COSEL

参考資料

TEST DATA OF PMA15F-12

Regulated DC Power Supply
June 4, 2010

Approved by : Katsumi Ishikawa
Katsumi Ishikawa — Design Manager

Prepared by : Tsutomu Okano
Tsutomu Okano — Design Engineer

COSEL CO.,LTD.

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Object	———————

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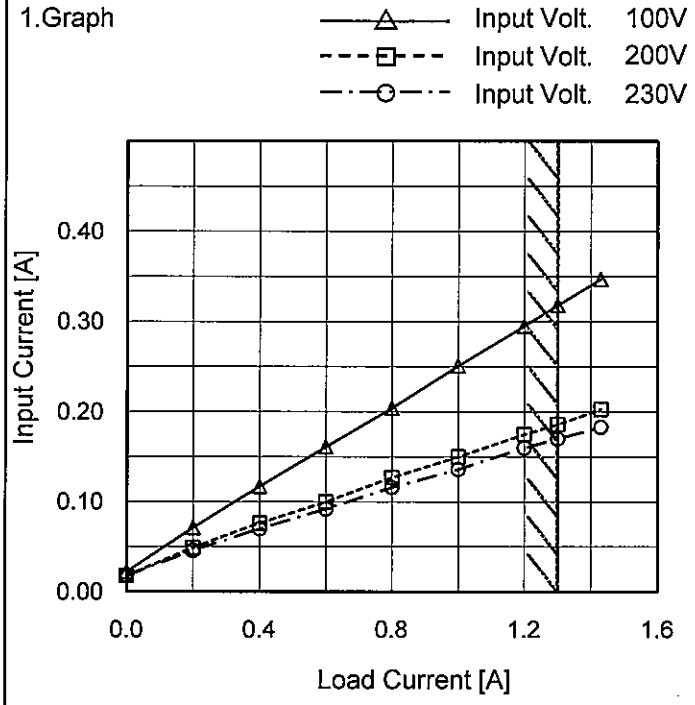

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.022	0.018	0.018
0.20	0.071	0.049	0.046
0.40	0.117	0.076	0.070
0.60	0.161	0.100	0.092
0.80	0.204	0.127	0.116
1.00	0.251	0.150	0.136
1.20	0.295	0.175	0.160
1.30	0.318	0.186	0.170
1.43	0.347	0.203	0.183
--	-	-	-
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BC-10417

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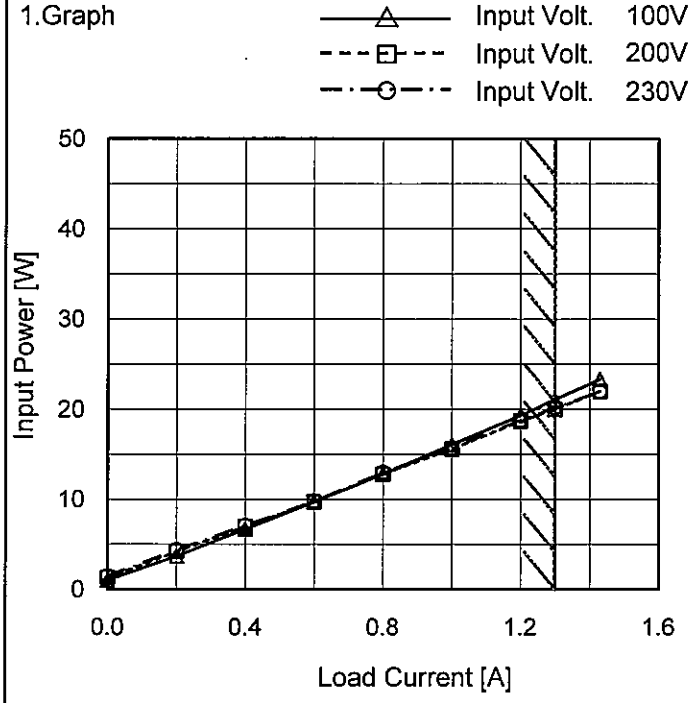
Model	PMA15F-12
Item	Input Power (by Load Current)
Object	———————

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. 200[V]	Input Volt. 230[V]
0.00	1.00	1.30	1.50
0.20	3.70	4.20	4.40
0.40	6.70	7.00	7.10
0.60	9.70	9.70	9.80
0.80	12.80	12.80	13.00
1.00	16.10	15.60	15.70
1.20	19.30	18.70	18.80
1.30	21.10	20.00	20.20
1.43	23.30	22.00	22.00
--	-	-	-
--	-	-	-

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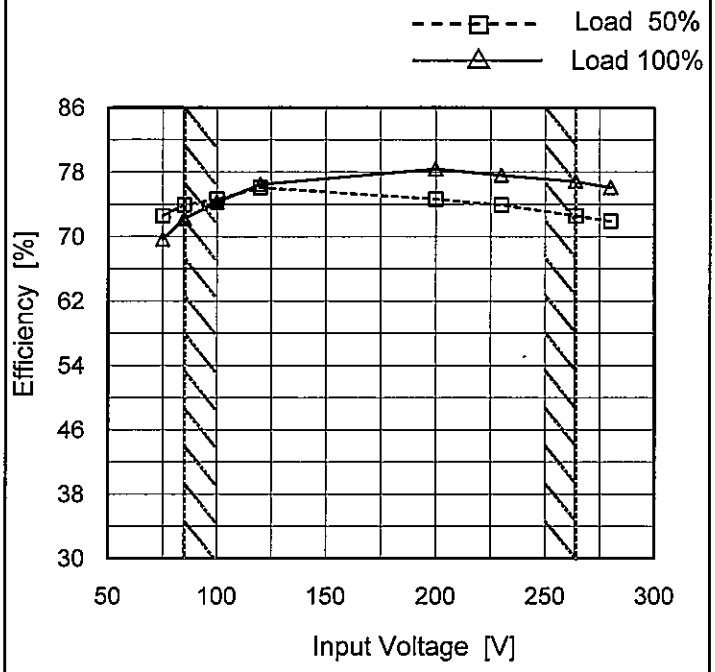
Model	PMA15F-12
Item	Efficiency (by Input Voltage)
Object	———————————

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%
75	72.6	69.7
85	73.9	72.2
100	74.6	74.3
120	76.1	76.5
200	74.7	78.4
230	73.9	77.6
264	72.6	76.8
280	71.9	76.1
--	-	-

