

TEST DATA OF MGW30515

Regulated DC Power Supply
October 25, 2016

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Takayuki Fukuda Design Manager

Prepared by : Takaaki Sekiguchi
Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

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Model		MGW30515		Temperature		25°C																																																																																
Item		Input Current (by Input Voltage)		Testing Circuitry		Figure A																																																																																
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1.Graph				2.Values																																																																																		
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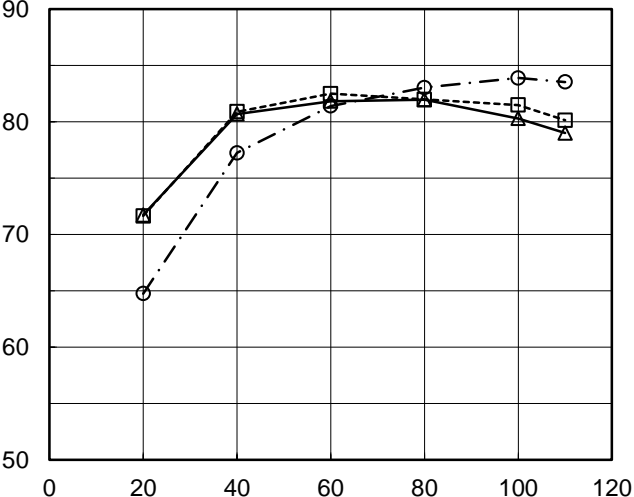


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Item		Efficiency (by Load Ratio)	Testing Circuitry		Figure A
Object					
1.Graph					
		—△—	Input Volt.	4.5V	
		---□---	Input Volt.	5V	
		-○-	Input Volt.	9V	
Efficiency [%]					
Load Ratio [%]					
2.Values					
Load Ratio [%]		Efficiency [%]			
		Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	
0		-	-	-	
20		71.7	71.6	64.8	
40		80.7	80.9	77.2	
60		81.8	82.5	81.4	
80		82.0	82.0	83.0	
100		80.3	81.5	83.9	
110		79.0	80.1	83.5	
--		-	-	-	
--		-	-	-	
--		-	-	-	
--		-	-	-	

Load Ratio [%]	Efficiency [%]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	-	-	-
20	71.7	71.6	64.8
40	80.7	80.9	77.2
60	81.8	82.5	81.4
80	82.0	82.0	83.0
100	80.3	81.5	83.9
110	79.0	80.1	83.5
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Model	MGW30515																																		
Item	Line Regulation	Temperature	25°C																																
Object	+15V0.1A	Testing Circuitry	Figure A																																
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Object		-15V0.1A		2.Values																																																		
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Note: Slanted line shows the range of the rated load current.

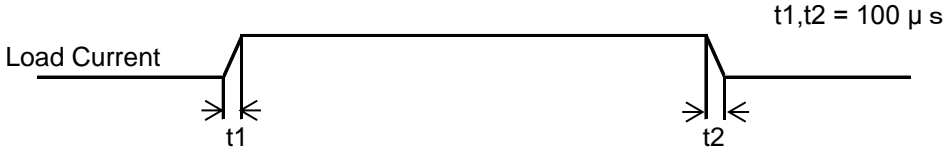
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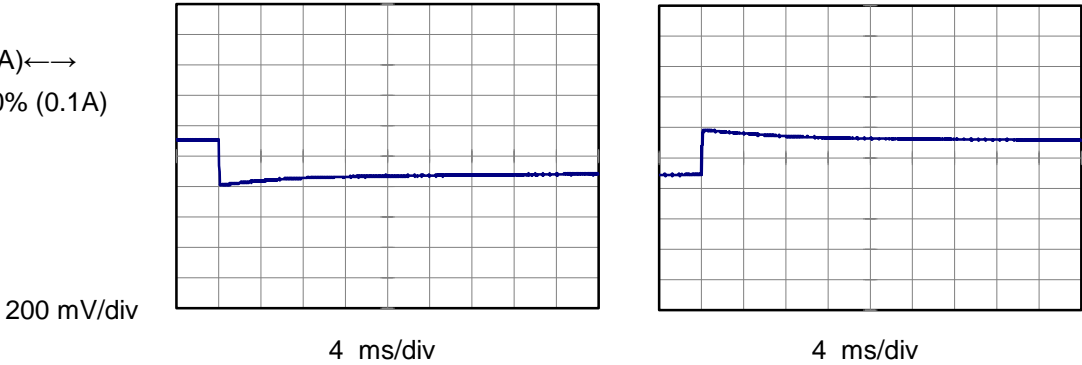


