

TEST DATA OF GT3.5W-12

Regulated DC Power Supply
October 26, 2010

Approved by : Eiyoshi Wakamatsu
Eiyoshi Wakamatsu Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

COSEL CO.,LTD.

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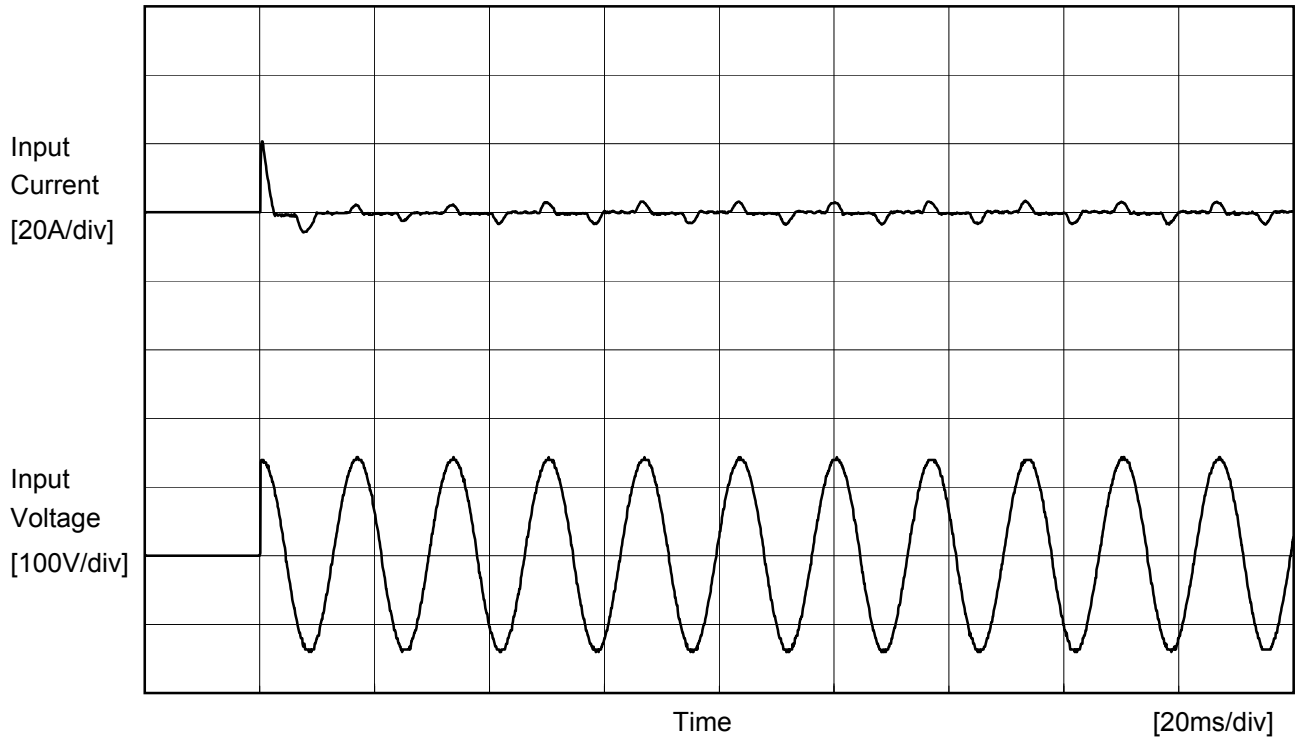
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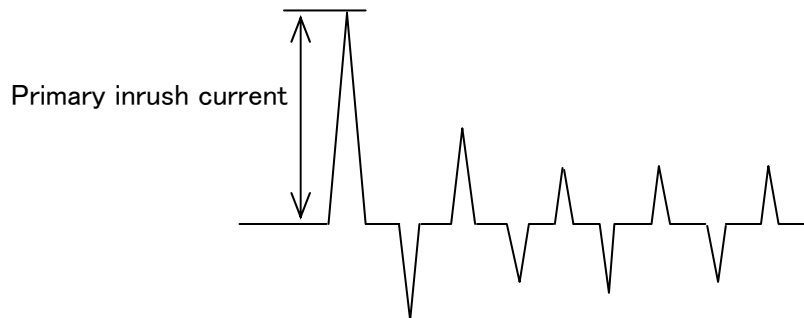


Model		GT3.5W-12	
Item		Inrush Current	
Object		_____	
		Temperature	25°C
		Testing Circuitry	Figure A



Input Voltage 100 V
 Frequency 60 Hz
 Load 100 %

Primary inrush current 20.7 A





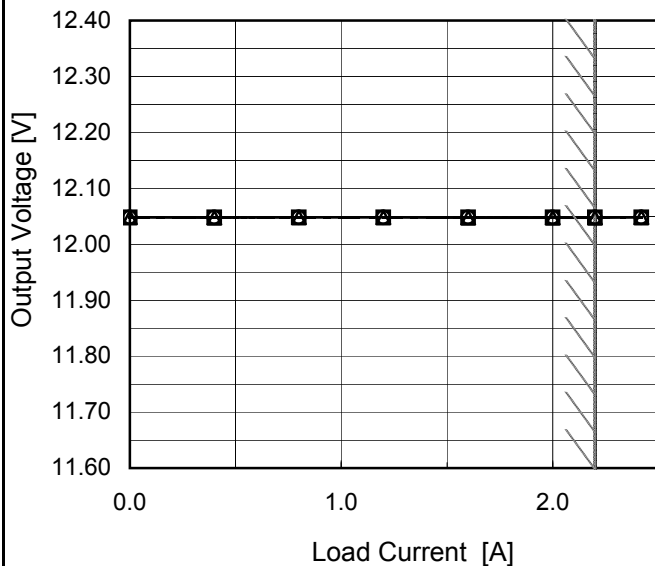
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Item	Load Regulation
Object	+12V2.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
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 - · - ○ - · - - Input Volt. 110V

