



TEST DATA OF PBA100F-3R3

Regulated DC Power Supply
Mar.30. 2004

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COSEL CO.,LTD.

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(Final Page 24)

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Model	PBA100F-3R3	Temperature	25°C																																																			
Item	Input Current (by Load Current)	Testing Circuitry	Figure A																																																			
Object	_____																																																					
1. Graph		—△— Input Volt. 100V - -□--- Input Volt. 200V - -○--- Input Volt. 230V																																																				
<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). All curves show a positive linear relationship between input current and load current. A slanted line is drawn across the graph, starting from approximately (0, 0.1) and ending at (20, 0.9), indicating the range of the rated load current.</p>			2. Values																																																			
<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>0</td><td>0.098</td><td>0.077</td><td>0.078</td></tr> <tr> <td>4</td><td>0.238</td><td>0.182</td><td>0.172</td></tr> <tr> <td>8</td><td>0.380</td><td>0.259</td><td>0.246</td></tr> <tr> <td>12</td><td>0.531</td><td>0.326</td><td>0.313</td></tr> <tr> <td>16</td><td>0.696</td><td>0.403</td><td>0.373</td></tr> <tr> <td>20</td><td>0.865</td><td>0.480</td><td>0.447</td></tr> <tr> <td>22</td><td>0.953</td><td>0.520</td><td>0.479</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> <tr> <td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				Load Current [A]	Input Current [A]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0	0.098	0.077	0.078	4	0.238	0.182	0.172	8	0.380	0.259	0.246	12	0.531	0.326	0.313	16	0.696	0.403	0.373	20	0.865	0.480	0.447	22	0.953	0.520	0.479	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Load Current [A]	Input Current [A]																																																					
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Note: Slanted line shows the range of the rated load current.

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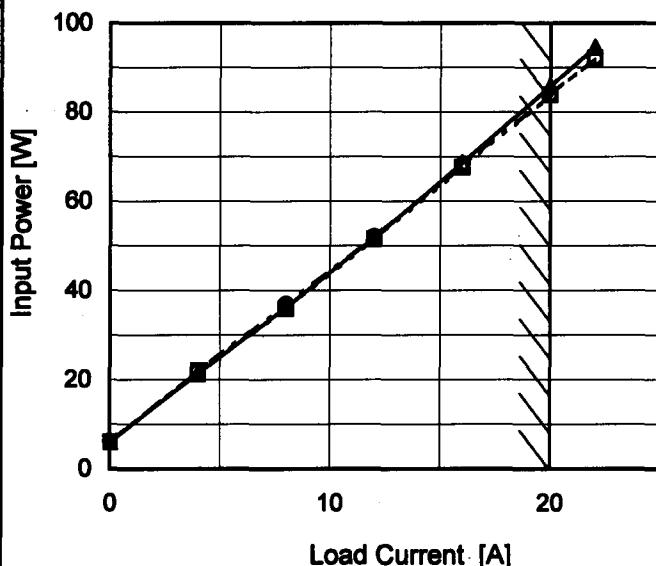
Model PBA100F-3R3

Item Input Power (by Load Current)

Object _____

1. Graph

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



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

Temperature 25°C
 Testing Circuitry Figure A

2. Values

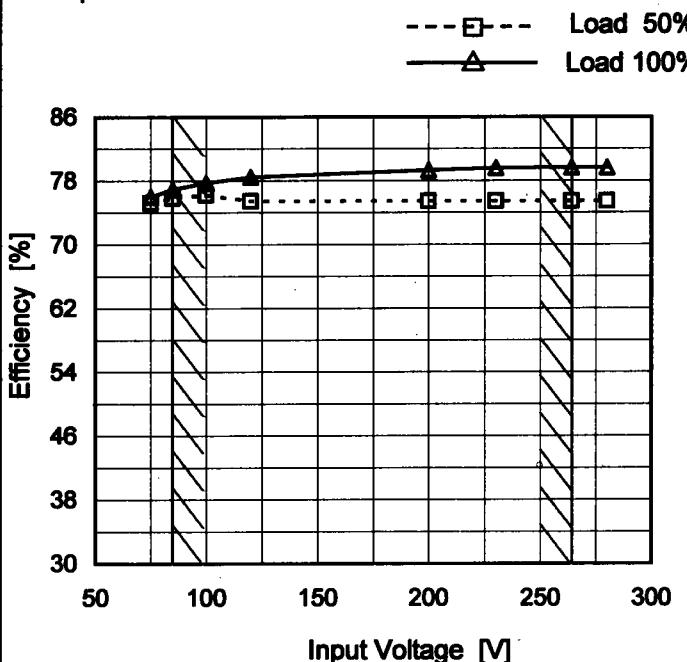
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	6.10	6.00	6.00
4	21.36	22.00	22.00
8	36.25	36.00	37.00
12	51.82	51.50	52.00
16	68.60	67.60	68.00
20	85.84	83.90	84.00
22	94.64	92.20	92.10
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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Model	PBA100F-3R3
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	75.3	76.0
85	75.9	76.9
100	76.3	77.8
120	75.5	78.5
200	75.5	79.3
230	75.5	79.6
264	75.5	79.6
280	75.5	79.6
-	-	-

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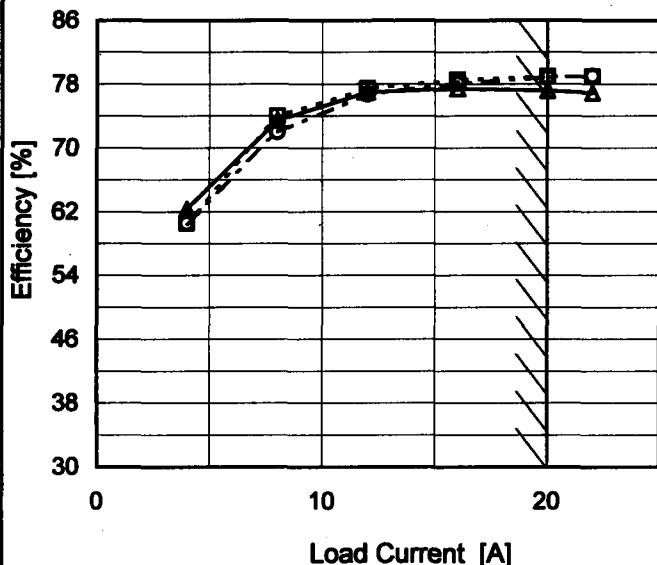
Model PBA100F-3R3

