

# TEST DATA OF PLA100F-15

Regulated DC Power Supply

June 26, 2013

Approved by : Katsumi Ishikawa  
Katsumi Ishikawa Design Manager

Prepared by : Naoki Fujita  
Naoki Fujita Design Engineer

**COSEL CO.,LTD.**



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Item	Input Current (by Load Current)	Temperature 25°C	Testing Circuitry Figure A																																																			
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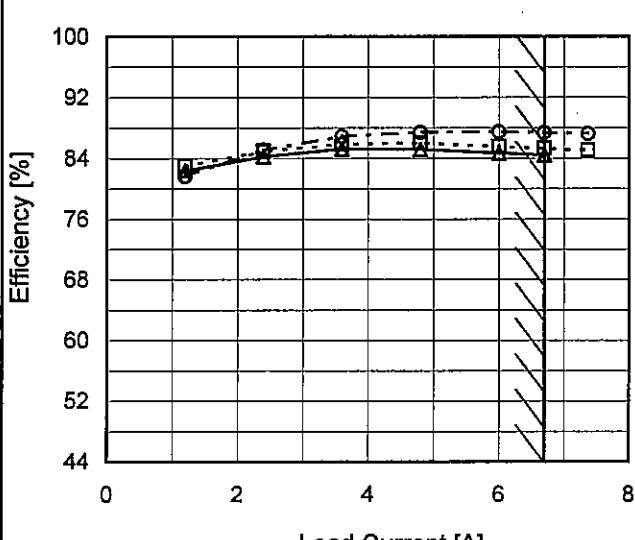
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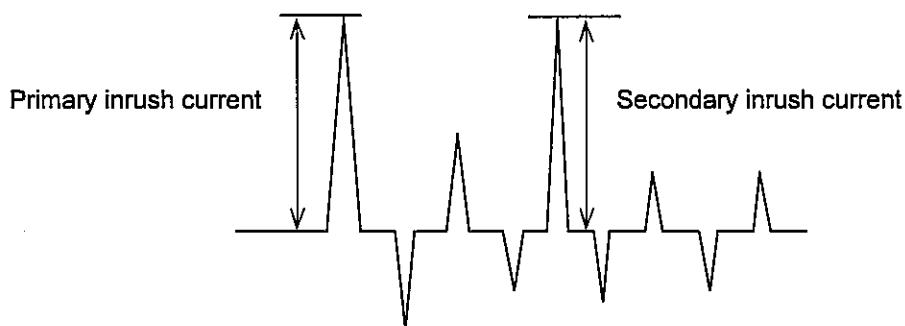
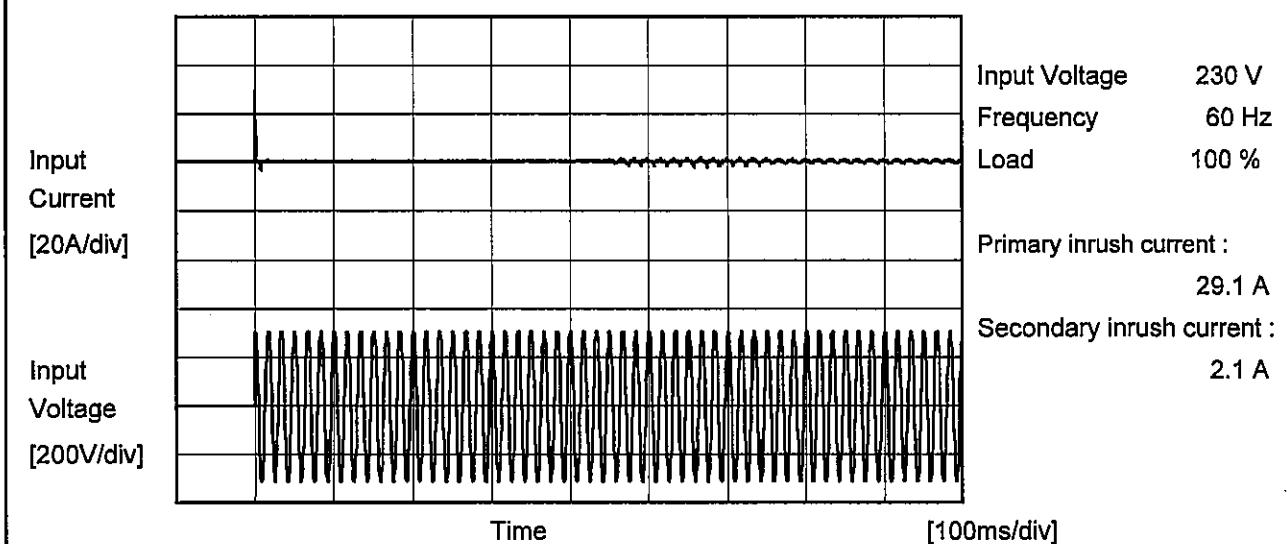
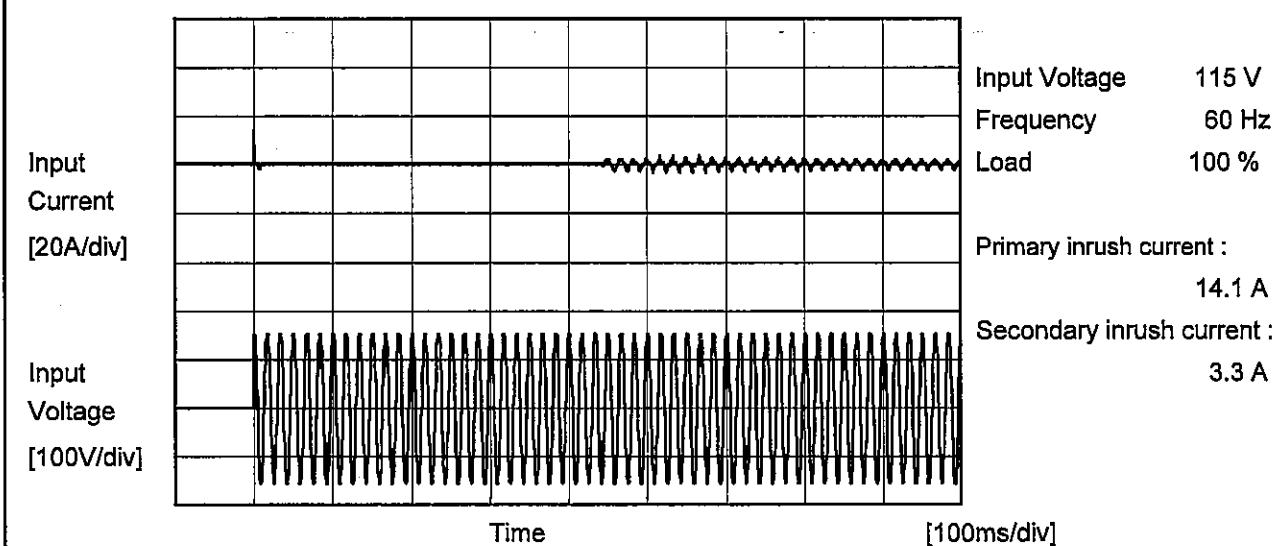
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Model	PLA100F-15	Temperature Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	





