COSEL

参考資料

TEST DATA OF LFA150F-48

Regulated DC Power Supply
November 12, 2010

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COSEL CO.,LTD.

参考資料

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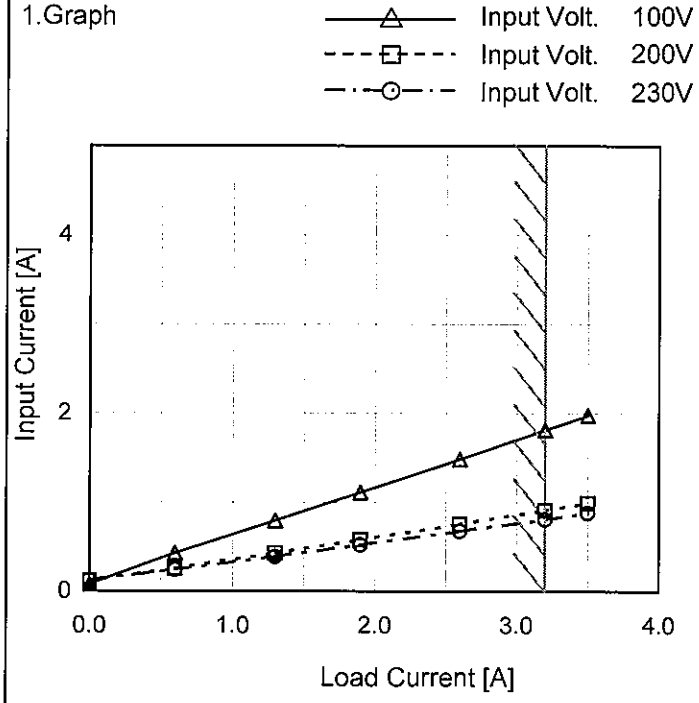
Model	LFA150F-48
Item	Input Current (by Load Current)
Object	――――――

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]
0.0	0.077	0.111	0.124
0.6	0.428	0.254	0.242
1.2	0.793	0.426	0.388
1.8	1.110	0.577	0.520
2.4	1.483	0.756	0.674
3.2	1.814	0.913	0.809
3.5	1.976	0.991	0.879
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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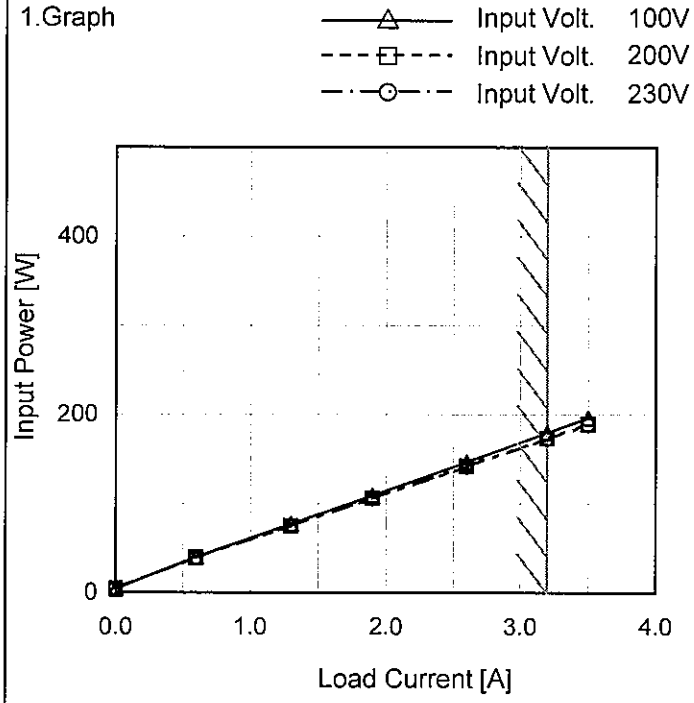
COSEL

Model	LFA150F-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]
0.0	3.9	4.2	4.2
0.6	39.8	39.0	39.1
1.2	76.7	74.8	74.6
1.8	108.8	105.8	105.5
2.4	146.4	142.1	141.6
3.2	179.7	173.5	172.8
3.5	196.2	189.4	188.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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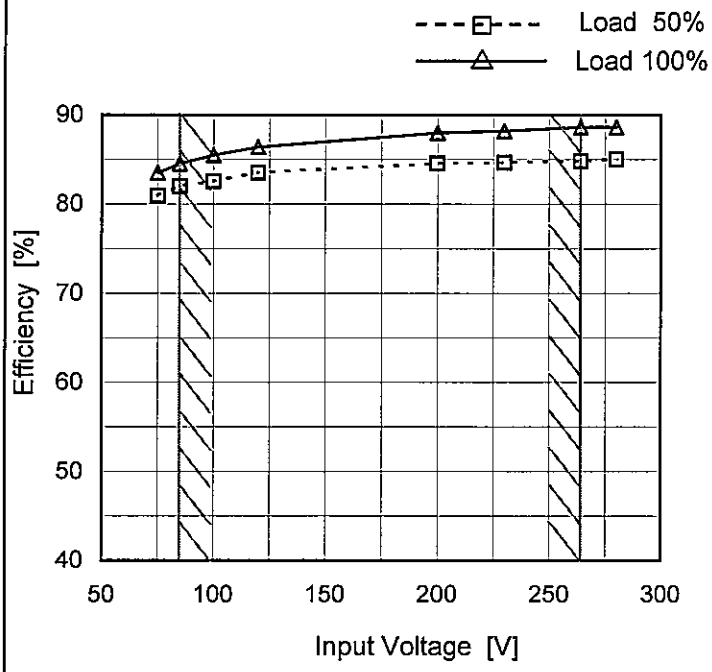
COSEL

Model	LFA150F-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	81.0	83.5
85	82.0	84.5
100	82.6	85.5
120	83.5	86.4
200	84.5	88.0
230	84.6	88.2
264	84.8	88.6
280	85.0	88.6
---	-	-

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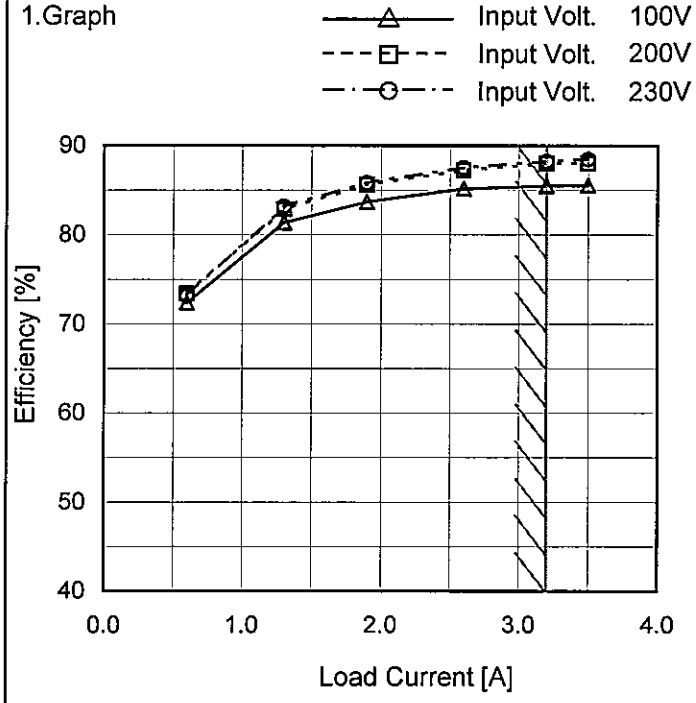
Model	LFA150F-48
Item	Efficiency (by Load Current)
Object	————————

