参考資料

COSEL

TEST DATA OF LFA50F-48

Regulated DC Power Supply
August 10, 2009

Approved by : Yoshiaki Shimizu
Yoshiaki Shimizu Design Manager

Prepared by : Kyohei Kosugi
Kyohei Kosugi Design Engineer

COSEL CO.,LTD.

参考資料

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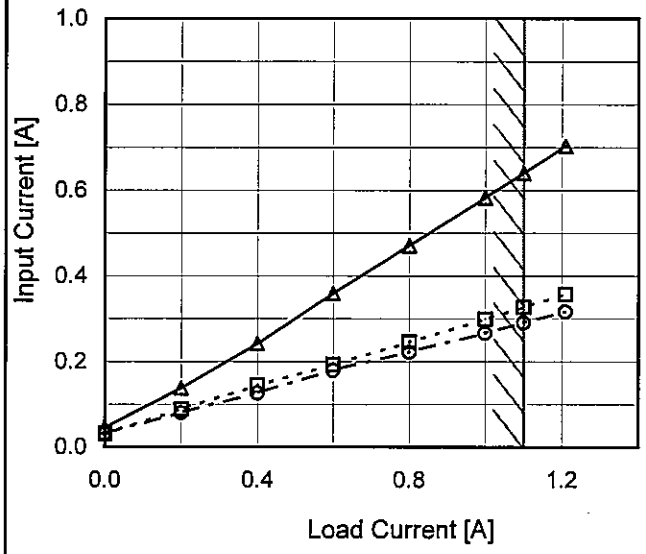
Model	LFA50F-48
Item	Input Current (by Load Current)
Object	————————

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	0.046	0.031	0.032
0.20	0.138	0.088	0.080
0.40	0.242	0.143	0.127
0.60	0.359	0.193	0.179
0.80	0.471	0.245	0.222
1.00	0.583	0.299	0.267
1.10	0.640	0.327	0.291
1.21	0.703	0.357	0.317
--	-	-	-
--	-	-	-
--	-	-	-

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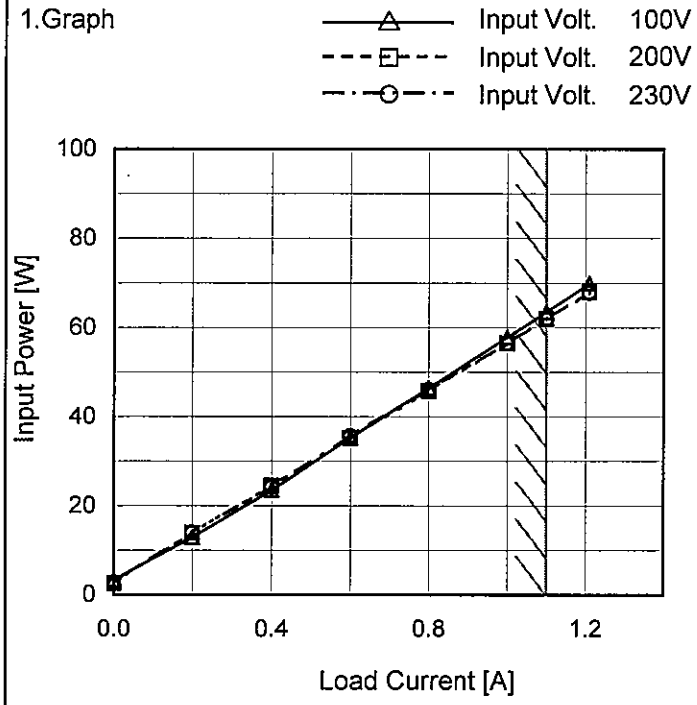
Model	LFA50F-48
Item	Input Power (by Load Current)
Object	――――――

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	3.30	2.60	2.80
0.20	12.96	13.90	14.00
0.40	23.46	24.50	24.20
0.60	35.28	35.20	35.70
0.80	46.50	45.80	46.10
1.00	57.80	56.50	56.50
1.10	63.50	62.00	61.90
1.21	69.90	68.00	67.80
--	-	-	-
--	-	-	-
--	-	-	-

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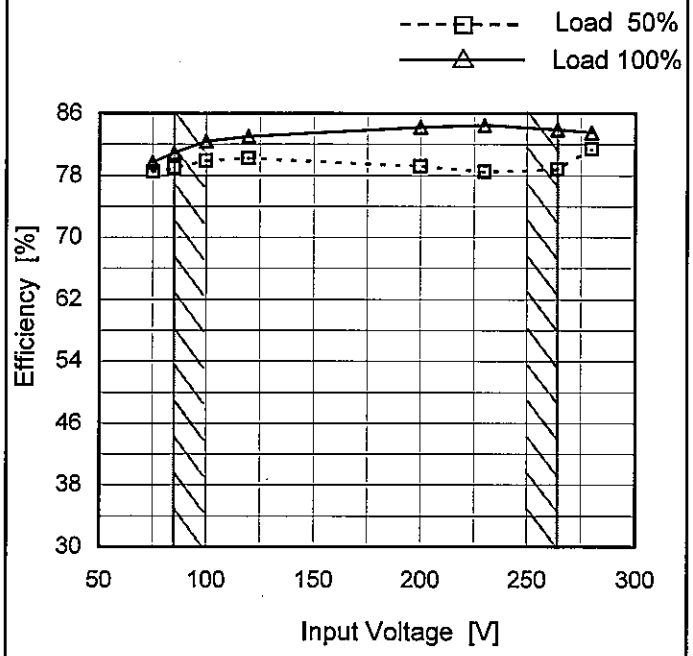
Model	LFA50F-48
Item	Efficiency (by Input Voltage)
Object	――――――――

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	78.5	79.7
85	78.9	80.9
100	79.9	82.4
120	80.2	83.1
200	79.1	84.3
230	78.5	84.5
264	78.8	83.9
280	81.4	83.5
--	-	-

