COSEL

参考資料

TEST DATA OF PJA100F-15

Regulated DC Power Supply
August 30, 2016

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Atsushi Nishikawa Design Engineer

COSEL CO.,LTD.

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CONTENTS

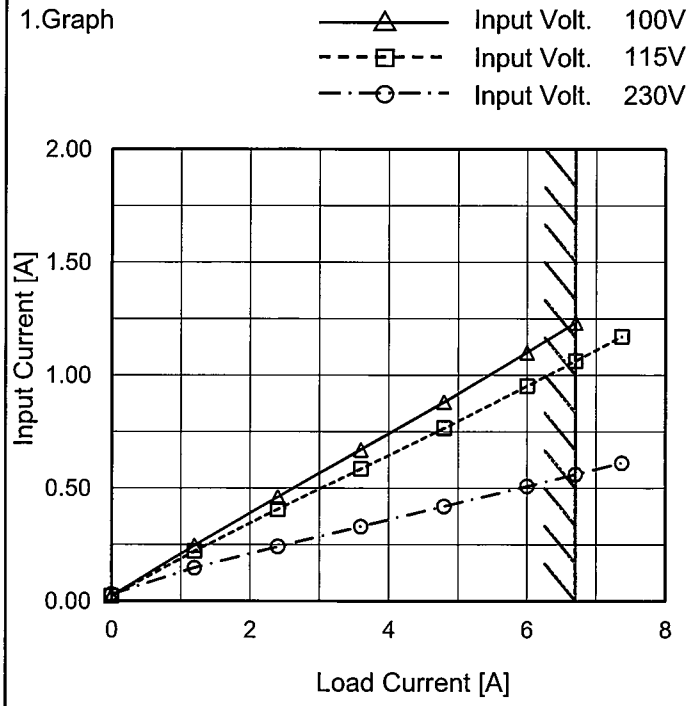
(Final Page 25)

COSEL

Model	PJA100F-15
Item	Input Current (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 Current [A]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	0.022	0.022	0.030
1.20	0.246	0.221	0.147
2.40	0.461	0.407	0.241
3.60	0.670	0.586	0.331
4.80	0.881	0.766	0.420
6.00	1.101	0.952	0.509
6.70	1.233	1.063	0.561
7.37	-	1.171	0.612
--	-	-	-
--	-	-	-
--	-	-	-

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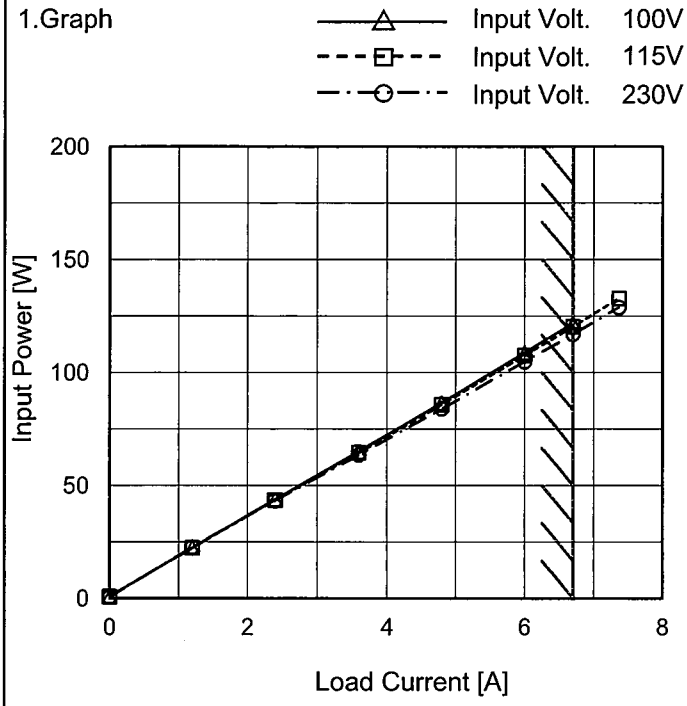
Model	PJA100F-15
Item	Input Power (by Load Current)
Object	———————

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]
0.00	0.8	0.8	0.6
1.20	22.5	22.3	22.7
2.40	43.9	43.5	43.3
3.60	65.1	64.5	63.6
4.80	86.6	85.8	84.0
6.00	108.8	107.5	104.8
6.70	121.9	120.3	117.0
7.37	-	132.8	128.8
--	-	-	-
--	-	-	-
--	-	-	-

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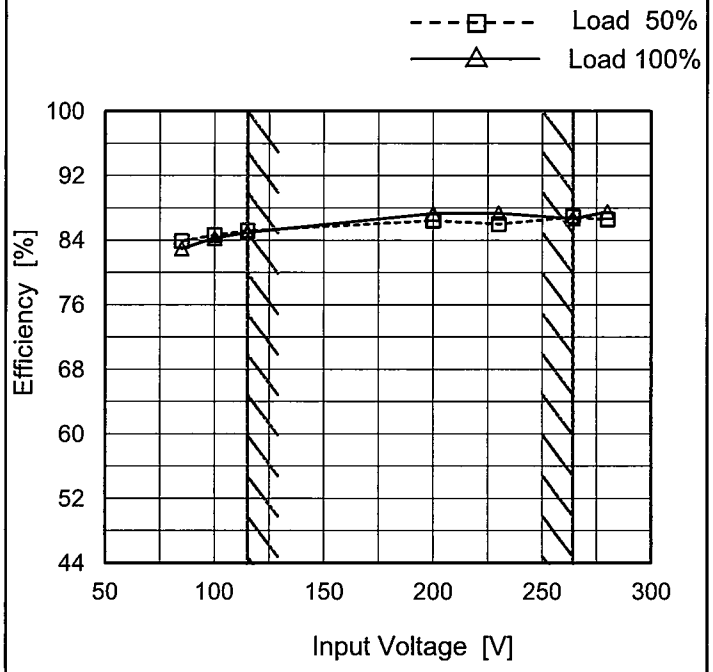
Model	PJA100F-15
Item	Efficiency (by Input Voltage)
Object	――――――――――

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	83.9	83.0 ※1
100	84.6	84.3 ※2
115	85.2	85.0
200	86.4	87.3
230	86.0	87.4
264	86.9	86.7
280	86.6	87.5
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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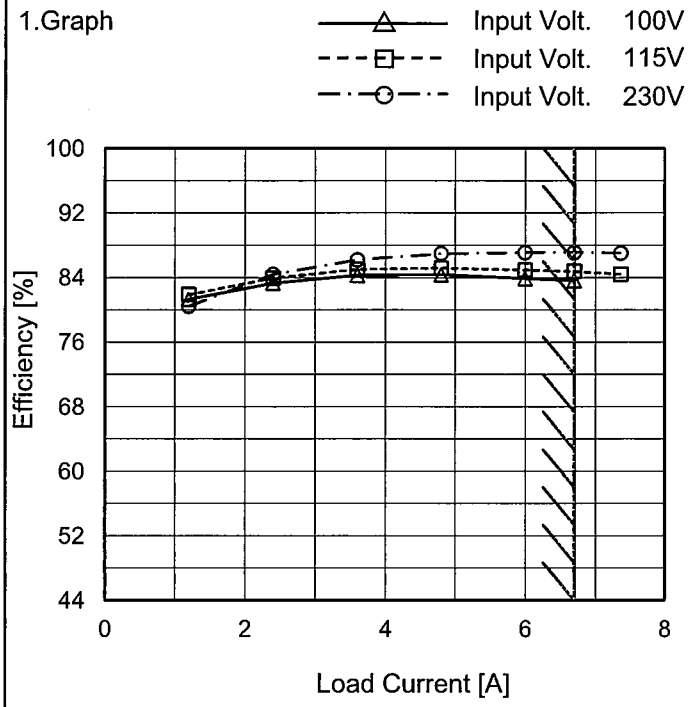
Model	PJA100F-15
Item	Efficiency (by Load Current)
Object	————————

