

TEST DATA OF MODULE W

(ACE series)

Regulated DC power supply
Jun.9.2003

Approved by : 
K. Shibutani Design Manager

Prepared by : 
M. Hamaguchi Design Engineer

COSEL CO.,LTD.

CONTENTS

1.Line Regulation 1

2.Load Regulation 2

3.Dynamic Load Response 3

4.Ripple Voltage (by Load Current) 5

5.Ripple-Noise 7

6.Ripple Voltage (by Ambient Temperature) 9

7.Ambient Temperature Drift 10

8.Output Voltage Accuracy 11

9.Time Lapse Drift 12

10.Overcurrent Protection 13

11.Overvoltage Protection 14

12.Figure of Testing Circuitry 15

(Final Page 15)



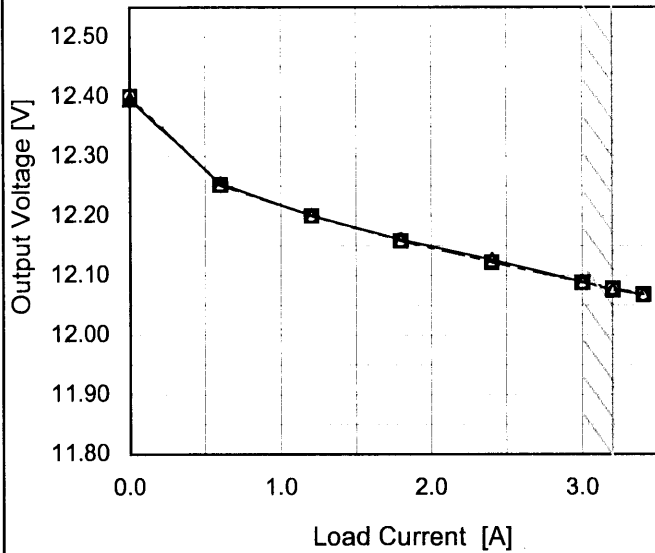
COSEL																																			
Model	MODULE W	Temperature	25°C																																
Item	Line Regulation	Testing Circuitry	Figure A																																
Object	+12V3.2A																																		
<p>1.Graph</p> <p style="text-align: right;"> ---□--- Load 50% —△— Load 100% </p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Output Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>85</td><td>12.173</td><td>12.077</td></tr> <tr><td>100</td><td>12.173</td><td>12.078</td></tr> <tr><td>120</td><td>12.173</td><td>12.078</td></tr> <tr><td>200</td><td>12.174</td><td>12.078</td></tr> <tr><td>230</td><td>12.174</td><td>12.078</td></tr> <tr><td>264</td><td>12.174</td><td>12.078</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>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	85	12.173	12.077	100	12.173	12.078	120	12.173	12.078	200	12.174	12.078	230	12.174	12.078	264	12.174	12.078	--	-	-	--	-	-	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
85	12.173	12.077																																	
100	12.173	12.078																																	
120	12.173	12.078																																	
200	12.174	12.078																																	
230	12.174	12.078																																	
264	12.174	12.078																																	
--	-	-																																	
--	-	-																																	
--	-	-																																	
Object	-12V3.2A																																		
<p>1.Graph</p> <p style="text-align: right;"> ---□--- Load 50% —△— Load 100% </p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Output Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>85</td><td>-12.192</td><td>-12.096</td></tr> <tr><td>100</td><td>-12.192</td><td>-12.097</td></tr> <tr><td>120</td><td>-12.192</td><td>-12.097</td></tr> <tr><td>200</td><td>-12.195</td><td>-12.099</td></tr> <tr><td>230</td><td>-12.195</td><td>-12.099</td></tr> <tr><td>264</td><td>-12.195</td><td>-12.099</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>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	85	-12.192	-12.096	100	-12.192	-12.097	120	-12.192	-12.097	200	-12.195	-12.099	230	-12.195	-12.099	264	-12.195	-12.099	--	-	-	--	-	-	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
85	-12.192	-12.096																																	
100	-12.192	-12.097																																	
120	-12.192	-12.097																																	
200	-12.195	-12.099																																	
230	-12.195	-12.099																																	
264	-12.195	-12.099																																	
--	-	-																																	
--	-	-																																	
--	-	-																																	
<p>Note: Slanted line shows the range of the rated input voltage.</p>																																			