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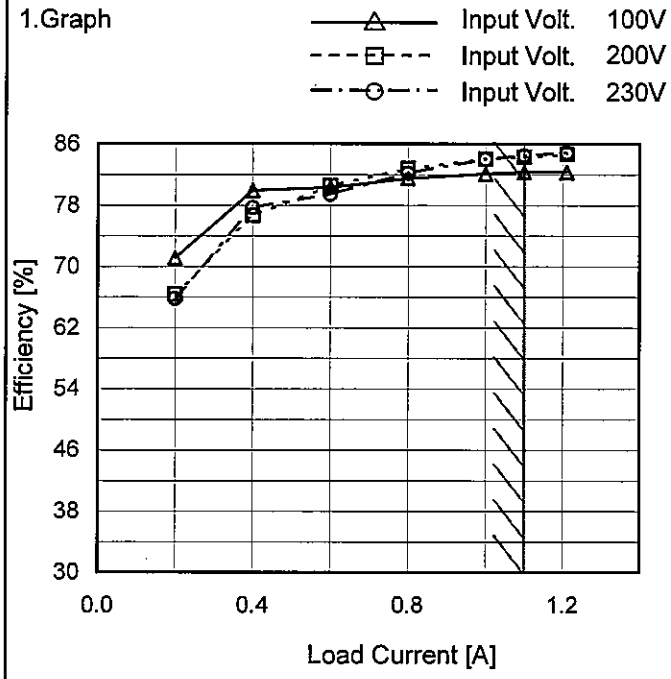
Model	LFA50F-48
Item	Efficiency (by Load Current)
Object	――――――

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	71.1	66.3	65.8
0.40	80.0	76.6	77.7
0.60	80.4	80.5	79.5
0.80	81.5	82.8	82.2
1.00	82.1	84.0	84.0
1.10	82.4	84.3	84.5
1.21	82.3	84.6	84.9
--	-	-	-
--	-	-	-
--	-	-	-

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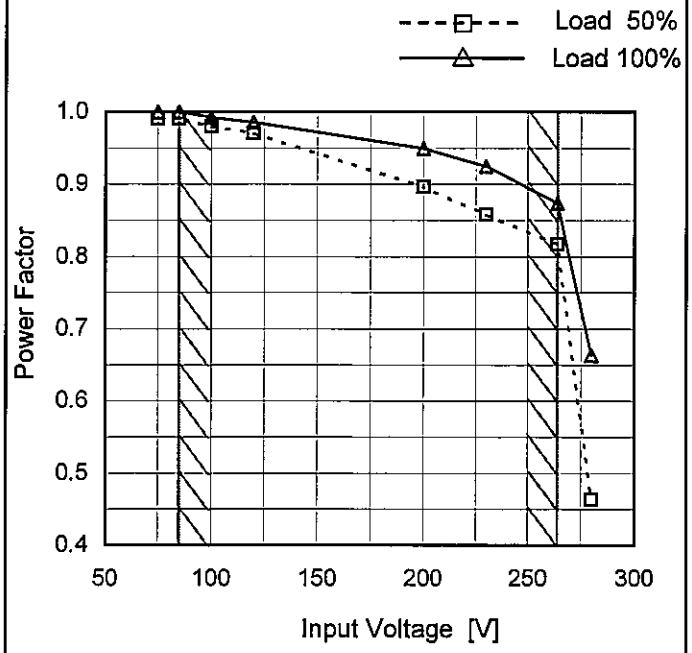
COSEL

Model	LFA50F-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	0.991	0.999
85	0.991	0.999
100	0.980	0.992
120	0.970	0.986
200	0.896	0.949
230	0.858	0.925
264	0.817	0.874
280	0.463	0.663
--	-	-

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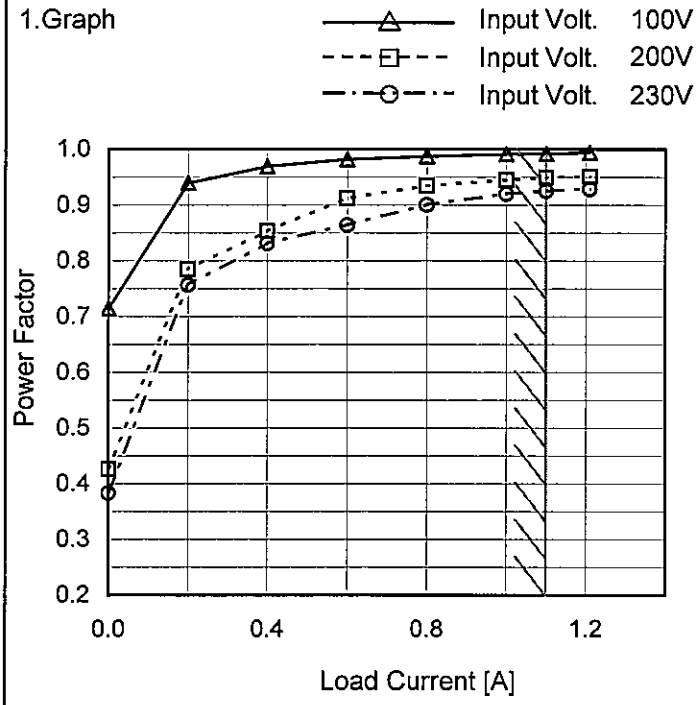
Model	LFA50F-48
Item	Power Factor (by Load Current)
Object	――――――

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	0.714	0.426	0.384
0.20	0.940	0.785	0.757
0.40	0.969	0.854	0.832
0.60	0.982	0.912	0.864
0.80	0.987	0.935	0.900
1.00	0.991	0.945	0.920
1.10	0.992	0.949	0.925
1.21	0.994	0.951	0.929
--	-	-	-
--	-	-	-
--	-	-	-

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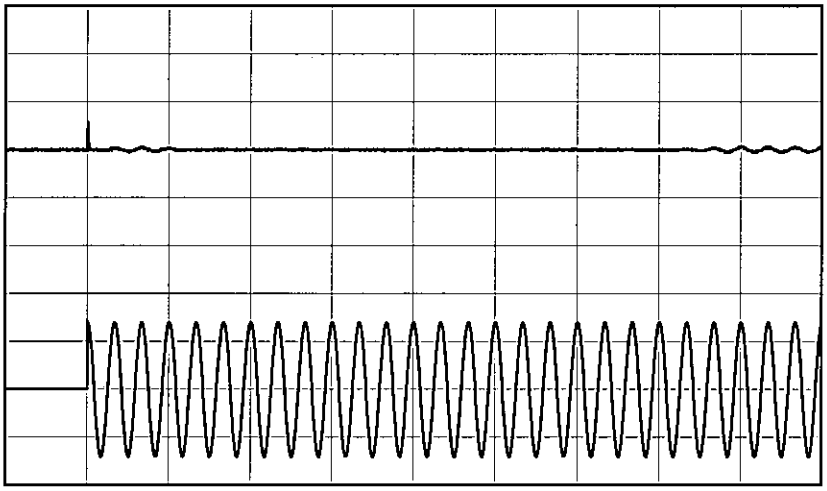
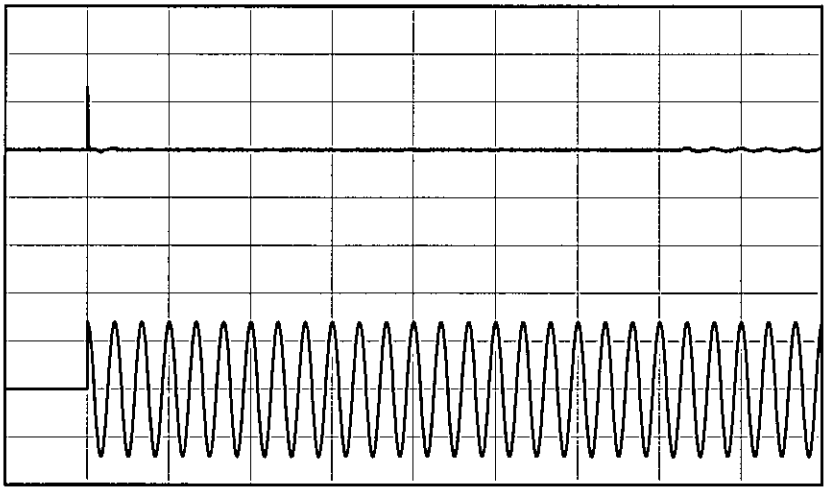
Model	LFA50F-48	
Item	Inrush Current	Temperature 25°C Testing Circuitry Figure A
Object	————————	



