

TEST DATA OF PLA150F-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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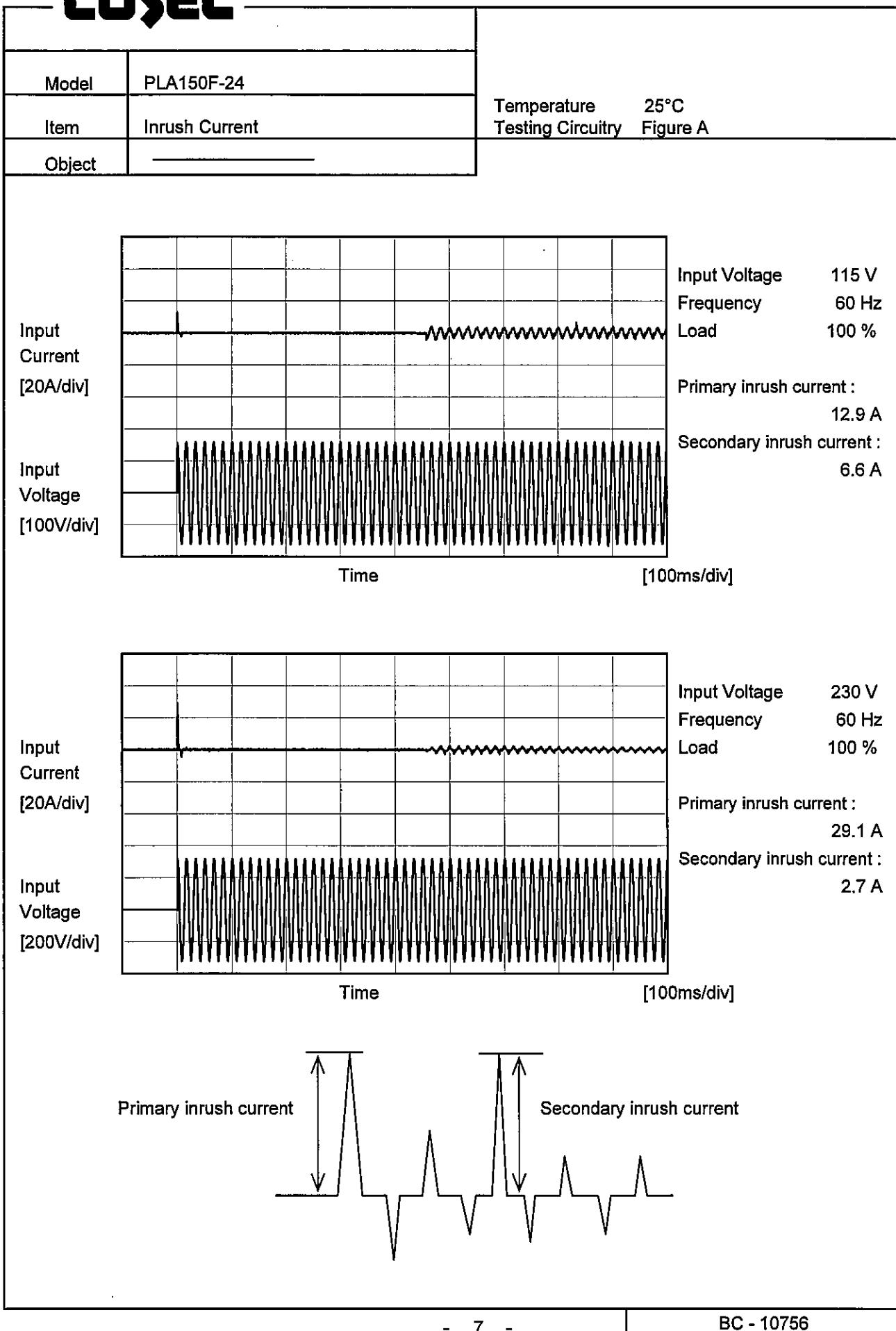
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Item	Leakage Current		
Object	<hr/>		

