

TEST DATA OF PJA300F-12

Regulated DC Power Supply
August 4, 2017

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Atsushi Nishikawa Design Engineer

COSEL CO.,LTD.

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(Final Page 25)

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Model		PJA300F-12																																																				
Item		Input Current (by Load Current)																																																				
Object																																																						
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>Note: Slanted line shows the range of the rated load current.</div>		<table><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><tr><td>0.0</td><td>0.110</td><td>0.099</td><td>0.102</td></tr><tr><td>4.0</td><td>0.798</td><td>0.690</td><td>0.389</td></tr><tr><td>8.0</td><td>1.356</td><td>1.168</td><td>0.620</td></tr><tr><td>12.0</td><td>1.920</td><td>1.671</td><td>0.861</td></tr><tr><td>16.0</td><td>2.511</td><td>2.178</td><td>1.115</td></tr><tr><td>20.0</td><td>3.140</td><td>2.709</td><td>1.372</td></tr><tr><td>24.0</td><td>3.760</td><td>3.248</td><td>1.628</td></tr><tr><td>25.0</td><td>3.912</td><td>3.385</td><td>1.696</td></tr><tr><td>27.5</td><td>4.321</td><td>3.729</td><td>1.869</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]	Input Current [A]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.0	0.110	0.099	0.102	4.0	0.798	0.690	0.389	8.0	1.356	1.168	0.620	12.0	1.920	1.671	0.861	16.0	2.511	2.178	1.115	20.0	3.140	2.709	1.372	24.0	3.760	3.248	1.628	25.0	3.912	3.385	1.696	27.5	4.321	3.729	1.869	--	-	-	-	--	-	-	-
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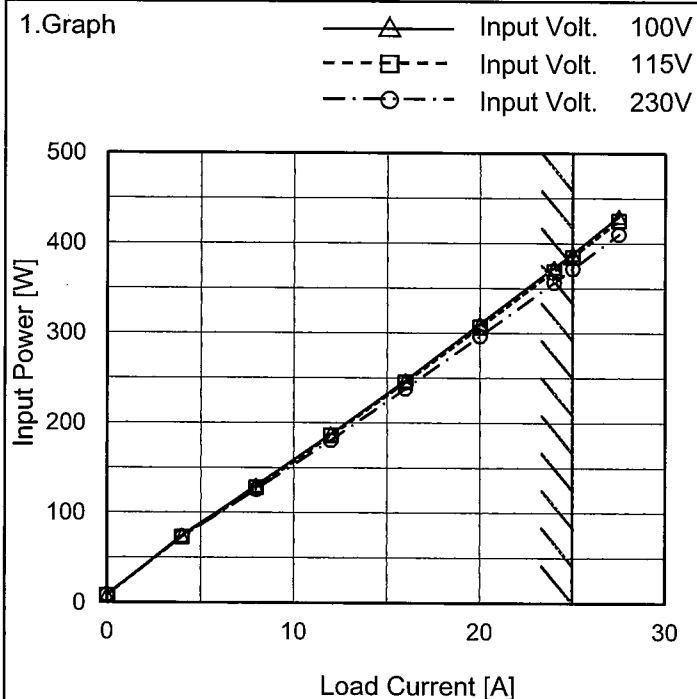
Model PJA300F-12

Item Input Power (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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	8.0	7.7	8.6
4.0	74.2	73.0	73.3
8.0	130.2	128.0	126.0
12.0	187.6	185.9	180.7
16.0	247.2	245.1	238.1
20.0	310.4	306.6	296.7
24.0	373.0	369.0	356.4
25.0	388.4	384.6	371.6
27.5	429.9	425.1	410.0
--	-	-	-
--	-	-	-

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Model		PJA300F-12		Temperature Testing Circuitry	25°C Figure A																																																			
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Model

PJA300F-12

Item

Power Factor (by Input Voltage)

Object

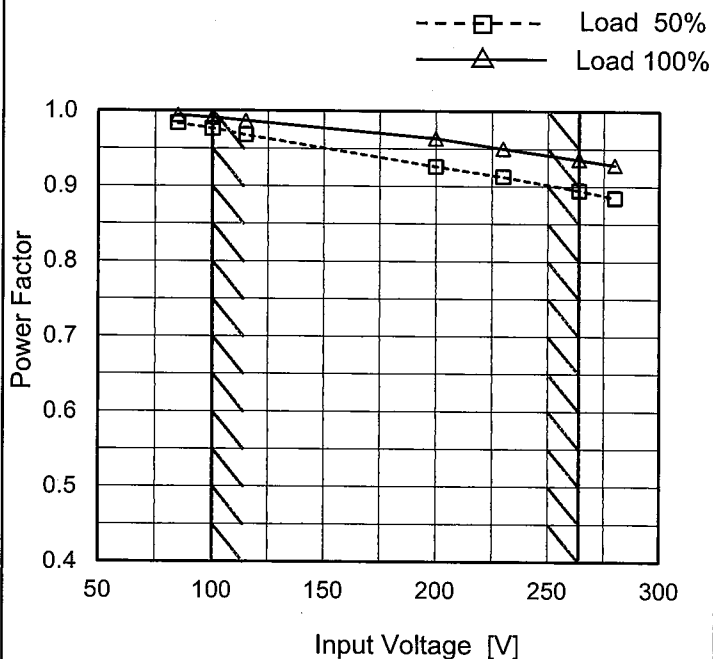
Temperature

25°C

Testing Circuitry

Figure A

1. Graph

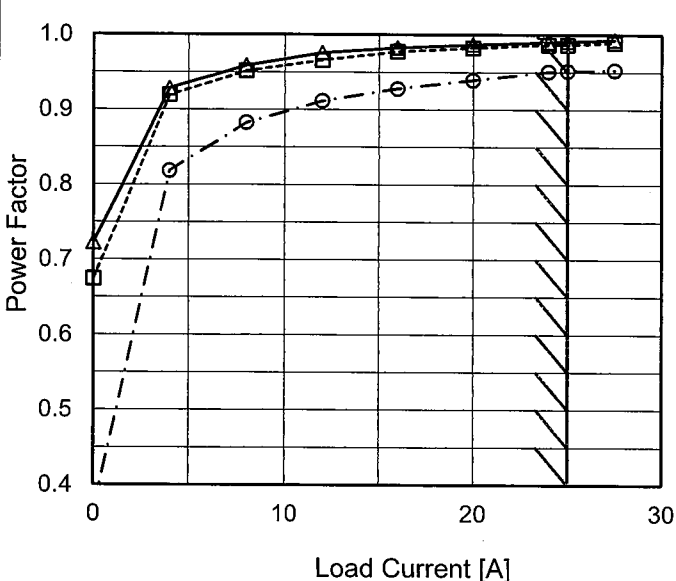


2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.984	0.995 ※1
100	0.977	0.991
115	0.968	0.987
200	0.926	0.964
230	0.913	0.950
264	0.895	0.936
280	0.885	0.929
--	-	-
--	-	-

