

TEST DATA OF MODULE Y

(ACE series)

Regulated DC power supply
Jun.7.2003

Approved by : 
K.Shibutani Design Manager

Prepared by : 
M.Hamaguchi Design Engineer

COSEL CO.,LTD.

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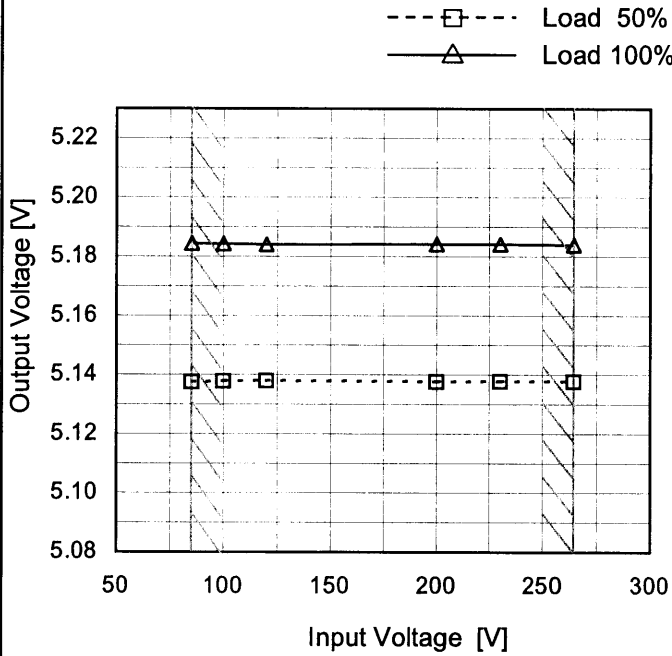
(Final Page 15)



Model	MODULE Y
Item	Line Regulation
Object	+5V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

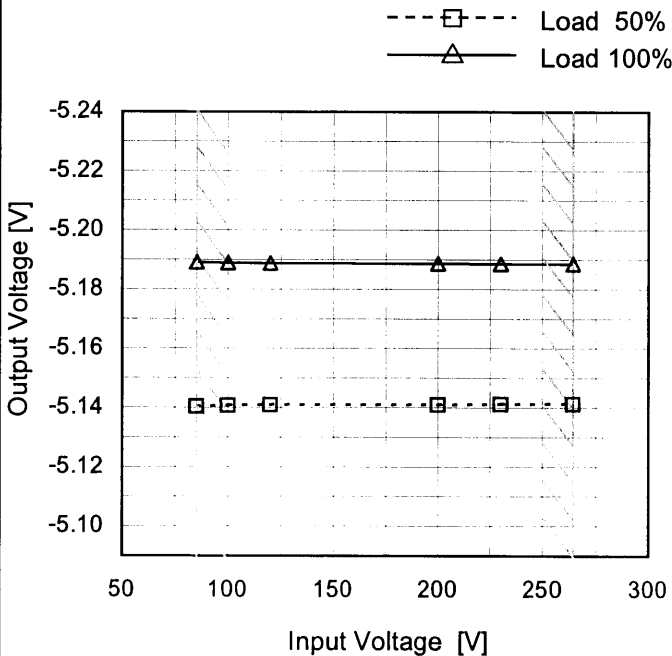


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	5.138	5.184
100	5.138	5.184
120	5.138	5.184
200	5.138	5.184
230	5.138	5.184
264	5.138	5.184
--	-	-
--	-	-
--	-	-

Object	-5V3A
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1.Graph



2.Values

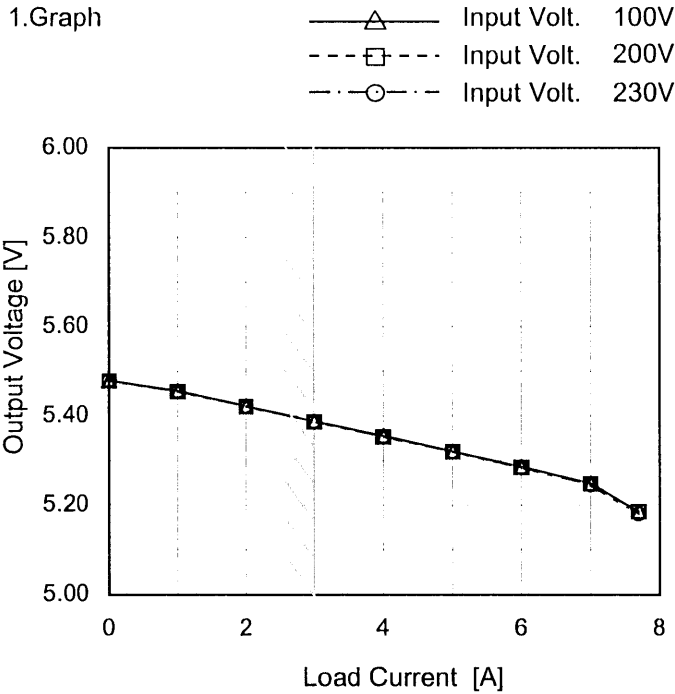
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	-5.140	-5.189
100	-5.141	-5.189
120	-5.141	-5.189
200	-5.141	-5.189
230	-5.141	-5.189
264	-5.141	-5.189
--	-	-
--	-	-
--	-	-