Model	PLA100F-15	Temperature	25°C
Item	Leakage Current	Testing Circuitry	Figure B
Object	<hr/>		

### 1. Results

[mA]

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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Item	Line Regulation																																	
Object	+15V6.7A																																	
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200	15.171	15.165																																
230	15.171	15.165																																
264	15.171	15.165																																
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<p>Note: Slanted line shows the range of the rated input voltage.</p>																																		

**COSEL**

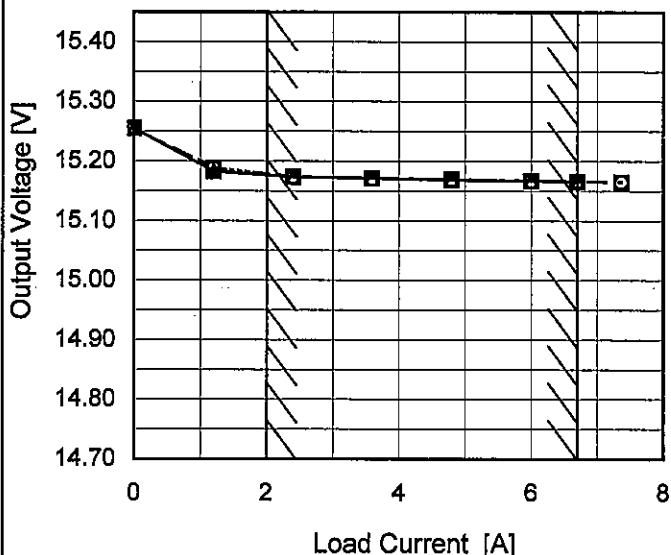
Model PLA100F-15

Item Load Regulation

Object +15V6.7A

1.Graph

—△— Input Volt. 100V  
 - - □ - - Input Volt. 115V  
 - - ○ - - Input Volt. 230V

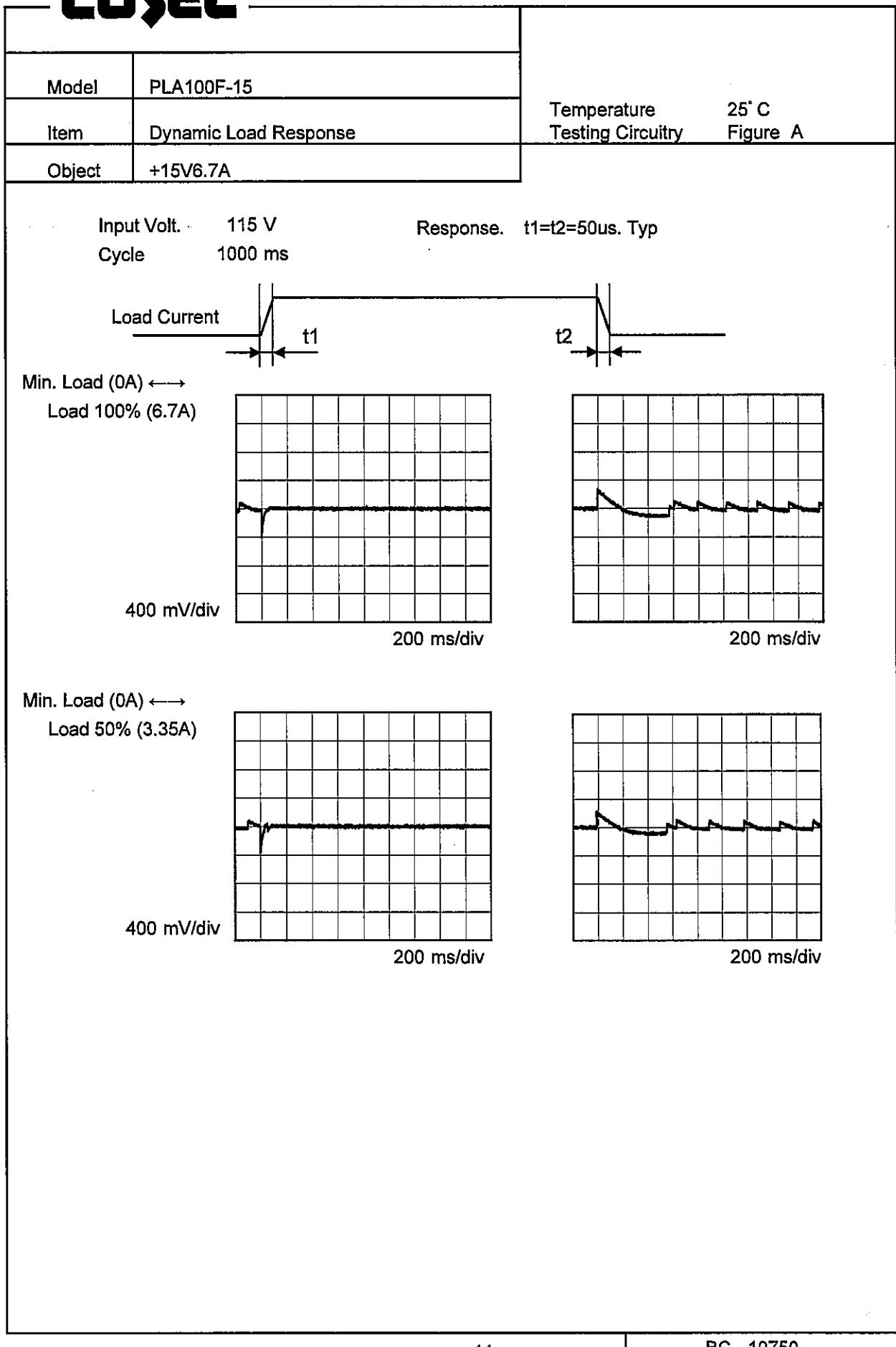


Note: Slanted line shows the range of the rated load current.

