

TEST DATA OF PLA600F-12

Regulated DC Power Supply
August 19, 2011

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Katsumi Ishikawa Design Manager

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COSEL CO.,LTD.



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Model		PLA600F-12		Temperature		25°C																																																				
Item		Input Current (by Load Current)		Testing Circuitry		Figure A																																																				
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1. Graph				2. Values																																																						
<p> —△— Input Volt. 100V - - - □ - - - Input Volt. 115V - - - ○ - - - Input Volt. 230V </p> <p>The graph plots Input Current [A] on the y-axis (0 to 10) against Load Current [A] on the x-axis (0 to 60). Three data series are shown: 100V (solid line with triangles), 115V (dashed line with squares), and 230V (dash-dot line with circles). A vertical slanted line is drawn at approximately 50A load current, indicating the rated load current range.</p>				<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Current [A]</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</td><td>0.173</td><td>0.174</td><td>0.288</td></tr> <tr><td>8</td><td>1.448</td><td>1.272</td><td>0.737</td></tr> <tr><td>16</td><td>2.522</td><td>2.200</td><td>1.177</td></tr> <tr><td>24</td><td>3.660</td><td>3.178</td><td>1.650</td></tr> <tr><td>32</td><td>4.820</td><td>4.170</td><td>2.129</td></tr> <tr><td>40</td><td>6.020</td><td>5.190</td><td>2.616</td></tr> <tr><td>48</td><td>7.220</td><td>6.220</td><td>3.108</td></tr> <tr><td>50</td><td>7.540</td><td>6.480</td><td>3.230</td></tr> <tr><td>55</td><td>-</td><td>7.128</td><td>3.553</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 Current [A]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0	0.173	0.174	0.288	8	1.448	1.272	0.737	16	2.522	2.200	1.177	24	3.660	3.178	1.650	32	4.820	4.170	2.129	40	6.020	5.190	2.616	48	7.220	6.220	3.108	50	7.540	6.480	3.230	55	-	7.128	3.553	--	-	-	-	--	-	-	-
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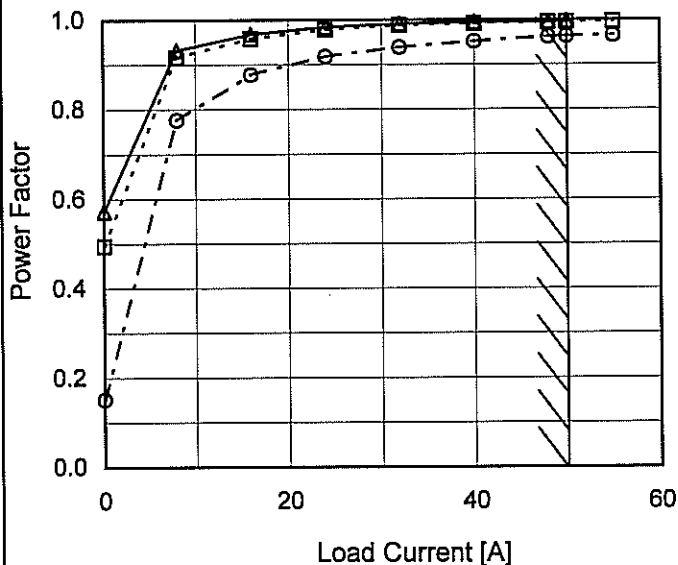


