

TEST DATA OF PLA100F-24

Regulated DC Power Supply
May 23, 2013

Approved by : Katsumi Ishikawa
Katsumi Ishikawa Design Manager

Prepared by : Naoki Fujita
Naoki Fujita Design Engineer

COSEL CO.,LTD.



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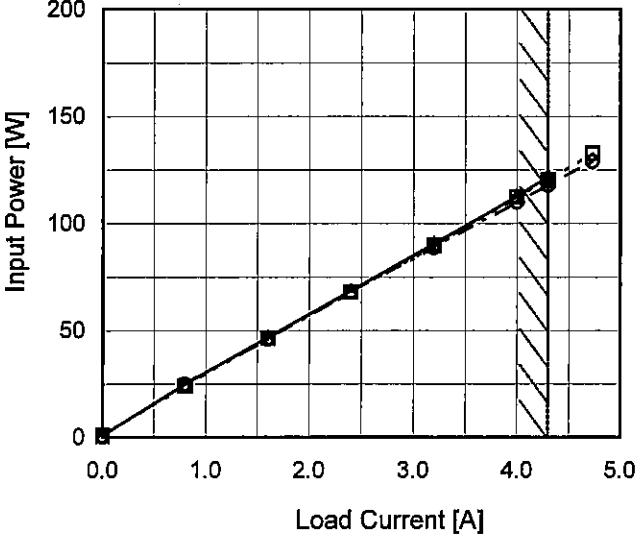
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1.Graph	<p>—▲— Input Volt. 100V - - □ - - Input Volt. 115V - - ○ - - Input Volt. 230V</p>  <p>The graph plots Input Power [W] on the Y-axis (0 to 200) against Load Current [A] on the X-axis (0.0 to 5.0). Three curves are shown for different