参考資料

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TEST DATA OF LFA30F-15

Regulated DC Power Supply
June 29, 2009

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COSEL CO.,LTD.

参考資料

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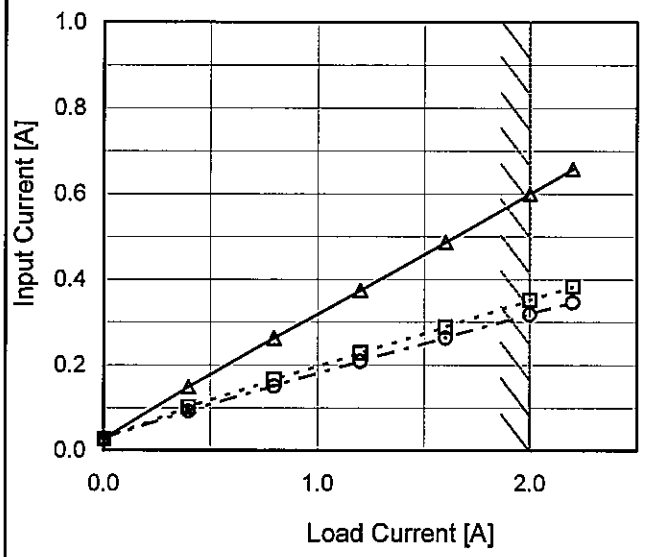
COSEL

Model	LFA30F-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	0.028	0.027	0.028
0.4	0.149	0.101	0.093
0.8	0.263	0.165	0.151
1.2	0.374	0.228	0.209
1.6	0.487	0.289	0.264
2.0	0.600	0.351	0.319
2.2	0.658	0.383	0.347
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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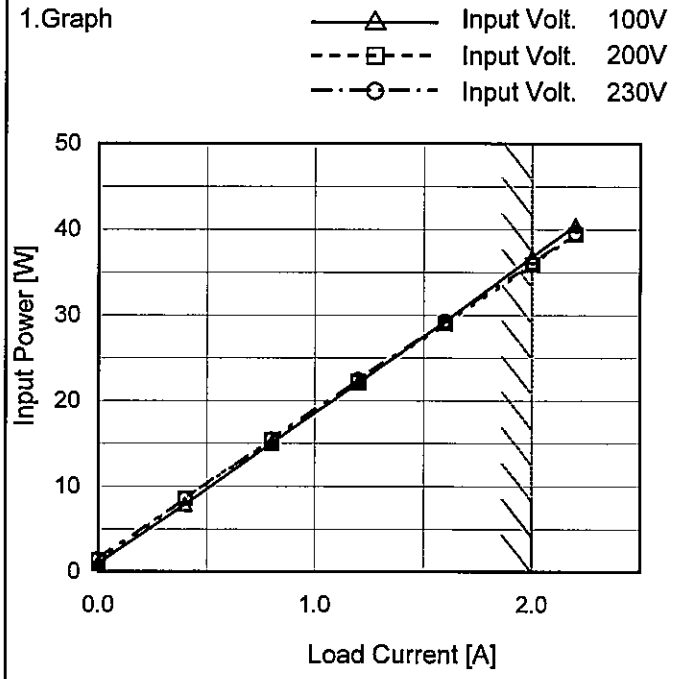
Model	LFA30F-15
Item	Input Power (by Load Current)
Object	————————

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]
0.0	1.00	1.30	1.50
0.4	7.90	8.50	8.60
0.8	15.10	15.40	15.50
1.2	22.10	22.20	22.50
1.6	29.30	29.00	29.30
2.0	36.80	35.90	36.10
2.2	40.50	39.40	39.50
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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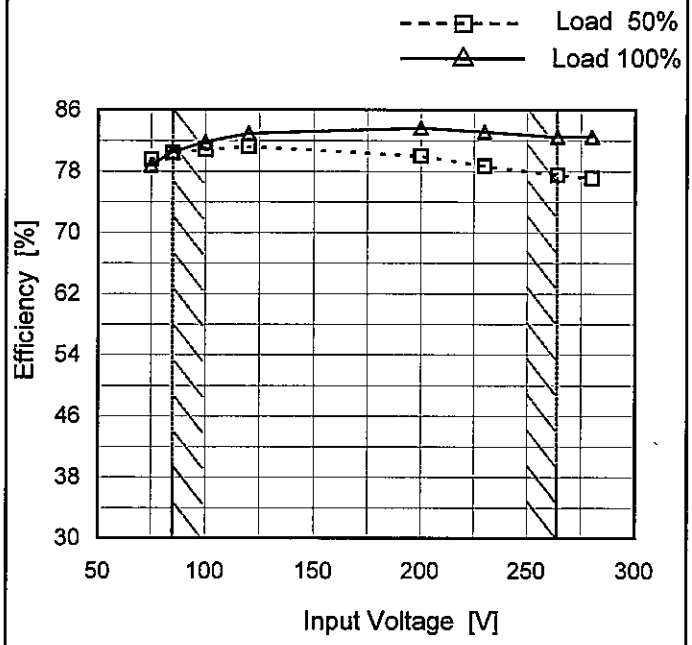
Model	LFA30F-15
Item	Efficiency (by Input Voltage)
Object	――――――――

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	79.5	78.8
85	80.4	80.5
100	80.8	81.7
120	81.2	83.0
200	79.9	83.7
230	78.7	83.2
264	77.5	82.5
280	77.1	82.5
–	-	-

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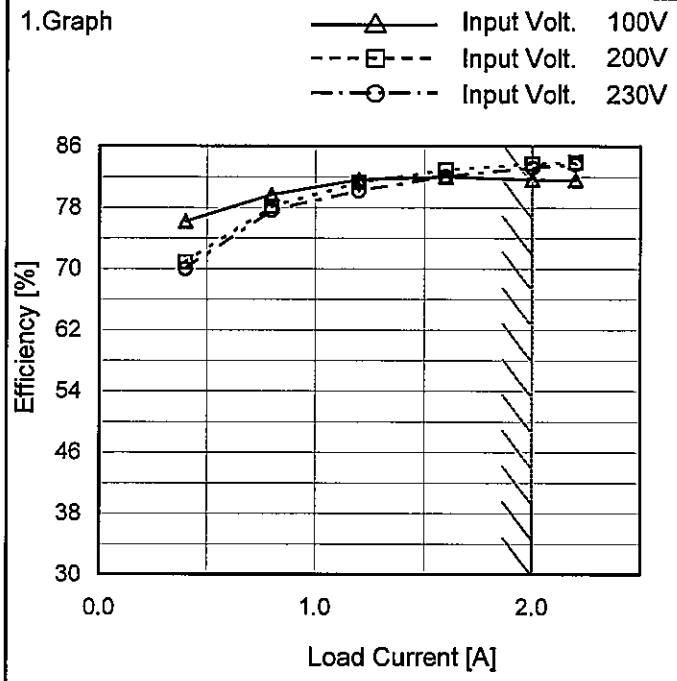
Model	LFA30F-15
Item	Efficiency (by Load Current)
Object	————————

