COSEL

TEST DATA OF PJMA600F-36

Regulated DC Power Supply
July 6, 2020

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COSEL CO.,LTD.

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CONTENTS

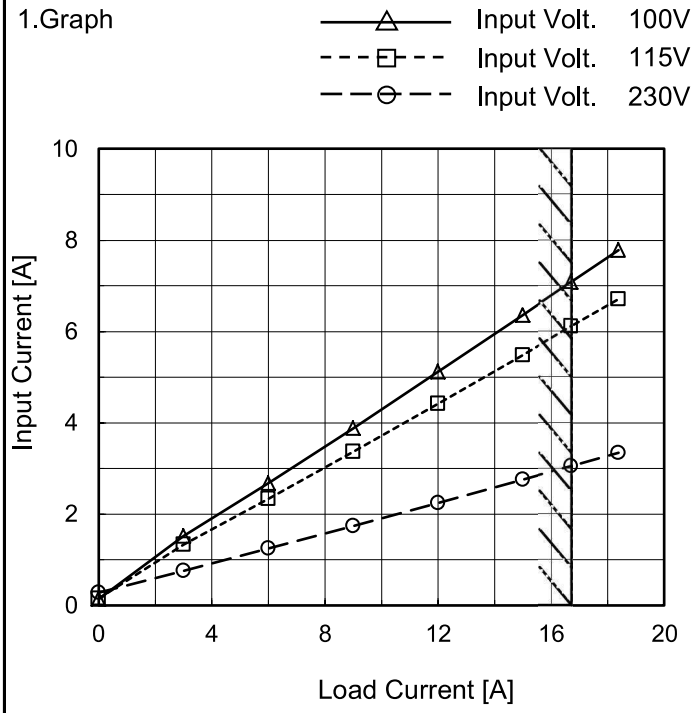
(Final Page 24)

COSEL

Model	PJMA600F-36
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	0.143	0.154	0.280
3.00	1.517	1.335	0.754
6.00	2.678	2.334	1.242
9.00	3.881	3.366	1.740
12.00	5.115	4.420	2.245
15.00	6.356	5.486	2.754
16.70	7.080	6.110	3.047
18.37	7.780	6.712	3.336
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--	-	-	-
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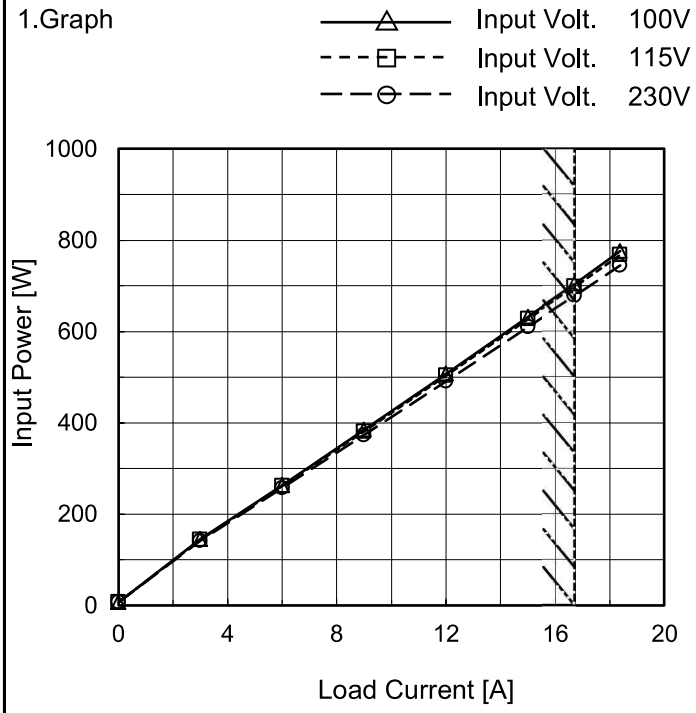
BC-11630

COSEL

Model	PJMA600F-36
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	6.6	6.6	7.1
3.00	144.3	143.7	141.7
6.00	262.6	261.2	256.4
9.00	384.0	381.4	373.1
12.00	507.4	503.4	491.0
15.00	632.5	627.1	610.0
16.70	704.0	698.2	678.0
18.37	776.0	768.0	745.0
--	-	-	-
--	-	-	-
--	-	-	-

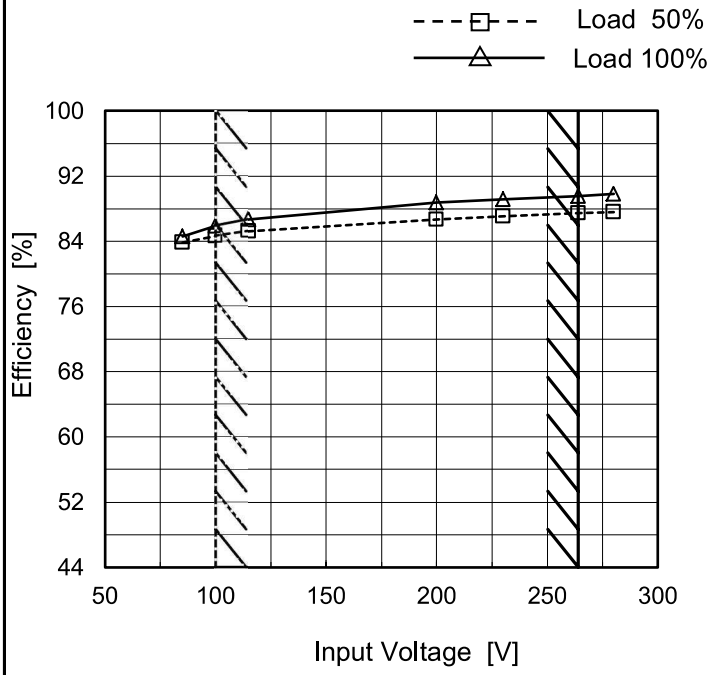
BC-11630

COSEL

Model	PJMA600F-36
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	84.6
100	84.6	85.9
115	85.2	86.7
200	86.7	88.8
230	87.0	89.2
264	87.4	89.6
280	87.6	89.8
--	-	-
--	-	-