 Temperature 25°C  
 Testing Circuitry Figure A

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	15.256	15.256	15.256
1.20	15.184	15.189	15.189
2.40	15.174	15.174	15.174
3.60	15.172	15.171	15.171
4.80	15.169	15.169	15.169
6.00	15.167	15.167	15.167
6.70	15.166	15.166	15.166
7.37	-	15.165	15.165
--	-	-	-
--	-	-	-
--	-	-	-

**COSEL**

**COSEL**

Model	PLA100F-15	Temperature Testing Circuitry	25°C Figure C																																						
Item	Ripple Voltage (by Load Current)																																								
Object	+15V6.7A																																								
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 decreasing trend of ripple voltage as load current increases, with a significant increase in slope at higher load currents.</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>155</td><td>155</td></tr> <tr><td>1.20</td><td>15</td><td>25</td></tr> <tr><td>2.40</td><td>15</td><td>15</td></tr> <tr><td>3.60</td><td>15</td><td>15</td></tr> <tr><td>4.80</td><td>10</td><td>10</td></tr> <tr><td>6.00</td><td>10</td><td>10</td></tr> <tr><td>6.70</td><td>15</td><td>15</td></tr> <tr><td>7.37</td><td>15</td><td>15</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 Voltage [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0.00	155	155	1.20	15	25	2.40	15	15	3.60	15	15	4.80	10	10	6.00	10	10	6.70	15	15	7.37	15	15	--	-	-	--	-	-	--	-	-
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1.20	15	25																																							
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7.37	15	15																																							
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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 vertical axis is labeled "Ripple [mVp-p]". The diagram shows a base level with two types of ripples superimposed: T1 (AC Input Line) and T2 (Switching). T1 is represented by a low-frequency, high-amplitude noise component, while T2 is represented by a high-frequency, low-amplitude noise component.</p>																																									
<p>Fig. Complex Ripple Wave Form</p>																																									

# COSEL

Model	PLA100F-15	Temperature	25°C																																						
Item	Ripple-Noise	Testing Circuitry	Figure C																																						
Object	+15V6.7A																																								
1. Graph																																									
<p style="text-align: center;"> <span style="display: inline-block; width: 15px; height: 15px; background-color: black; border-radius: 50%; vertical-align: middle;"></span> Input Volt. 115V  <span style="display: inline-block; width: 15px; height: 15px; border: 1px dashed black; border-radius: 50%; vertical-align: middle;"></span> Input Volt. 230V         </p>																																									
2. Values																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <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>0.00</td><td>160</td><td>160</td></tr> <tr><td>1.20</td><td>30</td><td>35</td></tr> <tr><td>2.40</td><td>25</td><td>25</td></tr> <tr><td>3.60</td><td>25</td><td>25</td></tr> <tr><td>4.80</td><td>25</td><td>25</td></tr> <tr><td>6.00</td><td>30</td><td>25</td></tr> <tr><td>6.70</td><td>30</td><td>25</td></tr> <tr><td>7.37</td><td>30</td><td>30</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]	0.00	160	160	1.20	30	35	2.40	25	25	3.60	25	25	4.80	25	25	6.00	30	25	6.70	30	25	7.37	30	30	-	-	-	-	-	-	-	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 115 [V]	Input Volt. 230 [V]																																							
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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 style="text-align: center;">         T1: Due to AC Input Line          T2: Due to Switching       </p>																																									
<p style="text-align: center;">Fig. Complex Ripple Wave Form</p>																																									

**COSEL**

Model	PLA100F-15																																							
Item	Ripple Voltage (by Ambient Temp.)																																							
Object	+15V6.7A																																							
1.Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C]. The Y-axis ranges from 0 to 100 mV, and the X-axis ranges from -40 to 60 °C. Two data series are plotted: Input Volt. 115V (dashed line with square markers) and Input Volt. 230V (solid line with triangle markers). Both series show a decrease in Ripple Voltage as ambient temperature increases from -20°C to 40°C. A slanted line indicates the rated ambient temperature range.</p> <table border="1"> <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>30</td><td>30</td></tr> <tr><td>-10</td><td>30</td><td>30</td></tr> <tr><td>0</td><td>25</td><td>25</td></tr> <tr><td>25</td><td>15</td><td>15</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	30	30	-10	30	30	0	25	25	25	15	15	40	15	15																				
Ambient Temperature [°C]	Ripple Voltage [mV] (Input Volt. 115V)	Ripple Voltage [mV] (Input Volt. 230V)																																						
-20	30	30																																						
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Ambient Temperature [°C]	Ripple Voltage [mV]																																							
	Input Volt. 115 [V]	Input Volt. 230 [V]																																						
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Measured by 20 MHz Oscilloscope.

