

# TEST DATA OF PBA1000F-48

Regulated DC Power Supply  
Mar.30, 2004

Approved by : Kuniaki Nagahara  
Kuniaki Nagahara Design Manager

Prepared by : Kazunari Uotani  
Kazunari Uotani Design Engineer

**COSEL CO.,LTD.**



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Model	PBA1000F-48																																																	
Item	Input Current (by Load Current)																																																	
Object	—																																																	
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	<p>The graph plots Input Power [W] on the Y-axis (0 to 2000) against Load Current [A] on the X-axis (0 to 25). Three curves are shown for different input voltages: 100V (solid line with triangles), 200V (dashed line with squares), and 230V (dash-dot line with circles). All curves show a linear increase in power with load current. A slanted line is drawn across the graph, starting from approximately (0, 100) and ending at approximately (25, 1400), representing the rated load current range.</p>	2.Values																																																				
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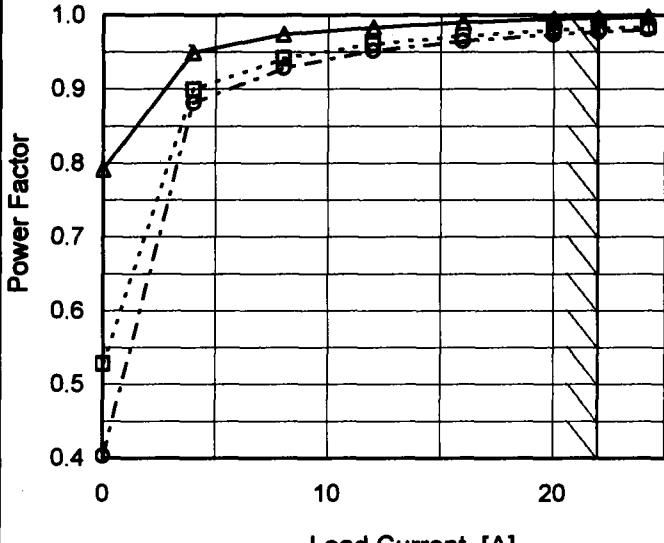
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Model PBA1000F-48

Item Inrush Current

Object

Temperature 25°C  
Testing Circuitry Figure AInput  
Current  
[20A/div]Input  
Voltage  
[100V/div]Input Voltage 100 V  
Frequency 60 Hz  
Load 100 %Primary inrush current :  
9.6 A  
Secondary inrush current :  
31.8 A

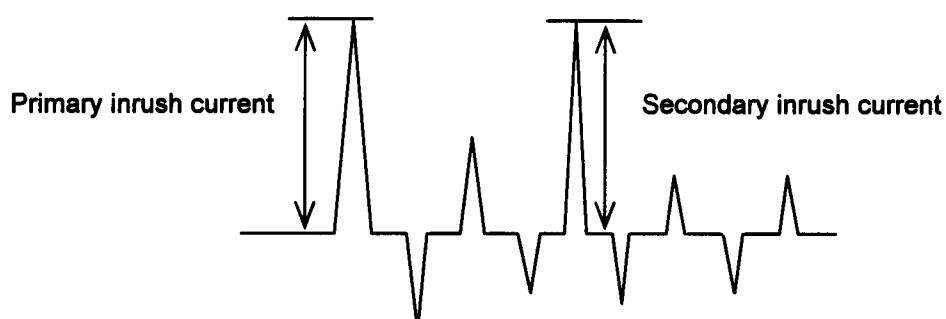
Time

[100mS/div]

Input  
Current  
[20A/div]Input  
Voltage  
[200V/div]Input Voltage 200 V  
Frequency 60 Hz  
Load 100 %Primary inrush current :  
21.0 A  
Secondary inrush current :  
39.8 A

Time

[100mS/div]





Model	PBA1000F-48	Temperature 25°C
Item	Leakage Current	Testing Circuitry Figure B
Object	_____	

### 1. Results

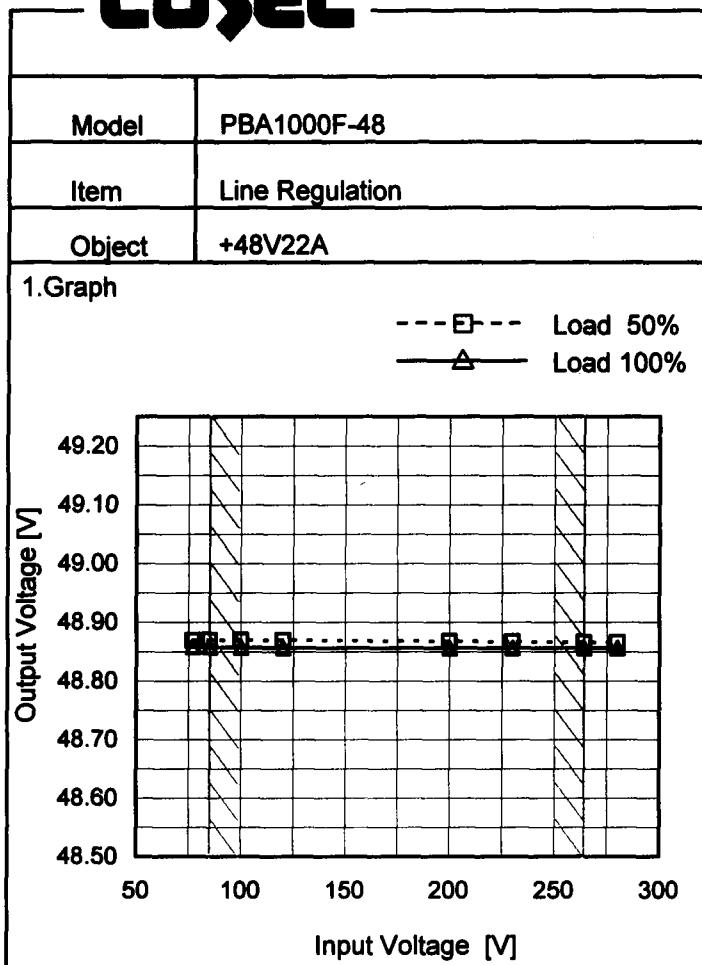
[mA]

Standards		Input Volt.			Note
		100[V]	200[V]	240[V]	
DEN-AN	Both phases	0.20	0.40	0.42	Operation
	One of phase	0.35	0.73	0.78	stand by
IEC60950	Both phases	0.21	0.40	0.52	Operation
	One of phase	0.36	0.72	0.87	stand by

The value for "One phase" is the reference value only.