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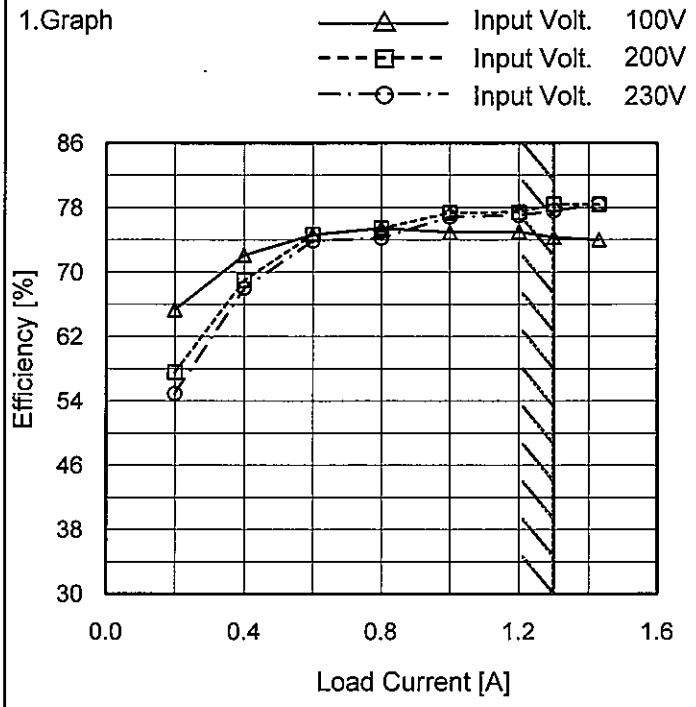
Model	PMA15F-12
Item	Efficiency (by Load Current)
Object	———————

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. 200[V]	Input Volt. 230[V]
0.0	-	-	-
0.2	65.3	57.6	54.9
0.4	72.1	69.0	68.0
0.6	74.7	74.7	73.9
0.8	75.4	75.4	74.3
1.0	75.0	77.4	76.9
1.2	75.0	77.4	77.0
1.3	74.3	78.4	77.6
1.43	74.0	78.4	78.4
--	-	-	-
--	-	-	-

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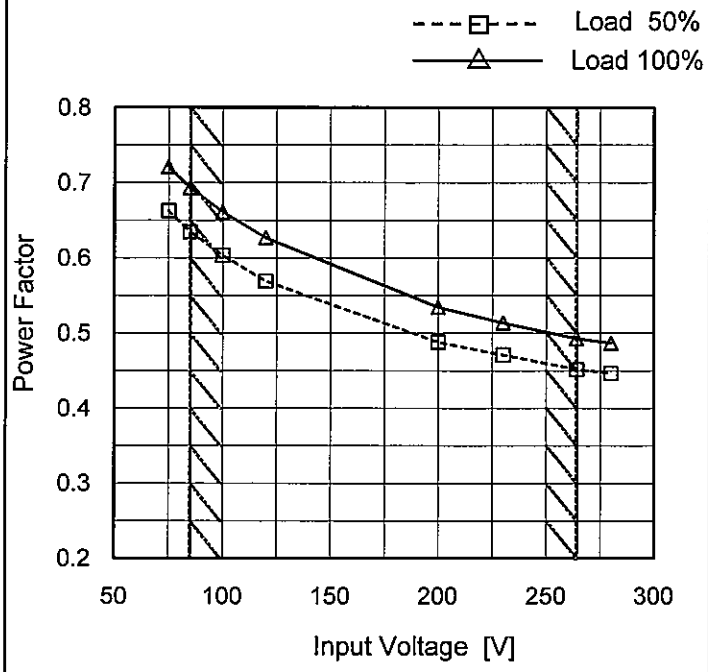
Model	PMA15F-12
Item	Power Factor (by Input Voltage)
Object	———————————

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%
75	0.663	0.721
85	0.635	0.693
100	0.603	0.661
120	0.569	0.627
200	0.488	0.535
230	0.471	0.514
264	0.452	0.493
280	0.447	0.487
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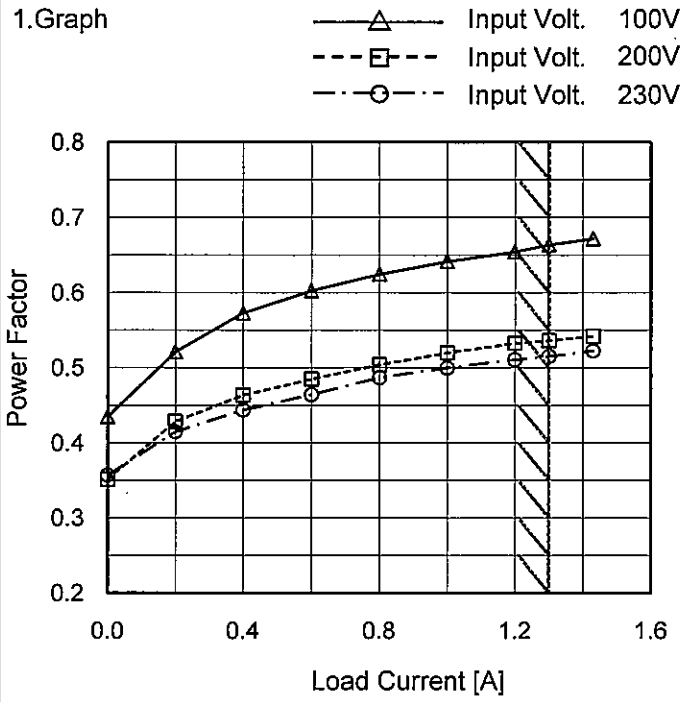
Model	PMA15F-12
Item	Power Factor (by Load Current)
Object	————————

