



TEST DATA OF PBA75F-36

Regulated DC Power Supply
Apr.5. 2004

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Kuniaki Nagahara Design Manager

Prepared by : Akito Joboji
Akito Joboji Design Engineer

COSEL CO.,LTD.



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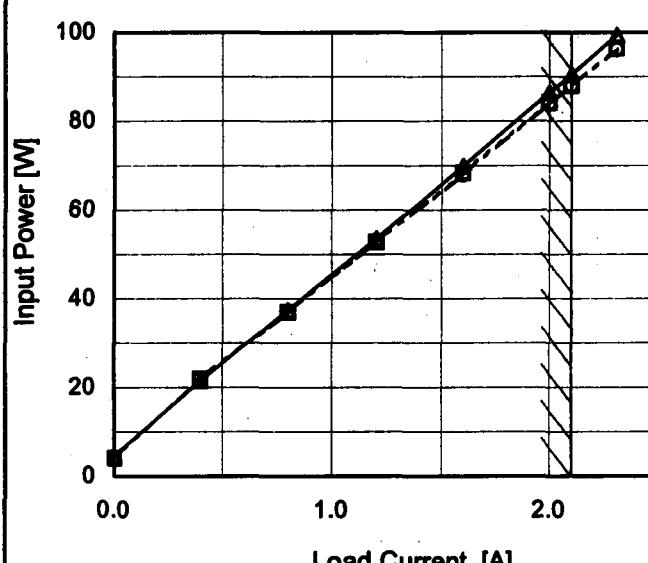
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Model	PBA75F-36	Temperature	25°C																																			
Item	Input Current (by Load Current)	Testing Circuitry	Figure A																																			
Object	—	—	—																																			
1. Graph		2. Values																																				
<p>—△— Input Volt. 100V - - -□- - Input Volt. 200V - -○- - Input Volt. 230V</p> <table border="1"> <caption>Data points estimated from Figure A graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 100V [A]</th> <th>Input Volt. 200V [A]</th> <th>Input Volt. 230V [A]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>0.071</td><td>0.048</td><td>0.046</td></tr> <tr><td>0.40</td><td>0.225</td><td>0.155</td><td>0.150</td></tr> <tr><td>0.80</td><td>0.381</td><td>0.227</td><td>0.211</td></tr> <tr><td>1.20</td><td>0.540</td><td>0.298</td><td>0.275</td></tr> <tr><td>1.60</td><td>0.702</td><td>0.374</td><td>0.340</td></tr> <tr><td>2.00</td><td>0.865</td><td>0.450</td><td>0.407</td></tr> <tr><td>2.10</td><td>0.906</td><td>0.470</td><td>0.424</td></tr> <tr><td>2.31</td><td>0.994</td><td>0.511</td><td>0.458</td></tr> </tbody> </table>	Load Current [A]	Input Volt. 100V [A]	Input Volt. 200V [A]	Input Volt. 230V [A]	0.00	0.071	0.048	0.046	0.40	0.225	0.155	0.150	0.80	0.381	0.227	0.211	1.20	0.540	0.298	0.275	1.60	0.702	0.374	0.340	2.00	0.865	0.450	0.407	2.10	0.906	0.470	0.424	2.31	0.994	0.511	0.458		
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<p>The graph plots Efficiency [%] on the y-axis (44 to 100) against Input Voltage [V] on the x-axis (50 to 300). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show efficiency increasing from approximately 78% at 75V to about 84% at 280V. A slanted line on the graph indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>75</td><td>78.9</td><td>81.8</td></tr> <tr><td>85</td><td>79.5</td><td>83.0</td></tr> <tr><td>100</td><td>80.1</td><td>84.2</td></tr> <tr><td>120</td><td>80.9</td><td>85.1</td></tr> <tr><td>200</td><td>80.8</td><td>86.6</td></tr> <tr><td>230</td><td>80.9</td><td>86.5</td></tr> <tr><td>264</td><td>80.8</td><td>86.5</td></tr> <tr><td>280</td><td>80.8</td><td>86.5</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>				Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	75	78.9	81.8	85	79.5	83.0	100	80.1	84.2	120	80.9	85.1	200	80.8	86.6	230	80.9	86.5	264	80.8	86.5	280	80.8	86.5	--	-	-
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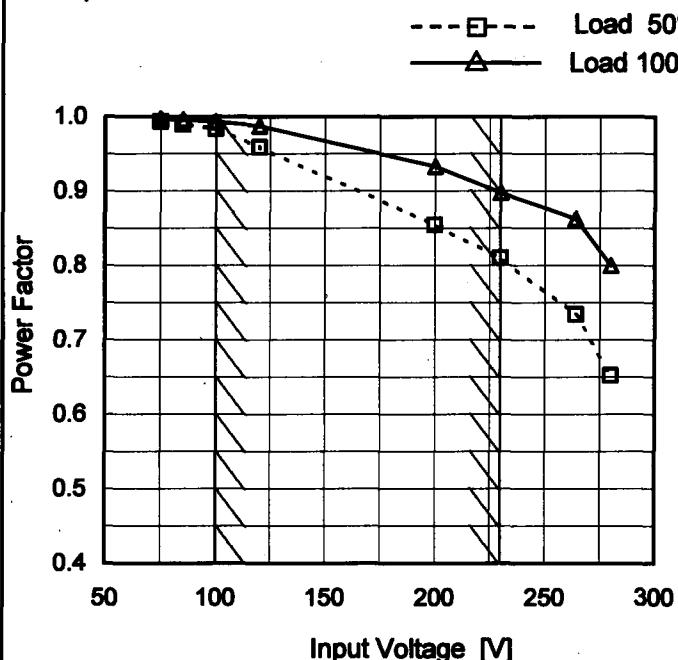
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Note: Slanted line shows the range of the rated load current.