### 2. Condition

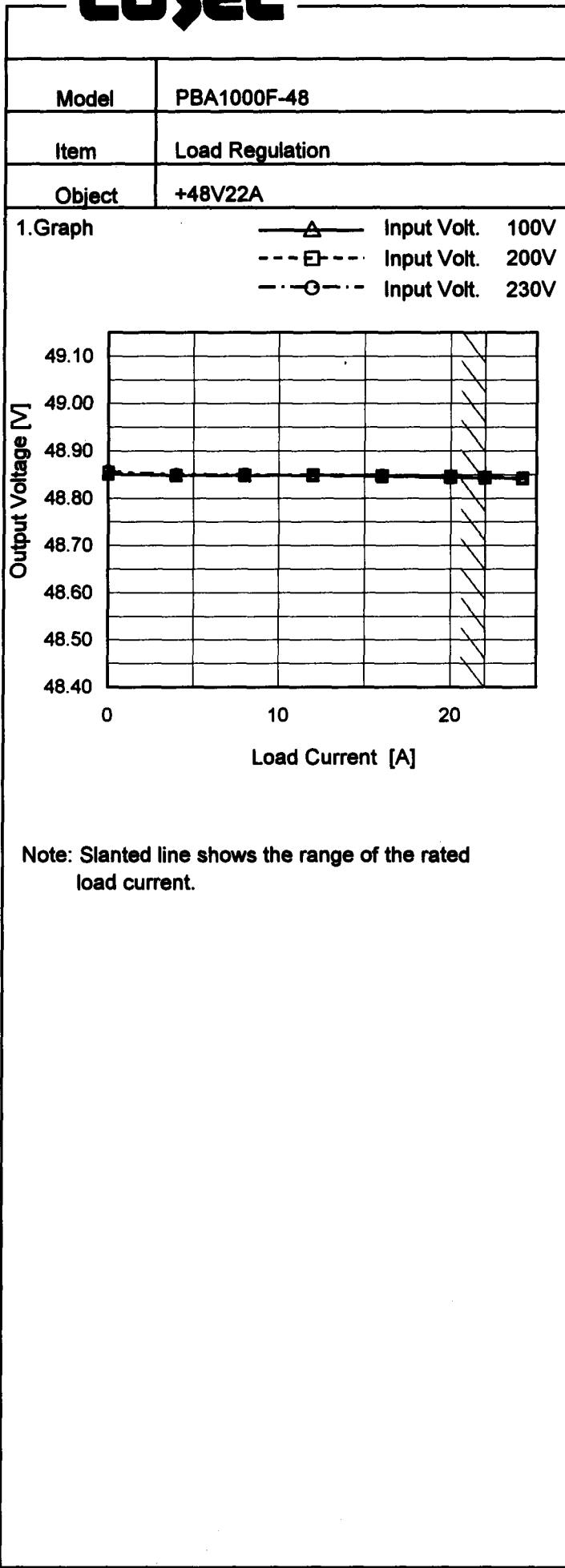
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

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 Temperature 25°C  
 Testing Circuitry Figure A

## 2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
77	48.869	48.859
85	48.870	48.858
100	48.870	48.858
120	48.870	48.857
200	48.868	48.856
230	48.867	48.856
264	48.866	48.857
280	48.866	48.856
—	—	—

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

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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	48.852	48.855	48.858
4.0	48.848	48.848	48.851
8.0	48.849	48.849	48.851
12.0	48.848	48.849	48.850
16.0	48.847	48.848	48.849
20.0	48.844	48.846	48.847
22.0	48.843	48.844	48.845
24.2	48.842	48.842	48.843
-	-	-	-
-	-	-	-
-	-	-	-

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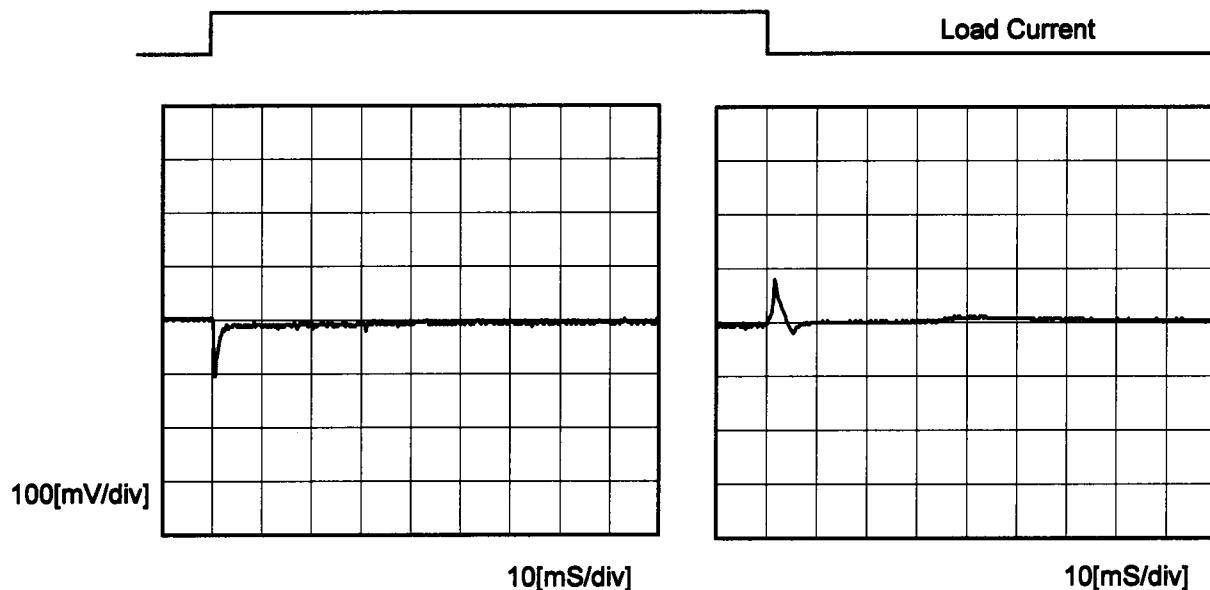
Model PBA1000F-48

