



TEST DATA OF PBA50F-5

Regulated DC Power Supply
Apr.1. 2004

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Kuniaki Nagahara Design Manager

Prepared by : Koji Todo
Koji Todo Design Engineer

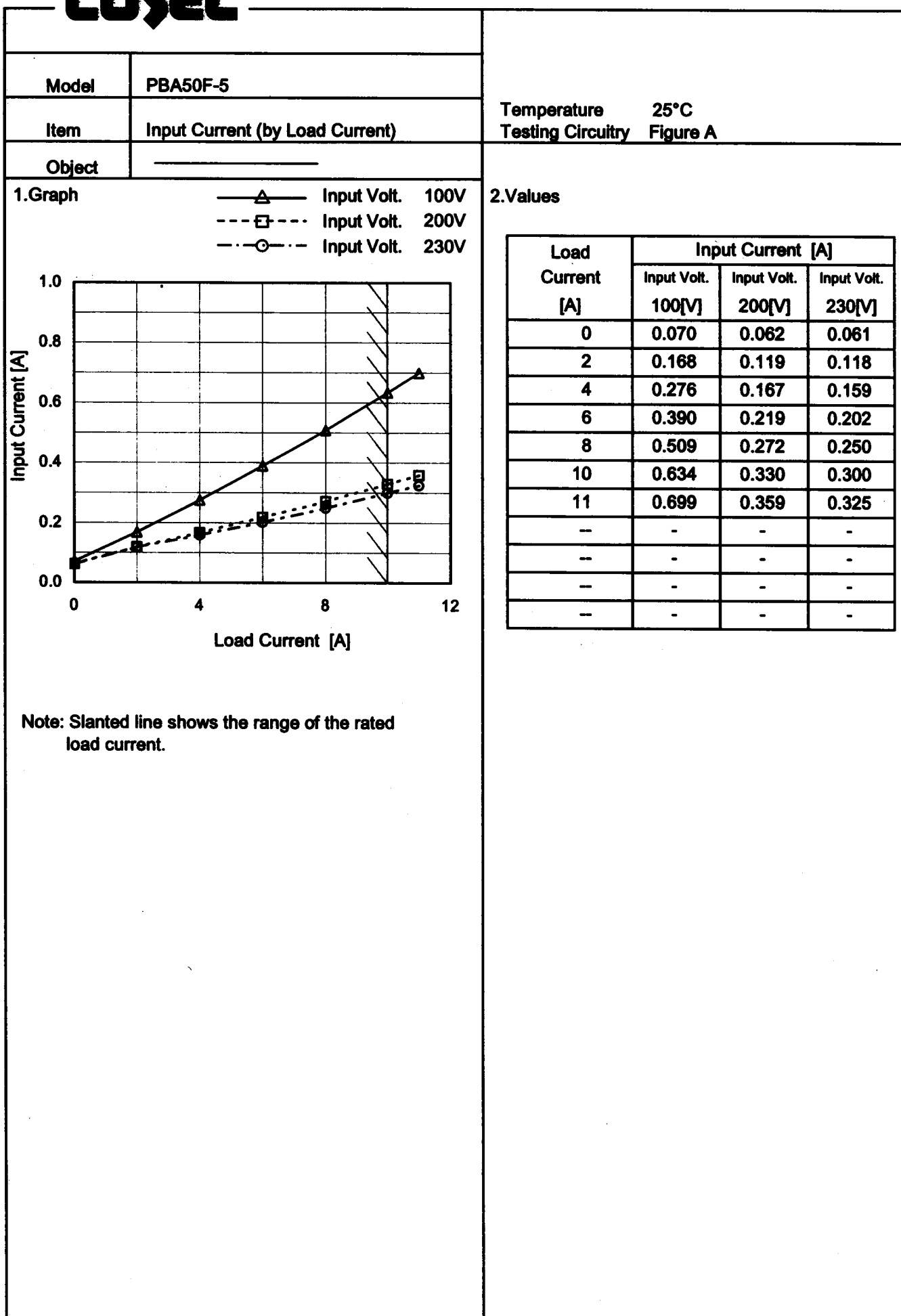
COSEL CO.,LTD.