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]	Efficiency [%] Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	-	-	-
1.20	81.3	81.9	80.5
2.40	83.3	83.9	84.4
3.60	84.3	85.0	86.2
4.80	84.4	85.2	87.0
6.00	83.9	84.9	87.1
6.70	83.6	84.7	87.1
7.37	-	84.4	87.0
--	-	-	-
--	-	-	-
--	-	-	-

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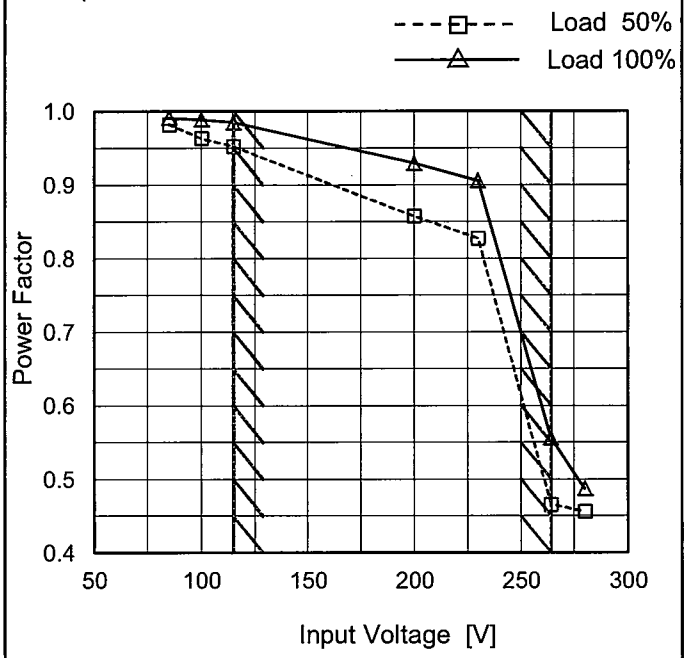
Model	PJA100F-15
Item	Power Factor (by Input Voltage)
Object	———————————

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	0.982	0.991 ※1
100	0.963	0.988 ※2
115	0.952	0.984
200	0.858	0.929
230	0.827	0.905
264	0.466	0.556
280	0.456	0.487
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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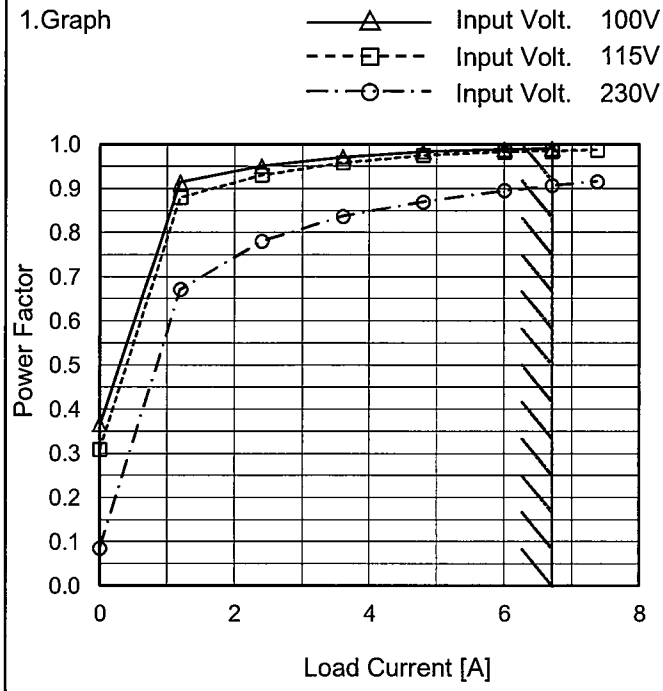
Model	PJA100F-15
Item	Power Factor (by Load Current)
Object	————————

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]
0.00	0.365	0.310	0.086
1.20	0.914	0.880	0.672
2.40	0.951	0.930	0.780
3.60	0.971	0.958	0.837
4.80	0.983	0.975	0.870
6.00	0.988	0.983	0.895
6.70	0.989	0.984	0.906
7.37	-	0.987	0.915
--	-	-	-
--	-	-	-
--	-	-	-

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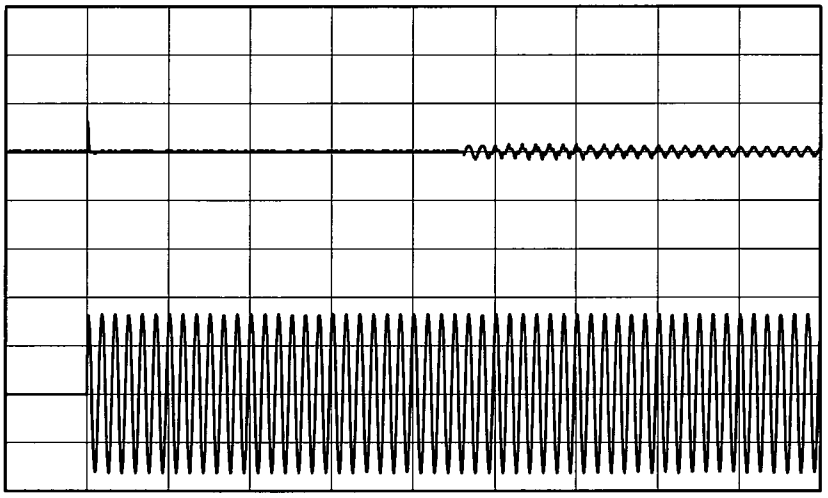
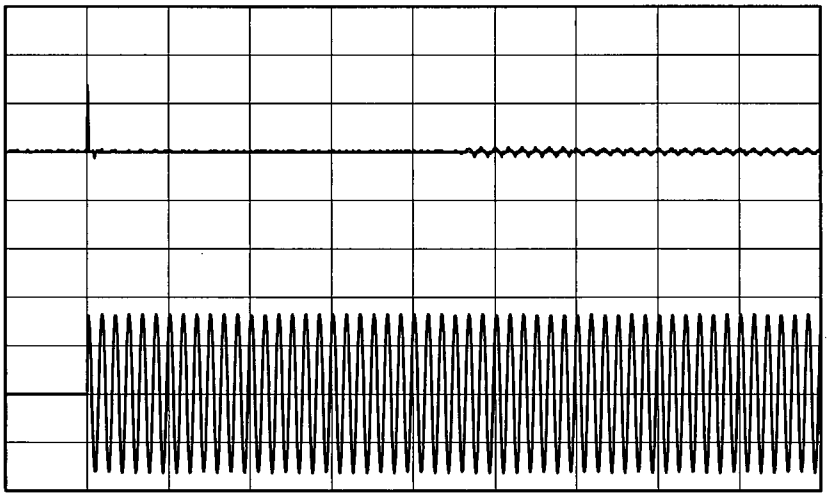
Model	PJA100F-15
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