Item Dynamic Load Response

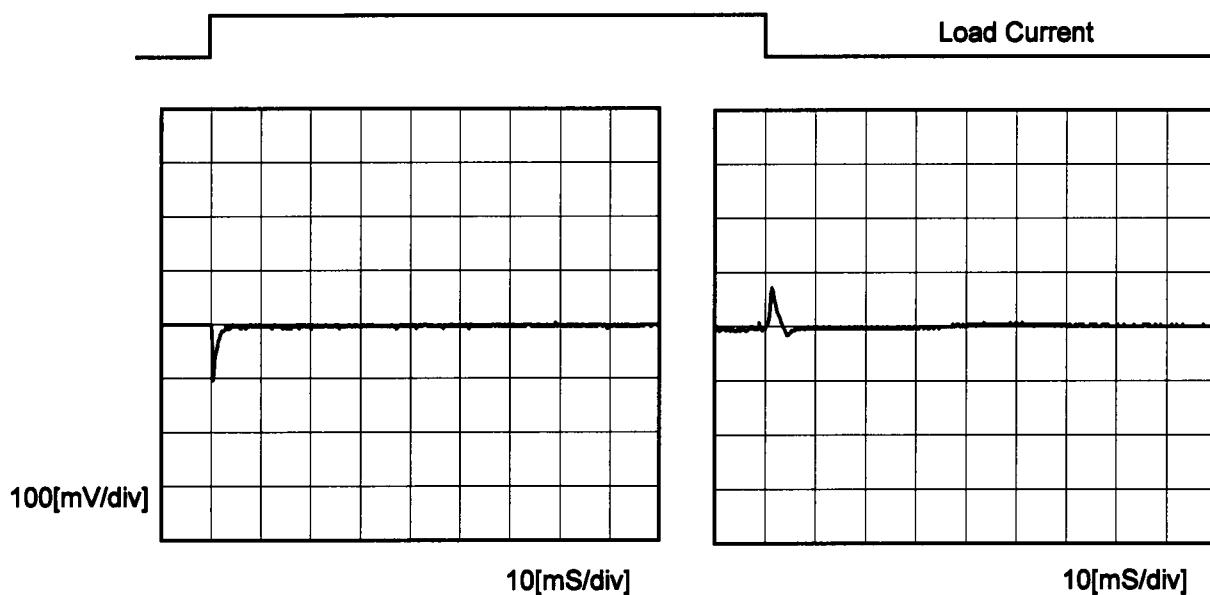
Object +48V22A

Temperature 25°C  
Testing Circuitry Figure AInput Volt. 100 V  
Cycle 1000 mS

Min. Load ( 0 A ) – Load 100% ( 22 A )



Min. Load ( 0 A ) – Load 50% ( 11 A )

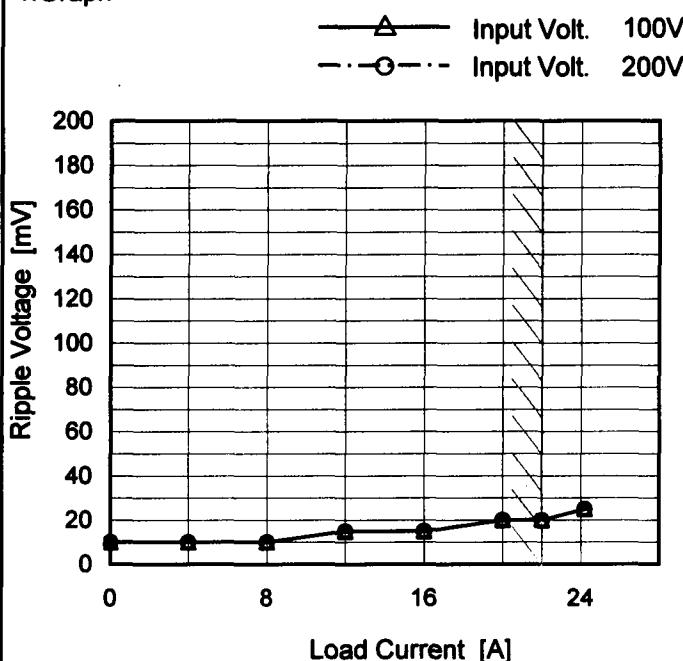


\* The characteristic of AC200V is equal.

**COSEL**

Model	PBA1000F-48
Item	Ripple Voltage (by Load Current)
Object	+48V22A

## 1. Graph



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.

