参考資料

COSEL

TEST DATA OF PBA50F-3R3

Regulated DC Power Supply
Apr.1. 2004

Approved by : Kuniaki Nagahara
Kuniaki Nagahara Design Manager

Prepared by : Koji Todo
Koji Todo Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

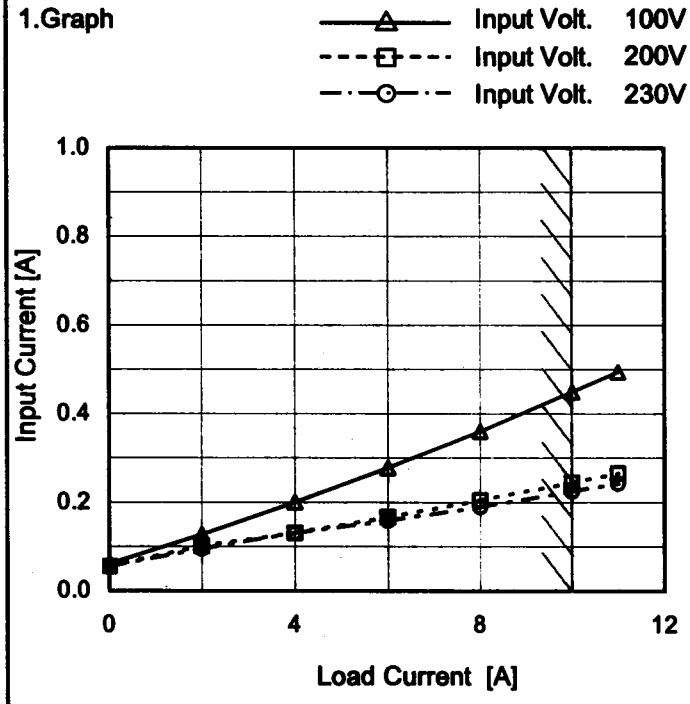
(Final Page 24)

COSEL

Model	PBA50F-3R3
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

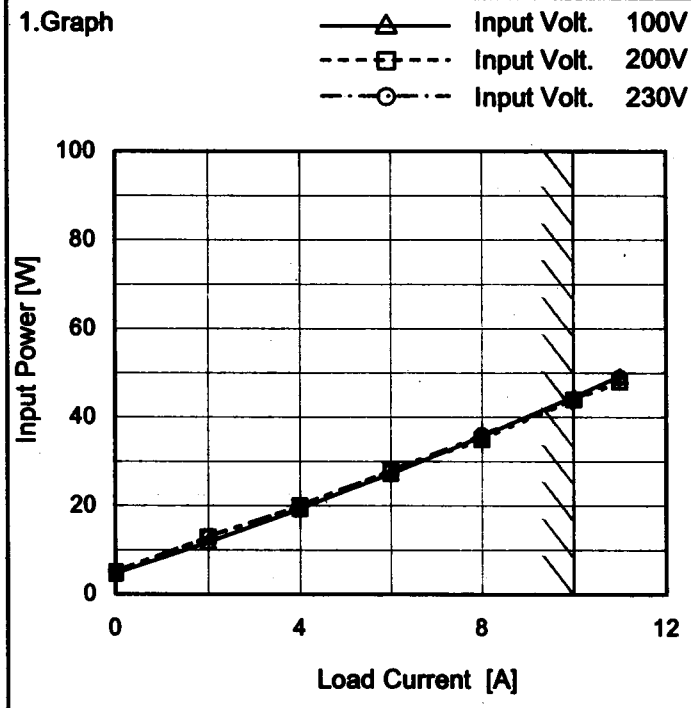
Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.061	0.055	0.055
2	0.127	0.101	0.095
4	0.200	0.131	0.131
6	0.278	0.167	0.159
8	0.361	0.205	0.190
10	0.449	0.245	0.225
11	0.494	0.266	0.243
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-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

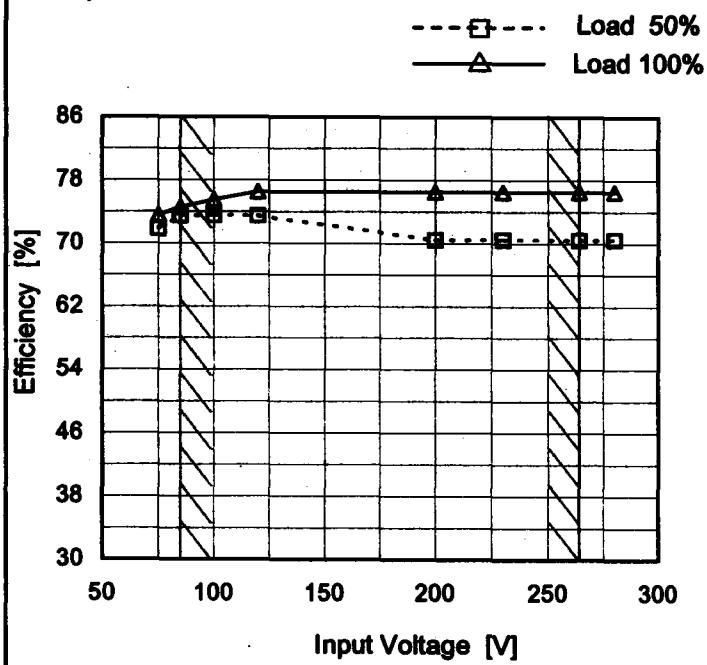
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	4.67	5.00	5.00
2	11.76	13.00	13.00
4	19.35	20.00	20.00
6	27.30	28.00	28.00
8	35.73	35.00	36.00
10	44.62	44.00	44.00
11	49.27	48.00	49.00
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	PBA50F-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

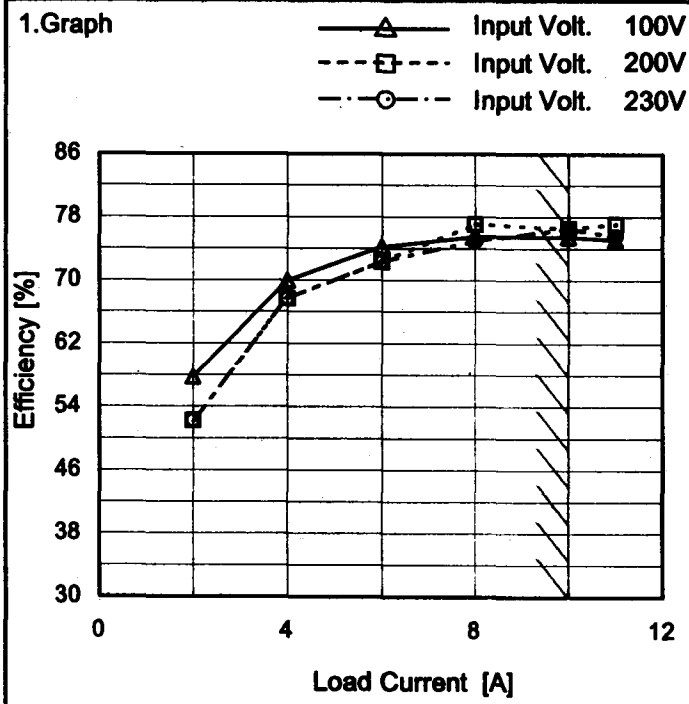
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	71.8	73.6
85	73.5	74.6
100	73.5	75.5
120	73.5	76.5
200	70.4	76.5
230	70.5	76.5
264	70.4	76.5
280	70.5	76.5
–	-	-

