

# TEST DATA OF PBA1000F-5

Regulated DC Power Supply  
Mar.30, 2004

Approved by : Kuniaki Nagahara  
Kuniaki Nagahara Design Manager

Prepared by : Kazunari Uotani  
Kazunari Uotani Design Engineer

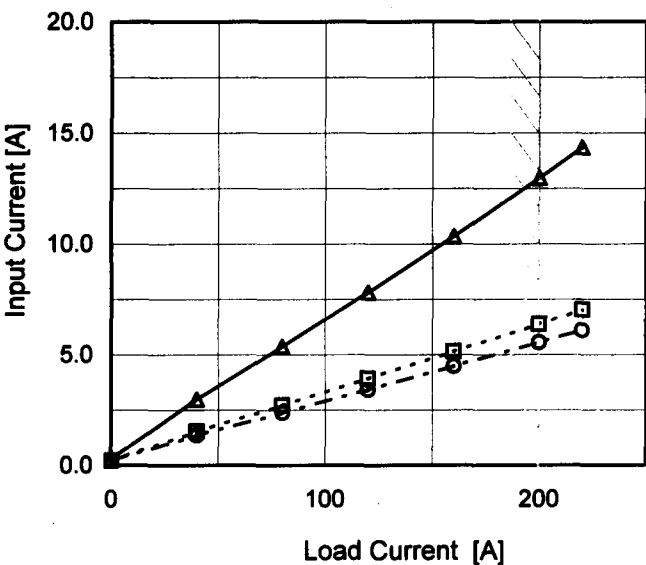
**COSEL CO.,LTD.**

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Model		PBA1000F-5																																																				
Item		Input Current (by Load Current)																																																				
Object																																																						
1.Graph		2.Values																																																				
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Model

PBA1000F-5

Item

Efficiency (by Input Voltage)

Object

1.Graph

---

□

---

Load 50%

---

△

---

Load 100%

Efficiency [%]

100

92

84

76

68

60

52

44

50

100

150

200

250

300

Input Voltage [V]

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
77	78.4	76.8
85	78.9	77.8
100	79.5	78.9
120	79.6	79.8
200	80.6	81.3
230	80.9	81.6
264	81.2	81.9
280	82.9	83.0
--	-	-

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Model	PBA1000F-5																																																		
Item	Efficiency (by Load Current)	Temperature	25°C																																																
Object		Testing Circuitry	Figure A																																																
1.Graph		2.Values																																																	
<div><div>—△—</div>Input Volt. 100V</div> <div><div>---□---</div>Input Volt. 200V</div> <div><div>-·-○-·-</div>Input Volt. 230V</div> <table><thead><tr><th>Load Current [A]</th><th>100V Efficiency [%]</th><th>200V Efficiency [%]</th><th>230V Efficiency [%]</th></tr></thead><tbody><tr><td>0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>40</td><td>72.3</td><td>73.4</td><td>74.0</td></tr><tr><td>80</td><td>78.0</td><td>79.5</td><td>79.9</td></tr><tr><td>120</td><td>79.7</td><td>81.1</td><td>81.5</td></tr><tr><td>160</td><td>79.6</td><td>81.4</td><td>81.9</td></tr><tr><td>200</td><td>78.9</td><td>81.3</td><td>81.6</td></tr><tr><td>220</td><td>78.5</td><td>81.0</td><td>81.4</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]	100V Efficiency [%]	200V Efficiency [%]	230V Efficiency [%]	0	-	-	-	40	72.3	73.4	74.0	80	78.0	79.5	79.9	120	79.7	81.1	81.5	160	79.6	81.4	81.9	200	78.9	81.3	81.6	220	78.5	81.0	81.4	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-		
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Note: Slanted line shows the range of the rated load current.																																																			

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Model		PBA1000F-5	
Item		Power Factor (by Input Voltage)	
Object			

1.Graph

---

□

Load 50%

---

△

Load 100%

Power Factor

1.0

0.9

0.8

0.7

0.6

0.5

0.4

50

100

150

200

250

300

Input Voltage [V]

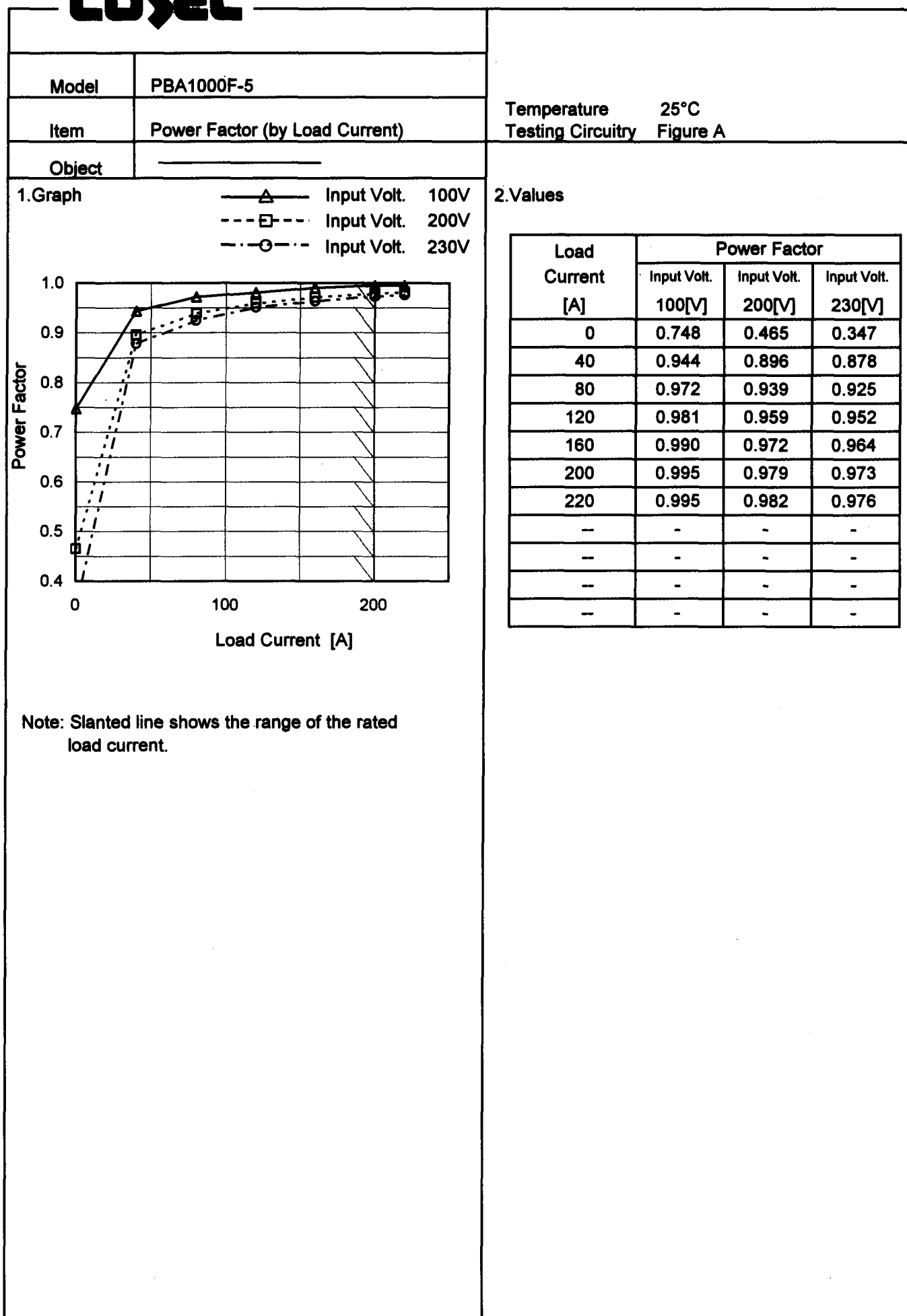
Input Voltage [V]	Load 50%	Load 100%
77	0.982	0.996
85	0.977	0.996
100	0.975	0.995
120	0.974	0.991
200	0.950	0.978
230	0.940	0.973
264	0.931	0.963
280	0.569	0.659