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	10	10
4.0	10	10
8.0	10	10
12.0	15	15
16.0	15	15
20.0	20	20
22.0	20	20
24.2	25	25
--	-	-
--	-	-
--	-	-

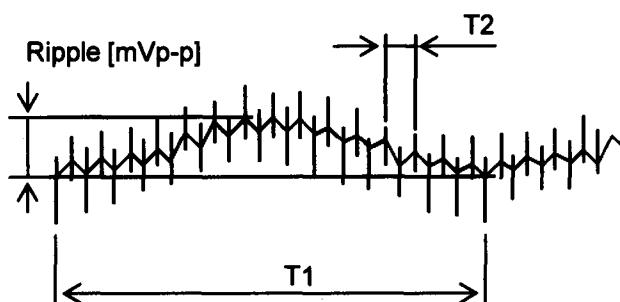
T1: Due to AC Input Line  
T2: Due to Switching

Fig. Complex Ripple Wave Form

**COSEL**

Model PBA1000F-48

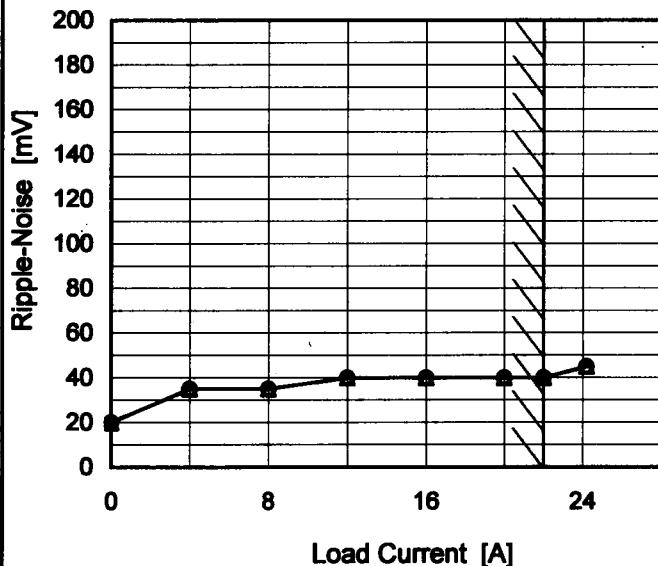
Item Ripple-Noise

Object +48V22A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph

—△— Input Volt. 100V  
 -○--- Input Volt. 200V



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.

## 2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	20	20
4.0	35	35
8.0	35	35
12.0	40	40
16.0	40	40
20.0	40	40
22.0	40	40
24.2	45	45
-	-	-
-	-	-
-	-	-

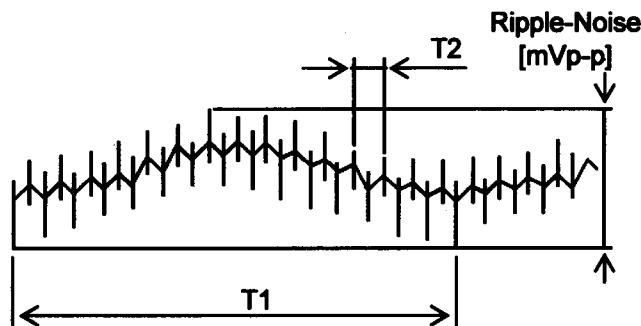
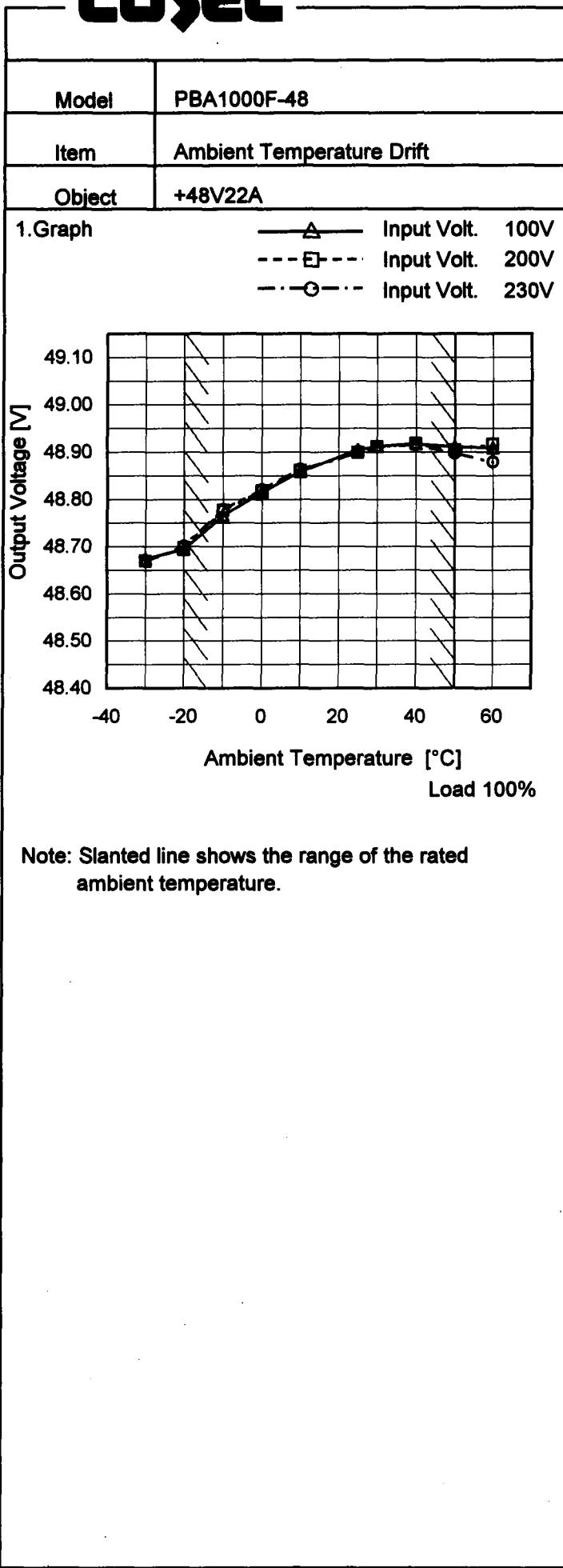
T1: Due to AC Input Line  
T2: Due to Switching

