

TEST DATA OF GT3W-12

Regulated DC Power Supply
November 1, 2010

Approved by : Eiyoshi Wakamatsu
Eiyoshi Wakamatsu Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

COSEL CO.,LTD.

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Model		GT3W-12		Temperature 25°C																																																				
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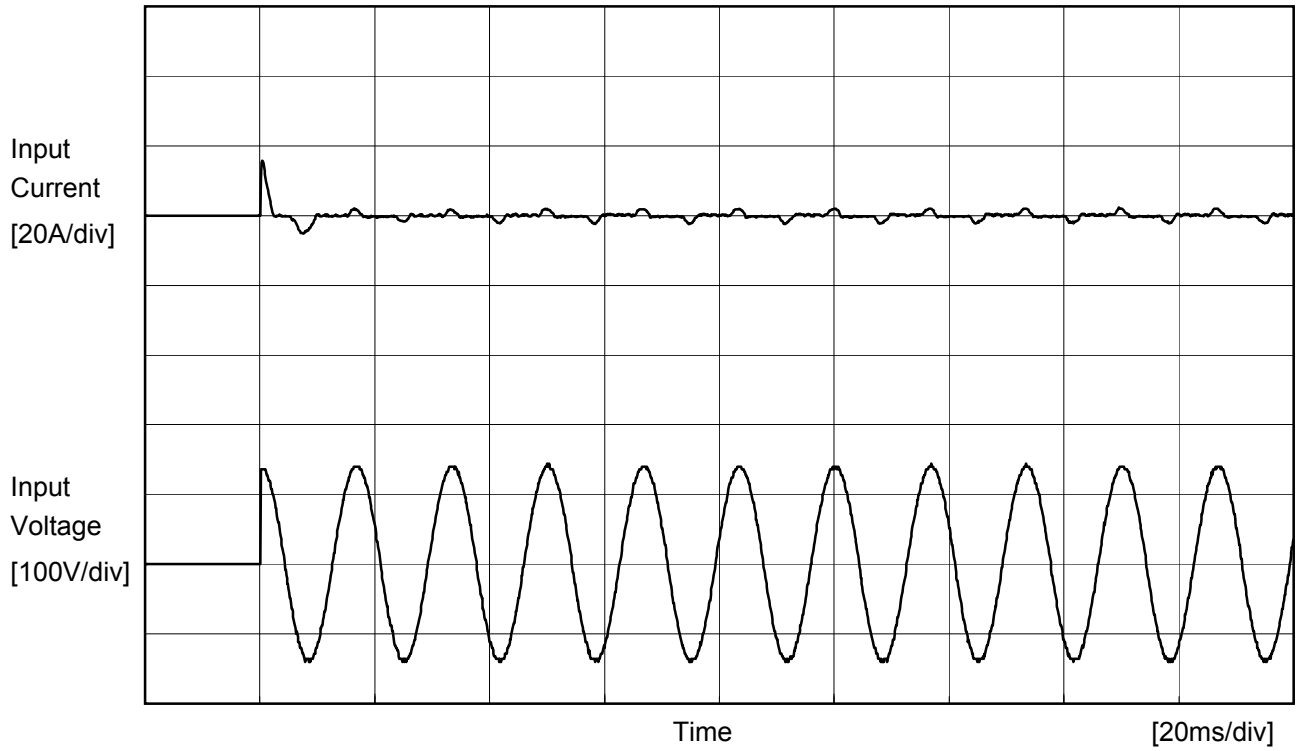
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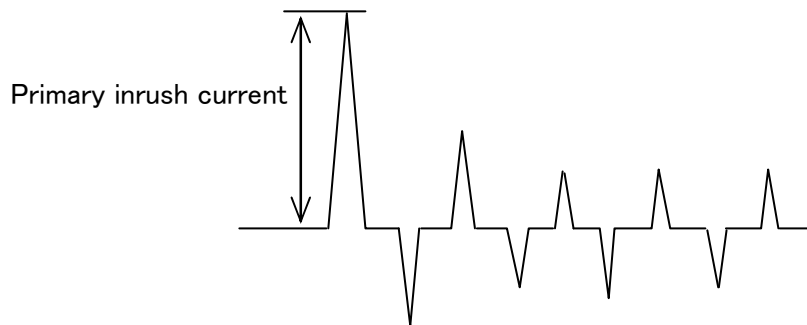
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COSEL			
Model	GT3W-12	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



Input Voltage	100 V
Frequency	60 Hz
Load	100 %
Primary inrush current	15.8 A





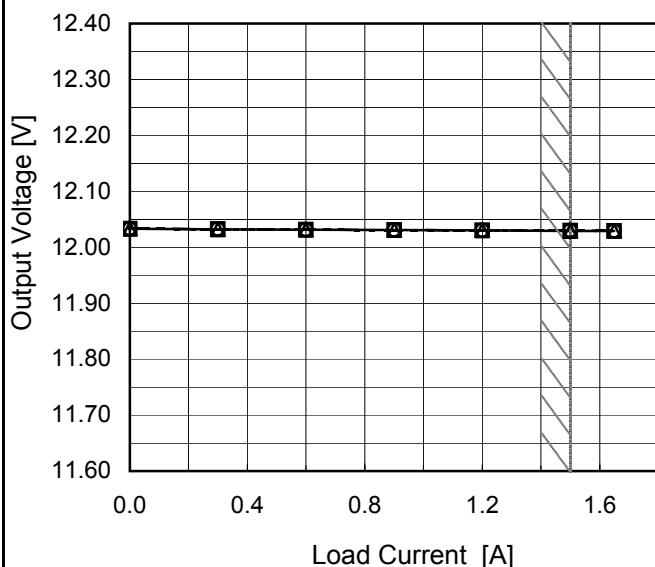
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Model	GT3W-12
Item	Load Regulation
Object	+12V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
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 ---□--- Input Volt. 100V
 -·○-·- Input Volt. 110V

