参考資料

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TEST DATA OF LFA30F-24

Regulated DC Power Supply
June 29, 2009

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参考資料

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CONTENTS

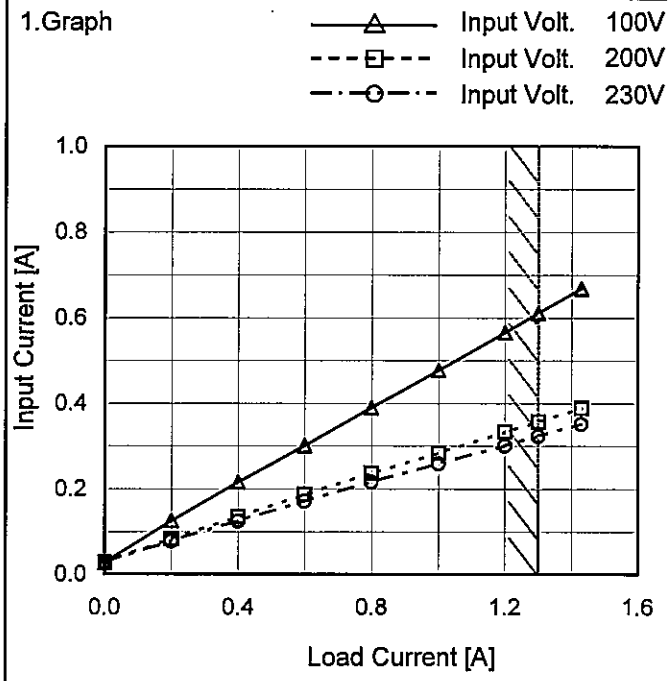
1.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Power Factor (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Power Factor (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Inrush Current ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Leakage Current ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 9
10.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 10
11.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 11
12.Ripple Voltage (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 12
13.Ripple-Noise ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 13
14.Ripple Voltage (by Ambient Temperature) ・・・・・・・・・・・・・・・・・・・・ 14
15.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 15
16.Output Voltage Accuracy ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 16
17.Time Lapse Drift ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 17
18.Rise and Fall Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 18
19.Hold-Up Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 19
20.Instantaneous Interruption Compensation ・・・・・・・・・・・・・・・・・・・・ 20
21.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・・・・・ 21
22.Overcurrent Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 22
23.Overvoltage Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 23
24.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・・・ 24
(Final Page 25)

COSEL

Model	LFA30F-24
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]
0.00	0.028	0.028	0.028
0.20	0.126	0.083	0.078
0.40	0.216	0.134	0.125
0.60	0.302	0.187	0.172
0.80	0.390	0.236	0.216
1.00	0.478	0.284	0.259
1.20	0.566	0.333	0.302
1.30	0.611	0.357	0.324
1.43	0.669	0.389	0.352
--	-	-	-
--	-	-	-

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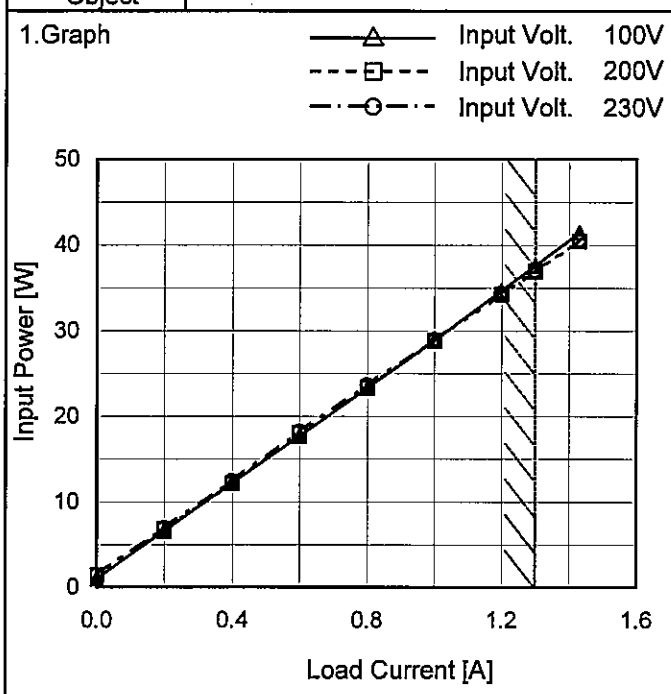
Model	LFA30F-24
Item	Input Power (by Load Current)
Object	————————

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]
0.00	1.00	1.40	1.50
0.20	6.60	6.80	7.00
0.40	12.20	12.10	12.50
0.60	17.70	18.00	18.30
0.80	23.30	23.40	23.70
1.00	28.90	28.80	29.00
1.20	34.70	34.20	34.40
1.30	37.60	36.90	37.00
1.43	41.50	40.40	40.60
--	-	-	-
--	-	-	-

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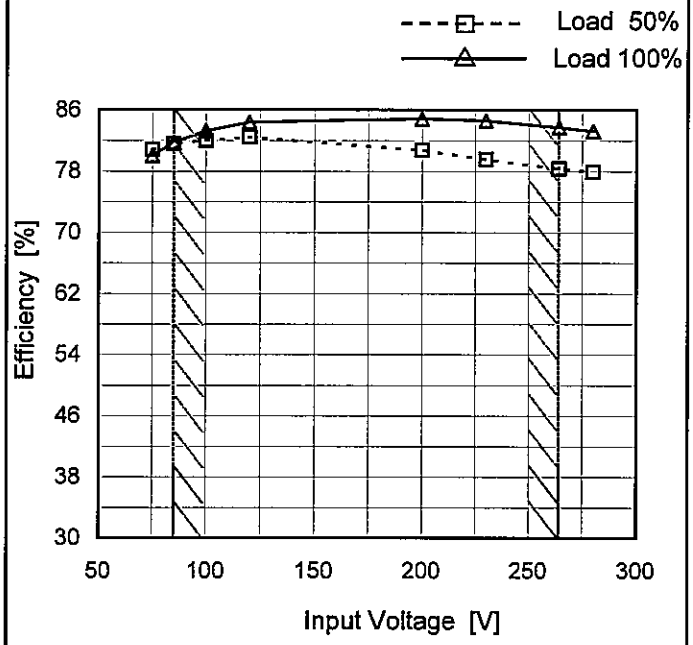
COSEL

Model	LFA30F-24
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	80.8	80.1
85	81.6	81.8
100	82.0	83.3
120	82.4	84.4
200	80.7	84.9
230	79.5	84.6
264	78.3	83.7
280	77.9	83.3
–	-	-

