

TEST DATA OF PLA30F-15

Regulated DC Power Supply
June 24, 2014

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Yuhei Sugimori Design Engineer

COSEL CO.,LTD.

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(Final Page 25)

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Model

PLA30F-15

Item

Input Current (by Load Current)

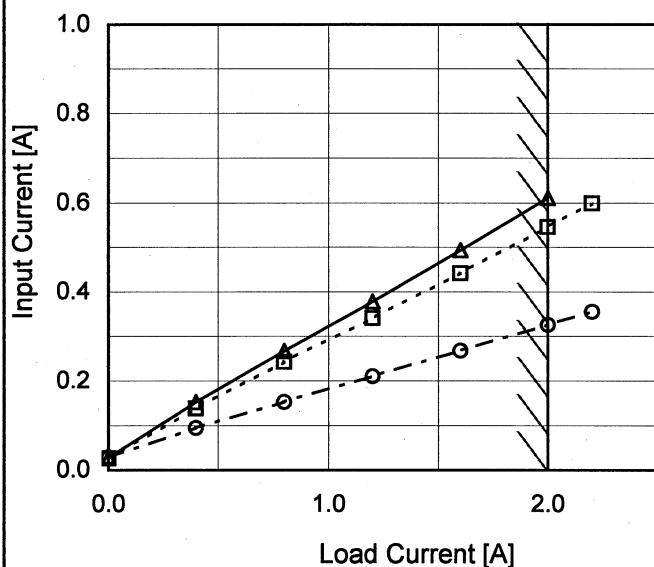
Object

Temperature
Testing Circuitry

25°C
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]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	0.028	0.027	0.029
0.4	0.153	0.139	0.095
0.8	0.267	0.243	0.153
1.2	0.379	0.341	0.211
1.6	0.493	0.442	0.268
2.0	0.611	0.546	0.326
2.2	-	0.599	0.355
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-



Model

PLA30F-15

Item

Input Power (by Load Current)

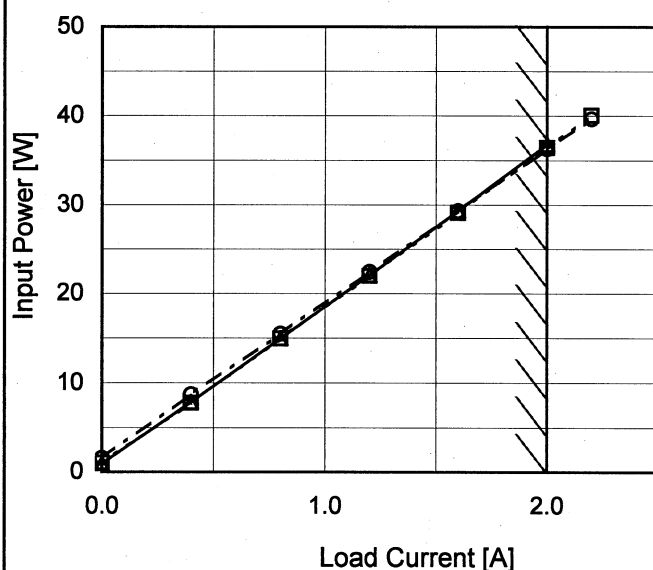
Object

Temperature
Testing Circuitry

25°C
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]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	0.98	1.03	1.58
0.4	7.87	7.75	8.73
0.8	15.01	14.97	15.53
1.2	22.10	21.98	22.44
1.6	29.34	29.09	29.30
2.0	36.83	36.45	36.30
2.2	-	40.07	39.70
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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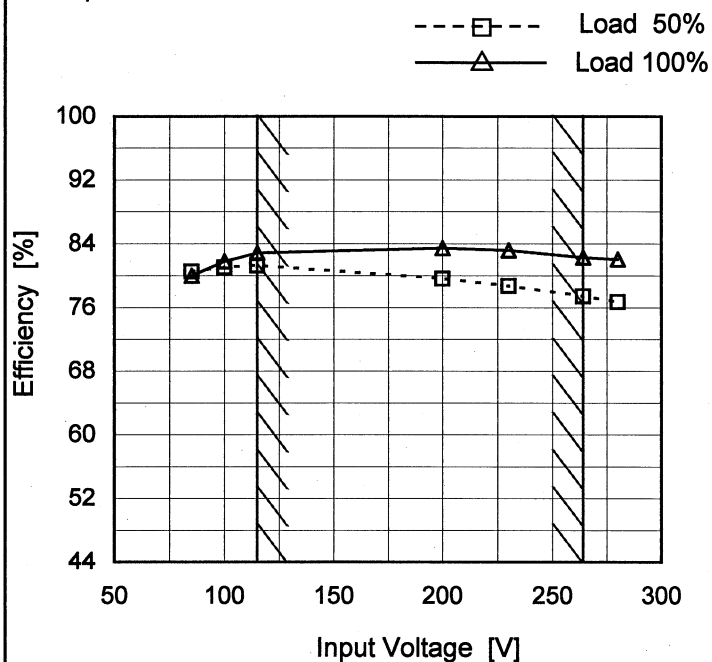
Model PLA30F-15

Item Efficiency (by Input Voltage)

Object

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]	Efficiency [%]	
	Load 50%	Load 100%
85	80.5	80.0 ※1
100	81.1	81.8 ※2
115	81.3	82.9
200	79.7	83.4
230	78.7	83.2
264	77.4	82.3
280	76.7	82.1
--	-	-
--	-	-