Note: Slanted line shows the range of the rated input voltage.



Model	MODULE Y
Item	Load Regulation
Object	+5V3A

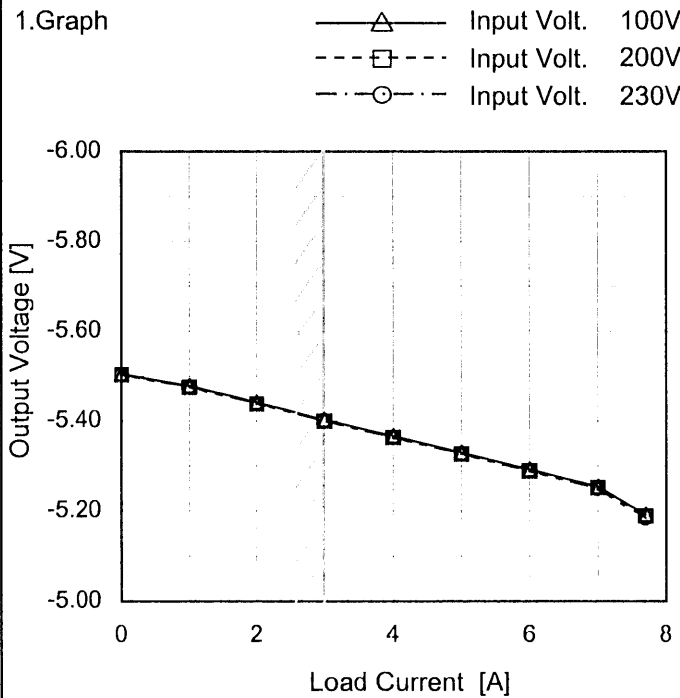
Temperature 25°C
Testing Circuitry Figure A



2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	5.479	5.478	5.479
1.0	5.456	5.454	5.454
2.0	5.422	5.420	5.421
3.0	5.388	5.386	5.386
4.0	5.355	5.353	5.353
5.0	5.321	5.320	5.319
6.0	5.286	5.284	5.283
7.0	5.249	5.248	5.246
7.7	5.186	5.185	5.180
--	-	-	-
--	-	-	-

Object	-5V3A
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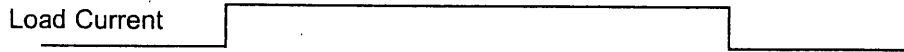
2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-5.505	-5.502	-5.503
1.0	-5.479	-5.475	-5.475
2.0	-5.441	-5.438	-5.438
3.0	-5.402	-5.399	-5.399
4.0	-5.367	-5.363	-5.362
5.0	-5.329	-5.326	-5.326
6.0	-5.293	-5.289	-5.288
7.0	-5.255	-5.252	-5.249
7.7	-5.192	-5.189	-5.184
--	-	-	-
--	-	-	-

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

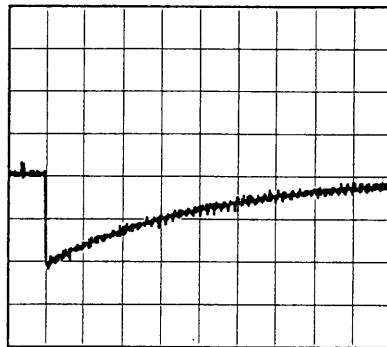
Model		MODULE Y	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		+5V3A	

Input Volt. 100 V
Cycle 1000 mS

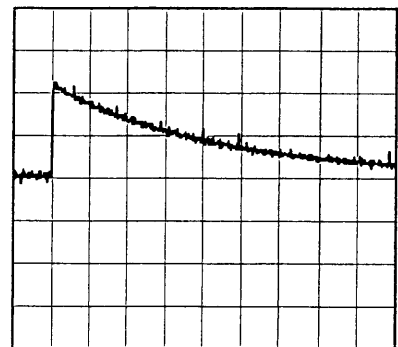


Min. Load (0A) ←→
Load 167% (5A)