1. Results

Standards		Input Volt.			Note
		100[V]	115[V]	240[V]	
DEN-AN	Both phases	0.45	0.50	0.65	Operation
	One of phases	0.30	0.35	0.78	Stand by
IEC60950-1	Both phases	0.30	0.31	0.55	Operation
	One of phases	0.27	0.31	0.72	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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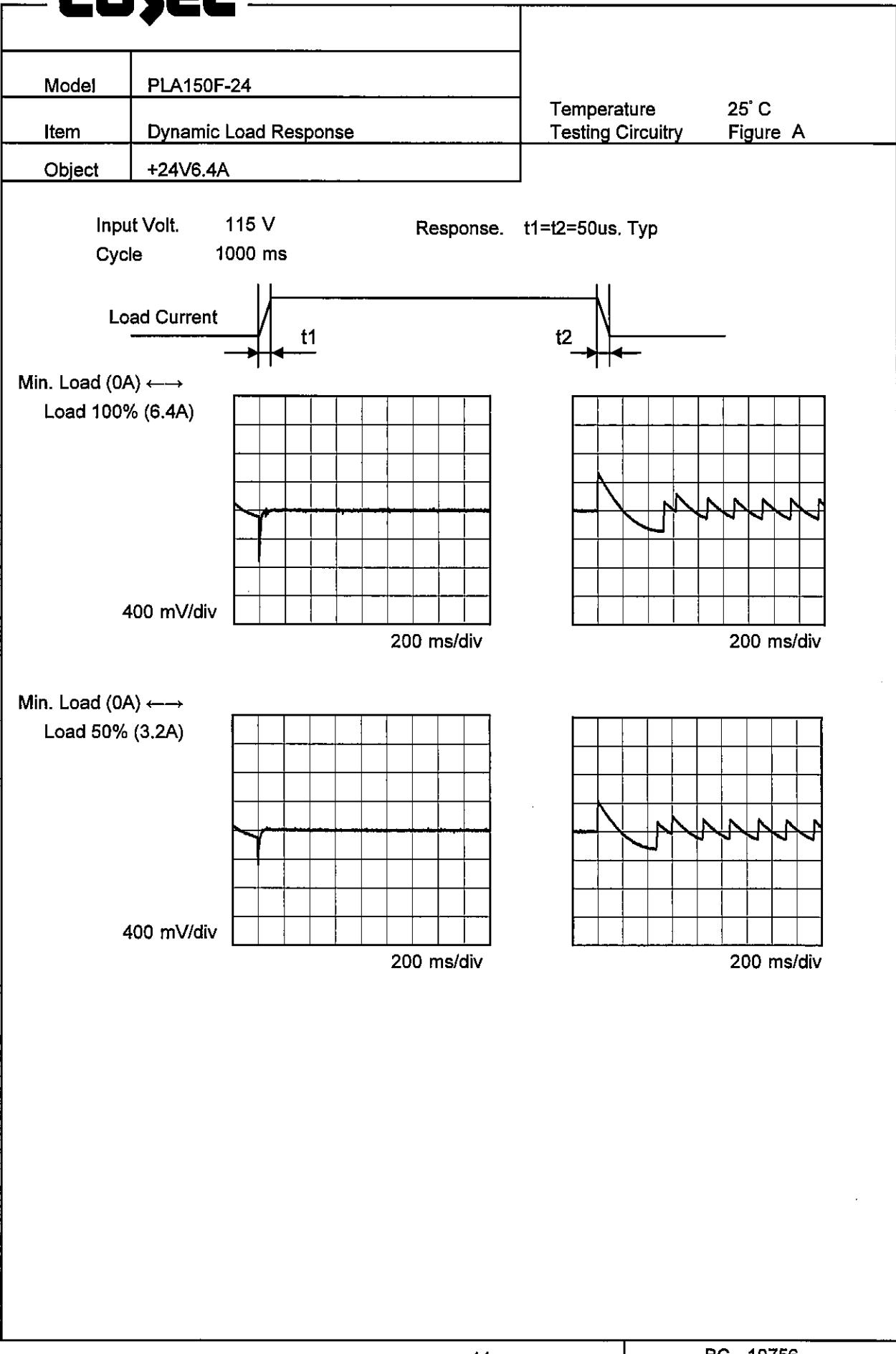
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Note: Slanted line shows the range of the rated load current.

