



TEST DATA OF PBA50F-9

Regulated DC Power Supply
Apr.1. 2004

Approved by : Kuniaki Nagahara
Kuniaki Nagahara Design Manager

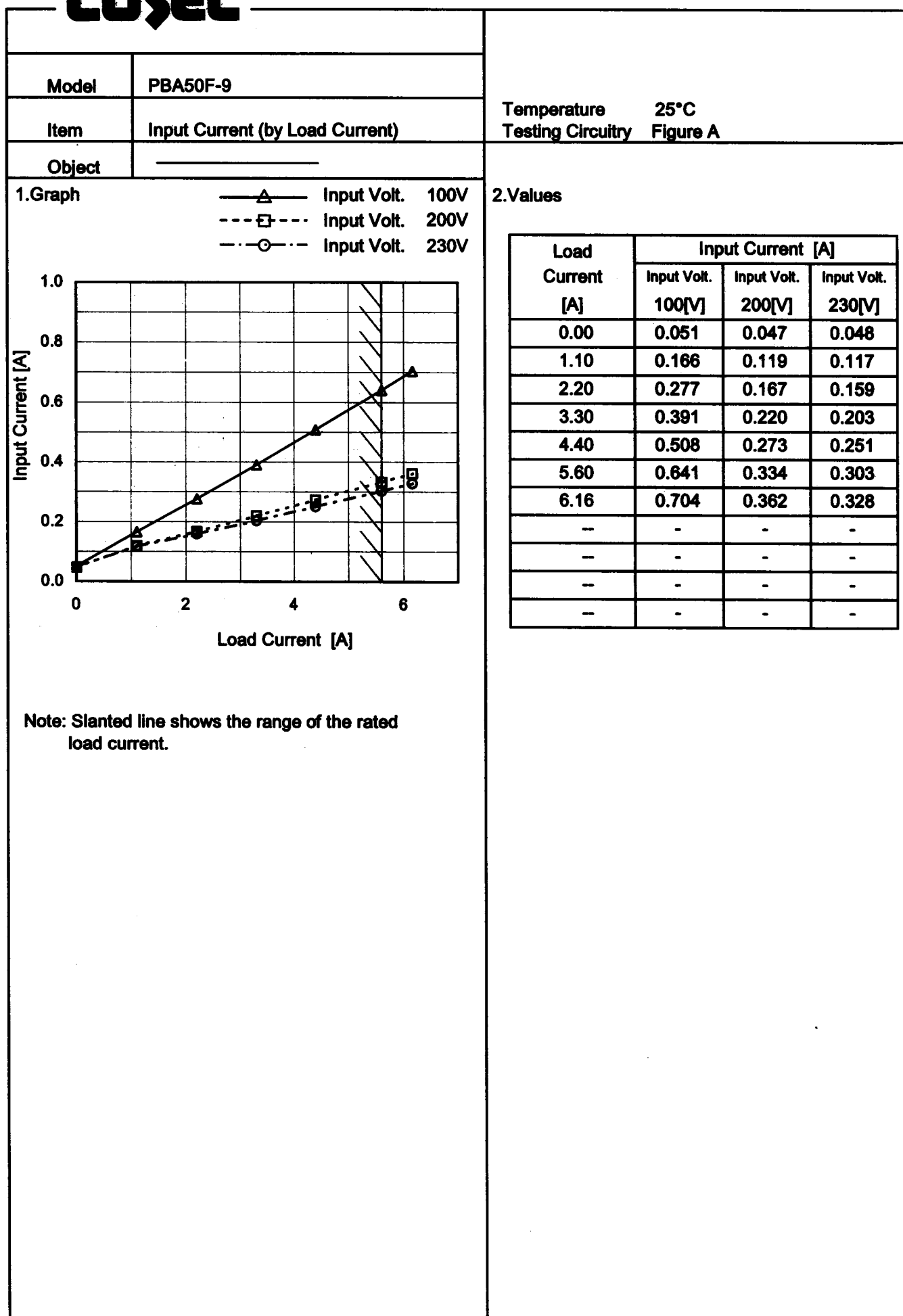
Prepared by : Koji Todo
Koji Todo Design Engineer

COSEL CO.,LTD.

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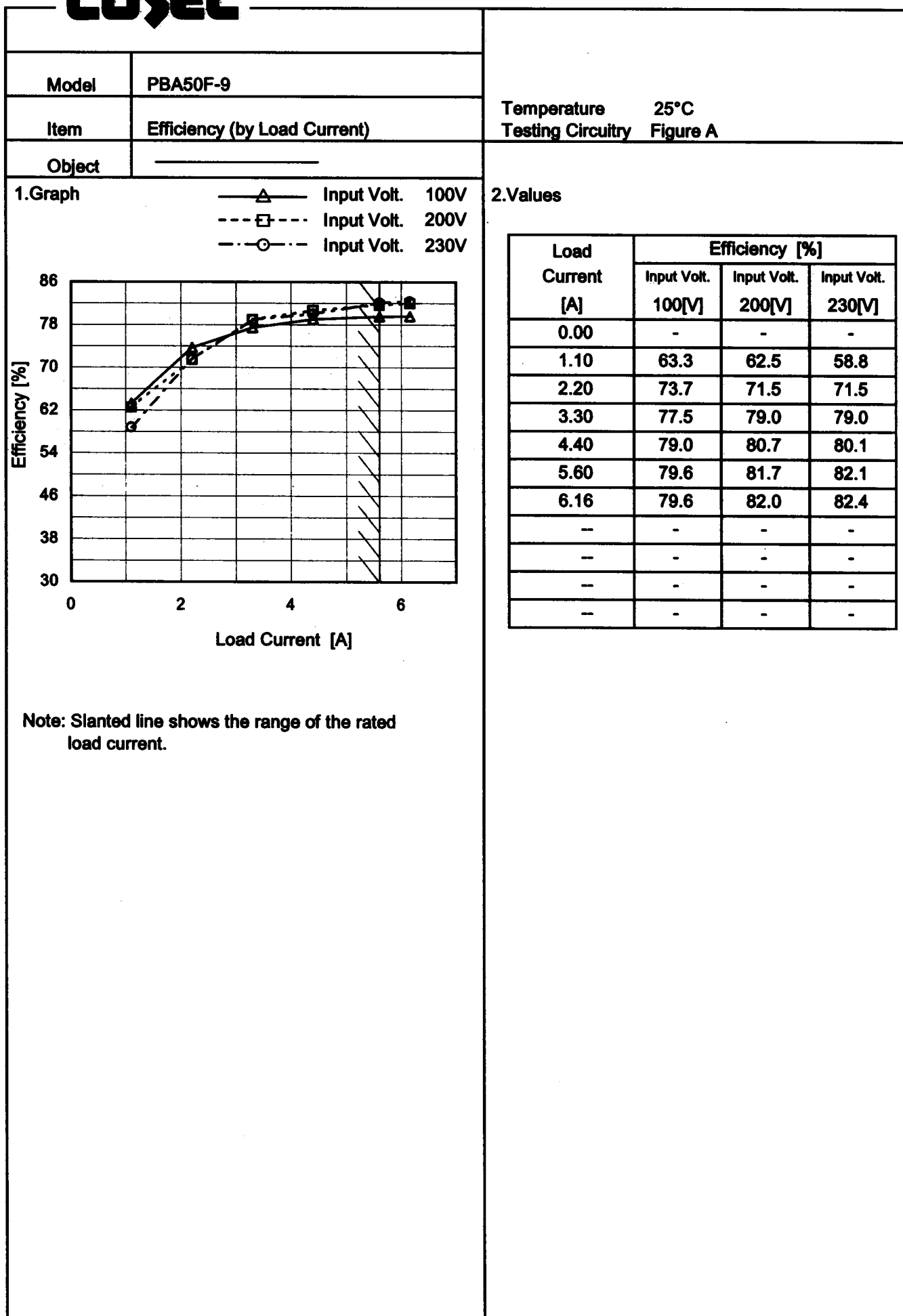
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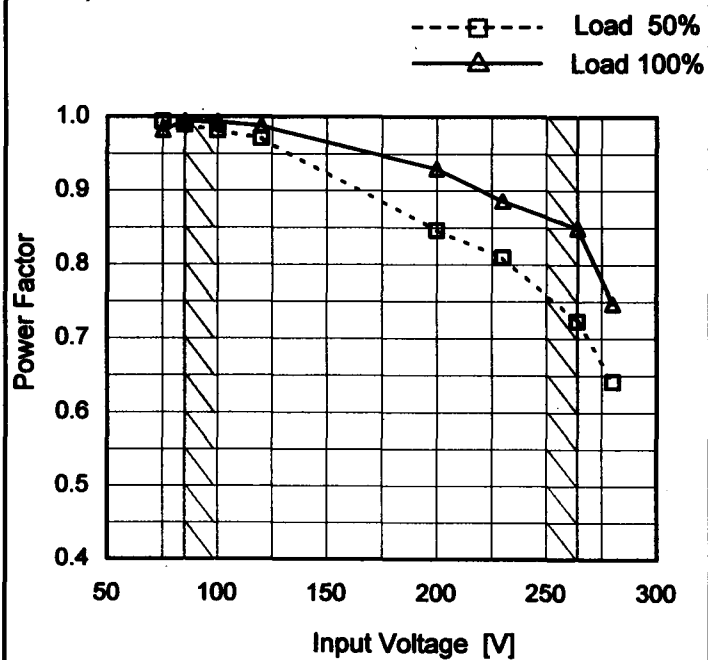
Model		PBA50F-9	
Item		Efficiency (by Input Voltage)	
Object			
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Model	PBA50F-9
Item	Power Factor (by Input Voltage)
Object	