input voltages: 100V (solid line with triangles), 115V (dashed line with squares), and 230V (dotted line with circles). A vertical slanted line is drawn through the point where the 100V curve reaches approximately 125W, indicating the rated load current range.</p>	2.Values																																																					
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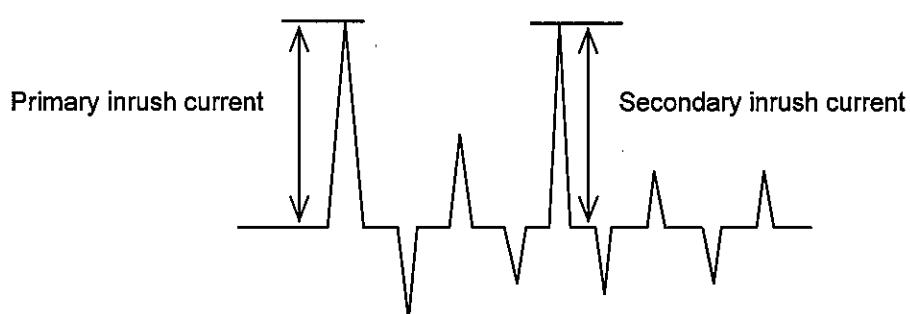
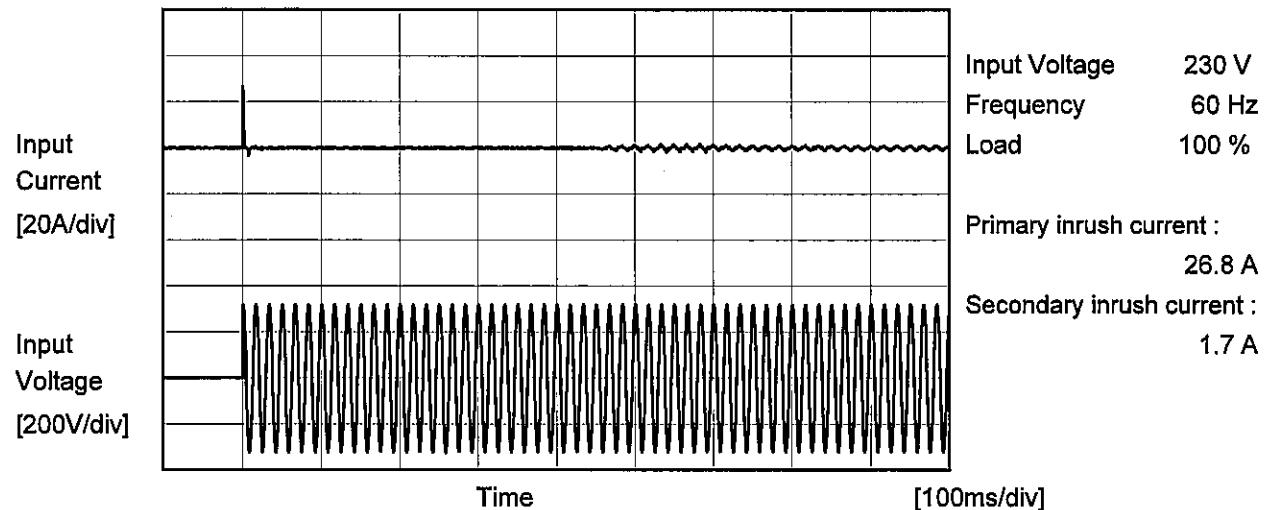
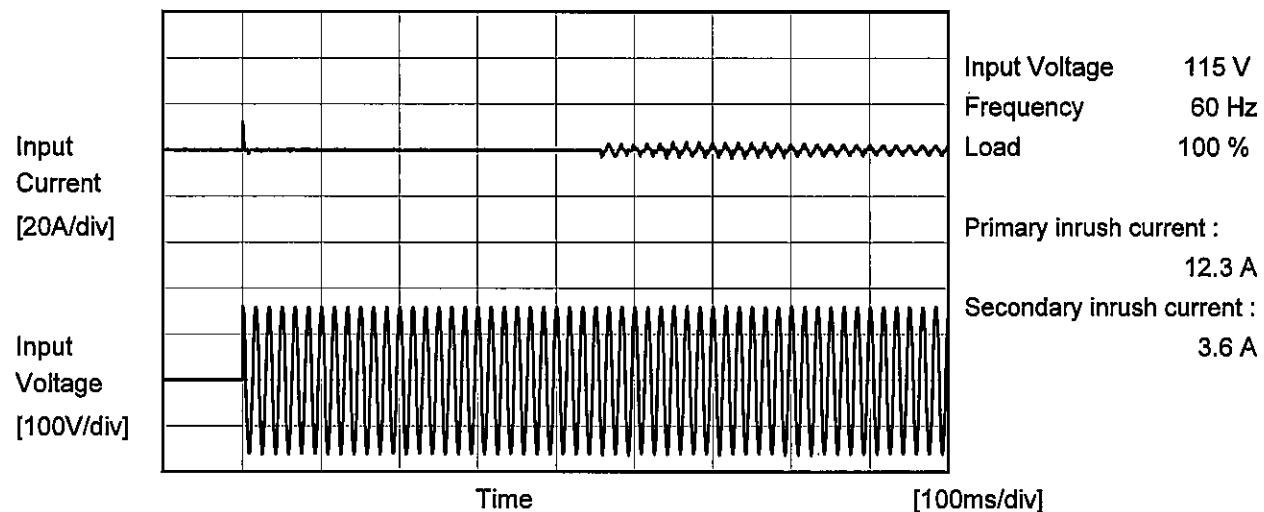
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Item	Inrush Current	
Object	_____	