Fig. Complex Ripple Wave Form

**COSEL**

Model	PBA1000F-48																																										
Item	Ripple Voltage (by Ambient Temp.)																																										
Object	+48V22A																																										
1. Graph																																											
<p style="text-align: center;">     - - - □ - - - Input Volt. 100V      — ▲ — Input Volt. 200V   </p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Ripple Voltage [mV] (Input Volt. 100V)</th> <th>Ripple Voltage [mV] (Input Volt. 200V)</th> </tr> </thead> <tbody> <tr><td>-40</td><td>160</td><td>160</td></tr> <tr><td>-20</td><td>105</td><td>105</td></tr> <tr><td>0</td><td>50</td><td>55</td></tr> <tr><td>20</td><td>20</td><td>20</td></tr> <tr><td>40</td><td>15</td><td>15</td></tr> <tr><td>60</td><td>-</td><td>-</td></tr> </tbody> </table>		Ambient Temperature [°C]	Ripple Voltage [mV] (Input Volt. 100V)	Ripple Voltage [mV] (Input Volt. 200V)	-40	160	160	-20	105	105	0	50	55	20	20	20	40	15	15	60	-	-																					
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-20	105	105																																									
0	50	55																																									
20	20	20																																									
40	15	15																																									
60	-	-																																									
<p style="text-align: center;">Load 100 %</p> <p>Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>																																											
Testing Circuitry Figure A																																											
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0	50	55																																									
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**COSEL**

Testing Circuitry Figure A

## 2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	48.674	48.670	48.669
-20	48.695	48.698	48.701
-10	48.765	48.777	48.779
0	48.815	48.818	48.821
10	48.859	48.862	48.863
25	48.905	48.899	48.900
30	48.912	48.912	48.912
40	48.918	48.918	48.916
50	48.911	48.904	48.898
60	48.909	48.917	48.879
--	-	-	-



Model	PBA1000F-48	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+48V22A	

### 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 : 0 - 22A

\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

$$\text{* Output Voltage Accuracy (Ration)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

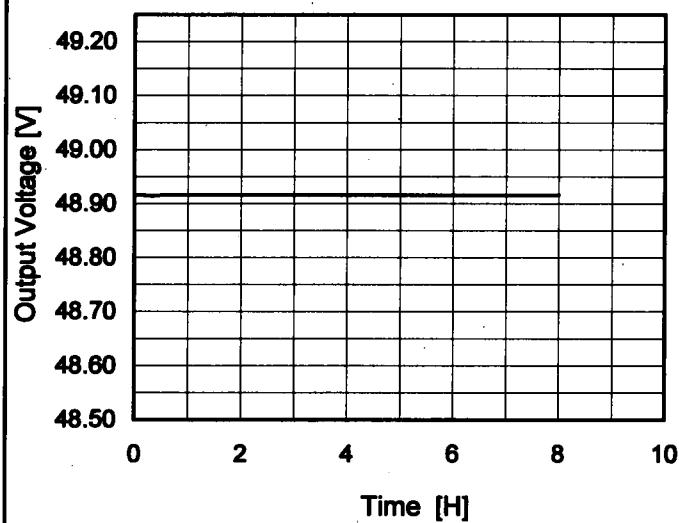
### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	264	0	48.914	$\pm 101$	$\pm 0.2$
Minimum Voltage	-20	85	22	48.713		

**COSEL**

Model	PBA1000F-48
Item	Time Lapse Drift
Object	+48V22A

## 1. Graph



Input Volt. 100V  
Load 100%

\* The characteristic of AC200V is equal.

