

# TEST DATA OF MGW151215

Regulated DC Power Supply

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**COSEL CO.,LTD.**

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1.Graph		<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> <div><div>Input Current [A]</div><div>Load Ratio [%]</div></div>		2.Values																																																				
		<table><tr><th rowspan="2">Load Ration [%]</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</td><td>0.055</td><td>0.042</td><td>0.029</td></tr><tr><td>20</td><td>0.415</td><td>0.318</td><td>0.217</td></tr><tr><td>40</td><td>0.773</td><td>0.590</td><td>0.394</td></tr><tr><td>60</td><td>1.143</td><td>0.856</td><td>0.580</td></tr><tr><td>80</td><td>1.516</td><td>1.126</td><td>0.748</td></tr><tr><td>100</td><td>1.887</td><td>1.408</td><td>0.943</td></tr><tr><td>110</td><td>2.085</td><td>1.552</td><td>1.026</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 Ration [%]	Input Current [A]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0	0.055	0.042	0.029	20	0.415	0.318	0.217	40	0.773	0.590	0.394	60	1.143	0.856	0.580	80	1.516	1.126	0.748	100	1.887	1.408	0.943	110	2.085	1.552	1.026	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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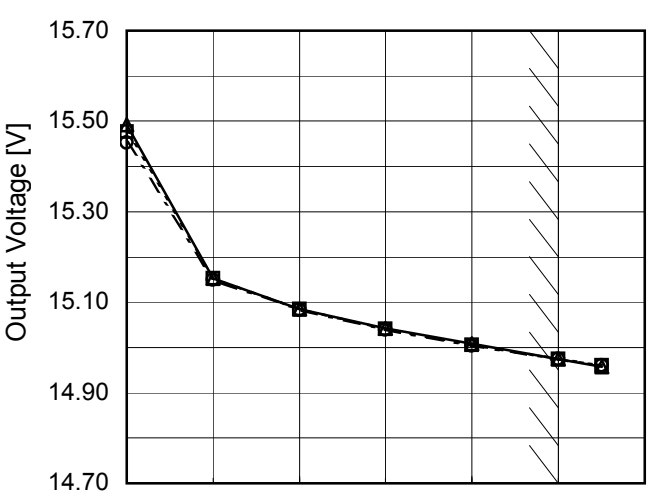
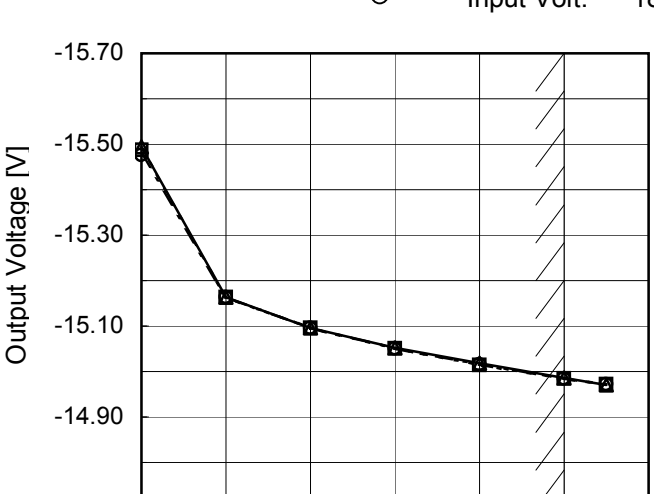
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<div><div>—△— Input Volt. 9V</div><div>---□--- Input Volt. 12V</div><div>-·-○-·- Input Volt. 18V</div></div> 		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>0.000</td><td>-15.495</td><td>-15.487</td><td>-15.476</td></tr><tr><td>0.100</td><td>-15.163</td><td>-15.164</td><td>-15.164</td></tr><tr><td>0.200</td><td>-15.095</td><td>-15.095</td><td>-15.096</td></tr><tr><td>0.300</td><td>-15.052</td><td>-15.050</td><td>-15.050</td></tr><tr><td>0.400</td><td>-15.018</td><td>-15.015</td><td>-15.015</td></tr><tr><td>0.500</td><td>-14.986</td><td>-14.985</td><td>-14.985</td></tr><tr><td>0.550</td><td>-14.970</td><td>-14.971</td><td>-14.972</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]	Output Voltage [V]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.000	-15.495	-15.487	-15.476	0.100	-15.163	-15.164	-15.164	0.200	-15.095	-15.095	-15.096	0.300	-15.052	-15.050	-15.050	0.400	-15.018	-15.015	-15.015	0.500	-14.986	-14.985	-14.985	0.550	-14.970	-14.971	-14.972	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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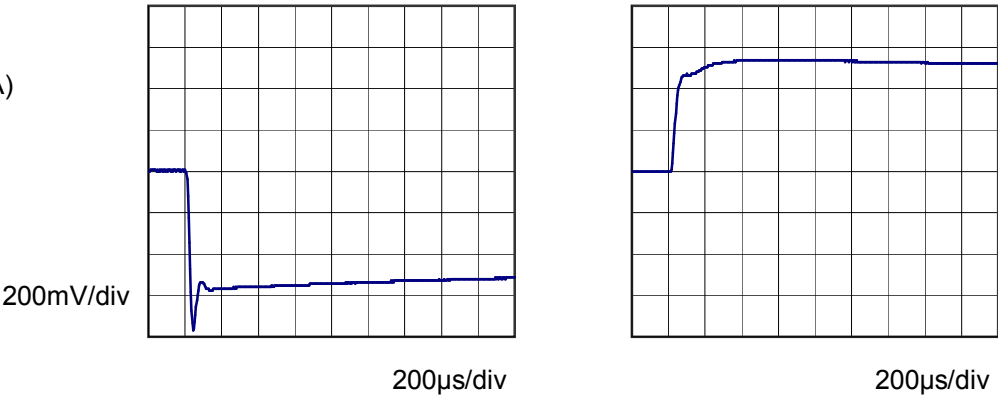


