COSEL

参考資料

TEST DATA OF LFA300F-15-TY

Regulated DC Power Supply
December 20, 2010

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COSEL CO.,LTD.

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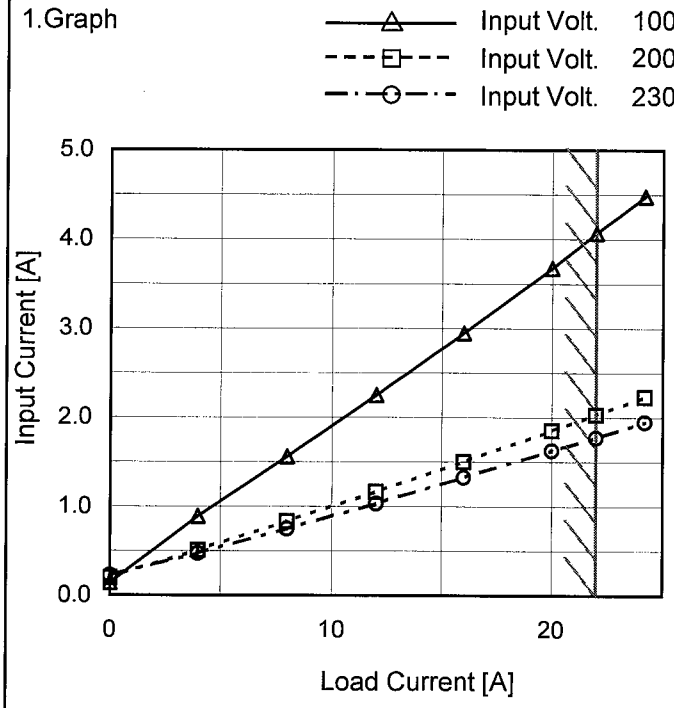
Model	LFA300F-15-TY
Item	Input Current (by Load Current)
Object	———————

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	0.140	0.198	0.224
4.0	0.886	0.506	0.470
8.0	1.560	0.830	0.746
12.0	2.247	1.165	1.032
16.0	2.947	1.502	1.324
20.0	3.676	1.854	1.626
22.0	4.070	2.030	1.772
24.2	4.480	2.230	1.948
--	-	-	-
--	-	-	-
--	-	-	-

BC-10494

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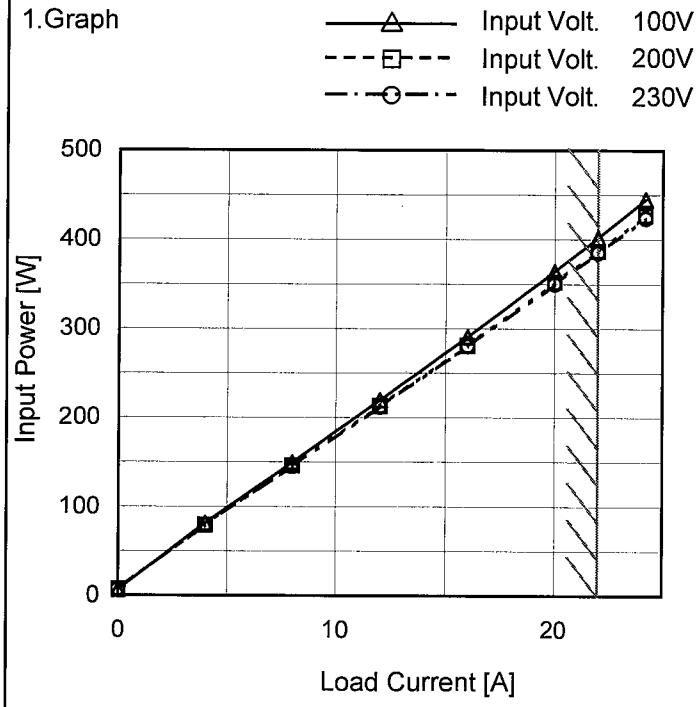
Model	LFA300F-15-TY
Item	Input Power (by Load Current)
Object	————————

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	6.6	7.0	7.0
4.0	81.0	79.0	79.0
8.0	149.5	146.0	145.0
12.0	219.5	213.0	212.0
16.0	290.7	281.0	280.0
20.0	364.2	352.0	350.0
22.0	402.0	387.0	385.0
24.2	445.0	427.0	424.0
--	-	-	-
--	-	-	-
--	-	-	-

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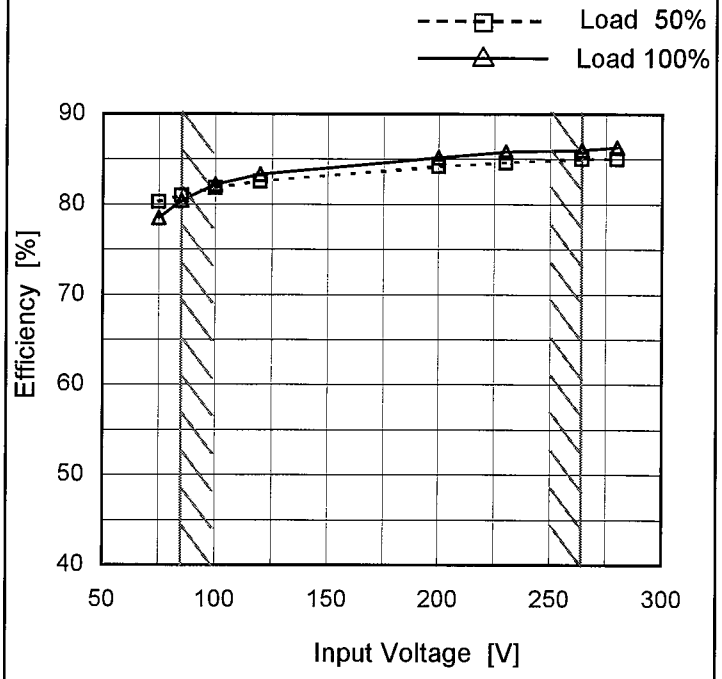
Model	LFA300F-15-TY
Item	Efficiency (by Input Voltage)
Object	———————————

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	80.3	78.5
85	81.0	80.4
100	81.8	82.2
120	82.6	83.3
200	84.2	85.2
230	84.6	85.8
264	85.1	86.1
280	85.1	86.3
--	-	-

