



TEST DATA OF MGS31205

Regulated DC Power Supply
March 24, 2016

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Shohei Mukaide
Shohei Mukaide Design Engineer

COSEL CO.,LTD.

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Model		MGS31205	Temperature		25°C																																																																															
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			<table><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><tr><td>0.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>6.0</td><td>0.003</td><td>0.002</td><td>0.003</td></tr><tr><td>7.8</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>8.0</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>8.2</td><td>0.003</td><td>0.003</td><td>0.003</td></tr><tr><td>8.4</td><td>0.014</td><td>0.219</td><td>0.443</td></tr><tr><td>8.6</td><td>0.014</td><td>0.214</td><td>0.432</td></tr><tr><td>9.0</td><td>0.013</td><td>0.204</td><td>0.405</td></tr><tr><td>10.0</td><td>0.012</td><td>0.183</td><td>0.369</td></tr><tr><td>12.0</td><td>0.006</td><td>0.153</td><td>0.304</td></tr><tr><td>14.0</td><td>0.005</td><td>0.131</td><td>0.260</td></tr><tr><td>16.0</td><td>0.004</td><td>0.115</td><td>0.227</td></tr><tr><td>18.0</td><td>0.004</td><td>0.103</td><td>0.202</td></tr><tr><td>20.0</td><td>0.004</td><td>0.093</td><td>0.182</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>			Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0.0	0.000	0.000	0.000	6.0	0.003	0.002	0.003	7.8	0.003	0.003	0.003	8.0	0.003	0.003	0.003	8.2	0.003	0.003	0.003	8.4	0.014	0.219	0.443	8.6	0.014	0.214	0.432	9.0	0.013	0.204	0.405	10.0	0.012	0.183	0.369	12.0	0.006	0.153	0.304	14.0	0.005	0.131	0.260	16.0	0.004	0.115	0.227	18.0	0.004	0.103	0.202	20.0	0.004	0.093	0.182	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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<div><div>Input Current [A]</div><div><div>0.60</div><div>0.45</div><div>0.30</div><div>0.15</div><div>0.00</div><div>0.0</div><div>0.2</div><div>0.4</div><div>0.6</div><div>0.8</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>0.00</td><td>0.013</td><td>0.006</td><td>0.004</td></tr><tr><td>0.12</td><td>0.089</td><td>0.070</td><td>0.055</td></tr><tr><td>0.24</td><td>0.167</td><td>0.127</td><td>0.092</td></tr><tr><td>0.36</td><td>0.248</td><td>0.186</td><td>0.130</td></tr><tr><td>0.48</td><td>0.330</td><td>0.246</td><td>0.168</td></tr><tr><td>0.60</td><td>0.405</td><td>0.304</td><td>0.202</td></tr><tr><td>0.66</td><td>0.458</td><td>0.339</td><td>0.227</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 Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.00	0.013	0.006	0.004	0.12	0.089	0.070	0.055	0.24	0.167	0.127	0.092	0.36	0.248	0.186	0.130	0.48	0.330	0.246	0.168	0.60	0.405	0.304	0.202	0.66	0.458	0.339	0.227	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Item	Dynamic Load Response	
Object	+5V0.6A	

Input Volt. 12 V
Cycle 1000 ms



Min.Load (0A) \longleftrightarrow
Load 100% (0.6A)

200 mV/div

100 μ s/div

200 μ s/div

Min.Load (0A) \longleftrightarrow
Load 50% (0.3A)

200 mV/div

100 μ s/div

200 μ s/div

Load 50% (0.3A) \longleftrightarrow
Load 100% (0.6A)

200 mV/div

100 μ s/div

200 μ s/div

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Model	MGS31205	Temperature 25°C Testing Circuitry Figure B																																							
Item	Ripple Voltage (by Load Current)																																								
Object	+5V0.6A																																								
1.Graph		2.Values																																							
<div><div><div><div></div></div><div>Input Volt.</div><div>9V</div></div><div><div><div></div></div><div>Input Volt.</div><div>18V</div></div></div> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 9 [V]</th><th>Input Volt. 18 [V]</th></tr><tr><td>0.00</td><td>5</td><td>10</td></tr><tr><td>0.12</td><td>10</td><td>10</td></tr><tr><td>0.24</td><td>25</td><td>10</td></tr><tr><td>0.36</td><td>35</td><td>20</td></tr><tr><td>0.48</td><td>55</td><td>40</td></tr><tr><td>0.60</td><td>80</td><td>45</td></tr><tr><td>0.66</td><td>85</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. 9 [V]	Input Volt. 18 [V]	0.00	5	10	0.12	10	10	0.24	25	10	0.36	35	20	0.48	55	40	0.60	80	45	0.66	85	50	--	-	-	--	-	-	--	-	-	--	-	-
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<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>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