1. Graph

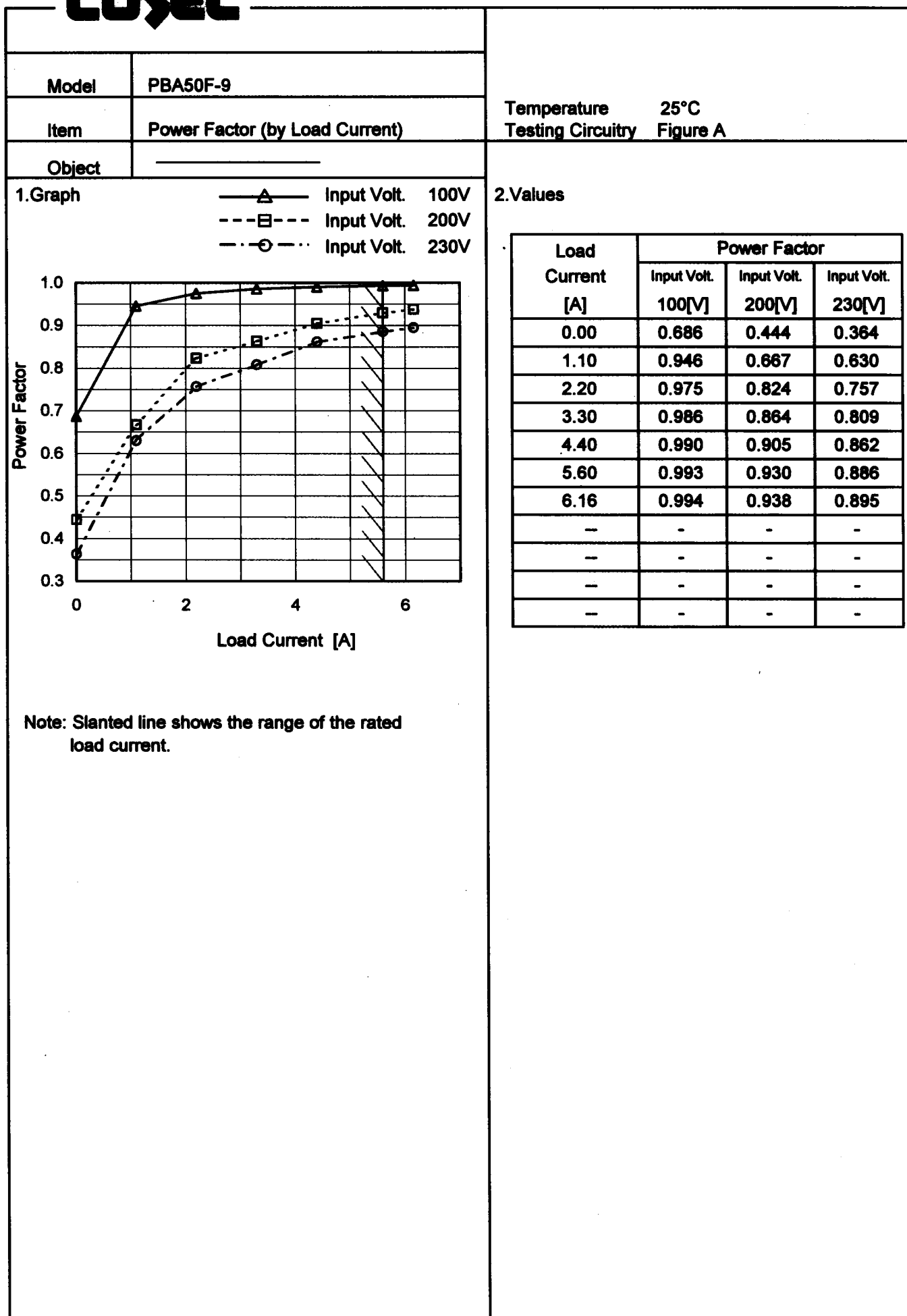


Note: Slanted line shows the range of the rated input voltage.