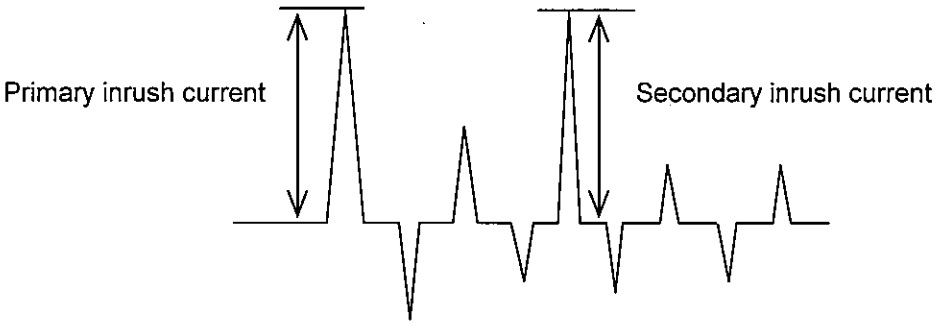
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
11.6 A
Secondary inrush current :
0.8 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
26.0 A
Secondary inrush current :
0.8 A



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Model	LFA50F-48	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	――――――――	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.13	0.25	0.31	Operation
	One of phases	0.19	0.48	0.57	Stand by
IEC60950	Both phases	0.14	0.29	0.34	Operation
	One of phases	0.22	0.43	0.50	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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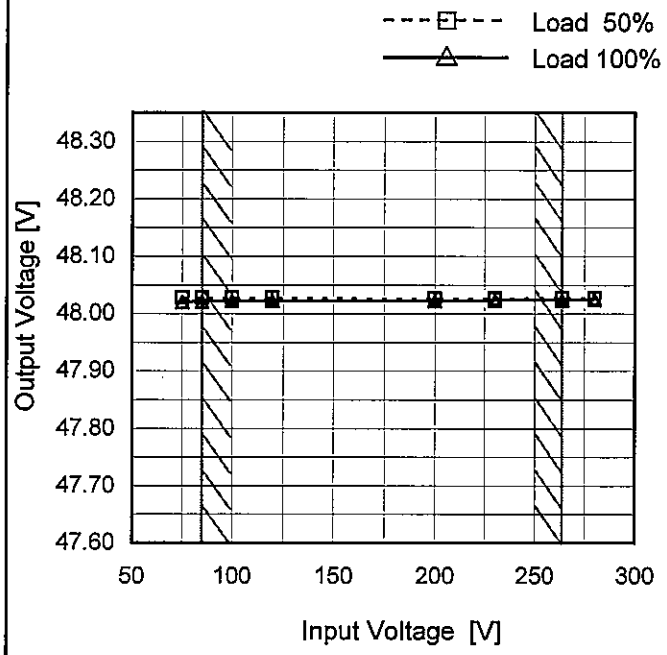
Model	LFA50F-48
Item	Line Regulation
Object	+48V1.1A

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	48.027	48.021
85	48.027	48.022
100	48.027	48.022
120	48.028	48.023
200	48.026	48.023
230	48.026	48.023
264	48.027	48.024
280	48.027	48.024
--	-	-

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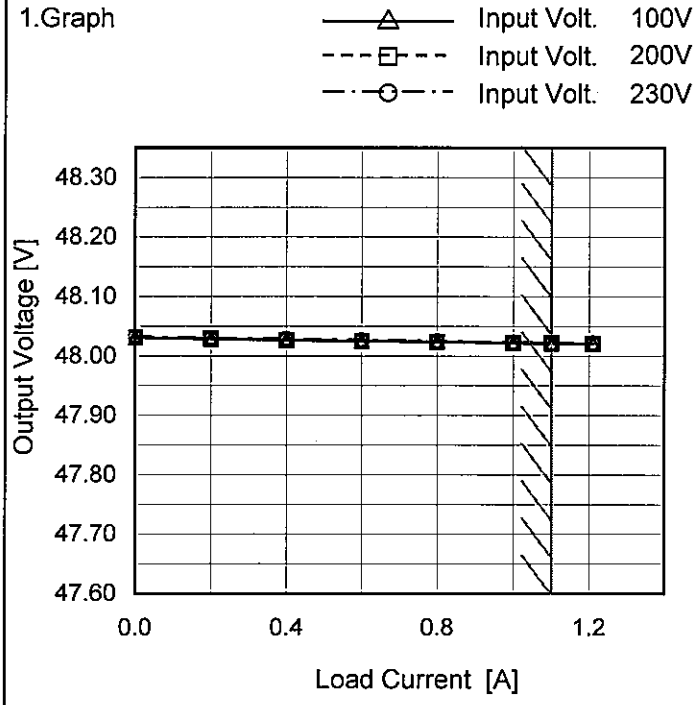
COSEL

Model	LFA50F-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	48.031	48.031	48.032
0.20	48.029	48.029	48.030
0.40	48.027	48.027	48.029
0.60	48.025	48.025	48.027
0.80	48.024	48.024	48.025
1.00	48.022	48.022	48.023
1.10	48.021	48.021	48.022
1.21	48.021	48.020	48.022
--	-	-	-
--	-	-	-
--	-	-	-

