

TEST DATA OF PLA100F-36

Regulated DC Power Supply

June 26, 2013

Approved by :

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Naoki Fujita

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Design Engineer

COSEL CO.,LTD.



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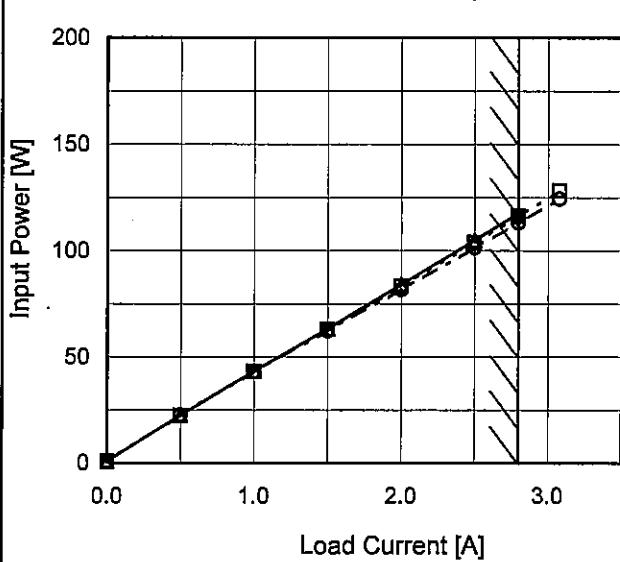
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Model	PLA100F-36																																																					
Item	Input Current (by Load Current)																																																					
Object	_____																																																					
1.Graph	—△— Input Volt. 100V - -□--- Input Volt. 115V. - -○--- Input Volt. 230V																																																					
	<p>The graph shows three curves representing different input voltages: 100V (solid line with triangles), 115V (dashed line with squares), and 230V (dashed line with circles). The curves show that as input voltage increases, the required load current to maintain a given input current decreases. A vertical slanted line is drawn through the 100V curve at approximately 2.7A, indicating the rated load current range.</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Input Current [A] (100V)</th> <th>Input Current [A] (115V)</th> <th>Input Current [A] (230V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.027</td><td>0.025</td><td>0.030</td></tr> <tr><td>1.0</td><td>0.241</td><td>0.213</td><td>0.137</td></tr> <tr><td>2.0</td><td>0.450</td><td>0.403</td><td>0.229</td></tr> <tr><td>2.7</td><td>1.00 (Rated)</td><td>0.916</td><td>0.480</td></tr> <tr><td>3.0</td><td>1.186</td><td>1.023</td><td>0.530</td></tr> </tbody> </table>			Load Current [A]	Input Current [A] (100V)	Input Current [A] (115V)	Input Current [A] (230V)	0.0	0.027	0.025	0.030	1.0	0.241	0.213	0.137	2.0	0.450	0.403	0.229	2.7	1.00 (Rated)	0.916	0.480	3.0	1.186	1.023	0.530																											
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	 <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 3.0). Three curves are shown for input voltages of 100V, 115V, and 230V. A slanted line indicates the rated load current range.</p> <table border="1"> <caption>Data points estimated from the graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Input Power [W] (100V)</th> <th>Input Power [W] (115V)</th> <th>Input Power [W] (230V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.50</td><td>22.5</td><td>22.3</td><td>22.7</td></tr> <tr><td>1.00</td><td>43.4</td><td>43.1</td><td>43.1</td></tr> <tr><td>1.50</td><td>63.4</td><td>63.0</td><td>62.3</td></tr> <tr><td>2.00</td><td>84.2</td><td>83.4</td><td>81.8</td></tr> <tr><td>2.50</td><td>105.1</td><td>103.9</td><td>101.5</td></tr> <tr><td>2.80</td><td>117.7</td><td>116.3</td><td>113.2</td></tr> <tr><td>3.08</td><td>-</td><td>128.1</td><td>124.4</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> </tbody> </table>			Load Current [A]	Input Power [W] (100V)	Input Power [W] (115V)	Input Power [W] (230V)	0.00	0.0	0.0	0.0	0.50	22.5	22.3	22.7	1.00	43.4	43.1	43.1	1.50	63.4	63.0	62.3	2.00	84.2	83.4	81.8	2.50	105.1	103.9	101.5	2.80	117.7	116.3	113.2	3.08	-	128.1	124.4	--	-	-	-	--	-	-	-	--	-	-	-			
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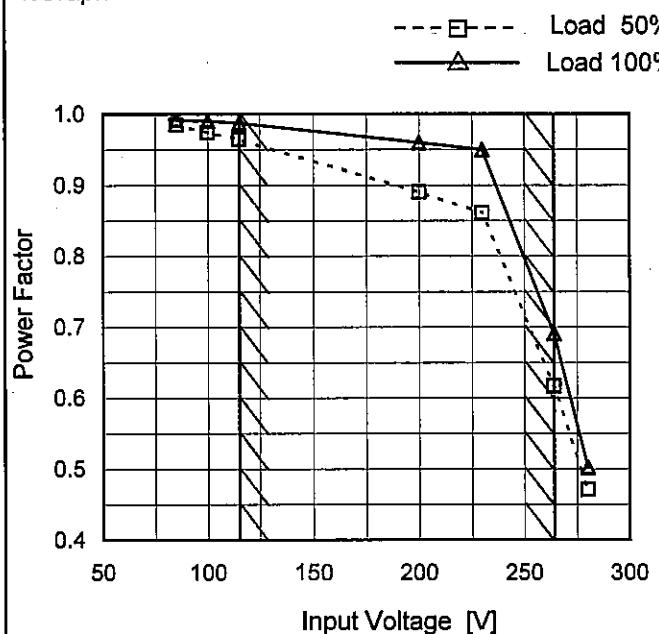
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Model	PLA100F-36
Item	Power Factor (by Input Voltage)
Object	—

