



# TEST DATA OF PBA15F-9

Regulated DC Power Supply  
Sep 29, 2005

Approved by : Kuniaki Nagahara  
Kuniaki Nagahara Design Manager

Prepared by : Yoshiaki Shimizu  
Yoshiaki Shimizu Design Engineer

**COSEL CO.,LTD.**



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(Final Page 24)



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Model	PBA15F-9																																																					
Item	Input Current (by Load Current)	Temperature	25°C																																																			
Object		Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div>—△—</div><div>Input Volt.</div><div>100V</div></div> <div><div>---□---</div><div>Input Volt.</div><div>200V</div></div> <div><div>-·-○-·-</div><div>Input Volt.</div><div>230V</div></div> <p>Input Current [A]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>0.025</td><td>0.021</td><td>0.021</td></tr><tr><td>0.30</td><td>0.084</td><td>0.058</td><td>0.053</td></tr><tr><td>0.60</td><td>0.138</td><td>0.090</td><td>0.083</td></tr><tr><td>0.90</td><td>0.191</td><td>0.121</td><td>0.110</td></tr><tr><td>1.20</td><td>0.244</td><td>0.149</td><td>0.136</td></tr><tr><td>1.50</td><td>0.296</td><td>0.180</td><td>0.164</td></tr><tr><td>1.70</td><td>0.333</td><td>0.197</td><td>0.181</td></tr><tr><td>1.87</td><td>0.363</td><td>0.215</td><td>0.195</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Input Current [A]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	0.025	0.021	0.021	0.30	0.084	0.058	0.053	0.60	0.138	0.090	0.083	0.90	0.191	0.121	0.110	1.20	0.244	0.149	0.136	1.50	0.296	0.180	0.164	1.70	0.333	0.197	0.181	1.87	0.363	0.215	0.195	--	-	-	-	--	-	-	-	--	-	-	-
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# COSEL

Model		PBA15F-9		Temperature Testing Circuitry	25°C Figure A																																																			
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# COSEL

Model

PBA15F-9

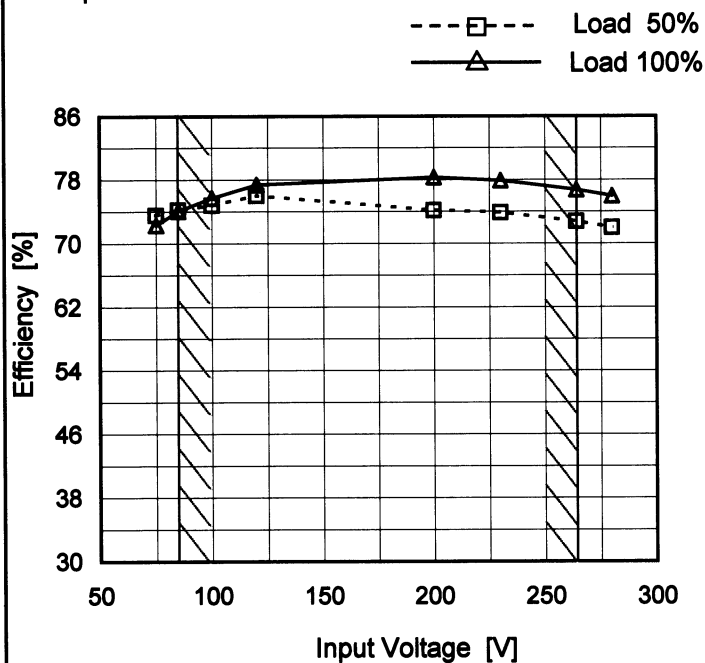
Item

Efficiency (by Input Voltage)

Object

 Temperature 25°C  
 Testing Circuitry Figure A

## 1. Graph



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

## 2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	73.6	72.3
85	74.2	74.1
100	74.8	75.7
120	76.0	77.4
200	74.2	78.3
230	73.9	77.9
264	72.7	76.7
280	72.0	76.0
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**COSEL**

Model

PBA15F-9

Item

Power Factor (by Input Voltage)