Model	MGW30515	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+15V0.1A	

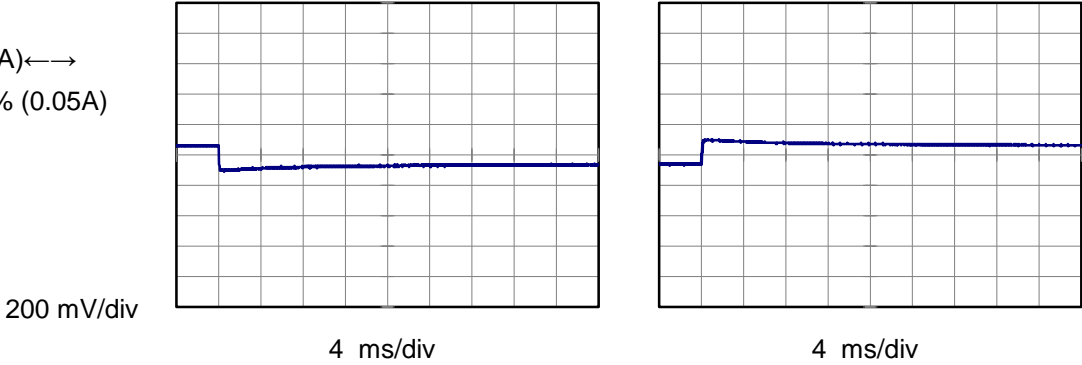
Input Volt. 5 V
-15V:rated load current.
Cycle 100 ms



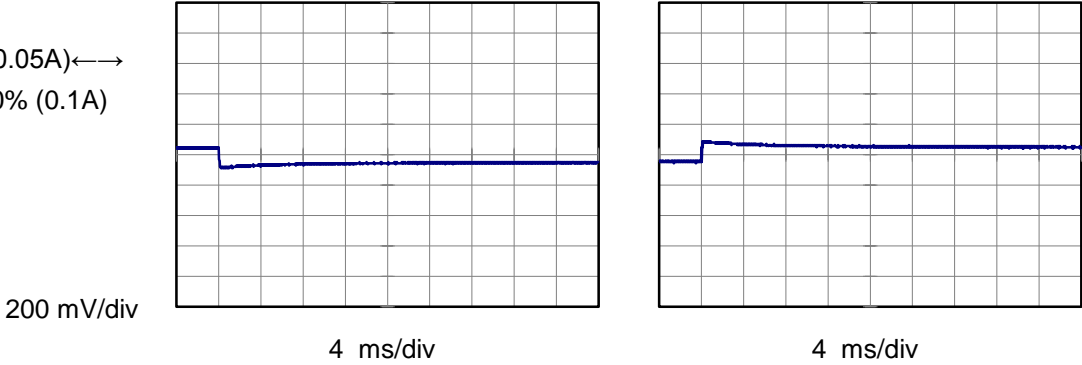
Min.Load (0A)←→
Load 100% (0.1A)



Min.Load (0A)←→
Load 50% (0.05A)



Load 50% (0.05A)←→
Load 100% (0.1A)





Model	MGW30515	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-15V0.1A		

Input Volt. 5 V
+15V:rated load current.
Cycle 100 ms

$t_1, t_2 = 100 \mu s$



Min.Load (0A) \longleftrightarrow
Load 100% (0.1A)

200 mV/div

4 ms/div

4 ms/div

Min.Load (0A) \longleftrightarrow
Load 50% (0.05A)

200 mV/div

4 ms/div

4 ms/div

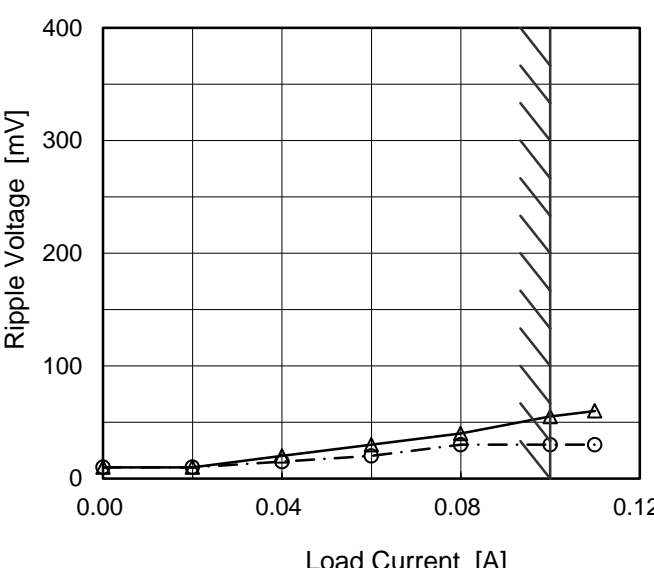
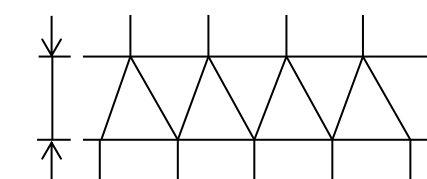
Load 50% (0.05A) \longleftrightarrow
Load 100% (0.1A)

