

# TEST DATA OF PJA300F-15

Regulated DC Power Supply  
August 4, 2017

Approved by : Yukihiro Takehashi  
Yukihiro Takehashi Design Manager

Prepared by : Atsushi Nishikawa  
Atsushi Nishikawa Design Engineer

**COSEL CO.,LTD.**

## CONTENTS

1.Input Current (by Load Current) . . . . .	1
2.Input Power (by Load Current) . . . . .	2
3.Efficiency (by Input Voltage) . . . . .	3
4.Efficiency (by Load Current) . . . . .	4
5.Power Factor (by Input Voltage) . . . . .	5
6.Power Factor (by Load Current) . . . . .	6
7.Inrush Current . . . . .	7
8.Leakage Current . . . . .	8
9.Line Regulation . . . . .	9
10.Load Regulation . . . . .	10
11.Dynamic Load Response . . . . .	11
12.Ripple Voltage (by Load Current) . . . . .	12
13.Ripple-Noise . . . . .	13
14.Ripple Voltage (by Ambient Temperature) . . . . .	14
15.Ambient Temperature Drift . . . . .	15
16.Output Voltage Accuracy . . . . .	16
17.Time Lapse Drift . . . . .	17
18.Rise and Fall Time . . . . .	18
19.Hold-Up Time . . . . .	19
20.Instantaneous Interruption Compensation . . . . .	20
21.Minimum Input Voltage for Regulated Output Voltage . . . . .	21
22.Overcurrent Protection . . . . .	22
23.Overvoltage Protection . . . . .	23
24.Figure of Testing Circuitry . . . . .	24

(Final Page 25)

**COSEL**

Model		PJA300F-15																																																				
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> <p>Input Current [A]</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">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</td><td>0.110</td><td>0.105</td><td>0.103</td></tr><tr><td>4</td><td>0.856</td><td>0.738</td><td>0.422</td></tr><tr><td>8</td><td>1.555</td><td>1.330</td><td>0.700</td></tr><tr><td>12</td><td>2.301</td><td>1.970</td><td>1.002</td></tr><tr><td>16</td><td>3.052</td><td>2.634</td><td>1.310</td></tr><tr><td>20</td><td>3.824</td><td>3.300</td><td>1.625</td></tr><tr><td>22</td><td>4.211</td><td>3.645</td><td>1.790</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]	Input Current [A]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0	0.110	0.105	0.103	4	0.856	0.738	0.422	8	1.555	1.330	0.700	12	2.301	1.970	1.002	16	3.052	2.634	1.310	20	3.824	3.300	1.625	22	4.211	3.645	1.790	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Input Current [A]																																																					
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																			
0	0.110	0.105	0.103																																																			
4	0.856	0.738	0.422																																																			
8	1.555	1.330	0.700																																																			
12	2.301	1.970	1.002																																																			
16	3.052	2.634	1.310																																																			
20	3.824	3.300	1.625																																																			
22	4.211	3.645	1.790																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			

# COSEL

Model PJA300F-15

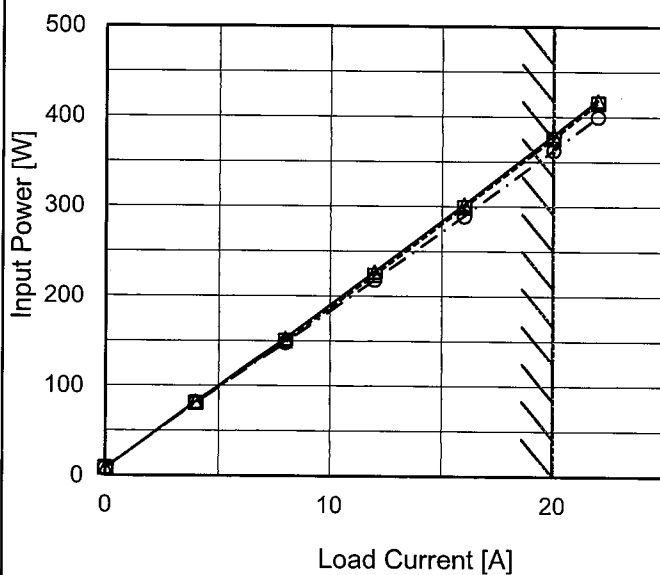
Item Input Power (by Load Current)

Object

Temperature 25°C  
Testing Circuitry Figure A

1. Graph

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



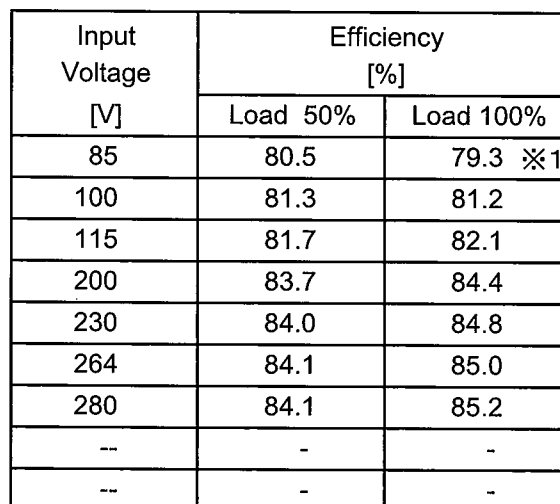
Note: Slanted line shows the range of the rated load current.

2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	8.2	8.5	8.5
4	82.5	81.2	81.1
8	152.8	150.1	148.2
12	227.2	223.4	218.1
16	302.3	299.4	289.4
20	379.3	375.8	362.7
22	418.3	415.3	400.1
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Temperature 25°C  
Testing Circuitry Figure A

## 2.Values



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



Model		PJA300F-15		Temperature 25°C																																																				
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<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>Efficiency [%]</p> <p>Load Current [A]</p>		2.Values																																																				
		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</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</td><td>-</td><td>-</td><td>-</td></tr><tr><td>4</td><td>74.5</td><td>75.6</td><td>75.9</td></tr><tr><td>8</td><td>80.3</td><td>81.7</td><td>82.9</td></tr><tr><td>12</td><td>81.0</td><td>82.4</td><td>84.4</td></tr><tr><td>16</td><td>81.2</td><td>82.0</td><td>84.8</td></tr><tr><td>20</td><td>81.0</td><td>81.7</td><td>84.7</td></tr><tr><td>22</td><td>80.7</td><td>81.3</td><td>84.4</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><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>				Load Current [A]	Efficiency [%]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0	-	-	-	4	74.5	75.6	75.9	8	80.3	81.7	82.9	12	81.0	82.4	84.4	16	81.2	82.0	84.8	20	81.0	81.7	84.7	22	80.7	81.3	84.4	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																					
0	-	-	-																																																					
4	74.5	75.6	75.9																																																					
8	80.3	81.7	82.9																																																					
12	81.0	82.4	84.4																																																					
16	81.2	82.0	84.8																																																					
20	81.0	81.7	84.7																																																					
22	80.7	81.3	84.4																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								