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Model		MGS31205	Testing Circuitry Figure B
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Object		+5V0.6A	
1.Graph			2.Values
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Model		MGS31205	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+5V0.6A	

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 : 9 - 18V

Load Current : 0 - 0.6A

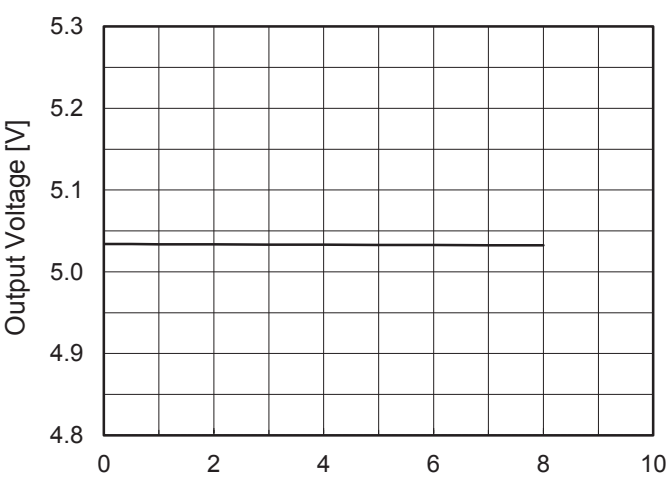
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

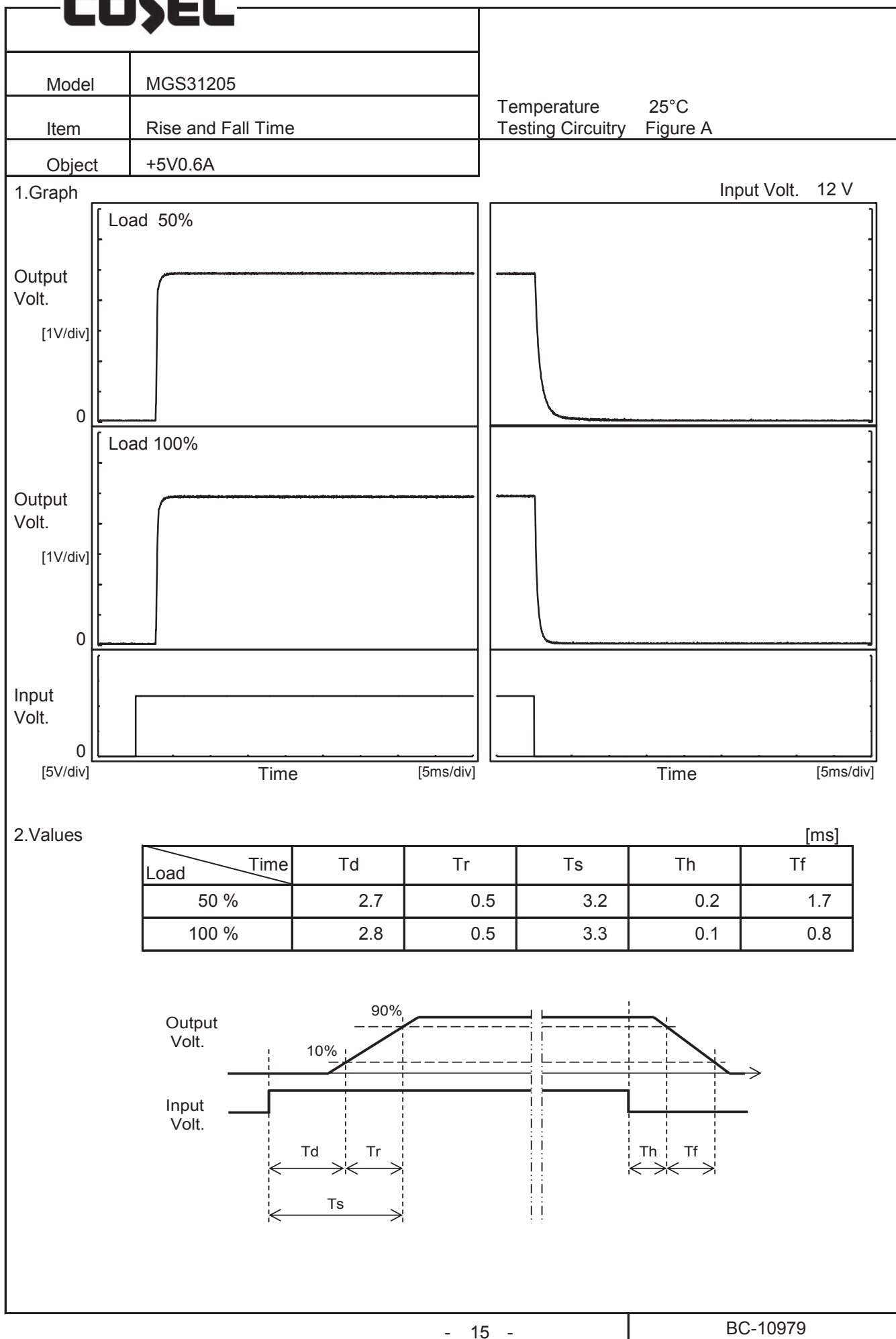
* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	18	0	5.039	±15	±0.3
Minimum Voltage	-40	9	0.6	5.009		