200 mV/div

4 ms/div

4 ms/div

Model		MGW30515	Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)	Testing Circuitry Figure B																																							
Object		+15V0.1A																																								
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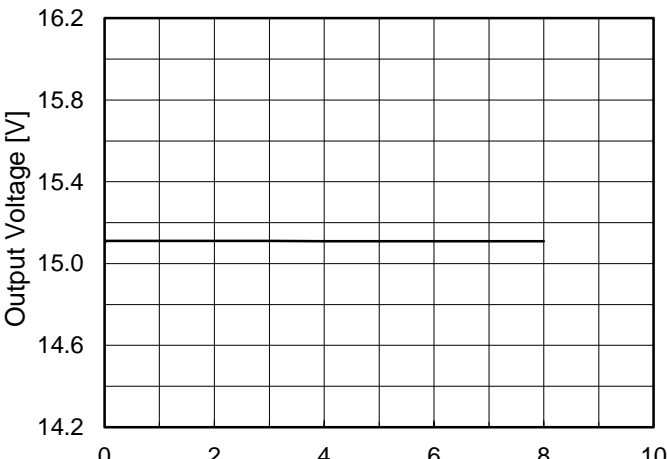
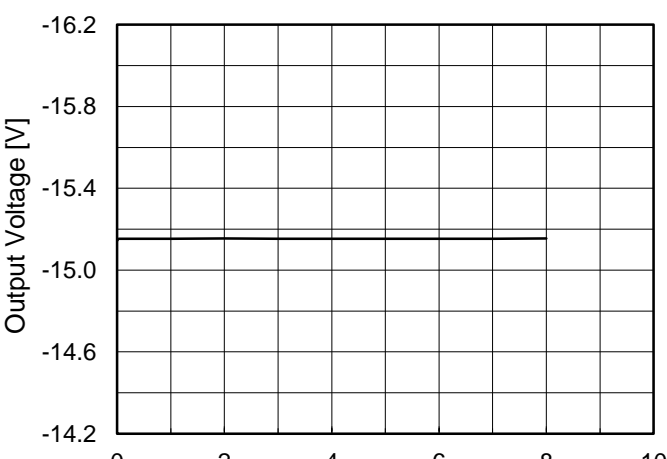
Model	MGW30515		
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure B	
Object	+15V0.1A		
1.Graph		2.Values	
<div> <div> <div>---</div> <div>□</div> <div>---</div> </div> <div>Load 50%</div> </div> <div> <div>—</div> <div>△</div> <div>—</div> </div> <div>Load 100%</div>			

Model		MGW30515		Testing Circuitry Figure A																																																		
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Note: Slanted line shows the range of the rated ambient temperature.																																																						

- 15 -

BC-10991

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Model		MGW30515	Temperature Testing Circuitry	25°C Figure A																						
Item		Time Lapse Drift																								
Object		+15V0.1A																								
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>15.103</td></tr><tr><td>0.5</td><td>15.111</td></tr><tr><td>1.0</td><td>15.111</td></tr><tr><td>2.0</td><td>15.110</td></tr><tr><td>3.0</td><td>15.110</td></tr><tr><td>4.0</td><td>15.110</td></tr><tr><td>5.0</td><td>15.110</td></tr><tr><td>6.0</td><td>15.110</td></tr><tr><td>7.0</td><td>15.110</td></tr><tr><td>8.0</td><td>15.110</td></tr></table> <p>-15V: Rated Load Current</p>		Time since start [H]	Output Voltage [V]	0.0	15.103	0.5	15.111	1.0	15.111	2.0	15.110	3.0	15.110	4.0	15.110	5.0	15.110	6.0	15.110	7.0	15.110	8.0	15.110
Time since start [H]	Output Voltage [V]																									
0.0	15.103																									
0.5	15.111																									
1.0	15.111																									
2.0	15.110																									
3.0	15.110																									
4.0	15.110																									
5.0	15.110																									
6.0	15.110																									
7.0	15.110																									
8.0	15.110																									
Object			-15V0.1A																							
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>-15.144</td></tr><tr><td>0.5</td><td>-15.154</td></tr><tr><td>1.0</td><td>-15.154</td></tr><tr><td>2.0</td><td>-15.154</td></tr><tr><td>3.0</td><td>-15.154</td></tr><tr><td>4.0</td><td>-15.154</td></tr><tr><td>5.0</td><td>-15.154</td></tr><tr><td>6.0</td><td>-15.154</td></tr><tr><td>7.0</td><td>-15.154</td></tr><tr><td>8.0</td><td>-15.154</td></tr></table> <p>+15V: Rated Load Current</p>		Time since start [H]	Output Voltage [V]	0.0	-15.144	0.5	-15.154	1.0	-15.154	2.0	-15.154	3.0	-15.154	4.0	-15.154	5.0	-15.154	6.0	-15.154	7.0	-15.154	8.0	-15.154
Time since start [H]	Output Voltage [V]																									
0.0	-15.144																									
0.5	-15.154																									
1.0	-15.154																									
2.0	-15.154																									
3.0	-15.154																									
4.0	-15.154																									
5.0	-15.154																									
6.0	-15.154																									
7.0	-15.154																									
8.0	-15.154																									