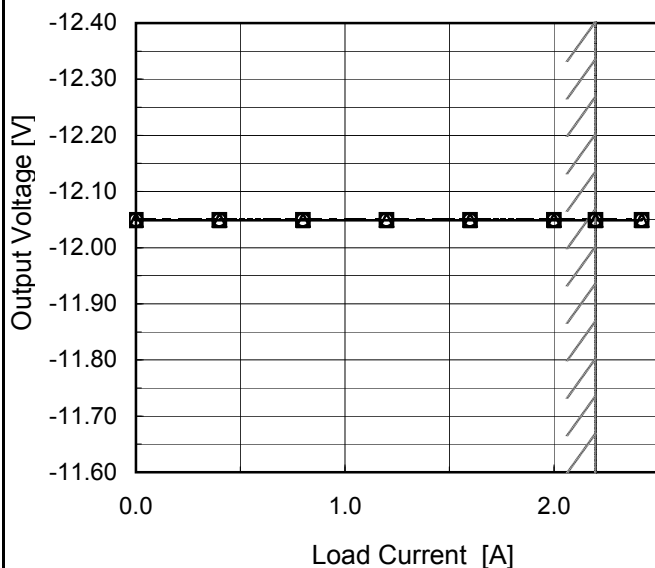


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	12.048	12.048	12.048
0.40	12.048	12.048	12.048
0.80	12.048	12.048	12.048
1.20	12.048	12.048	12.048
1.60	12.048	12.048	12.048
2.00	12.048	12.048	12.048
2.20	12.048	12.048	12.048
2.42	12.048	12.048	12.048
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Object	-12V2.2A
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1.Graph
 —△— Input Volt. 90V
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2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	-12.049	-12.049	-12.049
0.40	-12.049	-12.049	-12.049
0.80	-12.049	-12.049	-12.049
1.20	-12.049	-12.049	-12.049
1.60	-12.049	-12.049	-12.049
2.00	-12.049	-12.049	-12.049
2.20	-12.049	-12.049	-12.049
2.42	-12.049	-12.049	-12.049
--	-	-	-
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Note: Slanted line shows the range of the rated load current.



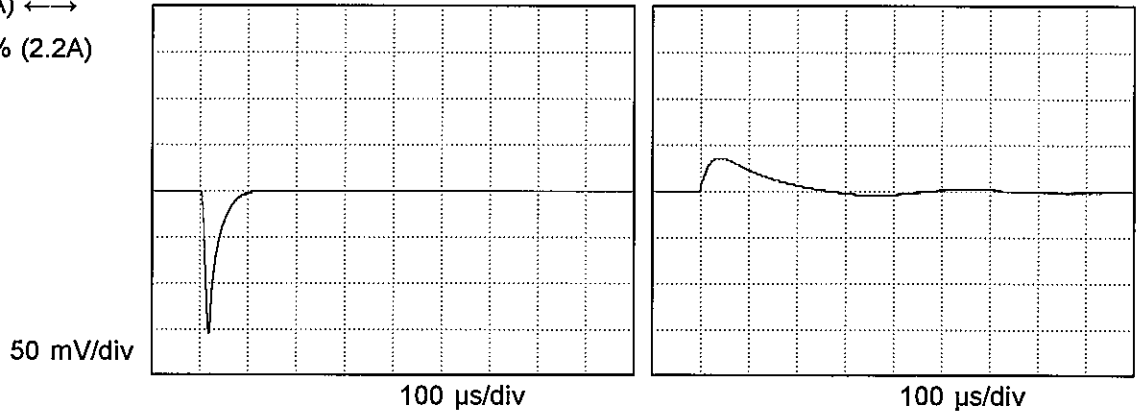
Model		GT3.5W-12	
Item		Dynamic Load Response	
Object		+12V2.2A	
		Temperature	25°C
		Testing Circuitry	Figure A

Input Volt. 100 V
 Cycle 1000 ms

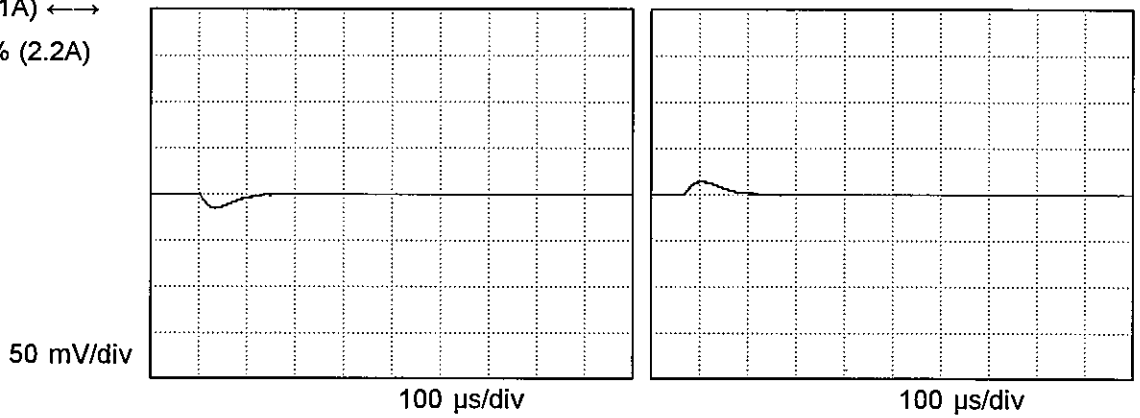
Load Current



Min. Load (0A) ←→
 Load 100% (2.2A)



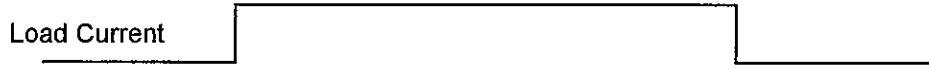
Load 50% (1.1A) ←→
 Load 100% (2.2A)



