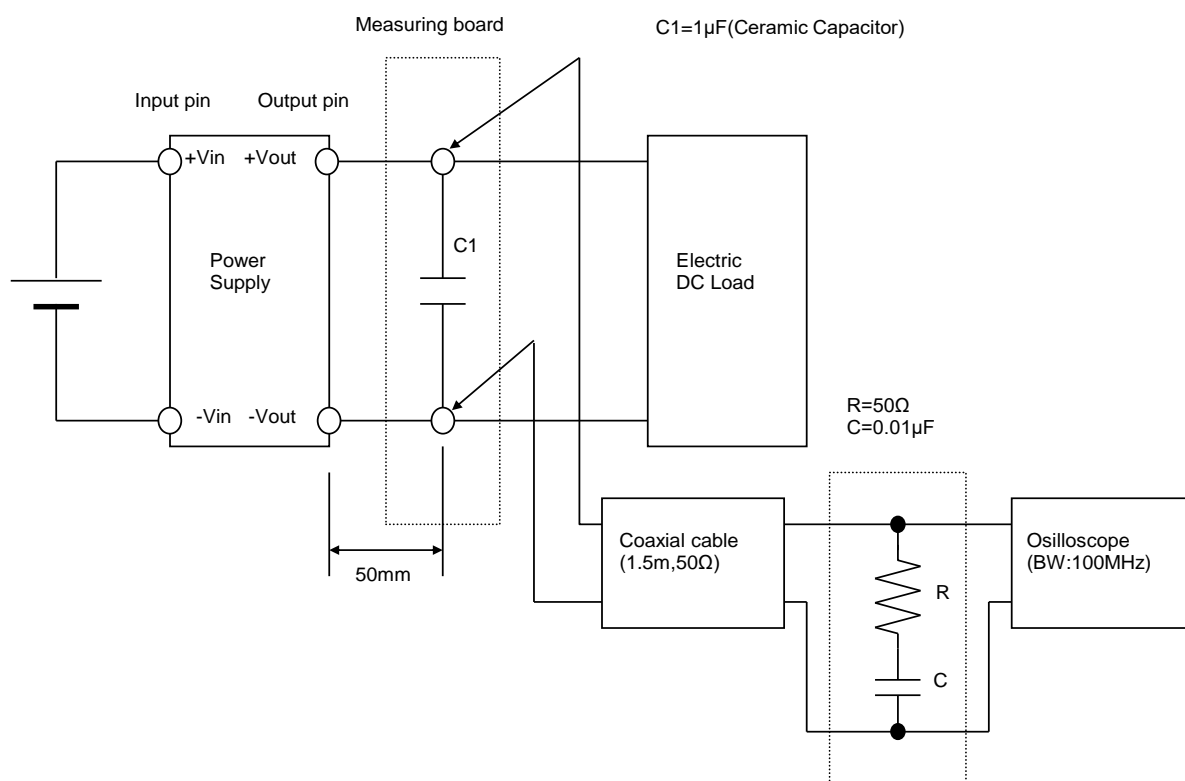


Figure B (Ripple and Ripple noise Characteristic)