COSEL

Model	PBA50F-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

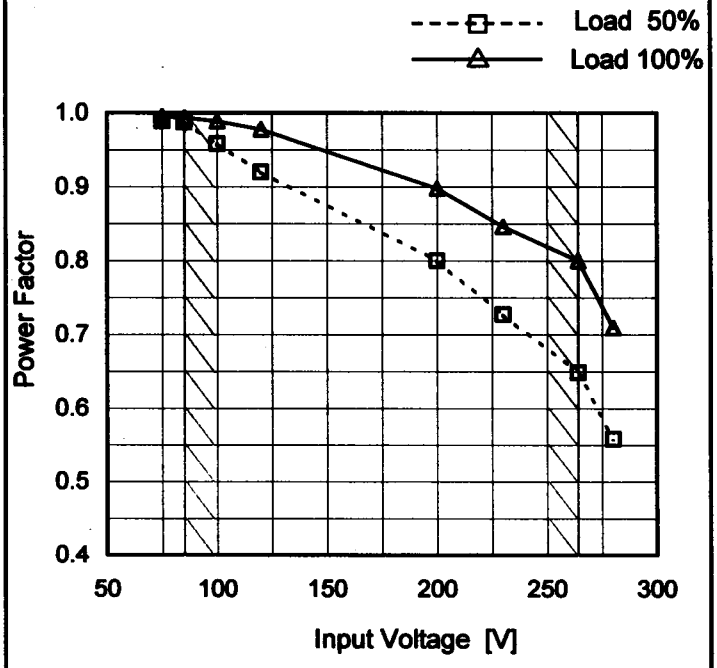
Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	-	-	-
2	57.7	52.2	52.2
4	70.0	67.7	67.7
6	74.2	72.4	72.4
8	75.5	77.1	75.0
10	75.5	76.6	76.5
11	75.1	77.1	75.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	PBA50F-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

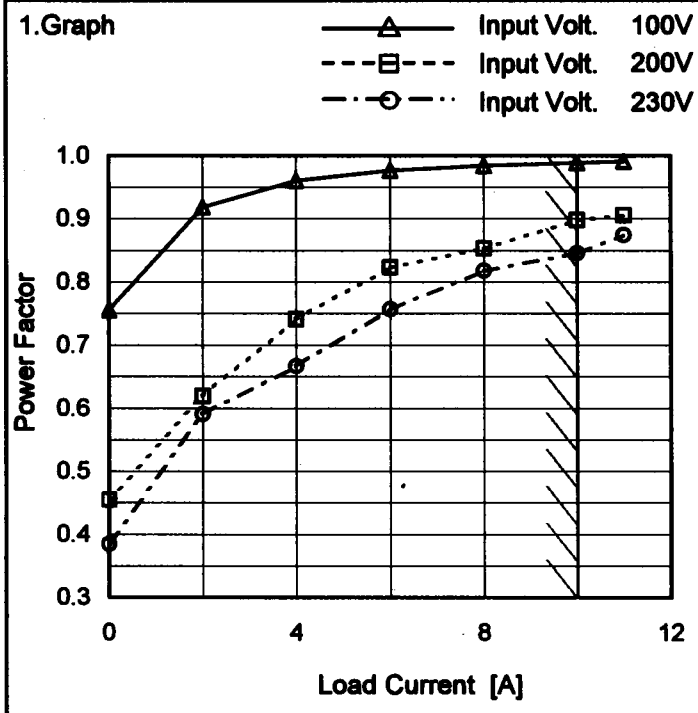
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.989	0.995
85	0.987	0.994
100	0.958	0.989
120	0.920	0.978
200	0.800	0.898
230	0.727	0.846
264	0.649	0.800
280	0.558	0.710
–	-	-

COSEL

Model	PBA50F-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.

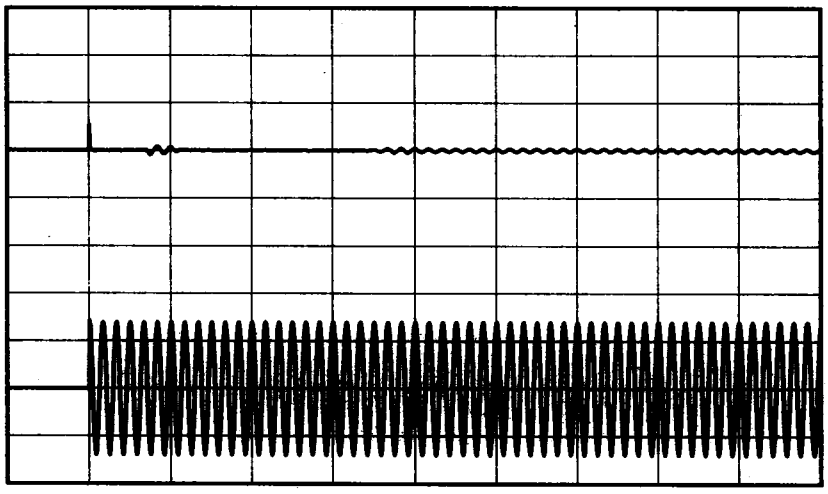
2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.756	0.455	0.385
2	0.919	0.619	0.591
4	0.961	0.741	0.667
6	0.976	0.824	0.757
8	0.984	0.854	0.818
10	0.988	0.898	0.846
11	0.991	0.906	0.875
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