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. 200[V]	Input Volt. 230[V]
0.00	0.435	0.351	0.357
0.20	0.521	0.429	0.415
0.40	0.573	0.464	0.444
0.60	0.602	0.485	0.464
0.80	0.624	0.504	0.487
1.00	0.641	0.520	0.500
1.20	0.654	0.533	0.511
1.30	0.664	0.536	0.515
1.43	0.671	0.542	0.523
--	-	-	-
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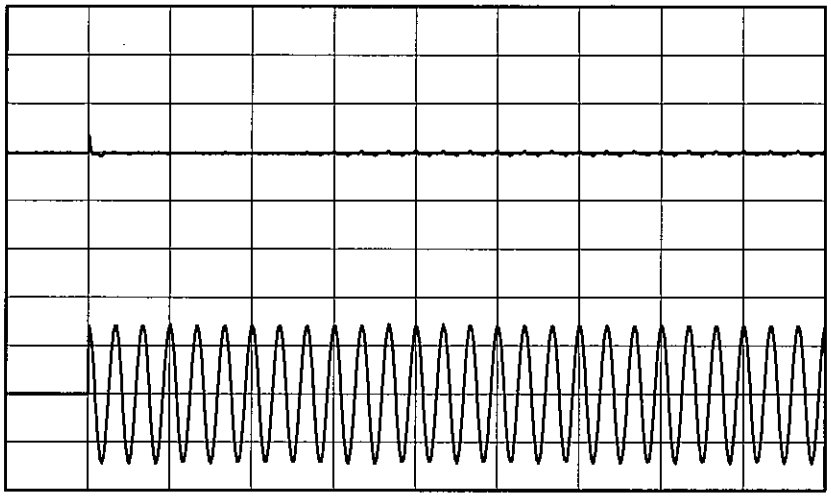
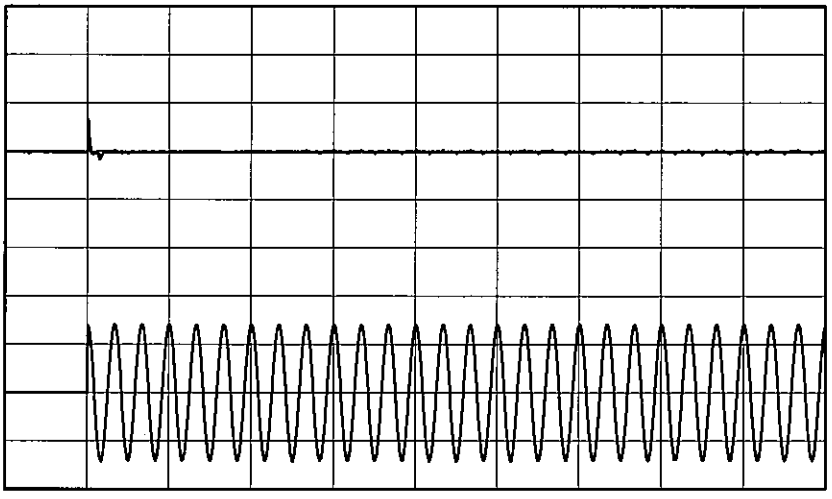
Model	PMA15F-12
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



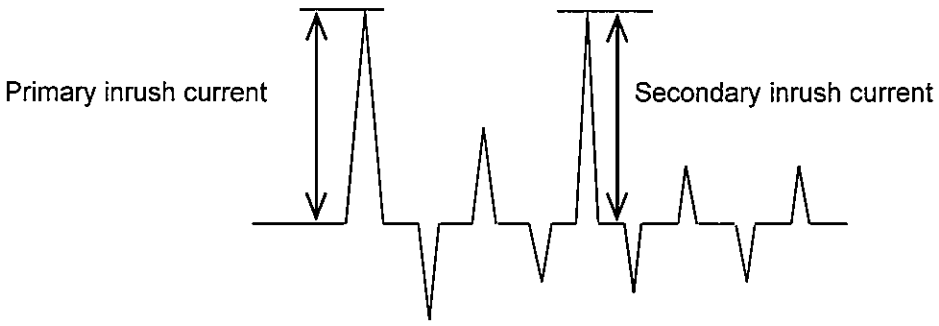
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
7.1 A
Secondary inrush current :
1.2 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
13.4 A
Secondary inrush current :
1.0 A



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Model	PMA15F-12		
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B	
Object	———————		

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
IEC60601	Both phases	0.02	0.04	0.05	Operation
	One of phases	0.03	0.07	0.08	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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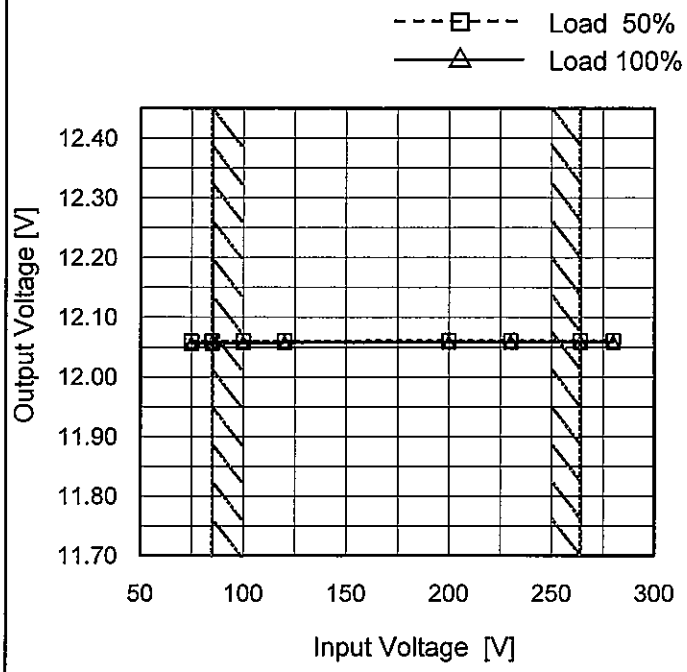
Model	PMA15F-12
Item	Line Regulation
Object	+12V1.3A

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%
75	12.060	12.056
85	12.060	12.057
100	12.060	12.058
120	12.061	12.058
200	12.061	12.059
230	12.061	12.059
264	12.061	12.059
280	12.061	12.059
--	-	-

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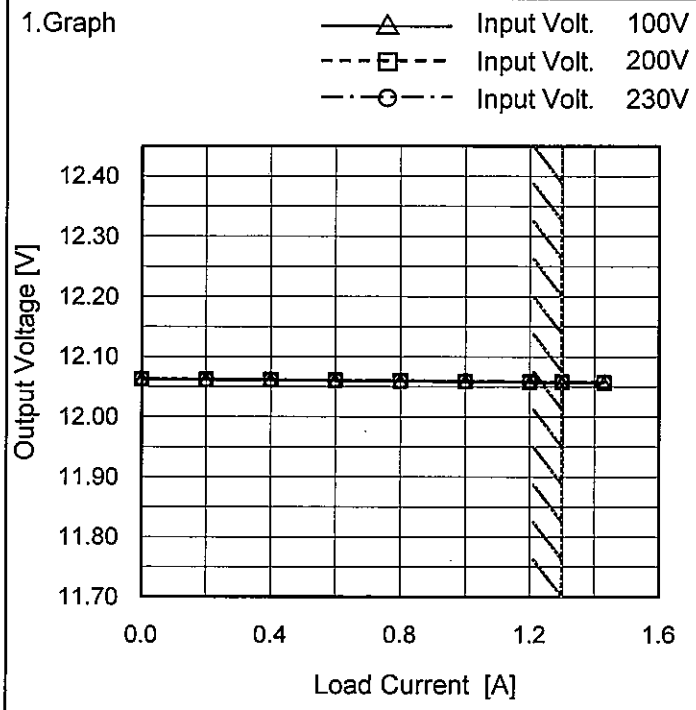
Model	PMA15F-12
Item	Load Regulation
Object	+12V1.3A

