参考資料

COSEL

TEST DATA OF LFA30F-3R3-Y

Regulated DC Power Supply
July 7, 2009

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COSEL CO.,LTD.

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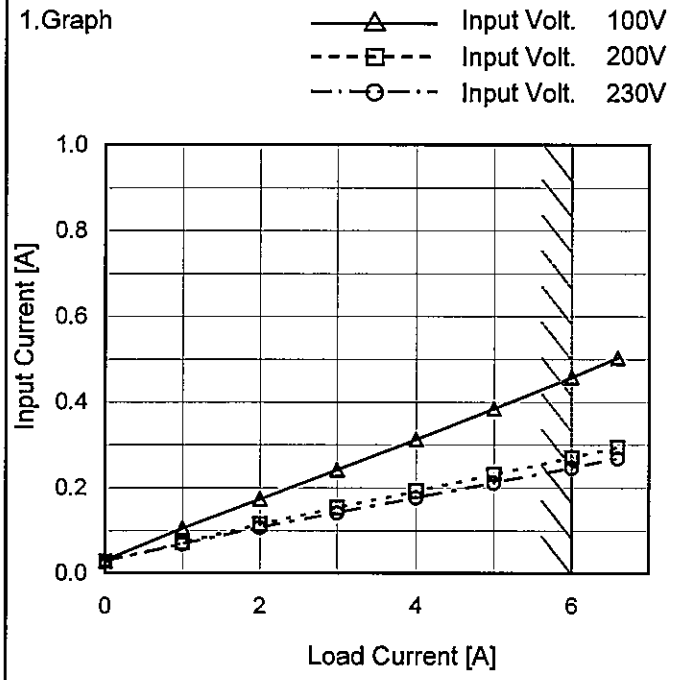
Item	Input Current (by Load Current)
Object	———————

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	0.031	0.028	0.028
1.0	0.105	0.071	0.069
2.0	0.174	0.114	0.107
3.0	0.242	0.153	0.142
4.0	0.313	0.192	0.177
5.0	0.385	0.231	0.212
6.0	0.458	0.270	0.247
6.6	0.503	0.295	0.268
—	-	-	-
—	-	-	-
—	-	-	-

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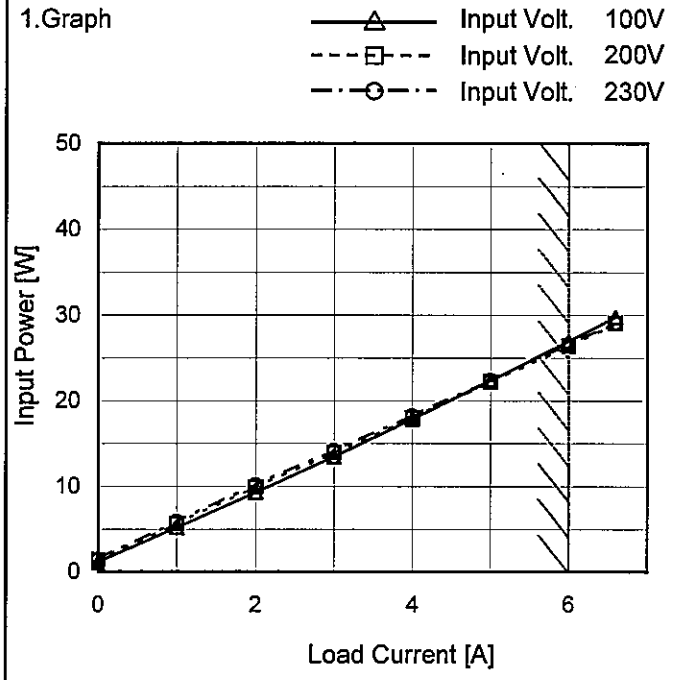
Model	LFA30F-3R3-Y
Item	Input Power (by Load Current)
Object	———————

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	1.15	1.40	1.50
1.0	5.22	5.60	5.90
2.0	9.31	9.90	10.20
3.0	13.52	13.90	14.20
4.0	17.88	18.00	18.30
5.0	22.36	22.20	22.40
6.0	26.96	26.40	26.60
6.6	29.79	29.00	29.10
—	-	-	-
—	-	-	-
—	-	-	-

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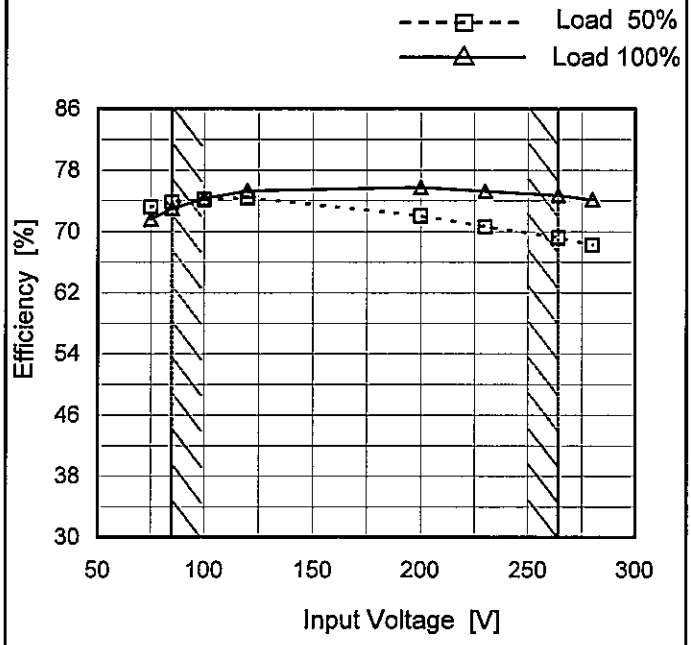
Model	LFA30F-3R3-Y
Item	Efficiency (by Input Voltage)
Object	———————

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	73.2	71.6
85	73.9	73.0
100	74.2	74.3
120	74.4	75.3
200	72.1	75.8
230	70.6	75.3
264	69.2	74.7
280	68.2	74.2
–	-	-

