参考資料

COSEL

TEST DATA OF PBA50F-15

Regulated DC Power Supply
Apr.7. 2004

Approved by : Kuniaki Nagahara
Kuniaki Nagahara Design Manager

Prepared by : Koji Todo
Koji Todo Design Engineer

COSEL CO.,LTD.

COSEL

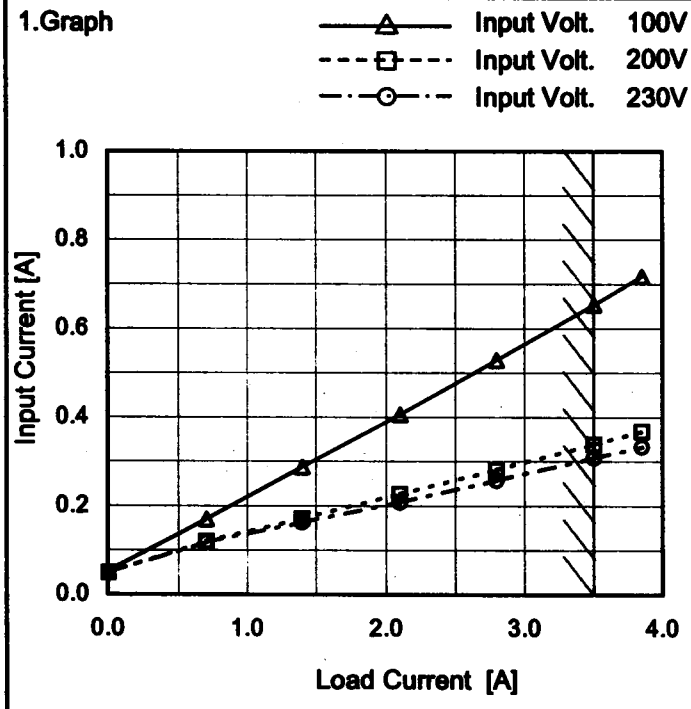
CONTENTS

COSEL

Model	PBA50F-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. 200[V]	Input Volt. 230[V]
0.00	0.052	0.049	0.049
0.70	0.170	0.120	0.118
1.40	0.287	0.172	0.163
2.10	0.406	0.227	0.208
2.80	0.529	0.282	0.258
3.50	0.654	0.339	0.308
3.85	0.717	0.369	0.333
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

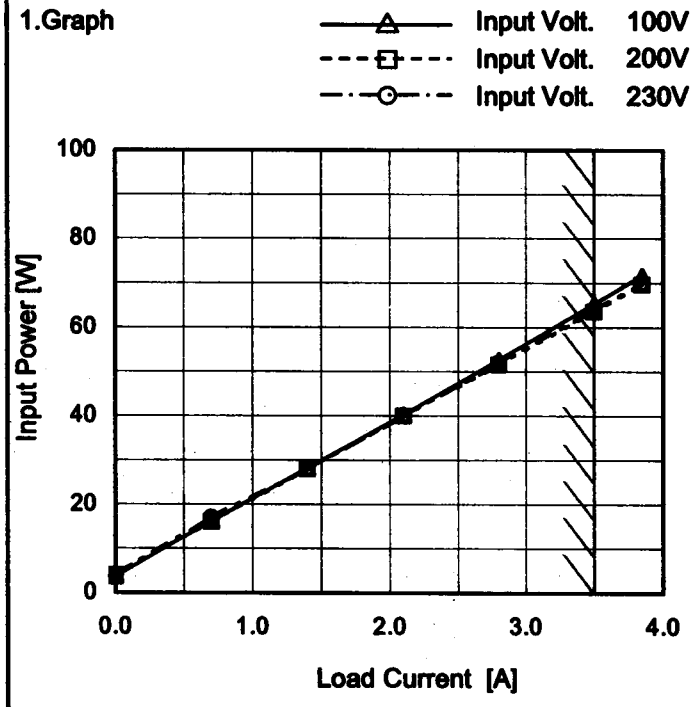
BC-3553

COSEL

Model	PBA50F-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

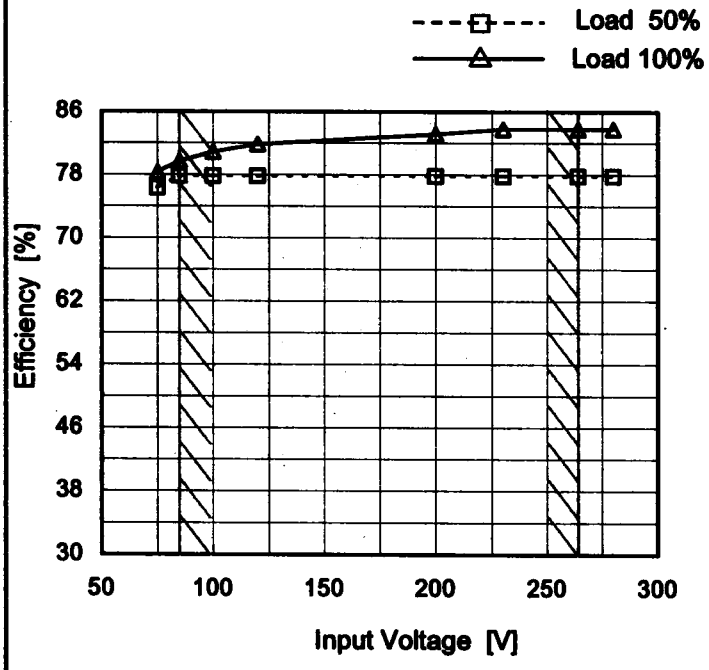
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	3.69	4.00	4.00
0.70	16.17	16.00	17.00
1.40	28.22	28.00	28.00
2.10	40.29	40.00	40.00
2.80	52.64	51.60	52.00
3.50	65.30	63.60	64.00
3.85	71.69	69.70	70.00
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

