参考資料

COSEL

TEST DATA OF PBA50F-48

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

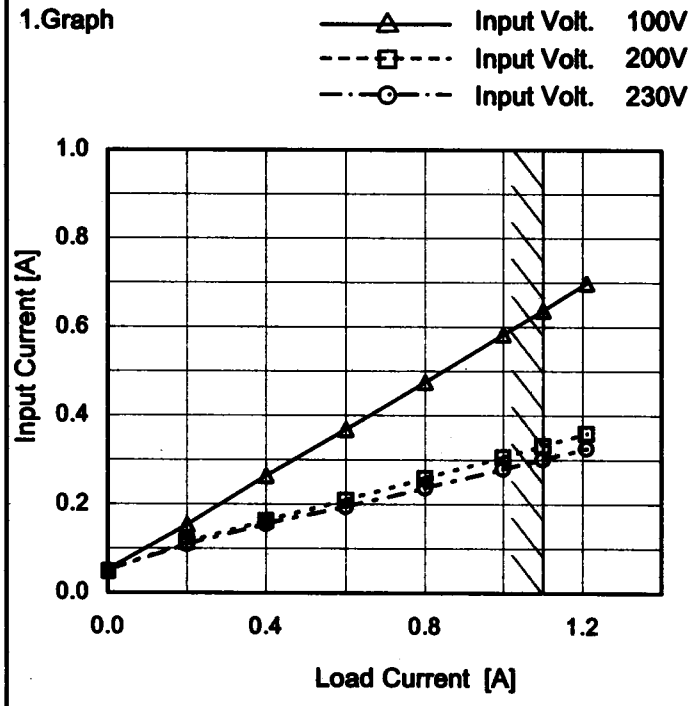
CONTENTS

COSEL

Model	PBA50F-48
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	0.048	0.050
0.20	0.153	0.114	0.109
0.40	0.264	0.162	0.155
0.60	0.369	0.210	0.194
0.80	0.475	0.259	0.237
1.00	0.583	0.307	0.280
1.10	0.637	0.332	0.302
1.21	0.698	0.360	0.326
–	-	-	-
–	-	-	-
–	-	-	-

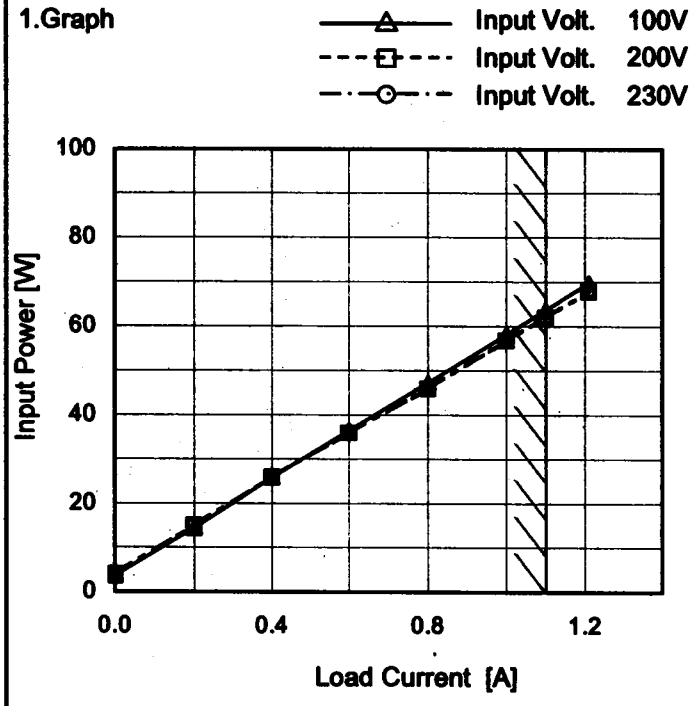
BC-3556

COSEL

Model	PBA50F-48
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

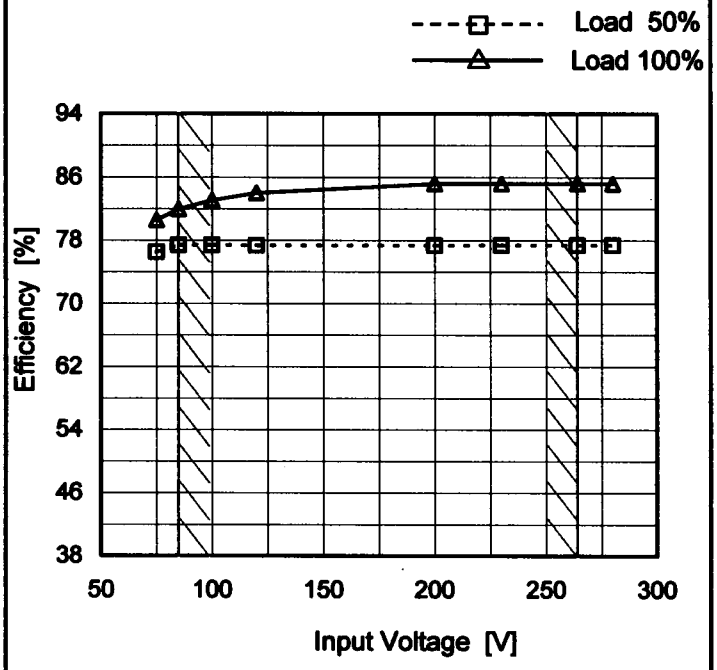
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	3.60	4.00	4.00
0.20	14.39	15.00	15.00
0.40	25.85	26.00	26.00
0.60	36.47	36.00	36.00
0.80	47.25	46.00	46.00
1.00	58.13	56.80	57.00
1.10	63.63	62.00	62.00
1.21	69.72	67.80	68.00
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-48
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