Model	PLA100F-24	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current		
Object	<hr/>		

1. Results

Standards		Input Volt.			Note
		100[V]	115[V]	240[V]	
DEN-AN	Both phases	0.34	0.34	0.62	Operation
	One of phases	0.30	0.34	0.77	Stand by
IEC60950-1	Both phases	0.25	0.28	0.55	Operation
	One of phases	0.27	0.32	0.71	Stand by

The value for "One of phases" 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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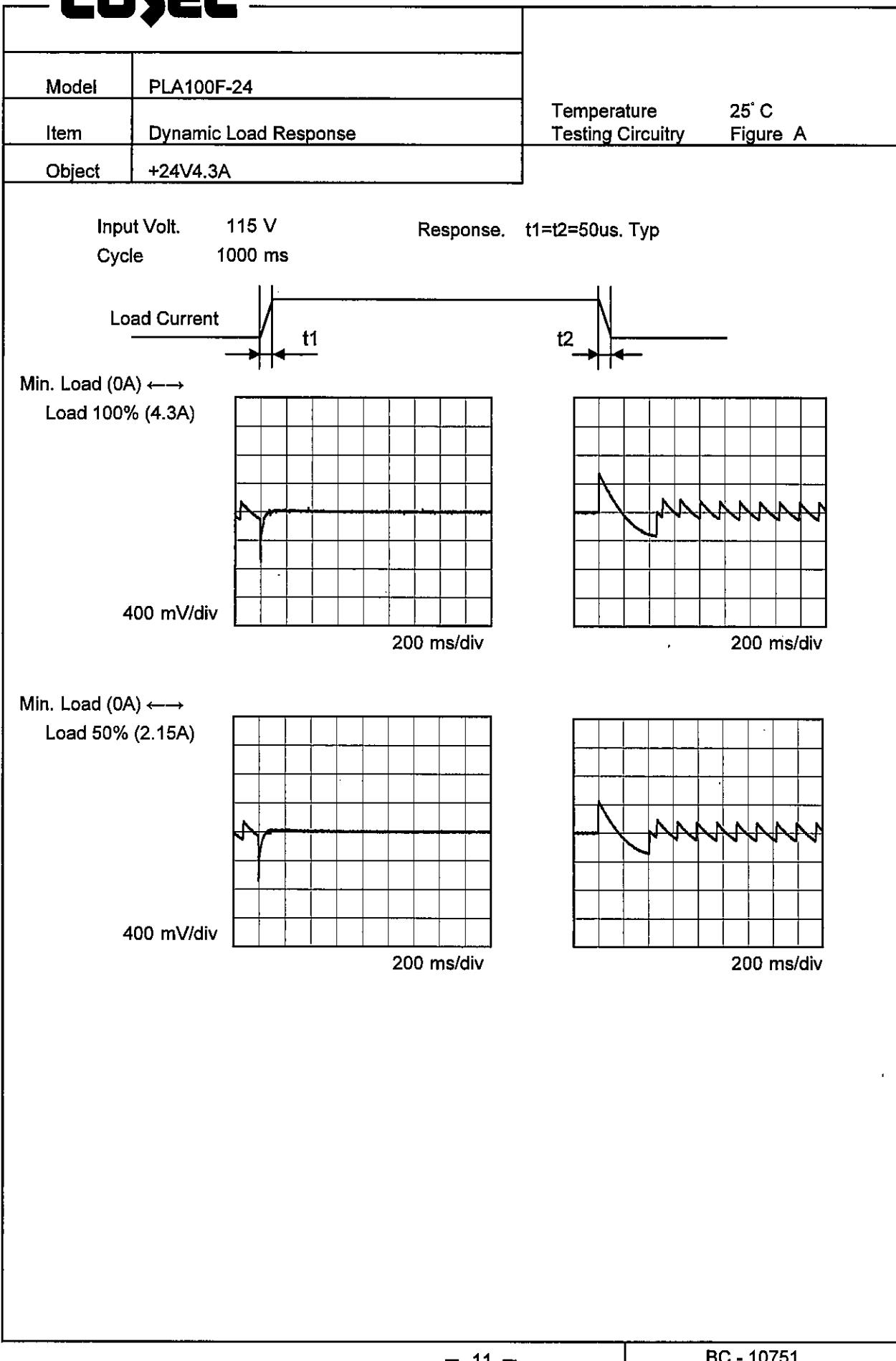
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1.60	24.116	24.115	24.114																														
2.40	24.109	24.109	24.108																														
3.20	24.104	24.104	24.103																														
4.00	24.099	24.099	24.098																														
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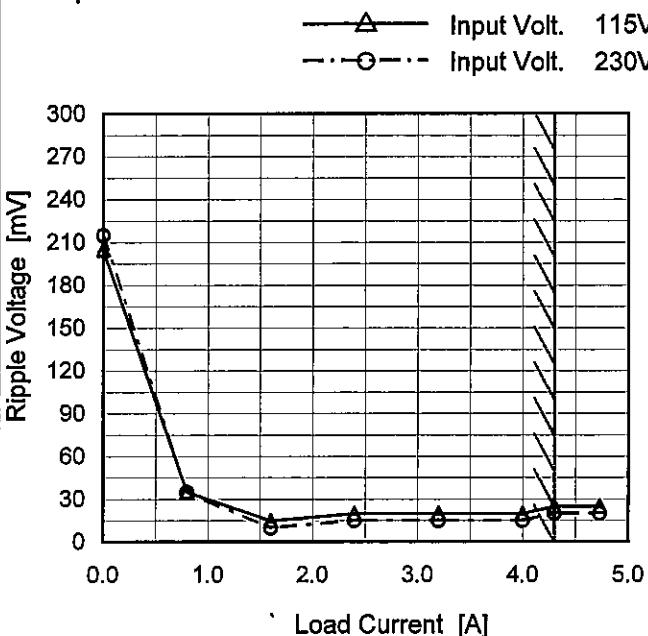
Note: Slanted line shows the range of the rated load current.