Object

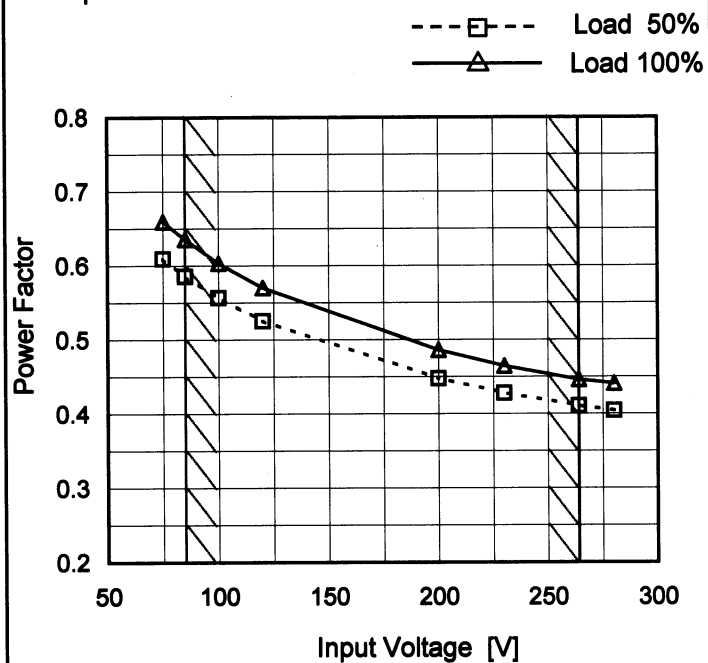
Temperature

25°C

Testing Circuitry

Figure A

## 1. Graph



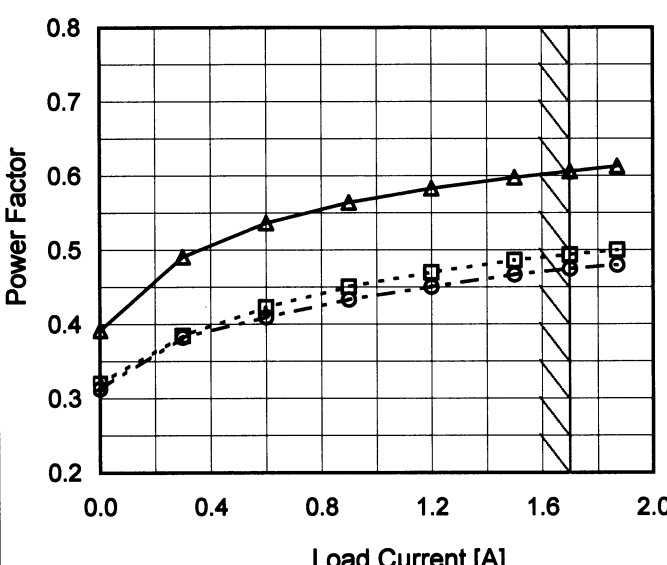
Note: Slanted line shows the range of the rated input voltage.

## 2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.610	0.659
85	0.586	0.636
100	0.557	0.603
120	0.525	0.570
200	0.448	0.486
230	0.428	0.464
264	0.411	0.446
280	0.404	0.441
--	-	-



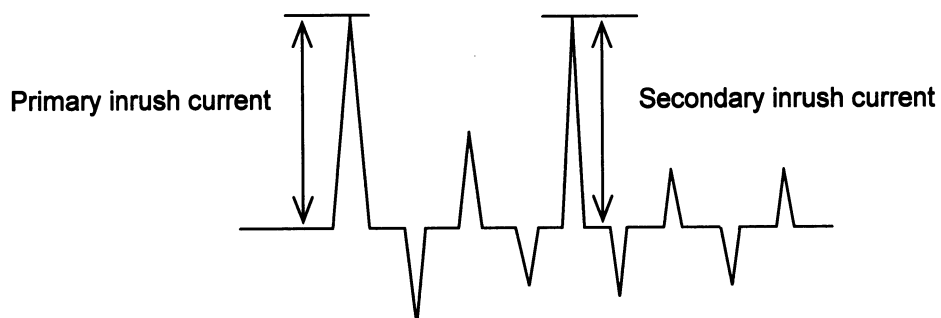
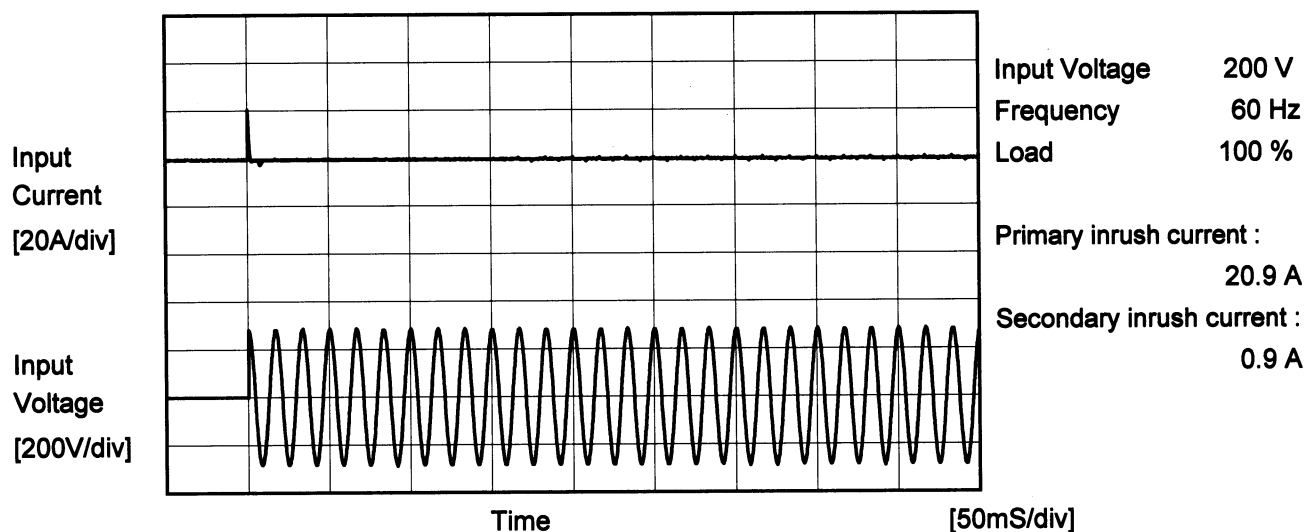
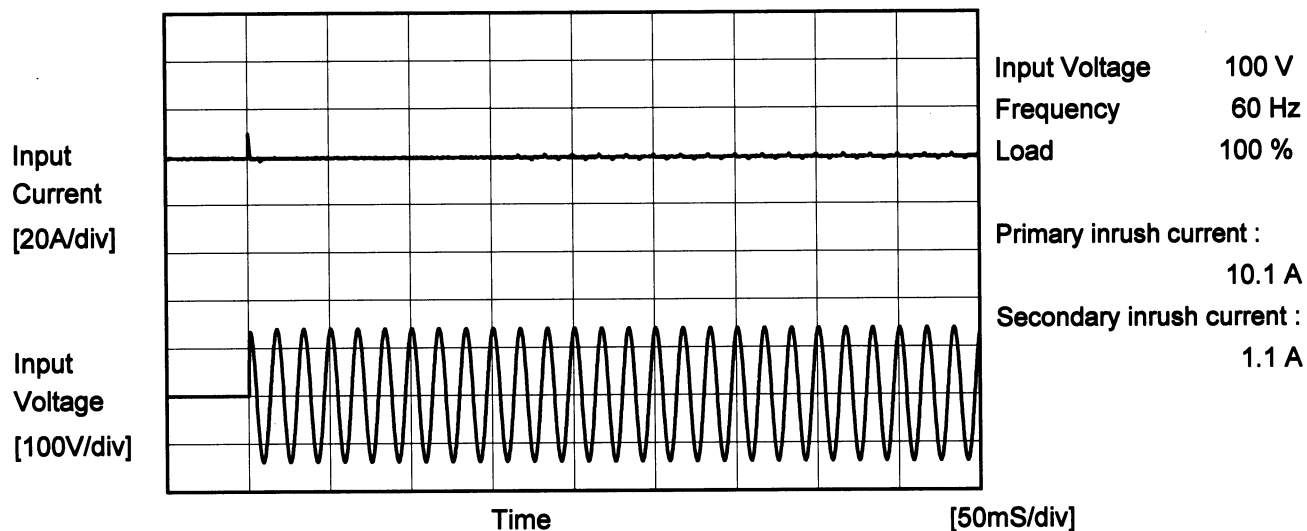
# COSEL