Model	MODULE W
Item	Load Regulation
Object	+12V3.2A

Temperature 25°C
Testing Circuitry Figure A

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

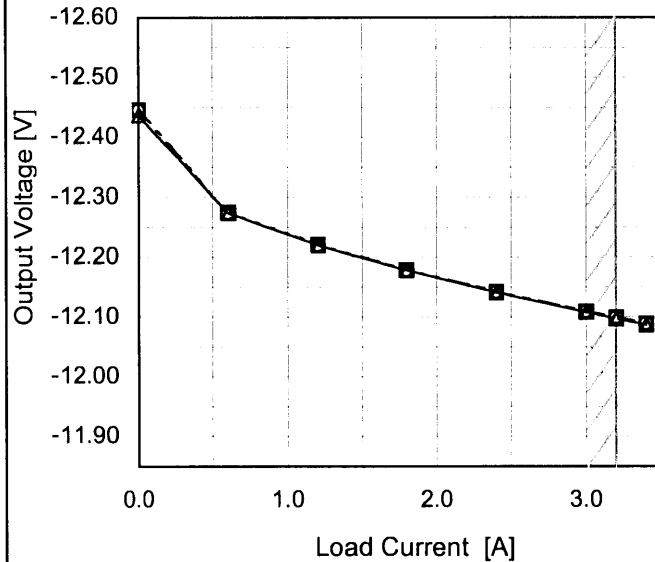


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	12.396	12.401	12.401
0.6	12.254	12.252	12.251
1.2	12.201	12.200	12.200
1.8	12.160	12.158	12.158
2.4	12.126	12.122	12.122
3.0	12.089	12.088	12.088
3.2	12.076	12.078	12.078
3.4	12.068	12.068	12.068
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V3.2A
--------	----------

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



2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-12.437	-12.446	-12.445
0.6	-12.274	-12.275	-12.274
1.2	-12.220	-12.221	-12.220
1.8	-12.178	-12.179	-12.178
2.4	-12.141	-12.142	-12.142
3.0	-12.108	-12.109	-12.109
3.2	-12.097	-12.099	-12.099
3.4	-12.087	-12.089	-12.089
--	-	-	-
--	-	-	-
--	-	-	-

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

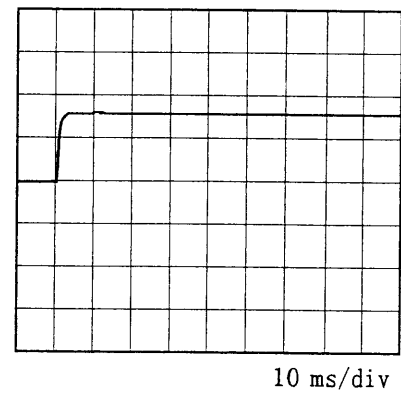
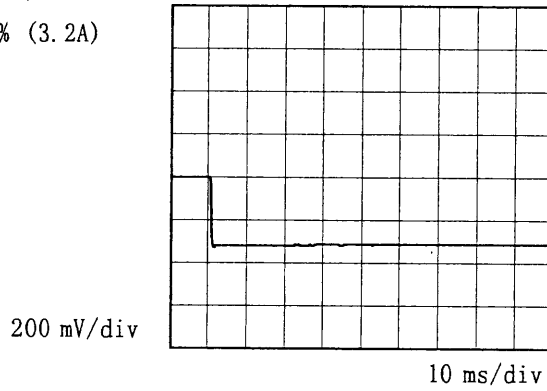


Model		MODULE W	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		+12V3.2A	

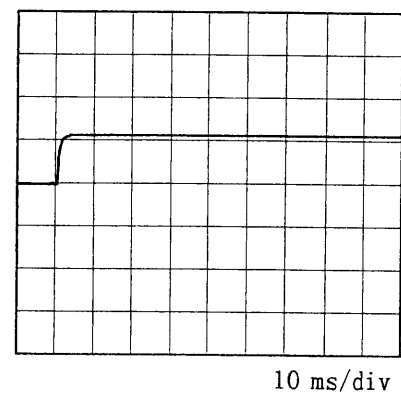
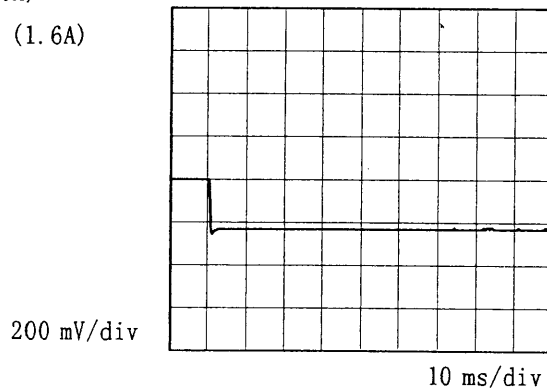
Input Volt. 100 V
Cycle 1000 mS

Load Current

Min. Load (0A) ←→
Load 100% (3.2A)



Min. Load (0A) ←→
Load 50% (1.6A)



* The characteristic of AC200V is equal.

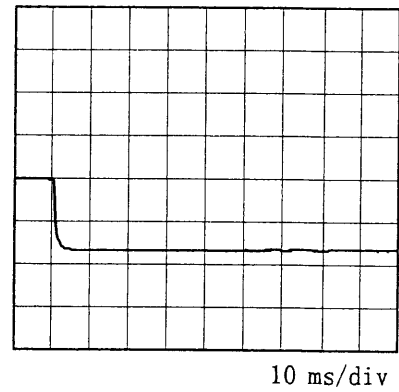
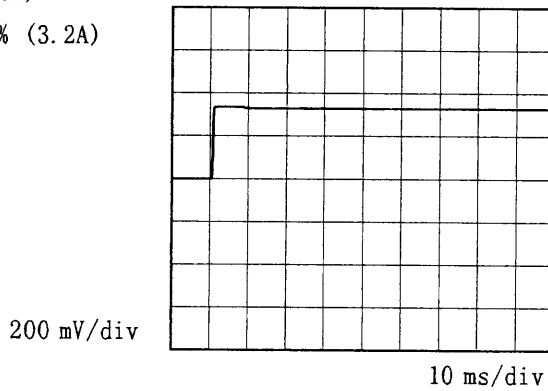