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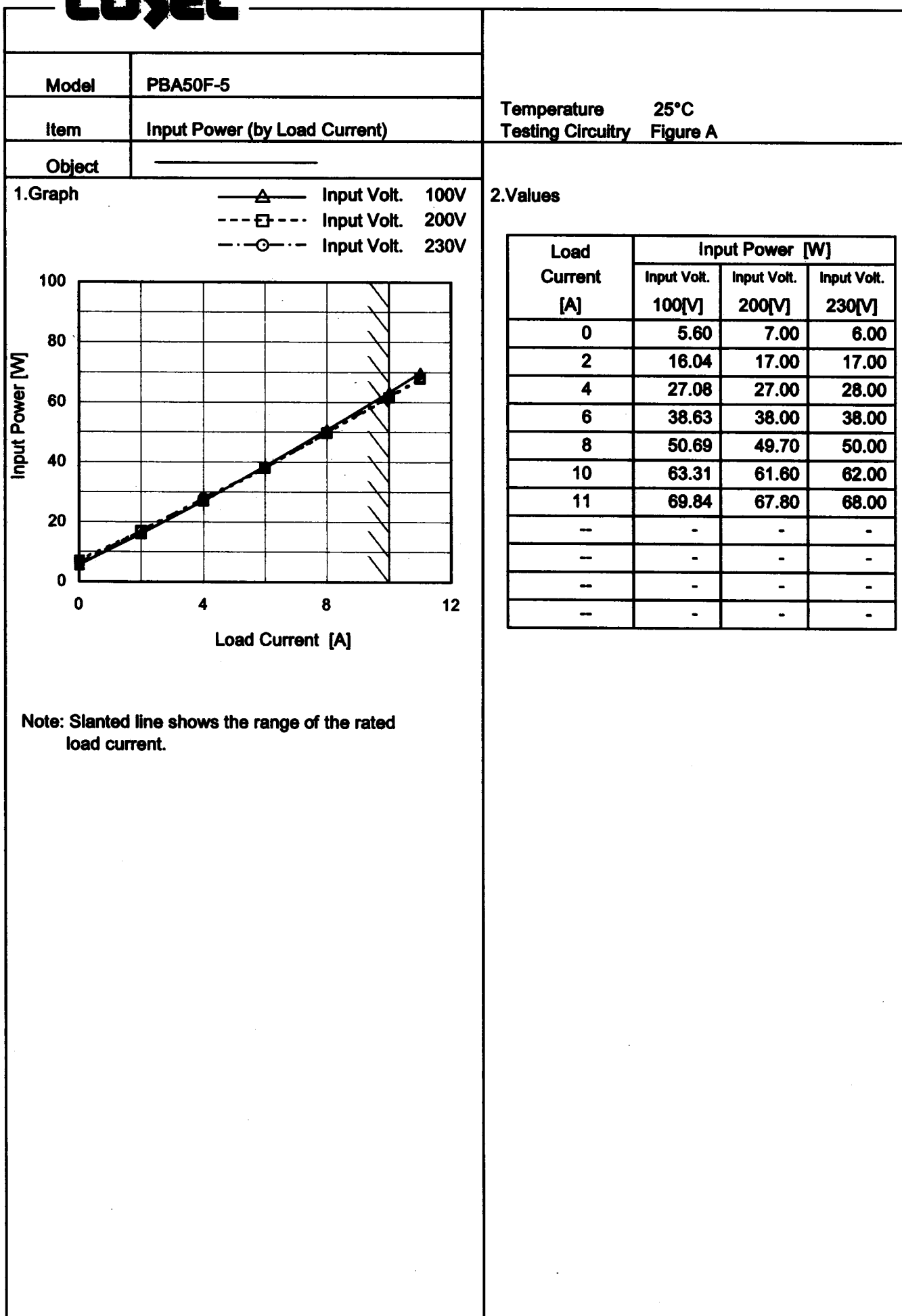
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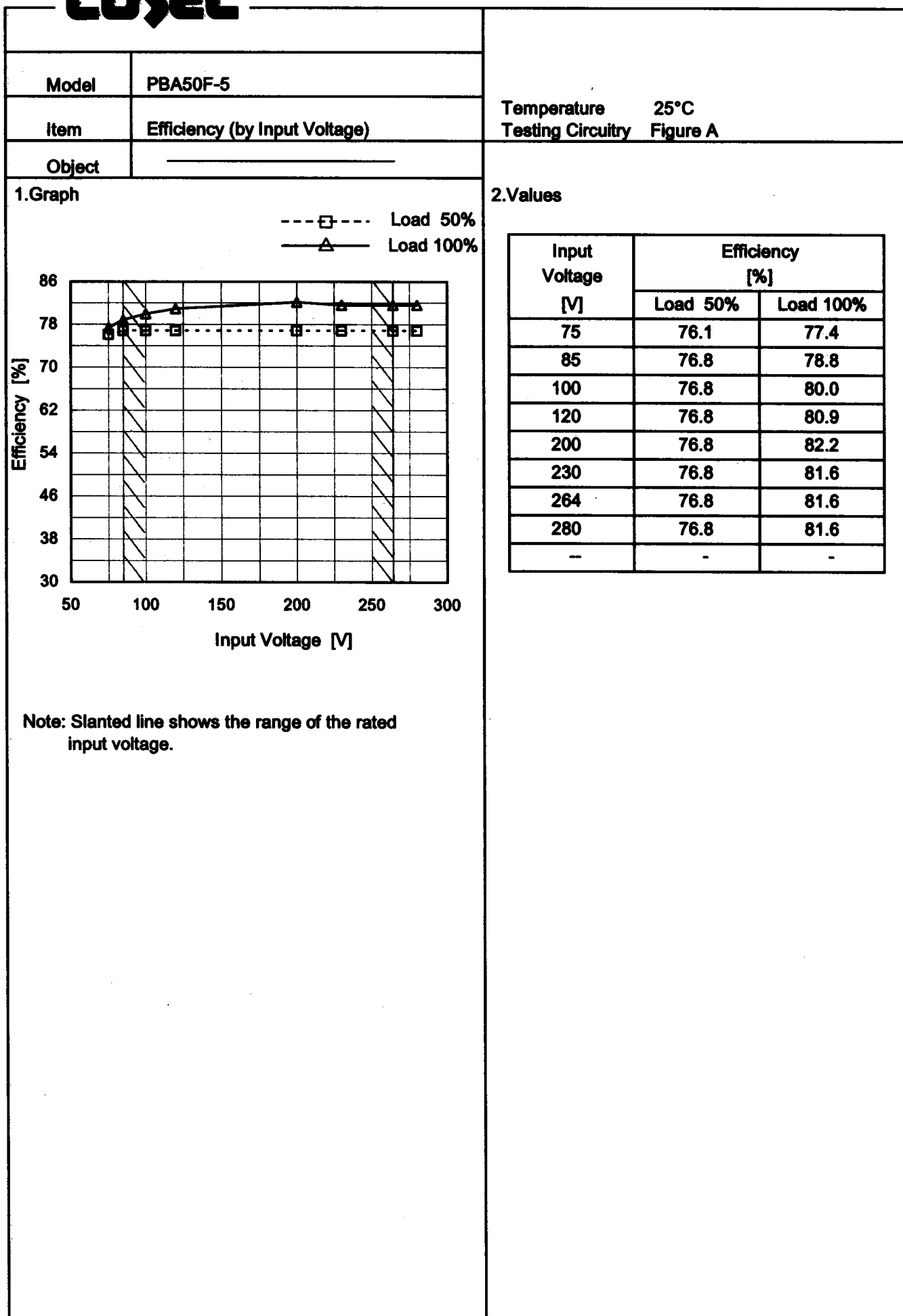
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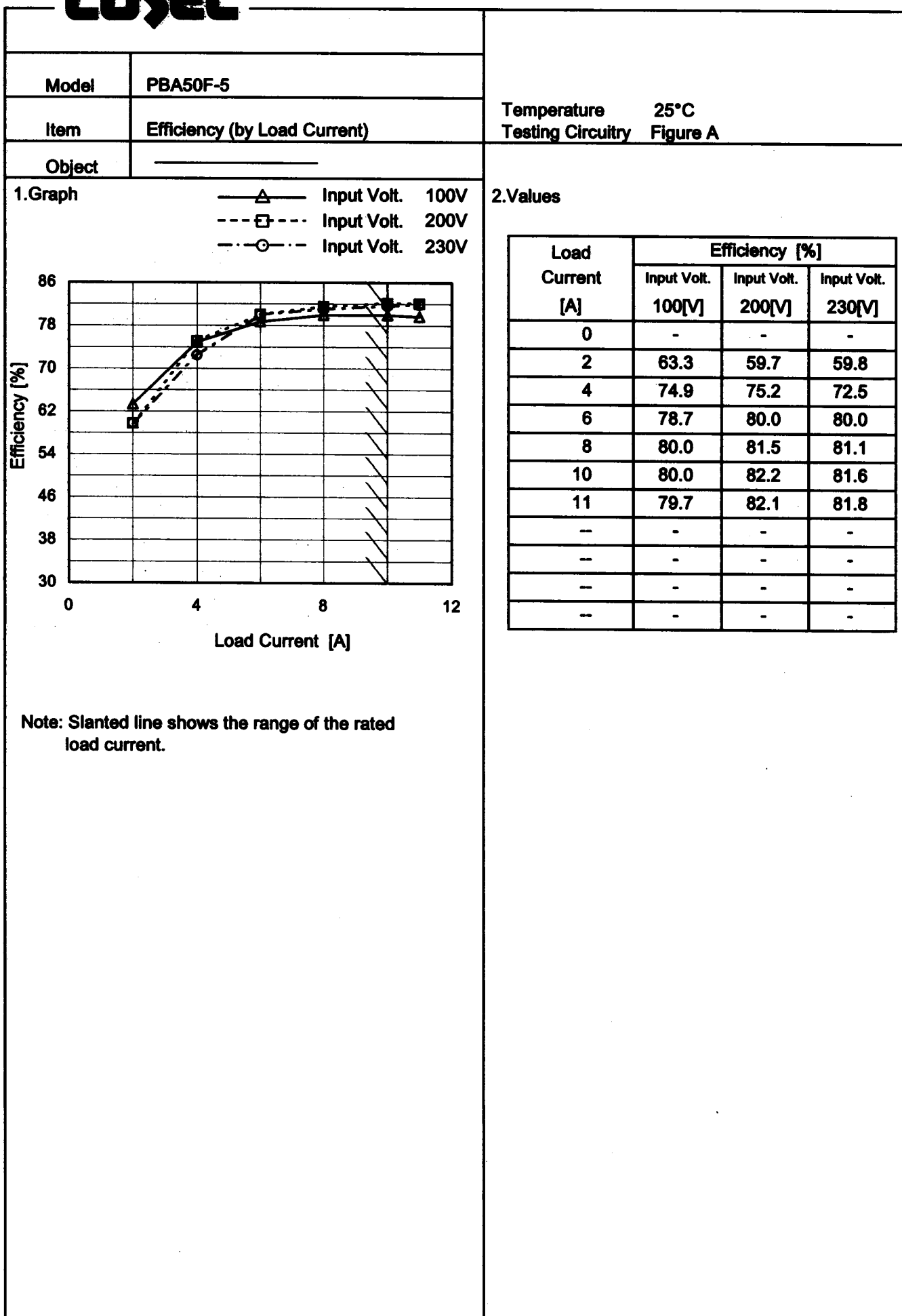