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]
0.0	-	-	-
0.4	76.2	70.8	70.0
0.8	79.7	78.1	77.6
1.2	81.6	81.3	80.2
1.6	82.1	82.9	82.1
2.0	81.7	83.7	83.2
2.2	81.6	83.9	83.7
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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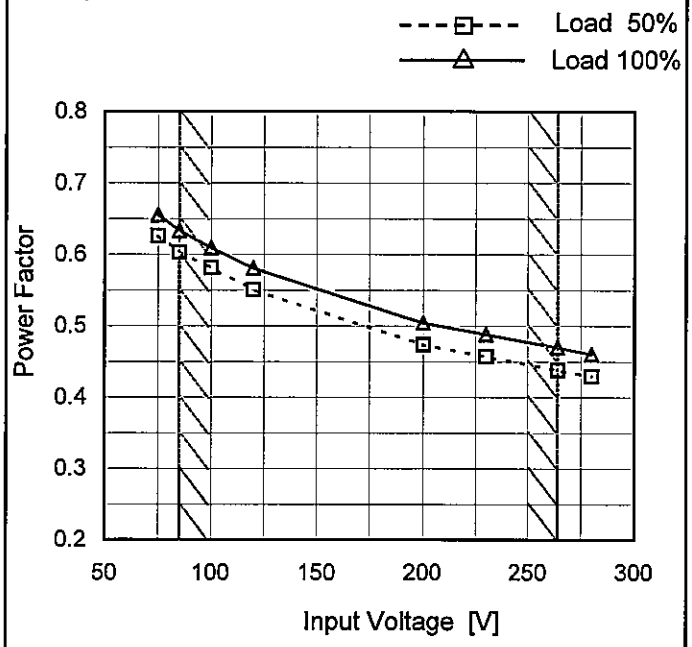
COSEL

Model	LFA30F-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	0.626	0.656
85	0.603	0.633
100	0.581	0.610
120	0.551	0.581
200	0.474	0.505
230	0.457	0.488
264	0.438	0.470
280	0.430	0.461
--	-	-

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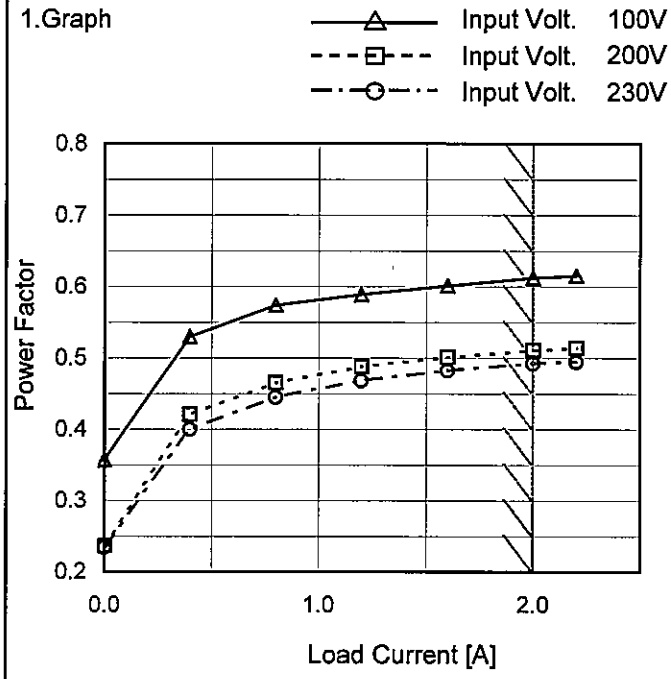
Model	LFA30F-15
Item	Power Factor (by Load Current)
Object	――――――

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	0.357	0.236	0.234
0.4	0.530	0.421	0.400
0.8	0.574	0.465	0.445
1.2	0.589	0.488	0.469
1.6	0.602	0.501	0.483
2.0	0.612	0.511	0.492
2.2	0.616	0.514	0.495
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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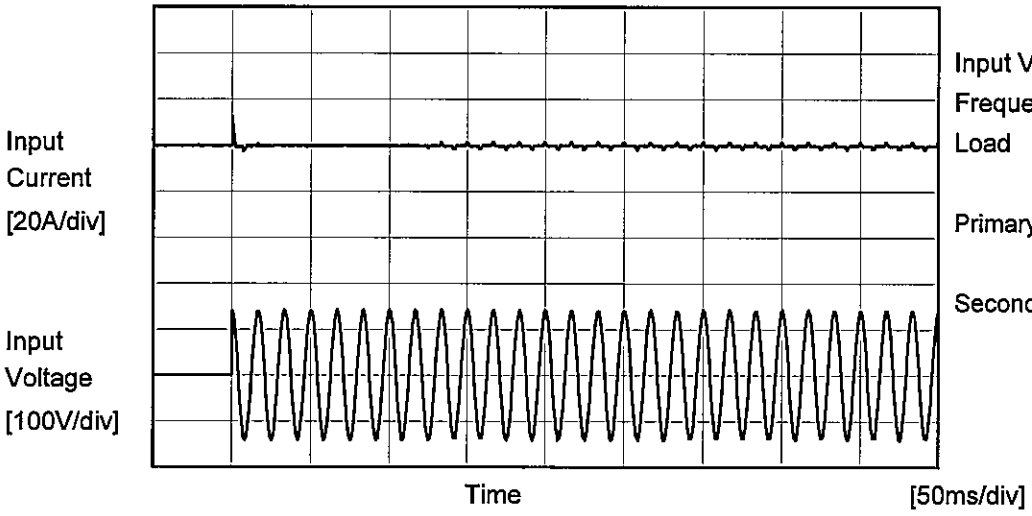
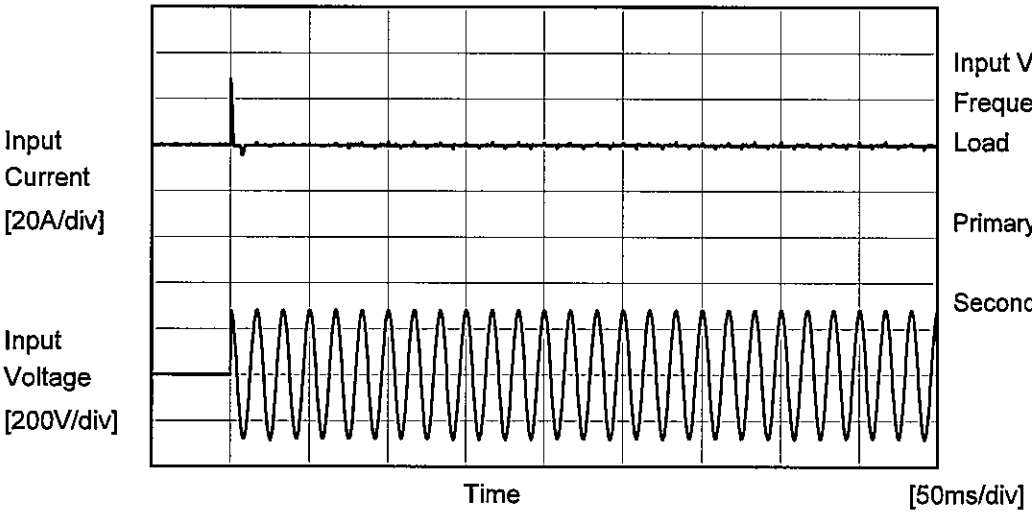
Model	LFA30F-15
Item	Inrush Current
Object	――――――