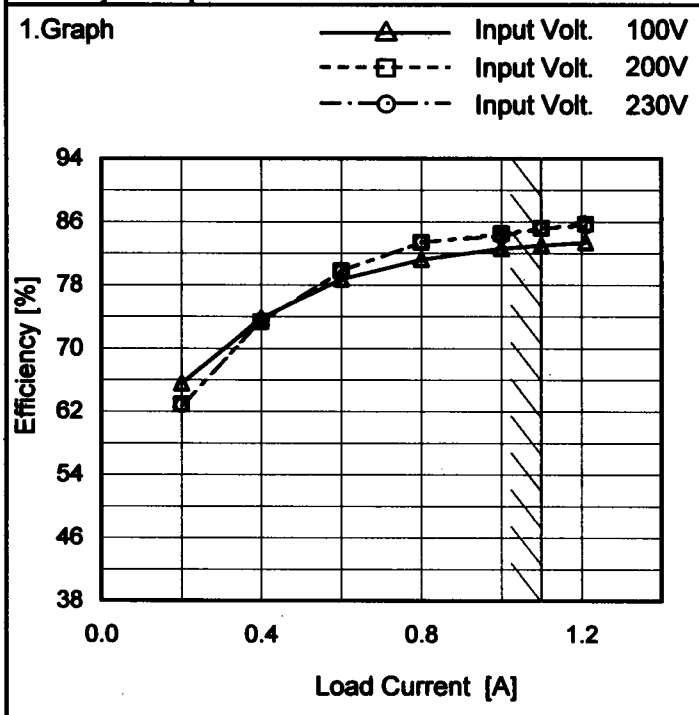
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	76.5	80.6
85	77.4	82.0
100	77.4	83.1
120	77.4	84.0
200	77.4	85.2
230	77.4	85.2
264	77.4	85.2
280	77.4	85.2
--	-	-

COSEL

Model	PBA50F-48
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

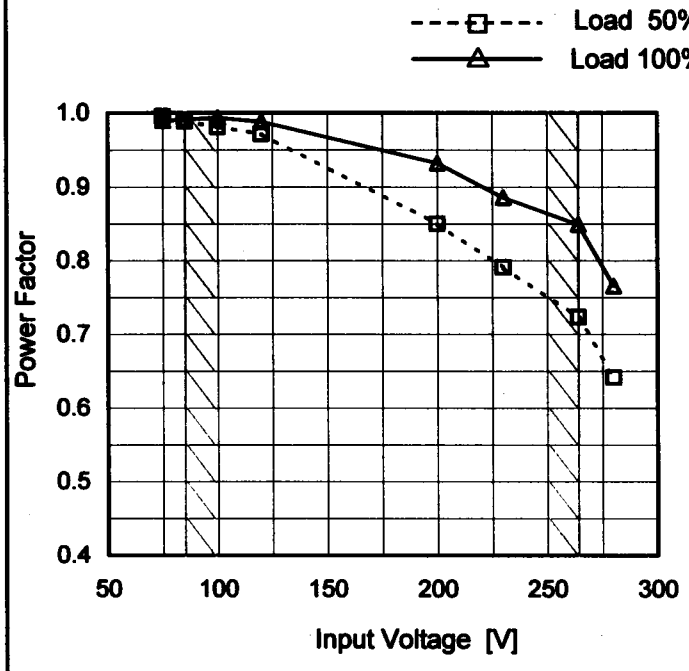
Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.20	65.5	62.9	62.8
0.40	73.8	73.3	73.4
0.60	78.7	79.8	79.7
0.80	81.2	83.4	83.4
1.00	82.6	84.5	84.2
1.10	83.0	85.2	85.2
1.21	83.4	85.7	85.5
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-48
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

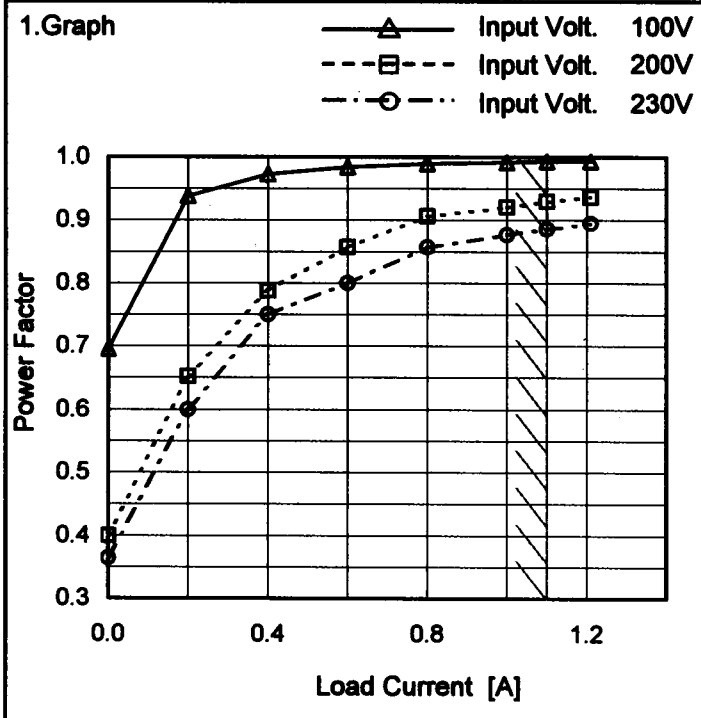
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.995	0.990
85	0.989	0.991
100	0.981	0.993
120	0.971	0.988
200	0.850	0.932
230	0.791	0.886
264	0.723	0.849
280	0.642	0.765
--	-	-

COSEL

Model	PBA50F-48
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.

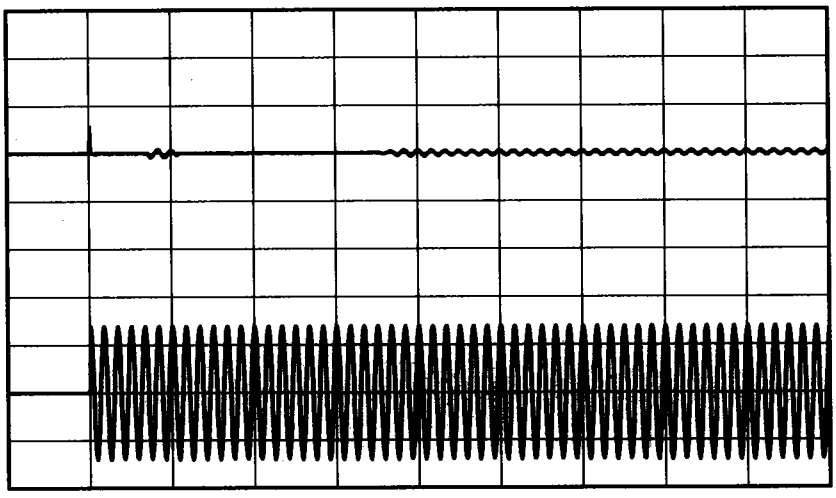
2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.695	0.400	0.364
0.20	0.938	0.652	0.600
0.40	0.973	0.788	0.750
0.60	0.984	0.857	0.800
0.80	0.989	0.906	0.857
1.00	0.992	0.921	0.877
1.10	0.993	0.930	0.886
1.21	0.993	0.936	0.895
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