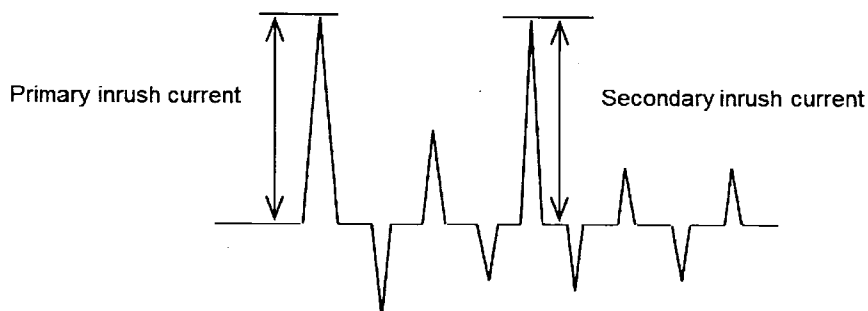
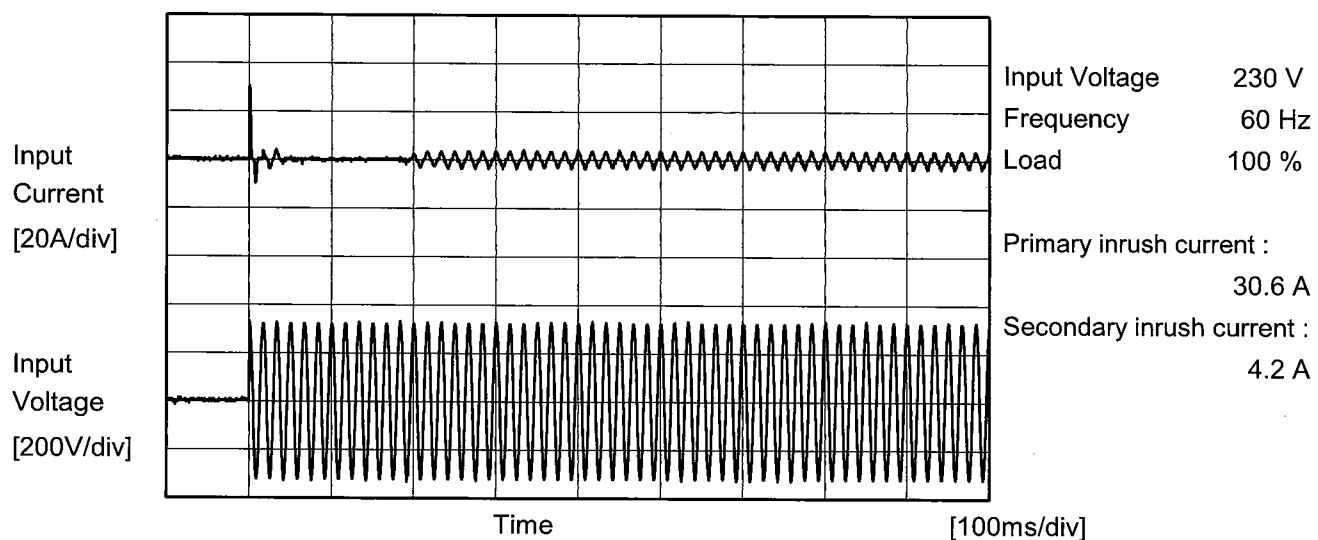
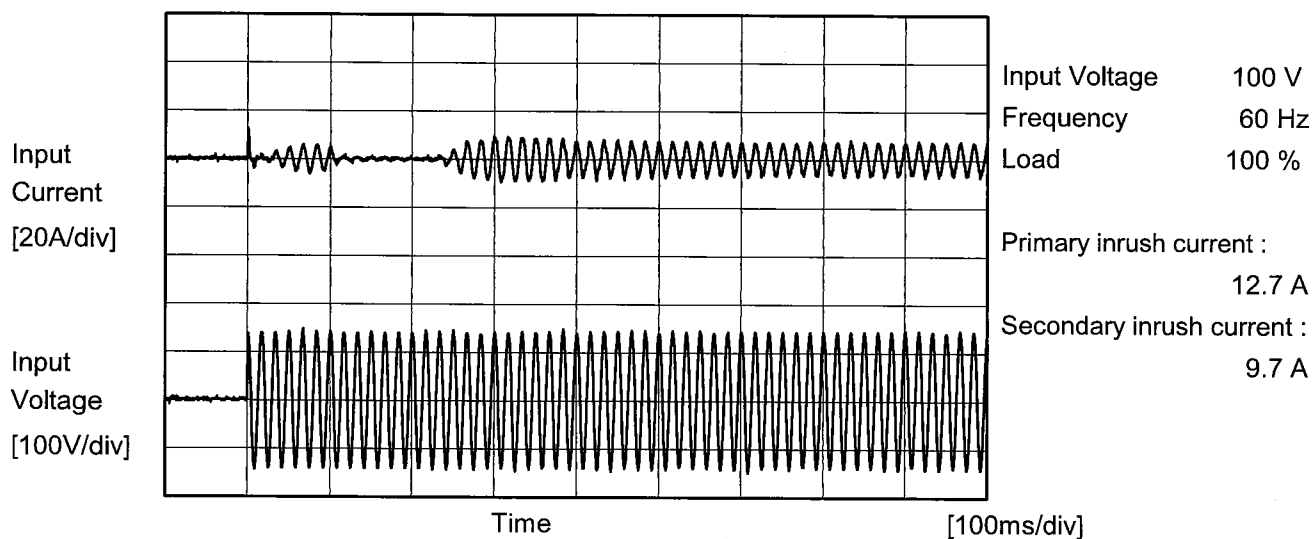
※1: Load 80%

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Model		PJA300F-12		Temperature		25°C																																																				
Item		Power Factor (by Load Current)		Testing Circuitry		Figure A																																																				
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Model	PJA300F-12		
Item	Inrush Current	Temperature	25°C
Object		Testing Circuitry	Figure A