Model	PLA600F-12
Item	Power Factor (by Load Current)
Object	_____

Temperature 25°C
Testing Circuitry Figure A

1. Graph

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



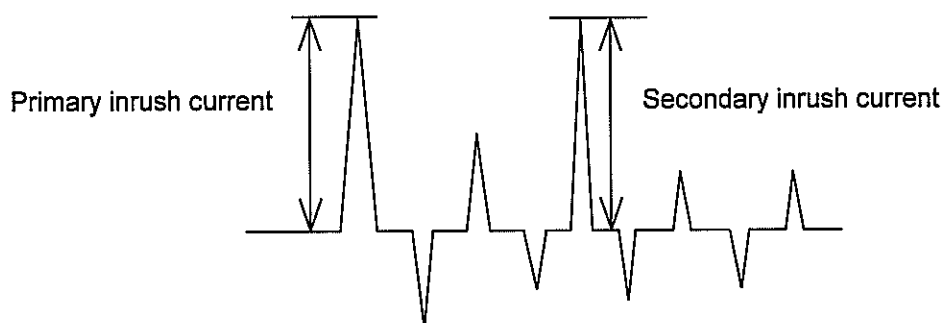
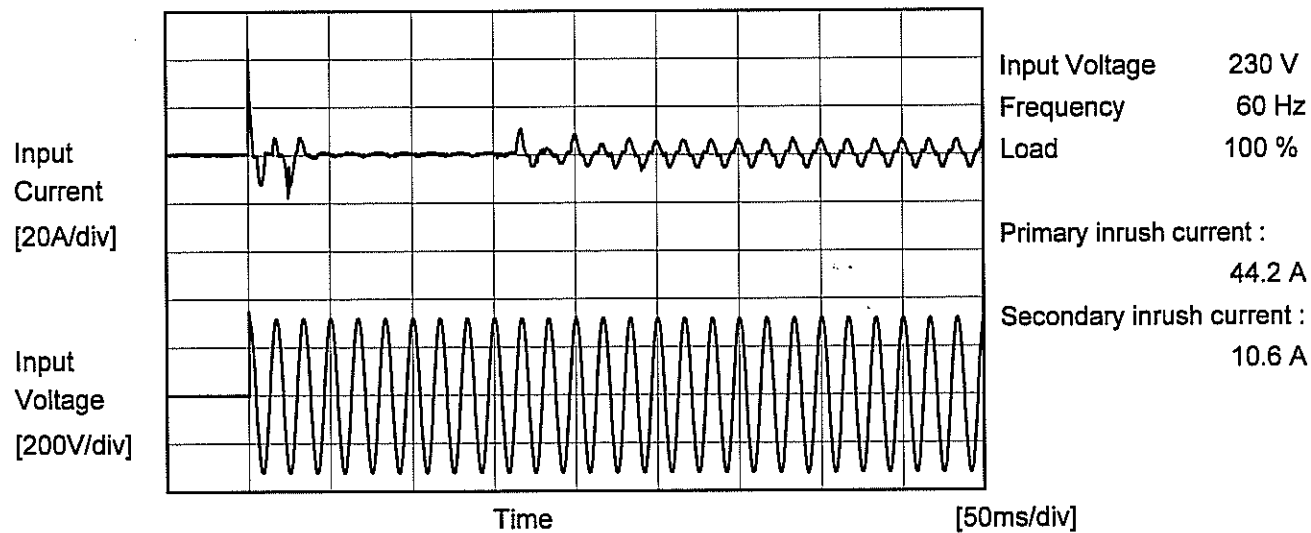
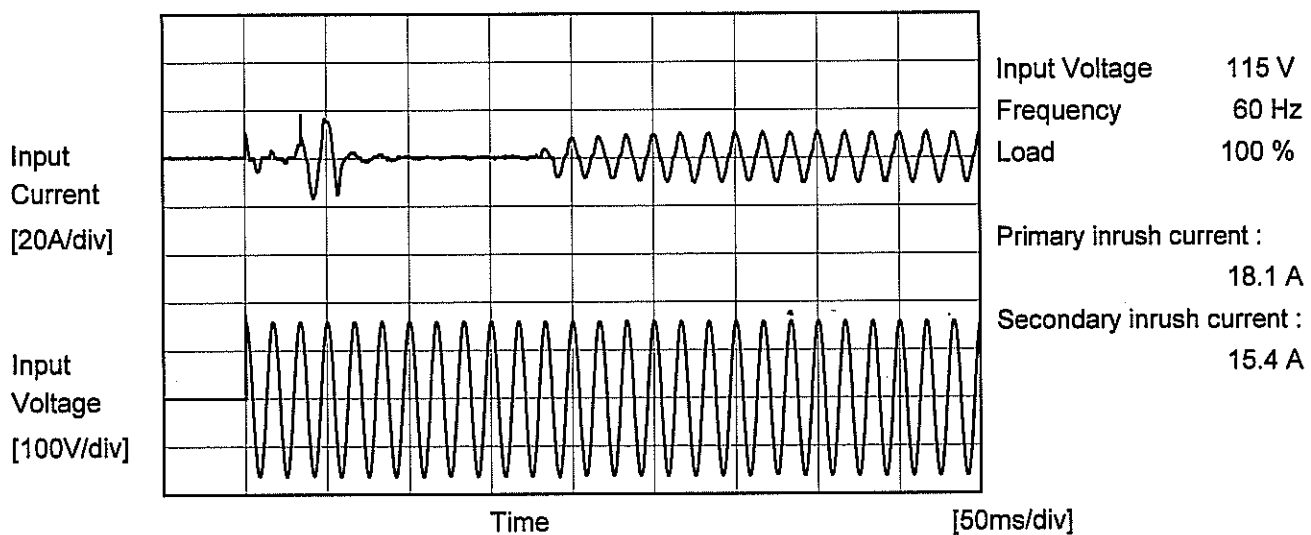
Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	0.572	0.495	0.152
8	0.932	0.917	0.776
16	0.967	0.958	0.878
24	0.984	0.978	0.918
32	0.992	0.987	0.939
40	0.995	0.992	0.952
48	0.996	0.994	0.962
50	0.997	0.995	0.964
55	-	0.996	0.965
--	-	-	-
--	-	-	-



Model		PLA600F-12	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		_____	





COSEL		Temperature 25°C Testing Circuitry Figure B
Model	PLA600F-12	
Item	Leakage Current	
Object	_____	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.31	0.33	0.66	Operation
	One of phases	0.43	0.51	1.10	Stand by
IEC60950-1	Both phases	0.25	0.29	0.64	Operation
	One of phases	0.44	0.50	1.10	Stand by

The value for "One of phases" is the reference value only.