2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
77	0.982	0.996
85	0.977	0.996
100	0.975	0.995
120	0.974	0.991
200	0.950	0.978
230	0.940	0.973
264	0.931	0.963
280	0.569	0.659
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Note: Slanted line shows the range of the rated input voltage.

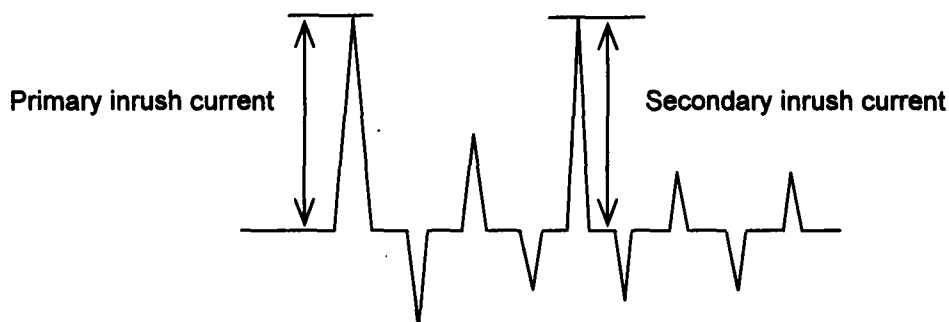
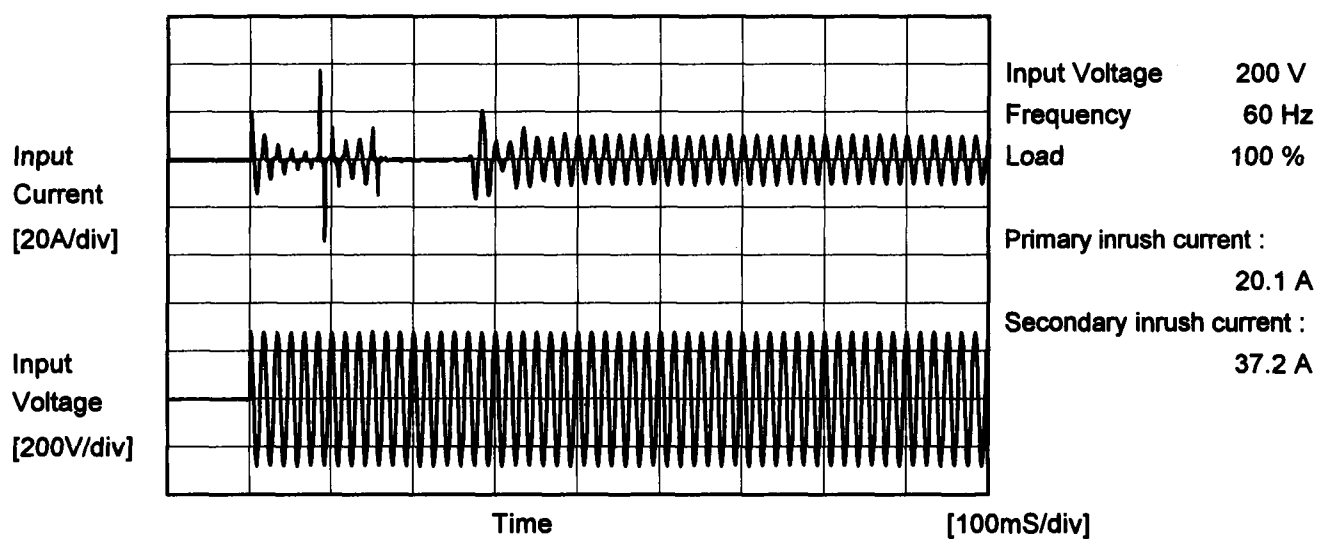
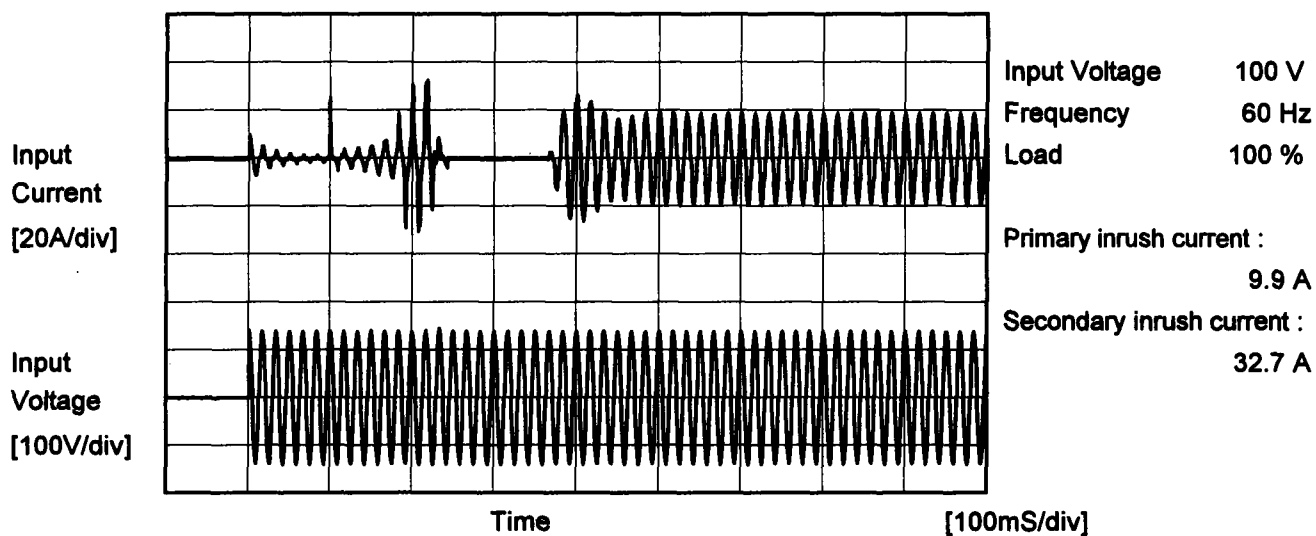
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Model	PBA1000F-5	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object			





		Temperature 25°C Testing Circuitry Figure B
Model	PBA1000F-5	
Item	Leakage Current	
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.