COSEL

Model	PBA50F-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

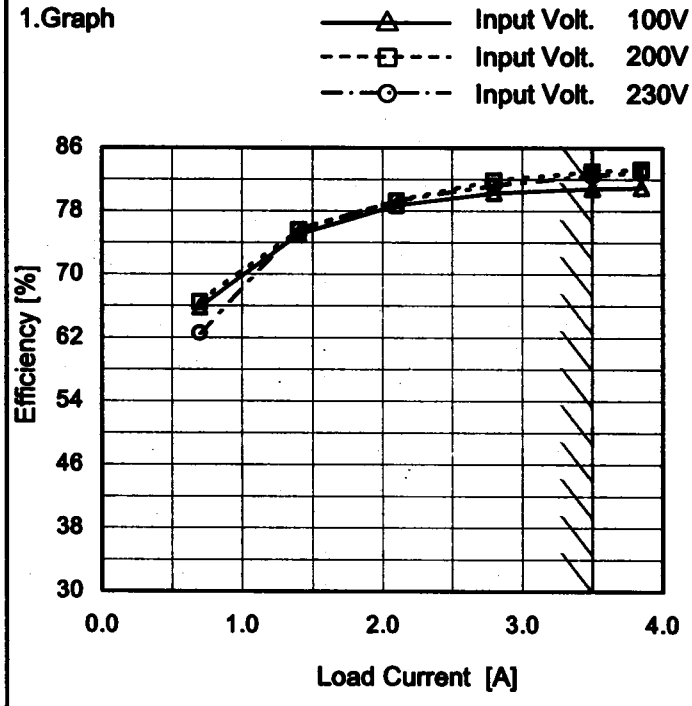
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	76.3	78.3
85	77.8	79.7
100	77.8	80.9
120	77.8	81.9
200	77.8	83.1
230	77.8	83.8
264	77.8	83.8
280	77.8	83.8
–	-	-

COSEL

Model	PBA50F-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

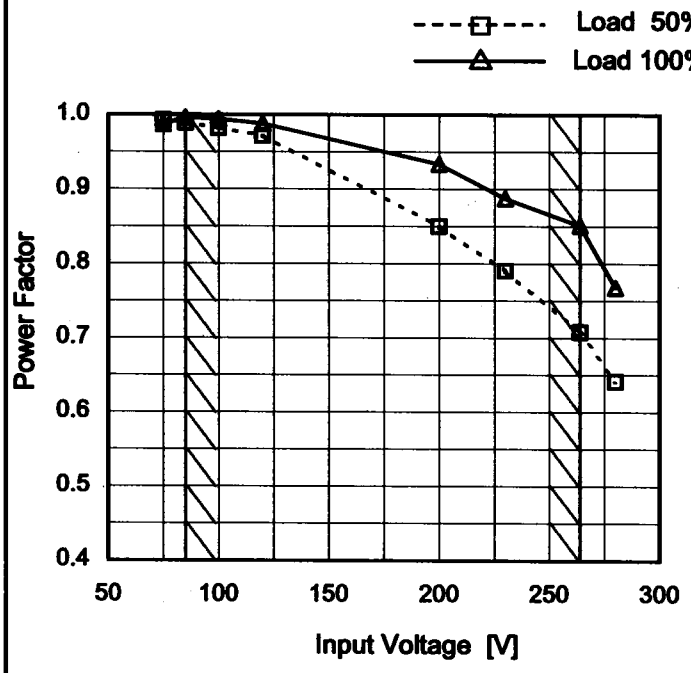
Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.70	65.8	66.5	62.6
1.40	75.1	75.6	75.7
2.10	78.7	79.3	79.3
2.80	80.3	81.9	81.3
3.50	80.9	83.0	82.5
3.85	81.0	83.3	82.9
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-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

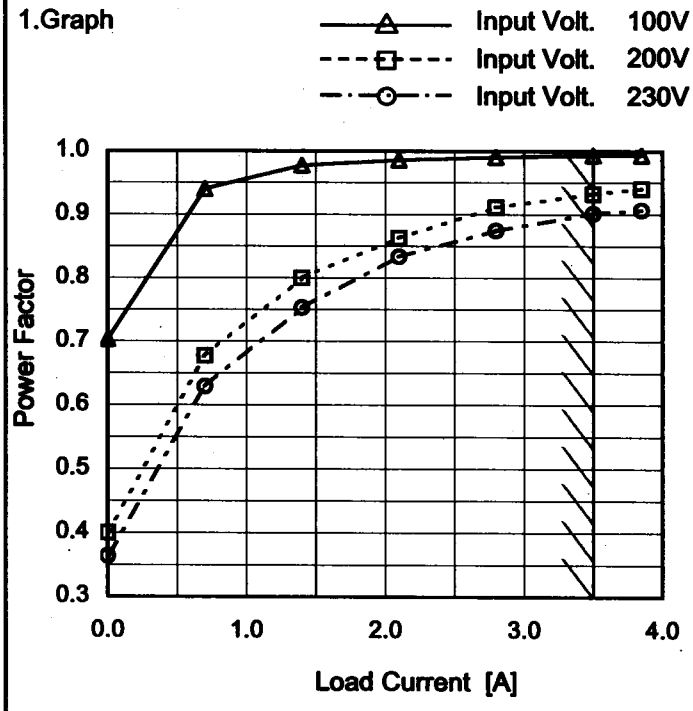
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.993	0.987
85	0.989	0.996
100	0.982	0.994
120	0.971	0.988
200	0.850	0.934
230	0.791	0.887
264	0.708	0.851
280	0.642	0.768
--	-	-

COSEL

Model	PBA50F-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.

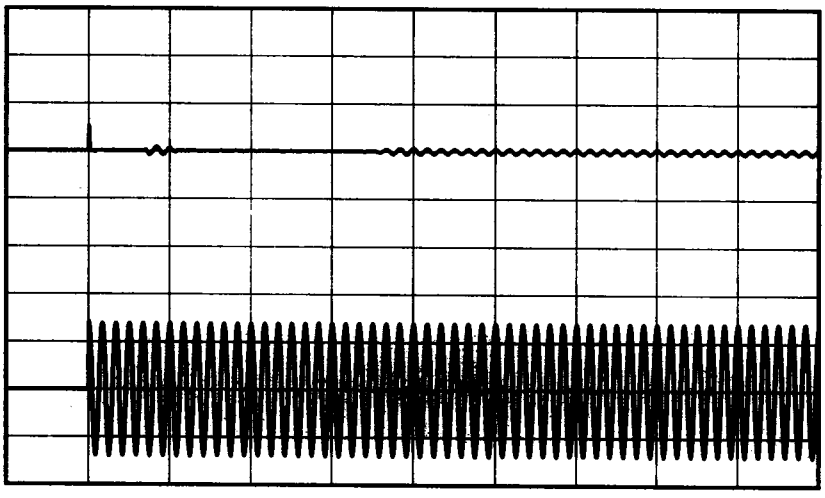
2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.703	0.400	0.364
0.70	0.940	0.677	0.630
1.40	0.977	0.800	0.753
2.10	0.986	0.863	0.833
2.80	0.991	0.912	0.875
3.50	0.993	0.933	0.901
3.85	0.994	0.941	0.907
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