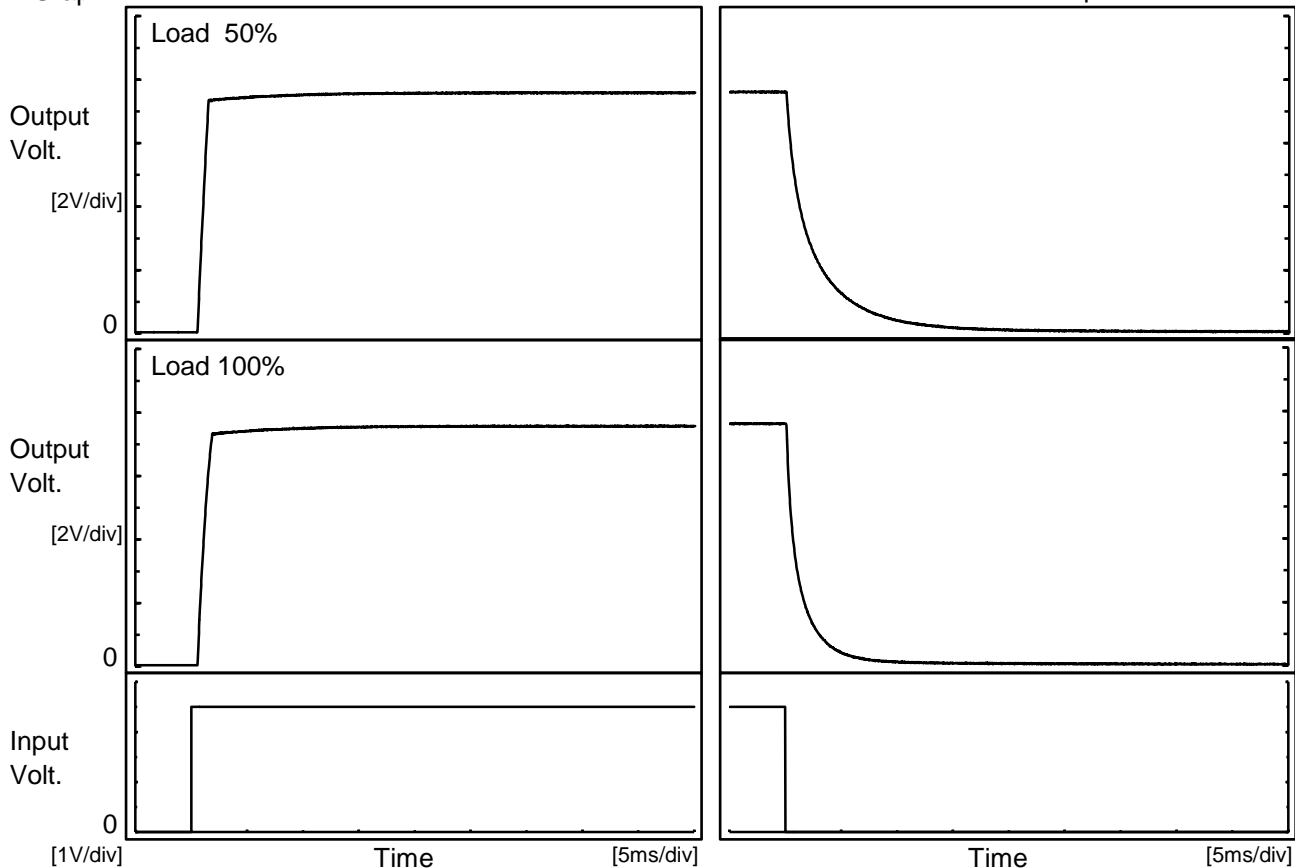
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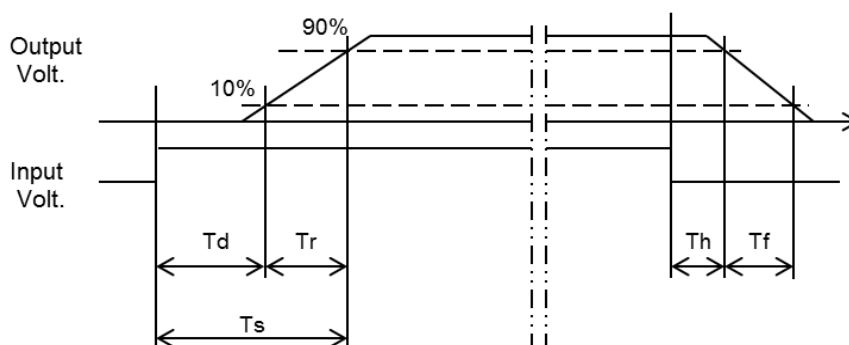
Model	MGW30515	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V0.1A		