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Model	PLA100F-24
Item	Ripple Voltage (by Load Current)
Object	+24V4.3A

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.

Temperature 25°C
Testing Circuitry Figure C

2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0.000	205	215
0.800	35	35
1.600	15	10
2.400	20	15
3.200	20	15
4.000	20	15
4.300	25	20
4.730	25	20
--	-	-
--	-	-
--	-	-

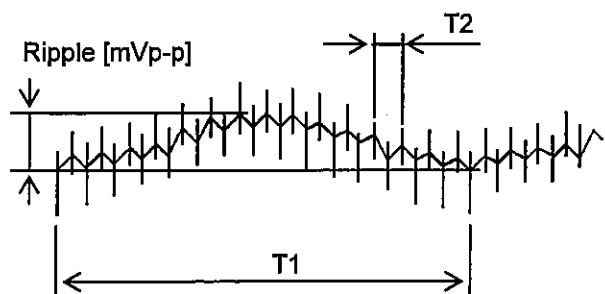
T1: Due to AC Input Line
T2: Due to Switching

Fig. Complex Ripple Wave Form

COSEL

Model	PLA100F-24	Temperature Testing Circuitry 25°C Figure C																																						
Item	Ripple-Noise																																							
Object	+24V4.3A																																							
1.Graph		2.Values																																						
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 300 mV, and the X-axis ranges from 0.0 to 5.0 A. Two curves are plotted: Input Volt. 115V (solid line with open circles) and Input Volt. 230V (dashed line with open circles). Both curves show a sharp decrease in noise from 0.0A to 1.0A, followed by a plateau around 50-60 mV. A slanted line indicates the rated load current range.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 115 [V]</th> <th>Input Volt. 230 [V]</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>230</td> <td>245</td> </tr> <tr> <td>0.800</td> <td>70</td> <td>65</td> </tr> <tr> <td>1.600</td> <td>50</td> <td>50</td> </tr> <tr> <td>2.400</td> <td>55</td> <td>50</td> </tr> <tr> <td>3.200</td> <td>55</td> <td>50</td> </tr> <tr> <td>4.000</td> <td>55</td> <td>50</td> </tr> <tr> <td>4.300</td> <td>55</td> <td>50</td> </tr> <tr> <td>4.730</td> <td>60</td> <td>55</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>	Load Current [A]	Ripple-Noise [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0.000	230	245	0.800	70	65	1.600	50	50	2.400	55	50	3.200	55	50	4.000	55	50	4.300	55	50	4.730	60	55	--	-	-	--	-	-	--	-	-
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<p>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.</p> <p>Diagram illustrating a Complex Ripple Wave Form. The diagram shows a waveform with two distinct components: T1 (Due to AC Input Line) and T2 (Due to Switching). The total width of the noise burst is indicated by T1, and the peak-to-peak amplitude is indicated by T2.</p>																																								

Fig. Complex Ripple Wave Form

COSEL

Model PLA100F-24 Item Ripple Voltage (by Ambient Temp.) Object +24V4.3A	Testing Circuitry Figure C																																						
	1. Graph	2.Values																																					
	<p style="text-align: center;"> - - - □ - - - Input Volt. 115V — ▲ — Input Volt. 230V </p> <table border="1"> <caption>Data points estimated from Figure C Graph</caption> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Ripple Voltage [mV] (Input Volt. 115V)</th> <th>Ripple Voltage [mV] (Input Volt. 230V)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>40</td><td>35</td></tr> <tr><td>0</td><td>40</td><td>35</td></tr> <tr><td>20</td><td>25</td><td>20</td></tr> <tr><td>40</td><td>15</td><td>15</td></tr> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV] (Input Volt. 115V)	Ripple Voltage [mV] (Input Volt. 230V)	-20	40	35	0	40	35	20	25	20	40	15	15																							
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Model	PLA100F-24
Item	Ambient Temperature Drift
Object	+24V4.3A

1. Graph

Output Voltage [V]

Ambient Temperature [°C]

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

Ambient Temperature [°C]	Output Voltage [V] (Input Volt. 100V)	Output Voltage [V] (Input Volt. 115V)	Output Voltage [V] (Input Volt. 230V)
-20	24.10	24.10	24.10
0	24.10	24.10	24.10
20	24.09	24.09	24.09
40	24.08	24.08	24.08
60	24.05	24.05	24.05

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt.	Input Volt.	Input Volt.
-20	100[V]	115[V]	230[V]
-10	24.103	24.092	24.086
0	24.105	24.104	24.101
10	24.104	24.102	24.101
20	24.104	24.100	24.100
25	24.101	24.098	24.099
35	24.099	24.097	24.096
45	24.096	24.094	24.093
55	24.094	24.092	24.093
65	24.053	24.054	24.053
—	24.026	24.026	24.023

Note: In case of Input Volt. 100V, Load 90%.