100 mV/div



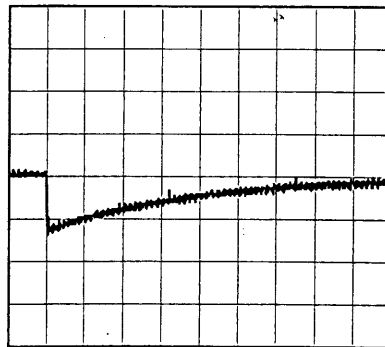
50 ms/div



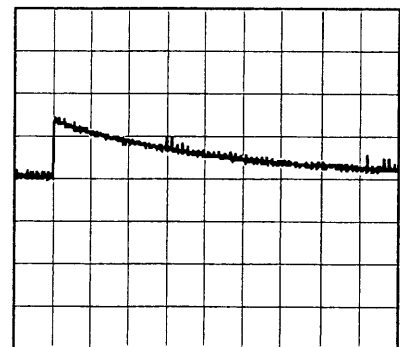
50 ms/div

Min. Load (0A) ←→
Load 84% (2.5A)

100 mV/div



50 ms/div



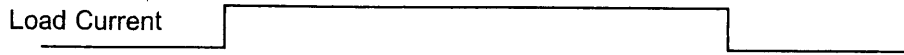
50 ms/div

* The characteristic of AC200V is equal.



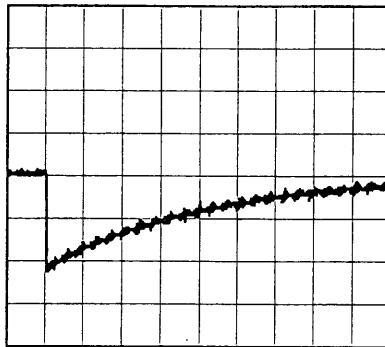
Model	MODULE Y	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-5V3A		

Input Volt. 100 V
 Cycle 1000 mS

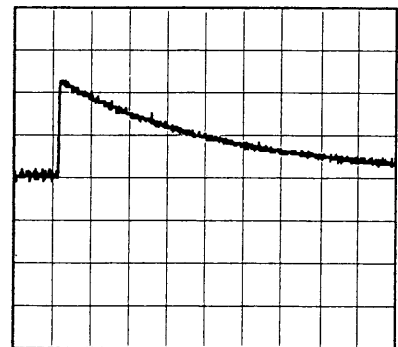


Min. Load (0A) ←→
 Load 167% (5A)

100 mV/div



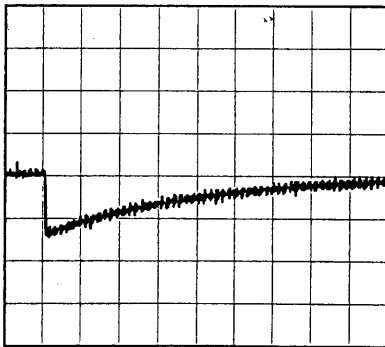
50 ms/div



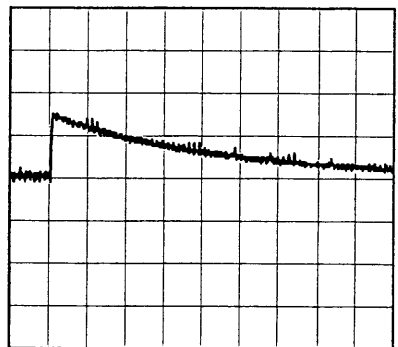
50 ms/div

Min. Load (0A) ←→
 Load 84% (2.5A)