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]
0.0	-	-	-
0.6	72.4	73.4	73.1
1.2	81.4	82.9	83.2
1.8	83.7	85.6	85.8
2.4	85.2	87.2	87.5
3.2	85.5	88.0	88.2
3.5	85.6	88.0	88.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

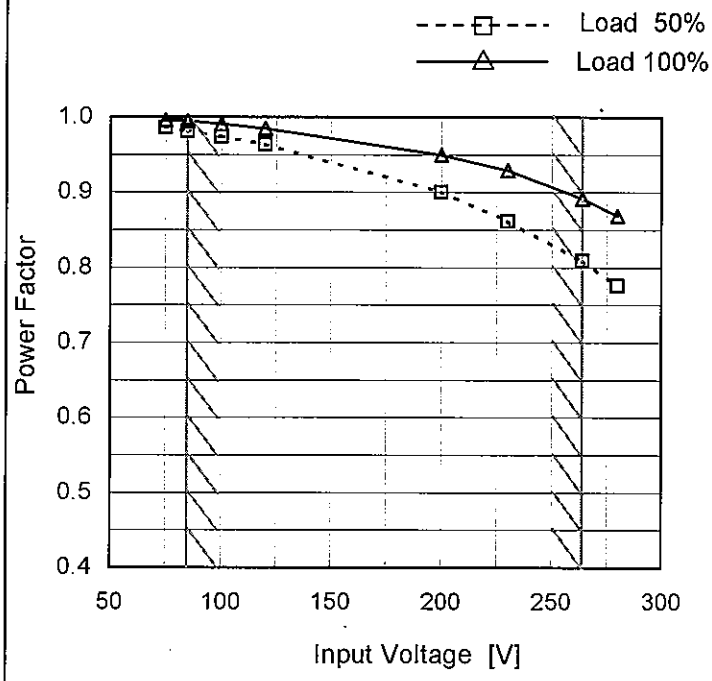
BC-10487

COSEL

Model	LFA150F-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

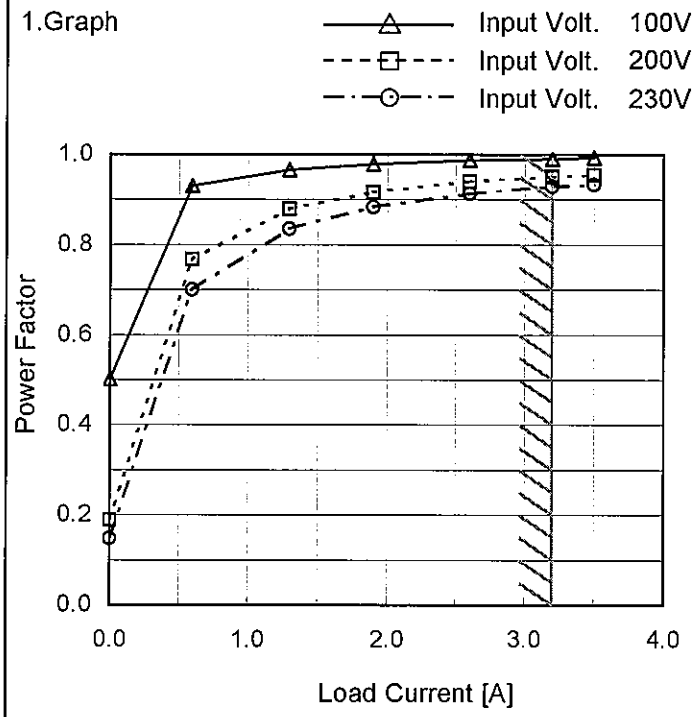
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.986	0.996
85	0.981	0.995
100	0.974	0.991
120	0.963	0.984
200	0.900	0.950
230	0.862	0.929
264	0.809	0.892
280	0.776	0.869
--	-	-

COSEL

Model	LFA150F-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]
0.0	0.501	0.188	0.147
0.6	0.930	0.768	0.701
1.2	0.966	0.879	0.835
1.8	0.979	0.917	0.883
2.4	0.987	0.940	0.913
3.2	0.991	0.950	0.929
3.5	0.993	0.955	0.933
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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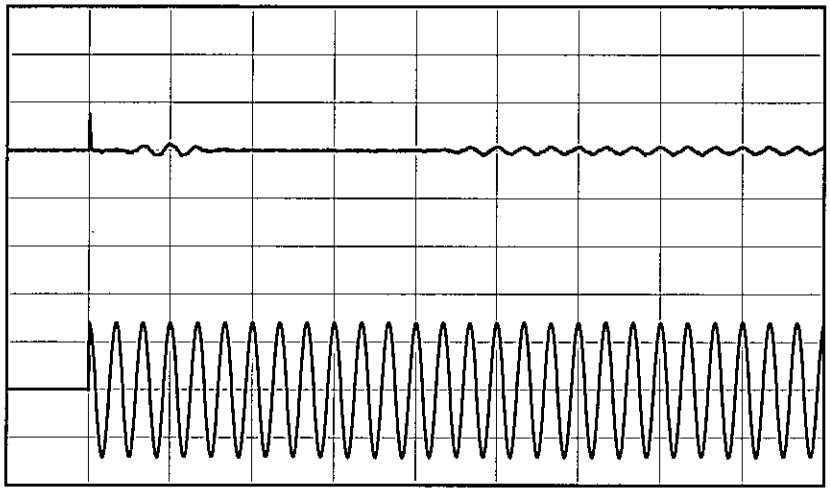
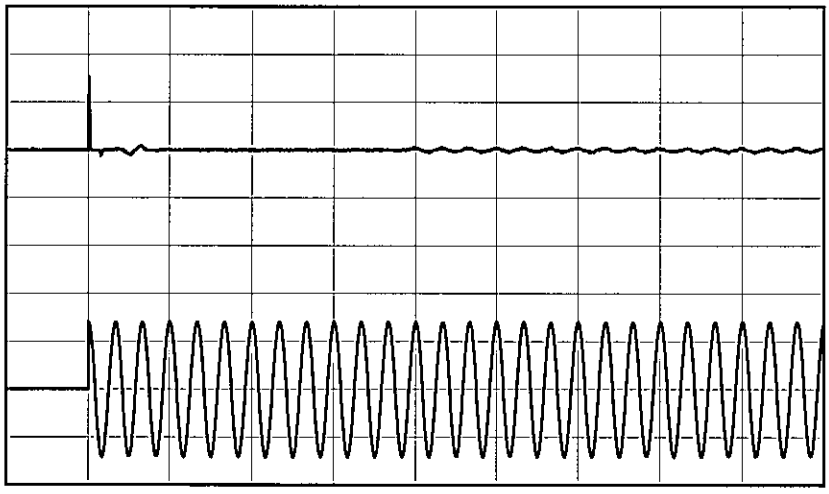
Model	LFA150F-48		
Item	Inrush Current	Temperature	25°C
		Testing Circuitry	Figure A
Object	――――――		