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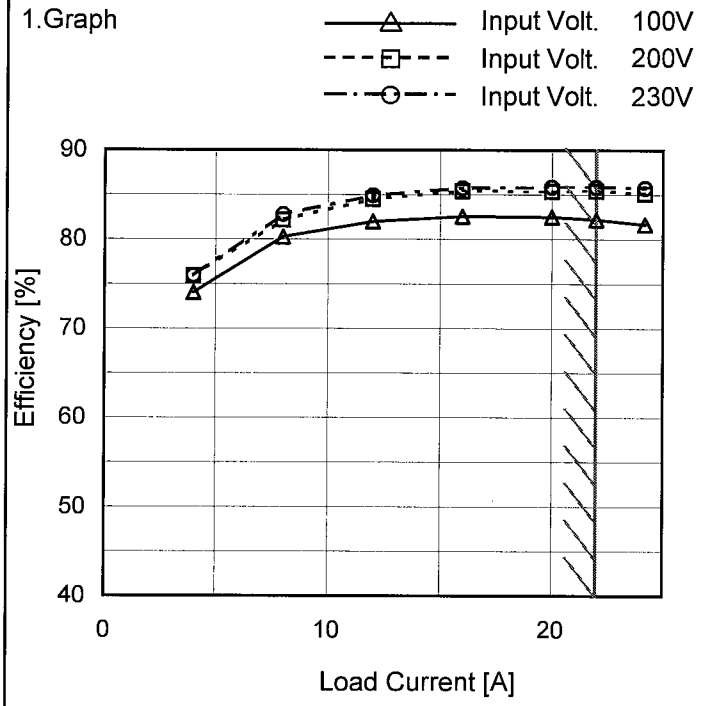
Model	LFA300F-15-TY
Item	Efficiency (by Load Current)
Object	————————

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	-	-	-
4.0	74.0	75.9	75.9
8.0	80.3	82.2	82.8
12.0	82.0	84.5	84.9
16.0	82.5	85.4	85.7
20.0	82.5	85.4	85.8
22.0	82.2	85.2	85.8
24.2	81.7	85.1	85.7
---	-	-	-
---	-	-	-
---	-	-	-

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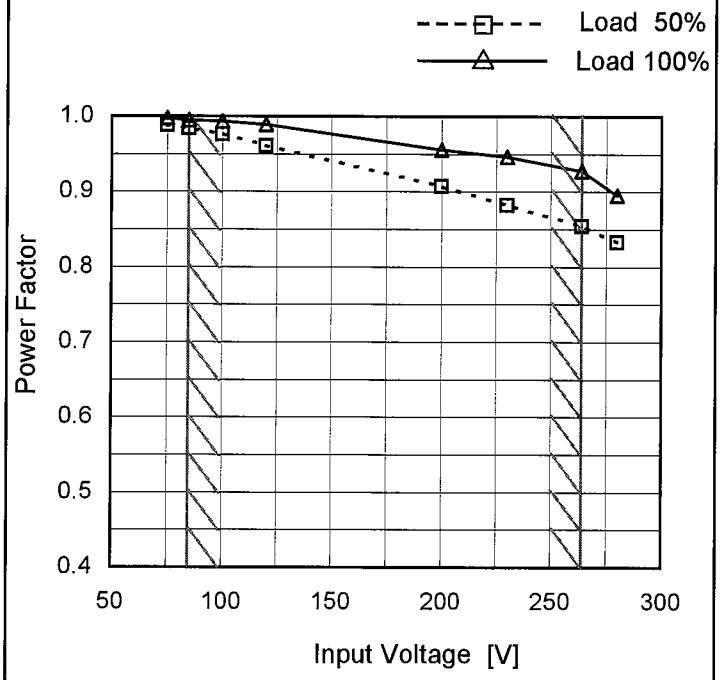
Model	LFA300F-15-TY
Item	Power Factor (by Input Voltage)
Object	――――――――

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	0.984	0.995
100	0.976	0.993
120	0.961	0.989
200	0.907	0.956
230	0.882	0.946
264	0.855	0.928
280	0.833	0.895
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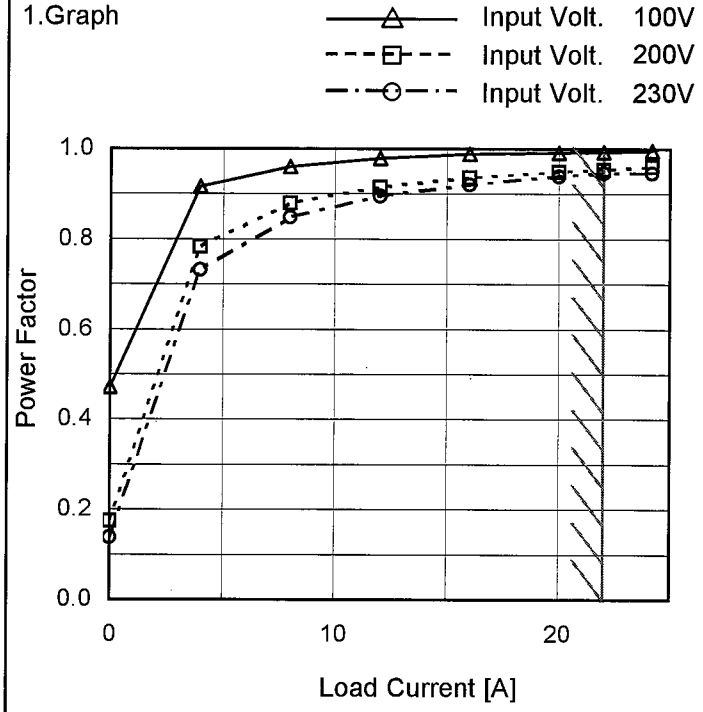
Model	LFA300F-15-TY
Item	Power Factor (by Load Current)
Object	————————

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	0.471	0.175	0.137
4.0	0.916	0.782	0.731
8.0	0.961	0.880	0.848
12.0	0.979	0.914	0.895
16.0	0.988	0.937	0.921
20.0	0.992	0.949	0.938
22.0	0.993	0.956	0.946
24.2	0.996	0.960	0.946
--	-	-	-
--	-	-	-
--	-	-	-