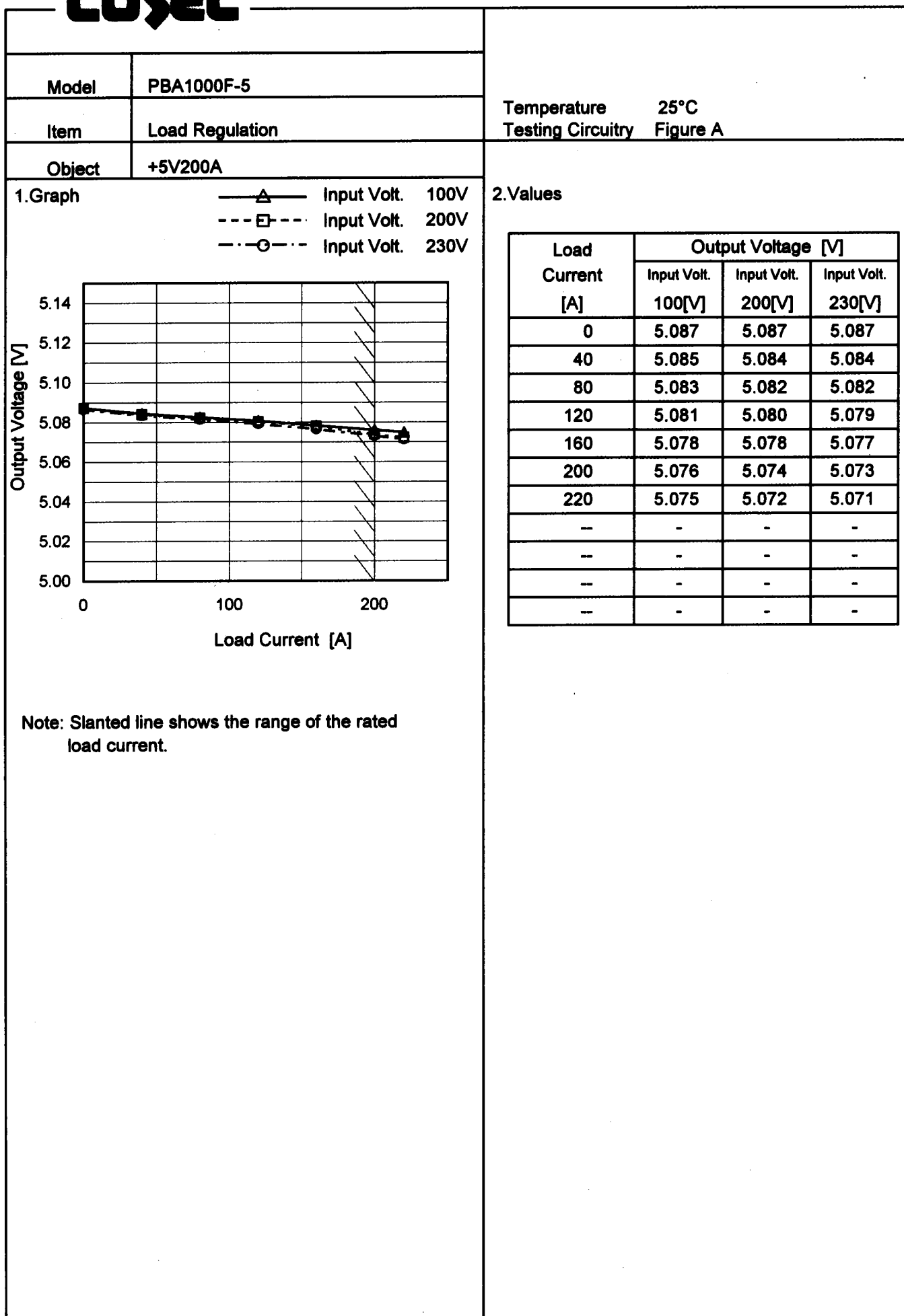
## 2.Condition

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

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Model	PBA1000F-5																																																																
Item	Line Regulation	Temperature	25°C																																																														
Object	+5V200A	Testing Circuitry	Figure A																																																														
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<div><div><div>---□---</div><div>△---</div></div><div>Load 50%</div><div>Load 100%</div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] (Load 50%)</th><th>Output Voltage [V] (Load 100%)</th></tr></thead><tbody><tr><td>77</td><td>5.081</td><td>5.075</td></tr><tr><td>85</td><td>5.081</td><td>5.074</td></tr><tr><td>100</td><td>5.081</td><td>5.073</td></tr><tr><td>120</td><td>5.081</td><td>5.072</td></tr><tr><td>200</td><td>5.081</td><td>5.072</td></tr><tr><td>230</td><td>5.081</td><td>5.071</td></tr><tr><td>264</td><td>5.081</td><td>5.071</td></tr><tr><td>280</td><td>5.081</td><td>5.071</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Output Voltage [V] (Load 50%)	Output Voltage [V] (Load 100%)	77	5.081	5.075	85	5.081	5.074	100	5.081	5.073	120	5.081	5.072	200	5.081	5.072	230	5.081	5.071	264	5.081	5.071	280	5.081	5.071	--	-	-	<table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>77</td><td>5.081</td><td>5.075</td></tr><tr><td>85</td><td>5.081</td><td>5.074</td></tr><tr><td>100</td><td>5.081</td><td>5.073</td></tr><tr><td>120</td><td>5.081</td><td>5.072</td></tr><tr><td>200</td><td>5.081</td><td>5.072</td></tr><tr><td>230</td><td>5.081</td><td>5.071</td></tr><tr><td>264</td><td>5.081</td><td>5.071</td></tr><tr><td>280</td><td>5.081</td><td>5.071</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	77	5.081	5.075	85	5.081	5.074	100	5.081	5.073	120	5.081	5.072	200	5.081	5.072	230	5.081	5.071	264	5.081	5.071	280	5.081	5.071	--	-	-
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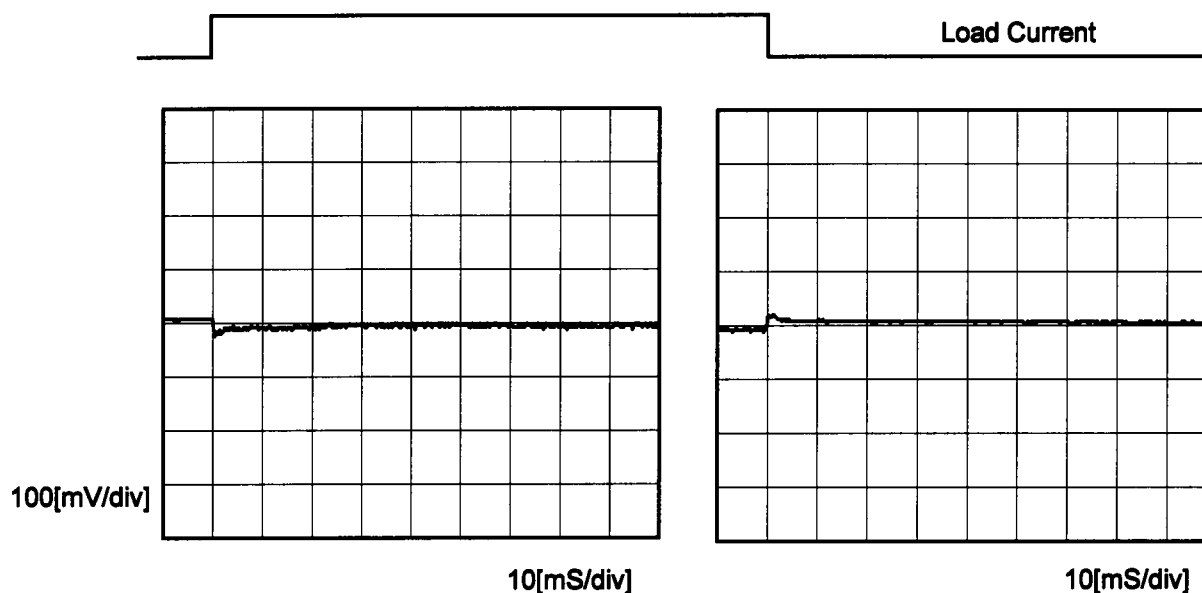