1.Graph



2.Values

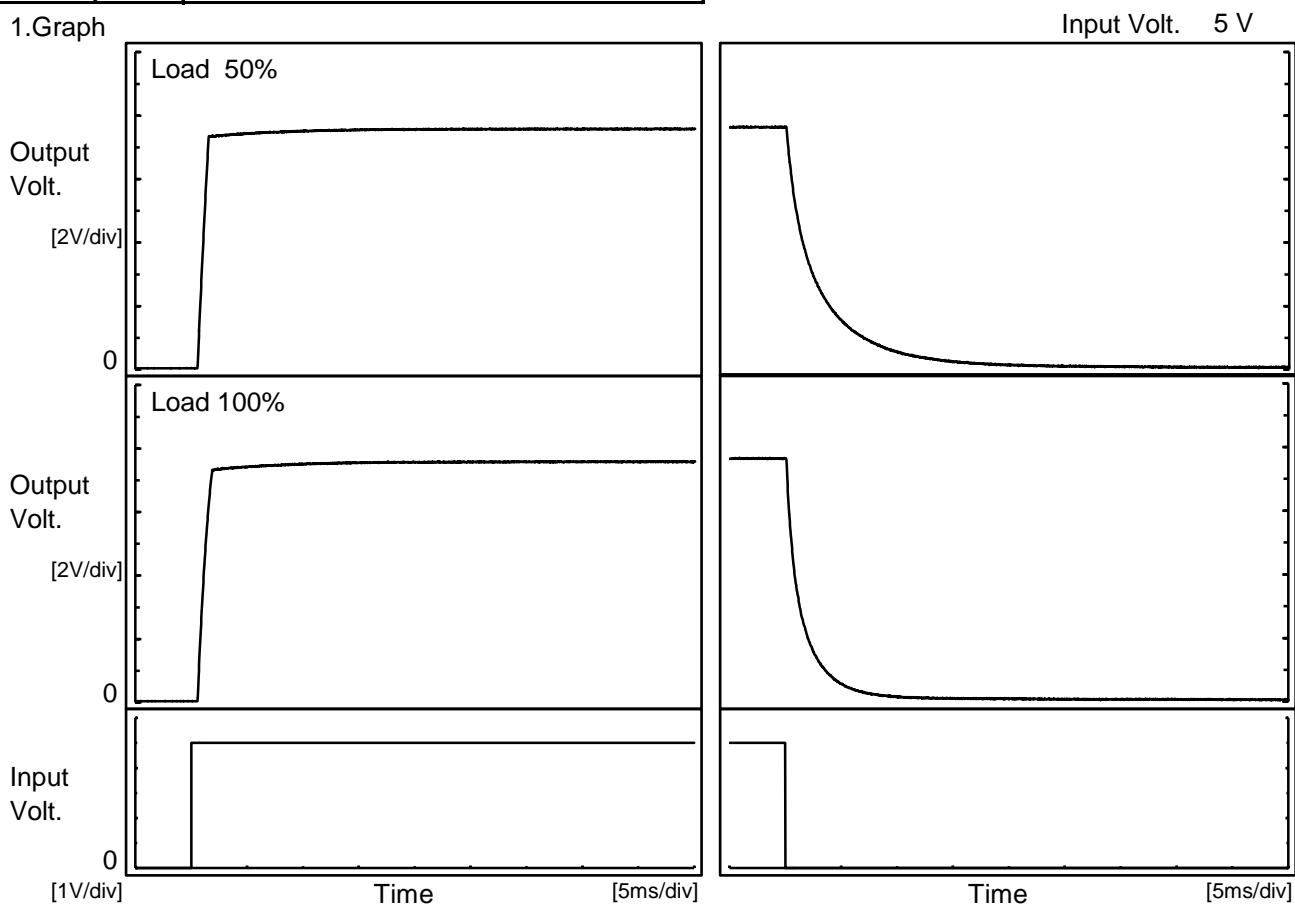
		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		0.7	0.8	1.5	0.3	6.8
100 %		0.7	1.1	1.8	0.2	3.4





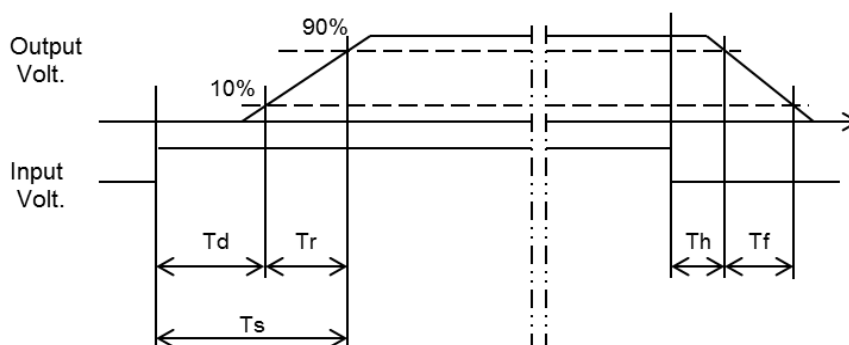
Model	MGW30515	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-15V0.1A		