※1: Load 80%

※2: Load 90%

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Model

PLA30F-15

Item

Efficiency (by Load Current)

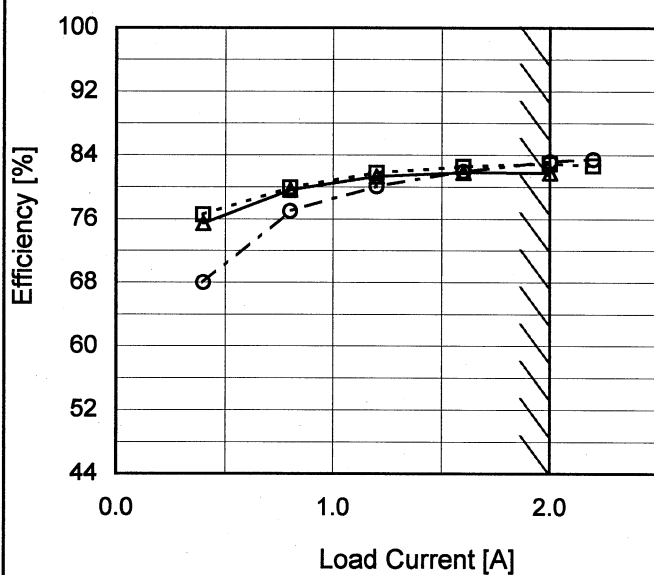
Object

Temperature
Testing Circuitry

25°C
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]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	-	-	-
0.4	75.5	76.6	68.0
0.8	79.6	79.9	77.0
1.2	81.3	81.8	80.1
1.6	81.8	82.5	81.9
2.0	81.8	82.9	83.2
2.2	-	82.7	83.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-



Model		PLA30F-15		Temperature Testing Circuitry	25°C Figure A																																
Item		Power Factor (by Input Voltage)																																			
Object																																					
1.Graph				2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Power Factor</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>85</td><td>0.585</td><td>0.623 ※1</td></tr><tr><td>100</td><td>0.566</td><td>0.598 ※2</td></tr><tr><td>115</td><td>0.540</td><td>0.581</td></tr><tr><td>200</td><td>0.468</td><td>0.500</td></tr><tr><td>230</td><td>0.450</td><td>0.481</td></tr><tr><td>264</td><td>0.433</td><td>0.461</td></tr><tr><td>280</td><td>0.427</td><td>0.453</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table> <div>※1:Load 80%</div> <div>※2:Load 90%</div>				Input Voltage [V]	Power Factor		Load 50%	Load 100%	85	0.585	0.623 ※1	100	0.566	0.598 ※2	115	0.540	0.581	200	0.468	0.500	230	0.450	0.481	264	0.433	0.461	280	0.427	0.453	--	-	-	--	-	-		
Input Voltage [V]	Power Factor																																				
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Model

PLA30F-15

Item

Power Factor (by Load Current)