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		Temperature 25°C Testing Circuitry Figure B
Model	PJA300F-12	
Item	Leakage Current	
Object		

1.Results

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	115 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.13	0.15	0.33	Operation
		One of phases	0.24	0.27	0.60	Stand by
IEC62368-1	Figure B-2	Both phases	0.14	0.16	0.35	Operation
		One of phases	0.25	0.29	0.65	Stand by
	Figure B-3	Both phases	0.14	0.16	0.32	Operation
		One of phases	0.24	0.27	0.59	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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Model PJA300F-12		Temperature 25°C Testing Circuitry Figure A																																
Item	Line Regulation																																	
Object	+12V25A																																	
<p>1.Graph</p> <div> <div> <div>---</div> <div>□---</div> <div>Load 50%</div> </div> <div> <div>---</div> <div>△---</div> <div>Load 100%</div> </div> </div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<p>2.Values</p> <table> <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> <tr><td>85</td><td>12.254</td><td>12.249 ※1</td></tr> <tr><td>100</td><td>12.254</td><td>12.249</td></tr> <tr><td>115</td><td>12.255</td><td>12.249</td></tr> <tr><td>200</td><td>12.255</td><td>12.250</td></tr> <tr><td>230</td><td>12.256</td><td>12.249</td></tr> <tr><td>264</td><td>12.256</td><td>12.250</td></tr> <tr><td>280</td><td>12.256</td><td>12.251</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </table> <p>※1:Load 80%</p>	Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	85	12.254	12.249 ※1	100	12.254	12.249	115	12.255	12.249	200	12.255	12.250	230	12.256	12.249	264	12.256	12.250	280	12.256	12.251	--	-	-	--	-	-
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Model		PJA300F-12		Temperature25°C Testing CircuitryFigure A
Item		Load Regulation		
Object		+12V25A		
1.Graph				
		—△— Input Volt. 100V ---□--- Input Volt. 115V ---○--- Input Volt. 230V		
Output Voltage [V]				
Load Current [A]				
Note: Slanted line shows the range of the rated load current.				
2.Values				
Load Current [A]		Output Voltage [V]		
		Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0		12.265	12.266	12.268
4.0		12.261	12.262	12.264
8.0		12.258	12.259	12.261
12.0		12.255	12.257	12.258
16.0		12.253	12.254	12.256
20.0		12.250	12.251	12.253
24.0		12.247	12.249	12.250
25.0		12.247	12.249	12.250
27.5		12.245	12.247	12.248
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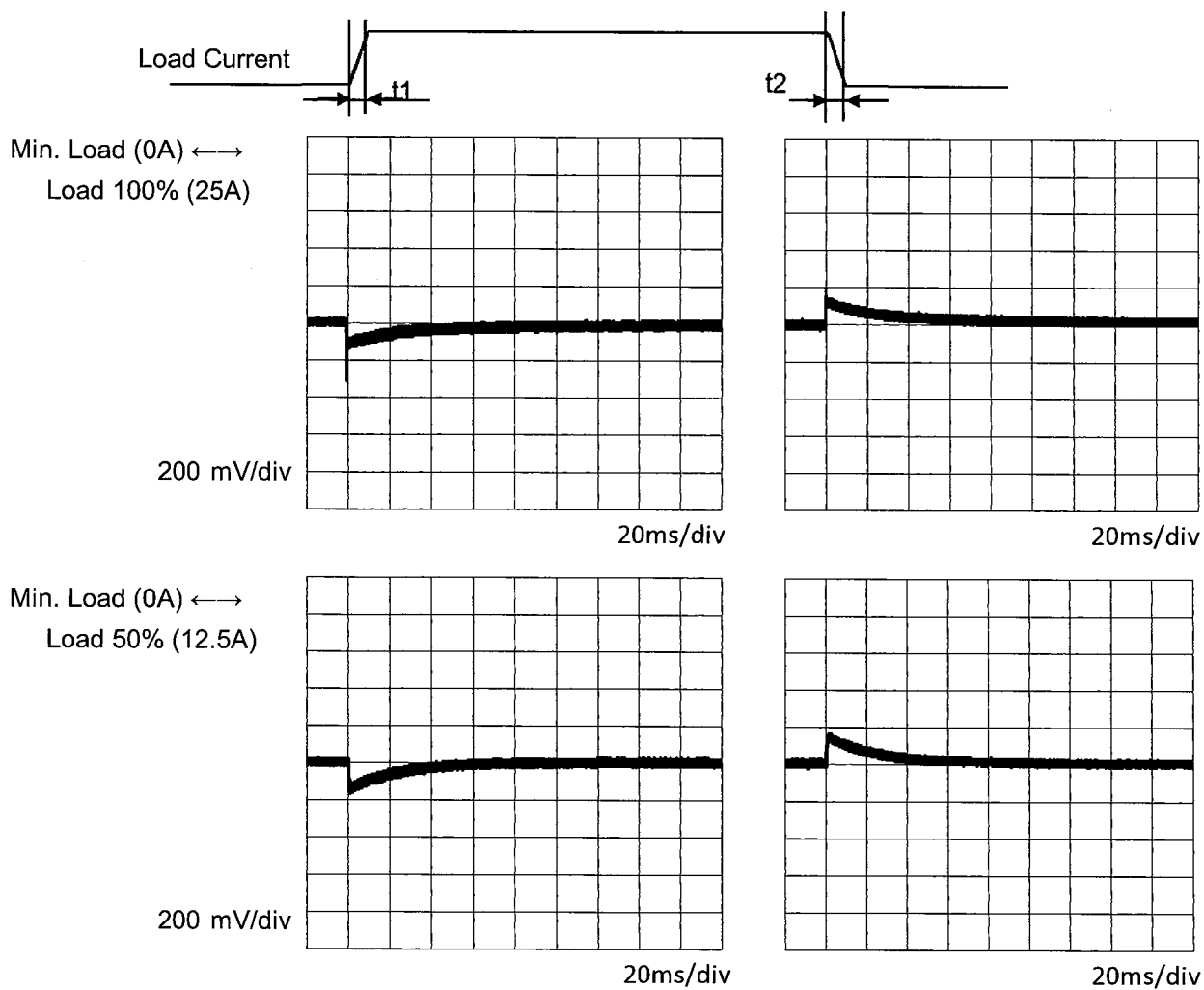
BC-11173