1. Graph



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

 Temperature 25°C
 Testing Circuitry Figure A

2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.985	0.992 ※1
100	0.974	0.991 ※2
115	0.964	0.988
130	0.890	0.960
150	0.861	0.950
170	0.617	0.691
190	0.471	0.502
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--	-	-

※1: Load 80%

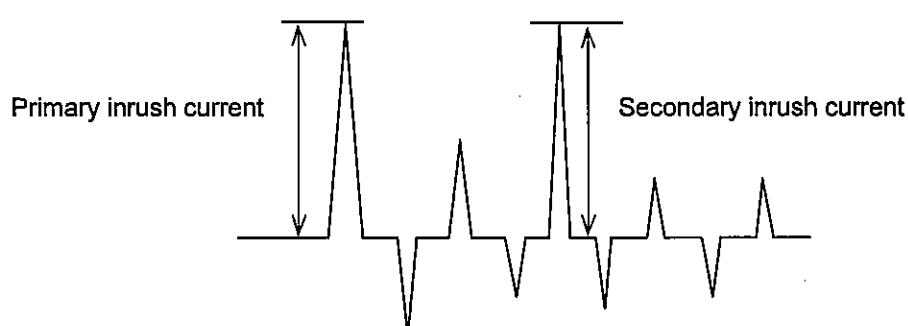
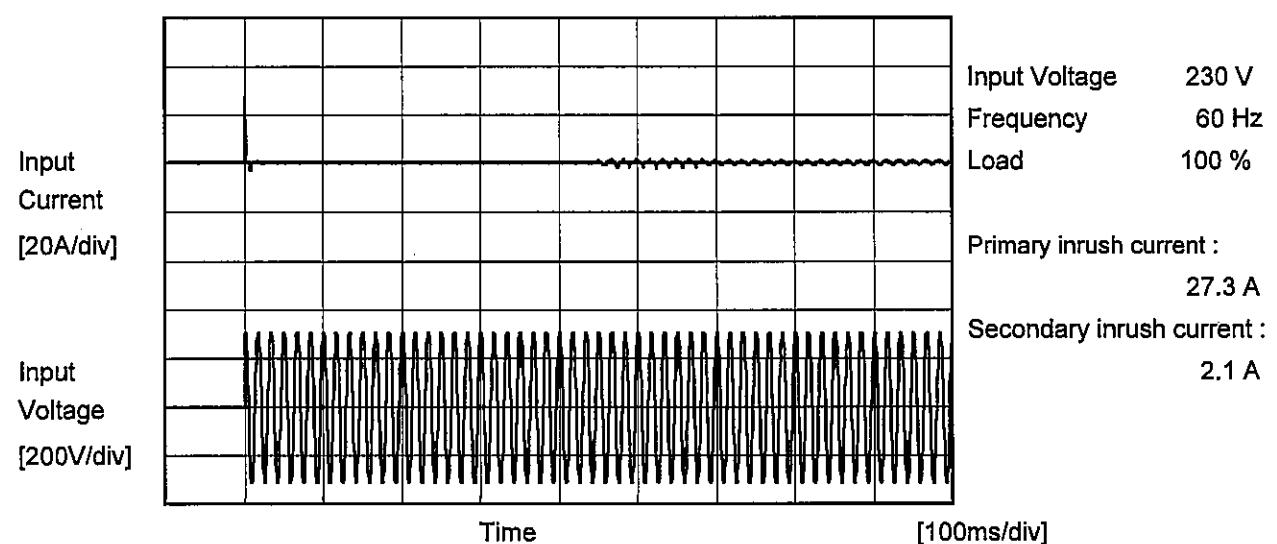
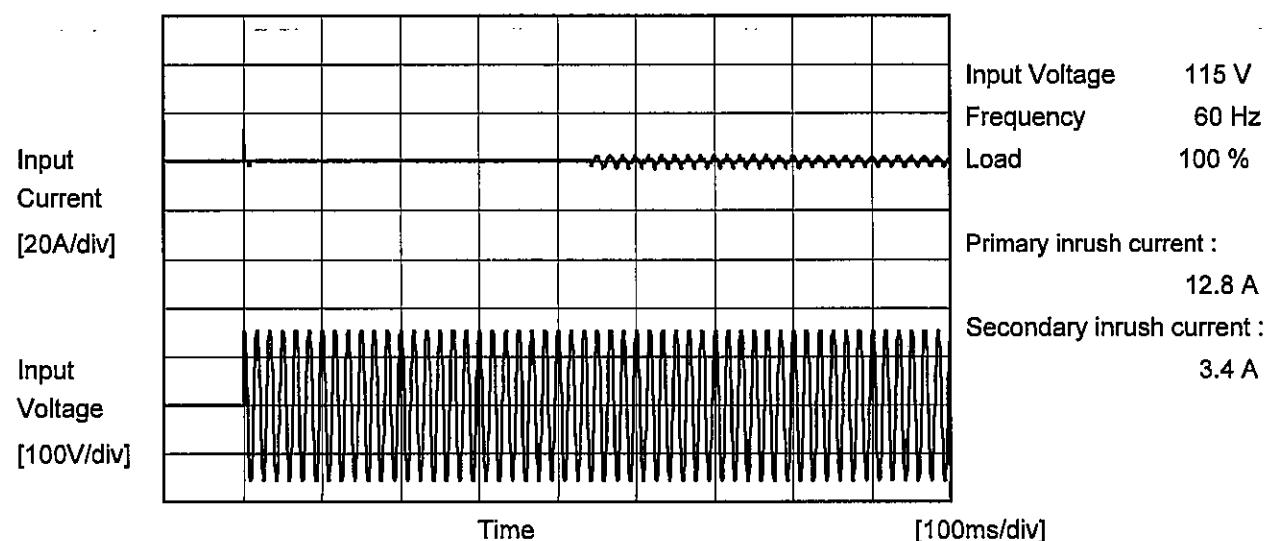
※2: Load 90%

