



TEST DATA OF PBA150F-12

Regulated DC Power Supply
Apr.8. 2004

Approved by : Kuniaki Nagahara
Kuniaki Nagahara Design Manager

Prepared by : Tetsuo Koide
Tetsuo Koide Design Engineer

COSEL CO.,LTD.

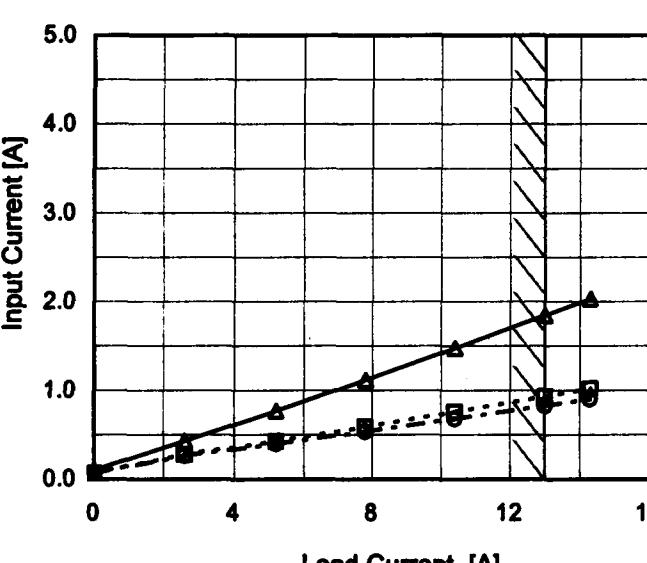


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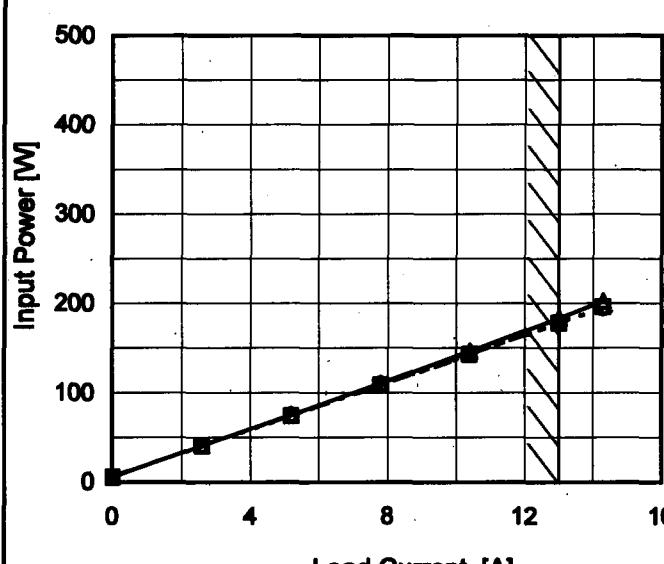
(Final Page 24)

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Model	PBA150F-12																																																					
Item	Input Current (by Load Current)	Temperature	25°C																																																			
Object	Testing Circuitry Figure A																																																					
1.Graph																																																						
—▲— Input Volt. 100V -·□- Input Volt. 200V -·○- Input Volt. 230V			2.Values																																																			
 <p>The graph shows three curves representing different input voltages: 100V (solid line with triangles), 200V (dashed line with squares), and 230V (dash-dot line with circles). The curves show that as input voltage increases, the required load current decreases for a given input current. A slanted line is drawn across the graph, starting from approximately (3, 0.4) and ending at (13, 2.0), indicating the range of rated load currents.</p>																																																						
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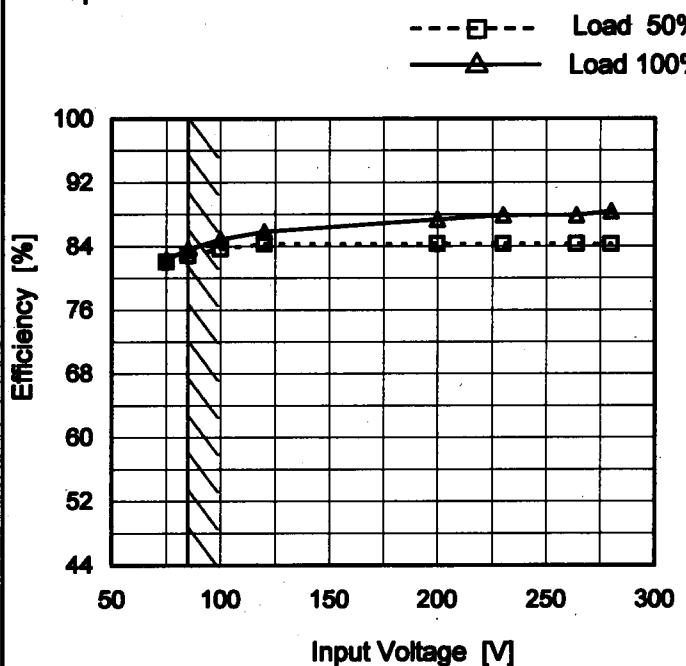
Note: Slanted line shows the range of the rated load current.