Model	PJA300F-12	Temperature	25° C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V25A		

Input Volt. 100 V
Cycle 1000 ms

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



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Model		PJA300F-12	
Item		Ripple Voltage (by Load Current)	
Object		+12V25A	
1.Graph		2.Values	

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Model		PJA300F-12	Temperature		25°C																																						
Item		Ripple-Noise	Testing Circuitry		Figure C																																						
Object		+12V25A																																									
1.Graph			2.Values																																								
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>- - ○ - -</div><div>Input Volt. 230V</div></div></div> <p>Ripple-Noise [mV]</p> <p>Load Current [A]</p>			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0.0</td><td>15</td><td>15</td></tr><tr><td>4.0</td><td>20</td><td>20</td></tr><tr><td>8.0</td><td>20</td><td>20</td></tr><tr><td>12.0</td><td>20</td><td>20</td></tr><tr><td>16.0</td><td>20</td><td>25</td></tr><tr><td>20.0</td><td>25</td><td>25</td></tr><tr><td>24.0</td><td>25</td><td>25</td></tr><tr><td>25.0</td><td>30</td><td>30</td></tr><tr><td>27.5</td><td>30</td><td>30</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>			Load Current [A]	Ripple-Noise [mV]		Input Volt. 100 [V]	Input Volt. 230 [V]	0.0	15	15	4.0	20	20	8.0	20	20	12.0	20	20	16.0	20	25	20.0	25	25	24.0	25	25	25.0	30	30	27.5	30	30	--	-	-	--	-	-
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27.5	30	30																																									
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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>																																											
<div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div><div>Ripple-Noise [mVp-p]</div><p>T1</p><p>T2</p></div> <p>Fig. Complex Ripple Wave Form</p>																																											

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Model

PJA300F-12

Item

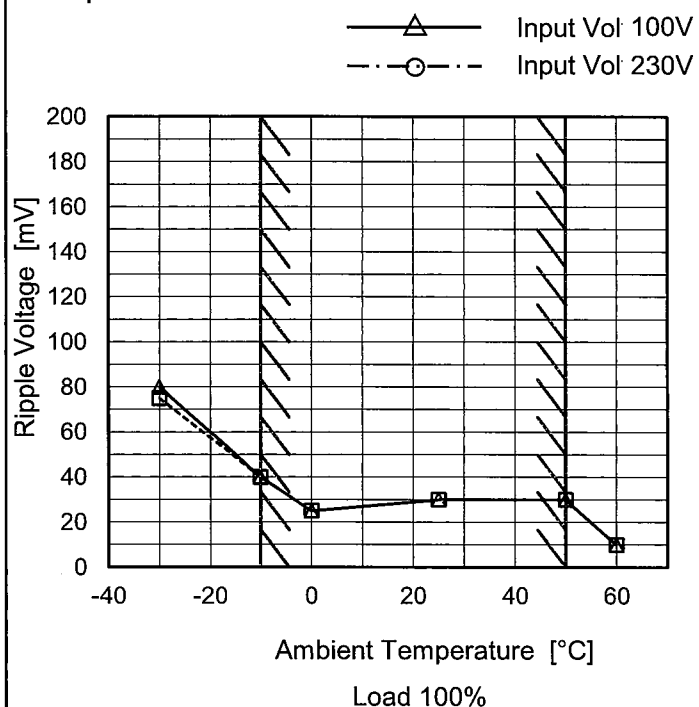
Ripple Voltage (by Ambient Temp.)

Object

+12V25A

Testing Circuitry Figure C

1. Graph



Measured by 20 MHz Oscilloscope.

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

2. Values

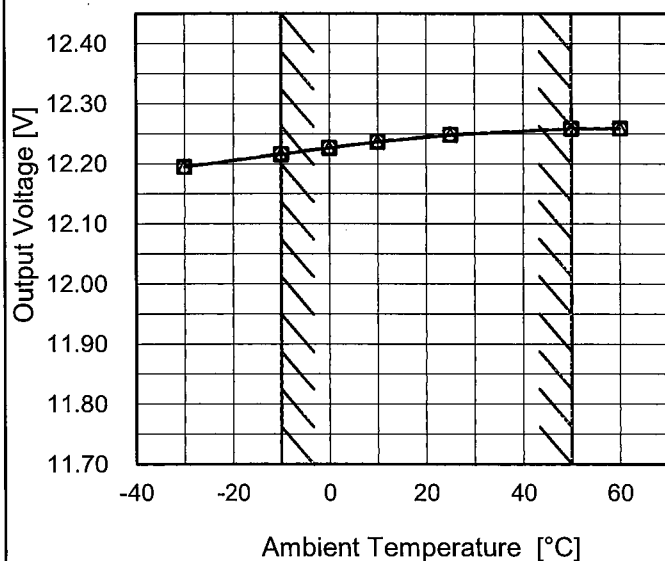
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	75	80
-10	40	40
0	25	25
25	30	30
50	30	30
60	10	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



Model	PJA300F-12
Item	Ambient Temperature Drift
Object	+12V25A

1. Graph

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



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]
-30	12.195	12.195	12.195
-10	12.216	12.216	12.217
0	12.226	12.227	12.228
10	12.237	12.237	12.238
25	12.248	12.249	12.249
50	12.259	12.259	12.259
60	12.259	12.259	12.259
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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		Testing Circuitry Figure A
Model	PJA300F-12	
Item	Output Voltage Accuracy	
Object	+12V25A	

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 : 100 - 264V

Load Current : 0 - 25A

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

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	264	25	12.259	±32	±0.3
Minimum Voltage	-10	100	25	12.215		