1.Graph



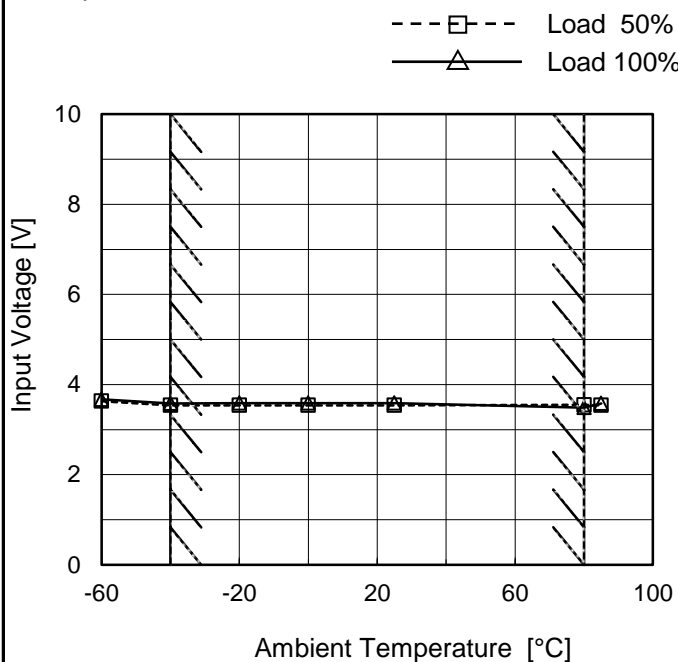
2.Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.7	0.8	1.5	0.3	8.1
100 %	0.7	1.1	1.8	0.2	3.9



	
Model	MGW30515
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.1A

1.Graph



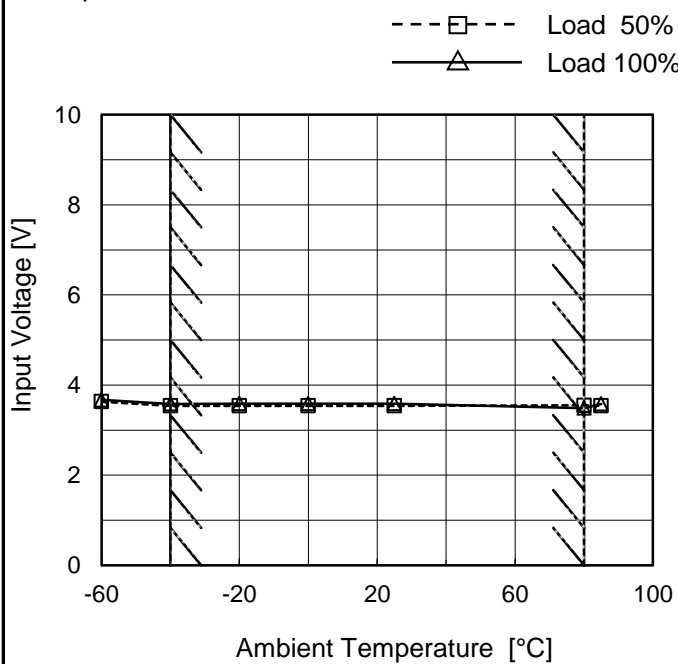
Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.7	3.7
-40	3.6	3.6
-20	3.6	3.6
0	3.6	3.6
25	3.6	3.6
80	3.6	3.5
85	3.6	3.6
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.1A
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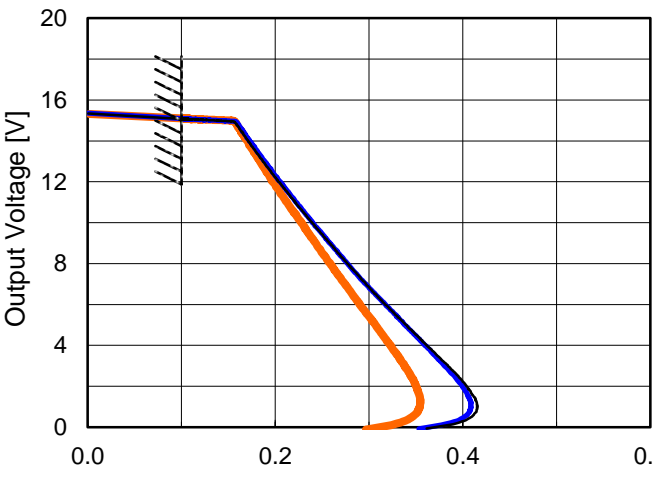
1. Graph