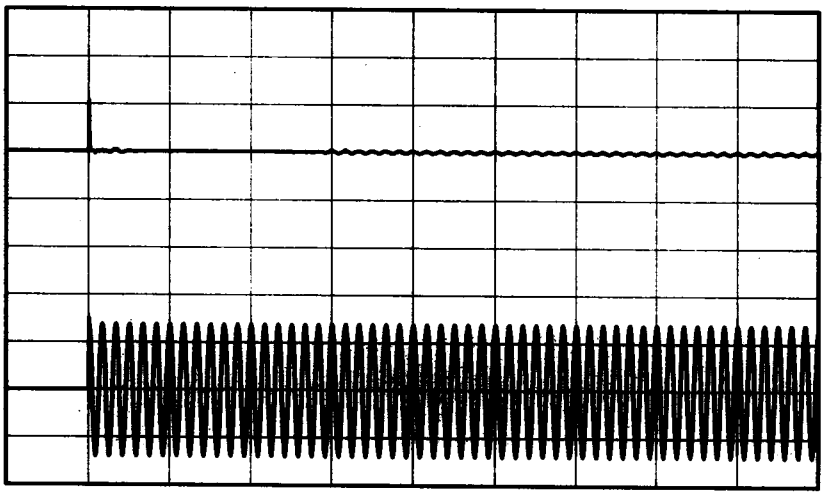
Model	PBA50F-15
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



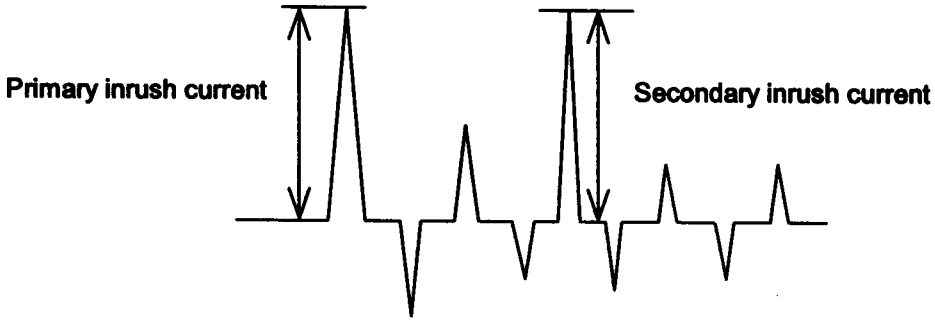
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
10.4 A
Secondary inrush current :
1.7 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
21.3 A
Secondary inrush current :
0.9 A



COSEL

Model	PBA50F-15	
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

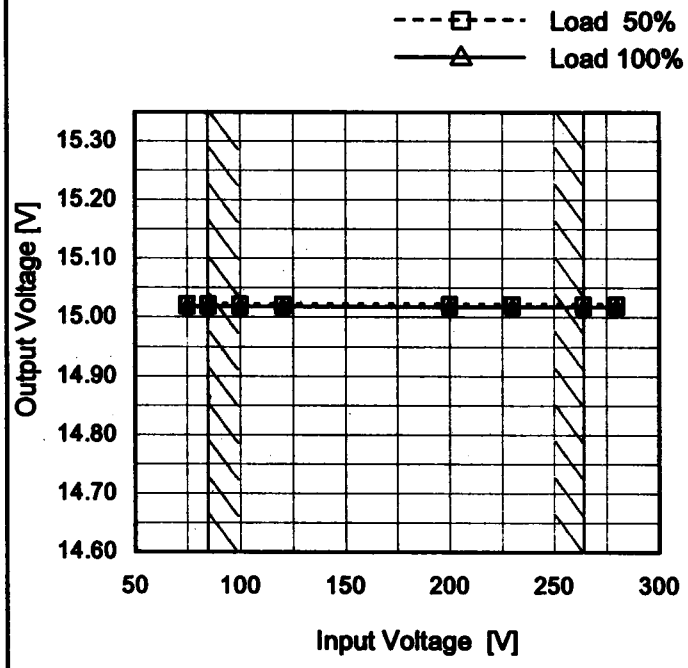
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	PBA50F-15
Item	Line Regulation
Object	+15V3.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

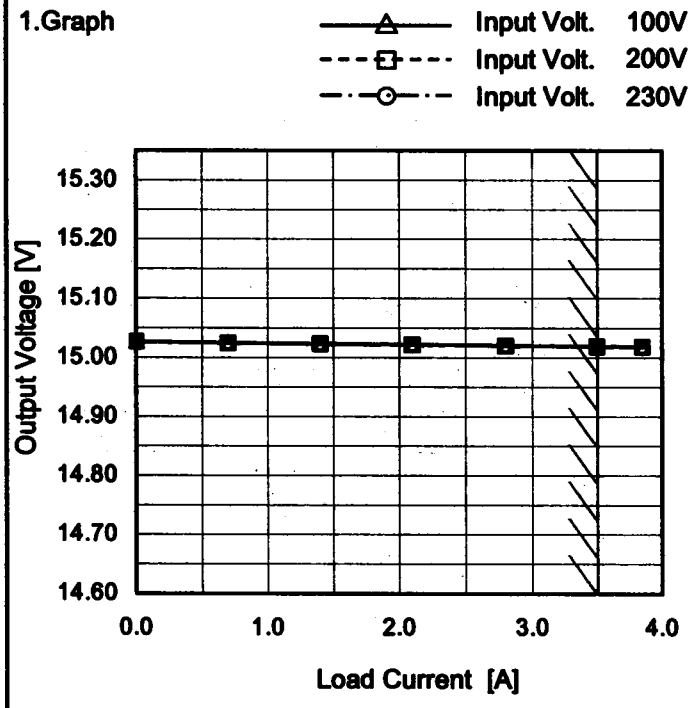
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	15.023	15.018
85	15.022	15.018
100	15.022	15.018
120	15.022	15.018
200	15.022	15.018
230	15.022	15.018
264	15.022	15.018
280	15.022	15.018
–	-	-

COSEL

Model	PBA50F-15
Item	Load Regulation
Object	+15V3.5A

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	15.028	15.027	15.027
0.70	15.025	15.025	15.024
1.40	15.024	15.023	15.023
2.10	15.022	15.022	15.022
2.80	15.021	15.020	15.020
3.50	15.019	15.019	15.019
3.85	15.019	15.019	15.018
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

