COSEL

参考資料

TEST DATA OF PMA15F-3R3

Regulated DC Power Supply
June 4, 2010

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COSEL CO.,LTD.

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Item	Input Current (by Load Current)
Object	———————

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Testing Circuitry Figure A

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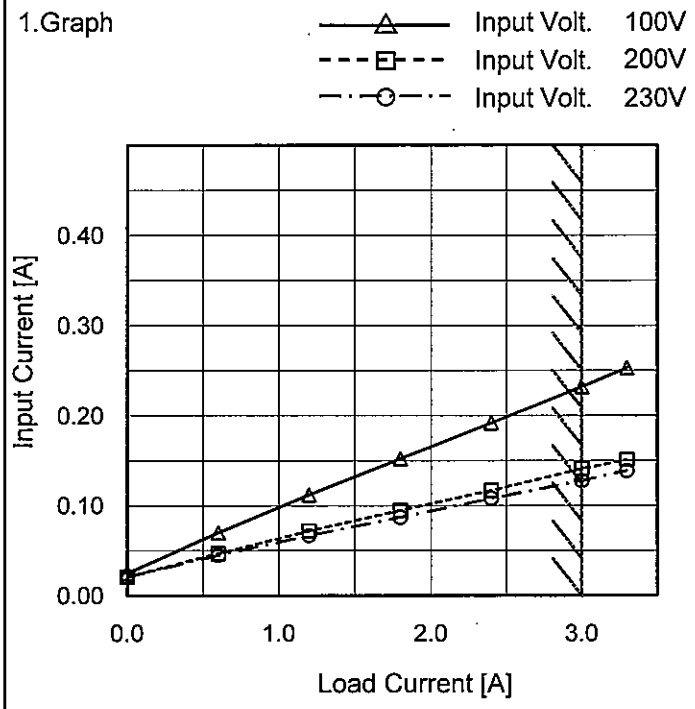

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.025	0.021	0.021
0.6	0.070	0.047	0.045
1.2	0.112	0.072	0.067
1.8	0.152	0.095	0.087
2.4	0.192	0.117	0.108
3.0	0.232	0.141	0.128
3.3	0.253	0.151	0.139
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-10415

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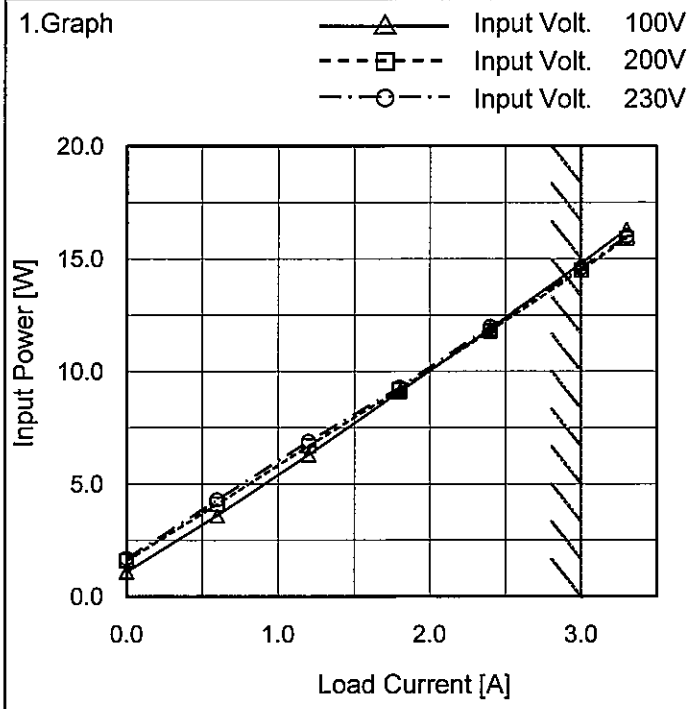
Model	PMA15F-3R3
Item	Input Power (by Load Current)
Object	———————

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]
0.0	1.10	1.60	1.70
0.6	3.60	4.10	4.30
1.2	6.30	6.70	6.90
1.8	9.10	9.20	9.30
2.4	11.90	11.80	12.00
3.0	14.80	14.50	14.60
3.3	16.30	15.90	16.00
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-10415

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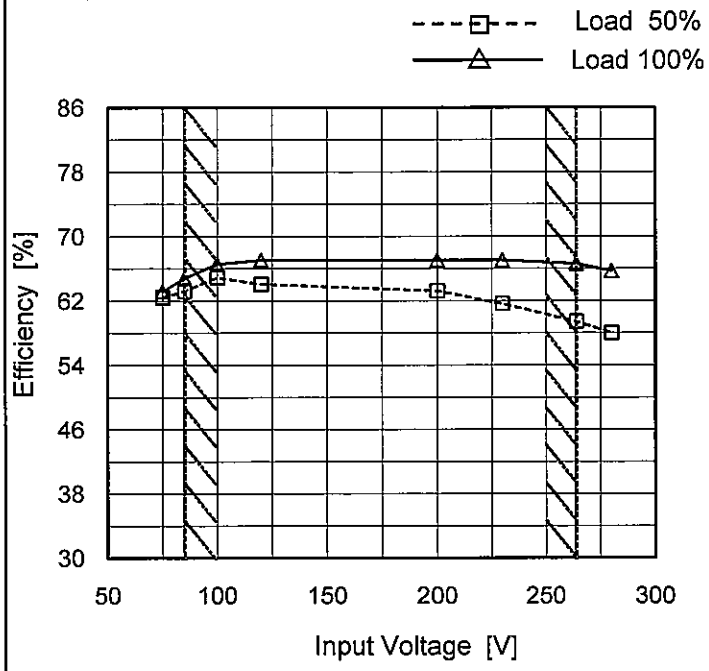
Model	PMA15F-3R3
Item	Efficiency (by Input Voltage)
Object	———————————

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	62.4	63.2
85	63.2	64.8
100	64.9	66.6
120	64.1	67.0
200	63.2	67.1
230	61.7	67.1
264	59.4	66.6
280	58.0	65.7
--	-	-