COSEL

Model	MGS31205																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+5V0.6A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 12V</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>5.034</td></tr><tr><td>0.5</td><td>5.034</td></tr><tr><td>1.0</td><td>5.034</td></tr><tr><td>2.0</td><td>5.034</td></tr><tr><td>3.0</td><td>5.033</td></tr><tr><td>4.0</td><td>5.033</td></tr><tr><td>5.0</td><td>5.033</td></tr><tr><td>6.0</td><td>5.033</td></tr><tr><td>7.0</td><td>5.033</td></tr><tr><td>8.0</td><td>5.032</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.034	0.5	5.034	1.0	5.034	2.0	5.034	3.0	5.033	4.0	5.033	5.0	5.033	6.0	5.033	7.0	5.033	8.0	5.032
Time since start [H]	Output Voltage [V]																								
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COSEL

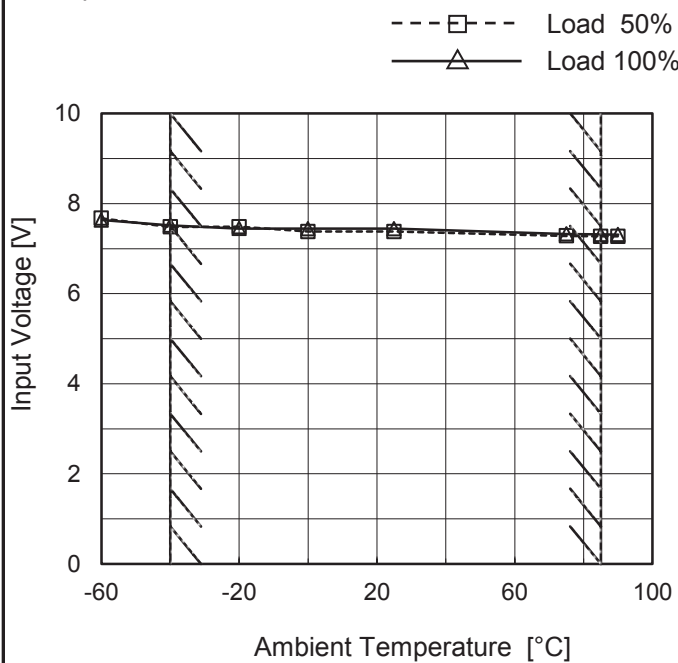
Model MGS31205

Item Minimum Input Voltage
for Regulated Output Voltage

Object +5V0.6A

Testing Circuitry Figure A

1. Graph

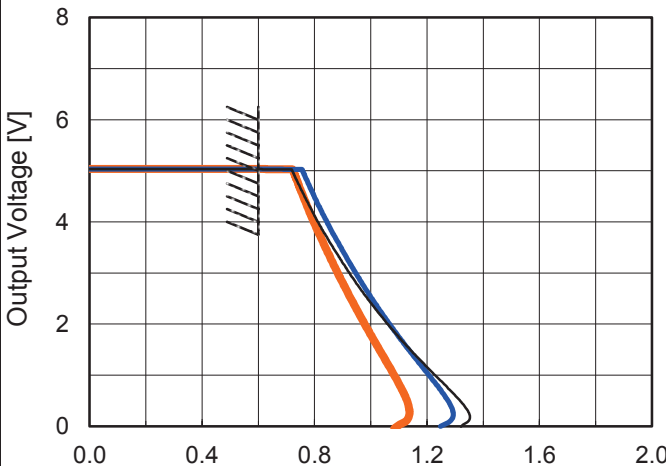


Note: Slanted line shows the range of the rated ambient temperature.