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Model	PBA75F-36
Item	Power Factor (by Input Voltage)
Object	_____

1.Graph



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

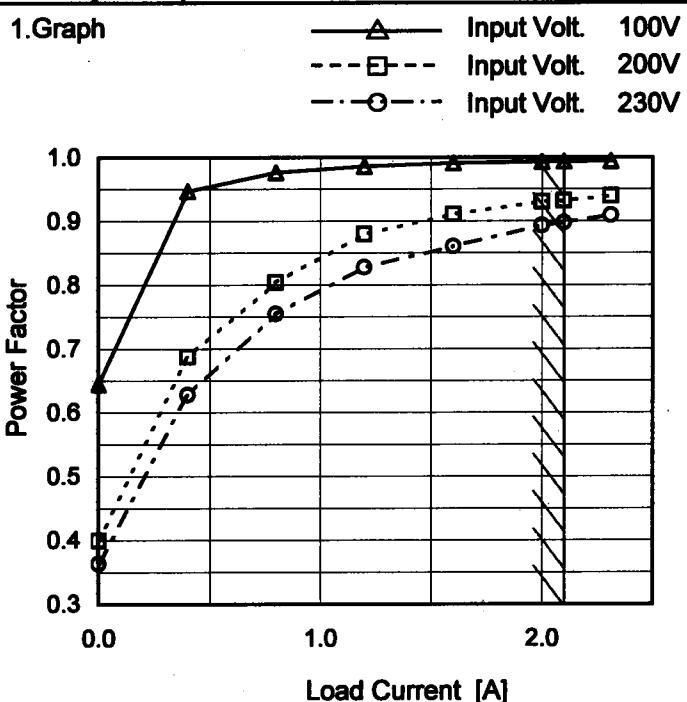
Temperature 25°C
Testing Circuitry Figure A

2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.993	0.997
85	0.990	0.996
100	0.984	0.993
120	0.959	0.988
200	0.855	0.933
230	0.810	0.898
264	0.734	0.863
280	0.653	0.800
-	-	-

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Model	PBA75F-36
Item	Power Factor (by Load Current)
Object	



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

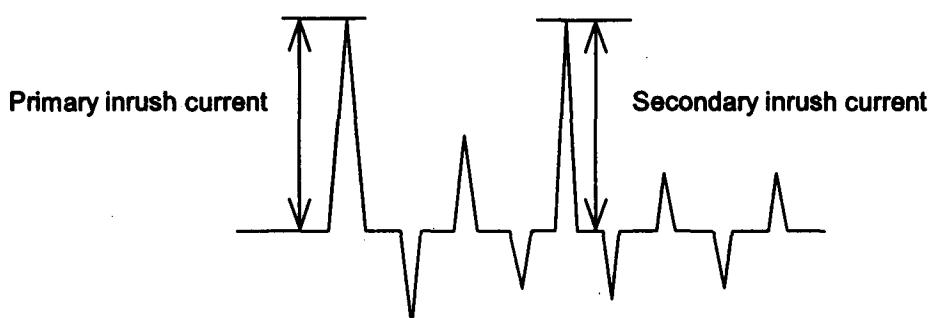
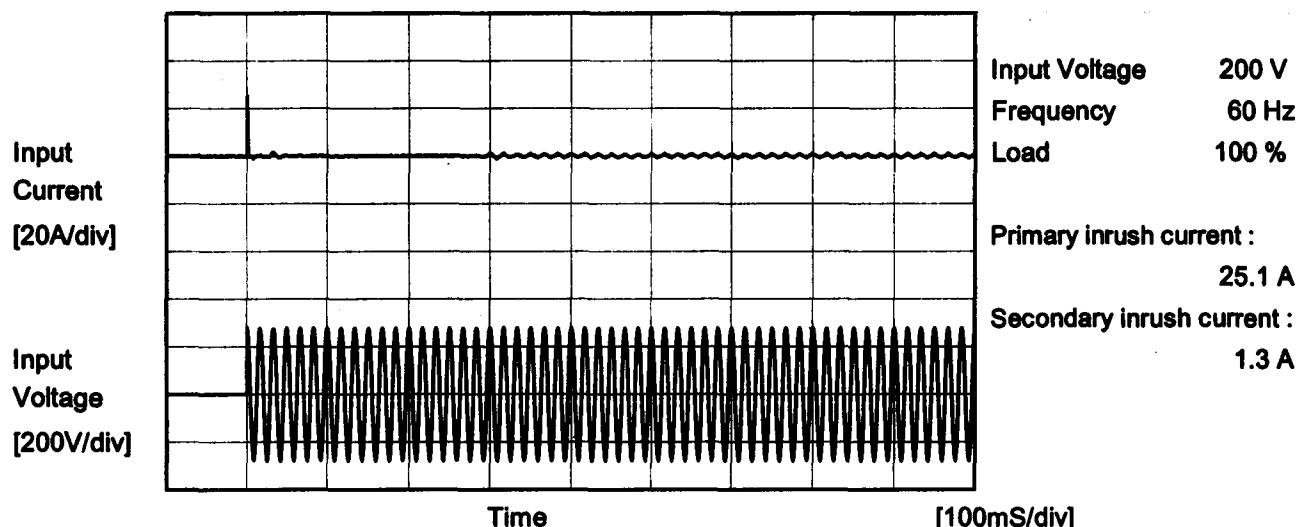
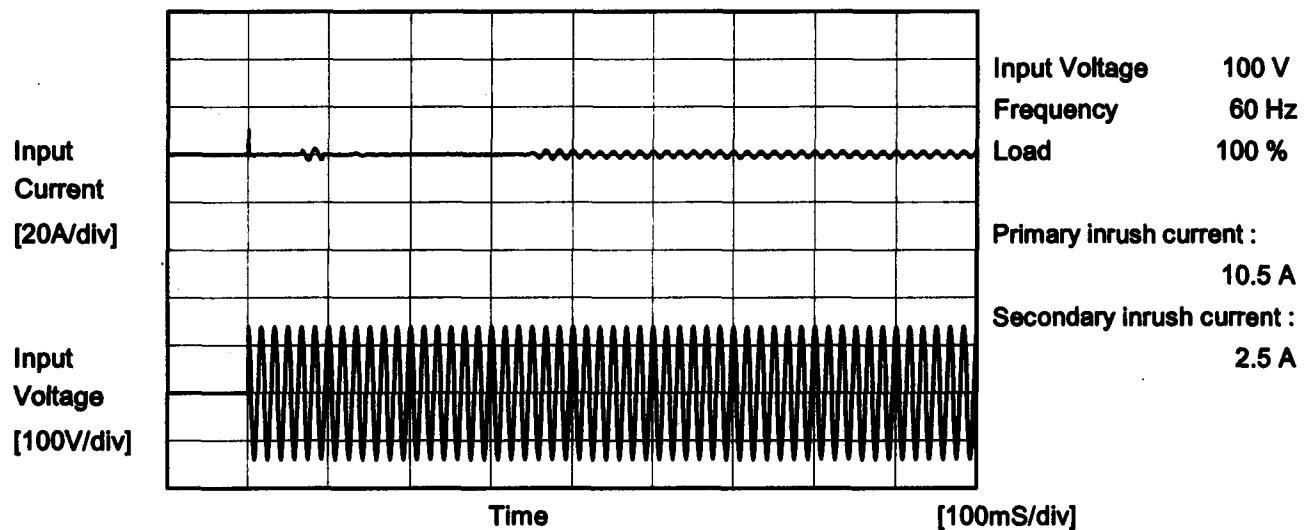
Temperature 25°C
Testing Circuitry Figure A

2. Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.645	0.400	0.364
0.40	0.947	0.688	0.629
0.80	0.977	0.804	0.755
1.20	0.986	0.880	0.828
1.60	0.991	0.911	0.861
2.00	0.993	0.930	0.894
2.10	0.993	0.932	0.898
2.31	0.994	0.940	0.909
-	-	-	-
-	-	-	-
-	-	-	-

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Model	PBA75F-36	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	—		





Model	PBA75F-36	Temperature	25°C
Item	Leakage Current	Testing Circuitry	Figure B
Object	<hr/>		

1. Results

Standards		Input Volt.			Note
		100 [V]	200 [V]	230 [V]	
DEN-AN	Both phases	0.16	0.26	0.30	Operation
	One of phase	0.24	0.45	0.53	stand by
IEC60950	Both phases	0.16	0.28	0.37	Operation
	One of phase	0.24	0.47	0.57	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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Model	PBA75F-36
Item	Line Regulation
Object	+36V2.1A

1.Graph

Output Voltage [V]

Input Voltage [V]

Legend:

- Load 50% (Dashed line)
- Load 100% (Solid line)

Temperature 25°C
Testing Circuitry Figure A

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	36.082	36.082
85	36.082	36.083
100	36.083	36.083
120	36.083	36.083
200	36.083	36.082
230	36.084	36.082
264	36.084	36.082
280	36.085	36.081
-	-	-

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

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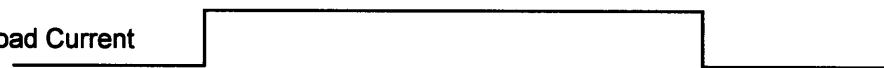
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COSEL

Model	PBA75F-36	Temperature Testing Circuitry	25°C
Item	Dynamic Load Response	Figure	A
Object	+36V2.1A		

Input Volt. 100 V
 Cycle 1000 ms

Load Current

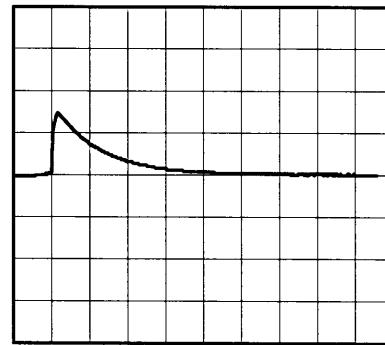
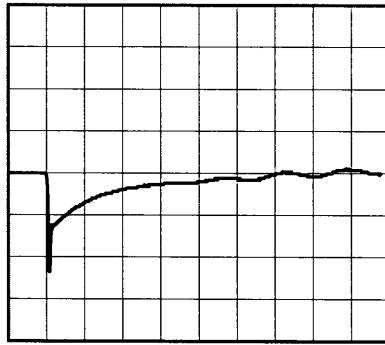


Min. Load (0A) ↔

Load 100% (2.1A)

100 mV/div

5 ms/div

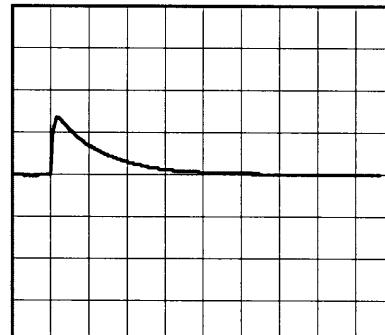


Min. Load (0A) ↔

Load 50% (1.05A)