Model		MGW151215	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		+15V0.5A	

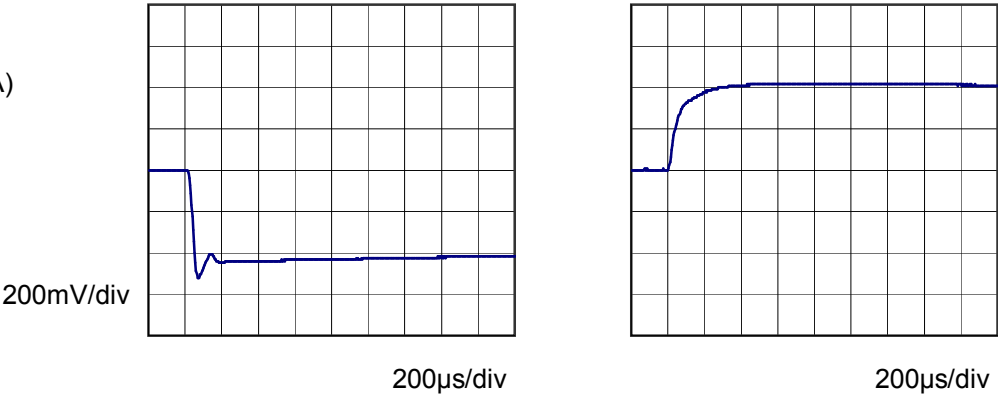
Input Volt. 12 V  
Other output current rated  
Cycle 1000 ms  $t_1, t_2 = 50\mu\text{s}$



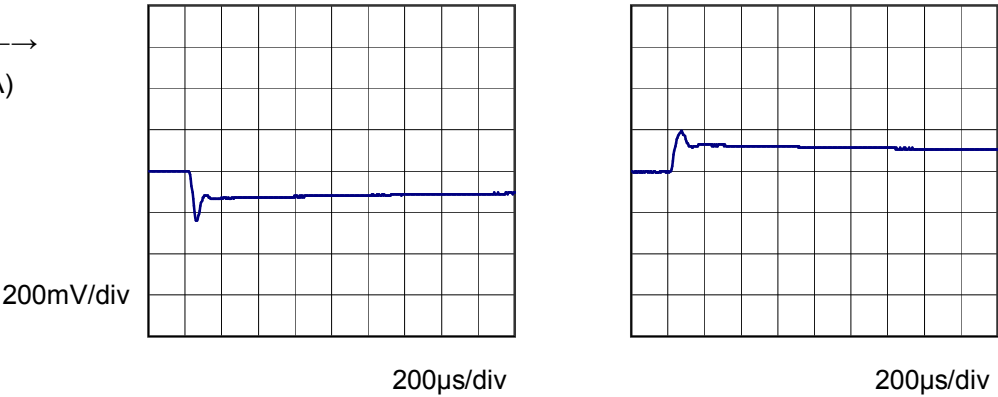
Min. Load (0A)  $\longleftrightarrow$   
Load 100% (0.5A)



Min. Load (0A)  $\longleftrightarrow$   
Load 50% (0.25A)



Load 50% (0.25A)  $\longleftrightarrow$   
Load 100% (0.5A)



# COSEL

Model	MGW151215	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	-15V0.5A	

Input Volt. 12 V

Other output current rated

Cycle 1000 ms

 $t_1, t_2 = 50\mu\text{s}$ 

Load Current

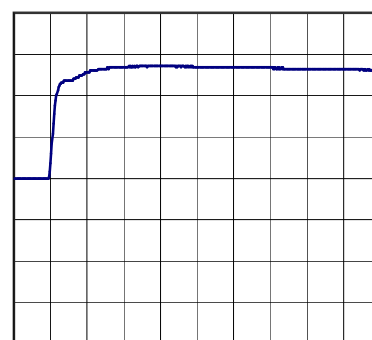
Min. Load (0A)  $\longleftrightarrow$ 

Load 100% (0.5A)