Item Efficiency (by Load Current)

Object _____

1. Graph

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



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

Temperature 25°C
 Testing Circuitry Figure A

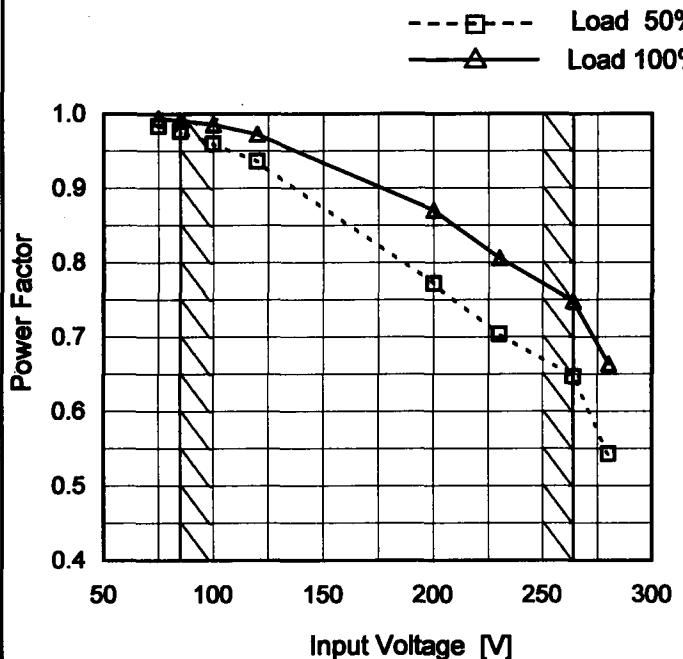
2. Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	-	-	-
4	62.4	60.6	60.6
8	73.5	74.0	72.0
12	77.0	77.5	76.7
16	77.4	78.6	78.1
20	77.2	79.0	78.9
22	76.9	79.0	79.0
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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Model	PBA100F-3R3
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	0.984	0.994
85	0.977	0.991
100	0.960	0.986
120	0.936	0.972
200	0.772	0.870
230	0.704	0.806
264	0.647	0.748
280	0.543	0.664
—	-	-

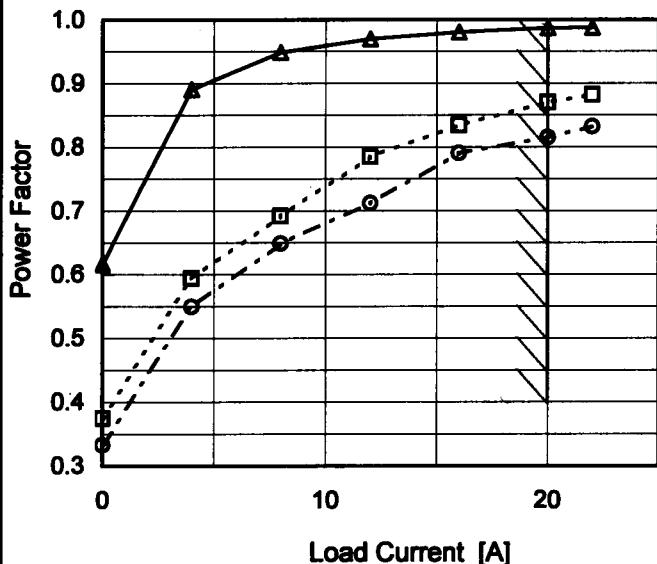
COSEL
Model PBA100F-3R3

Item Power Factor (by Load Current)