Model		PBA15F-9	Temperature 25°C Testing Circuitry Figure A																																																			
Item		Power Factor (by Load Current)																																																				
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1.Graph		<div><div><div>—△—</div><div>---□---</div><div>-·-○-·-</div></div><div><div>Input Volt. 100V</div><div>Input Volt. 200V</div><div>Input Volt. 230V</div></div></div>  <p>Power Factor</p> <p>Load Current [A]</p>	2.Values																																																			
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Note: Slanted line shows the range of the rated load current.																																																						



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Model	PBA15F-9	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		







Model		PBA15F-9	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object			

## 1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.06	0.12	0.14	Operation
	One of phase	0.10	0.22	0.27	stand by
IEC60950	Both phases	0.07	0.15	0.18	Operation
	One of phase	0.10	0.22	0.27	stand by

The value for "One of 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.



# COSEL

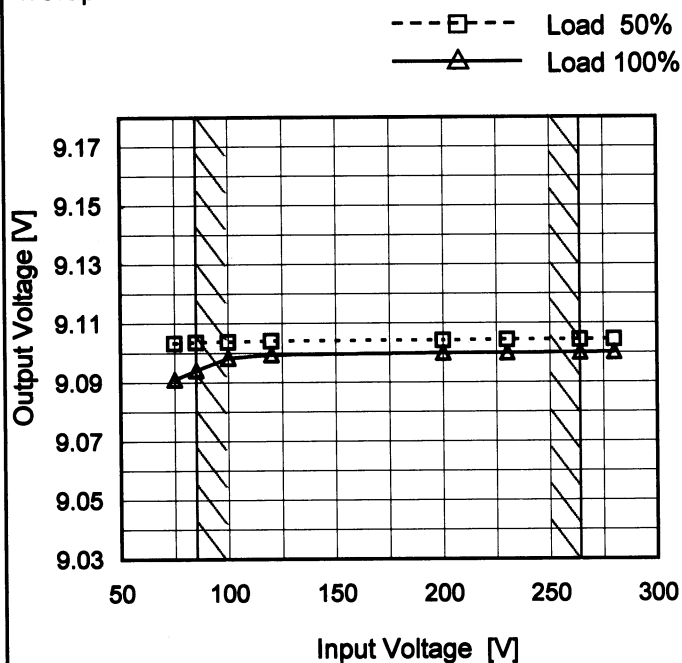
**Model** PBA15F-9

**Item** Line Regulation

**Object** +9V1.7A

**Temperature** 25°C  
**Testing Circuitry** Figure A

## 1. Graph



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

## 2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	9.103	9.091
85	9.104	9.094
100	9.104	9.098
120	9.104	9.099
200	9.104	9.100
230	9.104	9.100
264	9.104	9.100
280	9.105	9.100
--	-	-



BC-10021



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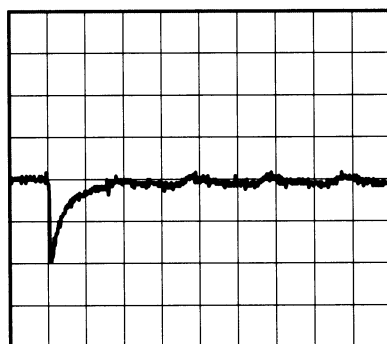
Model	PBA15F-9	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+9V1.7A		

Input Volt. 100 V  
Cycle 1000 ms

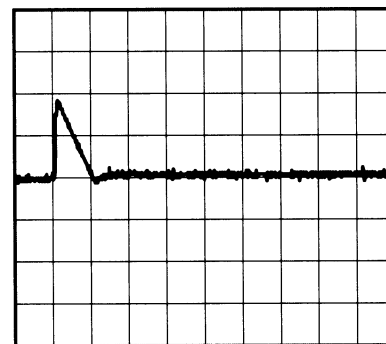
Load Current

Min. Load (0A) ←→  
Load 100% (1.7A)

100 mV/div



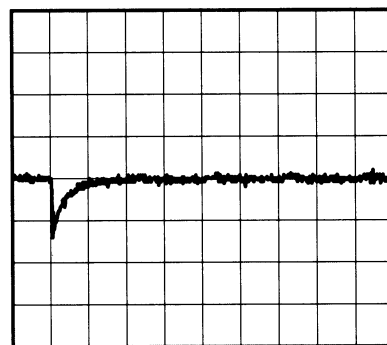
5 ms/div



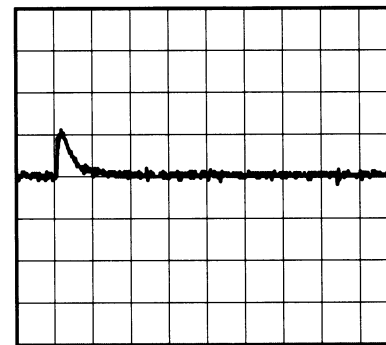
5 ms/div

Min. Load (0A) ←→  
Load 50% (0.85A)