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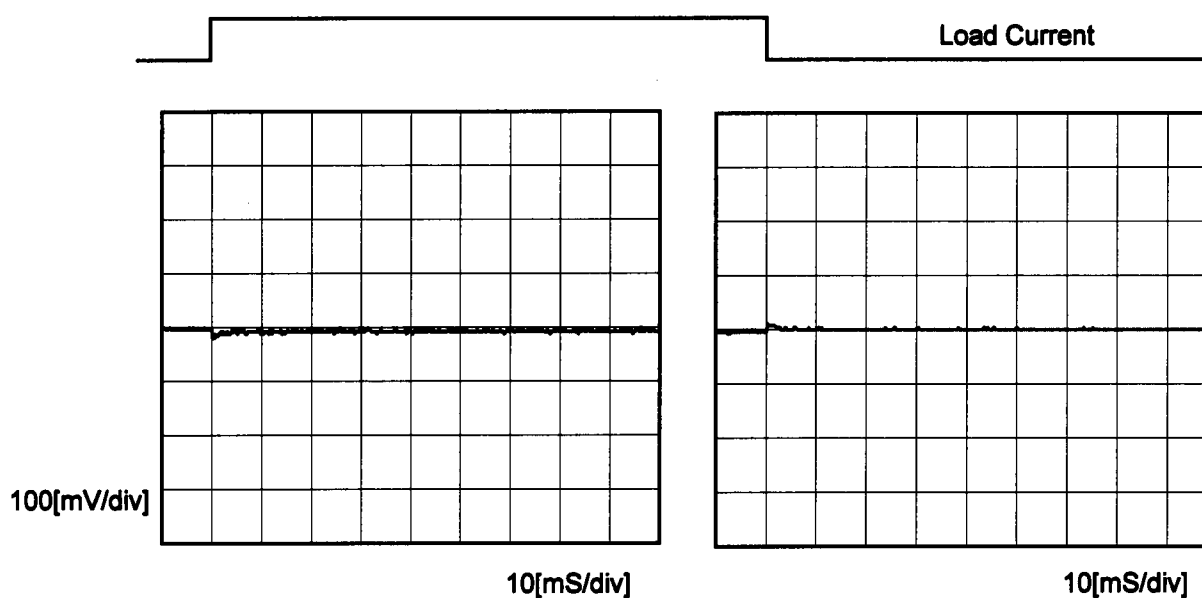
Model	PBA1000F-5	Temperature    25°C Testing Circuitry   Figure A	
Item	Dynamic Load Response		
Object	+5V200A		

Input Volt.    100 V  
Cycle        1000 mS

Min. Load ( 0 A ) – Load 100% ( 200 A )



Min. Load ( 0 A ) – Load 50% ( 100 A )



\* The characteristic of AC200V is equal.

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Model	PBA1000F-5																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
Object	+5V200A	Testing Circuitry	Figure A																																						
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 100V</div><div>- - -○- - - Input Volt. 200V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 200 [V]</th></tr><tr><td>0</td><td>20</td><td>20</td></tr><tr><td>40</td><td>30</td><td>30</td></tr><tr><td>80</td><td>30</td><td>30</td></tr><tr><td>120</td><td>35</td><td>35</td></tr><tr><td>160</td><td>40</td><td>40</td></tr><tr><td>200</td><td>45</td><td>45</td></tr><tr><td>220</td><td>50</td><td>50</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></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0	20	20	40	30	30	80	30	30	120	35	35	160	40	40	200	45	45	220	50	50	--	-	-	--	-	-	--	-	-	--	-	-
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<div>Measured by 20 MHz Oscilloscope.</div> <div>Ripple Voltage is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																									
<div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div><div>Ripple [mVp-p]</div><div>T1</div><div>T2</div></div>																																									
Fig. Complex Ripple Wave Form																																									

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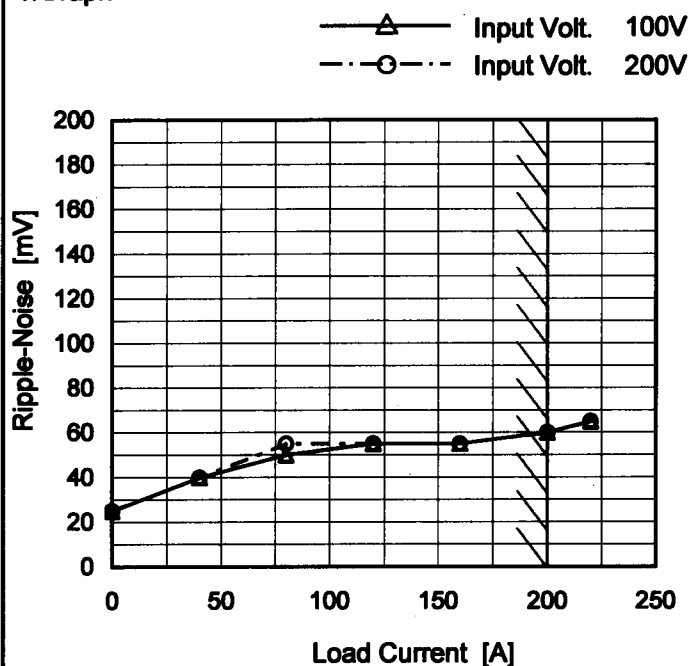
BC-3537

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Model	PBA1000F-5
Item	Ripple-Noise
Object	+5V200A

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	25	25
40	40	40
80	50	55
120	55	55
160	55	55
200	60	60
220	65	65
—	—	—
—	—	—
—	—	—
—	—	—