Object _____

1.Graph

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

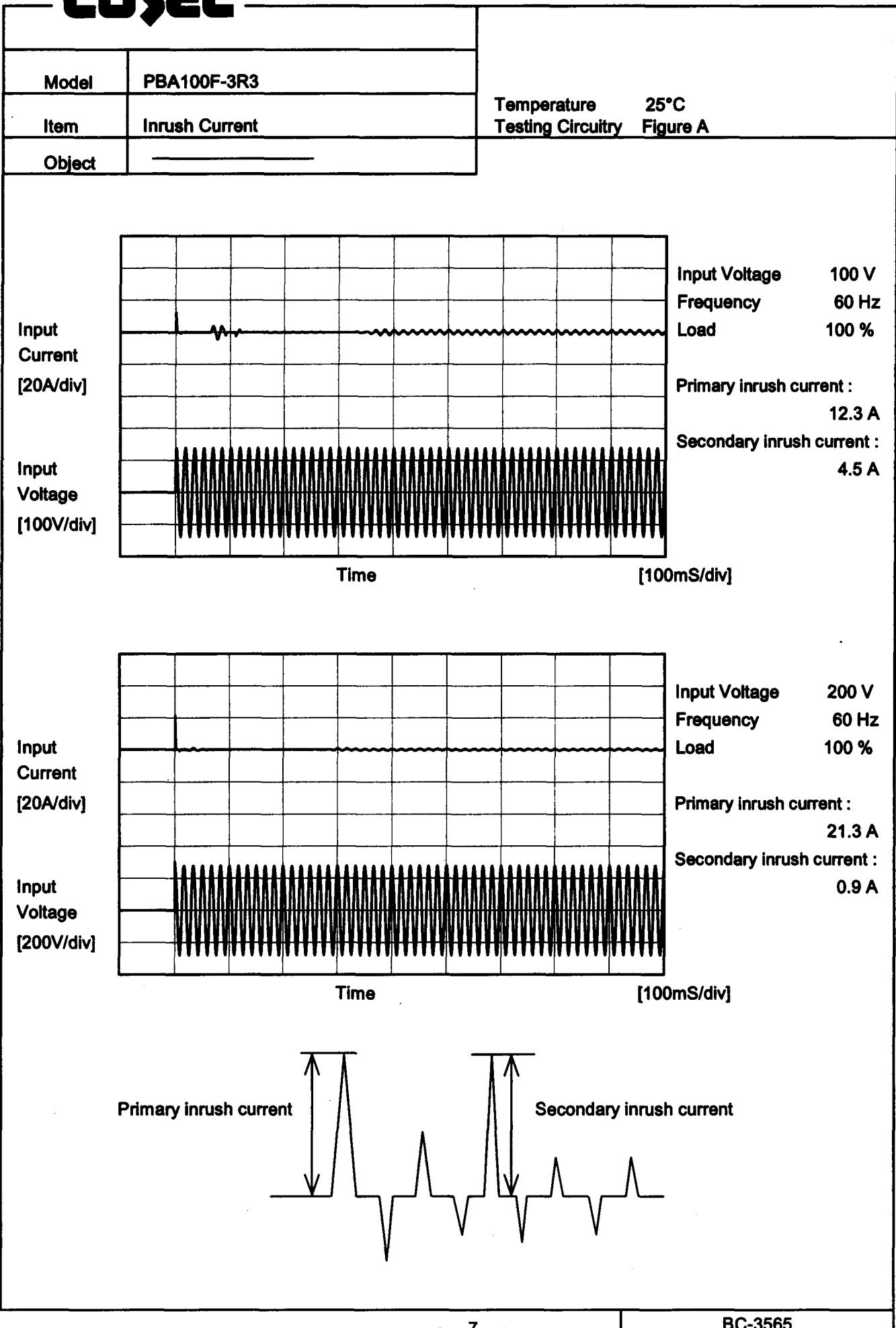


Note: Slanted line shows the range of the rated load current.

 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	0.616	0.375	0.333
4	0.891	0.595	0.550
8	0.948	0.692	0.649
12	0.970	0.785	0.712
16	0.981	0.835	0.791
20	0.987	0.870	0.816
22	0.987	0.882	0.833
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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Model	PBA100F-3R3	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	0.15	0.28	0.34	Operation
	One of phase	0.25	0.53	0.62	stand by
IEC60950	Both phases	0.15	0.34	0.38	Operation
	One of phase	0.25	0.58	0.67	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.

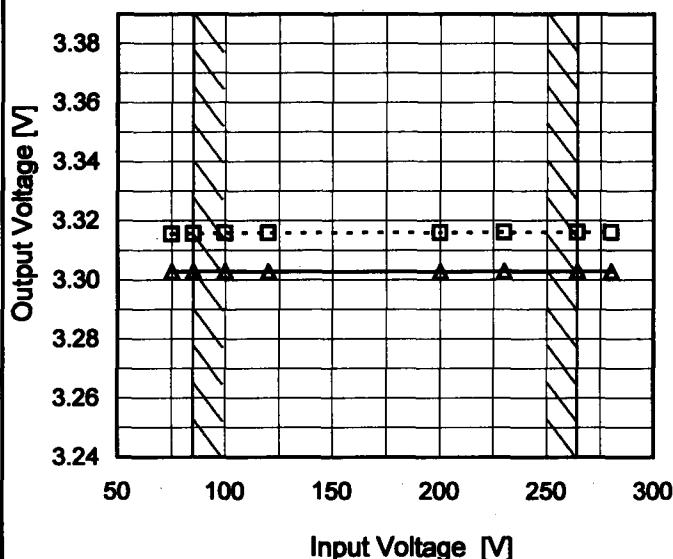
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Model PBA100F-3R3

Item Line Regulation

Object +3.3V20A

1.Graph

--- □--- Load 50%
 —△— Load 100%



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

Temperature 25°C
Testing Circuitry Figure A

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	3.316	3.303
85	3.316	3.303
100	3.316	3.303
120	3.316	3.303
200	3.316	3.303
230	3.316	3.303
264	3.316	3.303
280	3.316	3.303
-	-	-

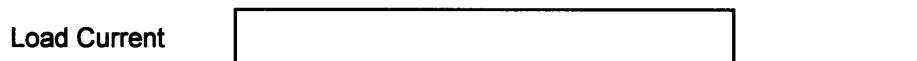
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Model	PBA100F-3R3	Temperature	25°C																																																			
Item	Load Regulation	Testing Circuitry	Figure A																																																			
Object	+3.3V20A																																																					
1.Graph	<p>—▲— Input Volt. 100V - - - □ - - Input Volt. 200V - - - ○ - - Input Volt. 230V</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (Input 100V)</th> <th>Output Voltage [V] (Input 200V)</th> <th>Output Voltage [V] (Input 230V)</th> </tr> </thead> <tbody> <tr><td>0</td><td>3.33</td><td>3.33</td><td>3.33</td></tr> <tr><td>4</td><td>3.32</td><td>3.32</td><td>3.32</td></tr> <tr><td>8</td><td>3.31</td><td>3.31</td><td>3.31</td></tr> <tr><td>12</td><td>3.305</td><td>3.305</td><td>3.305</td></tr> <tr><td>16</td><td>3.302</td><td>3.302</td><td>3.302</td></tr> <tr><td>20</td><td>3.301</td><td>3.301</td><td>3.301</td></tr> </tbody> </table>			Load Current [A]	Output Voltage [V] (Input 100V)	Output Voltage [V] (Input 200V)	Output Voltage [V] (Input 230V)	0	3.33	3.33	3.33	4	3.32	3.32	3.32	8	3.31	3.31	3.31	12	3.305	3.305	3.305	16	3.302	3.302	3.302	20	3.301	3.301	3.301																							
Load Current [A]	Output Voltage [V] (Input 100V)	Output Voltage [V] (Input 200V)	Output Voltage [V] (Input 230V)																																																			
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4	3.32	3.32	3.32																																																			
8	3.31	3.31	3.31																																																			
12	3.305	3.305	3.305																																																			
16	3.302	3.302	3.302																																																			
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Load Current [A]	Output Voltage [V]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
0	3.329	3.329	3.329																																																			
4	3.324	3.324	3.324																																																			
8	3.318	3.319	3.319																																																			
12	3.313	3.313	3.313																																																			
16	3.308	3.308	3.308																																																			
20	3.303	3.303	3.303																																																			
22	3.300	3.300	3.300																																																			
-	-	-	-																																																			
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Note:	Slanted line shows the range of the rated load current.																																																					

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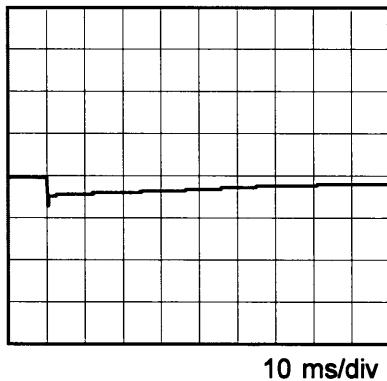
Model	PBA100F-3R3	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+3.3V20A		