Other case Load 100%.



Model	PLA100F-24	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+24V4.3A	

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 ~ 45°C

Input Voltage : 115 ~ 264V

Load Current : 1.29 ~ 4.3A

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

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	230	1.29	24.121	±15	±0.1
Minimum Voltage	45	115	4.3	24.092		

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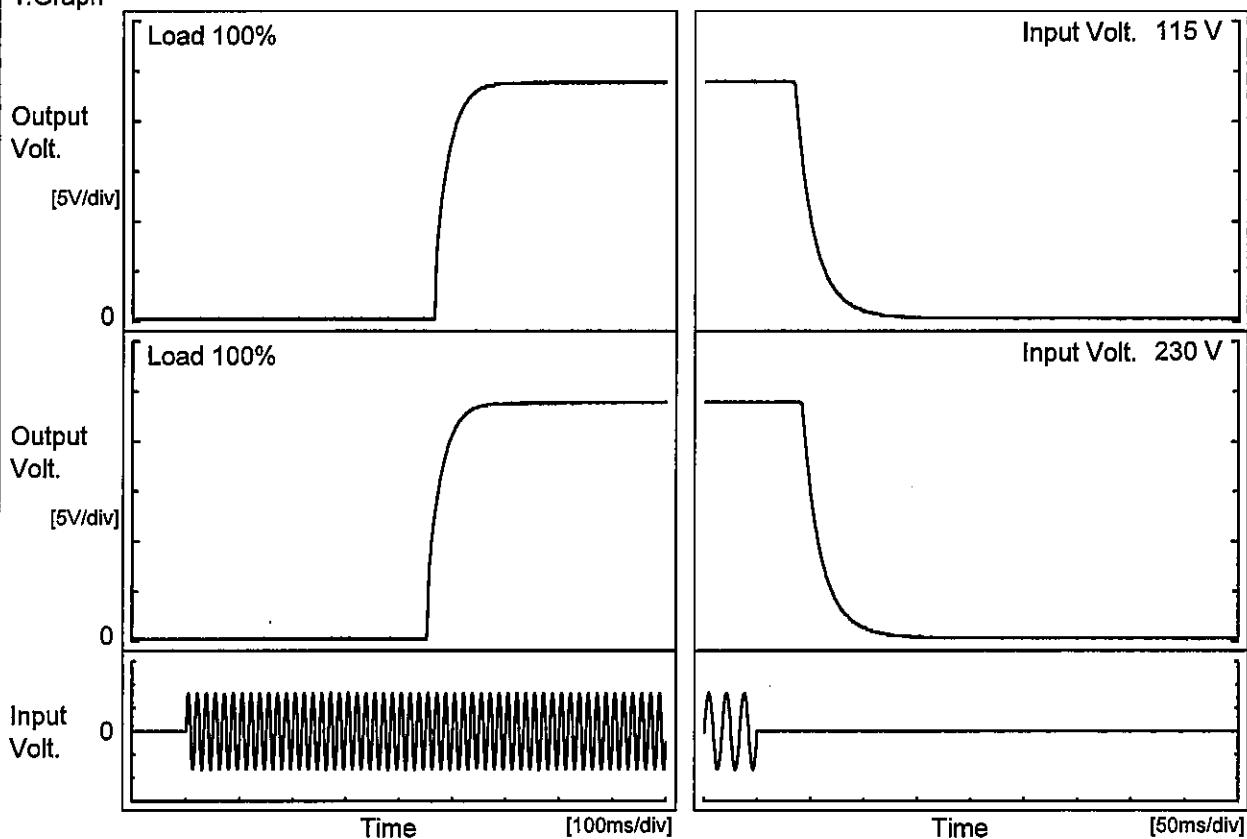
Model	PLA100F-24	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+24V4.3A																								
1. Graph																									
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 230V Load 100%</p>																									
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<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>24.096</td></tr> <tr><td>0.5</td><td>24.094</td></tr> <tr><td>1.0</td><td>24.094</td></tr> <tr><td>2.0</td><td>24.094</td></tr> <tr><td>3.0</td><td>24.094</td></tr> <tr><td>4.0</td><td>24.094</td></tr> <tr><td>5.0</td><td>24.094</td></tr> <tr><td>6.0</td><td>24.094</td></tr> <tr><td>7.0</td><td>24.094</td></tr> <tr><td>8.0</td><td>24.094</td></tr> </tbody> </table>				Time since start [H]	Output Voltage [V]	0.0	24.096	0.5	24.094	1.0	24.094	2.0	24.094	3.0	24.094	4.0	24.094	5.0	24.094	6.0	24.094	7.0	24.094	8.0	24.094
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* The characteristic of AC115V is equal.