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. 200[V]	Input Volt. 230[V]
0.00	12.063	12.063	12.063
0.20	12.062	12.063	12.063
0.40	12.061	12.062	12.062
0.60	12.061	12.061	12.061
0.80	12.060	12.060	12.060
1.00	12.059	12.060	12.060
1.20	12.058	12.059	12.059
1.30	12.057	12.059	12.059
1.43	12.056	12.058	12.058
--	-	-	-
--	-	-	-

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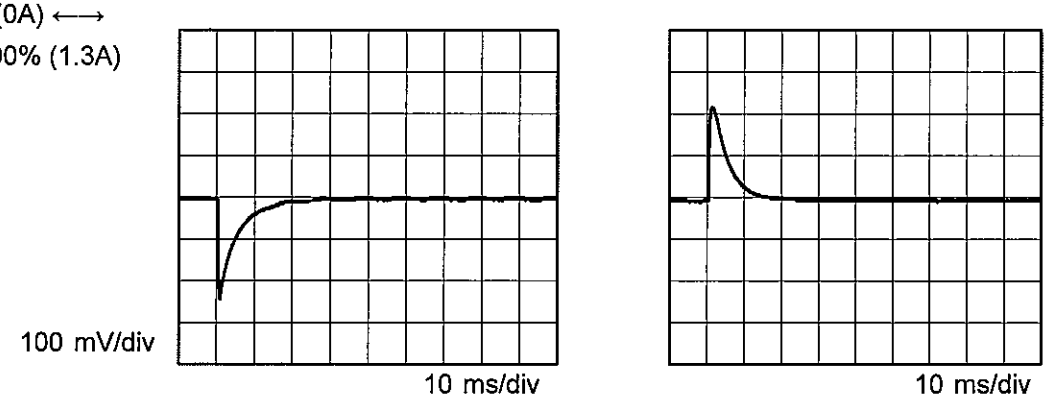
Model	PMA15F-12		
Item	Dynamic Load Response	Temperature Testing Circuitry	25˚C Figure A
Object	+15V1.3A		

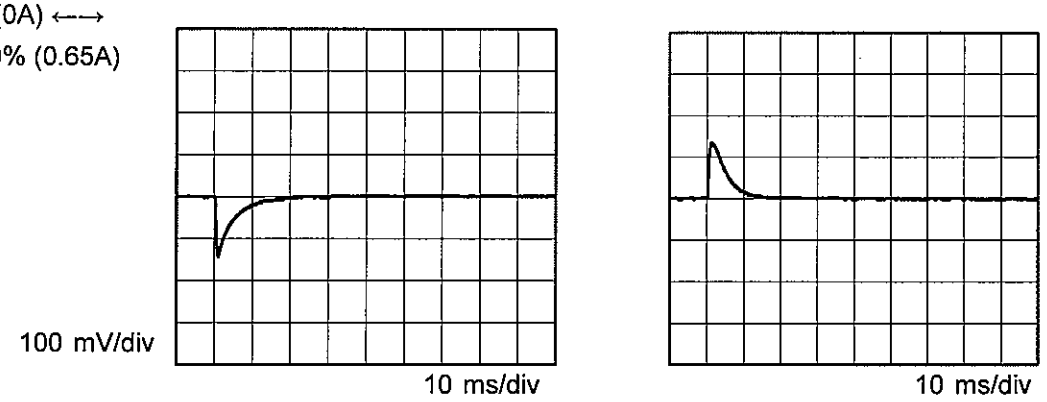
Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ

Min. Load (0A) ⟷
Load 100% (1.3A)



Min. Load (0A) ⟷
Load 50% (0.65A)



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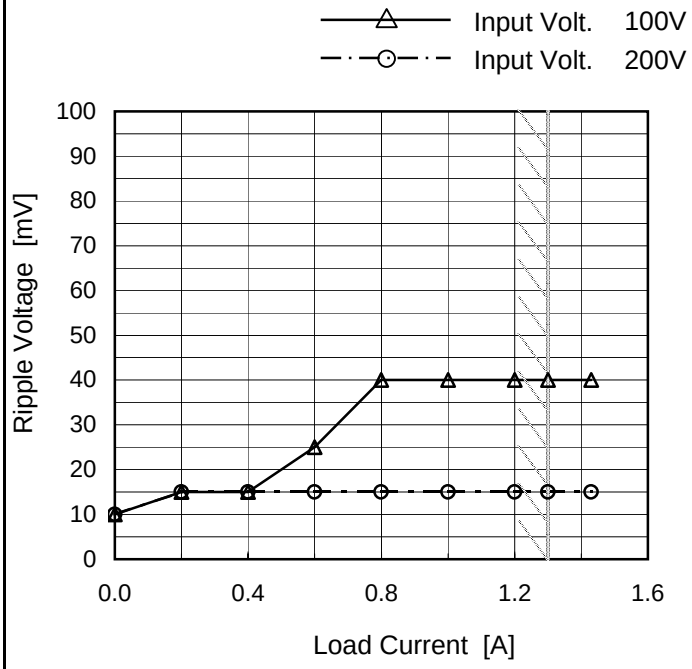
Model	PMA15F-12
Item	Ripple Voltage (by Load Current)
Object	+12V1.3A

Temperature 25°C
Testing Circuitry Figure A

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

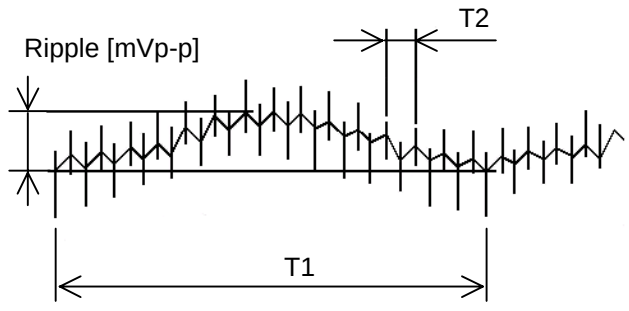


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	10	10
0.20	15	15
0.40	15	15
0.60	25	15
0.80	40	15
1.00	40	15
1.20	40	15
1.30	40	15
1.43	40	15
--	-	-
--	-	-