Input Volt. 100 V
 Cycle 1000 ms

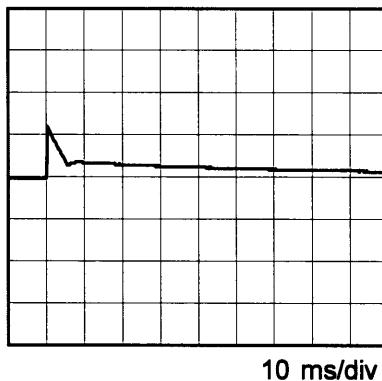


Min. Load (0A) ↔

Load 100% (20A)

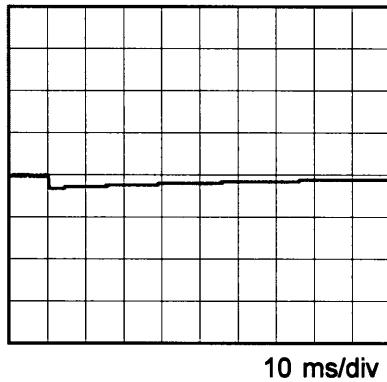


10 ms/div

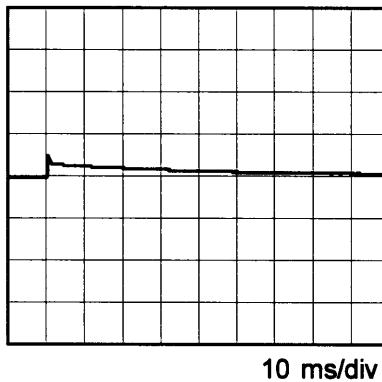


Min. Load (0A) ↔

Load 50% (10A)



10 ms/div



* The characteristic of AC200V is equal.

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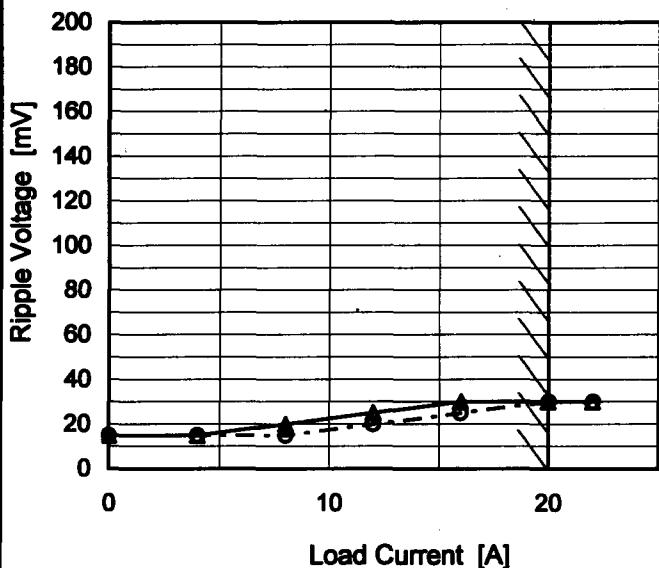
Model PBA100F-3R3

Item Ripple Voltage (by Load Current)

Object +3.3V20A

1. Graph

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



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	15	15
4	15	15
8	20	15
12	25	20
16	30	25
20	30	30
22	30	30
—	—	—
—	—	—
—	—	—
—	—	—

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

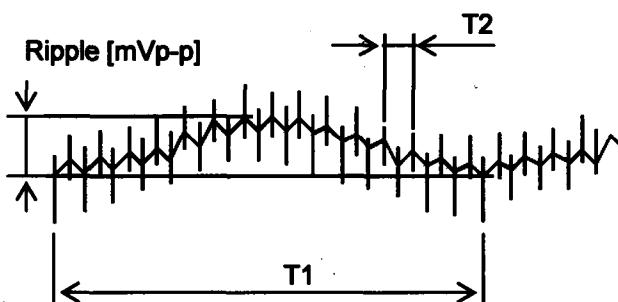


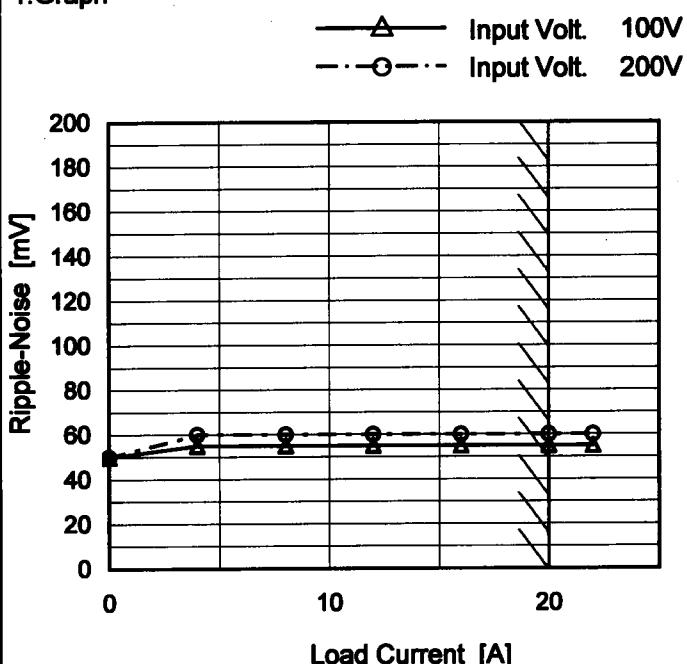
Fig. Complex Ripple Wave Form

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Model	PBA100F-3R3
Item	Ripple-Noise
Object	+3.3V20A

 Temperature 25°C
 Testing Circuitry Figure A

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0	50	50
4	55	60
8	55	60
12	55	60
16	55	60
20	55	60
22	55	60
-	-	-
-	-	-
-	-	-
-	-	-

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.