-

4

-

BC-11174

# COSEL

Model

PJA300F-15

Item

Power Factor (by Input Voltage)

Object

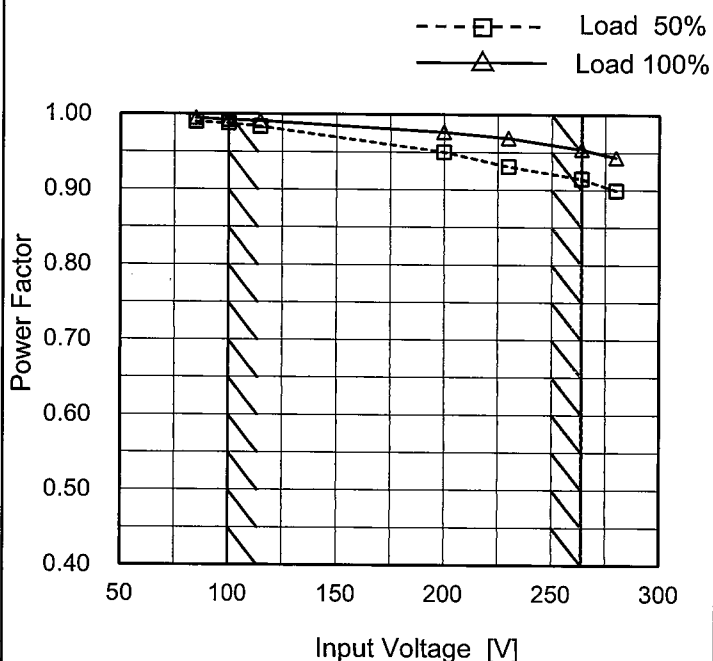
Temperature

25°C

Testing Circuitry

Figure A

## 1. Graph



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

## 2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.990	0.995 ※1
100	0.988	0.993
115	0.984	0.991
200	0.950	0.977
230	0.931	0.969
264	0.915	0.954
280	0.900	0.943
--	-	-
--	-	-

※1: Load 80%

# COSEL

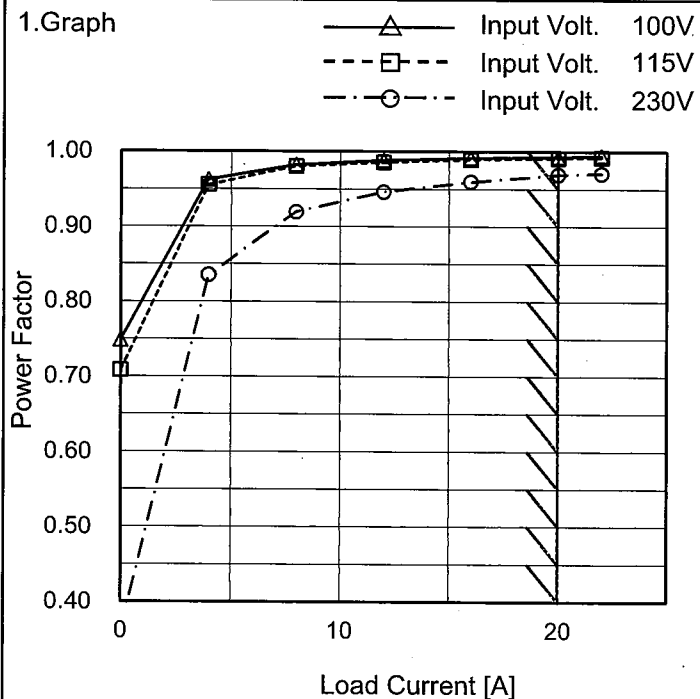
Model PJA300F-15

Item Power Factor (by Load Current)