100 mV/div

5 ms/div

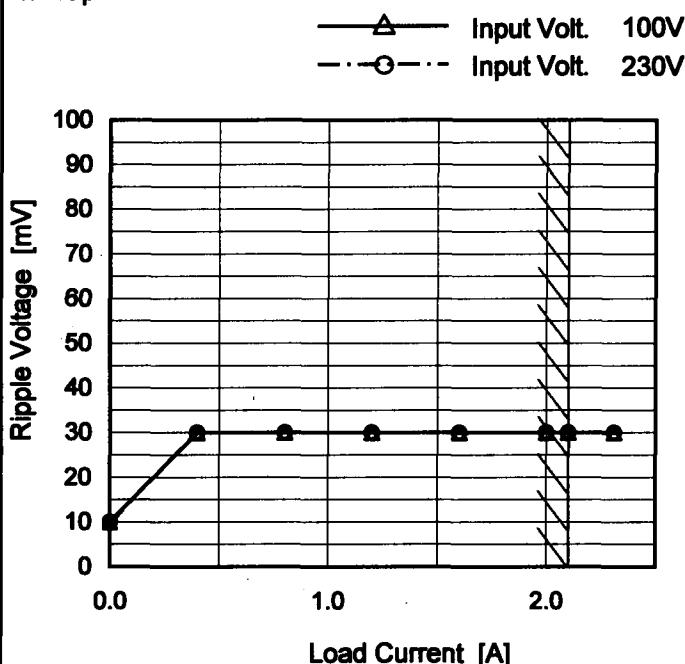


* The characteristic of AC200V is equal.

COSEL

Model	PBA75F-36
Item	Ripple Voltage (by Load Current)
Object	+36V2.1A

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. 230 [V]
0.00	10	10
0.40	30	30
0.80	30	30
1.20	30	30
1.60	30	30
2.00	30	30
2.10	30	30
2.31	30	30
—	—	—
—	—	—
—	—	—

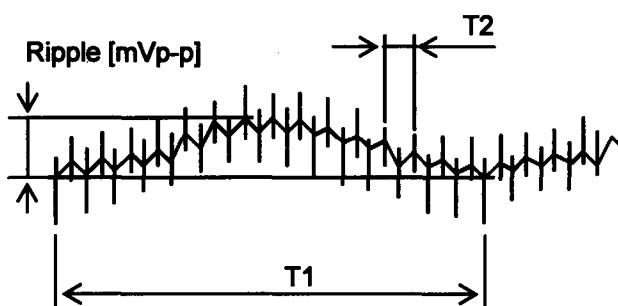
T1: Due to AC Input Line
T2: Due to Switching

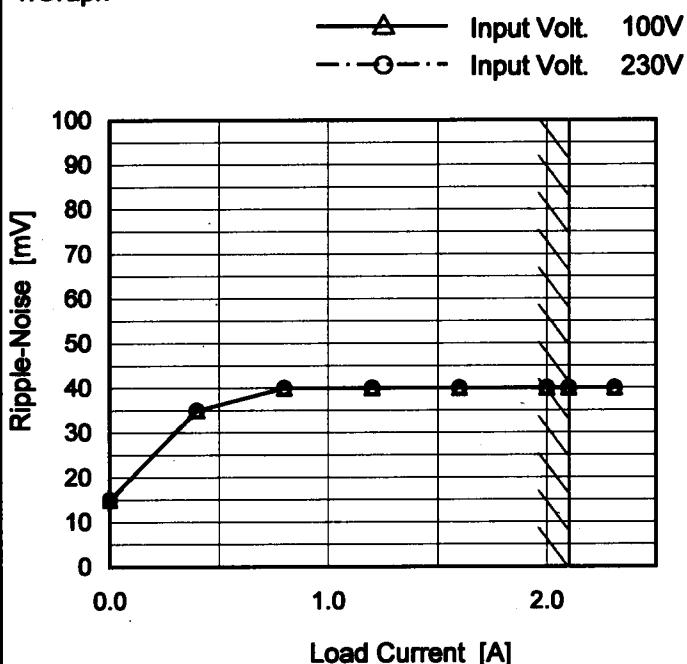
Fig. Complex Ripple Wave Form

COSEL

Model	PBA75F-36
Item	Ripple-Noise
Object	+36V2.1A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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. 230 [V]
0.00	15	15
0.40	35	35
0.80	40	40
1.20	40	40
1.60	40	40
2.00	40	40
2.10	40	40
2.31	40	40
—	—	—
—	—	—
—	—	—

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

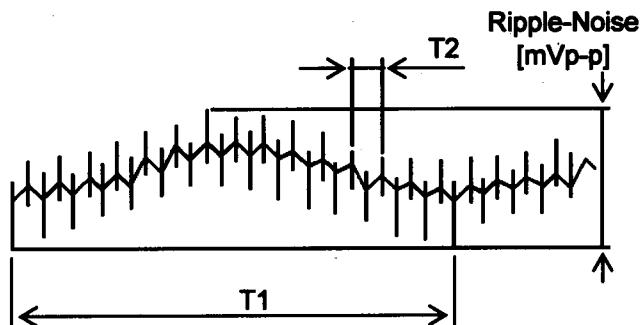
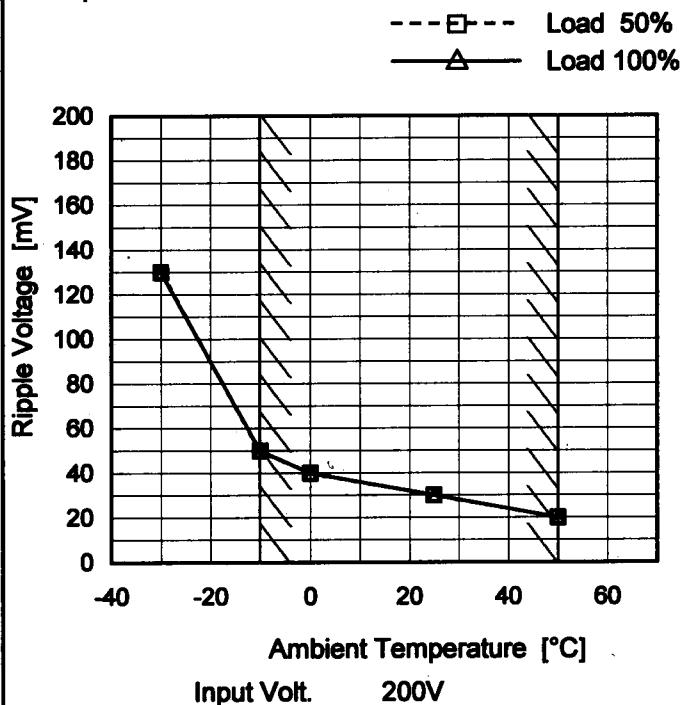