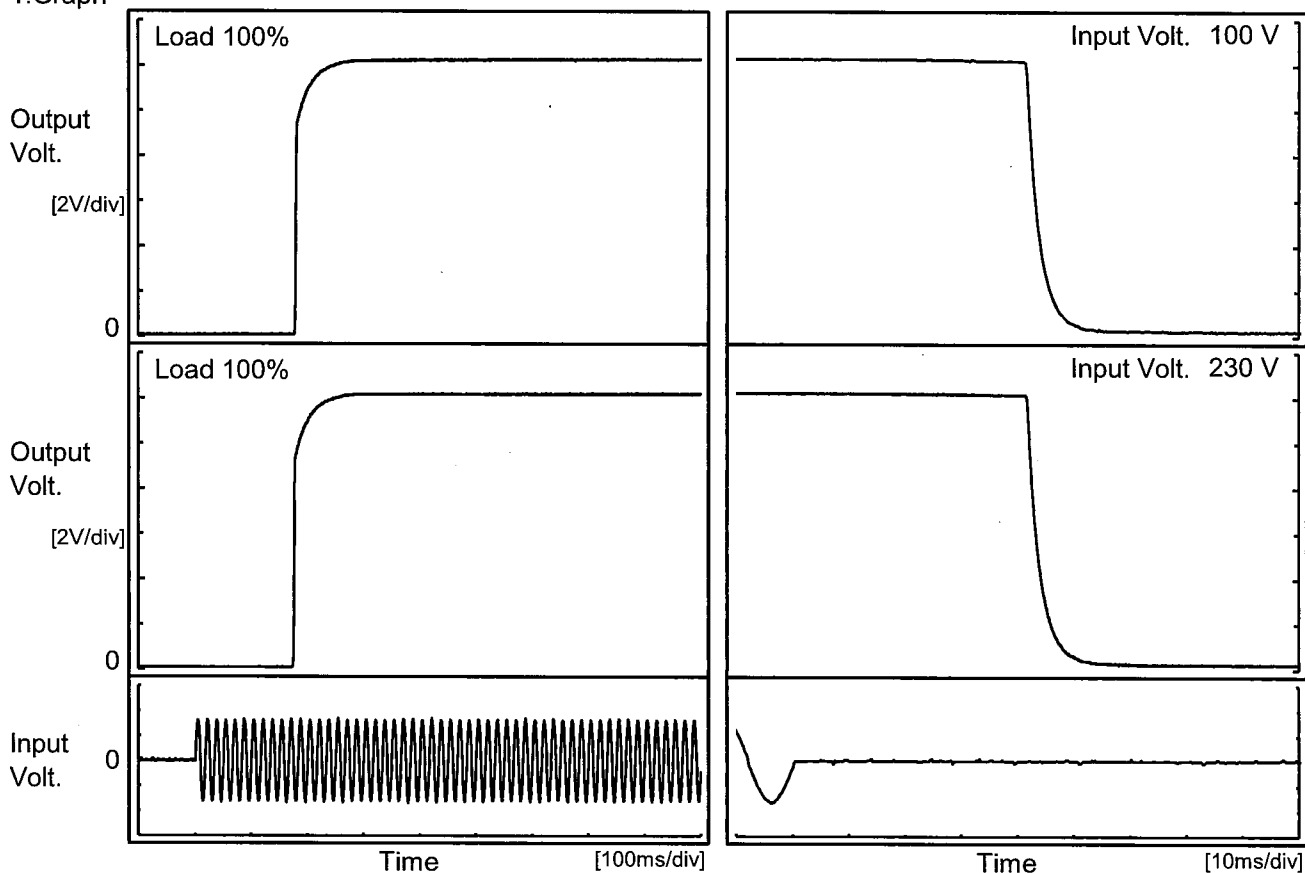


LUSEL																									
Model	PJA300F-12																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+12V25A																								
1.Graph		2.Values																							
<div><div><div>Output Voltage [V]</div><div><div><div>12.75</div><div>12.50</div><div>12.25</div><div>12.00</div><div>11.75</div><div>11.50</div><div>11.25</div><div>11.00</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>Time [H]</div></div><div><div>Input Volt.</div><div>230V</div><div>Load</div><div>100%</div></div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.225</td></tr><tr><td>0.5</td><td>12.238</td></tr><tr><td>1.0</td><td>12.238</td></tr><tr><td>2.0</td><td>12.225</td></tr><tr><td>3.0</td><td>12.238</td></tr><tr><td>4.0</td><td>12.238</td></tr><tr><td>5.0</td><td>12.225</td></tr><tr><td>6.0</td><td>12.238</td></tr><tr><td>7.0</td><td>12.239</td></tr><tr><td>8.0</td><td>12.225</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.225	0.5	12.238	1.0	12.238	2.0	12.225	3.0	12.238	4.0	12.238	5.0	12.225	6.0	12.238	7.0	12.239	8.0	12.225
Time since start [H]	Output Voltage [V]																								
0.0	12.225																								
0.5	12.238																								
1.0	12.238																								
2.0	12.225																								
3.0	12.238																								
4.0	12.238																								
5.0	12.225																								
6.0	12.238																								
7.0	12.239																								
8.0	12.225																								
* The characteristic of AC100V is equal.																									

COSEL

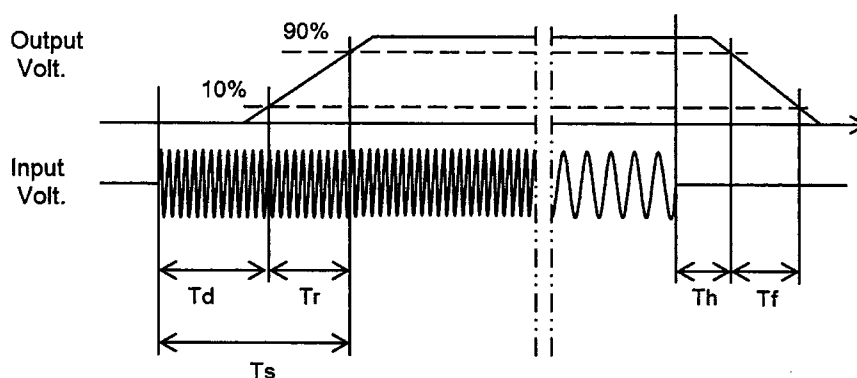
Model	PJA300F-12	Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+12V25A	

1. Graph



2. Values

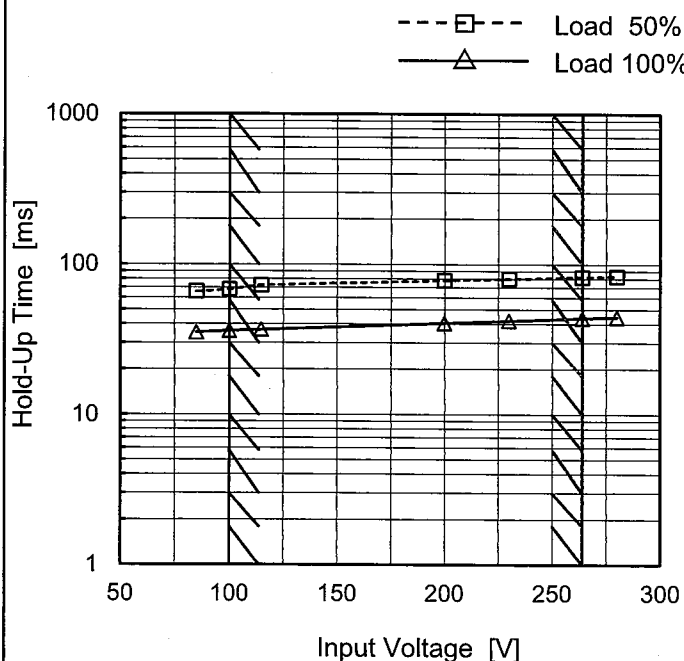
Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	214.0	22.0	236.0	36.3	5.2
230 V	176.5	23.0	199.5	42.0	5.3