Object

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



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

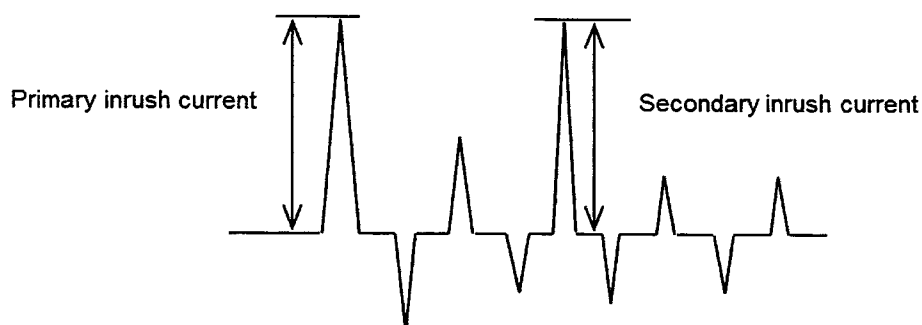
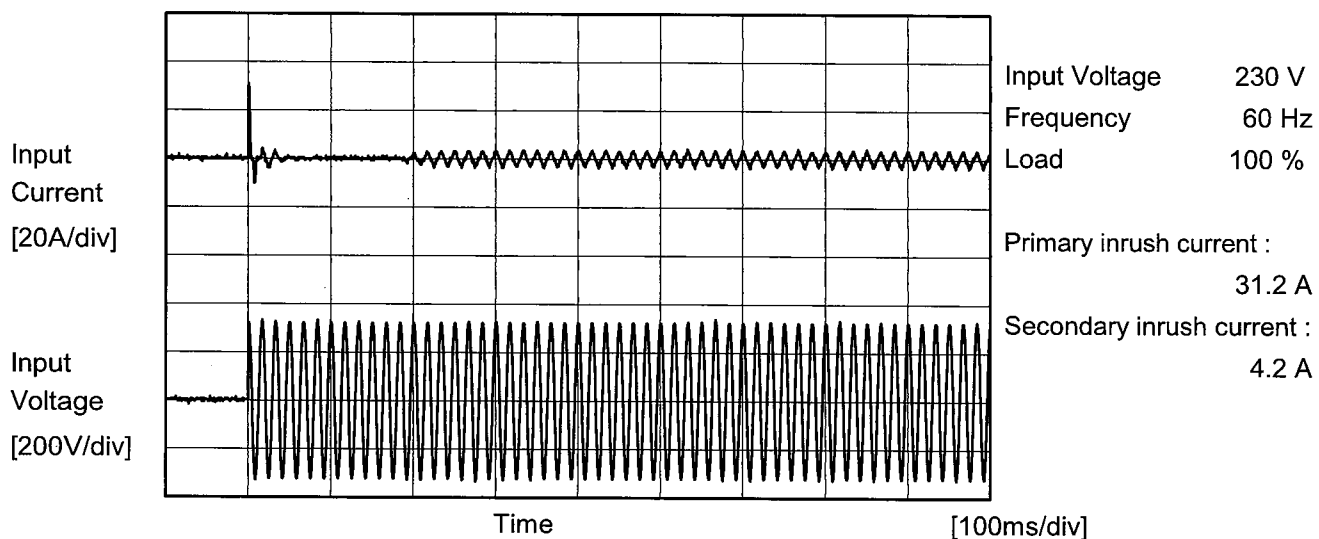
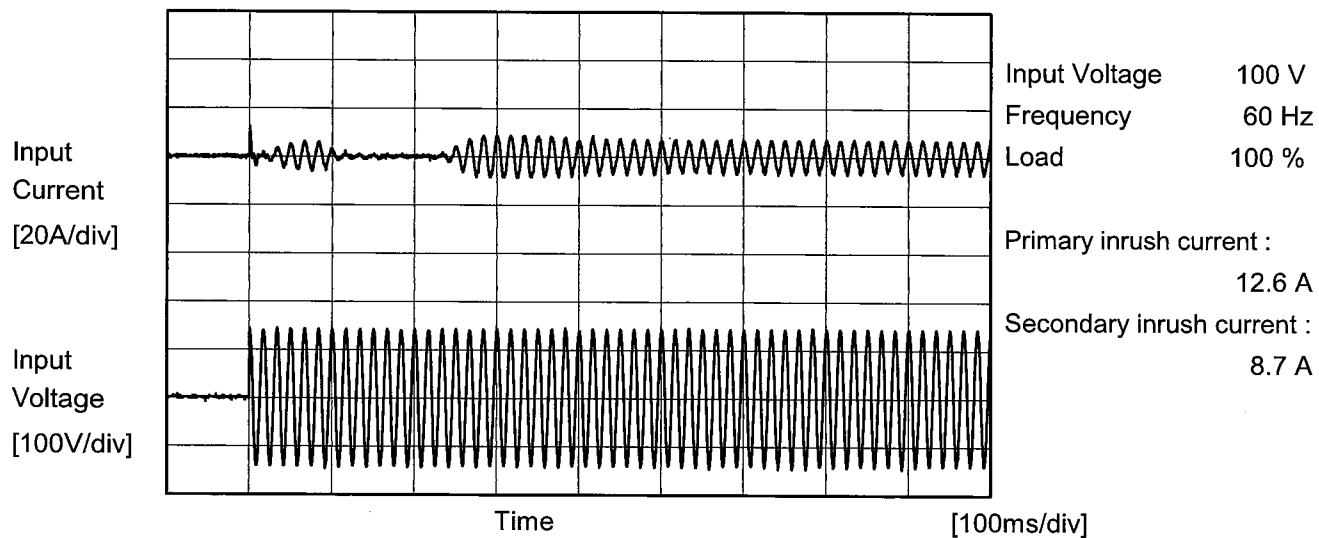
## 2. Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	0.749	0.708	0.359
4	0.963	0.956	0.835
8	0.982	0.980	0.919
12	0.989	0.986	0.946
16	0.992	0.990	0.960
20	0.993	0.992	0.970
22	0.995	0.992	0.971
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-



**COSEL**

Model	PJA300F-15		
Item	Inrush Current	Temperature	25°C
Object		Testing Circuitry	Figure A





Model		PJA300F-15	Temperature 25°C Testing Circuitry Figure B
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

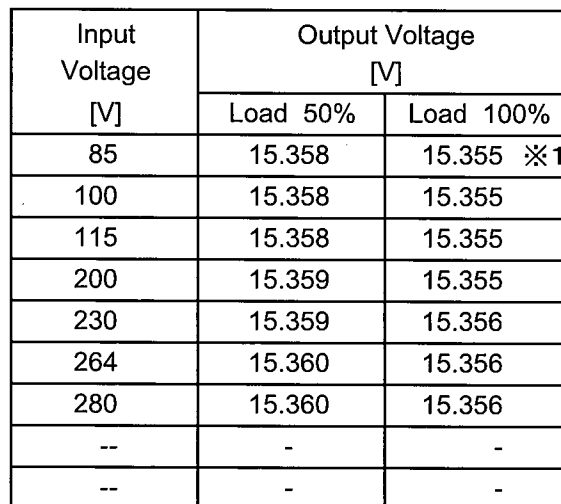
The value for "One of phases" is the reference value only.