Model		MODULE W	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		-12V3.2A	

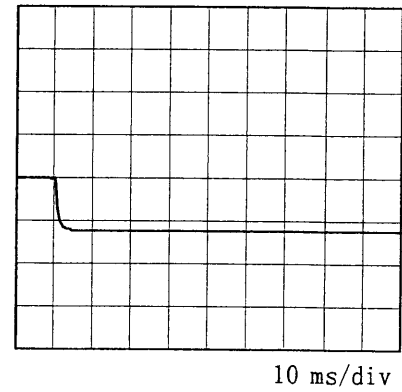
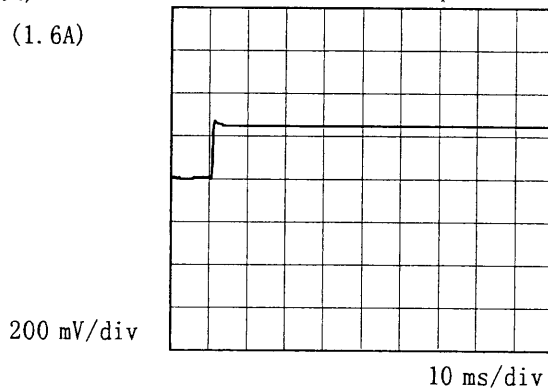
Input Volt. 100 V
Cycle 1000 mS

Load Current

Min. Load (0A) ←→
Load 100% (3.2A)



Min. Load (0A) ←→
Load 50% (1.6A)



* The characteristic of AC200V is equal.

Model		MODULE W		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure A																																							
Object		+12V3.2A																																									
1.Graph				2.Values																																							
<p> —△— Input Volt. 100V - - ○ - - Input Volt. 200V </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>0.6</td><td>20</td><td>20</td></tr> <tr><td>1.3</td><td>25</td><td>25</td></tr> <tr><td>1.9</td><td>30</td><td>30</td></tr> <tr><td>2.6</td><td>35</td><td>35</td></tr> <tr><td>3.2</td><td>35</td><td>35</td></tr> <tr><td>3.5</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	0.6	20	20	1.3	25	25	1.9	30	30	2.6	35	35	3.2	35	35	3.5	35	35	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 100 [V]	Input Volt. 200 [V]																																									
0.0	10	10																																									
0.6	20	20																																									
1.3	25	25																																									
1.9	30	30																																									
2.6	35	35																																									
3.2	35	35																																									
3.5	35	35																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
<p>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																											
<p> T1: Due to AC Input Line T2: Due to Switching </p> <p>Ripple [mVp-p]</p>																																											
<p>Fig. Complex Ripple Wave Form</p>																																											

Model		MODULE W	Temperature 25°C Testing Circuitry Figure A																																						
Item		Ripple Voltage (by Load Current)																																							
Object		-12V3.2A																																							
1.Graph			2.Values																																						
<p>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</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>0.6</td><td>20</td><td>20</td></tr> <tr><td>1.3</td><td>25</td><td>25</td></tr> <tr><td>1.9</td><td>30</td><td>30</td></tr> <tr><td>2.6</td><td>35</td><td>35</td></tr> <tr><td>3.2</td><td>35</td><td>35</td></tr> <tr><td>3.5</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	0.6	20	20	1.3	25	25	1.9	30	30	2.6	35	35	3.2	35	35	3.5	35	35	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 100 [V]	Input Volt. 200 [V]																																							
0.0	10	10																																							
0.6	20	20																																							
1.3	25	25																																							
1.9	30	30																																							
2.6	35	35																																							
3.2	35	35																																							
3.5	35	35																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
<p>T1: Due to AC Input Line T2: Due to Switching</p>																																									
<p>Fig. Complex Ripple Wave Form</p>																																									

Model		MODULE W		Temperature 25°C																																							
Item		Ripple-Noise		Testing Circuitry Figure A																																							
Object		+12V3.2A																																									
1.Graph				2.Values																																							
				<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [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>20</td><td>20</td></tr> <tr><td>0.6</td><td>35</td><td>35</td></tr> <tr><td>1.3</td><td>40</td><td>40</td></tr> <tr><td>1.9</td><td>45</td><td>45</td></tr> <tr><td>2.6</td><td>45</td><td>45</td></tr> <tr><td>3.2</td><td>45</td><td>45</td></tr> <tr><td>3.5</td><td>45</td><td>45</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-Noise [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0.0	20	20	0.6	35	35	1.3	40	40	1.9	45	45	2.6	45	45	3.2	45	45	3.5	45	45	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																										
	Input Volt. 100 [V]	Input Volt. 200 [V]																																									
0.0	20	20																																									
0.6	35	35																																									
1.3	40	40																																									
1.9	45	45																																									
2.6	45	45																																									
3.2	45	45																																									
3.5	45	45																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
<p>Measured by 20 MHz Oscilloscope. Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																											
<p>Fig. Complex Ripple Wave Form</p>																																											