Temperature 25°C  
Testing Circuitry Figure A

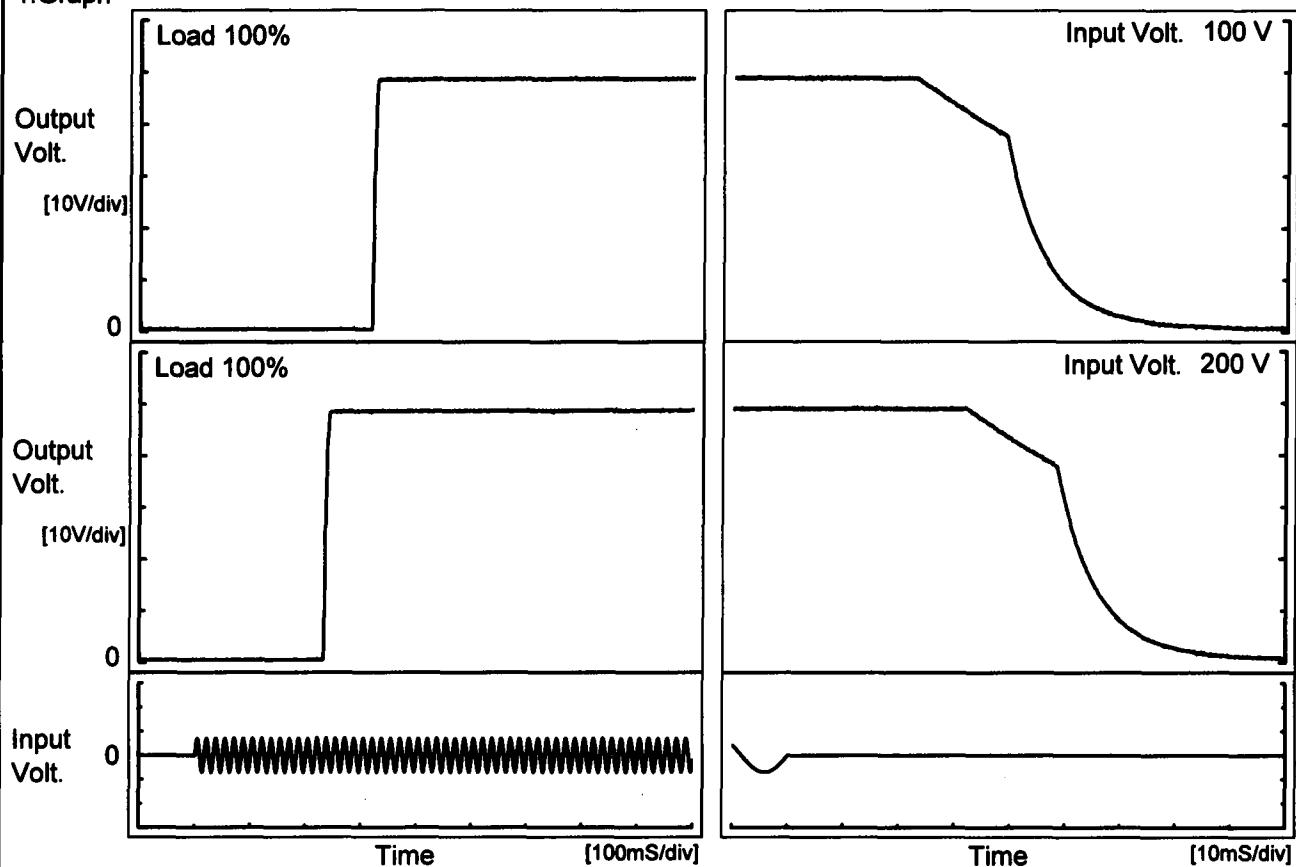
## 2. Values

Time since start [H]	Output Voltage [V]
0.0	48.916
0.5	48.916
1.0	48.916
2.0	48.916
3.0	48.916
4.0	48.916
5.0	48.916
6.0	48.916
7.0	48.916
8.0	48.916

**COSEL**

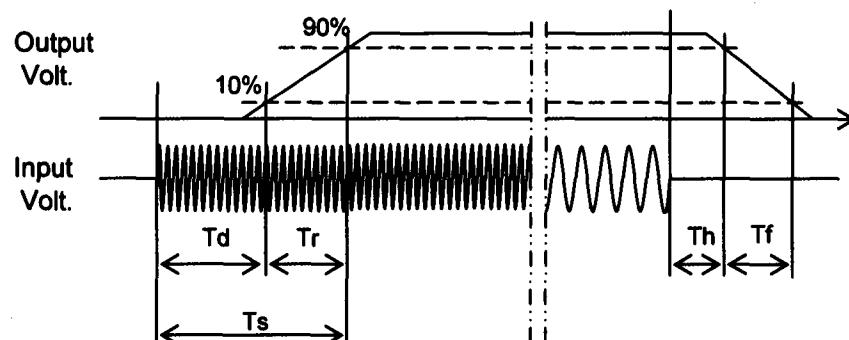
Model	PBA1000F-48	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+48V22A		

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[mS]
100 V		319.0	7.5	326.5	30.3	23.9	
200 V		232.5	8.0	240.5	39.6	24.3	

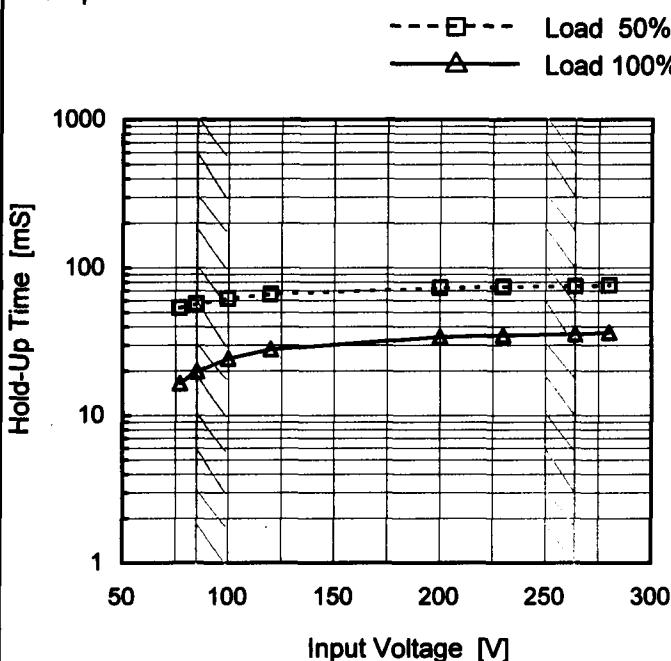


**COSEL**

Model	PBA1000F-48
Item	Hold-Up Time
Object	+48V22A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph