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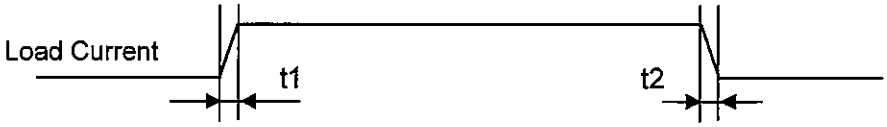
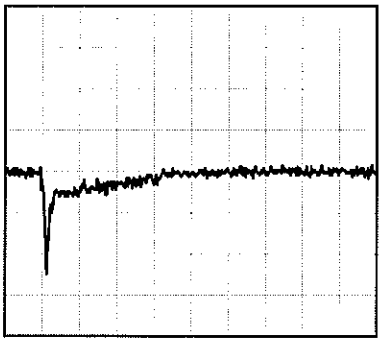
Model	LFA50F-48		
Item	Dynamic Load Response	Temperature Testing Circuitry	25℃ Figure A
Object	+48V1.1A		

Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ

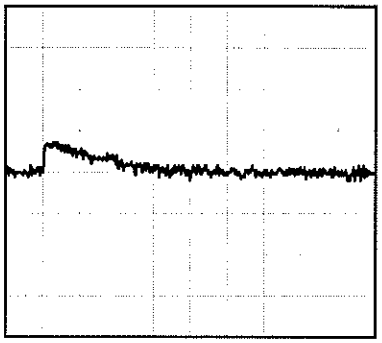


Min. Load (0A) ⟷
Load 100% (1.1A)



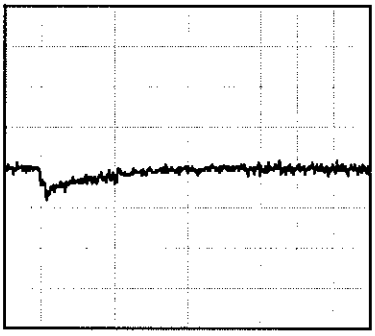
100 mV/div

10 ms/div



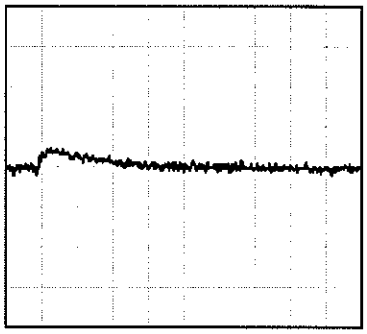
10 ms/div

Min. Load (0A) ⟷
Load 50% (0.55A)



100 mV/div

10 ms/div



10 ms/div

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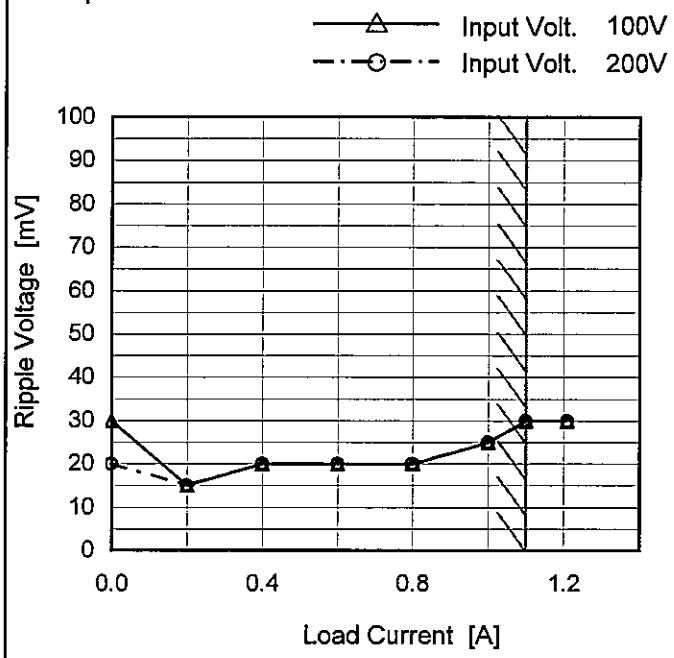
Model	LFA50F-48
Item	Ripple Voltage (by Load Current)
Object	+48V1.1A

Temperature 25°C
Testing Circuitry Figure C

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

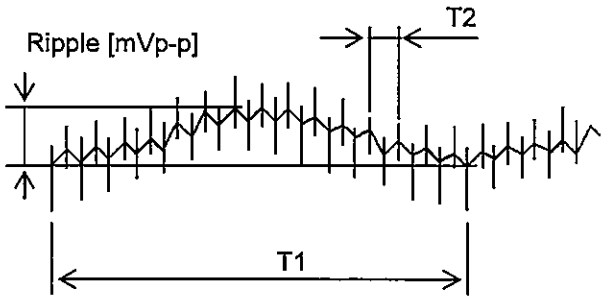


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	30	20
0.20	15	15
0.40	20	20
0.60	20	20
0.80	20	20
1.00	25	25
1.10	30	30
1.21	30	30
--	-	-
--	-	-
--	-	-

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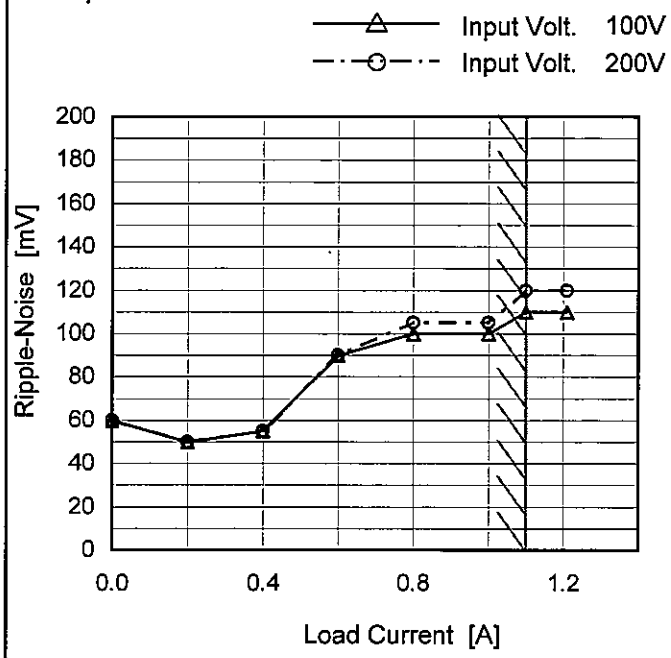
Model	LFA50F-48
Item	Ripple-Noise
Object	+48V1.1A