2.Condition

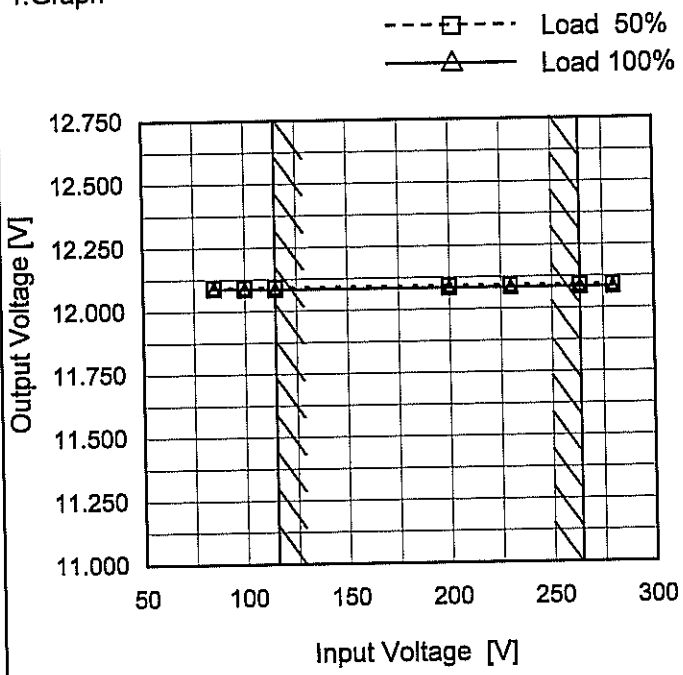
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.



Model	PLA600F-12
Item	Line Regulation
Object	+12V50A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	12.092	12.088 ※1
100	12.092	12.086 ※2
115	12.092	12.085
200	12.092	12.085
230	12.092	12.085
264	12.092	12.085
280	12.092	12.085
--	-	-
--	-	-

※1: Load 80%
 ※2: Load 90%



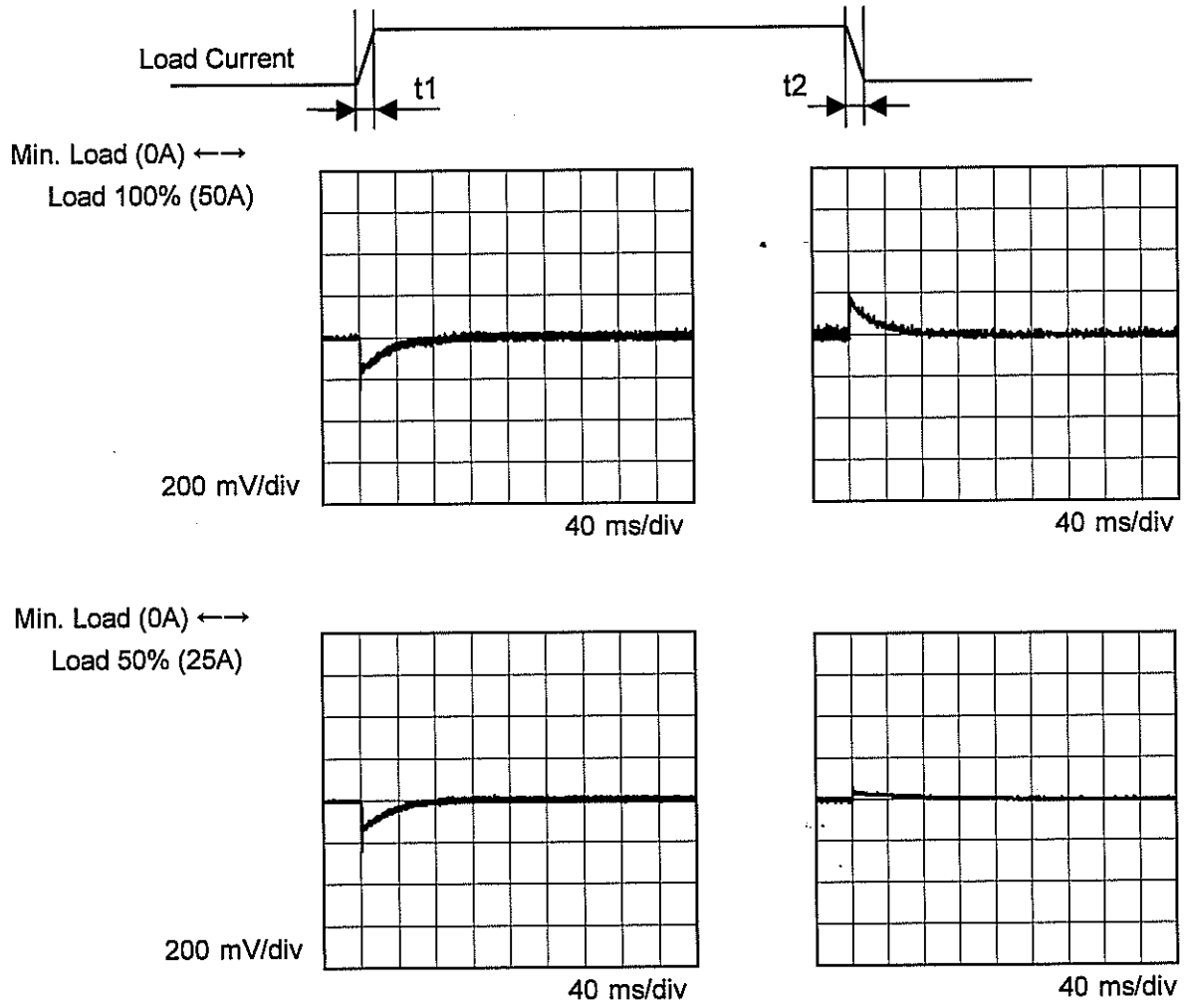
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Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V50A		