100 mV/div



5 ms/div

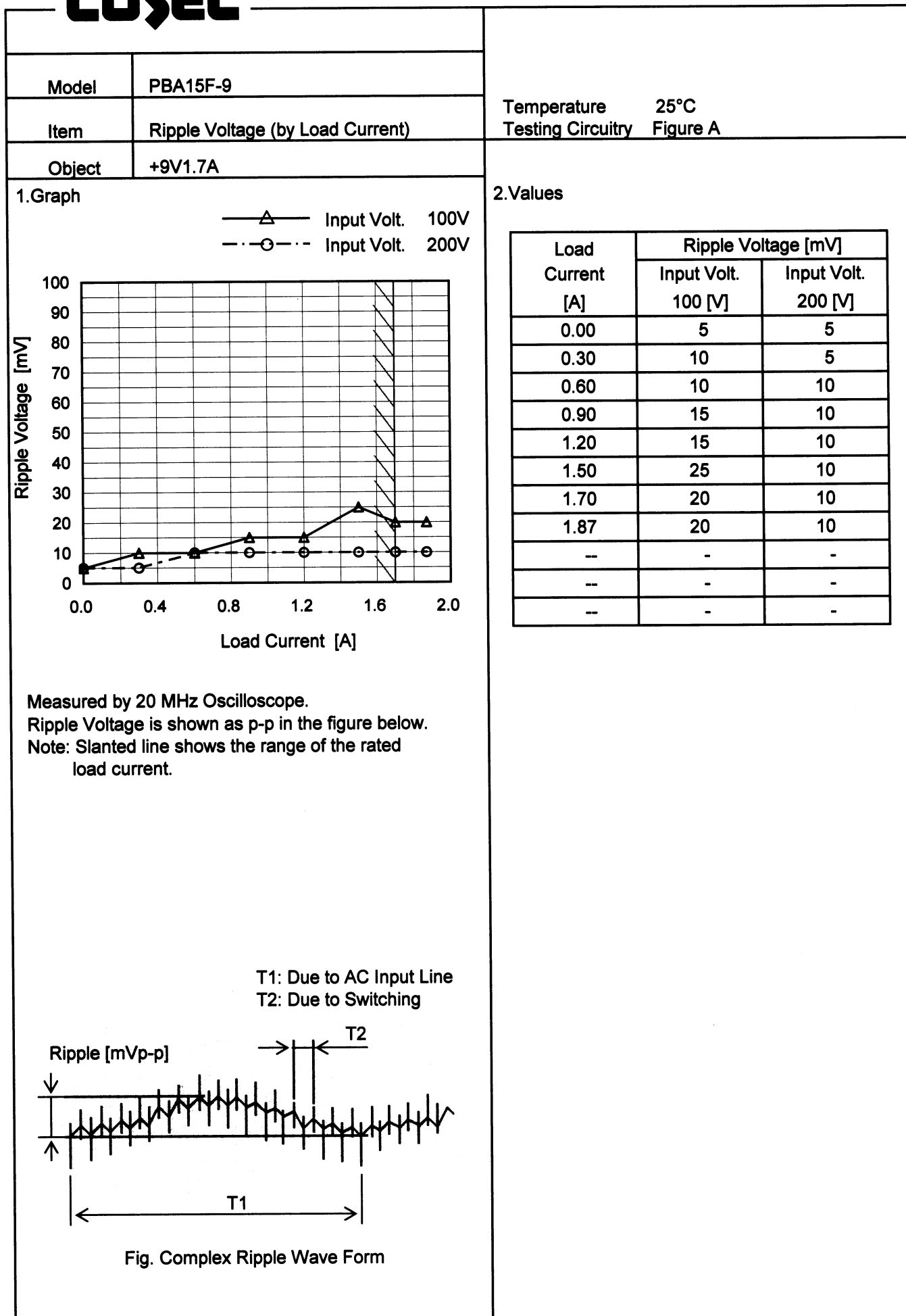


5 ms/div

\* The characteristic of AC200V is equal.



# COSEL





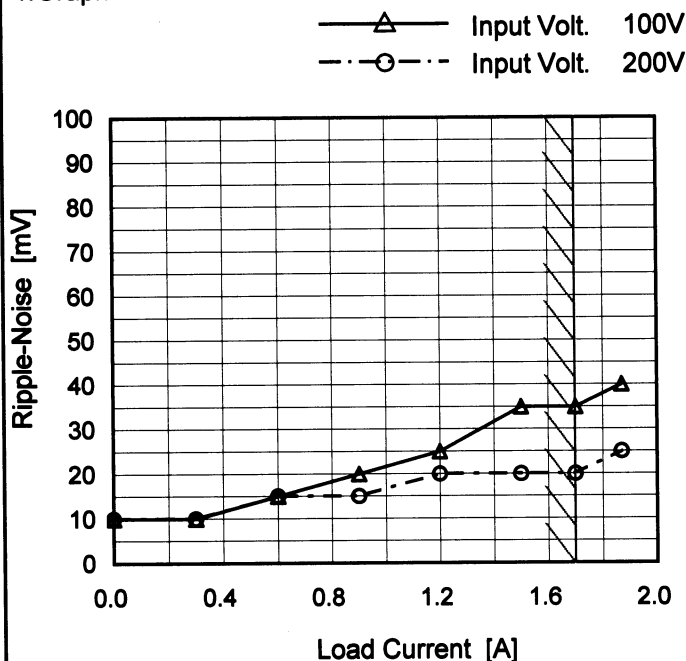
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**Model** PBA15F-9