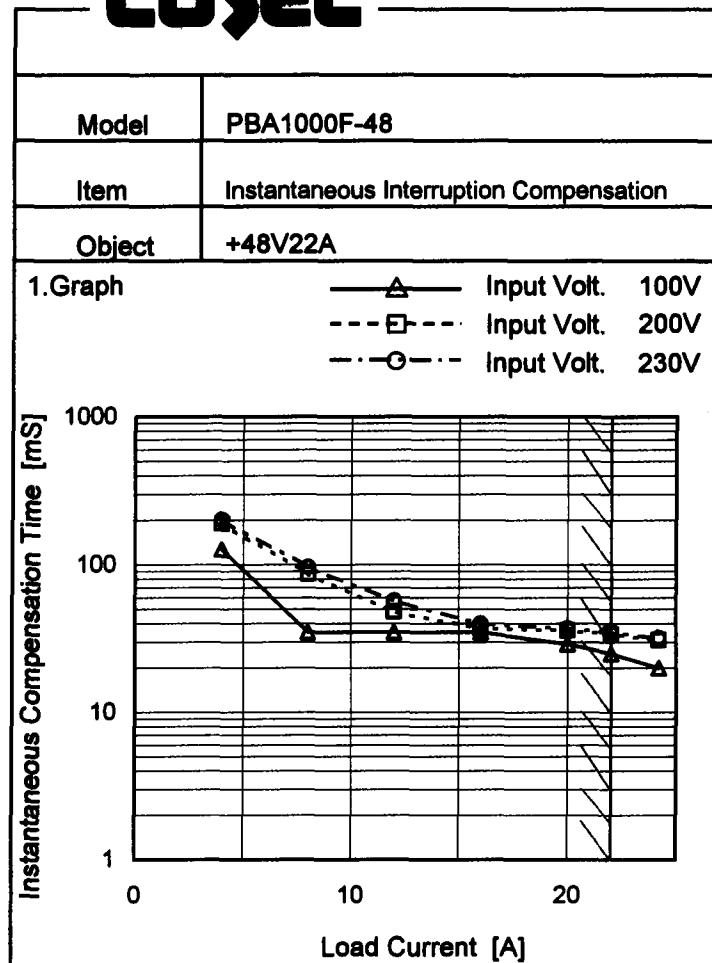


## 2. Values

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
77	54	17
85	57	20
100	62	24
120	66	28
200	73	34
230	74	35
264	75	36
280	76	37
--	-	-

This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

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

**COSEL**

 Temperature 25°C  
 Testing Circuitry Figure A

## 2. Values

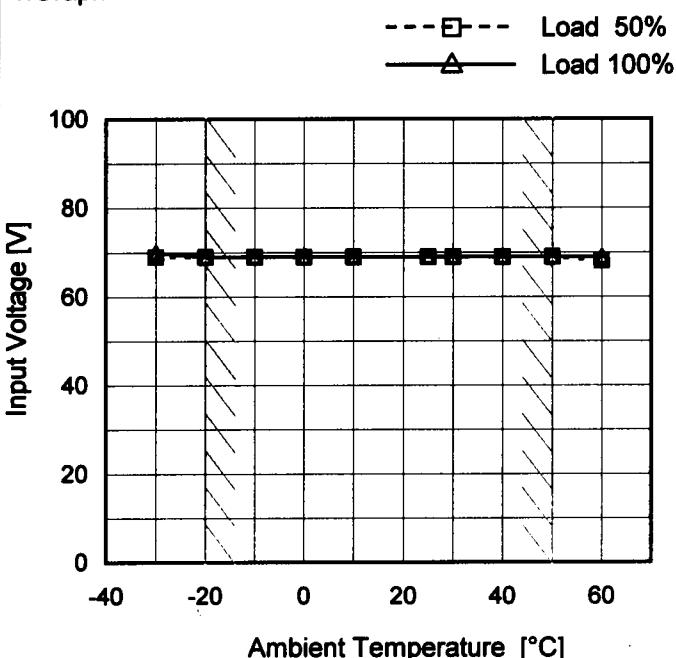
Load Current [A]	Time [mS]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
4.0	127	190	202
8.0	35	87	96
12.0	35	48	57
16.0	35	37	40
20.0	29	36	37
22.0	25	34	35
24.2	20	31	32
-	-	-	-
-	-	-	-
-	-	-	-

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

**COSEL**

Model	PBA1000F-48
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V22A

## 1. Graph



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

## Testing Circuitry Figure A

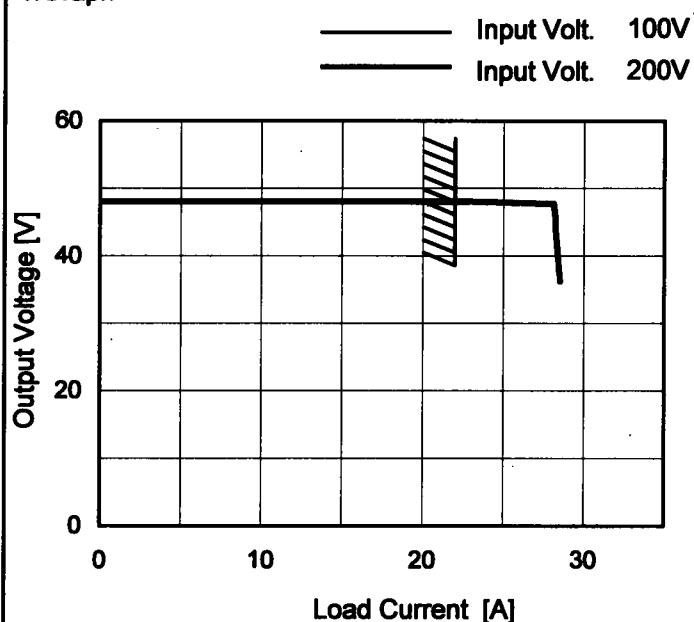
## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	69	70
-20	69	69
-10	69	69
0	69	69
10	69	69
25	69	69
30	69	69
40	69	69
50	69	69
60	68	69
-	-	-

**COSEL**

Model	PBA1000F-48
Item	Overcurrent Protection
Object	+48V22A

## 1. Graph



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

Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
48.0	28.11	28.21
45.6	28.15	28.22
43.2	28.26	28.26
38.4	28.42	28.43
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

**COSEL**

Model	PBA1000F-48	Testing Circuitry    Figure A																																							
Item	Overvoltage Protection																																								
Object	+48V22A																																								
1. Graph																																									
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend: Input Volt. 100V (solid line with triangles); Input Volt. 200V (dashed line with squares)</p>		2. Values																																							
		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> </tr> </thead> <tbody> <tr><td>-30</td><td>56.75</td><td>56.52</td></tr> <tr><td>-20</td><td>56.81</td><td>56.63</td></tr> <tr><td>-10</td><td>56.93</td><td>56.82</td></tr> <tr><td>0</td><td>56.93</td><td>56.93</td></tr> <tr><td>10</td><td>57.05</td><td>56.93</td></tr> <tr><td>25</td><td>57.12</td><td>57.06</td></tr> <tr><td>30</td><td>57.13</td><td>57.13</td></tr> <tr><td>40</td><td>57.13</td><td>57.13</td></tr> <tr><td>50</td><td>57.13</td><td>57.13</td></tr> <tr><td>60</td><td>57.12</td><td>57.12</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 200[V]	-30	56.75	56.52	-20	56.81	56.63	-10	56.93	56.82	0	56.93	56.93	10	57.05	56.93	25	57.12	57.06	30	57.13	57.13	40	57.13	57.13	50	57.13	57.13	60	57.12	57.12	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.																																									