Input Volt. 115 V
Cycle 1000 ms

Response. $t_1=t_2=50\mu\text{s}$. Typ





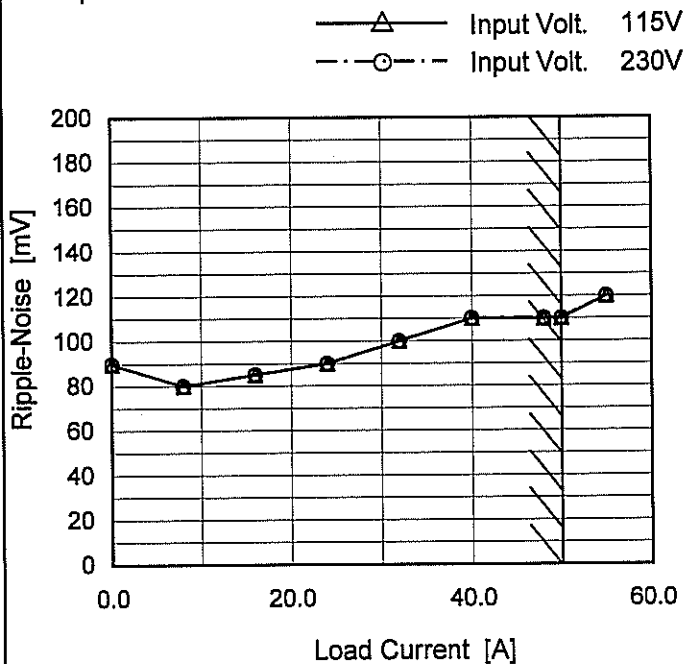
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<p>1.Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 115V -·-○-·- Input Volt. 230V</p> </div> <p>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>		<p>2.Values</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</td><td>30</td><td>30</td></tr> <tr><td>8</td><td>15</td><td>15</td></tr> <tr><td>16</td><td>15</td><td>15</td></tr> <tr><td>24</td><td>15</td><td>15</td></tr> <tr><td>32</td><td>20</td><td>20</td></tr> <tr><td>40</td><td>20</td><td>20</td></tr> <tr><td>48</td><td>25</td><td>25</td></tr> <tr><td>50</td><td>25</td><td>25</td></tr> <tr><td>55</td><td>30</td><td>30</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	30	30	8	15	15	16	15	15	24	15	15	32	20	20	40	20	20	48	25	25	50	25	25	55	30	30	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																							
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16	15	15																																						
24	15	15																																						
32	20	20																																						
40	20	20																																						
48	25	25																																						
50	25	25																																						
55	30	30																																						
--	-	-																																						
--	-	-																																						
<p>T1: Due to AC Input Line T2: Due to Switching</p> <p>Fig. Complex Ripple Wave Form</p>																																								



Model	PLA600F-12
Item	Ripple-Noise
Object	+12V50A

Temperature 25°C
Testing Circuitry Figure C

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0	90	90
8	80	80
16	85	85
24	90	90
32	100	100
40	110	110
48	110	110
50	110	110
55	120	120
--	-	-
--	-	-

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.

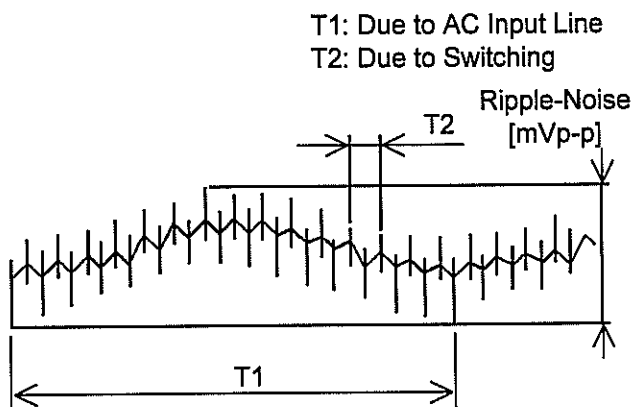


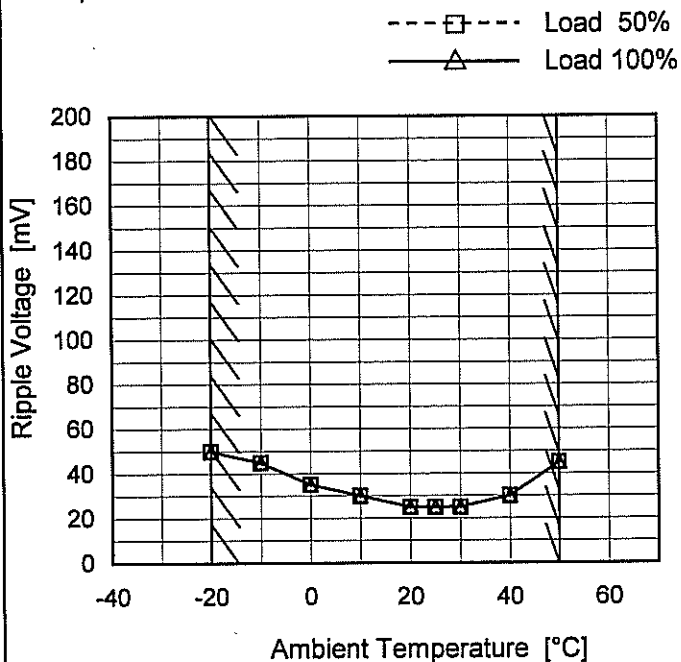
Fig. Complex Ripple Wave Form



Model	PLA600F-12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V50A

Testing Circuitry Figure C

1. Graph



Measured by 20 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
-20	50	50
-10	45	45
0	35	35
10	30	30
20	25	25
25	25	25
30	25	25
40	30	30
50	45	45
--	-	-
--	-	-