100 mV/div



50 ms/div



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Model		MODULE Y		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure A																																							
Object		+5V3A																																									
<p>1.Graph</p> <p> —△— Input Volt. 100V - -○- - Input Volt. 200V </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. 100 [V]</th> <th>Input Volt. 200 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>10</td><td>10</td></tr> <tr><td>1.4</td><td>15</td><td>15</td></tr> <tr><td>2.8</td><td>20</td><td>20</td></tr> <tr><td>4.2</td><td>20</td><td>20</td></tr> <tr><td>5.6</td><td>25</td><td>25</td></tr> <tr><td>7.0</td><td>35</td><td>35</td></tr> <tr><td>7.7</td><td>35</td><td>35</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. 100 [V]	Input Volt. 200 [V]	0.0	10	10	1.4	15	15	2.8	20	20	4.2	20	20	5.6	25	25	7.0	35	35	7.7	35	35	--	-	-	--	-	-	--	-	-	--	-	-
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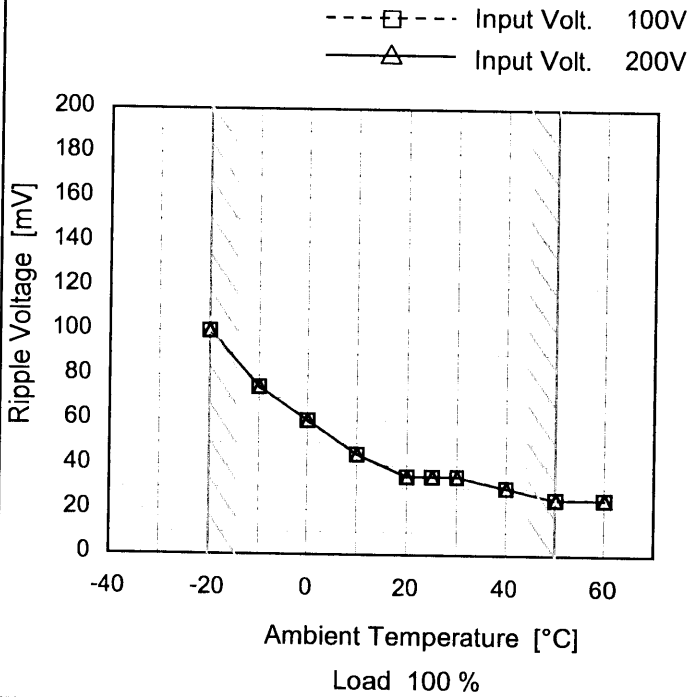
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Fig. Complex Ripple Wave Form																																											



Model	MODULE Y
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V3A

Testing Circuitry Figure A

1. Graph

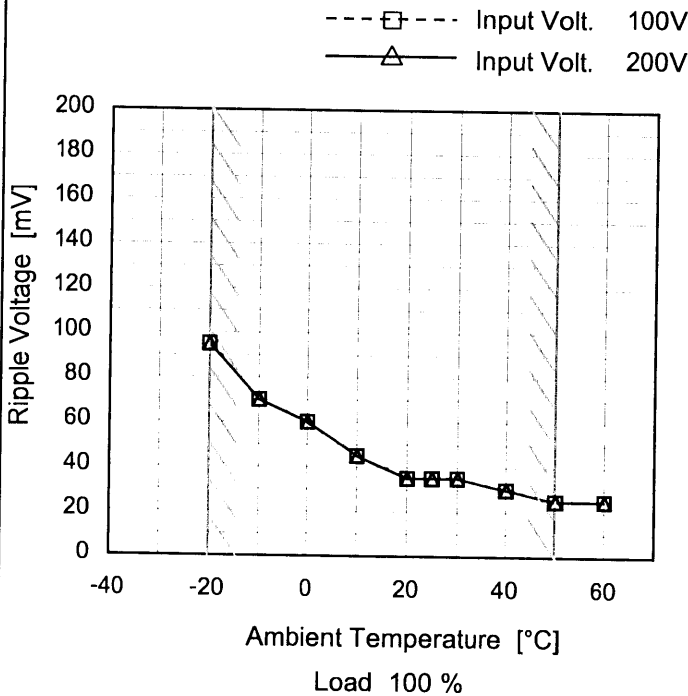


2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-20	100	100
-10	75	75
0	60	60
10	45	45
20	35	35
25	35	35
30	35	35
40	30	30
50	25	25
60	25	25
--	-	-

Object	-5V3A
--------	-------

1. Graph



2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-20	95	95
-10	70	70
0	60	60
10	45	45
20	35	35
25	35	35
30	35	35
40	30	30
50	25	25
60	25	25
--	-	-

Measured by 20 MHz Oscilloscope.

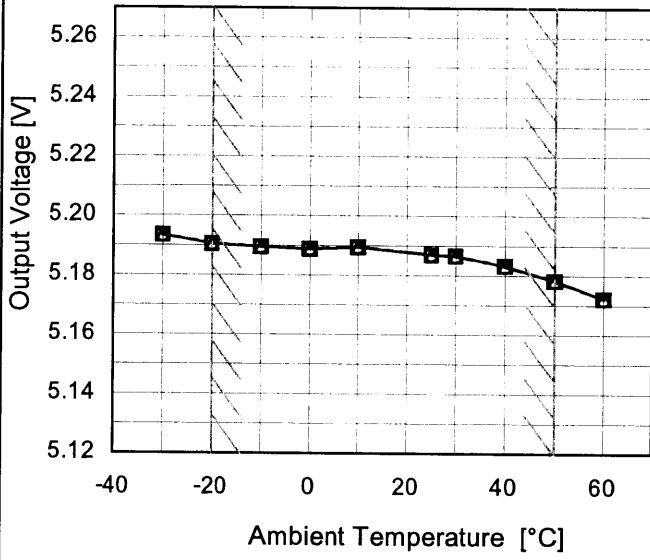
Note: Slanted line shows the range of the rated ambient temperature.