Temperature 25°C
Testing Circuitry Figure A



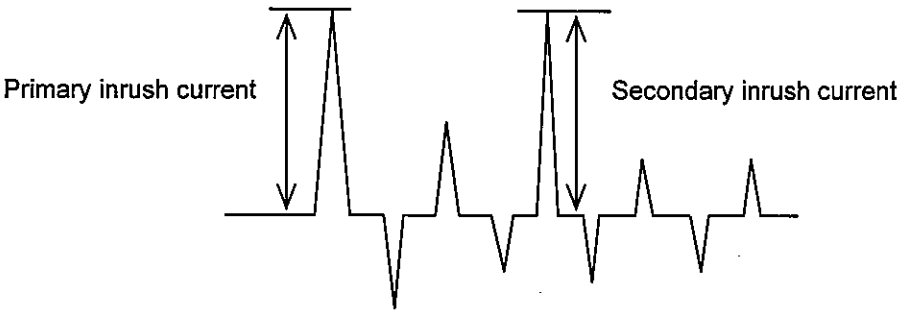
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current : 12.7 A
Secondary inrush current : 1.7 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current : 28.8 A
Secondary inrush current : 1.7 A



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Model	LFA30F-15	
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	0.13	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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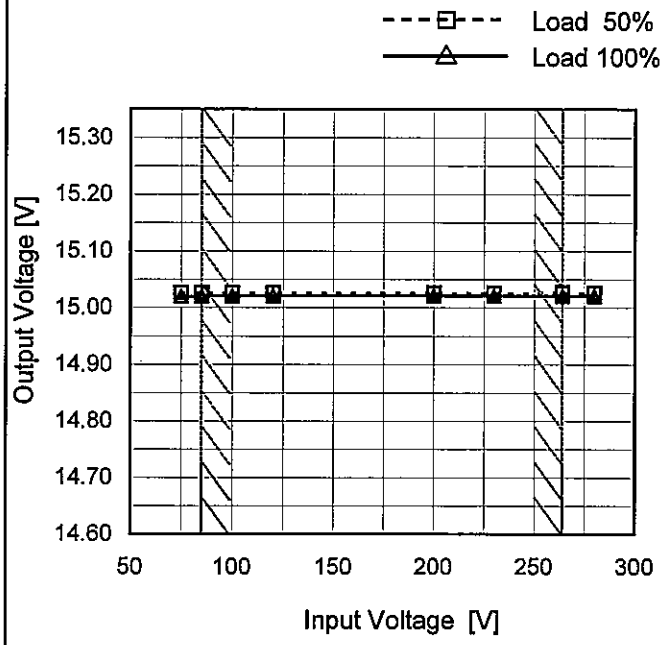
Model	LFA30F-15
Item	Line Regulation
Object	+15V2A

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	15.026	15.021
85	15.026	15.021
100	15.026	15.021
120	15.026	15.021
200	15.026	15.021
230	15.026	15.021
264	15.026	15.021
280	15.026	15.021
--	-	-

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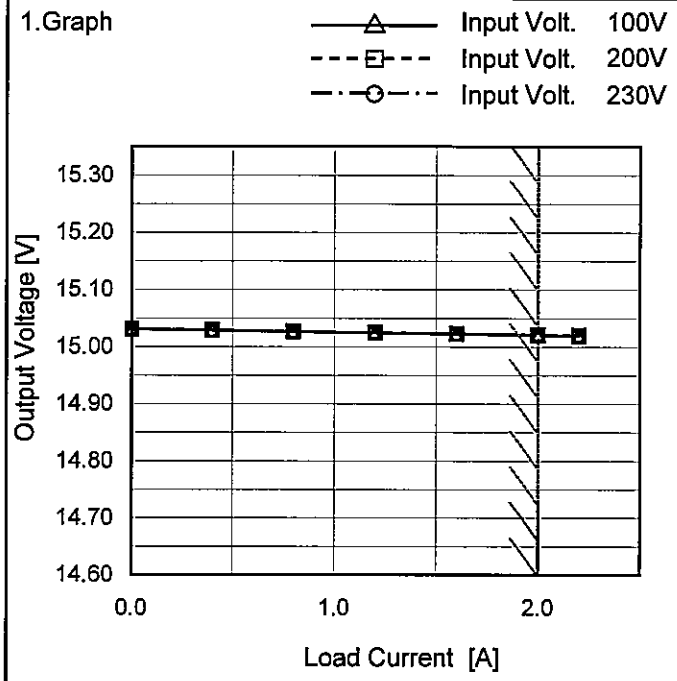
Model	LFA30F-15
Item	Load Regulation
Object	+15V2A

