参考資料

COSEL

TEST DATA OF LFP240F-24-Y

Regulated DC Power Supply
December 25, 2012

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COSEL CO.,LTD.

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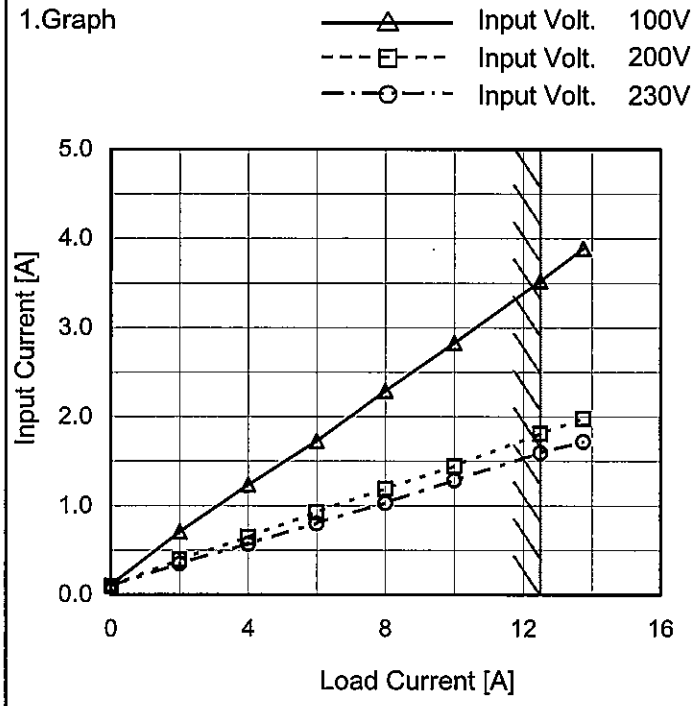
Model	LFP240F-24-Y
Item	Input Current (by Load Current)
Object	———————

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	0.114	0.098	0.096
2.00	0.708	0.390	0.350
4.00	1.234	0.646	0.572
6.00	1.726	0.928	0.801
8.00	2.290	1.190	1.030
10.00	2.831	1.444	1.286
12.50	3.524	1.811	1.596
13.75	3.890	1.978	1.720
--	-	-	-
--	-	-	-
--	-	-	-

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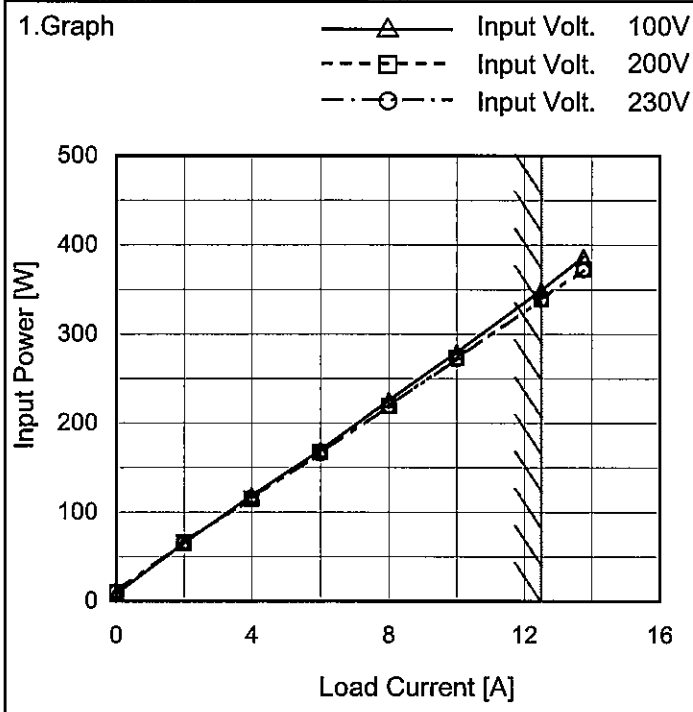
Model	LFP240F-24-Y
Item	Input Power (by Load Current)
Object	————————