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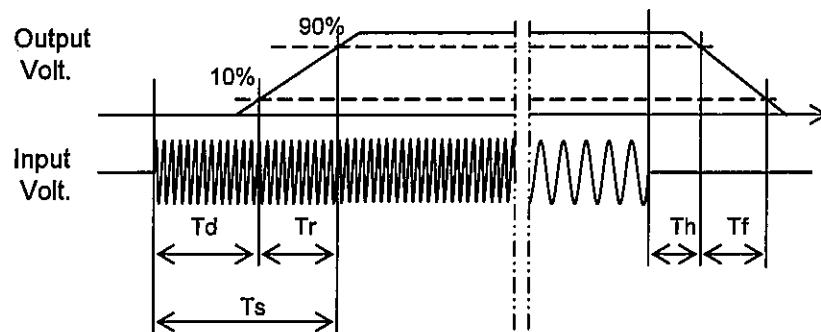
Model	PLA100F-24	Temperature Testing Circuitry 25°C Figure A
Item	Rise and Fall Time	
Object	+24V4.3A	

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[ms]
115 V		468.0	56.5	524.5	36.0	40.3	
230 V		454.5	56.5	511.0	43.5	39.8	



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Model	PLA100F-24	Temperature Testing Circuitry	25°C Figure A																																
Item	Hold-Up Time																																		
Object	+24V4.3A																																		
1. Graph		2. Values																																	
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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. Note: Slanted line shows the range of the rated input voltage.</p>																																			

COSEL

Model	PLA100F-24	Temperature Testing Circuitry	25°C Figure A																																																				
Item	Instantaneous Interruption Compensation																																																						
Object	+24V4.3A																																																						
1.Graph	<p>—▲— Input Volt. 100V</p> <p>- - □ - - Input Volt. 115V</p> <p>- - ○ - - 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>115V [ms]</th> <th>230V [ms]</th> </tr> </thead> <tbody> <tr><td>0.80</td><td>181</td><td>181</td><td>222</td></tr> <tr><td>1.60</td><td>92</td><td>93</td><td>114</td></tr> <tr><td>2.40</td><td>62</td><td>62</td><td>77</td></tr> <tr><td>3.20</td><td>47</td><td>47</td><td>57</td></tr> <tr><td>4.00</td><td>37</td><td>37</td><td>46</td></tr> <tr><td>4.30</td><td>31</td><td>32</td><td>40</td></tr> <tr><td>4.73</td><td>29</td><td>29</td><td>36</td></tr> </tbody> </table>	Load Current [A]	100V [ms]	115V [ms]	230V [ms]	0.80	181	181	222	1.60	92	93	114	2.40	62	62	77	3.20	47	47	57	4.00	37	37	46	4.30	31	32	40	4.73	29	29	36																						
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Note: Slanted line shows the range of the rated load current.

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Model PLA100F-24 Item Minimum Input Voltage for Regulated Output Voltage Object +24V4.3A	Testing Circuitry Figure A																																						
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COSEL

Model	PLA100F-24	Temperature Testing Circuitry 25°C Figure A																																												
Item	Overcurrent Protection																																													
Object	+24V4.3A																																													
1. Graph		2. Values																																												
<p>The graph plots Output Voltage [V] on the Y-axis (0 to 30) against Load Current [A] on the X-axis (0 to 8). Two curves are shown: one for Input Volt. 115V and one for Input Volt. 230V. Both curves show a slight decrease in output voltage as load current increases. A slanted line is drawn across the graph, representing the range of the rated load current.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="2">Load Current [A]</th> </tr> <tr> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>22.8</td><td>5.30</td><td>5.45</td></tr> <tr><td>21.6</td><td>5.38</td><td>5.52</td></tr> <tr><td>19.2</td><td>5.51</td><td>5.66</td></tr> <tr><td>16.8</td><td>5.68</td><td>5.83</td></tr> <tr><td>14.4</td><td>5.83</td><td>5.98</td></tr> <tr><td>12.0</td><td>6.00</td><td>6.14</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> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Output Voltage [V]	Load Current [A]		Input Volt. 115[V]	Input Volt. 230[V]	22.8	5.30	5.45	21.6	5.38	5.52	19.2	5.51	5.66	16.8	5.68	5.83	14.4	5.83	5.98	12.0	6.00	6.14	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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22.8	5.30	5.45																																												
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19.2	5.51	5.66																																												
16.8	5.68	5.83																																												
14.4	5.83	5.98																																												
12.0	6.00	6.14																																												
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Note: Slanted line shows the range of the rated load current.