Model	MODULE Y
Item	Ambient Temperature Drift
Object	+5V3A

Testing Circuitry Figure A

1.Graph
 —△— Input Volt. 100V
 - - - □ - - - Input Volt. 200V
 - - - ○ - - - Input Volt. 230V

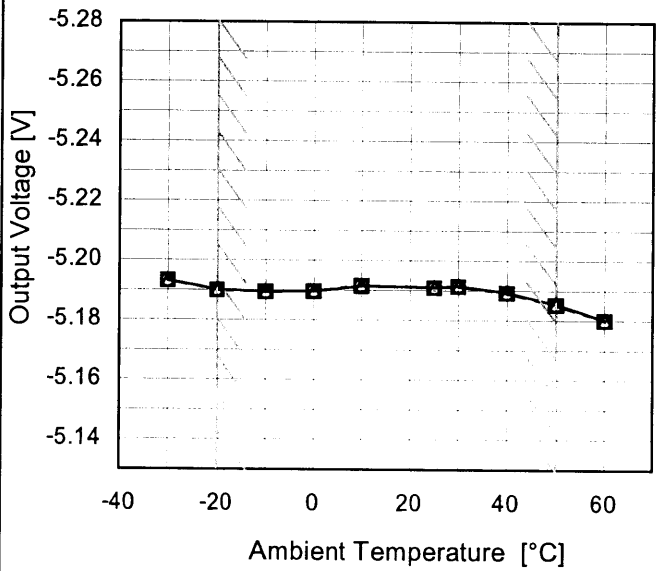


2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	5.194	5.194	5.193
-20	5.191	5.191	5.191
-10	5.190	5.190	5.190
0	5.189	5.189	5.189
10	5.189	5.190	5.190
25	5.187	5.187	5.187
30	5.187	5.187	5.187
40	5.183	5.183	5.183
50	5.178	5.178	5.178
60	5.172	5.172	5.172
--	-	-	-

Object	-5V3A
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1.Graph
 —△— Input Volt. 100V
 - - - □ - - - Input Volt. 200V
 - - - ○ - - - Input Volt. 230V



2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	-5.193	-5.193	-5.193
-20	-5.190	-5.190	-5.190
-10	-5.190	-5.189	-5.189
0	-5.190	-5.190	-5.190
10	-5.192	-5.192	-5.192
25	-5.191	-5.191	-5.191
30	-5.192	-5.191	-5.191
40	-5.189	-5.189	-5.189
50	-5.186	-5.185	-5.185
60	-5.180	-5.180	-5.180
--	-	-	-

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



COSEL		Testing Circuitry Figure A
Model	MODULE Y	
Item	Output Voltage Accuracy	

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 : -20 - 50°C

Input Voltage : 85 - 264V

Load Current (AVR 1) : 0 - 3A (AVR 2): 0 - 3A

* 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		+5V3A		Output		Output Voltage Accuracy	
Item	Temperature [°C]	Input Voltage[V]	Output		Value [mV]	Ration [%]	
			Current[A]	Voltage[V]			
Maximum Voltage	50	85	3	5.324	±146	±2.9	
Minimum Voltage	50	264	0	5.033			

Object		-5V3A		Output		Output Voltage Accuracy	
Item	Temperature [°C]	Input Voltage[V]	Output		Value [mV]	Ration [%]	
			Current[A]	Voltage[V]			
Maximum Voltage	50	200	3	-5.331	±146	±2.9	
Minimum Voltage	50	85	0	-5.039			