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



Model	PLA600F-12
Item	Ambient Temperature Drift
Object	+12V50A
1.Graph	<p> —△— Input Volt. 100V - - - □ - - - Input Volt. 115V - · - ○ - · - - Input Volt. 230V </p> <p> Note: Slanted line shows the range of the rated ambient temperature. </p>

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	12.084	12.082	12.083
-10	12.084	12.083	12.083
0	12.084	12.083	12.083
10	12.084	12.083	12.082
25	12.083	12.081	12.081
30	12.084	12.082	12.082
40	12.082	12.081	12.081
50	12.078	12.076	12.077
60	12.074	12.072	12.073
-	-	-	-
--	-	-	-

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



COSEL		
Model	PLA600F-12	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V50A	

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 : -20 - 50°C

Input Voltage : 115 - 264V

Load Current : 0 - 50A

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

* 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	115	0	12.098	±11	±0.1
Minimum Voltage	50	264	50	12.076		

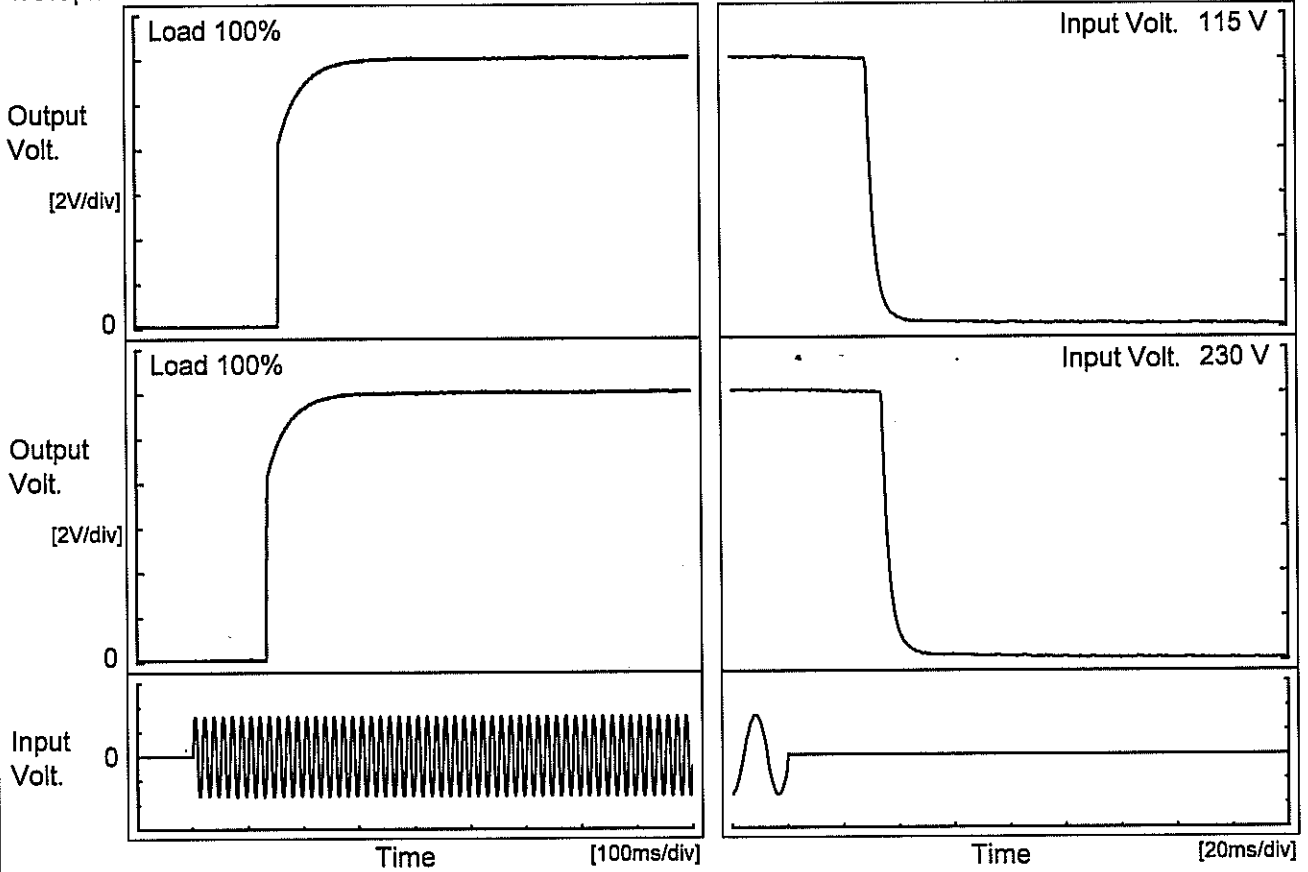


COSEL																									
Model	PLA600F-12	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+12V50A																								
1. Graph		2. Values																							
<p style="text-align: center;">Time [H]</p> <p style="text-align: center;">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>12.287</td></tr> <tr><td>0.5</td><td>12.288</td></tr> <tr><td>1.0</td><td>12.288</td></tr> <tr><td>2.0</td><td>12.288</td></tr> <tr><td>* 3.0</td><td>12.288</td></tr> <tr><td>4.0</td><td>12.288</td></tr> <tr><td>5.0</td><td>12.288</td></tr> <tr><td>6.0</td><td>12.288</td></tr> <tr><td>7.0</td><td>12.288</td></tr> <tr><td>8.0</td><td>12.289</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	12.287	0.5	12.288	1.0	12.288	2.0	12.288	* 3.0	12.288	4.0	12.288	5.0	12.288	6.0	12.288	7.0	12.288	8.0	12.289
Time since start [H]	Output Voltage [V]																								
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* The characteristic of AC115V is equal.																									