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

**COSEL**

Model	PLA100F-15	Testing Circuitry Figure A																																																					
Item	Ambient Temperature Drift																																																						
Object	+15V6.7A																																																						
1.Graph	<p style="text-align: center;"> <span style="color: black;">—△—</span> Input Volt. 100V  <span style="color: gray;">---□---</span> Input Volt. 115V  <span style="color: gray;">---○---</span> Input Volt. 230V         </p> <p style="text-align: center;">Output Voltage [V]</p> <p style="text-align: center;">Ambient Temperature [°C]</p>	2.Values																																																					
		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr> <td>-20</td> <td>15.164</td> <td>15.158</td> <td>15.163</td> </tr> <tr> <td>-10</td> <td>15.171</td> <td>15.171</td> <td>15.171</td> </tr> <tr> <td>0</td> <td>15.172</td> <td>15.172</td> <td>15.171</td> </tr> <tr> <td>10</td> <td>15.171</td> <td>15.170</td> <td>15.169</td> </tr> <tr> <td>20</td> <td>15.168</td> <td>15.167</td> <td>15.166</td> </tr> <tr> <td>25</td> <td>15.166</td> <td>15.166</td> <td>15.165</td> </tr> <tr> <td>30</td> <td>15.164</td> <td>15.164</td> <td>15.163</td> </tr> <tr> <td>40</td> <td>15.160</td> <td>15.160</td> <td>15.159</td> </tr> <tr> <td>45</td> <td>15.158</td> <td>15.158</td> <td>15.157</td> </tr> <tr> <td>50</td> <td>15.156</td> <td>15.155</td> <td>15.154</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>			Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	-20	15.164	15.158	15.163	-10	15.171	15.171	15.171	0	15.172	15.172	15.171	10	15.171	15.170	15.169	20	15.168	15.167	15.166	25	15.166	15.166	15.165	30	15.164	15.164	15.163	40	15.160	15.160	15.159	45	15.158	15.158	15.157	50	15.156	15.155	15.154	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																						
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																				
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50	15.156	15.155	15.154																																																				
--	-	-	-																																																				
		<p>Note: In case of Input Volt. 100V, Load 90%.</p> <p>Other case Load 100%.</p>																																																					