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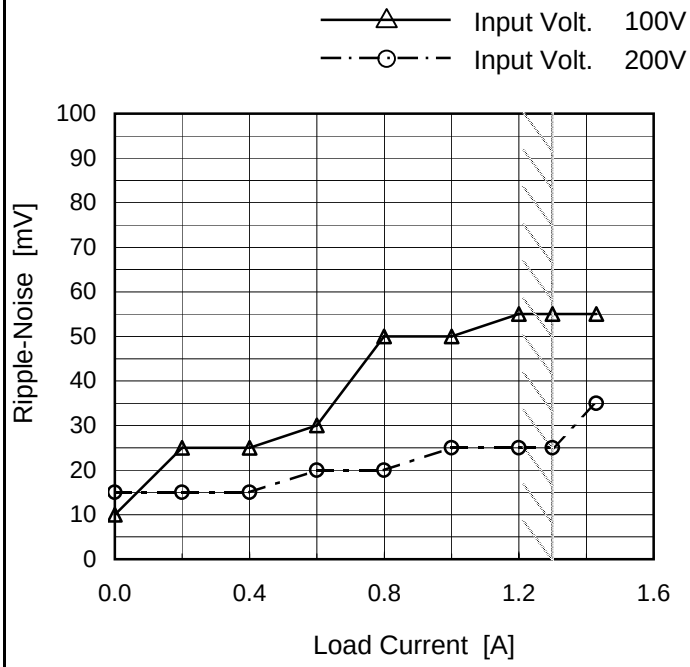
Model	PMA15F-12
Item	Ripple-Noise
Object	+12V1.3A

Temperature 25°C
Testing Circuitry Figure A

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.

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

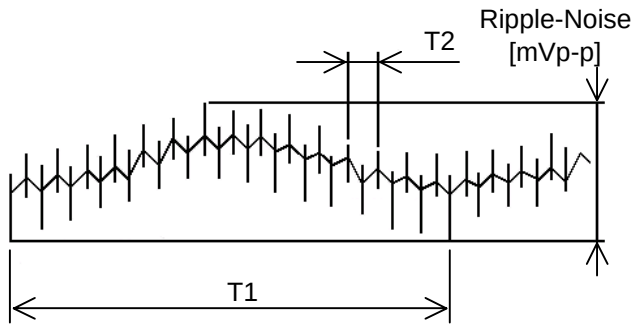


Fig. Complex Ripple Wave Form

2.Values

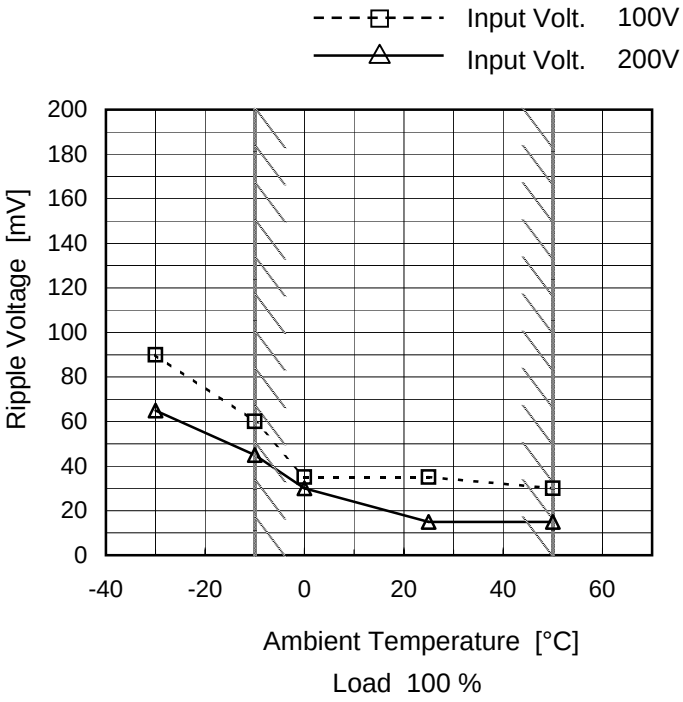
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	10	15
0.20	25	15
0.40	25	15
0.60	30	20
0.80	50	20
1.00	50	25
1.20	55	25
1.30	55	25
1.43	55	35
--	-	-
--	-	-

COSEL

Model	PMA15F-12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V1.3A

Testing Circuitry Figure A

1.Graph



Load 100 %

Measured by 20 MHz Oscilloscope.

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

2.Values

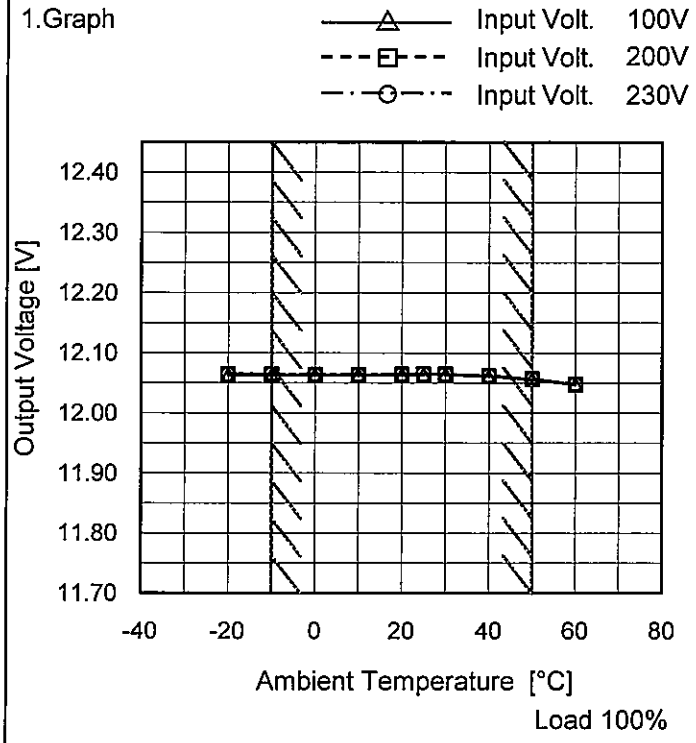
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	90	65
-10	60	45
0	35	30
25	35	15
50	30	15
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PMA15F-12
Item	Ambient Temperature Drift
Object	+12V1.3A

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. 200[V]	Input Volt. 230[V]
-20	12.063	12.065	12.065
-10	12.063	12.065	12.065
0	12.063	12.064	12.064
10	12.063	12.064	12.064
20	12.063	12.065	12.065
25	12.064	12.065	12.065
30	12.064	12.065	12.065
40	12.061	12.063	12.063
50	12.056	12.057	12.057
60	12.048	12.049	12.049
--	-	-	-

COSEL

Model	PMA15F-12	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V1.3A	

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 : 85 - 264V
Load Current : 0 - 1.3A