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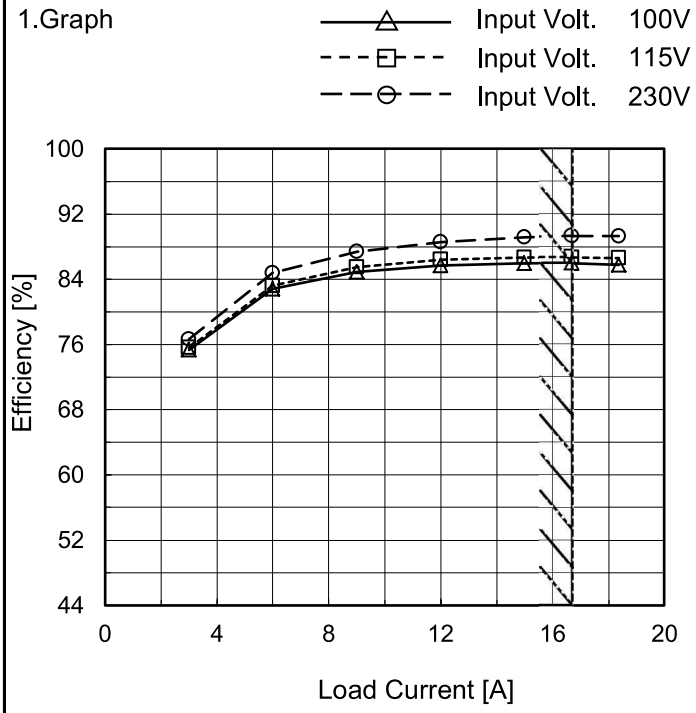
Model	PJMA600F-36
Item	Efficiency (by Load Current)
Object	———————

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	-	-	-
3.00	75.3	75.6	76.7
6.00	82.8	83.2	84.8
9.00	84.9	85.5	87.4
12.00	85.7	86.4	88.6
15.00	86.0	86.7	89.1
16.70	86.0	86.7	89.3
18.37	85.7	86.6	89.3
--	-	-	-
--	-	-	-
--	-	-	-

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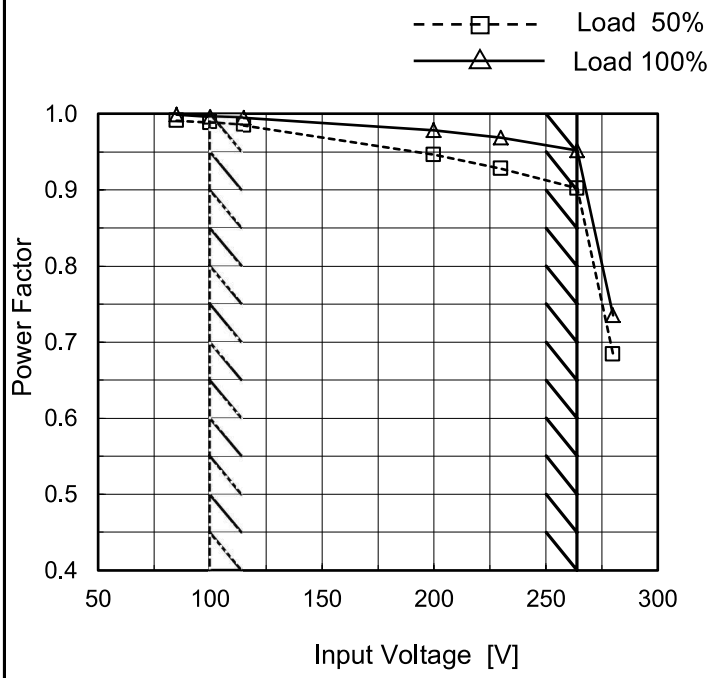
Model	PJMA600F-36
Item	Power Factor (by Input Voltage)
Object	———————————

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	0.991	0.999
100	0.988	0.996
115	0.985	0.995
200	0.946	0.978
230	0.928	0.969
264	0.902	0.952
280	0.684	0.735
--	-	-
--	-	-

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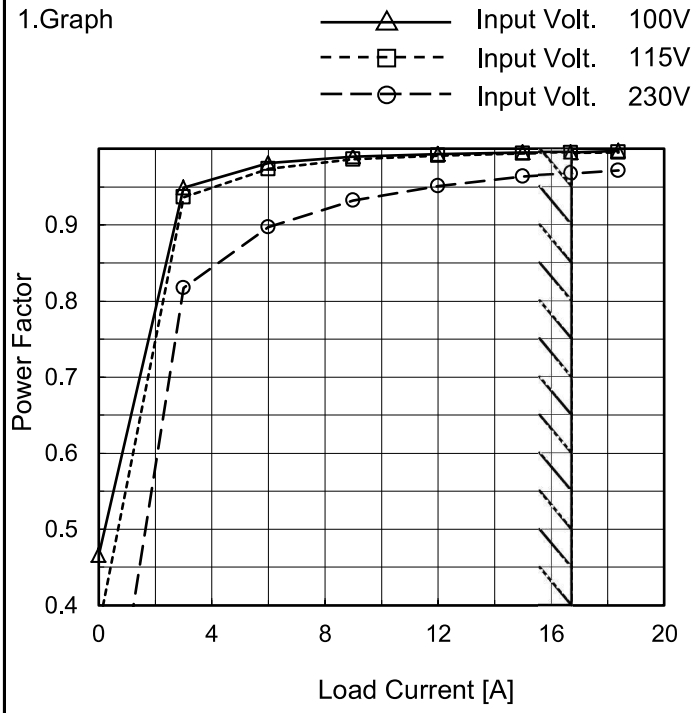
Model	PJMA600F-36
Item	Power Factor (by Load Current)
Object	———————

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	0.466	0.371	0.110
3.00	0.949	0.937	0.817
6.00	0.981	0.974	0.897
9.00	0.990	0.986	0.932
12.00	0.994	0.991	0.952
15.00	0.996	0.994	0.964
16.70	0.996	0.995	0.967
18.37	0.997	0.996	0.971
--	-	-	-
--	-	-	-
--	-	-	-