Model	PLA100F-15	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+15V6.7A	

### 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 ~ 40°C

Input Voltage : 115 ~ 264V

Load Current : 2.01 ~ 6.7A

\* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

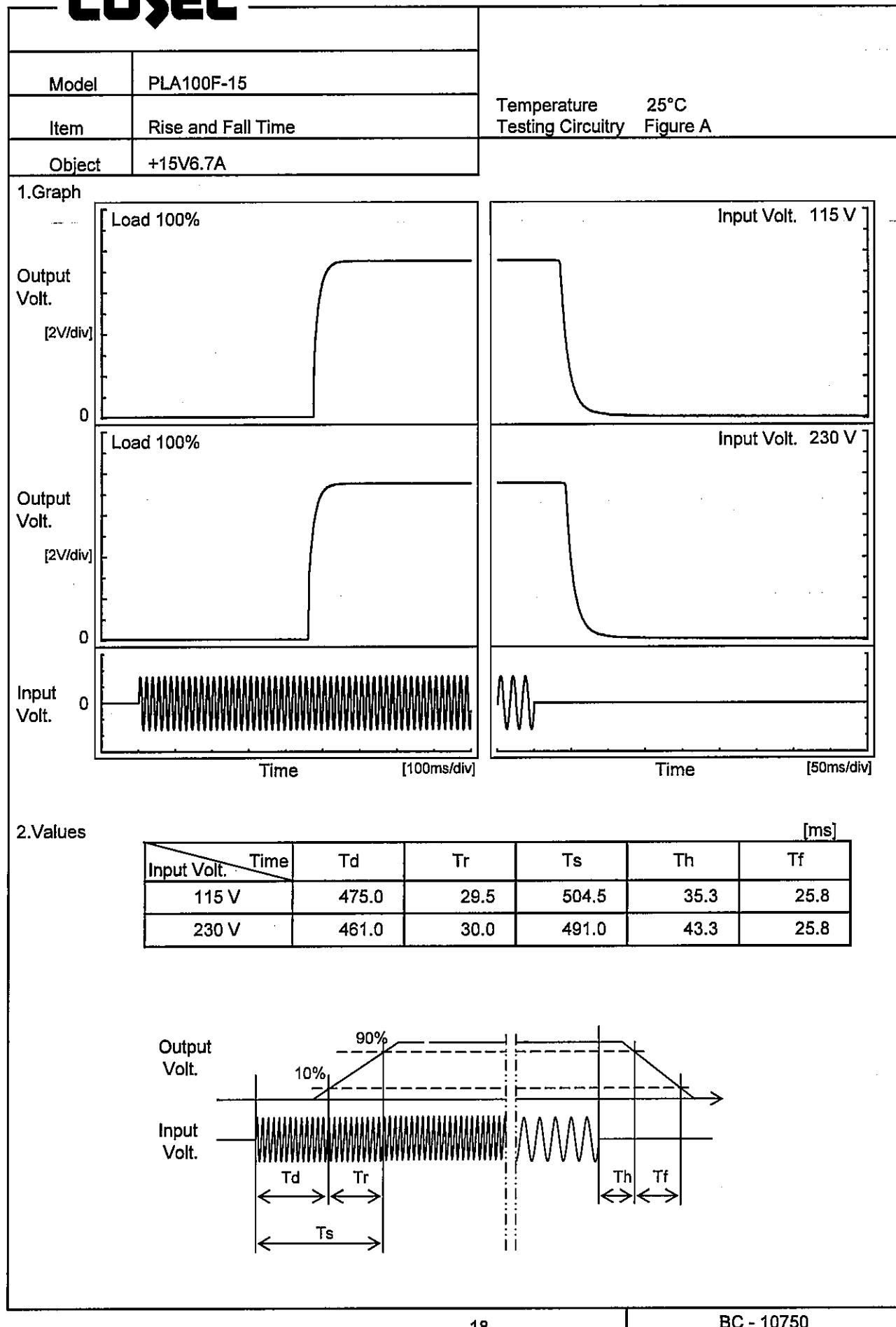
$$\text{* Output Voltage Accuracy (Ration)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	264	2.01	15.176	±10	±0.1
Minimum Voltage	40	115	6.7	15.156		

**COSEL**

Model	PLA150F-15	Temperature 25°C Testing Circuitry Figure A																						
Item	Time Lapse Drift																							
Object	+15V6.7A																							
1. Graph		2. Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 230V Load 100%</p>		<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>15.165</td></tr> <tr><td>0.5</td><td>15.163</td></tr> <tr><td>1.0</td><td>15.163</td></tr> <tr><td>2.0</td><td>15.163</td></tr> <tr><td>3.0</td><td>15.163</td></tr> <tr><td>4.0</td><td>15.163</td></tr> <tr><td>5.0</td><td>15.163</td></tr> <tr><td>6.0</td><td>15.163</td></tr> <tr><td>7.0</td><td>15.163</td></tr> <tr><td>8.0</td><td>15.163</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	15.165	0.5	15.163	1.0	15.163	2.0	15.163	3.0	15.163	4.0	15.163	5.0	15.163	6.0	15.163	7.0	15.163	8.0	15.163
Time since start [H]	Output Voltage [V]																							
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**COSEL**

# COSEL

Model	PLA100F-15	Temperature	25°C																																
Item	Hold-Up Time	Testing Circuitry	Figure A																																
Object	+15V6.7A																																		
1. Graph																																			
<p>Legend: --- □--- Load 50% — △— Load 100%</p> <p>Y-axis: Hold-Up Time [ms] X-axis: Input Voltage [V]</p>																																			
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Input Voltage [V]	Hold-Up Time [ms]																																		
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<p>※1: Load 80% ※2: Load 90%</p>																																			
<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-15	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation	Testing Circuitry	Figure A																																																			
Object	+15V6.7A																																																					
1.Graph	<p>—△— Input Volt. 100V        - - - □ - - Input Volt. 115V        - - ○ - - 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>1.20</td><td>196</td><td>197</td><td>240</td></tr> <tr><td>2.40</td><td>97</td><td>97</td><td>122</td></tr> <tr><td>3.60</td><td>64</td><td>64</td><td>82</td></tr> <tr><td>4.80</td><td>47</td><td>47</td><td>61</td></tr> <tr><td>6.00</td><td>38</td><td>39</td><td>48</td></tr> <tr><td>6.70</td><td>31</td><td>31</td><td>43</td></tr> <tr><td>7.37</td><td>-</td><td>29</td><td>39</td></tr> </tbody> </table>			Load Current [A]	100V [ms]	115V [ms]	230V [ms]	1.20	196	197	240	2.40	97	97	122	3.60	64	64	82	4.80	47	47	61	6.00	38	39	48	6.70	31	31	43	7.37	-	29	39																			
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**COSEL**