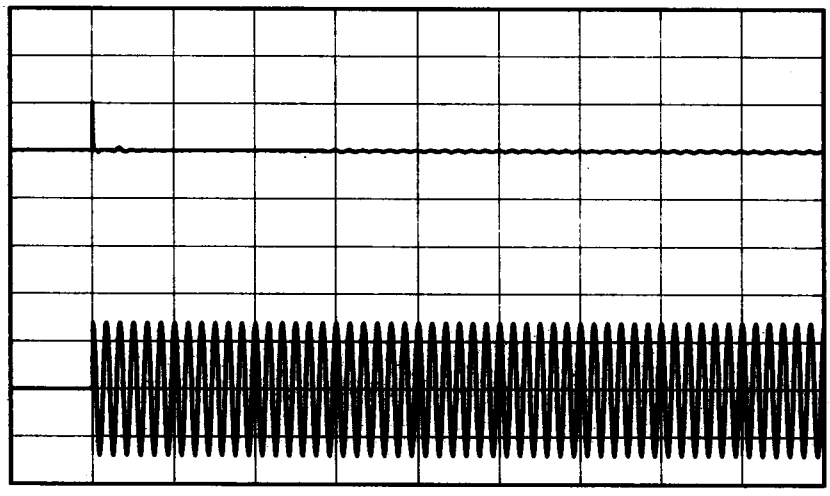
Model	PBA50F-3R3
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



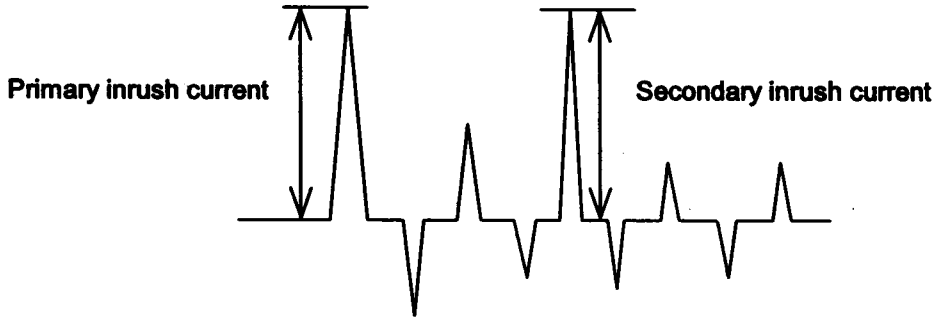
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
10.8 A
Secondary inrush current :
1.8 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
20.1 A
Secondary inrush current :
0.7 A



COSEL

Model	PBA50F-3R3	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	———————————	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	230 [V]	
DEN-AN	Both phases	0.18	0.30	0.34	Operation
	One of phase	0.22	0.48	0.55	stand by
IEC60950	Both phases	0.18	0.32	0.36	Operation
	One of phase	0.22	0.48	0.55	stand by

The value for "One phase" is the reference value only.

2.Condition

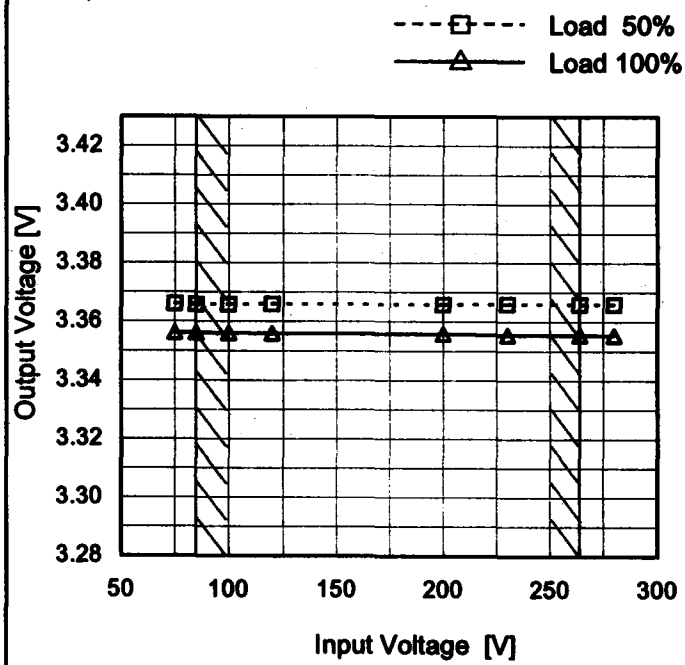
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	PBA50F-3R3
Item	Line Regulation
Object	+3.3V10A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

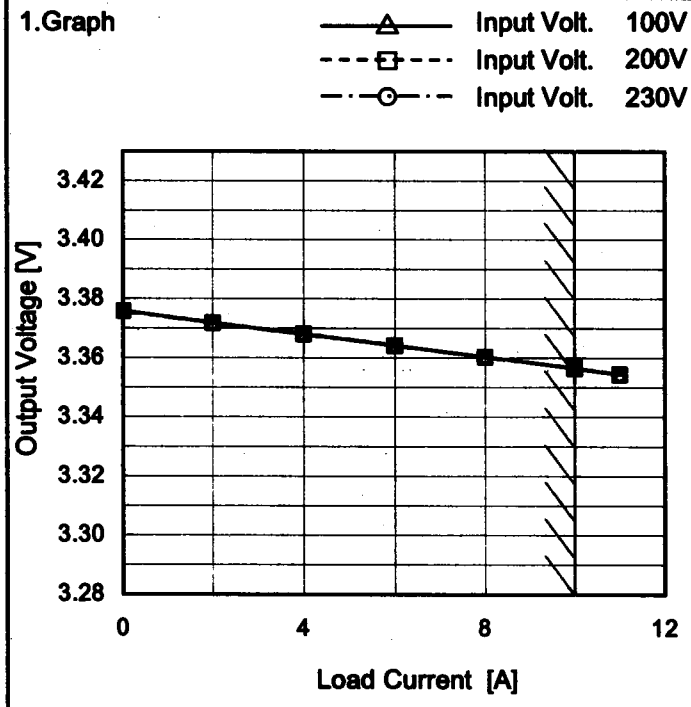
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	3.366	3.356
85	3.366	3.356
100	3.366	3.356
120	3.366	3.356
200	3.366	3.356
230	3.366	3.356
264	3.366	3.356
280	3.366	3.355
--	-	-

COSEL

Model	PBA50F-3R3
Item	Load Regulation
Object	+3.3V10A

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	3.376	3.376	3.376
2	3.372	3.372	3.372
4	3.368	3.368	3.368
6	3.364	3.364	3.364
8	3.360	3.360	3.360
10	3.357	3.357	3.357
11	3.355	3.355	3.355
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