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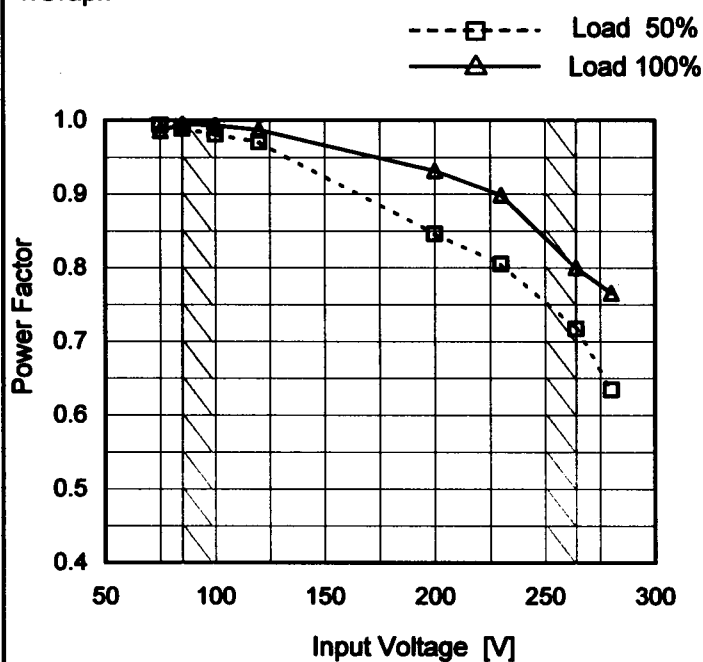
Model PBA50F-5

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.

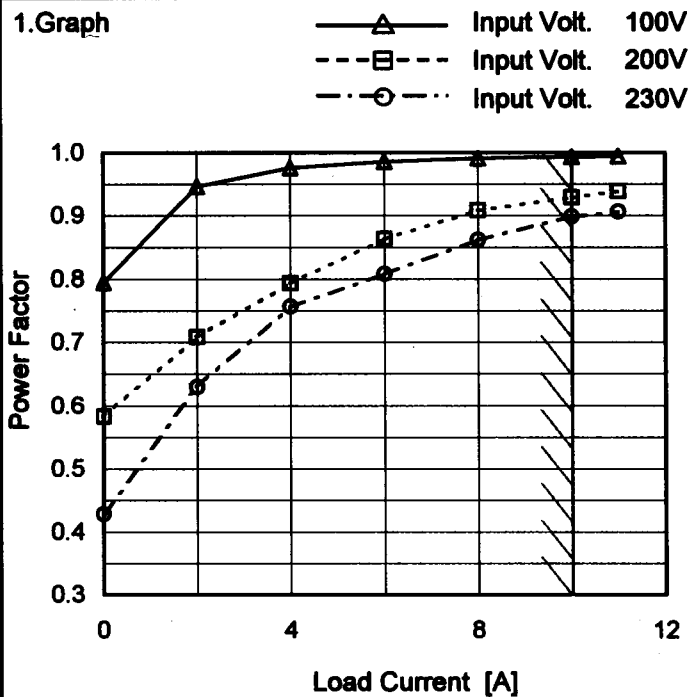
2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.994	0.986
85	0.989	0.995
100	0.981	0.993
120	0.971	0.987
200	0.846	0.932
230	0.805	0.899
264	0.717	0.800
280	0.635	0.765
—	—	—

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Model	PBA50F-5
Item	Power Factor (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

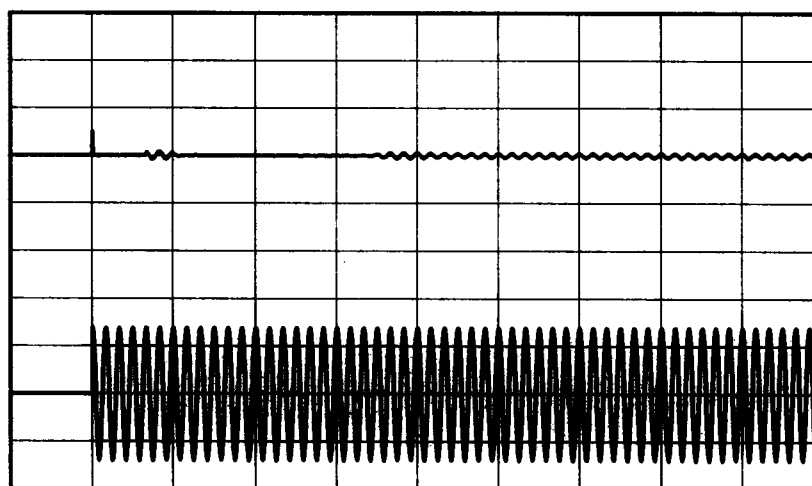


2. Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.794	0.583	0.429
2	0.946	0.708	0.630
4	0.976	0.794	0.757
6	0.986	0.864	0.809
8	0.991	0.909	0.862
10	0.993	0.929	0.899
11	0.994	0.939	0.907
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

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Model	PBA50F-5	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		

Input
Current
[20A/div]Input
Voltage
[100V/div]

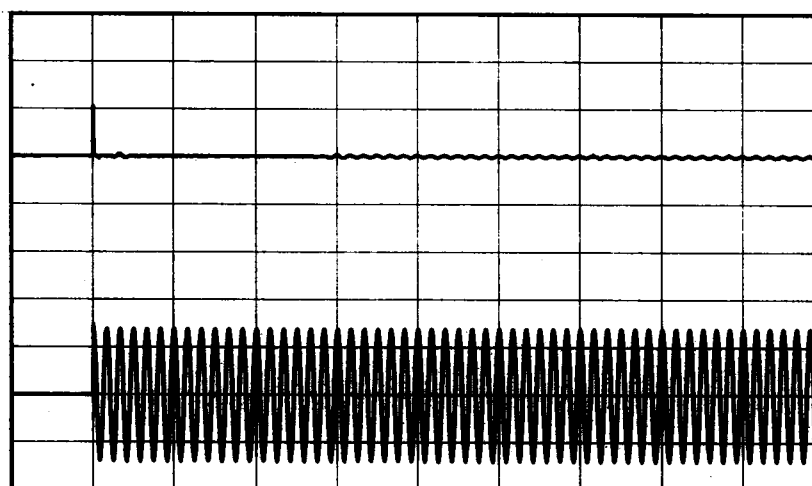
Time

[100mS/div]

Input Voltage 100 V

Frequency 60 Hz

Load 100 %

Primary inrush current :
10.1 ASecondary inrush current :
1.7 AInput
Current
[20A/div]Input
Voltage
[200V/div]

Time

[100mS/div]

Input Voltage 200 V

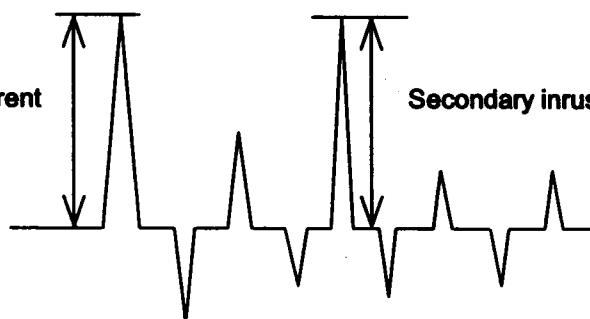
Frequency 60 Hz

Load 100 %

Primary inrush current :
20.9 ASecondary inrush current :
0.9 A

Primary inrush current

Secondary inrush current





		Temperature 25°C Testing Circuitry Figure B
Model	PBA50F-5	
Item	Leakage Current	
Object	_____	