2. Values

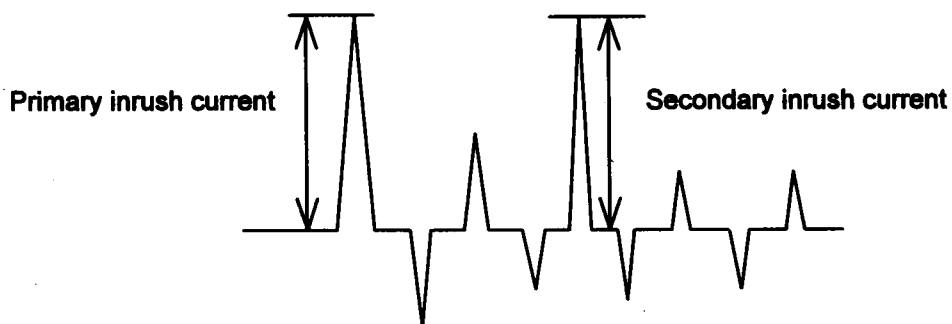
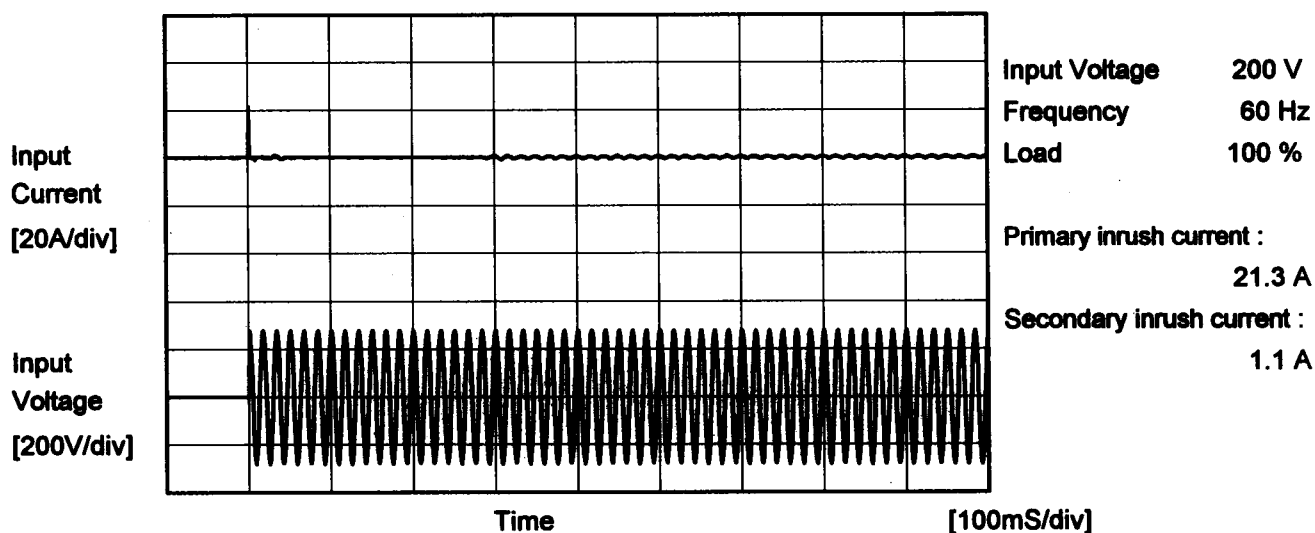
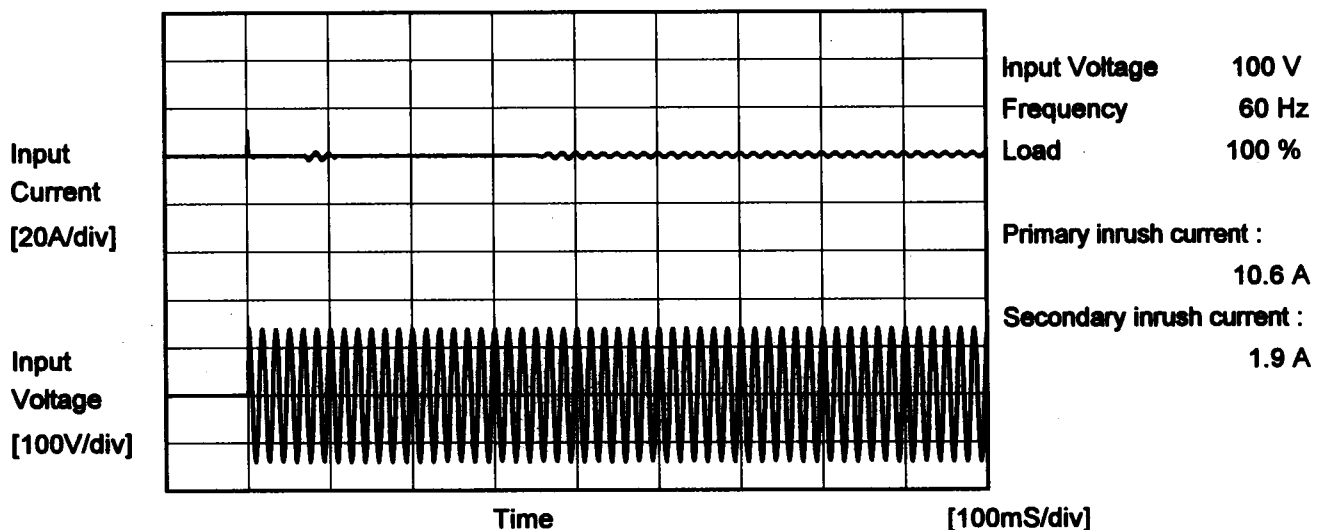
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.993	0.982
85	0.989	0.994
100	0.981	0.993
120	0.971	0.987
200	0.846	0.930
230	0.810	0.886
264	0.723	0.849
280	0.642	0.747
—	—	—

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Model	PBA50F-9	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		





		Temperature 25°C Testing Circuitry Figure B
Model	PBA50F-9	
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-9	Temperature 25°C Testing Circuitry Figure A																																																															
Item	Line Regulation																																																																
Object	+9V5.6A																																																																
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--	-	-																																																															
Note: Slanted line shows the range of the rated input voltage.																																																																	

Output Voltage [V]

9.10

9.08

9.06

9.04

9.02

9.00

8.98

8.96

50

100

150

200

250

300

Input Voltage [V]