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]
0.00	8.7	10.0	11.0
2.00	65.3	66.0	66.0
4.00	118.5	115.0	116.0
6.00	169.5	167.0	166.0
8.00	225.9	219.0	219.0
10.00	279.9	273.0	272.0
12.50	349.5	339.0	339.0
13.75	387.0	373.0	372.0
--	-	-	-
--	-	-	-
--	-	-	-

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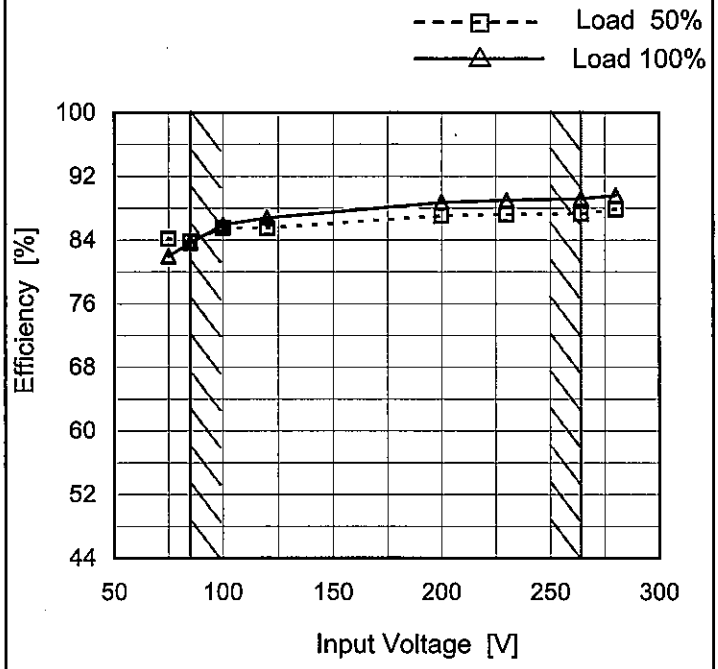
Model	LFP240F-24-Y
Item	Efficiency (by Input Voltage)
Object	————————

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	84.1	82.0
85	83.8	83.7
100	85.5	85.9
120	85.5	86.8
200	87.1	88.7
230	87.2	89.0
264	87.3	89.2
280	87.8	89.6
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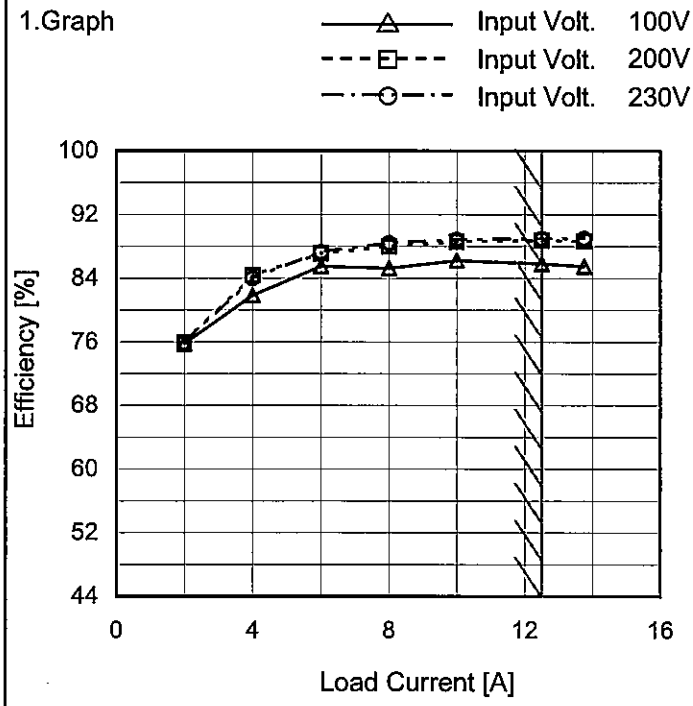
Model	LFP240F-24-Y
Item	Efficiency (by Load Current)
Object	———

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]
0.00	-	-	-
2.00	75.8	75.9	75.9
4.00	81.9	84.4	84.0
6.00	85.5	87.1	87.3
8.00	85.3	88.0	88.4
10.00	86.2	88.6	88.8
12.50	85.9	88.7	89.0
13.75	85.5	88.6	89.0
--	-	-	-
---	-	-	-
--	-	-	-