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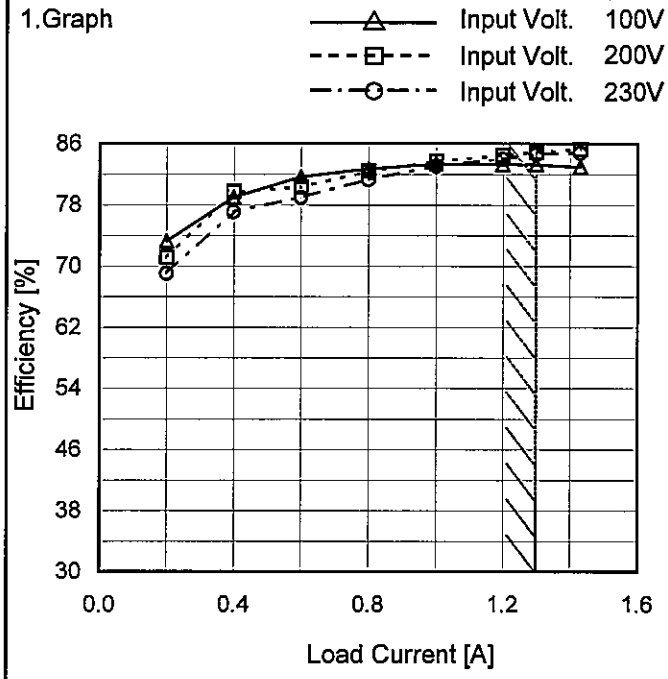
Model	LFA30F-24
Item	Efficiency (by Load Current)
Object	————————

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]
0.00	-	-	-
0.20	73.3	71.1	69.1
0.40	79.0	79.7	77.1
0.60	81.7	80.3	79.0
0.80	82.7	82.4	81.3
1.00	83.4	83.7	83.1
1.20	83.3	84.5	84.0
1.30	83.3	84.9	84.6
1.43	83.0	85.3	84.8
--	-	-	-
--	-	-	-

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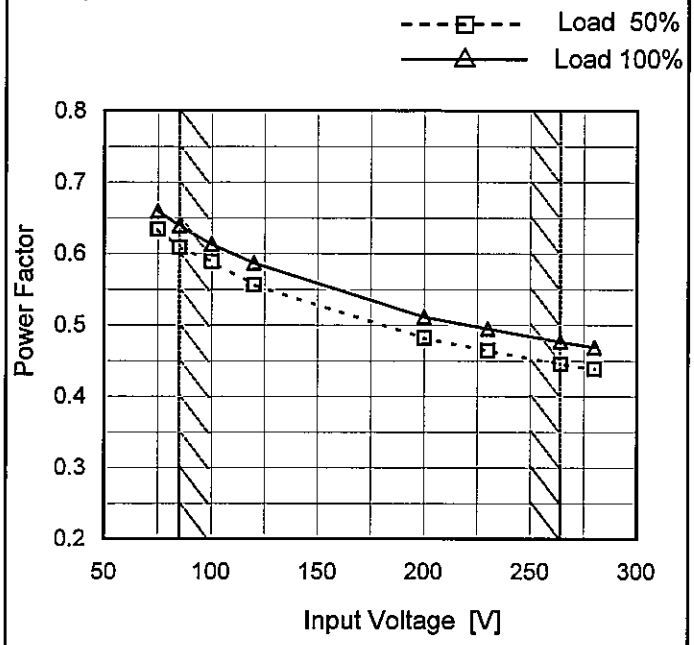
COSEL

Model	LFA30F-24
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	0.634	0.660
85	0.609	0.639
100	0.589	0.614
120	0.556	0.587
200	0.482	0.512
230	0.464	0.495
264	0.445	0.477
280	0.438	0.469
--	-	-

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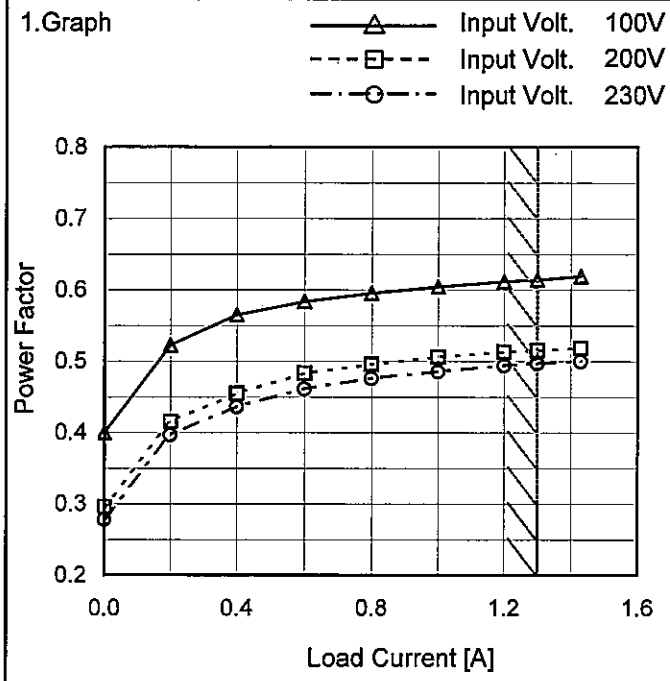
Model	LFA30F-24
Item	Power Factor (by Load Current)
Object	――――――

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]
0.00	0.400	0.296	0.278
0.20	0.523	0.416	0.397
0.40	0.565	0.455	0.436
0.60	0.584	0.483	0.462
0.80	0.595	0.496	0.476
1.00	0.605	0.506	0.486
1.20	0.612	0.513	0.494
1.30	0.615	0.515	0.497
1.43	0.619	0.518	0.501
--	-	-	-
--	-	-	-