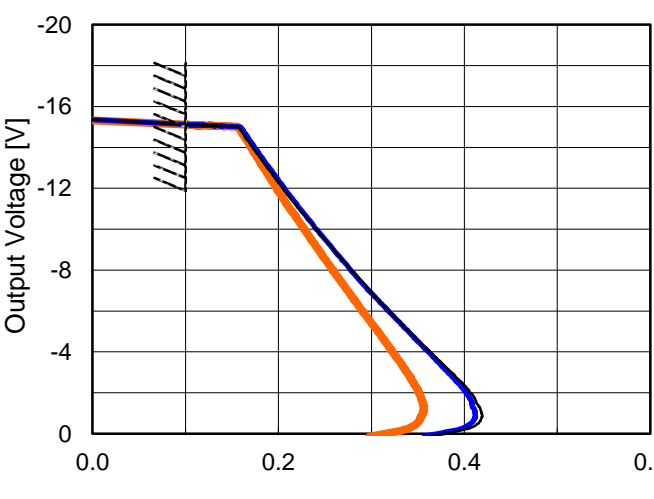


Note: Slanted line shows the range of the rated ambient temperature.

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.7	3.7
-40	3.6	3.6
-20	3.6	3.6
0	3.6	3.6
25	3.6	3.6
80	3.6	3.5
85	3.6	3.6
--	-	-
--	-	-
--	-	-
--	-	-

Model		MGW30515		Temperature 25°C																																																								
Item		Overcurrent Protection		Testing Circuitry Figure A																																																								
Object		+15V0.1A																																																										
1.Graph		<div><div><div></div>Input Volt. 4.5V</div><div><div></div>Input Volt. 5V</div><div><div></div>Input Volt. 9V</div></div> 																																																										
				2.Values																																																								
				<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>14.25</td><td>0.17</td><td>0.17</td><td>0.17</td></tr><tr><td>13.50</td><td>0.18</td><td>0.18</td><td>0.18</td></tr><tr><td>12.00</td><td>0.20</td><td>0.20</td><td>0.20</td></tr><tr><td>10.50</td><td>0.23</td><td>0.23</td><td>0.22</td></tr><tr><td>9.00</td><td>0.26</td><td>0.26</td><td>0.24</td></tr><tr><td>7.50</td><td>0.29</td><td>0.29</td><td>0.27</td></tr><tr><td>6.00</td><td>0.32</td><td>0.32</td><td>0.29</td></tr><tr><td>4.50</td><td>0.35</td><td>0.35</td><td>0.31</td></tr><tr><td>3.00</td><td>0.38</td><td>0.38</td><td>0.34</td></tr><tr><td>1.50</td><td>0.41</td><td>0.41</td><td>0.35</td></tr><tr><td>0.00</td><td>0.36</td><td>0.35</td><td>0.30</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]	14.25	0.17	0.17	0.17	13.50	0.18	0.18	0.18	12.00	0.20	0.20	0.20	10.50	0.23	0.23	0.22	9.00	0.26	0.26	0.24	7.50	0.29	0.29	0.27	6.00	0.32	0.32	0.29	4.50	0.35	0.35	0.31	3.00	0.38	0.38	0.34	1.50	0.41	0.41	0.35	0.00	0.36	0.35	0.30	--	-	-	-
Output Voltage [V]	Load Current [A]																																																											
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Output Voltage [V]	Load Current [A]																																																											
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				+15V: Rated Load Current																																																								



Model		MGW30515	Temperature		25°C																																																			
Item		Switching Frequency (by Load Current)	Testing Circuitry		Figure A																																																			
Object		+/-15V0.1A																																																						
1.Graph		<div><div>—△—</div>Input Volt. 4.5V</div> <div><div>---□---</div>Input Volt. 5V</div> <div><div>-○-</div>Input Volt. 9V</div> <div>Switching Frequency [kHz]</div> <div>10000</div> <div>1000</div> <div>100</div> <div>0.00</div> <div>0.04</div> <div>0.08</div> <div>0.12</div> <div>Load Current [A]</div>	2.Values																																																					
			<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>1141</td><td>1166</td><td>1160</td></tr><tr><td>0.02</td><td>672</td><td>706</td><td>883</td></tr><tr><td>0.04</td><td>473</td><td>507</td><td>680</td></tr><tr><td>0.06</td><td>363</td><td>393</td><td>550</td></tr><tr><td>0.08</td><td>292</td><td>319</td><td>463</td></tr><tr><td>0.10</td><td>244</td><td>268</td><td>399</td></tr><tr><td>0.11</td><td>224</td><td>248</td><td>372</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	1141	1166	1160	0.02	672	706	883	0.04	473	507	680	0.06	363	393	550	0.08	292	319	463	0.10	244	268	399	0.11	224	248	372	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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.																																																								