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Model	PLA100F-36	Temperature Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	





Model	PLA100F-36	Temperature Testing Circuitry	25°C Figure B	
Item	Leakage Current			
Object	_____			

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.

COSEL

Model	PLA100F-36	Temperature Testing Circuitry	25°C Figure A																																
Item	Line Regulation																																		
Object	+36V2.8A																																		
1.Graph			2.Values																																
<p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Legend: - - - □ - - - Load 50% — △ — Load 100%</p>			<table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Output Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>85</td> <td>36.170</td> <td>36.169 ※1</td> </tr> <tr> <td>100</td> <td>36.170</td> <td>36.168 ※2</td> </tr> <tr> <td>115</td> <td>36.170</td> <td>36.167</td> </tr> <tr> <td>200</td> <td>36.170</td> <td>36.167</td> </tr> <tr> <td>230</td> <td>36.170</td> <td>36.167</td> </tr> <tr> <td>264</td> <td>36.169</td> <td>36.167</td> </tr> <tr> <td>280</td> <td>36.169</td> <td>36.166</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>※1: Load 80% ※2: Load 90%</p>	Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	85	36.170	36.169 ※1	100	36.170	36.168 ※2	115	36.170	36.167	200	36.170	36.167	230	36.170	36.167	264	36.169	36.167	280	36.169	36.166	--	-	-	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
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100	36.170	36.168 ※2																																	
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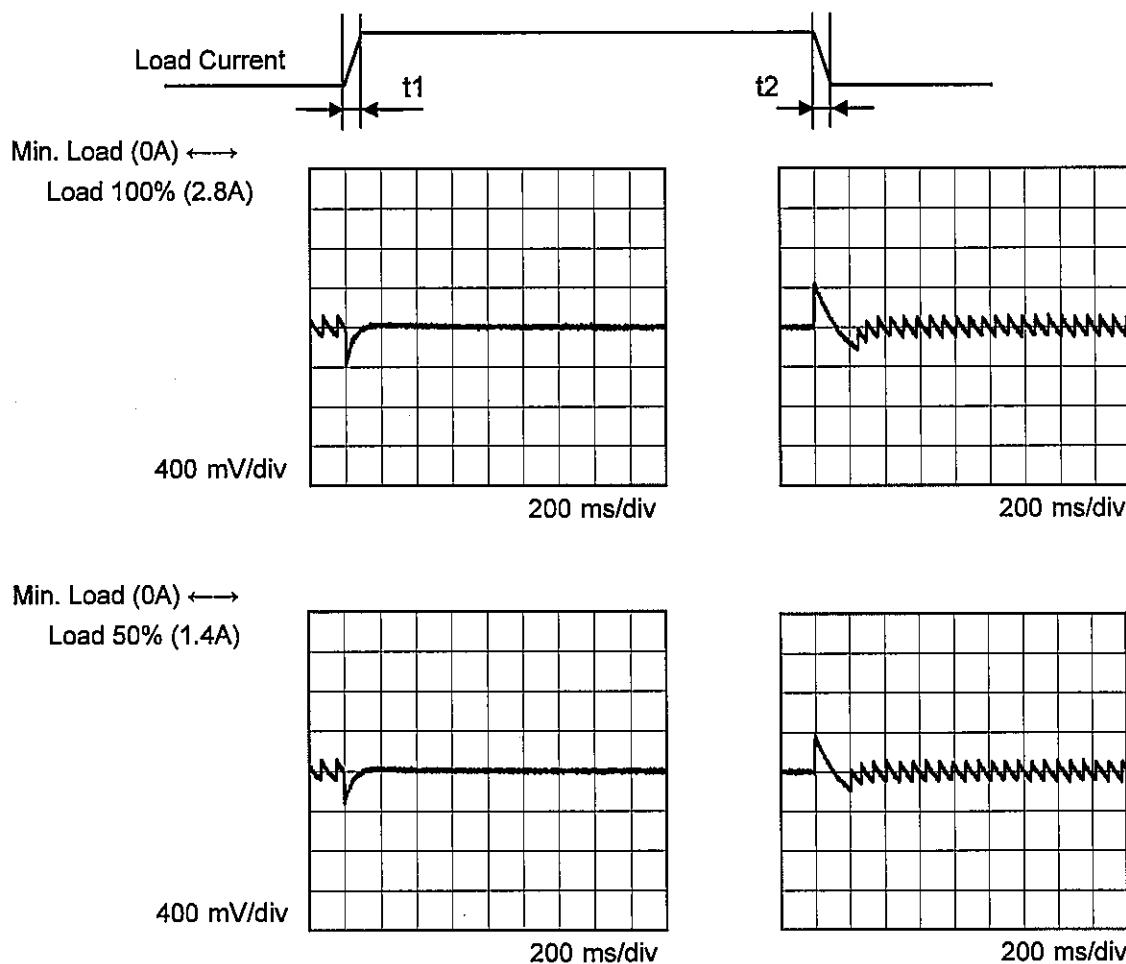
COSEL