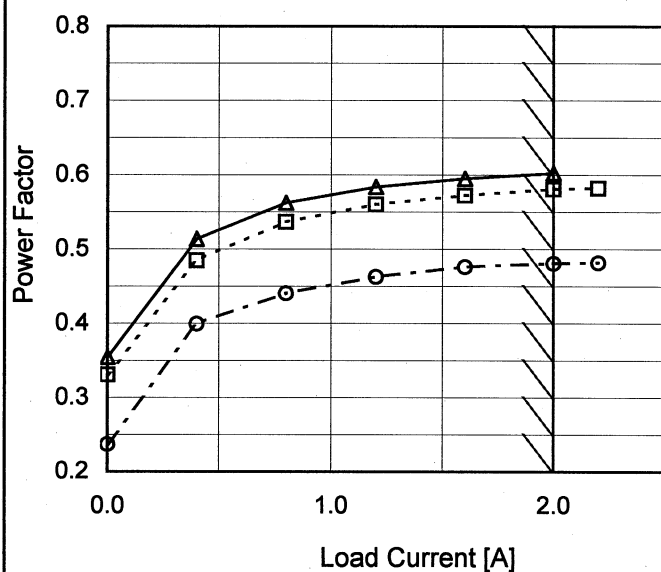
Object

Temperature
Testing Circuitry

25°C
Figure A

1. Graph

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



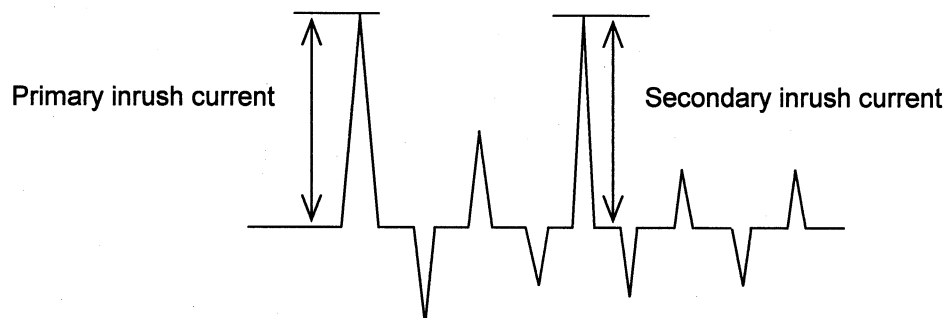
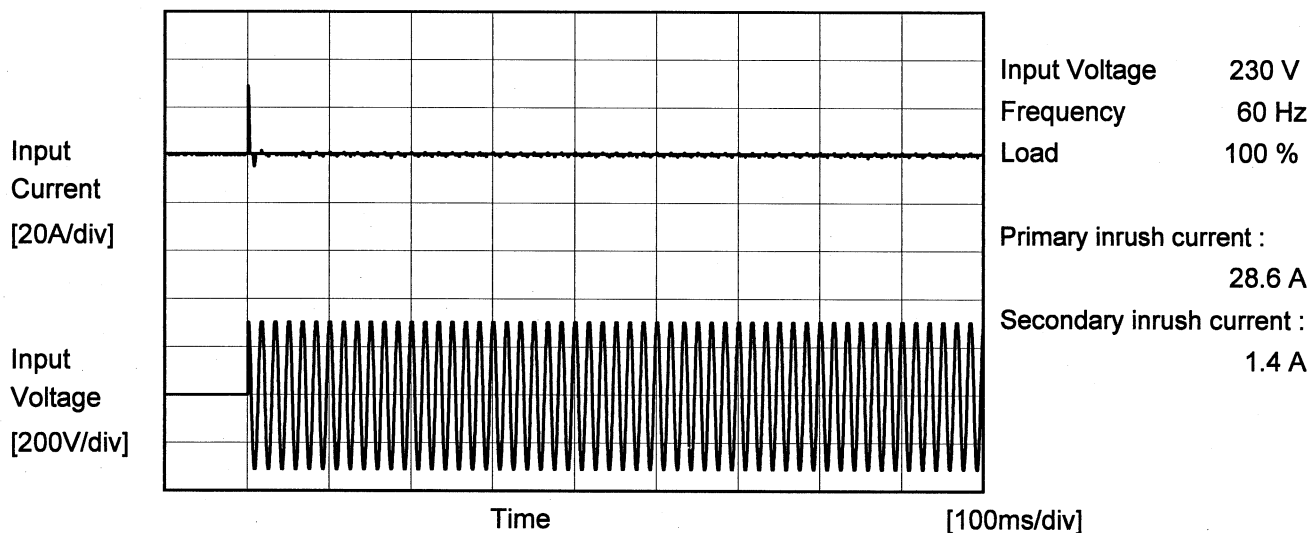
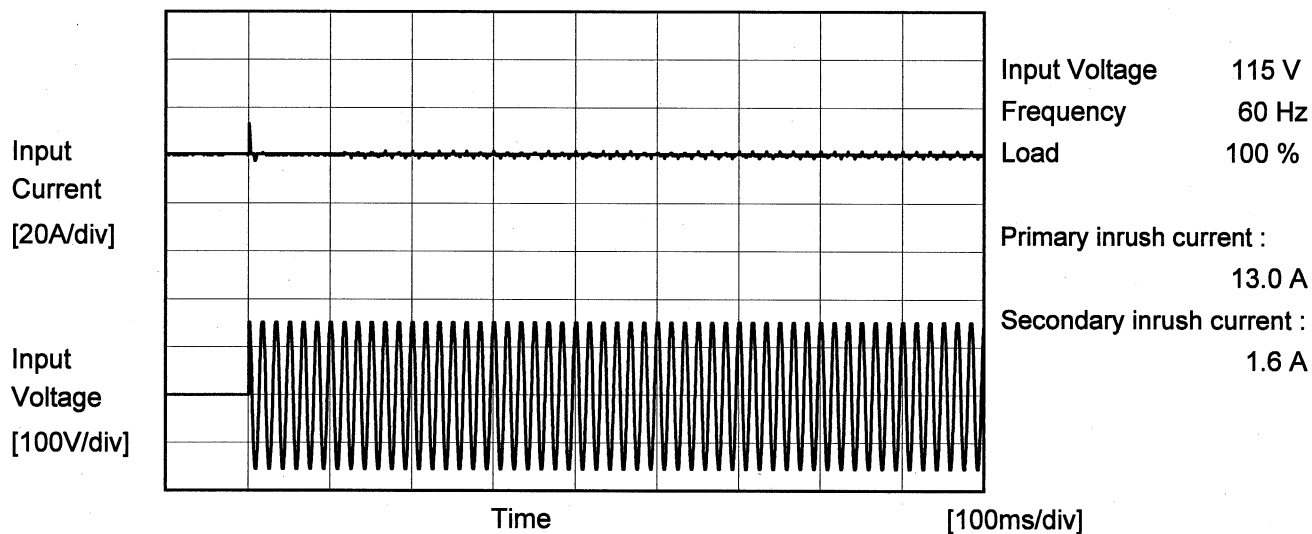
Note: Slanted line shows the range of the rated load current.

2. Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	0.355	0.331	0.237
0.4	0.514	0.485	0.400
0.8	0.563	0.537	0.441
1.2	0.584	0.560	0.463
1.6	0.595	0.573	0.476
2.0	0.603	0.581	0.481
2.2	-	0.582	0.482
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model		PLA30F-15	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		_____	



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		Temperature 25°C Testing Circuitry Figure B
Model	PLA30F-15	
Item	Leakage Current	
Object		

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.09	0.11	0.24	Operation
	One of phases	0.18	0.20	0.46	Stand by
IEC60950-1	Both phases	0.12	0.14	0.29	Operation
	One of phases	0.18	0.20	0.44	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		PLA30F-15	
Item		Line Regulation	
Object		+15V2A	

1.Graph

□

Load 50%

—

△

—

Load 100%

Output Voltage [V]