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	 <p>The graph plots Input Power [W] on the Y-axis (0 to 500) against Load Current [A] on the X-axis (0 to 16). Three curves are shown for different input voltages: 100V (solid line with triangle markers), 200V (dashed line with square markers), and 230V (dash-dot line with circle markers). A slanted line is drawn through the origin, representing the rated load current range.</p>																																																					
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Model	PBA150F-12
Item	Efficiency (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

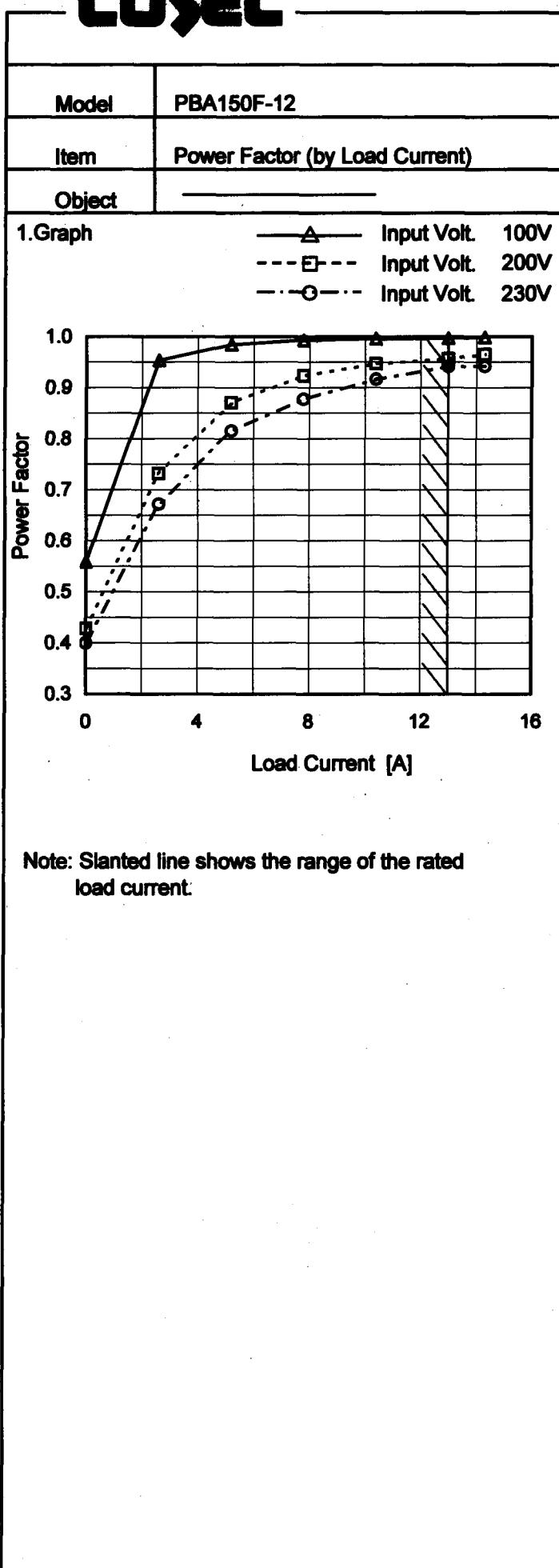
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	82.1	82.4
85	82.9	83.6
100	83.7	84.9
120	84.3	85.9
200	84.3	87.4
230	84.3	87.9
264	84.3	87.9
280	84.3	88.4
-	-	-

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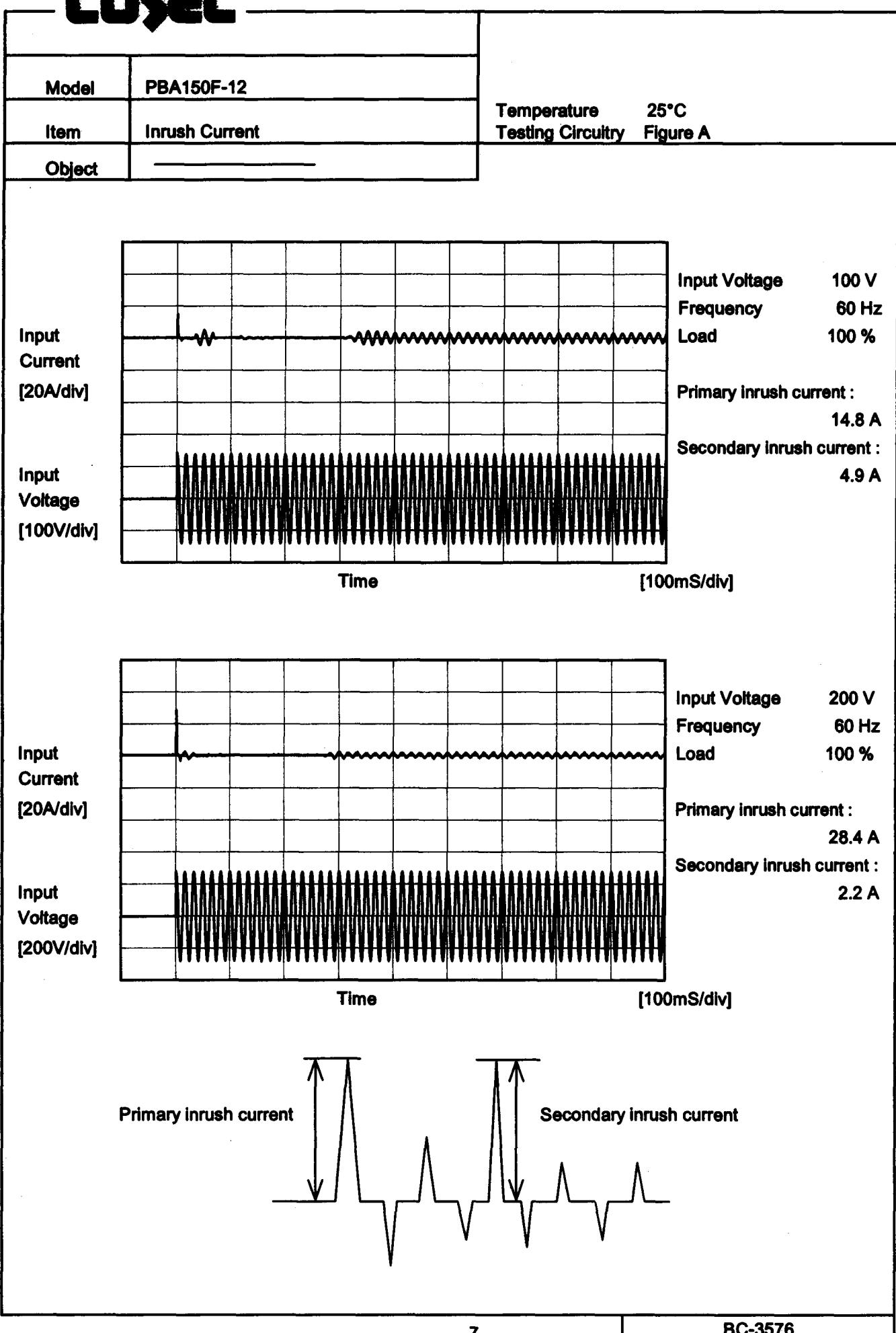
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Item	Power Factor (by Input Voltage)	Temperature 25°C Testing Circuitry Figure A																																
Object	—	—																																
1. Graph																																		
<p>Detailed description: The graph plots Power Factor on the y-axis (0.4 to 1.0) against Input Voltage [V] on the x-axis (50 to 300). Two data series are shown: 'Load 50%' represented by a dashed line with square markers, and 'Load 100%' represented by a solid line with triangle markers. Both series start near 1.0 at 50V and decrease as voltage increases. A slanted line from approximately (50, 0.95) to (280, 0.65) indicates the rated input voltage range.</p>																																		
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 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]
0.0	0.559	0.429	0.400
2.6	0.954	0.732	0.672
5.2	0.984	0.871	0.815
7.8	0.993	0.924	0.878
10.4	0.996	0.947	0.917
13.0	0.997	0.957	0.942
14.3	0.999	0.966	0.942
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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Model	PBA150F-12	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current		
Object	<hr/>		