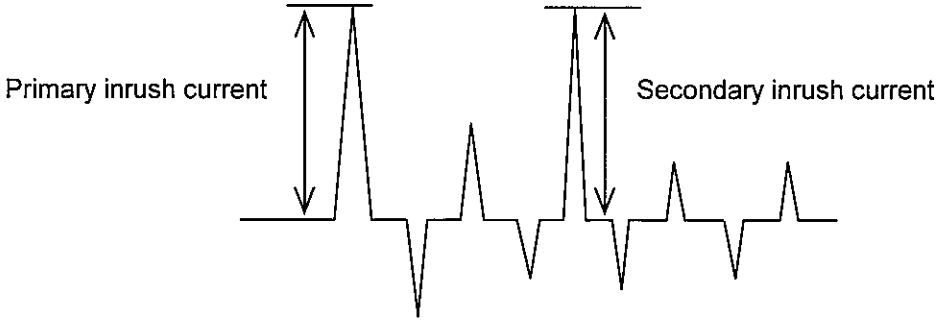
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
15.1 A
Secondary inrush current :
2.5 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
30.3 A
Secondary inrush current :
1.2 A



-

COSEL

Model	LFA150F-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	0.27	0.40	0.44	Operation
	One of phases	0.23	0.51	0.60	Stand by
IEC60950-1	Both phases	0.16	0.35	0.41	Operation
	One of phases	0.24	0.52	0.61	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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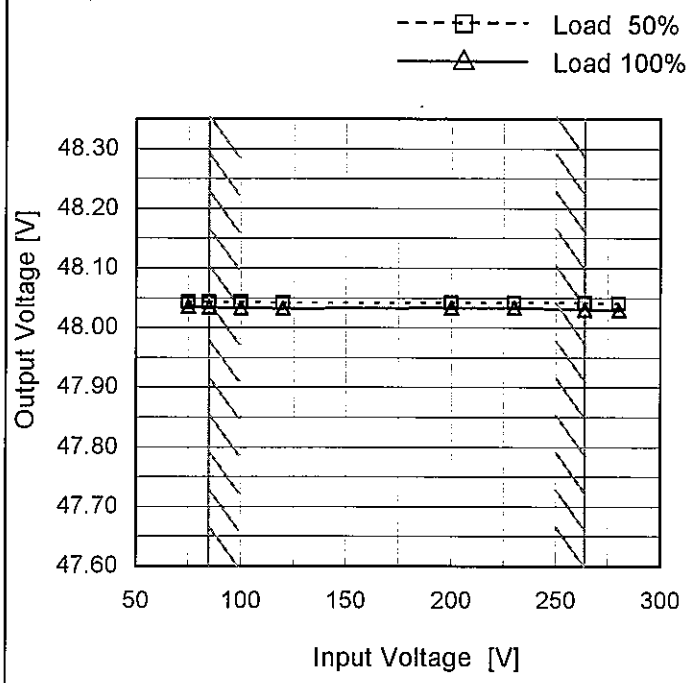
Model	LFA150F-48
Item	Line Regulation
Object	+48V3.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

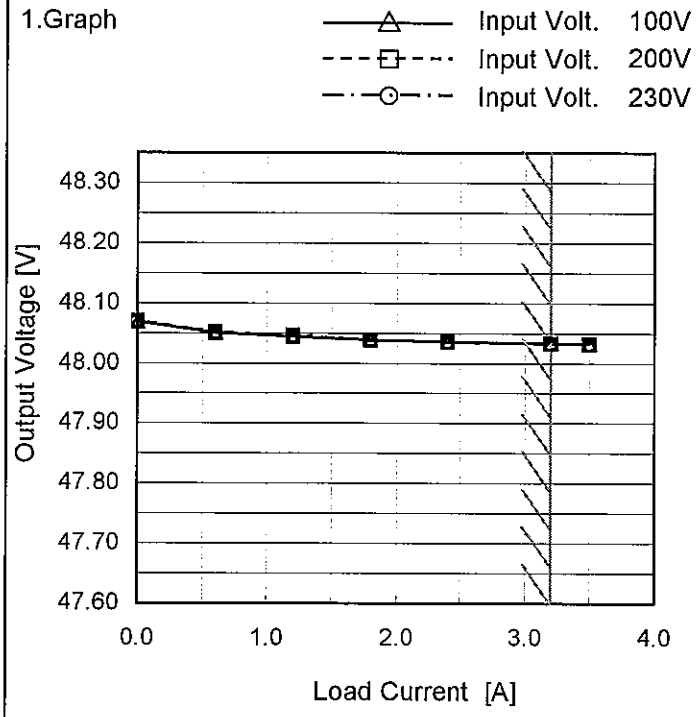
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	48.043	48.036
85	48.043	48.035
100	48.043	48.034
120	48.042	48.033
200	48.042	48.033
230	48.042	48.033
264	48.042	48.031
280	48.041	48.030
--	-	-

COSEL

Model	LFA150F-48
Item	Load Regulation
Object	+48V3.2A

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	48.069	48.070	48.070
0.6	48.051	48.052	48.051
1.2	48.044	48.046	48.045
1.8	48.039	48.039	48.038
2.4	48.035	48.036	48.035
3.2	48.034	48.033	48.033
3.5	48.032	48.032	48.031
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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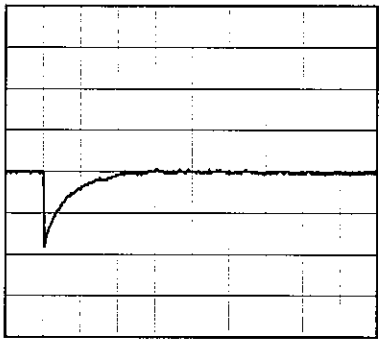
Model	LFA150F-48		
Item	Dynamic Load Response	Temperature Testing Circuitry	25°C Figure A
Object	+48V3.2A		