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Model	PLA150F-24	Temperature Testing Circuitry	25°C Figure C																																						
Item	Ripple Voltage (by Load Current)																																								
Object	+24V6.4A																																								
1. Graph			2. Values																																						
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 300 mV, and the X-axis ranges from 0 to 8 A. Two curves are plotted: Input Volt. 115V (solid line with triangle markers) and Input Volt. 230V (dashed line with circle markers). Both curves show a sharp drop from 0-2A, followed by a slight increase towards 8A. 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 Voltage [mV]</th> </tr> <tr> <th>Input Volt. 115 [V]</th> <th>Input Volt. 230 [V]</th> </tr> </thead> <tbody> <tr> <td>0.00</td><td>225</td><td>230</td></tr> <tr> <td>1.00</td><td>20</td><td>30</td></tr> <tr> <td>2.00</td><td>20</td><td>30</td></tr> <tr> <td>3.00</td><td>20</td><td>35</td></tr> <tr> <td>4.00</td><td>25</td><td>35</td></tr> <tr> <td>5.00</td><td>25</td><td>35</td></tr> <tr> <td>6.00</td><td>35</td><td>35</td></tr> <tr> <td>6.40</td><td>35</td><td>35</td></tr> <tr> <td>7.04</td><td>40</td><td>40</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> <tr> <td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Ripple Voltage [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0.00	225	230	1.00	20	30	2.00	20	30	3.00	20	35	4.00	25	35	5.00	25	35	6.00	35	35	6.40	35	35	7.04	40	40	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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<p>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.</p>																																									
<p>Diagram illustrating a Complex Ripple Wave Form. The diagram shows a base level with two types of ripples superimposed: T1 (Due to AC Input Line) and T2 (Due to Switching).</p>																																									
<p>Fig. Complex Ripple Wave Form</p>																																									

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Model	PLA150F-24	Temperature Testing Circuitry	25°C Figure C																																			
Item	Ripple-Noise																																					
Object	+24V6.4A																																					
1.Graph			2.Values																																			
<p>—△— Input Volt. 115V -·○- Input Volt. 230V</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple-Noise [mV] (Input Volt. 115V)</th> <th>Ripple-Noise [mV] (Input Volt. 230V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>275</td><td>280</td></tr> <tr><td>1.00</td><td>50</td><td>60</td></tr> <tr><td>2.00</td><td>50</td><td>60</td></tr> <tr><td>3.00</td><td>55</td><td>65</td></tr> <tr><td>4.00</td><td>60</td><td>65</td></tr> <tr><td>5.00</td><td>60</td><td>65</td></tr> <tr><td>6.00</td><td>60</td><td>65</td></tr> <tr><td>6.40</td><td>60</td><td>65</td></tr> <tr><td>7.04</td><td>65</td><td>65</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. 115V)	Ripple-Noise [mV] (Input Volt. 230V)	0.00	275	280	1.00	50	60	2.00	50	60	3.00	55	65	4.00	60	65	5.00	60	65	6.00	60	65	6.40	60	65	7.04	65	65	--	-	-	--	-	-		
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Model PLA150F-24 Item Ripple Voltage (by Ambient Temp.) Object +24V6.4A	Testing Circuitry Figure C																																						
	1. Graph	2. Values																																					
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Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.																																							

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Model	PLA150F-24	Testing Circuitry Figure A																																																				
Item	Ambient Temperature Drift																																																					
Object	+24V6.4A																																																					
1.Graph	<p style="text-align: center;"> —△— Input Volt. 100V ---□--- Input Volt. 115V ---○--- Input Volt. 230V </p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Output Voltage [V] (100V)</th> <th>Output Voltage [V] (115V)</th> <th>Output Voltage [V] (230V)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>24.147</td><td>24.147</td><td>24.146</td></tr> <tr><td>-10</td><td>24.145</td><td>24.144</td><td>24.144</td></tr> <tr><td>0</td><td>24.144</td><td>24.143</td><td>24.142</td></tr> <tr><td>10</td><td>24.143</td><td>24.142</td><td>24.141</td></tr> <tr><td>20</td><td>24.141</td><td>24.140</td><td>24.139</td></tr> <tr><td>25</td><td>24.140</td><td>24.139</td><td>24.138</td></tr> <tr><td>35</td><td>24.135</td><td>24.133</td><td>24.132</td></tr> <tr><td>45</td><td>24.125</td><td>24.124</td><td>24.123</td></tr> <tr><td>55</td><td>24.117</td><td>24.116</td><td>24.115</td></tr> <tr><td>65</td><td>24.103</td><td>24.102</td><td>24.101</td></tr> </tbody> </table>	Ambient Temperature [°C]	Output Voltage [V] (100V)	Output Voltage [V] (115V)	Output Voltage [V] (230V)	-20	24.147	24.147	24.146	-10	24.145	24.144	24.144	0	24.144	24.143	24.142	10	24.143	24.142	24.141	20	24.141	24.140	24.139	25	24.140	24.139	24.138	35	24.135	24.133	24.132	45	24.125	24.124	24.123	55	24.117	24.116	24.115	65	24.103	24.102	24.101									
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Note: Slanted line shows the range of the rated ambient temperature.

