COSEL

参考資料

TEST DATA OF LFA150F-15

Regulated DC Power Supply
November 9, 2010

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COSEL CO.,LTD.

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CONTENTS

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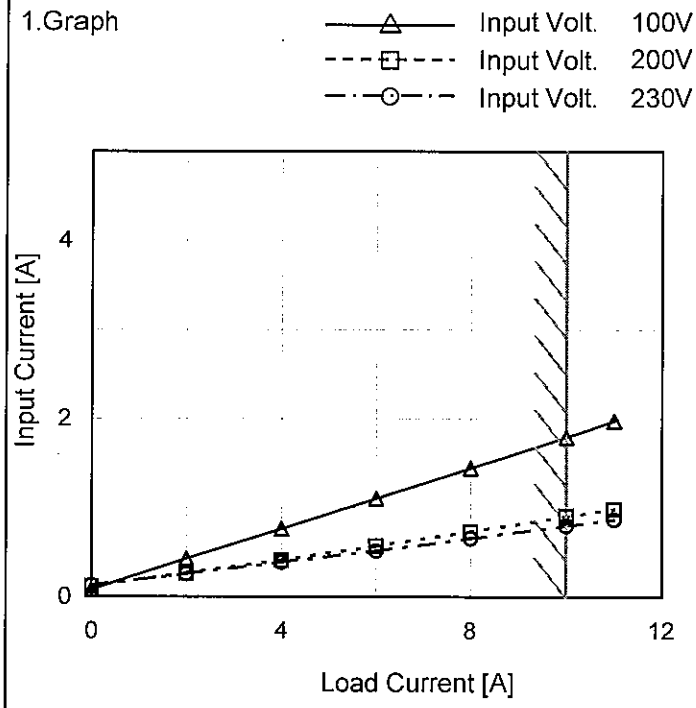
Model	LFA150F-15
Item	Input Current (by Load Current)
Object	———————

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	0.080	0.114	0.126
2	0.426	0.264	0.254
4	0.763	0.410	0.386
6	1.101	0.569	0.512
8	1.445	0.734	0.654
10	1.793	0.900	0.798
11	1.974	0.984	0.870
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-10484

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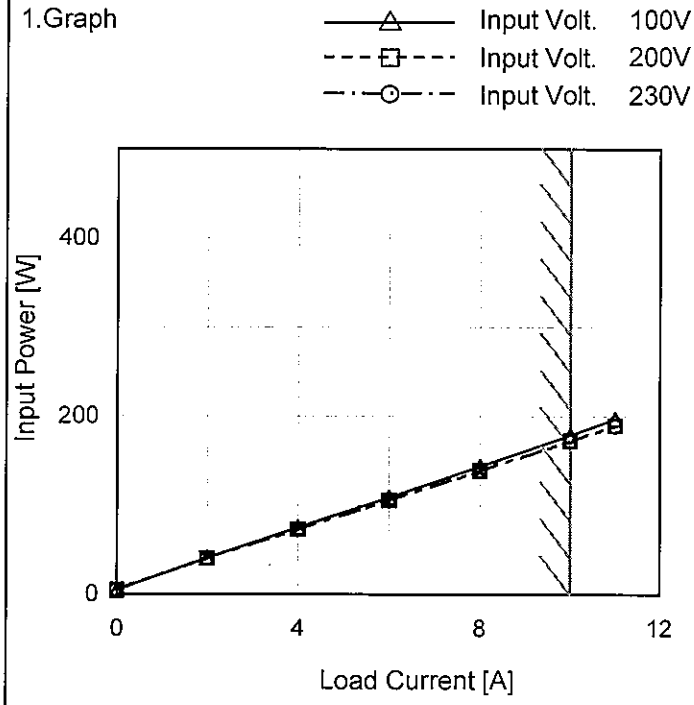
Model	LFA150F-15
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

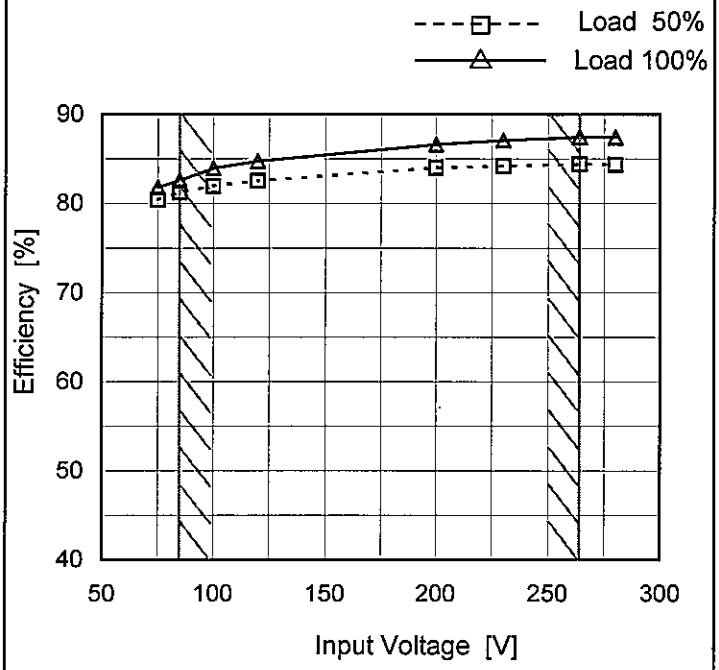
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	4.3	4.7	4.7
2	40.7	40.1	40.2
4	74.9	72.8	72.7
6	109.0	105.7	105.4
8	143.5	139.0	138.5
10	178.8	172.8	172.1
11	197.1	189.8	189.1
---	-	-	-
---	-	-	-
---	-	-	-
---	-	-	-

COSEL

Model	LFA150F-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	80.4	81.8
85	81.2	82.6
100	82.0	84.0
120	82.5	84.7
200	84.0	86.6
230	84.2	87.1
264	84.4	87.4
280	84.4	87.4
--	-	-

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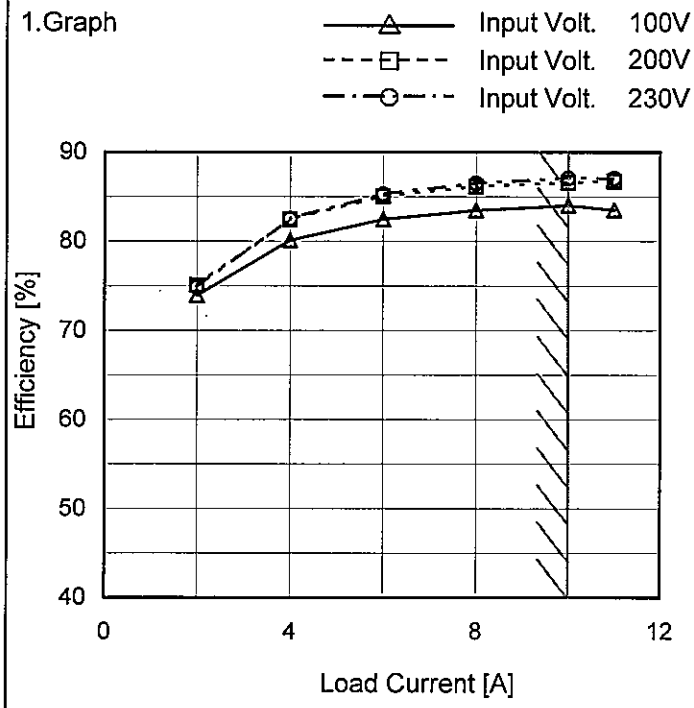
Model	LFA150F-15
Item	Efficiency (by Load Current)
Object	———————