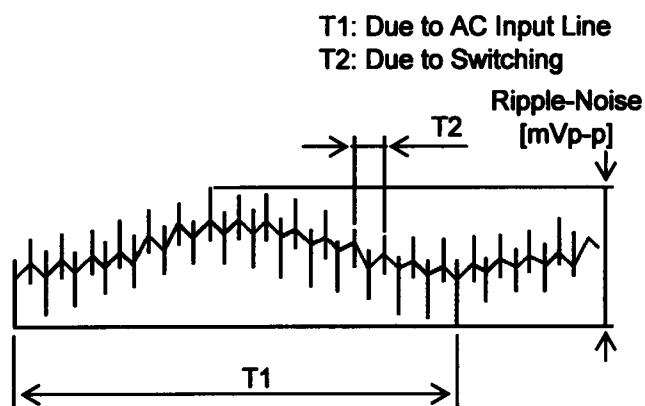
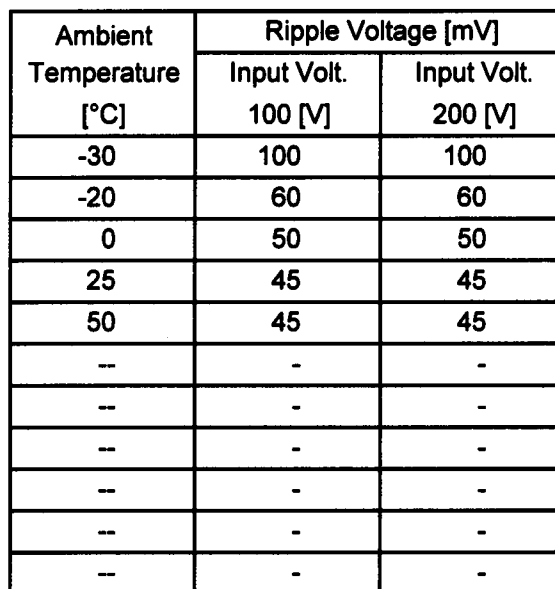


Fig. Complex Ripple Wave Form

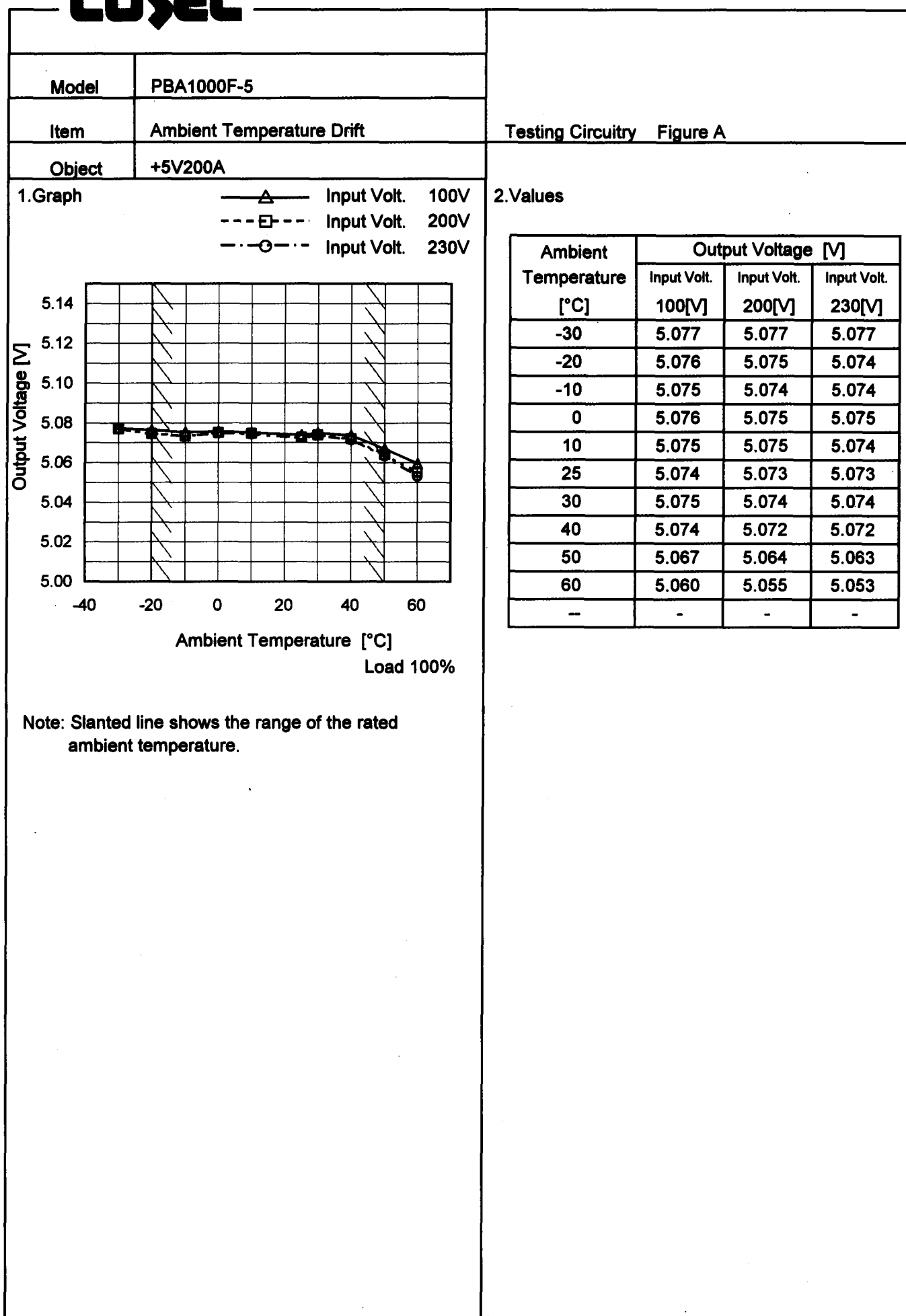
### Testing Circuitry Figure A

## 2.Values



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



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		Testing Circuitry Figure A
Model	PBA1000F-5	
Item	Output Voltage Accuracy	
Object	+5V200A	

### 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 - 200A

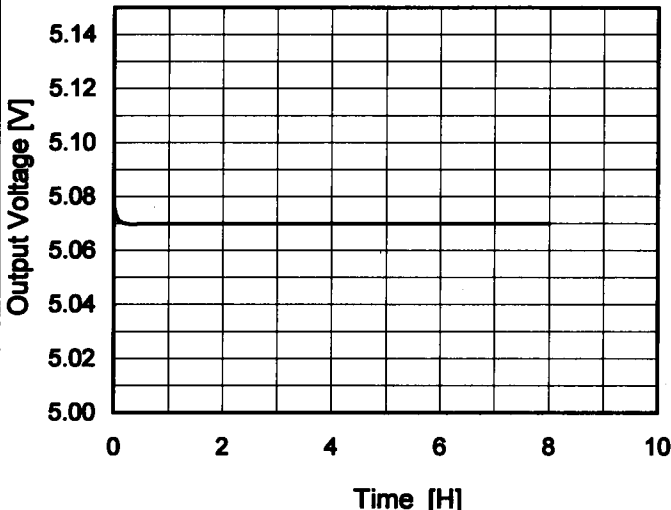
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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	-20	264	0	5.092	±17	±0.3
Minimum Voltage	50	264	200	5.059		