200mV/div



200μs/div

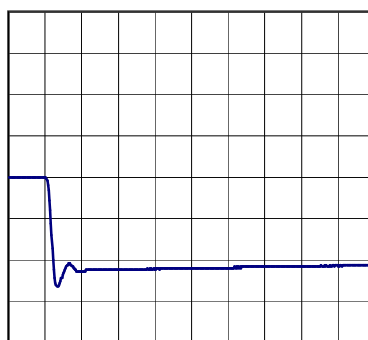


200μs/div

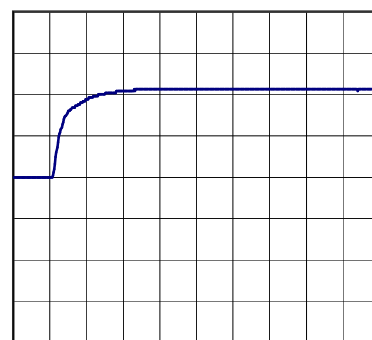
Min. Load (0A)  $\longleftrightarrow$ 

Load 50% (0.25A)

200mV/div



200μs/div

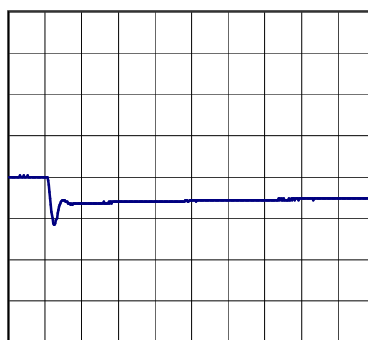


200μs/div

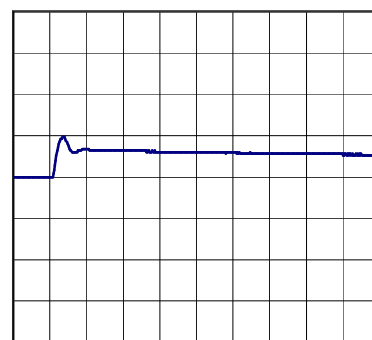
Load 50% (0.25A)  $\longleftrightarrow$ 

Load 100% (0.5A)

200mV/div



200μs/div



200μs/div

Model	MGW151215																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
		Testing Circuitry	Figure B																																						
Object	+15V0.5A																																								
1.Graph		2.Values																																							
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Load Current [A]	Ripple Voltage [mV]																																								
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0.00	7	8																																							
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<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

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Model		MGW151215																																							
Item		Ripple Voltage (by Load Current)																																							
Object		-15V0.5A																																							
1.Graph		2.Values																																							
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Load Current [A]	Ripple Voltage [mV]																																								
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BC-10461

Model		MGW151215																																							
Item		Ripple-Noise																																							
Object		+15V0.5A																																							
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Model	MGW151215																																								
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Model	MGW151215																																								
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Object	+15V0.5A																																								
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Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.																																									

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Model	MGW151215																																																						
Item	Ambient Temperature Drift	Testing Circuitry    Figure A																																																					
Object	+15V0.5A																																																						
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-60	14.899	14.901	14.903																																																				
-40	14.927	14.929	14.930																																																				
-20	14.947	14.949	14.949																																																				
0	14.962	14.964	14.964																																																				
25	14.974	14.975	14.976																																																				
60	14.980	14.981	14.982																																																				
65	14.980	14.981	14.981																																																				
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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>---○---</div></div><div><div>Input Volt.</div><div>Input Volt.</div><div>Input Volt.</div></div><div><div>9V</div><div>12V</div><div>18V</div></div></div><div><p>Output Voltage [V]</p><p>Ambient Temperature [°C]</p><p>Load 100%</p></div></div>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>-60</td><td>-14.905</td><td>-14.907</td><td>-14.908</td></tr><tr><td>-40</td><td>-14.934</td><td>-14.935</td><td>-14.937</td></tr><tr><td>-20</td><td>-14.956</td><td>-14.957</td><td>-14.958</td></tr><tr><td>0</td><td>-14.973</td><td>-14.973</td><td>-14.974</td></tr><tr><td>25</td><td>-14.986</td><td>-14.986</td><td>-14.987</td></tr><tr><td>60</td><td>-14.995</td><td>-14.994</td><td>-14.994</td></tr><tr><td>65</td><td>-14.994</td><td>-14.994</td><td>-14.994</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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	-60	-14.905	-14.907	-14.908	-40	-14.934	-14.935	-14.937	-20	-14.956	-14.957	-14.958	0	-14.973	-14.973	-14.974	25	-14.986	-14.986	-14.987	60	-14.995	-14.994	-14.994	65	-14.994	-14.994	-14.994	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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60	-14.995	-14.994	-14.994																																																				
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Note: Slanted line shows the range of the rated ambient temperature.																																																							