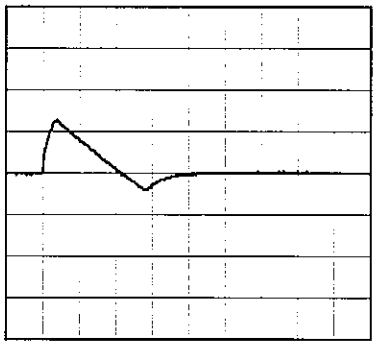
Input Volt. 100 V

Cycle 1000 ms

Response. t1=t2=50us. Typ

Min. Load (0A) ←→
Load 100% (3.2A)



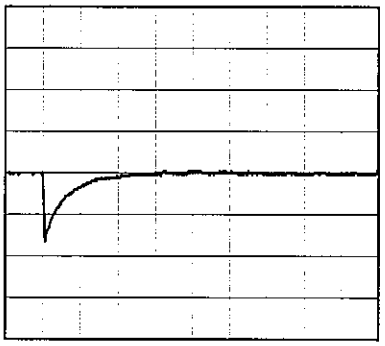


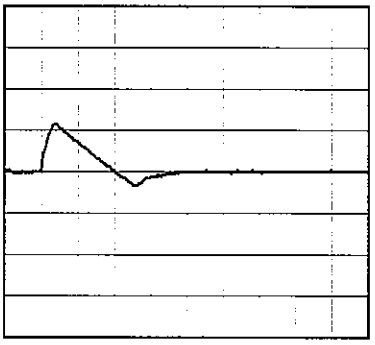
500 mV/div

10 ms/div

10 ms/div

Min. Load (0A) ←→
Load 50% (1.6A)





500 mV/div

10 ms/div

10 ms/div

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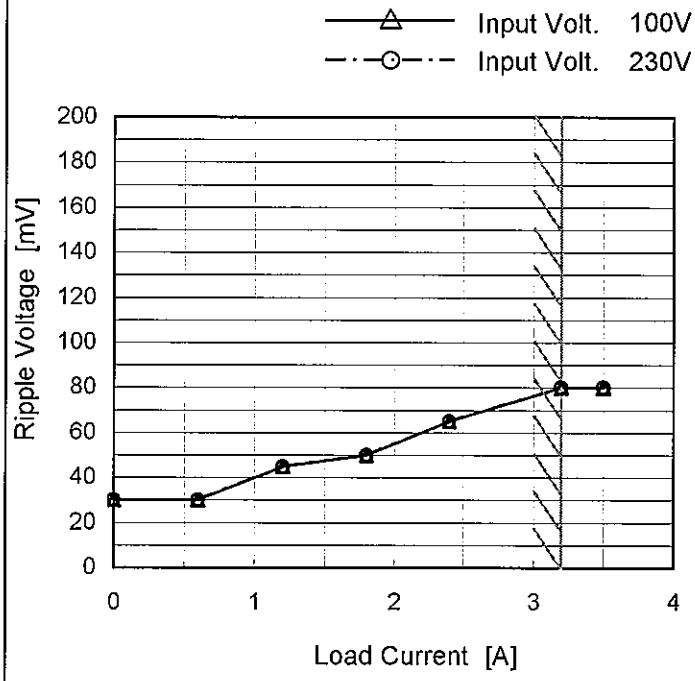
Model	LFA150F-48
Item	Ripple Voltage (by Load Current)
Object	+48V3.2A

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

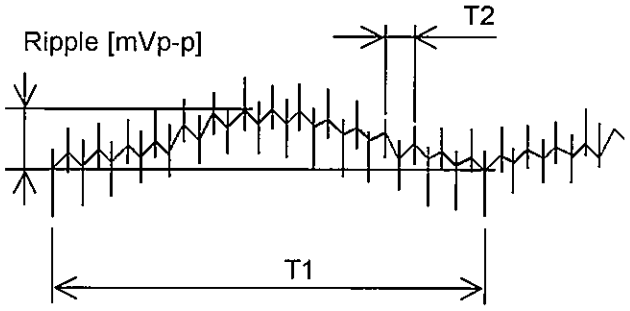


Fig. Complex Ripple Wave Form

2.Values

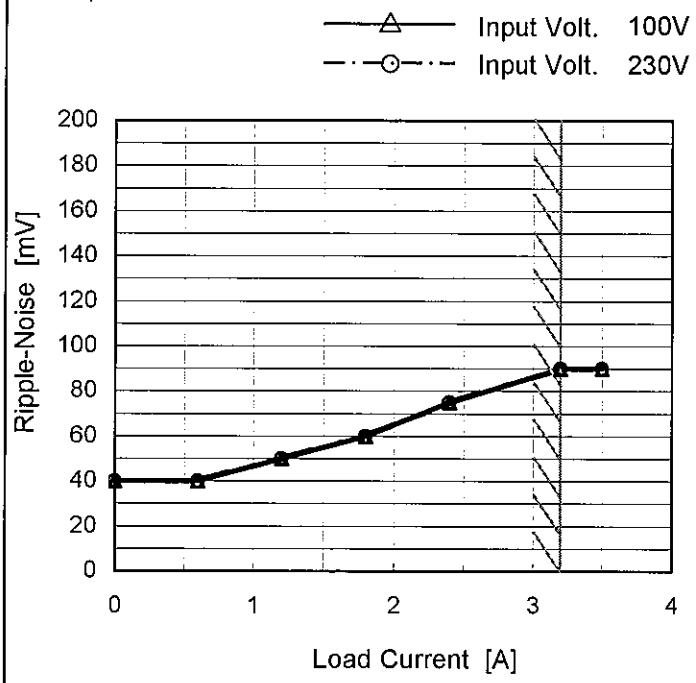
Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 230 [V]
0.0	30	30
0.6	30	30
1.2	45	45
1.8	50	50
2.4	65	65
3.2	80	80
3.5	80	80
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA150F-48
Item	Ripple-Noise
Object	+48V3.2A

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

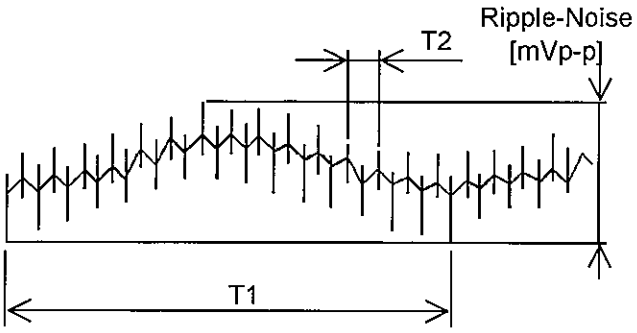


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV] Input Volt. 100 [V]	Ripple-Noise [mV] Input Volt. 230 [V]
0.0	40	40
0.6	40	40
1.2	50	50
1.8	60	60
2.4	75	75
3.2	90	90
3.5	90	90
--	-	-
--	-	-
--	-	-
--	-	-