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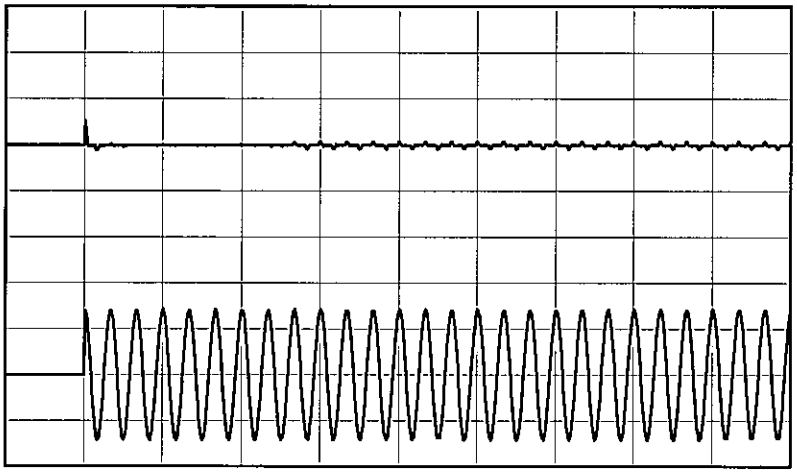
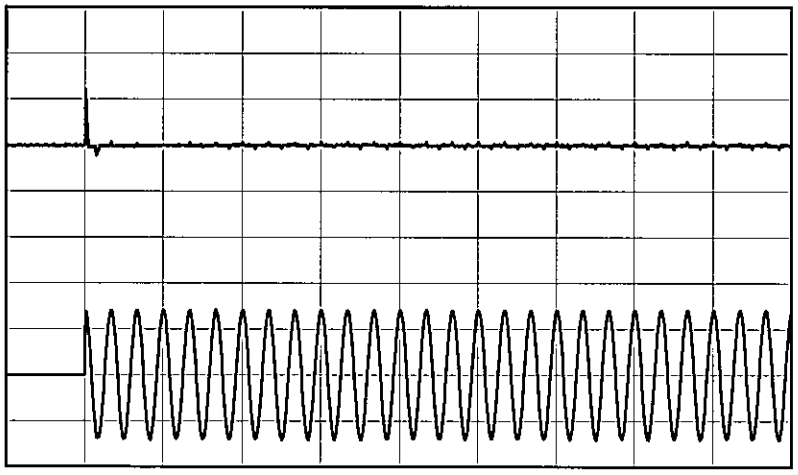
Model	LFA30F-24	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	———————		



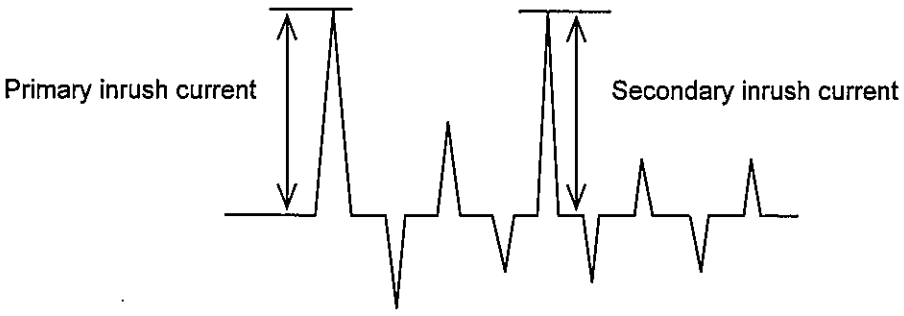
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current : 10.9 A
Secondary inrush current : 1.7 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current : 24.3 A
Secondary inrush current : 1.7 A



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Model	LFA30F-24	Temperature 25°C
Item	Leakage Current	Testing Circuitry Figure B
Object	――――――――	

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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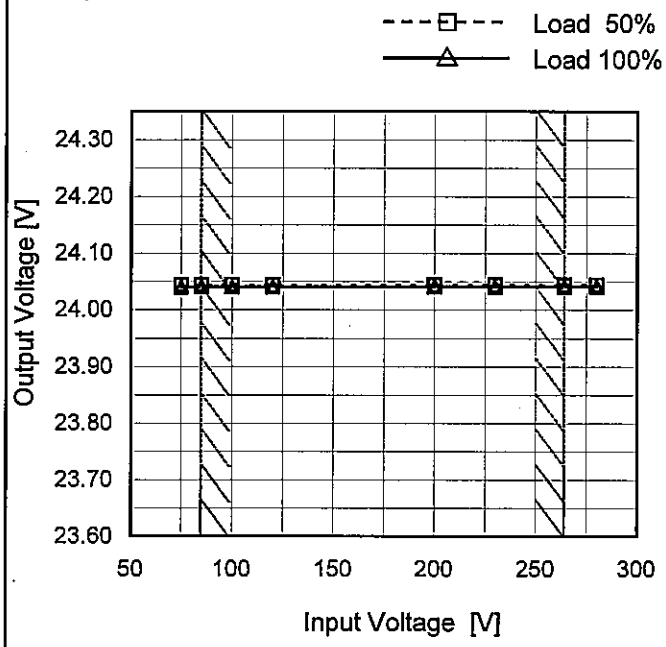
Model	LFA30F-24
Item	Line Regulation
Object	+24V1.3A

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	24.044	24.041
85	24.044	24.041
100	24.044	24.041
120	24.044	24.041
200	24.044	24.041
230	24.044	24.041
264	24.044	24.041
280	24.044	24.041
--	-	-

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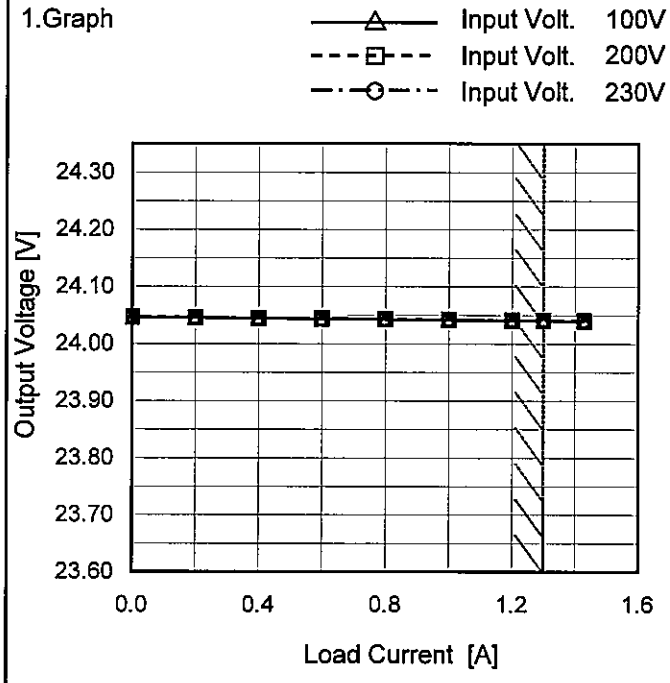
COSEL

Model	LFA30F-24
Item	Load Regulation
Object	+24V1.3A

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]
0.00	24.047	24.047	24.047
0.20	24.046	24.046	24.046
0.40	24.045	24.045	24.045
0.60	24.044	24.044	24.044
0.80	24.043	24.043	24.043
1.00	24.042	24.042	24.042
1.20	24.041	24.041	24.041
1.30	24.041	24.041	24.041
1.43	24.040	24.040	24.040
--	-	-	-
--	-	-	-