Model	PLA100F-15	Testing Circuitry Figure A																																							
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**COSEL**

Model	PLA100F-15
Item	Overcurrent Protection
Object	+15V6.7A

1. Graph

Output Voltage [V]

Load Current [A]

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

 Temperature 25°C  
 Testing Circuitry Figure A

## 2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 115[V]	Input Volt. 230[V]
14.25	8.71	8.97
13.50	8.82	9.07
12.00	8.98	9.28
10.50	9.07	9.45
9.00	9.48	9.73
7.50	9.74	9.97
6.00	10.00	10.19
4.50	10.06	10.26
--	-	-
--	-	-
--	-	-
--	-	-

Model	PLA100F-15
Item	Overtoltage Protection
Object	+15V6.7A
1.Graph	
<p style="text-align: center;"> <span style="display: inline-block; width: 15px; height: 10px; border-left: 2px solid black; border-bottom: 2px solid black; transform: rotate(-45deg); margin-right: 5px;"></span> Input Volt. 115V  <span style="display: inline-block; width: 15px; height: 10px; border-top: 2px solid black; border-right: 2px solid black; transform: rotate(45deg); margin-right: 5px;"></span> Input Volt. 230V         </p> <p style="text-align: center;">Operating Point [V]</p> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Load 0%</p>	
<p>Note: Slanted line shows the range of the rated ambient temperature.</p>	

Testing Circuitry Figure A	

## 2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 115[V]	Input Volt. 230[V]
-20	18.57	18.57
-10	18.74	18.74
0	18.74	18.74
10	18.98	18.98
20	19.04	19.04
25	19.15	19.15
30	19.15	19.15
40	19.39	19.39
45	19.44	19.44
50	19.44	19.44
--	-	-