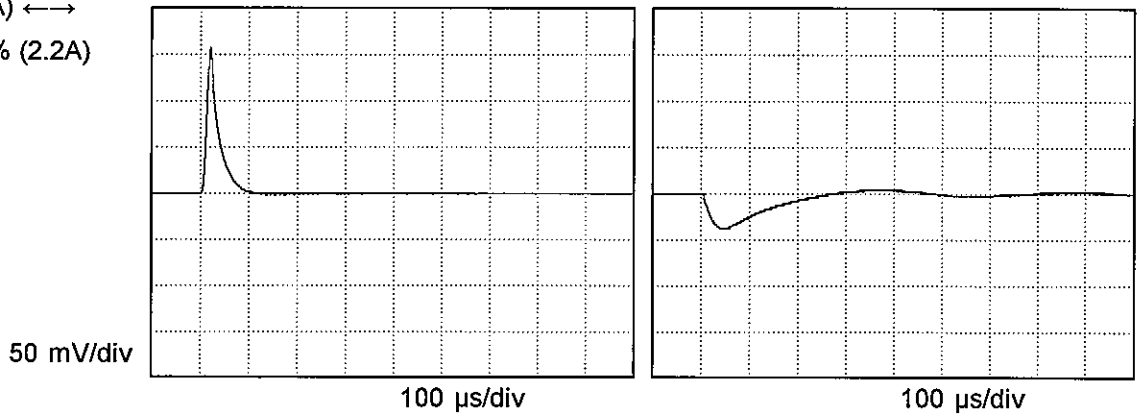


Model		GT3.5W-12	
Item		Dynamic Load Response	
Object		Temperature	25°C
		Testing Circuitry	Figure A

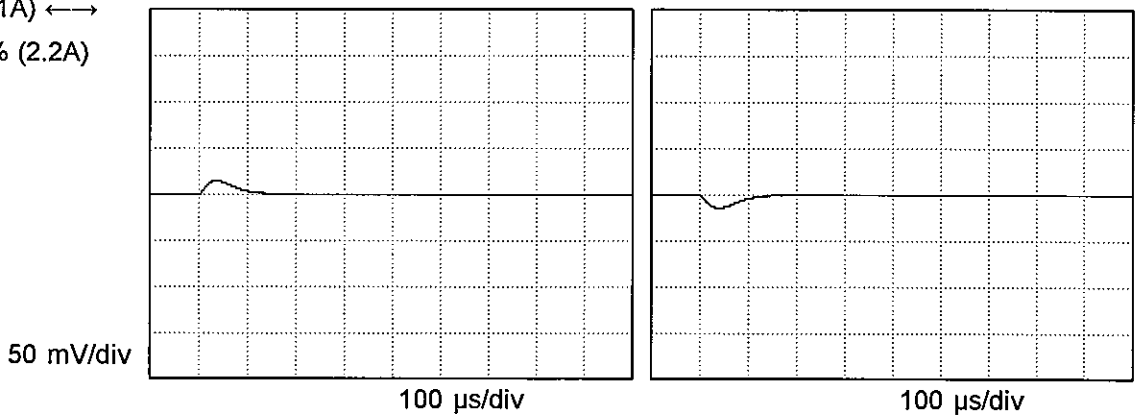
Input Volt. 100 V
 Cycle 1000 ms



Min. Load (0A) ←→
 Load 100% (2.2A)



Load 50% (1.1A) ←→
 Load 100% (2.2A)





Model	GT3.5W-12	Temperature	25°C																																									
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure A																																									
Object	+12V2.2A																																											
<p>1.Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 90V</p> <p>-·-○-·- Input Volt. 110V</p> </div> <p>Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated load current.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 90 [V]</th> <th>Input Volt. 110 [V]</th> </tr> </thead> <tbody> <tr> <td>0.0</td> <td>0.8</td> <td>0.8</td> </tr> <tr> <td>1.1</td> <td>0.8</td> <td>0.8</td> </tr> <tr> <td>2.2</td> <td>0.8</td> <td>0.8</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> <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> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 90 [V]	Input Volt. 110 [V]	0.0	0.8	0.8	1.1	0.8	0.8	2.2	0.8	0.8	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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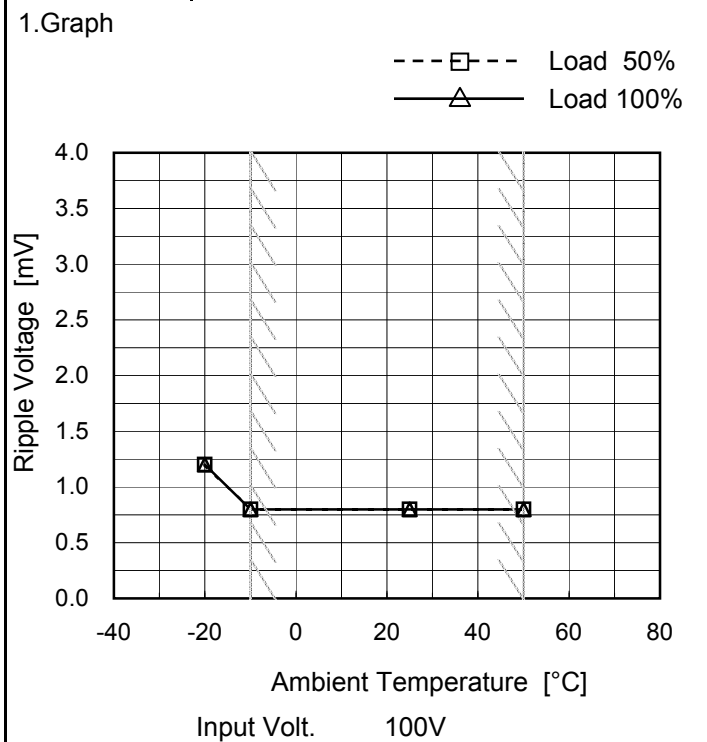


Model		GT3.5W-12		Temperature 25°C Testing Circuitry Figure A																																									
Item		Ripple Voltage (by Load Current)																																											
Object		-12V2.2A		2.Values																																									
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Model	GT3.5W-12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V2.2A