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	15.031	15.031	15.031
0.4	15.029	15.029	15.029
0.8	15.027	15.027	15.027
1.2	15.025	15.025	15.025
1.6	15.023	15.023	15.023
2.0	15.021	15.021	15.021
2.2	15.020	15.020	15.020
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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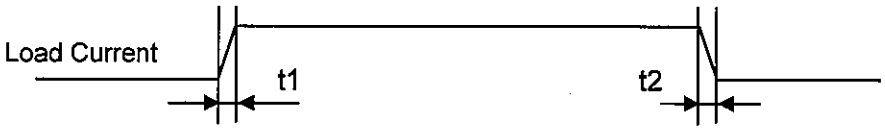
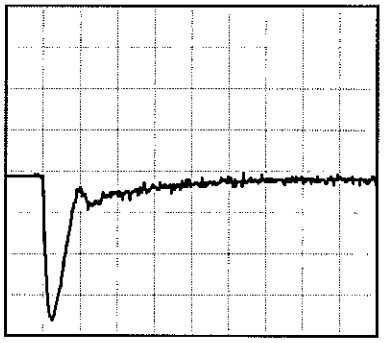
Model	LFA30F-15		
Item	Dynamic Load Response	Temperature Testing Circuitry	25℃ Figure A
Object	+15V2A		

Input Volt. 100 V
Cycle 1000 ms

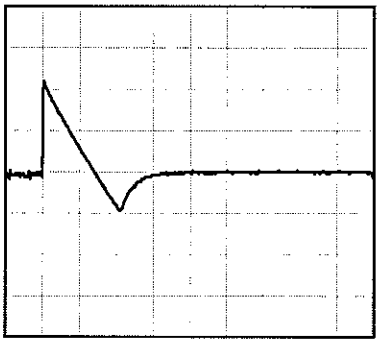
Response. t1=t2=50us. Typ



Min. Load (0A) ←→
Load 100% (2A)

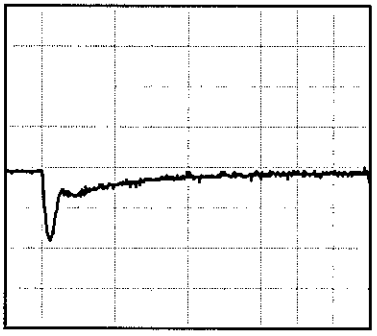


100 mV/div
400 μs/div

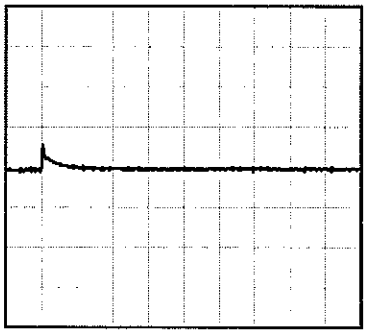


2 ms/div

Min. Load (0A) ←→
Load 50% (1A)



100 mV/div
400 μs/div



2 ms/div

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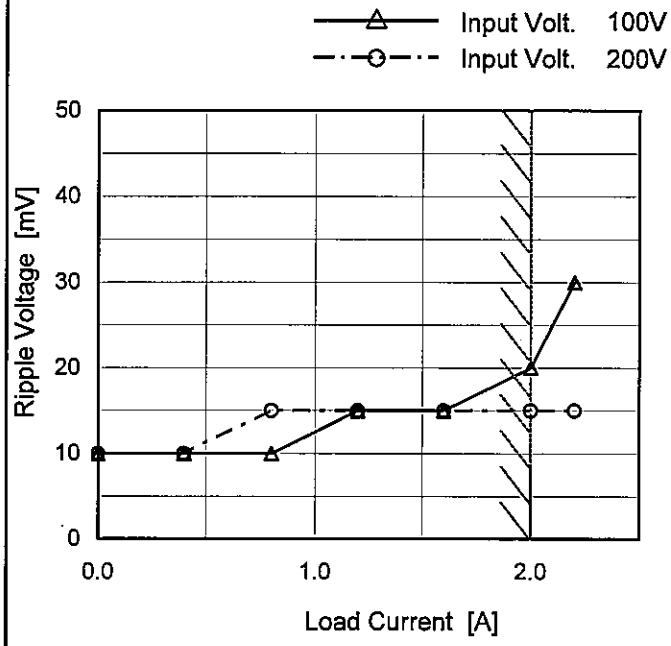
Model	LFA30F-15
Item	Ripple Voltage (by Load Current)
Object	+15V2A

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.

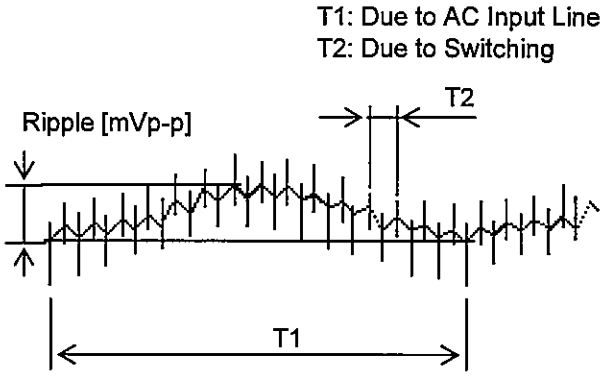


Fig. Complex Ripple Wave Form

2.Values

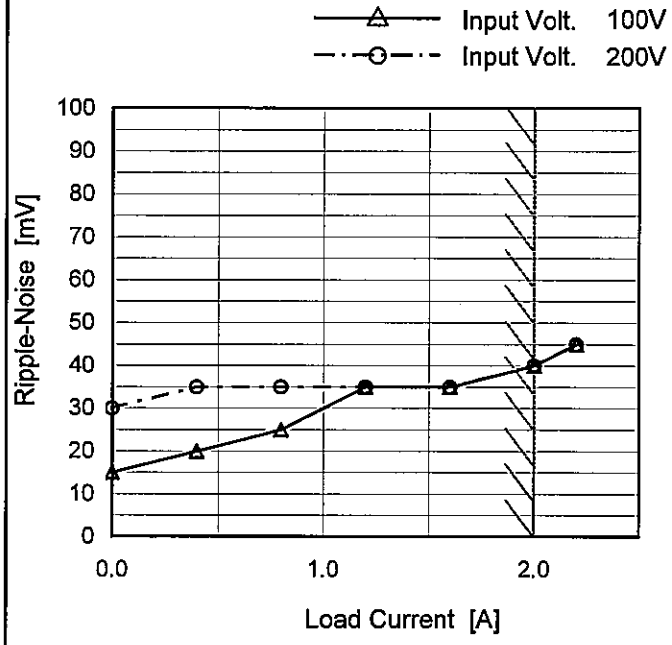
Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 200 [V]
0.0	10	10
0.4	10	10
0.8	10	15
1.2	15	15
1.6	15	15
2.0	20	15
2.2	30	15
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA30F-15
Item	Ripple-Noise
Object	+15V2A