Model	PJA300F-12
Item	Hold-Up Time
Object	+12V25A

Temperature	25°C
Testing Circuitry	Figure A

1. Graph



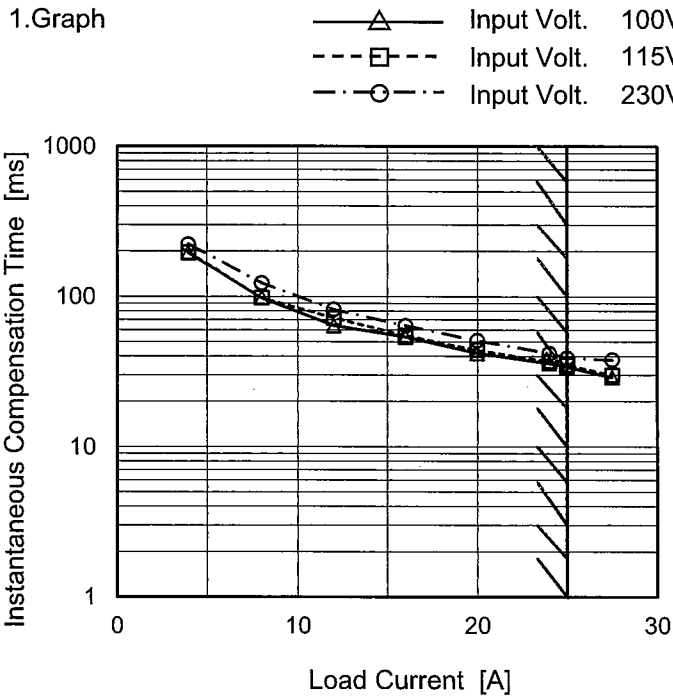
This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy. Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	66	35 ※1
100	68	36
115	73	37
200	78	41
230	80	42
264	82	44
280	83	45
--	-	-
--	-	-

※1 : Load 80%



Model		PJA300F-12		Temperature		25°C																																																				
Item		Instantaneous Interruption Compensation		Testing Circuitry		Figure A																																																				
Object		+12V25A																																																								
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>Note: Slanted line shows the range of the rated load current.</div>				<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>4.0</td><td>195</td><td>197</td><td>223</td></tr><tr><td>8.0</td><td>98</td><td>98</td><td>123</td></tr><tr><td>12.0</td><td>64</td><td>72</td><td>82</td></tr><tr><td>16.0</td><td>54</td><td>55</td><td>64</td></tr><tr><td>20.0</td><td>42</td><td>44</td><td>51</td></tr><tr><td>24.0</td><td>36</td><td>37</td><td>42</td></tr><tr><td>25.0</td><td>34</td><td>35</td><td>39</td></tr><tr><td>27.5</td><td>29</td><td>30</td><td>38</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	-	-	-	4.0	195	197	223	8.0	98	98	123	12.0	64	72	82	16.0	54	55	64	20.0	42	44	51	24.0	36	37	42	25.0	34	35	39	27.5	29	30	38	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																									
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																							
0.0	-	-	-																																																							
4.0	195	197	223																																																							
8.0	98	98	123																																																							
12.0	64	72	82																																																							
16.0	54	55	64																																																							
20.0	42	44	51																																																							
24.0	36	37	42																																																							
25.0	34	35	39																																																							
27.5	29	30	38																																																							
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COSEL

Model

PJA300F-12

Item

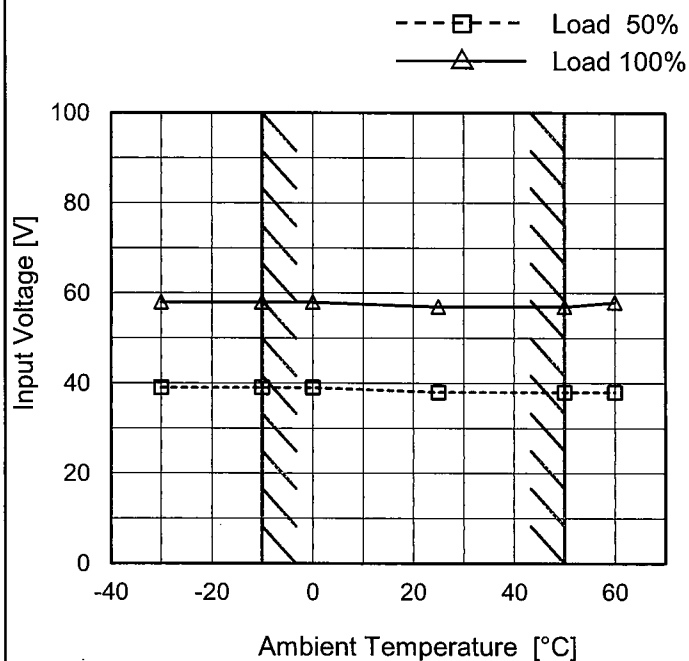
Minimum Input Voltage
for Regulated Output Voltage

Object

+12V25A

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%
-30	39	58
-10	39	58
0	39	58
25	38	57
50	38	57
60	38	58
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