1.Results

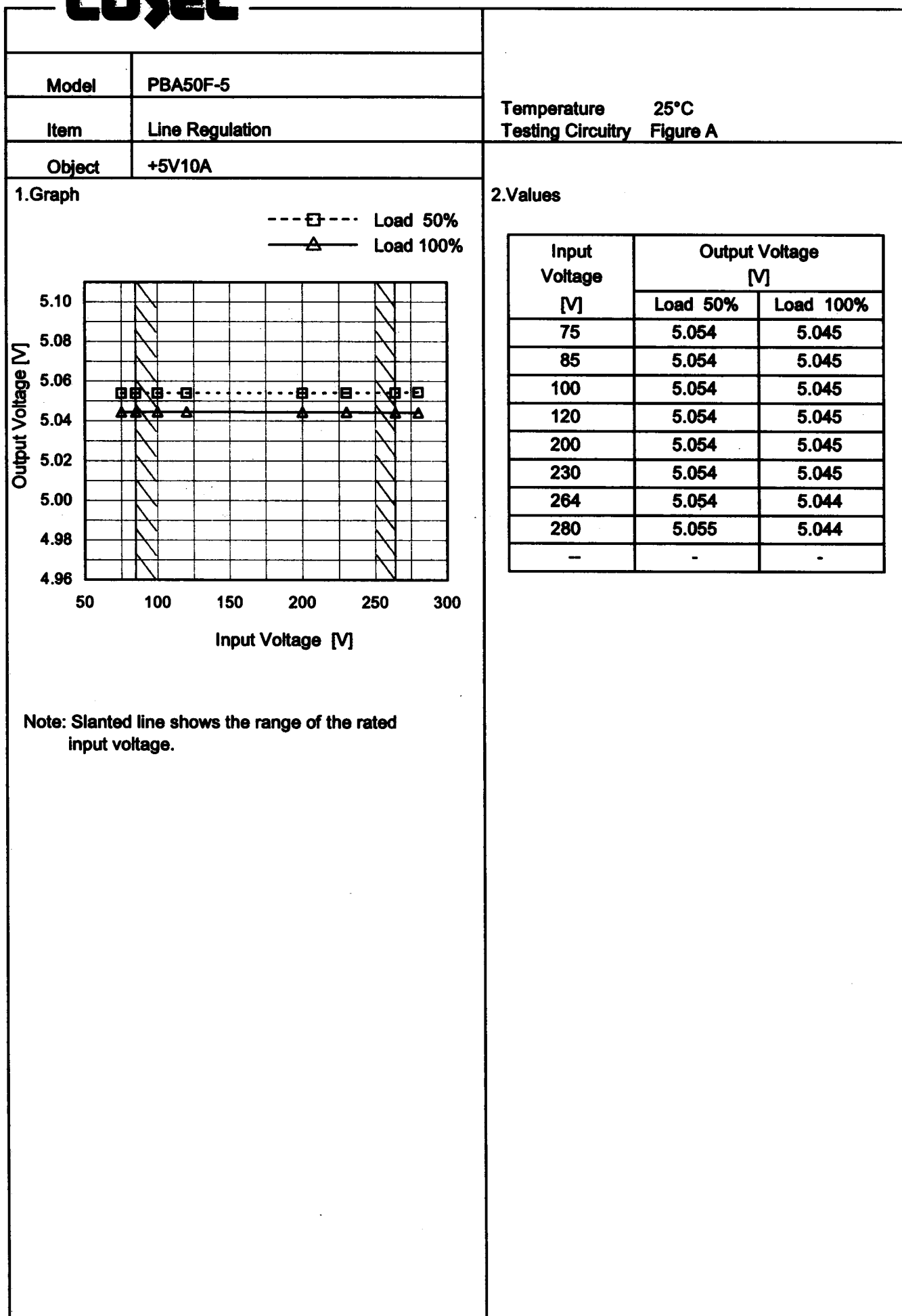
[mA]

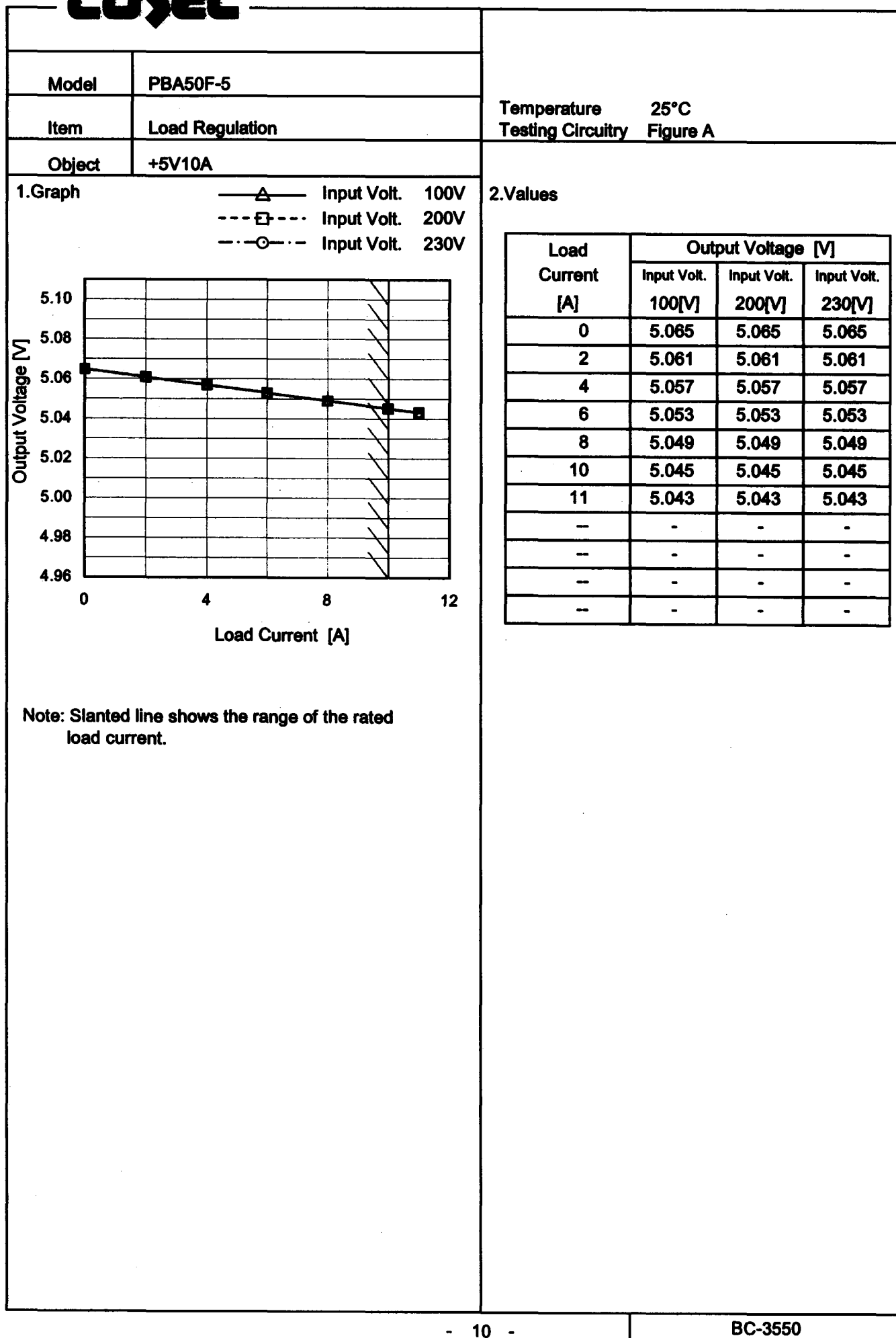
Standards		Input Volt.			Note
		100 [V]	200 [V]	230 [V]	
DEN-AN	Both phases	0.18	0.30	0.34	Operation
	One of phase	0.22	0.48	0.55	stand by
IEC60950	Both phases	0.18	0.32	0.36	Operation
	One of phase	0.22	0.48	0.55	stand by

- 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	PBA50F-5	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+5V10A		