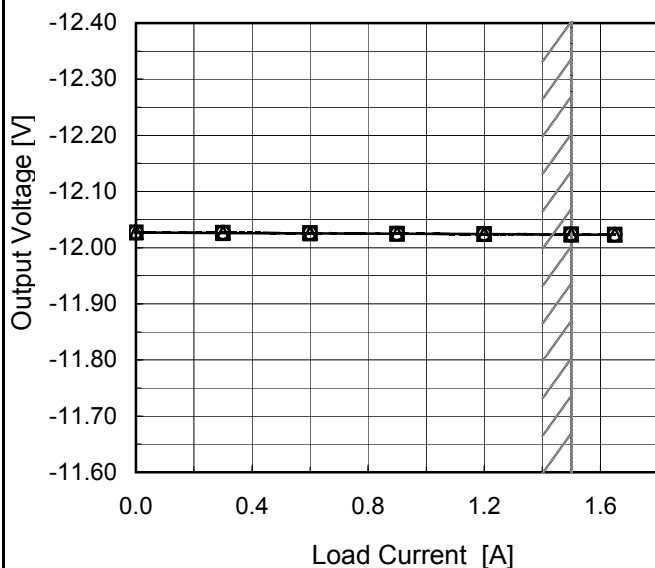


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	12.033	12.033	12.033
0.30	12.032	12.032	12.033
0.60	12.032	12.032	12.032
0.90	12.031	12.031	12.031
1.20	12.030	12.030	12.030
1.50	12.029	12.030	12.030
1.65	12.029	12.029	12.029
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--	-	-	-
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Object	-12V1.5A
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1.Graph
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 -·○-·- Input Volt. 110V



2.Values

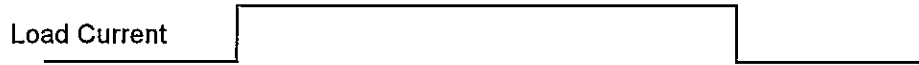
Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	-12.027	-12.027	-12.027
0.30	-12.026	-12.026	-12.026
0.60	-12.025	-12.026	-12.026
0.90	-12.025	-12.025	-12.025
1.20	-12.024	-12.024	-12.024
1.50	-12.023	-12.023	-12.023
1.65	-12.023	-12.023	-12.023
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Note: Slanted line shows the range of the rated load current.

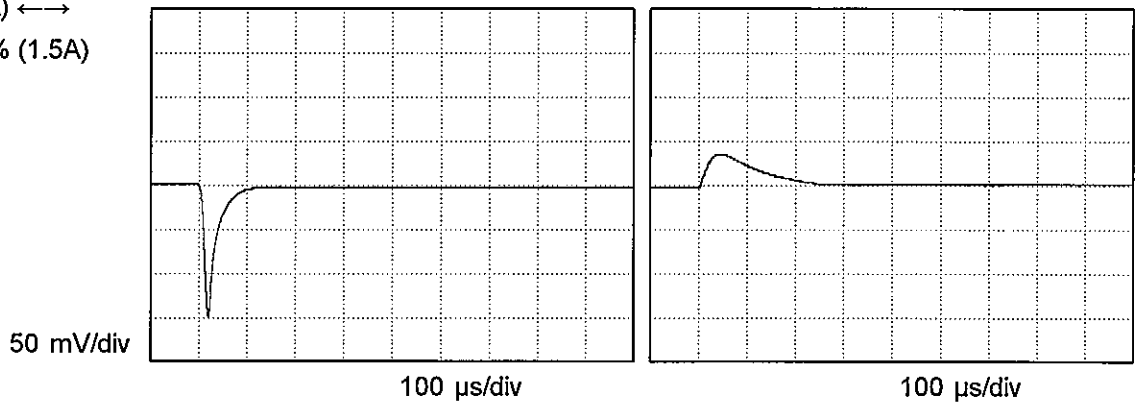


Model		GT3W-12	
Item		Dynamic Load Response	
Object		+12V1.5A	
		Temperature	25°C
		Testing Circuitry	Figure A