Model	PLA100F-36	Temperature	25°C																																																						
Item	Load Regulation	Testing Circuitry	Figure A																																																						
Object	+36V2.8A																																																								
1.Graph	<p>—▲— Input Volt. 100V - - - □ - - Input Volt. 115V - - ○ - - Input Volt. 230V</p> <table border="1"> <caption>Data points estimated from Graph 1</caption> <thead> <tr> <th>Load Current [A]</th> <th>100V [V]</th> <th>115V [V]</th> <th>230V [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>36.283</td><td>36.283</td><td>36.285</td></tr> <tr><td>0.50</td><td>36.196</td><td>36.196</td><td>36.193</td></tr> <tr><td>1.00</td><td>36.172</td><td>36.172</td><td>36.172</td></tr> <tr><td>1.50</td><td>36.171</td><td>36.171</td><td>36.170</td></tr> <tr><td>2.00</td><td>36.170</td><td>36.170</td><td>36.169</td></tr> <tr><td>2.50</td><td>36.168</td><td>36.168</td><td>36.168</td></tr> <tr><td>2.80</td><td>36.167</td><td>36.167</td><td>36.167</td></tr> <tr><td>3.08</td><td>-</td><td>36.166</td><td>36.166</td></tr> </tbody> </table>	Load Current [A]	100V [V]	115V [V]	230V [V]	0.0	36.283	36.283	36.285	0.50	36.196	36.196	36.193	1.00	36.172	36.172	36.172	1.50	36.171	36.171	36.170	2.00	36.170	36.170	36.169	2.50	36.168	36.168	36.168	2.80	36.167	36.167	36.167	3.08	-	36.166	36.166																				
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COSEL

Model	PLA100F-36	Temperature Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+36V2.8A	

Input Volt. 115 V Response. $t_1=t_2=50\mu s$, Typ
 Cycle 1000 ms



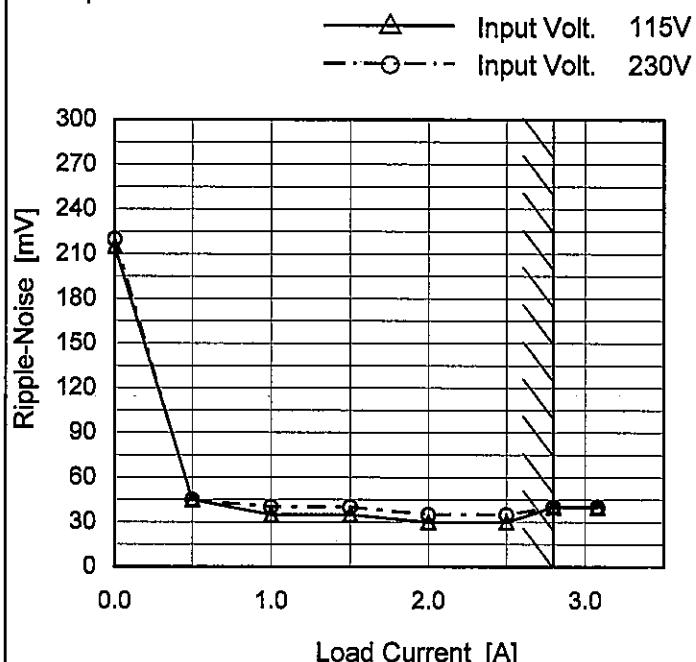
COSEL

Model	PLA100F-36	Temperature	25°C																																						
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure C																																						
Object	+36V2.8A																																								
1.Graph																																									
<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 0.0 to 3.0 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 ripple voltage as load current increases from 0.0 to 1.0 A, then leveling off around 30 mV. A slanted line indicates the rated load current range.</p>																																									
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Load Current [A]	Ripple Voltage [mV]																																								
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3.08	25	25																																							
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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>T1: Due to AC Input Line T2: Due to Switching</p> <p>Fig. Complex Ripple Wave Form</p>																																									

COSEL

Model	PLA100F-36
Item	Ripple-Noise
Object	+36V2.8A

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.