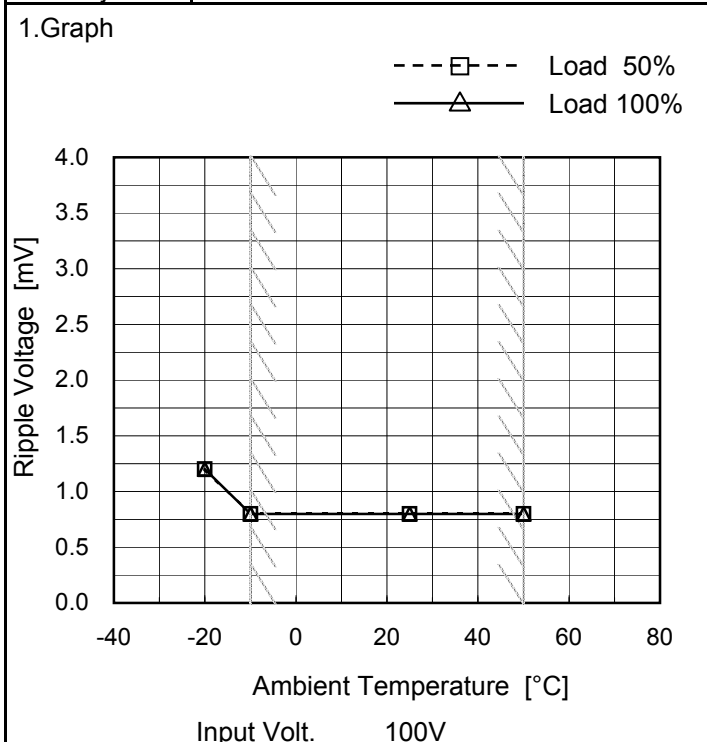
Testing Circuitry Figure A



2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	1.2	1.2
-10	0.8	0.8
25	0.8	0.8
50	0.8	0.8
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V2.2A
--------	----------

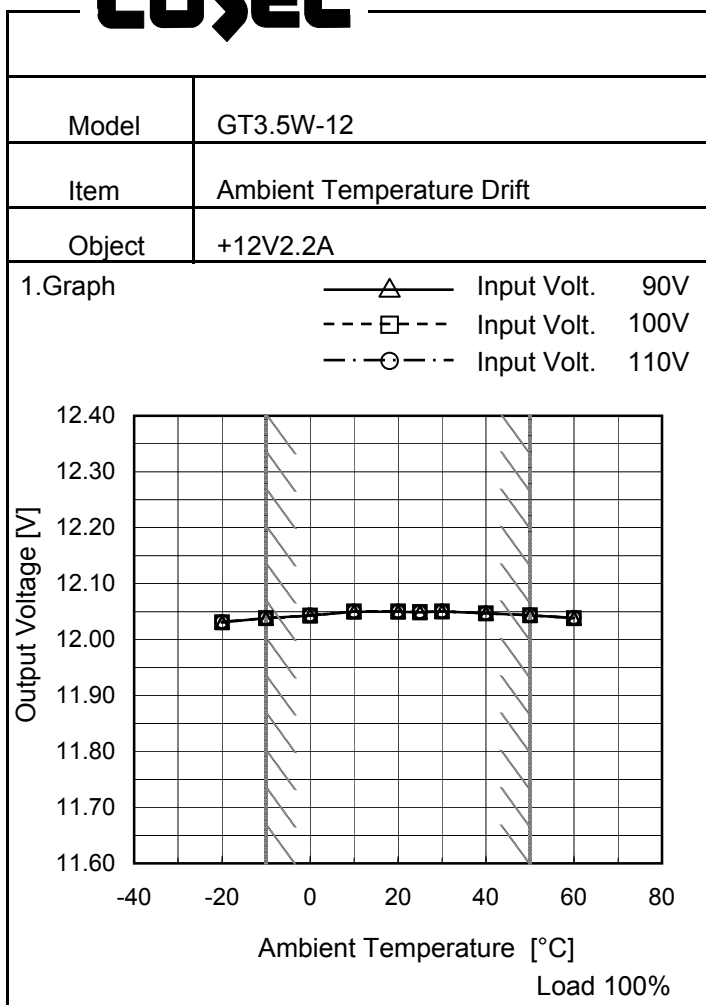


2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	1.2	1.2
-10	0.8	0.8
25	0.8	0.8
50	0.8	0.8
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 20 MHz Oscilloscope.

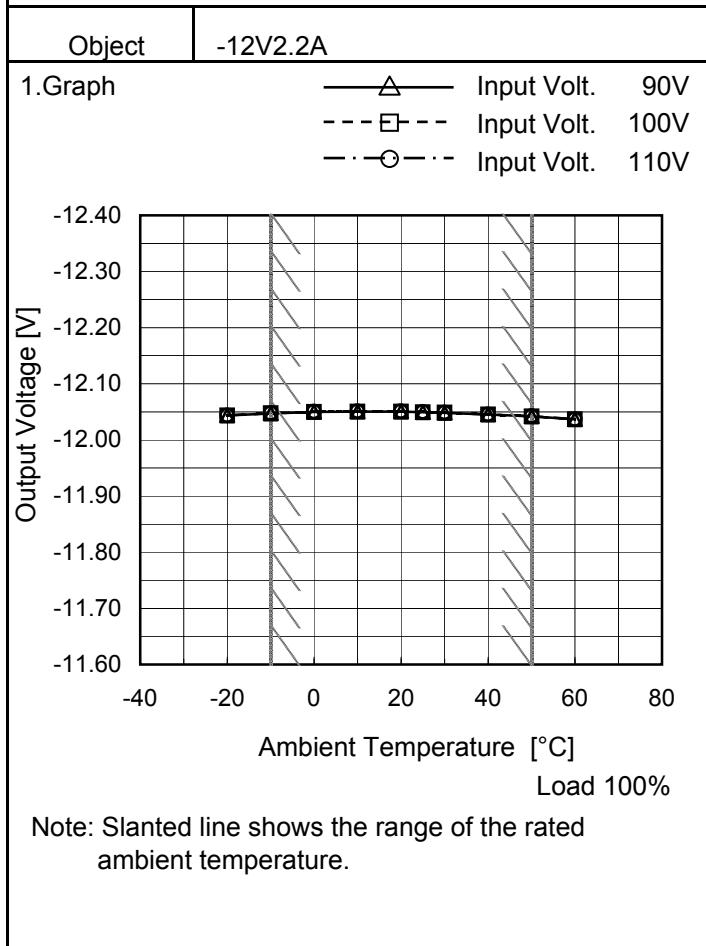
Note: Slanted line shows the range of the rated ambient temperature.



Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-20	12.031	12.031	12.031
-10	12.038	12.038	12.039
0	12.043	12.043	12.044
10	12.050	12.050	12.050
20	12.050	12.050	12.050
25	12.049	12.049	12.049
30	12.050	12.051	12.051
40	12.047	12.047	12.047
50	12.043	12.044	12.044
60	12.038	12.038	12.039
--	-	-	-



2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-20	-12.043	-12.044	-12.044
-10	-12.047	-12.048	-12.048
0	-12.050	-12.050	-12.050
10	-12.050	-12.051	-12.051
20	-12.050	-12.051	-12.051
25	-12.049	-12.050	-12.050
30	-12.048	-12.049	-12.049
40	-12.045	-12.045	-12.046
50	-12.042	-12.042	-12.042
60	-12.037	-12.037	-12.037
--	-	-	-



COSEL		
Model	GT3.5W-12	
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 : -10 - 50°C

Input Voltage : 90 - 110V

Load Current (AVR 1) : 0 - 2.2A (AVR 2) : 0 - 2.2A

* 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		+12V2.2A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	30	110	2.2	12.051	±7	±0.1
Minimum Voltage	-10	90	0	12.037		

Object		-12V2.2A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	20	110	0	-12.051	±5	±0.1
Minimum Voltage	50	90	2.2	-12.042		