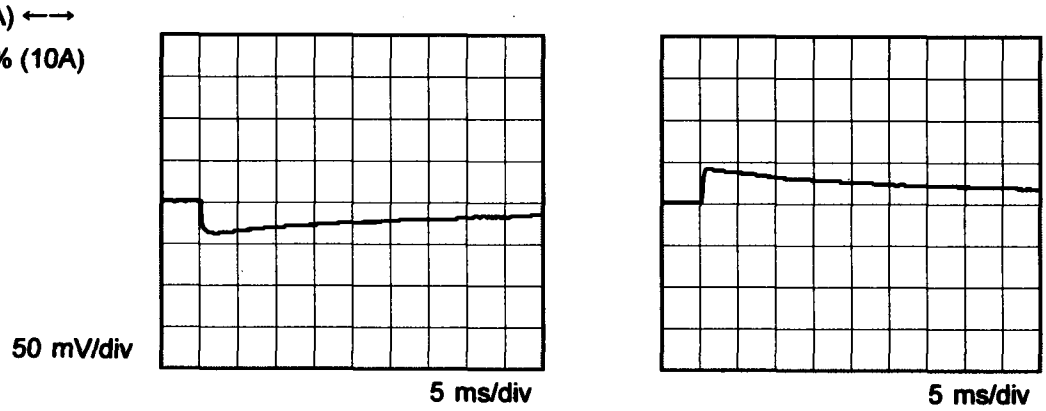
COSEL

Model	PBA50F-3R3		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+3.3V10A		

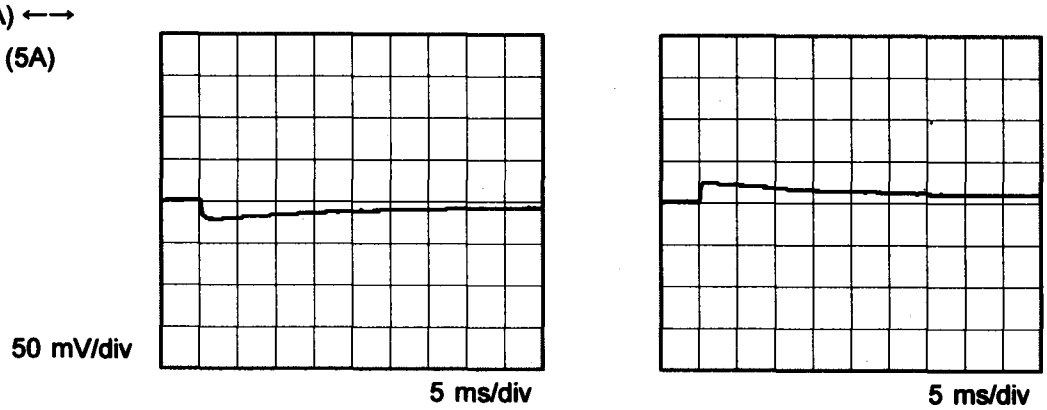
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ⟷
Load 100% (10A)



Min. Load (0A) ⟷
Load 50% (5A)



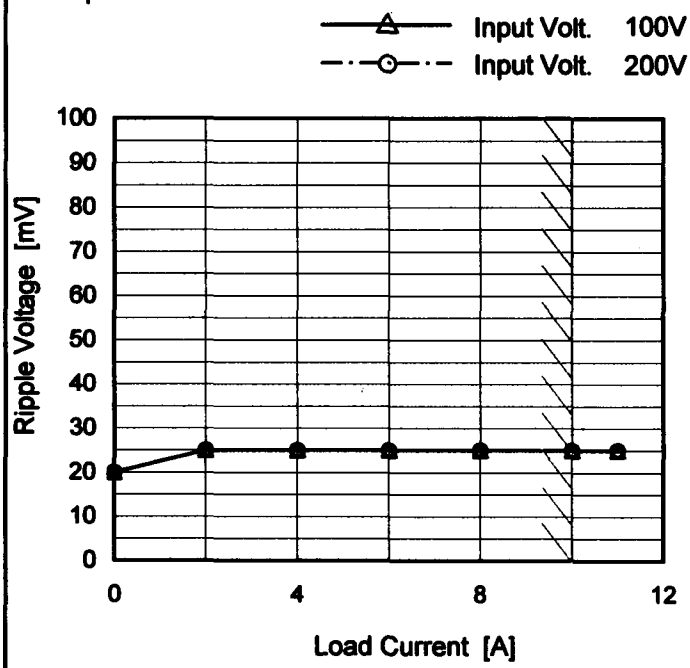
* The characteristic of AC200V is equal.

COSEL

Model	PBA50F-3R3
Item	Ripple Voltage (by Load Current)
Object	+3.3V10A

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

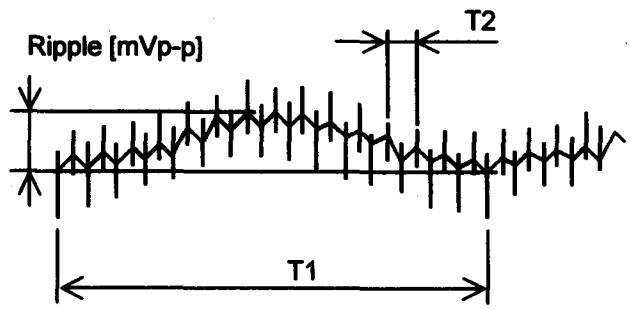


Fig. Complex Ripple Wave Form

2.Values

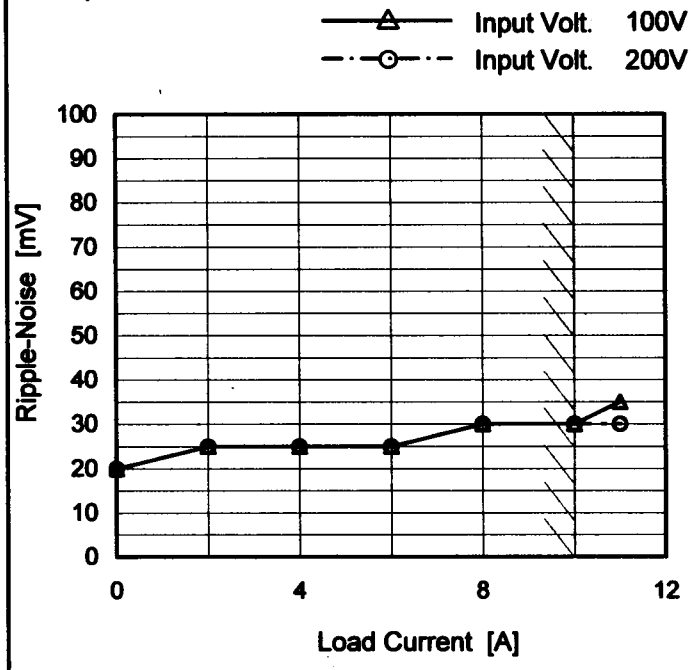
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0	20	20
2	25	25
4	25	25
6	25	25
8	25	25
10	25	25
11	25	25
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	PBA50F-3R3
Item	Ripple-Noise
Object	+3.3V10A

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.