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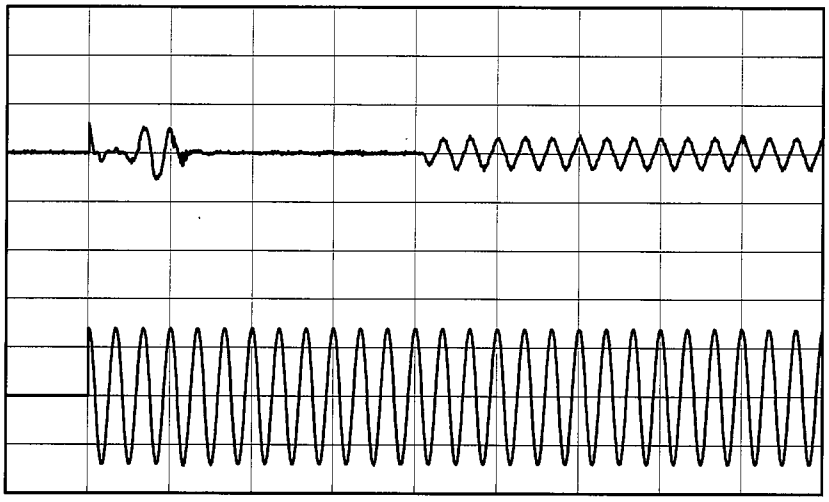
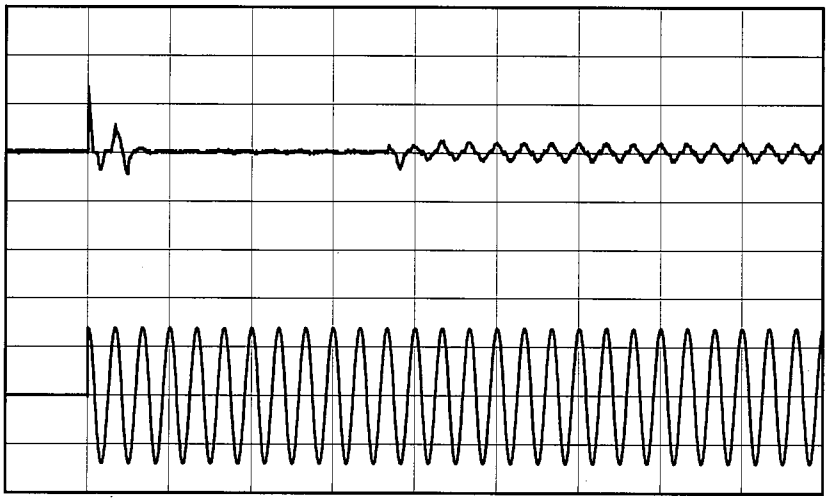
Model	LFA300F-15-TY
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



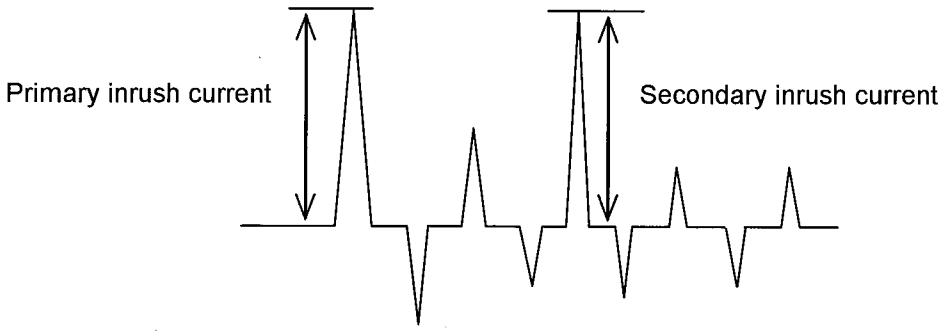
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
11.7 A
Secondary inrush current :
9.3 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
26.9 A
Secondary inrush current :
6.7 A



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Model	LFA300F-15-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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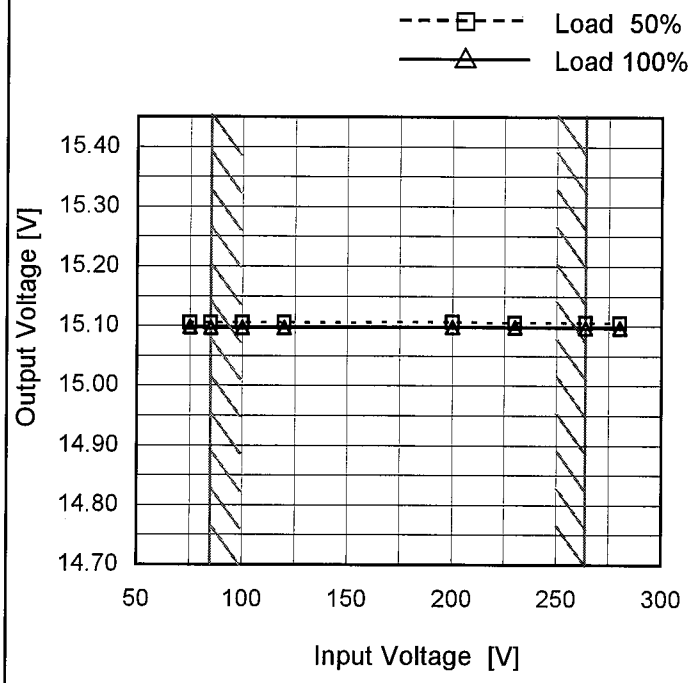
Model	LFA300F-15-TY
Item	Line Regulation
Object	+15V22A

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	15.106	15.098
85	15.106	15.098
100	15.105	15.098
120	15.105	15.098
200	15.106	15.098
230	15.106	15.098
264	15.106	15.098
280	15.105	15.097
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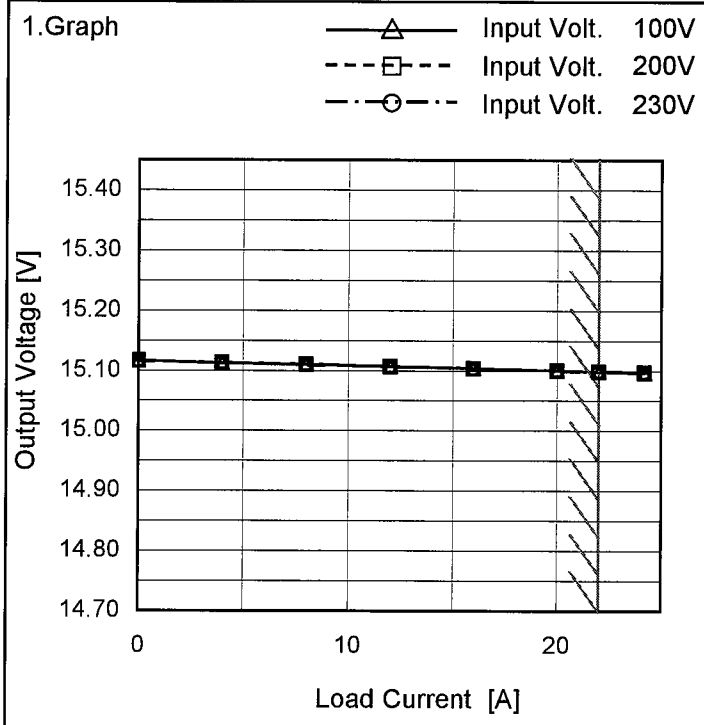
Model	LFA300F-15-TY
Item	Load Regulation
Object	+15V22A

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	15.117	15.117	15.116
4.0	15.113	15.113	15.112
8.0	15.110	15.110	15.109
12.0	15.107	15.107	15.106
16.0	15.103	15.104	15.103
20.0	15.100	15.100	15.100
22.0	15.098	15.098	15.098
24.2	15.097	15.097	15.097
--	-	-	-
--	-	-	-
--	-	-	-

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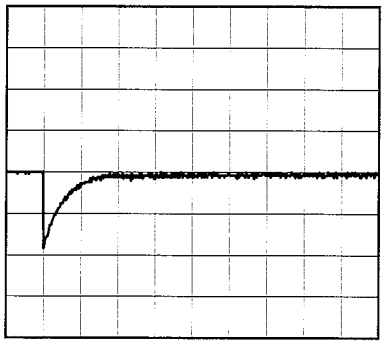
Model	LFA300F-15-TY		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+15V22A		

