COSEL

参考資料

TEST DATA OF LFA300F-36-TY

Regulated DC Power Supply
December 20, 2010

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COSEL CO.,LTD.

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Item	Input Current (by Load Current)
Object	————————

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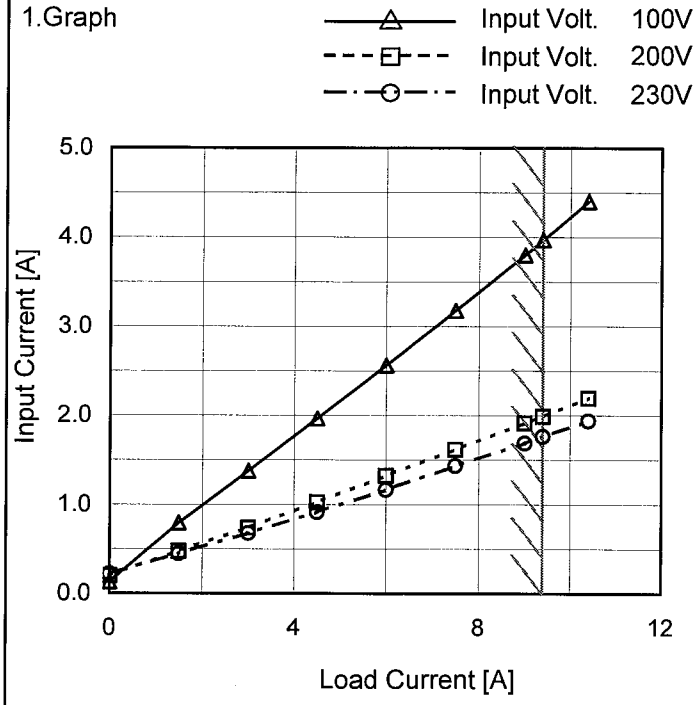

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.131	0.198	0.220
1.5	0.790	0.474	0.444
3.0	1.377	0.736	0.676
4.5	1.965	1.024	0.914
6.0	2.562	1.323	1.162
7.5	3.176	1.616	1.432
9.0	3.800	1.916	1.688
9.4	3.970	1.990	1.762
10.4	4.400	2.194	1.940
--	-	-	-
--	-	-	-

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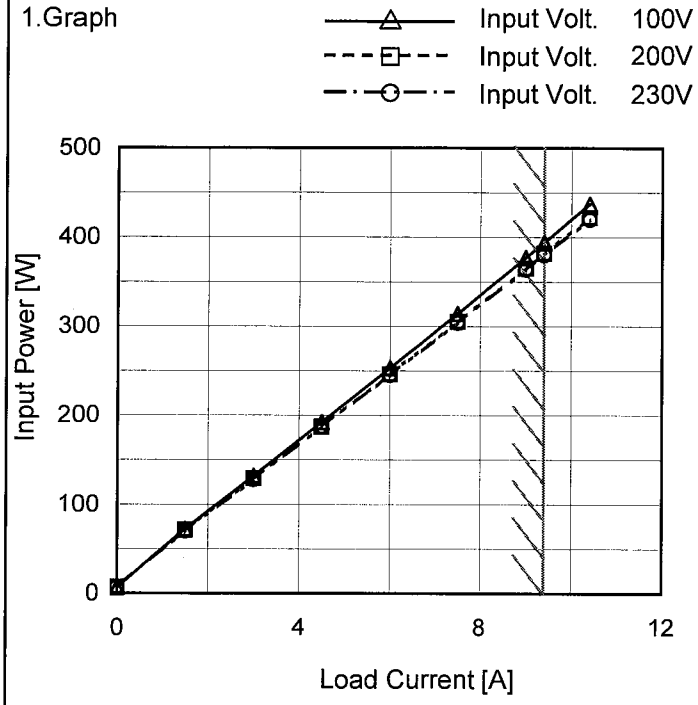
Model	LFA300F-36-TY
Item	Input Power (by Load Current)
Object	———————

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	6.3	7.0	7.0
1.5	72.3	71.0	70.0
3.0	131.8	129.0	128.0
4.5	192.0	187.0	187.0
6.0	252.9	246.0	245.0
7.5	314.0	305.0	304.0
9.0	377.0	365.0	364.0
9.4	394.0	382.0	380.0
10.4	437.0	422.0	420.0
--	-	-	-
--	-	-	-

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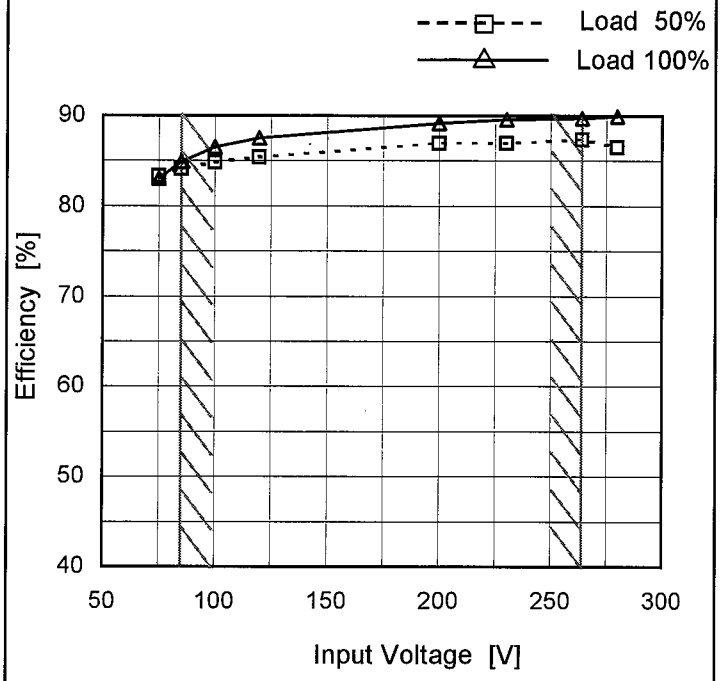
Model	LFA300F-36-TY
Item	Efficiency (by Input Voltage)
Object	———————————

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	83.3	83.1
85	84.1	84.9
100	84.8	86.4
120	85.4	87.5
200	86.9	89.1
230	86.9	89.6
264	87.4	89.7
280	86.5	89.9
--	-	-