Temperature 25°C
Testing Circuitry Figure C

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0.00	215	220
0.50	45	45
1.00	35	40
1.50	35	40
2.00	30	35
2.50	30	35
2.80	40	40
3.08	40	40
--	-	-
--	-	-
--	-	-

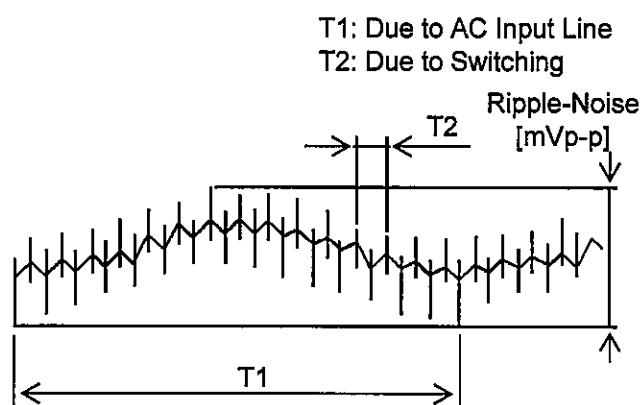


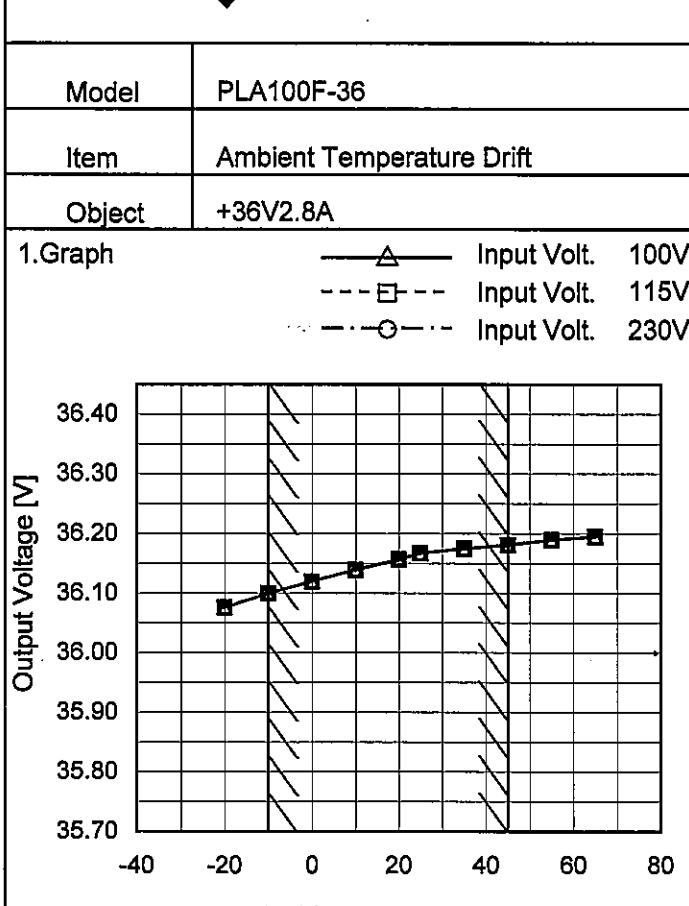
Fig. Complex Ripple Wave Form

COSEL

Model	PLA100F-36	Testing Circuitry Figure C																																							
Item	Ripple Voltage (by Ambient Temp.)																																								
Object	+36V2.8A																																								
1.Graph																																									
<p>Graph showing Ripple Voltage [mV] vs Ambient Temperature [°C]. The Y-axis ranges from 0 to 200 mV, and the X-axis ranges from -40 to 60 °C. Two sets of data points are shown for Input Volt. 115V (dashed line with squares) and Input Volt. 230V (solid line with triangles). A slanted line indicates the rated ambient temperature range.</p> <table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Ripple Voltage [mV] (115V)</th> <th>Ripple Voltage [mV] (230V)</th> </tr> </thead> <tbody> <tr> <td>-20</td> <td>45</td> <td>45</td> </tr> <tr> <td>0</td> <td>25</td> <td>25</td> </tr> <tr> <td>45</td> <td>20</td> <td>20</td> </tr> </tbody> </table>			Ambient Temperature [°C]	Ripple Voltage [mV] (115V)	Ripple Voltage [mV] (230V)	-20	45	45	0	25	25	45	20	20																											
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Measured by 20 MHz Oscilloscope.