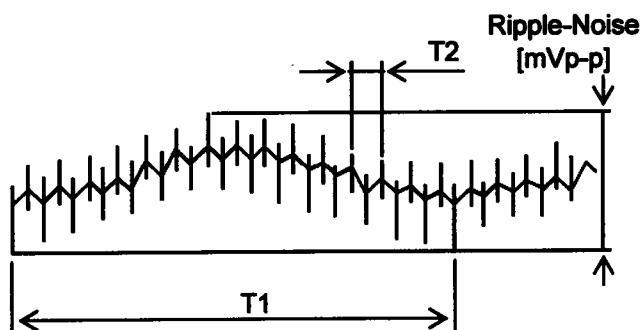
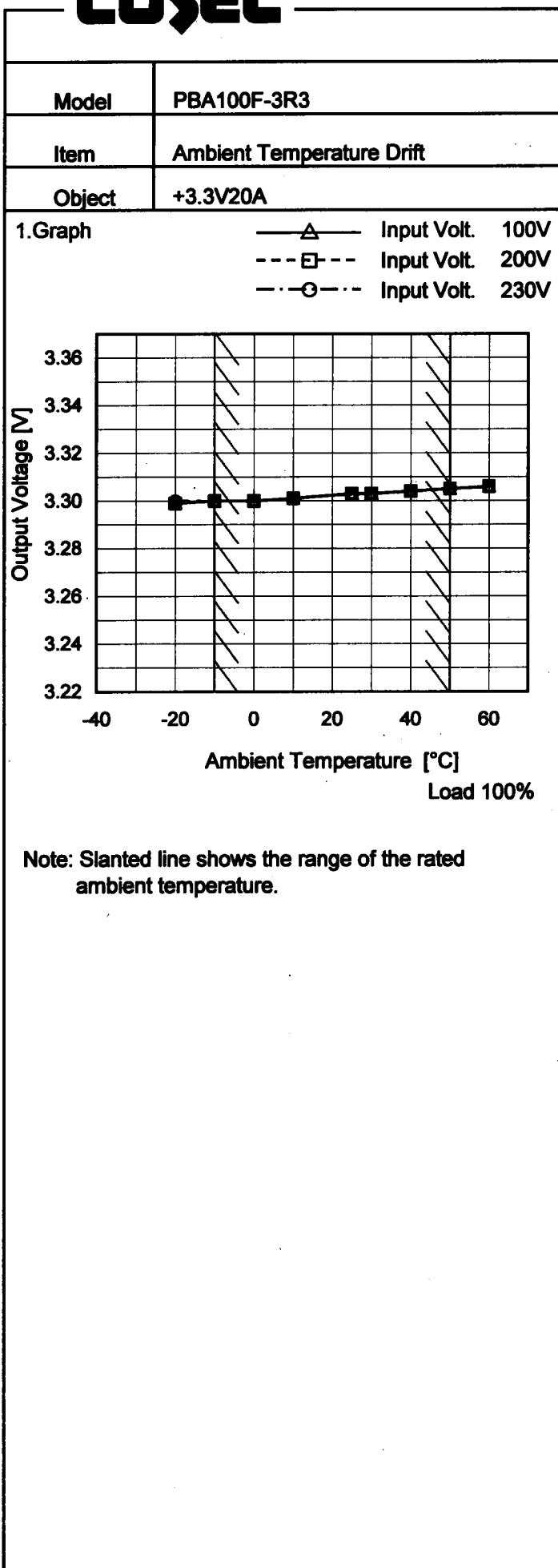
 T1: Due to AC Input Line
 T2: Due to Switching


Fig. Complex Ripple Wave Form

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Model	PBA100F-3R3																																								
Item	Ripple Voltage (by Ambient Temp.)																																								
Object	+3.3V20A																																								
1.Graph		Testing Circuitry Figure A																																							
		2.Values																																							
		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</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>-30</td><td>95</td><td>95</td></tr> <tr><td>-10</td><td>40</td><td>40</td></tr> <tr><td>0</td><td>40</td><td>40</td></tr> <tr><td>25</td><td>30</td><td>30</td></tr> <tr><td>50</td><td>30</td><td>30</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> <tr><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	-30	95	95	-10	40	40	0	40	40	25	30	30	50	30	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
	Input Volt. 100 [V]	Input Volt. 200 [V]																																							
-30	95	95																																							
-10	40	40																																							
0	40	40																																							
25	30	30																																							
50	30	30																																							
-	-	-																																							
-	-	-																																							
-	-	-																																							
-	-	-																																							
-	-	-																																							
-	-	-																																							
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C]. The Y-axis ranges from 0 to 200 mV, and the X-axis ranges from -40 to 60 °C. Two curves are shown: one for Input Volt. 100V (dashed line with open squares) and one for Input Volt. 200V (solid line with solid squares). Both curves show a sharp increase in ripple voltage at low temperatures, leveling off around 0°C for higher temperatures. A slanted line indicates the rated ambient temperature range.</p> <p>Load 100 %</p>																																									
<p>Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>																																									

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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	3.299	3.299	3.300
-10	3.300	3.300	3.300
0	3.300	3.300	3.300
10	3.301	3.301	3.301
25	3.303	3.303	3.303
30	3.303	3.303	3.303
40	3.304	3.304	3.304
50	3.305	3.305	3.305
60	3.306	3.306	3.306
--	-	-	-
--	-	-	-



Model	PBA100F-3R3	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+3.3V20A	

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 - 20A

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

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

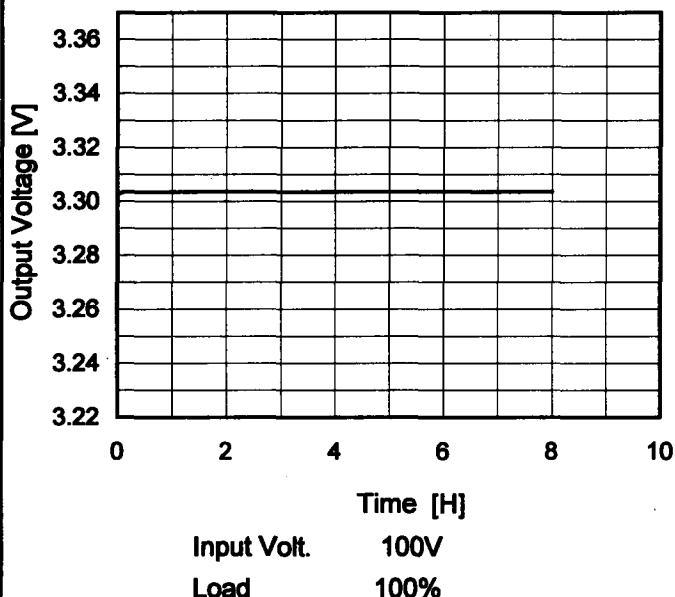
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	264	0	3.333	± 17	± 0.5
Minimum Voltage	-10	200	20	3.300		

COSEL

Model	PBA100F-3R3
Item	Time Lapse Drift
Object	+3.3V20A

1.Graph



Temperature 25°C
Testing Circuitry Figure A

2.Values

Time since start [H]	Output Voltage [V]
0.0	3.303
0.5	3.304
1.0	3.304
2.0	3.304
3.0	3.304
4.0	3.304
5.0	3.304
6.0	3.304
7.0	3.304
8.0	3.304

* The characteristic of AC200V is equal.