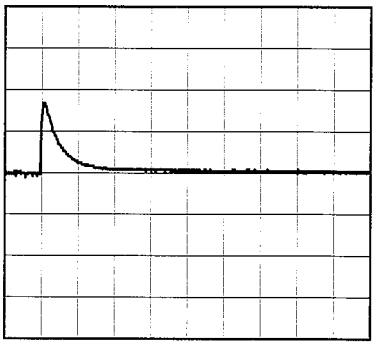
Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ

Min. Load (0A) ⟷
Load 100% (22A)

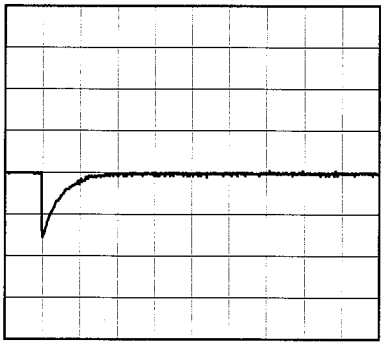


100 mV/div
20 ms/div

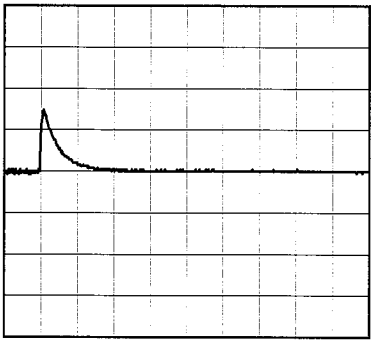


20 ms/div

Min. Load (0A) ⟷
Load 50% (11A)



100 mV/div
20 ms/div



20 ms/div

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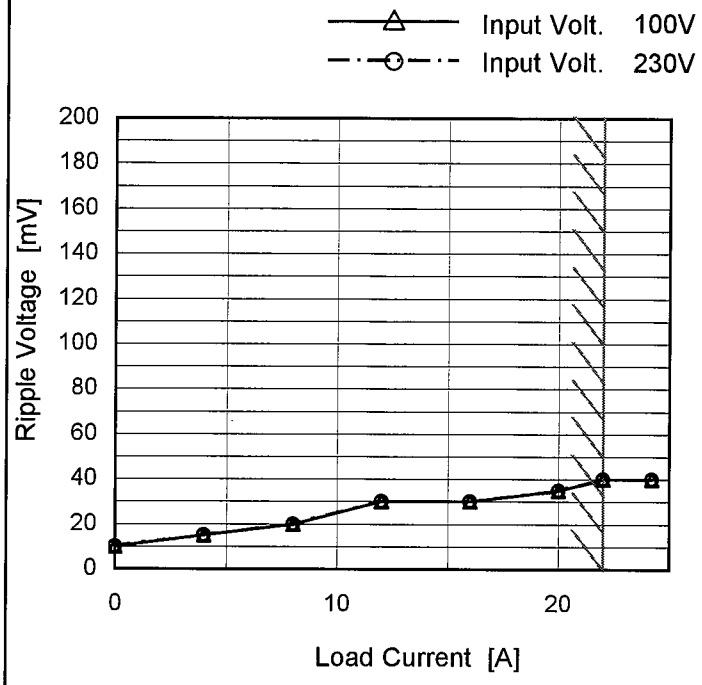
Model	LFA300F-15-TY
Item	Ripple Voltage (by Load Current)
Object	+15V22A

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

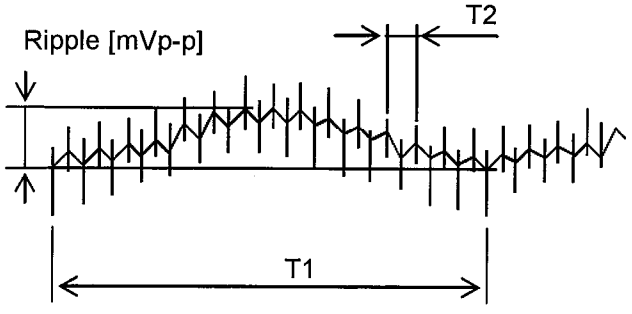


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	10	10
4.0	15	15
8.0	20	20
12.0	30	30
16.0	30	30
20.0	35	35
22.0	40	40
24.2	40	40
--	-	-
--	-	-
--	-	-

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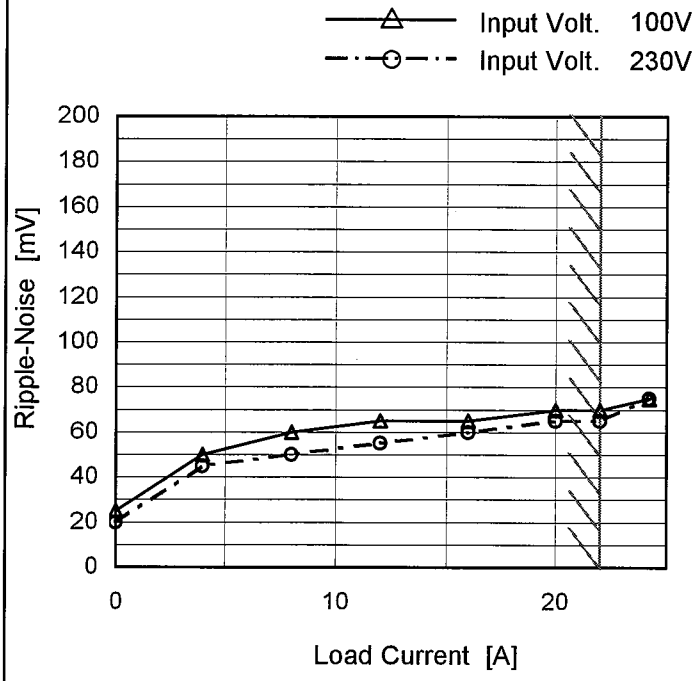
Model	LFA300F-15-TY
Item	Ripple-Noise
Object	+15V22A

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]
0.0	25	20
4.0	50	45
8.0	60	50
12.0	65	55
16.0	65	60
20.0	70	65
22.0	70	65
24.2	75	75
--	-	-
--	-	-
--	-	-