Model	MGW151215	
Item	Output Voltage Accuracy	

Testing Circuitry Figure A

## 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 : 9 - 18V

Load Current (AVR 1) : 0 - 0.5A (AVR 2) : 0 - 0.5A

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

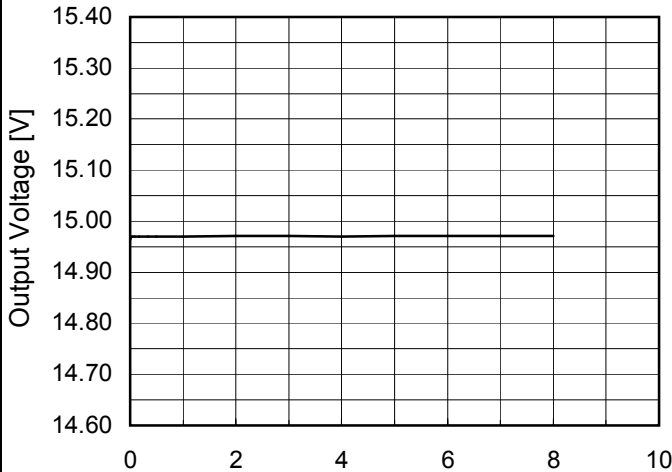
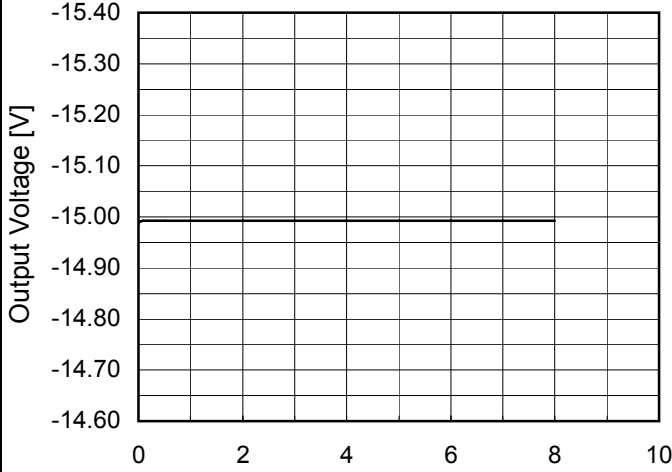
\* Output Voltage Accuracy (Ration) =  $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