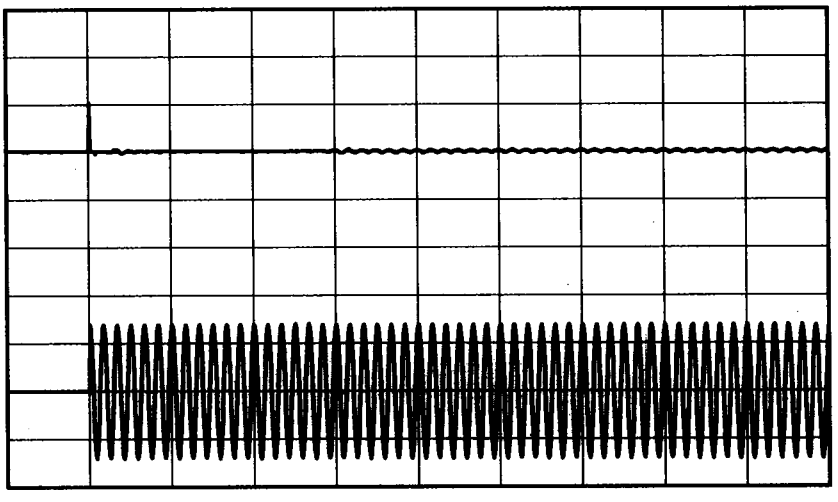
Model	PBA50F-48
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



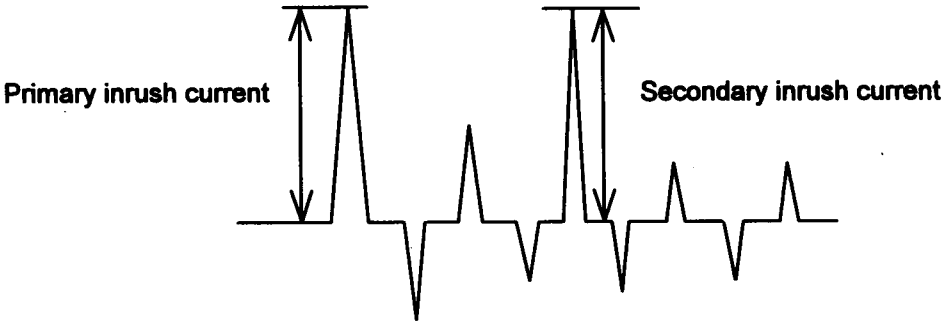
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
11.3 A
Secondary inrush current :
1.6 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
20.5 A
Secondary inrush current :
0.9 A



COSEL

Model	PBA50F-48	
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

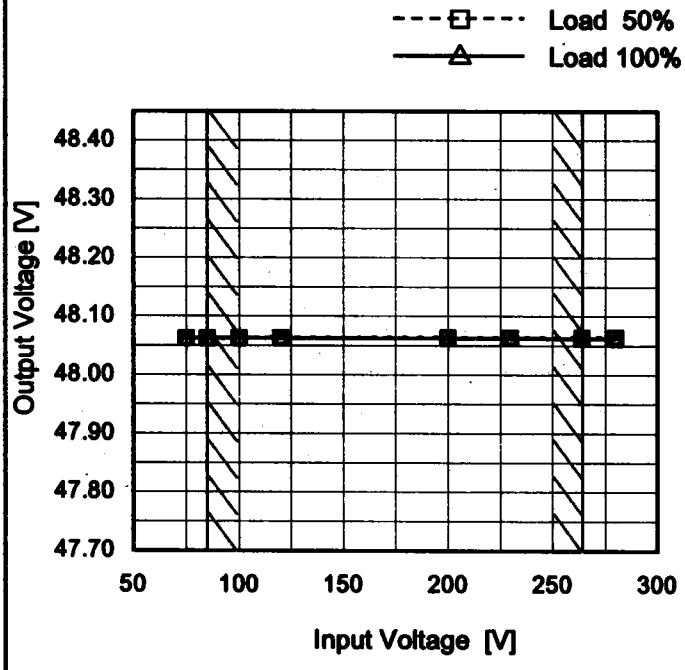
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	PBA50F-48
Item	Line Regulation
Object	+48V1.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

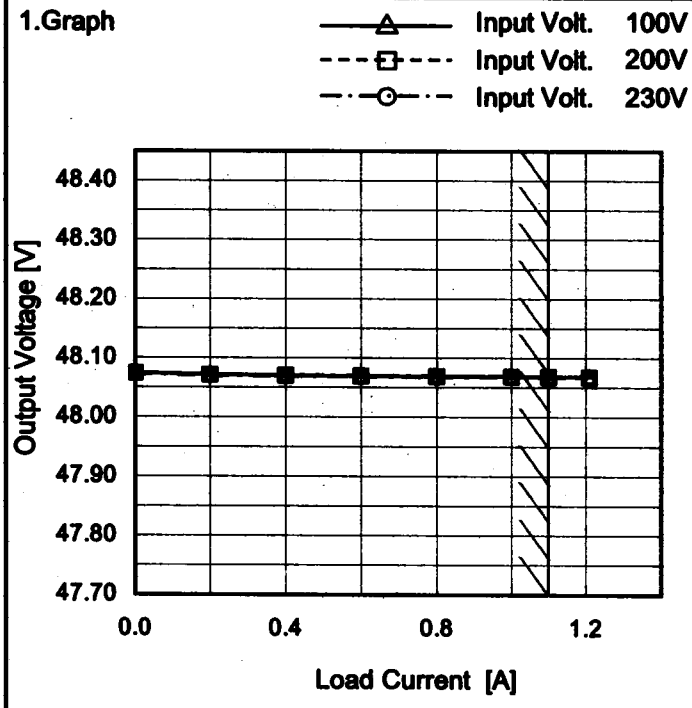
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	48.062	48.063
85	48.062	48.063
100	48.063	48.063
120	48.063	48.063
200	48.064	48.063
230	48.064	48.063
264	48.064	48.062
280	48.064	48.062
--	-	-

COSEL

Model	PBA50F-48
Item	Load Regulation
Object	+48V1.1A

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	48.074	48.074	48.073
0.20	48.072	48.071	48.070
0.40	48.070	48.070	48.069
0.60	48.070	48.070	48.068
0.80	48.069	48.069	48.068
1.00	48.069	48.069	48.067
1.10	48.069	48.068	48.067
1.21	48.068	48.068	48.067
--	-	-	-
--	-	-	-
--	-	-	-