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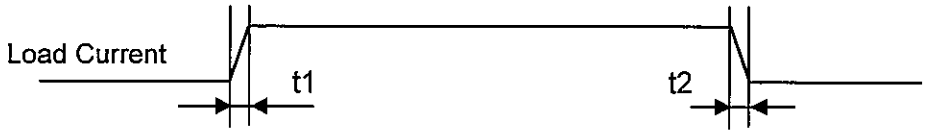
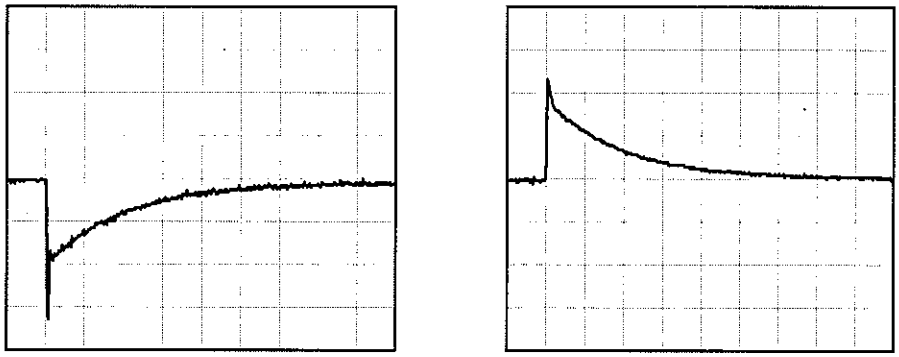
Model	LFA30F-24		
Item	Dynamic Load Response	Temperature Testing Circuitry	25℃ Figure A
Object	+24V1.3A		

Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ



Min. Load (0A) ←→
Load 100% (1.3A)

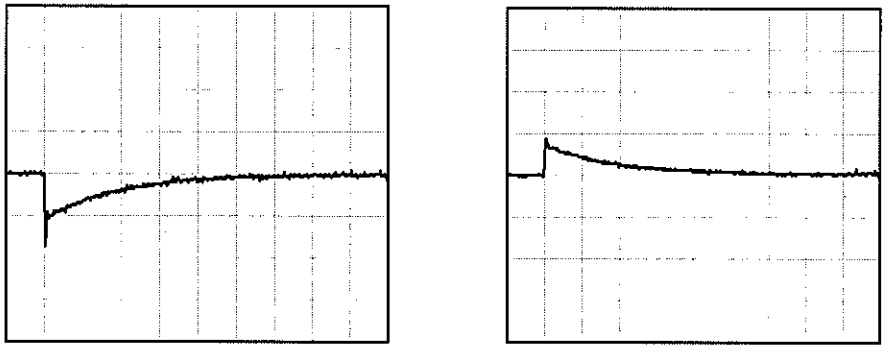


100 mV/div

4 ms/div

4 ms/div

Min. Load (0A) ←→
Load 50% (0.65A)



100 mV/div

4 ms/div

4 ms/div

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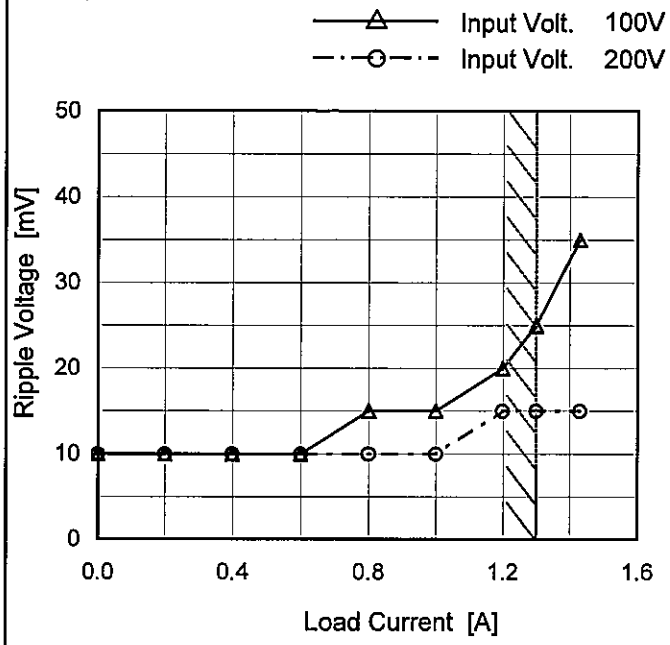
Model	LFA30F-24
Item	Ripple Voltage (by Load Current)
Object	+24V1.3A

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.

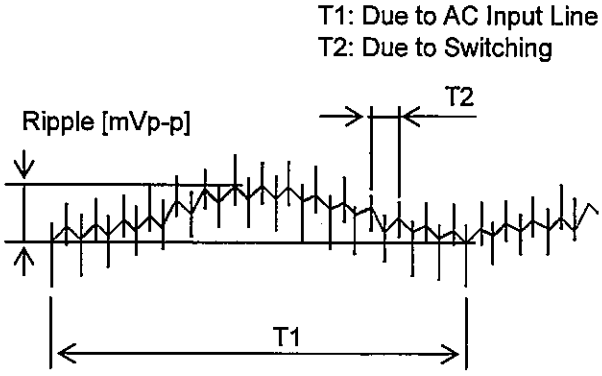


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 200 [V]
0.00	10	10
0.20	10	10
0.40	10	10
0.60	10	10
0.80	15	10
1.00	15	10
1.20	20	15
1.30	25	15
1.43	35	15
--	-	-
--	-	-

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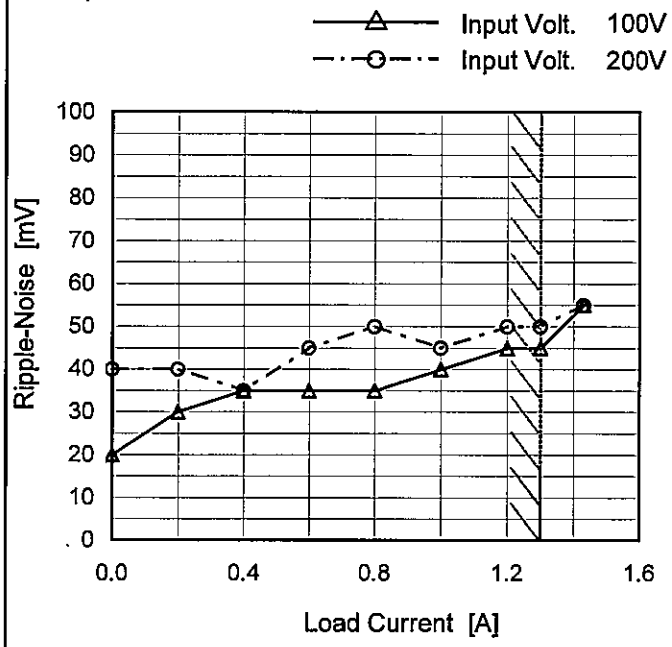
COSEL