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

COSEL


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. 115[V]	Input Volt. 230[V]
-20	36.076	36.076	36.075
-10	36.100	36.100	36.100
0	36.120	36.119	36.119
10	36.139	36.139	36.139
20	36.157	36.157	36.156
25	36.167	36.167	36.167
35	36.175	36.175	36.174
45	36.181	36.181	36.181
55	36.190	36.190	36.189
65	36.195	36.195	36.194
--	-	-	-

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



Model	PLA100F-36	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+36V2.8A	

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 : 0.84 - 2.8A

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

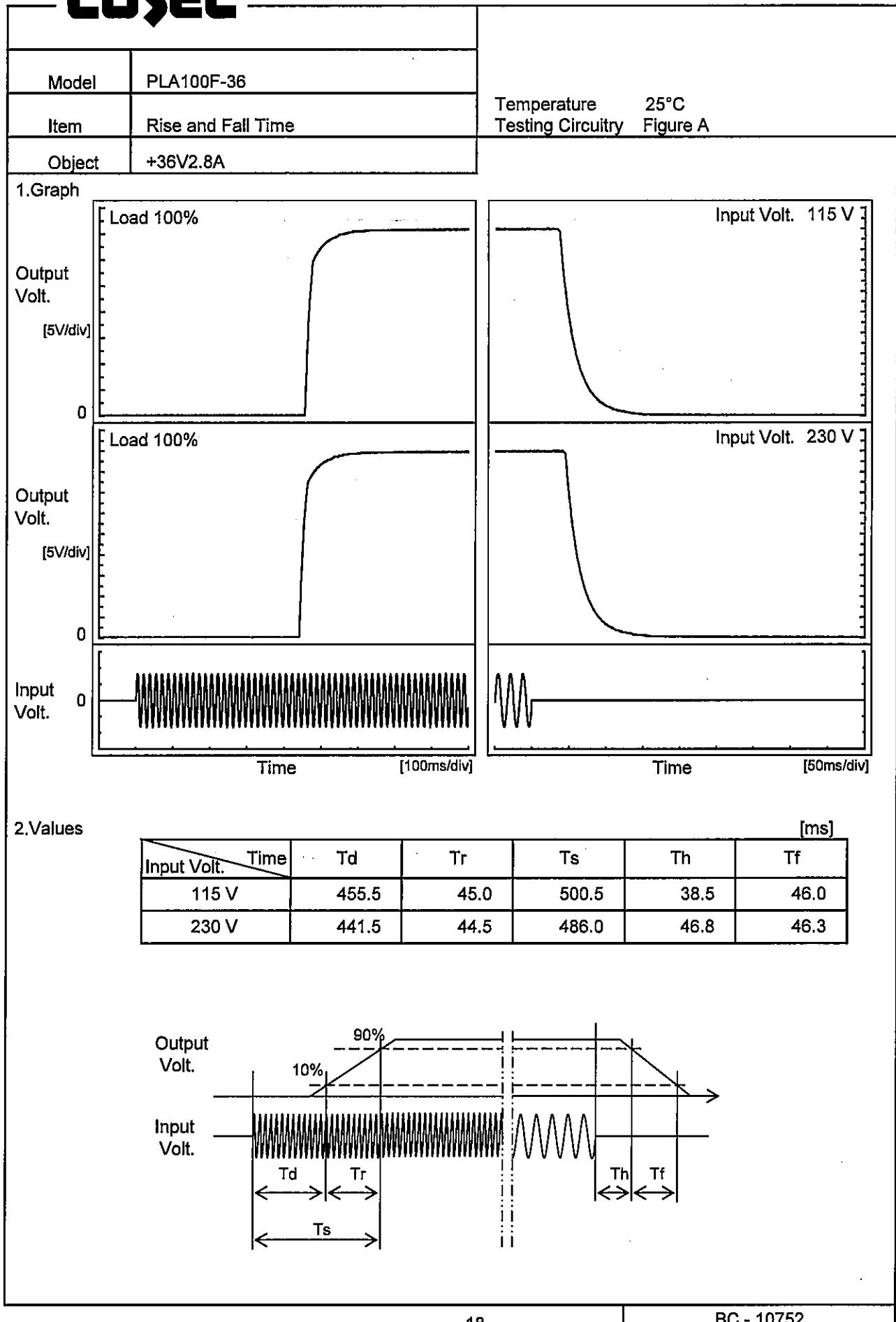
$$\text{* Output Voltage Accuracy (Ration)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	45	230	0.84	36.181	±41	±0.1
Minimum Voltage	-10	115	2.8	36.100		

COSEL

Model	PLA100F-36	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+36V2.8A																								
1. Graph			2. Values																						
			<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>36.167</td></tr> <tr><td>0.5</td><td>36.166</td></tr> <tr><td>1.0</td><td>36.166</td></tr> <tr><td>2.0</td><td>36.166</td></tr> <tr><td>3.0</td><td>36.166</td></tr> <tr><td>4.0</td><td>36.166</td></tr> <tr><td>5.0</td><td>36.165</td></tr> <tr><td>6.0</td><td>36.165</td></tr> <tr><td>7.0</td><td>36.165</td></tr> <tr><td>8.0</td><td>36.165</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	36.167	0.5	36.166	1.0	36.166	2.0	36.166	3.0	36.166	4.0	36.166	5.0	36.165	6.0	36.165	7.0	36.165	8.0	36.165
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8.0	36.165																								
Input Volt. 230V Load 100%																									
* The characteristic of AC115V is equal.																									