9.046

9.041

75

85

100

120

200

230

264

280

--

9.046

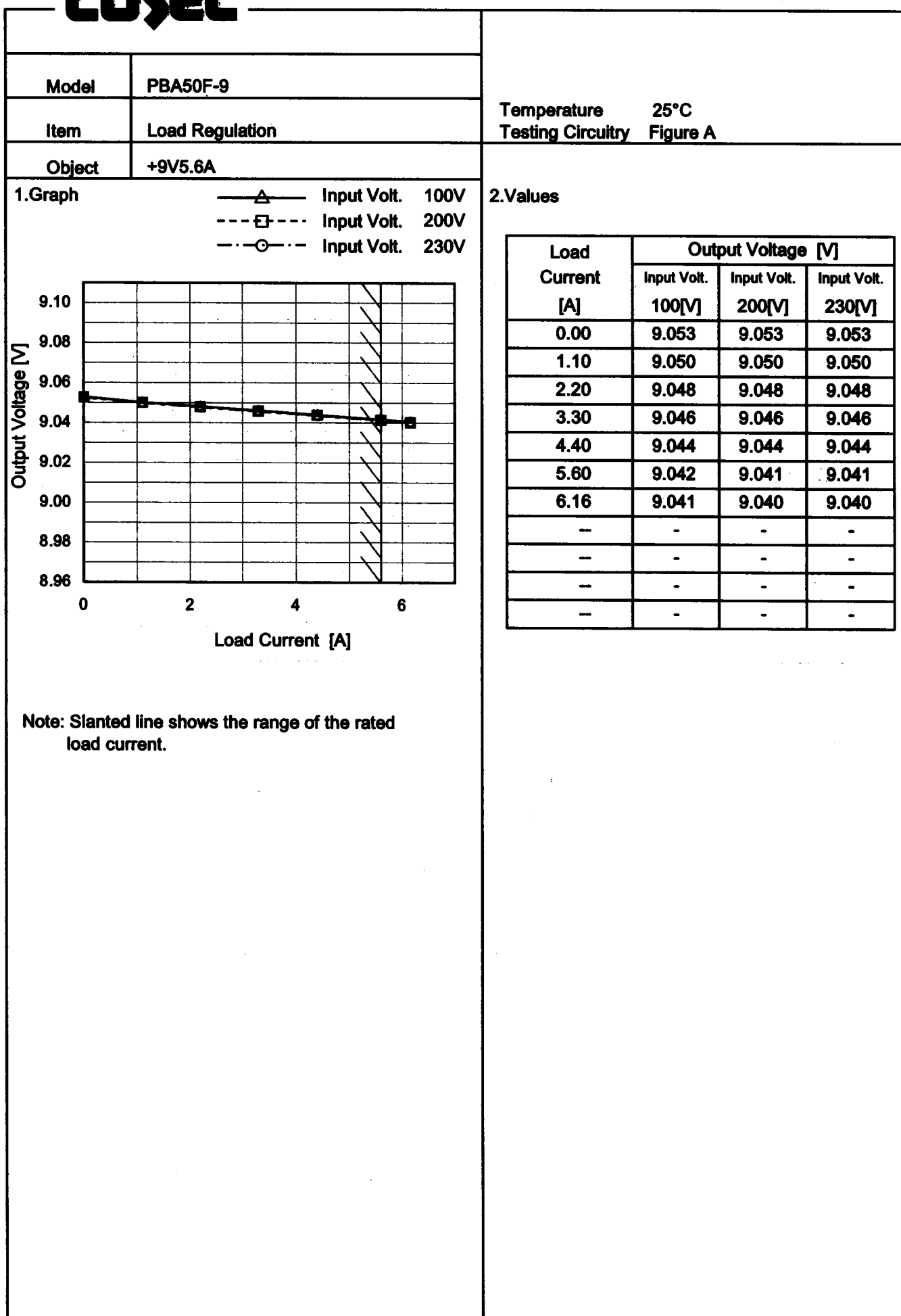
9.041

9.046

9.041

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

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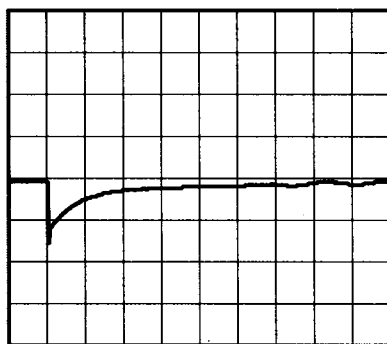
Model	PBA50F-9	Temperature 25°C Testing Circuitry Figure A	
Item	Dynamic Load Response		
Object	+9V5.6A		

Input Volt. 100 V
Cycle 1000 ms

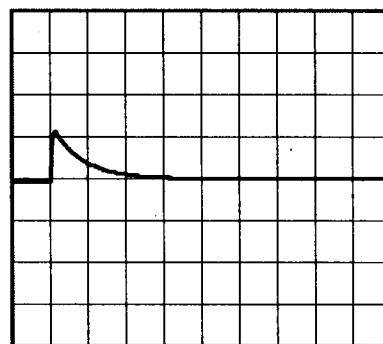
Load Current

Min. Load (0A) ←→
Load 100% (5.6A)

100 mV/div



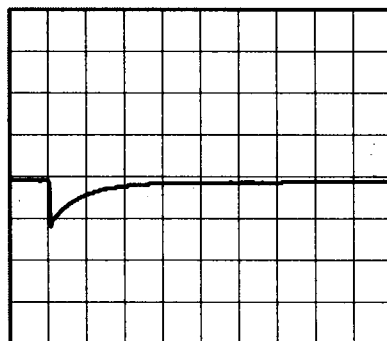
5 ms/div



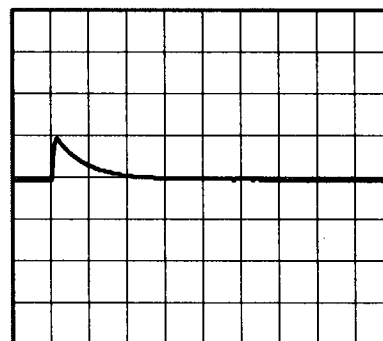
5 ms/div

Min. Load (0A) ←→
Load 50% (2.8A)

100 mV/div



5 ms/div



5 ms/div

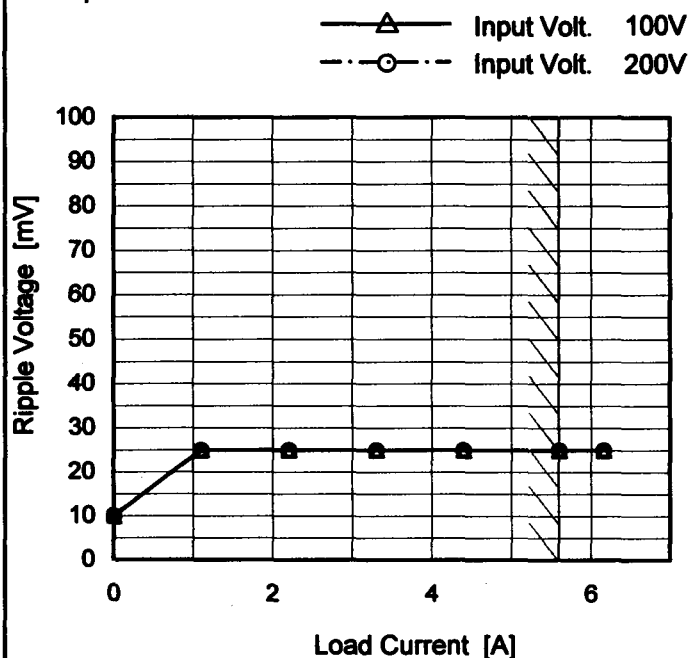
* The characteristic of AC200V is equal.

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Model	PBA50F-9
Item	Ripple Voltage (by Load Current)
Object	+9V5.6A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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.

2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	10	10
1.10	25	25
2.20	25	25
3.30	25	25
4.40	25	25
5.60	25	25
6.16	25	25
-	-	-
-	-	-
-	-	-
-	-	-