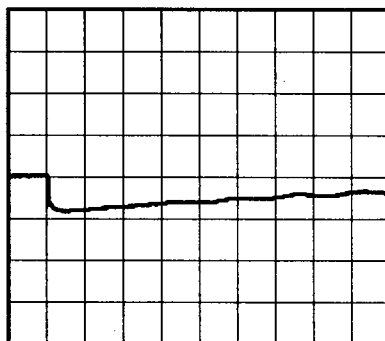
Input Volt. 100 V
Cycle 1000 ms

Load Current

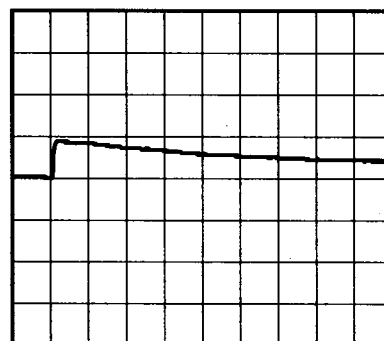
Min. Load (0A) ←→

Load 100% (10A)

50 mV/div



5 ms/div

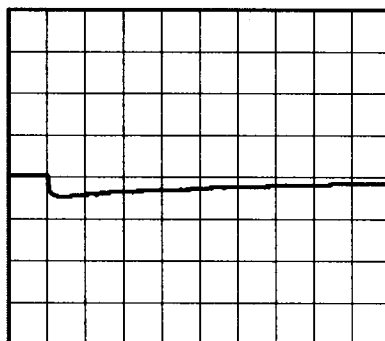


5 ms/div

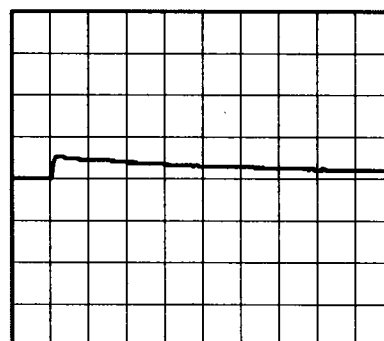
Min. Load (0A) ←→

Load 50% (5A)

50 mV/div



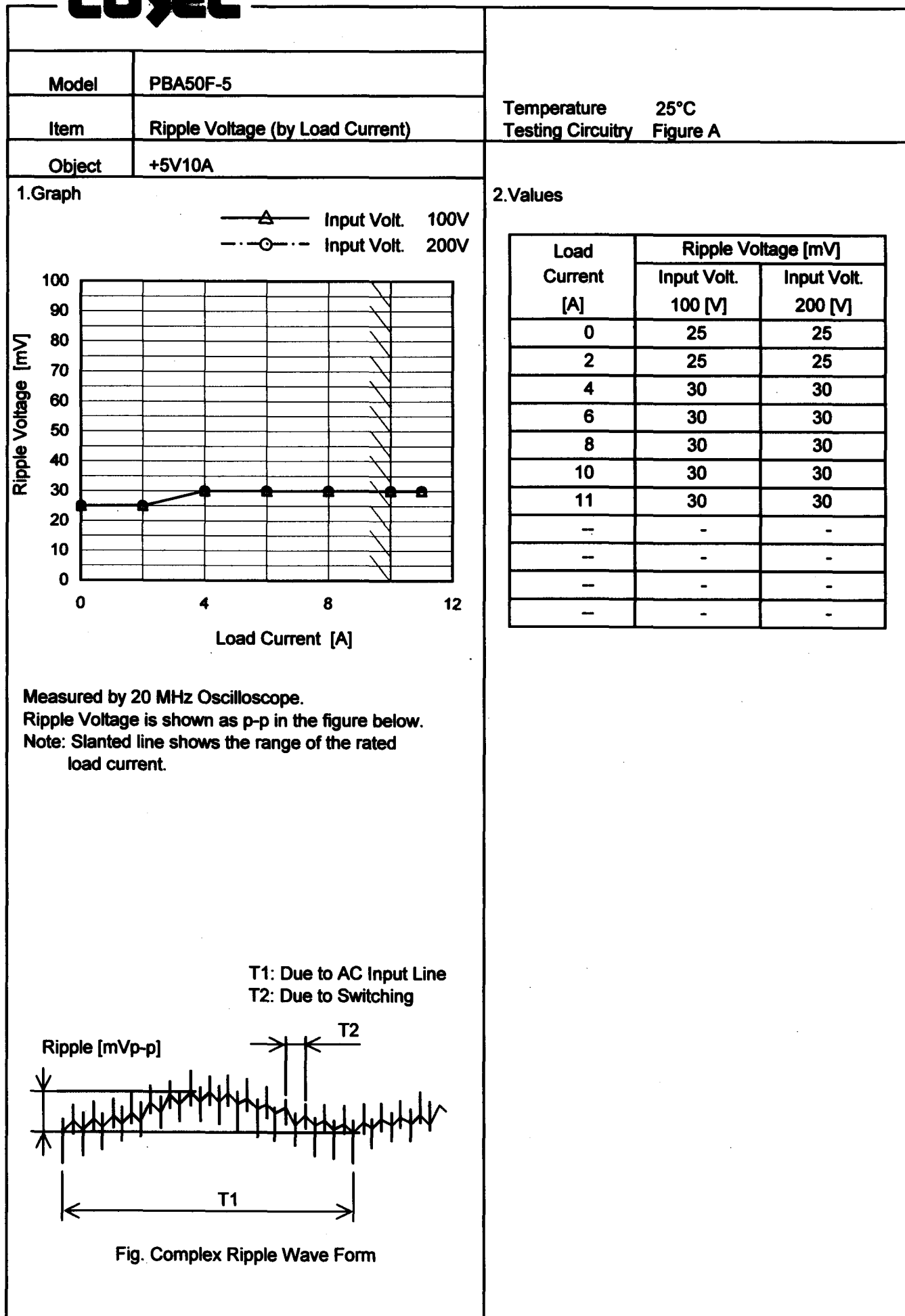
5 ms/div



5 ms/div

* The characteristic of AC200V is equal.

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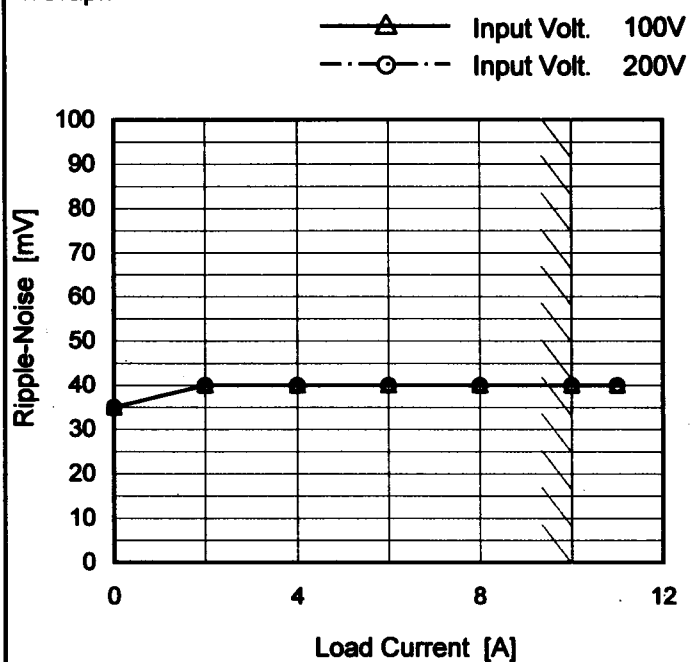


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Model	PBA50F-5
Item	Ripple-Noise
Object	+5V10A

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	35	35
2	40	40
4	40	40
6	40	40
8	40	40
10	40	40
11	40	40
—	—	—
—	—	—
—	—	—
—	—	—