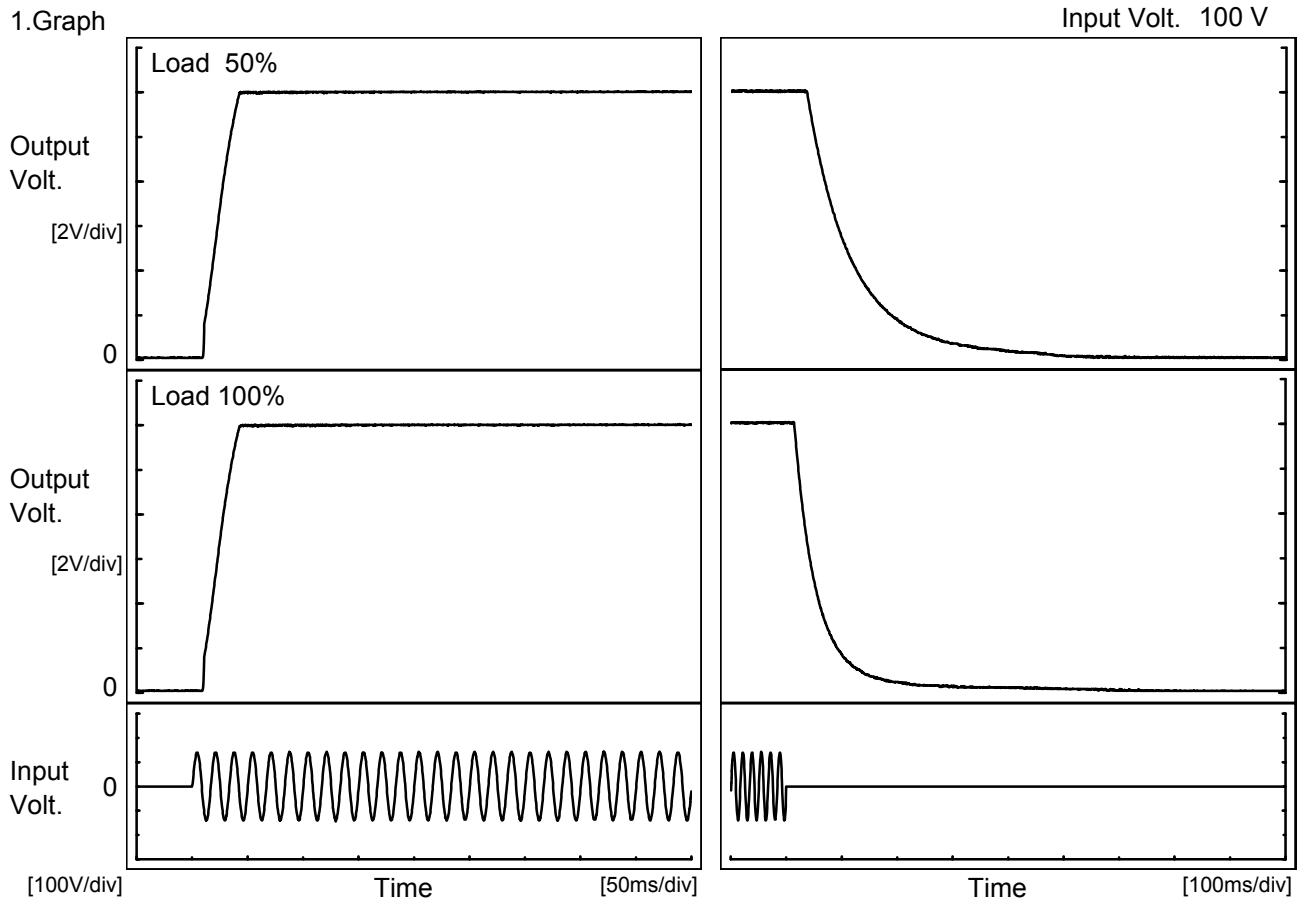


COSEL																									
Model	GT3.5W-12	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+12V2.2A																								
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p style="text-align: center;">Input Volt. 100V Load 100%</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>12.048</td></tr> <tr><td>0.5</td><td>12.048</td></tr> <tr><td>1.0</td><td>12.048</td></tr> <tr><td>2.0</td><td>12.048</td></tr> <tr><td>3.0</td><td>12.048</td></tr> <tr><td>4.0</td><td>12.048</td></tr> <tr><td>5.0</td><td>12.048</td></tr> <tr><td>6.0</td><td>12.048</td></tr> <tr><td>7.0</td><td>12.048</td></tr> <tr><td>8.0</td><td>12.048</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	12.048	0.5	12.048	1.0	12.048	2.0	12.048	3.0	12.048	4.0	12.048	5.0	12.048	6.0	12.048	7.0	12.048	8.0	12.048
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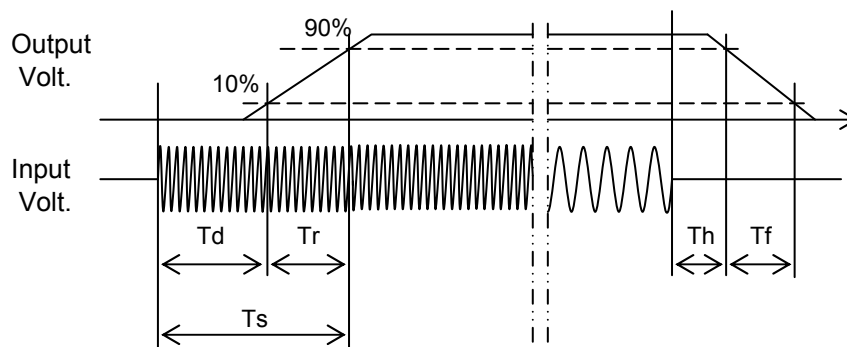
Model	GT3.5W-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V2.2A		

1. Graph



2. Values

		[ms]				
Load \ Time	Td	Tr	Ts	Th	Tf	
50 %	11.0	27.0	38.0	44.0	189.0	
100 %	10.8	27.3	38.1	18.0	99.0	

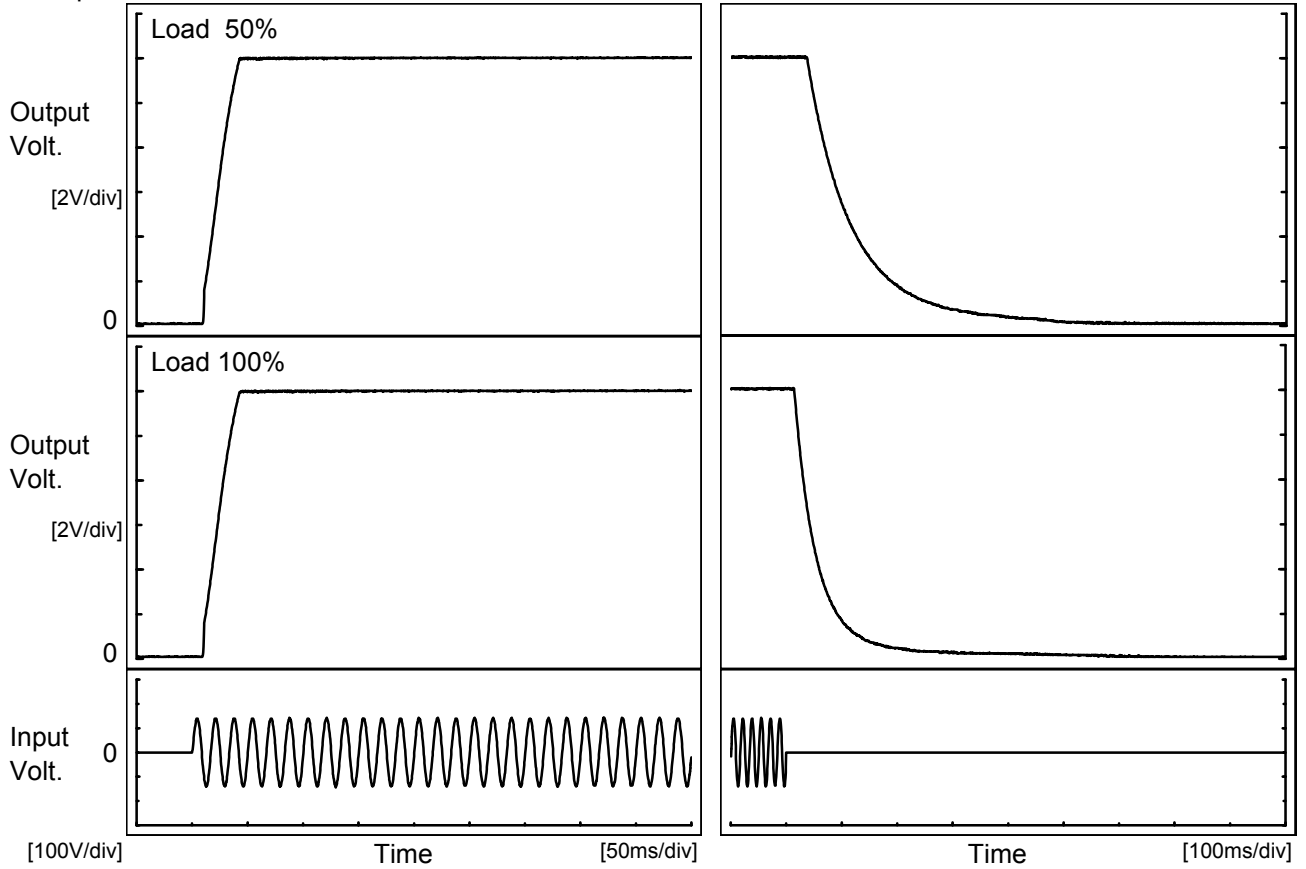




Model	GT3.5W-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-12V2.2A		

1. Graph

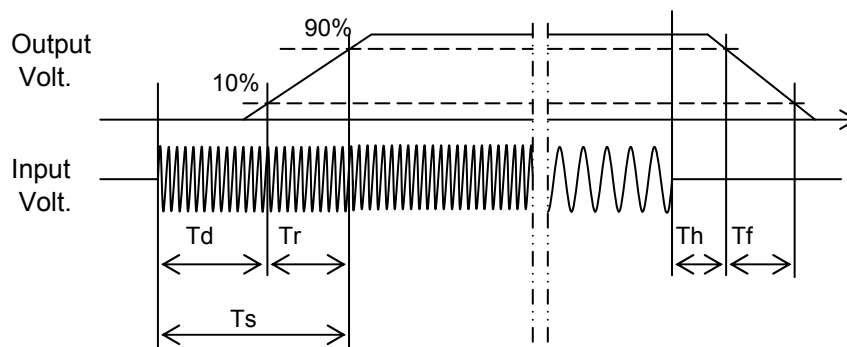
Input Volt. 100 V



2. Values

[ms]