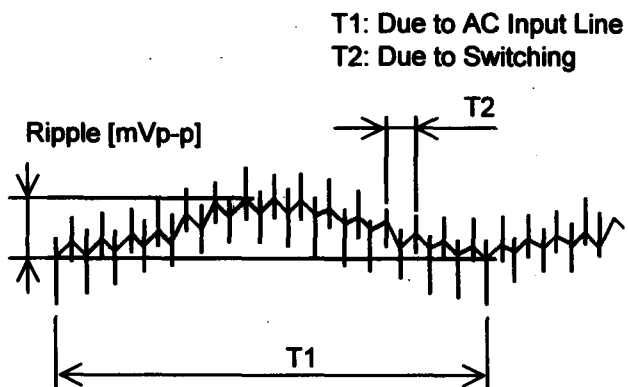
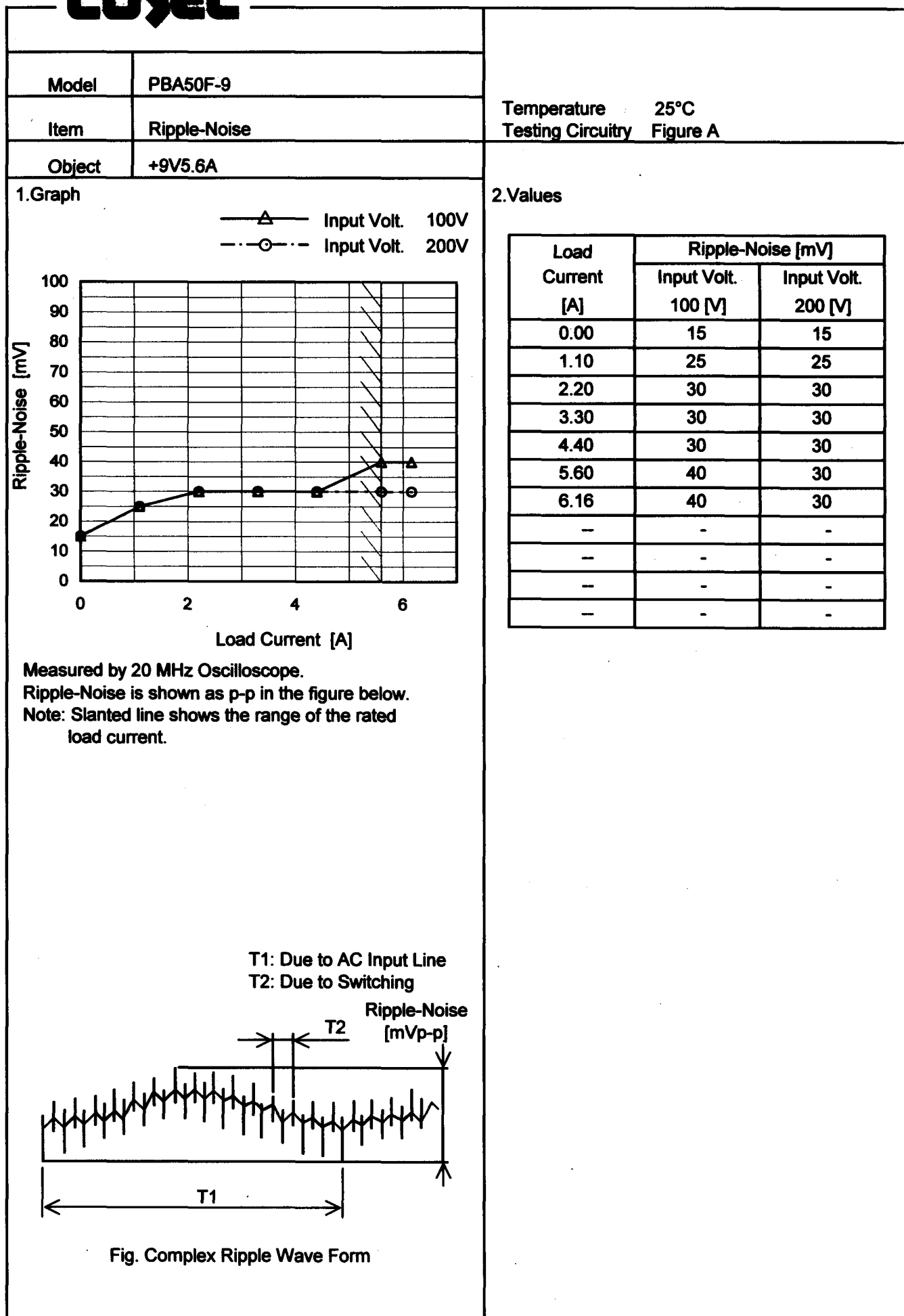


Fig. Complex Ripple Wave Form

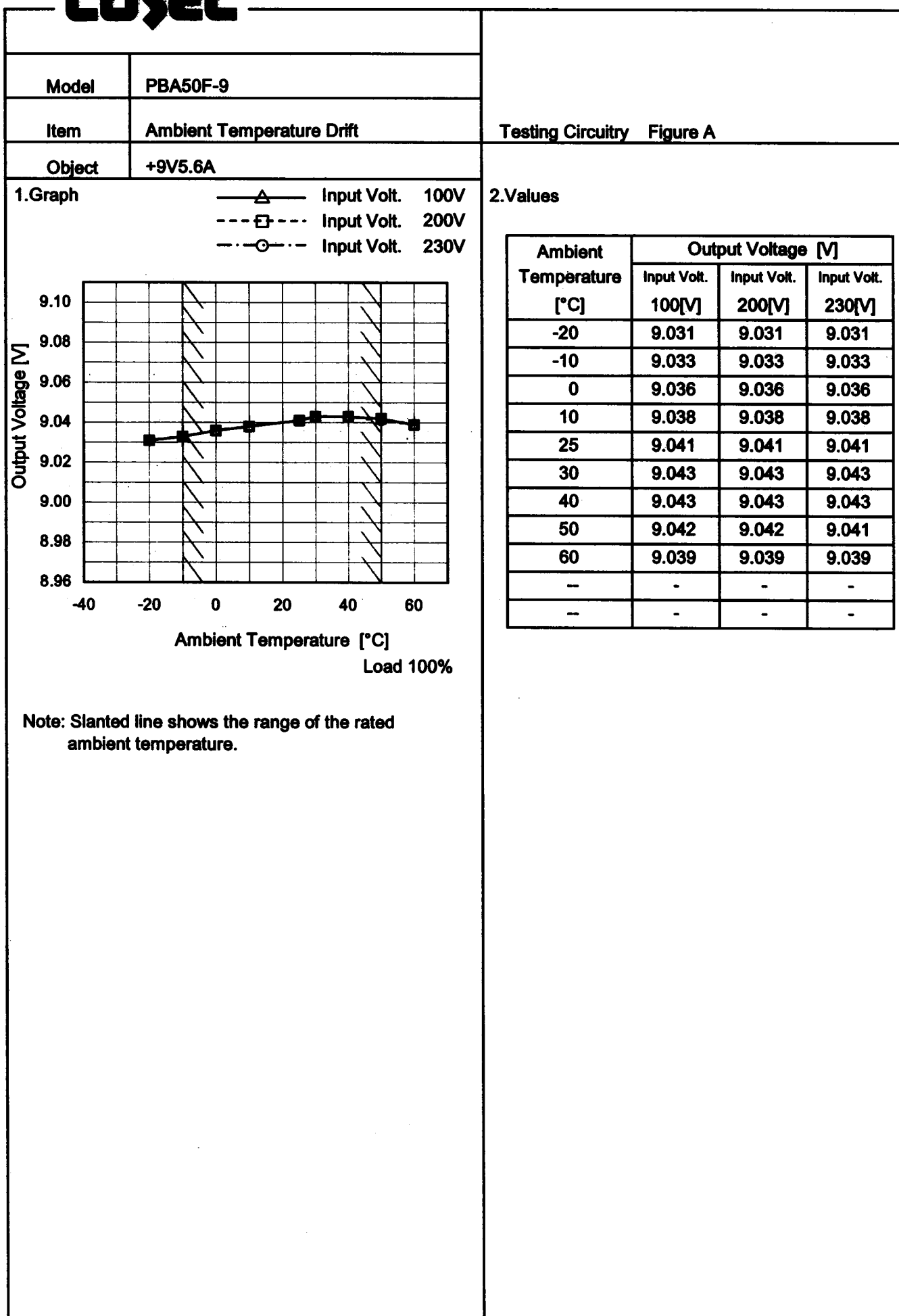
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Model		PBA50F-9																																																												
Item		Ripple Voltage (by Ambient Temp.)																																																												
Object		+9V5.6A																																																												
1.Graph		2.Values																																																												
<div><div><div><div>---□---</div><div>Input Volt. 100V</div></div><div><div>—△—</div><div>Input Volt. 200V</div></div></div><div><div><div><div><div>200</div><div>180</div><div>160</div><div>140</div><div>120</div><div>100</div><div>80</div><div>60</div><div>40</div><div>20</div><div>0</div></div><div><div>Ripple Voltage [mV]</div></div></div><div><div><div><div><div>-40</div><div>-20</div><div>0</div><div>20</div><div>40</div><div>60</div></div><div>Ambient Temperature [°C]</div></div><div>Load 100 %</div></div></div><table border="1"><caption>Graph Data Points (Estimated)</caption><thead><tr><th>Ambient Temperature [°C]</th><th>100V Input Ripple [mV]</th><th>200V Input Ripple [mV]</th></tr></thead><tbody><tr><td>-30</td><td>135</td><td>135</td></tr><tr><td>-10</td><td>60</td><td>60</td></tr><tr><td>0</td><td>40</td><td>40</td></tr><tr><td>25</td><td>25</td><td>25</td></tr><tr><td>50</td><td>20</td><td>20</td></tr></tbody></table></div></div></div>		Ambient Temperature [°C]	100V Input Ripple [mV]	200V Input Ripple [mV]	-30	135	135	-10	60	60	0	40	40	25	25	25	50	20	20	<table><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><tr><td>-30</td><td>135</td><td>135</td></tr><tr><td>-10</td><td>60</td><td>60</td></tr><tr><td>0</td><td>40</td><td>40</td></tr><tr><td>25</td><td>25</td><td>25</td></tr><tr><td>50</td><td>20</td><td>20</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>		Ambient Temperature [°C]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	-30	135	135	-10	60	60	0	40	40	25	25	25	50	20	20	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	100V Input Ripple [mV]	200V Input Ripple [mV]																																																												
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<div>Measured by 20 MHz Oscilloscope.</div> <div>Note: Slanted line shows the range of the rated ambient temperature.</div>																																																														