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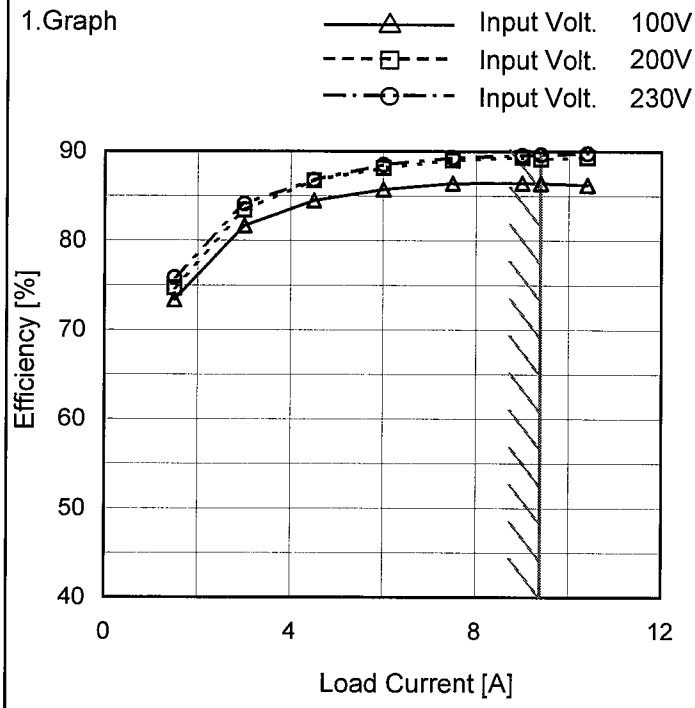
Model	LFA300F-36-TY
Item	Efficiency (by Load Current)
Object	————————

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	-	-	-
1.5	73.4	74.7	75.8
3.0	81.7	83.4	84.1
4.5	84.5	86.7	86.8
6.0	85.7	88.1	88.5
7.5	86.4	89.0	89.3
9.0	86.5	89.3	89.5
9.4	86.4	89.1	89.6
10.4	86.2	89.3	89.7
--	-	-	-
--	-	-	-

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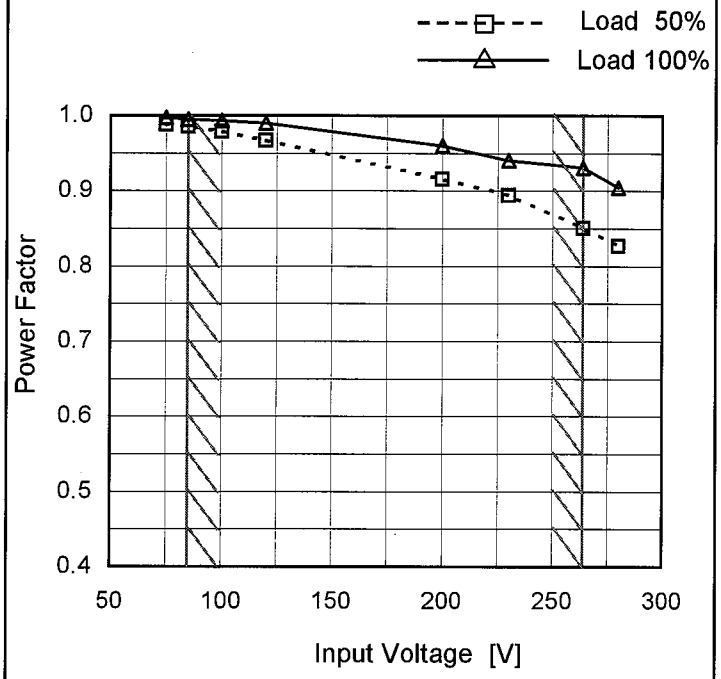
Model	LFA300F-36-TY
Item	Power Factor (by Input Voltage)
Object	———————————

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	0.988	0.998
85	0.985	0.995
100	0.979	0.993
120	0.967	0.990
200	0.915	0.960
230	0.894	0.938
264	0.851	0.931
280	0.827	0.904
--	-	-

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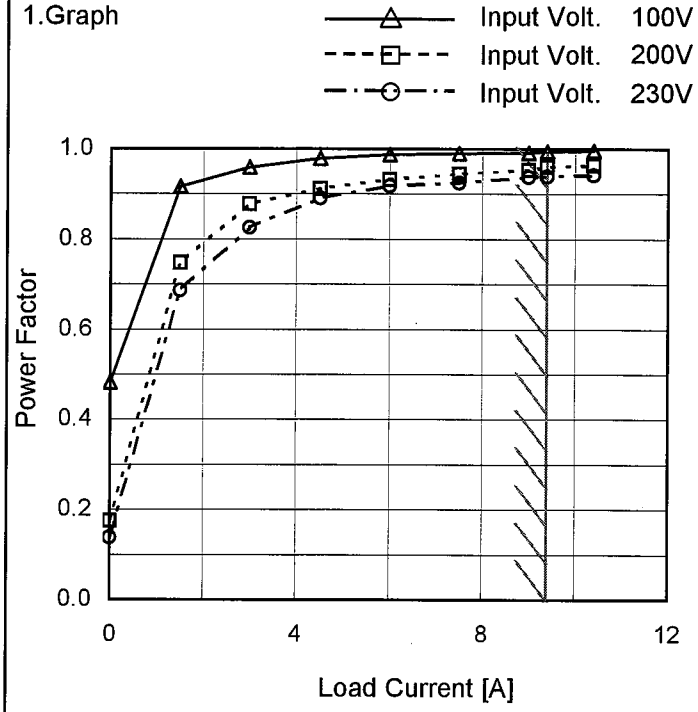
Model	LFA300F-36-TY
Item	Power Factor (by Load Current)
Object	————————

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	0.481	0.175	0.137
1.5	0.916	0.747	0.686
3.0	0.959	0.878	0.826
4.5	0.978	0.912	0.890
6.0	0.988	0.932	0.918
7.5	0.990	0.944	0.924
9.0	0.992	0.953	0.938
9.4	0.993	0.960	0.938
10.4	0.995	0.963	0.942
--	-	-	-
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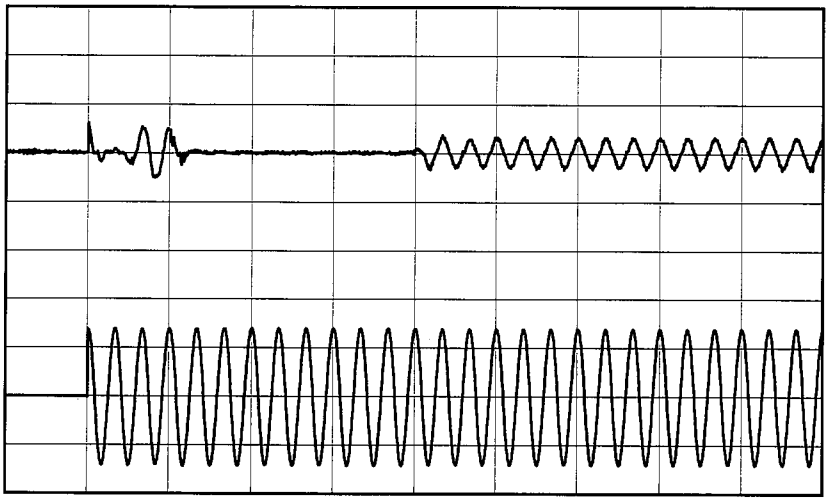
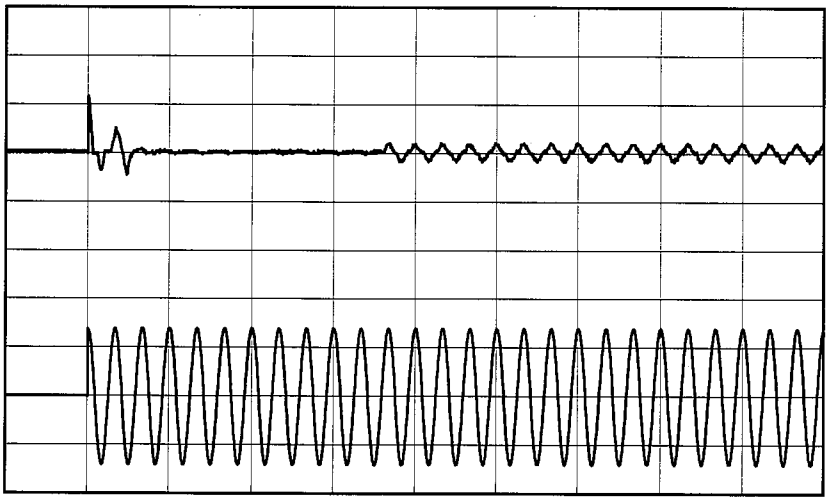
Model	LFA300F-36-TY
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