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	-	-	-
2	73.9	75.1	74.8
4	80.1	82.4	82.5
6	82.5	85.1	85.3
8	83.5	86.2	86.5
10	84.0	86.6	87.1
11	83.5	86.7	87.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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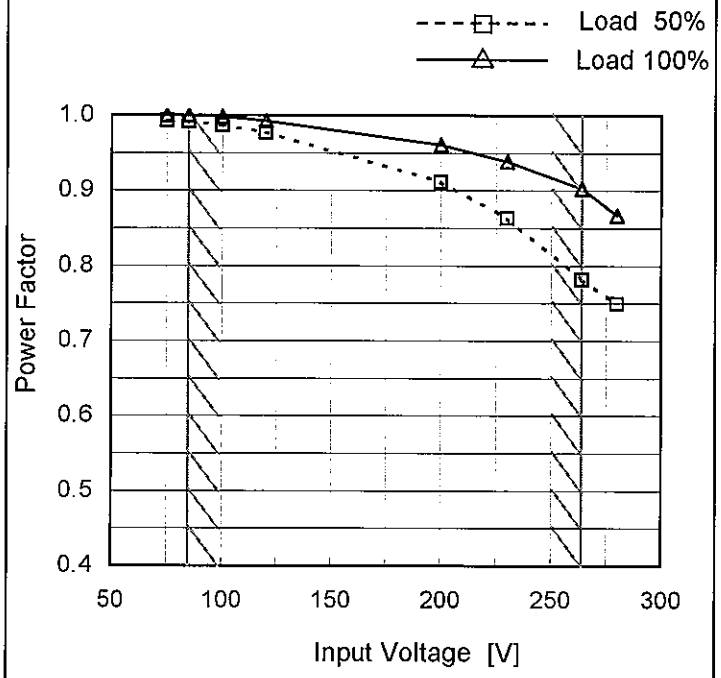
Model	LFA150F-15
Item	Power Factor (by Input Voltage)
Object	———————

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	0.994	0.999
85	0.991	0.999
100	0.986	0.998
120	0.977	0.992
200	0.911	0.961
230	0.863	0.938
264	0.782	0.903
280	0.749	0.867
--	-	-

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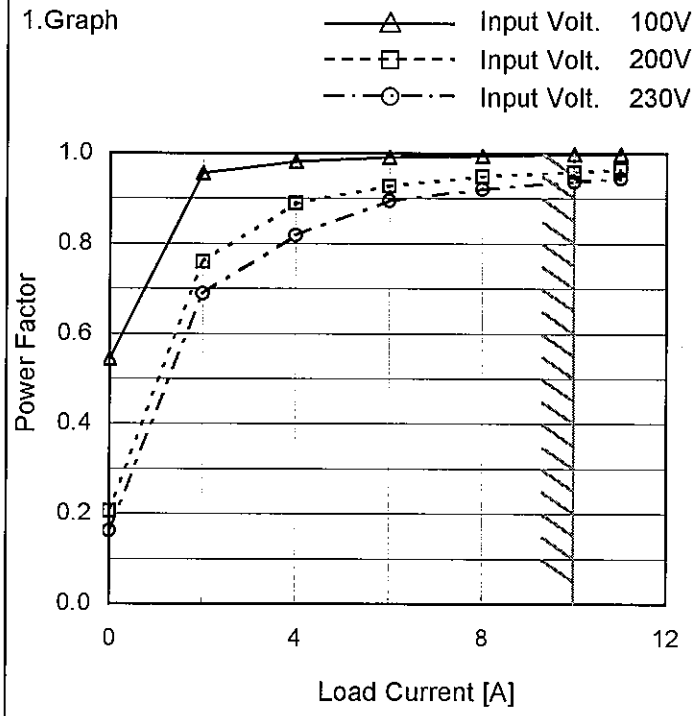
Model	LFA150F-15
Item	Power Factor (by Load Current)
Object	————————

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	0.545	0.206	0.162
2	0.955	0.759	0.688
4	0.982	0.889	0.819
6	0.991	0.928	0.895
8	0.994	0.948	0.921
10	0.998	0.961	0.938
11	0.998	0.964	0.945
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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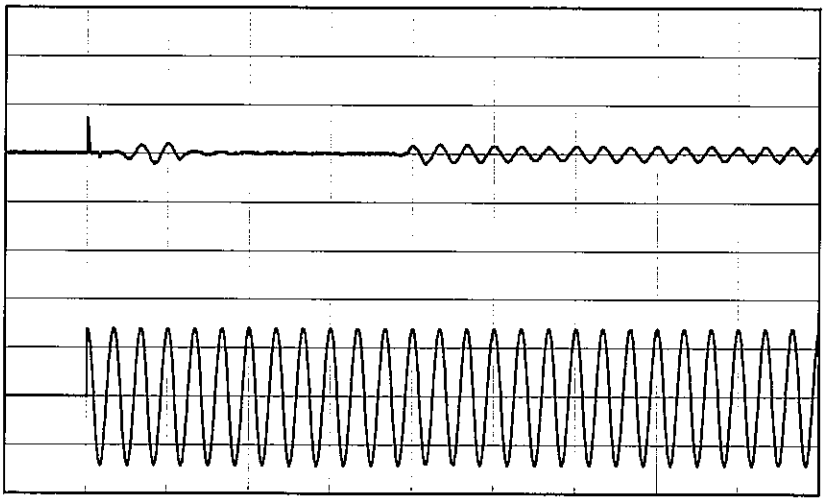
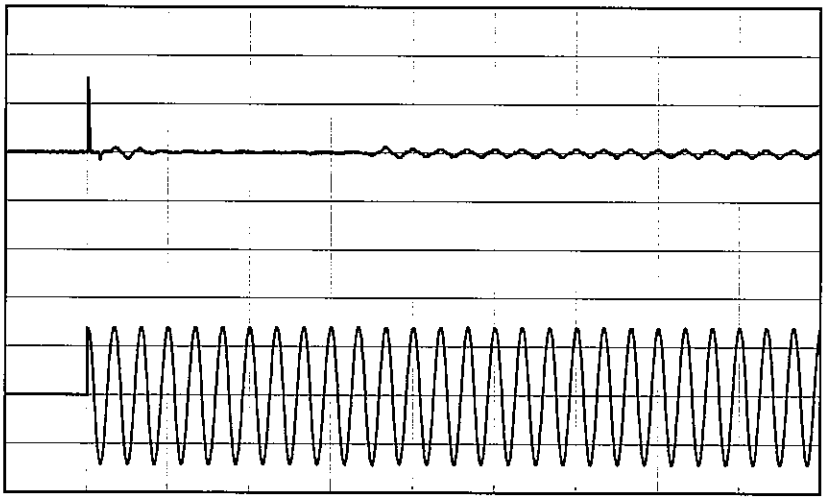
Model	LFA150F-15
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