**Item** Ripple-Noise

**Object** +9V1.7A

**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. 200 [V]
0.00	10	10
0.30	10	10
0.60	15	15
0.90	20	15
1.20	25	20
1.50	35	20
1.70	35	20
1.87	40	25
--	-	-
--	-	-
--	-	-

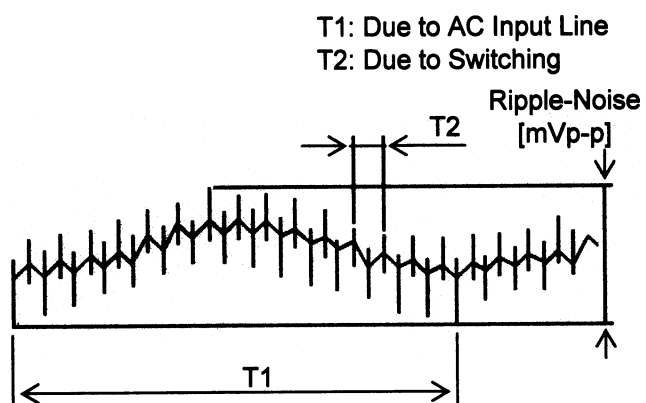


Fig. Complex Ripple Wave Form



# COSEL

Model

PBA15F-9

Item

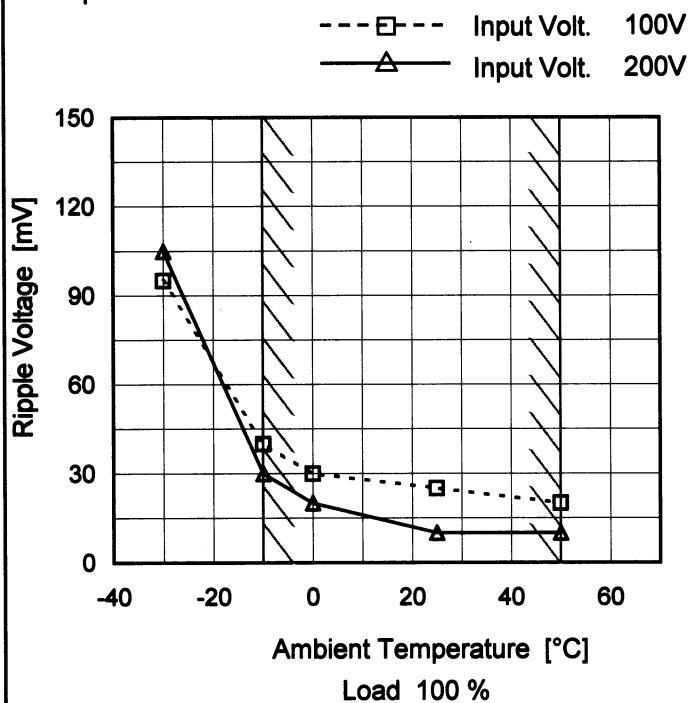
Ripple Voltage (by Ambient Temp.)

Object

+9V1.7A

Testing Circuitry Figure A

## 1. Graph



Measured by 20 MHz Oscilloscope.

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

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	95	105
-10	40	30
0	30	20
25	25	10
50	20	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



# COSEL

Model

PBA15F-9

Item

Ambient Temperature Drift

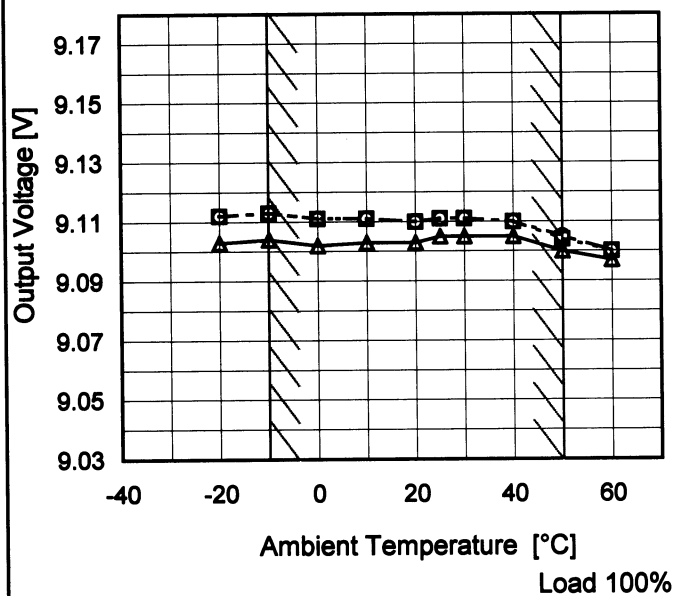
Object

+9V1.7A

Testing Circuitry Figure A

## 1. Graph

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



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

## 2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	9.103	9.112	9.112
-10	9.104	9.113	9.113
0	9.102	9.111	9.111
10	9.103	9.111	9.111
20	9.103	9.110	9.110
25	9.105	9.111	9.111
30	9.105	9.111	9.111
40	9.105	9.110	9.110
50	9.100	9.104	9.105
60	9.097	9.100	9.100
--	-	-	-