Fig. Complex Ripple Wave Form

COSEL

Model	PBA75F-36
Item	Ripple Voltage (by Ambient Temp.)
Object	+36V2.1A

1. Graph



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]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-30	130	130
-10	50	50
0	40	40
25	30	30
50	20	20
0	0	0
0	0	0
—	—	—
—	—	—
—	—	—
—	—	—

COSEL

Model	PBA75F-36	Testing Circuitry Figure A																																																					
Item	Ambient Temperature Drift																																																						
Object	+36V2.1A																																																						
1. Graph	<p>—▲— Input Volt. 100V - - □ - - Input Volt. 200V - - ○ - - Input Volt. 230V</p> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>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. 100[V]</th> <th>Input Volt. 200[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr> <td>-20</td><td>36.117</td><td>36.117</td><td>36.117</td></tr> <tr> <td>-10</td><td>36.114</td><td>36.114</td><td>36.114</td></tr> <tr> <td>0</td><td>36.108</td><td>36.108</td><td>36.109</td></tr> <tr> <td>10</td><td>36.109</td><td>36.109</td><td>36.109</td></tr> <tr> <td>25</td><td>36.100</td><td>36.101</td><td>36.096</td></tr> <tr> <td>30</td><td>36.096</td><td>36.096</td><td>36.095</td></tr> <tr> <td>40</td><td>36.080</td><td>36.083</td><td>36.082</td></tr> <tr> <td>50</td><td>36.065</td><td>36.065</td><td>36.063</td></tr> <tr> <td>60</td><td>36.040</td><td>36.040</td><td>36.039</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	-20	36.117	36.117	36.117	-10	36.114	36.114	36.114	0	36.108	36.108	36.109	10	36.109	36.109	36.109	25	36.100	36.101	36.096	30	36.096	36.096	36.095	40	36.080	36.083	36.082	50	36.065	36.065	36.063	60	36.040	36.040	36.039	--	-	-	-	--	-	-	-
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10	36.109	36.109	36.109																																																				
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Note:	Slanted line shows the range of the rated ambient temperature.																																																						



Model	PBA75F-36	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+36V2.1A	

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 : 85 - 264V

Load Current : 0 - 2.1A

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

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

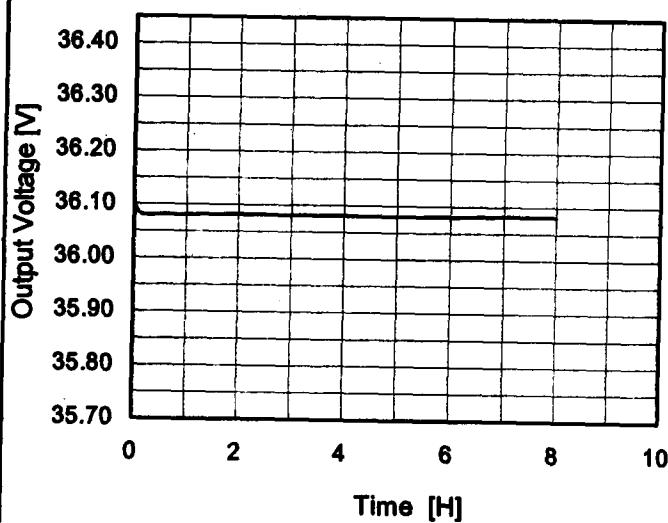
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	85	0	36.121	±29	±0.1
Minimum Voltage	50	264	2.1	36.063		

COSEL

Model	PBA75F-36
Item	Time Lapse Drift
Object	+36V2.1A

1. Graph



Input Volt. 100V

Load 100%

* The characteristic of AC200V is equal.