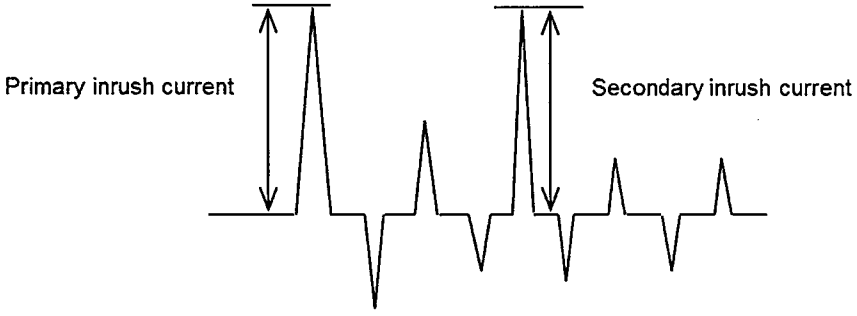
Input Voltage 115 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
12.6 A
Secondary inrush current :
3.0 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
27.6 A
Secondary inrush current :
1.8 A



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Model	PJA100F-15	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	———————————	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.19	0.21	0.42	Operation
	One of phases	0.28	0.32	0.71	Stand by
IEC60950-1	Both phases	0.14	0.16	0.43	Operation
	One of phases	0.26	0.31	0.72	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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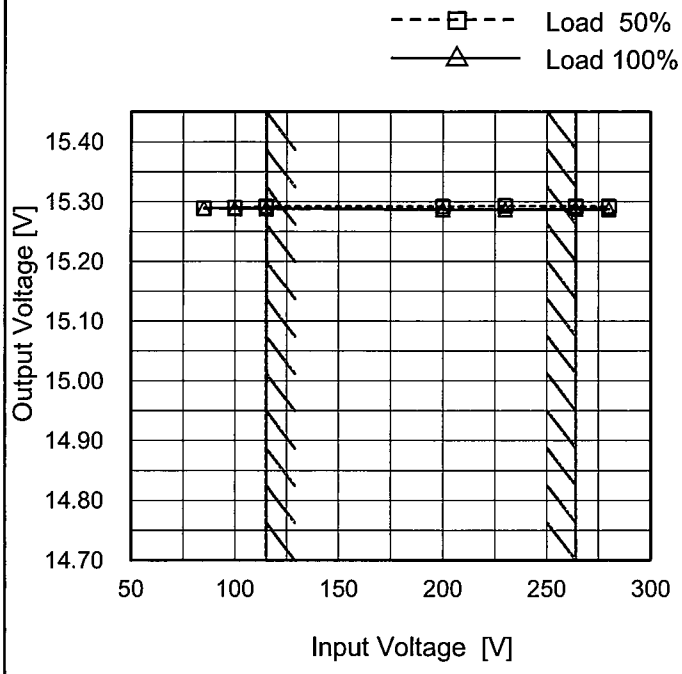
Model	PJA100F-15
Item	Line Regulation
Object	+15V6.7A

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	15.289	15.289 ※1
100	15.290	15.288 ※2
115	15.292	15.288
200	15.292	15.287
230	15.293	15.287
264	15.292	15.288
280	15.291	15.287
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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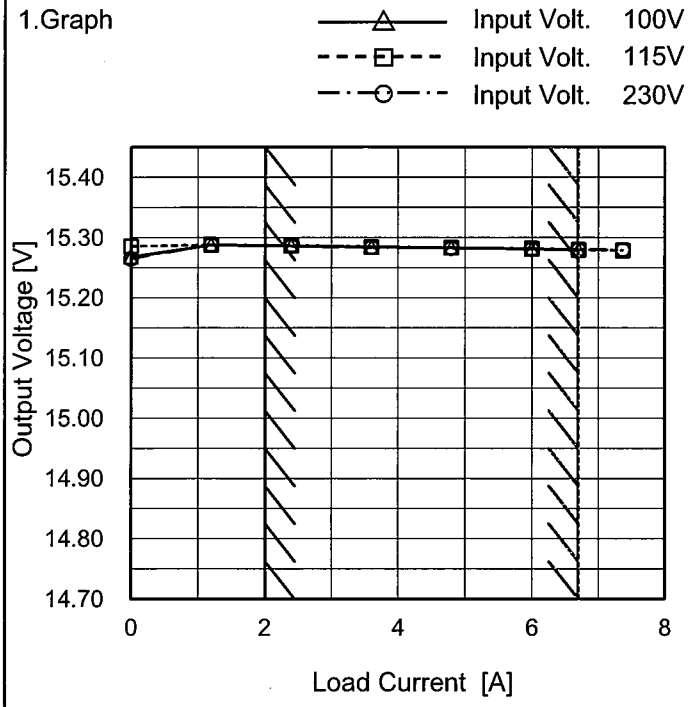
Model	PJA100F-15
Item	Load Regulation
Object	+15V6.7A

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]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	15.268	15.285	15.265
1.20	15.288	15.288	15.288
2.40	15.286	15.287	15.286
3.60	15.284	15.284	15.284
4.80	15.283	15.283	15.283
6.00	15.281	15.282	15.281
6.70	15.279	15.280	15.280
7.37	-	15.279	15.280
--	-	-	-
--	-	-	-
--	-	-	-