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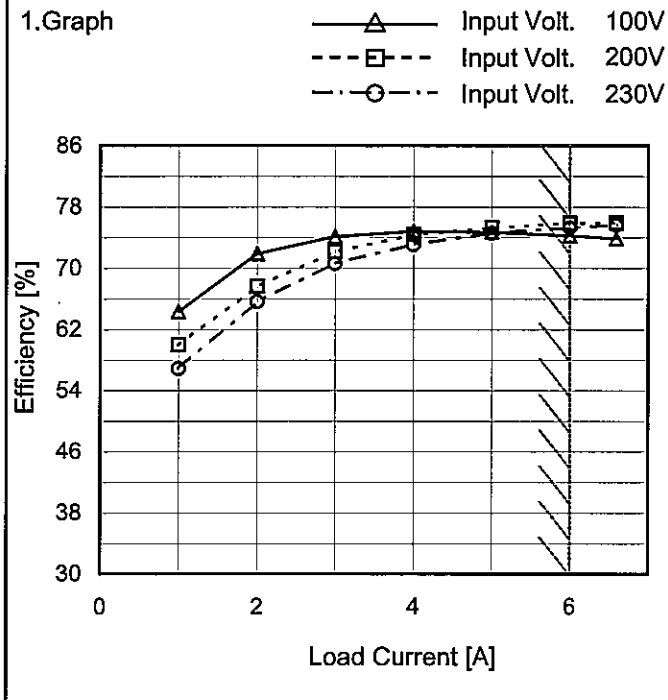
Model	LFA30F-3R3-Y
Item	Efficiency (by Load Current)
Object	———————

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	-	-	-
1.0	64.4	60.0	56.9
2.0	71.9	67.6	65.6
3.0	74.2	72.1	70.6
4.0	74.9	74.4	73.1
5.0	74.7	75.3	74.6
6.0	74.3	75.8	75.3
6.6	73.9	75.9	75.7
—	-	-	-
—	-	-	-
—	-	-	-

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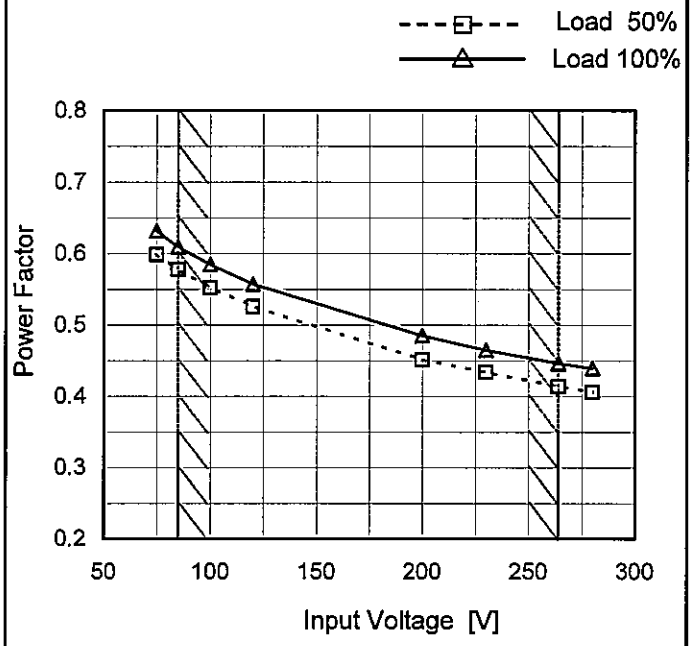
Model	LFA30F-3R3-Y
Item	Power Factor (by Input Voltage)
Object	———————————

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	0.599	0.632
85	0.577	0.609
100	0.553	0.585
120	0.526	0.557
200	0.451	0.485
230	0.434	0.465
264	0.414	0.447
280	0.406	0.440
–	-	-

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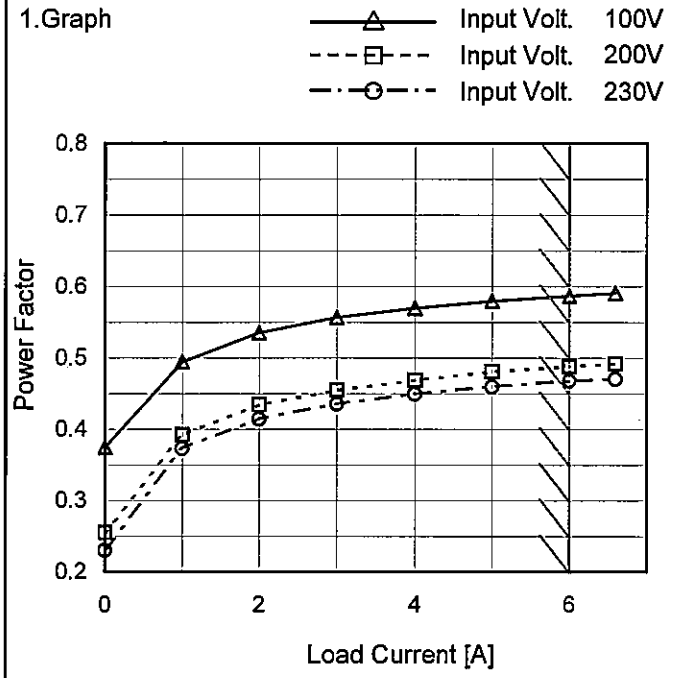
Model	LFA30F-3R3-Y
Item	Power Factor (by Load Current)
Object	———————

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	0.375	0.255	0.231
1.0	0.495	0.392	0.373
2.0	0.535	0.434	0.415
3.0	0.557	0.454	0.436
4.0	0.570	0.469	0.450
5.0	0.580	0.481	0.460
6.0	0.587	0.488	0.468
6.6	0.591	0.492	0.471
—	-	-	-
—	-	-	-
—	-	-	-

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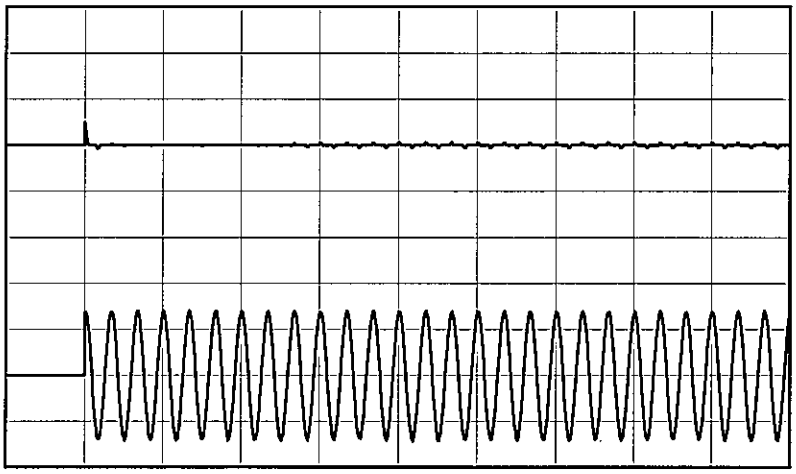
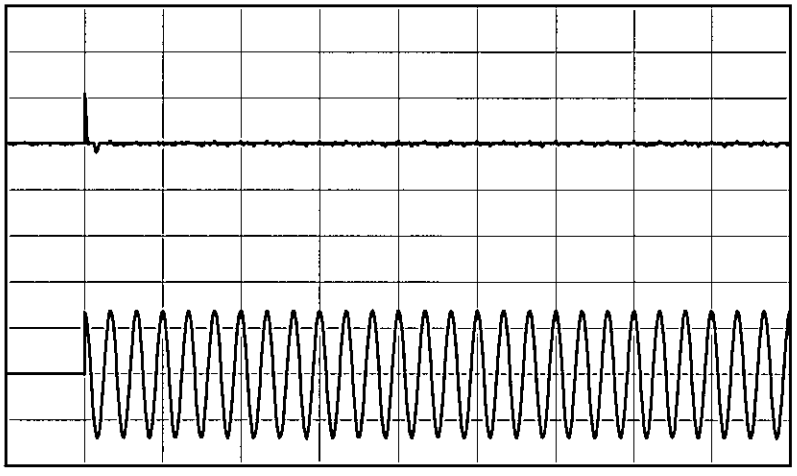
Model	LFA30F-3R3-Y
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