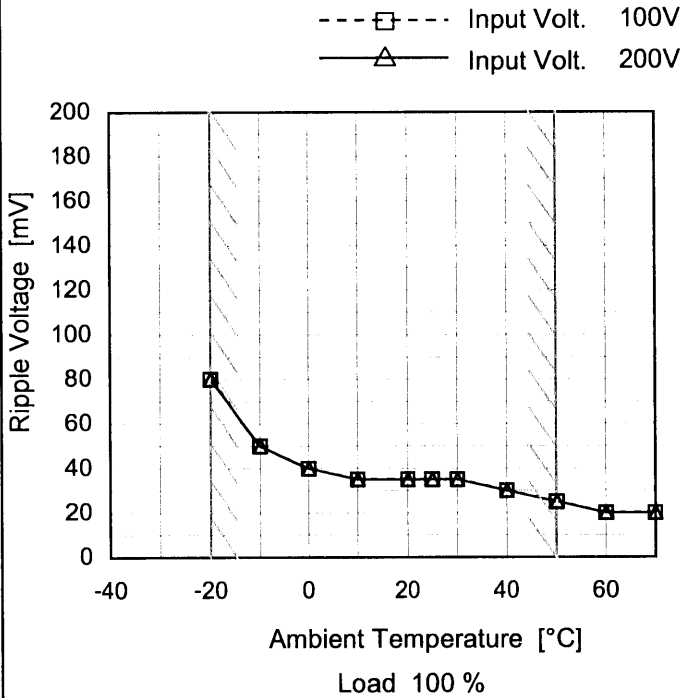
Model		MODULE W		Temperature 25°C																																							
Item		Ripple-Noise		Testing Circuitry Figure A																																							
Object		-12V3.2A																																									
1.Graph				2.Values																																							
				<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [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>20</td><td>20</td></tr> <tr><td>0.6</td><td>35</td><td>35</td></tr> <tr><td>1.3</td><td>40</td><td>40</td></tr> <tr><td>1.9</td><td>45</td><td>45</td></tr> <tr><td>2.6</td><td>45</td><td>45</td></tr> <tr><td>3.2</td><td>45</td><td>45</td></tr> <tr><td>3.5</td><td>45</td><td>45</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-Noise [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0.0	20	20	0.6	35	35	1.3	40	40	1.9	45	45	2.6	45	45	3.2	45	45	3.5	45	45	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																										
	Input Volt. 100 [V]	Input Volt. 200 [V]																																									
0.0	20	20																																									
0.6	35	35																																									
1.3	40	40																																									
1.9	45	45																																									
2.6	45	45																																									
3.2	45	45																																									
3.5	45	45																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
--	-	-																																									
<p>Measured by 20 MHz Oscilloscope. Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																											
<p>Fig. Complex Ripple Wave Form</p>																																											



Model	MODULE W
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V3.2A

Testing Circuitry Figure A

1.Graph

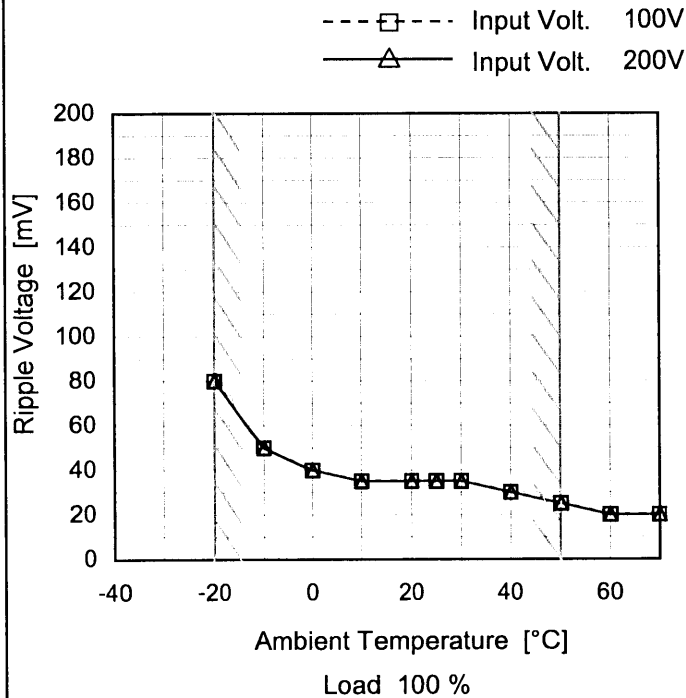


2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-20	80	80
-10	50	50
0	40	40
10	35	35
20	35	35
25	35	35
30	35	35
40	30	30
50	25	25
60	20	20
70	20	20

Object	-12V3.2A
--------	----------

1.Graph



2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-20	80	80
-10	50	50
0	40	40
10	35	35
20	35	35
25	35	35
30	35	35
40	30	30
50	25	25
60	20	20
70	20	20