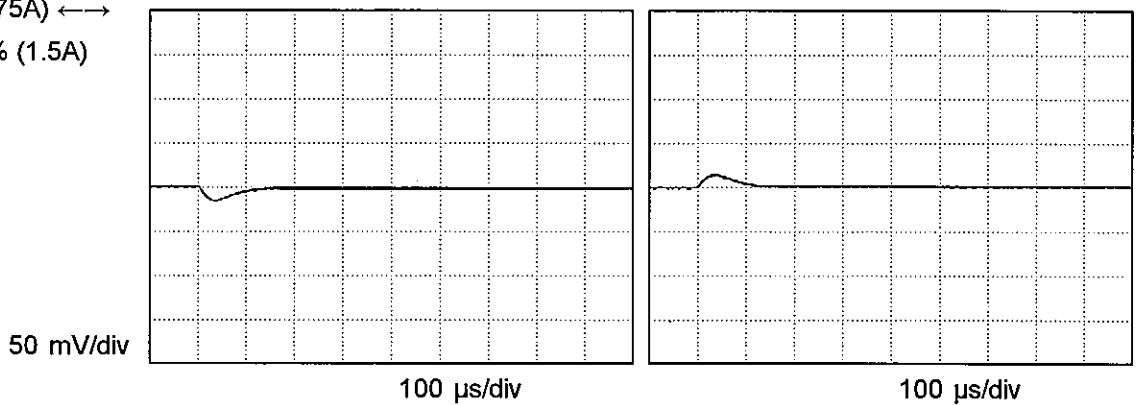
Input Volt. 100 V
 Cycle 1000 ms



Min. Load (0A) ←→
 Load 100% (1.5A)



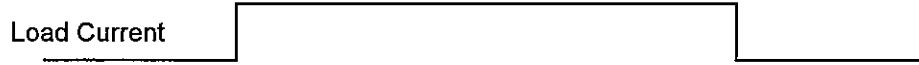
Load 50% (0.75A) ←→
 Load 100% (1.5A)





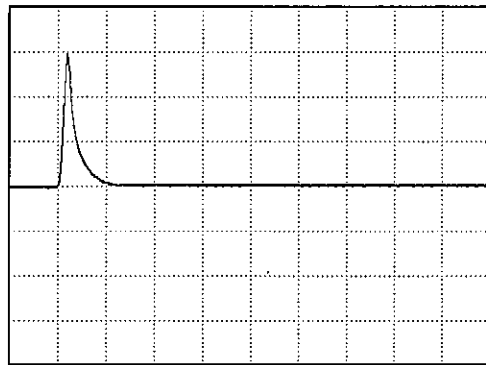
Model		GT3W-12	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		-12V1.5A	

Input Volt. 100 V
Cycle 1000 ms

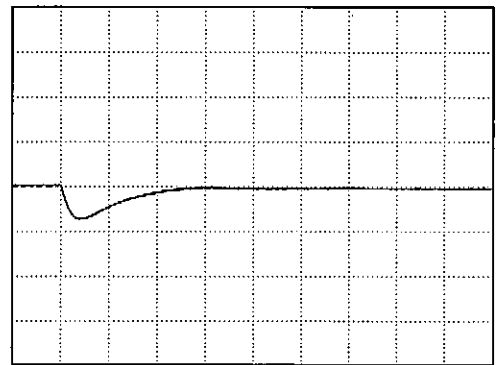


Min. Load (0A) ←→
Load 100% (1.5A)

50 mV/div



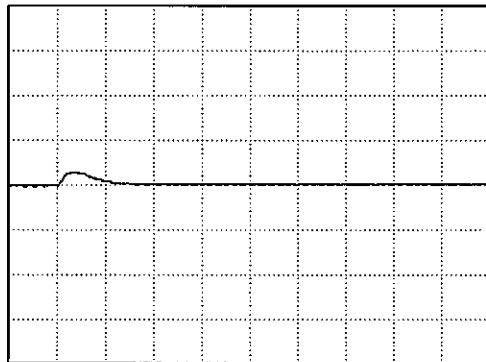
100 μs/div



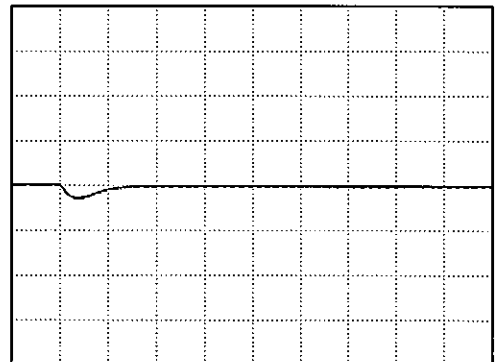
100 μs/div

Load 50% (0.75A) ←→
Load 100% (1.5A)