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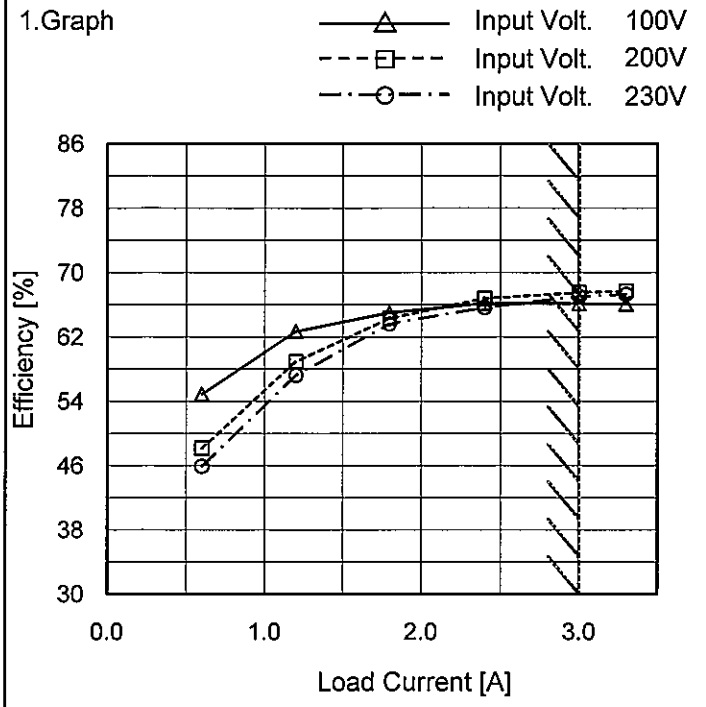
Model	PMA15F-3R3
Item	Efficiency (by Load Current)
Object	———————

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	-	-	-
0.6	54.9	48.2	45.9
1.2	62.7	58.9	57.2
1.8	65.0	64.3	63.6
2.4	66.2	66.8	65.7
3.0	66.1	67.5	67.1
3.3	66.0	67.7	67.3
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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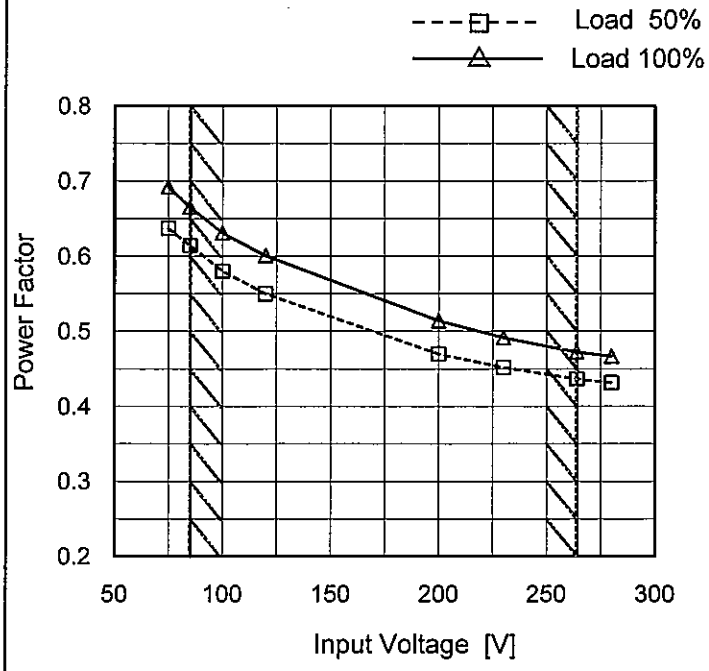
Model	PMA15F-3R3
Item	Power Factor (by Input Voltage)
Object	———

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	0.637	0.692
85	0.614	0.665
100	0.580	0.631
120	0.550	0.601
200	0.470	0.514
230	0.452	0.492
264	0.437	0.473
280	0.431	0.467
--	-	-

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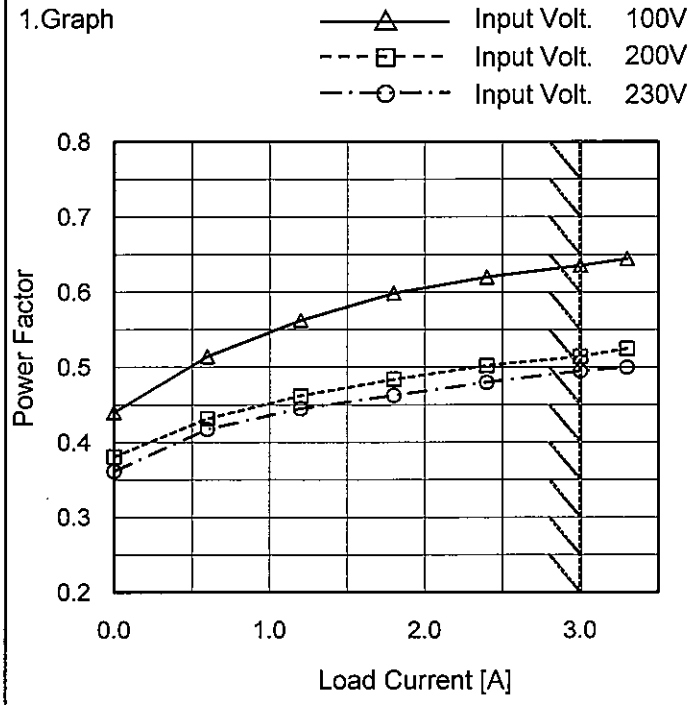
Model	PMA15F-3R3
Item	Power Factor (by Load Current)
Object	———————