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



Model	PLA150F-24	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+24V6.4A	

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 : 1.92 - 6.4A

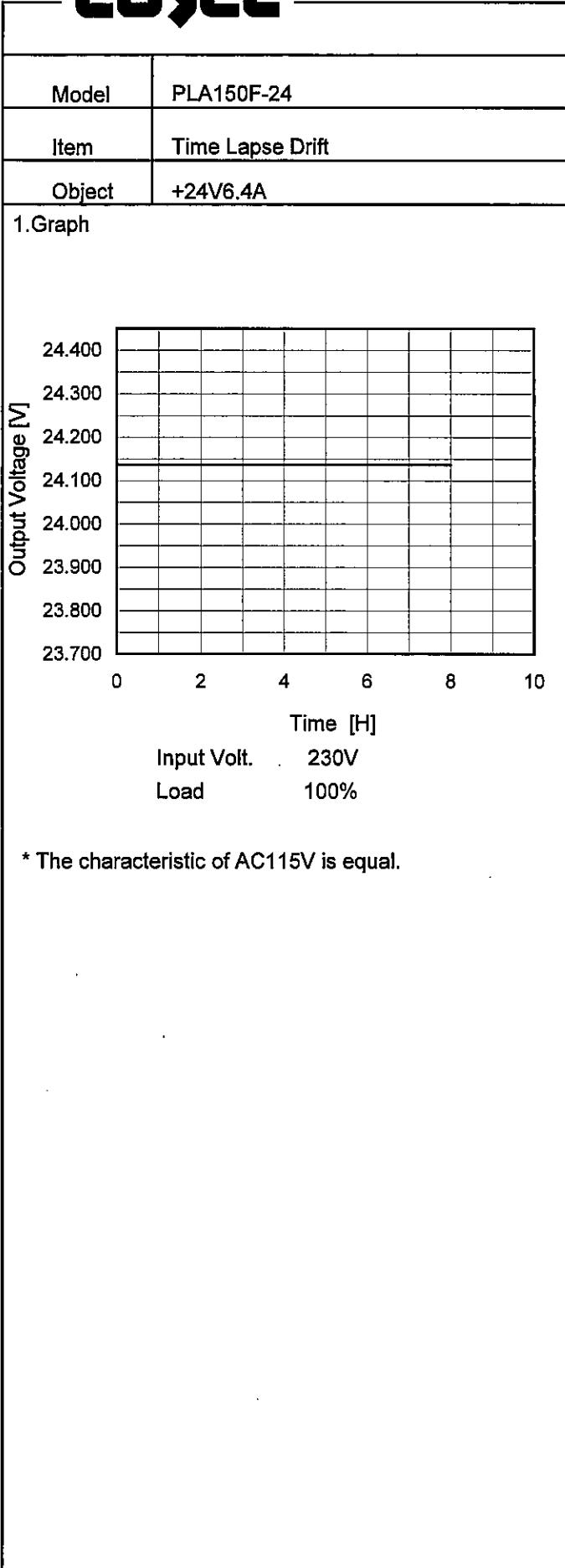
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	230	1.92	24.151	±14	±0.1
Minimum Voltage	45	264	6.4	24.123		

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Temperature 25°C
Testing Circuitry Figure A

