



# TEST DATA OF PJA600F-36

Regulated DC Power Supply  
December 2, 2016

Approved by : Jun Uchida  
Jun Uchida Design Manager

Prepared by : Hideaki Douguchi  
Hideaki Douguchi Design Engineer

**COSEL CO.,LTD.**



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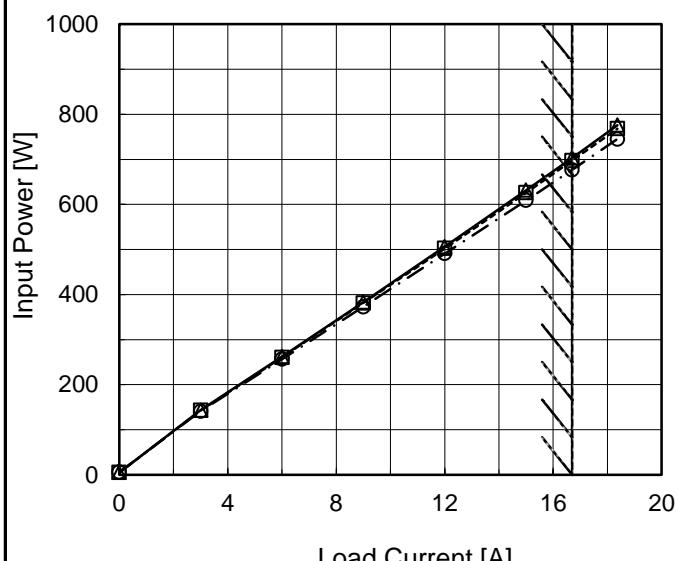
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Model	PJA600F-36																																																					
Item	Input Current (by Load Current)	Temperature 25°C	Testing Circuitry Figure A																																																			
Object	_____	_____	_____																																																			
1.Graph			2.Values																																																			
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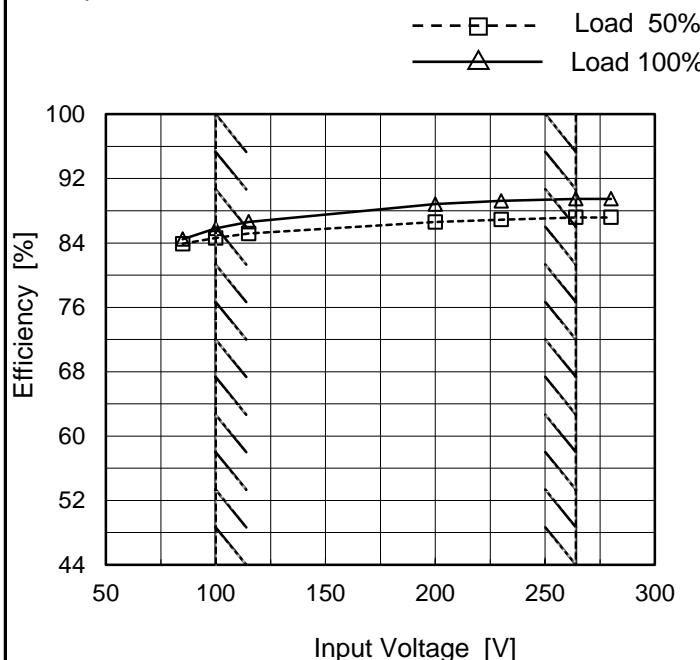
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Model	PJA600F-36
Item	Efficiency (by Input Voltage)
Object	_____

 Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



## 2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
85	83.9	84.5
100	84.6	85.8
115	85.2	86.6
200	86.6	88.8
230	86.9	89.2
264	87.2	89.5
280	87.2	89.5
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Note: Slanted line shows the range of the rated input voltage.

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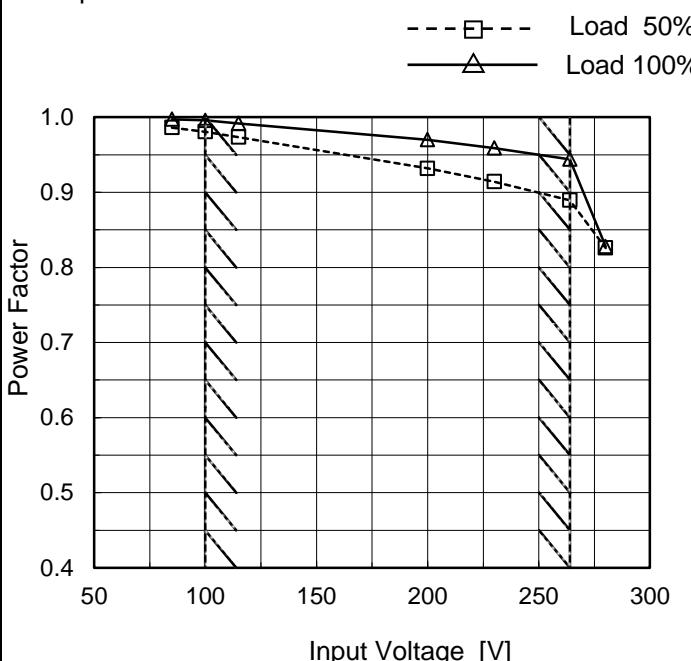
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Model	PJA600F-36
Item	Power Factor (by Input Voltage)
Object	_____

 Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



## 2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.986	0.997
100	0.981	0.996
115	0.973	0.992
200	0.932	0.970
230	0.914	0.959
264	0.889	0.944
280	0.826	0.828
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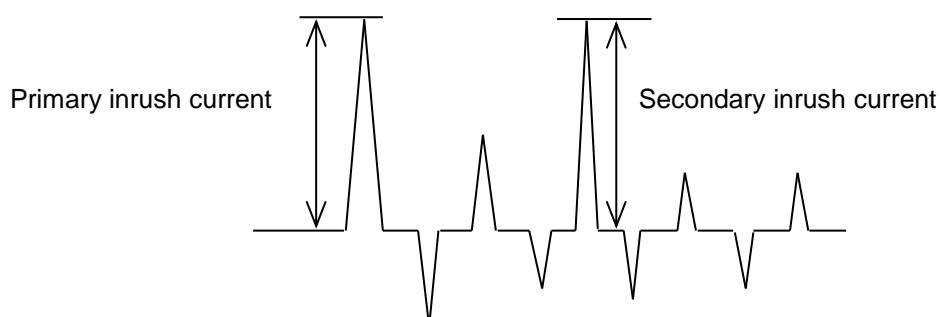
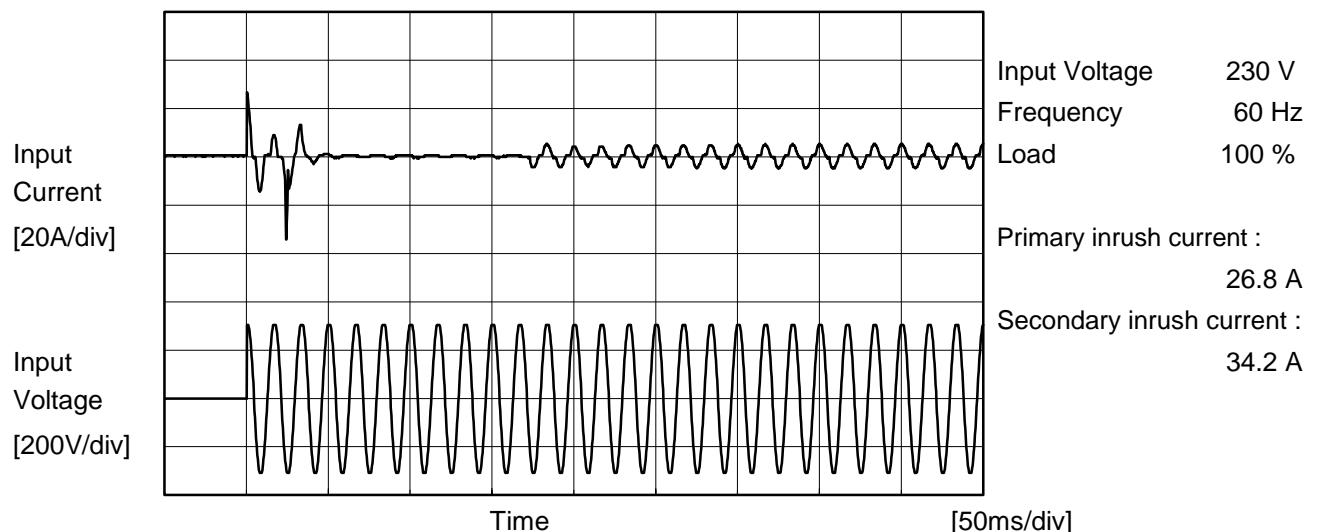
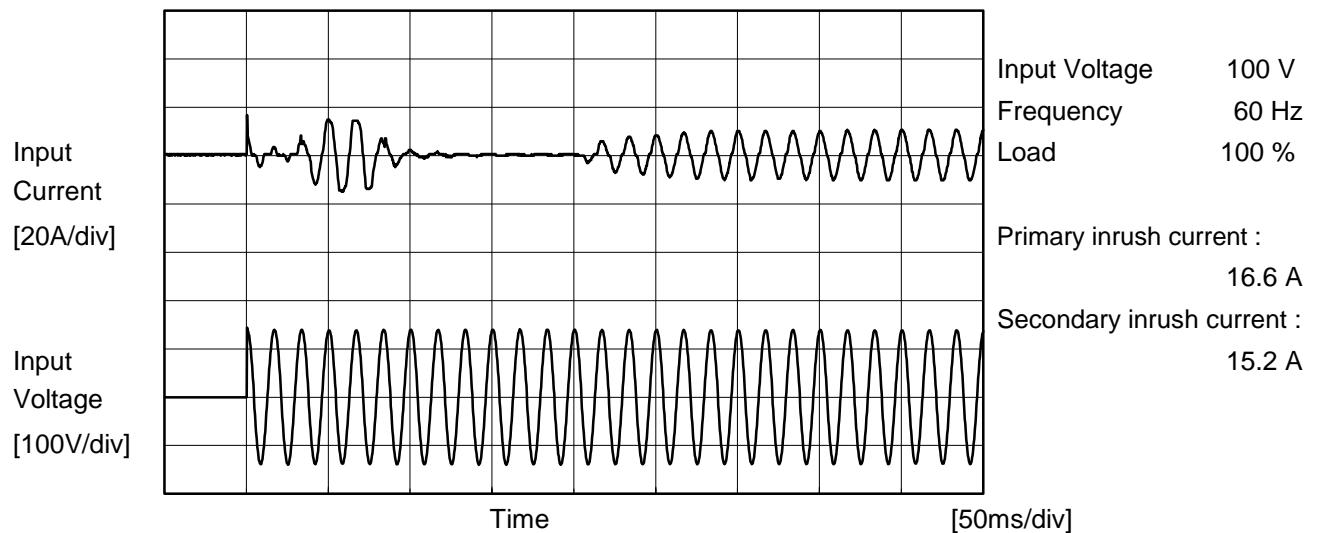
Note: Slanted line shows the range of the rated input voltage.

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Item	Power Factor (by Load Current)	Testing Circuitry	Figure A																																																			
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1.Graph	<p>The graph plots Power Factor (Y-axis, 0.0 to 1.0) against Load Current [A] (X-axis, 0 to 20). Three curves are shown for Input Voltages: 100V (solid line with triangles), 115V (dashed line with squares), and 230V (dash-dot line with circles). All curves show an increasing trend. A slanted line is drawn across the graph, starting from the origin and ending at approximately 18.37A on the X-axis, indicating the rated load current range.</p>																																																					
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Note:	Slanted line shows the range of the rated load current.																																																					

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Model	PJA600F-36	Temperature Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	





Model	PJA600F-36	Temperature Testing Circuitry	25°C Figure C	
Item	Leakage Current			
Object	_____			

## 1. Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	115 [V]	240 [V]	
DEN-AN	Figure C-1	Both phases	0.17	0.19	0.42	Operation
		One of phases	0.28	0.33	0.73	Stand by
IEC62368-1	Figure C-2	Both phases	0.16	0.18	0.39	Operation
		One of phases	0.28	0.32	0.71	Stand by
	Figure C-3	Both phases	0.16	0.18	0.39	Operation
		One of phases	0.28	0.32	0.68	Stand by

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

## 2. Condition

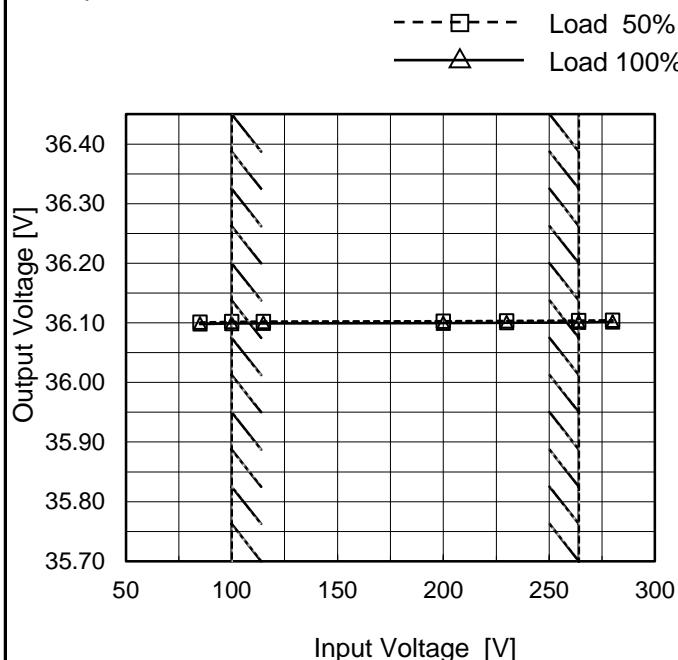
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

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Model	PJA600F-36
Item	Line Regulation
Object	+36V16.7A

 Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



## 2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	36.101	36.098
100	36.102	36.099
115	36.102	36.099
200	36.103	36.099
230	36.103	36.100
264	36.104	36.101
280	36.104	36.102
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Note: Slanted line shows the range of the rated input voltage.