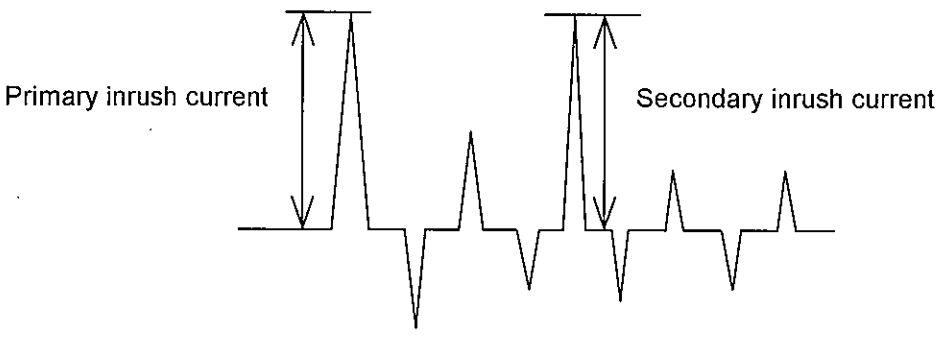
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
14.3 A
Secondary inrush current :
4.5 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
30.3 A
Secondary inrush current :
2.3 A



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Model	LFA150F-15		
Item	Leakage Current	Temperature	25°C
Object	———————	Testing Circuitry	Figure B

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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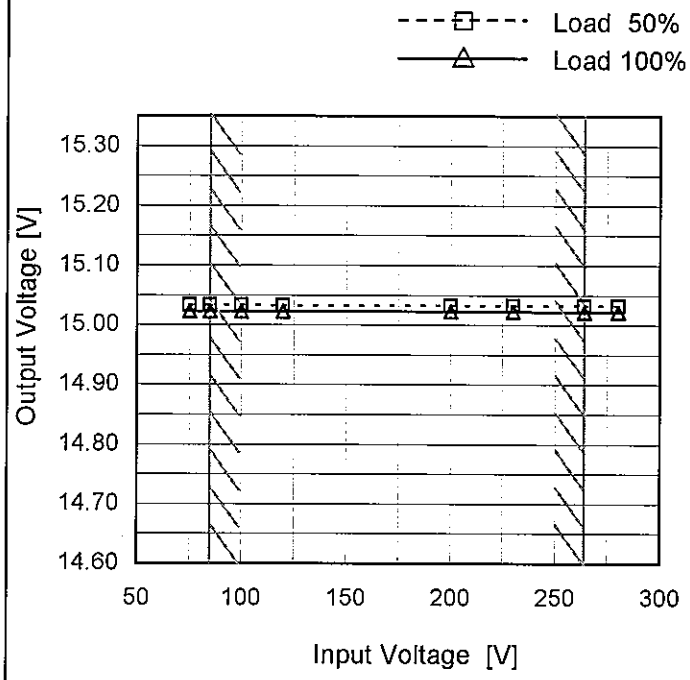
Model	LFA150F-15
Item	Line Regulation
Object	+15V10A

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	15.033	15.023
85	15.033	15.023
100	15.033	15.023
120	15.033	15.023
200	15.033	15.023
230	15.032	15.023
264	15.032	15.022
280	15.032	15.022
--	-	-

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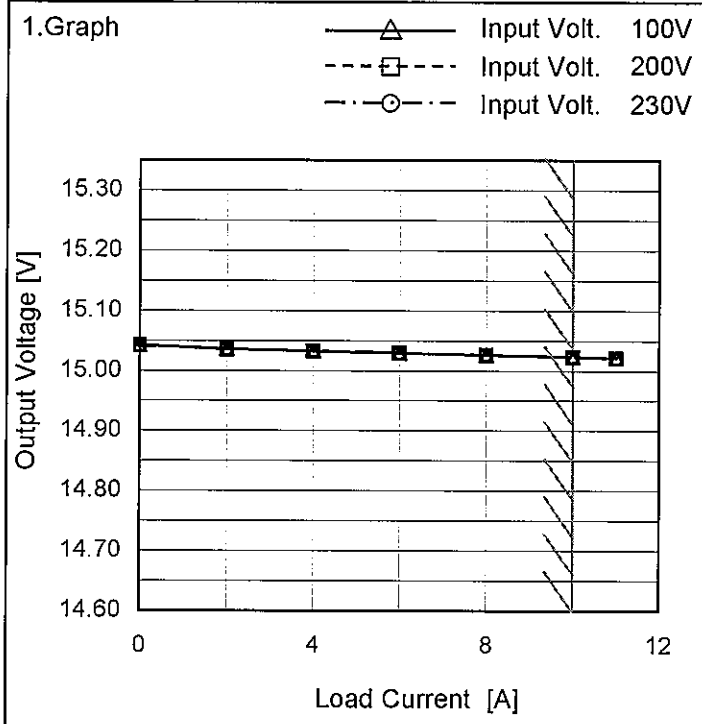
Model	LFA150F-15
Item	Load Regulation
Object	+15V10A

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	15.042	15.042	15.042
2	15.036	15.036	15.036
4	15.033	15.033	15.032
6	15.030	15.030	15.029
8	15.026	15.026	15.026
10	15.023	15.023	15.023
11	15.022	15.021	15.021
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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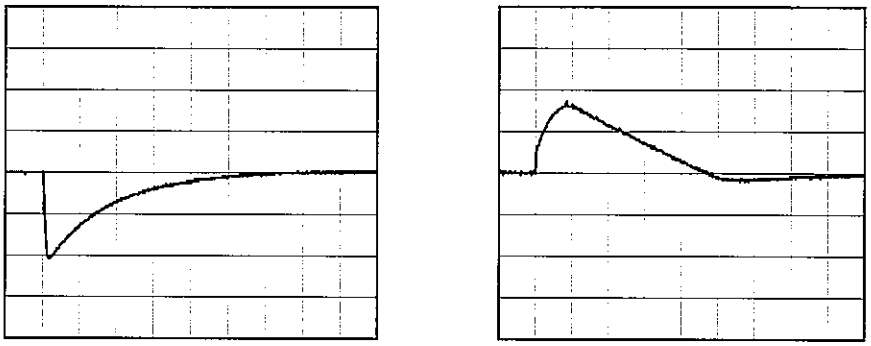
Model	LFA150F-15
Item	Dynamic Load Response
Object	+15V10A