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	7.7	7.7
-40	7.5	7.6
-20	7.5	7.5
0	7.4	7.5
25	7.4	7.5
75	7.3	7.4
85	7.3	7.4
90	7.3	7.4
--	-	-
--	-	-
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COSEL

Model		MGS31205	Temperature		25°C																																																							
Item		Overcurrent Protection	Testing Circuitry		Figure A																																																							
Object		+5V0.6A																																																										
1.Graph			2.Values																																																									
<div><div><div></div><div>Input Volt.</div><div>9V</div></div><div><div></div><div>Input Volt.</div><div>12V</div></div><div><div></div><div>Input Volt.</div><div>18V</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. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>5.00</td><td>0.60</td><td>0.60</td><td>0.60</td></tr><tr><td>4.75</td><td>0.74</td><td>0.78</td><td>0.74</td></tr><tr><td>4.50</td><td>0.76</td><td>0.80</td><td>0.76</td></tr><tr><td>4.00</td><td>0.81</td><td>0.84</td><td>0.80</td></tr><tr><td>3.50</td><td>0.87</td><td>0.89</td><td>0.84</td></tr><tr><td>3.00</td><td>0.92</td><td>0.95</td><td>0.88</td></tr><tr><td>2.50</td><td>0.99</td><td>1.00</td><td>0.93</td></tr><tr><td>2.00</td><td>1.06</td><td>1.07</td><td>0.98</td></tr><tr><td>1.50</td><td>1.14</td><td>1.13</td><td>1.03</td></tr><tr><td>1.00</td><td>1.23</td><td>1.20</td><td>1.08</td></tr><tr><td>0.50</td><td>1.32</td><td>1.27</td><td>1.13</td></tr><tr><td>0.00</td><td>1.32</td><td>1.25</td><td>1.08</td></tr></table>			Output Voltage [V]	Load Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	5.00	0.60	0.60	0.60	4.75	0.74	0.78	0.74	4.50	0.76	0.80	0.76	4.00	0.81	0.84	0.80	3.50	0.87	0.89	0.84	3.00	0.92	0.95	0.88	2.50	0.99	1.00	0.93	2.00	1.06	1.07	0.98	1.50	1.14	1.13	1.03	1.00	1.23	1.20	1.08	0.50	1.32	1.27	1.13	0.00	1.32	1.25	1.08
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Model		MGS31205	Temperature		25°C																																																			
Item		Switching frequency (by Load Current)	Testing Circuitry		Figure A																																																			
Object		+5V0.6A																																																						
1.Graph		<div><div>—△—</div>Input Volt. 9V</div> <div><div>---□---</div>Input Volt. 12V</div> <div><div>-·-○-·-</div>Input Volt. 18V</div> <p>Oscillator Frequency [KHz]</p> <p>Load Current [A]</p>	2.Values																																																					
			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Frequency [kHz]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>0.00</td><td>640</td><td>694</td><td>780</td></tr><tr><td>0.12</td><td>467</td><td>527</td><td>591</td></tr><tr><td>0.24</td><td>365</td><td>422</td><td>489</td></tr><tr><td>0.36</td><td>298</td><td>353</td><td>415</td></tr><tr><td>0.48</td><td>253</td><td>303</td><td>362</td></tr><tr><td>0.60</td><td>219</td><td>265</td><td>322</td></tr><tr><td>0.66</td><td>208</td><td>251</td><td>311</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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.00	640	694	780	0.12	467	527	591	0.24	365	422	489	0.36	298	353	415	0.48	253	303	362	0.60	219	265	322	0.66	208	251	311	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Frequency [kHz]																																																							
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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.																																																								