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

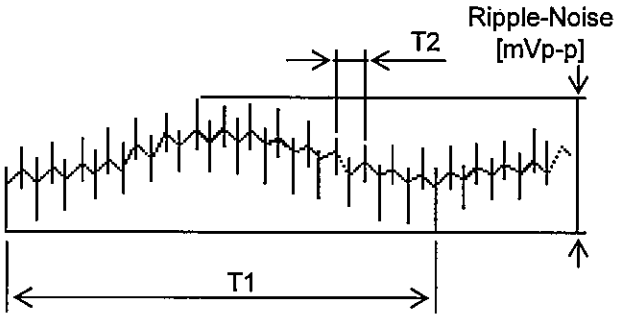


Fig. Complex Ripple Wave Form

2.Values

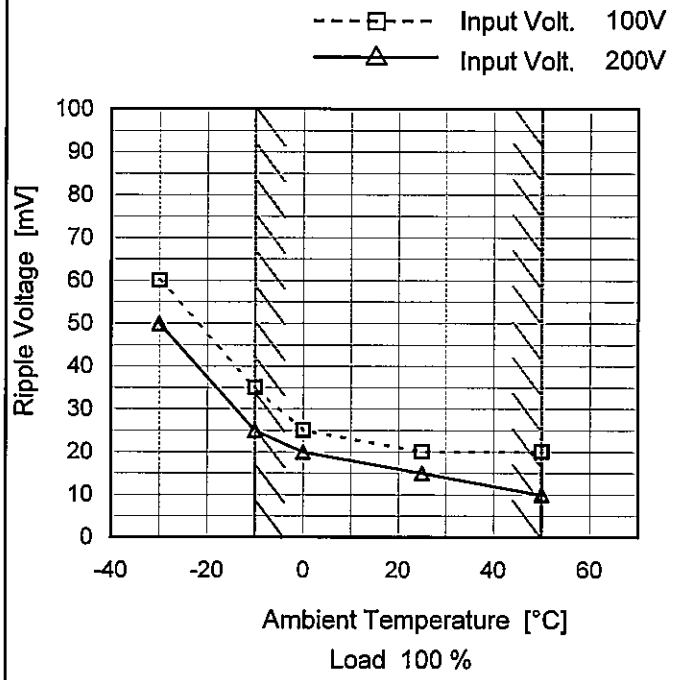
Load Current [A]	Ripple-Noise [mV] Input Volt. 100 [V]	Ripple-Noise [mV] Input Volt. 200 [V]
0.0	15	30
0.4	20	35
0.8	25	35
1.2	35	35
1.6	35	35
2.0	40	40
2.2	45	45
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA30F-15
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V2A

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	50
-10	35	25
0	25	20
25	20	15
50	20	10
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-
–	-	-

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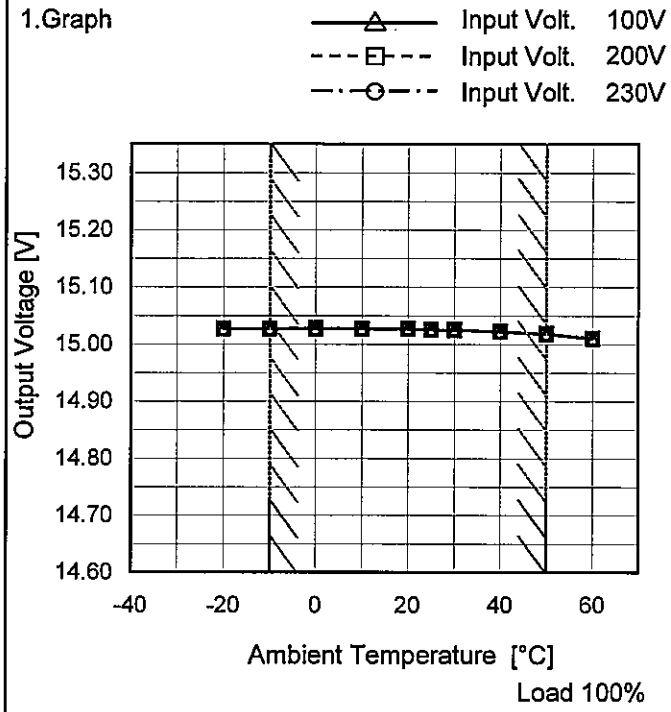
Model	LFA30F-15
Item	Ambient Temperature Drift
Object	+15V2A

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	15.027	15.027	15.027
-10	15.027	15.028	15.028
0	15.027	15.028	15.028
10	15.027	15.027	15.027
20	15.027	15.027	15.027
25	15.026	15.026	15.026
30	15.025	15.026	15.025
40	15.022	15.023	15.022
50	15.018	15.019	15.018
60	15.010	15.010	15.010
–	-	-	-

COSEL

Model	LFA30F-15	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V2A	

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 - 2A

* 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	0	264	0	15.036	±9	±0.1
Minimum Voltage	50	85	2	15.018		

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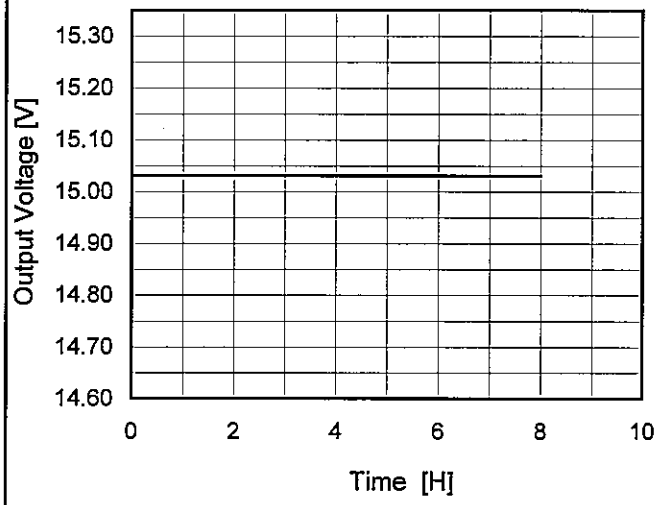
Model	LFA30F-15
Item	Time Lapse Drift
Object	+15V2A

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	15.032
0.5	15.032
1.0	15.032
2.0	15.032
3.0	15.032
4.0	15.032
5.0	15.032
6.0	15.032
7.0	15.032
8.0	15.032