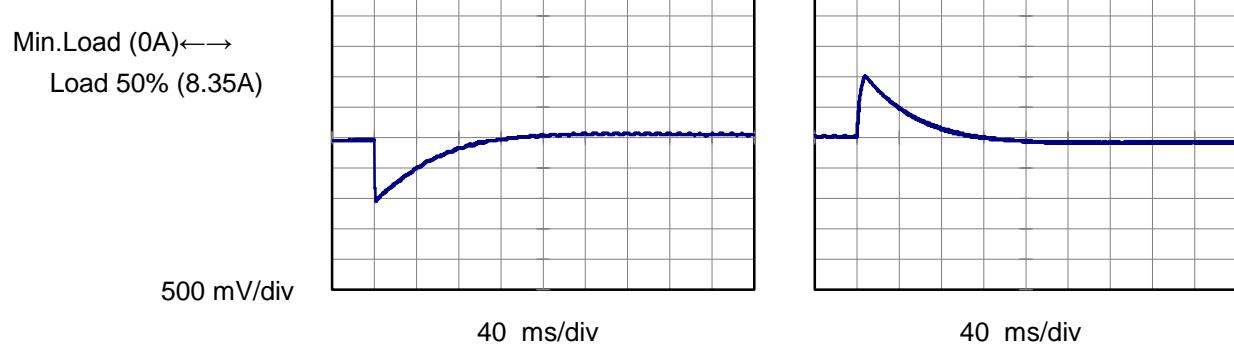
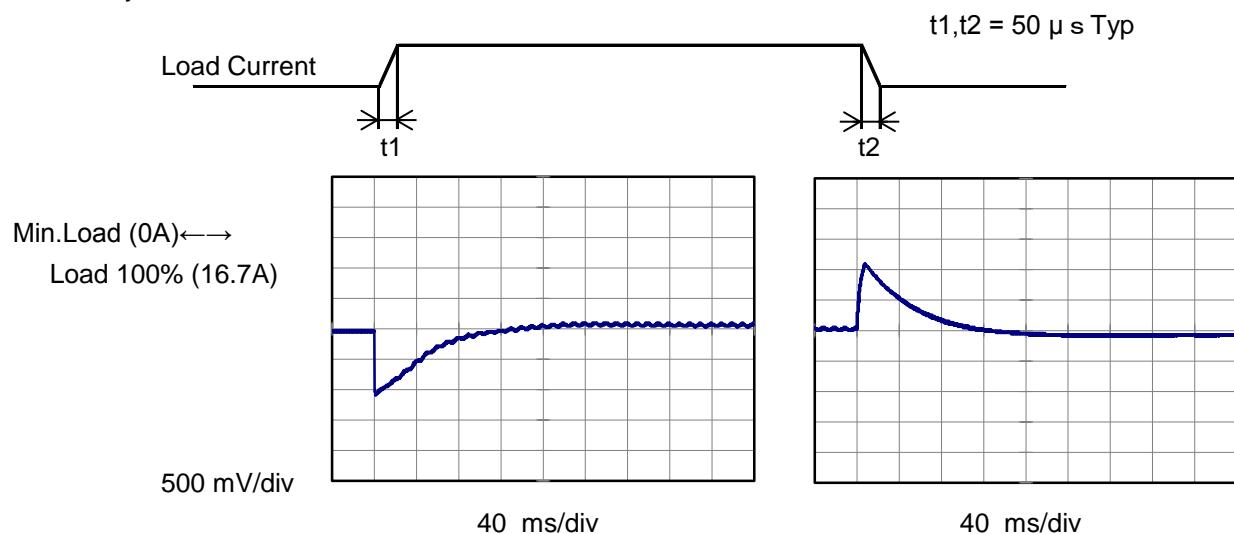
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Object	+36V16.7A																																																					
1.Graph	<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Input Volt.</p> <ul style="list-style-type: none"> <li>100V</li> <li>115V</li> <li>230V</li> </ul>																																																					
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Model	PJA600F-36	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+36V16.7A		

Input Volt. 100 V  
 Cycle 1000 ms

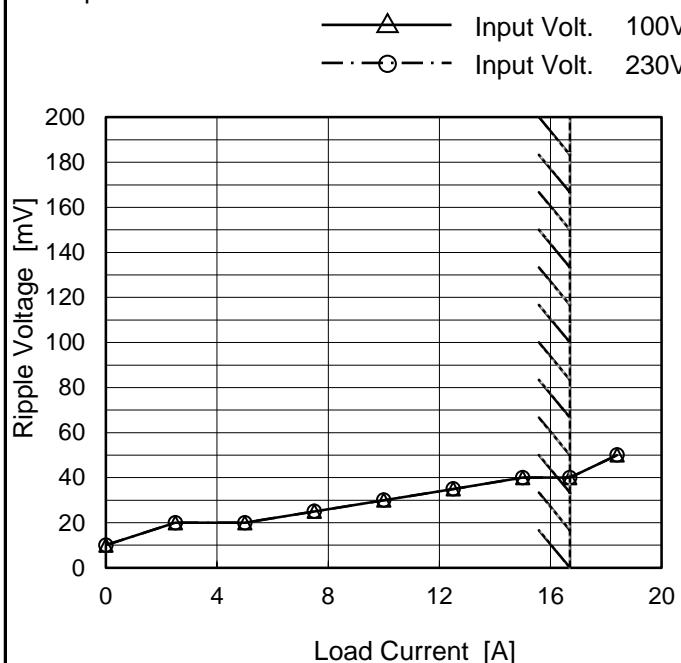


**COSEL**

Model	PJA600F-36
Item	Ripple Voltage (by Load Current)
Object	+36V16.7A

 Temperature 25°C  
 Testing Circuitry Figure B

## 1. Graph



## 2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	10	10
2.5	20	20
5.0	20	20
7.5	25	25
10.0	30	30
12.5	35	35
15.0	40	40
16.7	40	40
18.4	50	50
--	-	-
--	-	-

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.