## 2.Condition

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

Temperature	25°C
Testing Circuitry	Figure A

## 2.Values



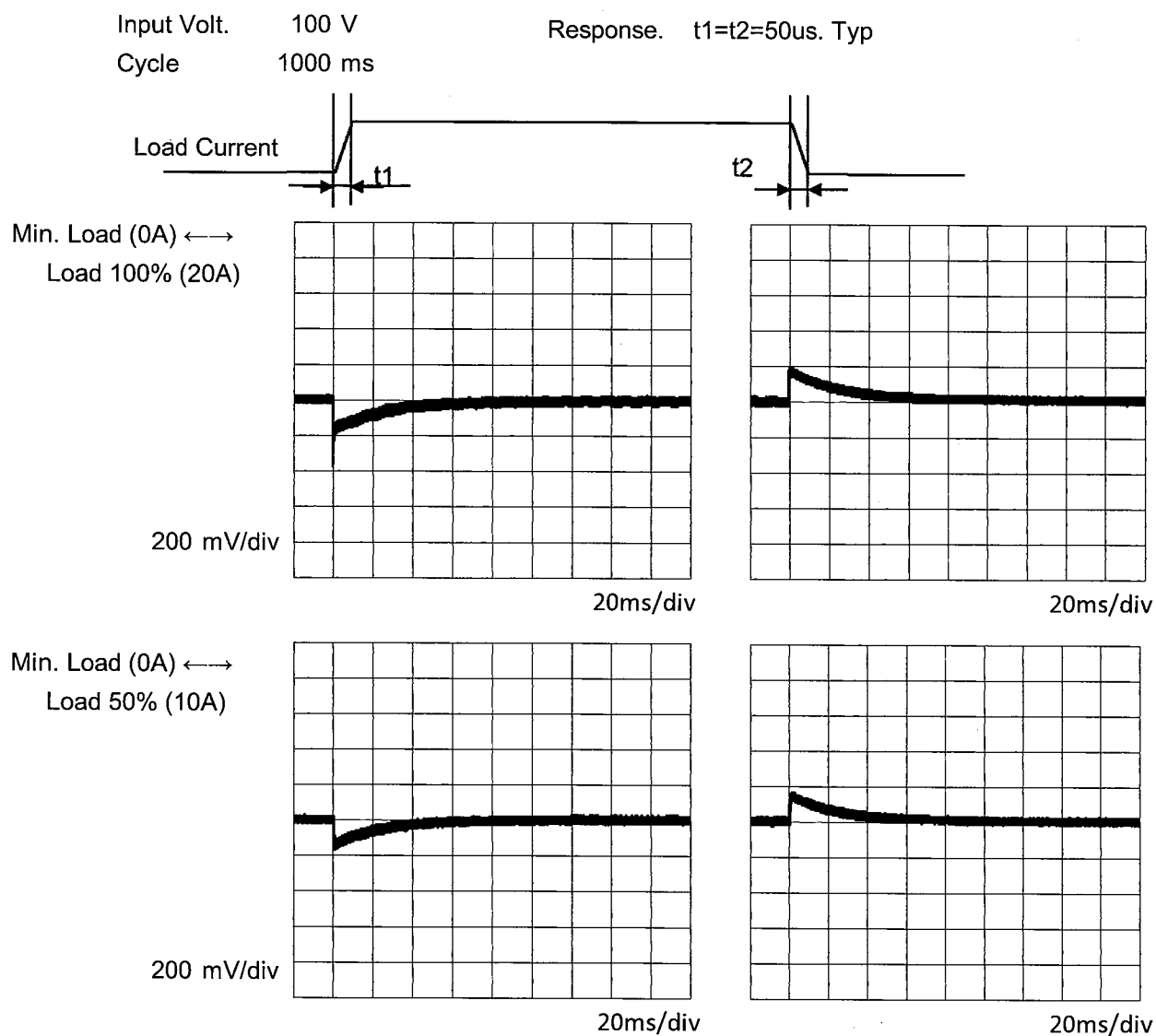
Note: Slanted line shows the range of the rated input voltage.



Model		PJA300F-15		Temperature Testing Circuitry	25°C Figure A																																																	
Item		Load Regulation																																																				
Object		+15V20A																																																				
1.Graph		<div><div><div>—△—</div><div>---□---</div><div>-·-○-·-</div></div><div><div>Input Volt. 100V</div><div>Input Volt. 115V</div><div>Input Volt. 230V</div></div></div>		2.Values																																																		
<div><div>Output Voltage [V]</div><div>Load Current [A]</div></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</td><td>15.365</td><td>15.366</td><td>15.367</td></tr><tr><td>4</td><td>15.361</td><td>15.363</td><td>15.363</td></tr><tr><td>8</td><td>15.359</td><td>15.360</td><td>15.361</td></tr><tr><td>12</td><td>15.357</td><td>15.358</td><td>15.359</td></tr><tr><td>16</td><td>15.355</td><td>15.356</td><td>15.357</td></tr><tr><td>20</td><td>15.353</td><td>15.354</td><td>15.355</td></tr><tr><td>22</td><td>15.352</td><td>15.353</td><td>15.354</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	15.365	15.366	15.367	4	15.361	15.363	15.363	8	15.359	15.360	15.361	12	15.357	15.358	15.359	16	15.355	15.356	15.357	20	15.353	15.354	15.355	22	15.352	15.353	15.354	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																			
0	15.365	15.366	15.367																																																			
4	15.361	15.363	15.363																																																			
8	15.359	15.360	15.361																																																			
12	15.357	15.358	15.359																																																			
16	15.355	15.356	15.357																																																			
20	15.353	15.354	15.355																																																			
22	15.352	15.353	15.354																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
Note: Slanted line shows the range of the rated load current.																																																						

# COSEL

Model	PJA300F-15	Temperature	25° C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V20A		



# COSEL

Model		PJA300F-15	
Item		Ripple Voltage (by Load Current)	
Object		+15V20A	
1.Graph		2.Values	

# COSEL

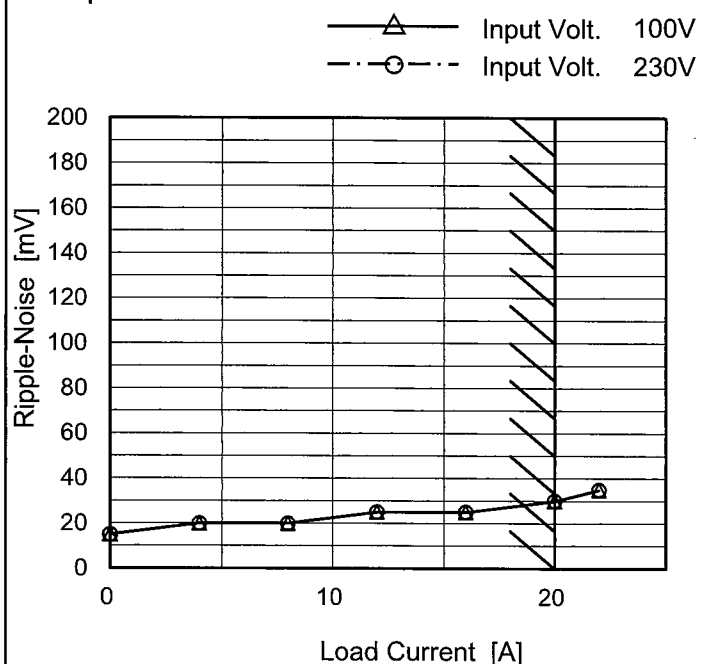
Model PJA300F-15

Item Ripple-Noise

Object +15V20A

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.