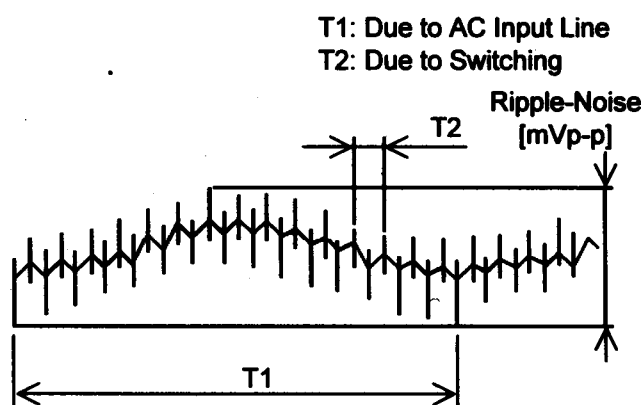
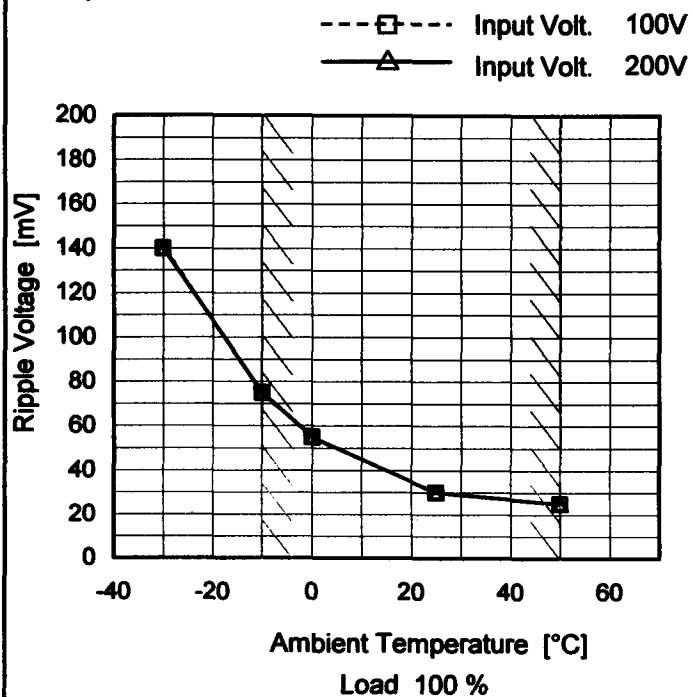


Fig. Complex Ripple Wave Form

Model	PBA50F-5
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V10A

1. Graph



Measured by 20 MHz Oscilloscope.

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

Testing Circuitry Figure A

2.Values

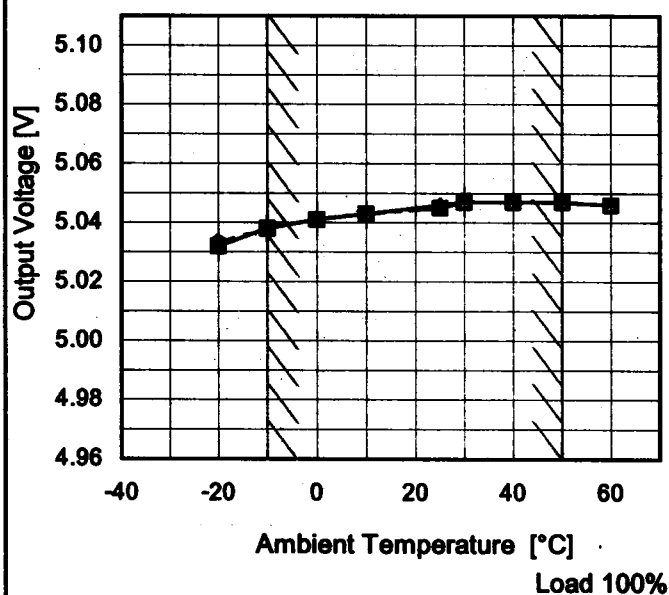
[illegible]

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Model	PBA50F-5
Item	Ambient Temperature Drift
Object	+5V10A

1. Graph

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



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

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	5.032	5.032	5.033
-10	5.038	5.038	5.038
0	5.041	5.041	5.041
10	5.043	5.043	5.043
25	5.046	5.045	5.045
30	5.047	5.047	5.047
40	5.047	5.047	5.047
50	5.047	5.047	5.047
60	5.046	5.046	5.046
--	-	-	-
--	-	-	-



		Testing Circuitry Figure A
Model	PBA50F-5	
Item	Output Voltage Accuracy	
Object	+5V10A	

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 - 10A

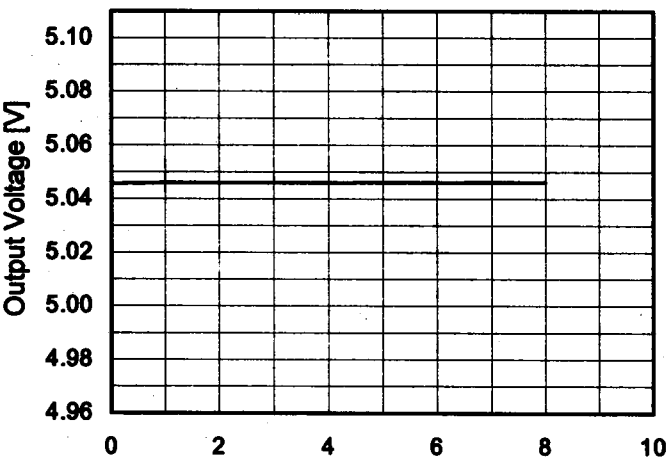
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* 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	50	200	0	5.068	±15	±0.3
Minimum Voltage	-10	85	10	5.038		