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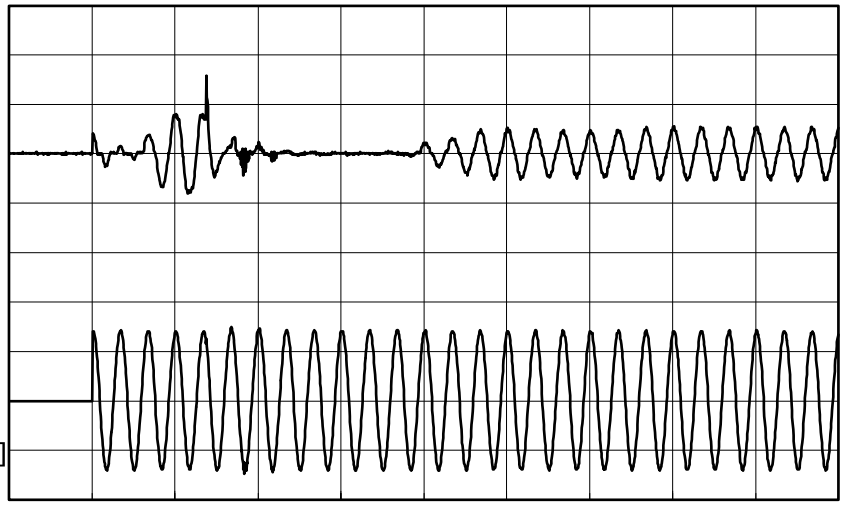
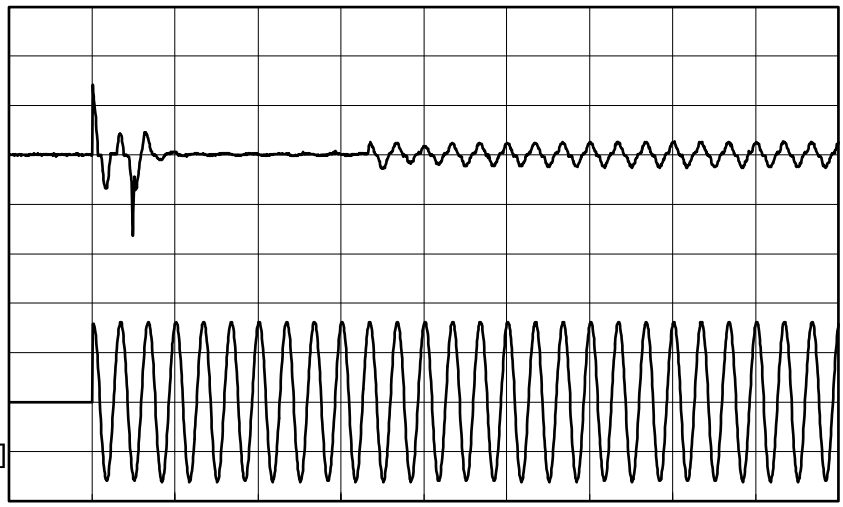
Model	PJMA600F-36		
Item	Inrush Current	Temperature	25°C
		Testing Circuitry	Figure A
Object	———————		



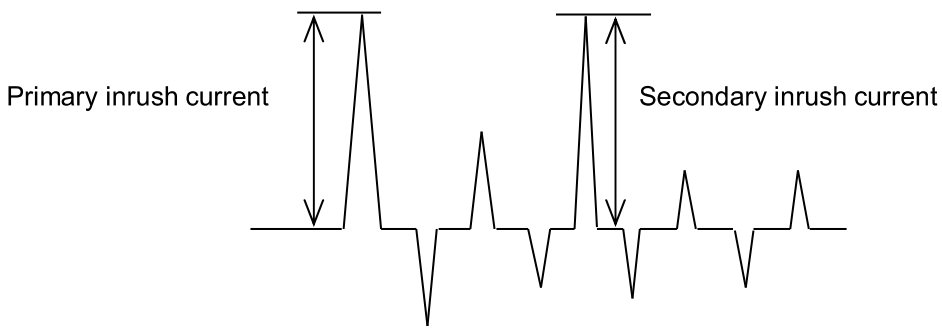
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
15.6 A
Secondary inrush current :
31.6 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
32.8 A
Secondary inrush current :
5.6 A



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Model	PJMA600F-36		
Item	Leakage Current	Temperature	25°C
		Testing Circuitry	Figure B
Object	———————————		

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
IEC60601-1	Both phases	0.09	0.10	0.23	Operation
	One of phases	0.16	0.19	0.43	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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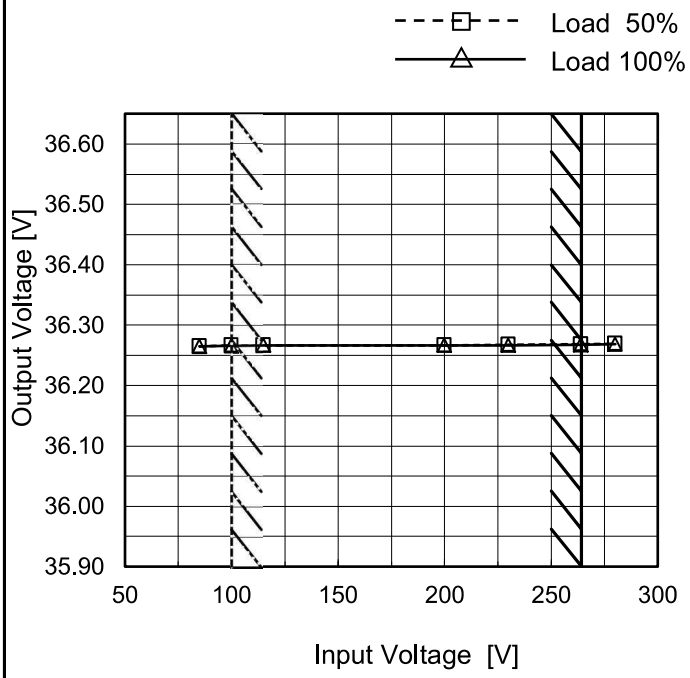
Model	PJMA600F-36
Item	Line Regulation
Object	+36V16.7A

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	36.265	36.265
100	36.267	36.266
115	36.267	36.267
200	36.267	36.266
230	36.268	36.267
264	36.269	36.268
280	36.269	36.268
--	-	-
--	-	-

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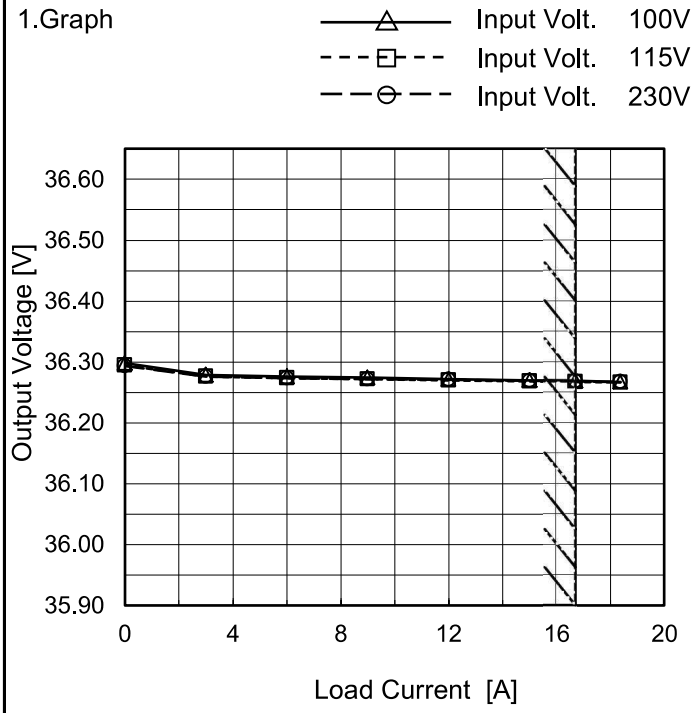
Model	PJMA600F-36
Item	Load Regulation
Object	+36V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



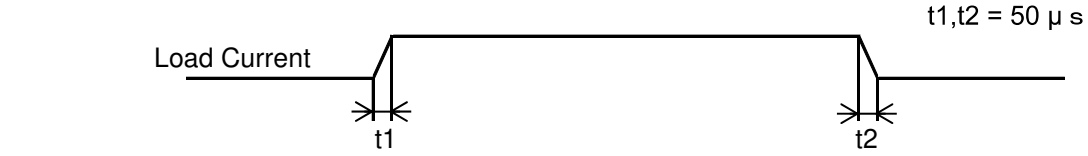
Note: Slanted line shows the range of the rated load current.