Model	LFA30F-24
Item	Ripple-Noise
Object	+24V1.3A

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

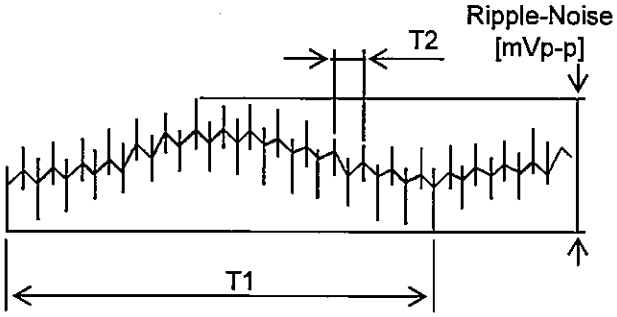


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV] Input Volt. 100 [V]	Ripple-Noise [mV] Input Volt. 200 [V]
0.00	20	40
0.20	30	40
0.40	35	35
0.60	35	45
0.80	35	50
1.00	40	45
1.20	45	50
1.30	45	50
1.43	55	55
--	-	-
--	-	-

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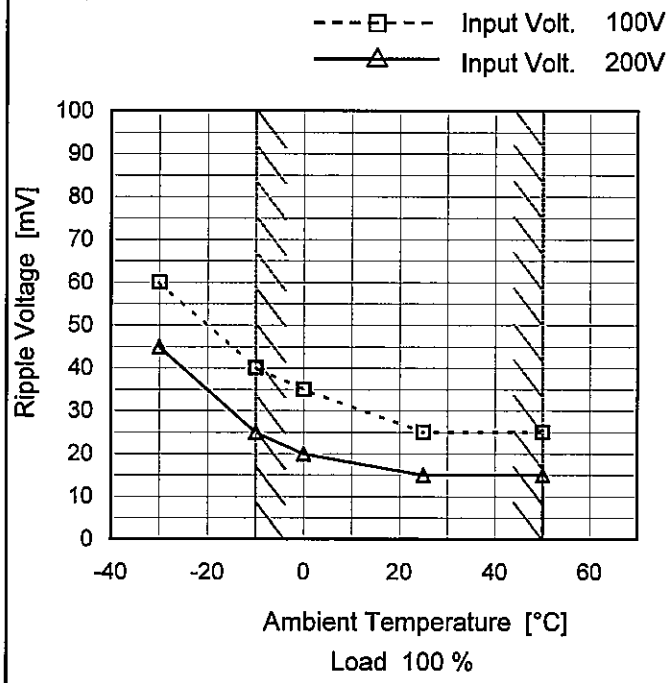
Model	LFA30F-24
Item	Ripple Voltage (by Ambient Temp.)
Object	+24V1.3A

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	60	45
-10	40	25
0	35	20
25	25	15
50	25	15
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-

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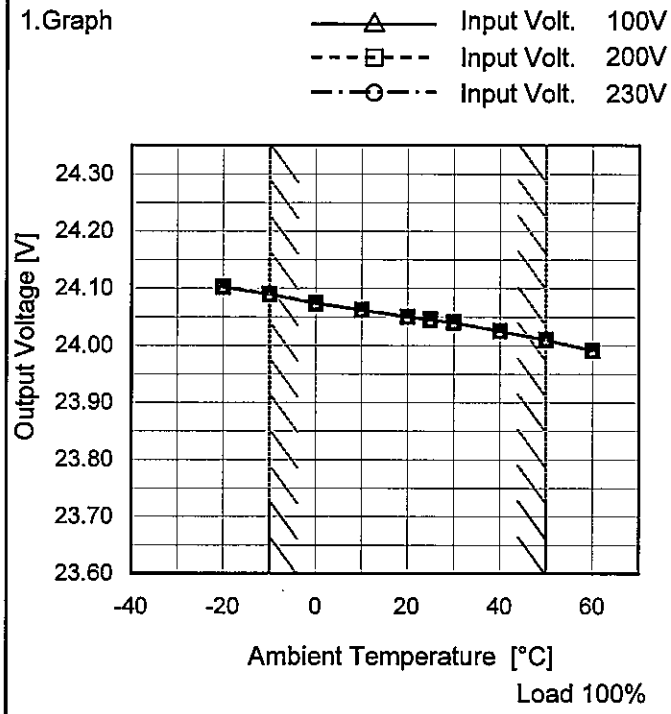
COSEL

Model	LFA30F-24
Item	Ambient Temperature Drift
Object	+24V1.3A

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	24.102	24.103	24.103
-10	24.090	24.090	24.090
0	24.074	24.074	24.074
10	24.062	24.063	24.062
20	24.050	24.051	24.051
25	24.045	24.046	24.046
30	24.040	24.041	24.041
40	24.026	24.026	24.026
50	24.010	24.011	24.011
60	23.991	23.991	23.991
--	-	-	-

COSEL

Model	LFA30F-24	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+24V1.3A	

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 - 1.3A

* 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	24.096	±43	±0.2
Minimum Voltage	50	85	1.3	24.010		

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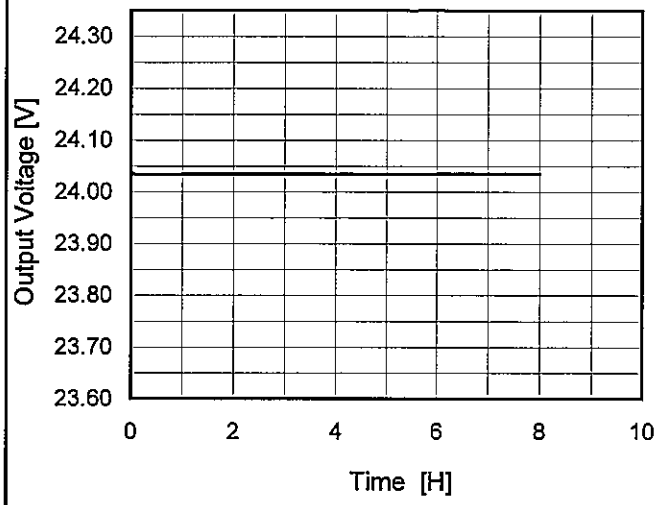
Model	LFA30F-24
Item	Time Lapse Drift
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