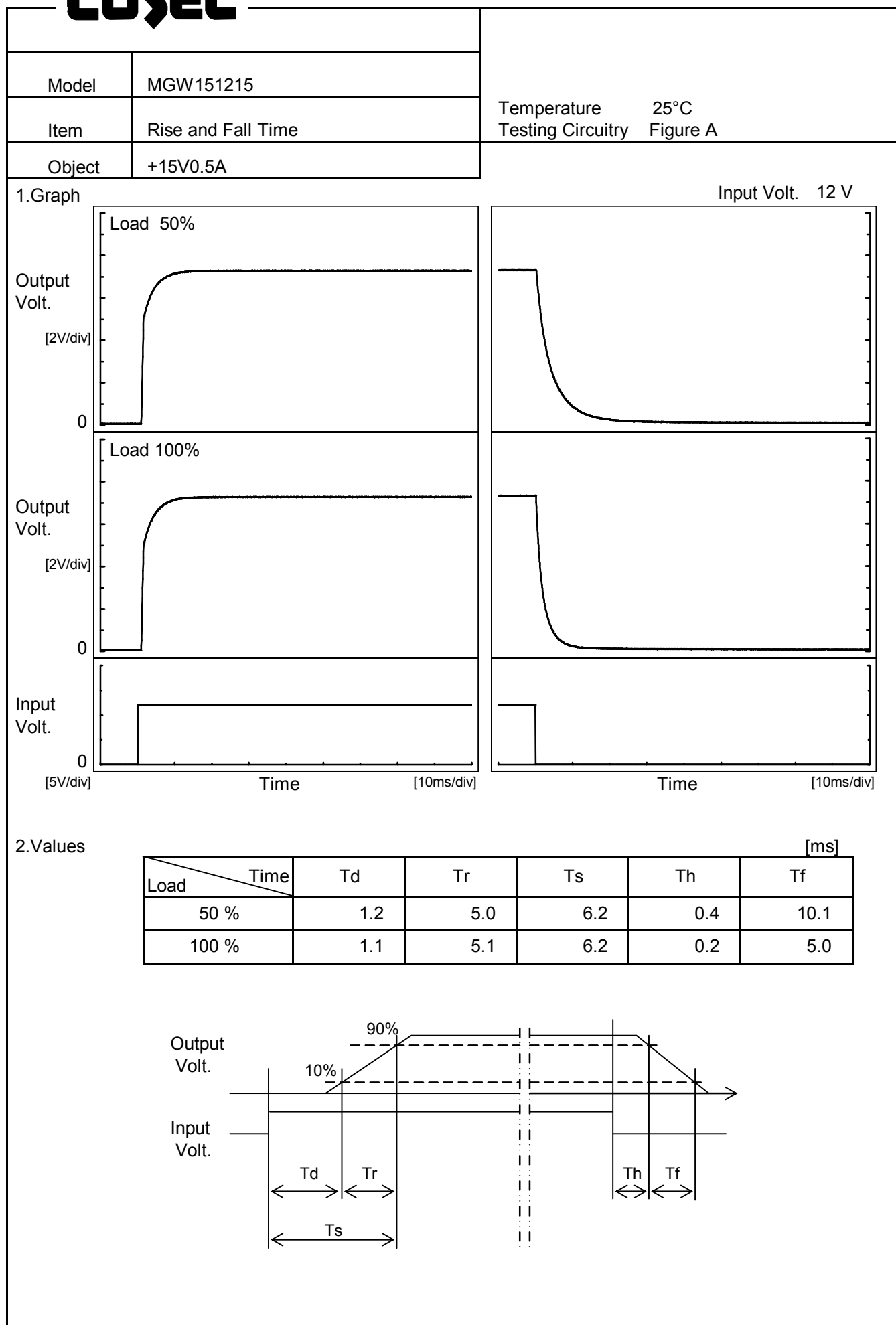
## 2. Values

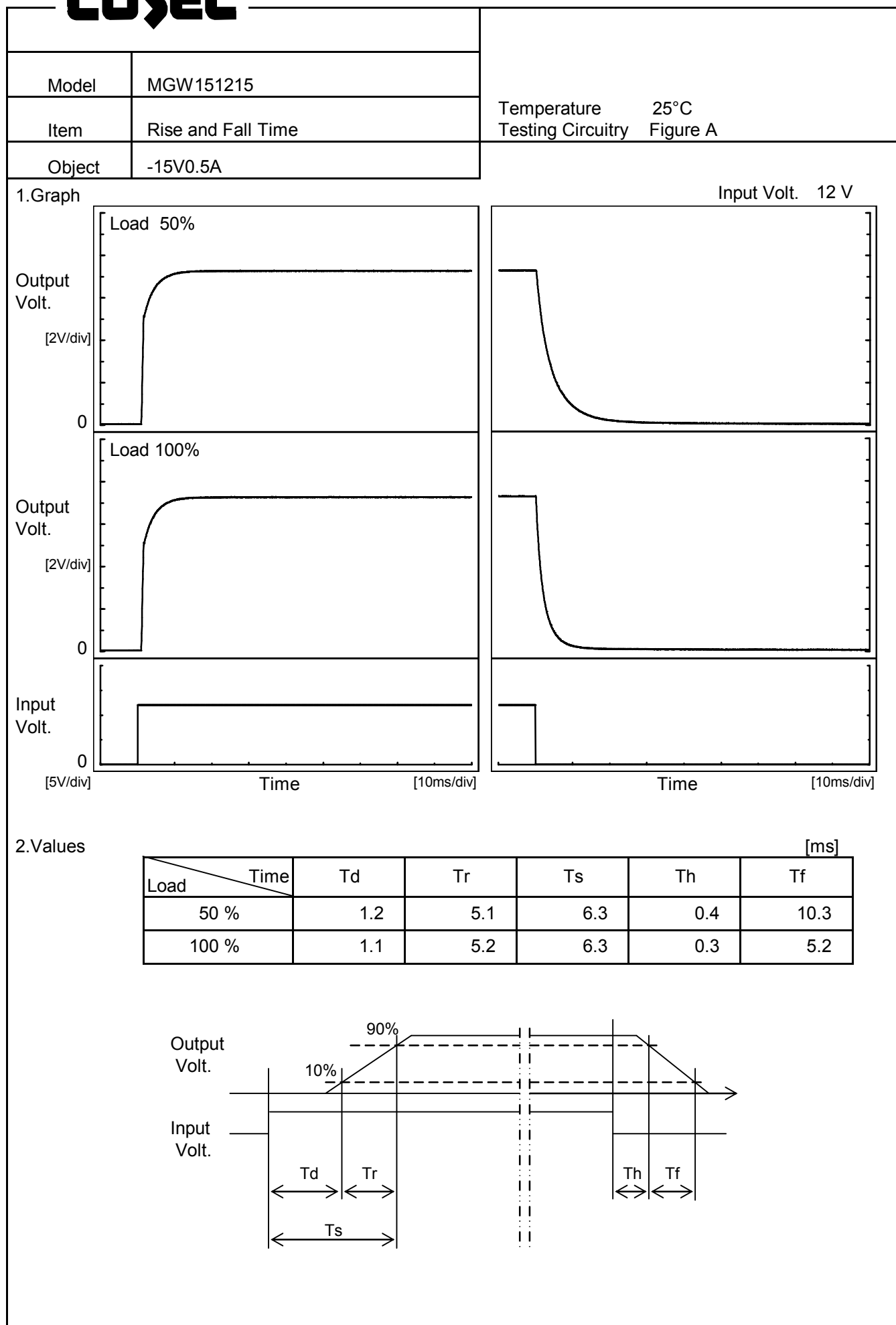
Object	+15V0.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	9	0	15.497	±285	±1.9
Minimum Voltage	-40	9	0.5	14.927		