Temperature 25°C
Testing Circuitry Figure C

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

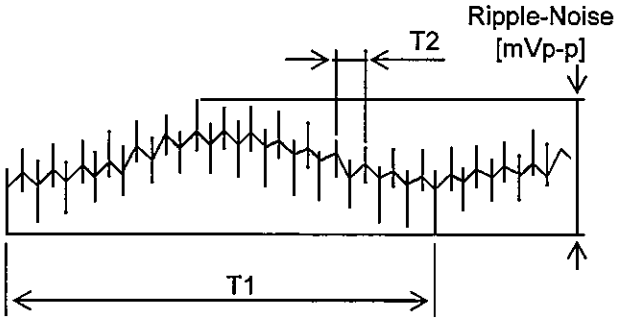


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV] Input Volt. 100 [V]	Ripple-Noise [mV] Input Volt. 200 [V]
0.00	60	60
0.20	50	50
0.40	55	55
0.60	90	90
0.80	100	105
1.00	100	105
1.10	110	120
1.21	110	120
--	-	-
--	-	-
--	-	-

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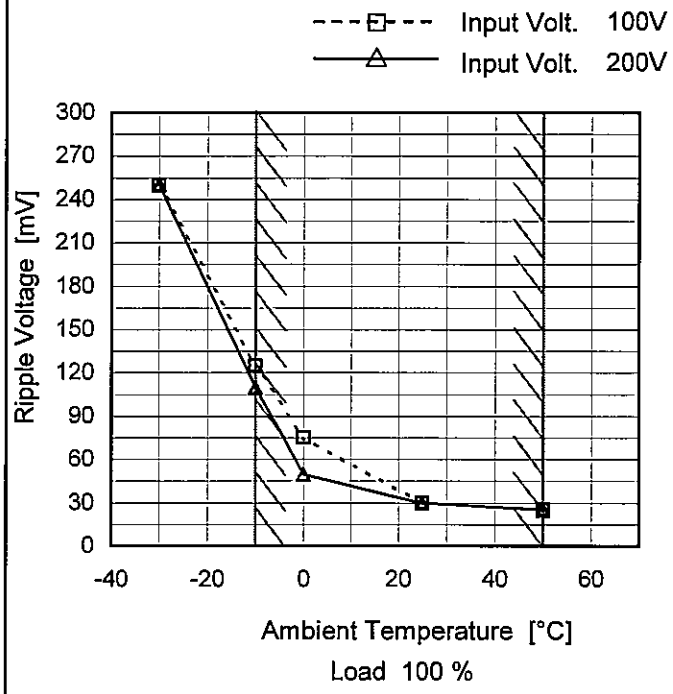
Model	LFA50F-48
Item	Ripple Voltage (by Ambient Temp.)
Object	+48V1.1A

Testing Circuitry Figure C

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	250	250
-10	125	110
0	75	50
25	30	30
50	25	25
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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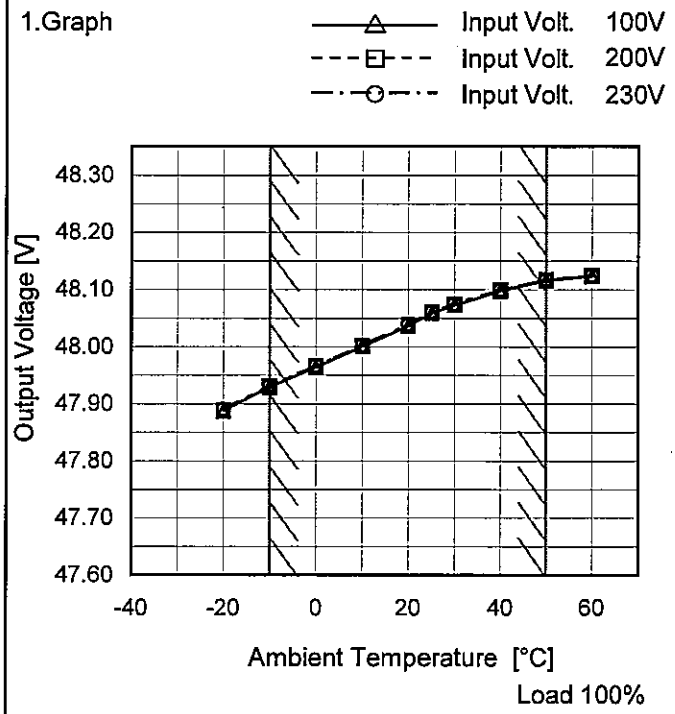
Model	LFA50F-48
Item	Ambient Temperature Drift
Object	+48V1.1A

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	47.888	47.890	47.891
-10	47.929	47.931	47.932
0	47.964	47.966	47.967
10	48.001	48.002	48.003
20	48.036	48.038	48.039
25	48.059	48.060	48.061
30	48.073	48.074	48.075
40	48.098	48.099	48.100
50	48.115	48.117	48.118
60	48.124	48.125	48.125
--	-	-	-

COSEL

Model	LFA50F-48
Item	Output Voltage Accuracy
Object	+48V1.1A

Testing Circuitry Figure A

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	50	85	0	48.126	±99	±0.2
Minimum Voltage	-10	85	1.1	47.928		

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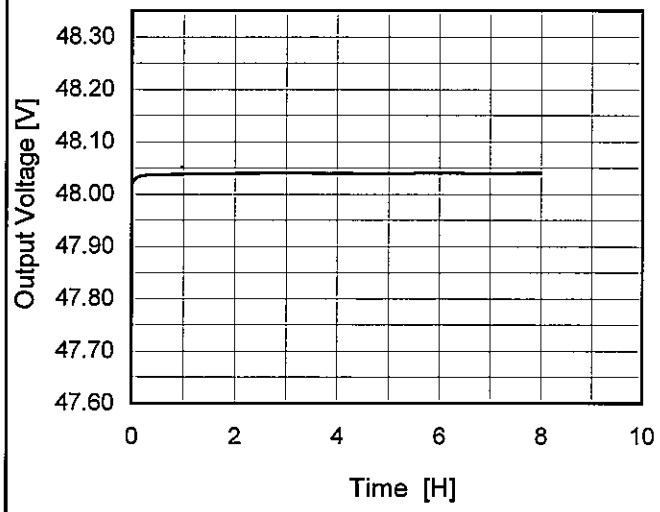
Model	LFA50F-48
Item	Time Lapse Drift
Object	+48V1.1A

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	48.009
0.5	48.038
1.0	48.039
2.0	48.040
3.0	48.040
4.0	48.040
5.0	48.040
6.0	48.041
7.0	48.040
8.0	48.041