Temperature 25°C
Testing Circuitry Figure A

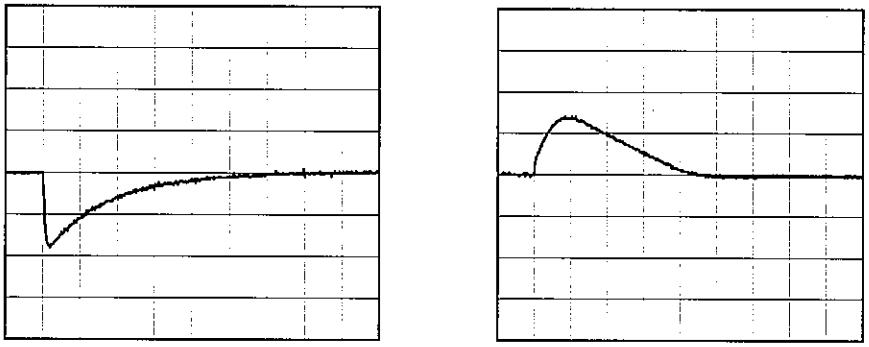
Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ

Min. Load (0A) ⟷
Load 100% (10A)



Min. Load (0A) ⟷
Load 50% (5A)



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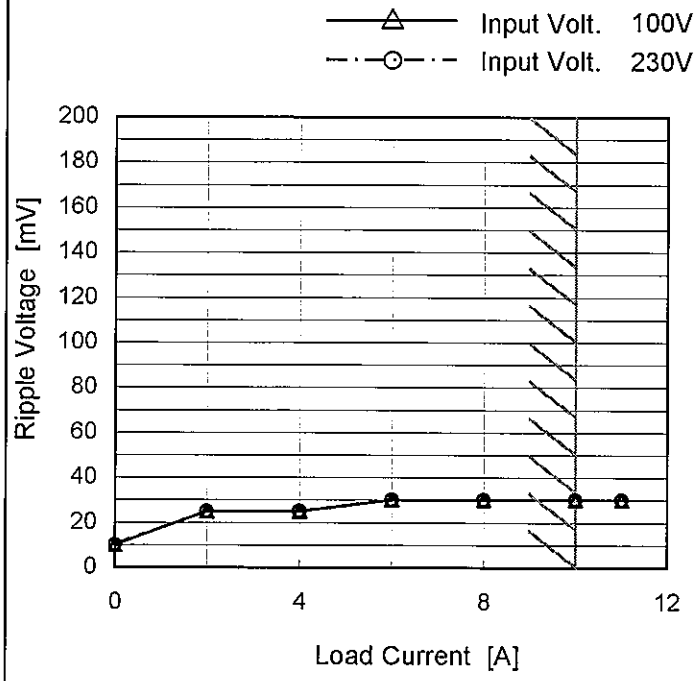
Model	LFA150F-15
Item	Ripple Voltage (by Load Current)
Object	+15V10A

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

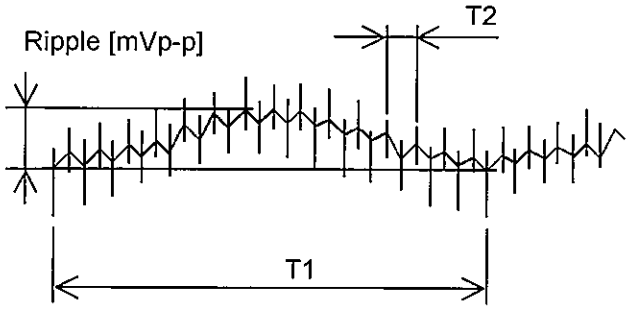


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0	10	10
2	25	25
4	25	25
6	30	30
8	30	30
10	30	30
11	30	30
--	-	-
--	-	-
--	-	-
--	-	-

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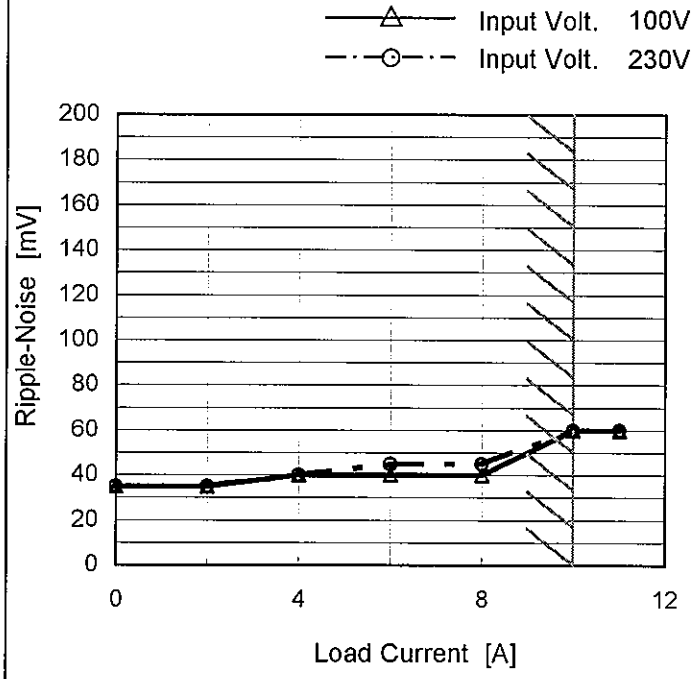
Model	LFA150F-15
Item	Ripple-Noise
Object	+15V10A

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.