2. Values

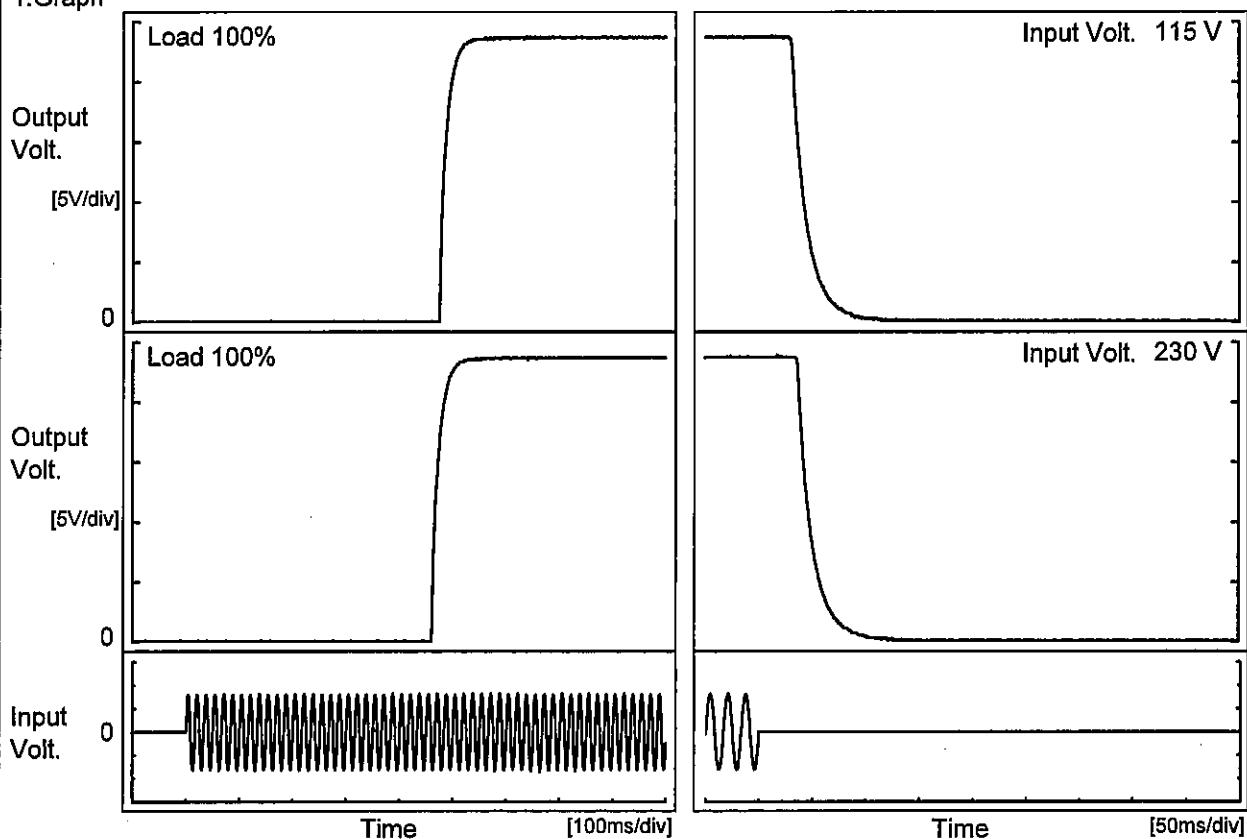
Time since start [H]	Output Voltage [V]
0.0	24.138
0.5	24.137
1.0	24.137
2.0	24.137
3.0	24.137
4.0	24.137
5.0	24.137
6.0	24.137
7.0	24.137
8.0	24.137

* The characteristic of AC115V is equal.

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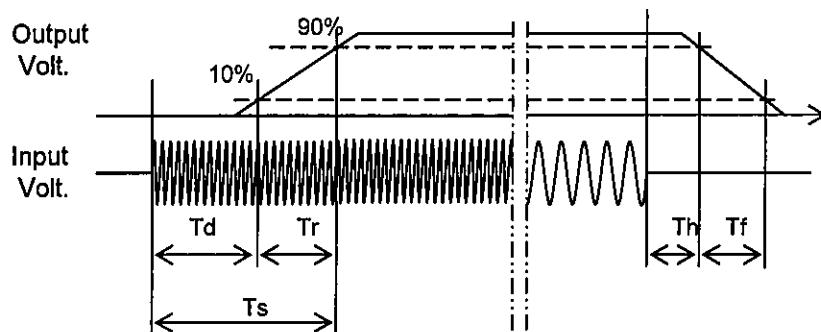
Model	PLA150F-24	Temperature Testing Circuitry 25°C Figure A
Item	Rise and Fall Time	
Object	+24V6.4A	

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[ms]
115 V		475.5	30.0	505.5	32.5	31.3	
230 V		462.0	30.0	492.0	38.5	37.3	



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Model	PLA150F-24	Temperature 25°C Testing Circuitry Figure A																																
Item	Hold-Up Time																																	
Object	+24V6.4A																																	
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<p>Legend: - - - □ - - - Load 50% —△— Load 100% </p>																																		
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Input Voltage [V]	Hold-Up Time [ms]																																	
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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.																																		