# COSEL

Model		PBA15F-9	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+9V1.7A	

## 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 - 1.7A

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

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

## 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	-10	264	0	9.023	±10	±0.1
Minimum Voltage	50	85	1.7	9.003		



**COSEL**

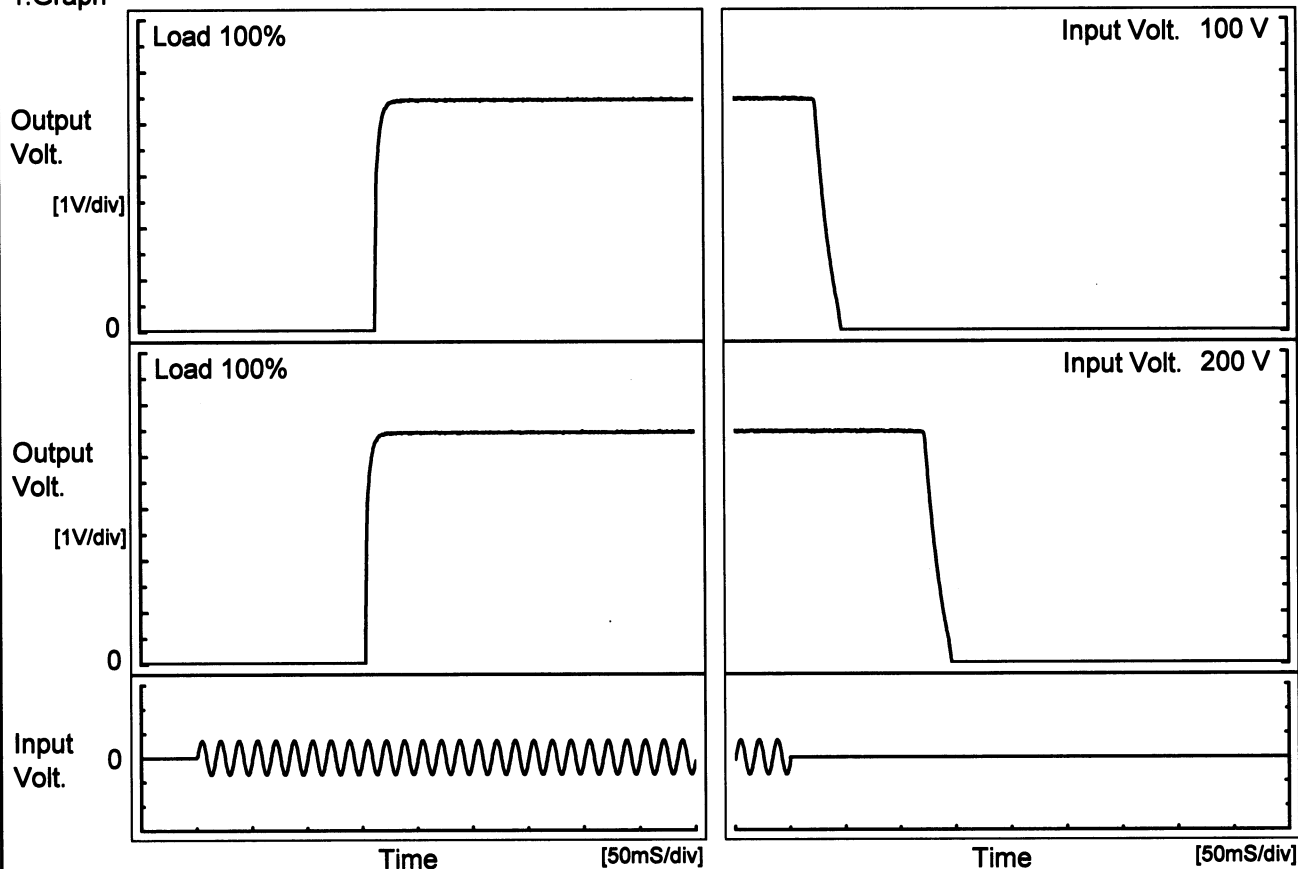
Model		PBA15F-9	Temperature25°C Testing CircuitryFigure A																						
Item		Time Lapse Drift																							
Object		+9V1.7A																							
1.Graph		2.Values																							
<div><div><div>9.17</div><div>9.15</div><div>9.13</div><div>9.11</div><div>9.09</div><div>9.07</div><div>9.05</div><div>9.03</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>Time [H]</div><div>Input Volt.100V</div><div>Load100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>9.103</td></tr><tr><td>0.5</td><td>9.103</td></tr><tr><td>1.0</td><td>9.103</td></tr><tr><td>2.0</td><td>9.103</td></tr><tr><td>3.0</td><td>9.103</td></tr><tr><td>4.0</td><td>9.103</td></tr><tr><td>5.0</td><td>9.103</td></tr><tr><td>6.0</td><td>9.103</td></tr><tr><td>7.0</td><td>9.103</td></tr><tr><td>8.0</td><td>9.103</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	9.103	0.5	9.103	1.0	9.103	2.0	9.103	3.0	9.103	4.0	9.103	5.0	9.103	6.0	9.103	7.0	9.103	8.0	9.103
Time since start [H]	Output Voltage [V]																								
0.0	9.103																								
0.5	9.103																								
1.0	9.103																								
2.0	9.103																								
3.0	9.103																								
4.0	9.103																								
5.0	9.103																								
6.0	9.103																								
7.0	9.103																								
8.0	9.103																								
* The characteristic of AC200V is equal.																									



**COSEL**

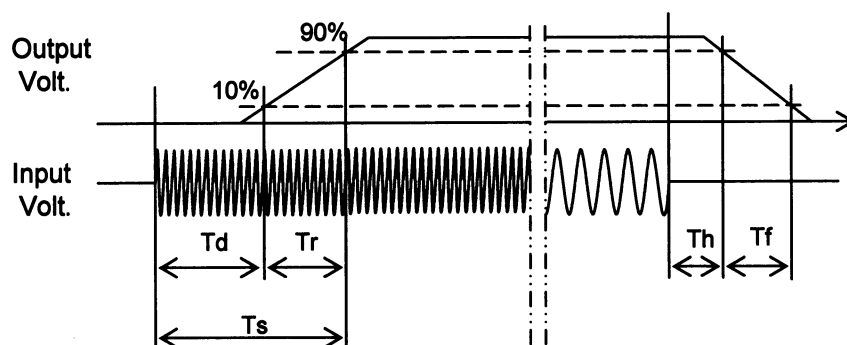
Model	PBA15F-9	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+9V1.7A		

## 1. Graph



## 2. Values

		[mS]				
Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		162.8	7.0	169.8	24.5	19.5
200 V		153.0	6.8	159.8	123.5	20.3