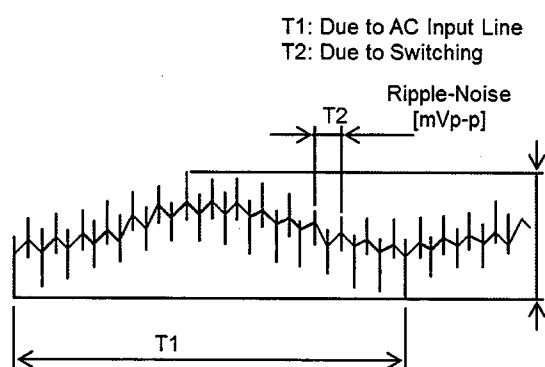


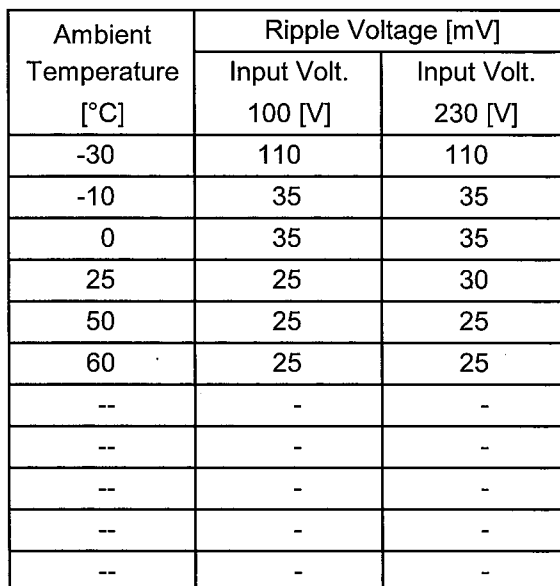
Fig. Complex Ripple Wave Form

## 2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0	15	15
4	20	20
8	20	20
12	25	25
16	25	25
20	30	30
22	35	35
--	-	-
--	-	-
--	-	-
--	-	-

Testing Circuitry Figure C

## 2.Values



BC-11174



# COSEL

Model PJA300F-15

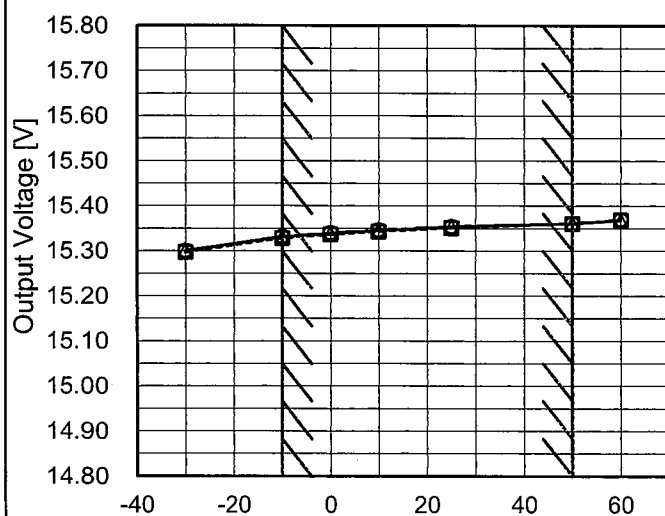
Item Ambient Temperature Drift

Object +15V20A

Testing Circuitry Figure A

## 1. Graph

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



Ambient Temperature [°C]

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

## 2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
-30	15.301	15.297	15.300
-10	15.331	15.328	15.332
0	15.339	15.336	15.340
10	15.346	15.343	15.347
25	15.354	15.351	15.355
50	15.361	15.361	15.362
60	15.368	15.369	15.370
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

**COSEL**

		Testing Circuitry Figure A
Model	PJA300F-15	
Item	Output Voltage Accuracy	
Object	+15V20A	

### 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 - 20A

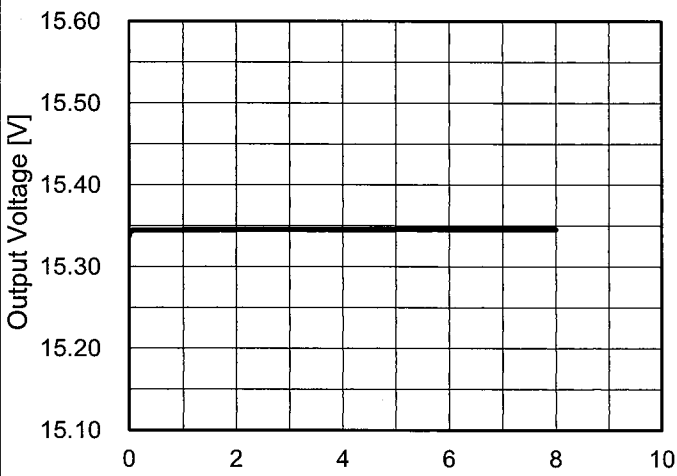
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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	25	264	0	15.367	±20	±0.1
Minimum Voltage	-10	115	20	15.328		