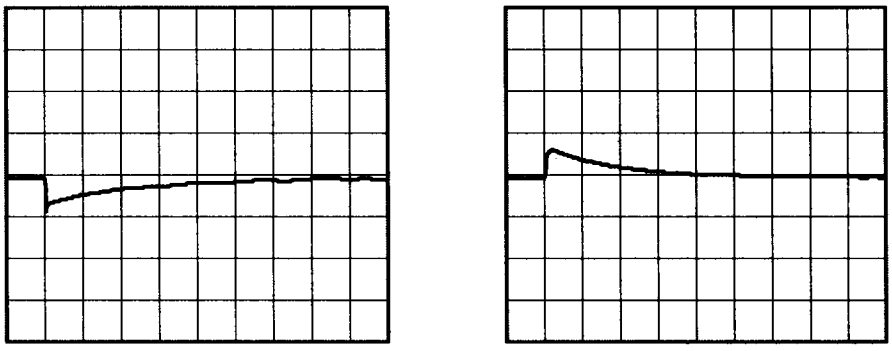
COSEL

Model	PBA50F-15		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+15V3.5A		

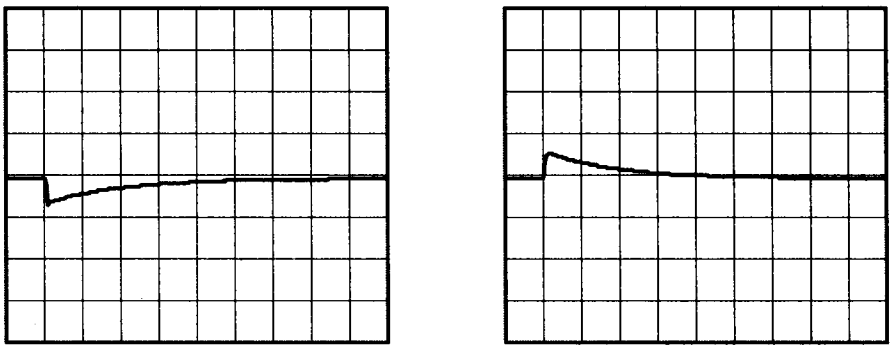
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ⟷
Load 100% (3.5A)



Min. Load (0A) ⟷
Load 50% (1.75A)



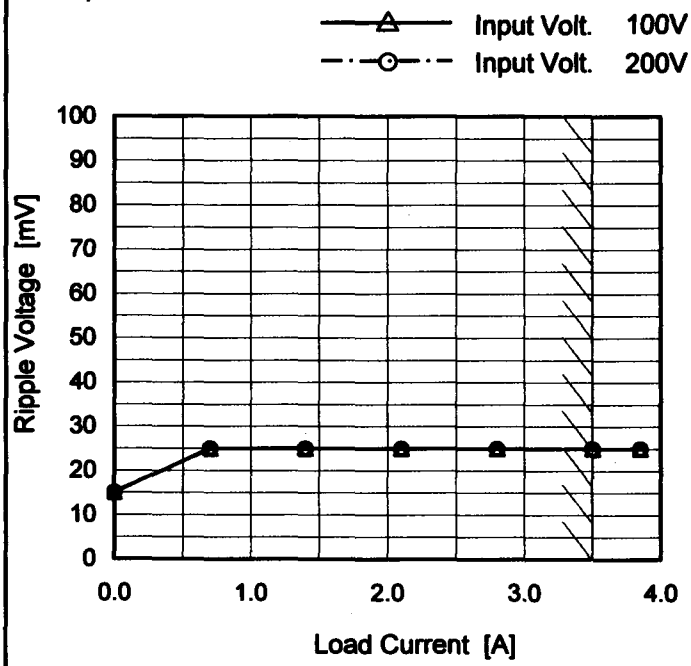
* The characteristic of AC200V is equal.

COSEL

Model	PBA50F-15
Item	Ripple Voltage (by Load Current)
Object	+15V3.5A

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

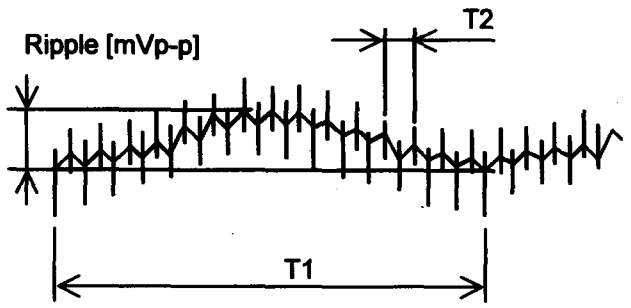


Fig. Complex Ripple Wave Form

2.Values

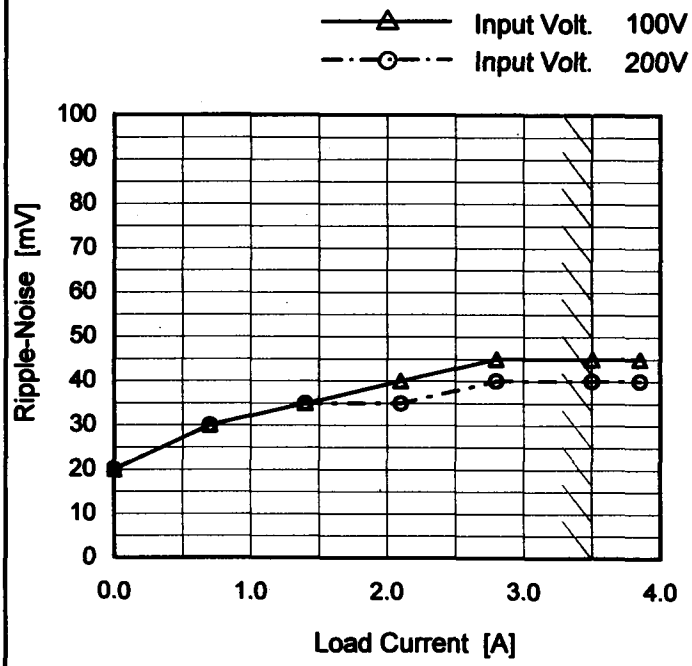
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	15	15
0.70	25	25
1.40	25	25
2.10	25	25
2.80	25	25
3.50	25	25
3.85	25	25
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	PBA50F-15
Item	Ripple-Noise
Object	+15V3.5A

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]	Input Volt. 200 [V]
0.00	20	20
0.70	30	30
1.40	35	35
2.10	40	35
2.80	45	40
3.50	45	40
3.85	45	40
–	-	-
–	-	-
–	-	-
–	-	-