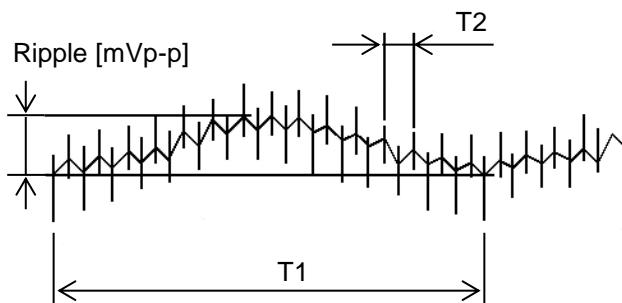
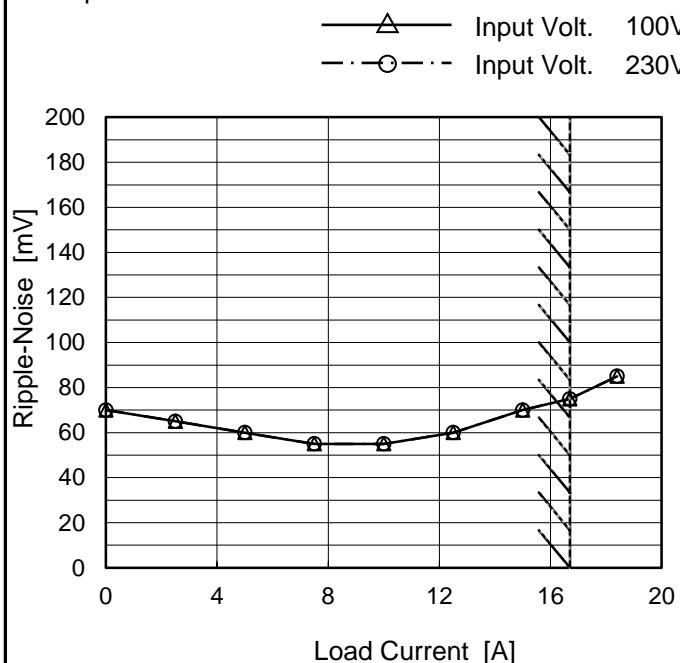
 T1: Due to AC Input Line  
 T2: Due to Switching


Fig. Complex Ripple Wave Form

# COSEL

Model	PJA600F-36	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	+36V16.7A		

## 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. 100 [V]	Input Volt. 230 [V]
0.0	70	70
2.5	65	65
5.0	60	60
7.5	55	55
10.0	55	55
12.5	60	60
15.0	70	70
16.7	75	75
18.4	85	85
--	-	-
--	-	-

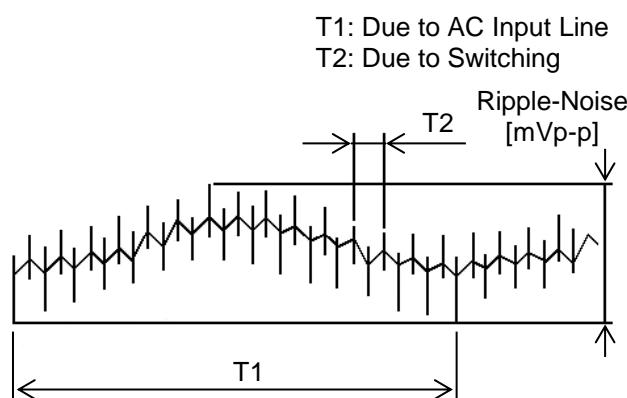


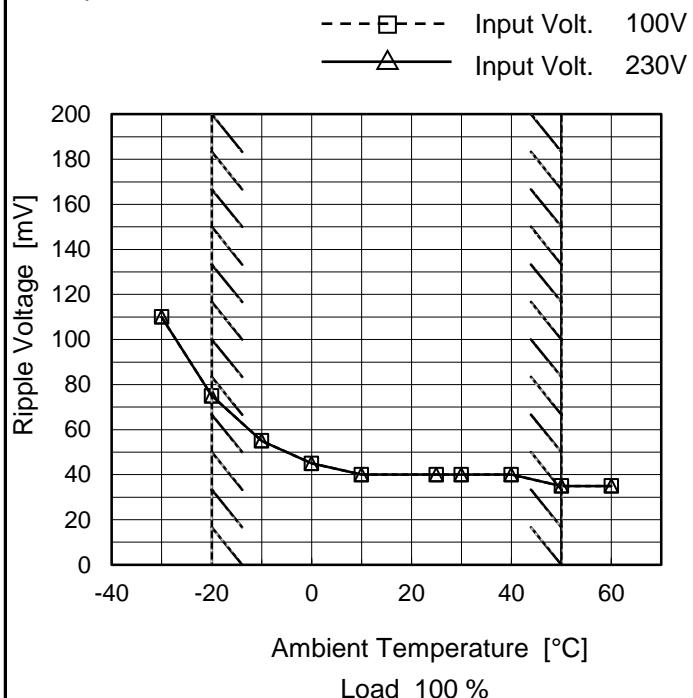
Fig. Complex Ripple Wave Form

**COSEL**

Model	PJA600F-36
Item	Ripple Voltage (by Ambient Temp.)
Object	+36V16.7A

## Testing Circuitry Figure B

## 1.Graph



## 2.Values

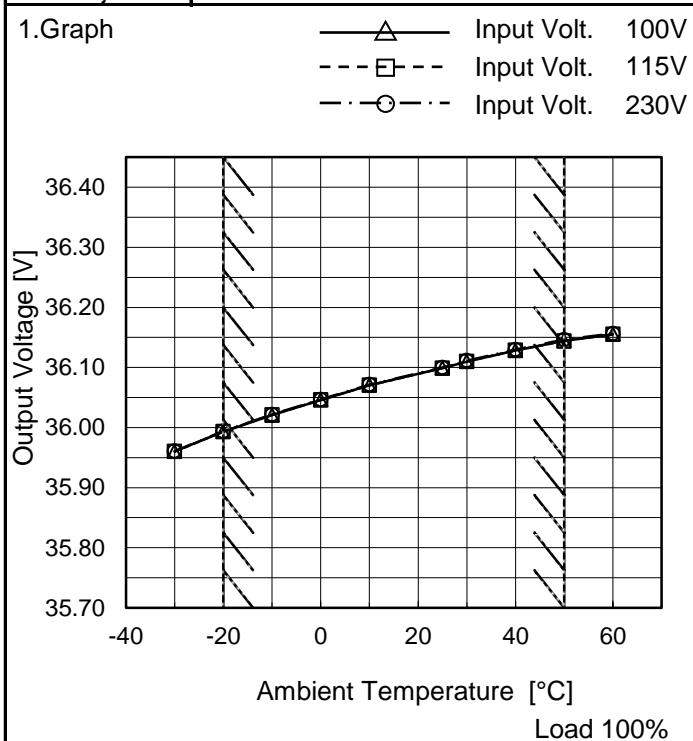
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	110	110
-20	75	75
-10	55	55
0	45	45
10	40	40
25	40	40
30	40	40
40	40	40
50	35	35
60	35	35
--	-	-

Measured by 20 MHz Oscilloscope.