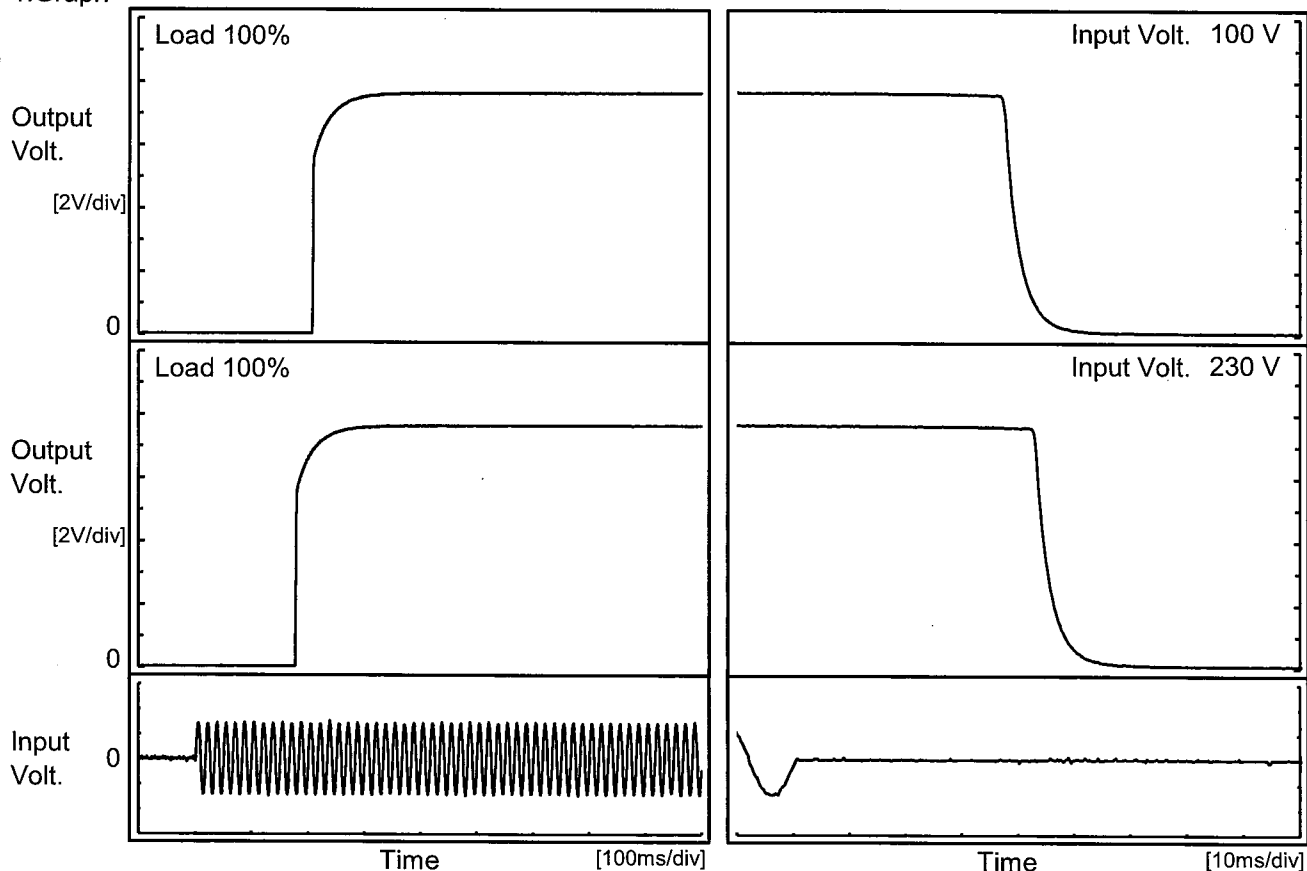


LUSEL																									
Model	PJA300F-15																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+15V20A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 230V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>15.337</td></tr><tr><td>0.5</td><td>15.345</td></tr><tr><td>1.0</td><td>15.345</td></tr><tr><td>2.0</td><td>15.345</td></tr><tr><td>3.0</td><td>15.345</td></tr><tr><td>4.0</td><td>15.346</td></tr><tr><td>5.0</td><td>15.346</td></tr><tr><td>6.0</td><td>15.346</td></tr><tr><td>7.0</td><td>15.346</td></tr><tr><td>8.0</td><td>15.346</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	15.337	0.5	15.345	1.0	15.345	2.0	15.345	3.0	15.345	4.0	15.346	5.0	15.346	6.0	15.346	7.0	15.346	8.0	15.346
Time since start [H]	Output Voltage [V]																								
0.0	15.337																								
0.5	15.345																								
1.0	15.345																								
2.0	15.345																								
3.0	15.345																								
4.0	15.346																								
5.0	15.346																								
6.0	15.346																								
7.0	15.346																								
8.0	15.346																								
* The characteristic of AC100V is equal.																									

# COSEL

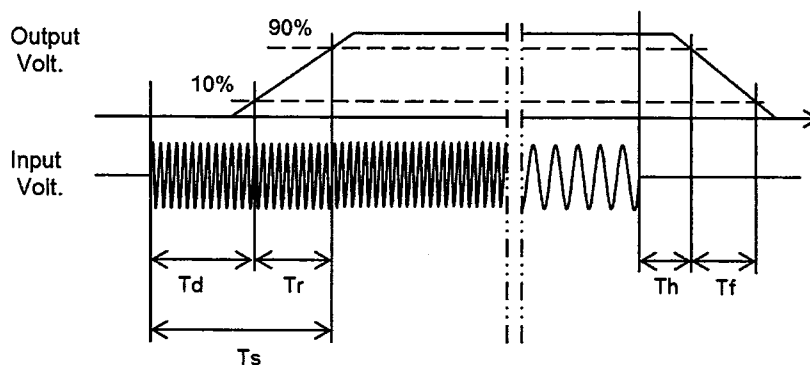
Model	PJA300F-15	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V20A		

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		207.5	28.5	236.0	38.0	5.9
230 V		178.0	28.0	206.0	43.3	5.9



# COSEL

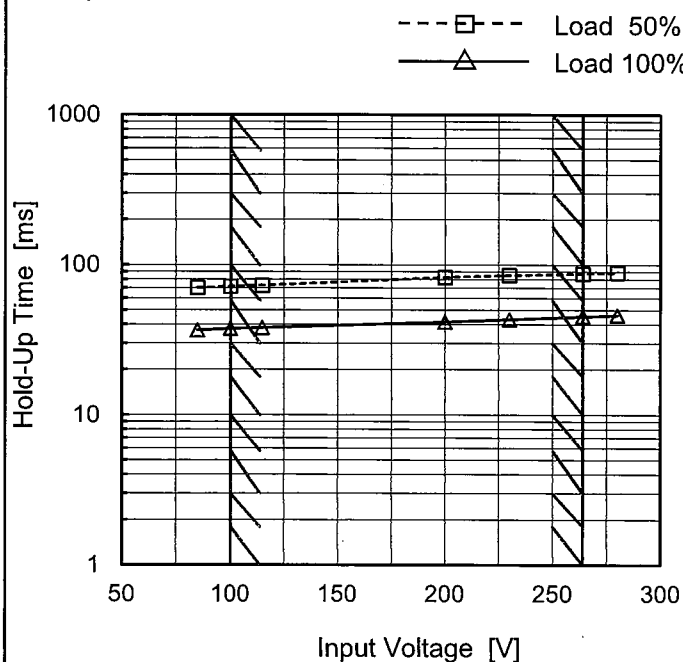
Model PJA300F-15

Item Hold-Up Time

Object +15V20A

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	70	37 ※1
100	72	38
115	73	38
200	83	42
230	85	43
264	87	45
280	89	46
--	-	-
--	-	-

※1: Load 80%



Model		PJA300F-15		Temperature 25°C																																																				
Item		Instantaneous Interruption Compensation		Testing Circuitry Figure A																																																				
Object		+15V20A																																																						
1.Graph		<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><div>Instantaneous Compensation Time [ms]</div><div>1000</div><div>100</div><div>10</div><div>1</div><div>0</div><div>10</div><div>20</div><div>Load Current [A]</div></div>		2.Values																																																				
		<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</td><td>-</td><td>-</td><td>-</td></tr><tr><td>4</td><td>172</td><td>177</td><td>206</td></tr><tr><td>8</td><td>81</td><td>85</td><td>106</td></tr><tr><td>12</td><td>60</td><td>61</td><td>71</td></tr><tr><td>16</td><td>45</td><td>46</td><td>54</td></tr><tr><td>20</td><td>37</td><td>37</td><td>43</td></tr><tr><td>22</td><td>30</td><td>31</td><td>39</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	-	-	-	4	172	177	206	8	81	85	106	12	60	61	71	16	45	46	54	20	37	37	43	22	30	31	39	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																							
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																					
0	-	-	-																																																					
4	172	177	206																																																					
8	81	85	106																																																					
12	60	61	71																																																					
16	45	46	54																																																					
20	37	37	43																																																					
22	30	31	39																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								