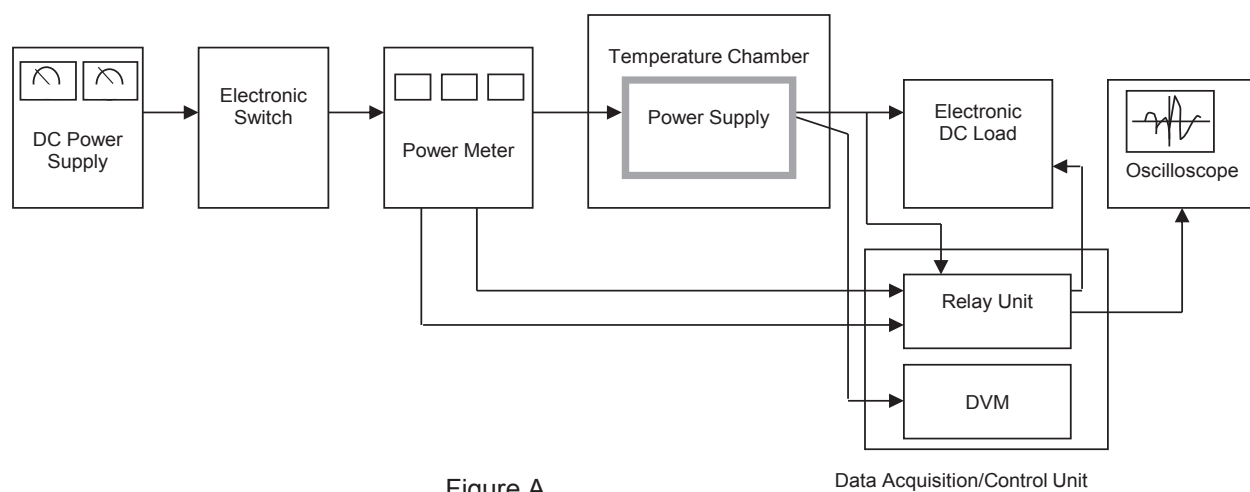


Figure A

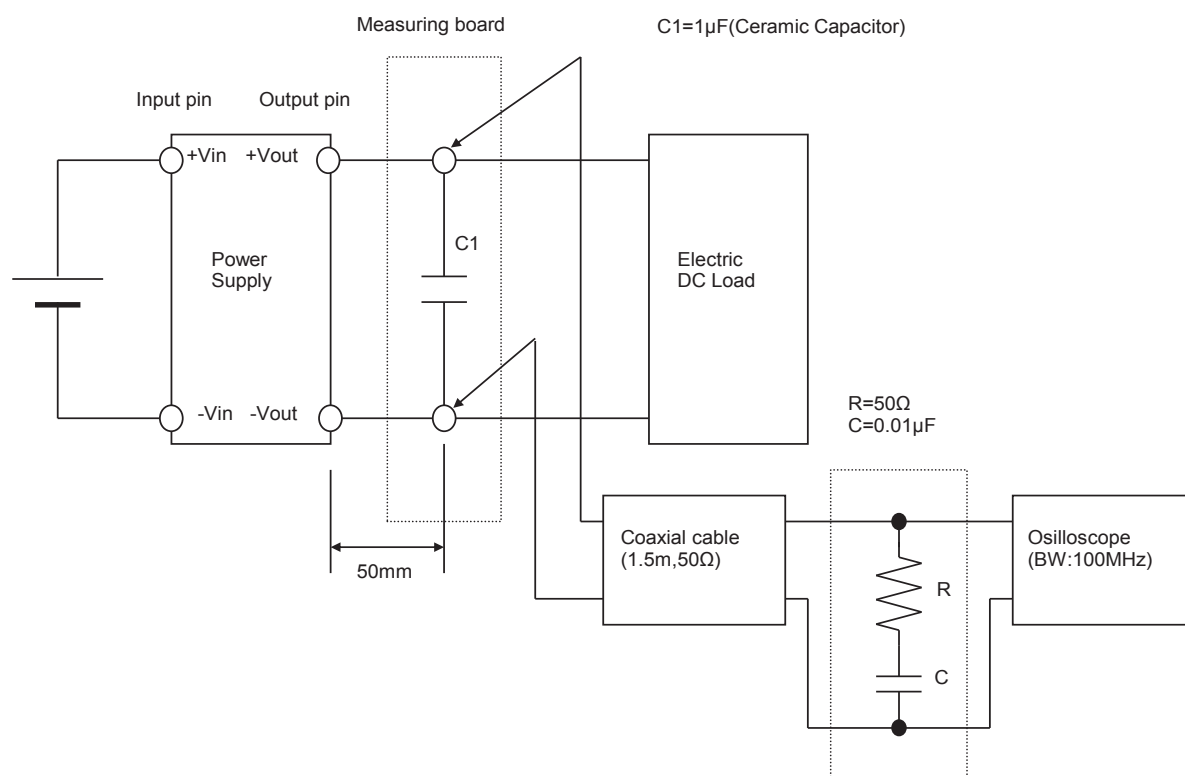


Figure B (Ripple and Ripple noise Characteristic)