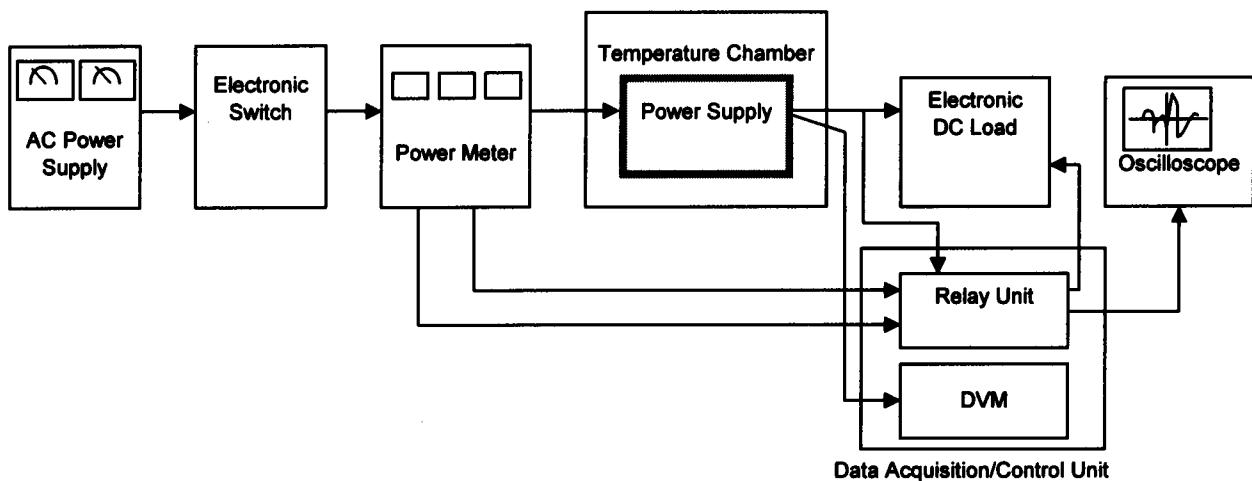


Figure A

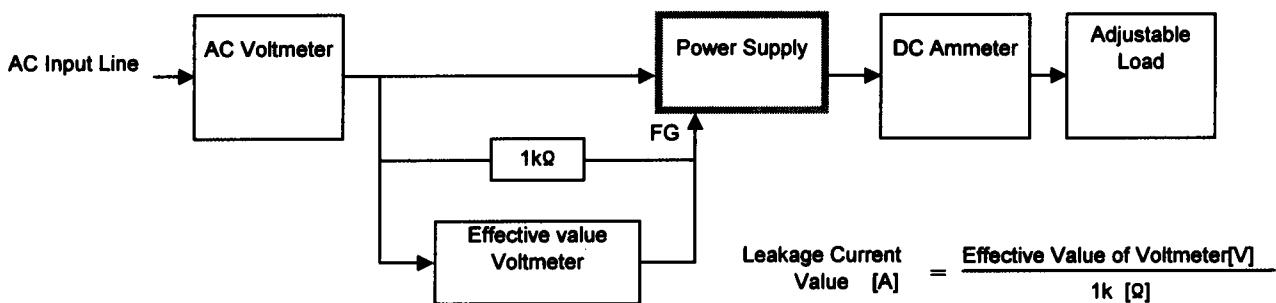


Figure B ( DEN-AN )

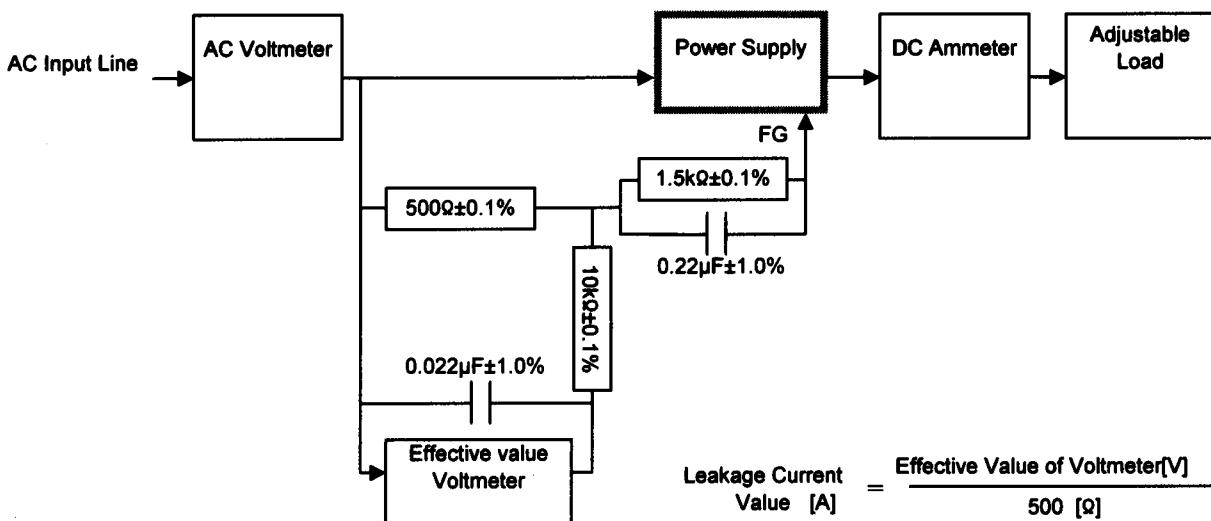


Figure B ( IEC60950 )