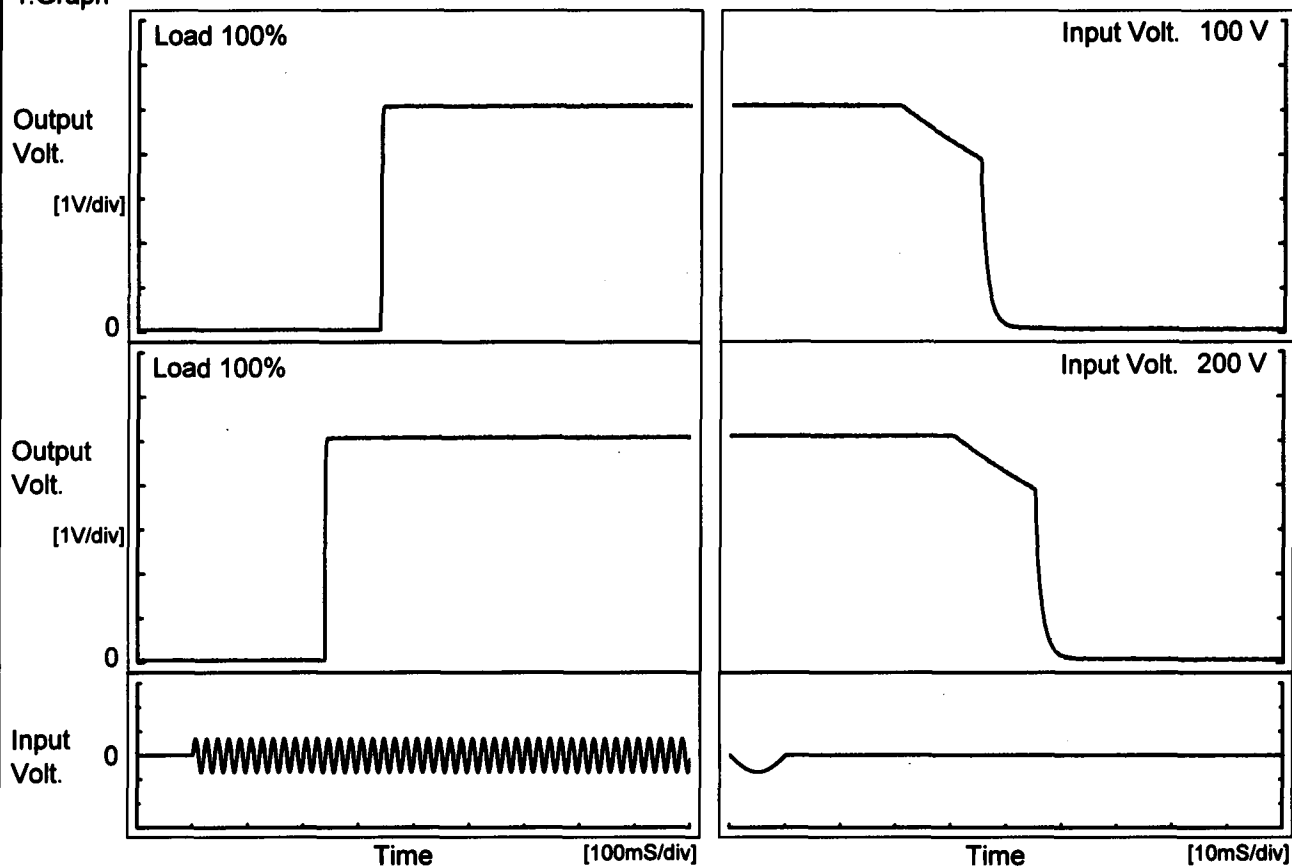
**COSEL**

Model	PBA1000F-5																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+5V200A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><div><div>5.14</div><div>5.12</div><div>5.10</div><div>5.08</div><div>5.06</div><div>5.04</div><div>5.02</div><div>5.00</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>Load 100%</div></div></div> 		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.076</td></tr><tr><td>0.5</td><td>5.070</td></tr><tr><td>1.0</td><td>5.070</td></tr><tr><td>2.0</td><td>5.070</td></tr><tr><td>3.0</td><td>5.070</td></tr><tr><td>4.0</td><td>5.070</td></tr><tr><td>5.0</td><td>5.070</td></tr><tr><td>6.0</td><td>5.070</td></tr><tr><td>7.0</td><td>5.070</td></tr><tr><td>8.0</td><td>5.070</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.076	0.5	5.070	1.0	5.070	2.0	5.070	3.0	5.070	4.0	5.070	5.0	5.070	6.0	5.070	7.0	5.070	8.0	5.070
Time since start [H]	Output Voltage [V]																								
0.0	5.076																								
0.5	5.070																								
1.0	5.070																								
2.0	5.070																								
3.0	5.070																								
4.0	5.070																								
5.0	5.070																								
6.0	5.070																								
7.0	5.070																								
8.0	5.070																								
* The characteristic of AC200V is equal.																									

**COSEL**

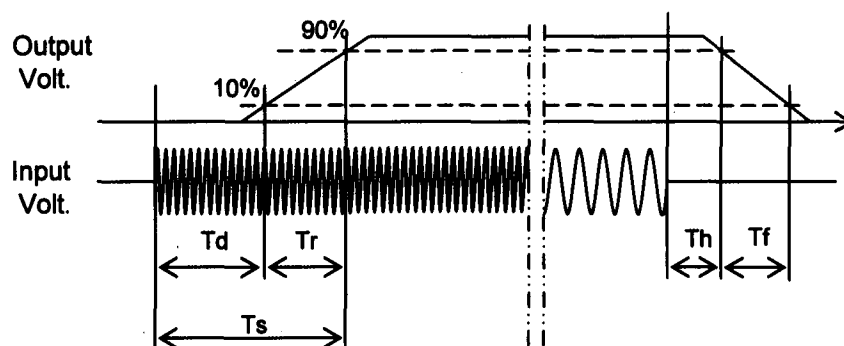
Model	PBA1000F-5	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V200A		

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		338.5	2.0	340.5	26.7	10.9
200 V		238.0	2.0	240.0	36.7	11.0



# COSEL

Model		PBA1000F-5	
Item		Hold-Up Time	
Object		+5V200A	

1.Graph

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□

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Load 50%

—

△

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Load 100%

Hold-Up Time [mS]

1000

100

10

1

50

100

150

200

250

300

Input Voltage [V]