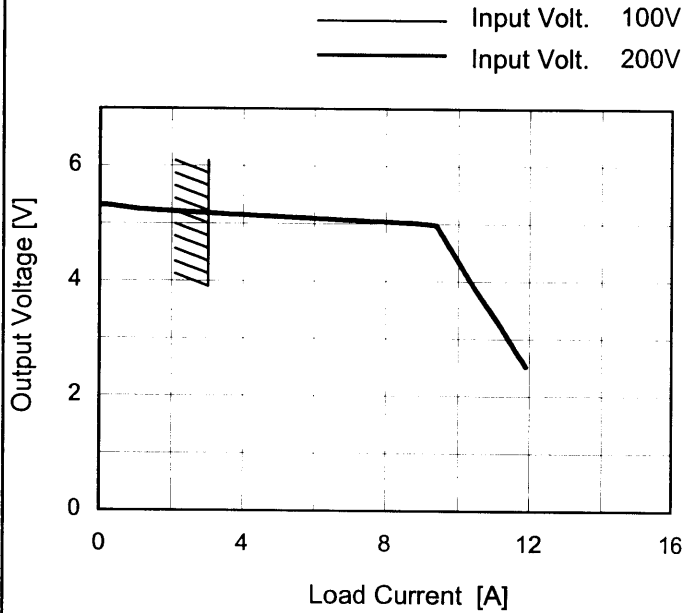


COSEL																									
Model	MODULE Y	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+5V3A																								
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p style="text-align: center;">Input Volt. 100V Load 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>5.189</td></tr> <tr><td>0.5</td><td>5.185</td></tr> <tr><td>1.0</td><td>5.185</td></tr> <tr><td>2.0</td><td>5.185</td></tr> <tr><td>3.0</td><td>5.185</td></tr> <tr><td>4.0</td><td>5.185</td></tr> <tr><td>5.0</td><td>5.185</td></tr> <tr><td>6.0</td><td>5.185</td></tr> <tr><td>7.0</td><td>5.185</td></tr> <tr><td>8.0</td><td>5.185</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	5.189	0.5	5.185	1.0	5.185	2.0	5.185	3.0	5.185	4.0	5.185	5.0	5.185	6.0	5.185	7.0	5.185	8.0	5.185
Time since start [H]	Output Voltage [V]																								
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<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>-5.187</td></tr> <tr><td>0.5</td><td>-5.186</td></tr> <tr><td>1.0</td><td>-5.186</td></tr> <tr><td>2.0</td><td>-5.186</td></tr> <tr><td>3.0</td><td>-5.186</td></tr> <tr><td>4.0</td><td>-5.186</td></tr> <tr><td>5.0</td><td>-5.186</td></tr> <tr><td>6.0</td><td>-5.186</td></tr> <tr><td>7.0</td><td>-5.186</td></tr> <tr><td>8.0</td><td>-5.186</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	-5.187	0.5	-5.186	1.0	-5.186	2.0	-5.186	3.0	-5.186	4.0	-5.186	5.0	-5.186	6.0	-5.186	7.0	-5.186	8.0	-5.186
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8.0	-5.186																								
<p>* The characteristic of AC200V is equal.</p>																									

Model	MODULE Y
Item	Overcurrent Protection
Object	+5V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



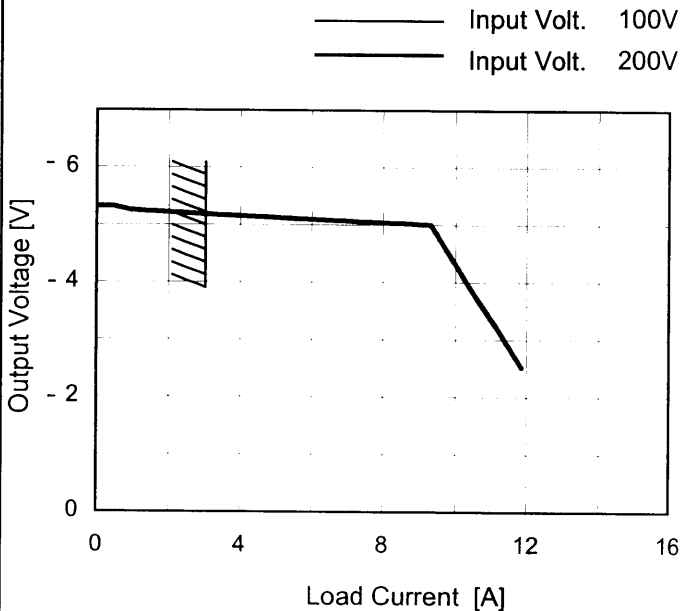
Intermittent operation occurs when the output voltage is from 2.5V to 0V.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
5.00	4.13	4.09
4.75	9.62	9.62
4.50	9.85	9.85
4.00	10.33	10.34
3.50	10.89	10.92
3.00	11.42	11.41
2.50	11.93	11.95
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Object	-5V3A
--------	-------

1.Graph



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

Intermittent operation occurs when the output voltage is from 2.5V to 0V.