COSEL																																												
Model	PJA300F-12																																											
Item	Overcurrent Protection	Temperature	25°C																																									
Object	+12V25A	Testing Circuitry	Figure A																																									
1.Graph		2.Values																																										
<div><div><div></div>Input Volt. 100V</div><div><div></div>Input Volt. 230V</div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>11.4</td><td>32.56</td><td>32.26</td></tr><tr><td>10.8</td><td>32.67</td><td>32.41</td></tr><tr><td>9.6</td><td>32.93</td><td>32.67</td></tr><tr><td>8.4</td><td>33.22</td><td>32.99</td></tr><tr><td>7.2</td><td>33.49</td><td>33.29</td></tr><tr><td>6.0</td><td>33.77</td><td>33.60</td></tr><tr><td>4.8</td><td>33.97</td><td>33.84</td></tr><tr><td>3.6</td><td>34.13</td><td>34.03</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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 230[V]	11.4	32.56	32.26	10.8	32.67	32.41	9.6	32.93	32.67	8.4	33.22	32.99	7.2	33.49	33.29	6.0	33.77	33.60	4.8	33.97	33.84	3.6	34.13	34.03	--	-	-	--	-	-	--	-	-	--	-	-
Output Voltage [V]	Load Current [A]																																											
	Input Volt. 100[V]	Input Volt. 230[V]																																										
11.4	32.56	32.26																																										
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7.2	33.49	33.29																																										
6.0	33.77	33.60																																										
4.8	33.97	33.84																																										
3.6	34.13	34.03																																										
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COSEL

Model

PJA300F-12

Item

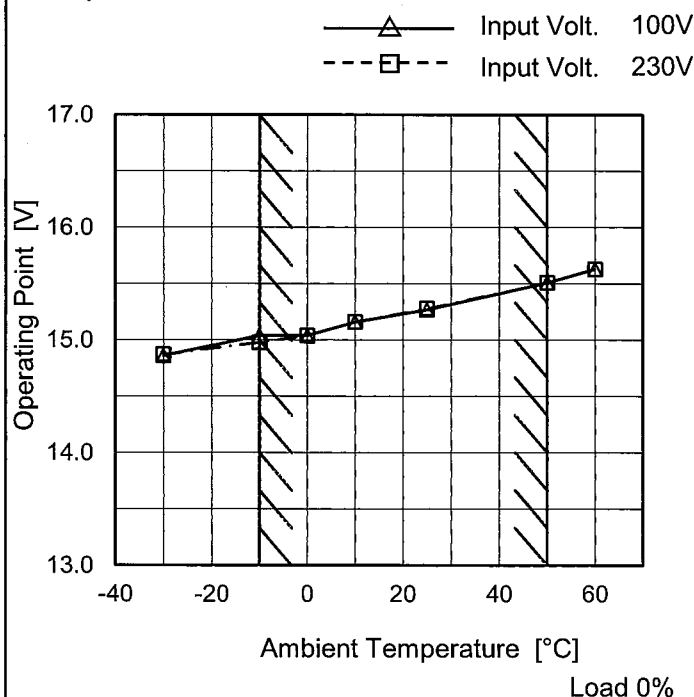
Overvoltage Protection

Object

+12V25A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-30	14.86	14.87
-10	15.04	14.98
0	15.04	15.04
10	15.16	15.16
25	15.27	15.28
50	15.51	15.51
60	15.63	15.63
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

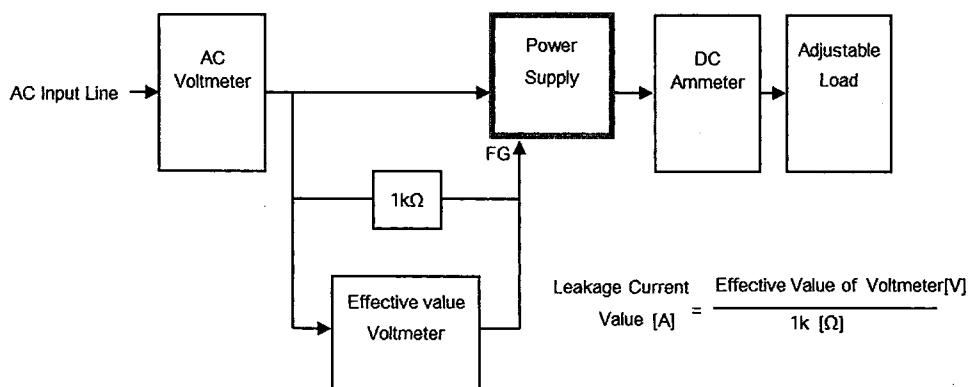
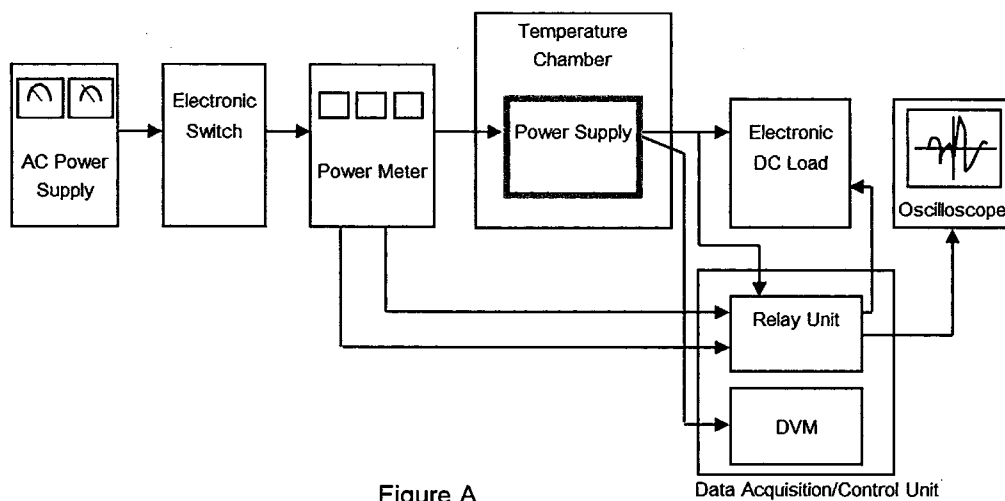


Figure B-1 (DEN-AN)