1. Results

Standards		Input Volt.			Note
		100 [V]	200 [V]	230 [V]	
DEN-AN	Both phases	0.19	0.37	0.43	Operation
	One of phase	0.27	0.54	0.62	stand by
IEC60950	Both phases	0.19	0.38	0.48	Operation
	One of phase	0.27	0.58	0.71	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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Item	Line Regulation	Testing Circuitry	Figure A																																
Object	+12V13A																																		
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Note: Slanted line shows the range of the rated input voltage.

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

COSEL

Model PBA150F-12

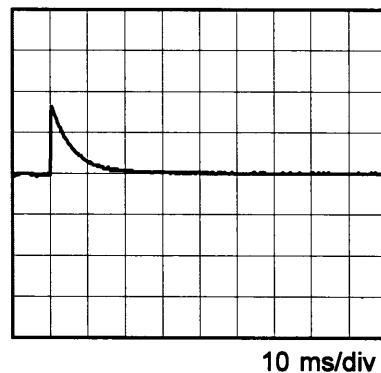
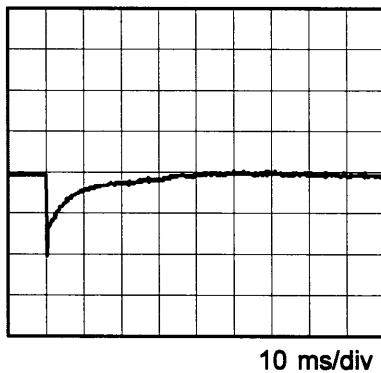
Item Dynamic Load Response

Object +12V13A

Temperature
Testing Circuitry25°C
Figure AInput Volt. 100 V
Cycle 1000 ms

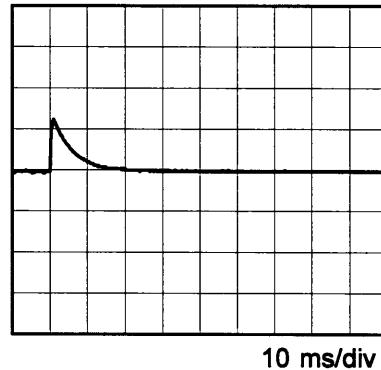
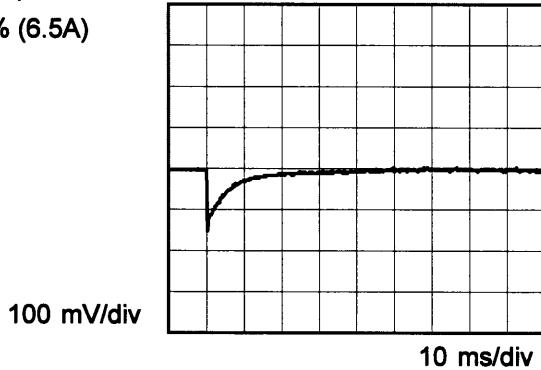
Min. Load (0A) ↔

Load 100% (13A)



Min. Load (0A) ↔

Load 50% (6.5A)

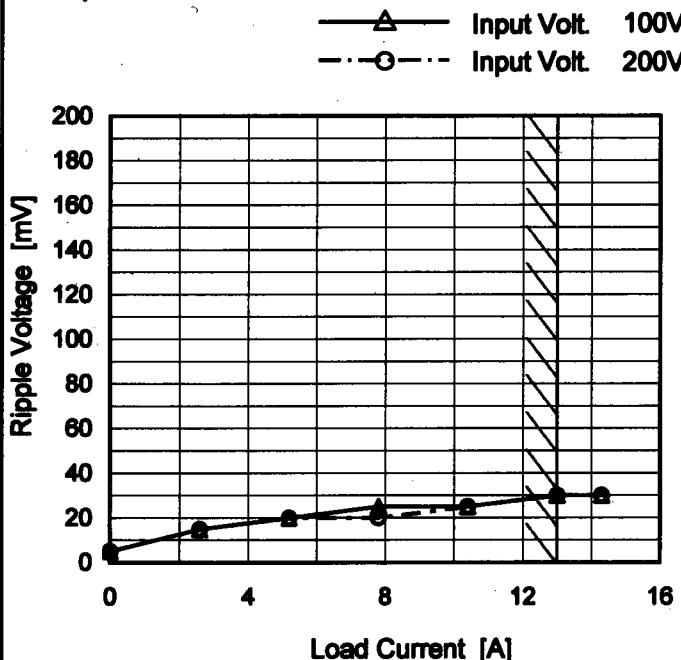


* The characteristic of AC200V is equal.