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		Testing Circuitry Figure A
Model	PBA50F-9	
Item	Output Voltage Accuracy	
Object	+9V5.6A	

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 - 5.6A

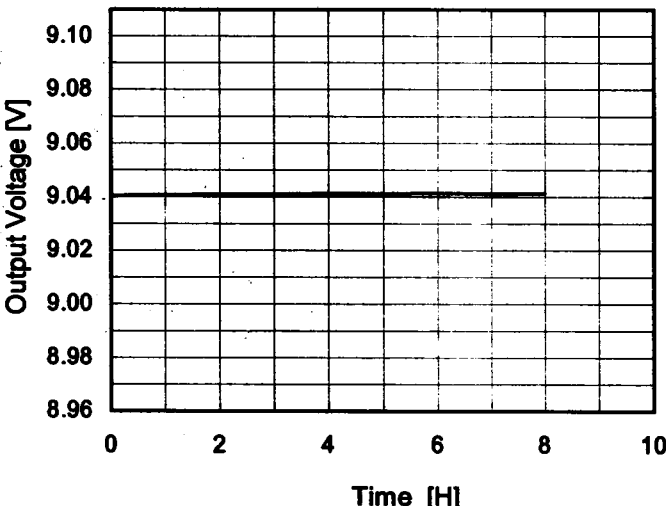
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* 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	40	264	0	9.055	±11	±0.1
Minimum Voltage	-10	200	5.6	9.033		

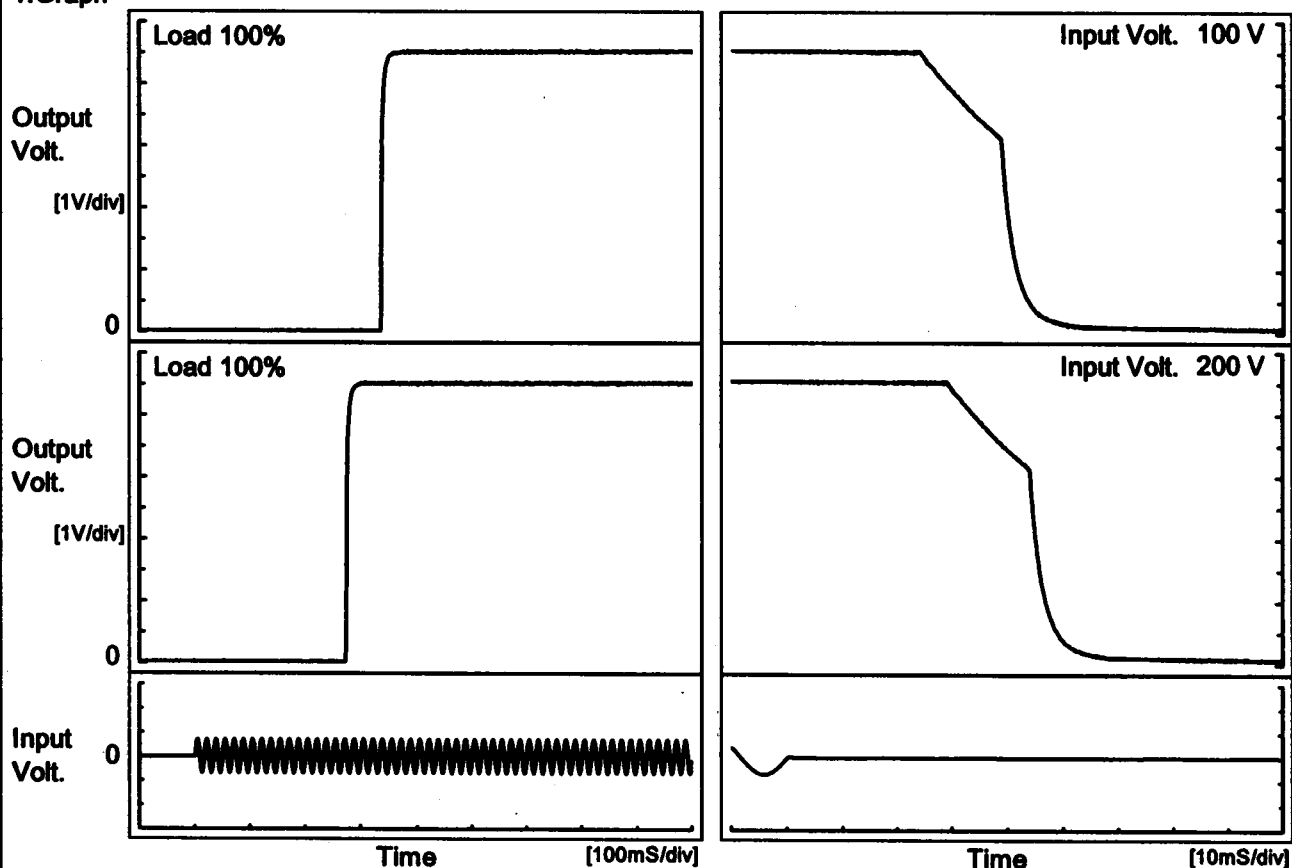
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Model	PBA50F-9																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+9V5.6A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V</p><p>Load 100%</p></div>		<table><thead><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr></thead><tbody><tr><td>0.0</td><td>9.042</td></tr><tr><td>0.5</td><td>9.041</td></tr><tr><td>1.0</td><td>9.041</td></tr><tr><td>2.0</td><td>9.041</td></tr><tr><td>3.0</td><td>9.041</td></tr><tr><td>4.0</td><td>9.041</td></tr><tr><td>5.0</td><td>9.041</td></tr><tr><td>6.0</td><td>9.041</td></tr><tr><td>7.0</td><td>9.041</td></tr><tr><td>8.0</td><td>9.041</td></tr></tbody></table>		Time since start [H]	Output Voltage [V]	0.0	9.042	0.5	9.041	1.0	9.041	2.0	9.041	3.0	9.041	4.0	9.041	5.0	9.041	6.0	9.041	7.0	9.041	8.0	9.041
Time since start [H]	Output Voltage [V]																								
0.0	9.042																								
0.5	9.041																								
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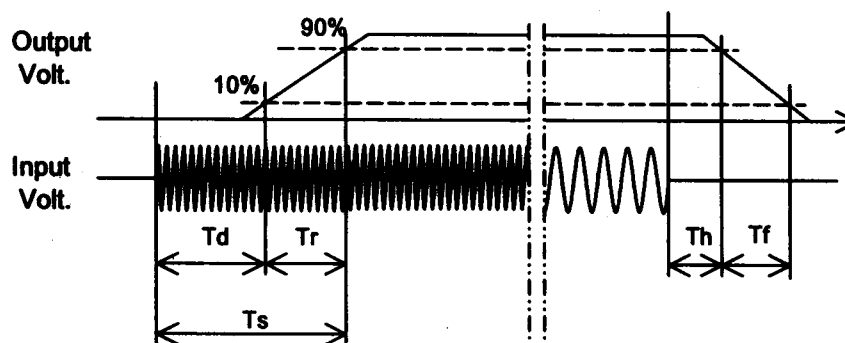
Model	PBA50F-9	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+9V5.6A		