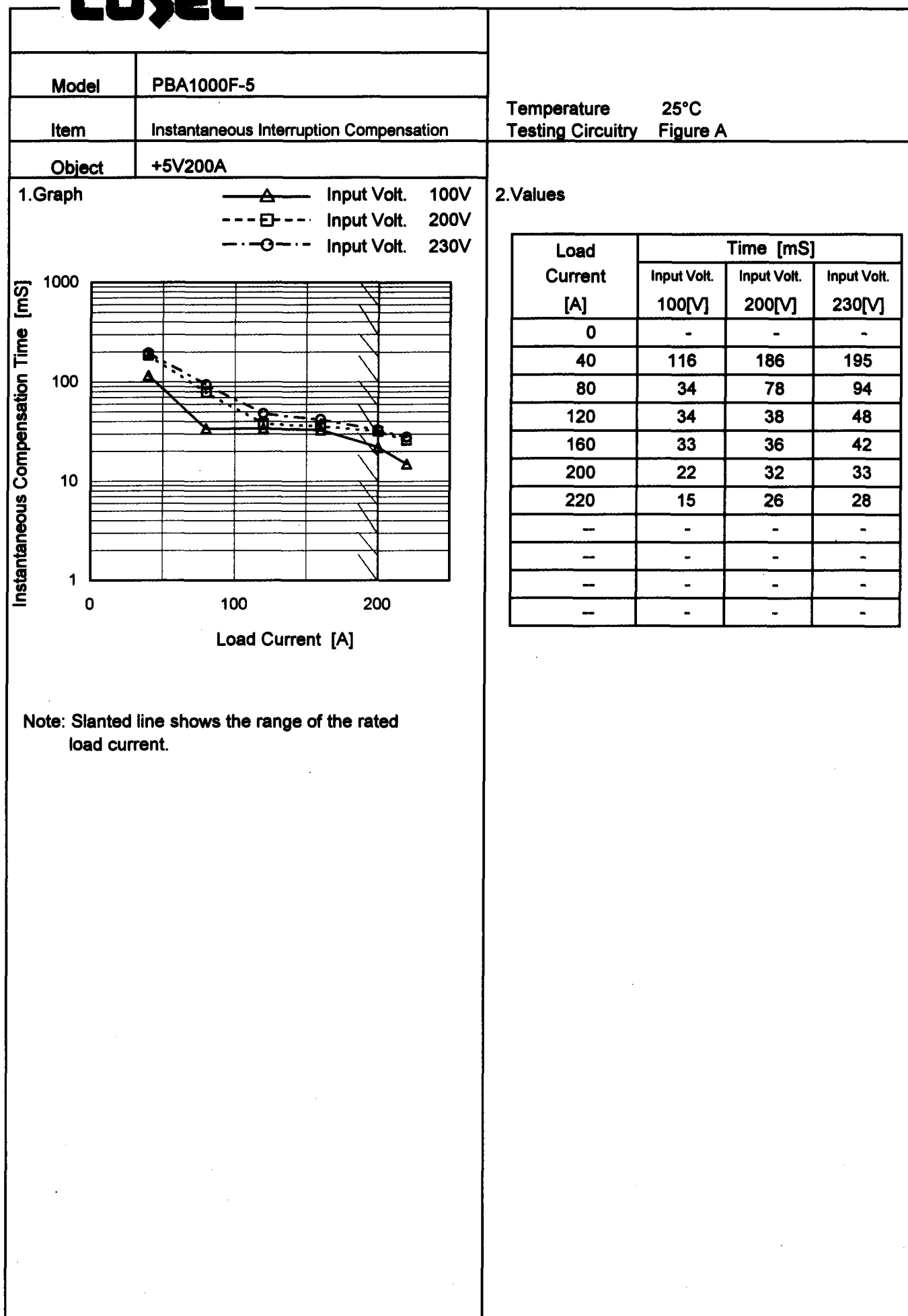
This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

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

2.Values

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
77	53	13
85	57	16
100	62	21
120	66	25
200	74	31
230	75	32
264	76	33
280	78	34
--	-	-

# COSEL



# COSEL

Model

PBA1000F-5

Item

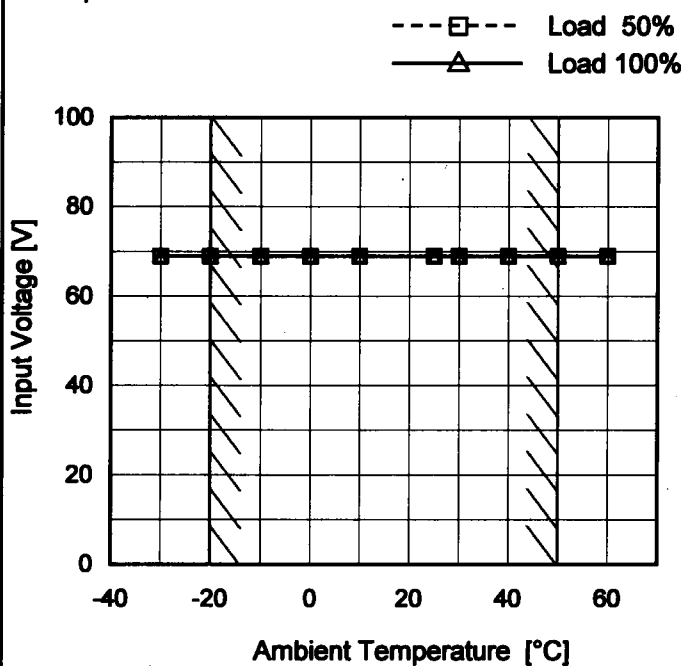
Minimum Input Voltage  
for Regulated Output Voltage

Object

+5V200A

Testing Circuitry Figure A

## 1. Graph

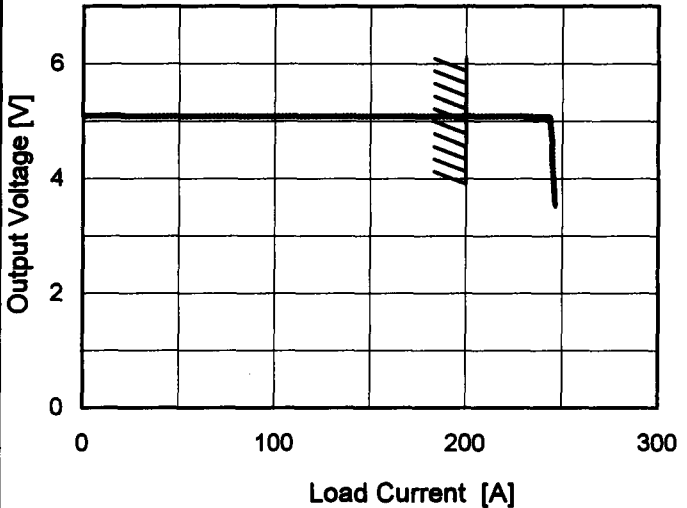


Note: Slanted line shows the range of the rated ambient temperature.

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	69	69
-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	69	69
—	—	—

**COSEL**

Model	PBA1000F-5																																														
Item	Overcurrent Protection	Temperature	25°C																																												
Object	+5V200A	Testing Circuitry	Figure A																																												
1.Graph		2.Values																																													
<div><div><div></div><div>Input Volt. 100V</div></div><div><div></div><div>Input Volt. 200V</div></div></div>  <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th></tr><tr><td>5.00</td><td>243.37</td><td>243.50</td></tr><tr><td>4.75</td><td>244.03</td><td>244.32</td></tr><tr><td>4.50</td><td>244.46</td><td>244.98</td></tr><tr><td>4.00</td><td>245.74</td><td>245.37</td></tr><tr><td>3.50</td><td>246.10</td><td>246.12</td></tr><tr><td>3.00</td><td>246.10</td><td>246.12</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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	5.00	243.37	243.50	4.75	244.03	244.32	4.50	244.46	244.98	4.00	245.74	245.37	3.50	246.10	246.12	3.00	246.10	246.12	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Output Voltage [V]	Load Current [A]																																														
	Input Volt. 100[V]	Input Volt. 200[V]																																													
5.00	243.37	243.50																																													
4.75	244.03	244.32																																													
4.50	244.46	244.98																																													
4.00	245.74	245.37																																													
3.50	246.10	246.12																																													
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**COSEL**