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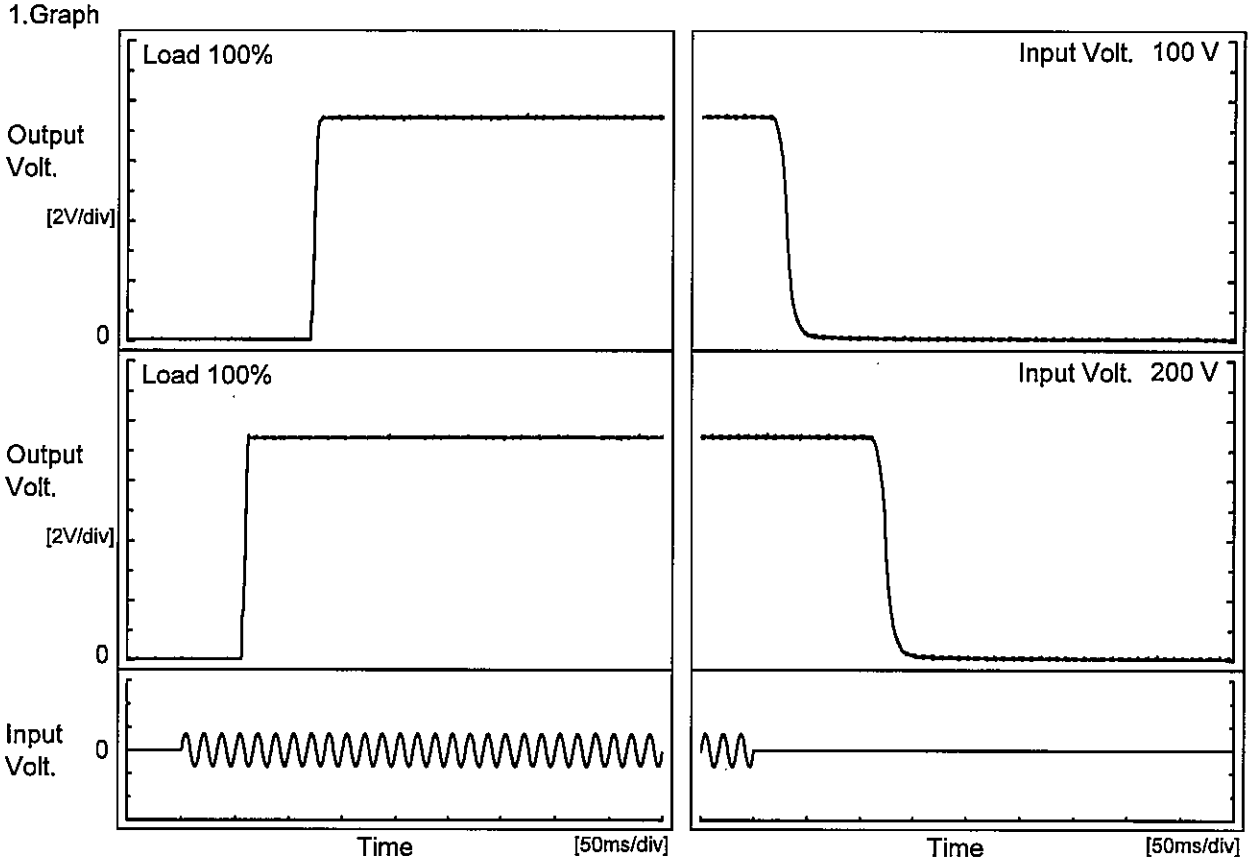
Model	LFA30F-15		
Item	Rise and Fall Time	Temperature Testing Circuitry	25°C Figure A
Object	+15V2A		

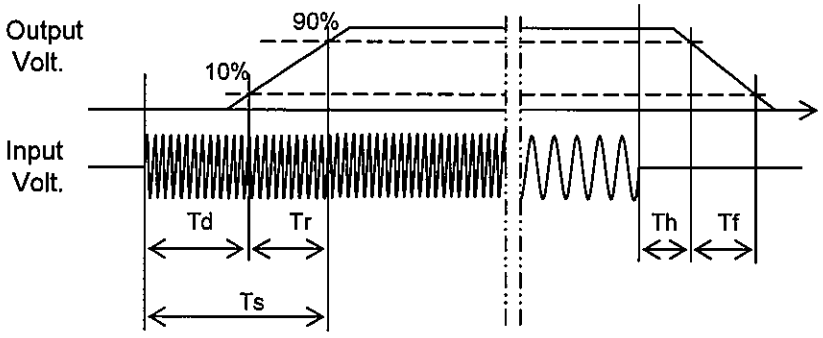
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	120.8	5.0	125.8	22.5	17.0
200 V	56.0	5.5	61.5	117.0	17.0



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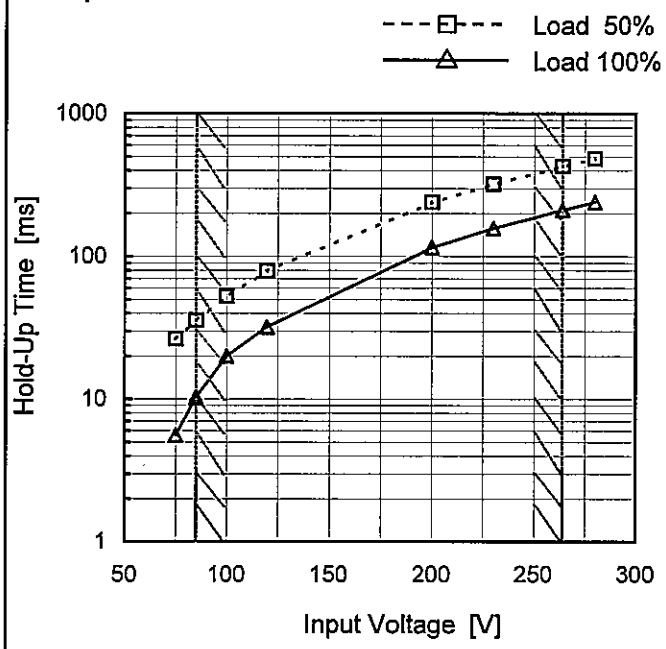
Model	LFA30F-15
Item	Hold-Up Time
Object	+15V2A

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	26	6
85	36	10
100	52	20
120	79	32
200	238	116
230	319	158
264	426	211
280	483	241
---	-	-