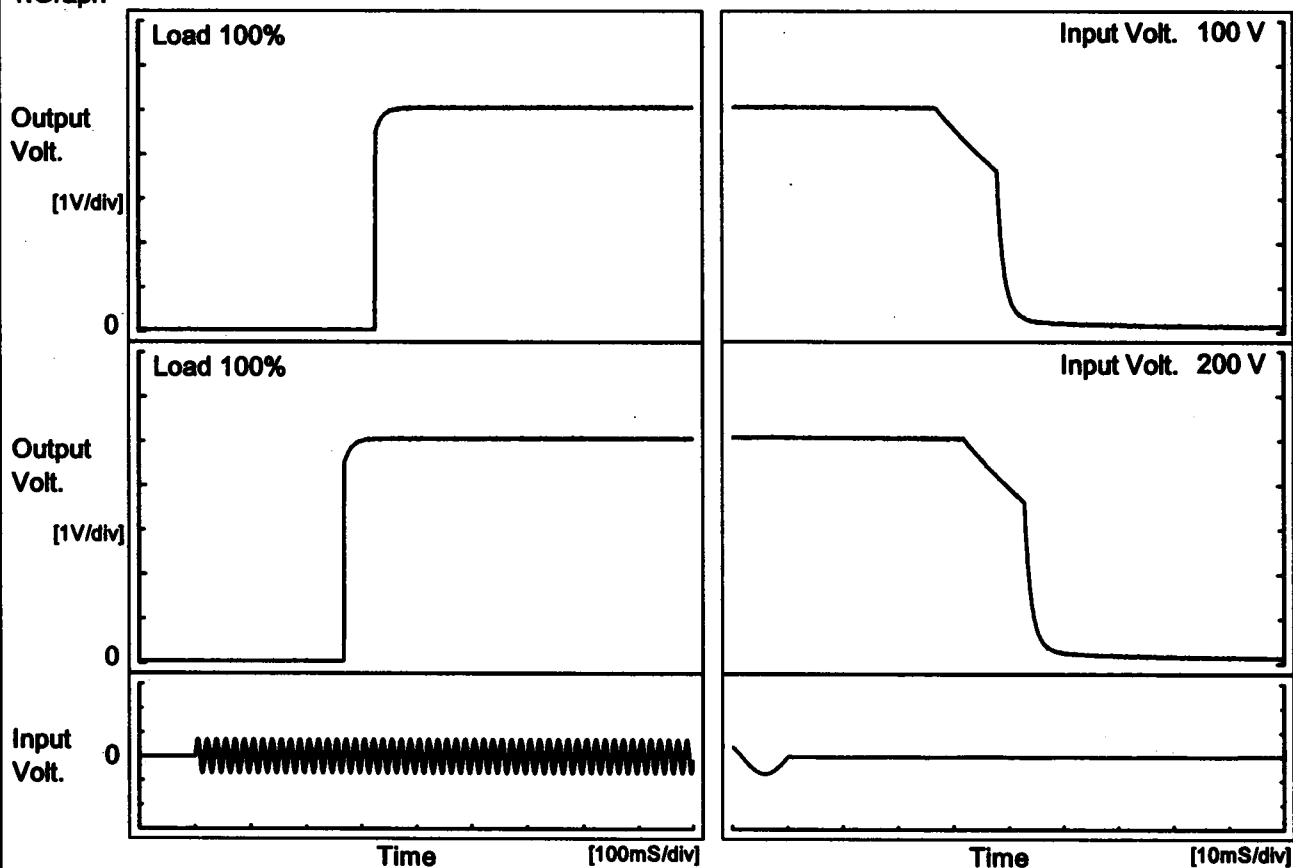
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Model	PBA50F-5																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+5V10A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.047</td></tr><tr><td>0.5</td><td>5.046</td></tr><tr><td>1.0</td><td>5.046</td></tr><tr><td>2.0</td><td>5.046</td></tr><tr><td>3.0</td><td>5.046</td></tr><tr><td>4.0</td><td>5.046</td></tr><tr><td>5.0</td><td>5.046</td></tr><tr><td>6.0</td><td>5.046</td></tr><tr><td>7.0</td><td>5.046</td></tr><tr><td>8.0</td><td>5.046</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.047	0.5	5.046	1.0	5.046	2.0	5.046	3.0	5.046	4.0	5.046	5.0	5.046	6.0	5.046	7.0	5.046	8.0	5.046
Time since start [H]	Output Voltage [V]																								
0.0	5.047																								
0.5	5.046																								
1.0	5.046																								
2.0	5.046																								
3.0	5.046																								
4.0	5.046																								
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6.0	5.046																								
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8.0	5.046																								
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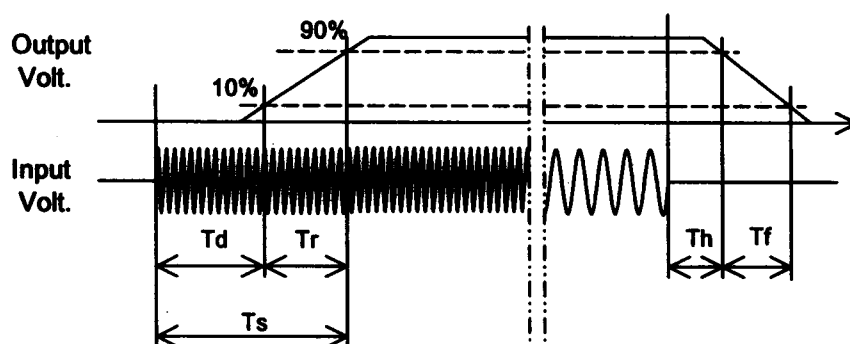
Model	PBA50F-5	Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+5V10A	

1. Graph

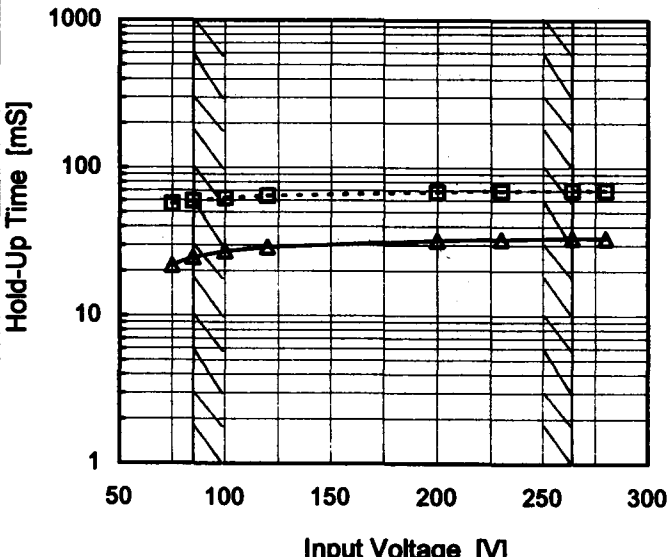


2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		325.5	2.5	328.0	30.4	10.6
200 V		268.0	2.5	270.5	35.4	10.6



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Model		PBA50F-5		Temperature 25°C																																	
Item		Hold-Up Time		Testing Circuitry Figure A																																	
Object		+5V10A																																			
1.Graph				2.Values																																	
<div><div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div><p>Hold-Up Time [mS]</p><p>Input Voltage [V]</p></div> <div><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></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>57</td><td>22</td></tr><tr><td>85</td><td>59</td><td>25</td></tr><tr><td>100</td><td>62</td><td>27</td></tr><tr><td>120</td><td>64</td><td>29</td></tr><tr><td>200</td><td>68</td><td>32</td></tr><tr><td>230</td><td>70</td><td>33</td></tr><tr><td>264</td><td>70</td><td>34</td></tr><tr><td>280</td><td>70</td><td>33</td></tr><tr><td>—</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Hold-Up Time [mS]		Load 50%	Load 100%	75	57	22	85	59	25	100	62	27	120	64	29	200	68	32	230	70	33	264	70	34	280	70	33	—	-	-
Input Voltage [V]	Hold-Up Time [mS]																																				
	Load 50%	Load 100%																																			
75	57	22																																			
85	59	25																																			
100	62	27																																			
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200	68	32																																			
230	70	33																																			
264	70	34																																			
280	70	33																																			
—	-	-																																			

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Model	PBA50F-5																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+5V10A	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</td><td>-</td><td>-</td><td>-</td></tr><tr><td>2</td><td>105</td><td>155</td><td>156</td></tr><tr><td>4</td><td>79</td><td>86</td><td>87</td></tr><tr><td>6</td><td>51</td><td>57</td><td>58</td></tr><tr><td>8</td><td>37</td><td>42</td><td>43</td></tr><tr><td>10</td><td>28</td><td>31</td><td>32</td></tr><tr><td>11</td><td>23</td><td>29</td><td>30</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></table>		Load Current [A]	Time [mS]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0	-	-	-	2	105	155	156	4	79	86	87	6	51	57	58	8	37	42	43	10	28	31	32	11	23	29	30	—	-	-	-	—	-	-	-	—	-	-	-	—	-	-	-
Load Current [A]	Time [mS]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
0	-	-	-																																																			
2	105	155	156																																																			
4	79	86	87																																																			
6	51	57	58																																																			
8	37	42	43																																																			
10	28	31	32																																																			
11	23	29	30																																																			
—	-	-	-																																																			
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Note: Slanted line shows the range of the rated load current.																																																						

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Model	PBA50F-5
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V10A

1.Graph

---□--- Load 50%
---△--- Load 100%

Input Voltage [V]

Ambient Temperature [°C]

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

Testing Circuitry Figure A

2.Values

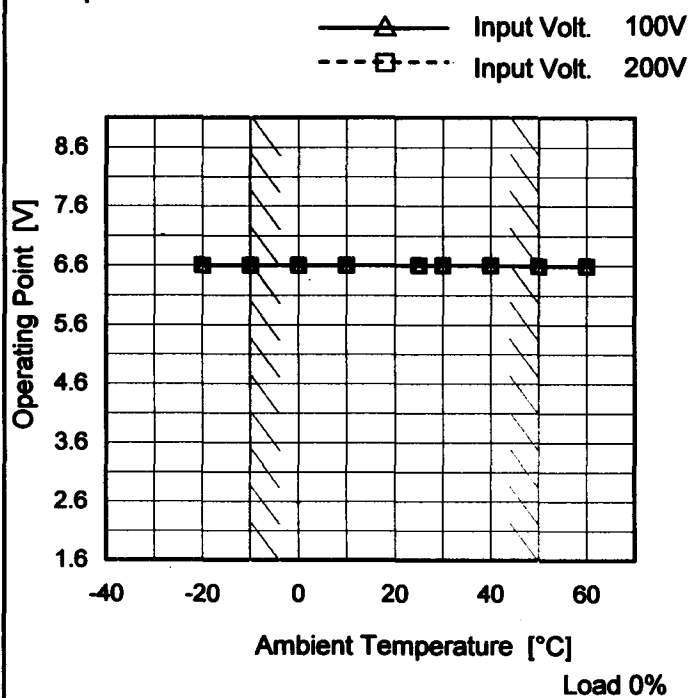
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	48	64
-10	47	64
0	47	64
10	47	64
25	47	64
30	47	65
40	47	65
50	47	65
60	47	65
—	-	-
—	-	-