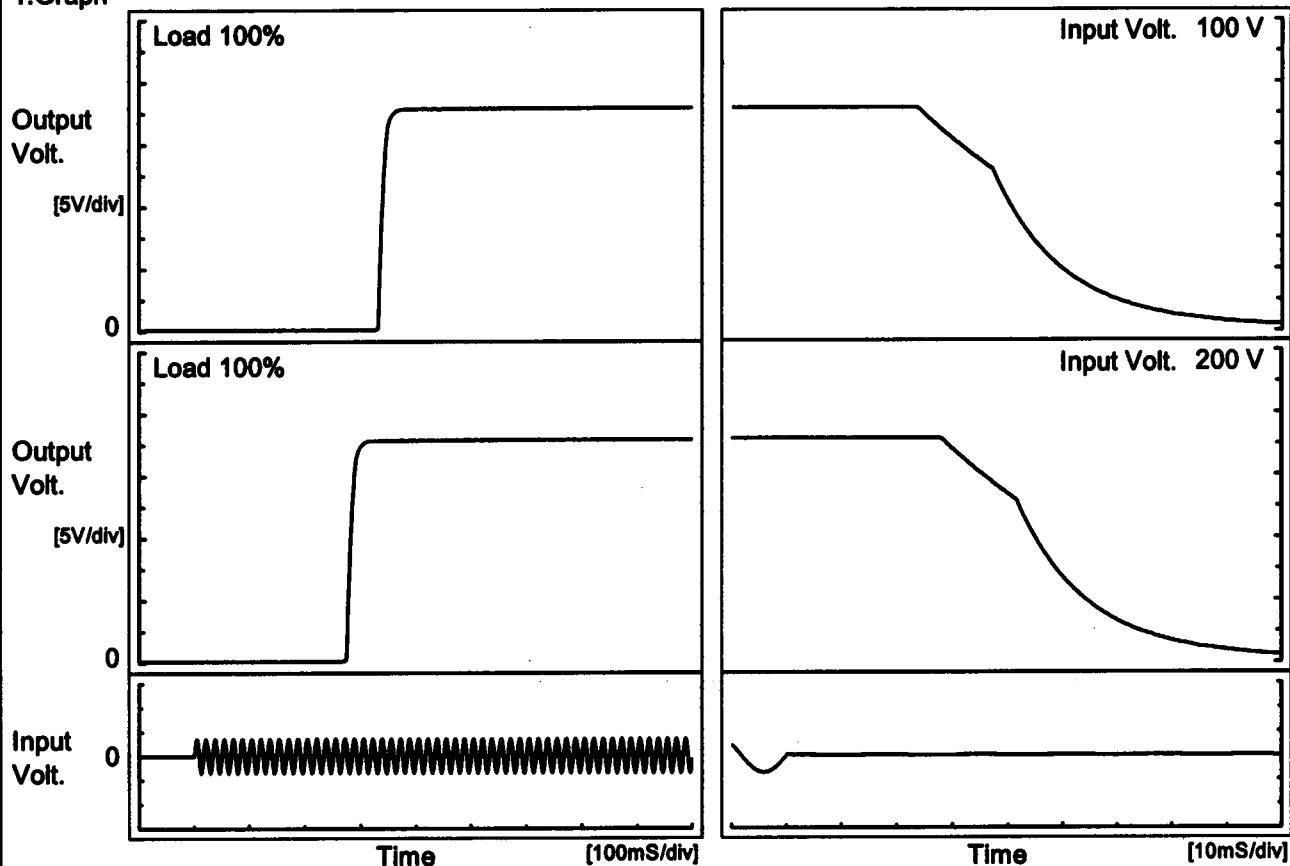
Temperature 25°C
Testing Circuitry Figure A

2. Values

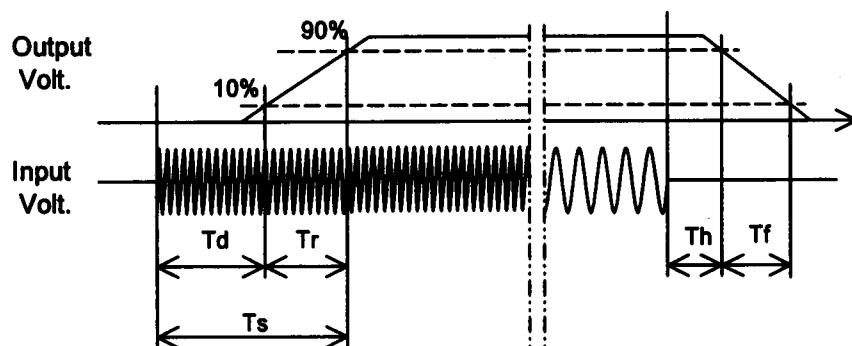
Time since start [H]	Output Voltage [V]
0.0	36.106
0.5	36.081
1.0	36.081
2.0	36.082
3.0	36.082
4.0	36.082
5.0	36.081
6.0	36.081
7.0	36.083
8.0	36.082

COSEL

Model	PBA75F-36
Item	Rise and Fall Time
Object	+36V2.1A

Temperature 25°C
Testing Circuitry Figure A**1. Graph****2. Values**

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[mS]
100 V		332.0	16.0	348.0	27.7	36.4	
200 V		275.0	16.0	291.0	32.0	36.8	



COSEL

Model	PBA75F-36	Temperature Testing Circuitry 25°C Figure A
Item	Hold-Up Time	
Object	+36V2.1A	

1. Graph

Y-axis: Hold-up Time [ms] (logarithmic scale: 1, 10, 100, 1000)

X-axis: Input Voltage [V] (linear scale: 50, 100, 150, 200, 250, 300)

Legend:

- Load 50% (dashed line with open squares)
- Load 100% (solid line with open triangles)

2. Values

Input Voltage [V]	Hold-up Time [ms]	
	Load 50%	Load 100%
75	48	20
85	50	23
100	52	25
120	54	26
200	58	29
230	59	29
264	60	30
280	60	30
--	-	-