# COSEL

Model	PBA15F-9																																		
Item	Hold-Up Time	Temperature	25°C																																
Object	+9V1.7A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div> <div>Hold-Up Time [ms]</div> <div>Input Voltage [V]</div>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [ms]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>75</td><td>24</td><td>9</td></tr><tr><td>85</td><td>34</td><td>14</td></tr><tr><td>100</td><td>51</td><td>23</td></tr><tr><td>120</td><td>79</td><td>37</td></tr><tr><td>200</td><td>244</td><td>123</td></tr><tr><td>230</td><td>329</td><td>167</td></tr><tr><td>264</td><td>441</td><td>226</td></tr><tr><td>280</td><td>501</td><td>256</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	24	9	85	34	14	100	51	23	120	79	37	200	244	123	230	329	167	264	441	226	280	501	256	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	24	9																																	
85	34	14																																	
100	51	23																																	
120	79	37																																	
200	244	123																																	
230	329	167																																	
264	441	226																																	
280	501	256																																	
--	-	-																																	
<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>																																			



Model	PBA15F-9																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+9V1.7A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>230V</div></div></div> <div>Instantaneous Compensation Time [ms]</div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.30</td><td>147</td><td>623</td><td>826</td></tr><tr><td>0.60</td><td>73</td><td>360</td><td>457</td></tr><tr><td>0.90</td><td>48</td><td>246</td><td>327</td></tr><tr><td>1.20</td><td>39</td><td>187</td><td>249</td></tr><tr><td>1.50</td><td>30</td><td>149</td><td>199</td></tr><tr><td>1.70</td><td>23</td><td>124</td><td>175</td></tr><tr><td>1.87</td><td>21</td><td>114</td><td>156</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	-	-	-	0.30	147	623	826	0.60	73	360	457	0.90	48	246	327	1.20	39	187	249	1.50	30	149	199	1.70	23	124	175	1.87	21	114	156	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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--	-	-	-																																																			
--	-	-	-																																																			
Note: Slanted line shows the range of the rated load current.																																																						



# COSEL

Model

PBA15F-9

Item

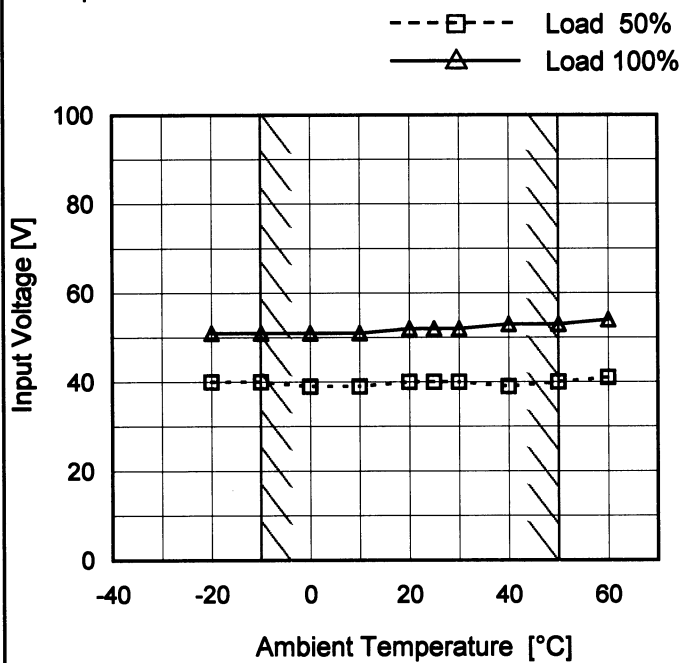
Minimum Input Voltage  
for Regulated Output Voltage

Object

+9V1.7A

Testing Circuitry Figure A

## 1. Graph



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

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	40	51
-10	40	51
0	39	51
10	39	51
20	40	52
25	40	52
30	40	52
40	39	53
50	40	53
60	41	54
--	-	-



# COSEL

Model		PBA15F-9	
Item		Overcurrent Protection	
Object		+9V1.7A	

1.Graph

△

Input Volt. 100V

○

Input Volt. 200V

Output Voltage [V]

</



# COSEL

Model

PBA15F-9

Item

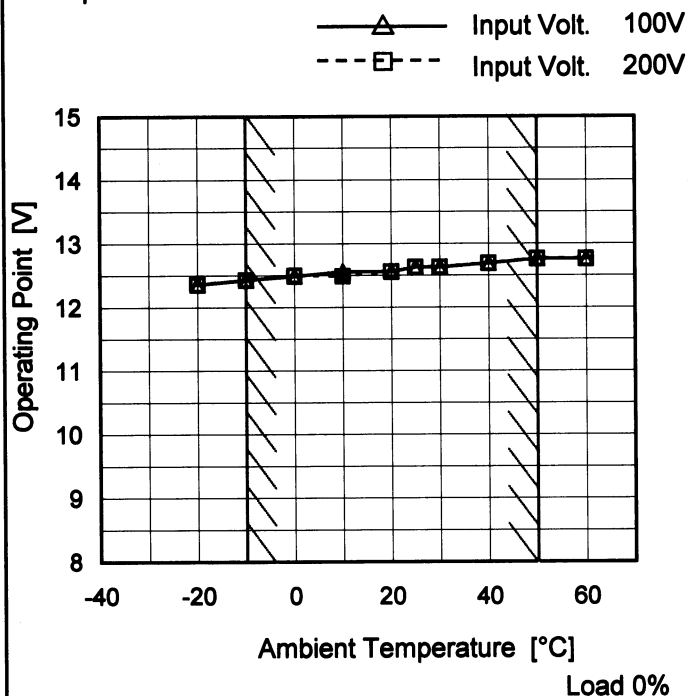
Overvoltage Protection

Object

+9V1.7A

Testing Circuitry Figure A

## 1. Graph



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

## 2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	12.36	12.36
-10	12.43	12.43
0	12.49	12.50
10	12.56	12.49
20	12.56	12.56
25	12.63	12.63
30	12.63	12.63
40	12.69	12.69
50	12.76	12.76
60	12.76	12.76
--	-	-