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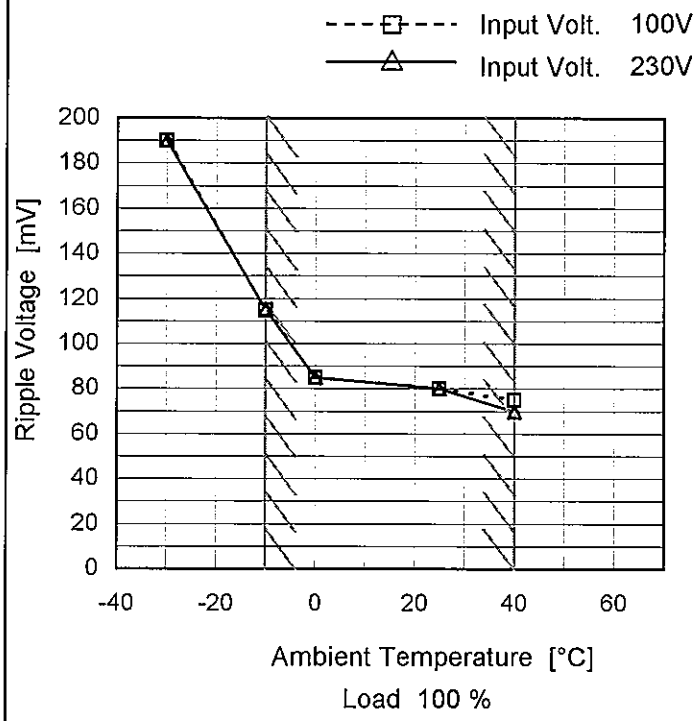
Model	LFA150F-48
Item	Ripple Voltage (by Ambient Temp.)
Object	+48V3.2A

Testing Circuitry Figure C

1.Graph



Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated ambient temperature.

2.Values

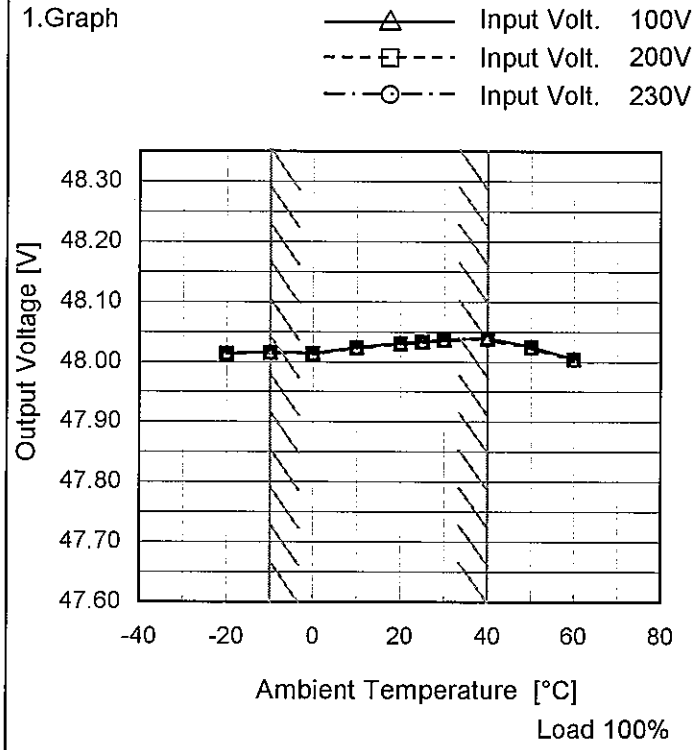
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	190	190
-10	115	115
0	85	85
25	80	80
40	75	70
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA150F-48
Item	Ambient Temperature Drift
Object	+48V3.2A

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	48.015	48.014	48.013
-10	48.016	48.014	48.014
0	48.014	48.013	48.013
10	48.024	48.023	48.023
20	48.031	48.030	48.030
25	48.034	48.033	48.033
30	48.037	48.035	48.035
40	48.040	48.038	48.037
50	48.025	48.024	48.023
60	48.005	48.003	48.003
--	-	-	-

COSEL

Model	LFA150F-48	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+48V3.2A	

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 - 40°C
Input Voltage : 85 - 264V
Load Current : 0 - 3.2A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

* Output Voltage Accuracy (Ration) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2.Values

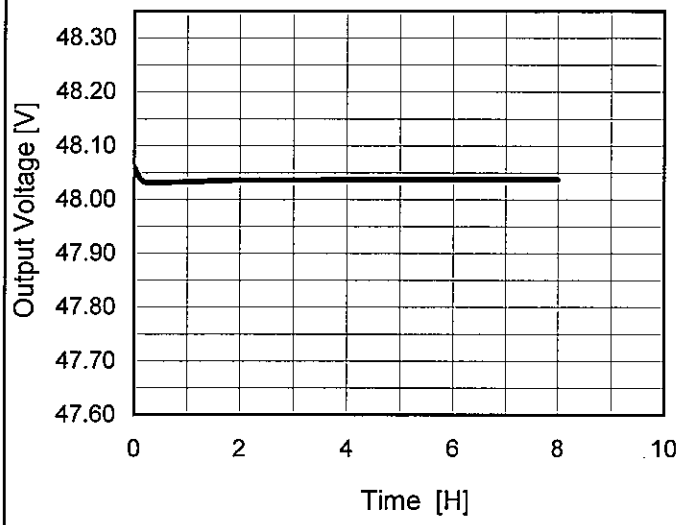
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	85	0	48.038	±33	±0.1
Minimum Voltage	0	264	3.2	47.973		

COSEL

Model	LFA150F-48
Item	Time Lapse Drift
Object	+48V3.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC230V is equal.