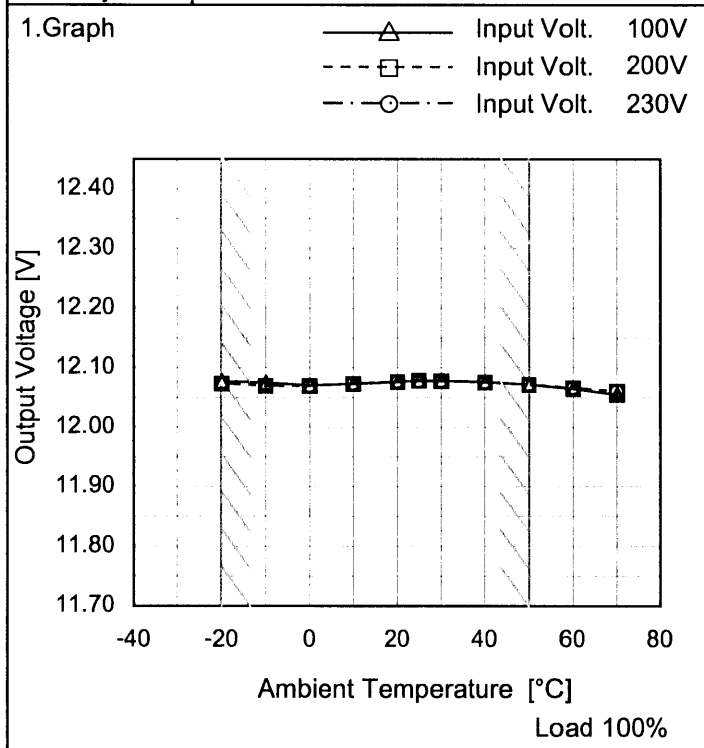
Measured by 20 MHz Oscilloscope.

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



Model	MODULE W
Item	Ambient Temperature Drift
Object	+12V3.2A

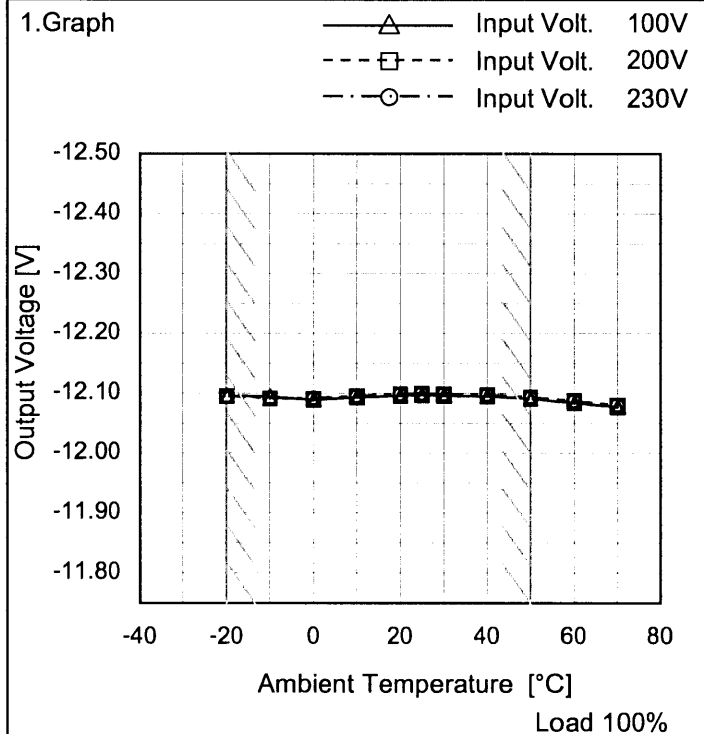
Testing Circuitry Figure A



2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	12.077	12.073	12.073
-10	12.075	12.069	12.069
0	12.070	12.069	12.069
10	12.073	12.073	12.073
20	12.076	12.076	12.076
25	12.078	12.078	12.077
30	12.078	12.077	12.077
40	12.076	12.075	12.075
50	12.072	12.071	12.071
60	12.065	12.066	12.066
70	12.055	12.060	12.060

Object	-12V3.2A
--------	----------



2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	-12.096	-12.095	-12.095
-10	-12.094	-12.091	-12.091
0	-12.089	-12.090	-12.091
10	-12.093	-12.095	-12.095
20	-12.096	-12.098	-12.098
25	-12.097	-12.099	-12.099
30	-12.096	-12.098	-12.098
40	-12.095	-12.097	-12.097
50	-12.091	-12.093	-12.093
60	-12.084	-12.087	-12.087
70	-12.077	-12.080	-12.080

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



COSEL		Testing Circuitry Figure A
Model	MODULE W	
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 - 3.2A (AVR 2) : 0 - 3.2A

* 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		+12V3.2A		Output Voltage Accuracy		
Item	Temperature [°C]	Input Voltage[V]	Output		Value [mV]	Ration [%]
			Current[A]	Voltage[V]		
Maximum Voltage	50	170	0	12.395	±162	±1.4
Minimum Voltage	50	85	3.2	12.071		