2.Values

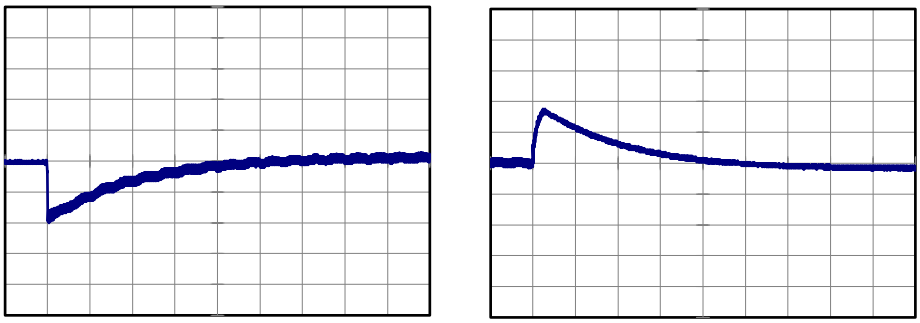
Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	36.298	36.294	36.293
3.00	36.279	36.276	36.276
6.00	36.276	36.274	36.274
9.00	36.274	36.271	36.272
12.00	36.272	36.270	36.270
15.00	36.270	36.268	36.269
16.70	36.269	36.267	36.268
18.37	36.268	36.267	36.267
--	-	-	-
--	-	-	-
--	-	-	-

Model	PJMA600F-36	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+36V16.7A	

Input Volt. 100 V
Cycle 1000 ms



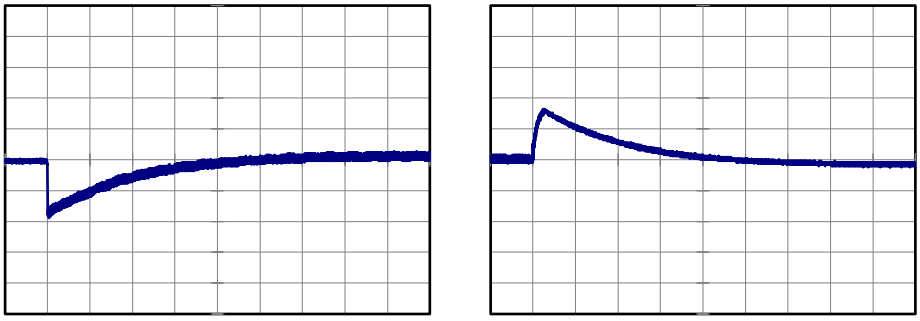
Min.Load (0A)←→
Load 100% (16.7A)



500 mV/div

20 ms/div 20 ms/div

Min.Load (0A)←→
Load 50% (8.35A)



500 mV/div

20 ms/div 20 ms/div

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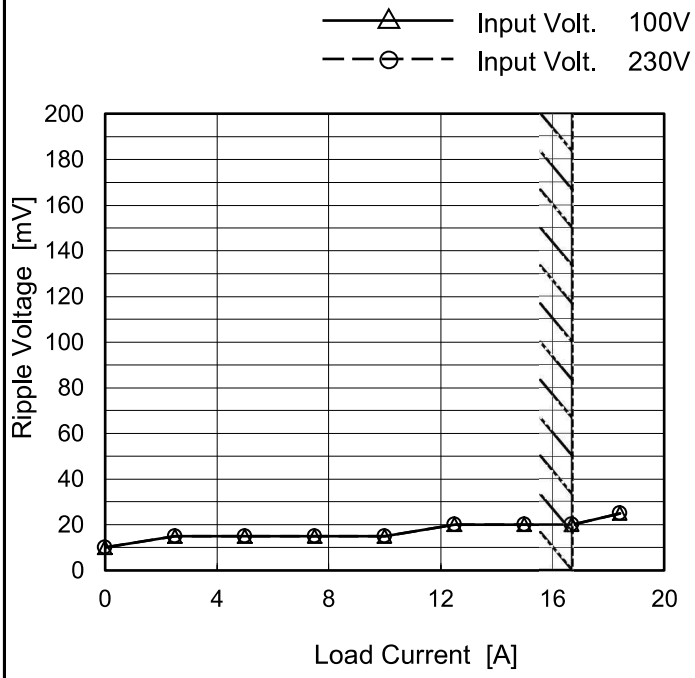
Model	PJMA600F- 36
Item	Ripple Voltage (by Load Current)
Object	+36V16.7A

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.

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	10	10
2.5	15	15
5.0	15	15
7.5	15	15
10.0	15	15
12.5	20	20
15.0	20	20
16.7	20	20
18.4	25	25
--	-	-
--	-	-

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

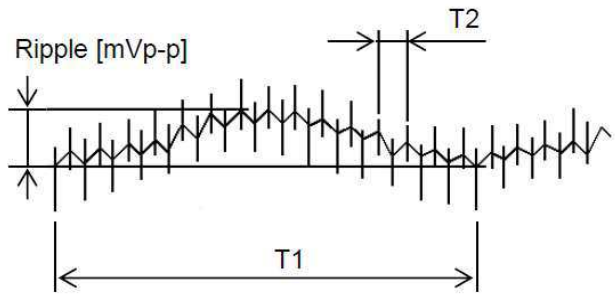


Fig. Complex Ripple Wave Form

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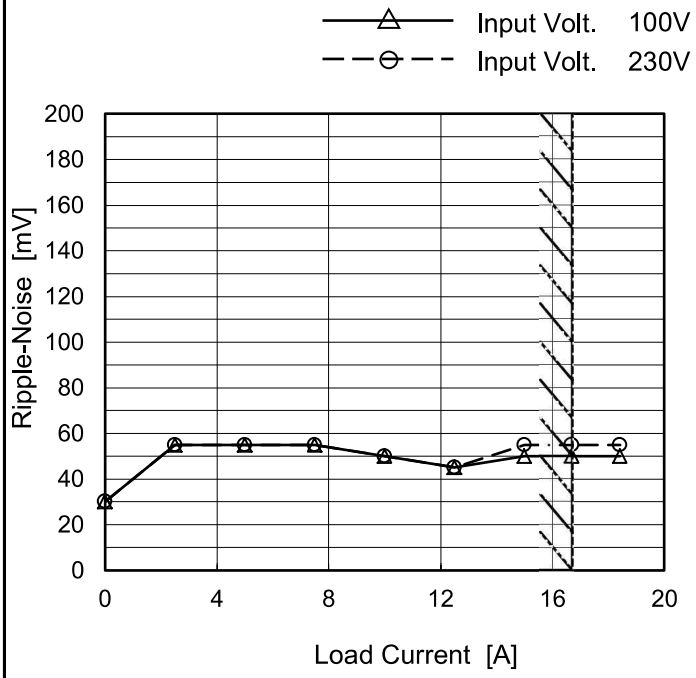
Model	PJMA600F-36
Item	Ripple-Noise
Object	+36V16.7A

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.