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

**COSEL**

Model	PJA600F-36
Item	Ambient Temperature Drift
Object	+36V16.7A



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	35.960	35.960	35.961
-20	35.993	35.993	35.994
-10	36.021	36.021	36.022
0	36.046	36.046	36.047
10	36.070	36.070	36.072
25	36.099	36.099	36.100
30	36.110	36.110	36.112
40	36.128	36.128	36.130
50	36.144	36.144	36.146
60	36.155	36.155	36.156
--	-	-	-

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



Model	PJA600F-36	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+36V16.7A	

### 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 : -20 - 50°C

Input Voltage : 100 - 230V

Load Current : 0 - 16.7A

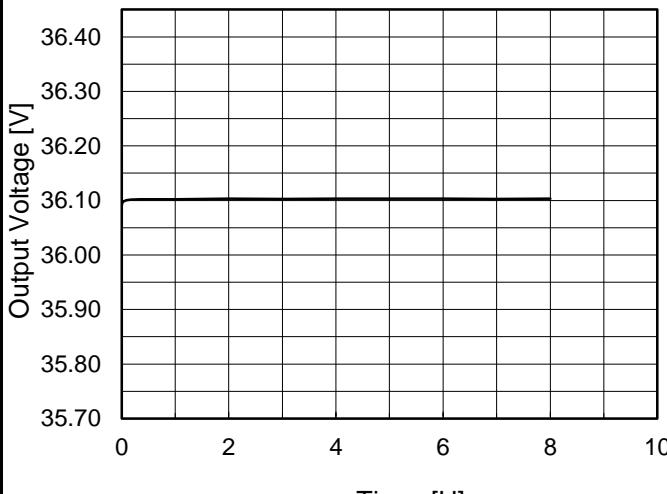
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	230	0	36.179	$\pm 93$	$\pm 0.3$
Minimum Voltage	-20	100	16.7	35.993		

**COSEL**

Model	PJA600F-36	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+36V16.7A																								
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>36.091</td></tr> <tr><td>0.5</td><td>36.102</td></tr> <tr><td>1.0</td><td>36.102</td></tr> <tr><td>2.0</td><td>36.103</td></tr> <tr><td>3.0</td><td>36.103</td></tr> <tr><td>4.0</td><td>36.103</td></tr> <tr><td>5.0</td><td>36.103</td></tr> <tr><td>6.0</td><td>36.103</td></tr> <tr><td>7.0</td><td>36.103</td></tr> <tr><td>8.0</td><td>36.103</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	36.091	0.5	36.102	1.0	36.102	2.0	36.103	3.0	36.103	4.0	36.103	5.0	36.103	6.0	36.103	7.0	36.103	8.0	36.103
Time since start [H]	Output Voltage [V]																								
0.0	36.091																								
0.5	36.102																								
1.0	36.102																								
2.0	36.103																								
3.0	36.103																								
4.0	36.103																								
5.0	36.103																								
6.0	36.103																								
7.0	36.103																								
8.0	36.103																								

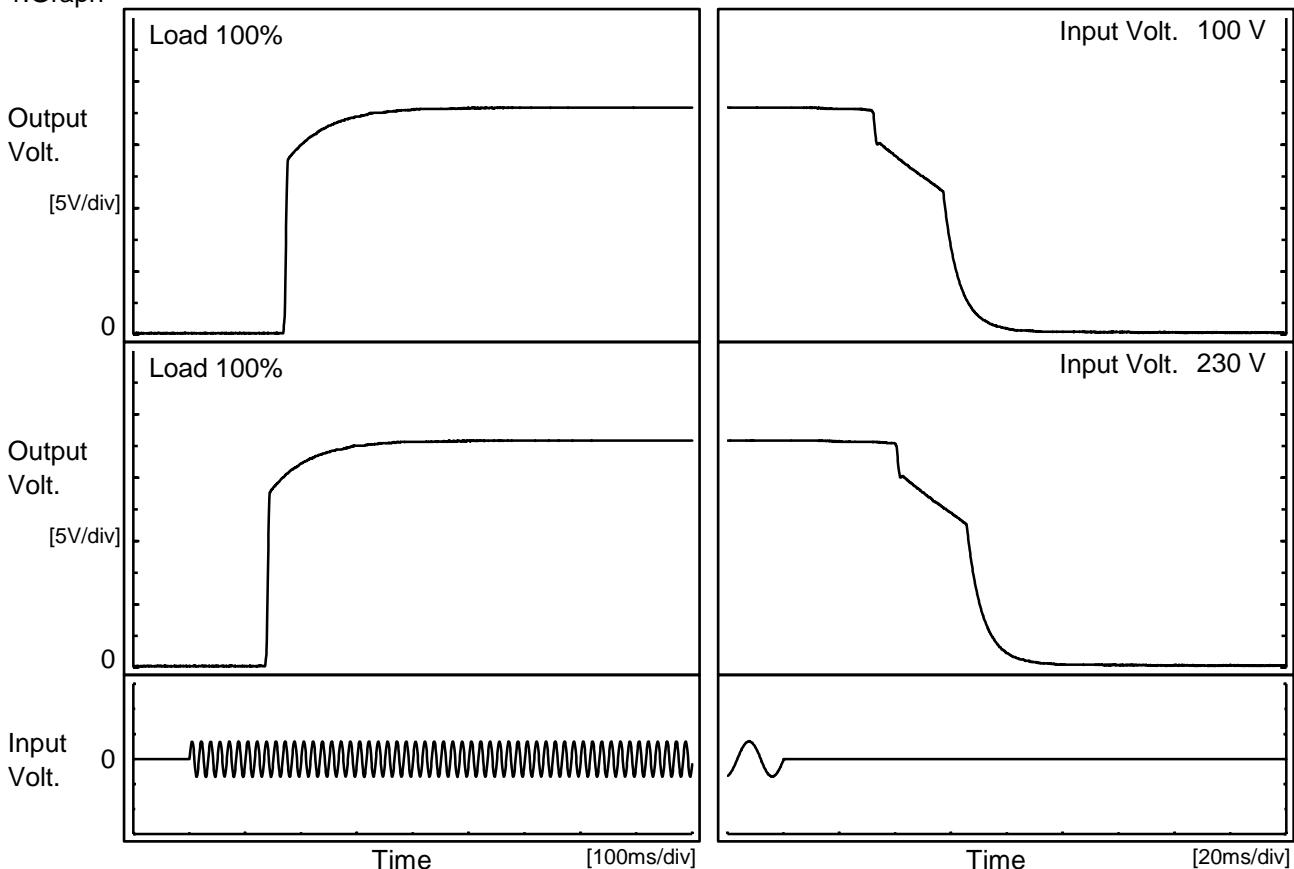
\*The characteristic of AC100V is equal.