Model

PJA300F-15

Item

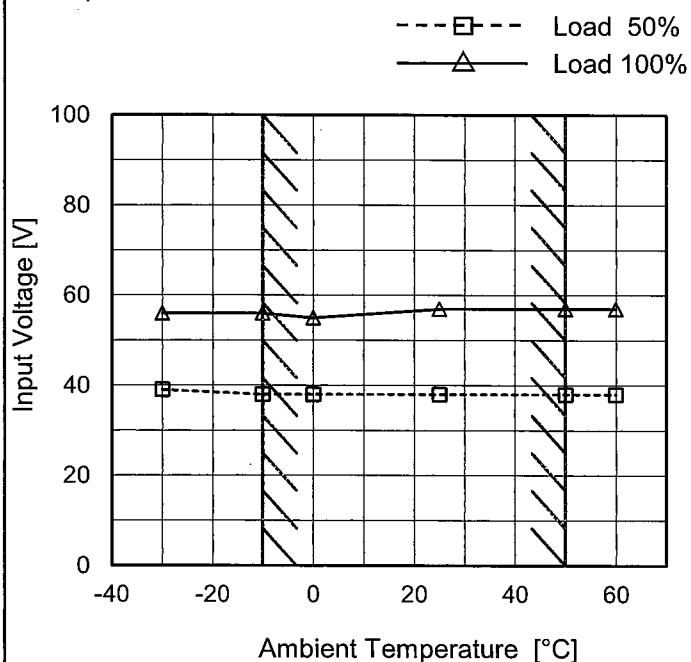
Minimum Input Voltage  
for Regulated Output Voltage

Object

+15V20A

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	56
-10	38	56
0	38	55
25	38	57
50	38	57
60	38	57
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



Model		PJA300F-15	
Item		Overcurrent Protection	
Object		+15V20A	

1.Graph

Input Volt. 100V

Input Volt. 230V

Output Voltage [V]





Model

PJA300F-15

Item

Overvoltage Protection

Object

+15V20A

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 230V

Operating Point [V]

21.0

20.0

19.0

18.0

17.0

-40

-20

0

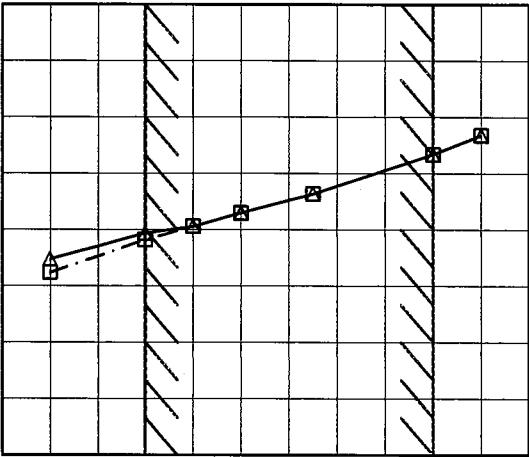
20

40

60

Ambient Temperature [°C]

Load 0%



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	18.74	18.62
-10	18.97	18.91
0	19.03	19.03
10	19.15	19.15
25	19.32	19.32
50	19.67	19.67
60	19.84	19.84
--	-	-
--	-	-
--	-	-
--	-	-

**COSEL**

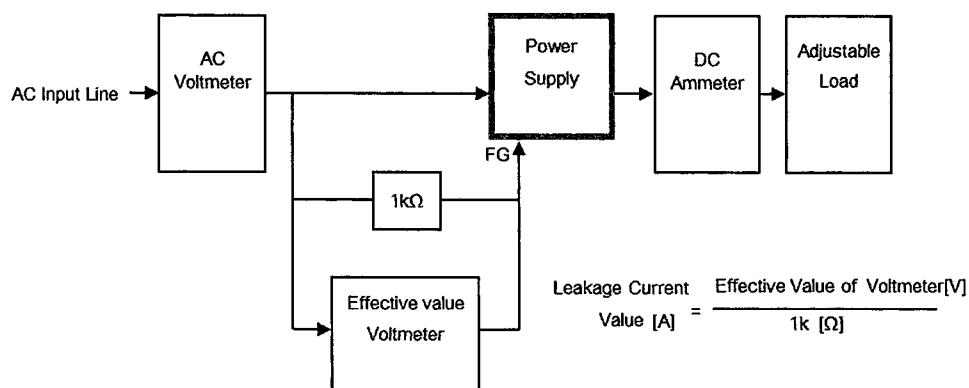
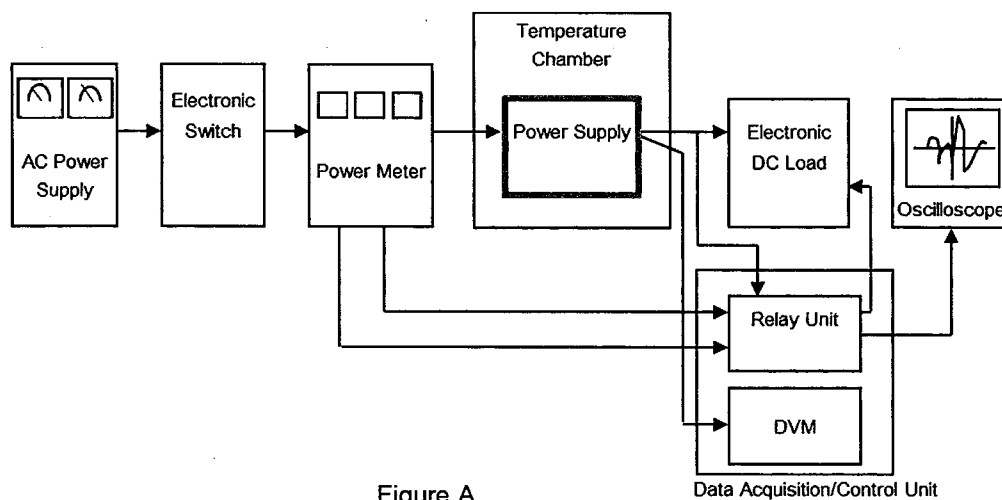


Figure B-1 ( DEN-AN )