1. Graph



2. Values

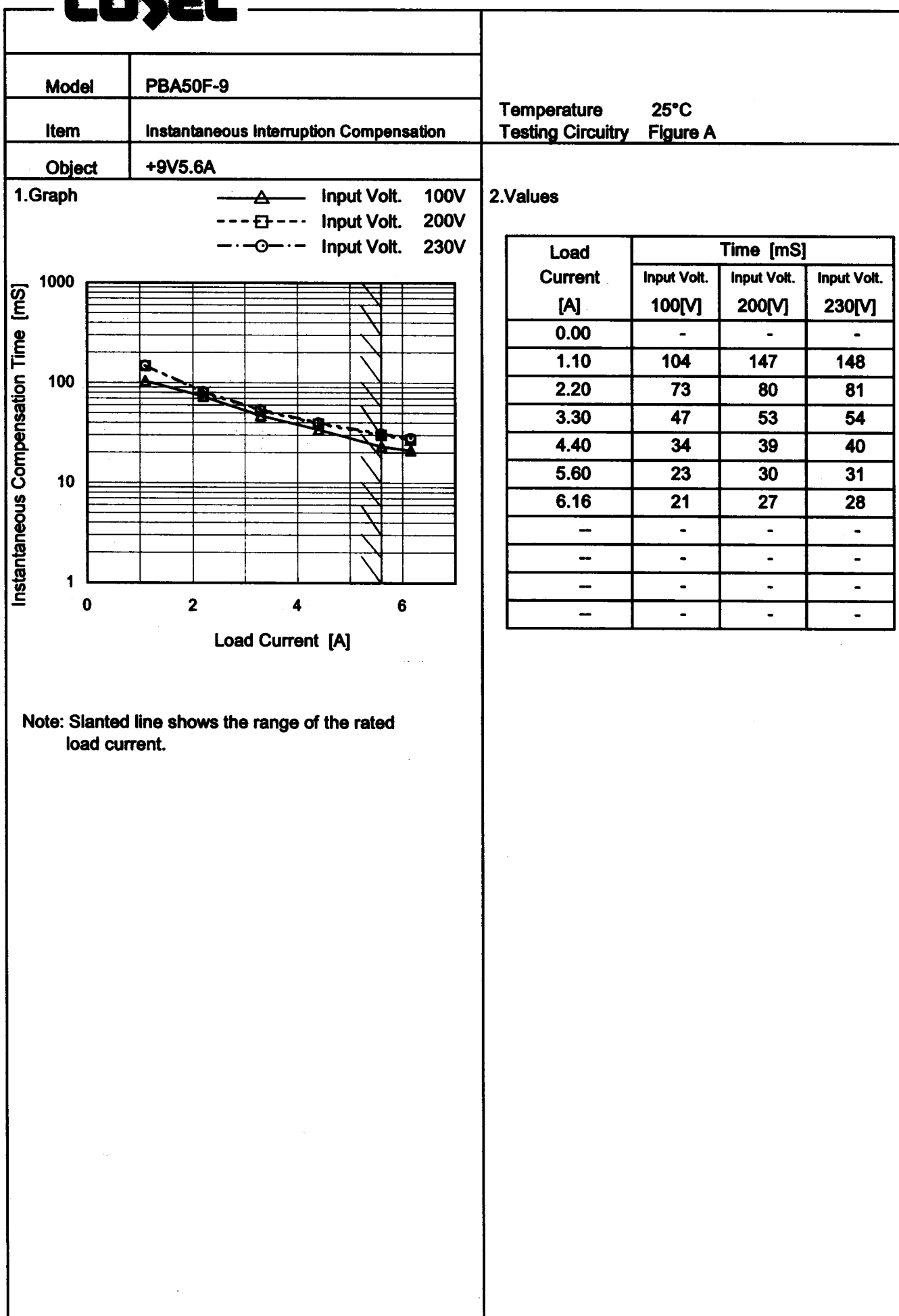
Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		336.0	6.0	342.0	28.3	15.8
200 V		274.0	6.5	280.5	33.2	16.0



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Model	PBA50F-9																																																													
Item	Hold-Up Time	Temperature	25°C																																																											
Object	+9V5.6A	Testing Circuitry	Figure A																																																											
1.Graph		2.Values																																																												
<div><div><div></div><div></div></div><div><div></div><div></div></div></div> <p>The graph shows Hold-Up Time [mS] on a logarithmic y-axis (1 to 1000) versus Input Voltage [V] on a linear x-axis (50 to 300). Two data series are plotted: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show a slight increase in hold-up time as input voltage increases. A slanted line indicates the range of the rated input voltage (approximately 80V to 280V).</p> <table><tr><th>Input Voltage [V]</th><th>Load 50%</th><th>Load 100%</th></tr><tr><td>75</td><td>51</td><td>20</td></tr><tr><td>85</td><td>53</td><td>23</td></tr><tr><td>100</td><td>56</td><td>25</td></tr><tr><td>120</td><td>58</td><td>27</td></tr><tr><td>200</td><td>62</td><td>30</td></tr><tr><td>230</td><td>63</td><td>31</td></tr><tr><td>264</td><td>64</td><td>31</td></tr><tr><td>280</td><td>64</td><td>31</td></tr></table>		Input Voltage [V]	Load 50%	Load 100%	75	51	20	85	53	23	100	56	25	120	58	27	200	62	30	230	63	31	264	64	31	280	64	31	<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>51</td><td>20</td></tr><tr><td>85</td><td>53</td><td>23</td></tr><tr><td>100</td><td>56</td><td>25</td></tr><tr><td>120</td><td>58</td><td>27</td></tr><tr><td>200</td><td>62</td><td>30</td></tr><tr><td>230</td><td>63</td><td>31</td></tr><tr><td>264</td><td>64</td><td>31</td></tr><tr><td>280</td><td>64</td><td>31</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Hold-Up Time [mS]		Load 50%	Load 100%	75	51	20	85	53	23	100	56	25	120	58	27	200	62	30	230	63	31	264	64	31	280	64	31	--	-	-
Input Voltage [V]	Load 50%	Load 100%																																																												
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<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>																																																														

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Model

PBA50F-9

Item

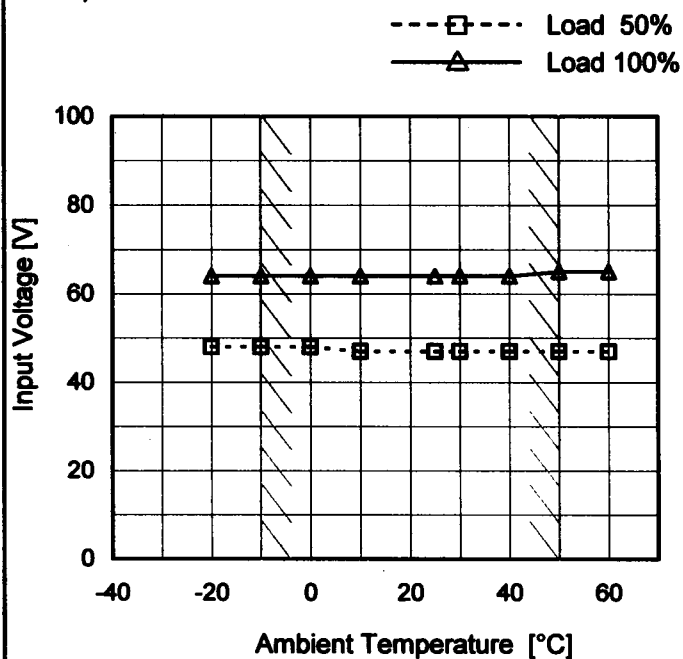
Minimum Input Voltage
for Regulated Output Voltage