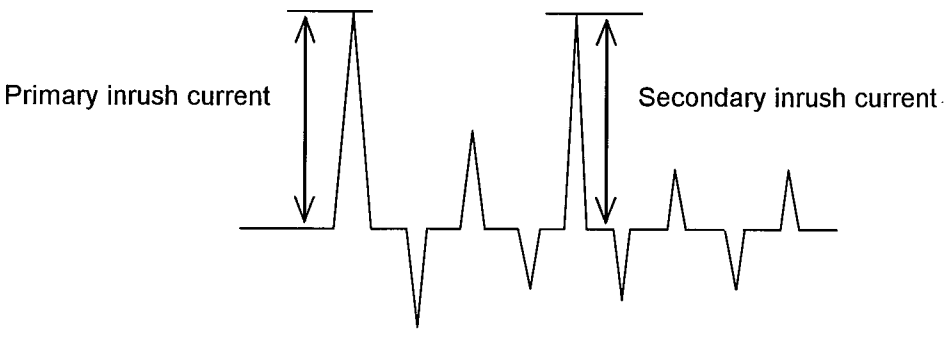
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
12.3 A
Secondary inrush current :
9.3 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
23.3 A
Secondary inrush current :
4.1 A



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Model	LFA300F-36-TY	
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	0.33	0.53	0.60	Operation
	One of phases	0.34	0.70	0.83	Stand by
IEC60950-1	Both phases	0.24	0.50	0.57	Operation
	One of phases	0.32	0.68	0.74	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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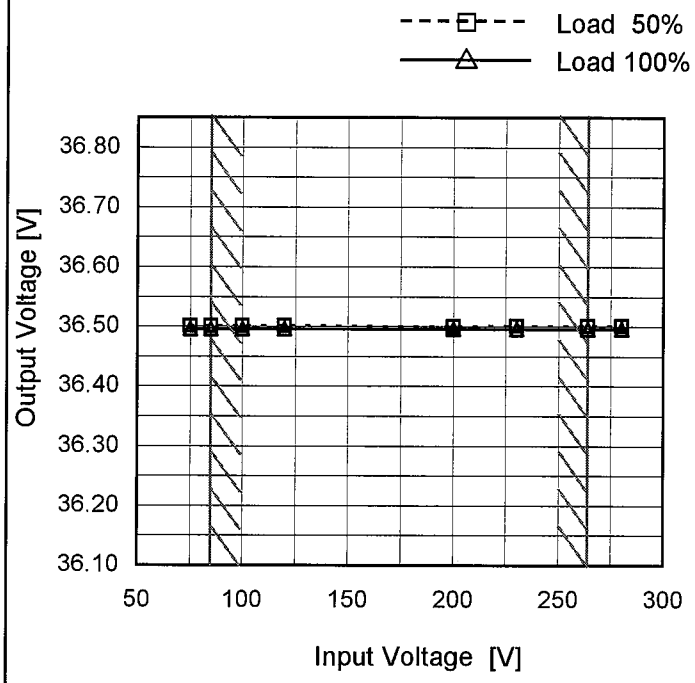
Model	LFA300F-36-TY
Item	Line Regulation
Object	+36V9.4A

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	36.501	36.495
85	36.501	36.496
100	36.501	36.496
120	36.501	36.496
200	36.501	36.496
230	36.501	36.496
264	36.501	36.496
280	36.501	36.496
--	-	-

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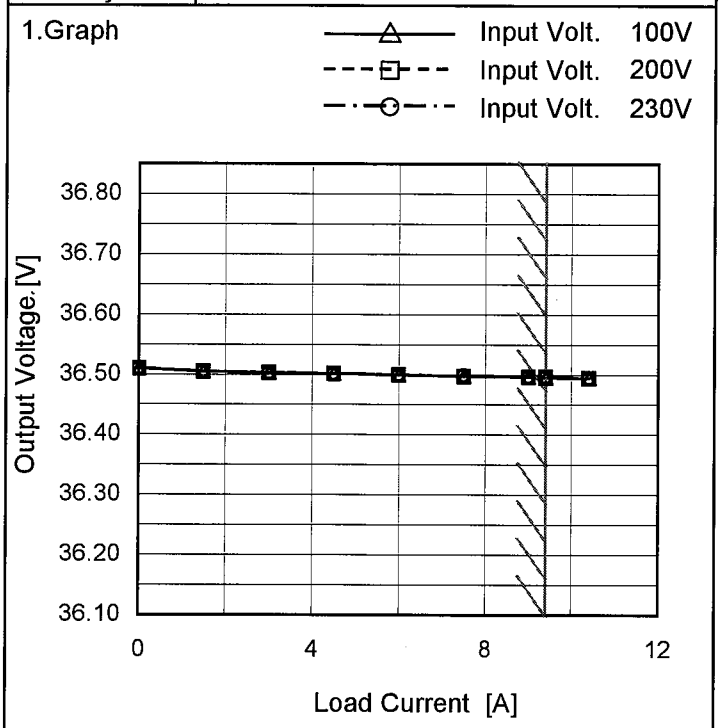
Model	LFA300F-36-TY
Item	Load Regulation
Object	+36V9.4A

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	36.510	36.510	36.510
1.5	36.505	36.505	36.505
3.0	36.503	36.503	36.503
4.5	36.501	36.501	36.502
6.0	36.500	36.500	36.500
7.5	36.498	36.498	36.498
9.0	36.496	36.496	36.496
9.4	36.496	36.496	36.496
10.4	36.494	36.495	36.495
--	-	-	-
--	-	-	-

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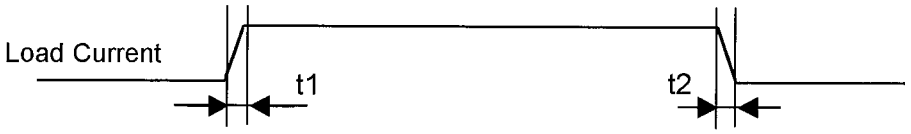
Model	LFA300F-36-TY
Item	Dynamic Load Response
Object	+36V9.4A