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

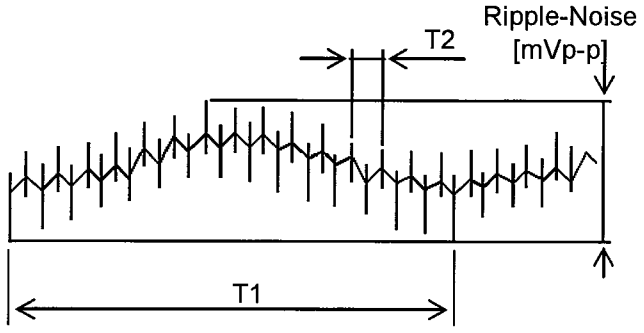


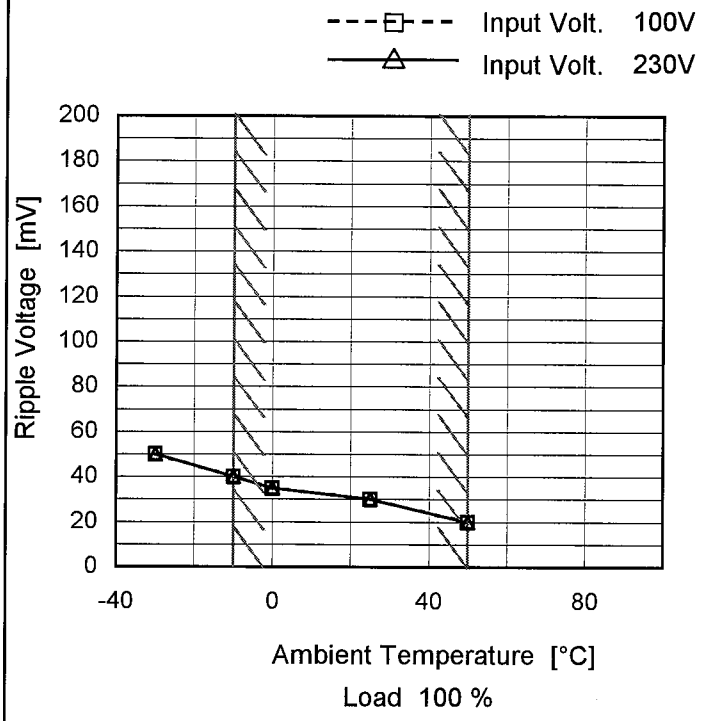
Fig. Complex Ripple Wave Form

COSEL

Model	LFA300F-15-TY
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V22A

Testing Circuitry Figure C

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

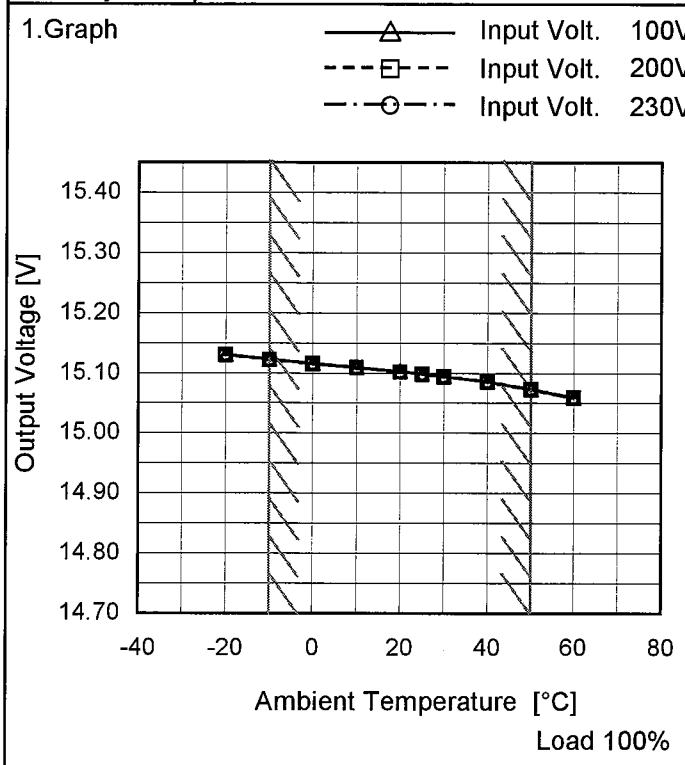
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	50	50
-10	40	40
0	35	35
25	30	30
50	20	20
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA300F-15-TY
Item	Ambient Temperature Drift
Object	+15V22A

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	15.130	15.130	15.130
-10	15.123	15.122	15.122
0	15.115	15.115	15.116
10	15.109	15.109	15.108
20	15.102	15.102	15.102
25	15.098	15.098	15.098
30	15.094	15.094	15.094
40	15.085	15.085	15.085
50	15.073	15.073	15.072
60	15.059	15.059	15.059
--	-	-	-

COSEL

Model	LFA300F-15-TY	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V22A	

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 - 22A

* 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	-10	264	0	15.139	±34	±0.2
Minimum Voltage	50	264	22	15.072		

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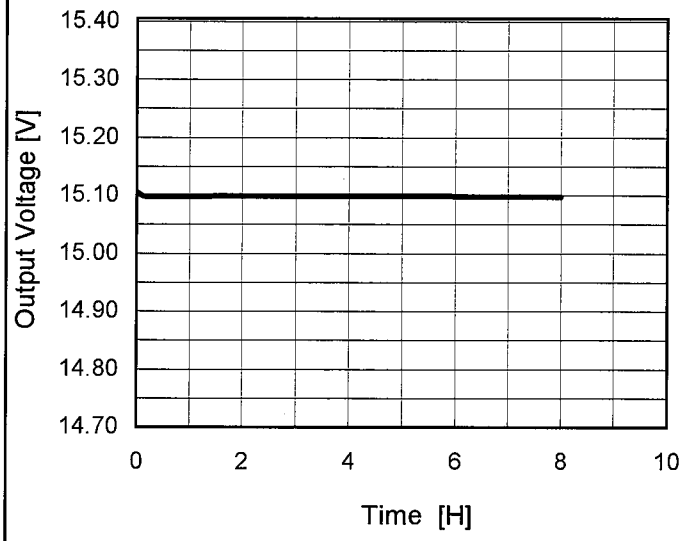
Model	LFA300F-15-TY
Item	Time Lapse Drift
Object	+15V22A

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	15.105
0.5	15.098
1.0	15.098
2.0	15.099
3.0	15.099
4.0	15.099
5.0	15.099
6.0	15.099
7.0	15.099
8.0	15.098