2.Values

Load Current [A]	Ripple-Noise [mV] Input Volt. 100 [V]	Ripple-Noise [mV] Input Volt. 200 [V]
0	20	20
2	25	25
4	25	25
6	25	25
8	30	30
10	30	30
11	35	30
–	-	-
–	-	-
–	-	-
–	-	-

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

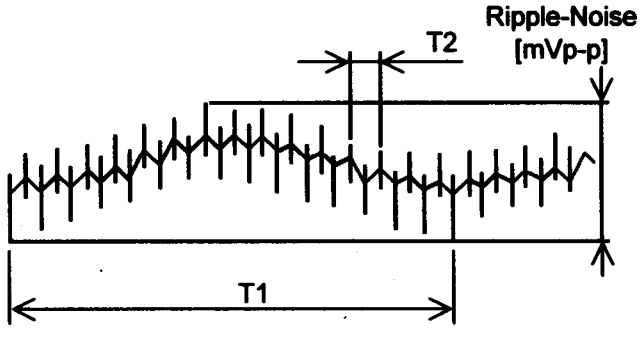


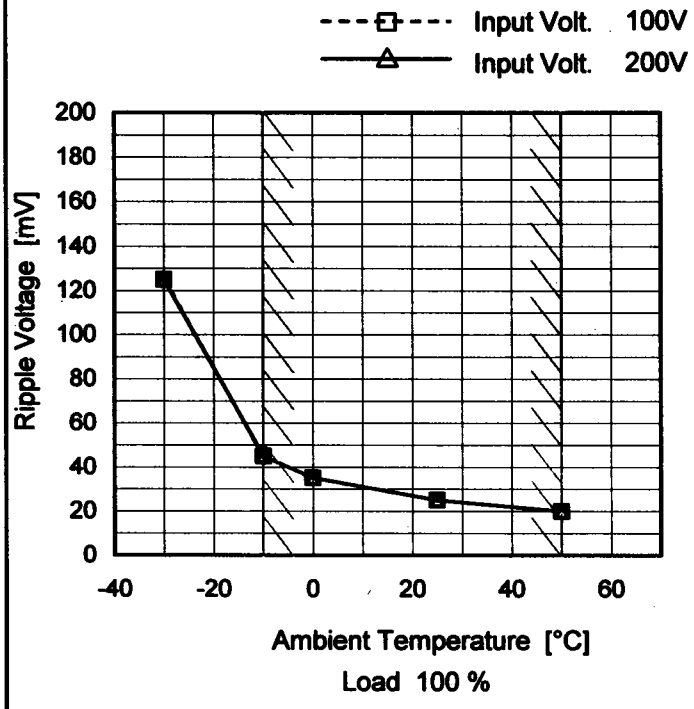
Fig. Complex Ripple Wave Form

COSEL

Model	PBA50F-3R3
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V10A

Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

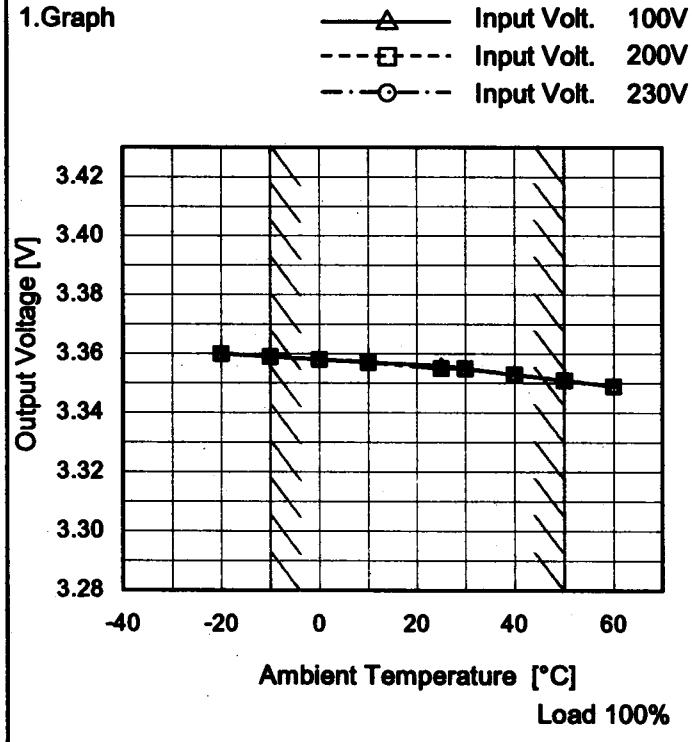
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	125	125
-10	45	45
0	35	35
25	25	25
50	20	20
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	PBA50F-3R3
Item	Ambient Temperature Drift
Object	+3.3V10A

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	3.360	3.360	3.360
-10	3.359	3.359	3.359
0	3.358	3.358	3.358
10	3.357	3.357	3.357
25	3.356	3.355	3.355
30	3.355	3.355	3.355
40	3.353	3.353	3.353
50	3.351	3.351	3.351
60	3.349	3.349	3.349
--	-	-	-
--	-	-	-

COSEL

Model	PBA50F-3R3	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+3.3V10A	

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 - 10A

* 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

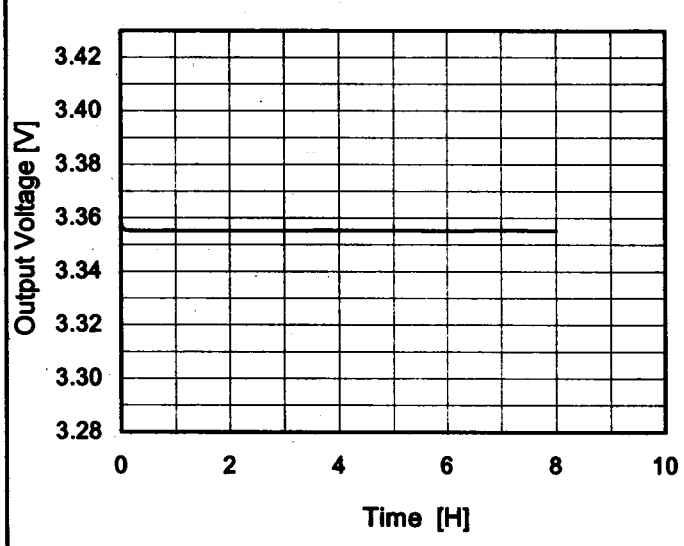
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	264	0	3.377	±13	±0.4
Minimum Voltage	50	264	10	3.351		

COSEL

Model	PBA50F-3R3
Item	Time Lapse Drift
Object	+3.3V10A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