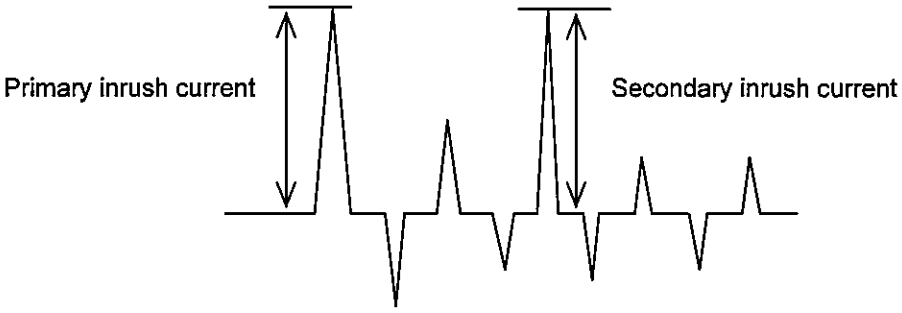
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
9.9 A
Secondary inrush current :
1.2 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
21.6 A
Secondary inrush current :
1.2 A



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Model	LFA30F-3R3-Y		
Item	Leakage Current	Temperature	25°C
Object	———————	Testing Circuitry	Figure B

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.13	0.27	0.32	Operation
	One of phases	0.21	0.45	0.55	Stand by
IEC60950	Both phases	0.15	0.30	0.37	Operation
	One of phases	0.22	0.46	0.55	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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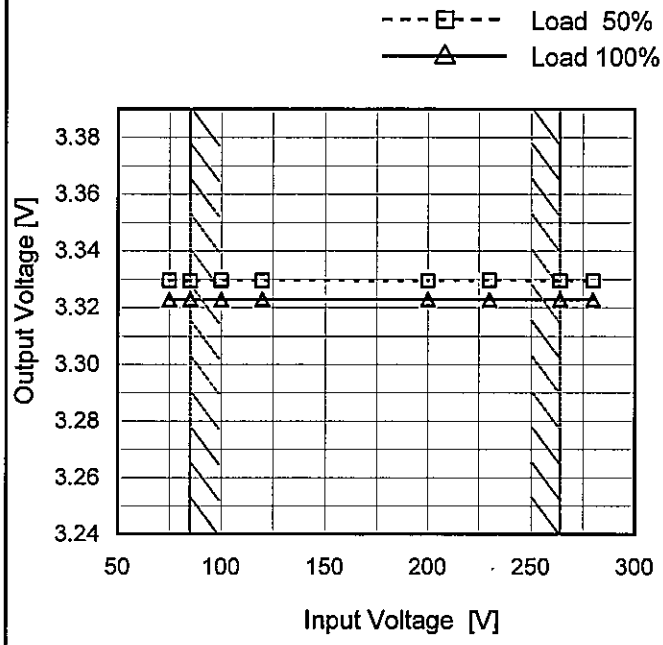
Model	LFA30F-3R3-Y
Item	Line Regulation
Object	+3.3V6A

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	3.330	3.323
85	3.330	3.323
100	3.330	3.323
120	3.330	3.323
200	3.330	3.323
230	3.330	3.323
264	3.330	3.323
280	3.330	3.323
–	-	-

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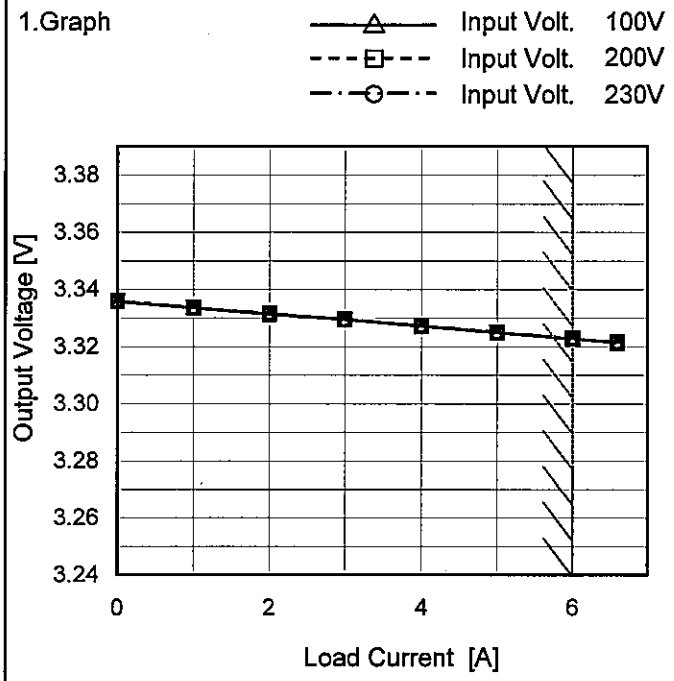
Model	LFA30F-3R3-Y
Item	Load Regulation
Object	+3.3V6A

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	3.336	3.336	3.336
1.0	3.334	3.334	3.334
2.0	3.331	3.332	3.332
3.0	3.330	3.330	3.330
4.0	3.327	3.327	3.327
5.0	3.325	3.325	3.325
6.0	3.323	3.323	3.323
6.6	3.322	3.322	3.322
--	-	-	-
--	-	-	-
--	-	-	-

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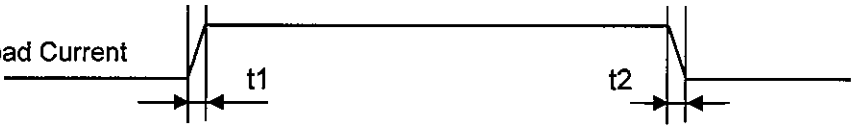
Model	LFA30F-3R3-Y
Item	Dynamic Load Response
Object	+3.3V6A