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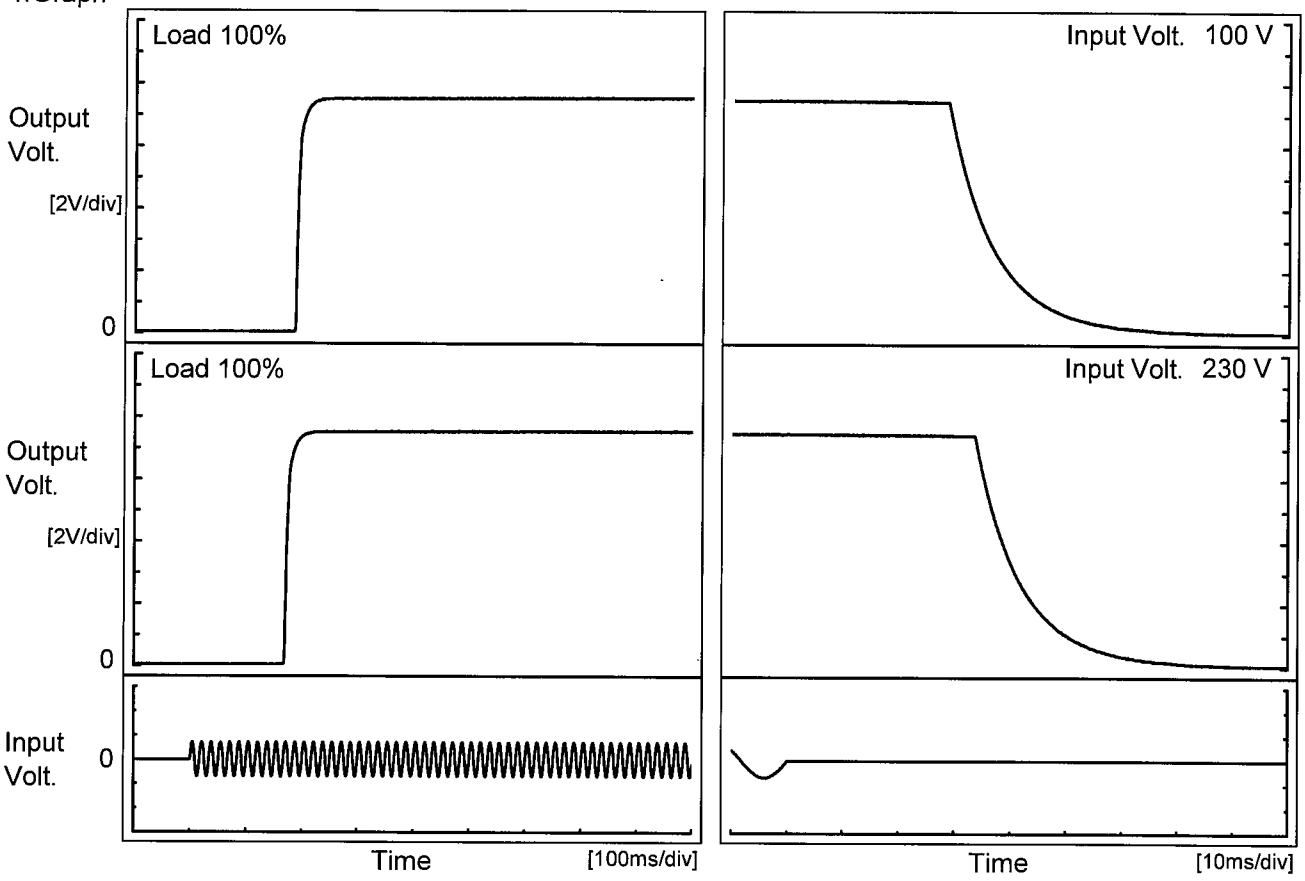
Model	LFA300F-15-TY
Item	Rise and Fall Time
Object	+15V22A

Temperature 25°C
Testing Circuitry Figure A

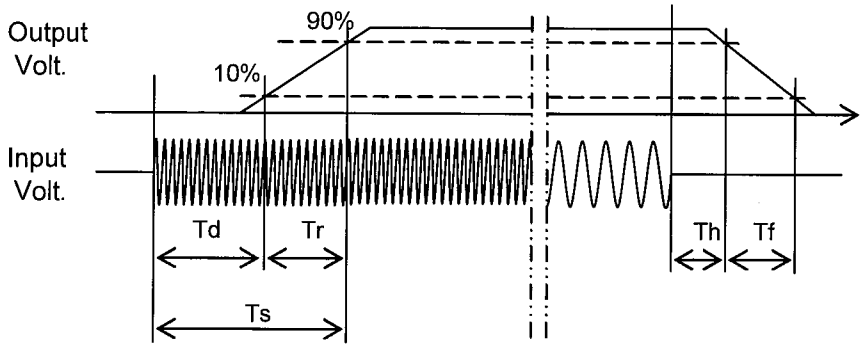
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	187.0	14.0	201.0	29.4	18.8
230 V	169.5	14.0	183.5	34.5	18.8



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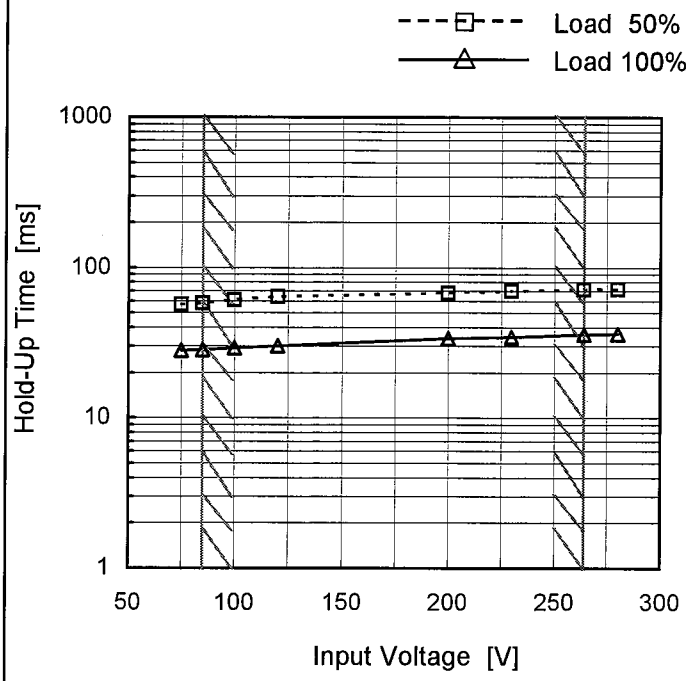
Model	LFA300F-15-TY
Item	Hold-Up Time
Object	+15V22A

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	61	29
120	64	30
200	68	34
230	70	35
264	71	36
280	72	36
--	-	-

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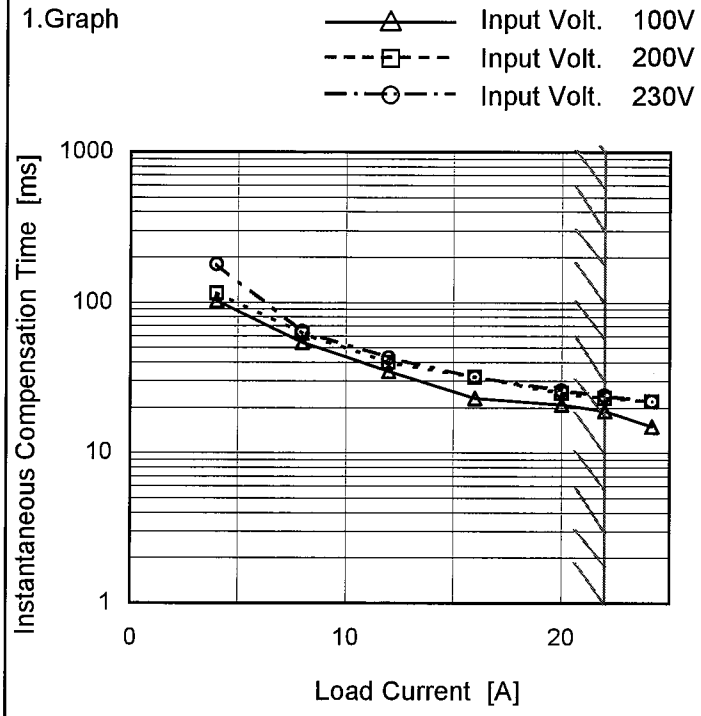
Model	LFA300F-15-TY
Item	Instantaneous Interruption Compensation
Object	+15V22A