Object		-12V3.2A		Output Voltage Accuracy		
Item	Temperature [°C]	Input Voltage[V]	Output		Value [mV]	Ration [%]
			Current[A]	Voltage[V]		
Maximum Voltage	50	170	0	-12.440	±175	±1.5
Minimum Voltage	50	85	3.2	-12.090		



COSEL																									
Model	MODULE W	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+12V3.2A																								
<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>12.089</td></tr> <tr><td>0.5</td><td>12.078</td></tr> <tr><td>1.0</td><td>12.078</td></tr> <tr><td>2.0</td><td>12.079</td></tr> <tr><td>3.0</td><td>12.079</td></tr> <tr><td>4.0</td><td>12.079</td></tr> <tr><td>5.0</td><td>12.080</td></tr> <tr><td>6.0</td><td>12.080</td></tr> <tr><td>7.0</td><td>12.080</td></tr> <tr><td>8.0</td><td>12.080</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	12.089	0.5	12.078	1.0	12.078	2.0	12.079	3.0	12.079	4.0	12.079	5.0	12.080	6.0	12.080	7.0	12.080	8.0	12.080
Time since start [H]	Output Voltage [V]																								
0.0	12.089																								
0.5	12.078																								
1.0	12.078																								
2.0	12.079																								
3.0	12.079																								
4.0	12.079																								
5.0	12.080																								
6.0	12.080																								
7.0	12.080																								
8.0	12.080																								
Object	-12V3.2A																								
<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>-12.089</td></tr> <tr><td>0.5</td><td>-12.097</td></tr> <tr><td>1.0</td><td>-12.096</td></tr> <tr><td>2.0</td><td>-12.097</td></tr> <tr><td>3.0</td><td>-12.097</td></tr> <tr><td>4.0</td><td>-12.097</td></tr> <tr><td>5.0</td><td>-12.097</td></tr> <tr><td>6.0</td><td>-12.098</td></tr> <tr><td>7.0</td><td>-12.098</td></tr> <tr><td>8.0</td><td>-12.098</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	-12.089	0.5	-12.097	1.0	-12.096	2.0	-12.097	3.0	-12.097	4.0	-12.097	5.0	-12.097	6.0	-12.098	7.0	-12.098	8.0	-12.098
Time since start [H]	Output Voltage [V]																								
0.0	-12.089																								
0.5	-12.097																								
1.0	-12.096																								
2.0	-12.097																								
3.0	-12.097																								
4.0	-12.097																								
5.0	-12.097																								
6.0	-12.098																								
7.0	-12.098																								
8.0	-12.098																								
<p>* The characteristic of AC200V is equal.</p>																									



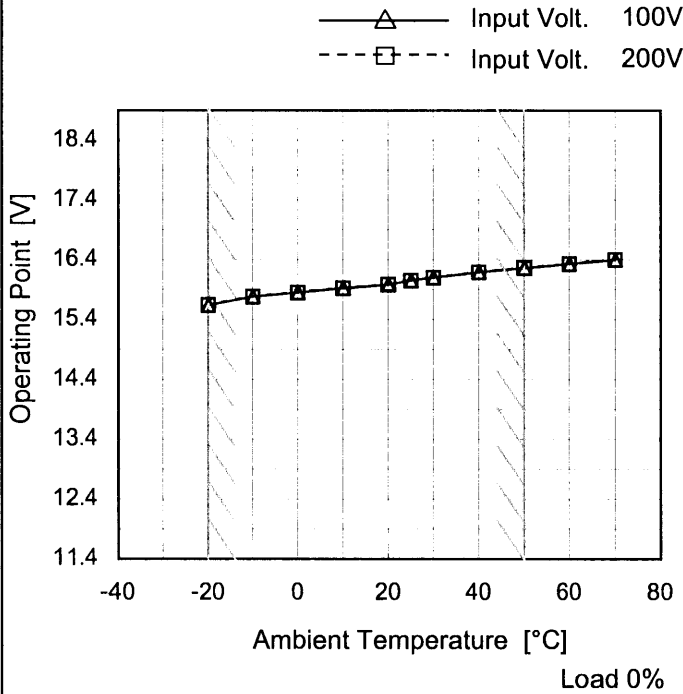
<p>Model MODULE W</p>		<p>Temperature 25°C Testing Circuitry Figure A</p>																																										
<p>Item Overcurrent Protection</p>																																												
<p>Object +12V3.2A</p>																																												
<p>1.Graph</p> <p>Intermittent operation occurs when the output voltage is from 6V to 0V.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="2">Load Current [A]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> </tr> </thead> <tbody> <tr><td>12.0</td><td>3.20</td><td>3.20</td></tr> <tr><td>11.4</td><td>4.28</td><td>4.29</td></tr> <tr><td>10.8</td><td>4.34</td><td>4.34</td></tr> <tr><td>9.6</td><td>4.45</td><td>4.47</td></tr> <tr><td>8.4</td><td>4.58</td><td>4.59</td></tr> <tr><td>7.2</td><td>4.73</td><td>4.72</td></tr> <tr><td>6.0</td><td>4.82</td><td>4.82</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>	Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	12.0	3.20	3.20	11.4	4.28	4.29	10.8	4.34	4.34	9.6	4.45	4.47	8.4	4.58	4.59	7.2	4.73	4.72	6.0	4.82	4.82	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	
Output Voltage [V]	Load Current [A]																																											
	Input Volt. 100[V]	Input Volt. 200[V]																																										
12.0	3.20	3.20																																										
11.4	4.28	4.29																																										
10.8	4.34	4.34																																										
9.6	4.45	4.47																																										
8.4	4.58	4.59																																										
7.2	4.73	4.72																																										
6.0	4.82	4.82																																										
--	-	-																																										
--	-	-																																										
--	-	-																																										
--	-	-																																										
--	-	-																																										
<p>Object -12V3.2A</p>		<p>Temperature 25°C Testing Circuitry Figure A</p>																																										
<p>1.Graph</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from -6V to 0V.</p>			<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="2">Load Current [A]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> </tr> </thead> <tbody> <tr><td>-12.0</td><td>3.20</td><td>3.20</td></tr> <tr><td>-11.4</td><td>4.28</td><td>4.29</td></tr> <tr><td>-10.8</td><td>4.33</td><td>4.34</td></tr> <tr><td>-9.6</td><td>4.45</td><td>4.46</td></tr> <tr><td>-8.4</td><td>4.58</td><td>4.60</td></tr> <tr><td>-7.2</td><td>4.72</td><td>4.72</td></tr> <tr><td>-6.0</td><td>4.82</td><td>4.80</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>	Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	-12.0	3.20	3.20	-11.4	4.28	4.29	-10.8	4.33	4.34	-9.6	4.45	4.46	-8.4	4.58	4.60	-7.2	4.72	4.72	-6.0	4.82	4.80	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Output Voltage [V]	Load Current [A]																																											
	Input Volt. 100[V]	Input Volt. 200[V]																																										
-12.0	3.20	3.20																																										
-11.4	4.28	4.29																																										
-10.8	4.33	4.34																																										
-9.6	4.45	4.46																																										
-8.4	4.58	4.60																																										
-7.2	4.72	4.72																																										
-6.0	4.82	4.80																																										
--	-	-																																										
--	-	-																																										
--	-	-																																										
--	-	-																																										
--	-	-																																										