2.Values

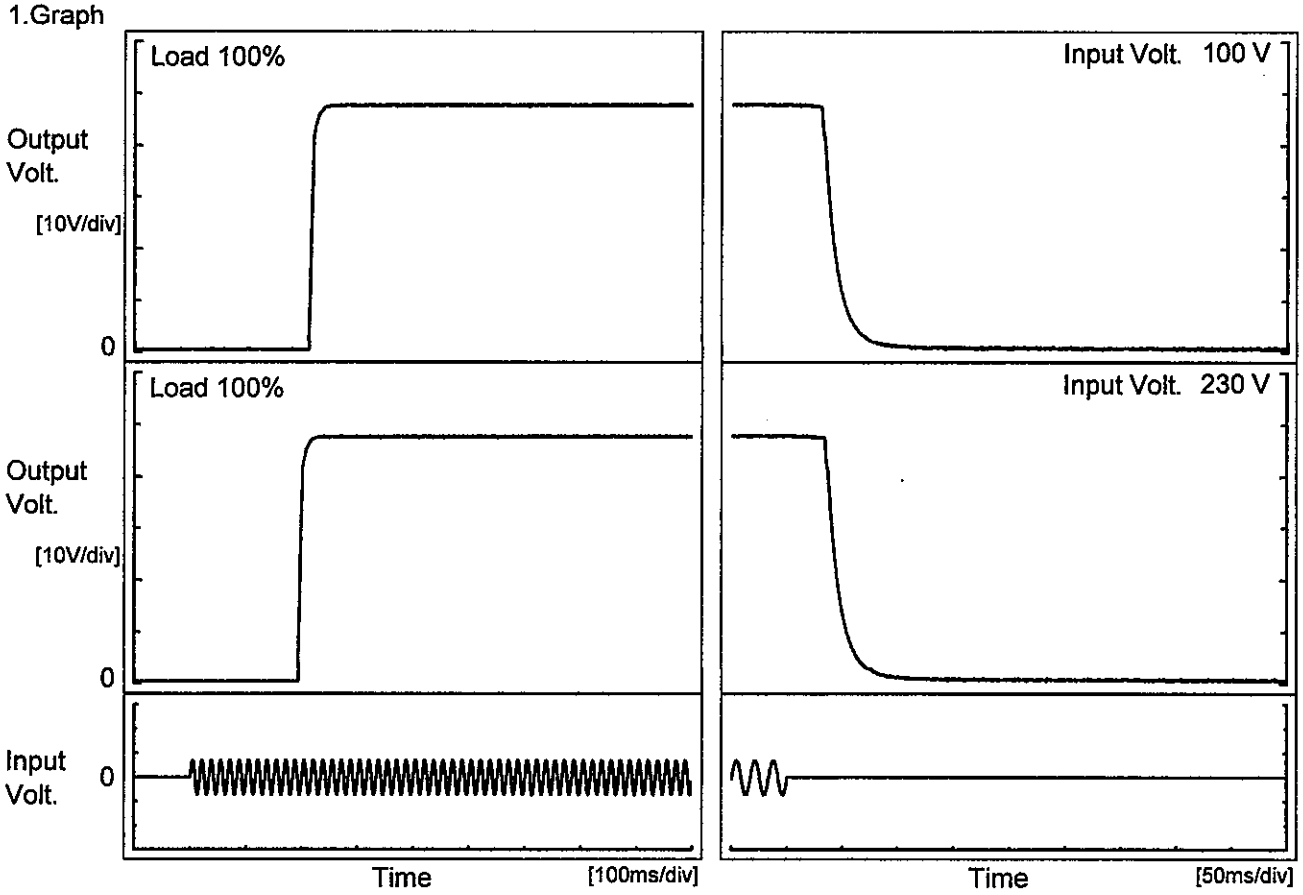
Time since start [H]	Output Voltage [V]
0.0	48.061
0.5	48.032
1.0	48.033
2.0	48.036
3.0	48.036
4.0	48.037
5.0	48.037
6.0	48.037
7.0	48.037
8.0	48.038

COSEL

Model	LFA150F-48
Item	Rise and Fall Time
Object	+48V3.2A

Temperature 25°C
Testing Circuitry Figure A

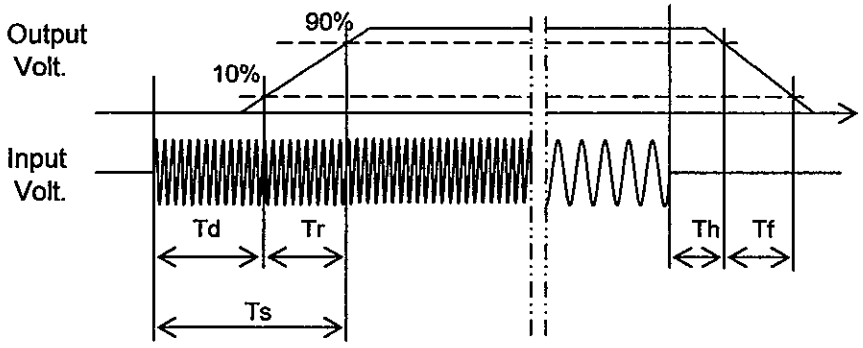
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	213.5	10.0	223.5	31.8	28.8
230 V	194.5	10.5	205.0	35.3	28.5



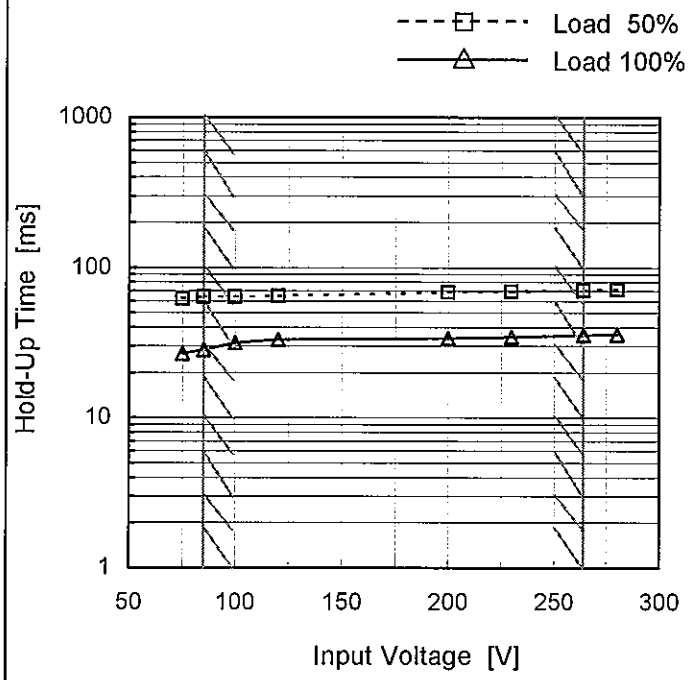
BC-10487

COSEL

Model	LFA150F-48
Item	Hold-Up Time
Object	+48V3.2A

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	62	27
85	64	29
100	64	32
120	65	33
200	69	34
230	69	35
264	71	36
280	71	36
--	-	-

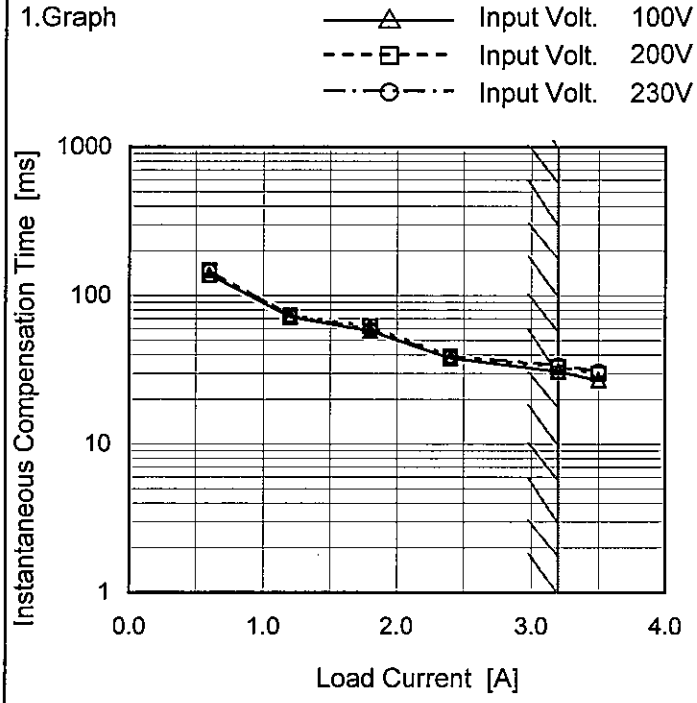
BC-10487

COSEL

Model	LFA150F-48
Item	Instantaneous Interruption Compensation
Object	+48V3.2A

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	139	147	147
1.2	72	73	73
1.8	58	62	59
2.4	38	39	39
3.2	31	33	34
3.5	27	30	31
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