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]
0.0	0.440	0.381	0.362
0.6	0.514	0.432	0.417
1.2	0.563	0.462	0.445
1.8	0.599	0.484	0.463
2.4	0.620	0.502	0.480
3.0	0.635	0.514	0.495
3.3	0.644	0.525	0.500
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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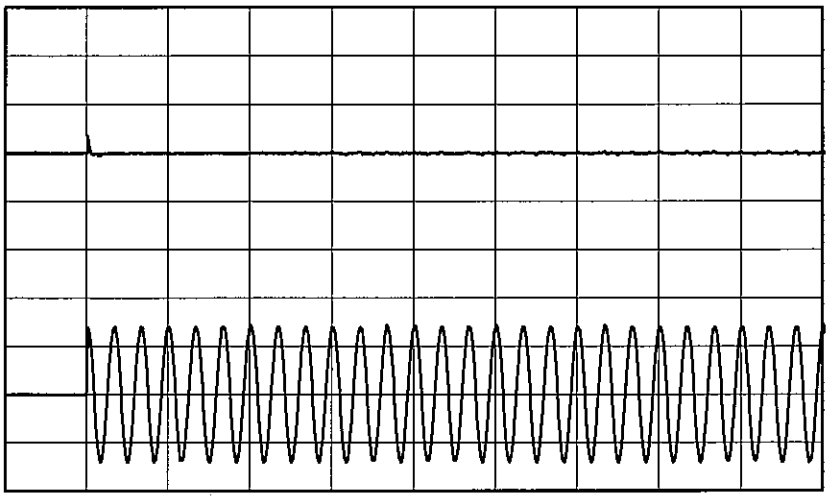
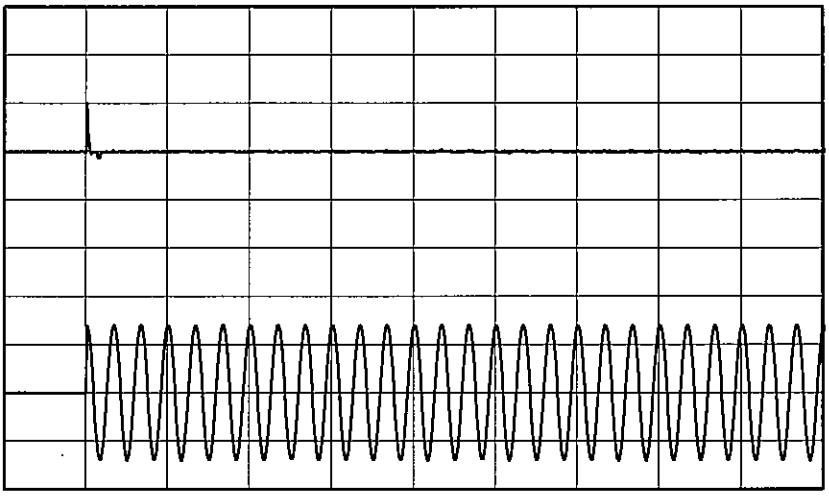
Model	PMA15F-3R3
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



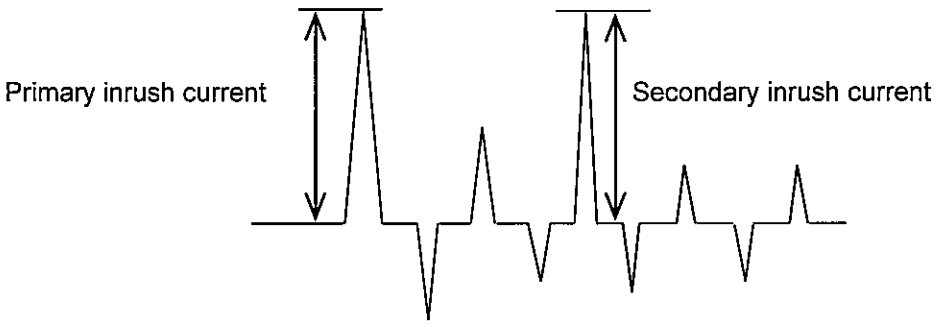
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
7.1 A
Secondary inrush current :
1.0 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
20.2 A
Secondary inrush current :
0.9 A



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Model	PMA15F-3R3	
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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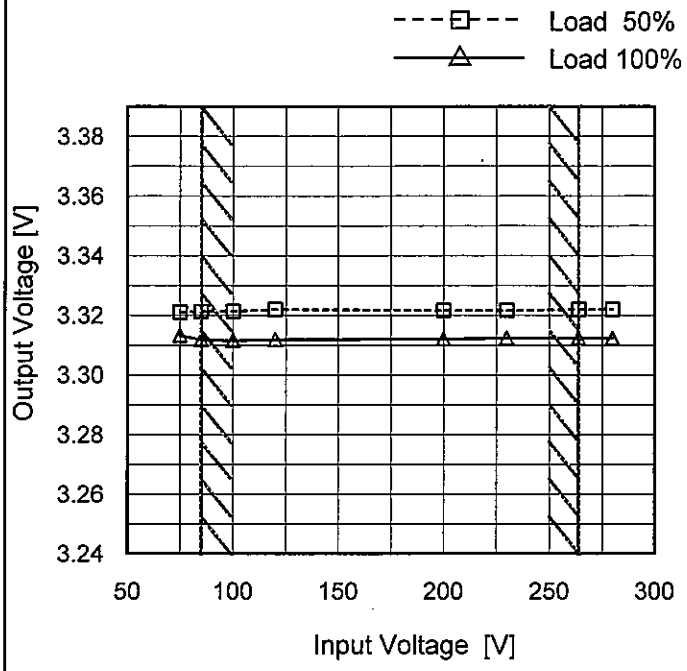
Model	PMA15F-3R3
Item	Line Regulation
Object	+3.3V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

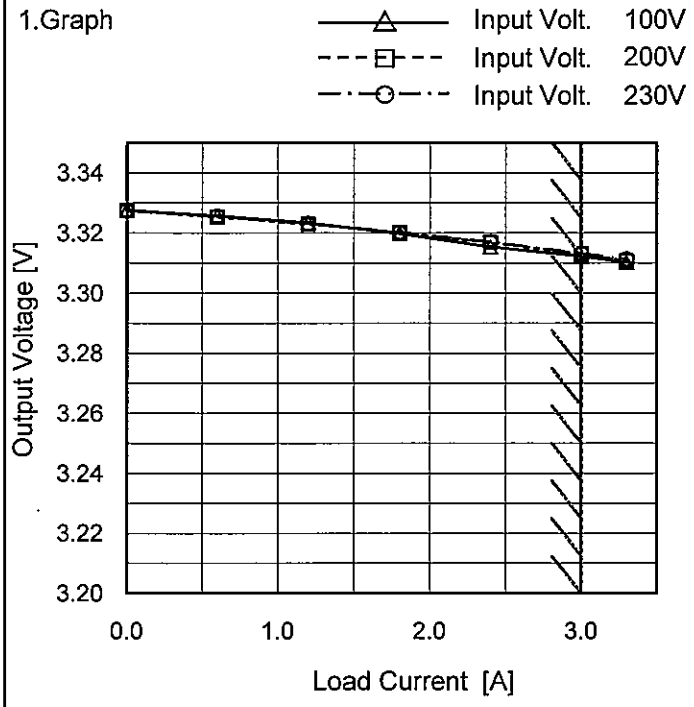
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	3.321	3.313
85	3.321	3.312
100	3.321	3.312
120	3.322	3.312
200	3.322	3.312
230	3.322	3.312
264	3.322	3.312
280	3.322	3.312
--	-	-