50 mV/div



100 μs/div



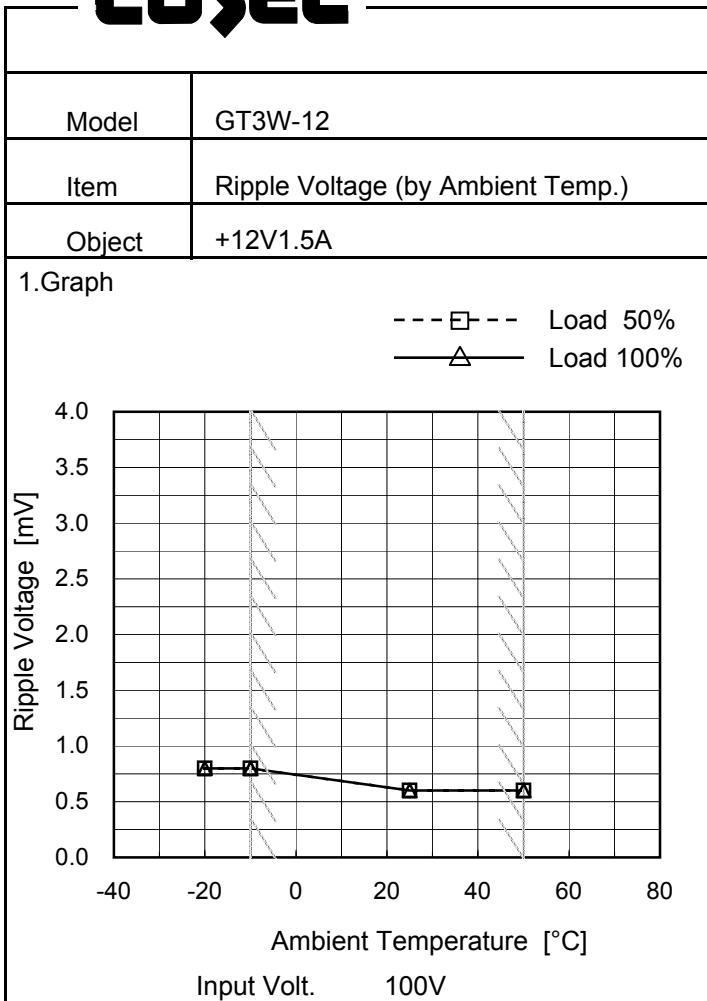
100 μs/div



<p>Model GT3W-12</p>		<p>Temperature 25°C Testing Circuitry Figure A</p>																																									
<p>Item</p>	<p>Ripple Voltage (by Load Current)</p>																																										
<p>Object</p>	<p>+12V1.5A</p>																																										
<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>0.00</td> <td>0.6</td> <td>0.6</td> </tr> <tr> <td>0.75</td> <td>0.6</td> <td>0.6</td> </tr> <tr> <td>1.50</td> <td>0.6</td> <td>0.6</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]	0.00	0.6	0.6	0.75	0.6	0.6	1.50	0.6	0.6	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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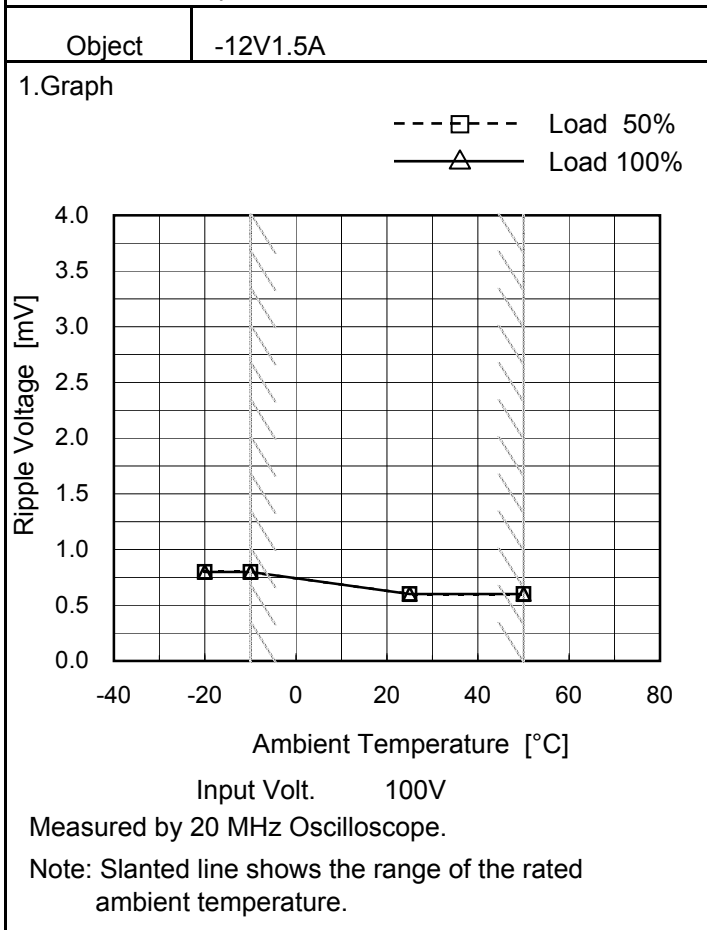
COSEL																																												
Model	GT3W-12	Temperature	25°C																																									
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure A																																									
Object	-12V1.5A																																											
<p>1.Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 90V</p> <p>-·-○-·- Input Volt. 110V</p> </div> <p style="text-align: center;">Ripple Voltage [mV]</p> <p style="text-align: center;">Load Current [A]</p> <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" style="margin-left: auto; margin-right: auto;"> <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>0.00</td> <td>0.6</td> <td>0.6</td> </tr> <tr> <td>0.75</td> <td>0.6</td> <td>0.6</td> </tr> <tr> <td>1.50</td> <td>0.6</td> <td>0.6</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]	0.00	0.6	0.6	0.75	0.6	0.6	1.50	0.6	0.6	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	0.8	0.8
-10	0.8	0.8
25	0.6	0.6
50	0.6	0.6
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	0.8	0.8
-10	0.8	0.8
25	0.6	0.6
50	0.6	0.6
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