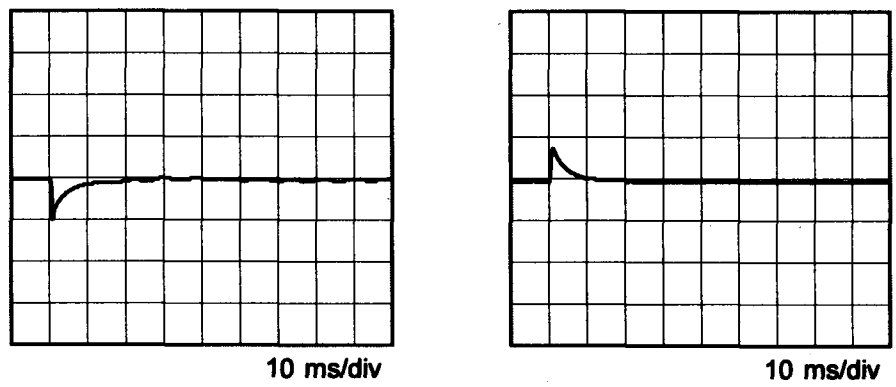
COSEL

Model	PBA50F-48		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+48V1.1A		

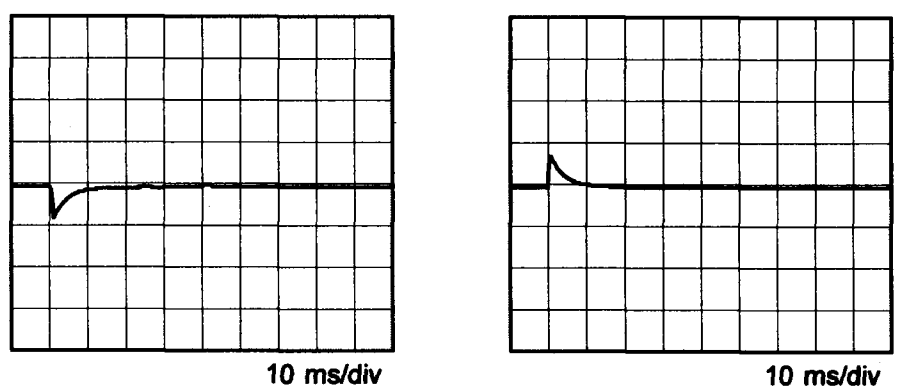
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ⟷
Load 100% (1.1A)



Min. Load (0A) ⟷
Load 50% (0.55A)



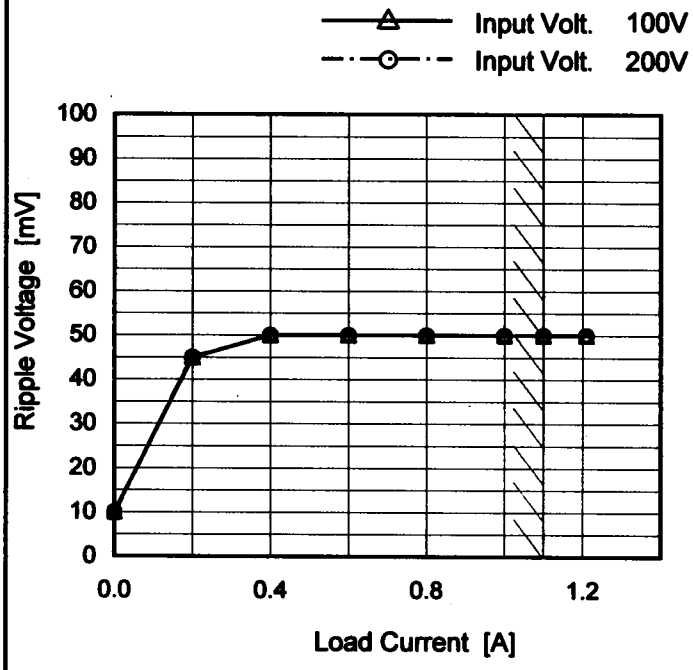
* The characteristic of AC200V is equal.

COSEL

Model	PBA50F-48
Item	Ripple Voltage (by Load Current)
Object	+48V1.1A

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

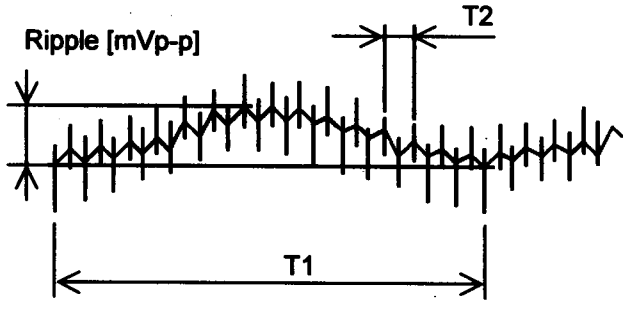


Fig. Complex Ripple Wave Form

2.Values

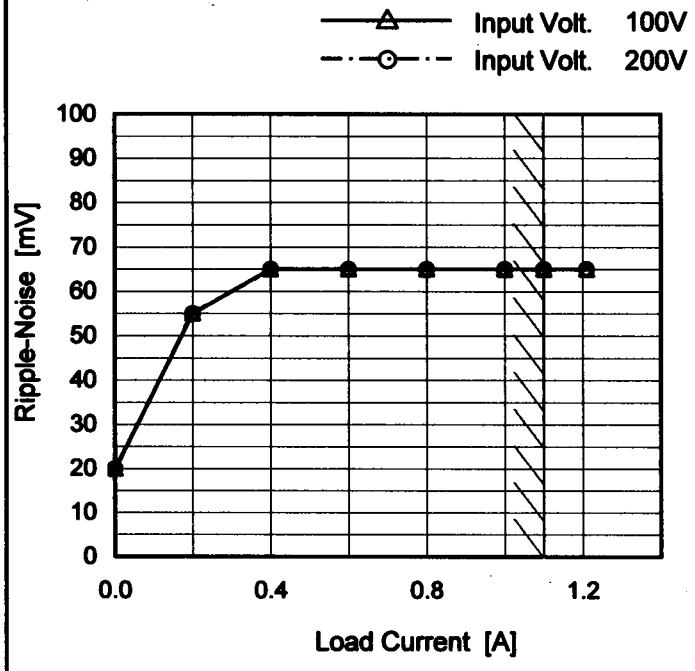
Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 200 [V]
0.00	10	10
0.20	45	45
0.40	50	50
0.60	50	50
0.80	50	50
1.00	50	50
1.10	50	50
1.21	50	50
–	-	-
–	-	-
–	-	-

COSEL

Model	PBA50F-48
Item	Ripple-Noise
Object	+48V1.1A

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
0.20	55	55
0.40	65	65
0.60	65	65
0.80	65	65
1.00	65	65
1.10	65	65
1.21	65	65
–	-	-
–	-	-
–	-	-