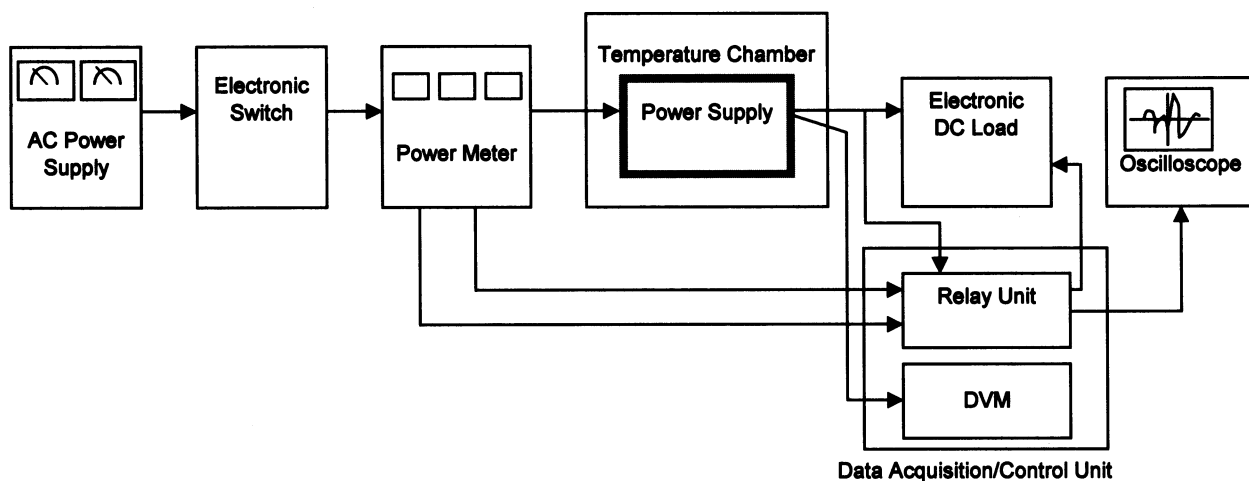


Figure A

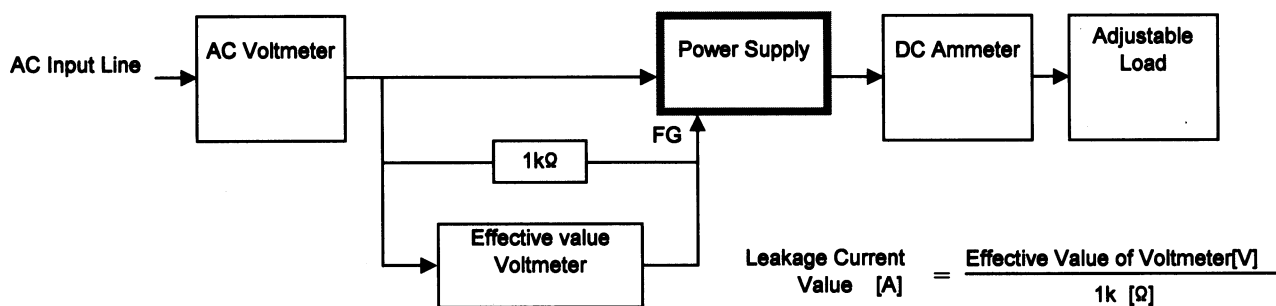


Figure B ( DEN-AN )

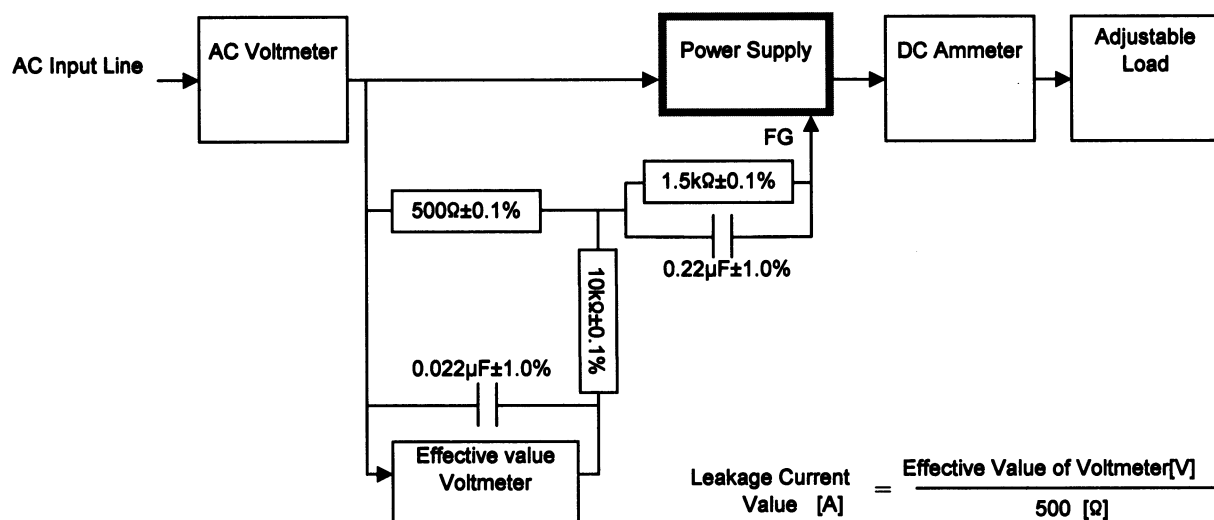


Figure B ( IEC60950 )