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Model	PLA150F-24	Temperature Testing Circuitry 25°C Figure A																																																			
Item	Instantaneous Interruption Compensation																																																				
Object	+24V6.4A																																																				
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Note: Slanted line shows the range of the rated load current.

COSEL

Model Item Object	PLA150F-24	Testing Circuitry Figure A 2.Values																																						
	Minimum Input Voltage for Regulated Output Voltage																																							
	+24V6.4A																																							
1.Graph	<p>Input Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Legend: ---□--- Load 50% —△— Load 100%</p>																																							
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COSEL

Model	PLA150F-24
Item	Overcurrent Protection
Object	+24V6.4A

1. Graph

Output Voltage [V]

Load Current [A]

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

Intermittent operation occurs when the output voltage is from 12V to 0V.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 115[V]	Input Volt. 230[V]
22.8	7.53	7.72
21.6	7.42	7.62
19.2	7.83	8.04
16.8	8.06	8.25
14.4	8.30	8.46
12.0	8.50	8.55
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PLA150F-24	Testing Circuitry Figure A																																						
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Object	+24V6.4A																																							
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<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>—▲— Input Volt. 115V ---□--- Input Volt. 230V</p>		<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>30.67</td><td>30.67</td> </tr> <tr> <td>-10</td><td>30.67</td><td>30.67</td> </tr> <tr> <td>0</td><td>30.67</td><td>30.67</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>30.66</td><td>30.66</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	30.67	30.67	-10	30.67	30.67	0	30.67	30.67	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	30.66	30.66	65	30.65	30.65	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.