16.00

15.75

15.50

15.25

15.00

14.75

14.50

14.25

14.00

13.75

50

100

150

200

250

300

Input Voltage [V]

50

100

150

200

250

300

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	15.056	15.055 ※1
100	15.056	15.054 ※2
115	15.056	15.054
200	15.056	15.054
230	15.056	15.054
264	15.056	15.054
280	15.056	15.054
--	-	-
--	-	-

※1:Load 80%

※2:Load 90%

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

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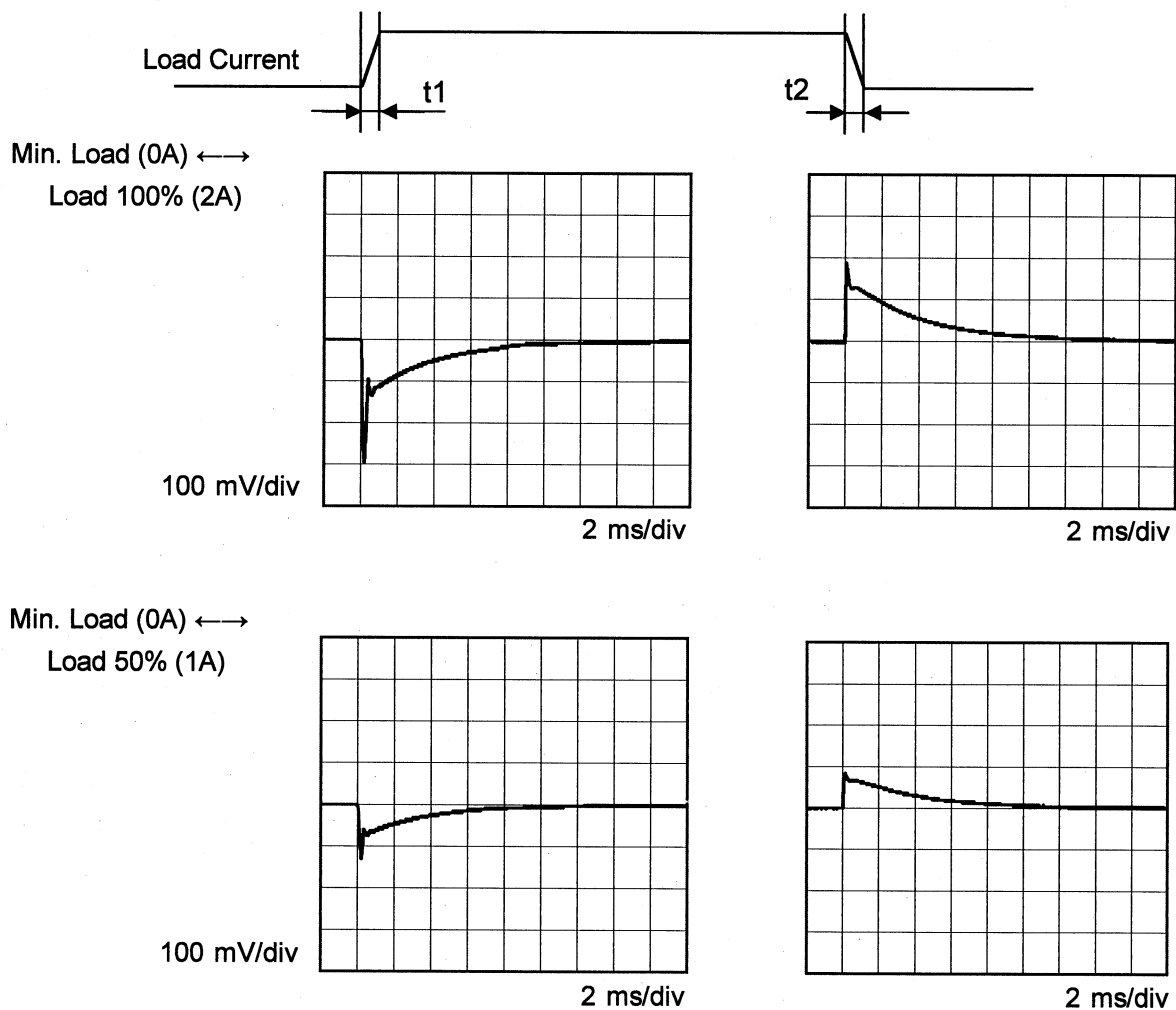
Model		PLA30F-15																																																				
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Object		+15V2A																																																				
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>115V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div> <div>Output Voltage [V]</div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</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><tr><td>0.0</td><td>15.057</td><td>15.057</td><td>15.058</td></tr><tr><td>0.4</td><td>15.056</td><td>15.056</td><td>15.056</td></tr><tr><td>0.8</td><td>15.056</td><td>15.056</td><td>15.056</td></tr><tr><td>1.2</td><td>15.055</td><td>15.055</td><td>15.055</td></tr><tr><td>1.6</td><td>15.054</td><td>15.054</td><td>15.054</td></tr><tr><td>2.0</td><td>15.054</td><td>15.054</td><td>15.054</td></tr><tr><td>2.2</td><td>-</td><td>15.053</td><td>15.053</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><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.0	15.057	15.057	15.058	0.4	15.056	15.056	15.056	0.8	15.056	15.056	15.056	1.2	15.055	15.055	15.055	1.6	15.054	15.054	15.054	2.0	15.054	15.054	15.054	2.2	-	15.053	15.053	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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Note: Slanted line shows the range of the rated load current.																																																						

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Model	PLA30F-15	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+15V2A	