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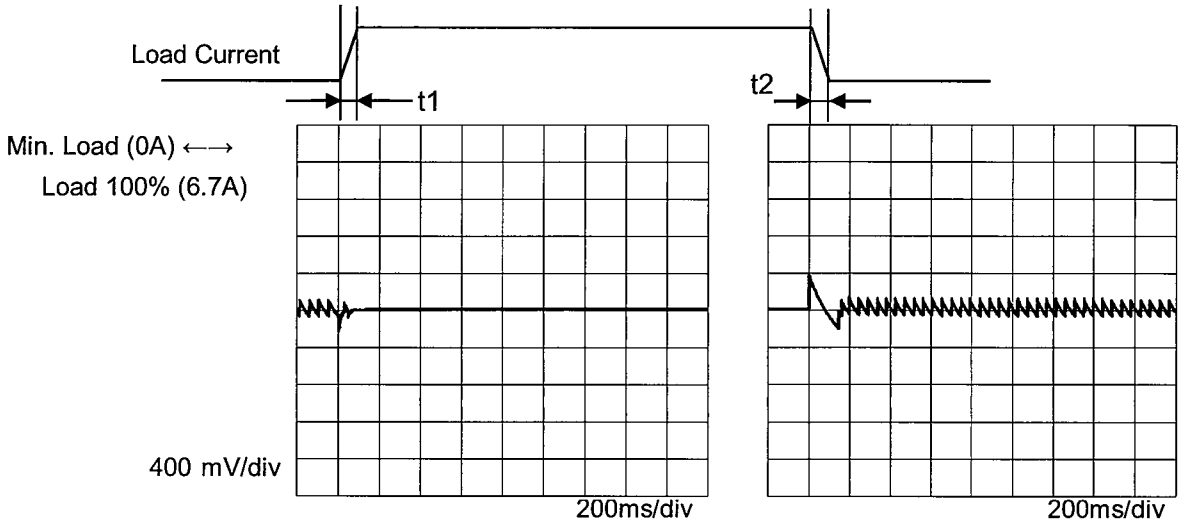
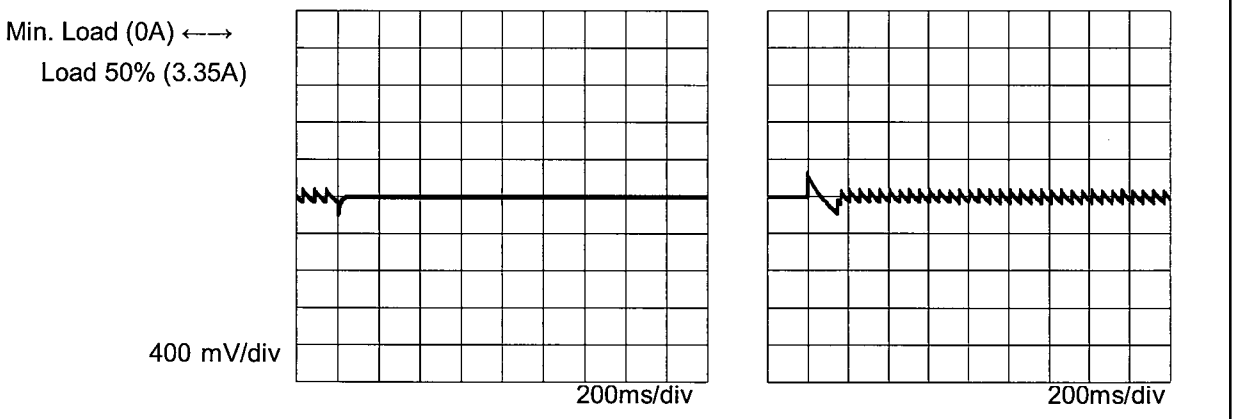
Model	PJA100F-15		
Item	Dynamic Load Response	Temperature	25˚C
		Testing Circuitry	Figure A
Object	+15V6.7A		

Input Volt. 115 V
Cycle 1000 ms

Response. t1=t2=50us. Typ





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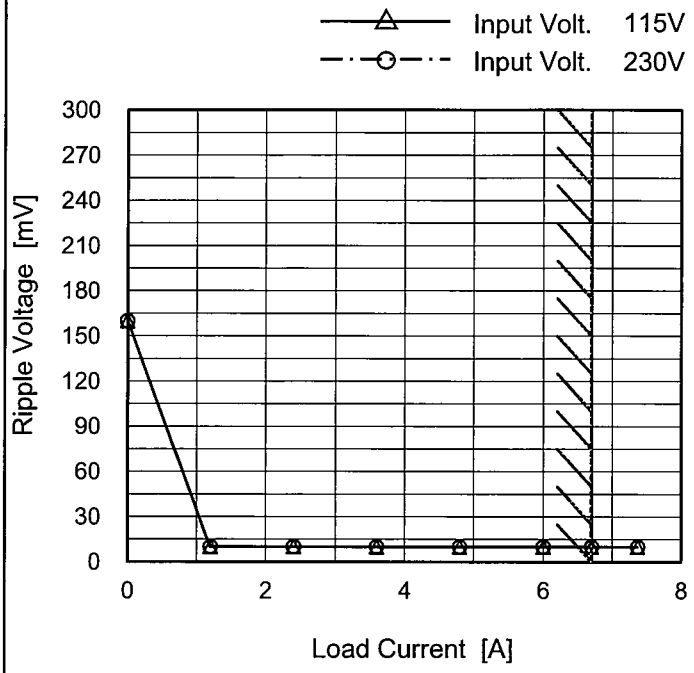
Model	PJA100F-15
Item	Ripple Voltage (by Load Current)
Object	+15V6.7A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



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

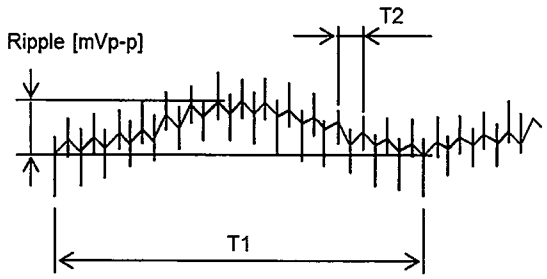


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0.00	160	160
1.20	10	10
2.40	10	10
3.60	10	10
4.80	10	10
6.00	10	10
6.70	10	10
7.37	10	10
--	-	-
--	-	-
--	-	-

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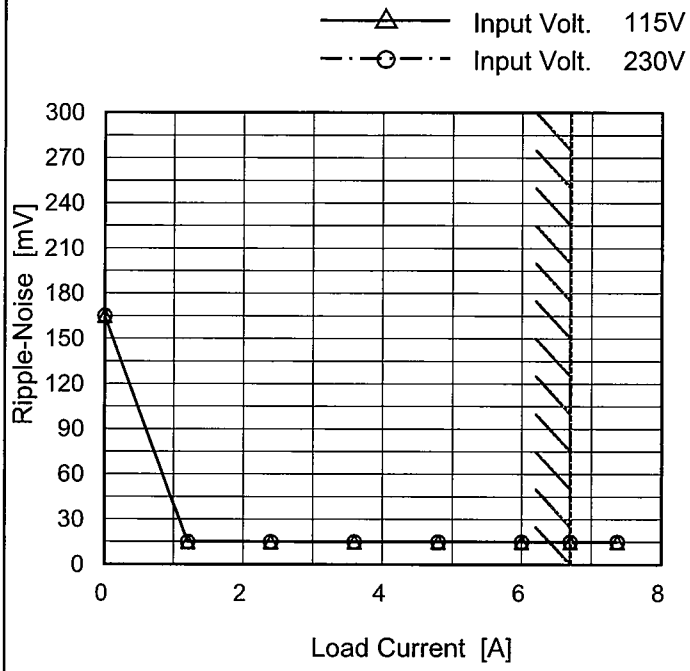
Model	PJA100F-15
Item	Ripple-Noise
Object	+15V6.7A

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.