2.Values

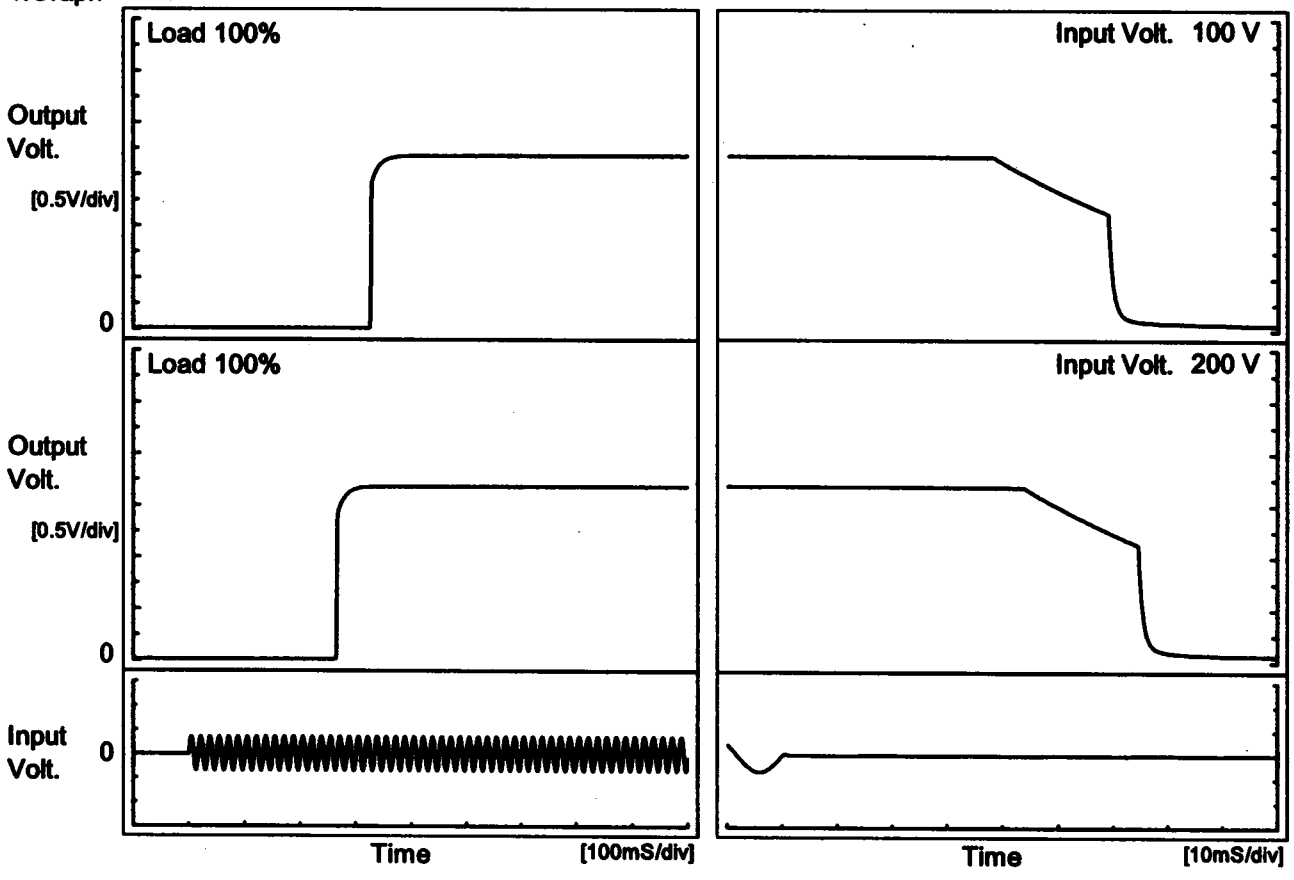
Time since start [H]	Output Voltage [V]
0.0	3.358
0.5	3.355
1.0	3.355
2.0	3.355
3.0	3.355
4.0	3.355
5.0	3.355
6.0	3.355
7.0	3.355
8.0	3.355

COSEL

Model	PBA50F-3R3
Item	Rise and Fall Time
Object	+3.3V10A

Temperature 25°C
Testing Circuitry Figure A

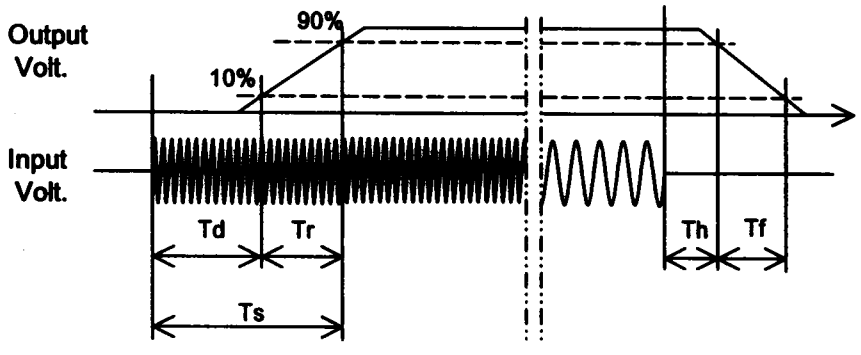
1.Graph



2.Values

[mS]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	326.5	7.5	334.0	44.2	17.1
200 V	265.0	8.0	273.0	49.8	17.1