Load \ Time	T _d	T _r	T _s	T _h	T _f
50 %	10.8	27.3	38.1	45.0	194.0
100 %	11.0	26.8	37.8	18.5	96.5





Model		GT3.5W-12																																	
Item		Hold-Up Time																																	
Object		+12V2.2A																																	
Temperature		25°C																																	
Testing Circuitry		Figure A																																	
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<p>Model GT3.5W-12</p>		<p>Temperature 25°C Testing Circuitry Figure A</p>																																																			
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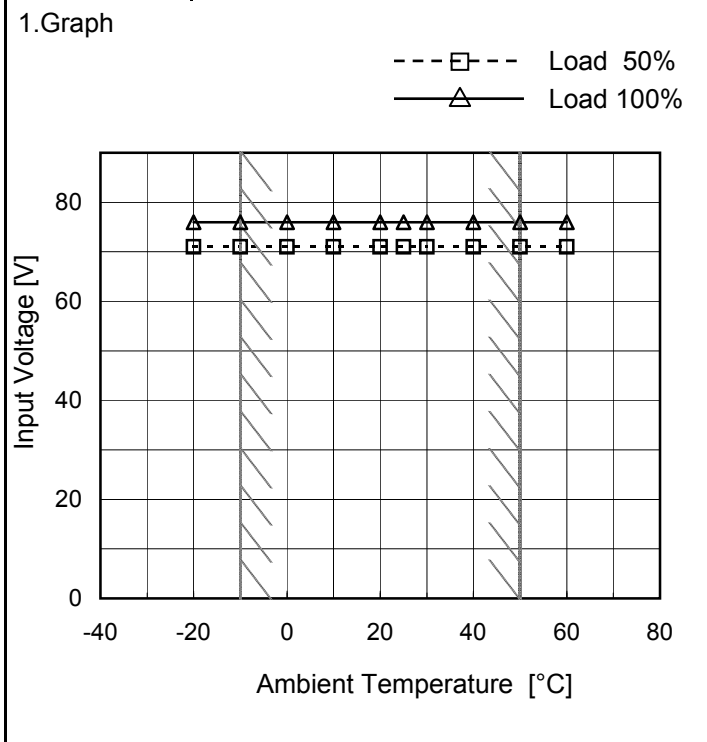


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Model	GT3.5W-12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V2.2A

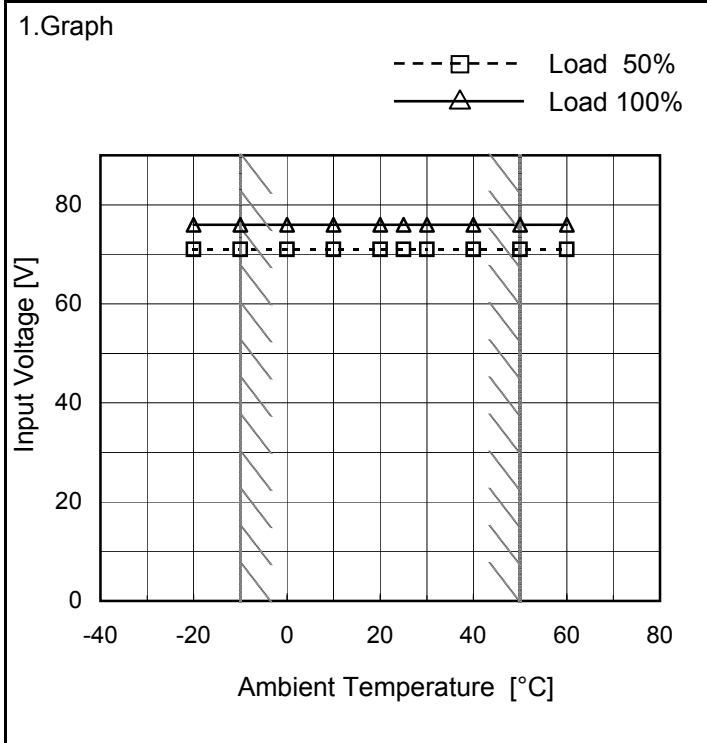
Testing Circuitry Figure A



2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	71	76
-10	71	76
0	71	76
10	71	76
20	71	76
25	71	76
30	71	76
40	71	76
50	71	76
60	71	76
--	-	-

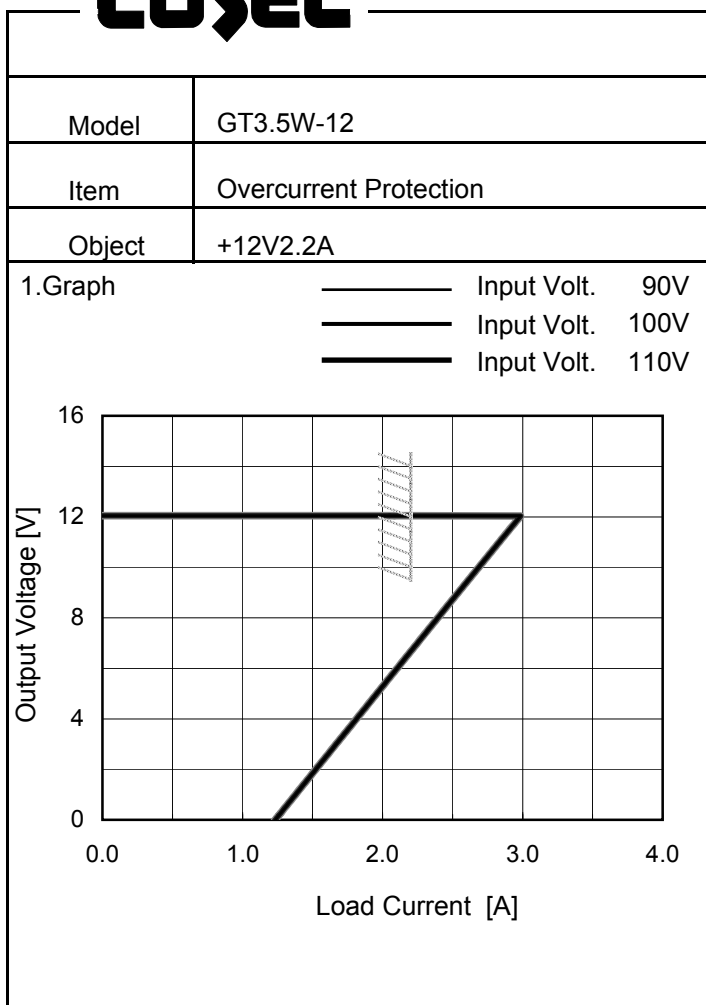
Object	-12V2.2A
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2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	71	76
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--	-	-