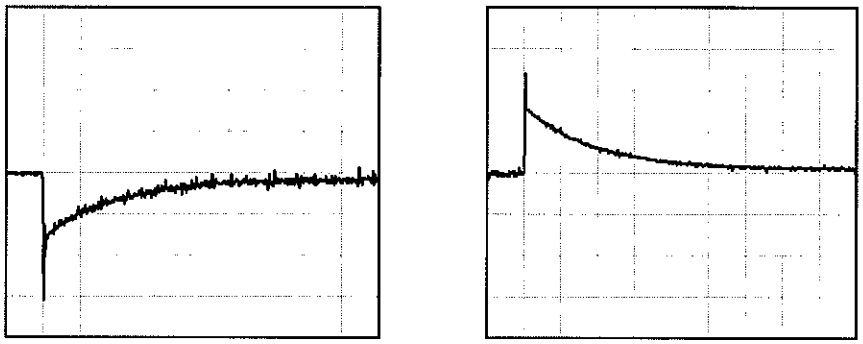
Temperature 25℃
Testing Circuitry Figure A

Input Volt. 100 V
Cycle 1000 ms

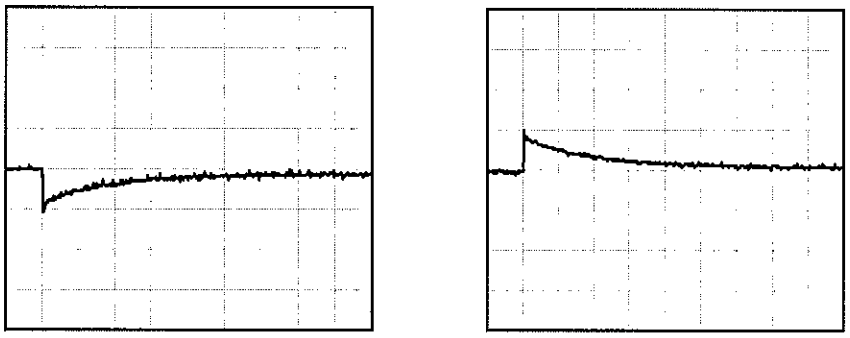
Response. t1=t2=50us. Typ



Min. Load (0A) ⟷
Load 100% (6A)



Min. Load (0A) ⟷
Load 50% (3A)



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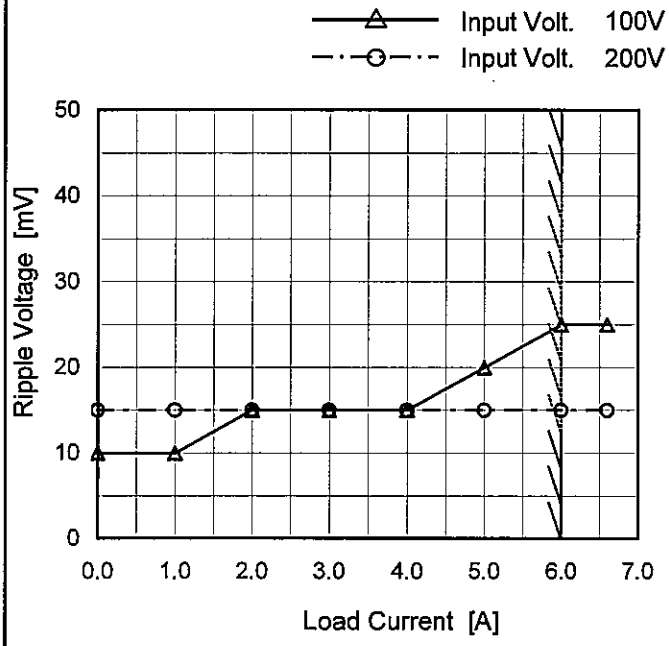
Model	LFA30F-3R3-Y
Item	Ripple Voltage (by Load Current)
Object	+3.3V6A

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

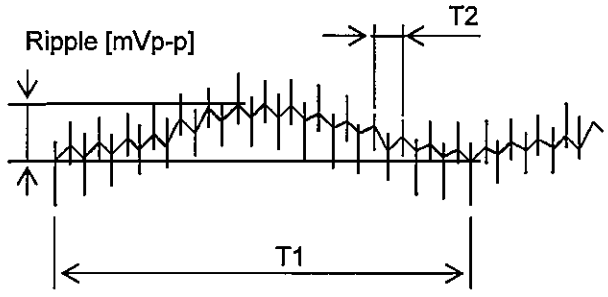


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	10	15
1.0	10	15
2.0	15	15
3.0	15	15
4.0	15	15
5.0	20	15
6.0	25	15
6.6	25	15
—	-	-
—	-	-
—	-	-

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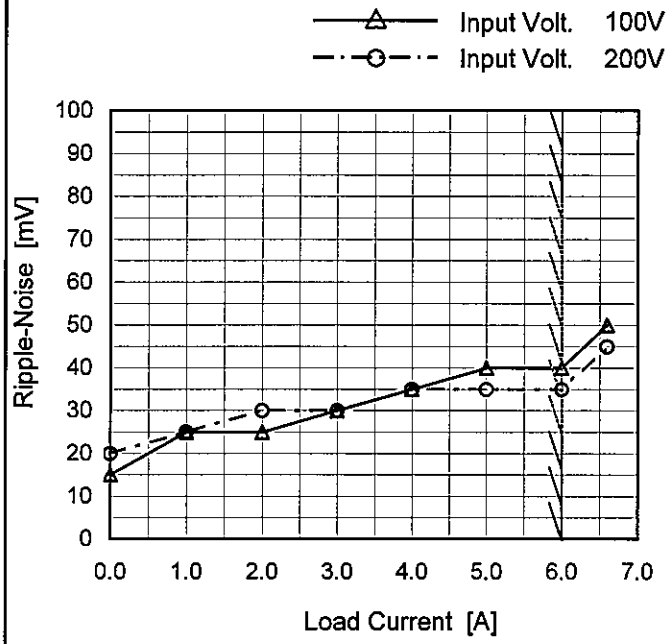
Model	LFA30F-3R3-Y
Item	Ripple-Noise
Object	+3.3V6A