COSEL

COSEL

Model	PLA100F-36	Temperature Testing Circuitry	25°C Figure A																																
Item	Hold-Up Time																																		
Object	+36V2.8A																																		
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Input Voltage [V]	Hold-Up Time [ms]																																		
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264	90	46																																	
280	101	49																																	
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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>																																			

COSEL

Model	PLA100F-36	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation	Testing Circuitry	Figure A																																																			
Object	+36V2.8A																																																					
1. Graph		2. Values																																																				
<p>Graph showing Instantaneous Compensation Time [ms] vs Load Current [A]. The Y-axis is logarithmic from 1 to 1000 ms. The X-axis is linear from 0.0 to 3.0 A. Three curves are plotted for Input Volt. 100V (solid line with triangles), Input Volt. 115V (dashed line with squares), and Input Volt. 230V (dash-dot line with circles). A slanted line indicates the rated load current range.</p>		<table border="1"> <thead> <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. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>0.50</td><td>203</td><td>202</td><td>248</td></tr> <tr><td>1.00</td><td>104</td><td>104</td><td>127</td></tr> <tr><td>1.50</td><td>69</td><td>70</td><td>86</td></tr> <tr><td>2.00</td><td>53</td><td>53</td><td>62</td></tr> <tr><td>2.50</td><td>39</td><td>39</td><td>51</td></tr> <tr><td>2.80</td><td>36</td><td>37</td><td>45</td></tr> <tr><td>3.08</td><td>-</td><td>21</td><td>37</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> </tbody> </table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.00	-	-	-	0.50	203	202	248	1.00	104	104	127	1.50	69	70	86	2.00	53	53	62	2.50	39	39	51	2.80	36	37	45	3.08	-	21	37	--	-	-	-	--	-	-	-	--	-	-	-
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COSEL

Model	PLA100F-36																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																							
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COSEL

Model	PLA100F-36
Item	Overcurrent Protection
Object	+36V2.8A

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]
34.2	3.20	3.30
32.4	3.24	3.25
28.8	3.33	3.42
25.2	3.41	3.51
21.6	3.51	3.60
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



<p>Model PLA100F-36</p> <p>Item Overvoltage Protection</p> <p>Object +36V2.8A</p>	Testing Circuitry Figure A																																			
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	<p style="text-align: center;"> Input Volt. 115V Input Volt. 230V </p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Operating Point [V] (Input Volt. 115V)</th> <th>Operating Point [V] (Input Volt. 230V)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>44.49</td><td>44.49</td></tr> <tr><td>-10</td><td>44.49</td><td>44.49</td></tr> <tr><td>0</td><td>44.48</td><td>44.48</td></tr> <tr><td>10</td><td>44.77</td><td>44.77</td></tr> <tr><td>20</td><td>45.18</td><td>45.18</td></tr> <tr><td>25</td><td>45.36</td><td>45.36</td></tr> <tr><td>35</td><td>45.65</td><td>45.65</td></tr> <tr><td>45</td><td>46.06</td><td>46.06</td></tr> <tr><td>55</td><td>46.36</td><td>46.36</td></tr> <tr><td>65</td><td>46.76</td><td>46.76</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V] (Input Volt. 115V)	Operating Point [V] (Input Volt. 230V)	-20	44.49	44.49	-10	44.49	44.49	0	44.48	44.48	10	44.77	44.77	20	45.18	45.18	25	45.36	45.36	35	45.65	45.65	45	46.06	46.06	55	46.36	46.36	65	46.76	46.76	--	-
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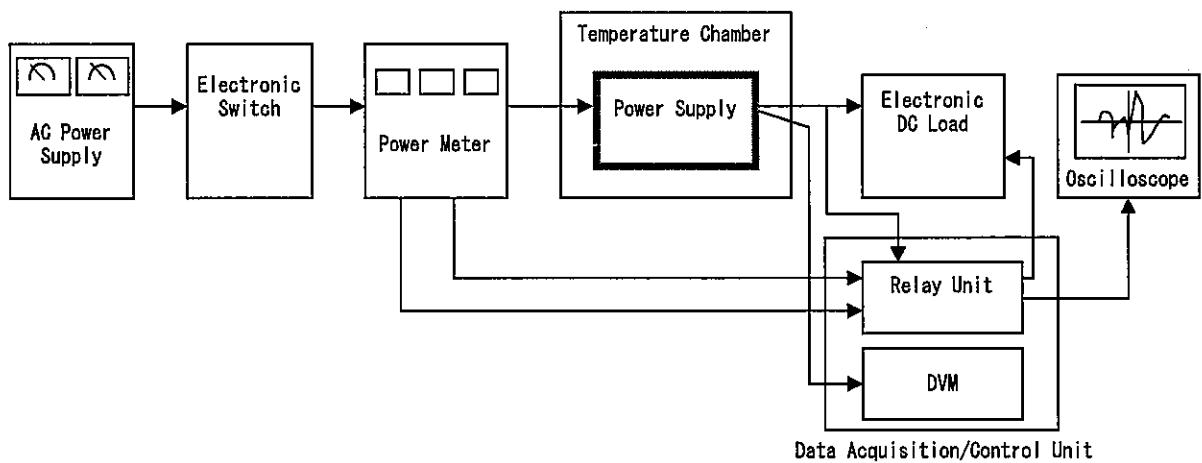