COSEL

Model	PBA150F-12
Item	Ripple Voltage (by Load Current)
Object	+12V13A

1. Graph



Measured by 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	5	5
2.6	15	15
5.2	20	20
7.8	25	20
10.4	25	25
13.0	30	30
14.3	30	30
—	—	—
—	—	—
—	—	—
—	—	—

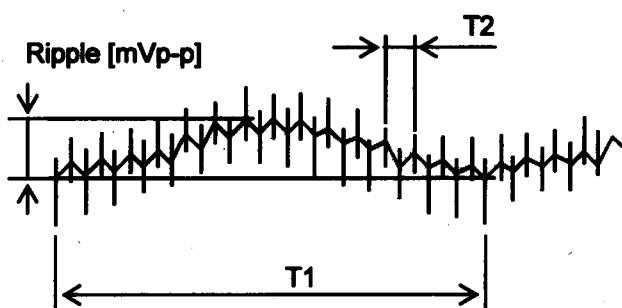
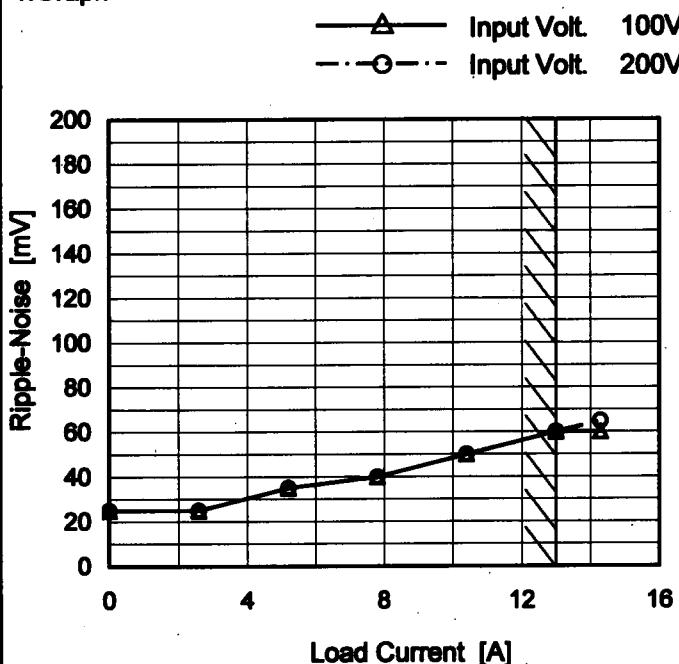
T1: Due to AC Input Line
T2: Due to Switching

Fig. Complex Ripple Wave Form

COSSEL

Model	PBA150F-12
Item	Ripple-Noise
Object	+12V13A

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.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	25	25
2.6	25	25
5.2	35	35
7.8	40	40
10.4	50	50
13.0	60	60
14.3	60	65
-	-	-
-	-	-
-	-	-
-	-	-

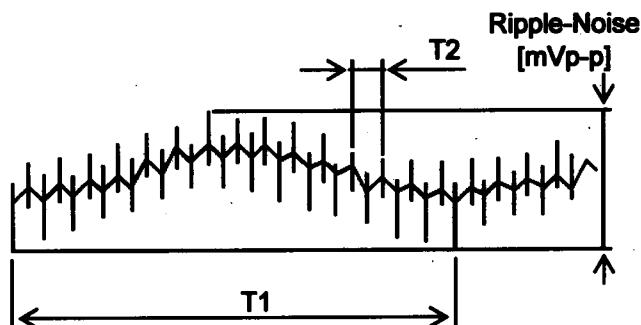
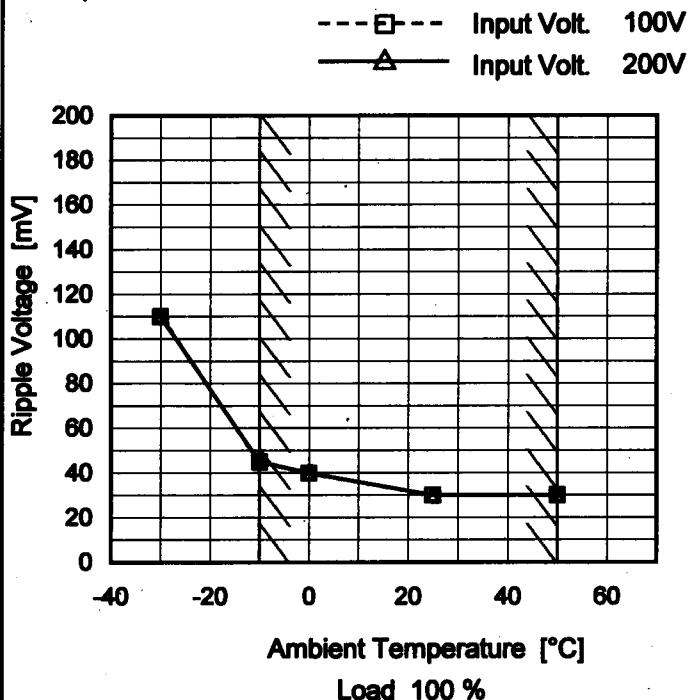
T1: Due to AC Input Line
T2: Due to Switching