COSEL																																																						
Model	GT3W-12	Testing Circuitry Figure A																																																				
Item	Ambient Temperature Drift																																																					
Object	+12V1.5A																																																					
1.Graph	<p>—△— Input Volt. 90V ---□--- Input Volt. 100V ---○--- Input Volt. 110V</p> <p style="text-align: center;">Ambient Temperature [°C] Load 100%</p>	2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 90[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 110[V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>11.995</td><td>11.995</td><td>11.995</td></tr> <tr><td>-10</td><td>12.007</td><td>12.007</td><td>12.007</td></tr> <tr><td>0</td><td>12.016</td><td>12.016</td><td>12.016</td></tr> <tr><td>10</td><td>12.022</td><td>12.022</td><td>12.022</td></tr> <tr><td>20</td><td>12.028</td><td>12.028</td><td>12.028</td></tr> <tr><td>25</td><td>12.031</td><td>12.031</td><td>12.031</td></tr> <tr><td>30</td><td>12.033</td><td>12.033</td><td>12.033</td></tr> <tr><td>40</td><td>12.035</td><td>12.035</td><td>12.035</td></tr> <tr><td>50</td><td>12.033</td><td>12.033</td><td>12.033</td></tr> <tr><td>60</td><td>12.031</td><td>12.031</td><td>12.031</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]	-20	11.995	11.995	11.995	-10	12.007	12.007	12.007	0	12.016	12.016	12.016	10	12.022	12.022	12.022	20	12.028	12.028	12.028	25	12.031	12.031	12.031	30	12.033	12.033	12.033	40	12.035	12.035	12.035	50	12.033	12.033	12.033	60	12.031	12.031	12.031	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]																																																			
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10	12.022	12.022	12.022																																																			
20	12.028	12.028	12.028																																																			
25	12.031	12.031	12.031																																																			
30	12.033	12.033	12.033																																																			
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1.Graph	<p>—△— Input Volt. 90V ---□--- Input Volt. 100V ---○--- Input Volt. 110V</p> <p style="text-align: center;">Ambient Temperature [°C] Load 100%</p>	2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 90[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 110[V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>-12.017</td><td>-12.017</td><td>-12.017</td></tr> <tr><td>-10</td><td>-12.022</td><td>-12.022</td><td>-12.022</td></tr> <tr><td>0</td><td>-12.026</td><td>-12.026</td><td>-12.026</td></tr> <tr><td>10</td><td>-12.029</td><td>-12.029</td><td>-12.029</td></tr> <tr><td>20</td><td>-12.030</td><td>-12.030</td><td>-12.030</td></tr> <tr><td>25</td><td>-12.030</td><td>-12.029</td><td>-12.030</td></tr> <tr><td>30</td><td>-12.029</td><td>-12.029</td><td>-12.029</td></tr> <tr><td>40</td><td>-12.025</td><td>-12.025</td><td>-12.025</td></tr> <tr><td>50</td><td>-12.021</td><td>-12.021</td><td>-12.021</td></tr> <tr><td>60</td><td>-12.014</td><td>-12.014</td><td>-12.014</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]	-20	-12.017	-12.017	-12.017	-10	-12.022	-12.022	-12.022	0	-12.026	-12.026	-12.026	10	-12.029	-12.029	-12.029	20	-12.030	-12.030	-12.030	25	-12.030	-12.029	-12.030	30	-12.029	-12.029	-12.029	40	-12.025	-12.025	-12.025	50	-12.021	-12.021	-12.021	60	-12.014	-12.014	-12.014	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
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Note: Slanted line shows the range of the rated ambient temperature.																																																						



COSEL		
Model	GT3W-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 - 1.5A (AVR 2) : 0 - 1.5A

* 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		+12V1.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy		
			Current[A]	Voltage[V]	Value [mV]	Ration [%]	
Maximum Voltage	50	110	0	12.039	±17	±0.1	
Minimum Voltage	-10	90	1.5	12.005			

Object		-12V1.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy		
			Current[A]	Voltage[V]	Value [mV]	Ration [%]	
Maximum Voltage	20	100	0	-12.033	±7	±0.1	
Minimum Voltage	50	90	1.5	-12.019			