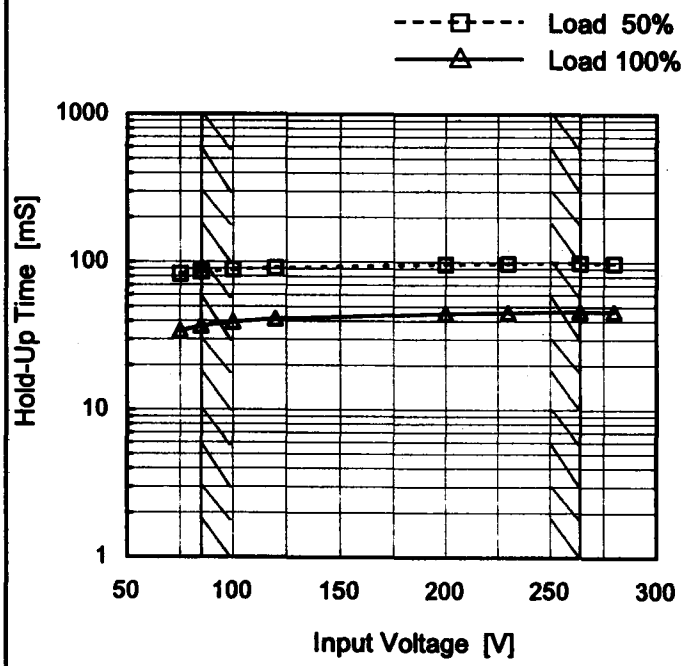


COSEL

Model	PBA50F-3R3
Item	Hold-Up Time
Object	+3.3V10A

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

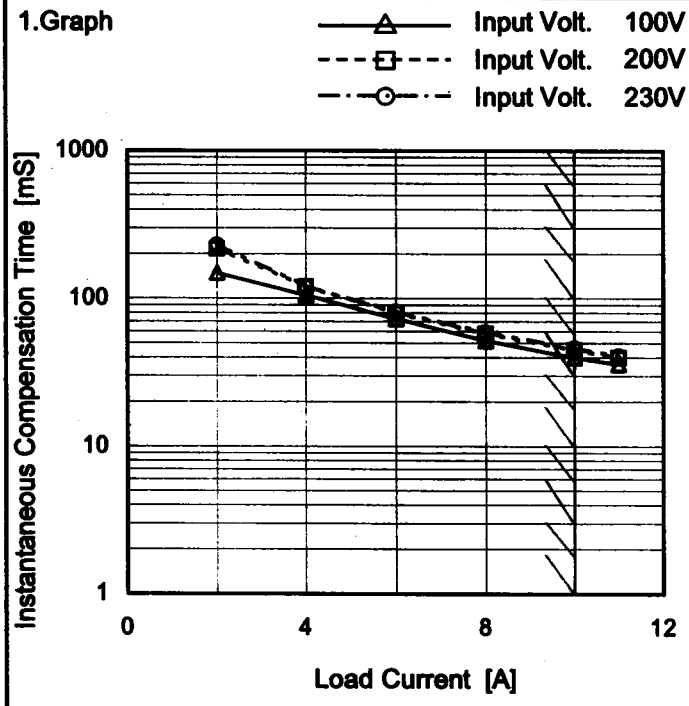
Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	83	34
85	86	37
100	89	39
120	91	41
200	97	45
230	98	46
264	99	47
280	98	46
–	-	-

COSEL

Model	PBA50F-3R3
Item	Instantaneous Interruption Compensation
Object	+3.3V10A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

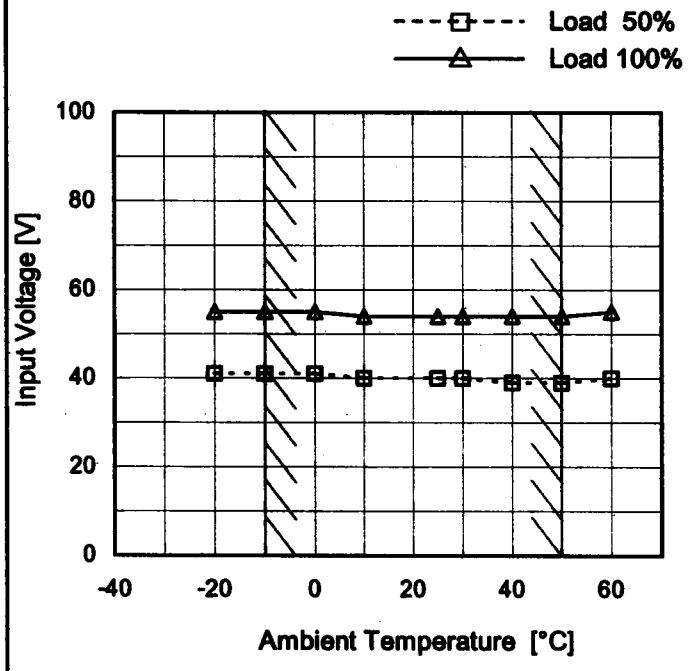
Load Current [A]	Time [mS]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	-	-	-
2	149	217	230
4	105	120	121
6	73	80	81
8	52	58	59
10	40	45	46
11	36	40	41
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-3R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V10A

Testing Circuitry Figure A

1.Graph



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

2.Values

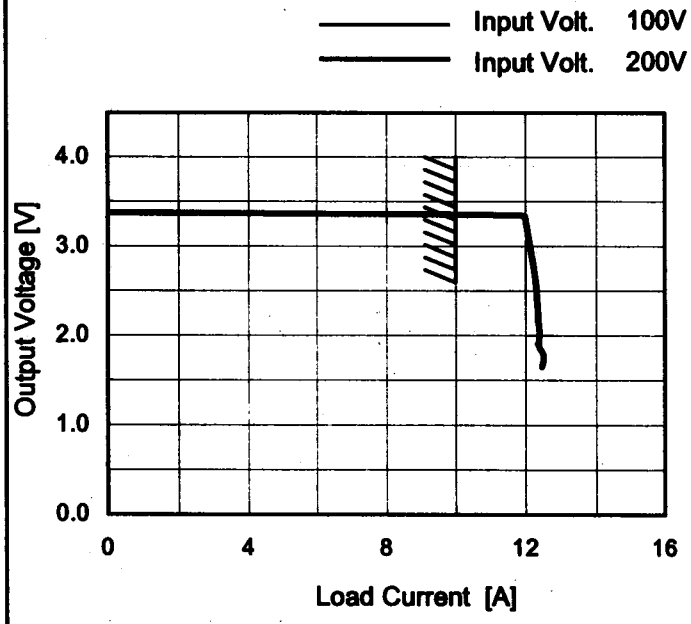
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	41	55
-10	41	55
0	41	55
10	40	54
25	40	54
30	40	54
40	39	54
50	39	54
60	40	55
--	-	-
--	-	-

COSEL

Model	PBA50F-3R3
Item	Overcurrent Protection
Object	+3.3V10A

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 1.65V to 0V.

2.Values

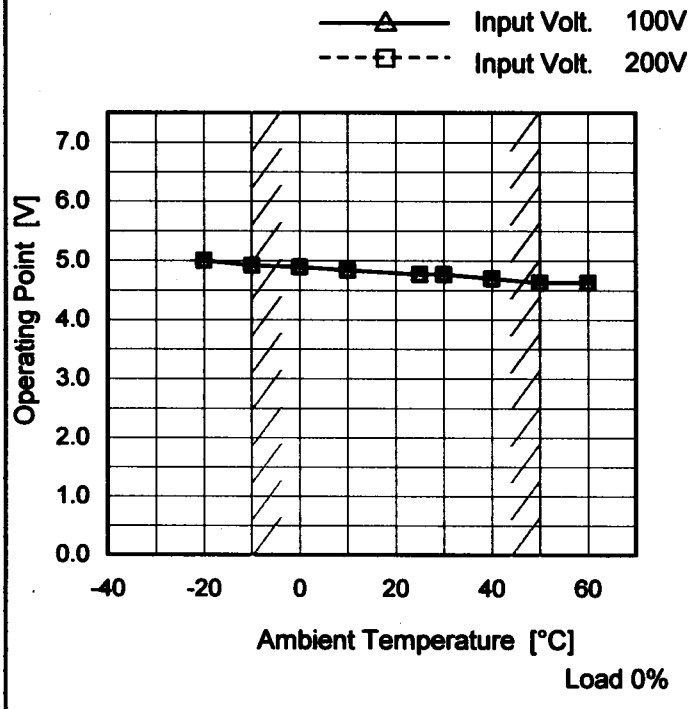
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
3.300	10.97	10.97
3.135	12.05	12.09
2.970	12.15	12.16
2.640	12.28	12.27
2.310	12.35	12.34
1.980	12.41	12.38
1.650	12.48	12.45
—	-	-
—	-	-
—	-	-
—	-	-
—	-	-