COSEL

Model	PMA15F-3R3
Item	Load Regulation
Object	+3.3V3A

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]
0.0	3.328	3.328	3.328
0.6	3.326	3.325	3.326
1.2	3.323	3.323	3.323
1.8	3.320	3.320	3.320
2.4	3.315	3.317	3.317
3.0	3.312	3.313	3.313
3.3	3.310	3.311	3.311
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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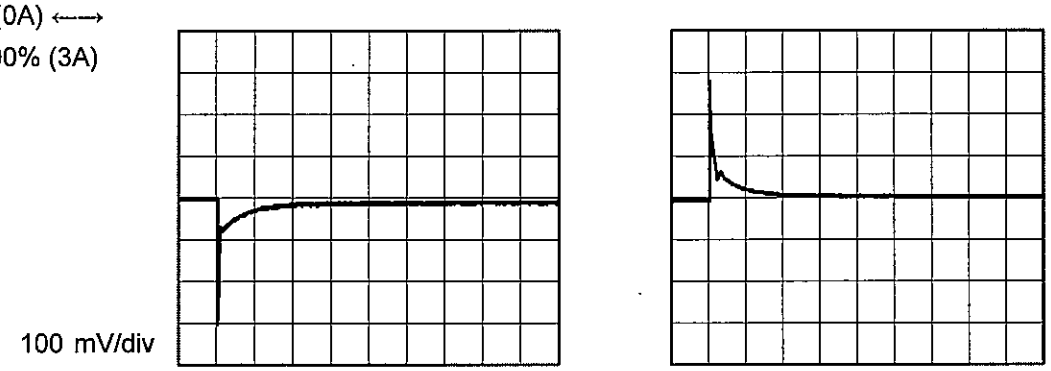
Model	PMA15F-3R3		
Item	Dynamic Load Response	Temperature Testing Circuitry	25˚C Figure A
Object	+3.3V3A		

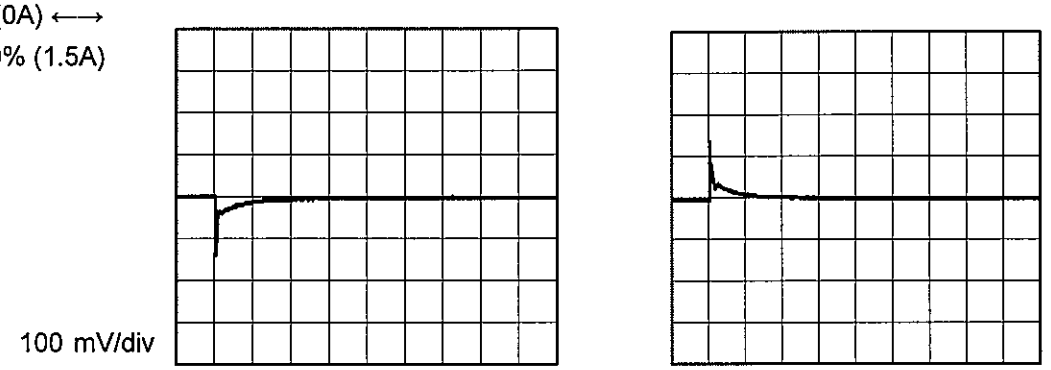
Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ

Min. Load (0A) ⟷
Load 100% (3A)



Min. Load (0A) ⟷
Load 50% (1.5A)



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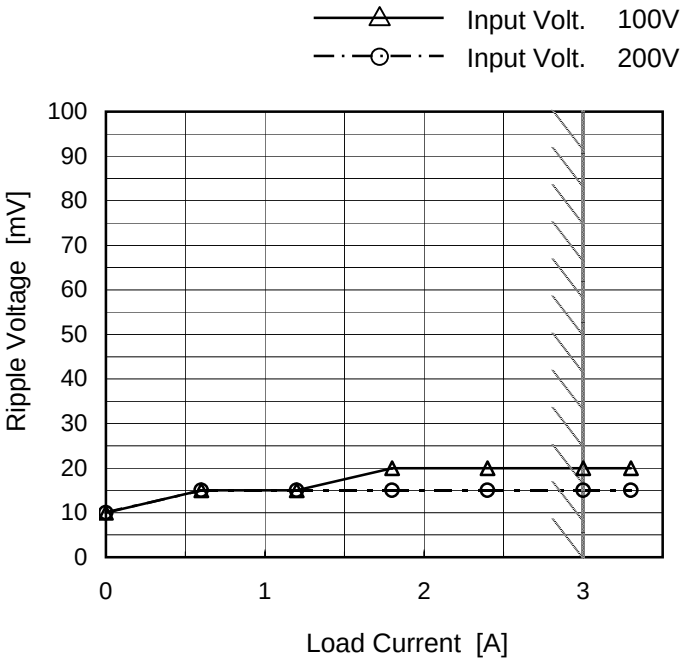
Model	PMA15F-3R3
Item	Ripple Voltage (by Load Current)
Object	+3.3V3A

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

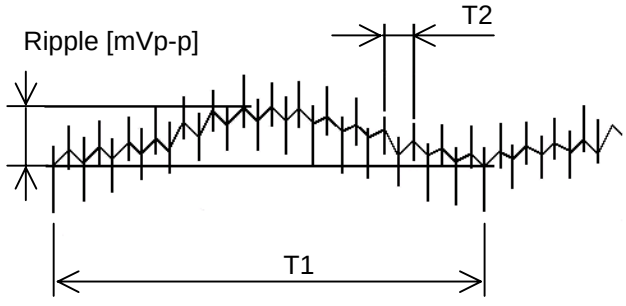


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	10	10
0.6	15	15
1.2	15	15
1.8	20	15
2.4	20	15
3.0	20	15
3.3	20	15
--	-	-
--	-	-
--	-	-
--	-	-