Object

+9V5.6A

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	48	64
-10	48	64
0	48	64
10	47	64
25	47	64
30	47	64
40	47	64
50	47	65
60	47	65
—	—	—
—	—	—

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Model		PBA50F-9		Temperature		25°C																																										
Item		Overcurrent Protection		Testing Circuitry		Figure A																																										
Object		+9V5.6A																																														
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>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 4.5V 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>9.00</td><td>6.02</td><td>6.02</td></tr><tr><td>8.55</td><td>6.88</td><td>6.89</td></tr><tr><td>8.10</td><td>6.93</td><td>6.93</td></tr><tr><td>7.20</td><td>7.03</td><td>7.03</td></tr><tr><td>6.30</td><td>7.08</td><td>7.08</td></tr><tr><td>5.40</td><td>7.09</td><td>7.09</td></tr><tr><td>4.50</td><td>7.14</td><td>7.14</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]	9.00	6.02	6.02	8.55	6.88	6.89	8.10	6.93	6.93	7.20	7.03	7.03	6.30	7.08	7.08	5.40	7.09	7.09	4.50	7.14	7.14	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Model		PBA50F-9
Item		Overvoltage Protection
Object		+9V5.6A

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

200V

Operating Point [V]

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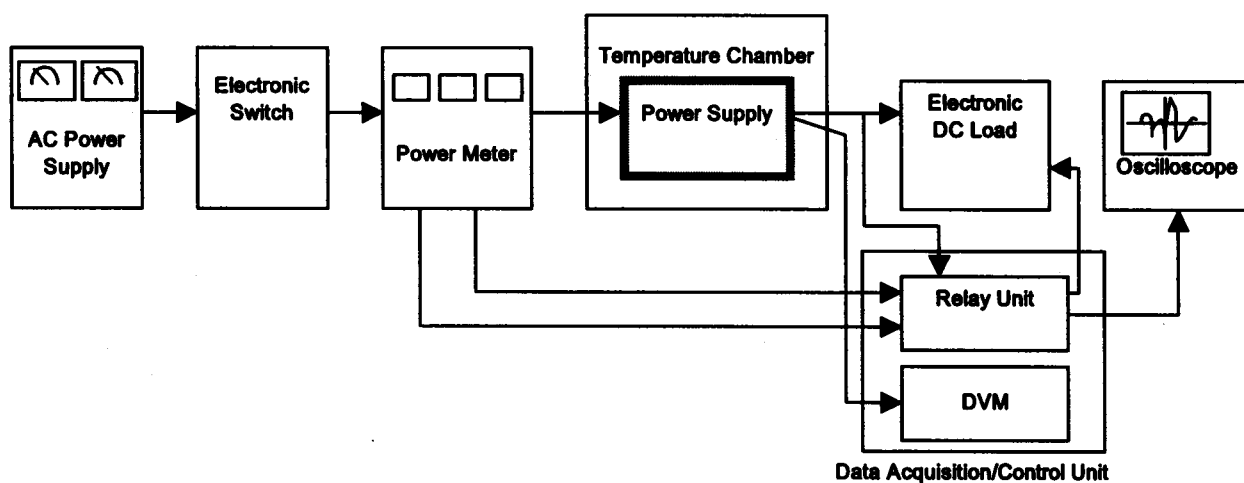


Figure A

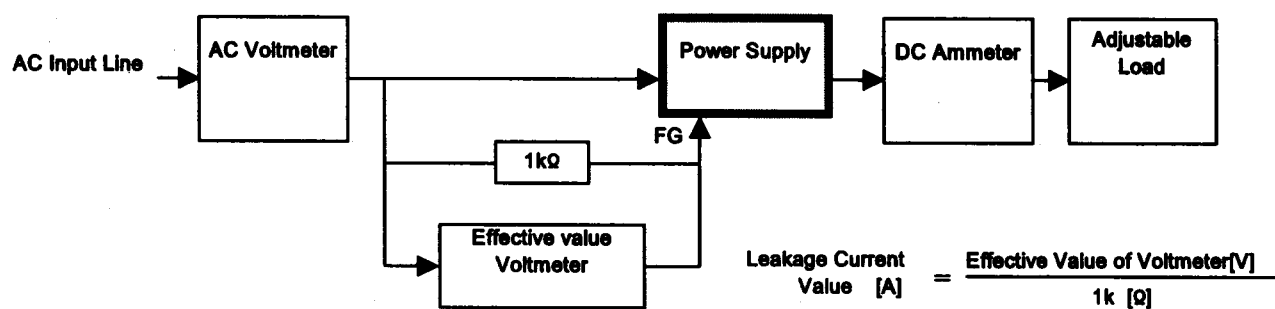


Figure B (DEN-AN)

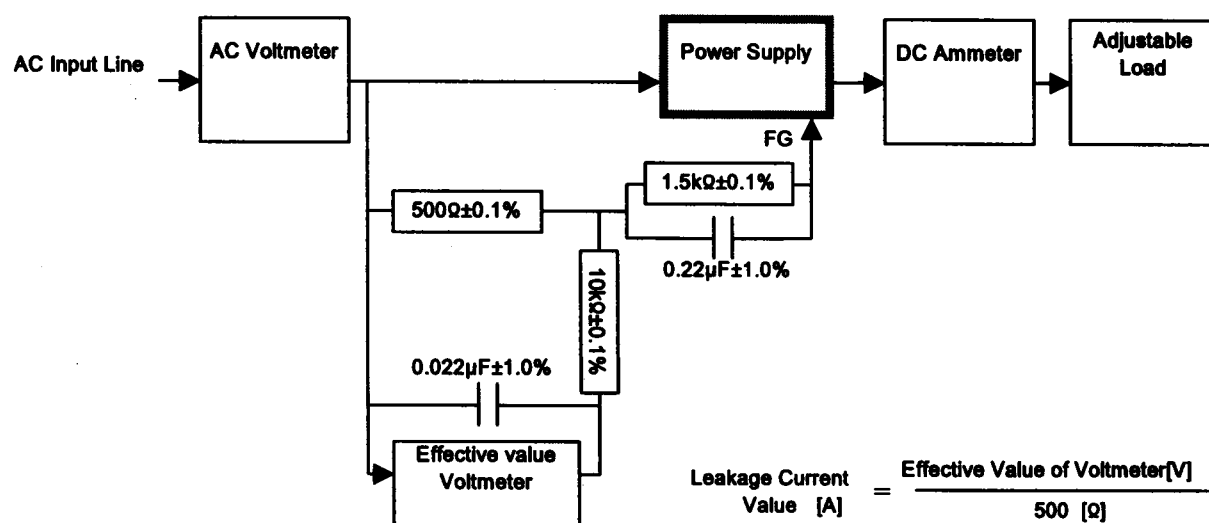


Figure B (IEC60950)