Fig. Complex Ripple Wave Form

COSEL

Model	PBA150F-12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V13A

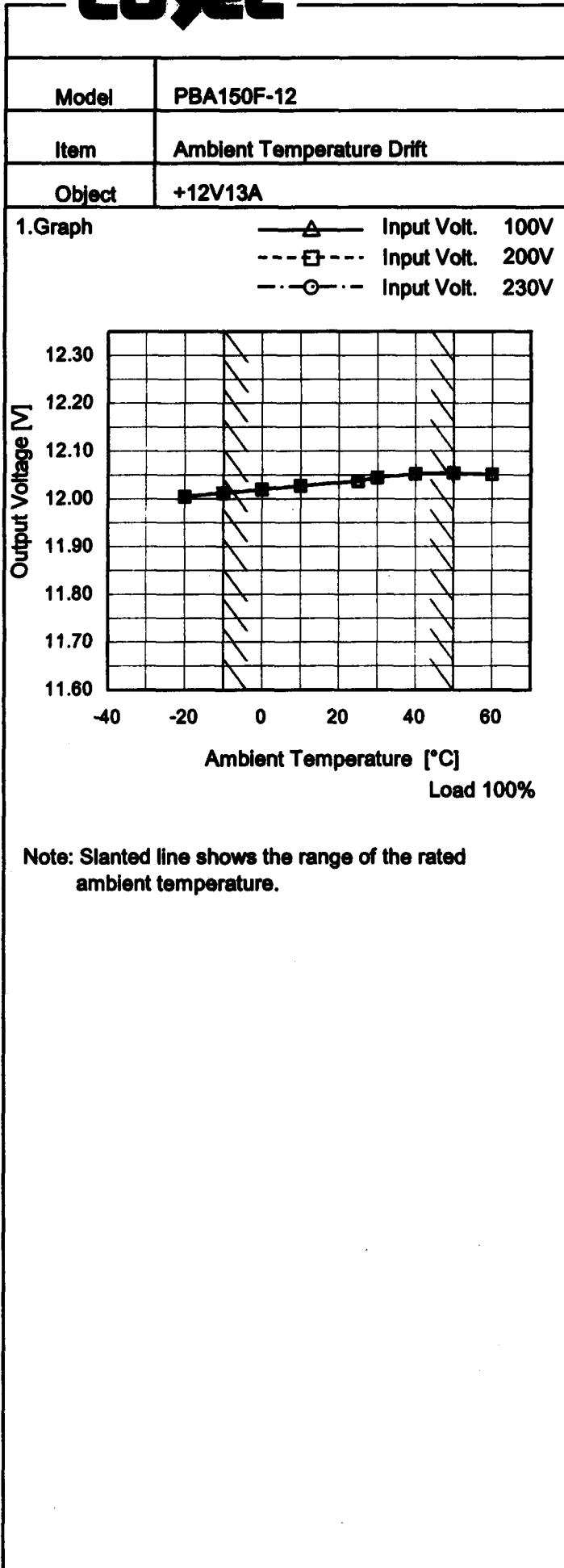
1. Graph

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]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	110	110
-10	45	45
0	40	40
25	30	30
50	30	30
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

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]
-20	12.005	12.005	12.005
-10	12.012	12.012	12.013
0	12.019	12.020	12.020
10	12.027	12.027	12.027
25	12.037	12.037	12.037
30	12.044	12.045	12.045
40	12.052	12.053	12.053
50	12.054	12.054	12.054
60	12.052	12.051	12.051
--	-	-	-
--	-	-	-



Model	PBA150F-12	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+12V13A	

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 - 13A

* 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

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	12.071	±29	±0.2
Minimum Voltage	-10	85	13	12.014		

CSEL

Model	PBA150F-12	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+12V13A																								
1.Graph			2.Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 100V Load 100%</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>12.038</td></tr> <tr><td>0.5</td><td>12.036</td></tr> <tr><td>1.0</td><td>12.036</td></tr> <tr><td>2.0</td><td>12.037</td></tr> <tr><td>3.0</td><td>12.037</td></tr> <tr><td>4.0</td><td>12.037</td></tr> <tr><td>5.0</td><td>12.038</td></tr> <tr><td>6.0</td><td>12.037</td></tr> <tr><td>7.0</td><td>12.038</td></tr> <tr><td>8.0</td><td>12.038</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	12.038	0.5	12.036	1.0	12.036	2.0	12.037	3.0	12.037	4.0	12.037	5.0	12.038	6.0	12.037	7.0	12.038	8.0	12.038
Time since start [H]	Output Voltage [V]																								
0.0	12.038																								
0.5	12.036																								
1.0	12.036																								
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8.0	12.038																								