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

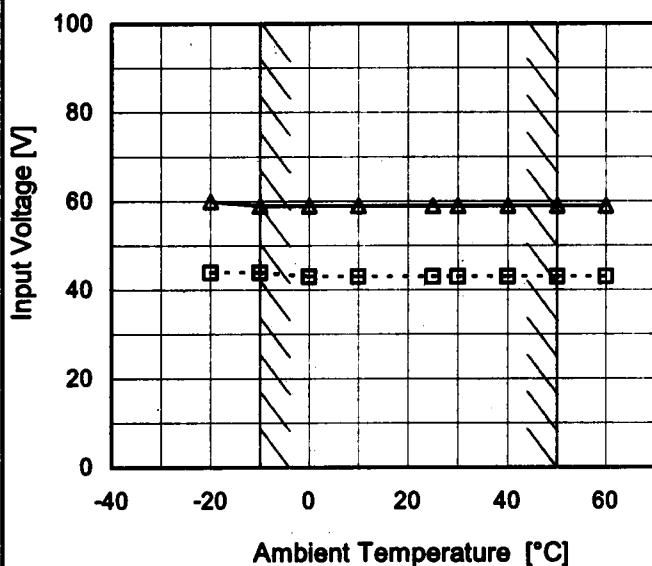
Model	PBA75F-36	Temperature Testing Circuitry	25°C Figure A																																																			
Item	Instantaneous Interruption Compensation																																																					
Object	+36V2.1A																																																					
1.Graph	<p>—△— Input Volt. 100V - - -□- - Input Volt. 200V - - -○- - Input Volt. 230V</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>100V [mS]</th> <th>200V [mS]</th> <th>230V [mS]</th> </tr> </thead> <tbody> <tr><td>0.40</td><td>130</td><td>138</td><td>146</td></tr> <tr><td>0.80</td><td>70</td><td>80</td><td>78</td></tr> <tr><td>1.20</td><td>46</td><td>52</td><td>53</td></tr> <tr><td>1.60</td><td>34</td><td>38</td><td>39</td></tr> <tr><td>2.00</td><td>26</td><td>31</td><td>36</td></tr> <tr><td>2.10</td><td>25</td><td>29</td><td>30</td></tr> <tr><td>2.31</td><td>22</td><td>26</td><td>28</td></tr> </tbody> </table>			Load Current [A]	100V [mS]	200V [mS]	230V [mS]	0.40	130	138	146	0.80	70	80	78	1.20	46	52	53	1.60	34	38	39	2.00	26	31	36	2.10	25	29	30	2.31	22	26	28																			
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Note:	Slanted line shows the range of the rated load current.																																																					

COSEL
Model PBA75F-36

Item Minimum Input Voltage
for Regulated Output Voltage

Object +36V2.1A
1. Graph

---□--- Load 50%
—△— Load 100%



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%
-20	44	60
-10	44	59
0	43	59
10	43	59
25	43	59
30	43	59
40	43	59
50	43	59
60	43	59
--	-	-
--	-	-

COSEL

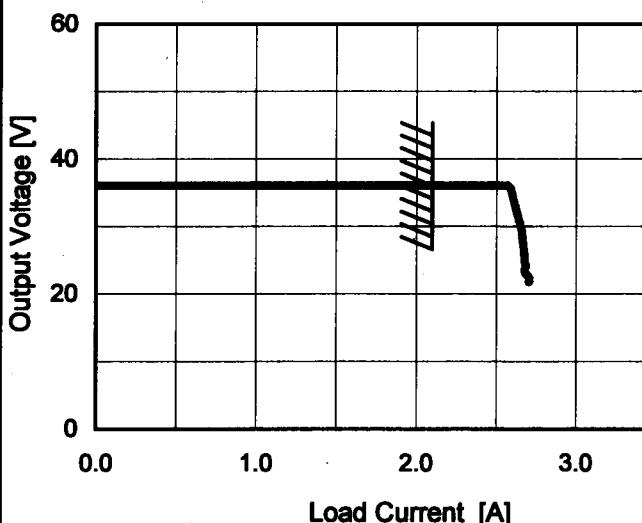
Model PBA75F-36

Item Overcurrent Protection

Object +36V2.1A

1. Graph

— Input Volt. 100V
 — Input Volt. 200V
 — Input Volt. 230V



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

Intermittent operation occurs when the output voltage is from 21.6V to 0V.

Temperature 25°C
 Testing Circuitry Figure A

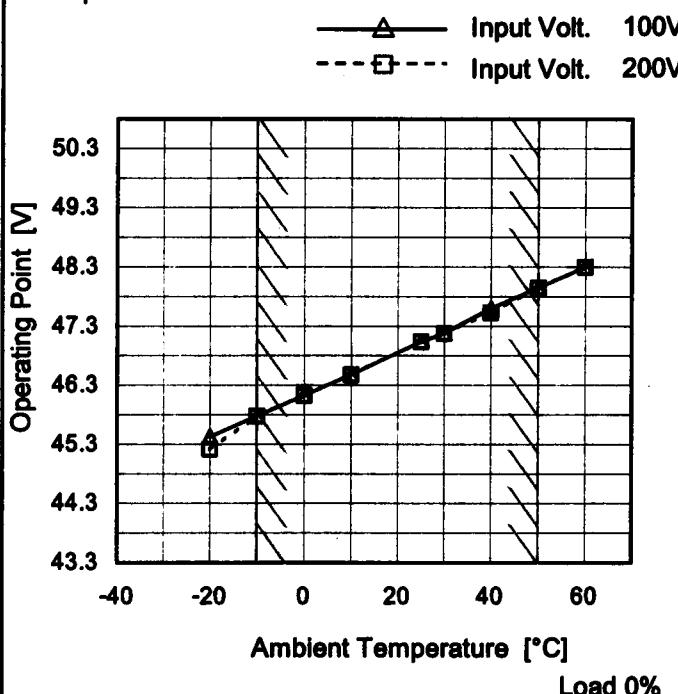
2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
36.0	2.18	2.18	2.22
34.2	2.61	2.61	2.61
32.4	2.63	2.63	2.63
28.8	2.66	2.66	2.66
25.2	2.68	2.68	2.68
21.6	2.71	2.70	2.70
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