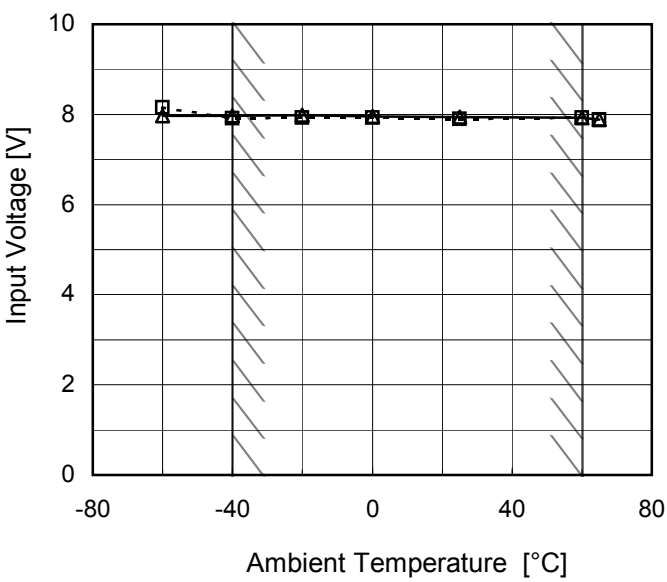
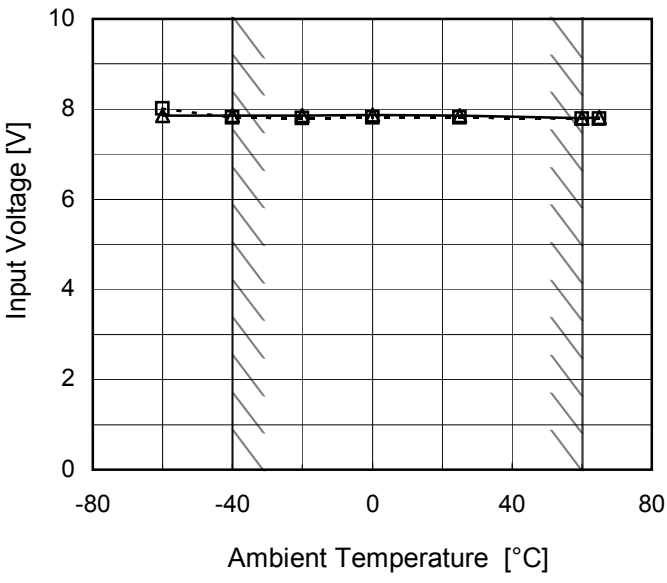
Object	-15V0.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	9	0	-15.507	±287	±1.9
Minimum Voltage	-40	9	0.5	-14.934		