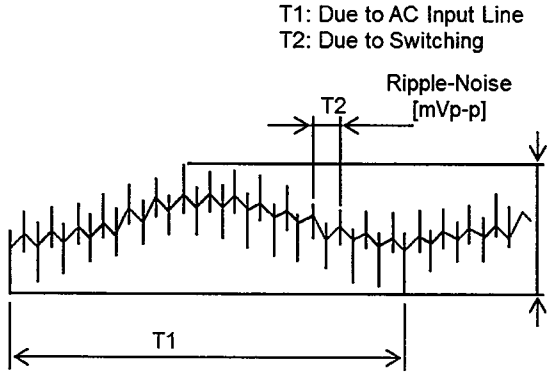


Fig. Complex Ripple Wave Form

2.Values

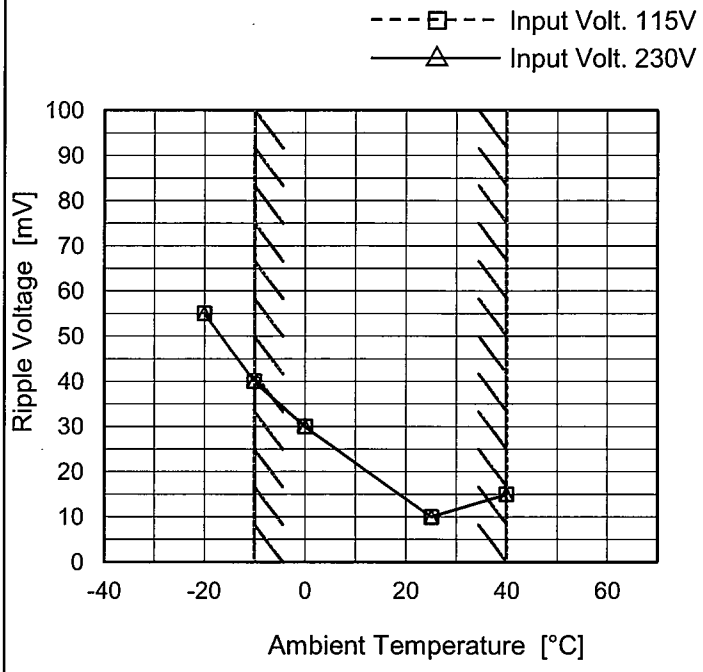
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0.00	165	165
1.20	15	15
2.40	15	15
3.60	15	15
4.80	15	15
6.00	15	15
6.70	15	15
7.37	15	15
--	-	-
--	-	-
--	-	-

COSEL

Model	PJA100F-15
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V6.7A

Testing Circuitry Figure C

1.Graph



Load 100%

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	55	55
-10	40	40
0	30	30
25	10	10
40	15	15
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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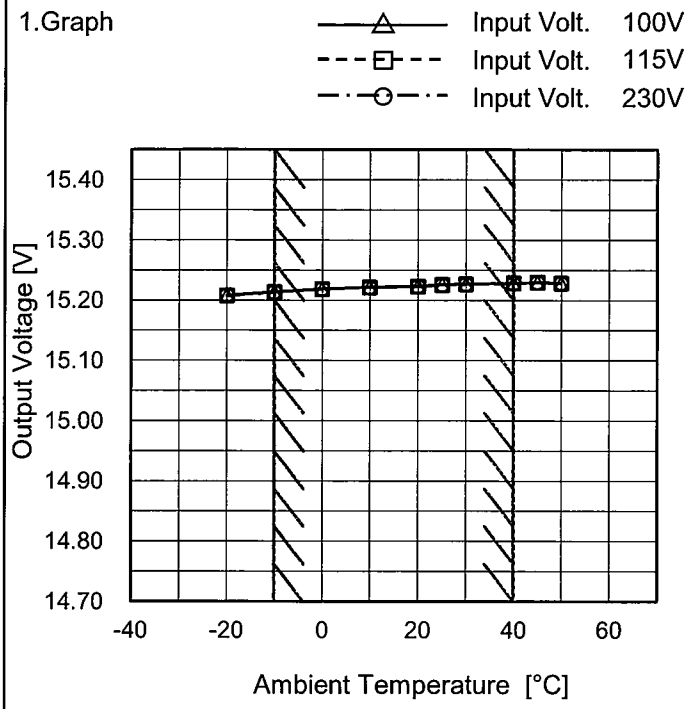
Model	PJA100F-15
Item	Ambient Temperature Drift
Object	+15V6.7A

Testing Circuitry Figure A

1.Graph



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]
-20	15.208	15.207	15.208
-10	15.214	15.213	15.214
0	15.219	15.218	15.219
10	15.222	15.222	15.222
20	15.224	15.223	15.223
25	15.226	15.225	15.226
30	15.227	15.227	15.227
40	15.229	15.229	15.228
45	15.230	15.230	15.230
50	15.229	15.228	15.229
--	-	-	-

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

COSEL

Model	PJA100F-15	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V6.7A	

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 : -10 - 40°C
Input Voltage : 115 - 264V
Load Current : 2.01 - 6.7A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	30	115	2.4	15.287	±37	±0.2
Minimum Voltage	-10	115	6.7	15.213		

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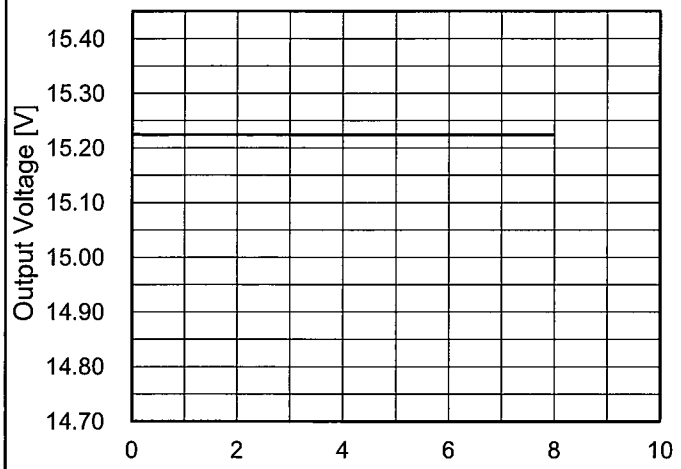
Model	PJA100F-15
Item	Time Lapse Drift
Object	+15V6.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 230V
Load 100%

* The characteristic of AC115V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.225
0.5	15.224
1.0	15.224
2.0	15.224
3.0	15.224
4.0	15.224
5.0	15.224
6.0	15.224
7.0	15.224
8.0	15.224