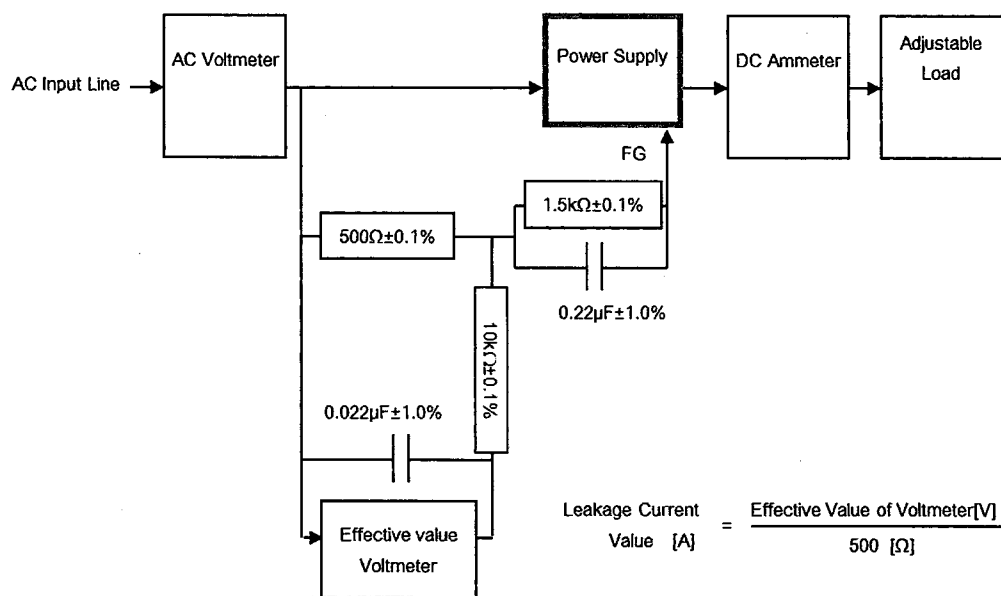


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

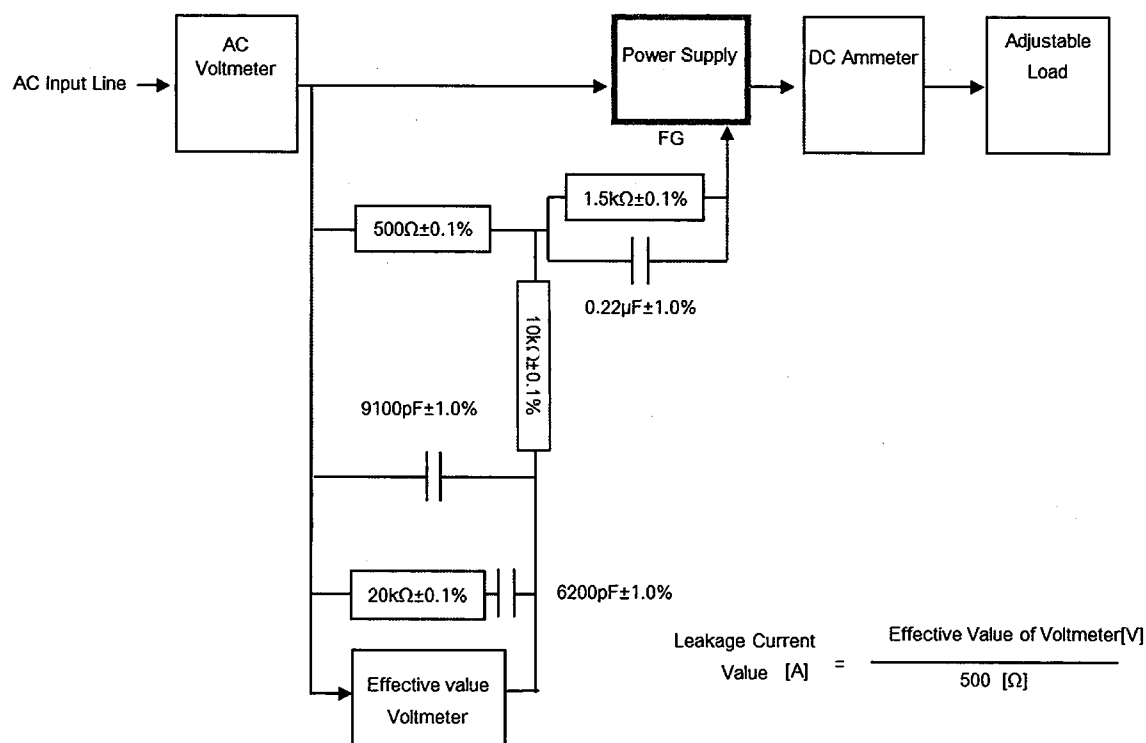


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)

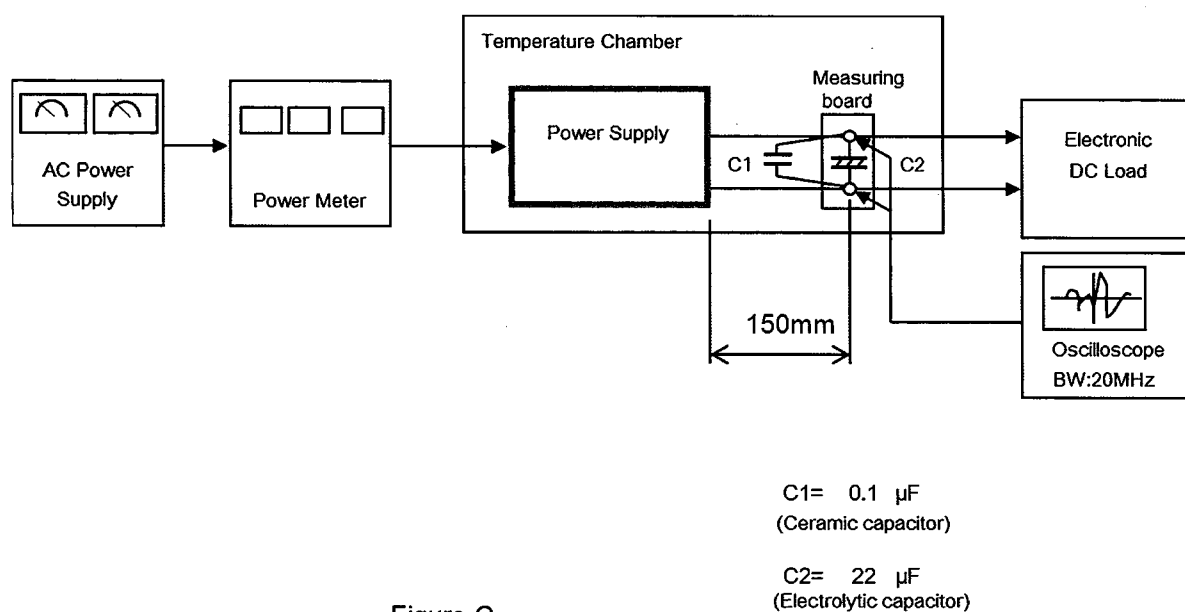


Figure C