**COSEL**

Model	PJA600F-36
Item	Rise and Fall Time
Object	+36V16.7A

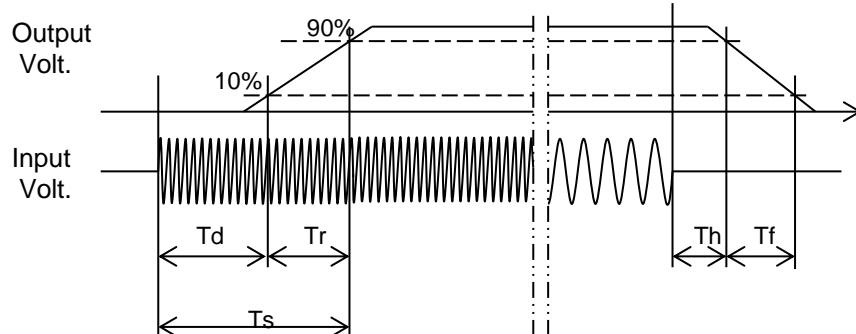
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[ms]
100 V		171.5	69.5	241.0	32.7	35.4	
230 V		139.0	68.5	207.5	41.0	35.4	

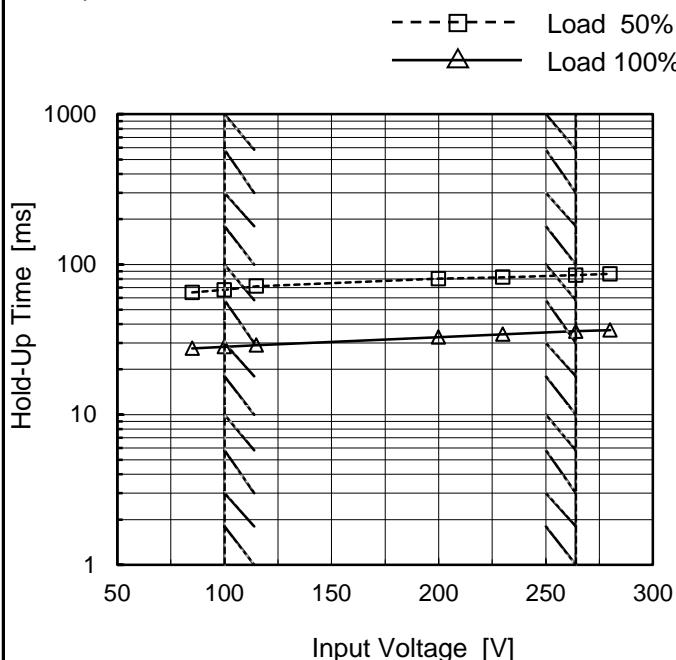


**COSEL**

Model	PJA600F-36
Item	Hold-Up Time
Object	+36V16.7A

 Temperature 25°C  
 Testing Circuitry Figure A

## 1. Graph



## 2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	65	28
100	68	28
115	72	29
200	80	33
230	82	34
264	85	36
280	86	37
--	-	-
--	-	-

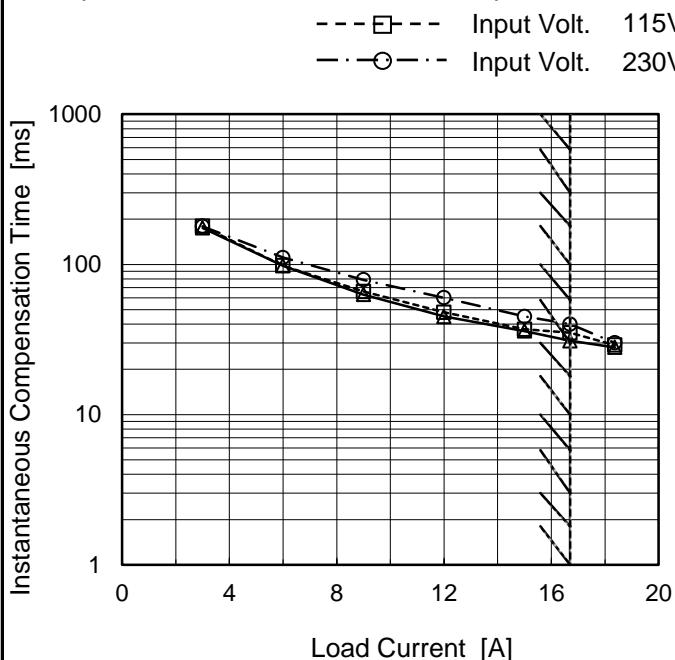
This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.  
 Note: Slanted line shows the range of the rated input voltage.

**COSEL**

Model	PJA600F-36
Item	Instantaneous Interruption Compensation
Object	+36V16.7A

Temperature 25°C  
Testing Circuitry Figure A

## 1.Graph



## 2.Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	-	-	-
3.00	175	179	179
6.00	98	98	111
9.00	63	66	79
12.00	45	48	60
15.00	36	37	45
16.70	31	35	40
18.37	28	29	30
--	-	-	-
--	-	-	-
--	-	-	-

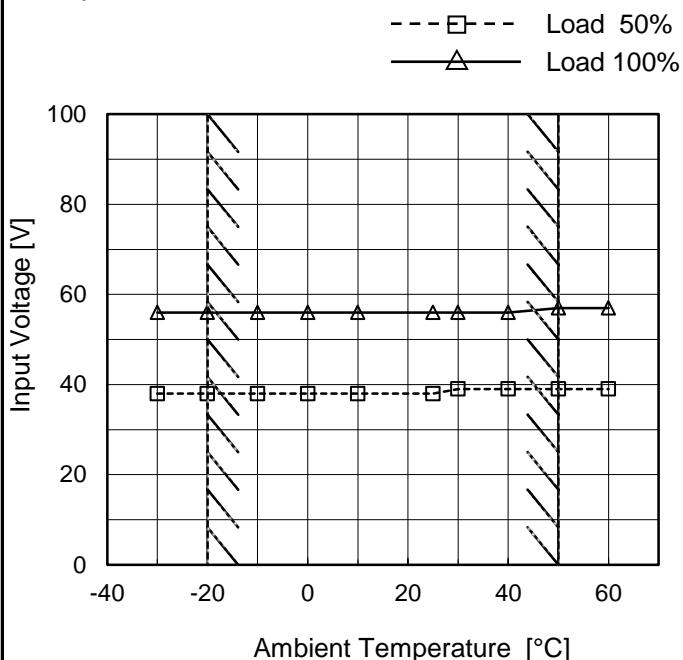
Note: Slanted line shows the range of the rated load current.