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	30	30
2.5	55	55
5.0	55	55
7.5	55	55
10.0	50	50
12.5	45	45
15.0	50	55
16.7	50	55
18.4	50	55
--	-	-
--	-	-

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

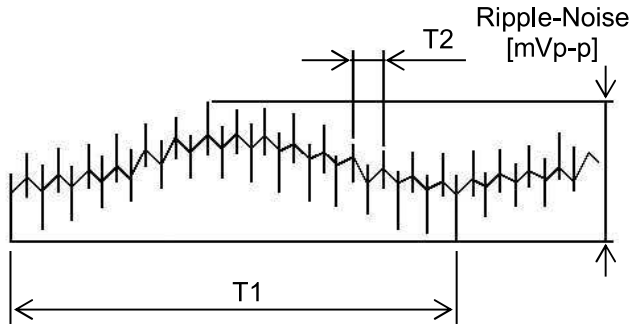


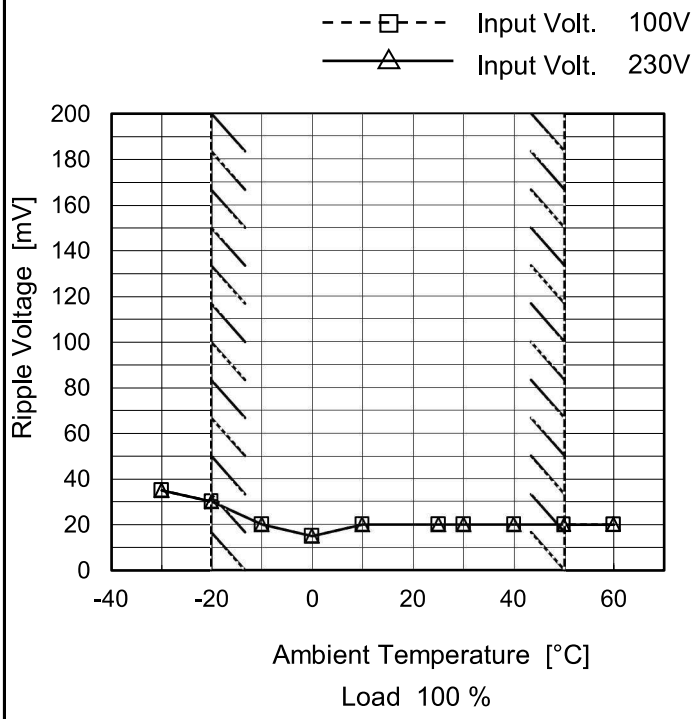
Fig. Complex Ripple Wave Form

COSEL

Model	PJMA600F-36
Item	Ripple Voltage (by Ambient Temp.)
Object	+36V16.7A

Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

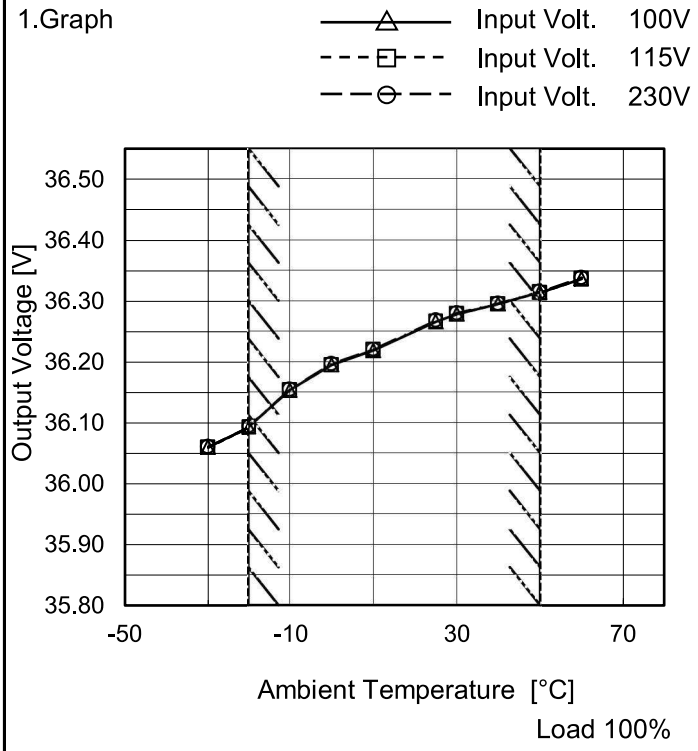
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	35	35
-20	30	30
-10	20	20
0	15	15
10	20	20
25	20	20
30	20	20
40	20	20
50	20	20
60	20	20
--	-	-

COSEL

Model	PJMA600F-36
Item	Ambient Temperature Drift
Object	+36V16.7A

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]
-30	36.060	36.060	36.060
-20	36.092	36.093	36.094
-10	36.153	36.153	36.154
0	36.194	36.195	36.196
10	36.218	36.219	36.220
25	36.266	36.266	36.267
30	36.278	36.278	36.279
40	36.294	36.295	36.296
50	36.313	36.314	36.315
60	36.336	36.337	36.338
--	-	-	-

Model	PJMA600F-36	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
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 = ±(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	50	230	0	36.343	±126	±0.4
Minimum Voltage	-20	100	16.7	36.092		

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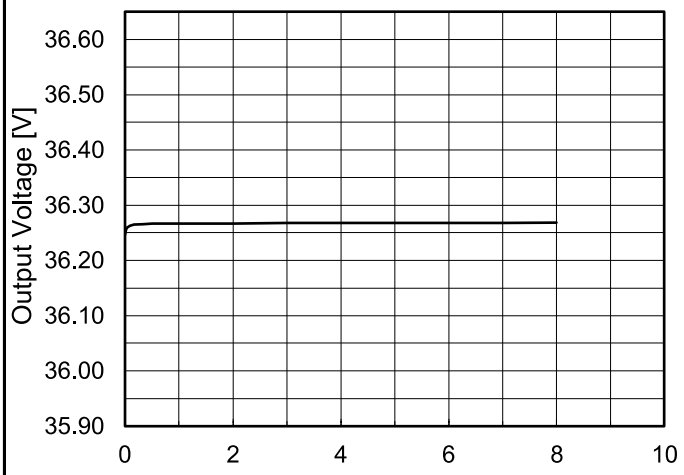
Model	PJMA600F-36
Item	Time Lapse Drift
Object	+36V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