# COSEL

Model	MGW151215																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+15V0.5A	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>14.964</td></tr><tr><td>0.5</td><td>14.971</td></tr><tr><td>1.0</td><td>14.970</td></tr><tr><td>2.0</td><td>14.971</td></tr><tr><td>3.0</td><td>14.971</td></tr><tr><td>4.0</td><td>14.971</td></tr><tr><td>5.0</td><td>14.971</td></tr><tr><td>6.0</td><td>14.971</td></tr><tr><td>7.0</td><td>14.971</td></tr><tr><td>8.0</td><td>14.971</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	14.964	0.5	14.971	1.0	14.970	2.0	14.971	3.0	14.971	4.0	14.971	5.0	14.971	6.0	14.971	7.0	14.971	8.0	14.971
Time since start [H]	Output Voltage [V]																								
0.0	14.964																								
0.5	14.971																								
1.0	14.970																								
2.0	14.971																								
3.0	14.971																								
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5.0	14.971																								
6.0	14.971																								
7.0	14.971																								
8.0	14.971																								
Object -15V0.5A		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>-14.986</td></tr><tr><td>0.5</td><td>-14.992</td></tr><tr><td>1.0</td><td>-14.992</td></tr><tr><td>2.0</td><td>-14.993</td></tr><tr><td>3.0</td><td>-14.993</td></tr><tr><td>4.0</td><td>-14.993</td></tr><tr><td>5.0</td><td>-14.993</td></tr><tr><td>6.0</td><td>-14.993</td></tr><tr><td>7.0</td><td>-14.993</td></tr><tr><td>8.0</td><td>-14.993</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	-14.986	0.5	-14.992	1.0	-14.992	2.0	-14.993	3.0	-14.993	4.0	-14.993	5.0	-14.993	6.0	-14.993	7.0	-14.993	8.0	-14.993
Time since start [H]	Output Voltage [V]																								
0.0	-14.986																								
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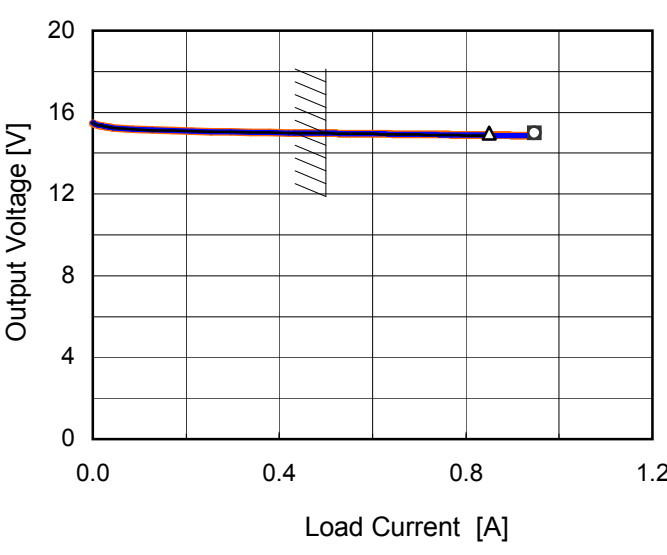
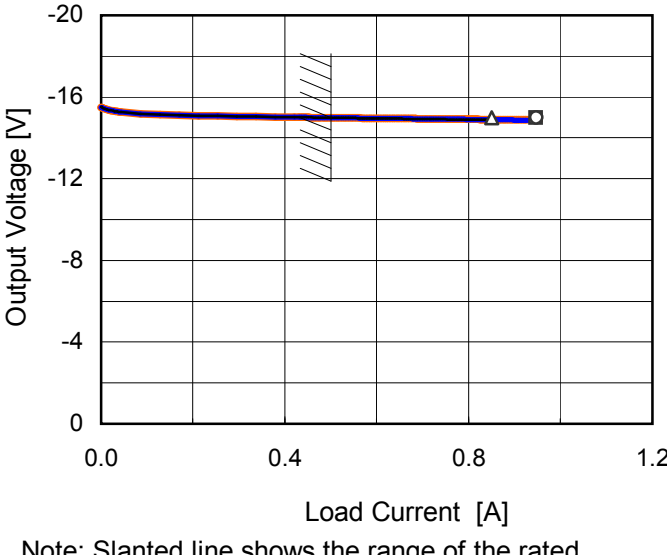




Model	MGW151215	Testing Circuitry    Figure A																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																								
Object	+15V0.5A																																								
1.Graph		2.Values																																							
<div><div>---□---    Load 50%</div><div>—△—       Load 100%</div></div>		<table><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><tr><td>-60</td><td>8.2</td><td>8.0</td></tr><tr><td>-40</td><td>8.0</td><td>8.0</td></tr><tr><td>-20</td><td>8.0</td><td>8.0</td></tr><tr><td>0</td><td>8.0</td><td>8.0</td></tr><tr><td>25</td><td>7.9</td><td>8.0</td></tr><tr><td>60</td><td>8.0</td><td>8.0</td></tr><tr><td>65</td><td>7.9</td><td>7.9</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>		Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-60	8.2	8.0	-40	8.0	8.0	-20	8.0	8.0	0	8.0	8.0	25	7.9	8.0	60	8.0	8.0	65	7.9	7.9	--	-	-	--	-	-	--	-	-	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.																																									

- 20 -

BC-10461

Model	MGW151215																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+15V0.5A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
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Note: Slanted line shows the range of the rated load current.																																																										
Intermittent operation occurs when overcurrent protection is activated.																																																										