COSEL

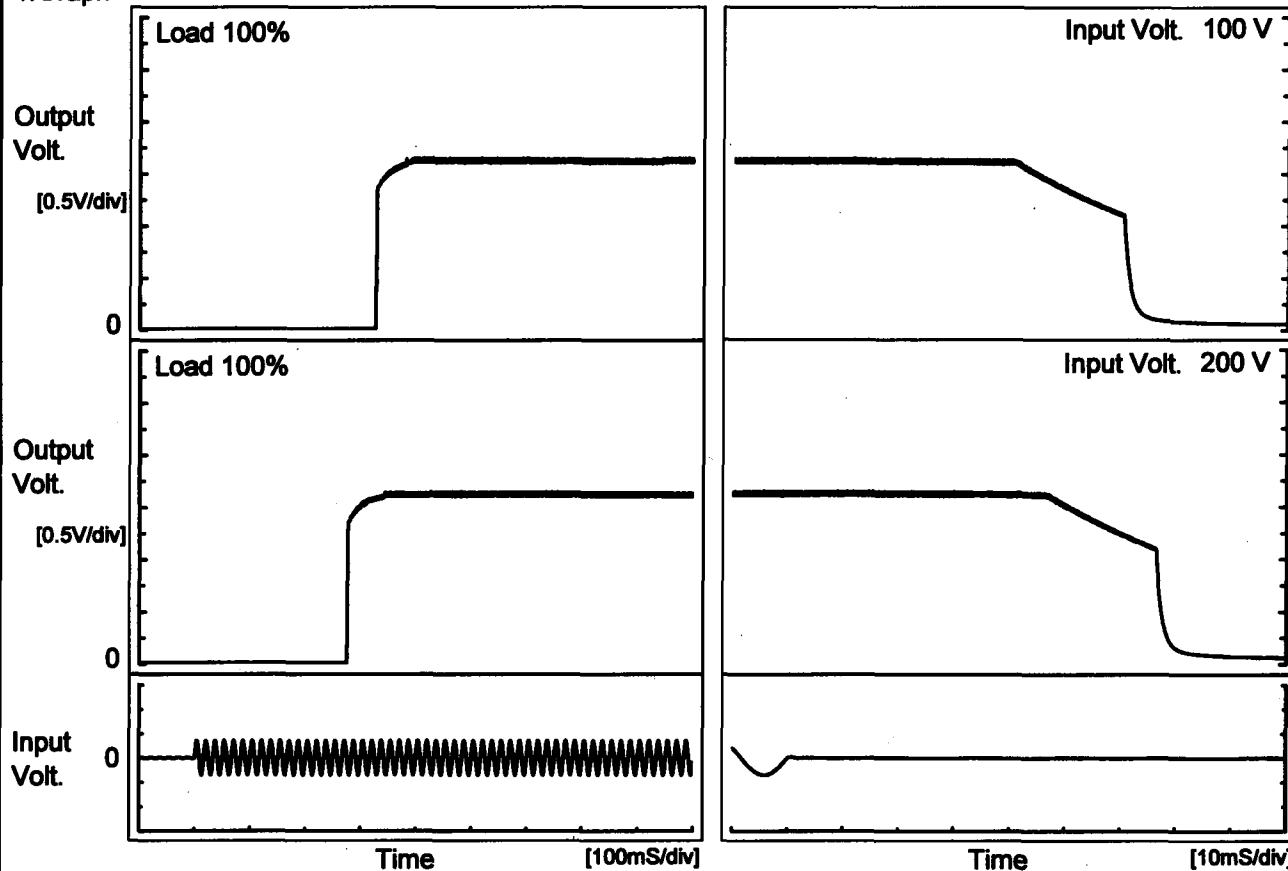
Model PBA100F-3R3

Item Rise and Fall Time

Object +3.3V20A

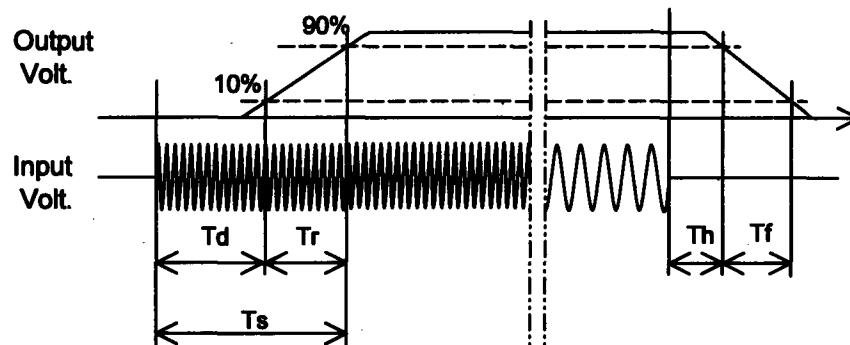
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

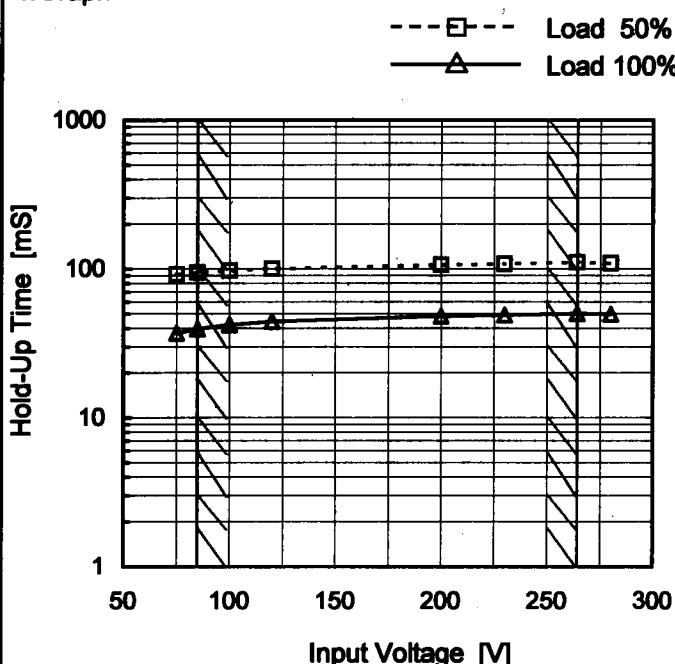
Input Volt.	Time	Td	Tr	Ts	Th	Tf	[mS]
100 V		325.5	20.0	345.5	45.1	18.3	
200 V		275.0	20.0	295.0	51.0	18.6	