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	-	-	-
4.0	103	115	180
8.0	54	62	64
12.0	35	40	43
16.0	23	32	32
20.0	21	25	26
22.0	19	23	24
24.2	15	22	22
--	-	-	-
--	-	-	-
--	-	-	-

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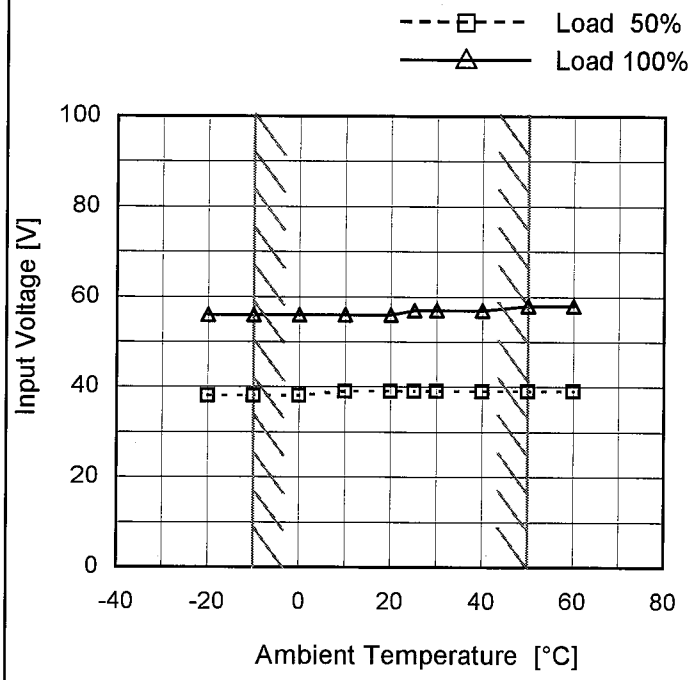
Model	LFA300F-15-TY
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V22A

Testing Circuitry Figure A

1.Graph



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

2.Values

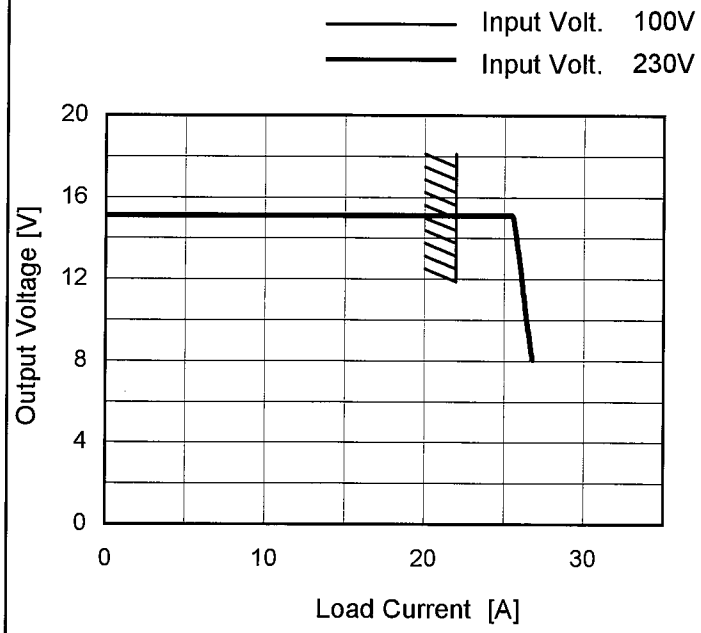
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	38	56
-10	38	56
0	38	56
10	39	56
20	39	56
25	39	57
30	39	57
40	39	57
50	39	58
60	39	58
--	-	-

COSEL

Model	LFA300F-15-TY
Item	Overcurrent Protection
Object	+15V22A

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 8V to 0V.

2.Values

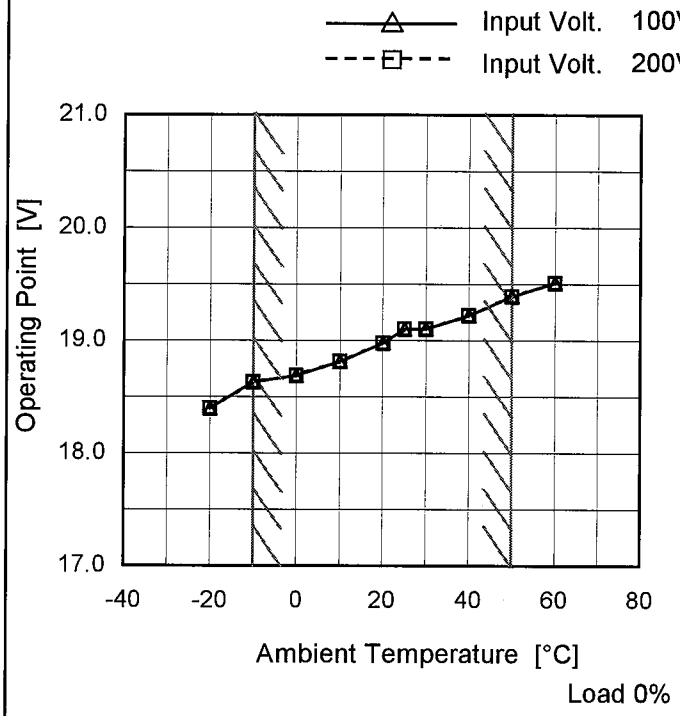
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
15.00	25.68	25.63
14.25	25.80	25.76
13.50	25.54	25.49
12.00	26.15	26.10
10.50	26.38	26.33
9.00	26.61	26.58
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA300F-15-TY
Item	Overvoltage Protection
Object	+15V22A

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	18.40	18.40
-10	18.63	18.63
0	18.69	18.69
10	18.81	18.81
20	18.98	18.98
25	19.10	19.10
30	19.10	19.10
40	19.22	19.22
50	19.39	19.39
60	19.51	19.51
--	-	-