Model	MODULE W
Item	Oversvoltage Protection
Object	+12V3.2A

Testing Circuitry Figure A

1.Graph

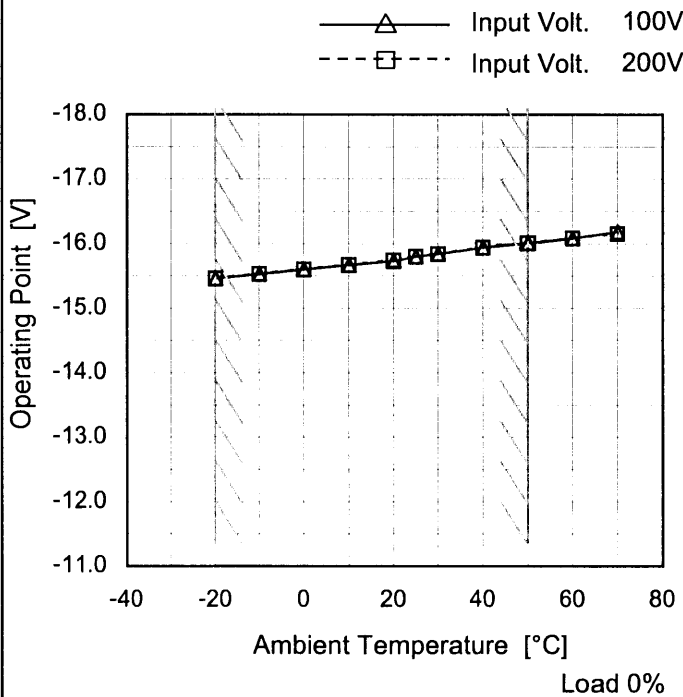


2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	15.59	15.59
-10	15.73	15.73
0	15.80	15.80
10	15.87	15.87
20	15.93	15.93
25	16.00	16.00
30	16.05	16.05
40	16.14	16.14
50	16.21	16.21
60	16.28	16.28
70	16.35	16.35

Object	-12V3.2A
--------	----------

1.Graph



2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	-15.46	-15.46
-10	-15.53	-15.53
0	-15.60	-15.60
10	-15.67	-15.67
20	-15.73	-15.74
25	-15.80	-15.80
30	-15.84	-15.84
40	-15.94	-15.94
50	-16.01	-16.01
60	-16.08	-16.08
70	-16.18	-16.15