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

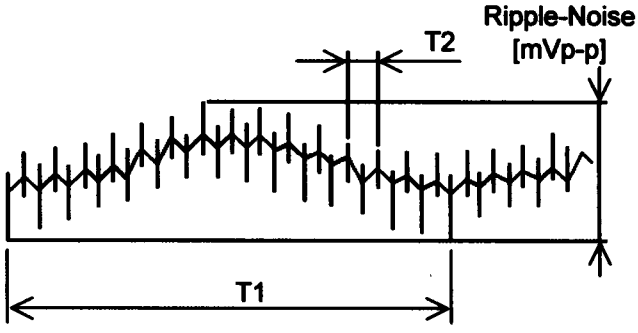


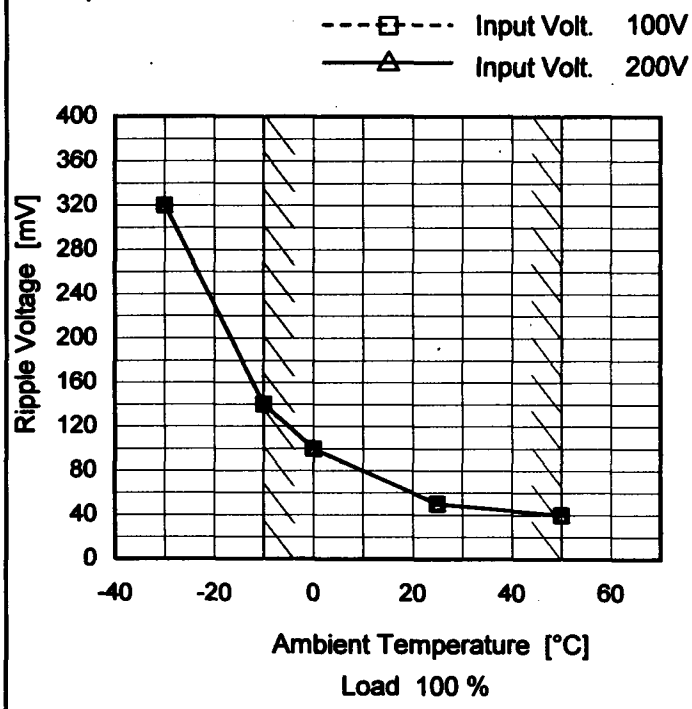
Fig. Complex Ripple Wave Form

COSEL

Model	PBA50F-48
Item	Ripple Voltage (by Ambient Temp.)
Object	+48V1.1A

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	320	320
-10	140	140
0	100	100
25	50	50
50	40	40
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-

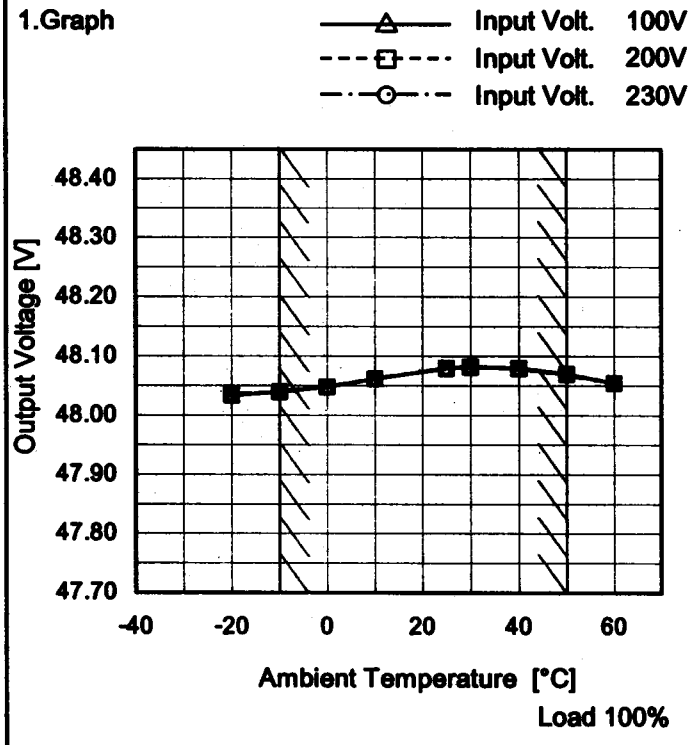
BC-3556

COSEL

Model	PBA50F-48
Item	Ambient Temperature Drift
Object	+48V1.1A

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	48.034	48.035	48.035
-10	48.040	48.040	48.040
0	48.048	48.048	48.048
10	48.062	48.062	48.062
25	48.080	48.080	48.080
30	48.082	48.082	48.082
40	48.080	48.080	48.079
50	48.070	48.070	48.069
60	48.055	48.055	48.054
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-48	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+48V1.1A	

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 - 1.1A

* 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

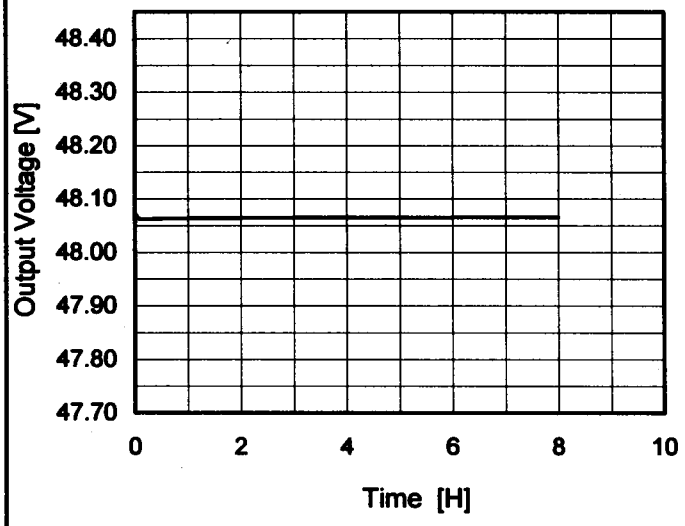
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	30	85	0	48.088	±24	±0.1
Minimum Voltage	-10	85	1.1	48.040		

COSEL

Model	PBA50F-48
Item	Time Lapse Drift
Object	+48V1.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