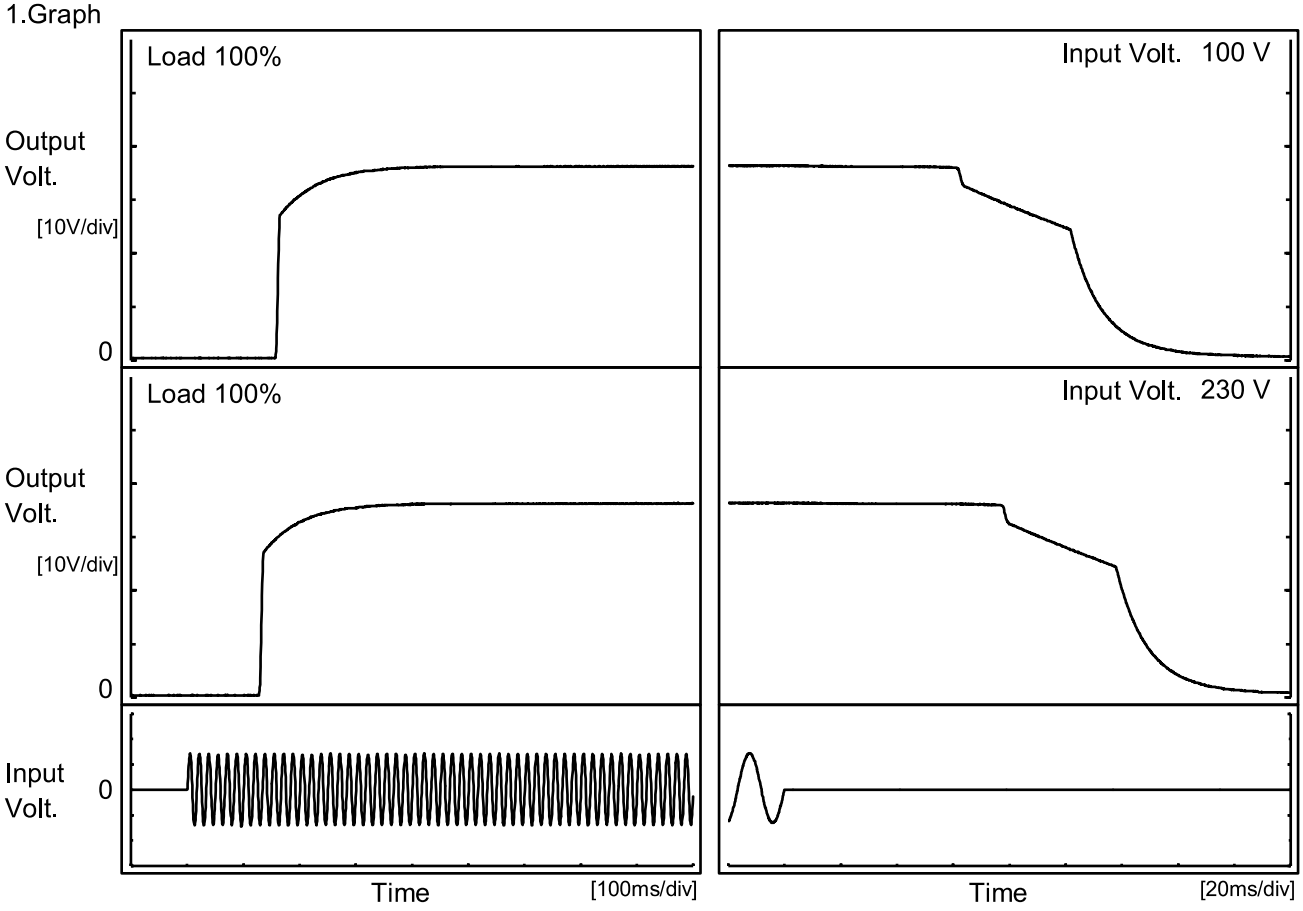
Input Volt. 230V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	36.246
0.5	36.267
1.0	36.267
2.0	36.267
3.0	36.267
4.0	36.268
5.0	36.267
6.0	36.268
7.0	36.268
8.0	36.269

Model	PJMA600F-36	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+36V16.7A	

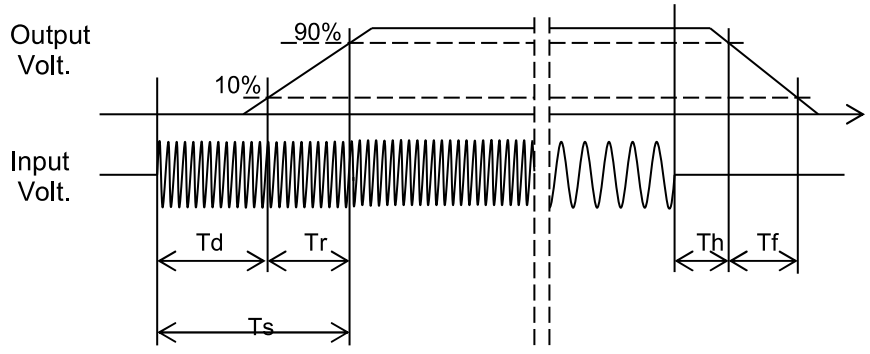
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	159.5	72.5	232.0	29.3	33.3
230 V	130.5	72.0	202.5	36.6	33.5