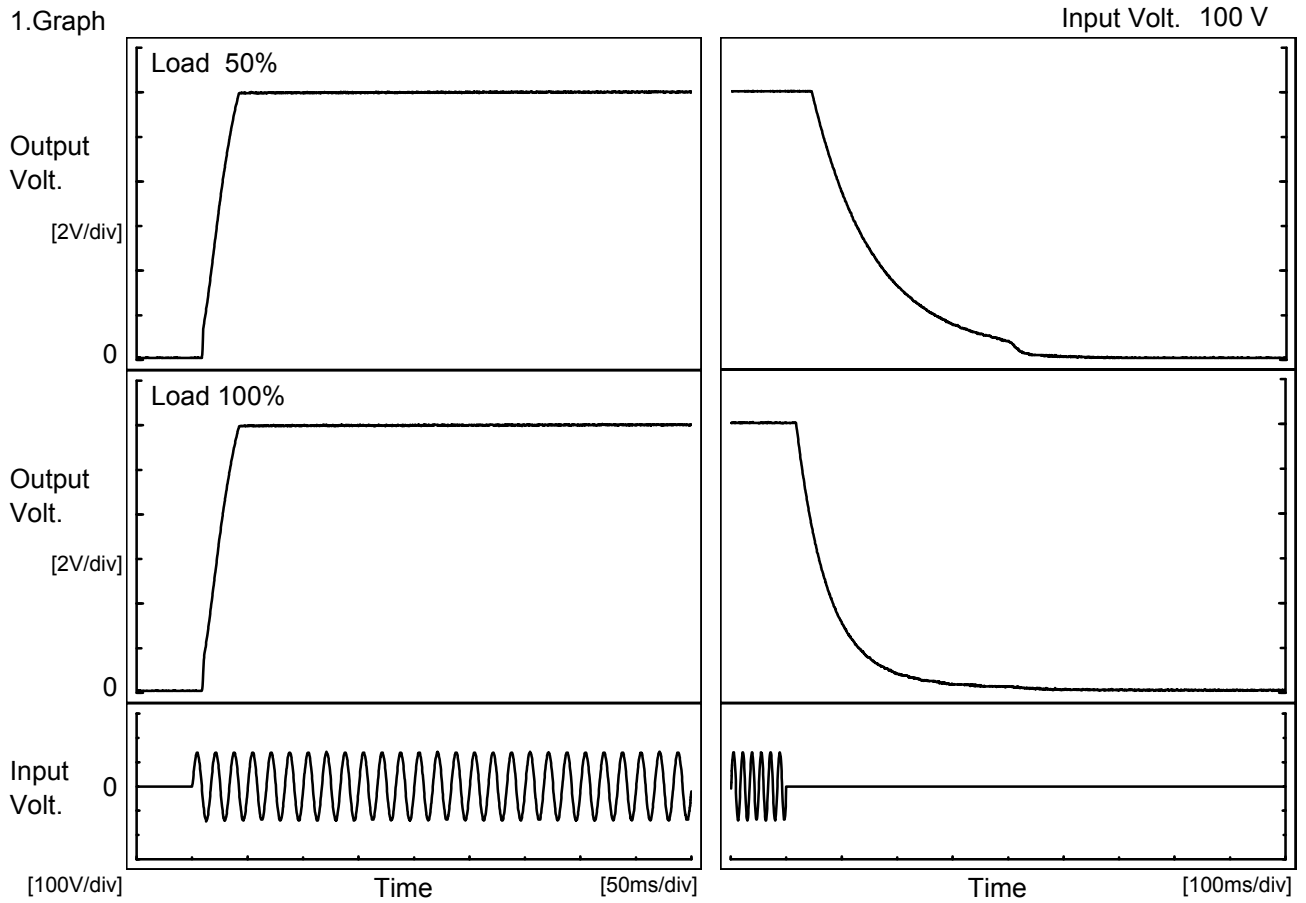


COSEL																									
Model	GT3W-12	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+12V1.5A																								
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p style="text-align: center;">Input Volt. 100V 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>12.029</td></tr> <tr><td>0.5</td><td>12.030</td></tr> <tr><td>1.0</td><td>12.030</td></tr> <tr><td>2.0</td><td>12.030</td></tr> <tr><td>3.0</td><td>12.030</td></tr> <tr><td>4.0</td><td>12.030</td></tr> <tr><td>5.0</td><td>12.030</td></tr> <tr><td>6.0</td><td>12.030</td></tr> <tr><td>7.0</td><td>12.030</td></tr> <tr><td>8.0</td><td>12.030</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	12.029	0.5	12.030	1.0	12.030	2.0	12.030	3.0	12.030	4.0	12.030	5.0	12.030	6.0	12.030	7.0	12.030	8.0	12.030
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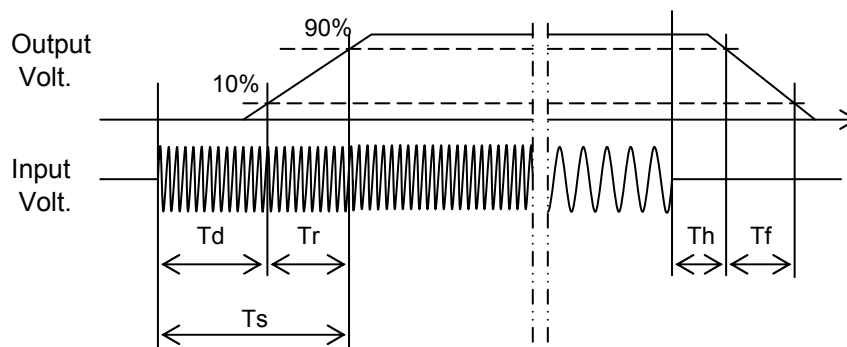
Model	GT3W-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V1.5A		

1. Graph



2. Values

		[ms]				
Load \ Time	Td	Tr	Ts	Th	Tf	
50 %	10.0	27.5	37.5	56.0	276.5	
100 %	10.5	27.0	37.5	23.5	142.0	