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0	35	35
2	35	35
4	40	40
6	40	45
8	40	45
10	60	60
11	60	60
--	-	-
--	-	-
--	-	-
--	-	-

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

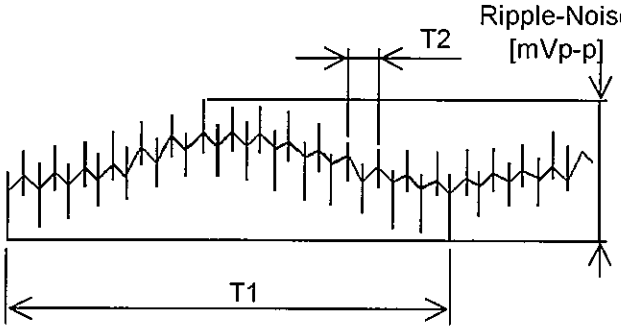


Fig. Complex Ripple Wave Form

BC-10484

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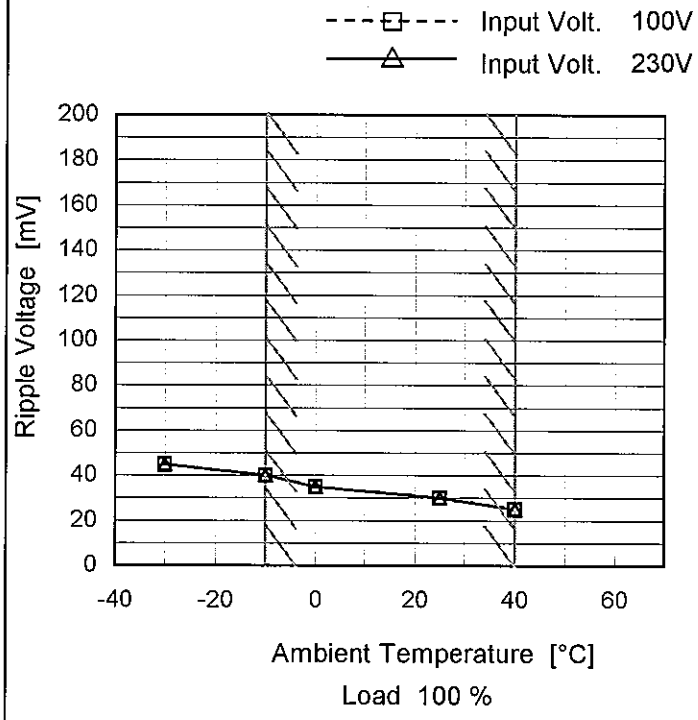
Model	LFA150F-15
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V10A

Testing Circuitry Figure C

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

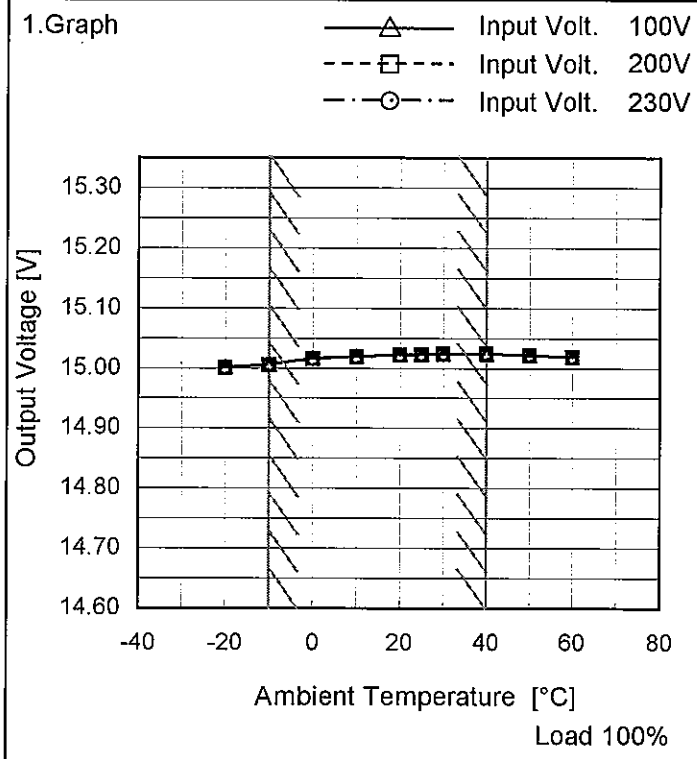
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	45	45
-10	40	40
0	35	35
25	30	30
40	25	25
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA150F-15
Item	Ambient Temperature Drift
Object	+15V10A

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	15.002	15.001	15.001
-10	15.006	15.005	15.005
0	15.017	15.016	15.016
10	15.019	15.019	15.019
20	15.023	15.022	15.022
25	15.023	15.023	15.023
30	15.025	15.024	15.024
40	15.024	15.024	15.024
50	15.022	15.022	15.022
60	15.019	15.019	15.018
--	-	-	-

COSEL

Model	LFA150F-15	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V10A	

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 - 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

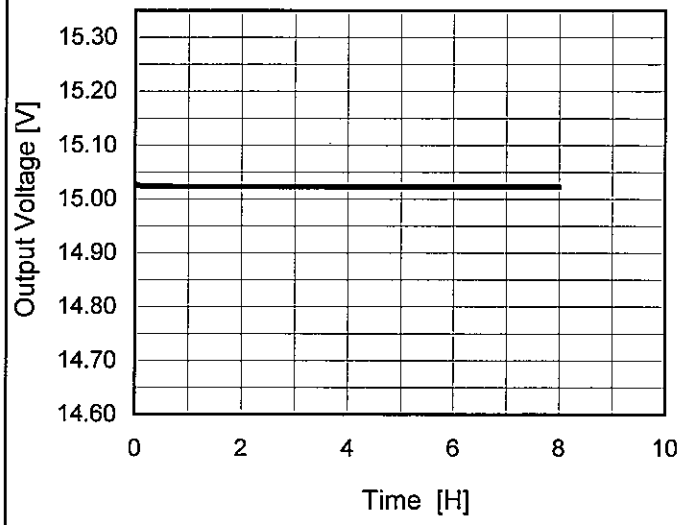
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	85	0	15.032	±19	±0.1
Minimum Voltage	-10	200	10	14.995		

COSEL

Model	LFA150F-15
Item	Time Lapse Drift
Object	+15V10A

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	15.028
0.5	15.024
1.0	15.023
2.0	15.023
3.0	15.023
4.0	15.023
5.0	15.023
6.0	15.023
7.0	15.023
8.0	15.023