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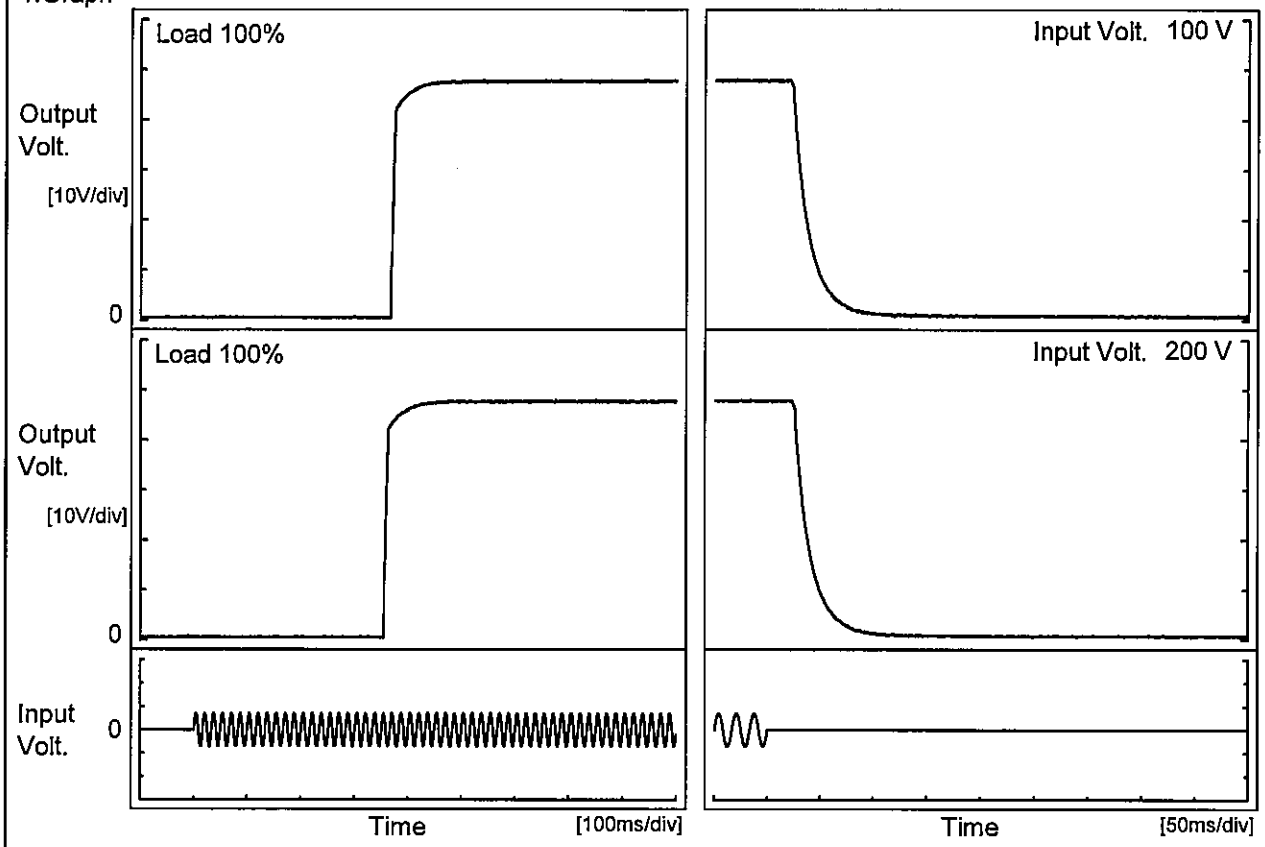
Model	LFA50F-48	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+48V1.1A	

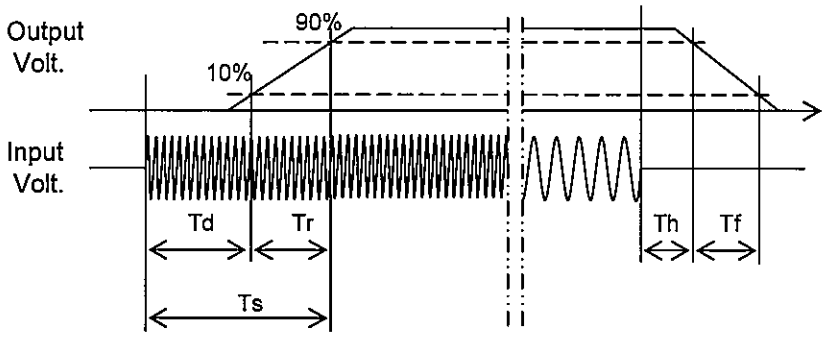
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	368.0	18.0	386.0	24.3	35.8
200 V	355.0	17.5	372.5	26.3	35.0



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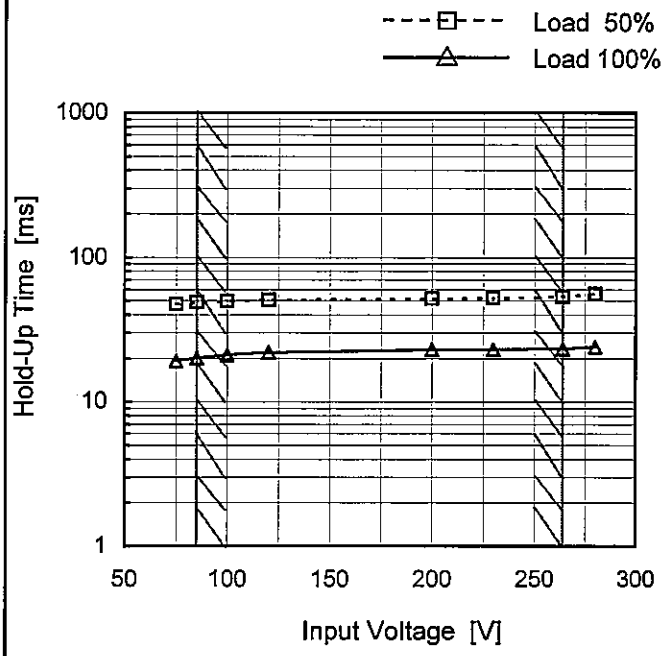
Model	LFA50F-48
Item	Hold-Up Time
Object	+48V1.1A

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	47	19
85	49	20
100	50	21
120	51	22
200	52	23
230	52	23
264	53	23
280	56	24
--	-	-