2.Values

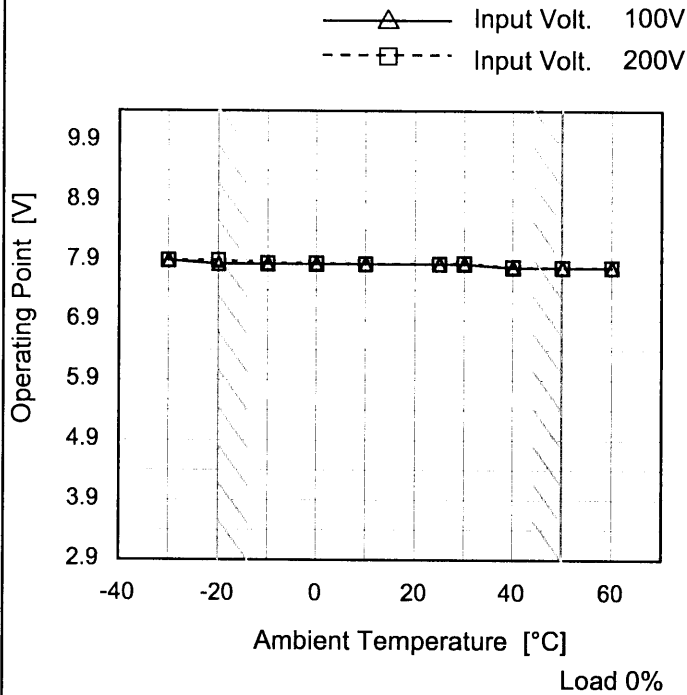
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
-5.00	4.15	4.09
-4.75	9.54	9.57
-4.50	9.76	9.80
-4.00	10.28	10.33
-3.50	10.79	10.85
-3.00	11.35	11.38
-2.50	11.90	11.87
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



Model	MODULE Y
Item	Overvoltage Protection
Object	+5V3A

Testing Circuitry Figure A

1.Graph

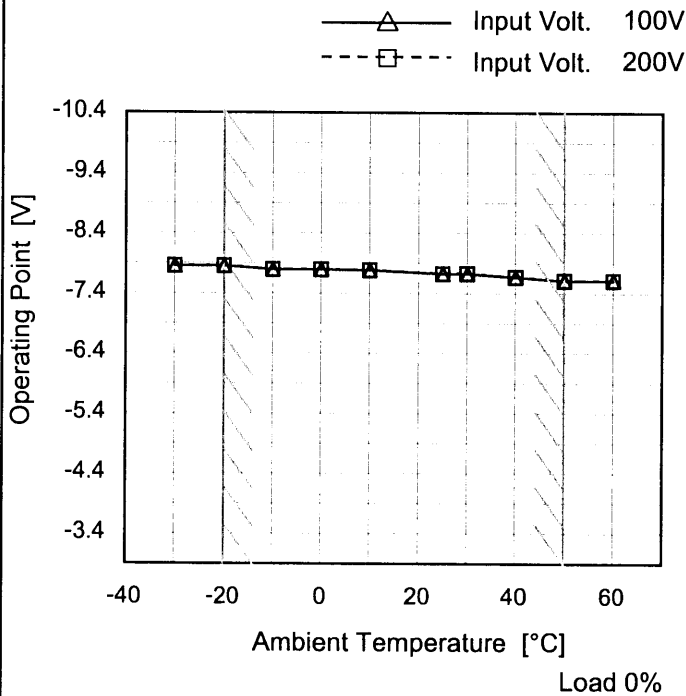


2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-30	7.92	7.92
-20	7.86	7.92
-10	7.86	7.87
0	7.86	7.87
10	7.86	7.86
25	7.86	7.86
30	7.86	7.87
40	7.80	7.81
50	7.80	7.80
60	7.80	7.80
--	-	-

Object	-5V3A
--------	-------

1.Graph



2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-30	-7.87	-7.87
-20	-7.87	-7.87
-10	-7.81	-7.81
0	-7.81	-7.81
10	-7.80	-7.80
25	-7.74	-7.74
30	-7.74	-7.75
40	-7.69	-7.69
50	-7.63	-7.63
60	-7.63	-7.63
--	-	-