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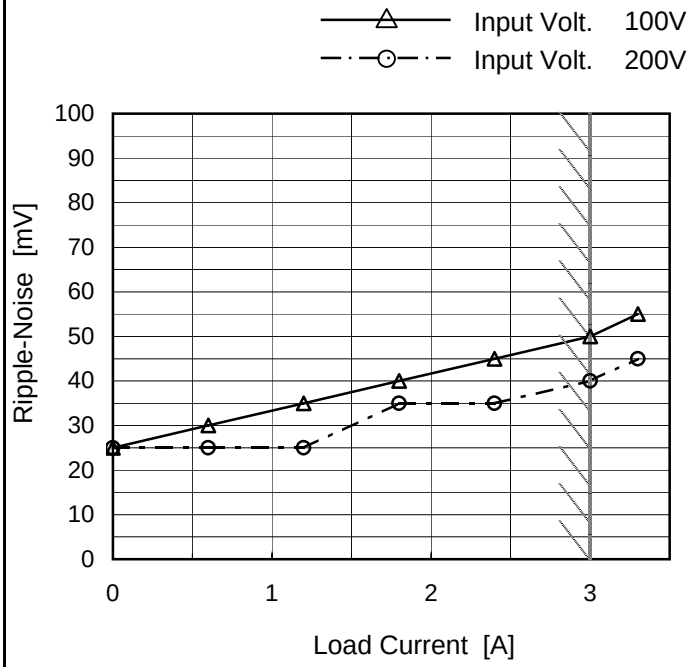
Model	PMA15F-3R3
Item	Ripple-Noise
Object	+3.3V3A

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

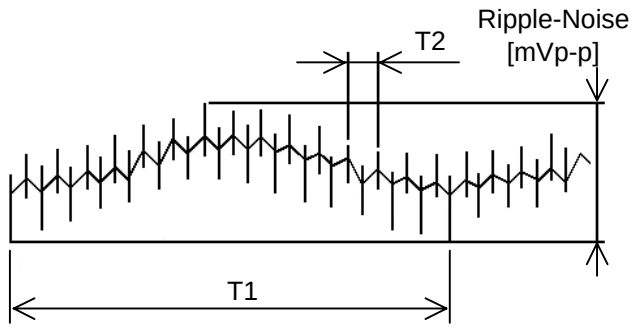


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	25	25
0.6	30	25
1.2	35	25
1.8	40	35
2.4	45	35
3.0	50	40
3.3	55	45
--	-	-
--	-	-
--	-	-
--	-	-

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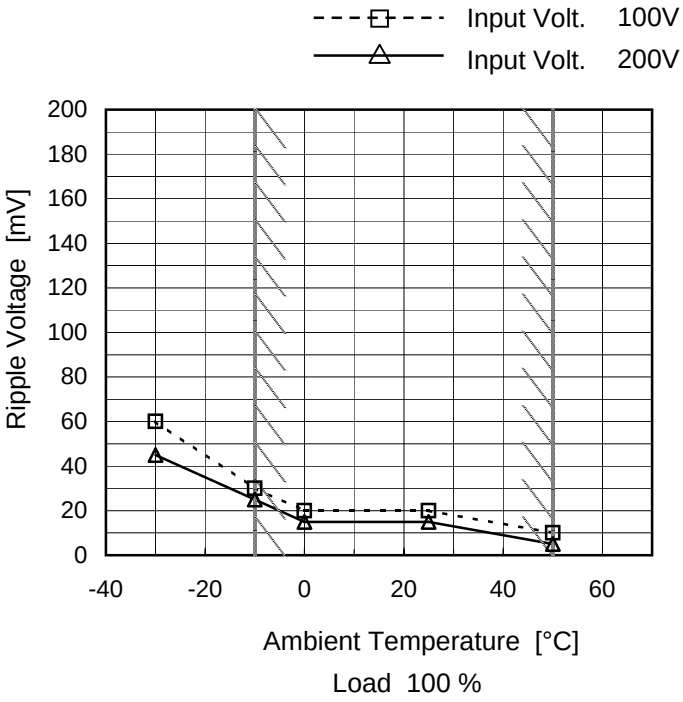
Model	PMA15F-3R3
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V3A

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

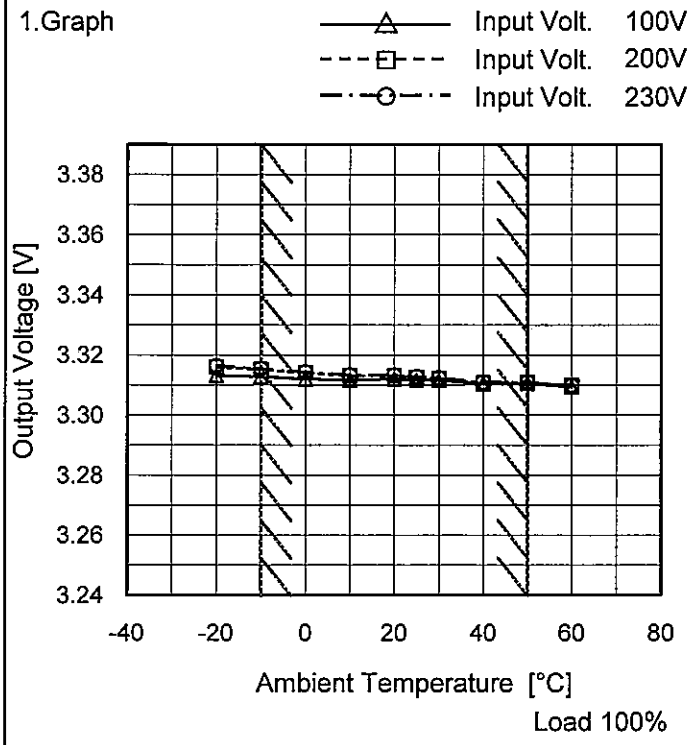
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	60	45
-10	30	25
0	20	15
25	20	15
50	10	5
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PMA15F-3R3
Item	Ambient Temperature Drift
Object	+3.3V3A

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	3.313	3.316	3.317
-10	3.313	3.315	3.316
0	3.312	3.314	3.314
10	3.312	3.313	3.313
20	3.312	3.313	3.313
25	3.312	3.313	3.313
30	3.312	3.312	3.313
40	3.311	3.311	3.311
50	3.311	3.311	3.311
60	3.309	3.310	3.310
--	-	-	-

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Model	PMA15F-3R3	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+3.3V3A	

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 - 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

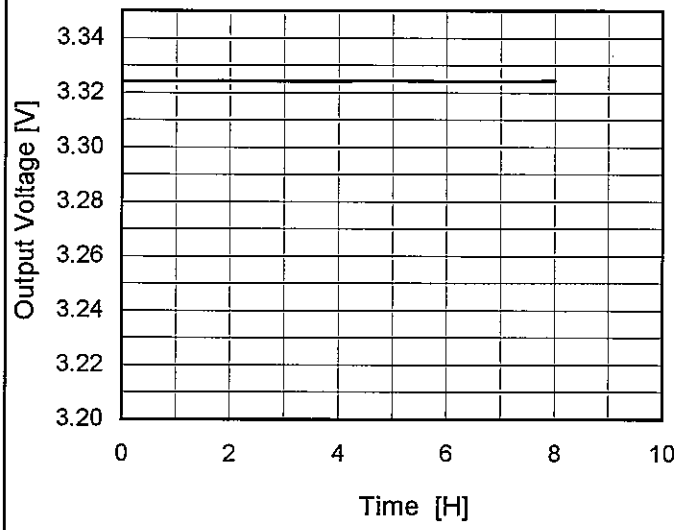
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	264	0	3.329	±9	±0.3
Minimum Voltage	50	264	3	3.311		