COSEL

Model	PBA100F-3R3
Item	Hold-Up Time
Object	+3.3V20A

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	92	37
85	95	40
100	98	42
120	101	44
200	107	48
230	108	49
264	111	50
280	110	50
-	-	-

COSEL

Model	PBA100F-3R3	Temperature Testing Circuitry 25°C Figure A																																																			
Item	Instantaneous Interruption Compensation																																																				
Object	+3.3V20A																																																				
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>2</td><td>250</td><td>350</td><td>400</td></tr> <tr><td>4</td><td>180</td><td>260</td><td>274</td></tr> <tr><td>6</td><td>120</td><td>160</td><td>180</td></tr> <tr><td>8</td><td>85</td><td>133</td><td>135</td></tr> <tr><td>10</td><td>65</td><td>90</td><td>90</td></tr> <tr><td>12</td><td>57</td><td>88</td><td>90</td></tr> <tr><td>14</td><td>48</td><td>70</td><td>70</td></tr> <tr><td>16</td><td>43</td><td>64</td><td>65</td></tr> <tr><td>18</td><td>38</td><td>55</td><td>55</td></tr> <tr><td>20</td><td>43</td><td>49</td><td>49</td></tr> </tbody> </table>	Load Current [A]	100V [ms]	200V [ms]	230V [ms]	2	250	350	400	4	180	260	274	6	120	160	180	8	85	133	135	10	65	90	90	12	57	88	90	14	48	70	70	16	43	64	65	18	38	55	55	20	43	49	49								
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Load Current [A]	Time [mS]																																																				
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Note: Slanted line shows the range of the rated load current.

COSEL

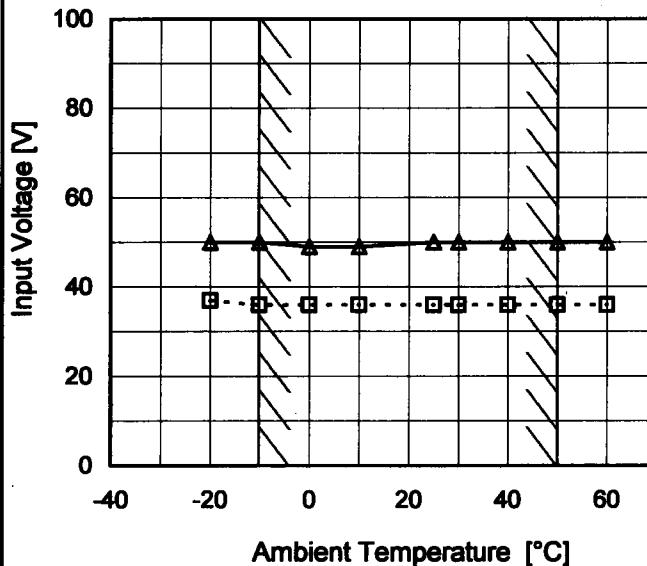
Model PBA100F-3R3

Item Minimum Input Voltage
for Regulated Output Voltage

Object +3.3V20A

1. Graph

---□--- Load 50%
—△— Load 100%



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

Testing Circuitry Figure A

2. Values

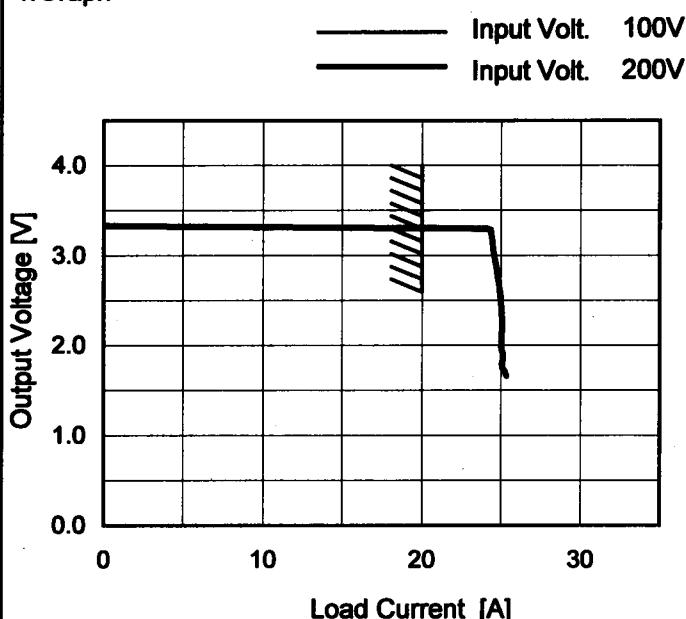
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	37	50
-10	36	50
0	36	49
10	36	49
25	36	50
30	36	50
40	36	50
50	36	50
60	36	50
—	—	—
—	—	—

COSEL

Model	PBA100F-3R3
Item	Overcurrent Protection
Object	+3.3V20A

Temperature 25°C
 Testing Circuitry Figure A

1. Graph



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

Intermittent operation occurs when the output voltage is from 1.65V to 0V.

2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
3.300	22.30	22.10
3.135	24.51	24.48
2.970	24.63	24.60
2.640	24.93	24.90
2.310	25.12	25.09
1.980	25.07	25.02
1.650	25.40	25.36
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