Input Volt. 115 V
Cycle 1000 ms

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



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Model		PLA30F-15	
Item		Ripple Voltage (by Load Current)	
Object		+15V2A	

1.Graph

△

Input Volt. 115V

○

Input Volt. 230V

50

40

30

20

10

0

0.0

1.0

2.0

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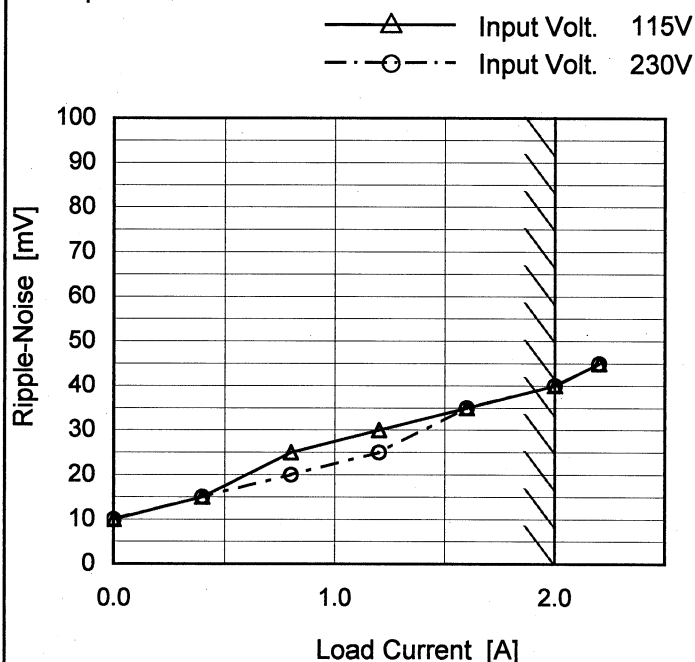
Model PLA30F-15

Item Ripple-Noise

Object +15V2A

Temperature 25°C
Testing Circuitry Figure C

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.

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0.0	10	10
0.4	15	15
0.8	25	20
1.2	30	25
1.6	35	35
2.0	40	40
2.2	45	45
--	-	-
--	-	-
--	-	-
--	-	-

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

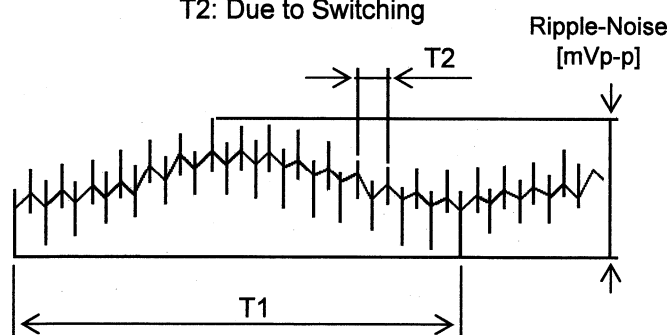


Fig. Complex Ripple Wave Form



Model		PLA30F-15
Item		Ripple Voltage (by Ambient Temp.)
Object		+15V2A

1.Graph

---□---

Input Volt. 115V

—△—

Input Volt. 230V

100

90

80

70

60

50

40

30

20

10

0

Ripple Voltage [mV]

-40

-20

0

20

40

60

Ambient Temperature [°C]

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]
-30	40	30
-10	25	20
0	20	15
25	15	10
50	10	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Testing Circuitry Figure A



Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
-20	15.056	15.056	15.056
-10	15.056	15.056	15.056
0	15.056	15.056	15.056
10	15.055	15.055	15.055
20	15.054	15.054	15.054
25	15.054	15.054	15.054
30	15.054	15.054	15.054
40	15.054	15.054	15.054
50	15.053	15.052	15.053
60	15.048	15.048	15.048
--	-	-	-

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

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		Testing Circuitry Figure A
Model	PLA30F-15	
Item	Output Voltage Accuracy	
Object	+15V2A	

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 - 50°C

Input Voltage : 115 - 264V

Load Current : 0 - 2A

* 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	264	0	15.063	±8	±0.1
Minimum Voltage	50	115	2	15.048		



Model		PLA30F-15	
Item		Time Lapse Drift	
Object		+15V2A	

1.Graph

Output Voltage [V]