2.Values

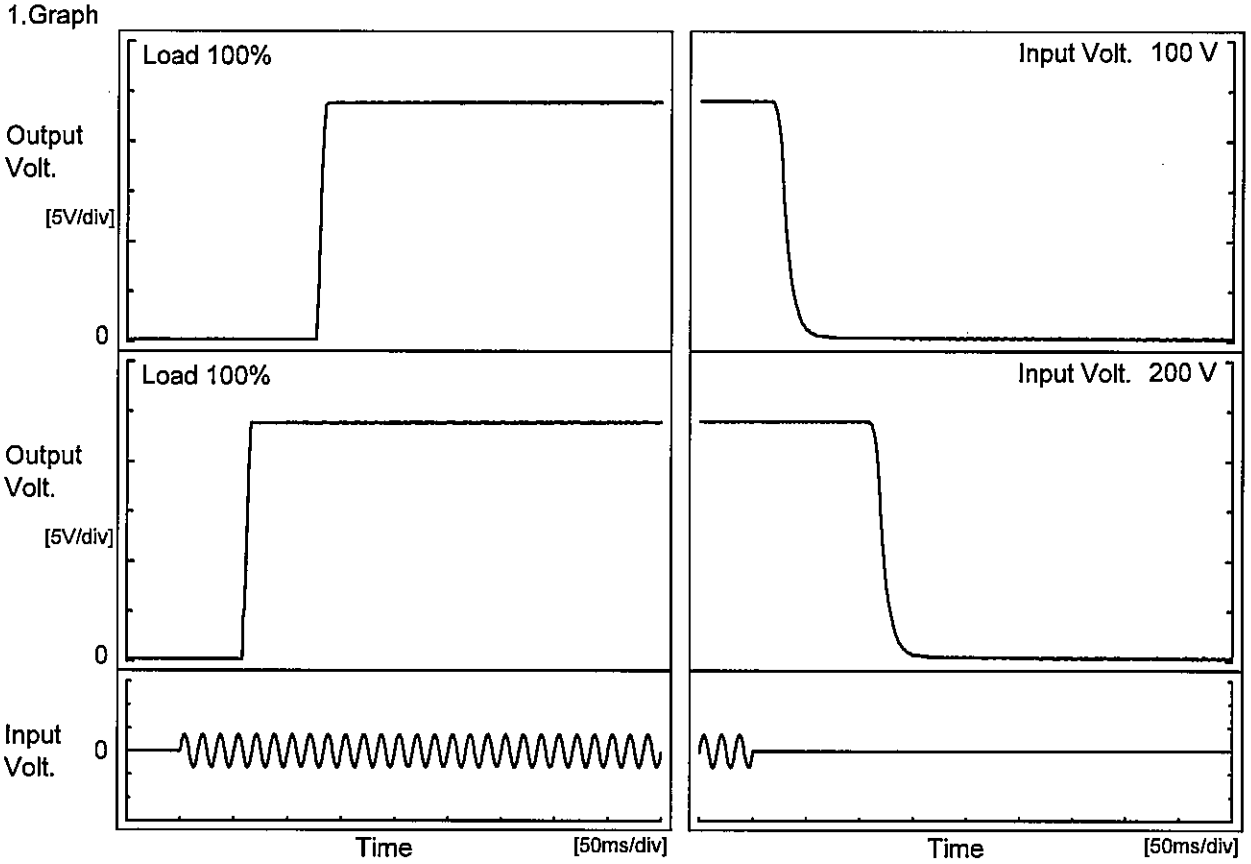
Time since start [H]	Output Voltage [V]
0.0	24.042
0.5	24.035
1.0	24.035
2.0	24.035
3.0	24.035
4.0	24.035
5.0	24.035
6.0	24.035
7.0	24.036
8.0	24.036

BC-10361

COSEL

Model	LFA30F-24	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+24V1.3A	

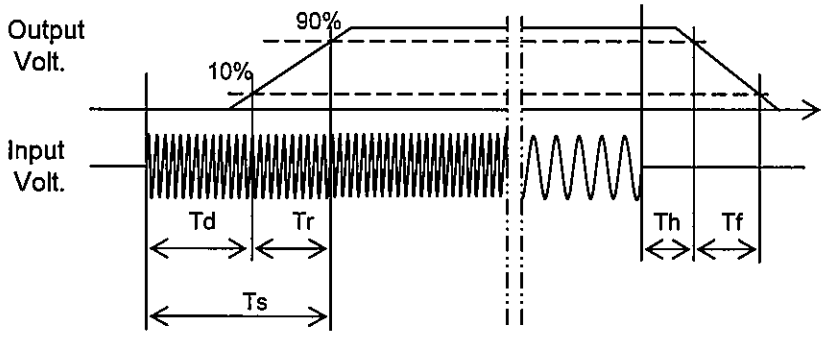
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	127.3	6.3	133.6	23.5	19.3
200 V	58.3	6.5	64.8	114.8	19.8



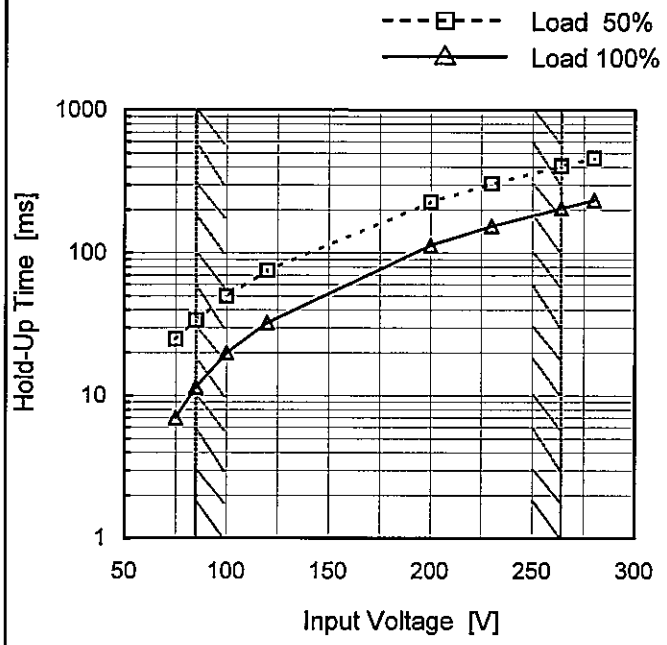
BC-10361

COSEL

Model	LFA30F-24
Item	Hold-Up Time
Object	+24V1.3A

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	25	7
85	34	12
100	50	20
120	75	33
200	227	113
230	304	155
264	406	206
280	460	234
–	-	-