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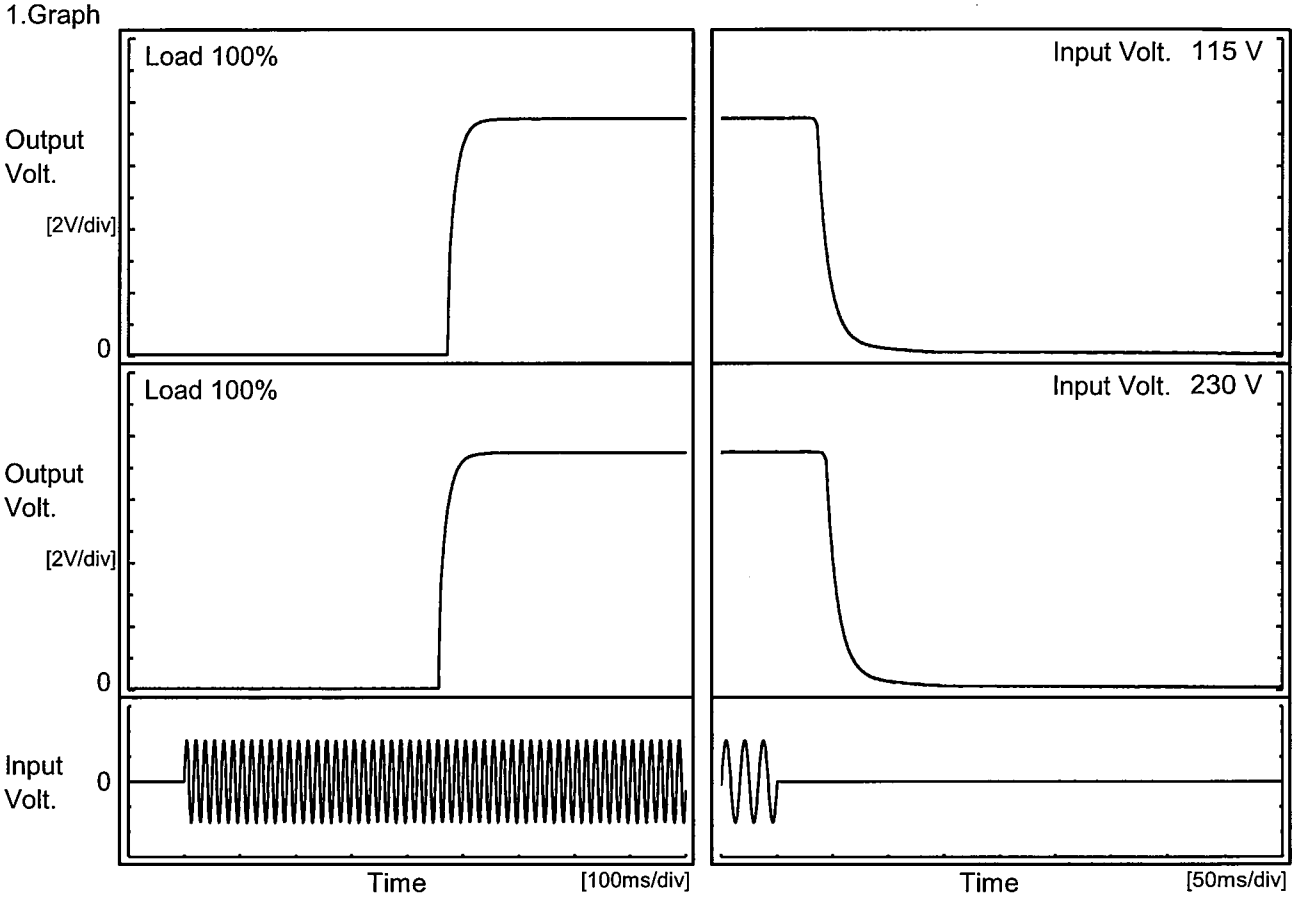
Model	PJA100F-15
Item	Rise and Fall Time
Object	+15V6.7A

Temperature 25°C
Testing Circuitry Figure A

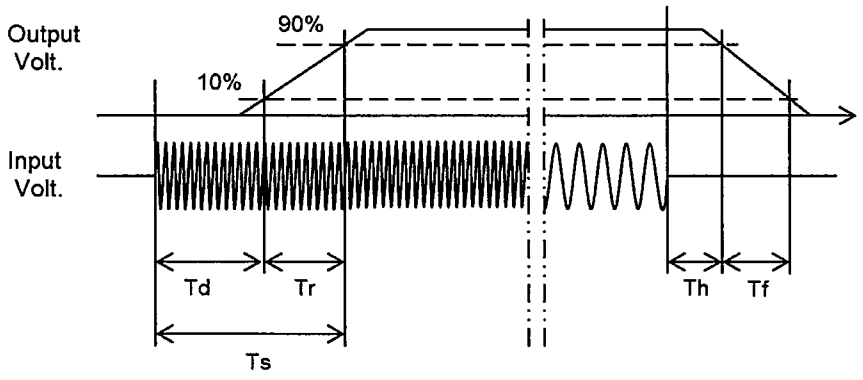
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
115 V	473.5	30.0	503.5	36.8	26.8
230 V	457.5	30.0	487.5	45.0	26.8



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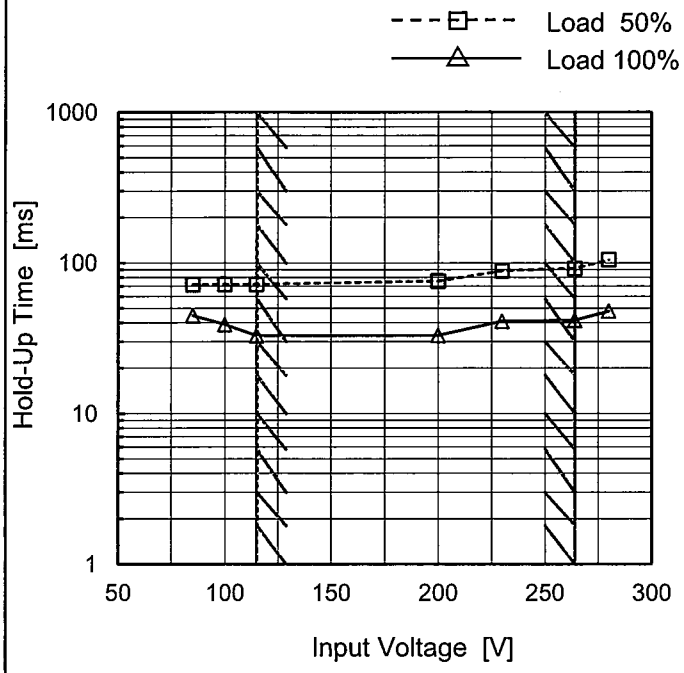
Model	PJA100F-15
Item	Hold-Up Time
Object	+15V6.7A