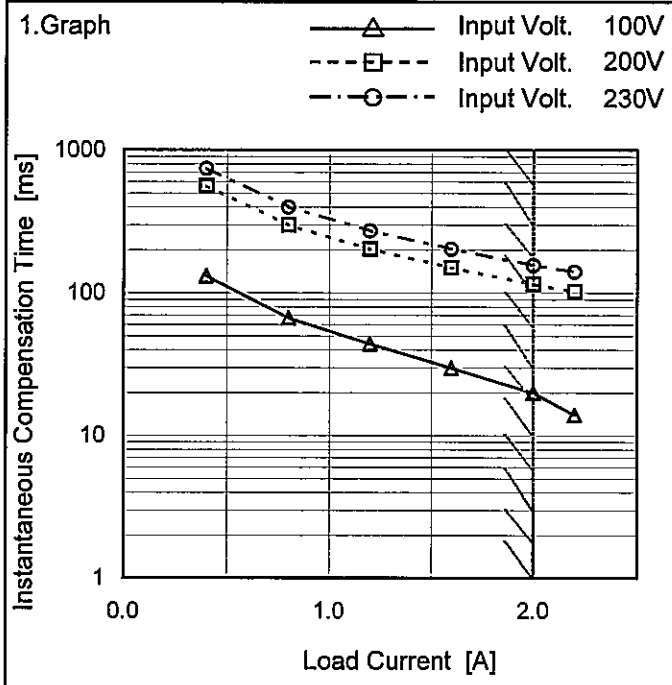
BC-10360

COSEL

Model	LFA30F-15
Item	Instantaneous Interruption Compensation
Object	+15V2A

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	-	-	-
0.4	132	560	742
0.8	67	298	399
1.2	44	202	272
1.6	30	150	203
2.0	20	115	156
2.2	14	102	141
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

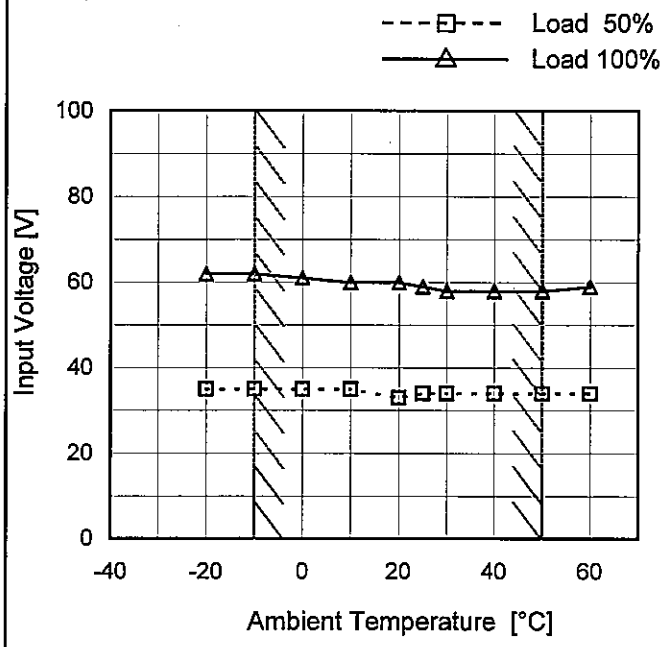
BC-10360

COSEL

Model	LFA30F-15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V2A

Testing Circuitry Figure A

1.Graph



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

2.Values

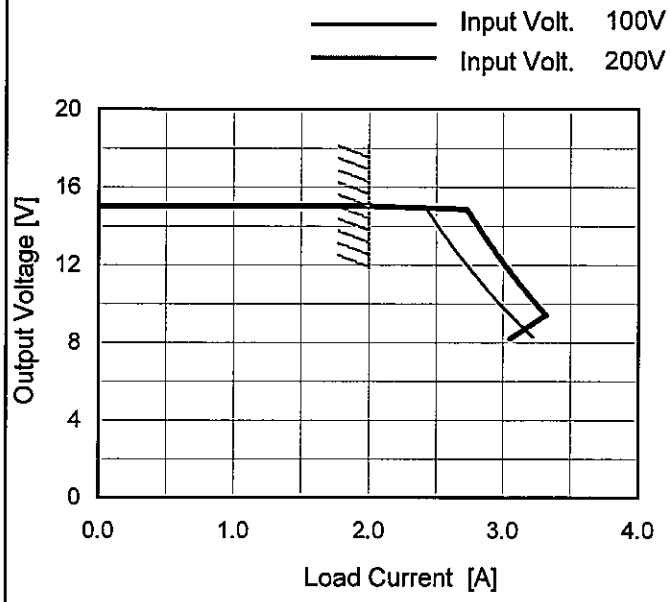
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	35	62
-10	35	62
0	35	61
10	35	60
20	33	60
25	34	59
30	34	58
40	34	58
50	34	58
60	34	59
--	-	-

COSEL

Model	LFA30F-15
Item	Overcurrent Protection
Object	+15V2A

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 8.2V to 0V.

2.Values

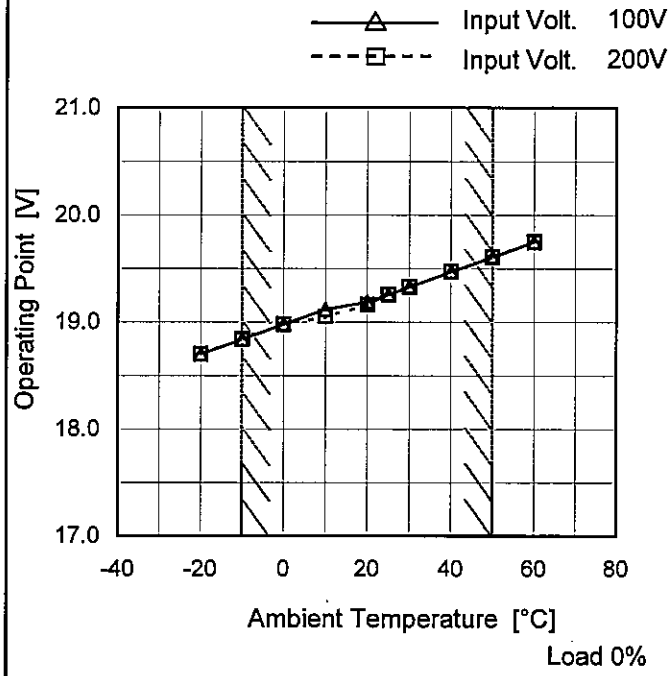
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
15.00	2.00	2.00
14.25	2.49	2.79
13.50	2.56	2.86
12.00	2.73	3.01
10.50	2.91	3.18
9.00	3.11	3.32
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LFA30F-15
Item	Overvoltage Protection
Object	+15V2A

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	18.70	18.70
-10	18.84	18.84
0	18.98	18.98
10	19.12	19.05
20	19.19	19.16
25	19.26	19.26
30	19.33	19.33
40	19.47	19.47
50	19.61	19.61
60	19.75	19.75
--	-	-