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

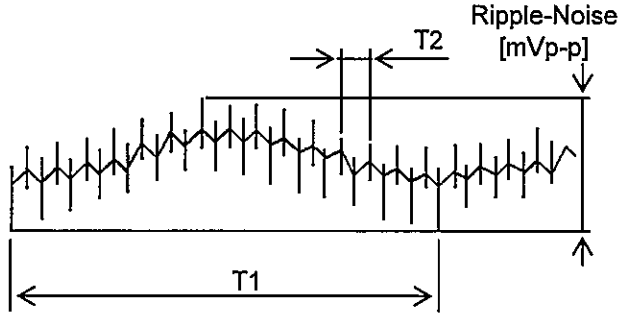


Fig. Complex Ripple Wave Form

2.Values

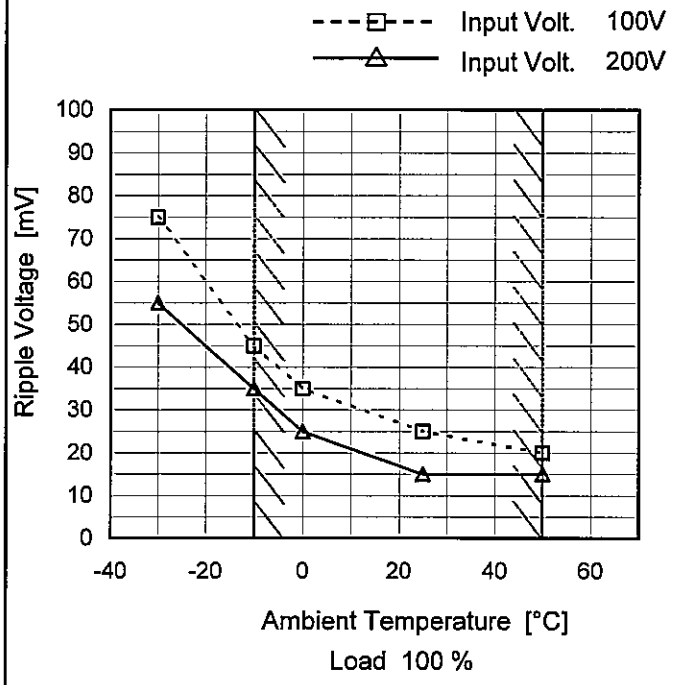
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	15	20
1.0	25	25
2.0	25	30
3.0	30	30
4.0	35	35
5.0	40	35
6.0	40	35
6.6	50	45
–	-	-
–	-	-
–	-	-

COSEL

Model	LFA30F-3R3-Y
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V6A

Testing Circuitry Figure C

1.Graph



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

2.Values

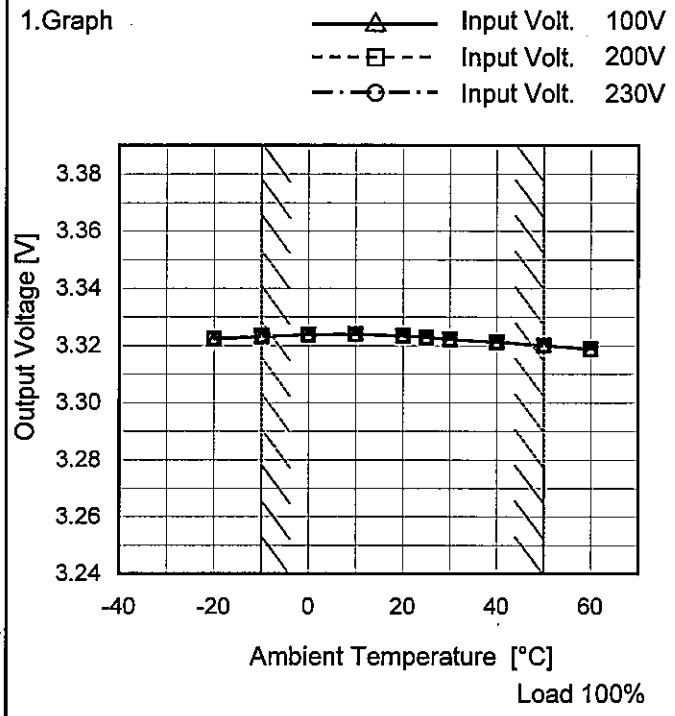
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	75	55
-10	45	35
0	35	25
25	25	15
50	20	15
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	LFA30F-3R3-Y
Item	Ambient Temperature Drift
Object	+3.3V6A

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	3.322	3.322	3.323
-10	3.323	3.323	3.323
0	3.324	3.324	3.324
10	3.324	3.324	3.324
20	3.323	3.323	3.323
25	3.323	3.323	3.323
30	3.322	3.322	3.322
40	3.321	3.321	3.321
50	3.320	3.320	3.320
60	3.319	3.319	3.319
-	-	-	-

COSEL

Model	LFA30F-3R3-Y	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+3.3V6A	

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 - 6A

* 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	20	85	0	3.323	±2	±0.1
Minimum Voltage	50	264	6	3.320		

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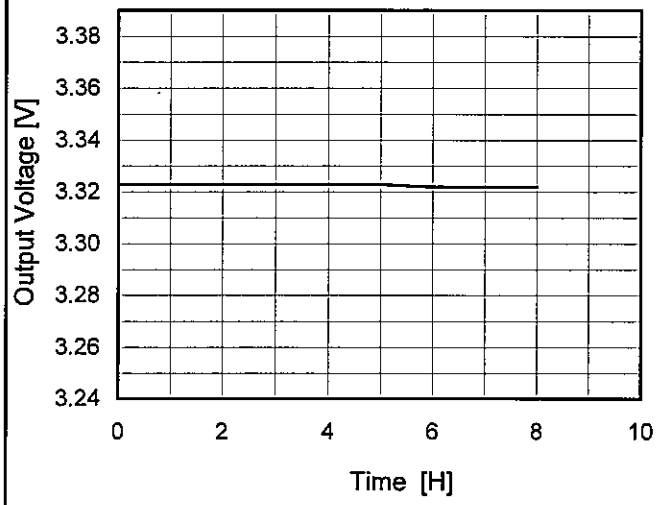
Model	LFA30F-3R3-Y
Item	Time Lapse Drift
Object	+3.3V6A

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	3.323
0.5	3.323
1.0	3.323
2.0	3.323
3.0	3.323
4.0	3.323
5.0	3.323
6.0	3.322
7.0	3.322
8.0	3.322