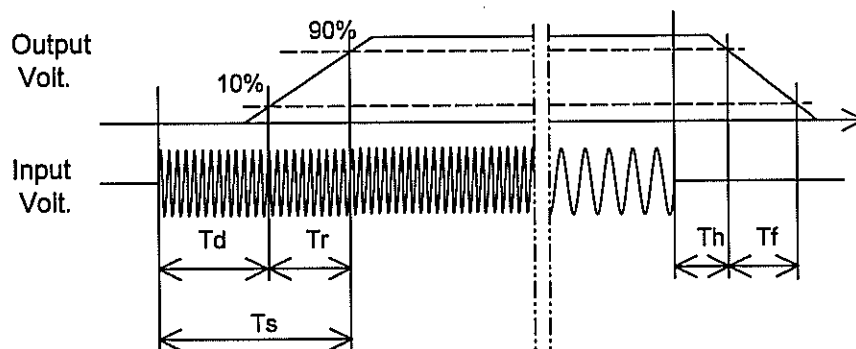
Model	PLA600F-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V50A		

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
115 V		157.5	48.5	206.0	29.0	6.0
230 V		134.5	46.0	180.5	34.0	6.0

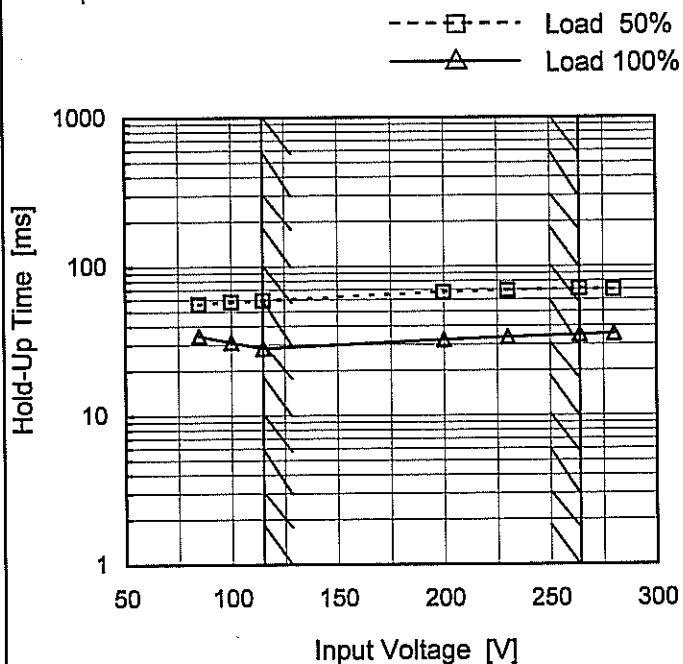




Model	PLA600F-12
Item	Hold-Up Time
Object	+12V50A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	56	34 ※1
100	58	31 ※2
115	59	28
200	67	32
230	69	34
264	71	35
280	70	35
--	-	-
--	-	-

※1: Load 80%

※2: Load 90%

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.



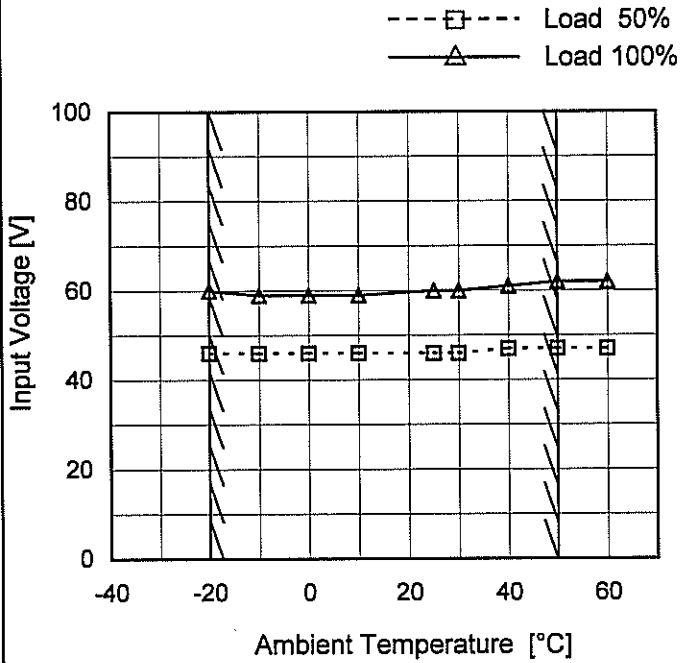
<p>Model PLA600F-12</p>		<p>Temperature 25°C Testing Circuitry Figure A</p>																																																			
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<p>1. Graph</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> </div> <div style="width: 35%;"> <p>—△— Input Volt. 100V - - -□- - - Input Volt. 115V - · -○- · - - Input Volt. 230V</p> </div> </div>																																																					
<p>2. Values</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <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</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>8</td><td>139</td><td>145</td><td>190</td></tr> <tr><td>16</td><td>81</td><td>80</td><td>90</td></tr> <tr><td>24</td><td>57</td><td>58</td><td>64</td></tr> <tr><td>32</td><td>47</td><td>48</td><td>54</td></tr> <tr><td>40</td><td>37</td><td>38</td><td>44</td></tr> <tr><td>48</td><td>30</td><td>30</td><td>36</td></tr> <tr><td>50</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>55</td><td>-</td><td>26</td><td>27</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	-	-	-	8	139	145	190	16	81	80	90	24	57	58	64	32	47	48	54	40	37	38	44	48	30	30	36	50	28	29	30	55	-	26	27	--	-	-	-	--	-	-	-
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<p>Note: Slanted line shows the range of the rated load current.</p>																																																					