2.Values

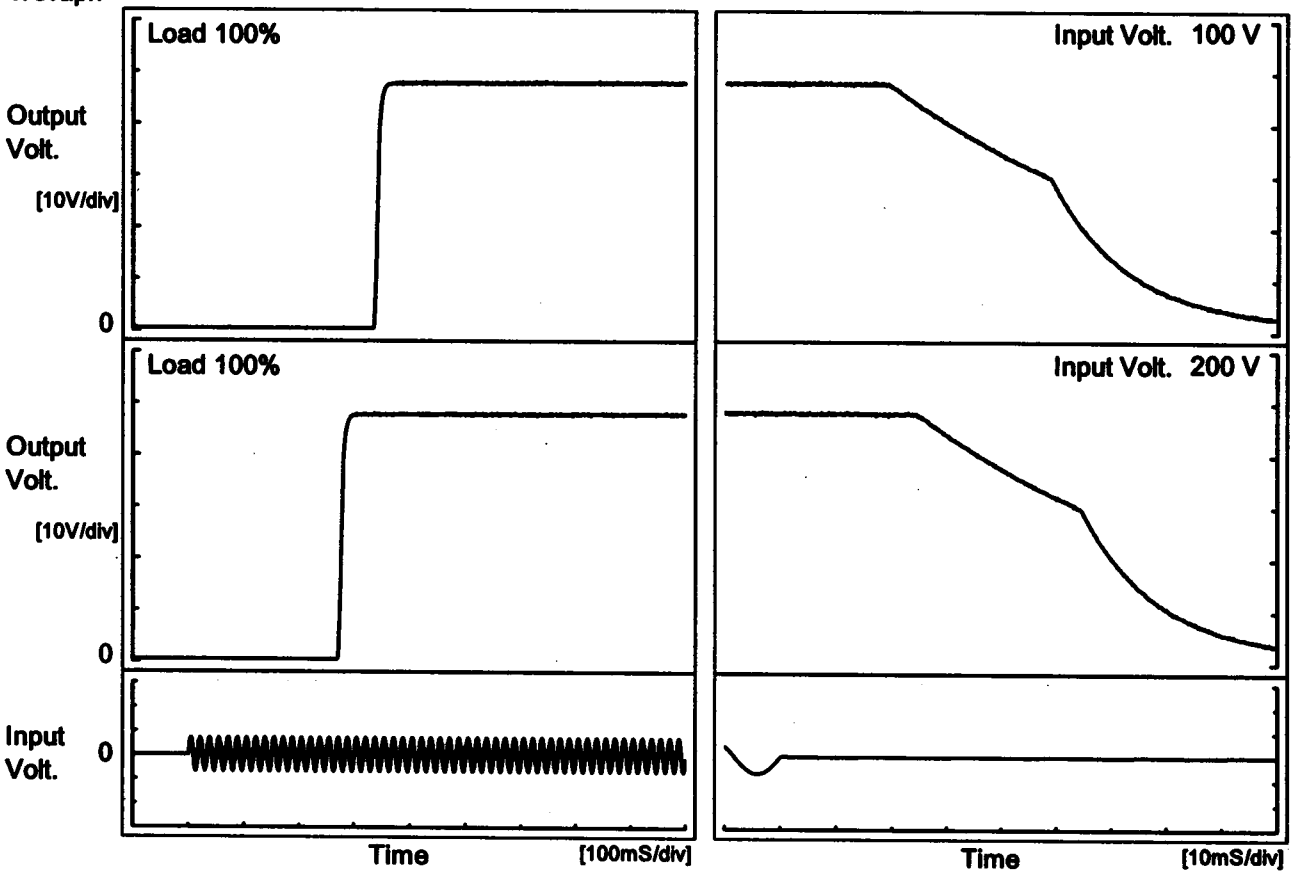
Time since start [H]	Output Voltage [V]
0.0	48.070
0.5	48.063
1.0	48.064
2.0	48.064
3.0	48.065
4.0	48.065
5.0	48.065
6.0	48.065
7.0	48.066
8.0	48.066

COSEL

Model	PBA50F-48
Item	Rise and Fall Time
Object	+48V1.1A

Temperature 25°C
Testing Circuitry Figure A

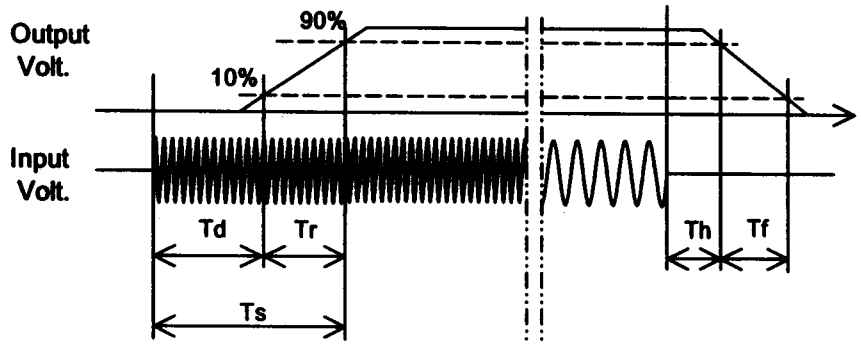
1.Graph



2.Values

[mS]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	337.5	11.5	349.0	25.2	51.7
200 V	272.5	12.0	284.5	30.5	51.7