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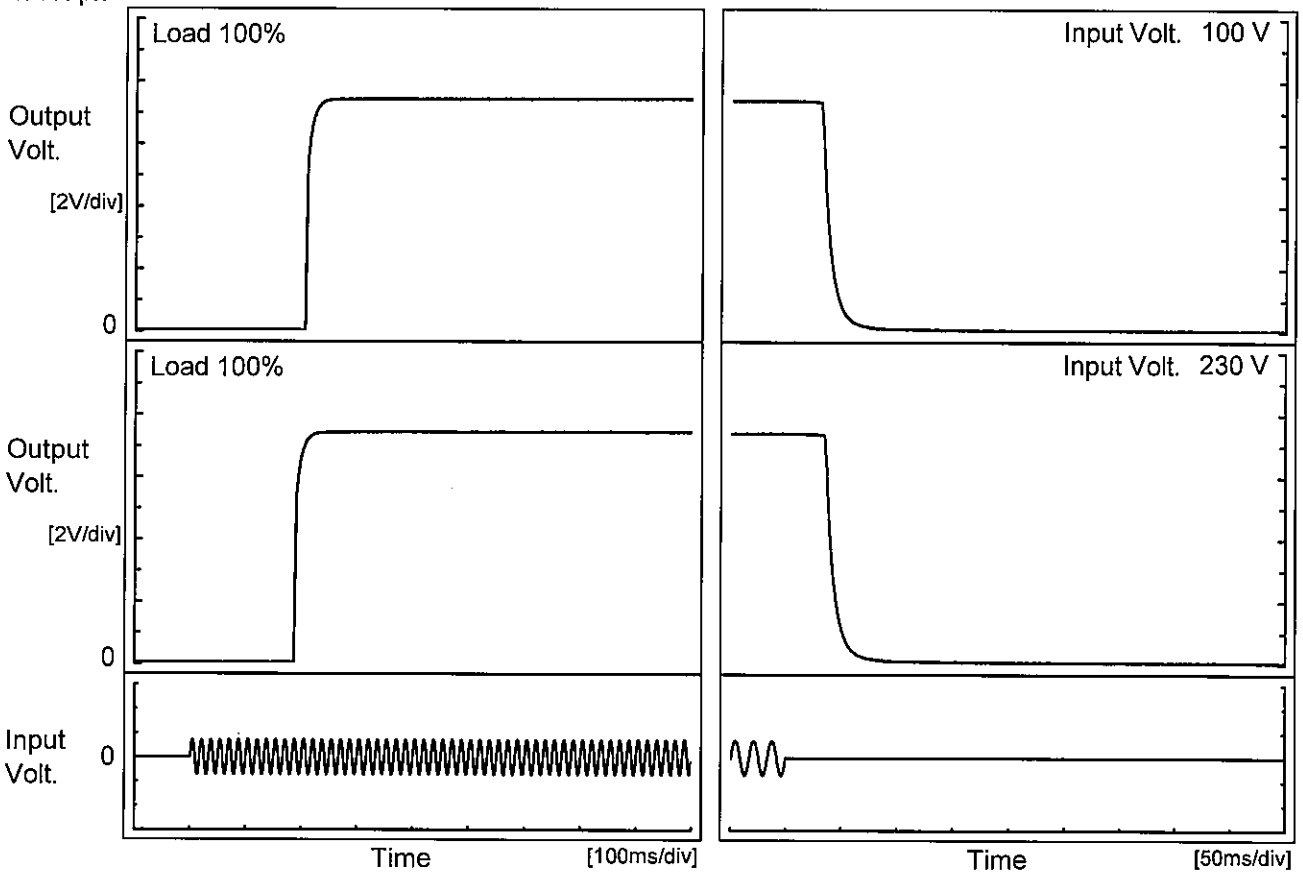
Model	LFA150F-15		
Item	Rise and Fall Time	Temperature	25°C
		Testing Circuitry	Figure A
Object	+15V10A		

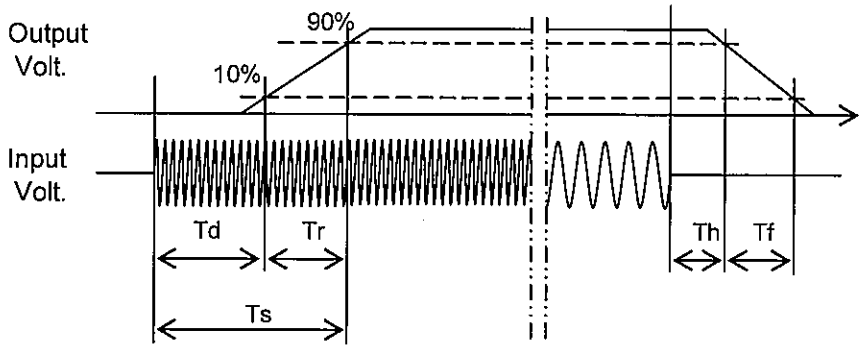
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	205.5	14.5	220.0	32.0	18.5
230 V	187.5	14.5	202.0	36.0	18.3

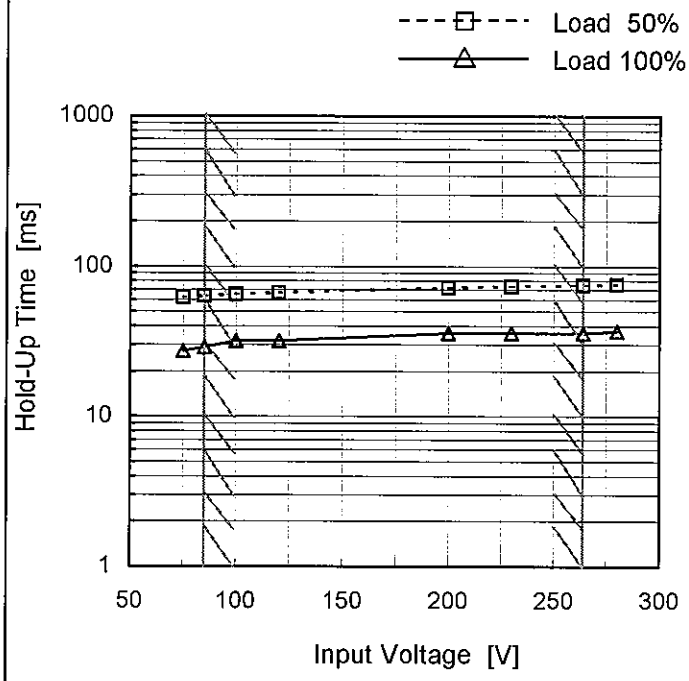


COSEL

Model	LFA150F-15
Item	Hold-Up Time
Object	+15V10A

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	65	32
120	67	32
200	72	36
230	74	36
264	75	36
280	76	37
--	-	-

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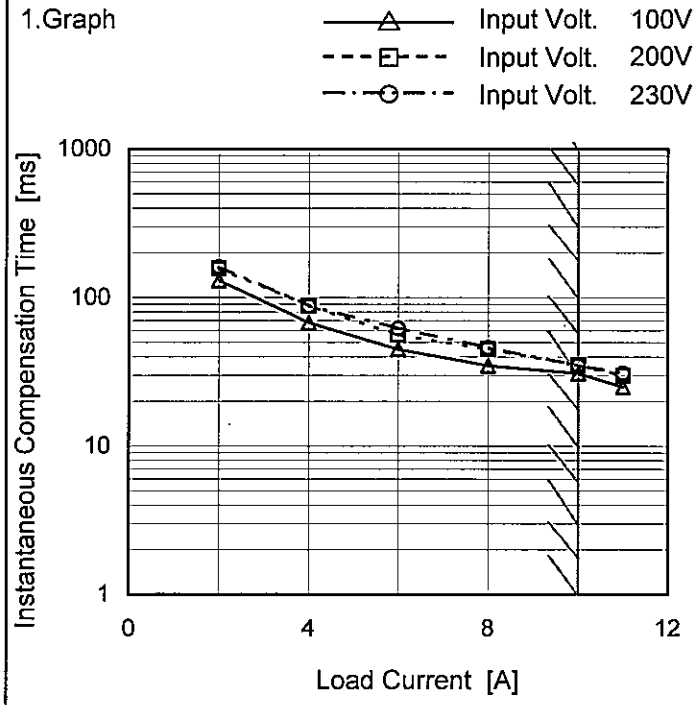
Model	LFA150F-15
Item	Instantaneous Interruption Compensation
Object	+15V10A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