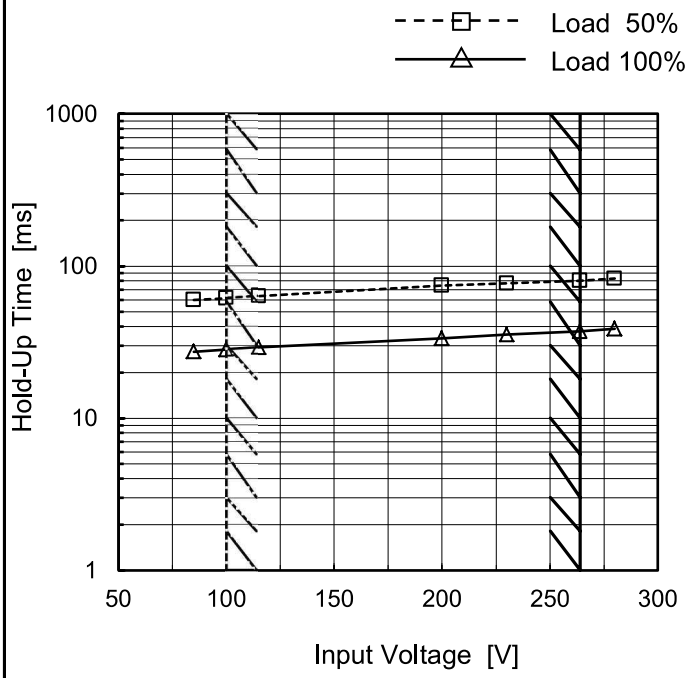


COSEL

Model	PJMA600F-36
Item	Hold-Up Time
Object	+36V16.7A

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

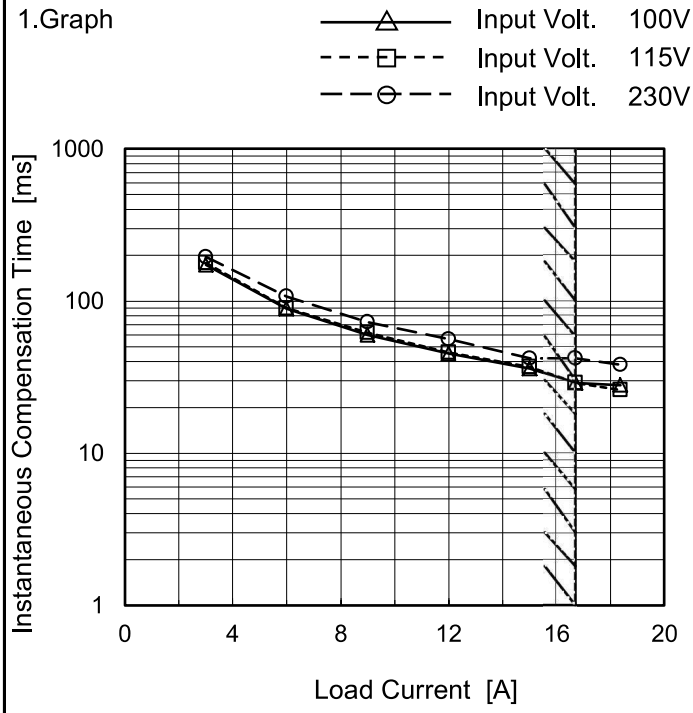
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	60	27
100	62	28
115	63	29
200	75	33
230	77	35
264	80	37
280	83	39
---	-	-
---	-	-

COSEL

Model	PJMA600F-36
Item	Instantaneous Interruption Compensation
Object	+36V16.7A

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	-	-	-
3.00	173	178	195
6.00	89	90	107
9.00	60	62	73
12.00	45	46	56
15.00	36	37	42
16.70	29	29	42
18.37	28	26	38
--	-	-	-
--	-	-	-
--	-	-	-

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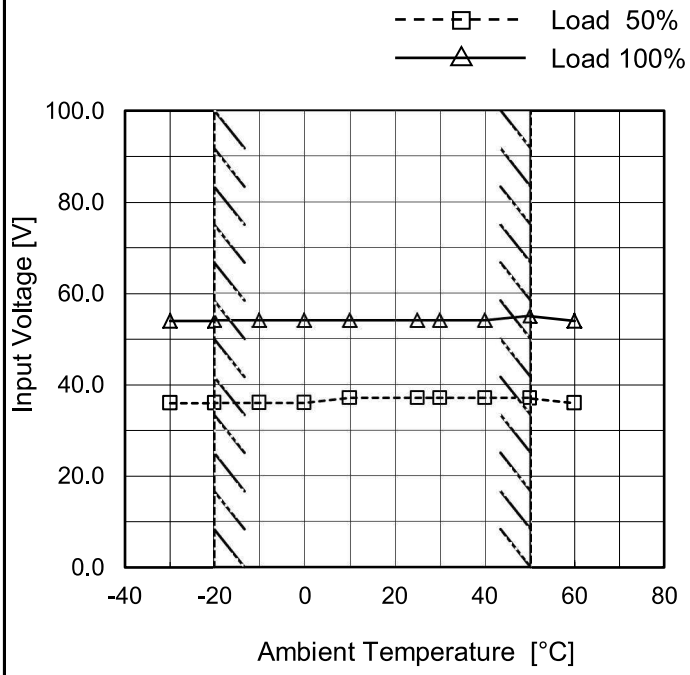
Model	PJMA600F-36
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+36V16.7A

Testing Circuitry Figure A

1.Graph



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

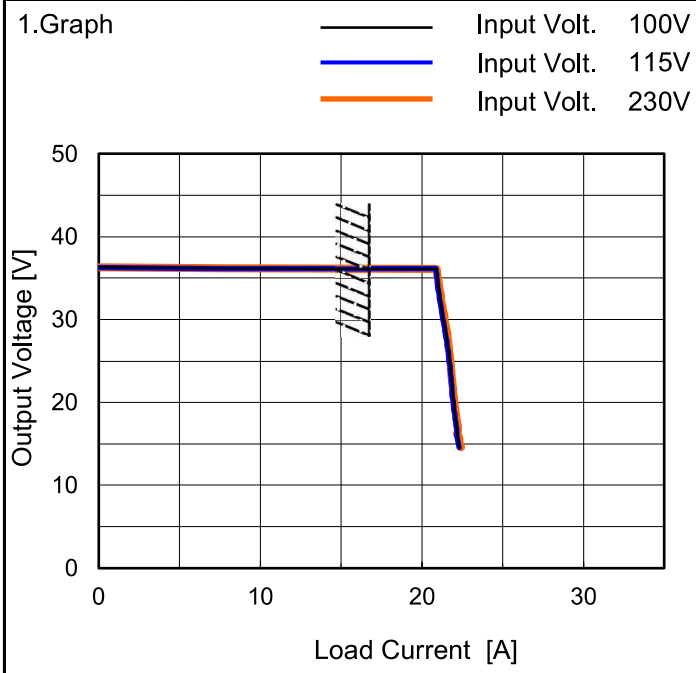
2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	36.0	54.0
-20	36.0	54.0
-10	36.0	54.0
0	36.0	54.0
10	37.0	54.0
25	37.0	54.0
30	37.0	54.0
40	37.0	54.0
50	37.0	55.0
60	36.0	54.0
--	-	-

Model	PJMA600F-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.