COSEL

Model	PBA50F-3R3
Item	Overvoltage Protection
Object	+3.3V10A

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. 200[V]
-20	4.99	4.99
-10	4.91	4.91
0	4.88	4.88
10	4.83	4.83
25	4.76	4.76
30	4.76	4.76
40	4.69	4.69
50	4.62	4.62
60	4.62	4.62
–	-	-
–	-	-

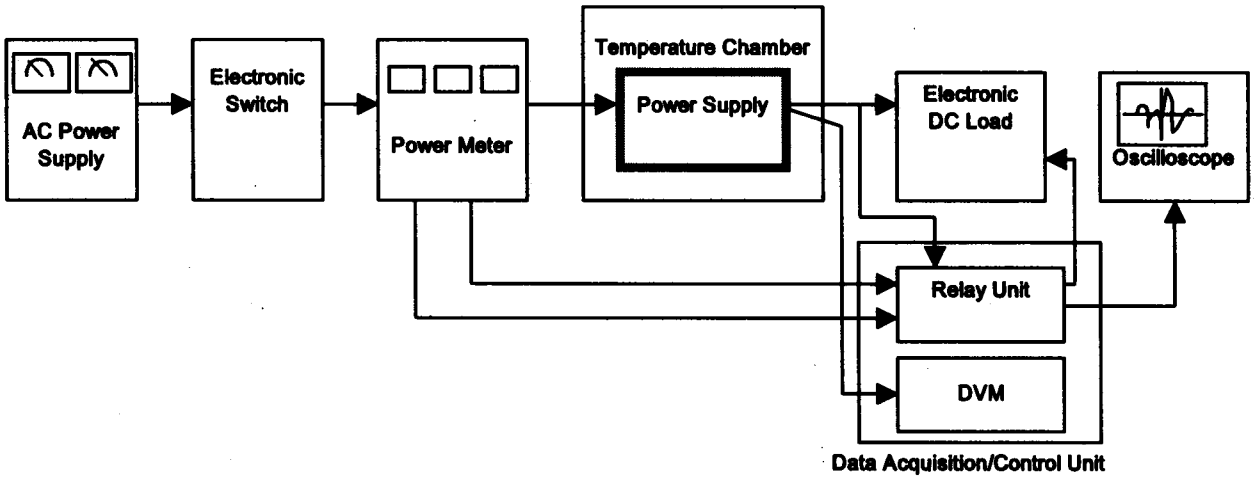


Figure A

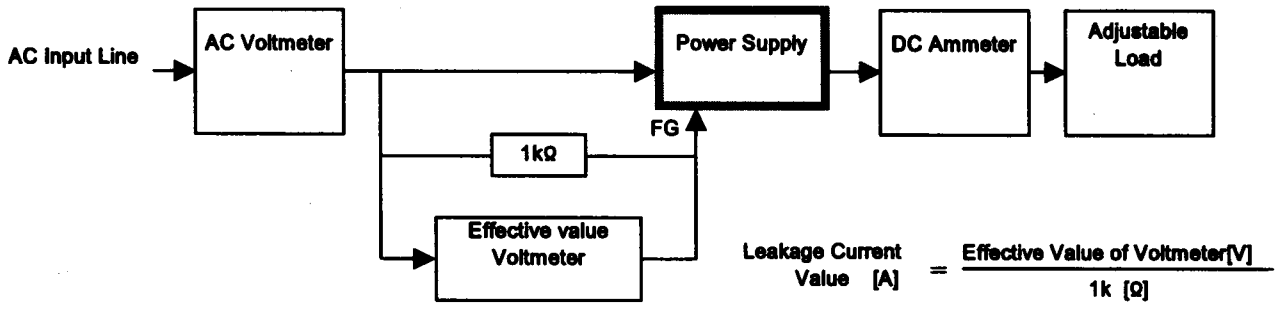


Figure B (DEN-AN)

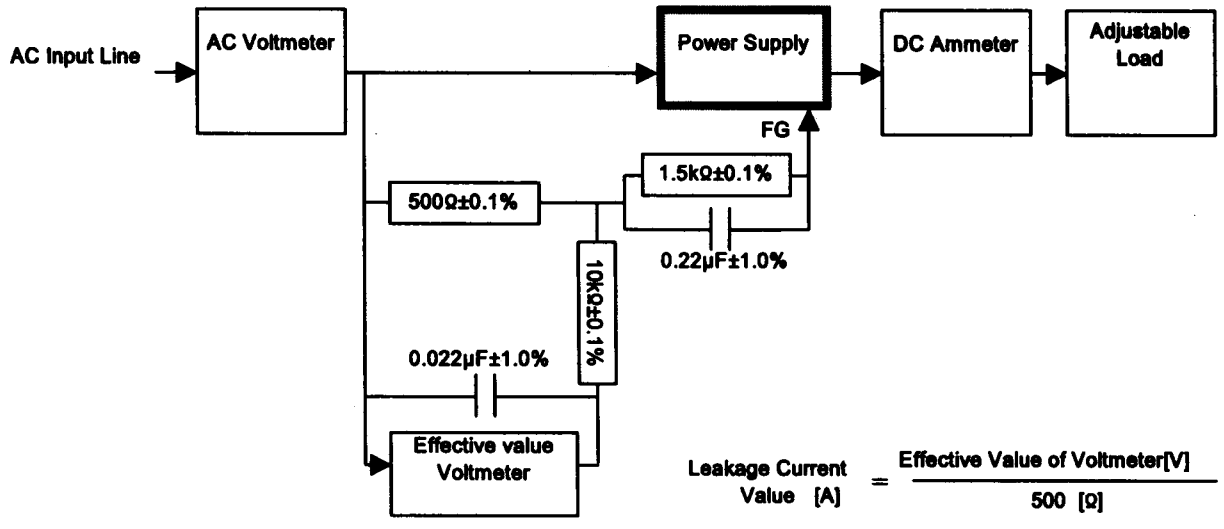


Figure B (IEC60950)