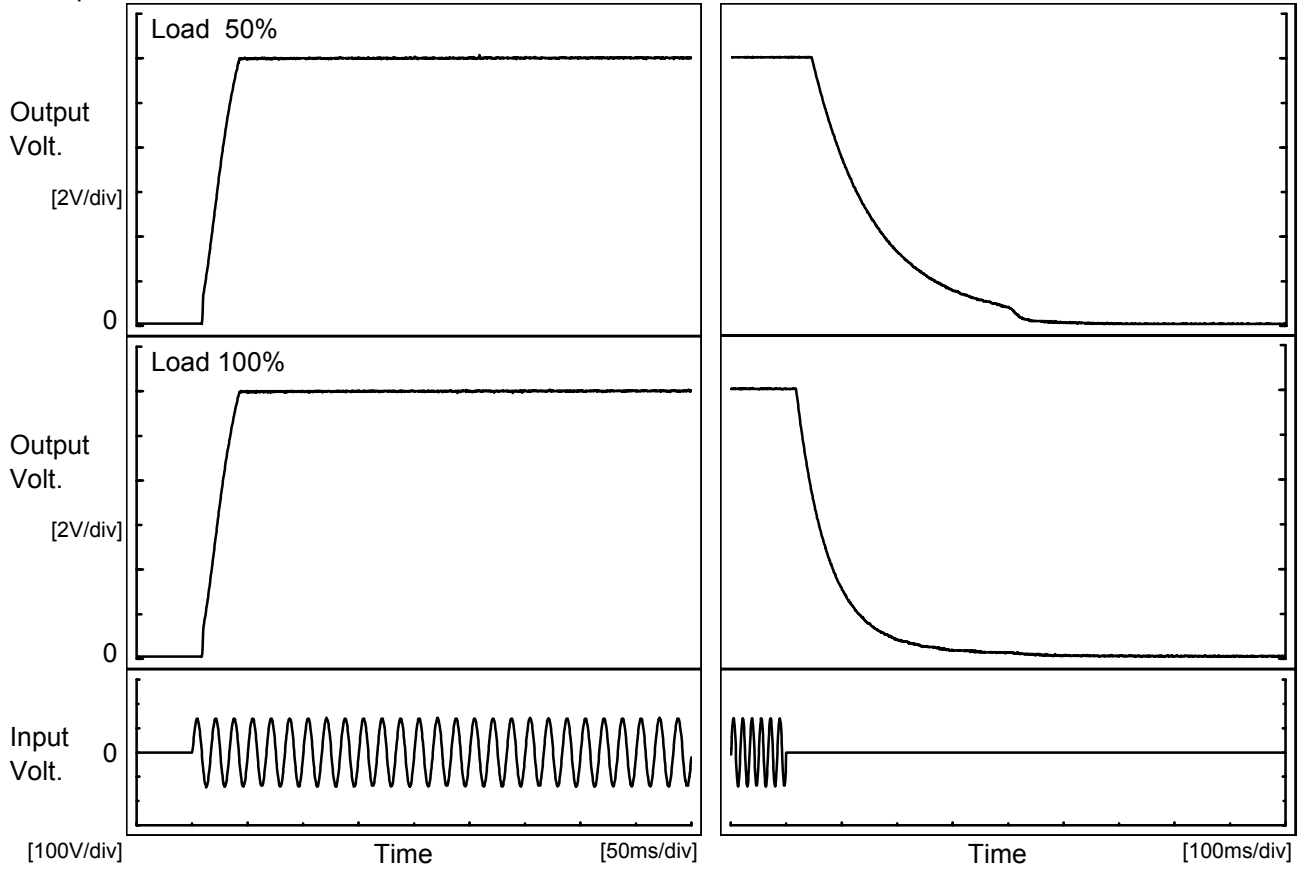




Model	GT3W-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-12V1.5A		

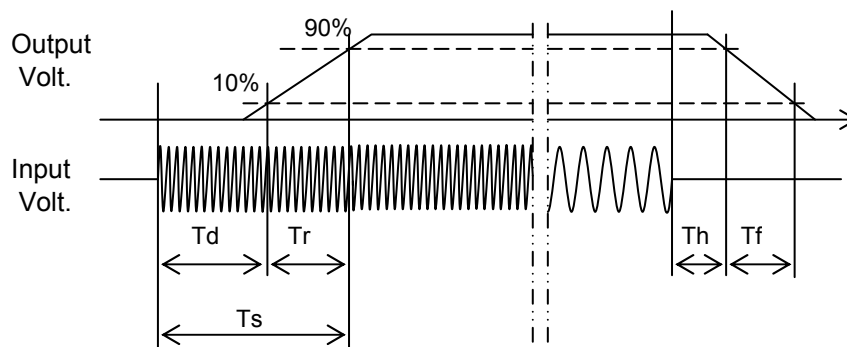
1. Graph

Input Volt. 100 V



2. Values

Load	Time	[ms]				
		Td	Tr	Ts	Th	Tf
50 %		10.0	27.8	37.8	55.5	275.5
100 %		10.0	27.8	37.8	23.5	139.0