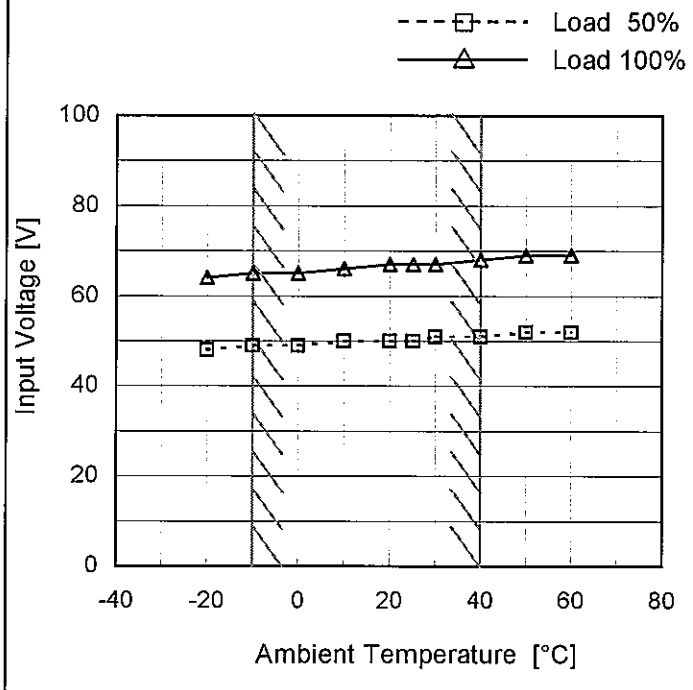
BC-10487

COSEL

Model	LFA150F-48
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V3.2A

Testing Circuitry Figure A

1.Graph



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

2.Values

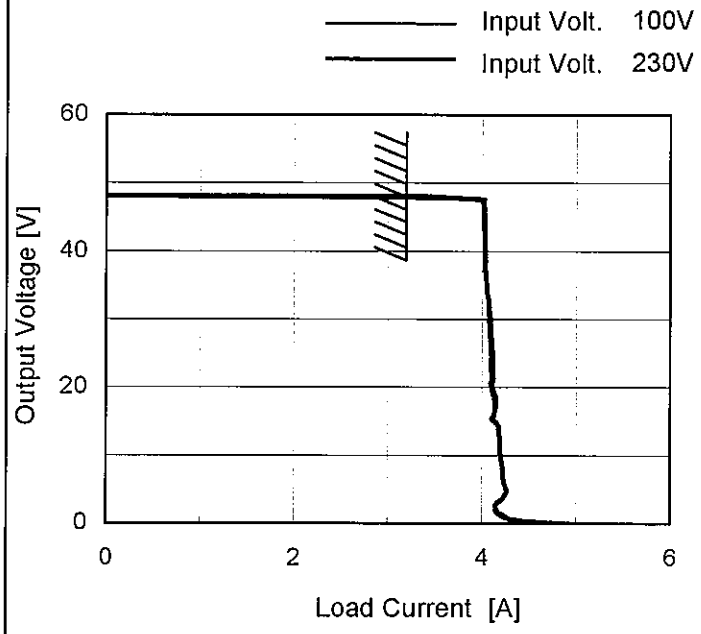
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	48	64
-10	49	65
0	49	65
10	50	66
20	50	67
25	50	67
30	51	67
40	51	68
50	52	69
60	52	69
--	-	-

COSEL

Model	LFA150F-48
Item	Overcurrent Protection
Object	+48V3.2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

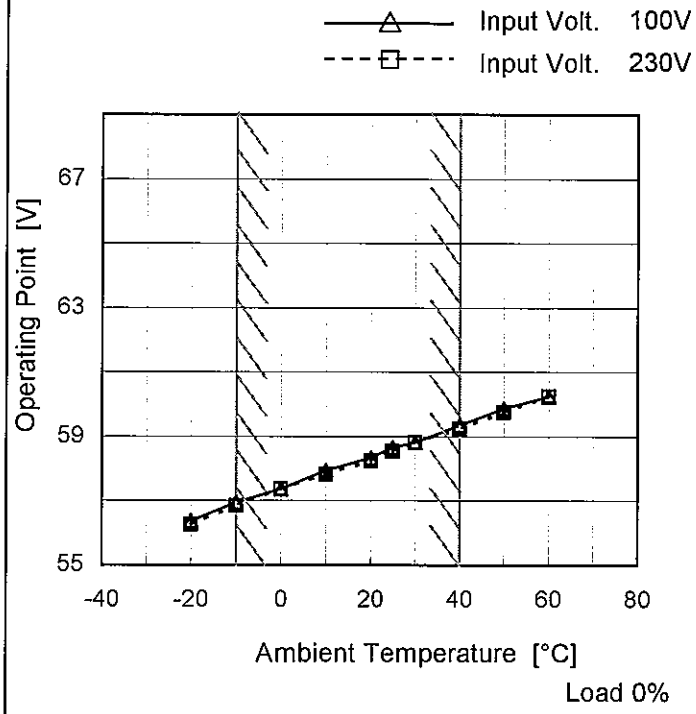
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
48.0	4.04	3.39
45.6	4.03	4.02
43.2	4.04	3.39
38.4	4.04	4.04
33.6	4.06	4.06
28.8	4.11	4.09
24.0	4.12	4.10
19.2	4.14	4.11
14.4	4.18	4.16
9.6	4.21	4.20
4.8	4.25	4.27
0.0	4.89	4.97

COSEL

Model	LFA150F-48
Item	Overvoltage Protection
Object	+48V3.2A

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	56.37	56.25
-10	56.95	56.84
0	57.36	57.36
10	57.94	57.83
20	58.35	58.24
25	58.65	58.53
30	58.82	58.82
40	59.35	59.23
50	59.87	59.76
60	60.25	60.25
--	-	-