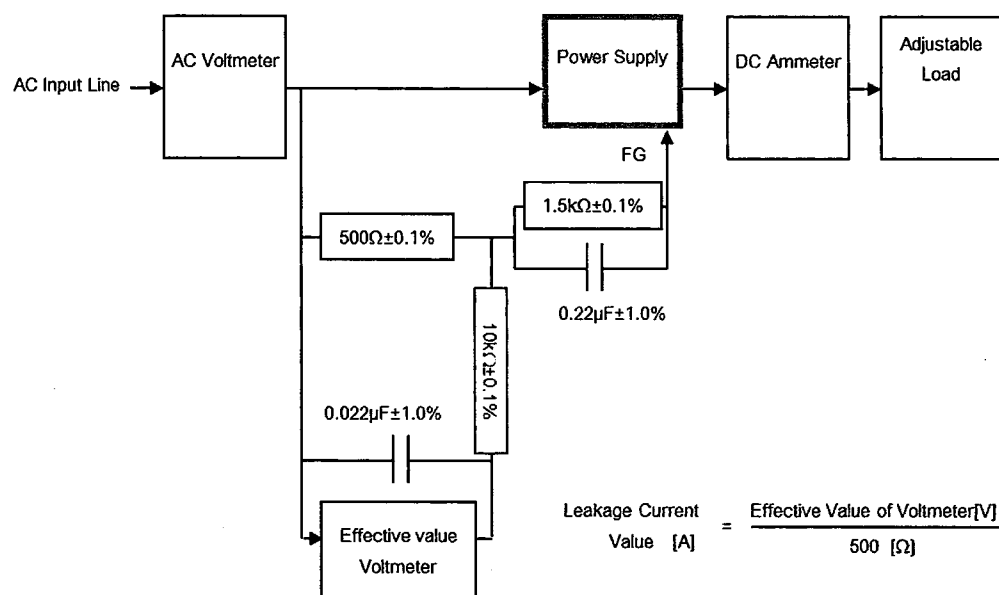


Figure B-2 ( IEC62368-1 refer to IEC60990 Fig.4 )

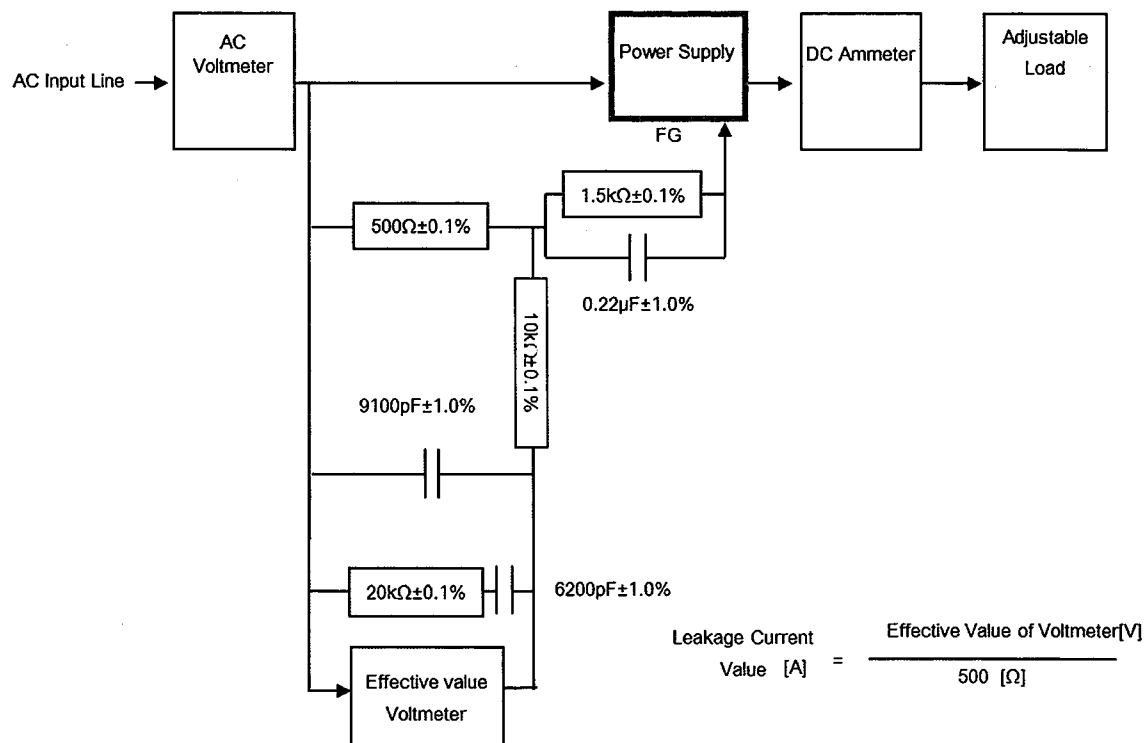


Figure B-3 ( IEC62368-1 refer to IEC60990 Fig.5)

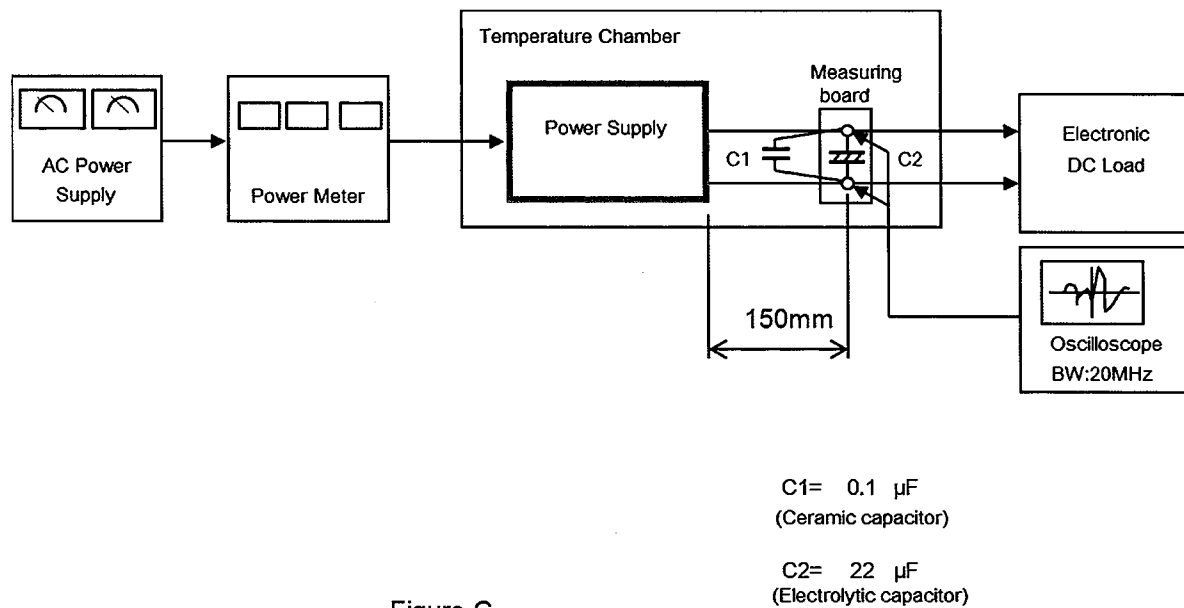


Figure C