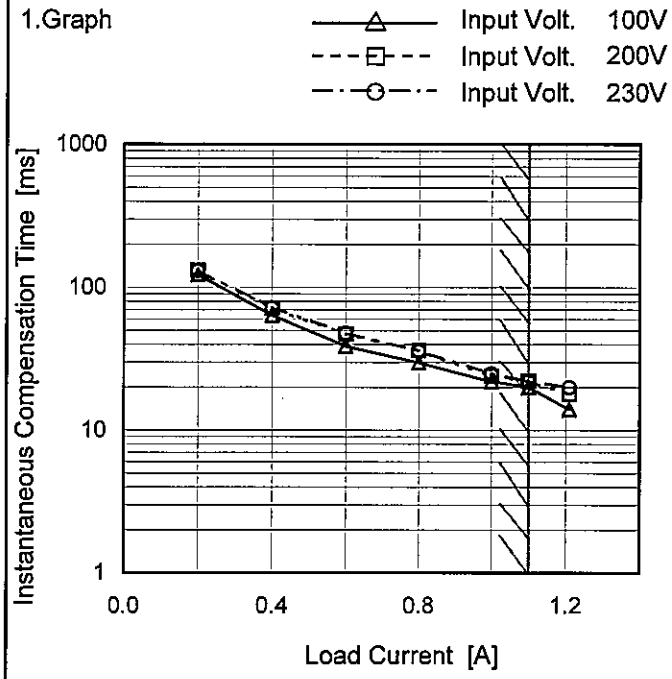
BC-10368

COSEL

Model	LFA50F-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	123	131	131
0.40	64	71	72
0.60	39	47	48
0.80	30	36	36
1.00	22	24	25
1.10	20	22	22
1.21	14	18	20
--	-	-	-
--	-	-	-
--	-	-	-

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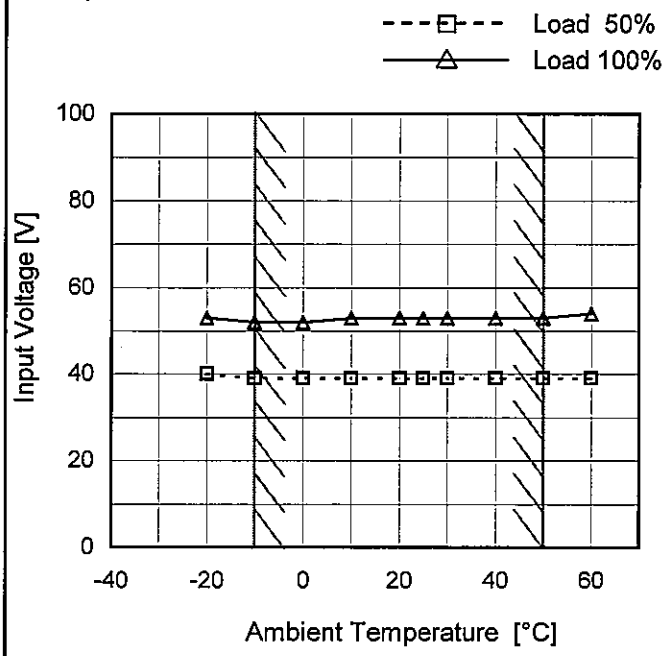
COSEL

Model	LFA50F-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

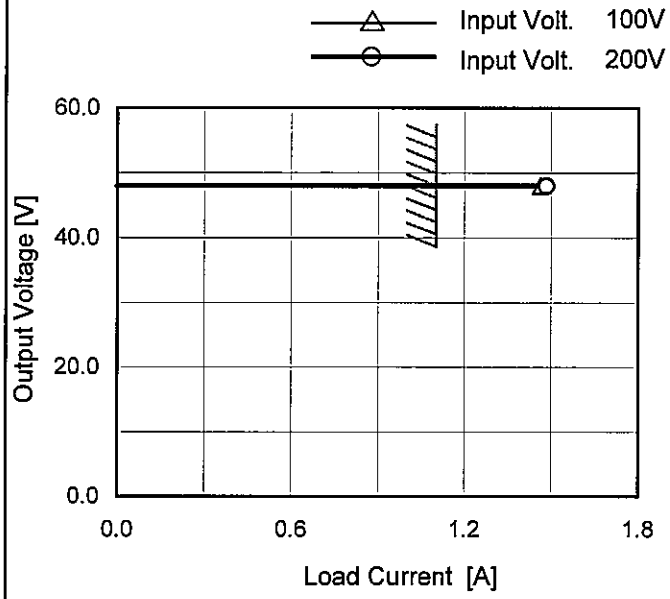
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	40	53
-10	39	52
0	39	52
10	39	53
20	39	53
25	39	53
30	39	53
40	39	53
50	39	53
60	39	54
--	-	-

COSEL

Model	LFA50F-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 less than rated output voltage.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
48.0	1.46	1.46
45.6	-	-
43.2	-	-
38.4	-	-
33.6	-	-
28.8	-	-
24.0	-	-
19.2	-	-
14.4	-	-
9.6	-	-
4.8	-	-
0.0	-	-

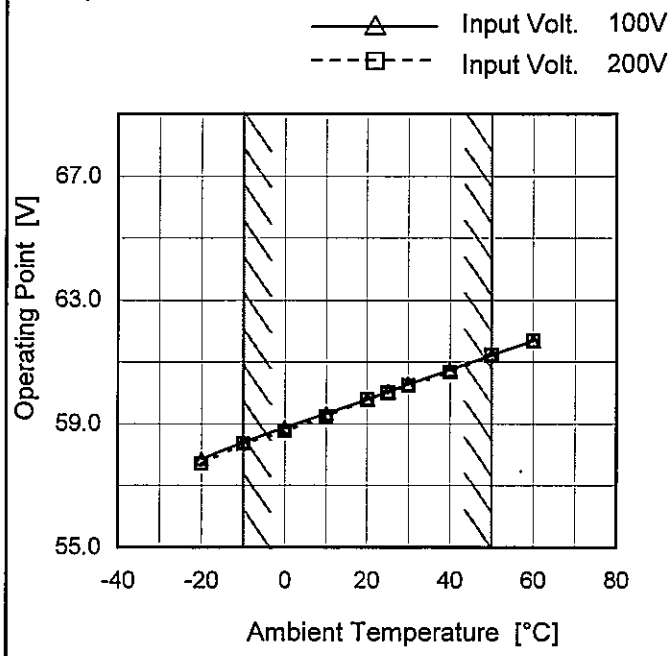
BC-10368

COSEL

Model	LFA50F-48
Item	Overvoltage Protection
Object	+48V1.1A

Testing Circuitry Figure A

1.Graph



Load 0%

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	57.87	57.70
-10	58.40	58.34
0	58.87	58.75
10	59.33	59.22
20	59.80	59.80
25	60.05	60.00
30	60.29	60.23
40	60.75	60.64
50	61.22	61.22
60	61.69	61.69
--	-	-