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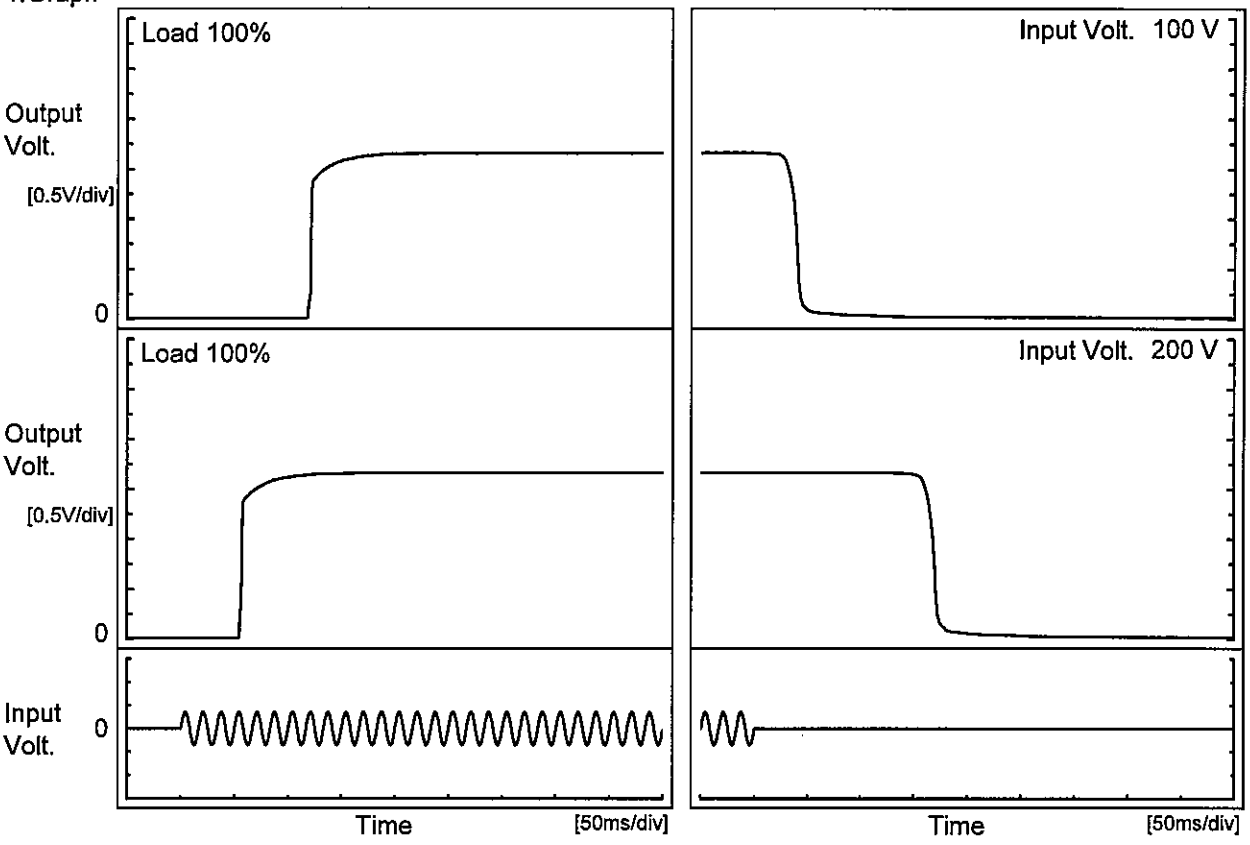
Model	LFA30F-3R3-Y	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+3.3V6A	

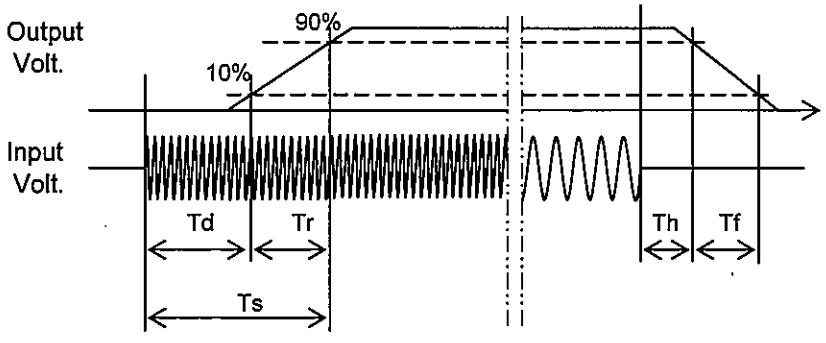
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	119.8	14.5	134.3	31.8	12.3
200 V	55.0	14.3	69.3	161.3	13.0

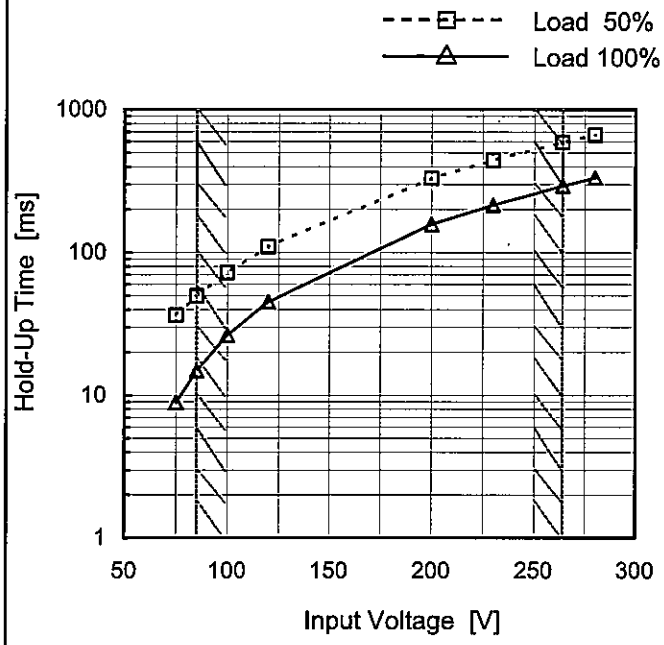


COSEL

Model	LFA30F-3R3-Y
Item	Hold-Up Time
Object	+3.3V6A

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

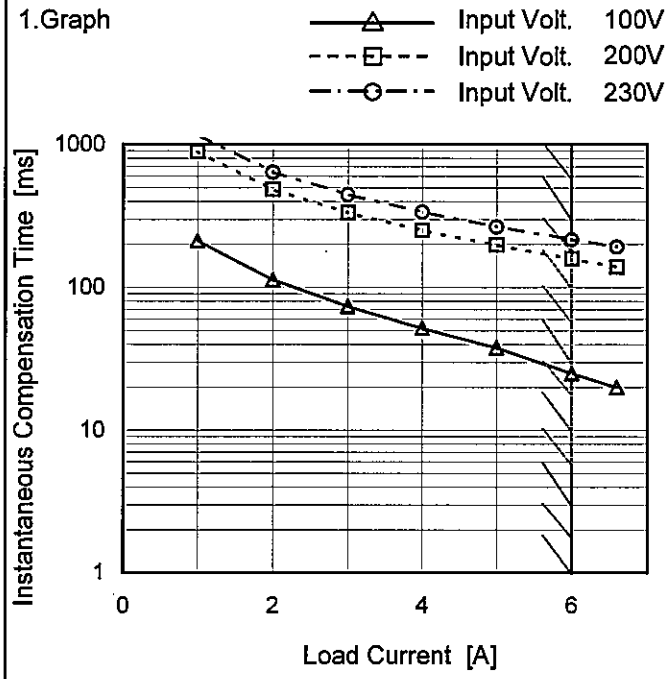
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	37	9
85	50	15
100	73	26
120	110	45
200	331	158
230	443	216
264	591	294
280	667	335
--	-	-