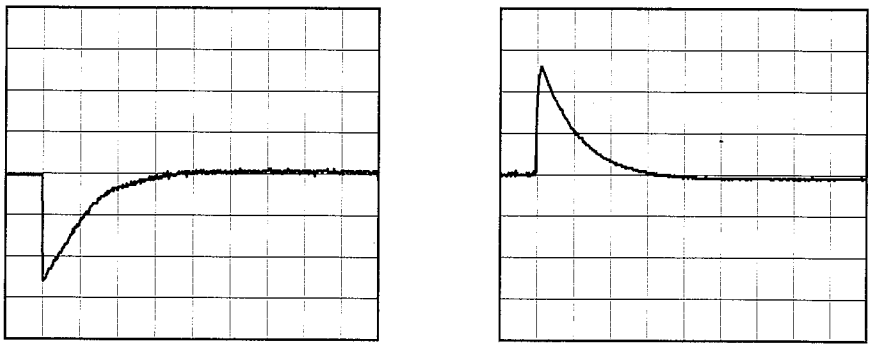
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 100 V
Cycle 1000 ms

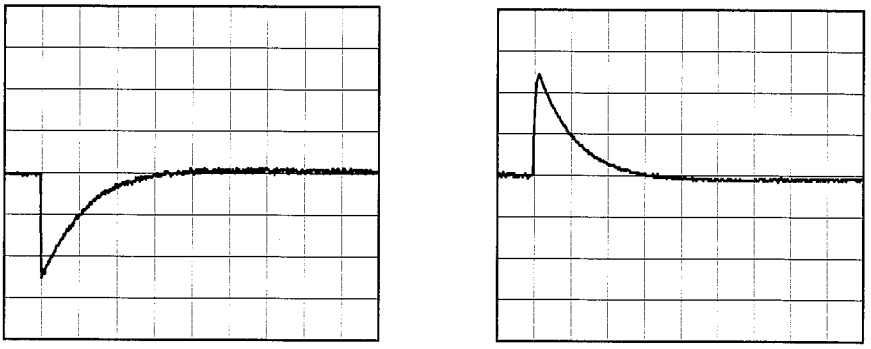
Response. t1=t2=50us. Typ



Min. Load (0A) ←→
Load 100% (9.4A)



Min. Load (0A) ←→
Load 50% (4.7A)



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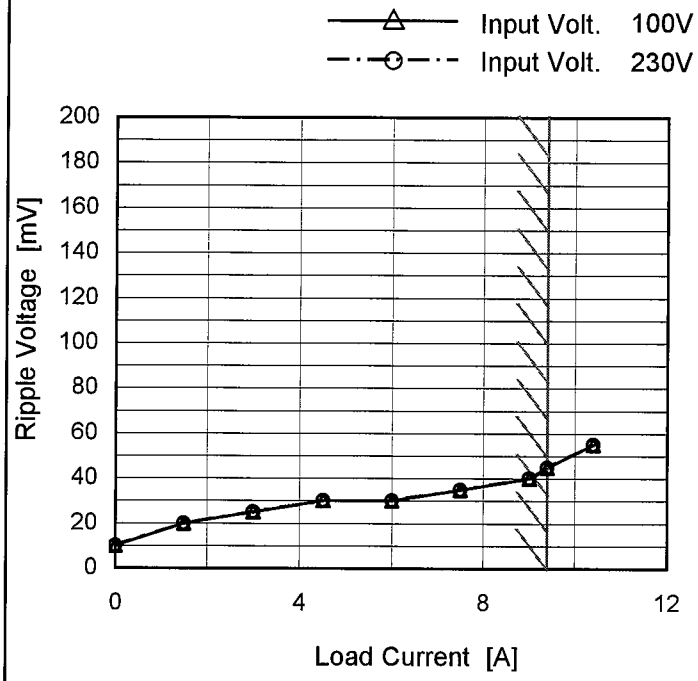
Model	LFA300F-36-TY
Item	Ripple Voltage (by Load Current)
Object	+36V9.4A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



Measured by 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

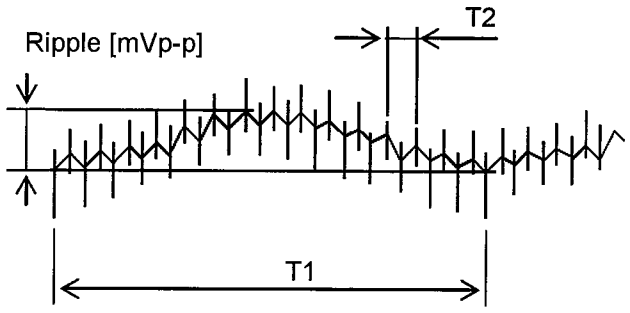


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	10	10
1.5	20	20
3.0	25	25
4.5	30	30
6.0	30	30
7.5	35	35
9.0	40	40
9.4	45	45
10.4	55	55
--	-	-
--	-	-

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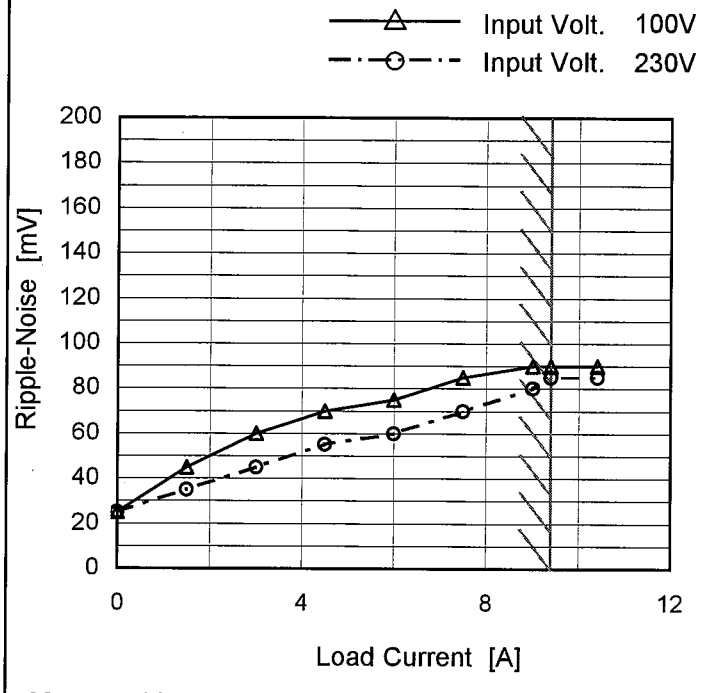
Model	LFA300F-36-TY
Item	Ripple-Noise
Object	+36V9.4A