COSEL

Model	PMA15F-3R3
Item	Time Lapse Drift
Object	+3.3V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	3.325
0.5	3.324
1.0	3.324
2.0	3.324
3.0	3.324
4.0	3.324
5.0	3.324
6.0	3.324
7.0	3.324
8.0	3.324

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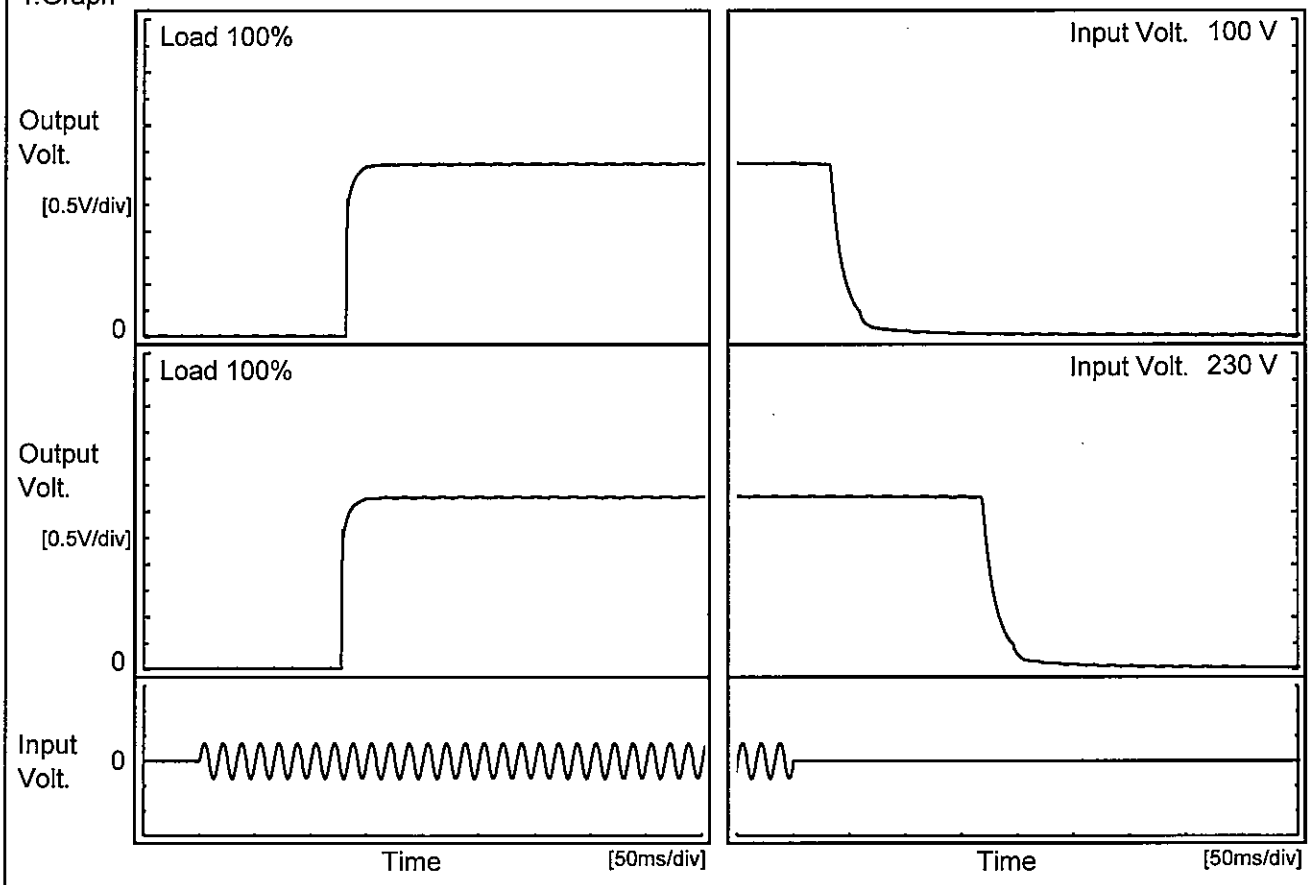
Model	PMA15F-3R3
Item	Rise and Fall Time
Object	+3.3V3A

Temperature 25°C
Testing Circuitry Figure A

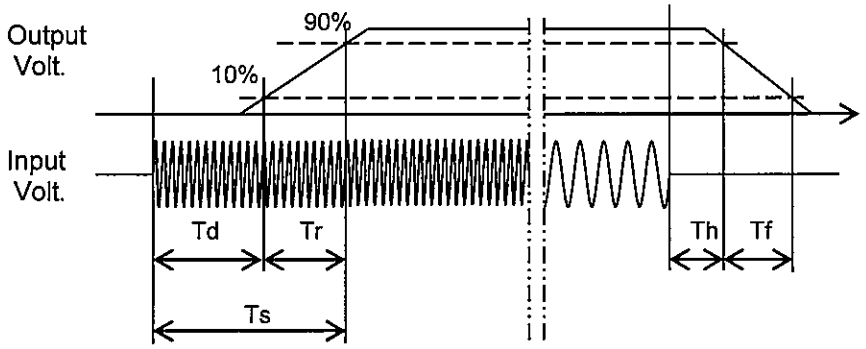
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	132.0	8.0	140.0	34.0	27.0
230 V	128.0	7.0	135.0	169.5	28.5