Figure A

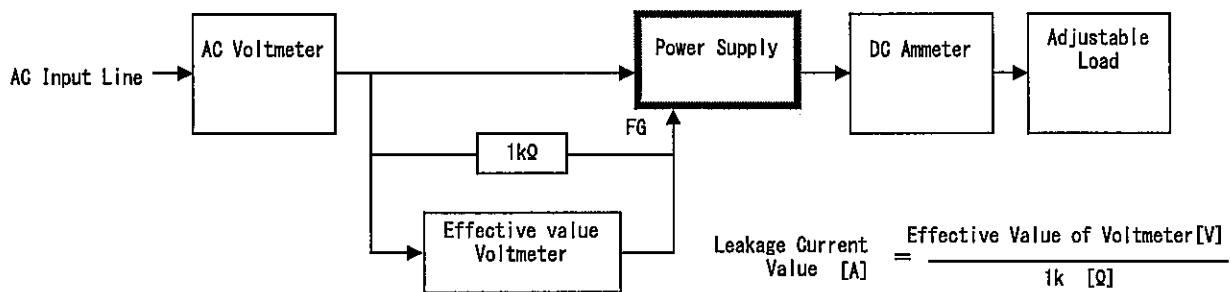


Figure B (DEN-AN)

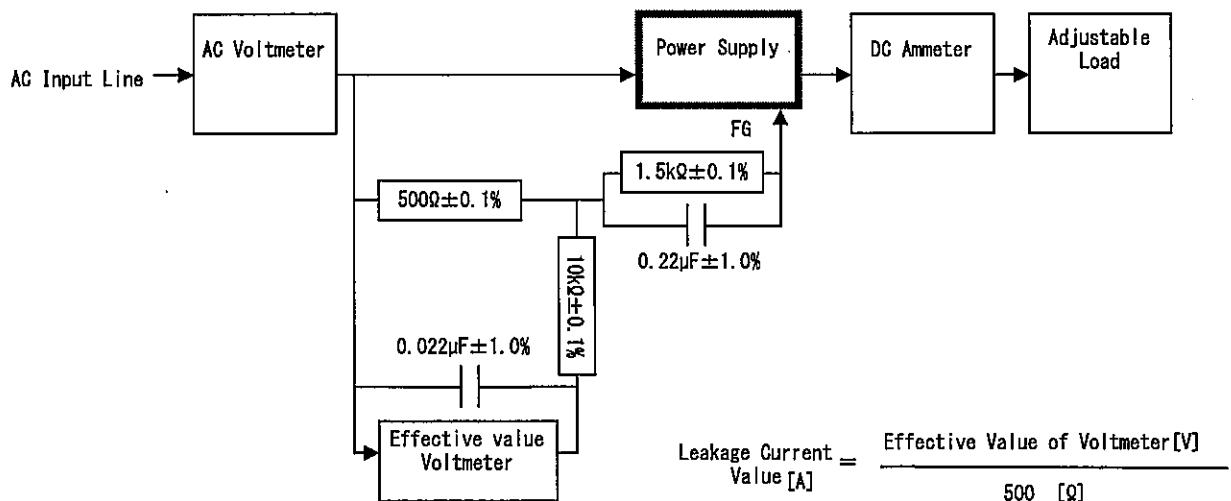


Figure B (IEC60950-1)

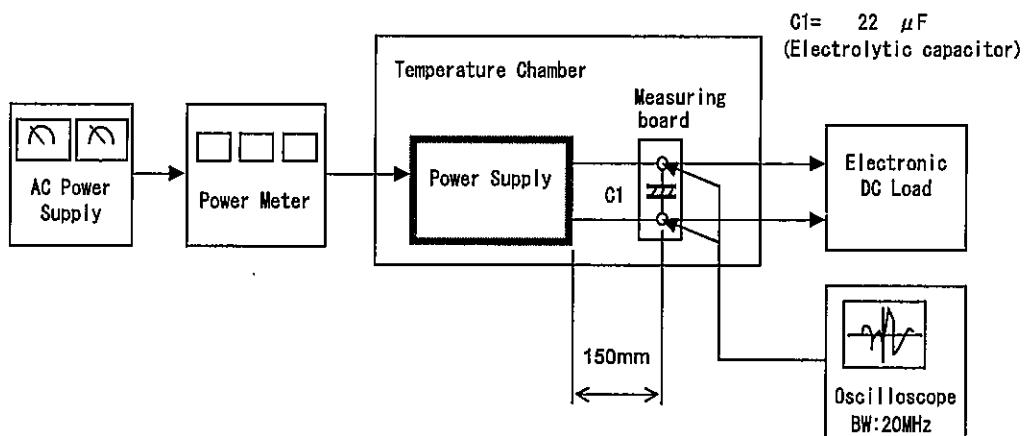


Figure C