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

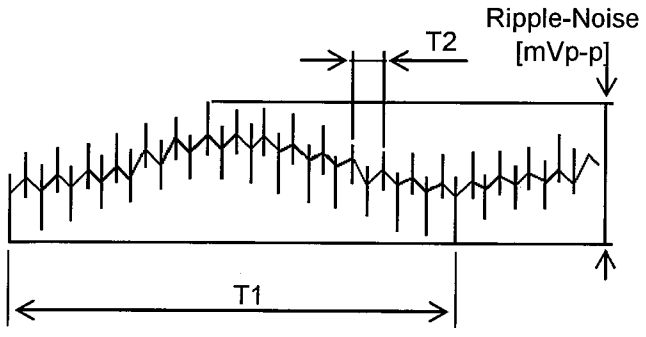


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	25	25
1.5	45	35
3.0	60	45
4.5	70	55
6.0	75	60
7.5	85	70
9.0	90	80
9.4	90	85
10.4	90	85
--	-	-
--	-	-

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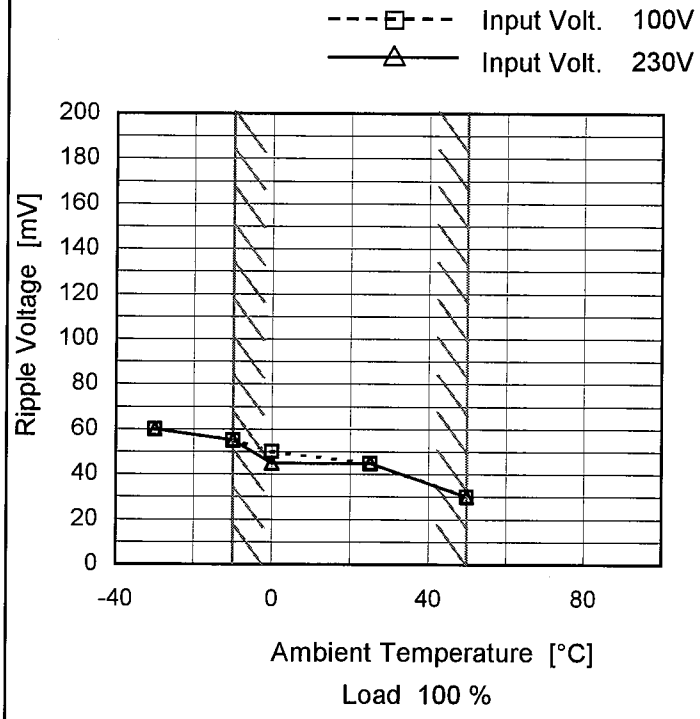
Model	LFA300F-36-TY
Item	Ripple Voltage (by Ambient Temp.)
Object	+36V9.4A

Testing Circuitry Figure C

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

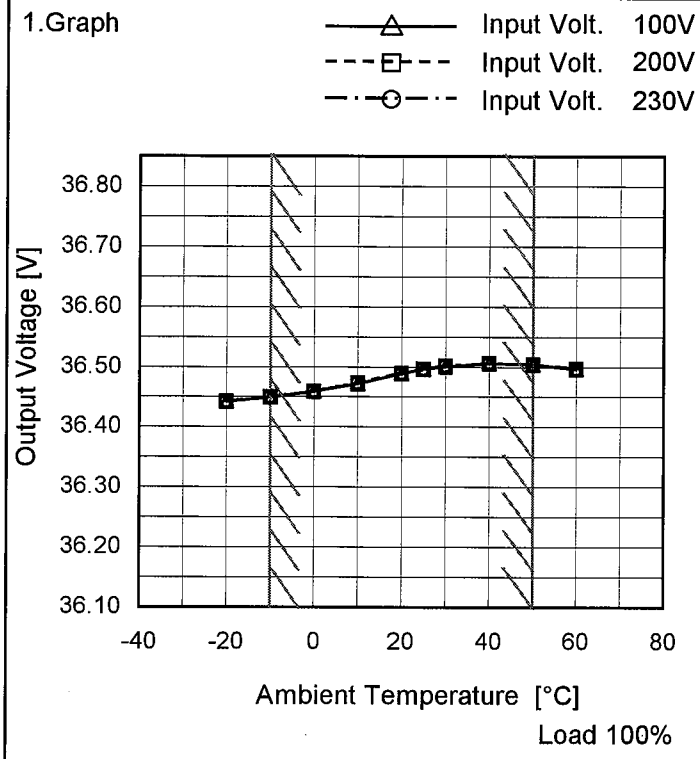
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	60	60
-10	55	55
0	50	45
25	45	45
50	30	30
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA300F-36-TY
Item	Ambient Temperature Drift
Object	+36V9.4A

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	36.442	36.442	36.442
-10	36.450	36.450	36.450
0	36.459	36.459	36.459
10	36.472	36.472	36.473
20	36.488	36.489	36.489
25	36.496	36.496	36.496
30	36.501	36.502	36.501
40	36.506	36.506	36.506
50	36.504	36.504	36.503
60	36.497	36.496	36.496
--	-	-	-

COSEL

Model	LFA300F-36-TY
Item	Output Voltage Accuracy
Object	+36V9.4A

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 - 9.4A

* 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	264	0	36.521	±36	±0.1
Minimum Voltage	-10	85	9.4	36.450		

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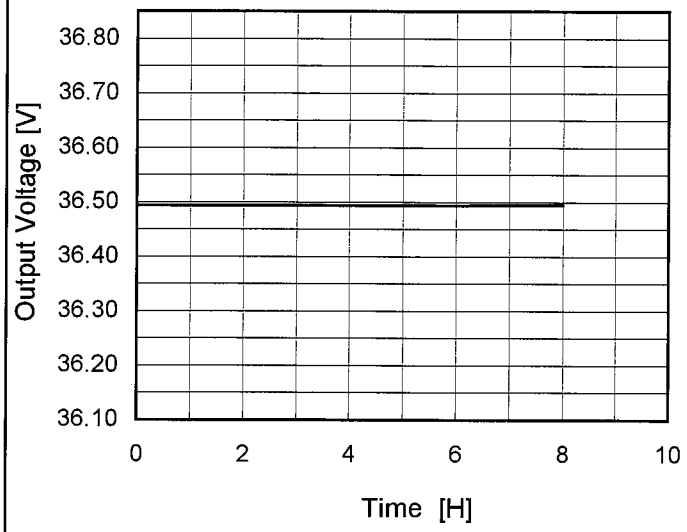
Model	LFA300F-36-TY
Item	Time Lapse Drift
Object	+36V9.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 230V
Load 100%

* The characteristic of AC100V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	36.496
0.5	36.496
1.0	36.496
2.0	36.496
3.0	36.496
4.0	36.496
5.0	36.496
6.0	36.496
7.0	36.496
8.0	36.497