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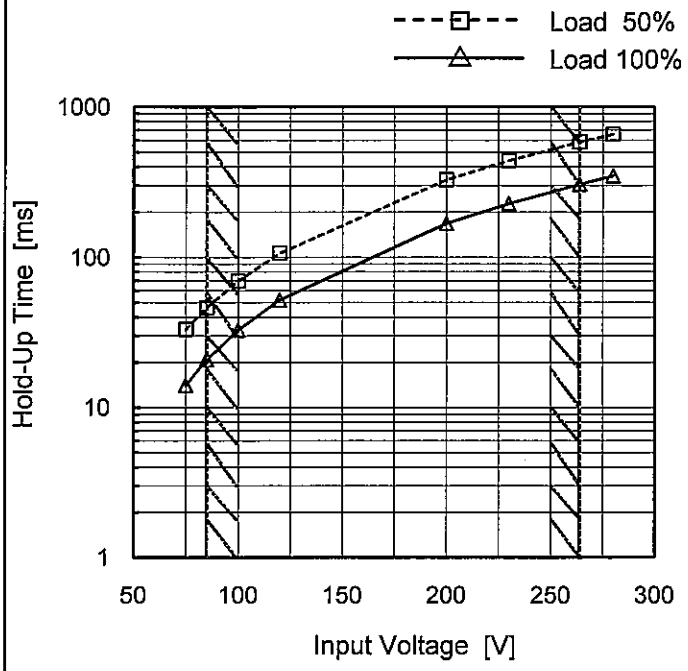
Model	PMA15F-3R3
Item	Hold-Up Time
Object	+3.3V3A

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	33	14
85	46	21
100	70	33
120	107	52
200	328	168
230	440	228
264	585	307
280	660	348
--	-	-

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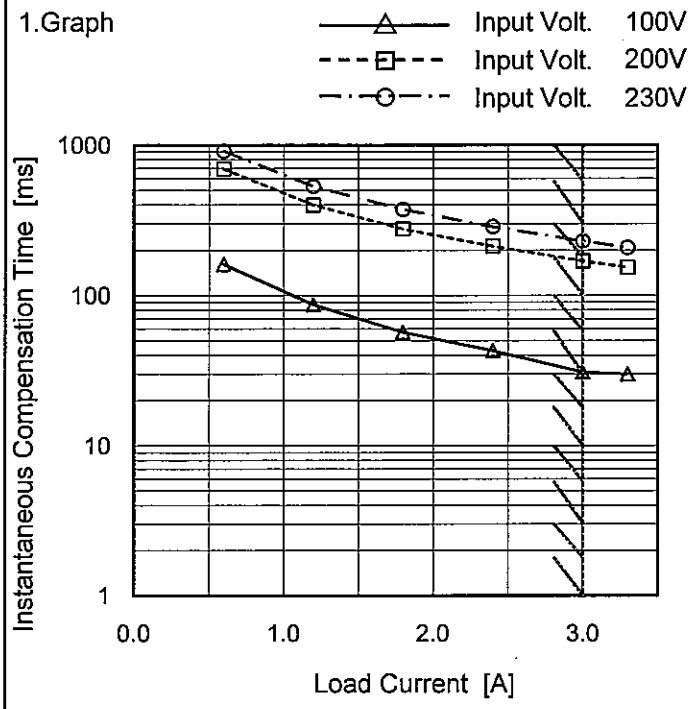
Model	PMA15F-3R3
Item	Instantaneous Interruption Compensation
Object	+3.3V3A

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]
0.0	-	-	-
0.6	162	694	913
1.2	87	400	532
1.8	57	278	374
2.4	43	213	287
3.0	31	170	230
3.3	30	154	209
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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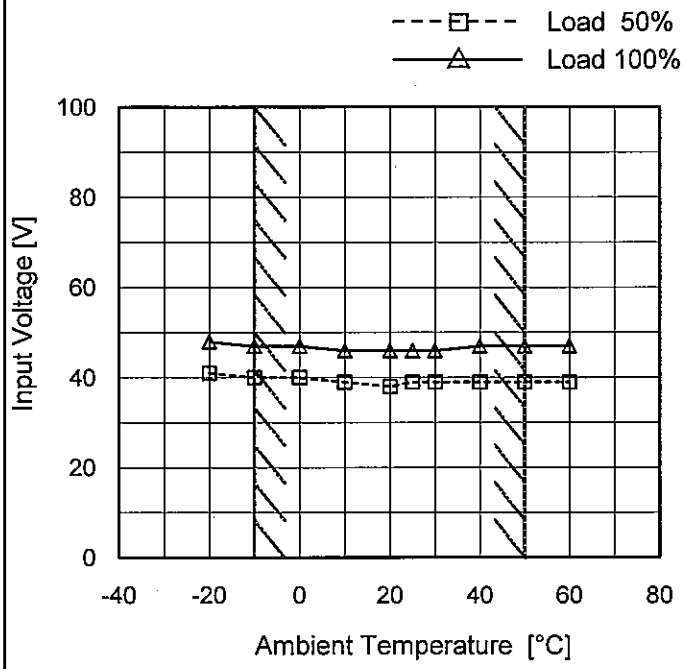
Model	PMA15F-3R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V3A

Testing Circuitry Figure A

1.Graph



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

2.Values

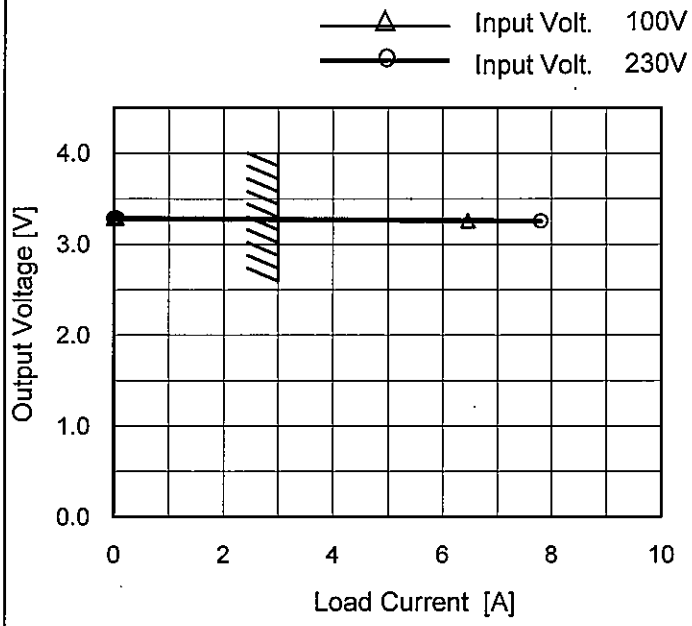
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	41	48
-10	40	47
0	40	47
10	39	46
20	38	46
25	39	46
30	39	46
40	39	47
50	39	47
60	39	47
--	-	-

COSEL

Model	PMA15F-3R3
Item	Overcurrent Protection
Object	+3.3V3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