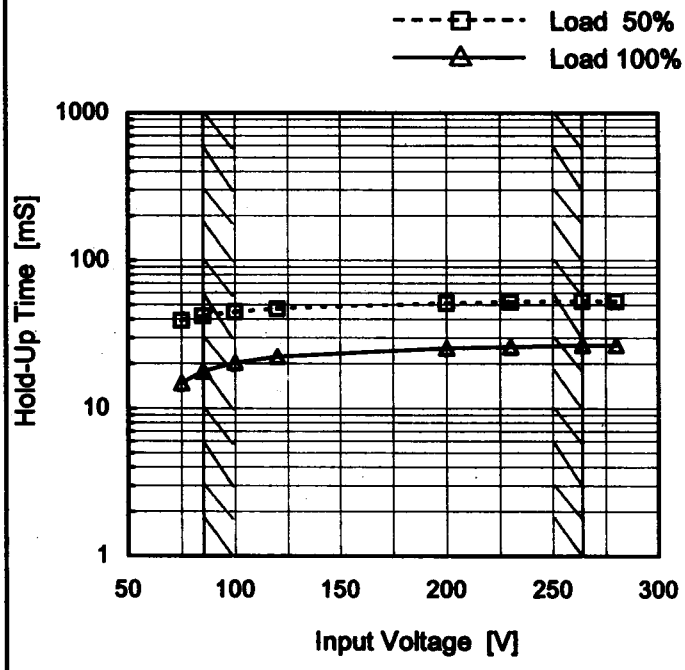


COSEL

Model	PBA50F-48
Item	Hold-Up Time
Object	+48V1.1A

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

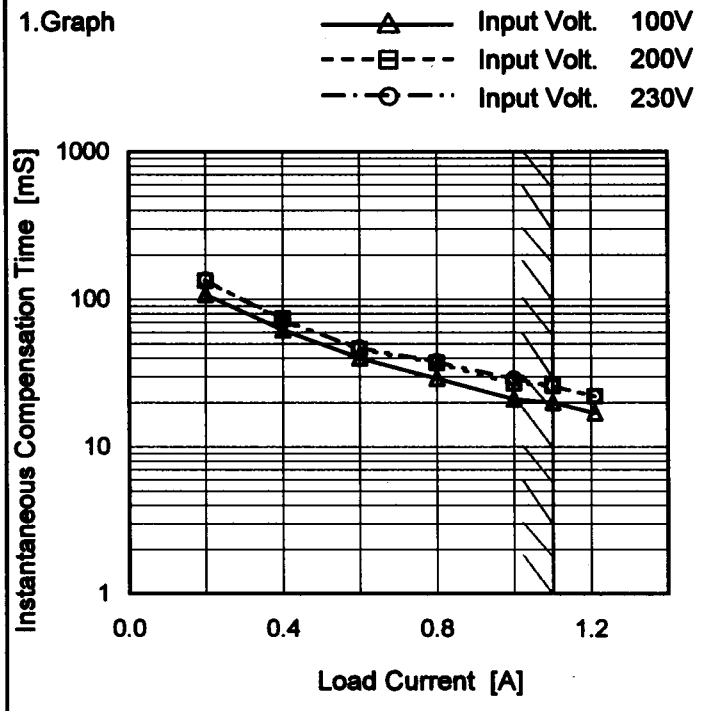
Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	39	15
85	42	18
100	45	20
120	47	22
200	51	26
230	52	26
264	53	27
280	53	27
--	-	-

COSEL

Model	PBA50F-48
Item	Instantaneous Interruption Compensation
Object	+48V1.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

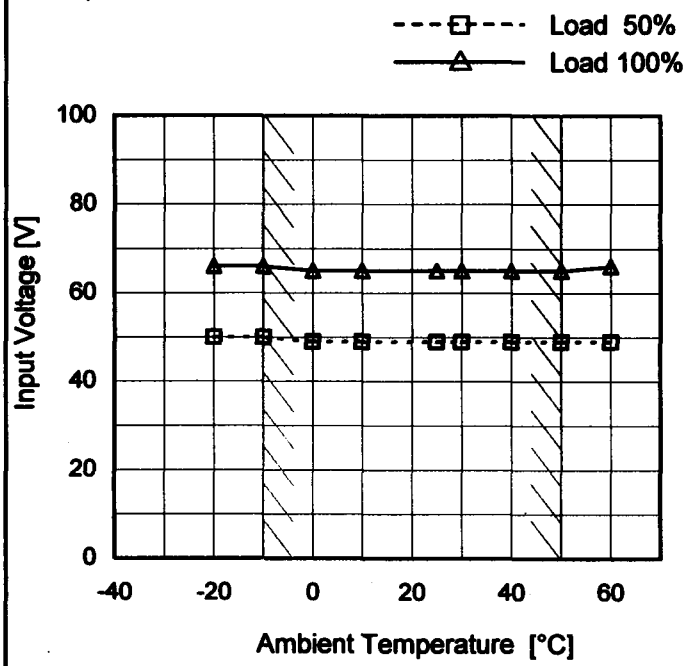
Load Current [A]	Time [mS] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.20	108	134	136
0.40	62	74	72
0.60	40	46	47
0.80	29	37	38
1.00	21	27	29
1.10	20	26	26
1.21	17	22	22
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	PBA50F-48
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V1.1A

Testing Circuitry Figure A

1.Graph



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

2.Values

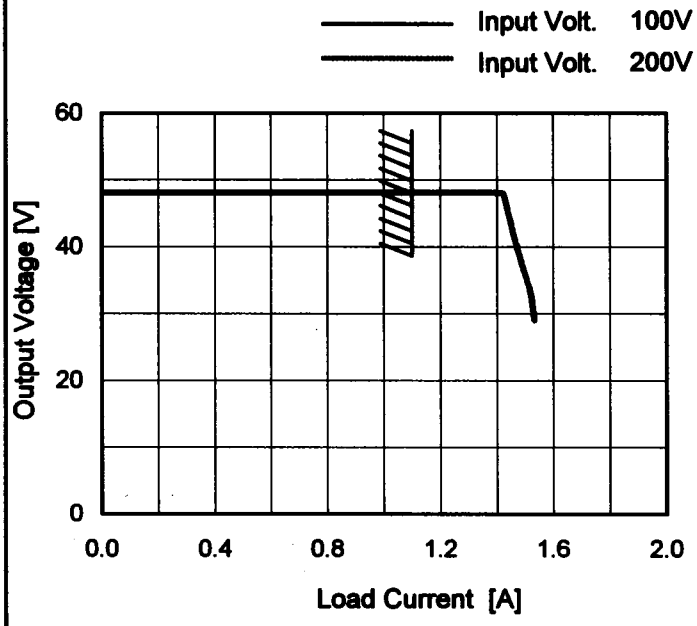
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	50	66
-10	50	66
0	49	65
10	49	65
25	49	65
30	49	65
40	49	65
50	49	65
60	49	66
—	-	-
—	-	-

COSEL

Model	PBA50F-48
Item	Overcurrent Protection
Object	+48V1.1A

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 28.8V to 0V.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
48.0	1.16	1.16
45.6	1.44	1.44
43.2	1.45	1.45
38.4	1.48	1.48
33.6	1.52	1.52
28.8	1.53	1.53
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-