16.00

15.75

15.50

15.25

15.00

14.75

14.50

14.25

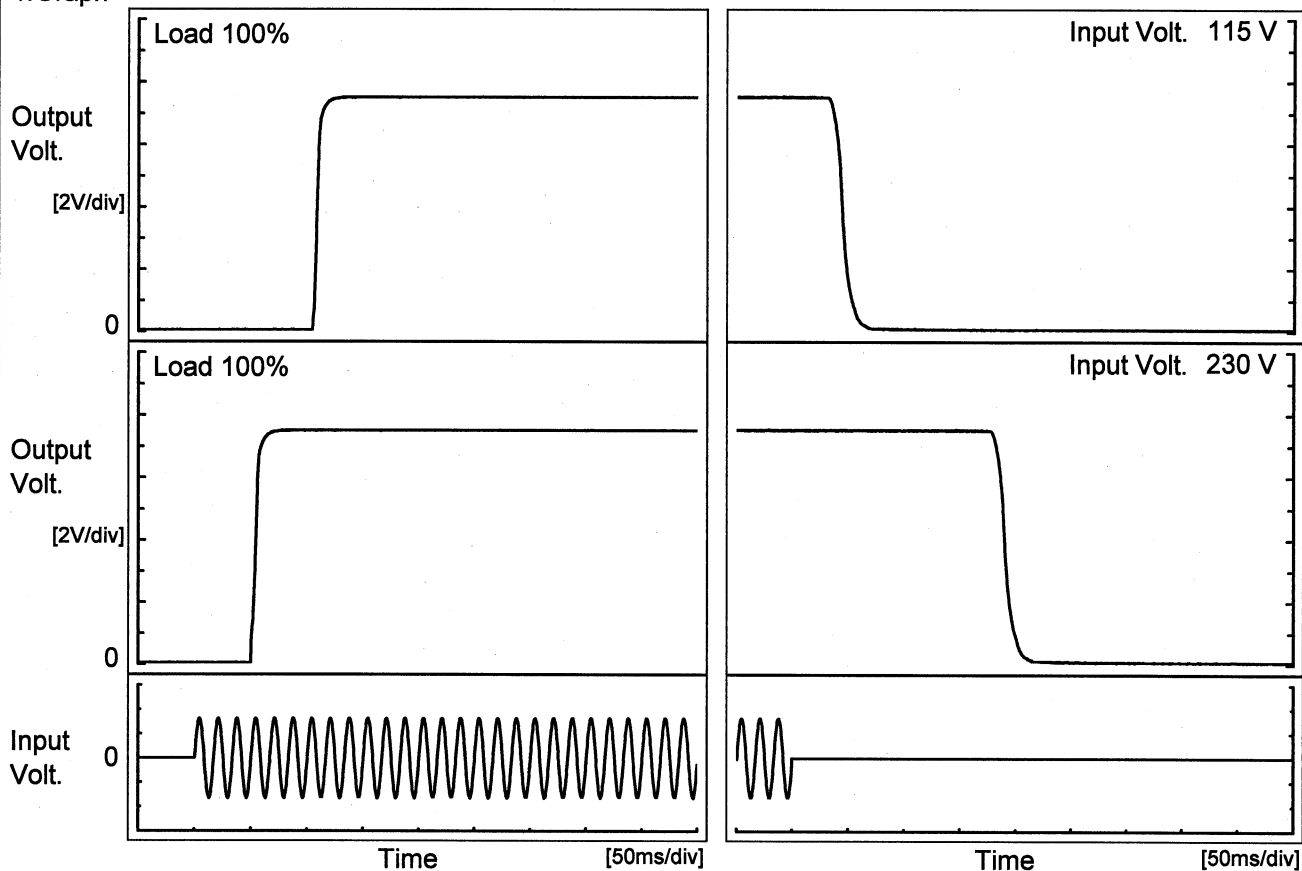
14.00

13.75

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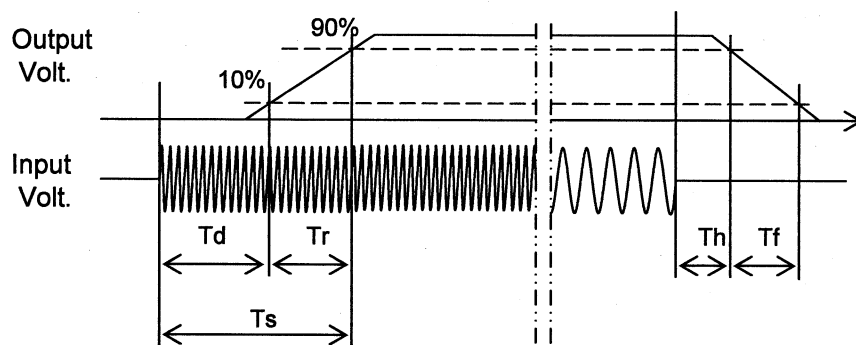
Model	PLA30F-15	Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+15V2A	

1. Graph



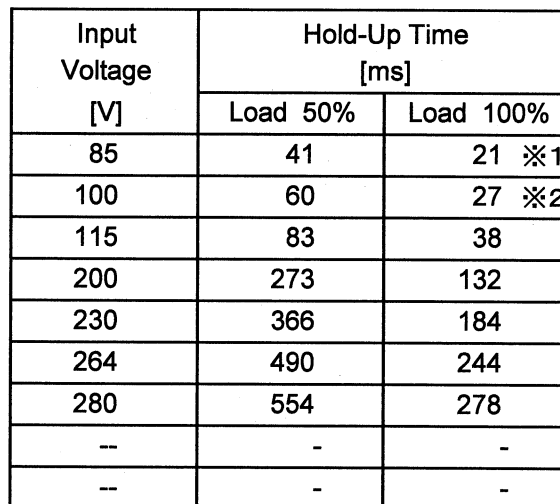
2. Values

		[ms]				
Input Volt.	Time	Td	Tr	Ts	Th	Tf
115 V		106.0	6.0	112.0	37.8	16.8
230 V		50.8	7.0	57.8	183.8	17.3



Temperature 25°C
Testing Circuitry Figure A

2.Values



※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.