COSEL

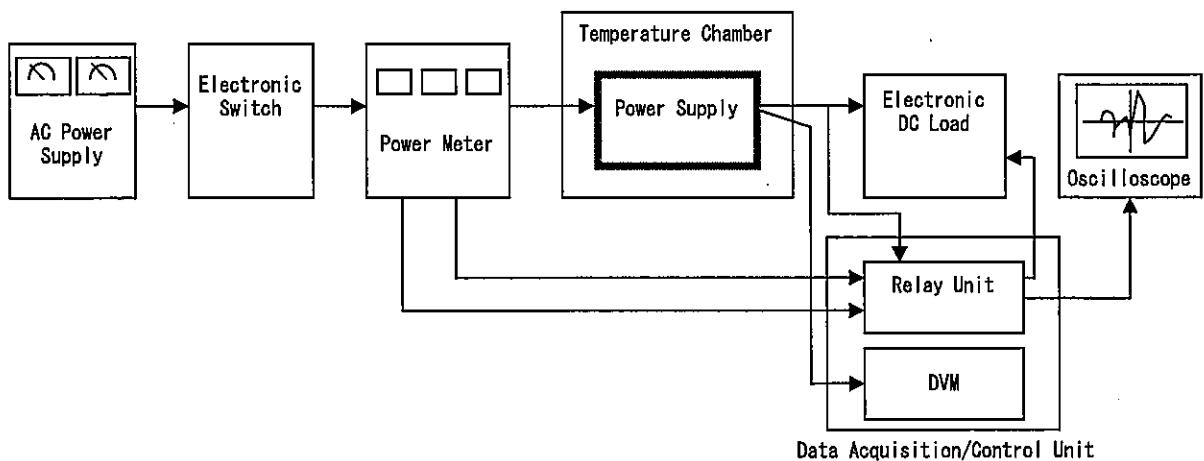


Figure A

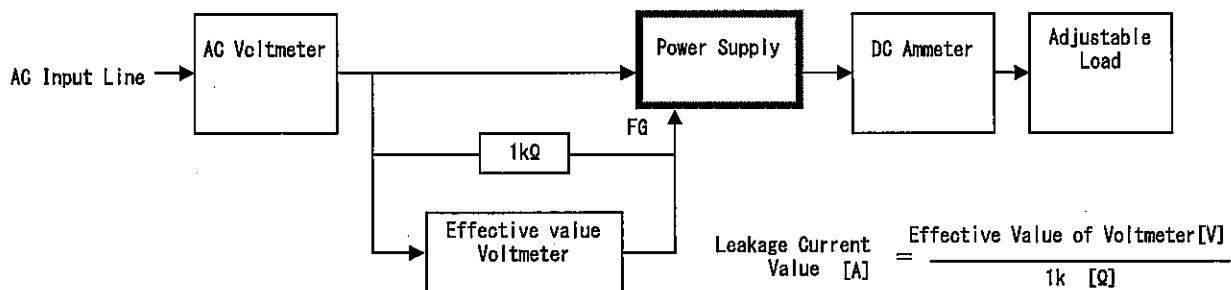


Figure B ( DEN-AN )

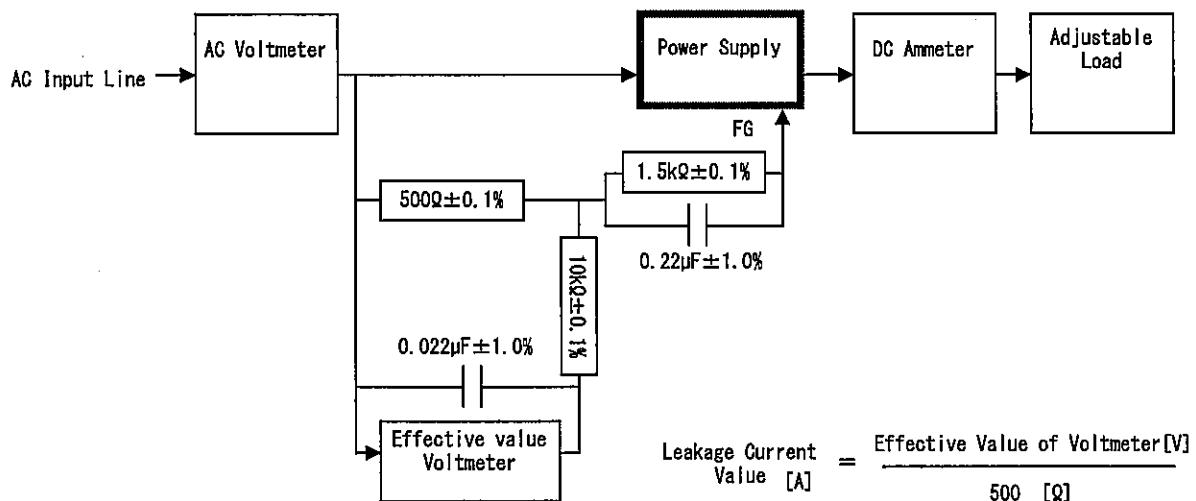


Figure B ( IEC60950-1 )

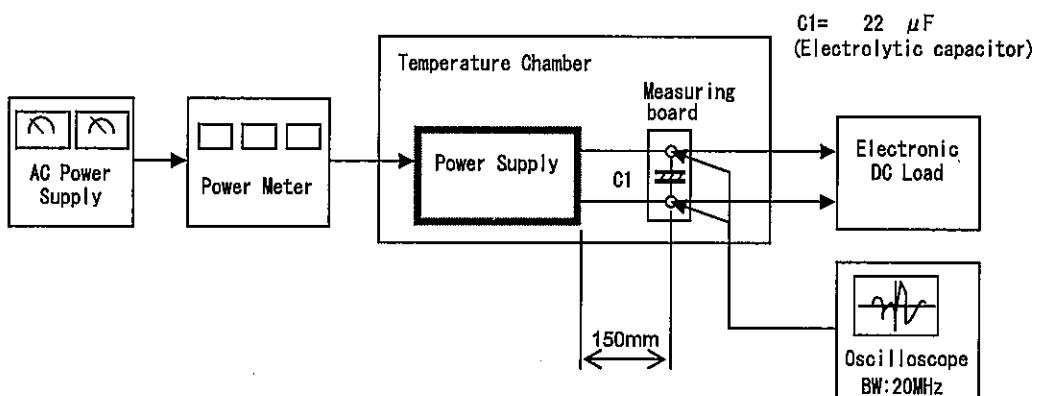
**COSEL**

Figure C