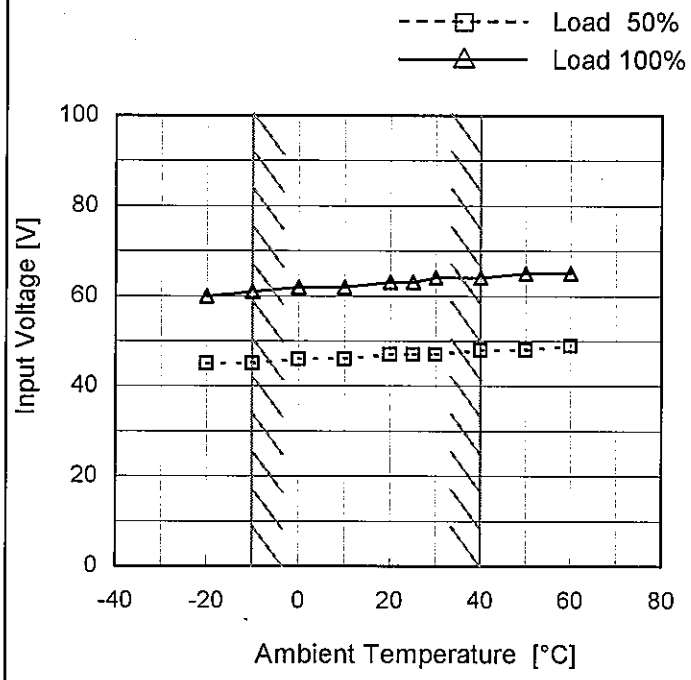
Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	-	-	-
2	131	156	161
4	68	88	88
6	45	56	62
8	35	45	46
10	31	35	35
11	25	30	31
---	-	-	-
---	-	-	-
---	-	-	-
---	-	-	-

COSEL

Model	LFA150F-15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V10A

Testing Circuitry Figure A

1.Graph



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

2.Values

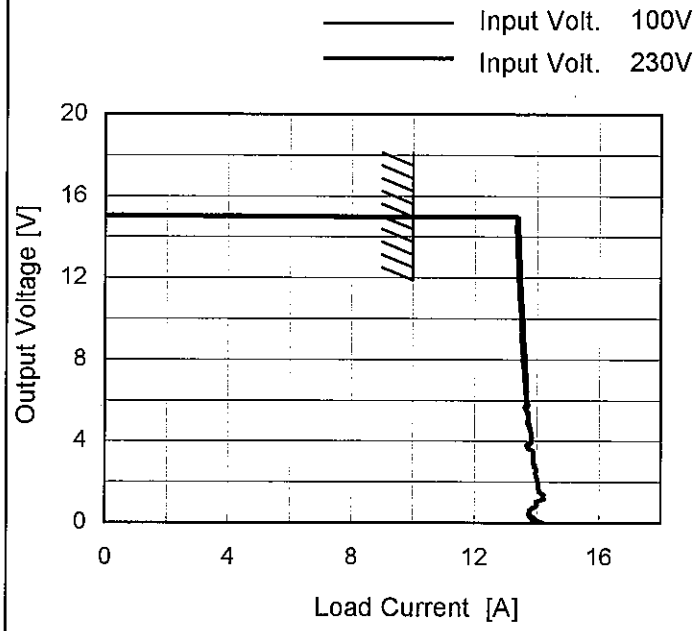
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	45	60
-10	45	61
0	46	62
10	46	62
20	47	63
25	47	63
30	47	64
40	48	64
50	48	65
60	49	65
--	-	-

COSEL

Model	LFA150F-15
Item	Overcurrent Protection
Object	+15V10A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

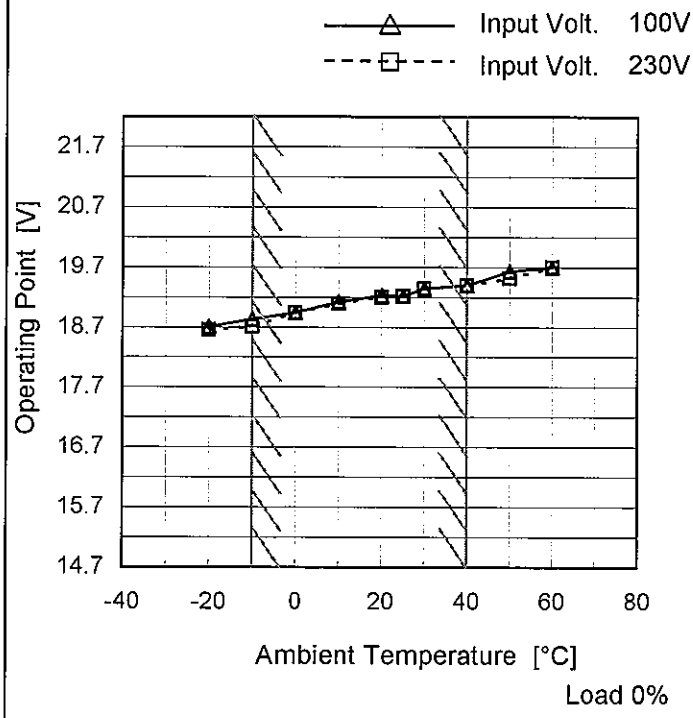
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
15.00	13.44	13.35
14.25	13.44	13.35
13.50	13.45	13.37
12.00	13.50	13.40
10.50	13.56	13.47
9.00	13.62	13.52
7.50	13.67	13.59
6.00	13.73	13.65
4.50	13.84	13.80
3.00	13.92	13.88
1.50	14.11	14.12
0.00	13.98	14.20

COSEL

Model	LFA150F-15
Item	Overvoltage Protection
Object	+15V10A

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	18.73	18.67
-10	18.85	18.73
0	18.96	18.96
10	19.14	19.11
20	19.25	19.22
25	19.24	19.24
30	19.36	19.36
40	19.42	19.42
50	19.65	19.54
60	19.72	19.72
--	-	-