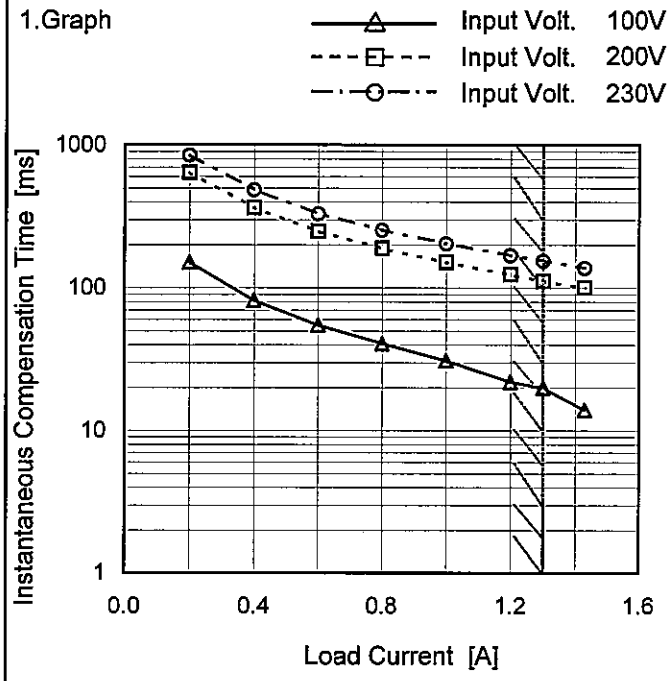
BC-10361

COSEL

Model	LFA30F-24
Item	Instantaneous Interruption Compensation
Object	+24V1.3A

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]
0.00	-	-	-
0.20	152	639	851
0.40	82	363	486
0.60	55	248	331
0.80	41	189	254
1.00	31	151	204
1.20	22	124	169
1.30	20	111	155
1.43	14	100	138
--	-	-	-
--	-	-	-

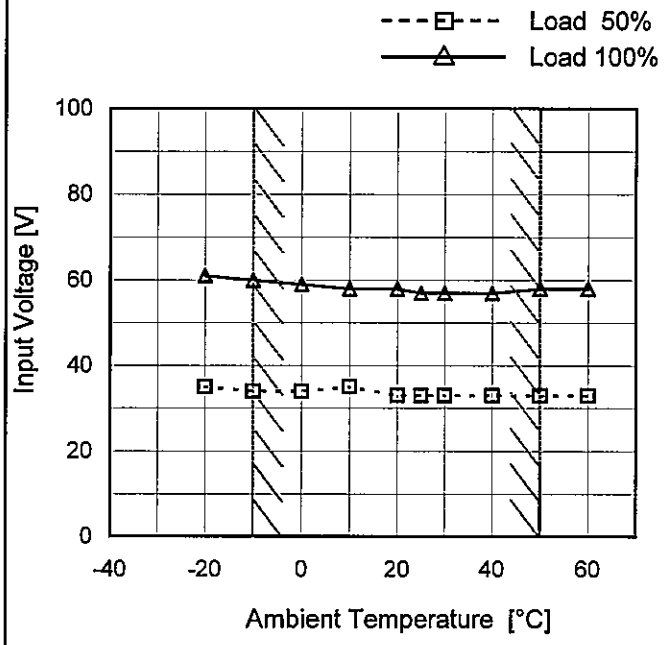
BC-10361

COSEL

Model	LFA30F-24
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V1.3A

Testing Circuitry Figure A

1.Graph



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

2.Values

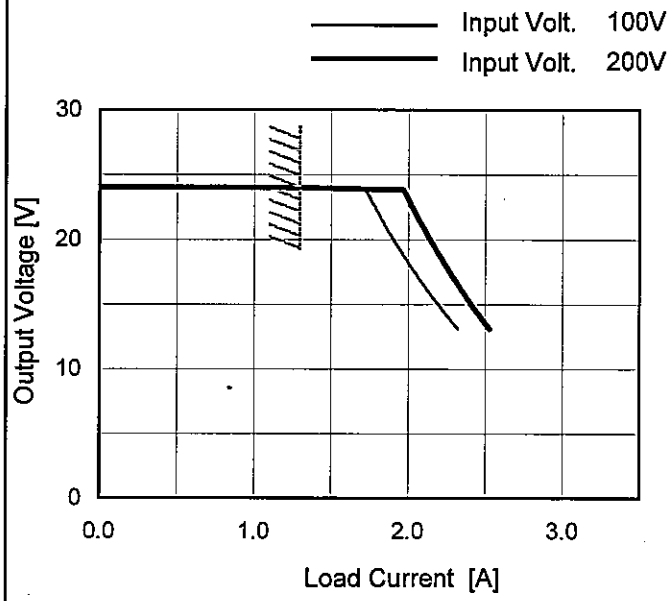
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	35	61
-10	34	60
0	34	59
10	35	58
20	33	58
25	33	57
30	33	57
40	33	57
50	33	58
60	33	58
--	-	-

COSEL

Model	LFA30F-24
Item	Overcurrent Protection
Object	+24V1.3A

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 13V to 0V.

2.Values

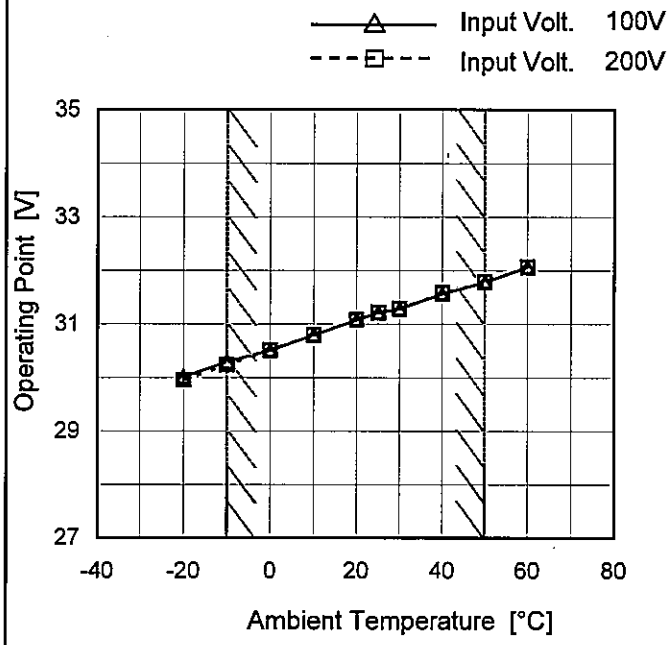
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
24.0	1.30	1.30
22.8	1.78	2.01
21.6	1.82	2.07
19.2	1.95	2.18
16.8	2.08	2.31
14.4	2.23	2.45
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA30F-24
Item	Overvoltage Protection
Object	+24V1.3A

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	30.02	29.95
-10	30.30	30.23
0	30.51	30.51
10	30.80	30.80
20	31.08	31.08
25	31.22	31.22
30	31.29	31.29
40	31.57	31.58
50	31.79	31.79
60	32.07	32.07
--	-	-