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Model		PLA30F-15		Temperature 25°C																																																				
Item		Instantaneous Interruption Compensation		Testing Circuitry Figure A																																																				
Object		+15V2A																																																						
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<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>115V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>				<table><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><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.4</td><td>150</td><td>204</td><td>848</td></tr><tr><td>0.8</td><td>78</td><td>106</td><td>458</td></tr><tr><td>1.2</td><td>51</td><td>70</td><td>313</td></tr><tr><td>1.6</td><td>35</td><td>50</td><td>235</td></tr><tr><td>2.0</td><td>23</td><td>38</td><td>184</td></tr><tr><td>2.2</td><td>-</td><td>30</td><td>165</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><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.0	-	-	-	0.4	150	204	848	0.8	78	106	458	1.2	51	70	313	1.6	35	50	235	2.0	23	38	184	2.2	-	30	165	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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COSEL

Model

PLA30F-15

Item

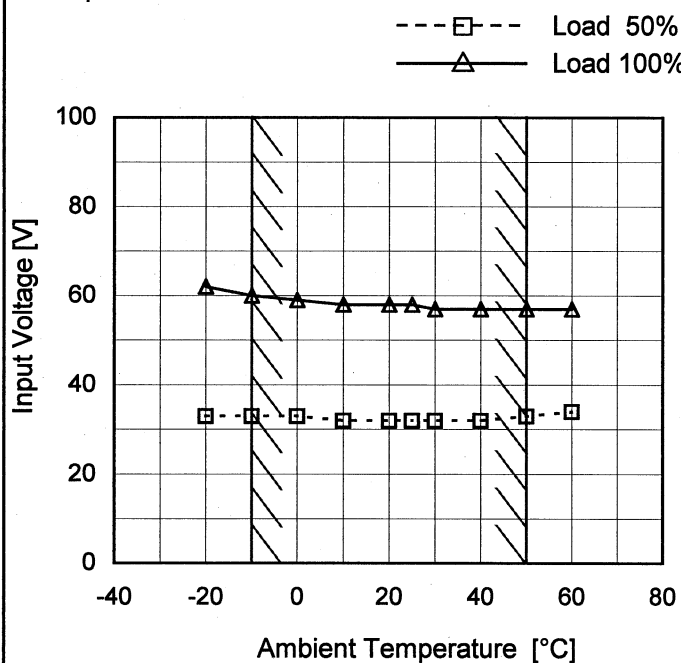
Minimum Input Voltage
for Regulated Output Voltage

Object

+15V2A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	33	62
-10	33	60
0	33	59
10	32	58
20	32	58
25	32	58
30	32	57
40	32	57
50	33	57
60	34	57
--	-	-

COSEL

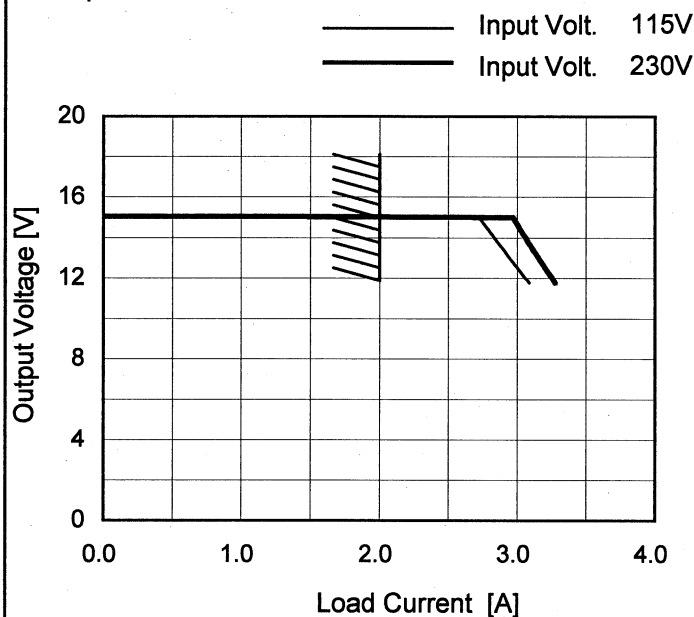
Model PLA30F-15

Item Overcurrent Protection

Object +15V2A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 115[V]	Input Volt. 230[V]
14.25	2.80	3.04
13.50	2.72	2.97
12.00	3.06	3.25
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



Model		PLA30F-15
Item		Overvoltage Protection
Object		+15V2A

1.Graph

—△—

Input Volt. 115V

---□---

Input Volt. 230V

Operating Point [V]