COSEL

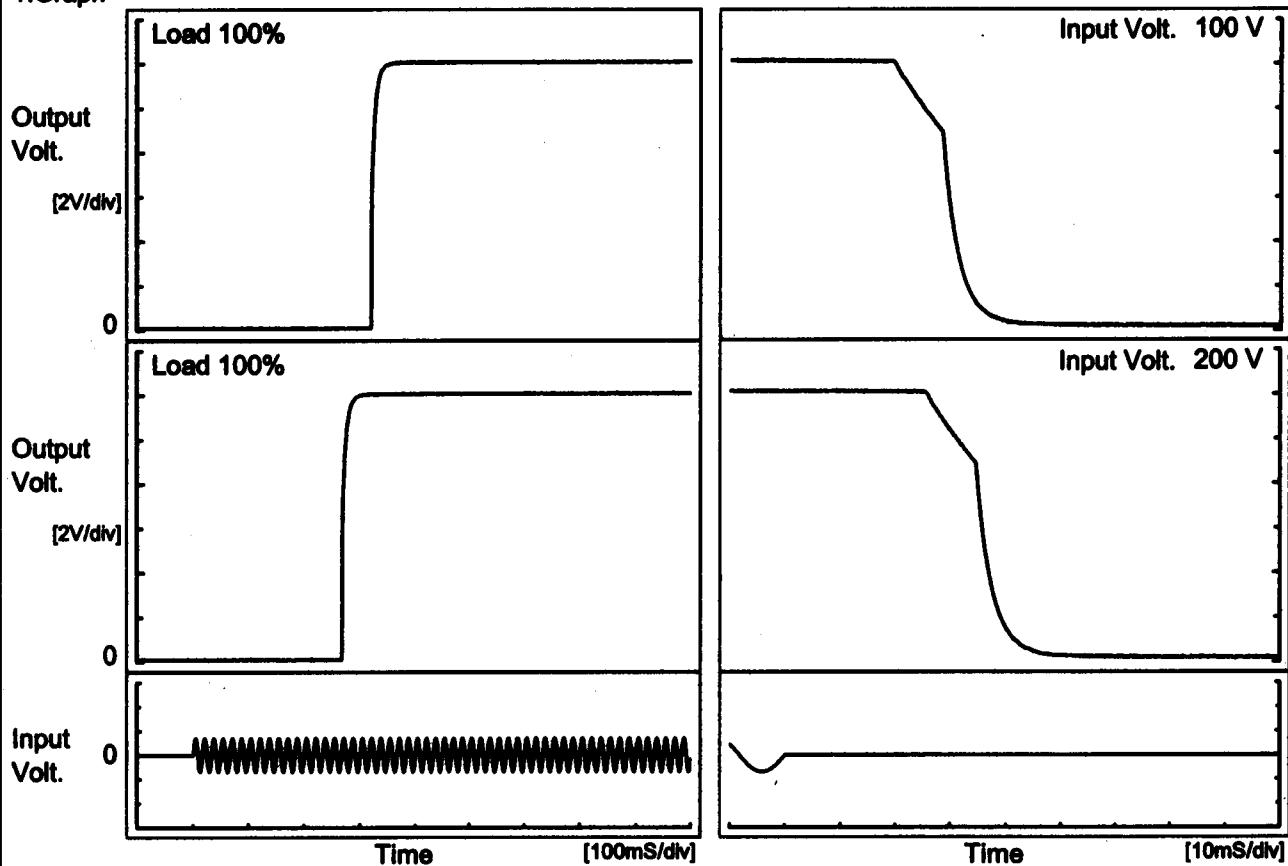
Model PBA150F-12

Item Rise and Fall Time

Temperature 25°C
Testing Circuitry Figure A

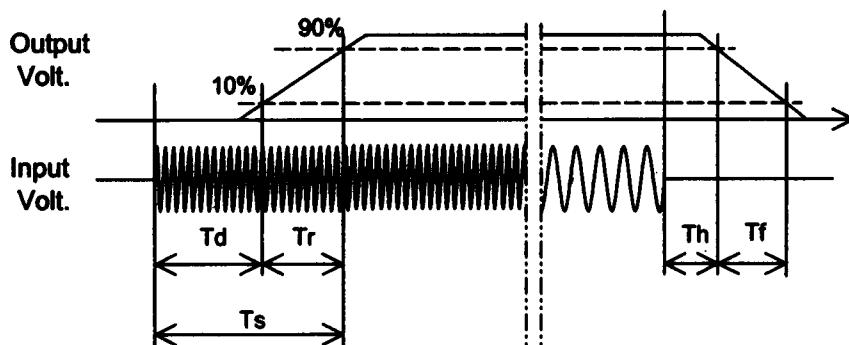
Object +12V13A

1. Graph



2. Values

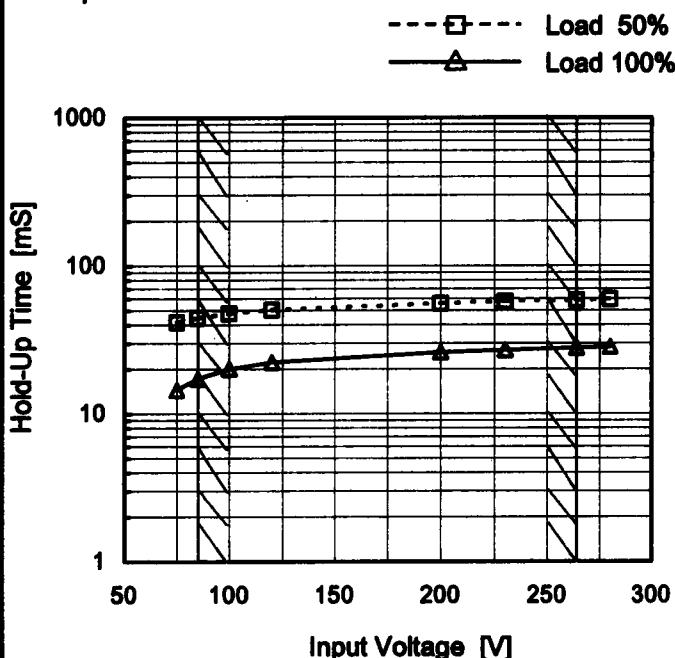
Input Volt.	Time	Td	Tr	Ts	Th	Tf	[mS]
100 V		320.5	11.0	331.5	22.7	11.9	
200 V		268.0	11.0	279.0	28.7	12.0	



COSEL

Model	PBA150F-12
Item	Hold-Up Time
Object	+12V13A

1. Graph



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.