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	72	45 ※1
100	72	39 ※2
115	72	33
200	76	33
230	89	41
264	92	42
280	105	48
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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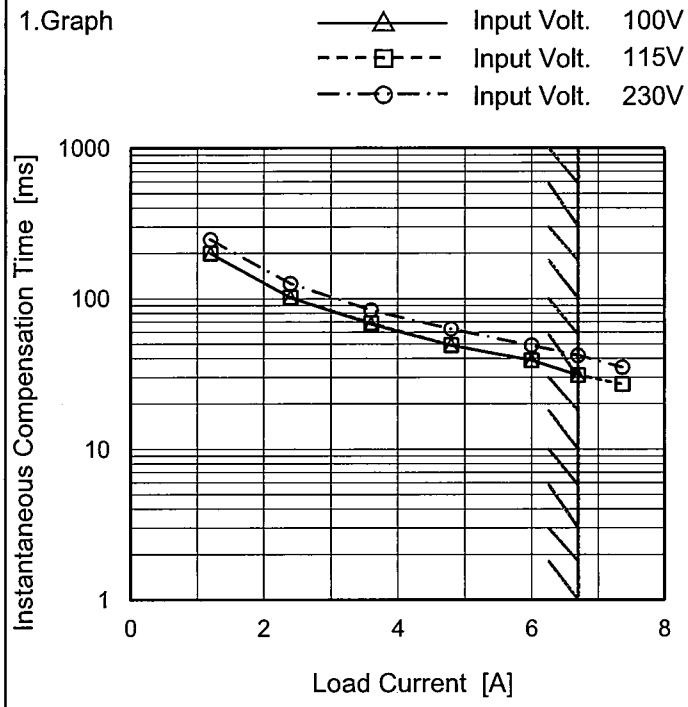
Model	PJA100F-15
Item	Instantaneous Interruption Compensation
Object	+15V6.7A

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]	Time [ms] Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	-	-	-
1.20	200	200	247
2.40	102	102	126
3.60	68	69	84
4.80	49	49	63
6.00	39	39	49
6.70	31	31	42
7.37	-	27	35
--	-	-	-
--	-	-	-
--	-	-	-

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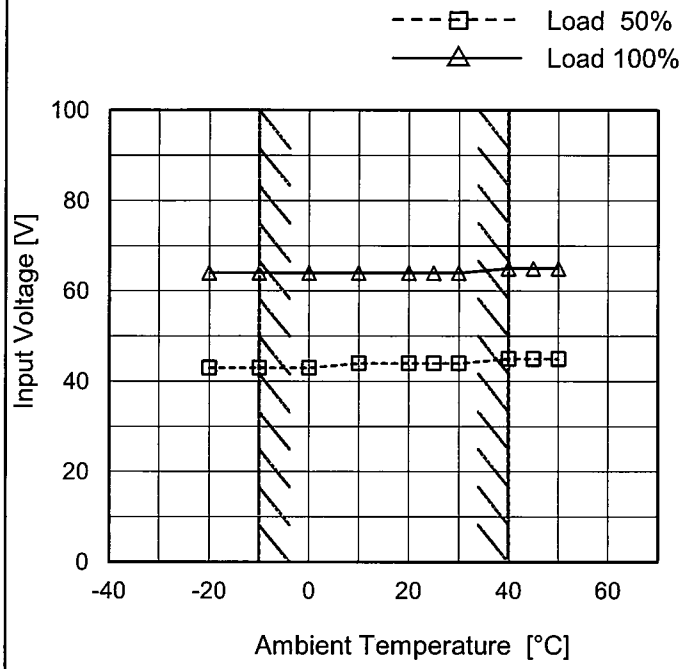
Model	PJA100F-15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V6.7A

Testing Circuitry Figure A

1.Graph



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

2.Values

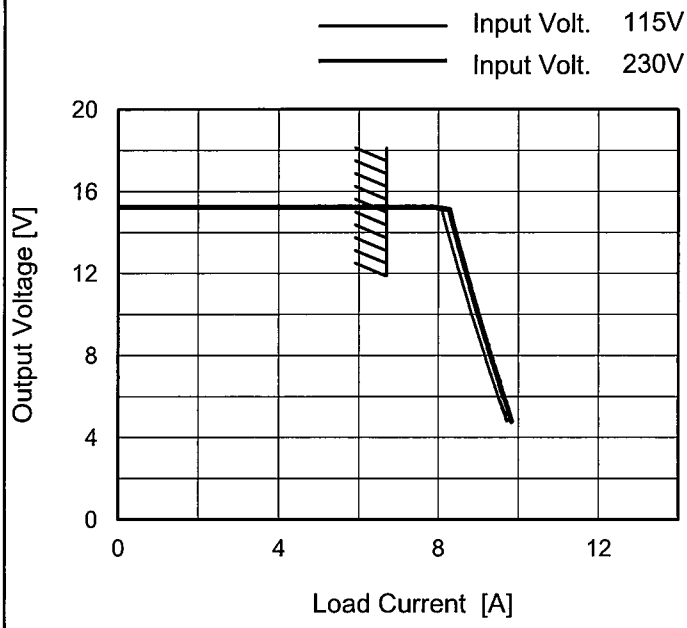
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	43	64
-10	43	64
0	43	64
10	44	64
20	44	64
25	44	64
30	44	64
40	45	65
45	45	65
50	45	65
--	-	-

COSEL

Model	PJA100F-15
Item	Overcurrent Protection
Object	+15V6.7A

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 4.8V to 0V.

2.Values

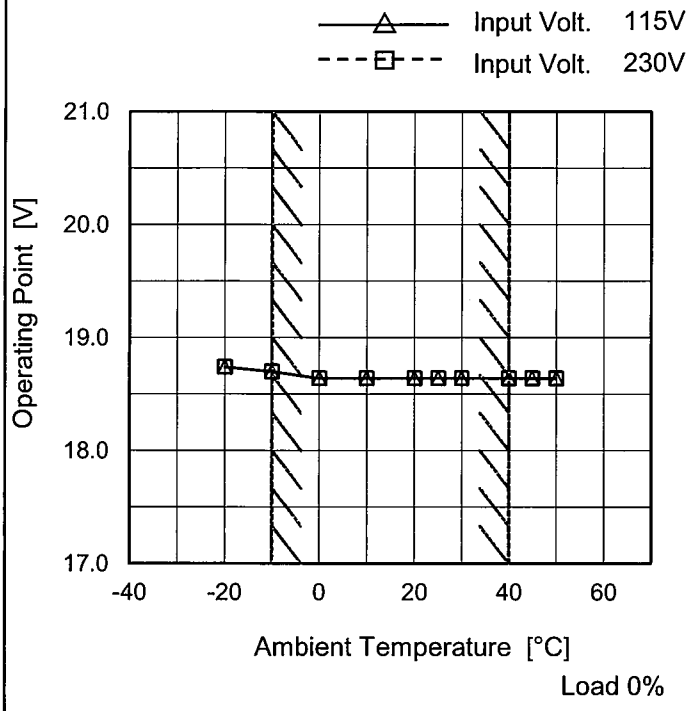
Output Voltage [V]	Load Current [A]	
	Input Volt. 115[V]	Input Volt. 230[V]
14.25	8.20	8.40
13.50	8.31	8.48
12.00	8.52	8.70
10.50	8.75	8.92
9.00	9.00	9.15
7.50	9.23	9.40
6.00	9.49	9.62
4.50	9.71	9.83
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PJA100F-15
Item	Overvoltage Protection
Object	+15V6.7A