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

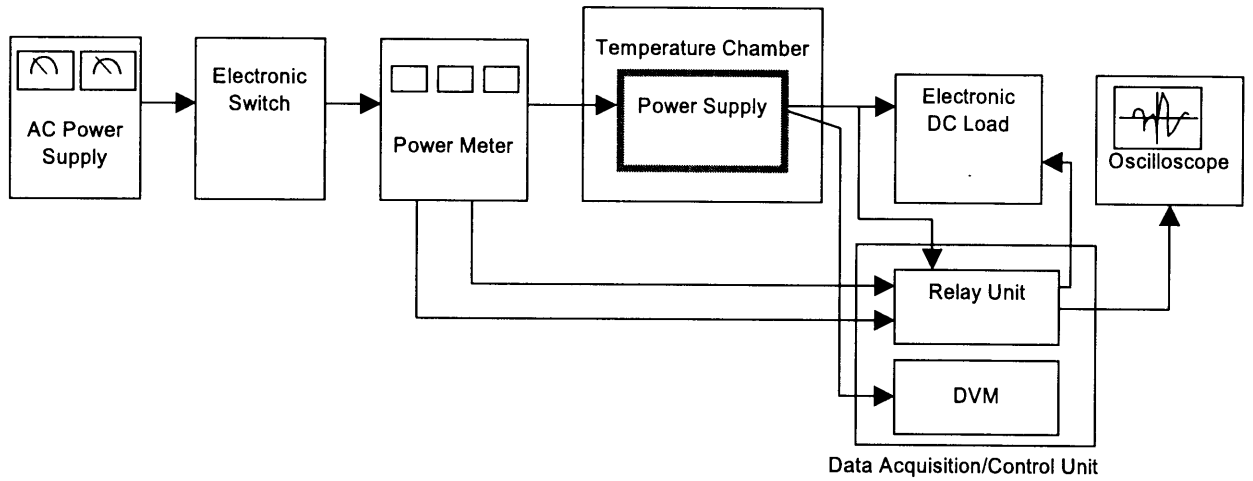


Figure A

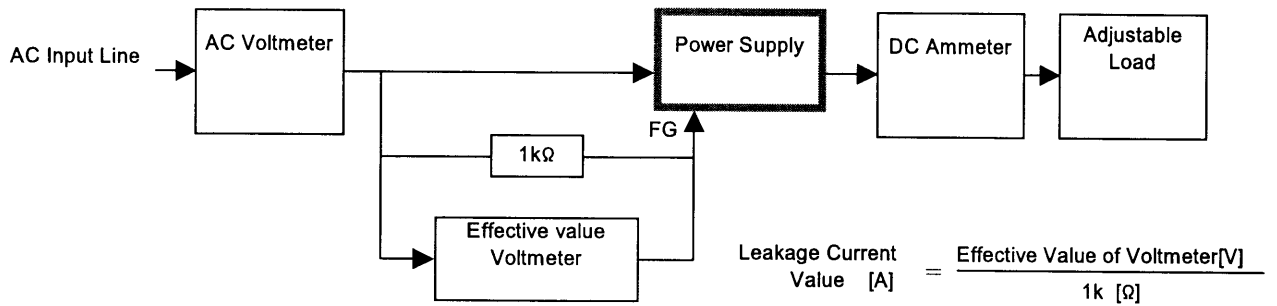


Figure B (DEN-AN)

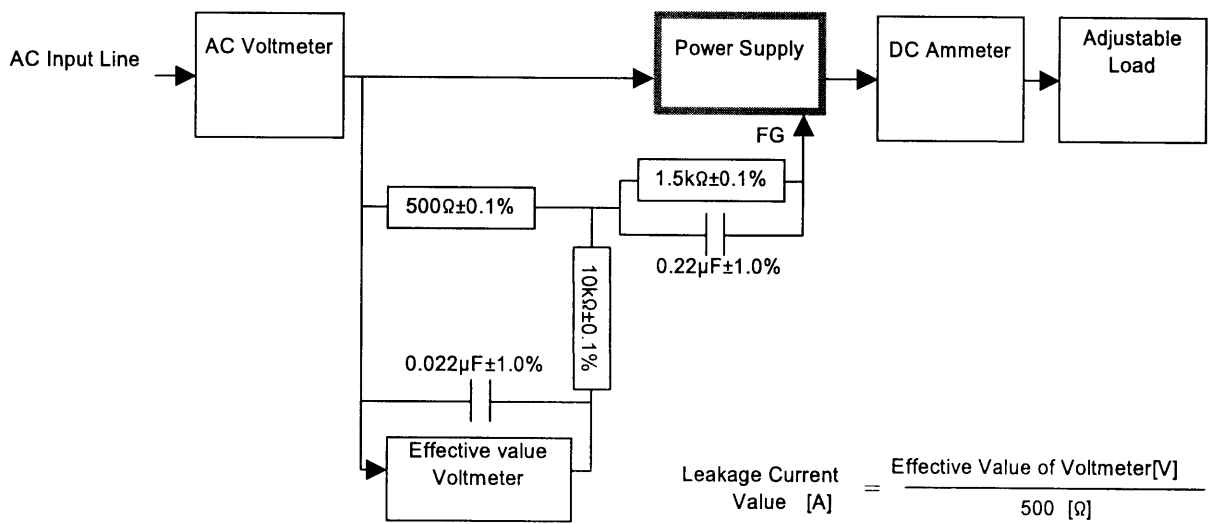


Figure B (IEC60950)