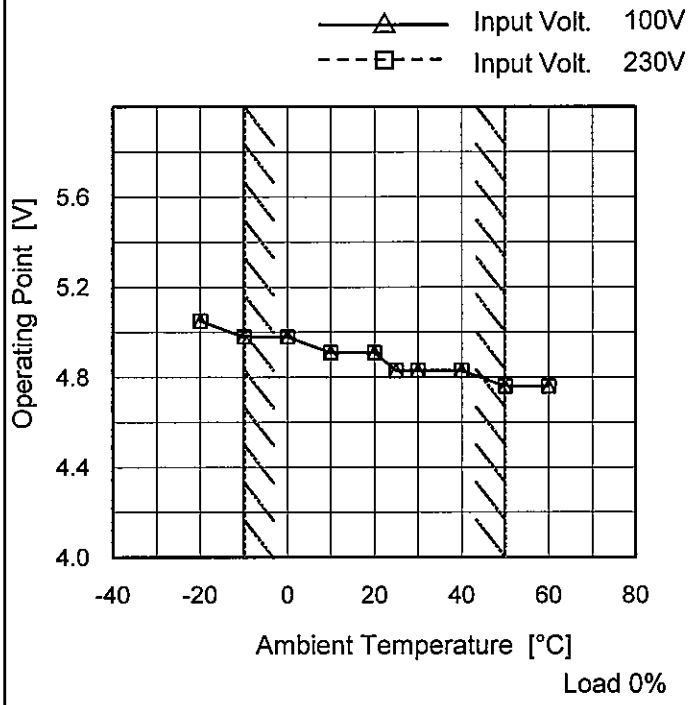
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
3.300	6.46	7.80
3.135	-	-
2.970	-	-
2.640	-	-
2.310	-	-
1.980	-	-
1.650	-	-
1.320	-	-
0.990	-	-
0.660	-	-
0.330	-	-
0.000	-	-

COSEL

Model	PMA15F-3R3
Item	Overvoltage Protection
Object	+3.3V3A

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	5.05	5.05
-10	4.98	4.98
0	4.98	4.98
10	4.91	4.91
20	4.91	4.91
25	4.83	4.83
30	4.83	4.83
40	4.83	4.83
50	4.76	4.76
60	4.76	4.76
--	-	-

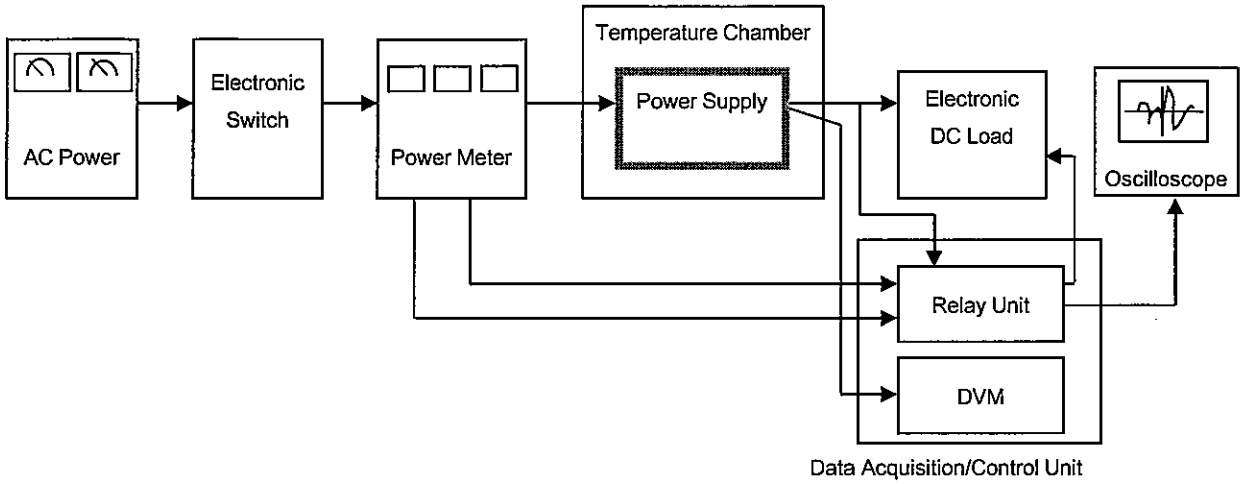


Figure A

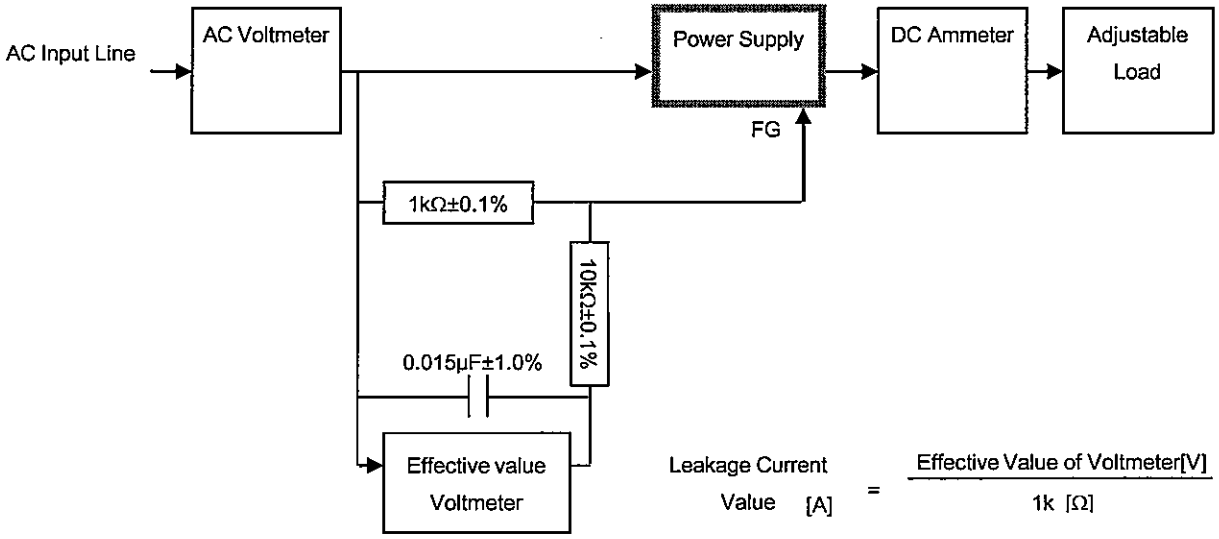


Figure B (IEC60601-1)