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. 115[V]	Input Volt. 230[V]
-20	18.74	18.74
-10	18.70	18.70
0	18.64	18.64
10	18.64	18.64
20	18.64	18.64
25	18.64	18.64
30	18.64	18.64
40	18.64	18.64
45	18.64	18.64
50	18.64	18.64
--	-	-

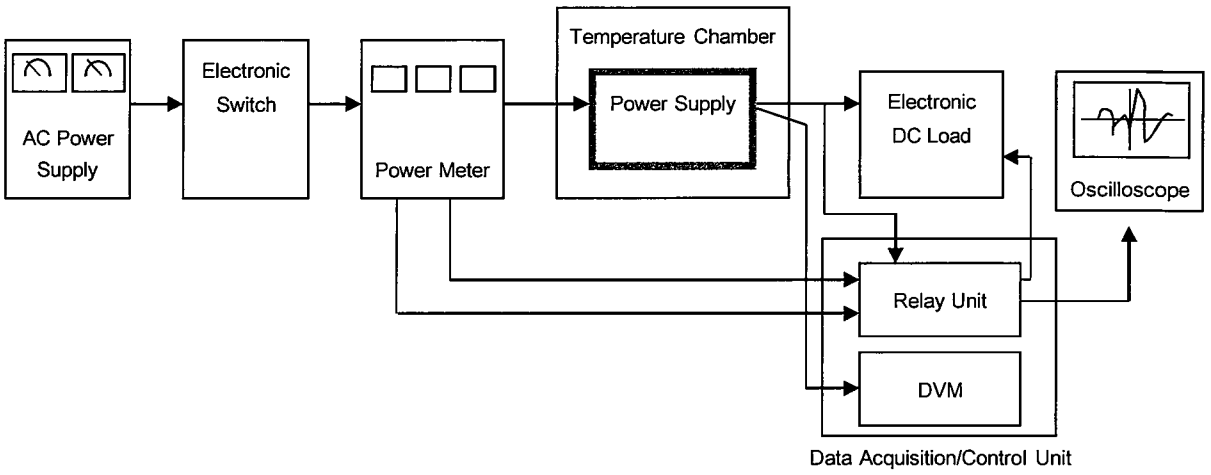


Figure A

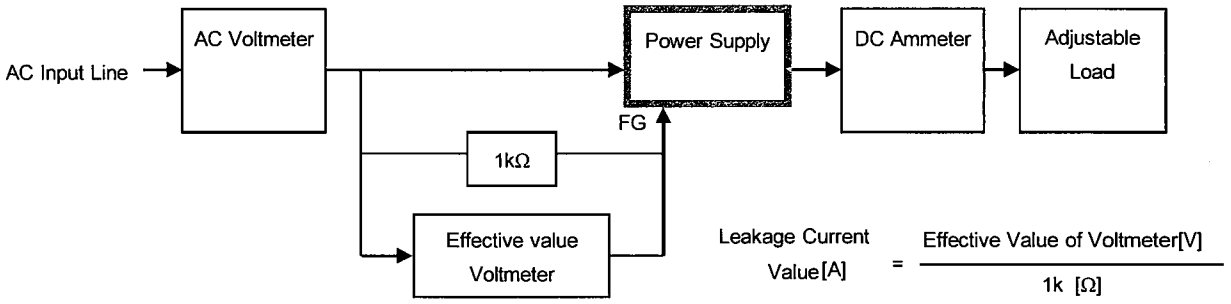


Figure B (DEN-AN)

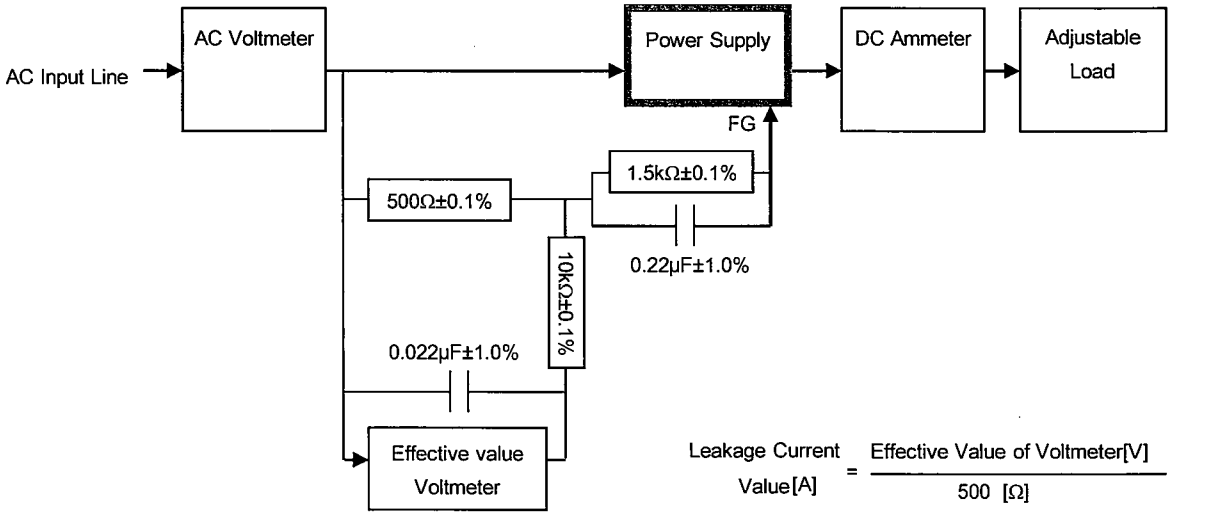
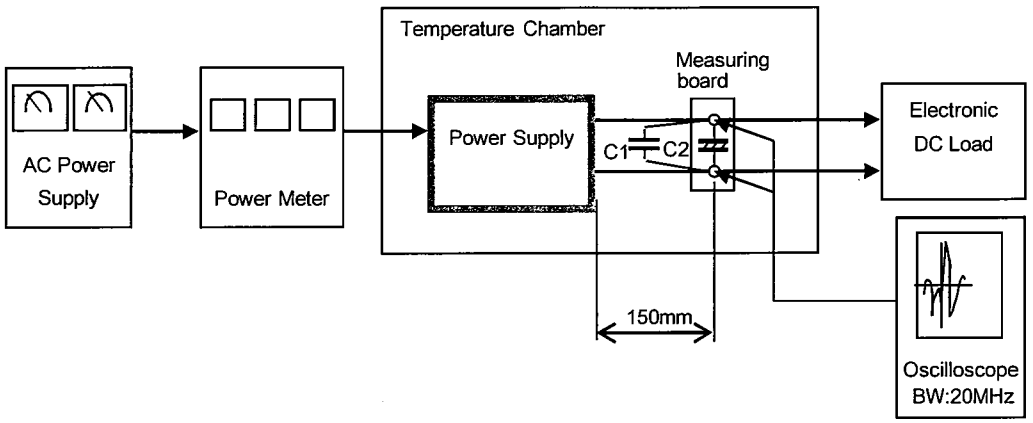


Figure B (IEC60950-1)



C1= 0.1 μF
(Ceramic capacitor)
C2= 22 μF
(Electrolytic capacitor)

Figure C