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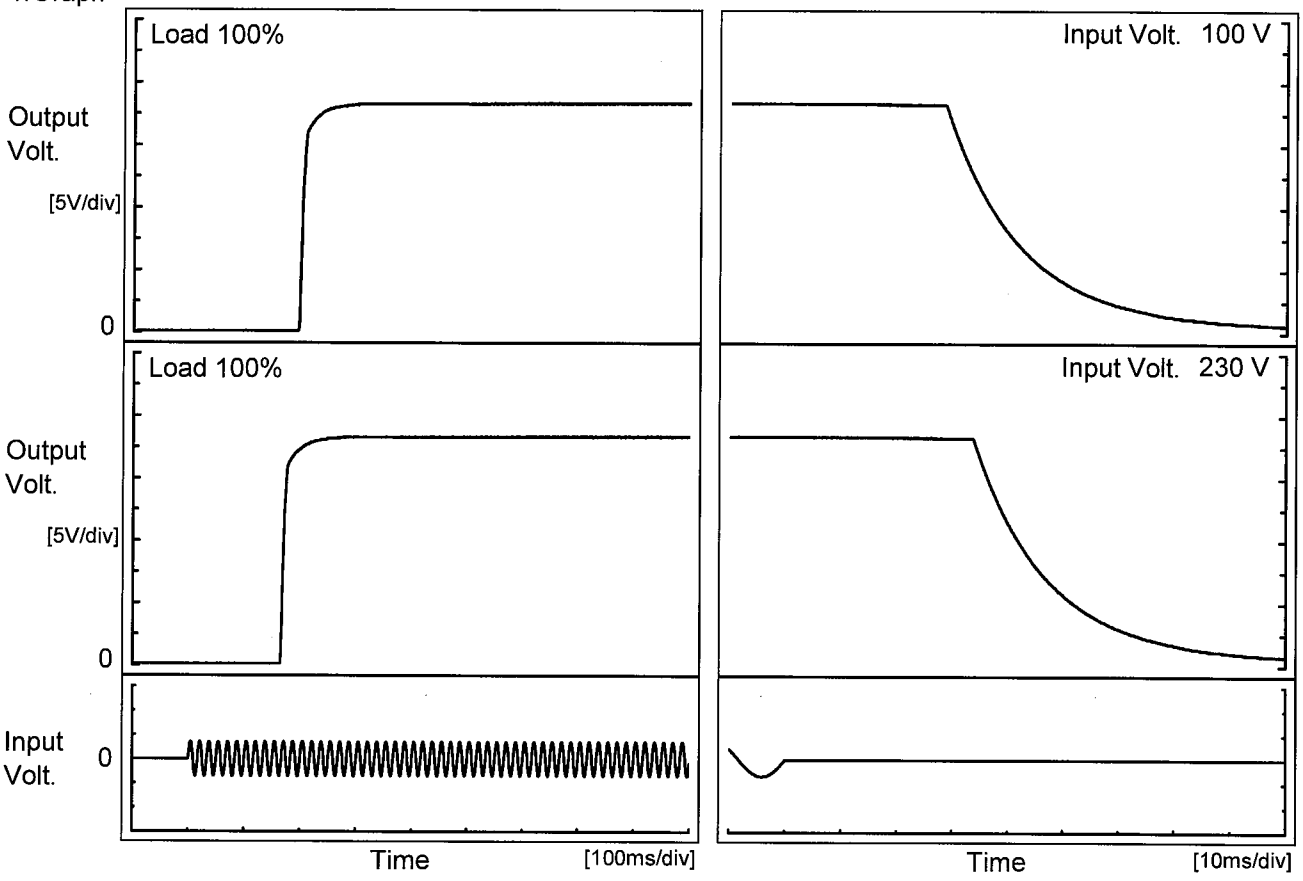
Model	LFA300F-36-TY	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+36V9.4A	

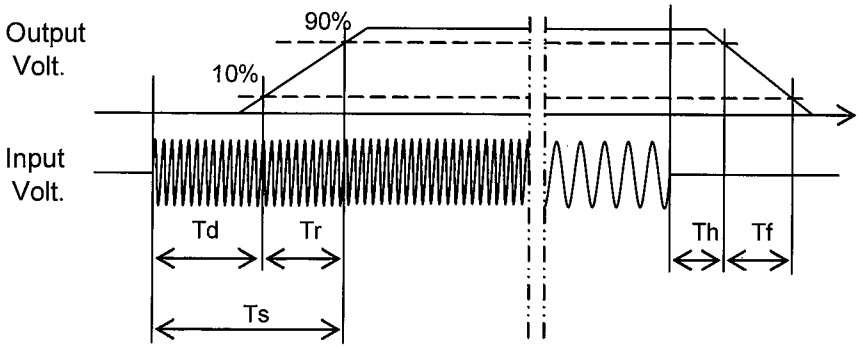
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	197.5	15.5	213.0	30.2	32.6
230 V	166.0	15.5	181.5	35.3	32.6



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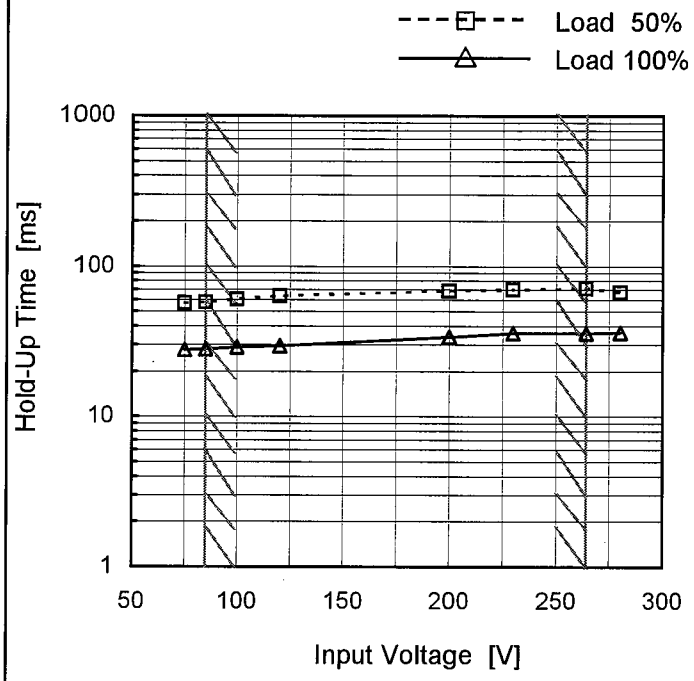
Model	LFA300F-36-TY
Item	Hold-Up Time
Object	+36V9.4A

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	57	28
85	58	28
100	60	30
120	63	30
200	69	34
230	70	35
264	71	36
280	68	36
--	-	-

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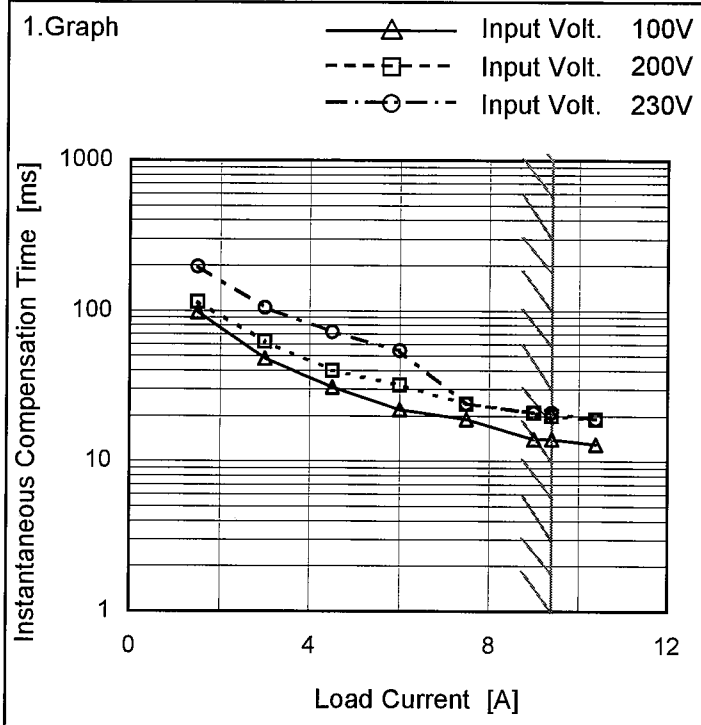
Model	LFA300F-36-TY
Item	Instantaneous Interruption Compensation
Object	+36V9.4A