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

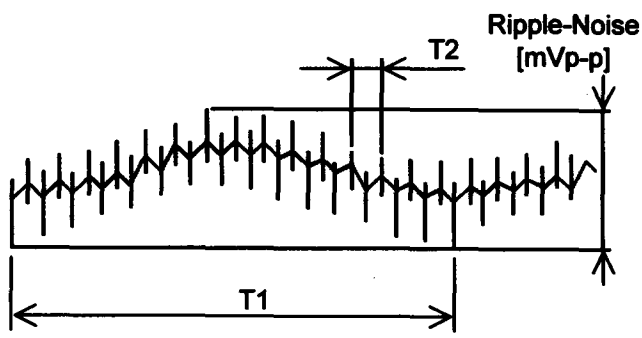


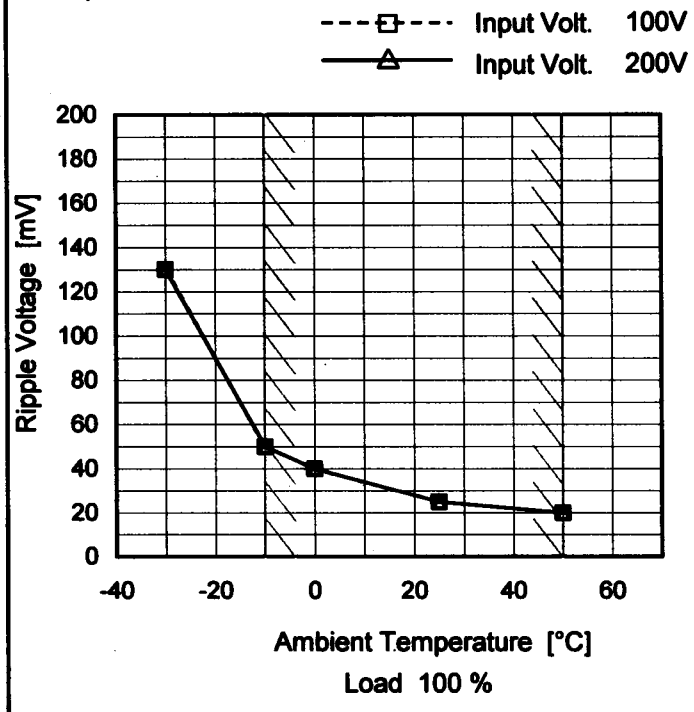
Fig. Complex Ripple Wave Form

COSEL

Model	PBA50F-15
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V3.5A

Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

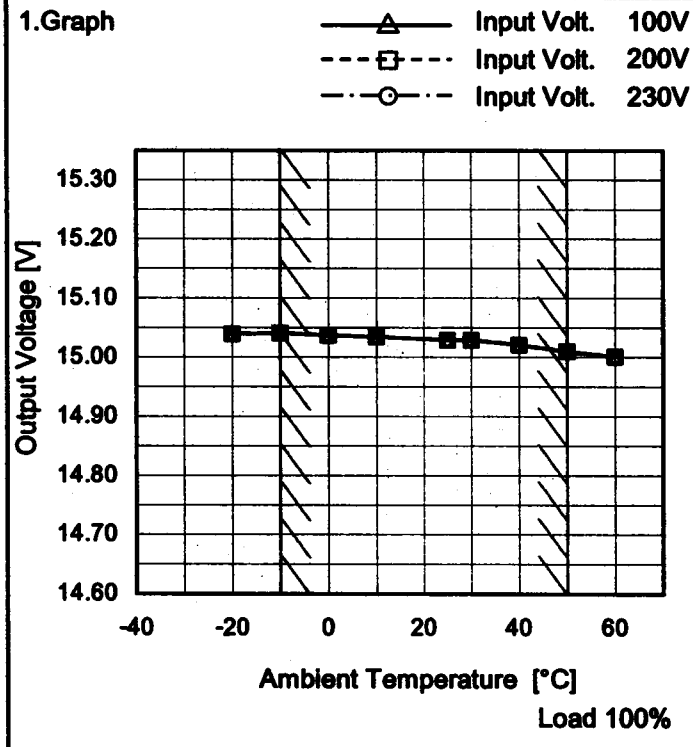
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	130	130
-10	50	50
0	40	40
25	25	25
50	20	20
—	-	-
—	-	-
—	-	-
—	-	-
—	-	-
—	-	-

COSEL

Model	PBA50F-15
Item	Ambient Temperature Drift
Object	+15V3.5A

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	15.039	15.039	15.039
-10	15.041	15.041	15.041
0	15.037	15.037	15.037
10	15.034	15.034	15.034
25	15.029	15.029	15.029
30	15.029	15.029	15.029
40	15.021	15.021	15.021
50	15.010	15.010	15.009
60	15.001	15.001	15.001
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-15	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V3.5A	

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 - 3.5A

* 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

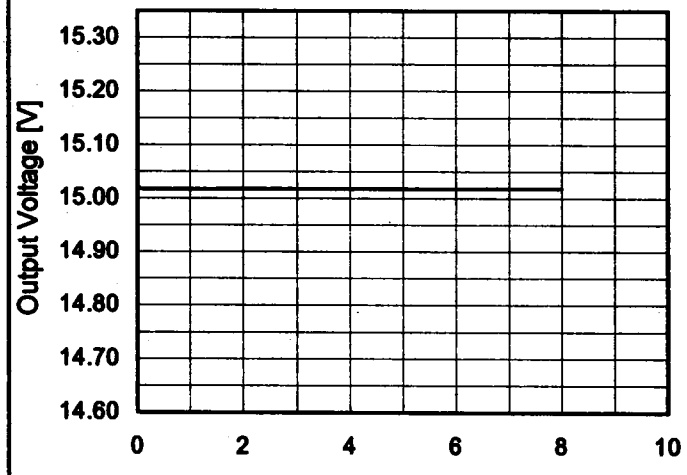
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	200	0	15.048	±20	±0.1
Minimum Voltage	50	264	3.5	15.009		

COSEL

Model	PBA50F-15
Item	Time Lapse Drift
Object	+15V3.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