2.Values

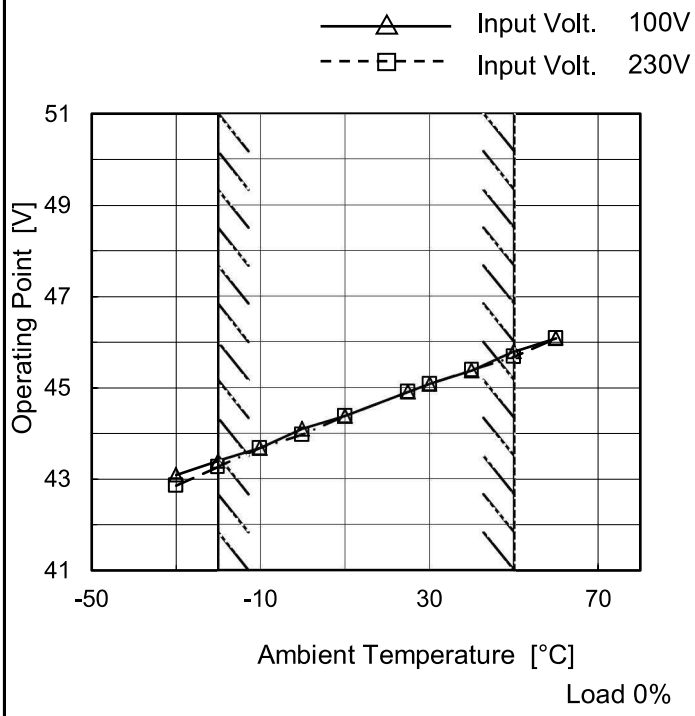
Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
34.2	21.00	20.97	21.03
32.4	20.89	20.85	20.89
28.8	21.42	21.39	21.48
25.2	21.69	21.66	21.73
21.6	21.88	21.84	21.90
18.0	22.06	22.03	22.13
14.4	22.30	22.28	22.40
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	PJMA600F-36
Item	Overvoltage Protection
Object	+36V16.7A

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. 100[V]	Input Volt. 230[V]
-30	43.09	42.86
-20	43.39	43.27
-10	43.68	43.68
0	44.09	43.97
10	44.38	44.38
25	44.90	44.90
30	45.08	45.08
40	45.37	45.38
50	45.79	45.67
60	46.08	46.08
--	-	-

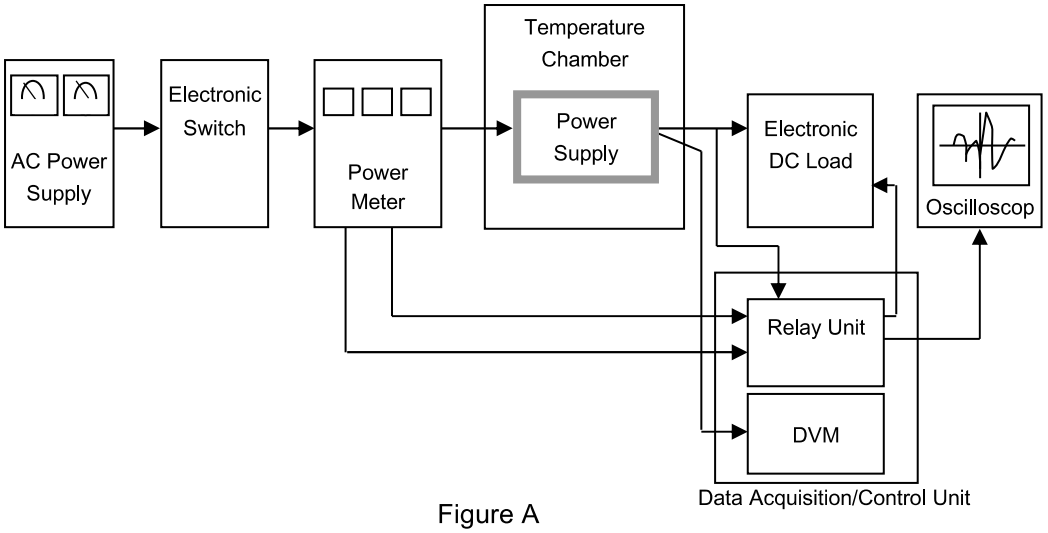


Figure A

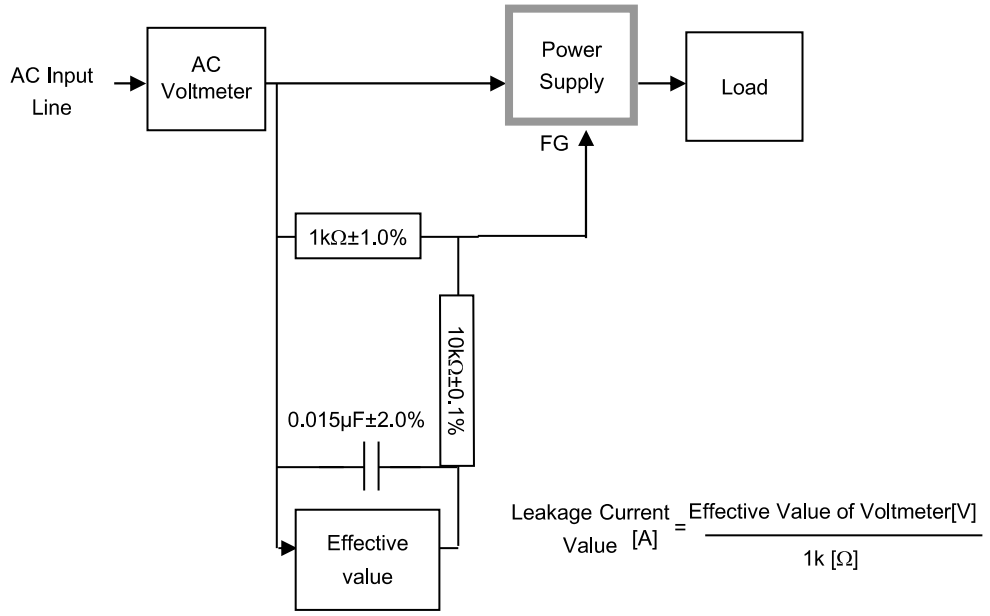
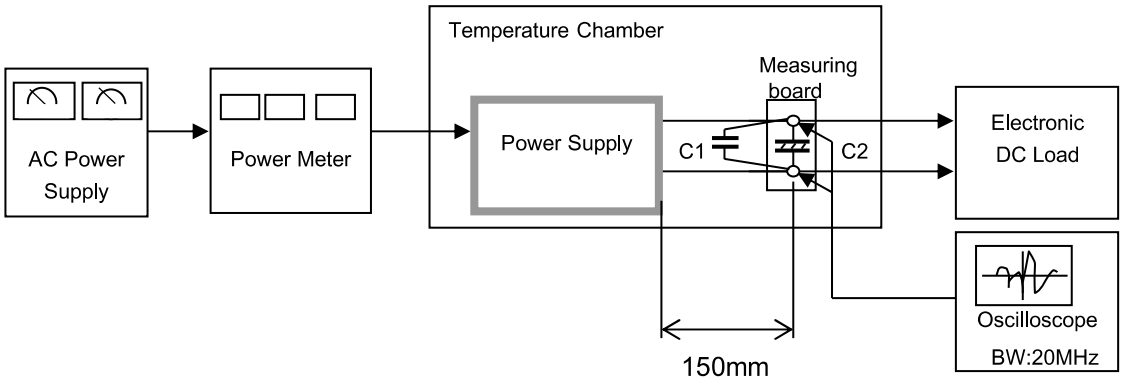


Figure B (IEC60601-1)



(Ceramic capacitor)
C1= 0.1 μF

(Electrolytic capacitor)
C2= 47 μF

Figure C