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	-	-	-
1.5	98	114	197
3.0	48	62	105
4.5	31	40	72
6.0	22	32	54
7.5	19	24	24
9.0	14	21	21
9.4	14	20	21
10.4	13	19	19
--	-	-	-
--	-	-	-

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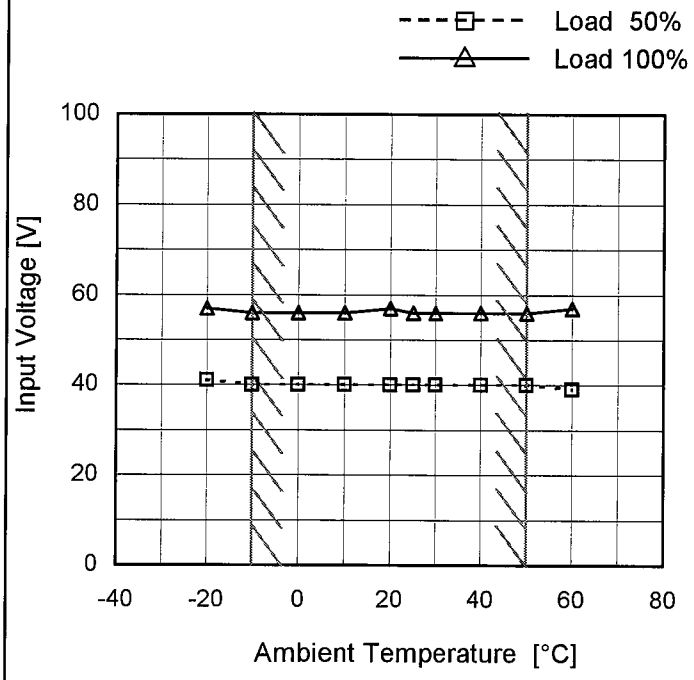
Model	LFA300F-36-TY
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+36V9.4A

Testing Circuitry Figure A

1.Graph



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

2.Values

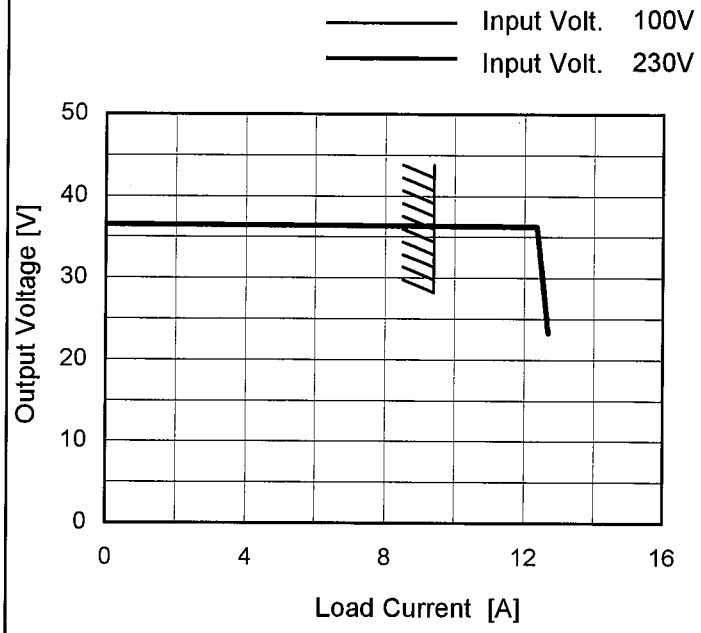
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	41	57
-10	40	56
0	40	56
10	40	56
20	40	57
25	40	56
30	40	56
40	40	56
50	40	56
60	39	57
--	-	-

COSEL

Model	LFA300F-36-TY
Item	Overcurrent Protection
Object	+36V9.4A

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 23V to 0V.

2.Values

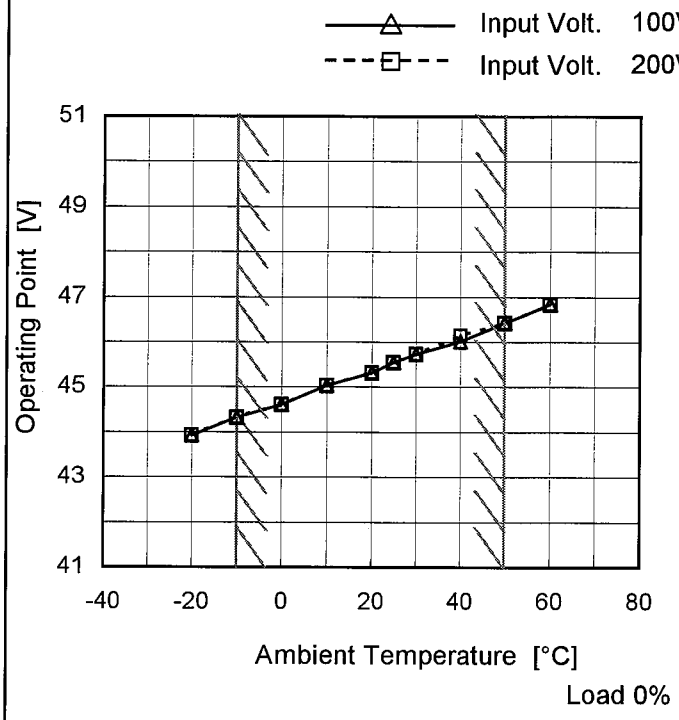
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
36.0	12.40	12.36
34.2	12.45	12.41
32.4	12.40	12.35
28.8	12.59	12.55
25.2	12.68	12.64
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA300F-36-TY
Item	Overvoltage Protection
Object	+36V9.4A

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	43.92	43.92
-10	44.32	44.32
0	44.61	44.61
10	45.03	45.03
20	45.32	45.32
25	45.55	45.55
30	45.73	45.73
40	46.02	46.14
50	46.43	46.43
60	46.84	46.84
--	-	-