COSEL

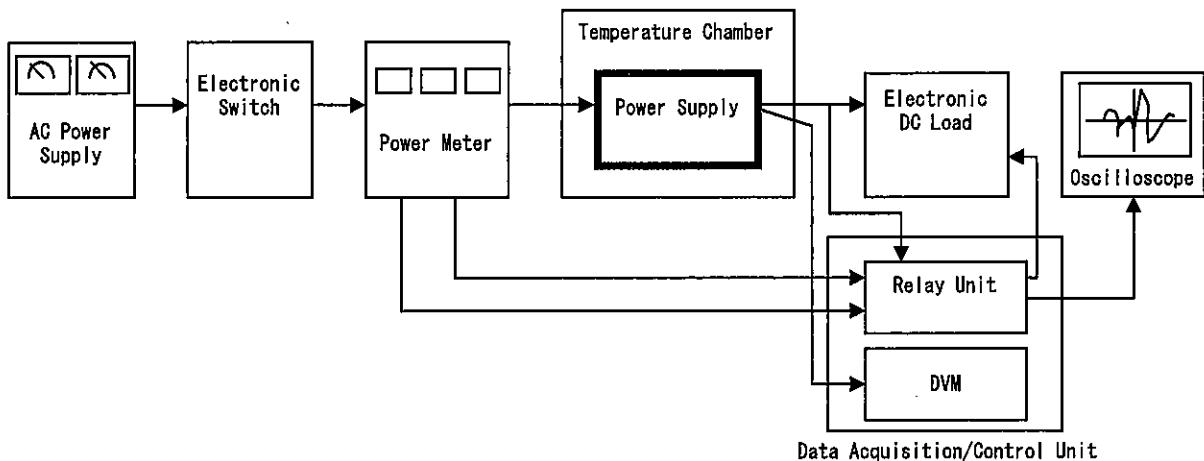


Figure A

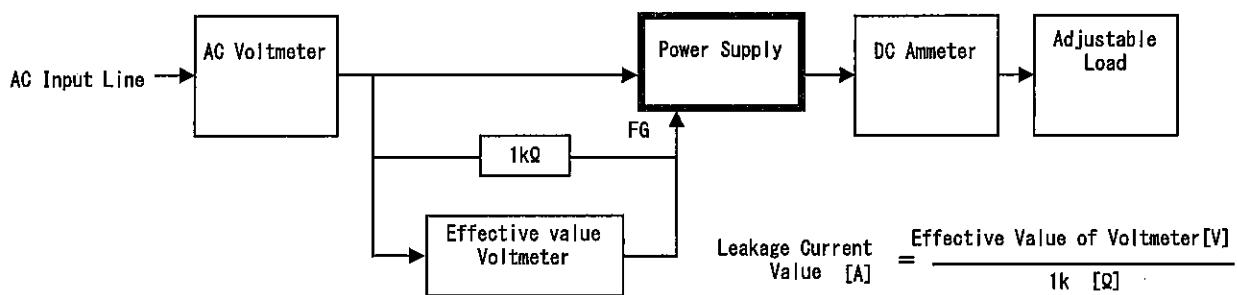


Figure B (DEN-AN)

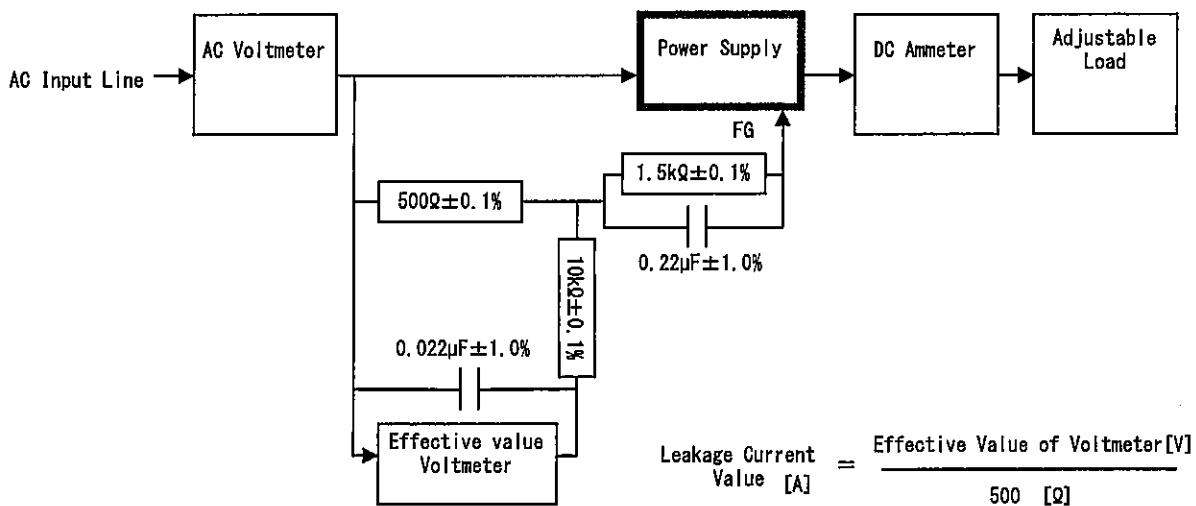


Figure B (IEC60950-1)

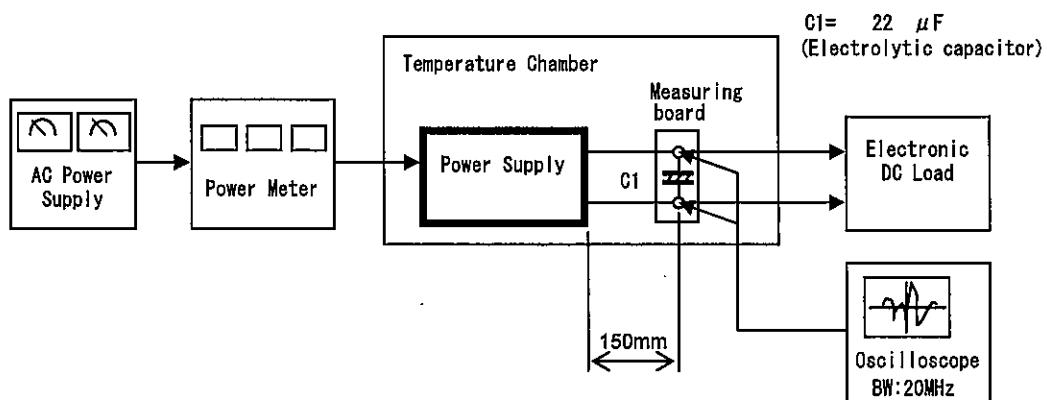
COSEL

Figure C