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

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

2.Values

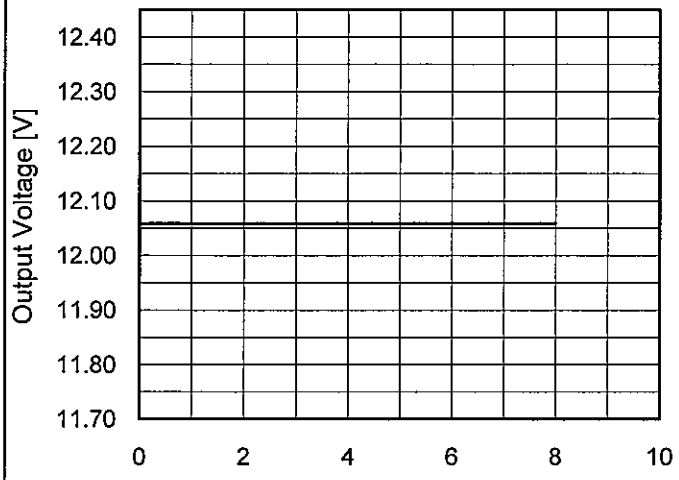
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	264	0	12.071	±8	±0.1
Minimum Voltage	50	85	1.3	12.055		

COSEL

Model	PMA15F-12
Item	Time Lapse Drift
Object	+12V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 230V
Load 100%

* The characteristic of AC100V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.059
0.5	12.059
1.0	12.059
2.0	12.059
3.0	12.059
4.0	12.059
5.0	12.059
6.0	12.059
7.0	12.059
8.0	12.059

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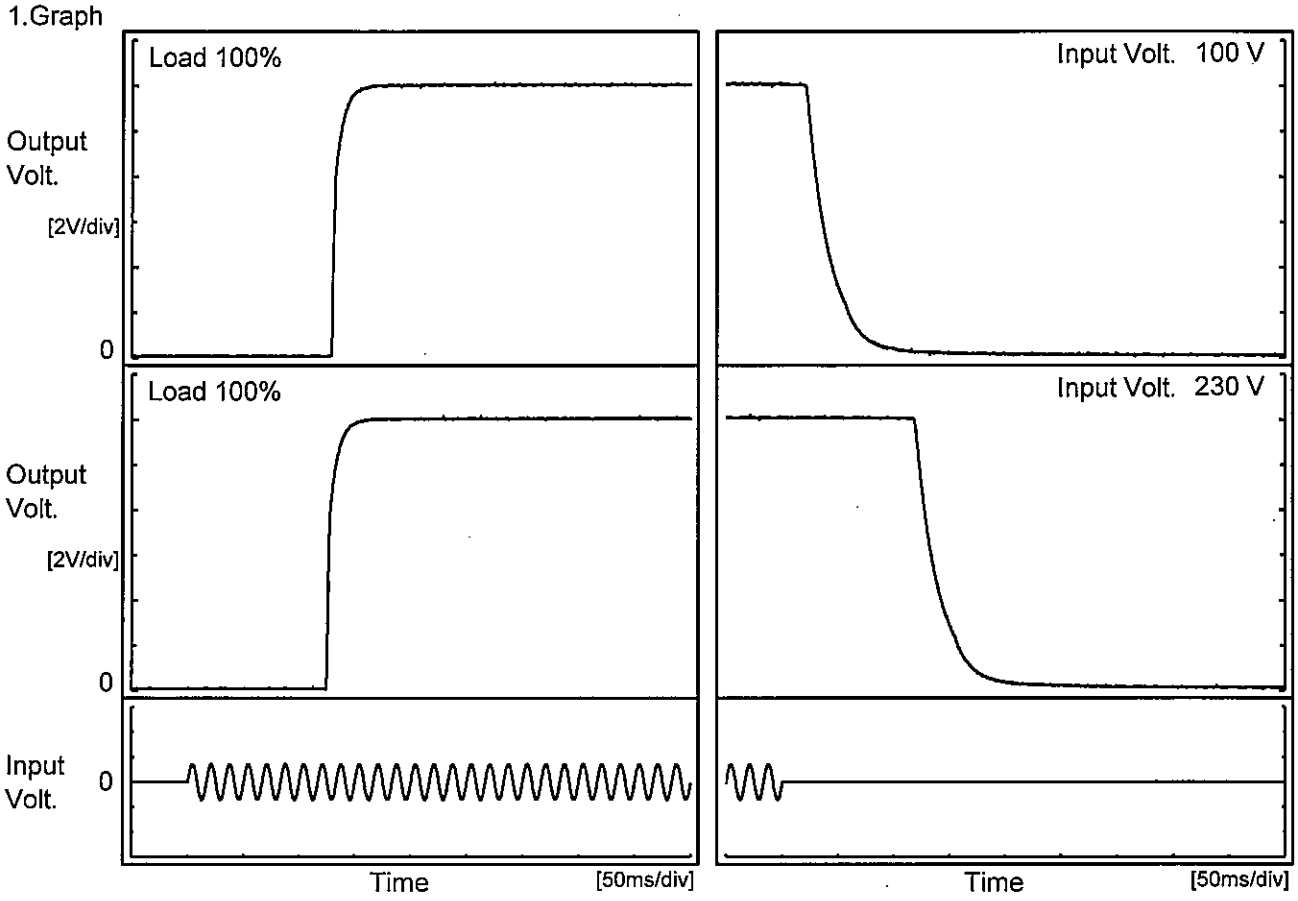
Model	PMA15F-12	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V1.3A	

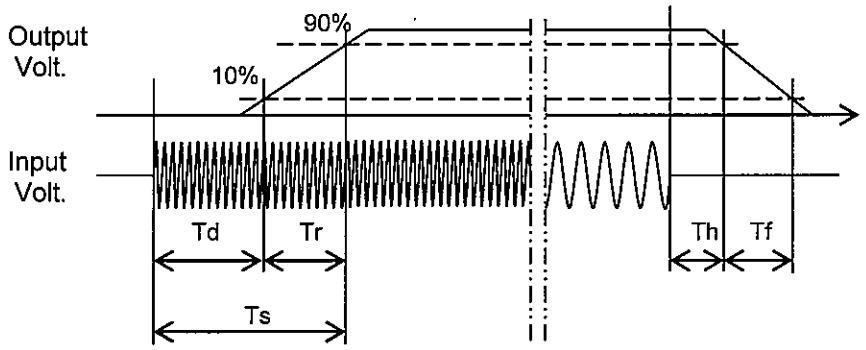
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	129.5	12.3	141.8	24.0	43.3
230 V	125.3	11.8	137.1	121.3	44.8