COSEL

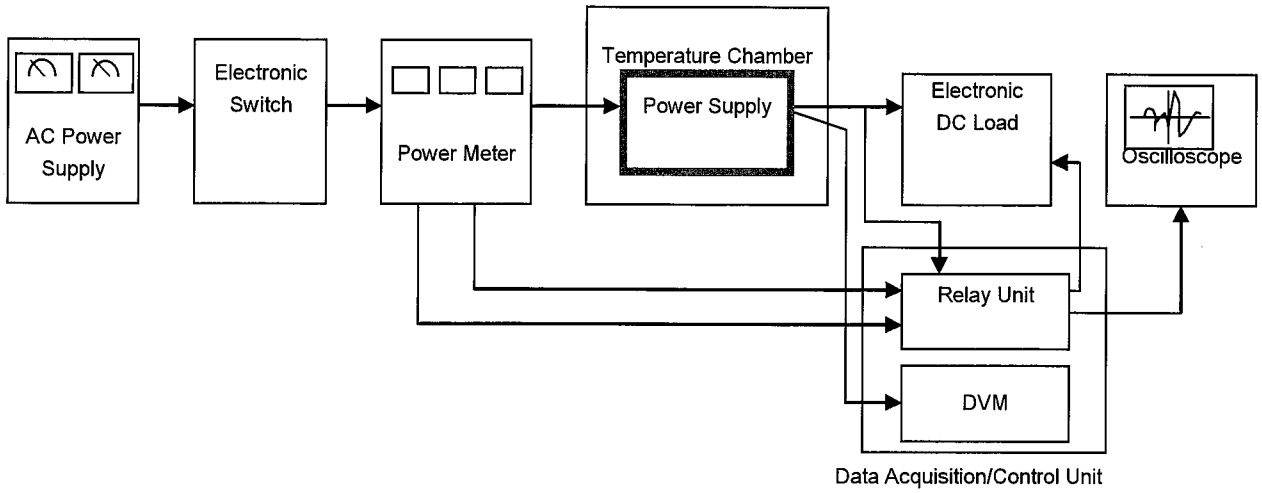


Figure A

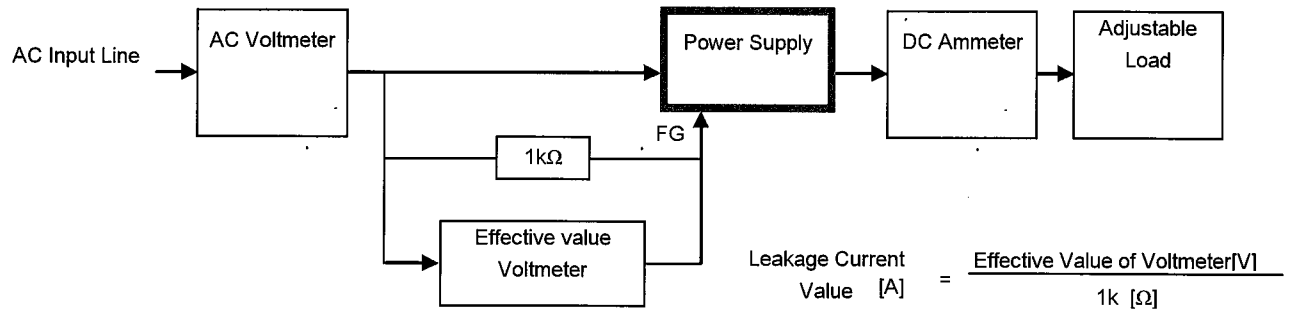


Figure B (DEN-AN)

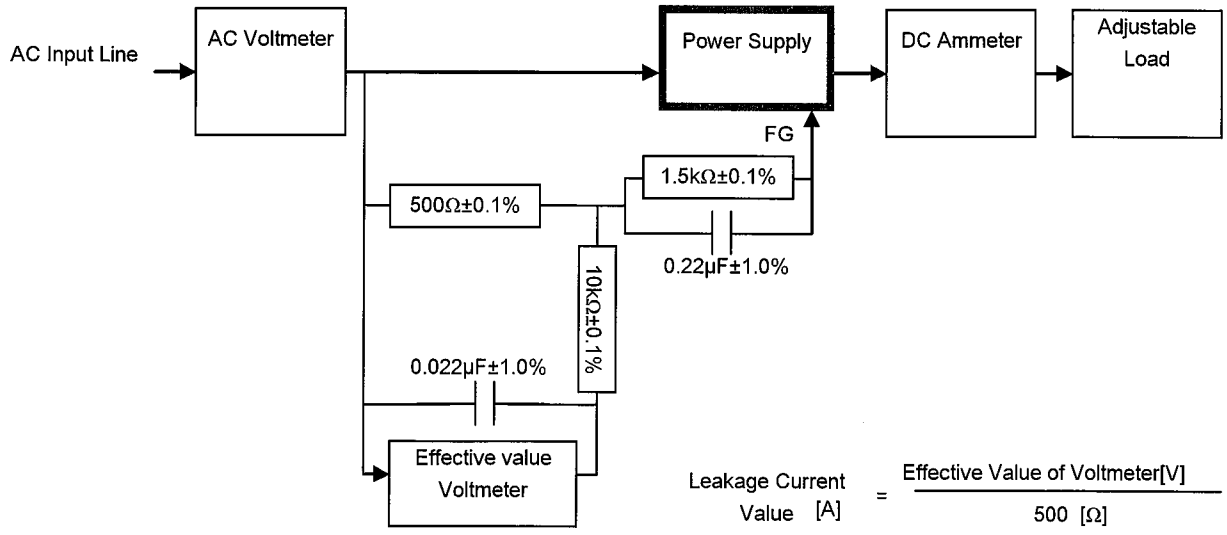


Figure B (IEC60950-1)

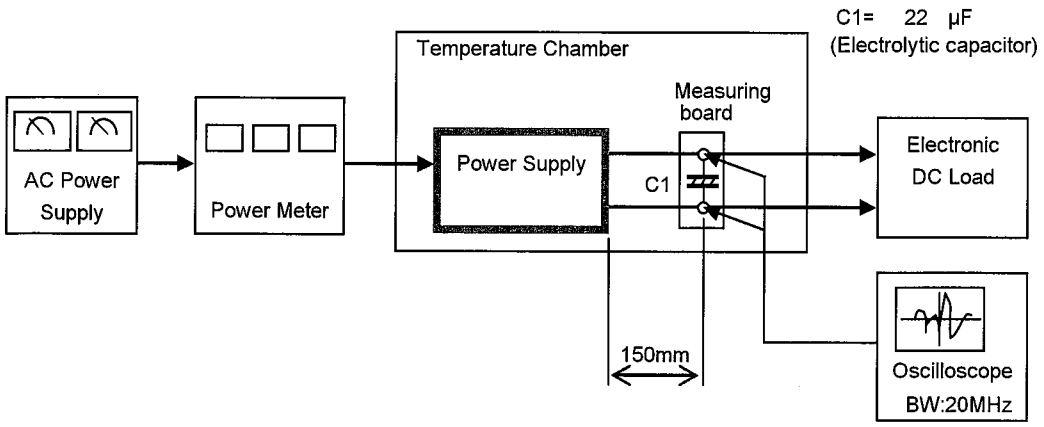

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope
BW:20MHz

Figure C