Model	PLA600F-12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V50A

Testing Circuitry Figure A

1. Graph



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	46	60
-10	46	59
0	46	59
10	46	59
25	46	60
30	46	60
40	47	61
50	47	62
60	47	62
--	-	-
--	-	-

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



Model		PLA600F-12	Temperature		25°C																																									
Item		Overcurrent Protection	Testing Circuitry		Figure A																																									
Object		+12V50A																																												
1.Graph			2.Values																																											
<p> Input Volt. 115V Input Volt. 230V </p> <p>Note: Slanted line shows 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>11.4</td><td>57.41</td><td>57.44</td></tr> <tr><td>10.8</td><td>57.19</td><td>57.62</td></tr> <tr><td>9.6</td><td>58.04</td><td>58.04</td></tr> <tr><td>8.4</td><td>58.52</td><td>58.49</td></tr> <tr><td>7.2</td><td>58.96</td><td>58.85</td></tr> <tr><td>6.0</td><td>59.24</td><td>58.52</td></tr> <tr><td>4.8</td><td>59.07</td><td>58.84</td></tr> <tr><td>3.6</td><td>59.36</td><td>58.81</td></tr> <tr><td>2.4</td><td>59.12</td><td>58.75</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]	11.4	57.41	57.44	10.8	57.19	57.62	9.6	58.04	58.04	8.4	58.52	58.49	7.2	58.96	58.85	6.0	59.24	58.52	4.8	59.07	58.84	3.6	59.36	58.81	2.4	59.12	58.75	--	-	-	--	-	-	--	-	-
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<p>Model PLA600F-12</p> <p>Item Overtoltage Protection</p> <p>Object +12V50A</p>		<p>Testing Circuitry Figure A</p>																																						
<p>1.Graph</p> <p style="text-align: right;"> —△— Input Volt. 115V ---□--- Input Volt. 230V </p> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: right;">Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>			<p>2.Values</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>14.21</td><td>14.21</td></tr> <tr><td>-10</td><td>14.21</td><td>14.21</td></tr> <tr><td>0</td><td>14.21</td><td>14.21</td></tr> <tr><td>10</td><td>14.21</td><td>14.21</td></tr> <tr><td>25</td><td>14.20</td><td>14.21</td></tr> <tr><td>30</td><td>14.20</td><td>14.21</td></tr> <tr><td>40</td><td>14.20</td><td>14.20</td></tr> <tr><td>50</td><td>14.20</td><td>14.20</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> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 115[V]	Input Volt. 230[V]	-20	14.21	14.21	-10	14.21	14.21	0	14.21	14.21	10	14.21	14.21	25	14.20	14.21	30	14.20	14.21	40	14.20	14.20	50	14.20	14.20	--	-	-	--	-	-	--	-
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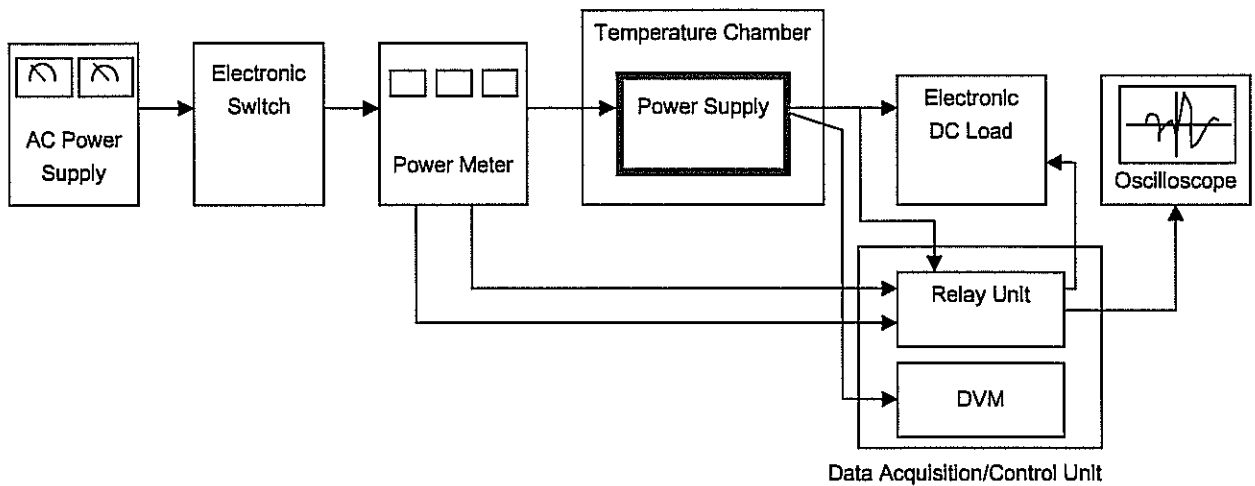