COSEL

Model	PBA75F-36
Item	Ovvoltage Protection
Object	+36V2.1A

1. Graph



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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	45.44	45.23
-10	45.79	45.79
0	46.14	46.14
10	46.49	46.49
25	47.05	47.05
30	47.19	47.19
40	47.61	47.54
50	47.96	47.96
60	48.31	48.31
--	-	-
--	-	-

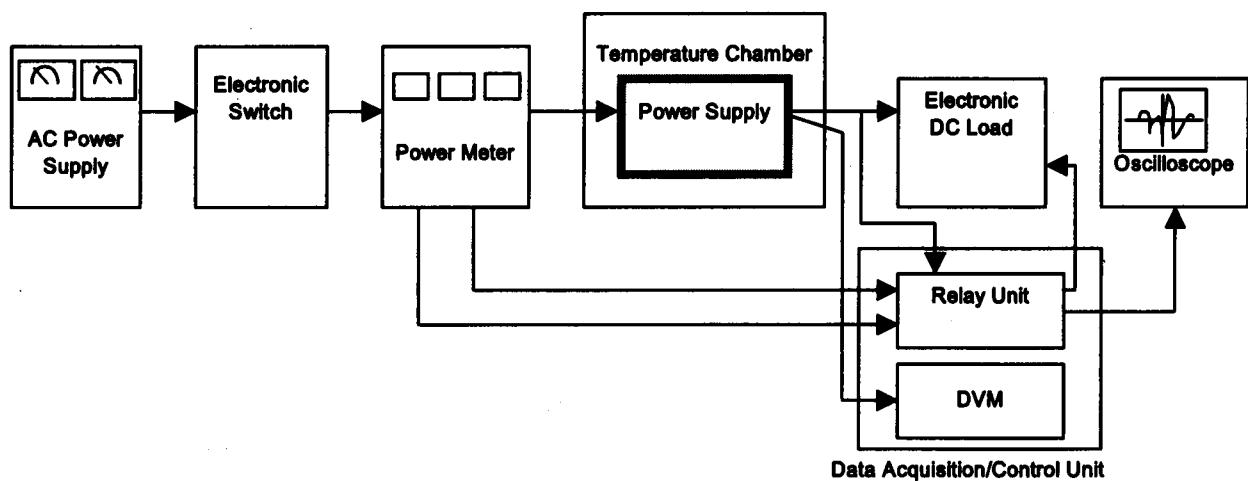


Figure A

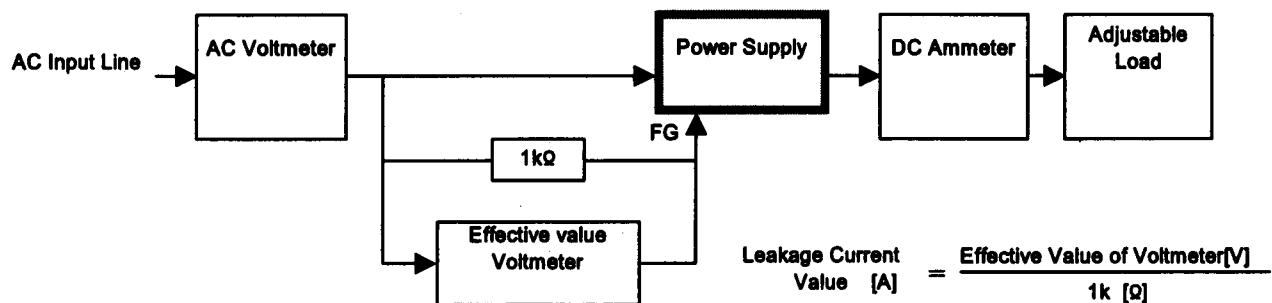


Figure B (DEN-AN)

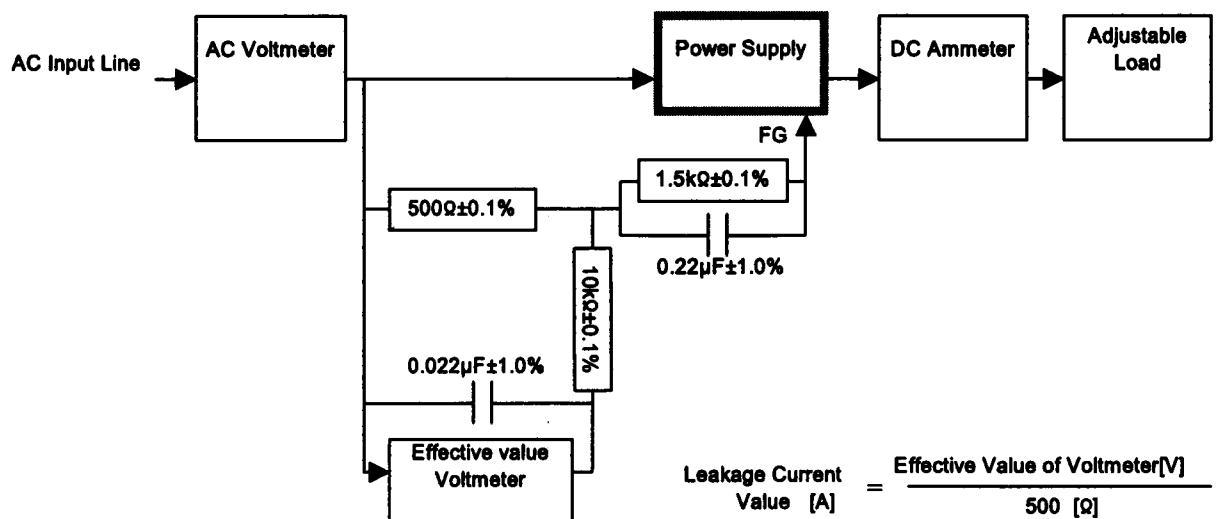


Figure B (IEC60950)