**COSEL**

Model	PJA600F-36
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+36V16.7A

Testing Circuitry Figure A

## 1.Graph



## 2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	38	56
-20	38	56
-10	38	56
0	38	56
10	38	56
25	38	56
30	39	56
40	39	56
50	39	57
60	39	57
--	-	-

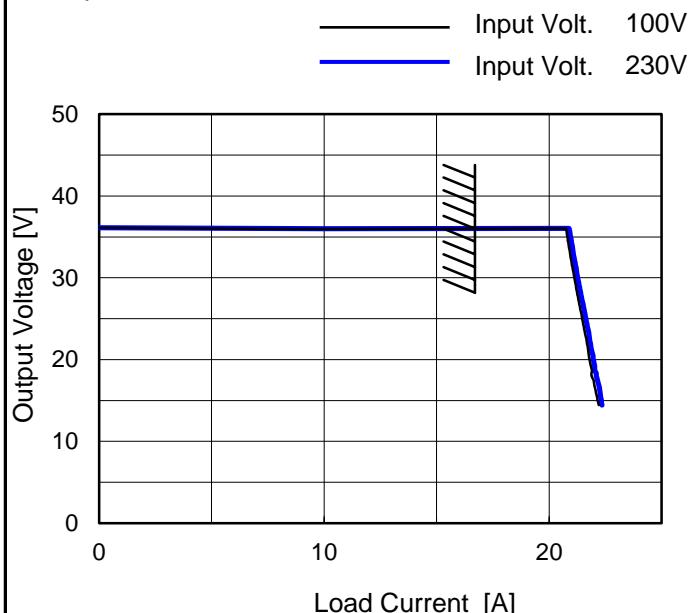
Note: Slanted line shows the range of the rated ambient temperature.

**COSEL**

Model	PJA600F-36
Item	Overcurrent Protection
Object	+36V16.7A

 Temperature 25°C  
 Testing Circuitry Figure A

## 1. Graph



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

Intermittent operation occurs when the output voltage is from 14.4V to 0V.

## 2. Values

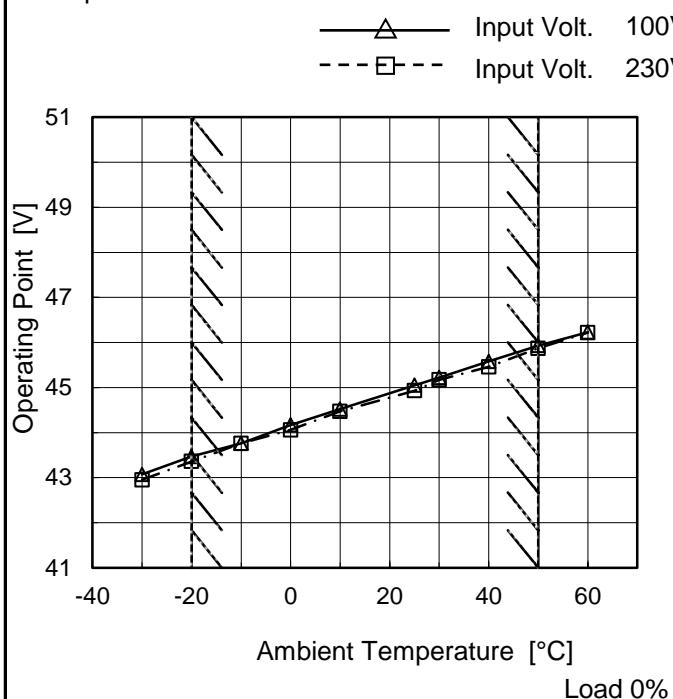
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
34.2	20.85	21.01
32.4	20.75	20.89
28.8	21.20	21.35
25.2	21.46	21.61
21.6	21.71	21.85
18.0	21.66	22.09
14.4	22.20	22.35
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**

Model	PJA600F-36
Item	Overvoltage Protection
Object	+36V16.7A

## Testing Circuitry Figure A

## 1.Graph



## 2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-30	43.07	42.95
-20	43.47	43.36
-10	43.76	43.76
0	44.17	44.06
10	44.52	44.47
25	45.05	44.93
30	45.22	45.17
40	45.58	45.46
50	45.93	45.87
60	46.23	46.22
--	-	-

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

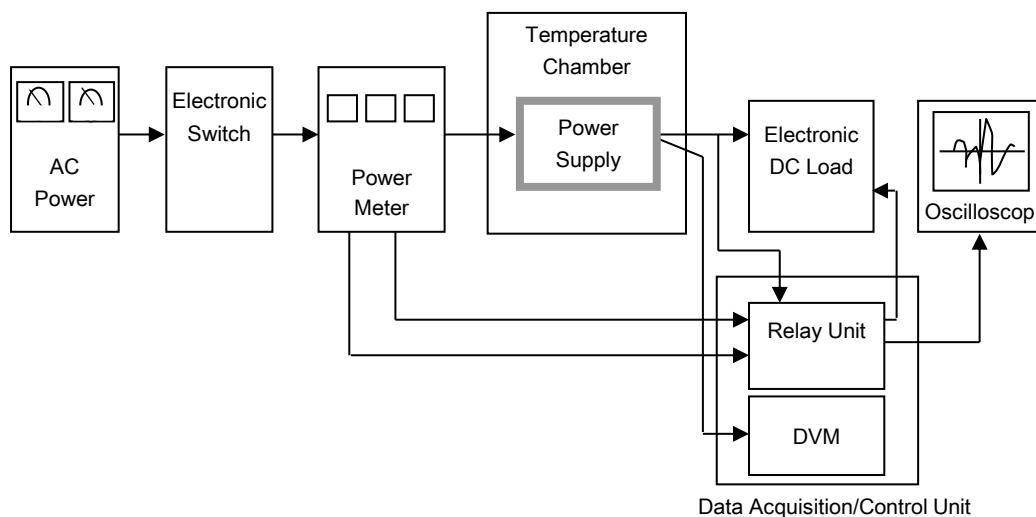
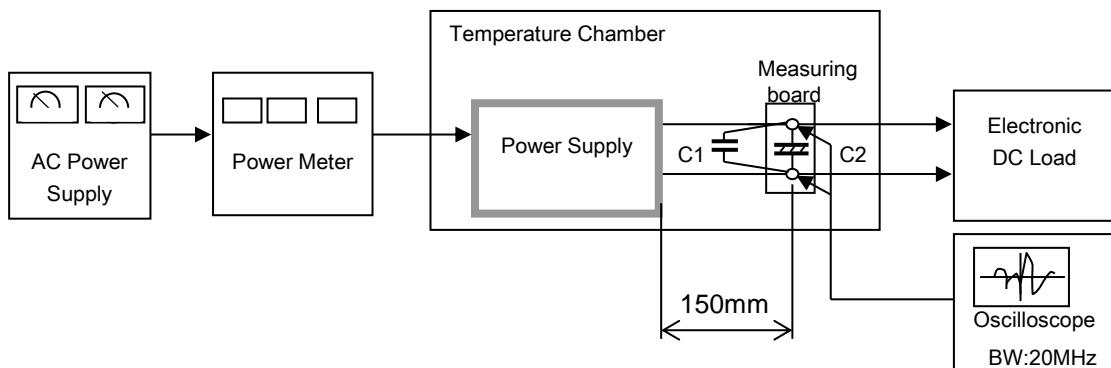