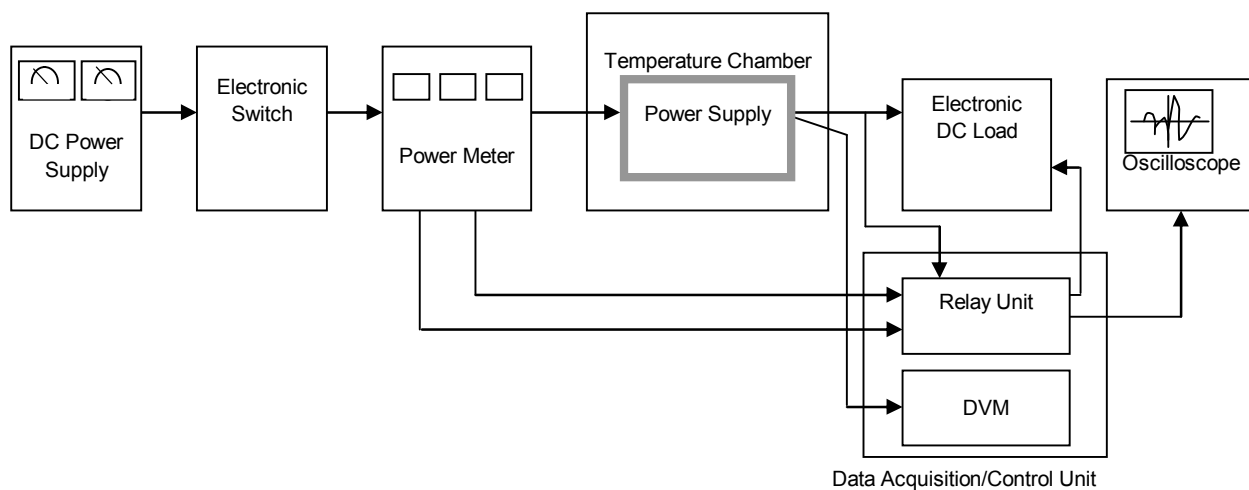


Figure A

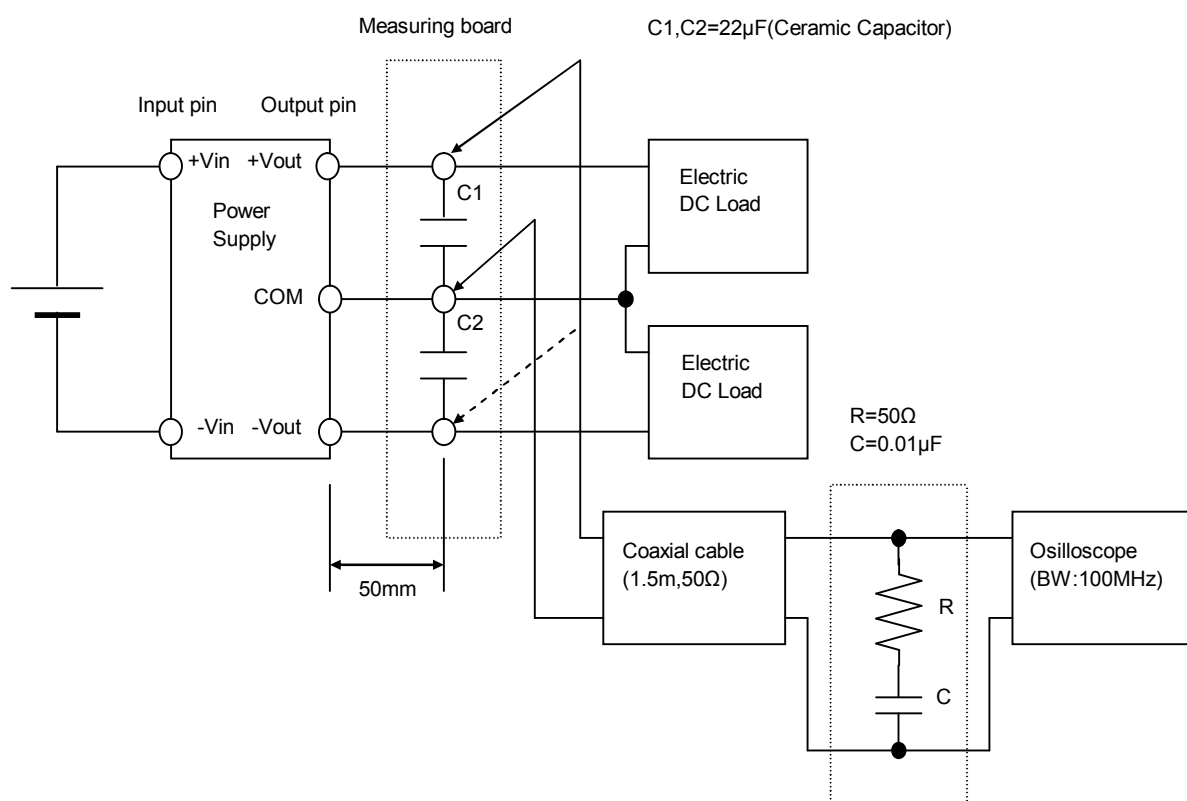


Figure B (Ripple and Ripple noise Characteristic)