COSEL

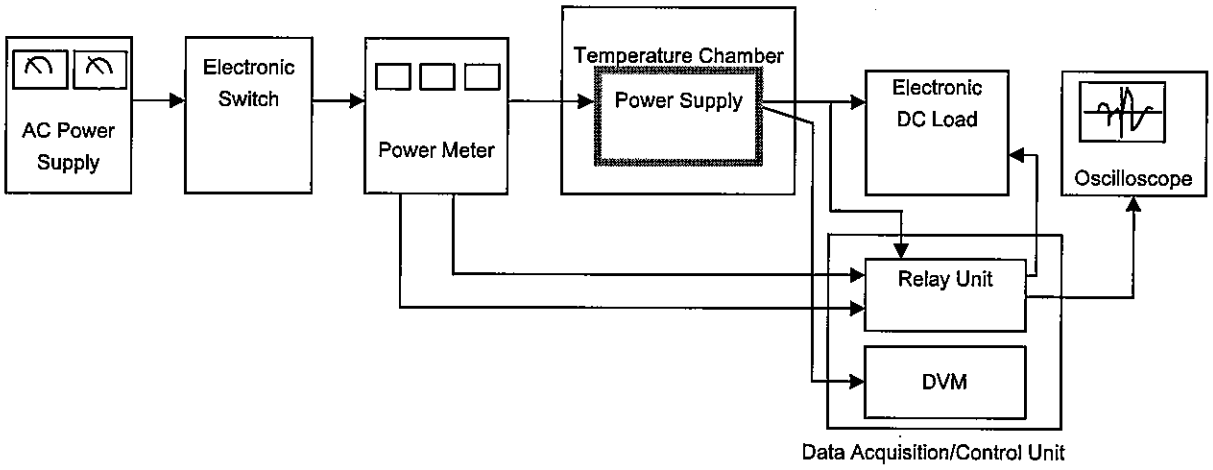


Figure A

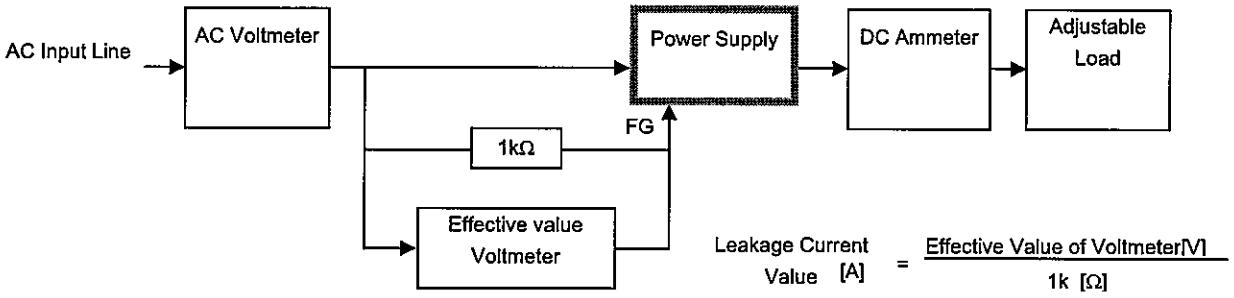


Figure B (DEN-AN)

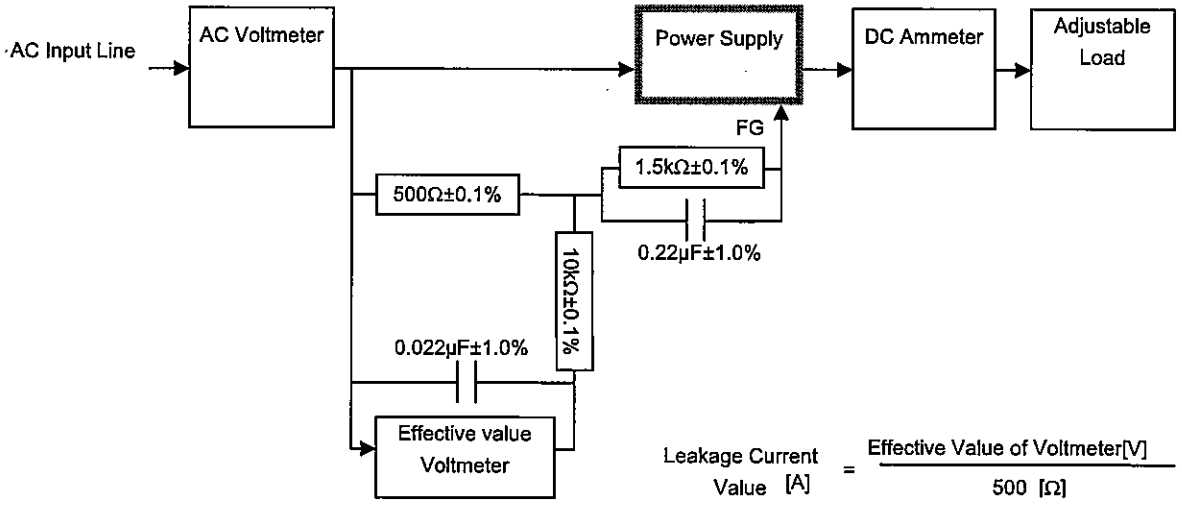


Figure B (IEC60950-1)

COSEL

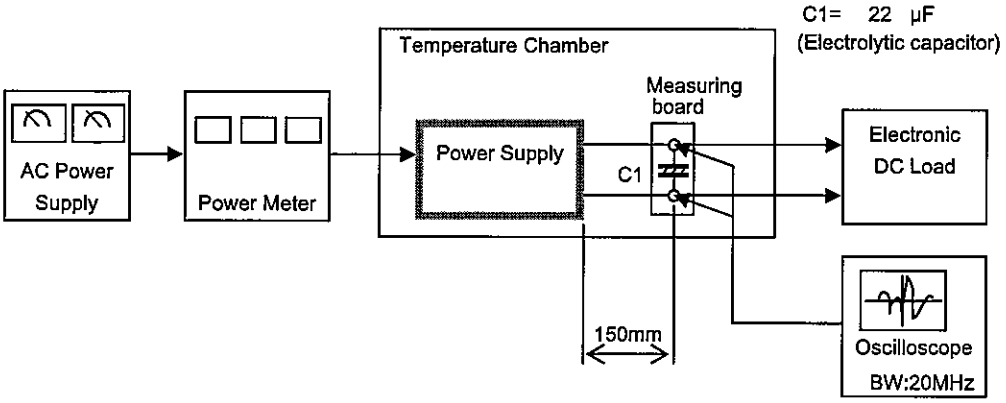


Figure C