Figure A

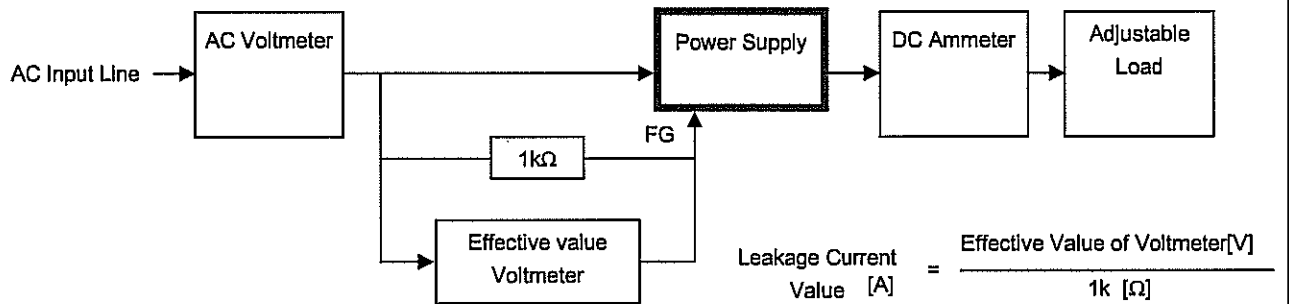


Figure B (DEN-AN)

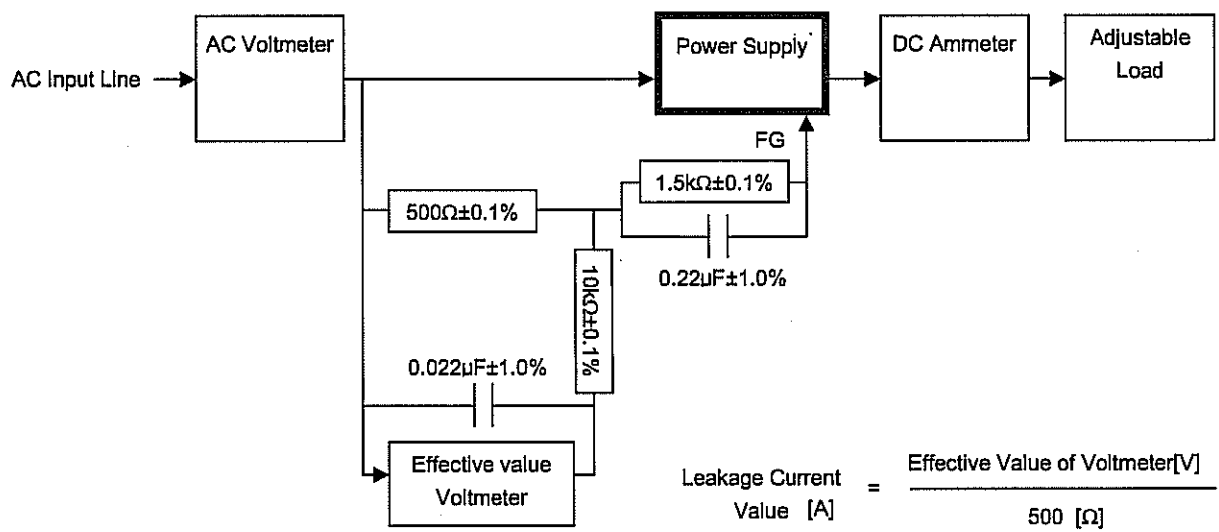


Figure B (IEC60950-1)

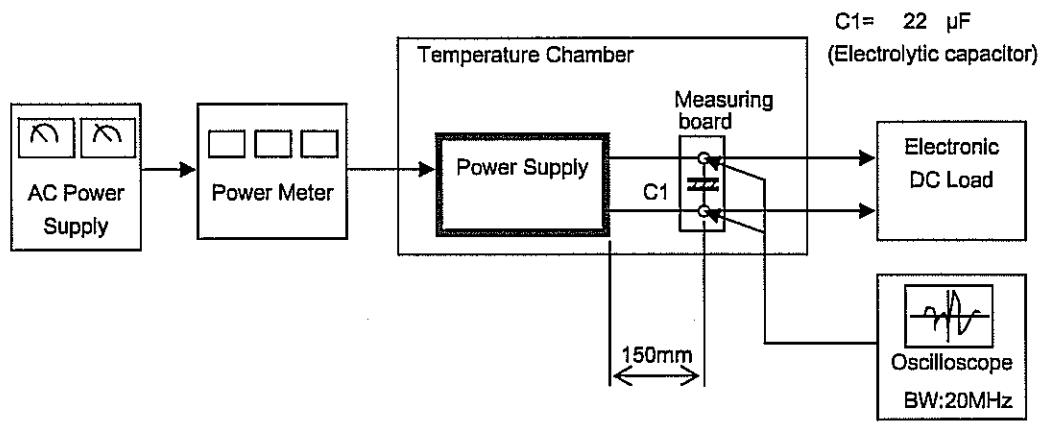


Figure C