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Model	PBA50F-5																																											
Item	Overcurrent Protection	Temperature	25°C																																									
Object	+5V10A	Testing Circuitry	Figure A																																									
1.Graph		2.Values																																										
<div><div><div></div>Input Volt. 100V</div><div><div></div>Input Volt. 200V</div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 2.5V to 0V.</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>10.71</td><td>10.70</td></tr><tr><td>4.75</td><td>12.43</td><td>12.42</td></tr><tr><td>4.50</td><td>12.48</td><td>12.50</td></tr><tr><td>4.00</td><td>12.60</td><td>12.59</td></tr><tr><td>3.50</td><td>12.65</td><td>12.66</td></tr><tr><td>3.00</td><td>12.67</td><td>12.68</td></tr><tr><td>2.50</td><td>12.74</td><td>12.72</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	10.71	10.70	4.75	12.43	12.42	4.50	12.48	12.50	4.00	12.60	12.59	3.50	12.65	12.66	3.00	12.67	12.68	2.50	12.74	12.72	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Output Voltage [V]	Load Current [A]																																											
	Input Volt. 100[V]	Input Volt. 200[V]																																										
5.00	10.71	10.70																																										
4.75	12.43	12.42																																										
4.50	12.48	12.50																																										
4.00	12.60	12.59																																										
3.50	12.65	12.66																																										
3.00	12.67	12.68																																										
2.50	12.74	12.72																																										
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Model	PBA50F-5
Item	Overvoltage Protection
Object	+5V10A

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	6.60	6.60
-10	6.60	6.60
0	6.60	6.60
10	6.60	6.60
25	6.60	6.60
30	6.60	6.60
40	6.60	6.60
50	6.59	6.59
60	6.59	6.59
—	—	—
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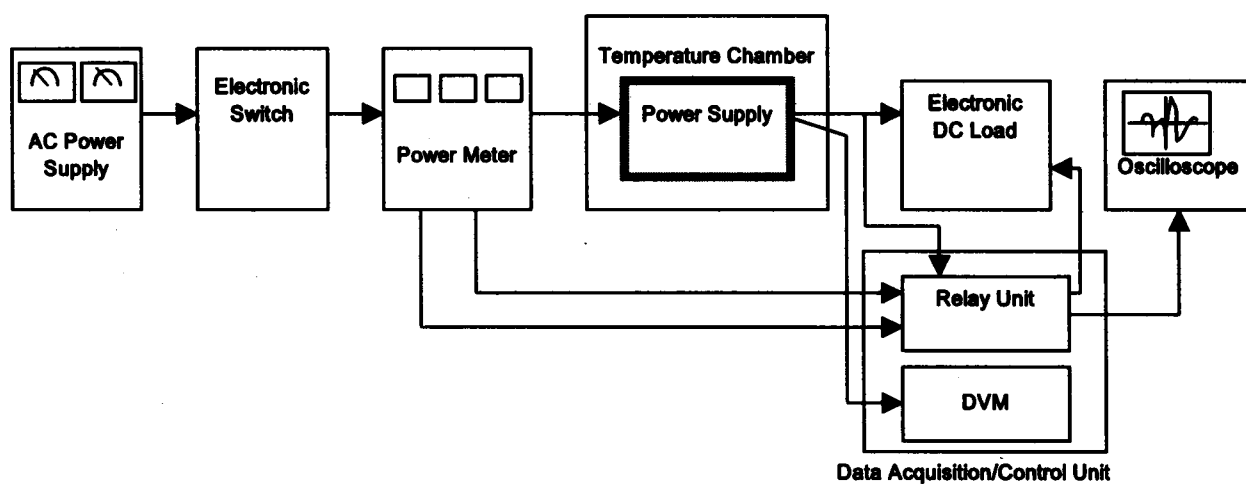


Figure A

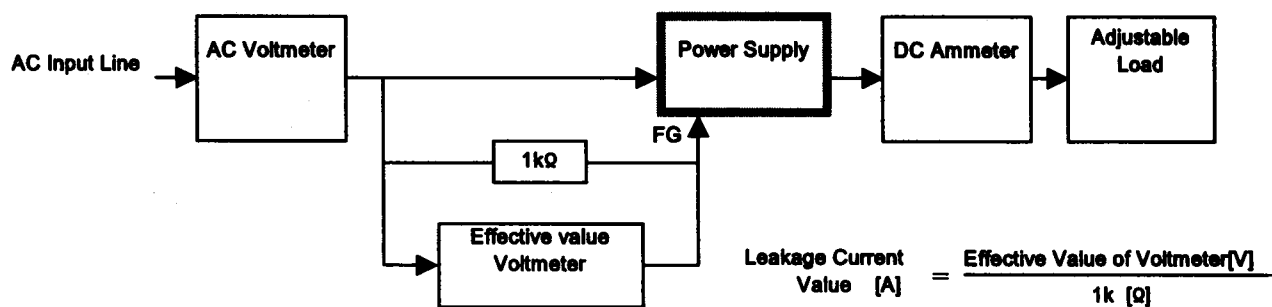


Figure B (DEN-AN)

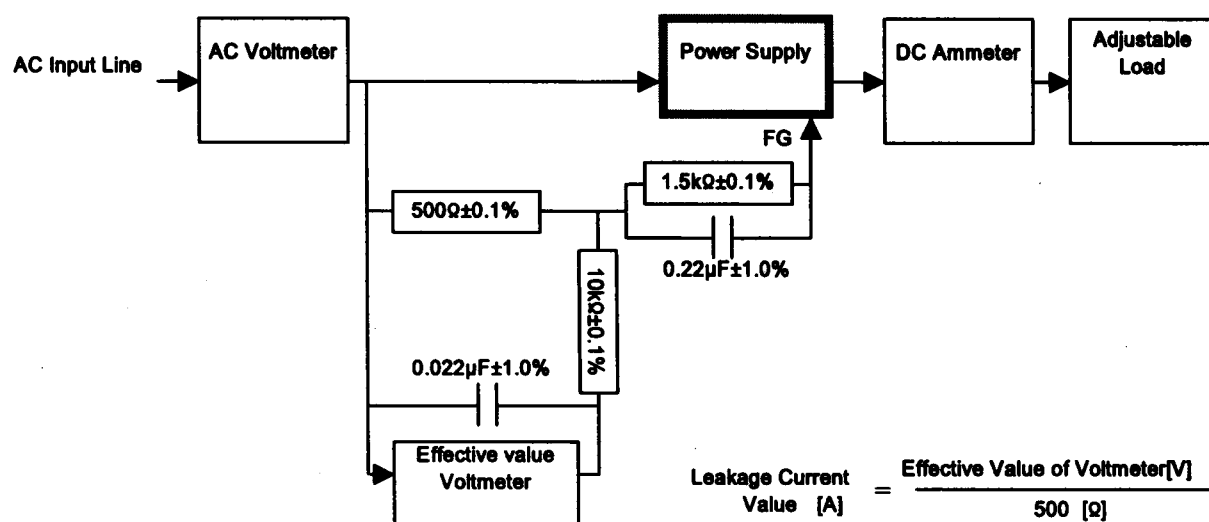


Figure B (IEC60950)