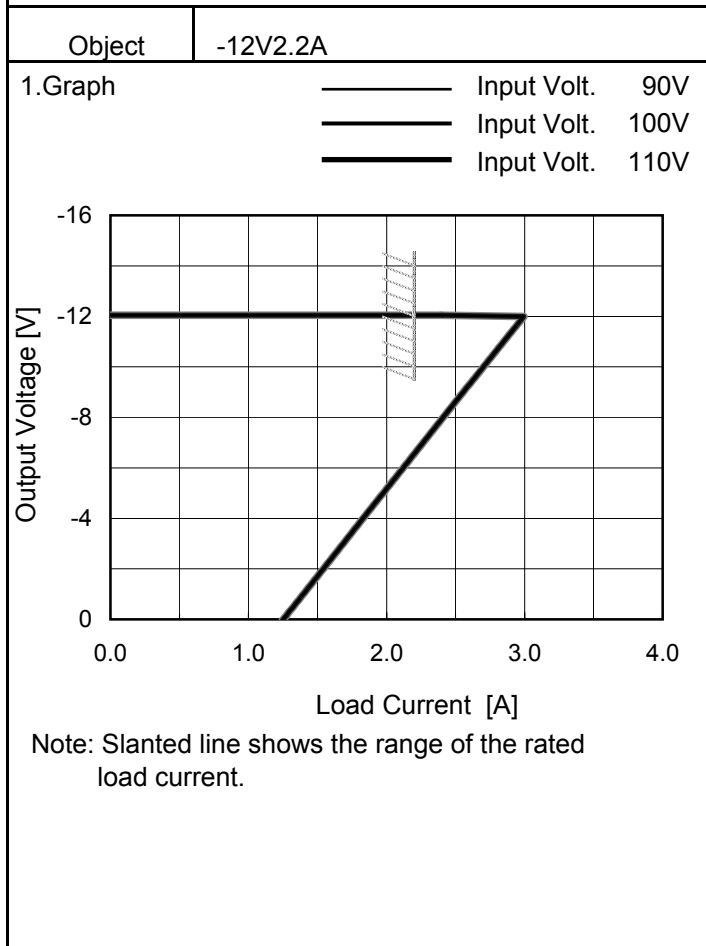
Note: Slanted line shows the range of the rated ambient temperature.



Temperature 25°C
Testing Circuitry Figure A

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
12.0	2.99	2.99	2.99
11.4	2.90	2.90	2.90
10.8	2.81	2.81	2.81
9.6	2.64	2.64	2.64
8.4	2.47	2.47	2.47
7.2	2.29	2.29	2.29
6.0	2.11	2.11	2.11
4.8	1.93	1.93	1.93
3.6	1.76	1.76	1.76
2.4	1.60	1.60	1.60
1.2	1.42	1.42	1.42
0.0	1.23	1.23	1.23



2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-12.0	2.99	2.99	2.99
-11.4	2.90	2.90	2.90
-10.8	2.82	2.82	2.82
-9.6	2.65	2.65	2.65
-8.4	2.48	2.48	2.48
-7.2	2.30	2.30	2.30
-6.0	2.12	2.12	2.12
-4.8	1.95	1.95	1.95
-3.6	1.79	1.79	1.79
-2.4	1.61	1.61	1.61
-1.2	1.44	1.44	1.44
0.0	1.25	1.25	1.25

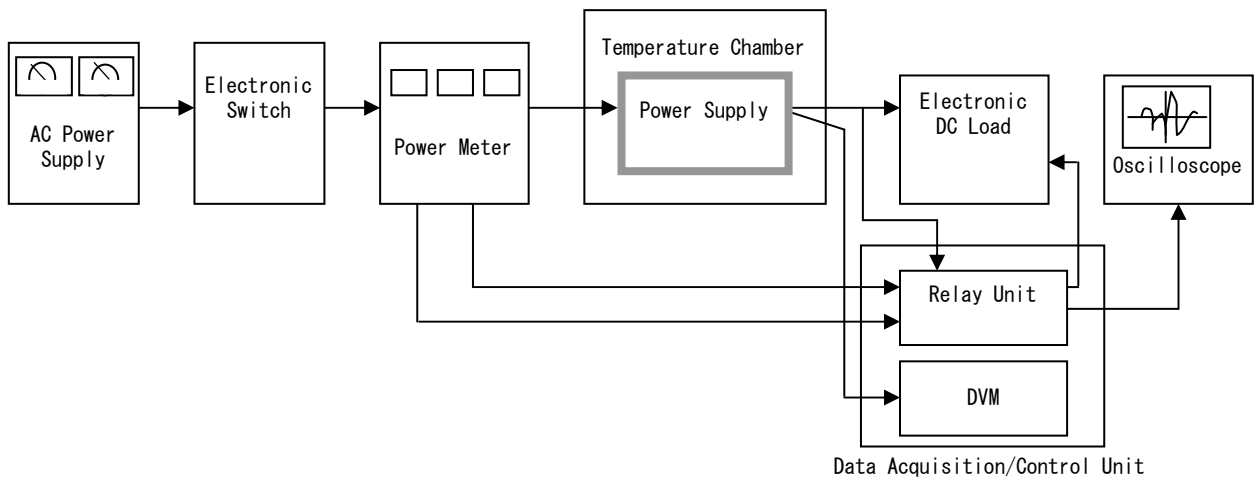


Figure A