Model		GT3W-12																																	
Item		Hold-Up Time																																	
Object		+12V1.5A																																	
1.Graph		Temperature 25°C Testing Circuitry Figure A																																	
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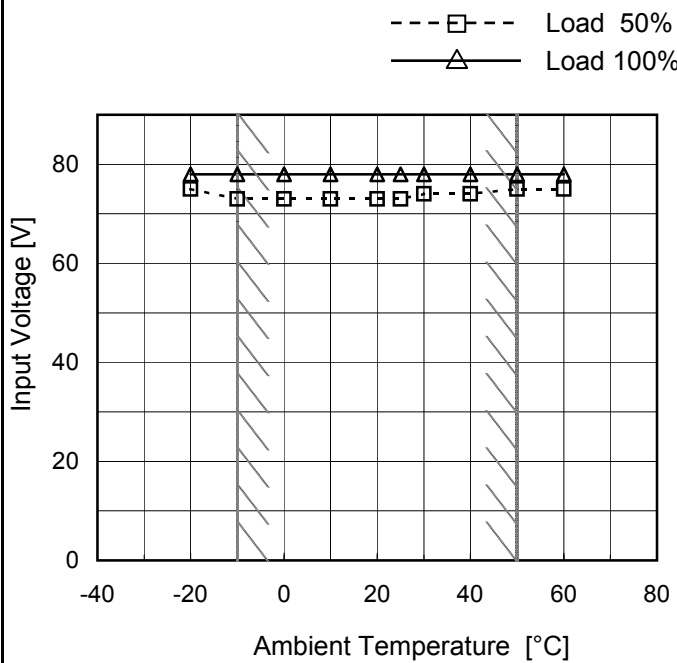
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Model	GT3W-12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V1.5A

Testing Circuitry Figure A

1.Graph

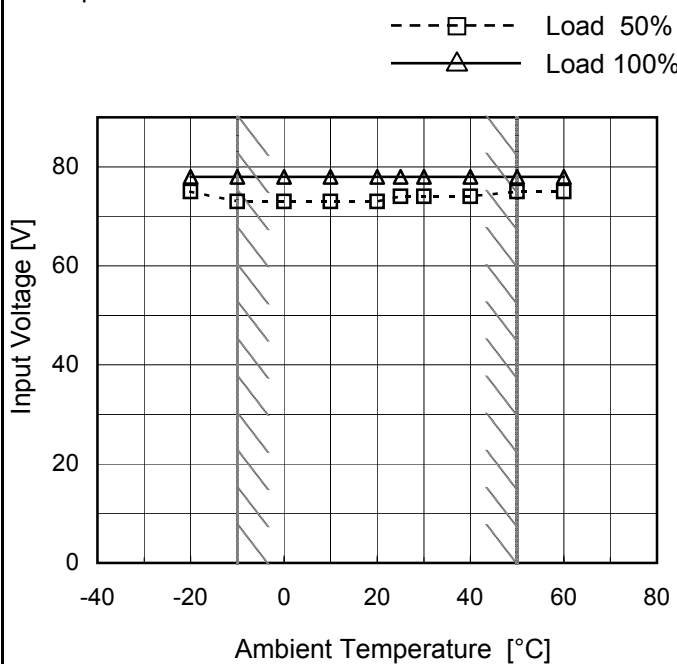


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	75	78
-10	73	78
0	73	78
10	73	78
20	73	78
25	73	78
30	74	78
40	74	78
50	75	78
60	75	78
--	-	-

Object	-12V1.5A
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1.Graph



2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	75	78
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10	73	78
20	73	78
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30	74	78
40	74	78
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60	75	78
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Note: Slanted line shows the range of the rated ambient temperature.



COSEL																																																										
Model	GT3W-12	Temperature	25°C																																																							
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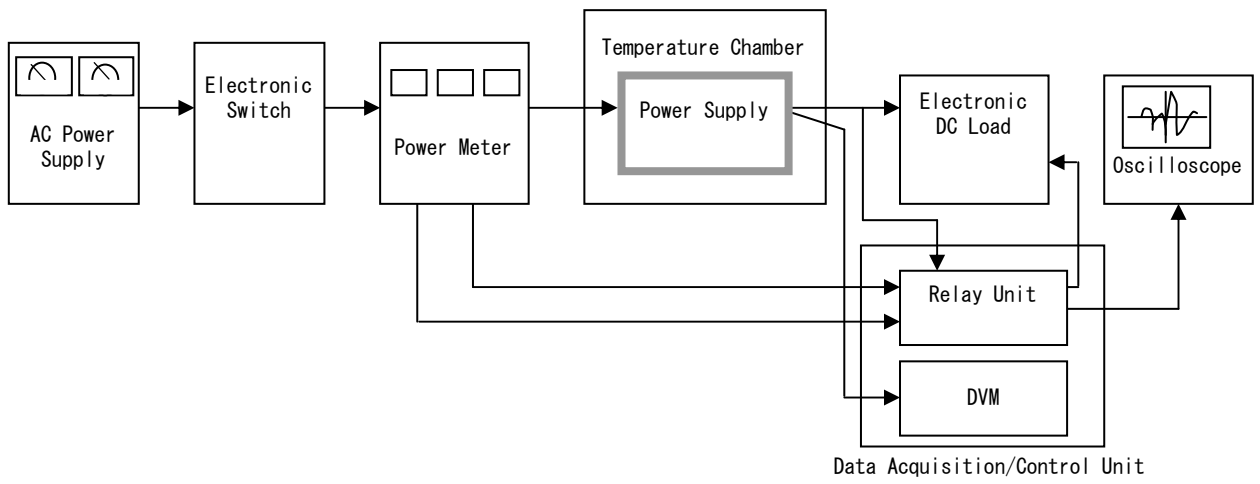


Figure A