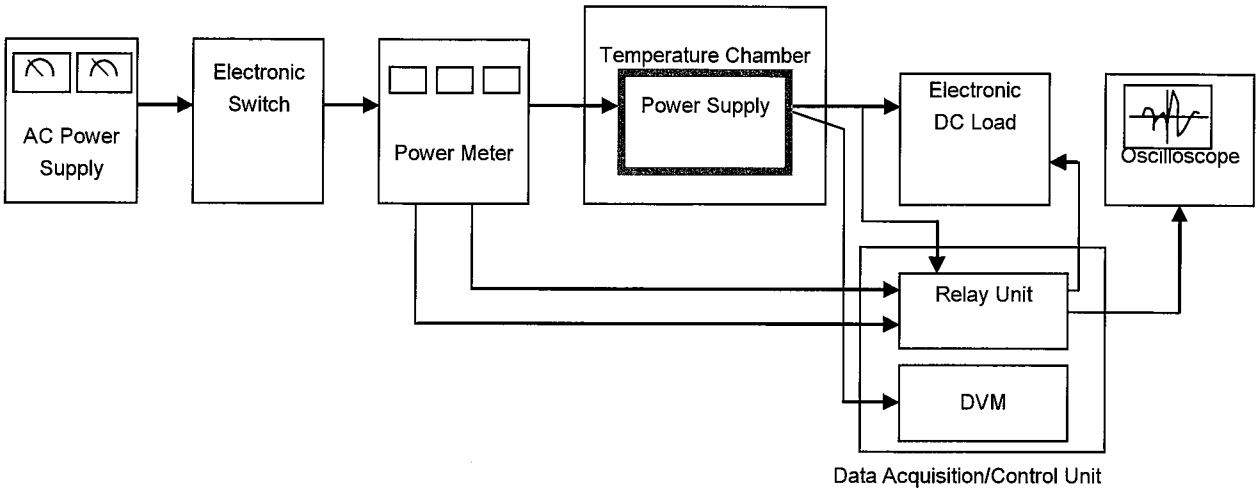


Figure A

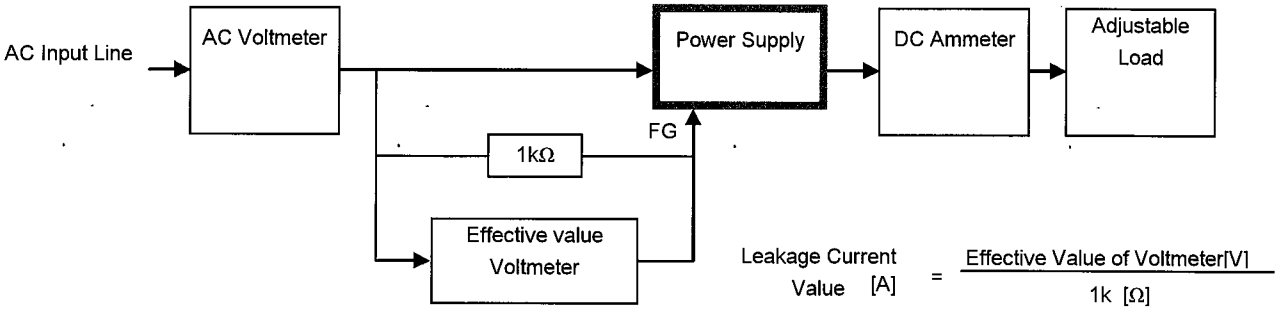


Figure B (DEN-AN)

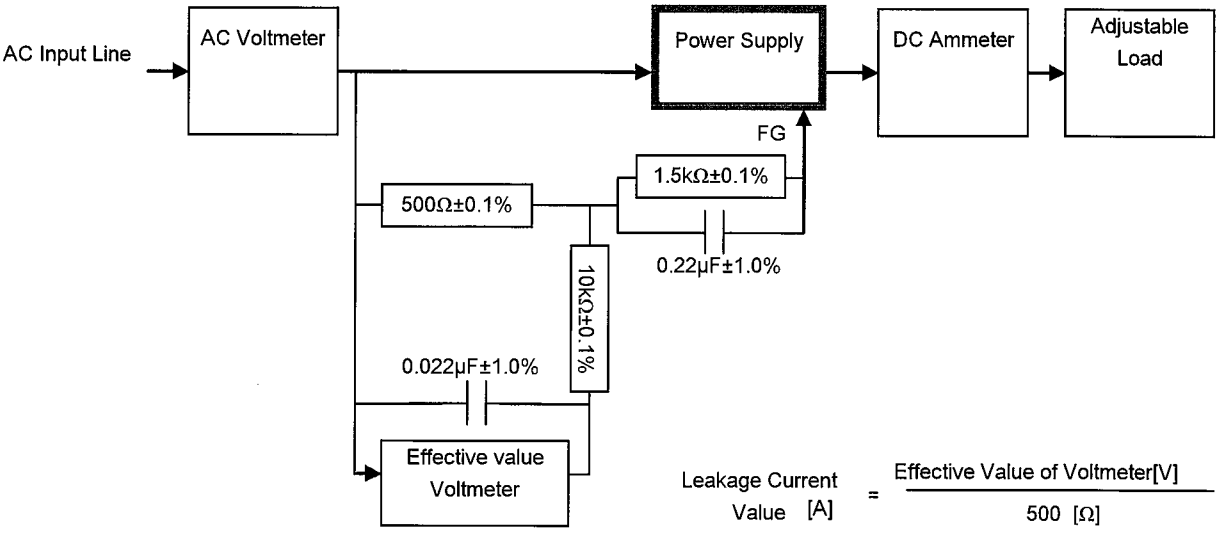


Figure B (IEC60950-1)

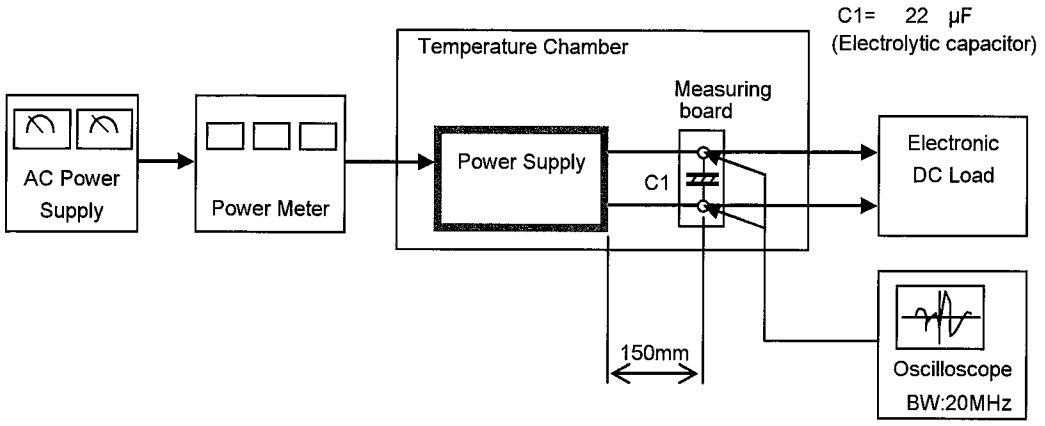

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope
BW:20MHz

Figure C