COSEL

Model	LFA30F-3R3-Y
Item	Instantaneous Interruption Compensation
Object	+3.3V6A

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	-	-	-
1.0	213	888	1169
2.0	113	483	641
3.0	74	332	445
4.0	52	250	337
5.0	38	197	266
6.0	25	159	217
6.6	20	139	193
--	-	-	-
--	-	-	-
--	-	-	-

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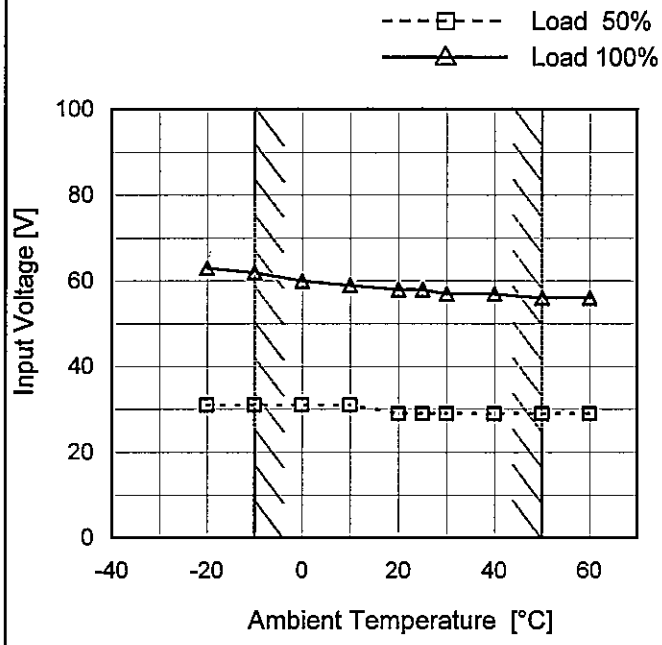
COSEL

Model	LFA30F-3R3-Y
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V6A

Testing Circuitry Figure A

1.Graph



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

2.Values

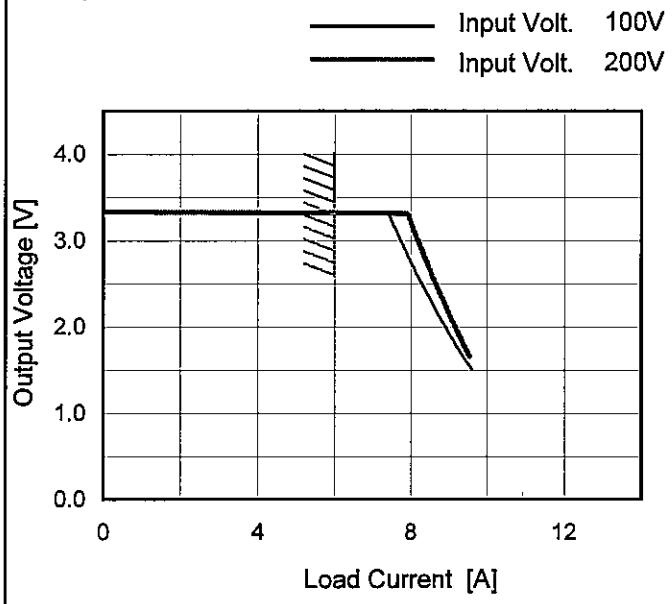
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	31	63
-10	31	62
0	31	60
10	31	59
20	29	58
25	29	58
30	29	57
40	29	57
50	29	56
60	29	56
–	-	-

COSEL

Model	LFA30F-3R3-Y
Item	Overcurrent Protection
Object	+3.3V6A

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 1.5V to 0V.

2.Values

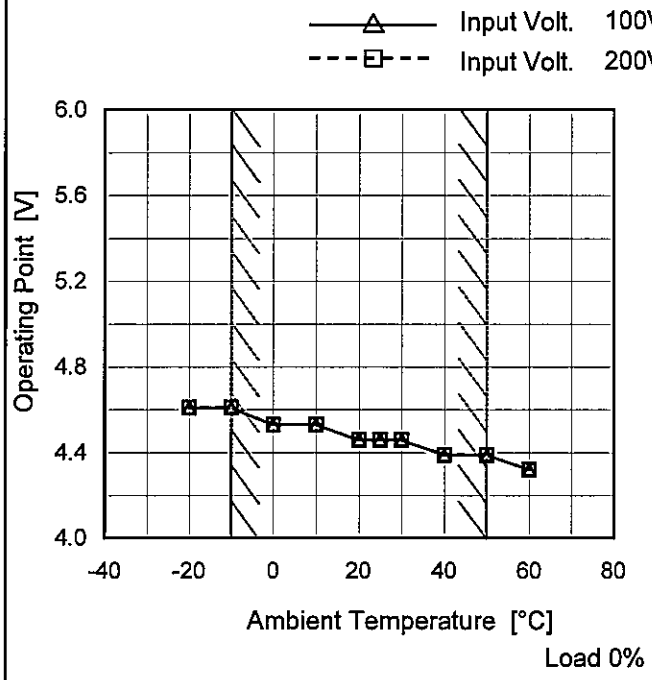
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
3.300	6.53	6.57
3.135	7.60	8.07
2.970	7.77	8.22
2.640	8.11	8.51
2.310	8.52	8.85
1.980	8.94	9.18
1.650	9.39	9.55
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA30F-3R3-Y
Item	Overvoltage Protection
Object	+3.3V6A

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	4.61	4.61
-10	4.61	4.61
0	4.53	4.53
10	4.53	4.53
20	4.46	4.46
25	4.46	4.46
30	4.46	4.46
40	4.39	4.39
50	4.39	4.39
60	4.32	4.32
—	-	-