Temperature 25°C
Testing Circuitry Figure A

2. Values

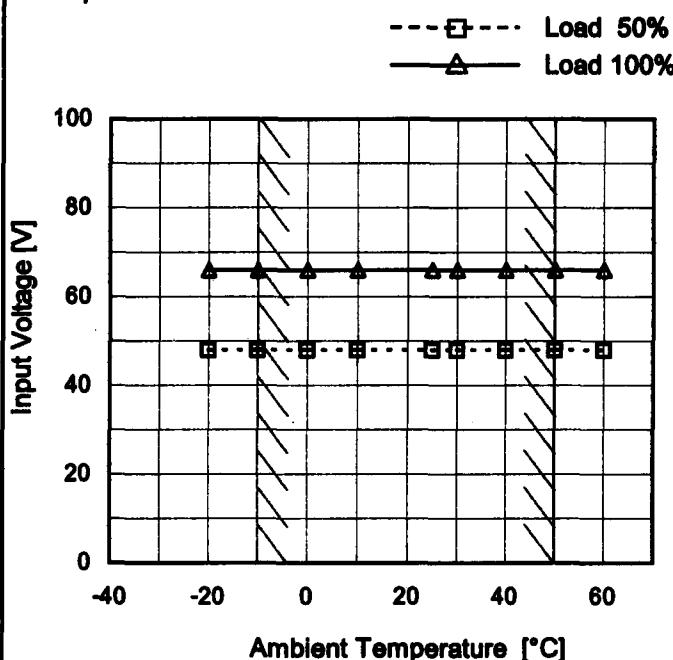
Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	42	15
85	45	17
100	48	20
120	50	22
200	56	26
230	58	27
264	59	28
280	59	28
--	-	-

COSEL

Model	PBA150F-12	Temperature	25°C																																																			
Item	Instantaneous interruption Compensation	Testing Circuitry	Figure A																																																			
Object	+12V13A																																																					
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>3.0</td><td>100</td><td>100</td><td>100</td></tr> <tr><td>5.2</td><td>62</td><td>62</td><td>62</td></tr> <tr><td>7.8</td><td>39</td><td>39</td><td>39</td></tr> <tr><td>10.4</td><td>27</td><td>27</td><td>27</td></tr> <tr><td>13.0</td><td>20</td><td>20</td><td>20</td></tr> <tr><td>14.3</td><td>18</td><td>18</td><td>18</td></tr> </tbody> </table>			Load Current [A]	100V [mS]	200V [mS]	230V [mS]	3.0	100	100	100	5.2	62	62	62	7.8	39	39	39	10.4	27	27	27	13.0	20	20	20	14.3	18	18	18																							
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Note:	Slanted line shows the range of the rated load current.																																																					

COSEL

Model	PBA150F-12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V13A

1.Graph

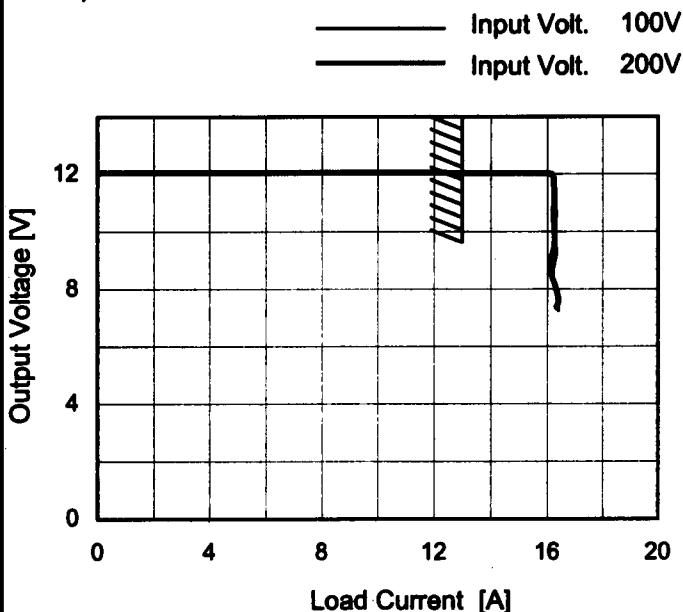
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure A**2.Values**

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	48	66
-10	48	66
0	48	66
10	48	66
25	48	66
30	48	66
40	48	66
50	48	66
60	48	66
--	-	-
--	-	-

COSSEL

Model	PBA150F-12
Item	Overcurrent Protection
Object	+12V13A

1.Graph

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

Intermittent operation occurs when the output voltage is from 7.2V 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]
12.0	13.36	13.26
11.4	16.29	16.24
10.8	16.31	16.22
9.6	16.30	16.25
8.4	16.18	16.18
7.2	16.35	16.26
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	PBA150F-12	Testing Circuitry Figure A																																					
Item	Overvoltage Protection																																						
Object	+12V13A																																						
1. Graph																																							
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend: Input Volt. 100V (solid line with open circles), Input Volt. 200V (dashed line with open squares)</p>			2. Values																																				
<table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Operating Point [V] Input Volt. 100[V]</th> <th>Operating Point [V] Input Volt. 200[V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>15.83</td><td>15.83</td></tr> <tr><td>-10</td><td>15.95</td><td>15.95</td></tr> <tr><td>0</td><td>16.01</td><td>16.01</td></tr> <tr><td>10</td><td>16.13</td><td>16.13</td></tr> <tr><td>25</td><td>16.31</td><td>16.31</td></tr> <tr><td>30</td><td>16.31</td><td>16.30</td></tr> <tr><td>40</td><td>16.42</td><td>16.42</td></tr> <tr><td>50</td><td>16.54</td><td>16.54</td></tr> <tr><td>60</td><td>16.60</td><td>16.60</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>				Ambient Temperature [°C]	Operating Point [V] Input Volt. 100[V]	Operating Point [V] Input Volt. 200[V]	-20	15.83	15.83	-10	15.95	15.95	0	16.01	16.01	10	16.13	16.13	25	16.31	16.31	30	16.31	16.30	40	16.42	16.42	50	16.54	16.54	60	16.60	16.60	--	-	-	--	-	-
Ambient Temperature [°C]	Operating Point [V] Input Volt. 100[V]	Operating Point [V] Input Volt. 200[V]																																					
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25	16.31	16.31																																					
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40	16.42	16.42																																					
50	16.54	16.54																																					
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--	-	-																																					
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																							