Intermittent operation occurs when the output voltage is from 10.7V to 0V.

COSEL

Model PLA100F-24 Item Overvoltage Protection Object +24V4.3A	Testing Circuitry Figure A																																						
	2.Values																																						
	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr> <td>-20</td><td>30.66</td><td>30.66</td></tr> <tr> <td>-10</td><td>30.66</td><td>30.66</td></tr> <tr> <td>0</td><td>30.66</td><td>30.66</td></tr> <tr> <td>10</td><td>30.66</td><td>30.66</td></tr> <tr> <td>20</td><td>30.66</td><td>30.66</td></tr> <tr> <td>25</td><td>30.66</td><td>30.66</td></tr> <tr> <td>35</td><td>30.66</td><td>30.66</td></tr> <tr> <td>45</td><td>30.66</td><td>30.66</td></tr> <tr> <td>55</td><td>30.65</td><td>30.65</td></tr> <tr> <td>65</td><td>30.65</td><td>30.65</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> </tbody> </table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 115[V]	Input Volt. 230[V]	-20	30.66	30.66	-10	30.66	30.66	0	30.66	30.66	10	30.66	30.66	20	30.66	30.66	25	30.66	30.66	35	30.66	30.66	45	30.66	30.66	55	30.65	30.65	65	30.65	30.65	--	-
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65	30.65	30.65																																					
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1.Graph <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend: Input Volt. 115V (solid line), Input Volt. 230V (dashed line)</p>																																							
<p>Note: Slanted line shows the range of the rated ambient temperature.</p>																																							

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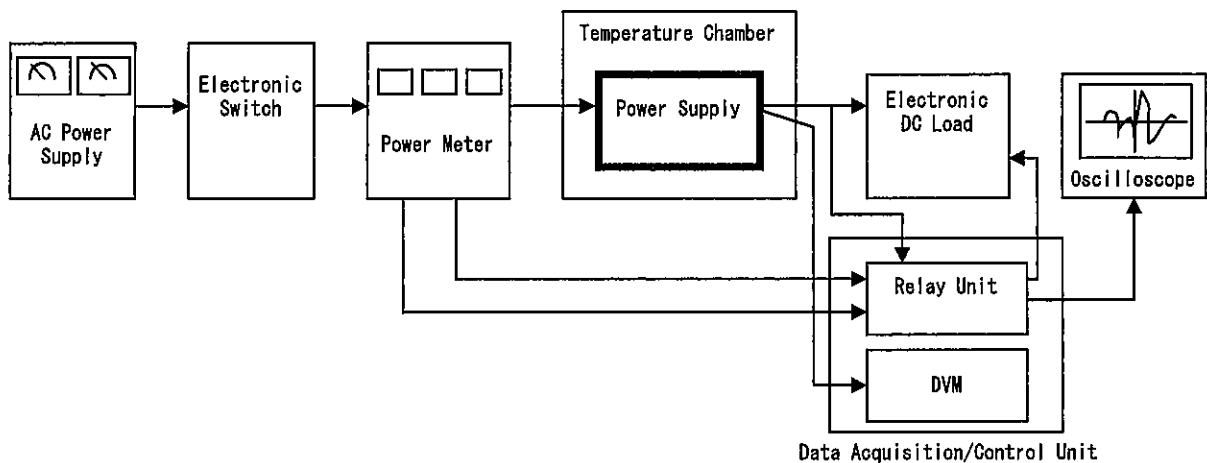