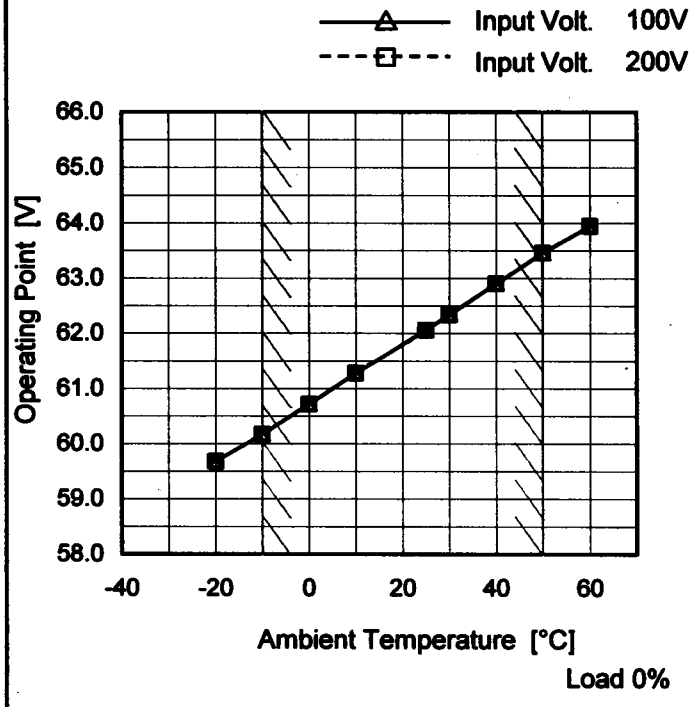
BC-3556

COSEL

Model	PBA50F-48
Item	Overvoltage Protection
Object	+48V1.1A

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	59.68	59.68
-10	60.17	60.17
0	60.72	60.72
10	61.28	61.28
25	62.06	62.06
30	62.34	62.34
40	62.90	62.90
50	63.46	63.46
60	63.95	63.95
--	-	-
--	-	-

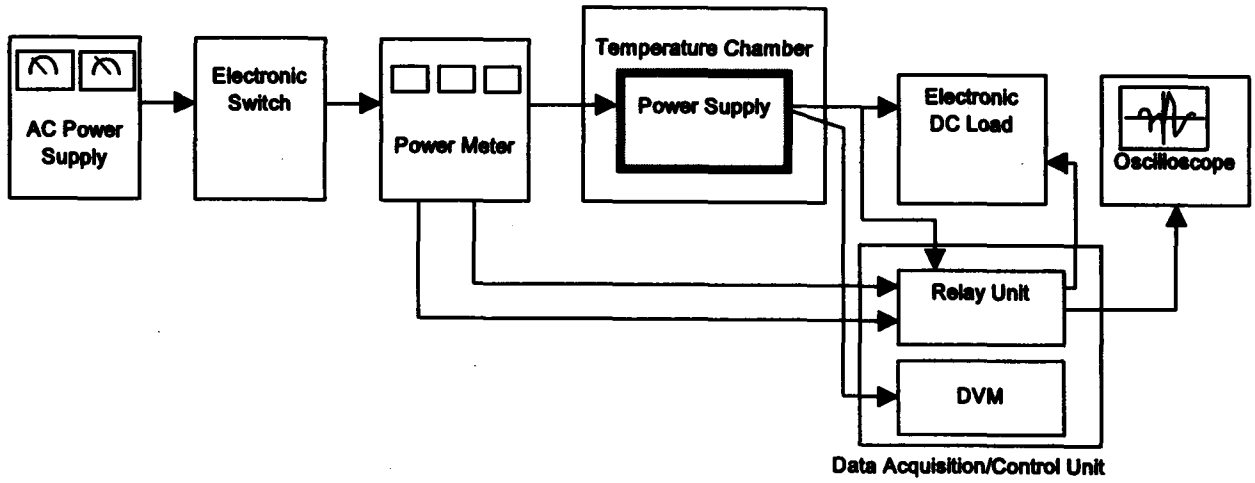


Figure A

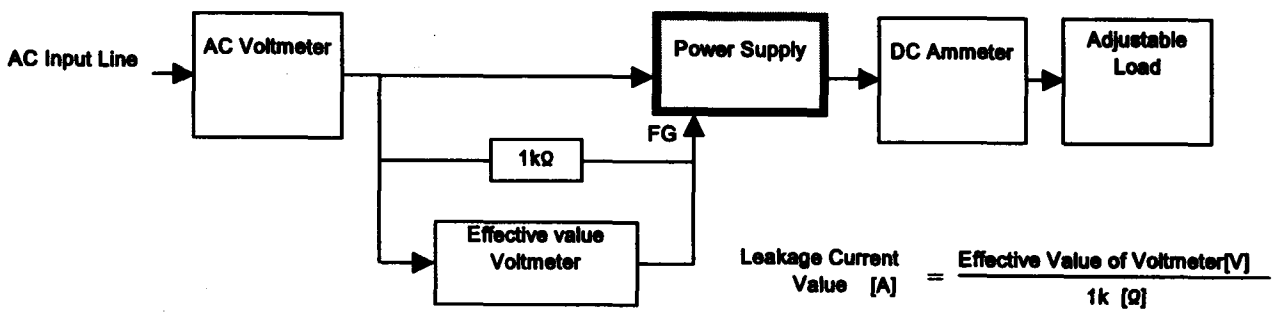


Figure B (DEN-AN)

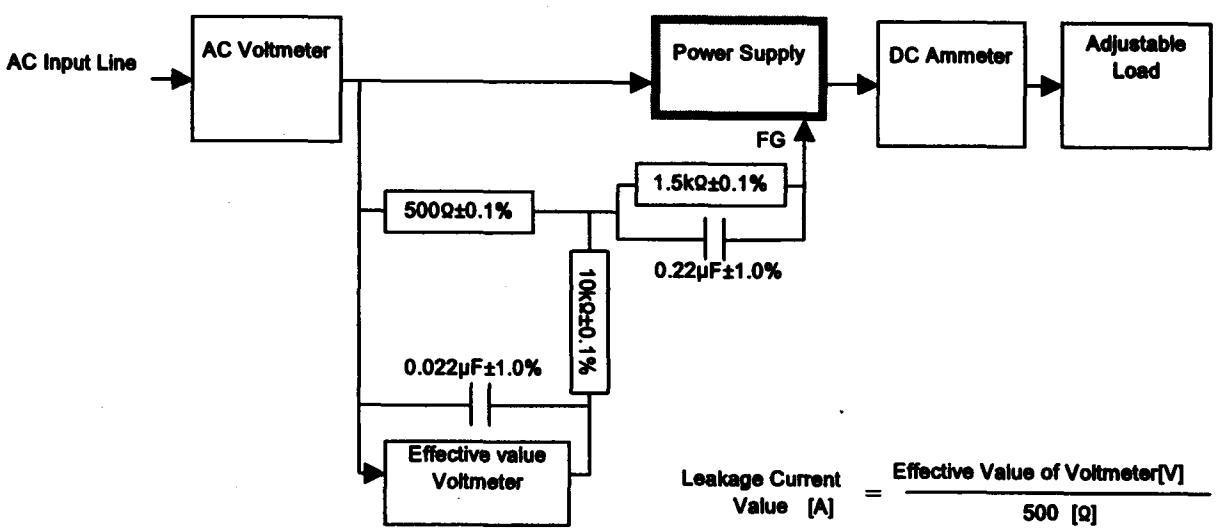


Figure B (IEC60950)