BC-10361

COSEL

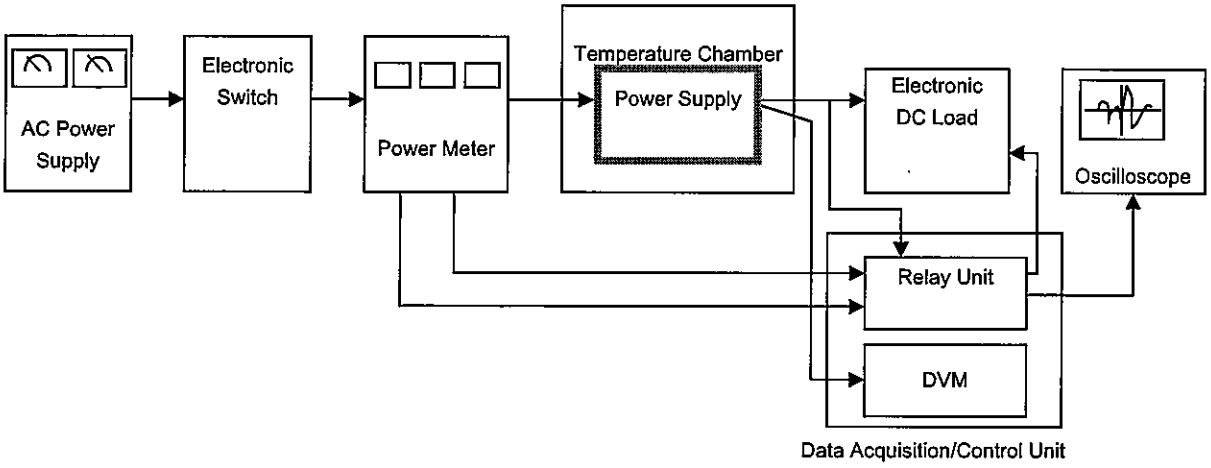


Figure A

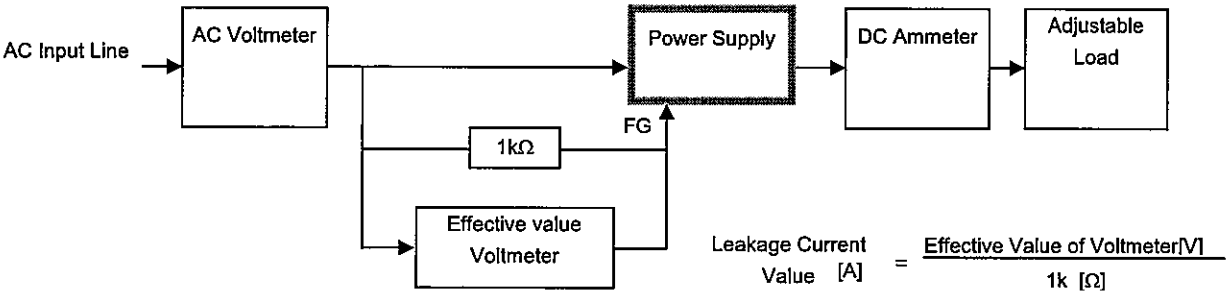


Figure B (DEN-AN)

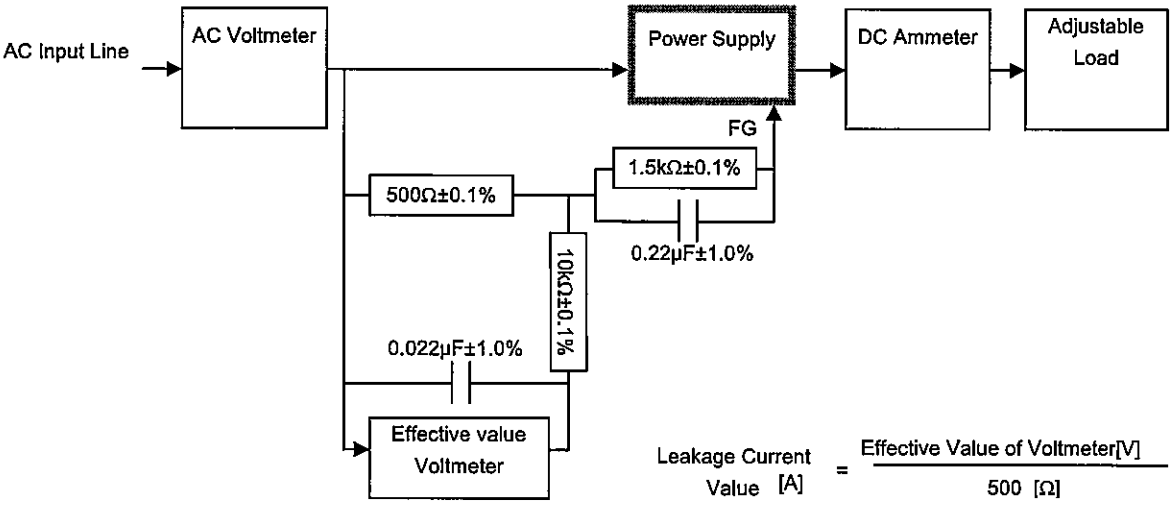


Figure B (IEC60950-1)

COSEL

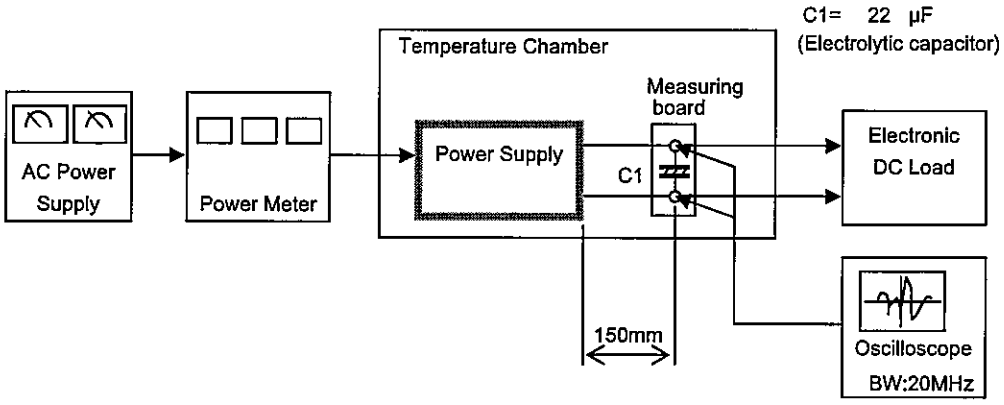


Figure C