Figure A

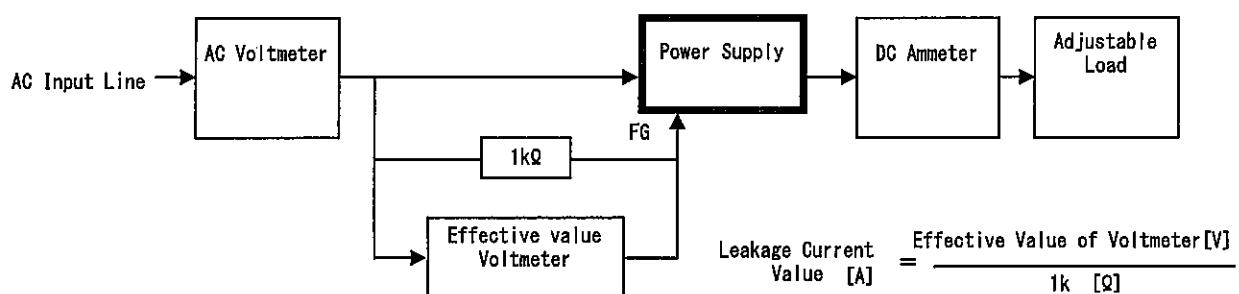


Figure B (DEN-AN)

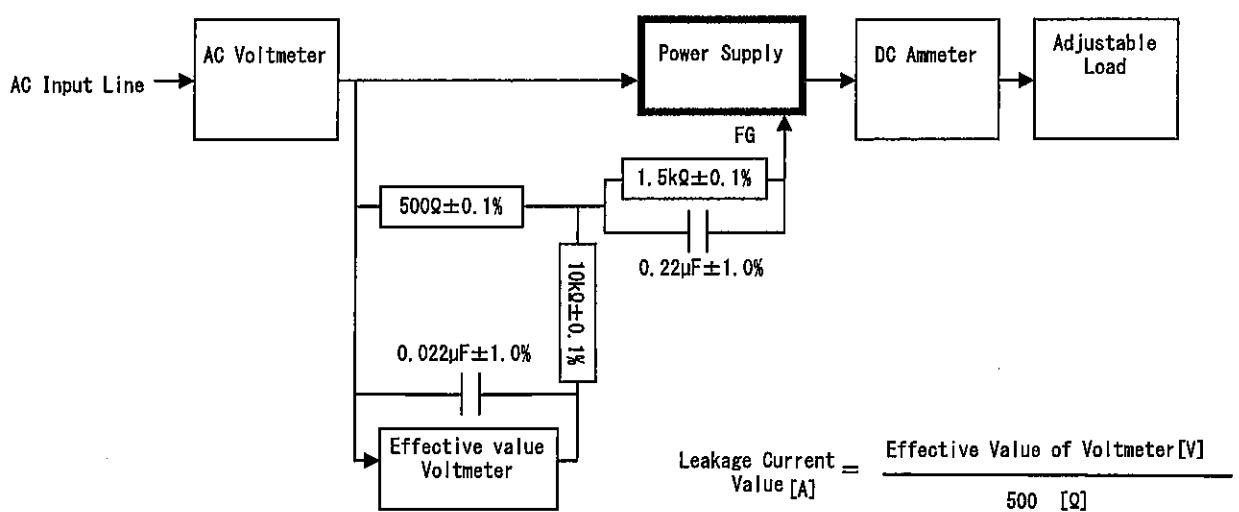


Figure B (IEC60950-1)

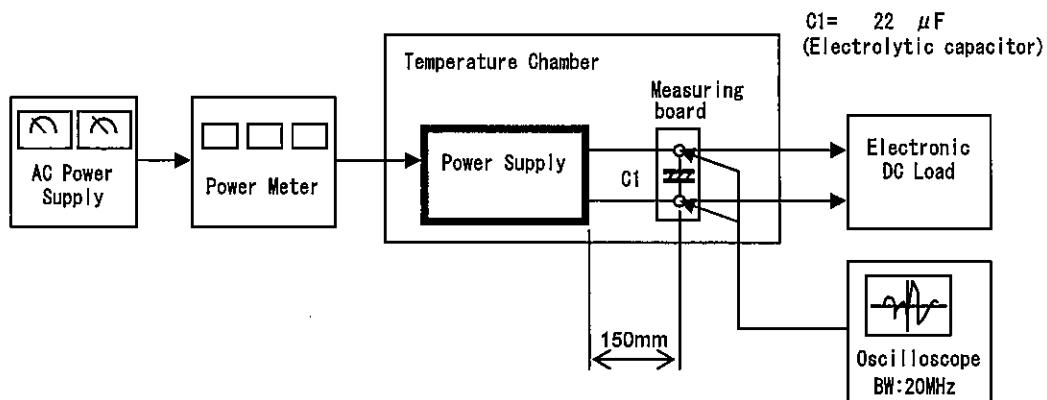
COSEL

Figure C