</

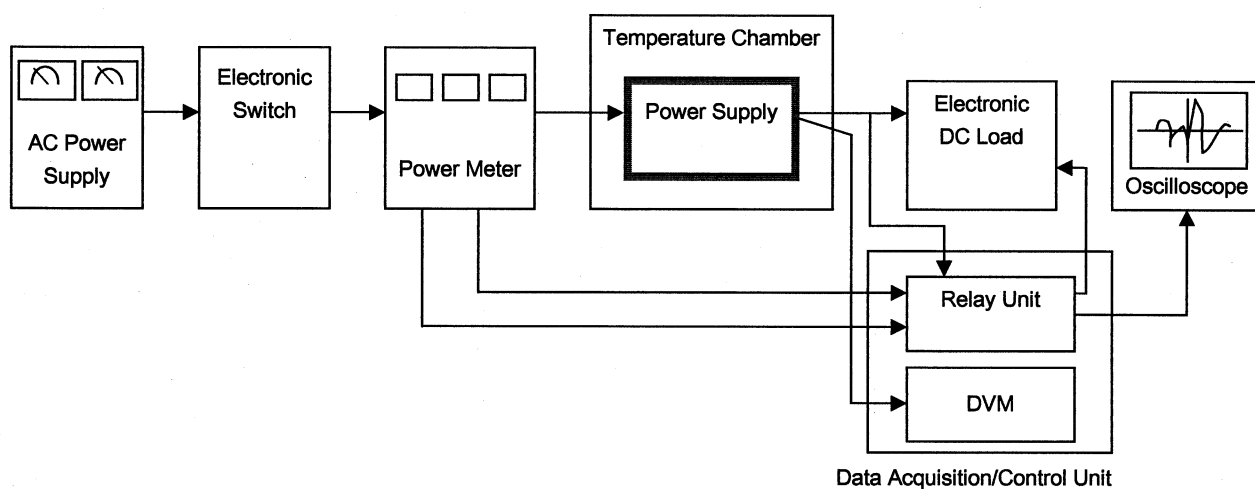


Figure A

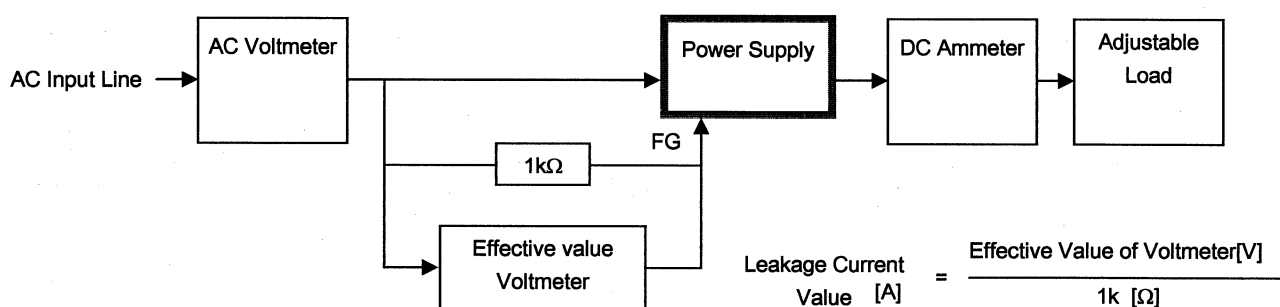


Figure B (DEN-AN)

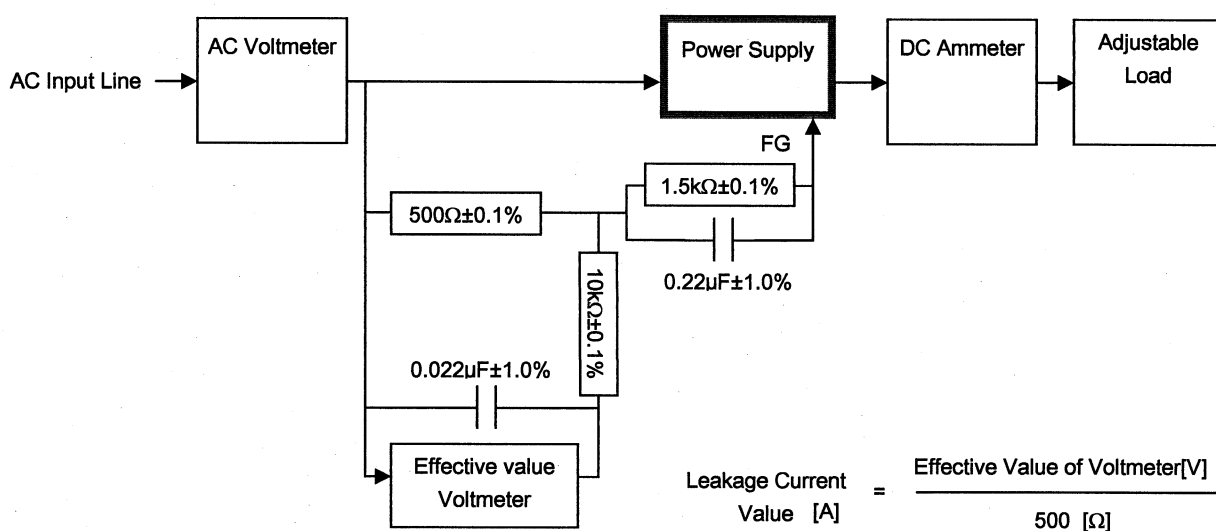


Figure B (IEC60950-1)

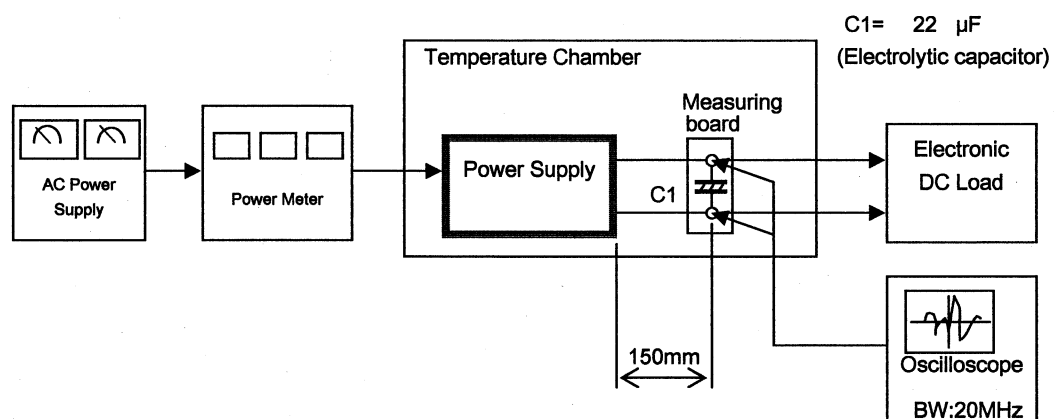


Figure C