COSEL

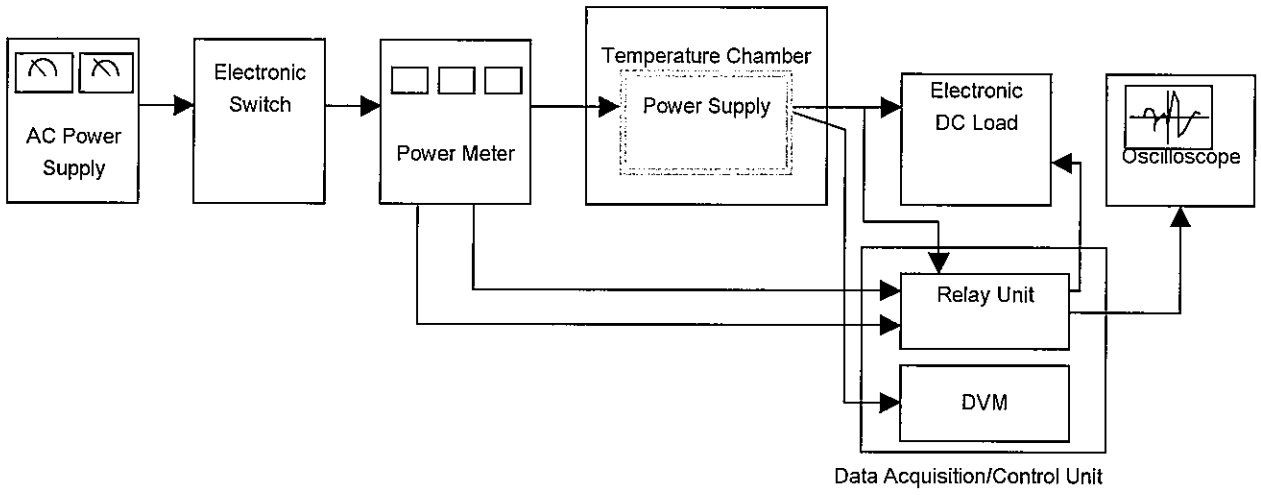


Figure A

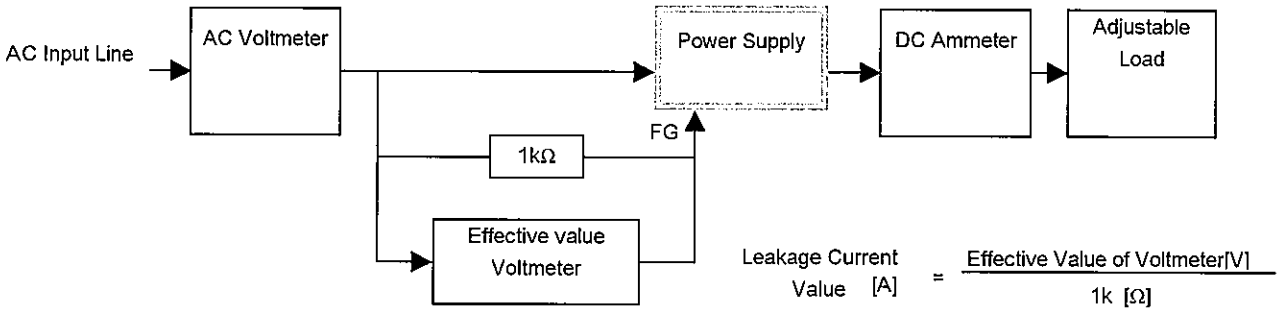


Figure B (DEN-AN)

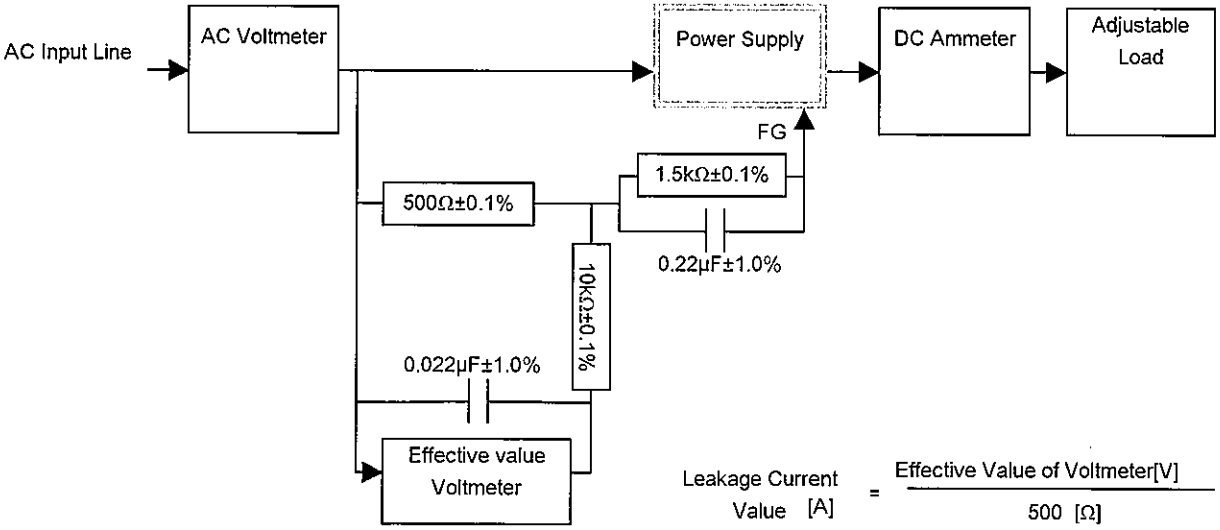


Figure B (IEC60950-1)

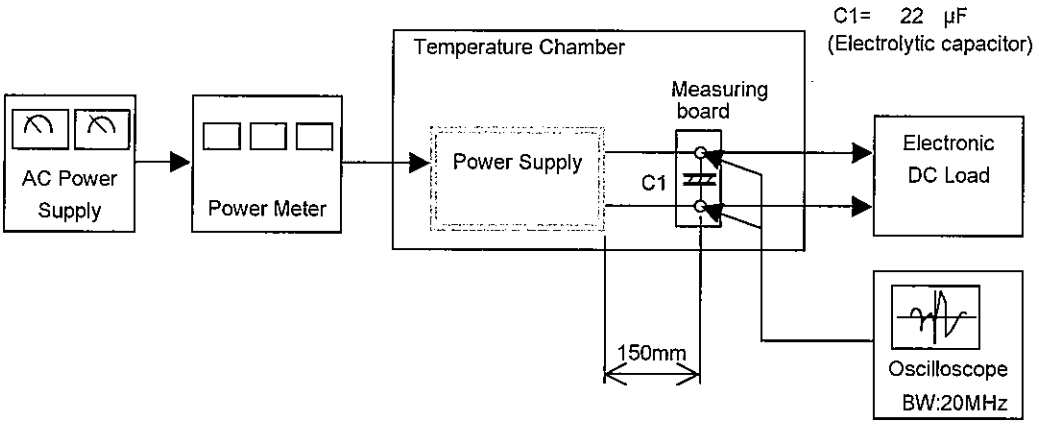

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope
BW:20MHz

Figure C