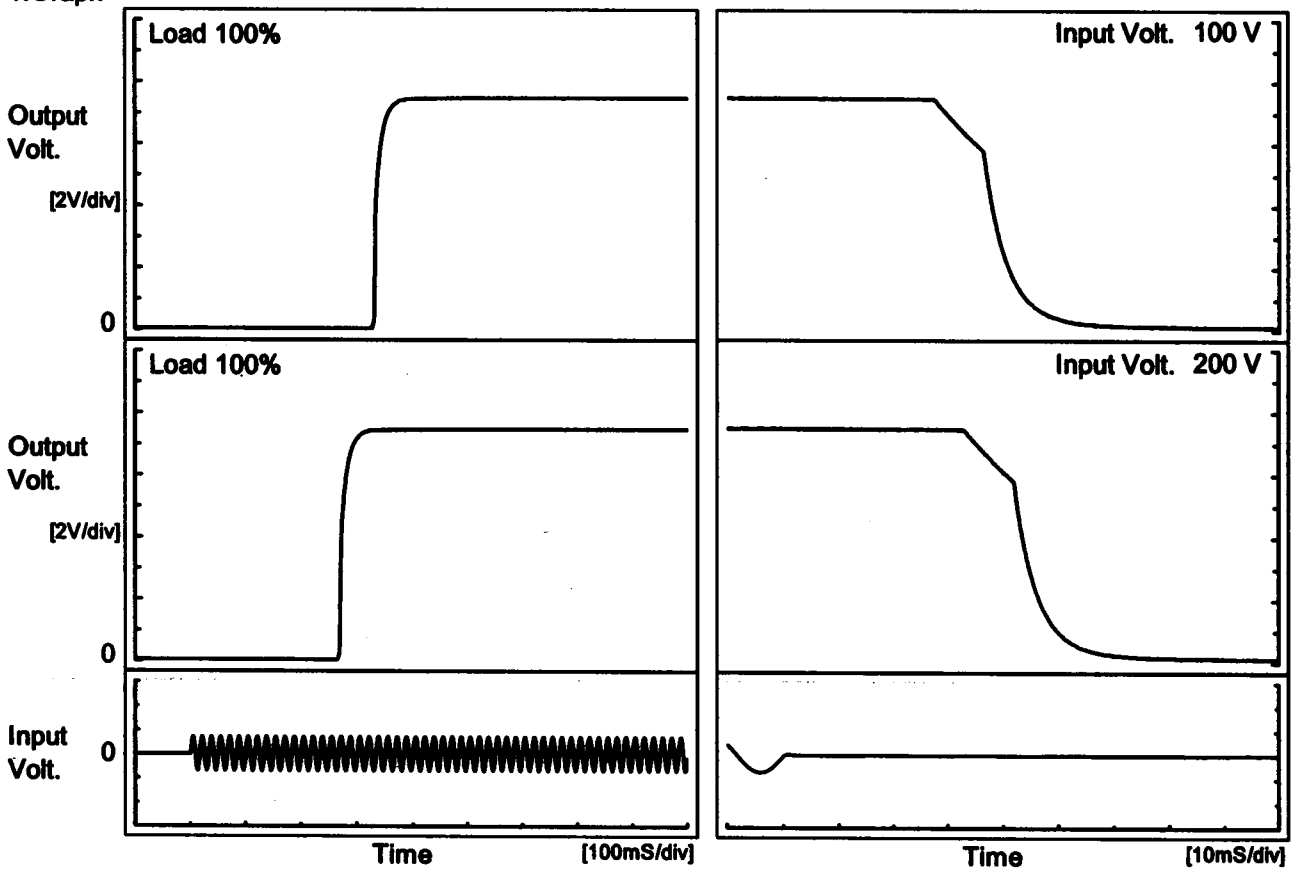
2.Values

Time since start [H]	Output Voltage [V]
0.0	15.025
0.5	15.017
1.0	15.017
2.0	15.018
3.0	15.018
4.0	15.018
5.0	15.018
6.0	15.018
7.0	15.018
8.0	15.018

COSEL

Model	PBA50F-15	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V3.5A	

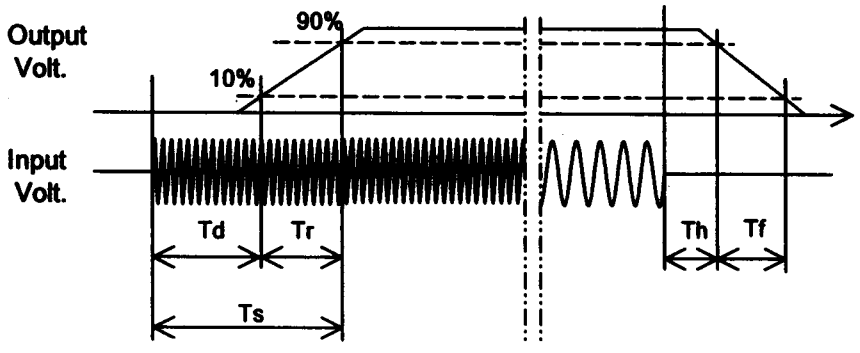
1.Graph



2.Values

[mS]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	331.0	21.0	352.0	30.9	14.7
200 V	269.5	20.5	290.0	36.4	14.8