COSEL

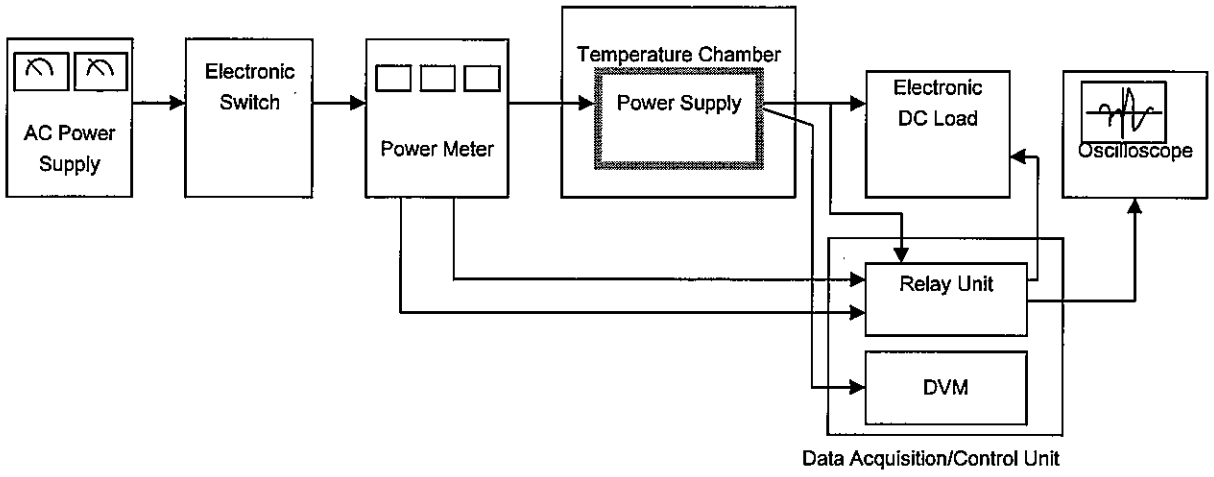


Figure A

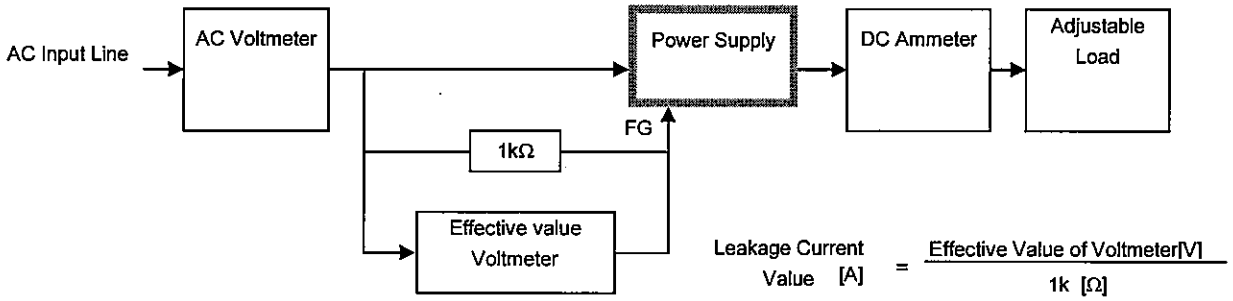


Figure B (DEN-AN)

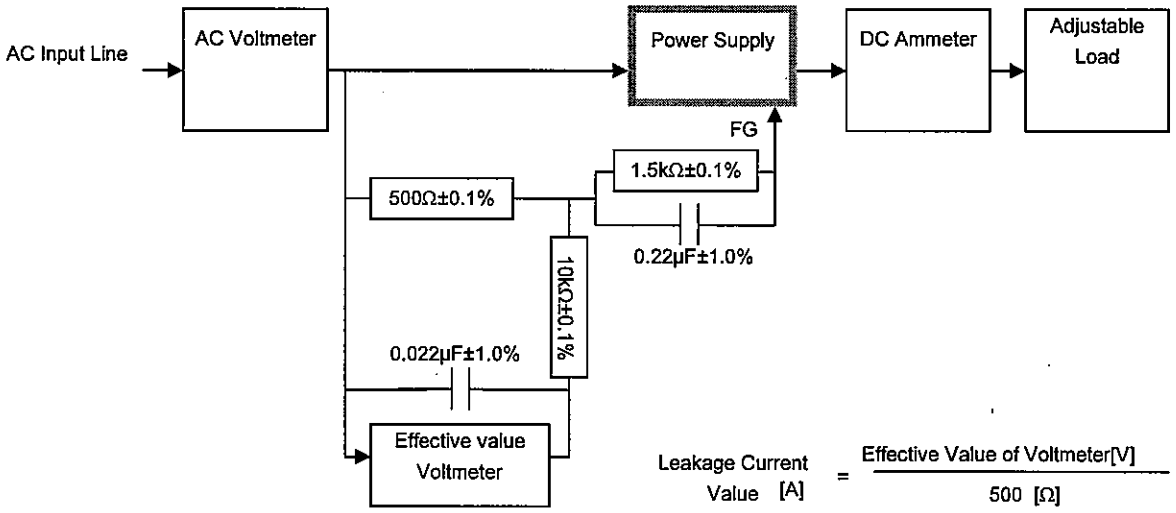


Figure B (IEC60950-1)

COSEL

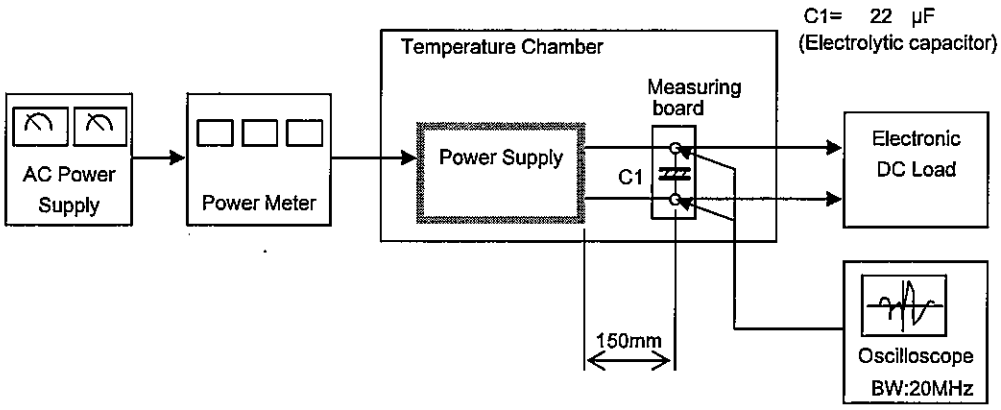


Figure C