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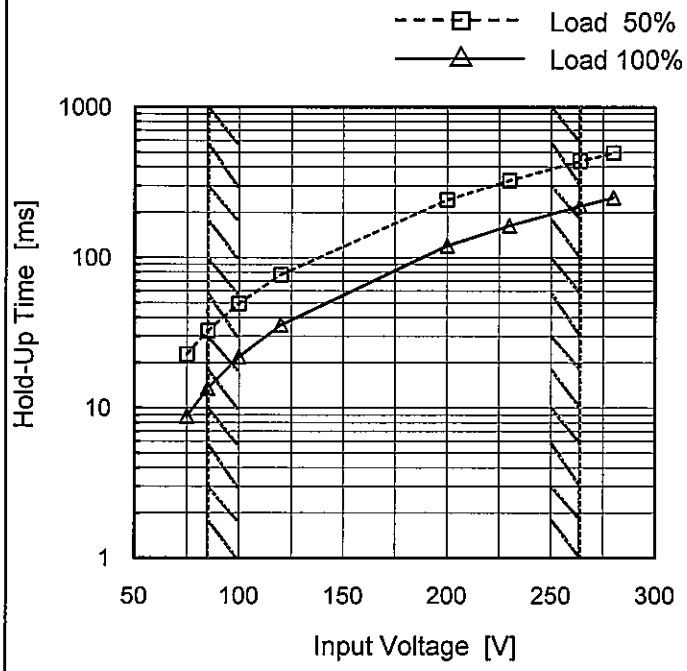
Model	PMA15F-12
Item	Hold-Up Time
Object	+12V1.3A

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%
75	23	9
85	33	14
100	50	22
120	77	36
200	242	120
230	326	163
264	438	220
280	496	250
--	-	-

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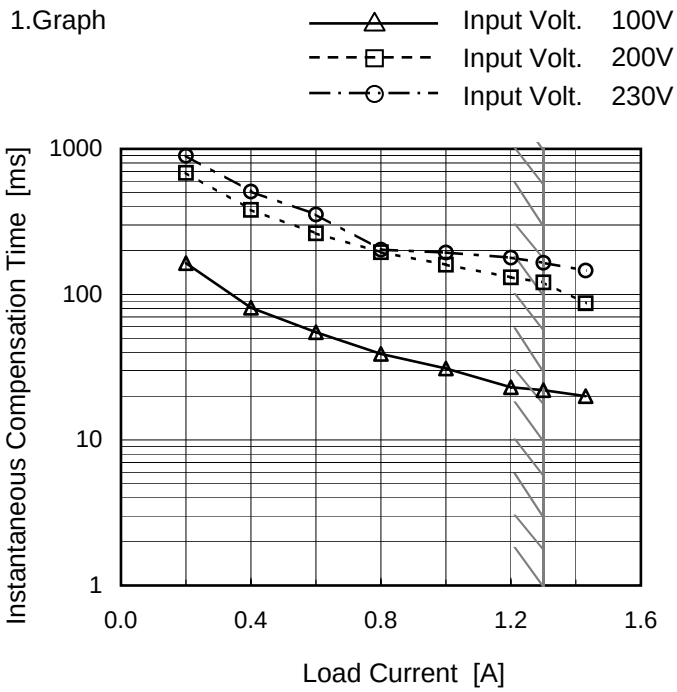
Model	PMA15F-12
Item	Instantaneous Interruption Compensation
Object	+12V1.3A

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. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.20	164	685	897
0.40	81	381	509
0.60	55	263	354
0.80	39	195	203
1.00	31	160	194
1.20	23	131	179
1.30	22	121	165
1.43	20	87	146
--	-	-	-
--	-	-	-

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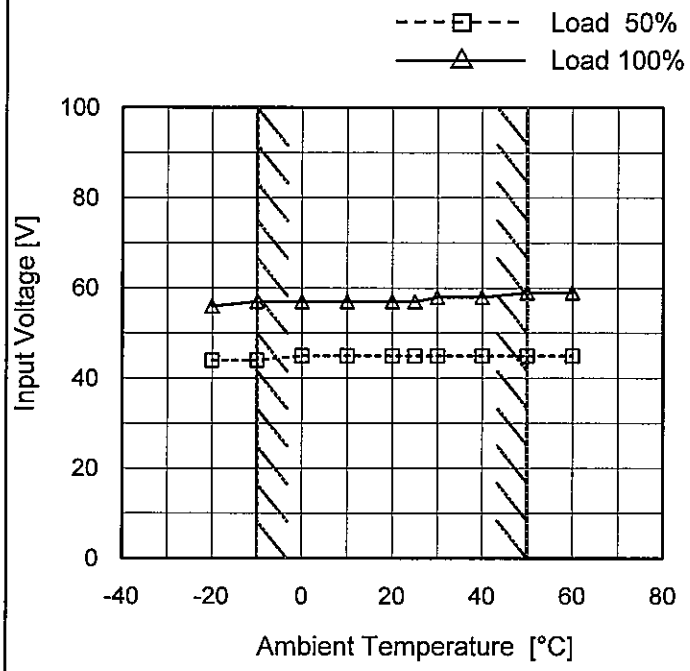
Model	PMA15F-12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V1.3A

Testing Circuitry Figure A

1.Graph



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

2.Values

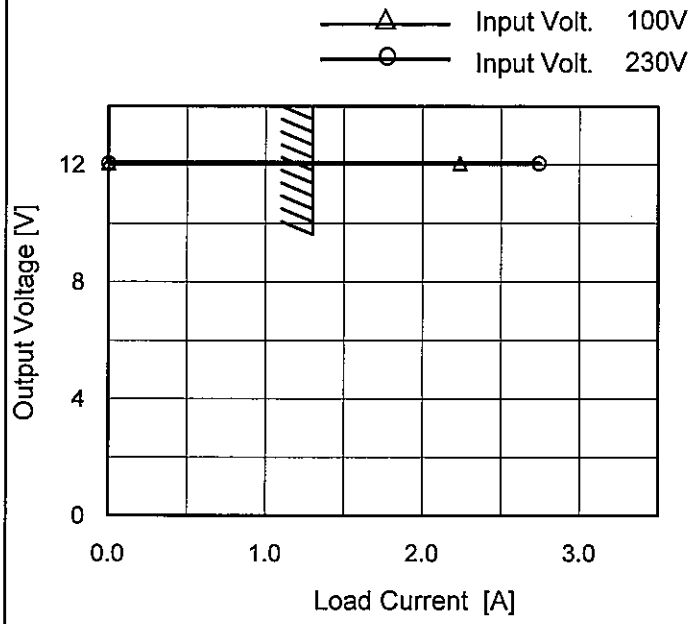
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	44	56
-10	44	57
0	45	57
10	45	57
20	45	57
25	45	57
30	45	58
40	45	58
50	45	59
60	45	59
--	-	-