COSEL

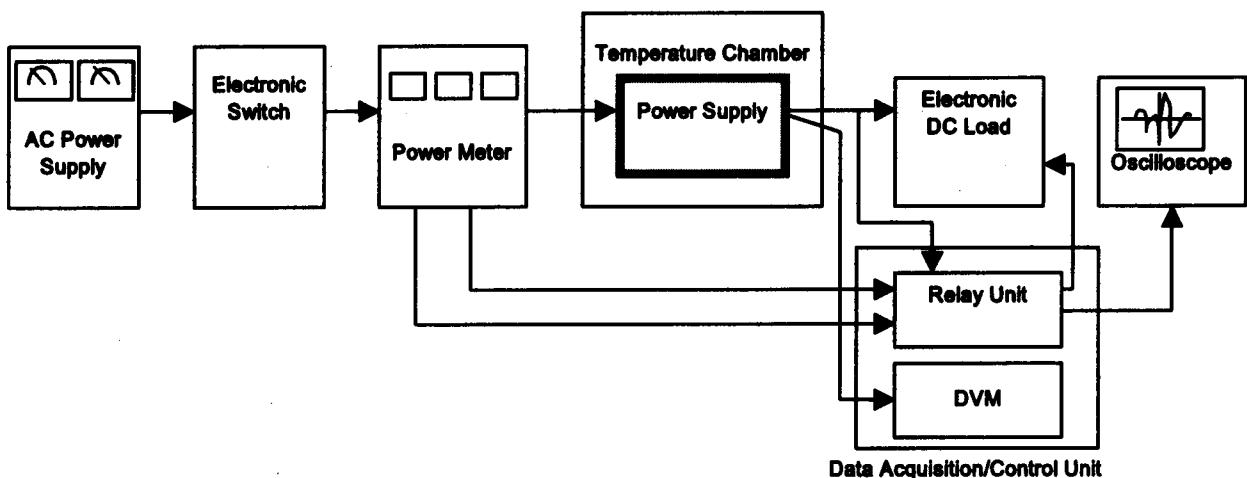


Figure A

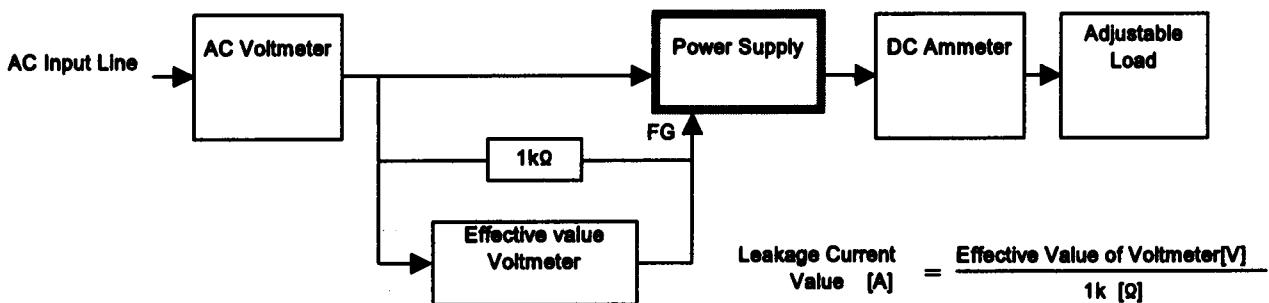


Figure B (DEN-AN)

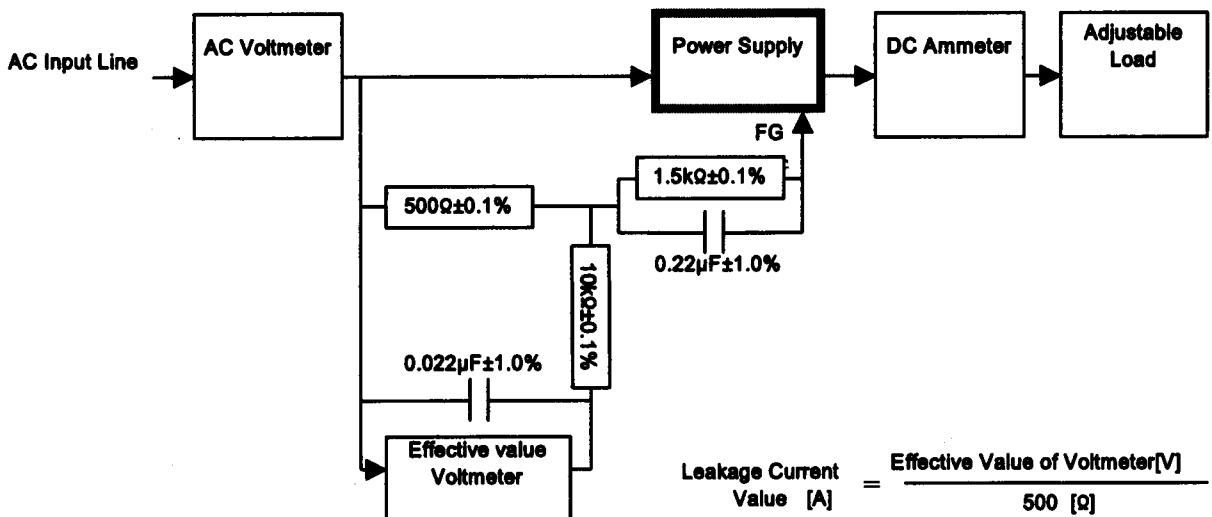


Figure B (IEC60950)