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

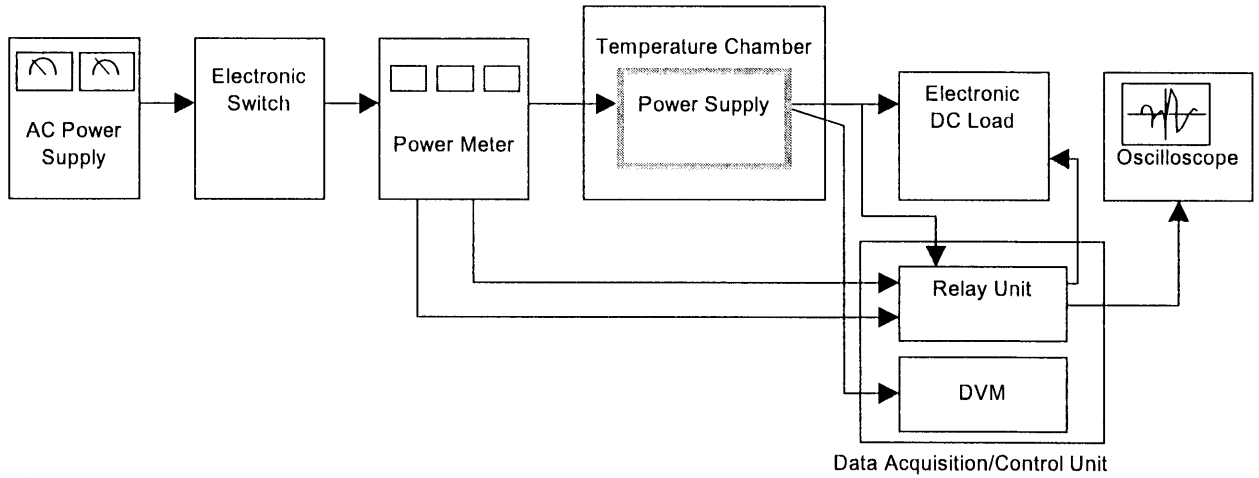


Figure A

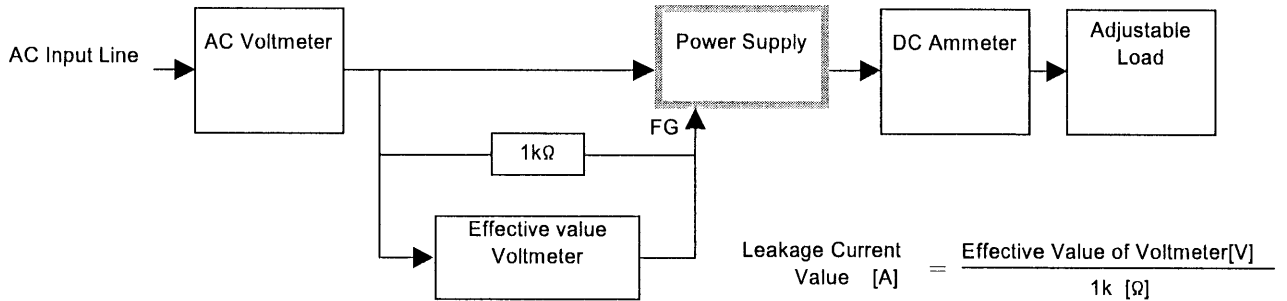


Figure B (DEN-AN)

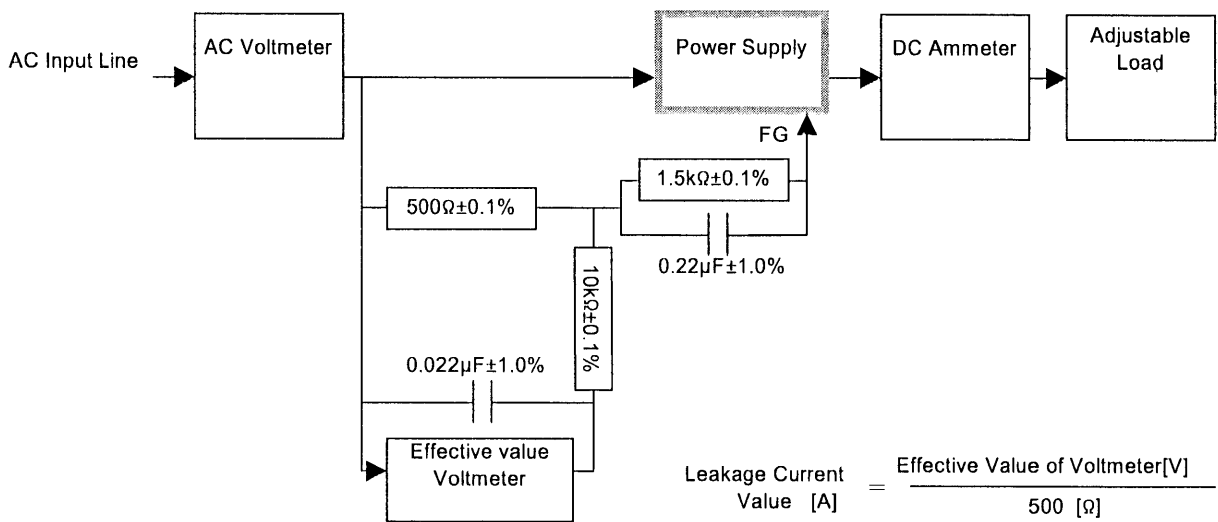


Figure B (IEC60950)