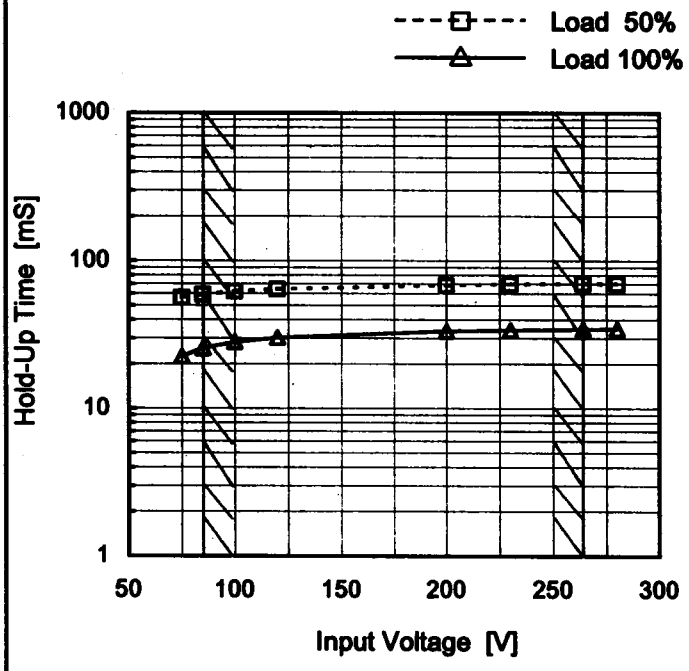


COSEL

Model	PBA50F-15
Item	Hold-Up Time
Object	+15V3.5A

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

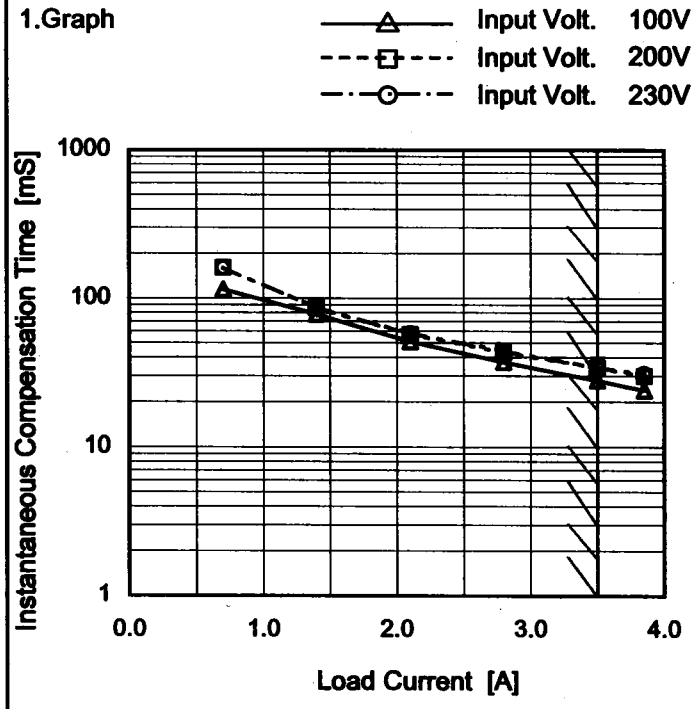
Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	56	23
85	59	26
100	62	28
120	64	30
200	68	34
230	70	34
264	70	35
280	70	35
--	-	-

COSEL

Model	PBA50F-15
Item	Instantaneous Interruption Compensation
Object	+15V3.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

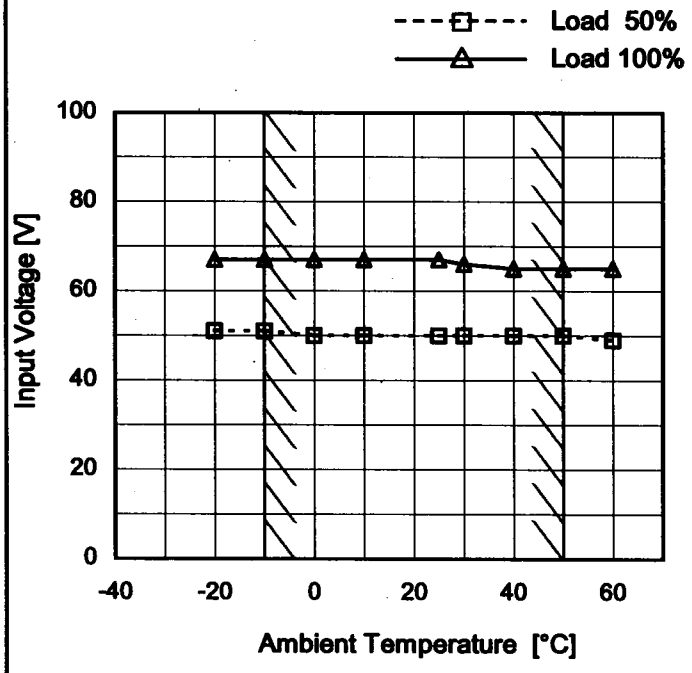
Load Current [A]	Time [mS] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.70	115	160	160
1.40	78	86	86
2.10	51	57	58
2.80	37	43	44
3.50	28	34	34
3.85	24	30	31
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V3.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

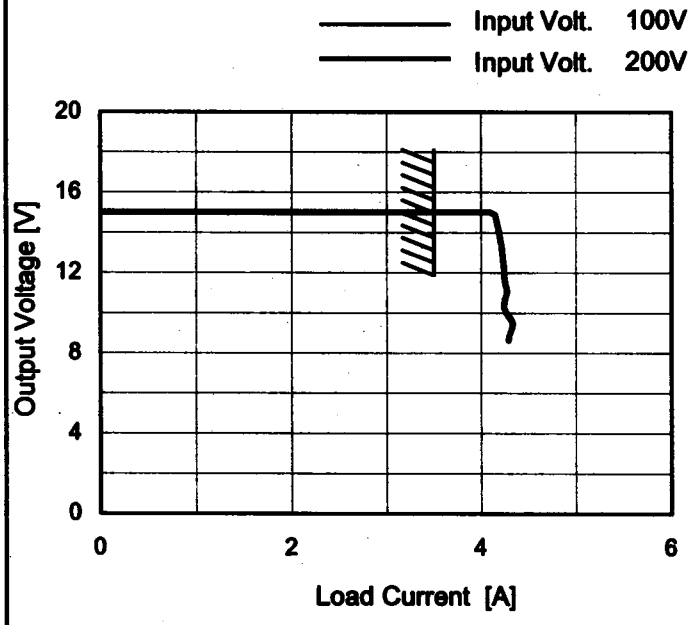
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	51	67
-10	51	67
0	50	67
10	50	67
25	50	67
30	50	66
40	50	65
50	50	65
60	49	65
–	-	-
–	-	-

COSEL

Model	PBA50F-15
Item	Overcurrent Protection
Object	+15V3.5A

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 7.5V to 0V.

2.Values

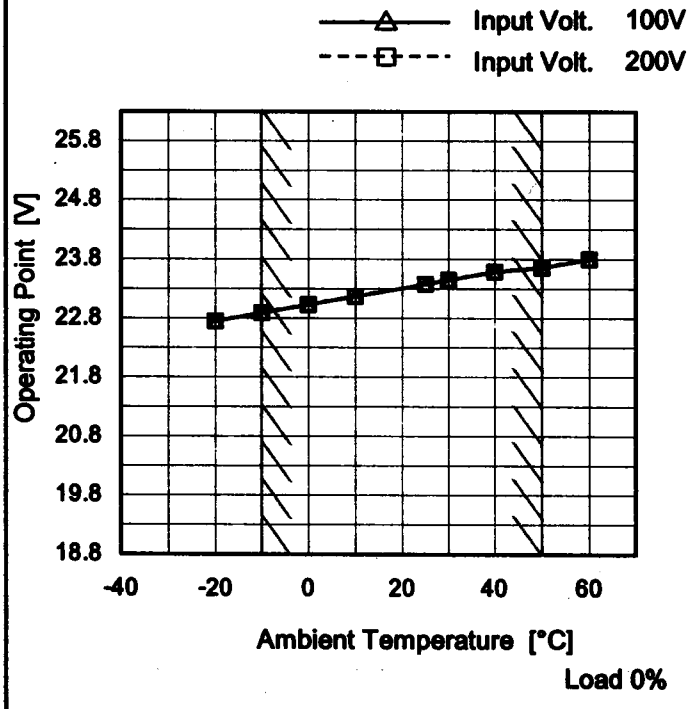
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
15.00	3.74	3.66
14.25	4.17	4.18
13.50	4.20	4.21
12.00	4.24	4.25
10.50	4.25	4.24
9.00	4.30	4.30
7.50	4.29	4.29
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PBA50F-15
Item	Overvoltage Protection
Object	+15V3.5A