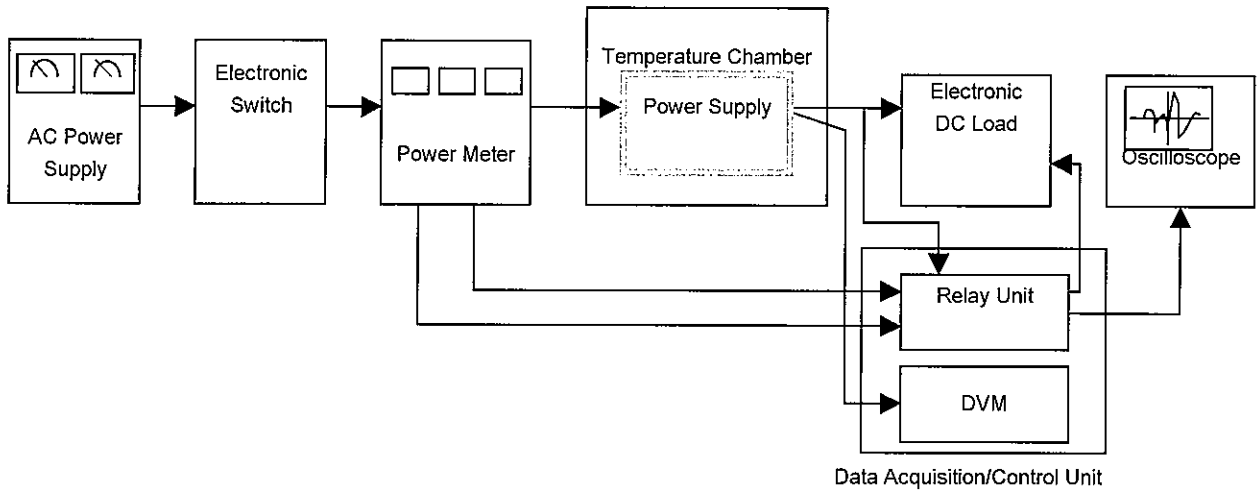


Figure A

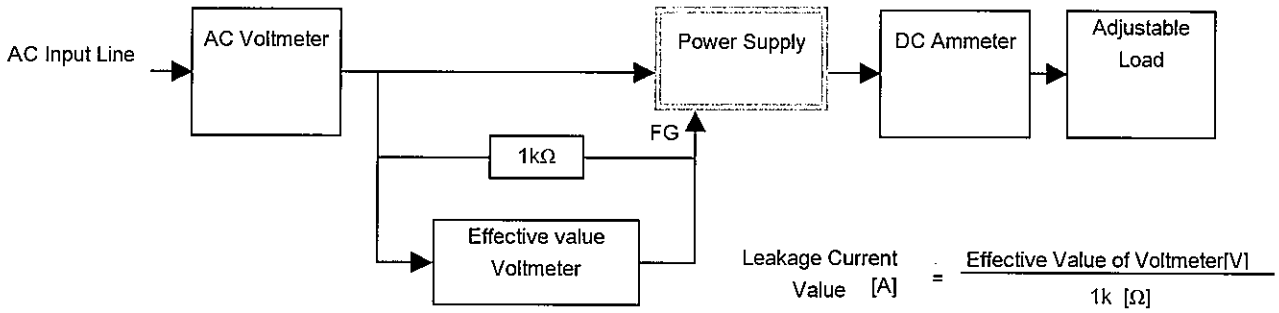


Figure B (DEN-AN)

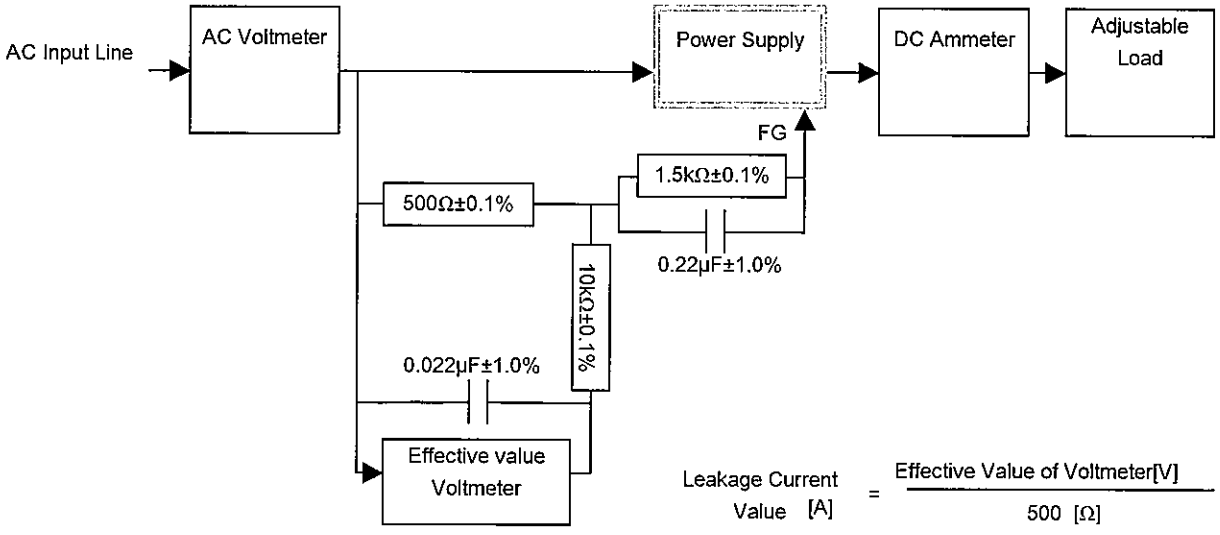


Figure B (IEC60950-1)

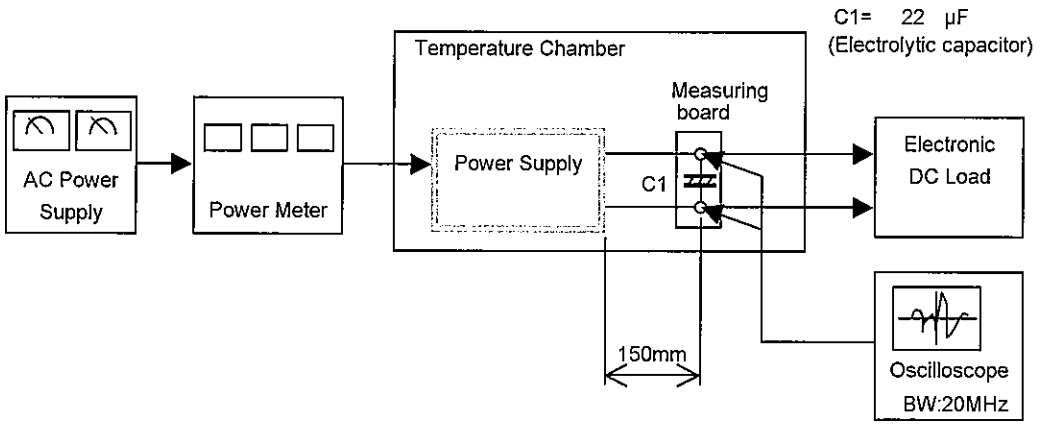

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope
BW:20MHz

Figure C