Figure A



C1= 0.1  $\mu$ F  
(Ceramic capacitor)

C2= 22  $\mu$ F  
(Electrolytic capacitor)

Figure B

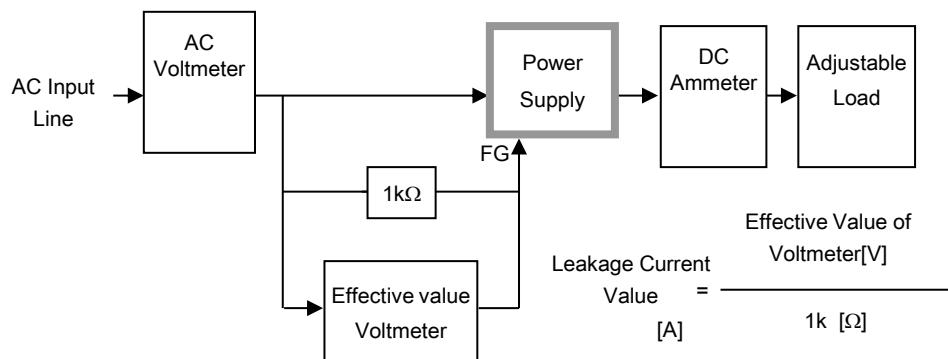


Figure C-1 ( DEN-AN )

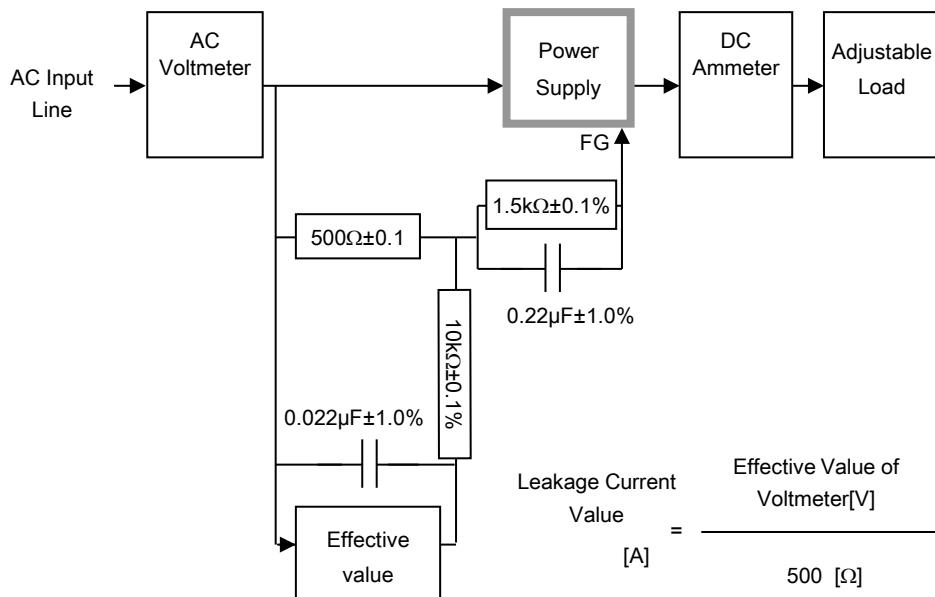


Figure C-2 ( IEC62368-1 refer to IEC60990 Fig.4 )

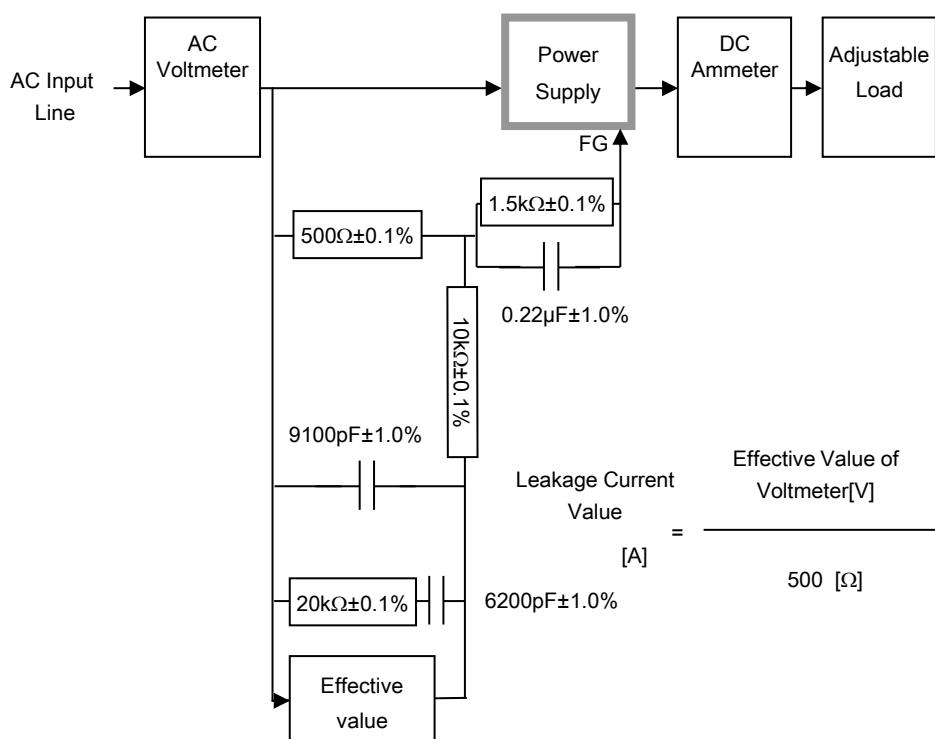


Figure C-3 ( IEC62368-1 refer to IEC60990 Fig.5 )