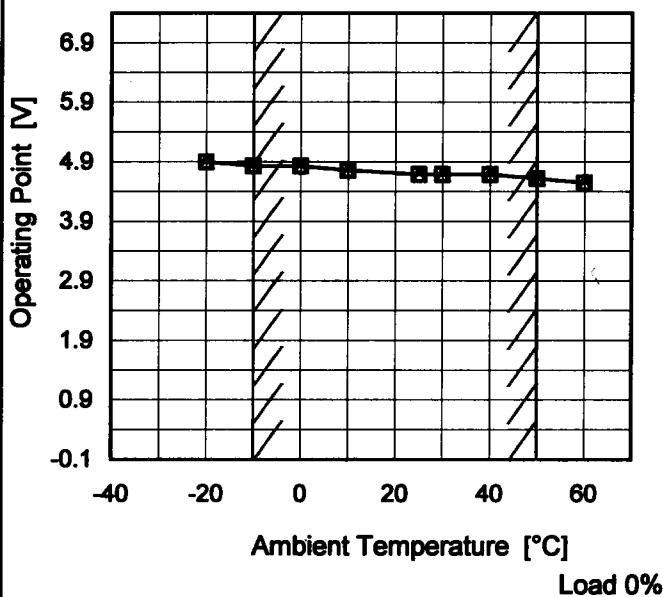
COSEL
Model PBA100F-3R3

Item Overvoltage Protection

Object +3.3V20A

1. Graph

—▲— Input Volt. 100V
 - - □ - - Input Volt. 200V



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	4.93	4.93
-10	4.86	4.86
0	4.86	4.86
10	4.79	4.79
25	4.72	4.72
30	4.72	4.72
40	4.72	4.72
50	4.65	4.65
60	4.58	4.58
--	-	-
--	-	-

COSEL

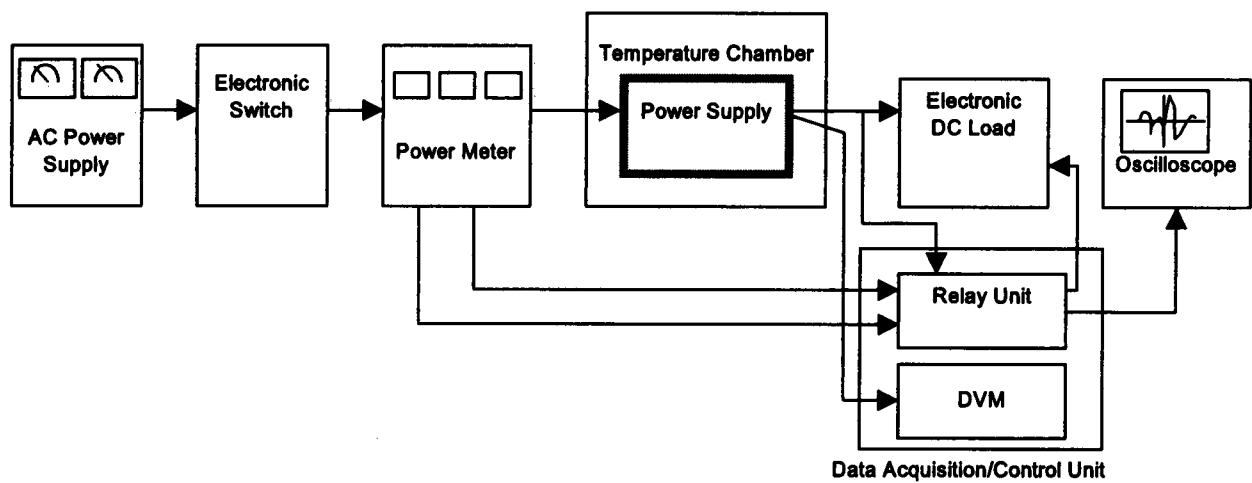


Figure A

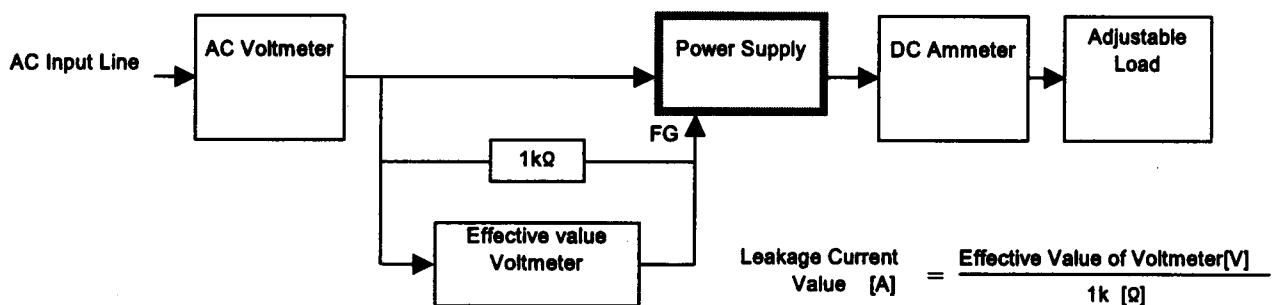


Figure B (DEN-AN)

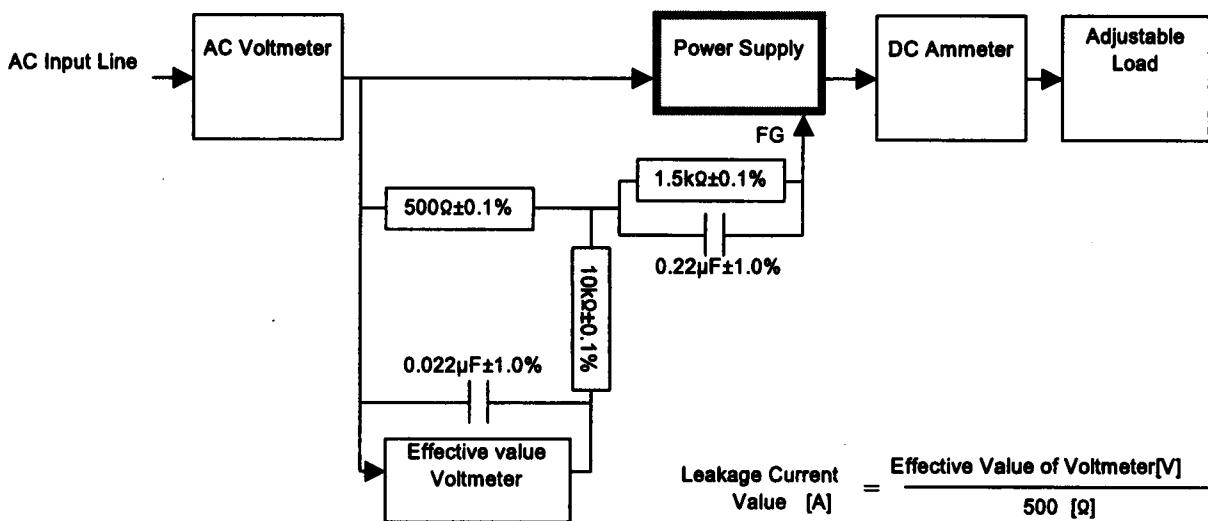


Figure B (IEC60950)