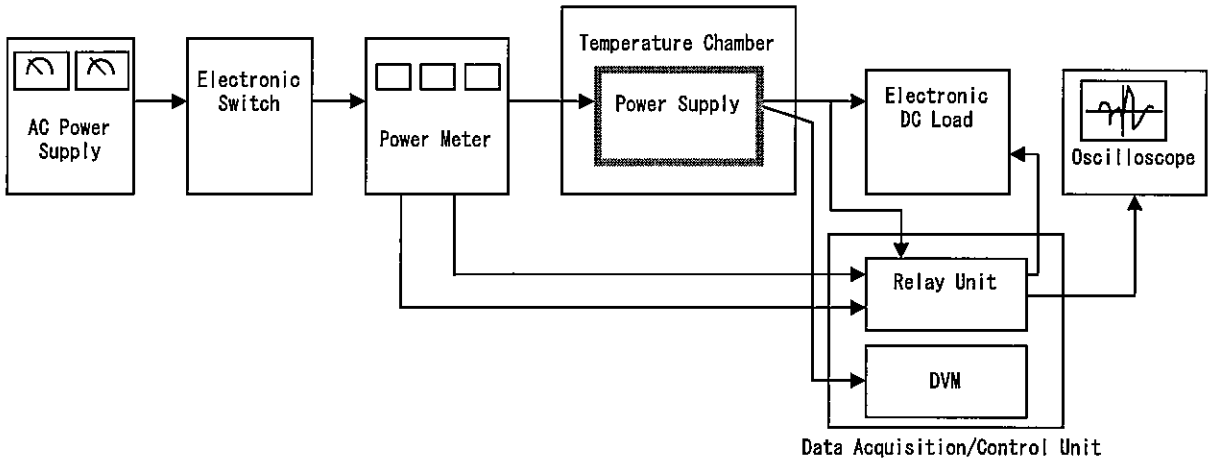


Figure A

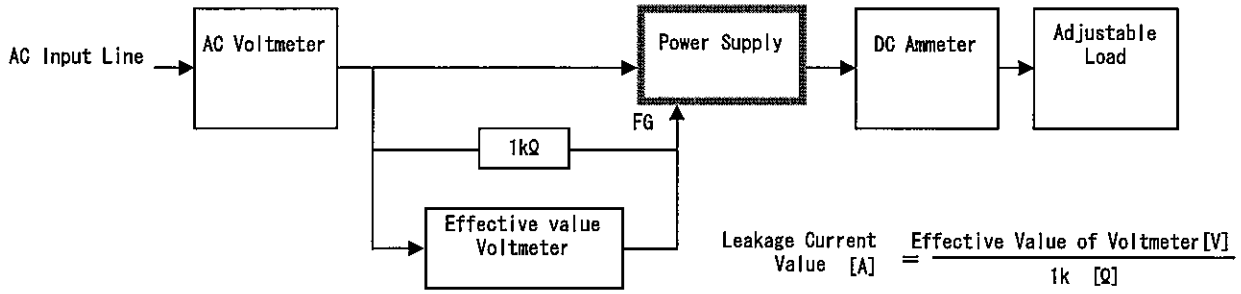


Figure B (DEN-AN)

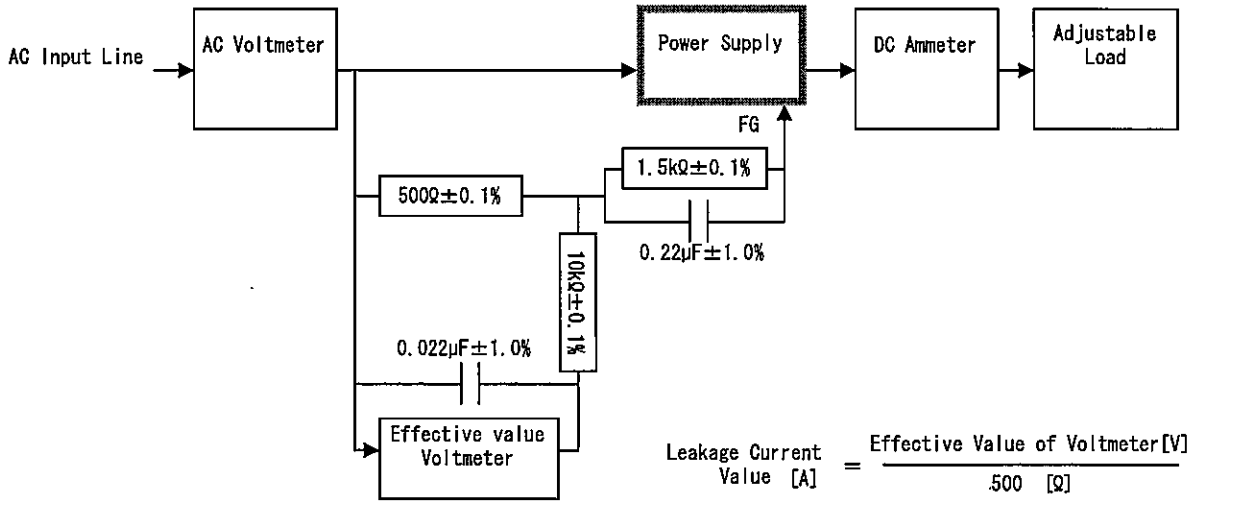


Figure B (IEC60950-1)

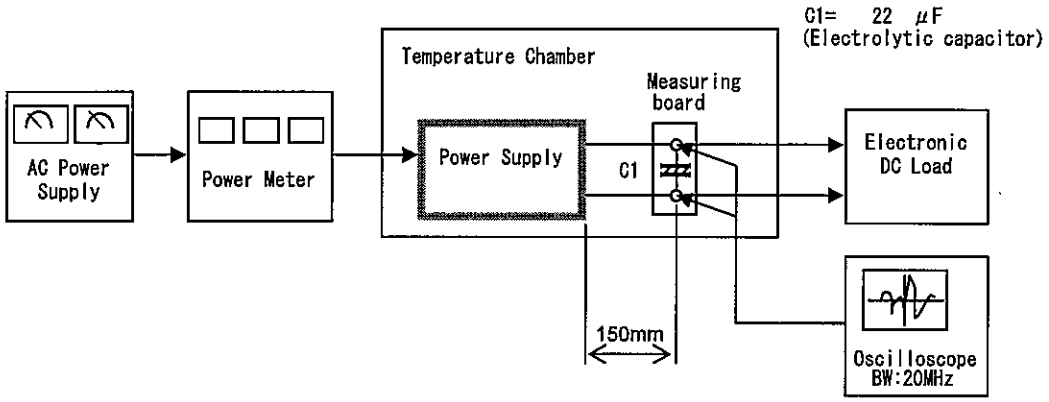

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope BW:20MHz

Figure C