Model

PBA1000F-5

Item

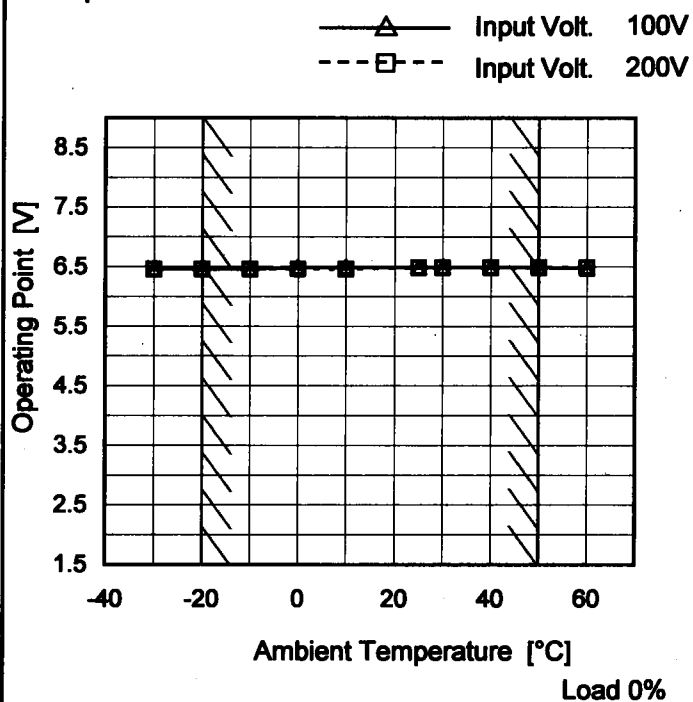
Overvoltage Protection

Object

+5V200A

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]
-30	6.45	6.45
-20	6.45	6.45
-10	6.45	6.45
0	6.48	6.45
10	6.48	6.45
25	6.48	6.48
30	6.48	6.48
40	6.48	6.48
50	6.48	6.48
60	6.47	6.48
—	—	—

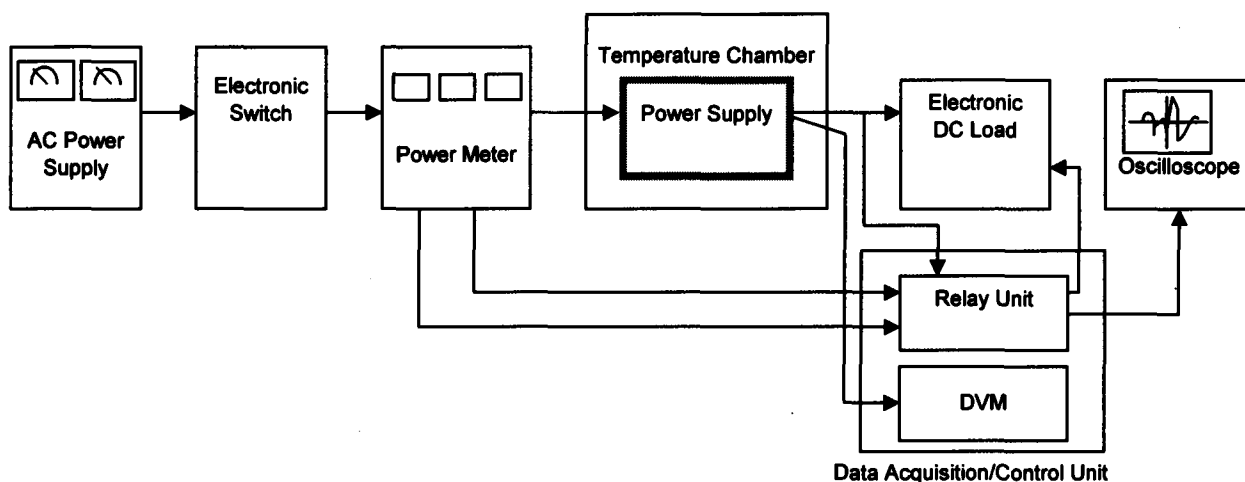


Figure A

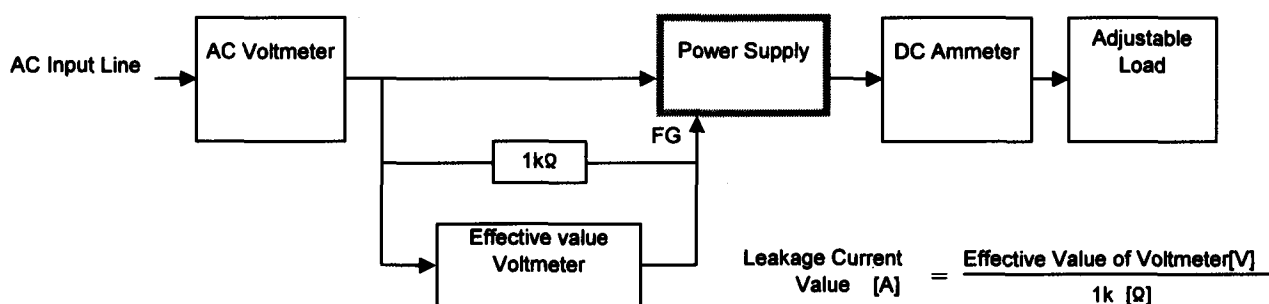


Figure B ( DEN-AN )

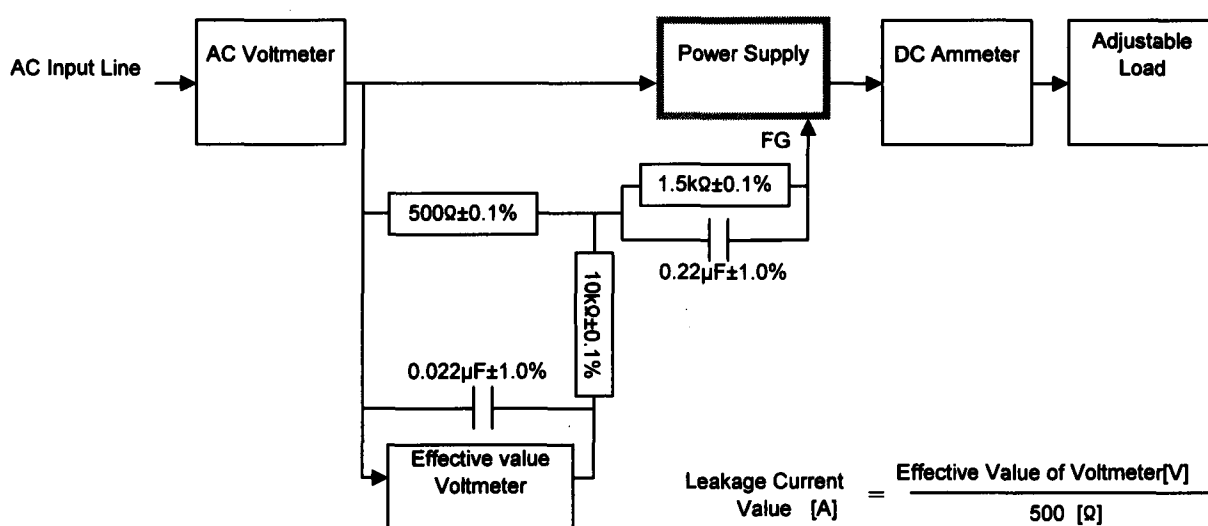


Figure B ( IEC60950 )