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]	Operating Point [V] Input Volt. 200[V]
-20	22.72	22.72
-10	22.86	22.86
0	23.00	23.00
10	23.14	23.14
25	23.35	23.35
30	23.42	23.42
40	23.56	23.56
50	23.63	23.63
60	23.77	23.77
--	-	-
--	-	-

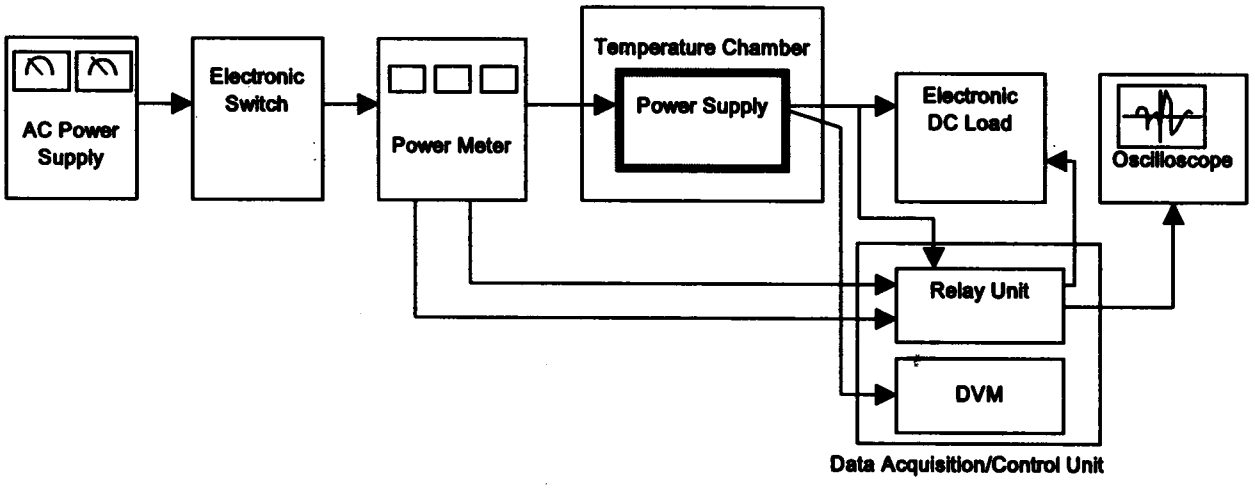


Figure A

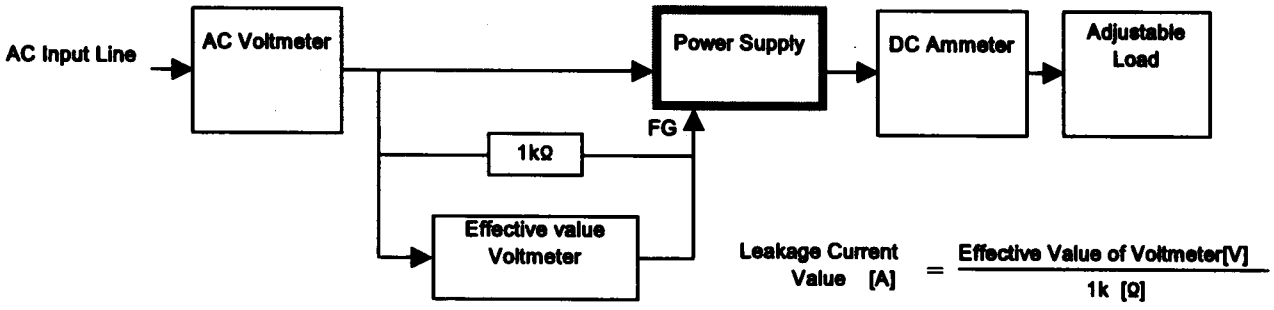


Figure B (DEN-AN)

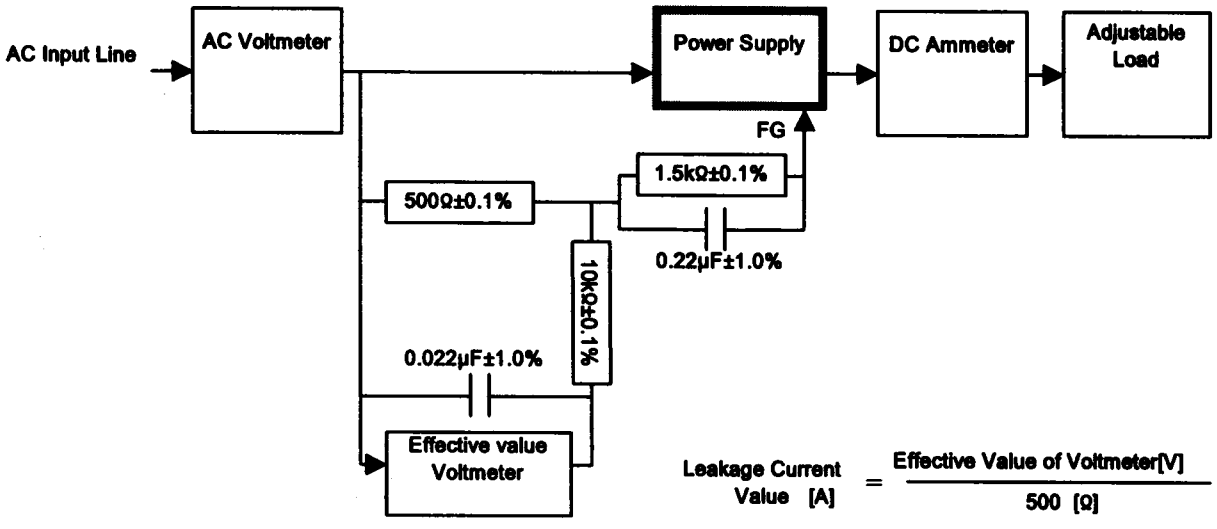


Figure B (IEC60950)