COSEL

Model	PMA15F-12
Item	Overcurrent Protection
Object	+12V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

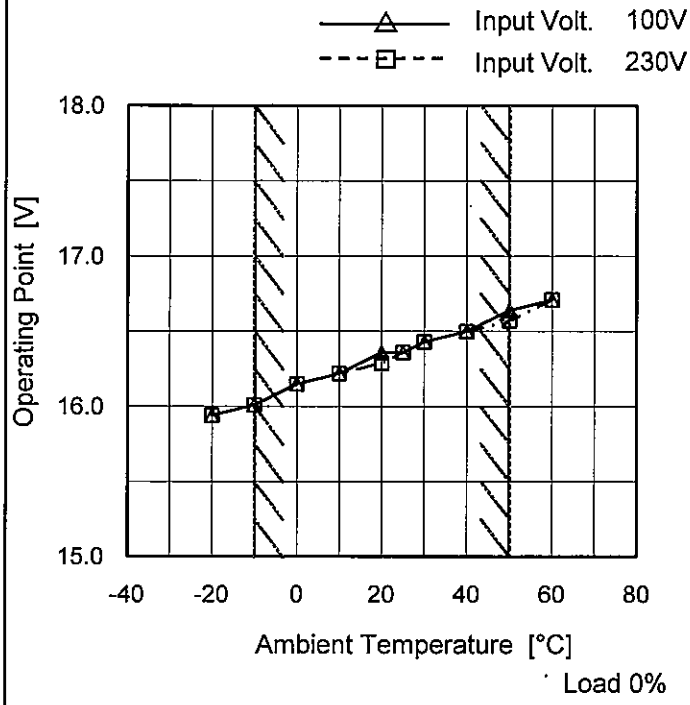
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
12.0	2.24	2.74
11.4	-	-
10.8	-	-
9.6	-	-
8.4	-	-
7.2	-	-
6.0	-	-
4.8	-	-
3.6	-	-
2.4	-	-
1.2	-	-
0.0	-	-

COSEL

Model	PMA15F-12
Item	Overvoltage Protection
Object	+12V1.3A

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]
-20	15.94	15.94
-10	16.01	16.01
0	16.15	16.15
10	16.22	16.22
20	16.36	16.29
25	16.36	16.36
30	16.43	16.43
40	16.50	16.50
50	16.64	16.57
60	16.71	16.71
--	-	-

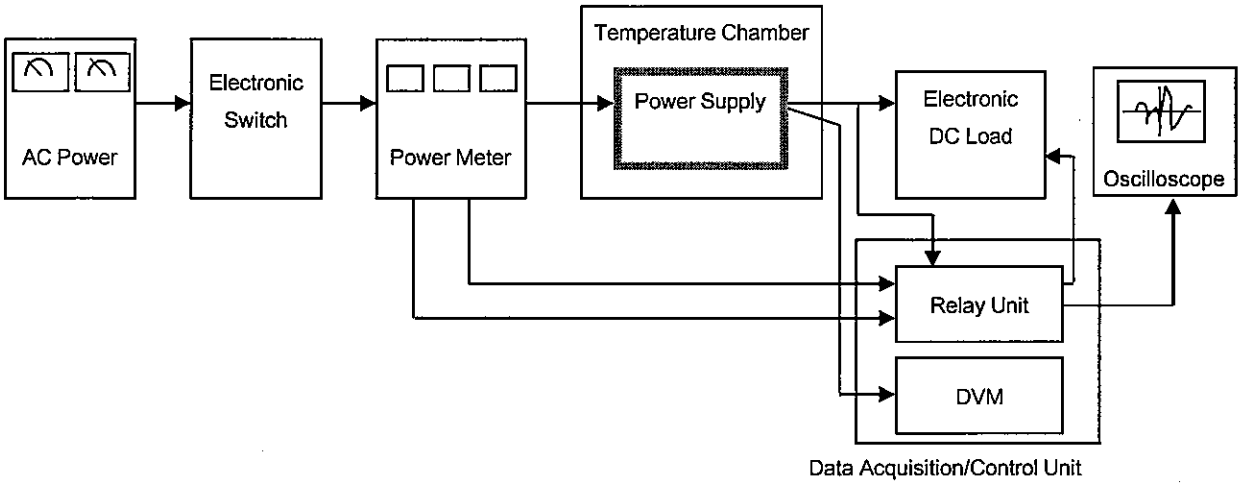


Figure A

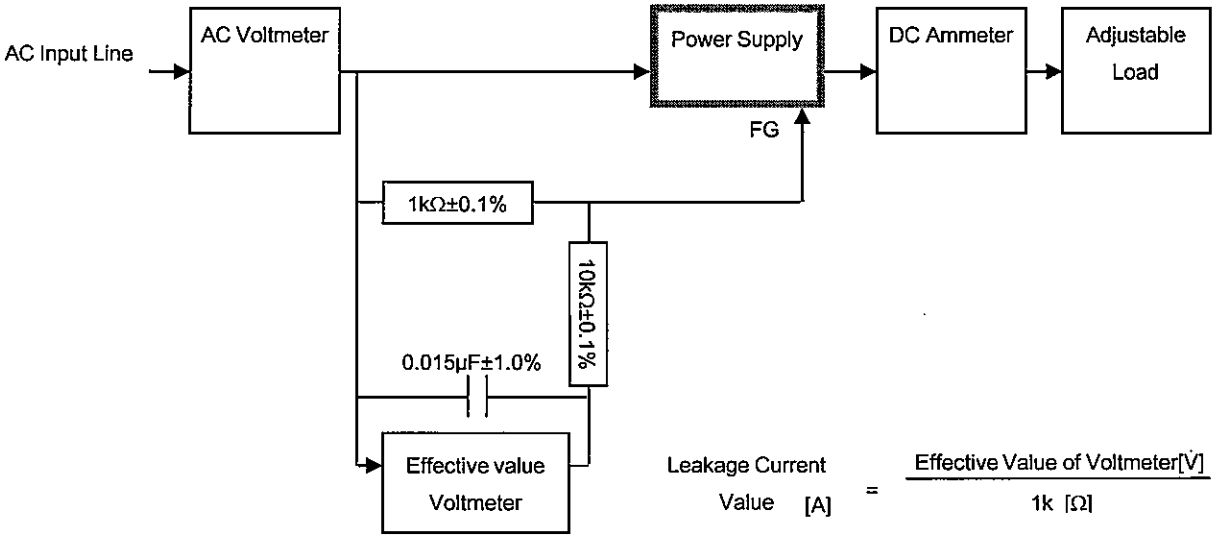


Figure B (IEC60601-1)