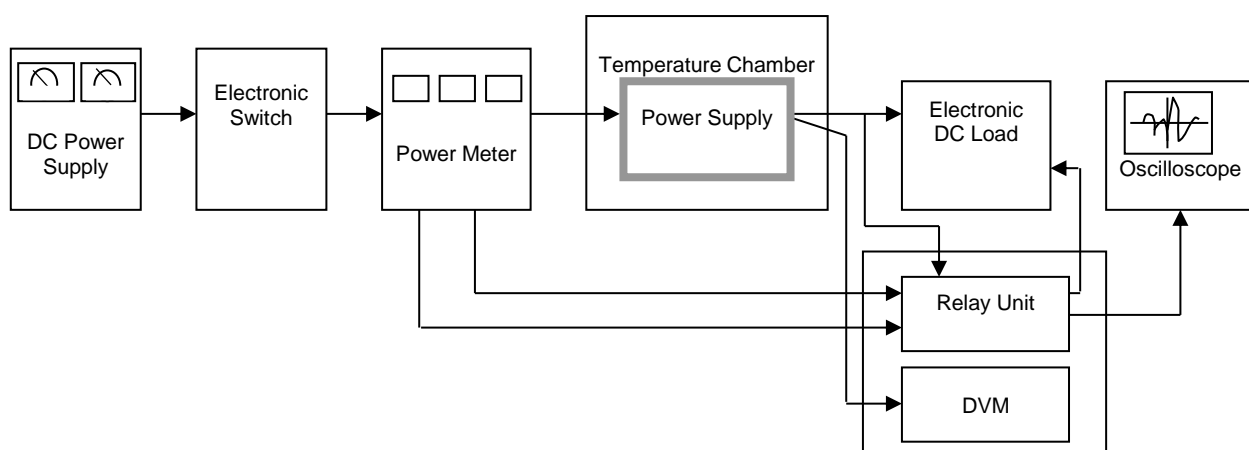


Figure A

Data Acquisition/Control Unit

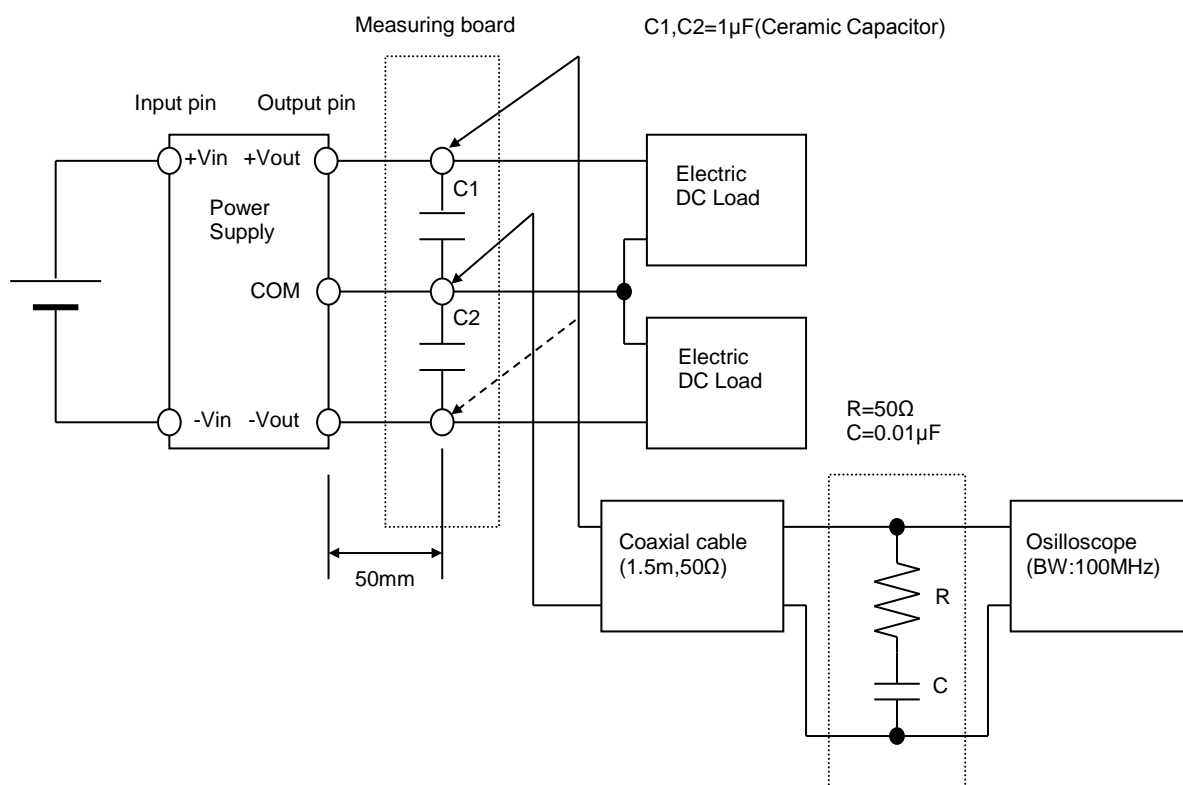


Figure B (Ripple and Ripple noise Characteristic)