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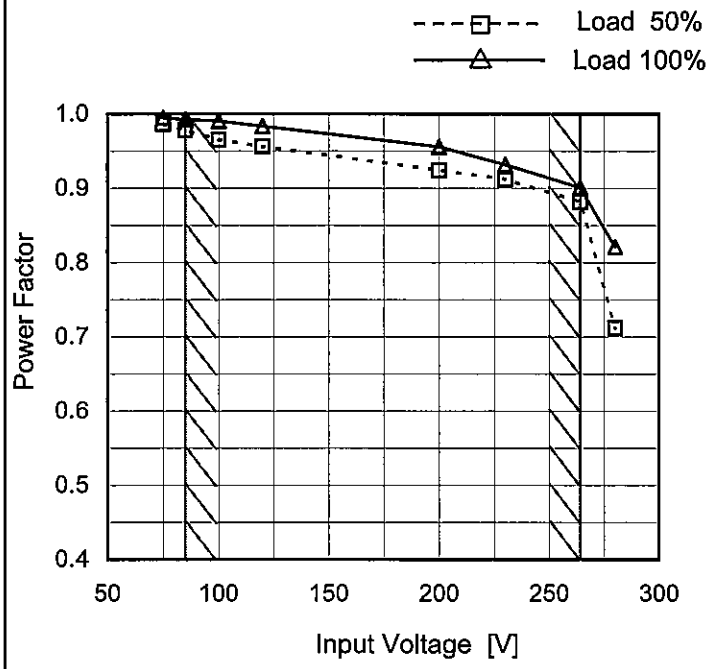
Model	LFP240F-24-Y
Item	Power Factor (by Input Voltage)
Object	————————

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	0.986	0.995
85	0.978	0.993
100	0.965	0.991
120	0.956	0.983
200	0.924	0.956
230	0.912	0.932
264	0.882	0.901
280	0.712	0.821
--	-	-

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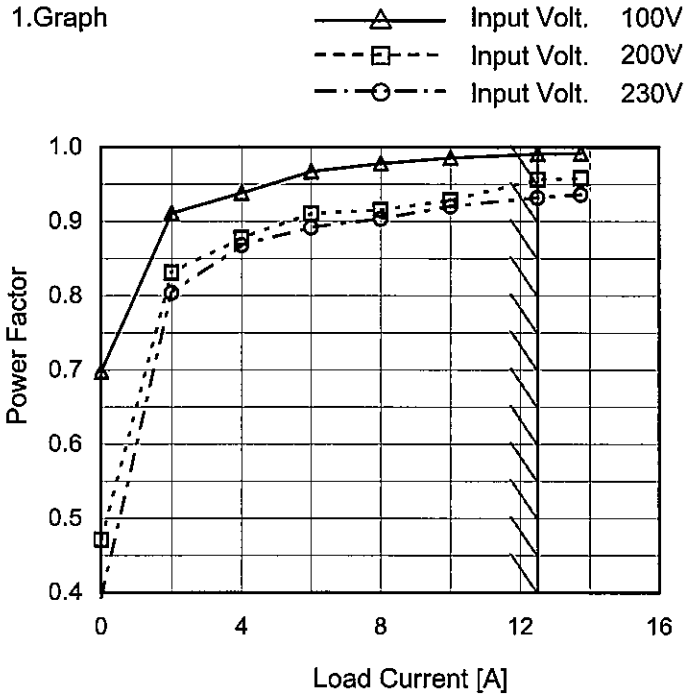
Model	LFP240F-24-Y
Item	Power Factor (by Load Current)
Object	———————

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]
0.00	0.698	0.471	0.393
2.00	0.911	0.831	0.804
4.00	0.938	0.878	0.868
6.00	0.967	0.910	0.892
8.00	0.978	0.915	0.904
10.00	0.986	0.928	0.920
12.50	0.991	0.956	0.932
13.75	0.992	0.958	0.936
--	-	-	-
--	-	-	-
--	-	-	-

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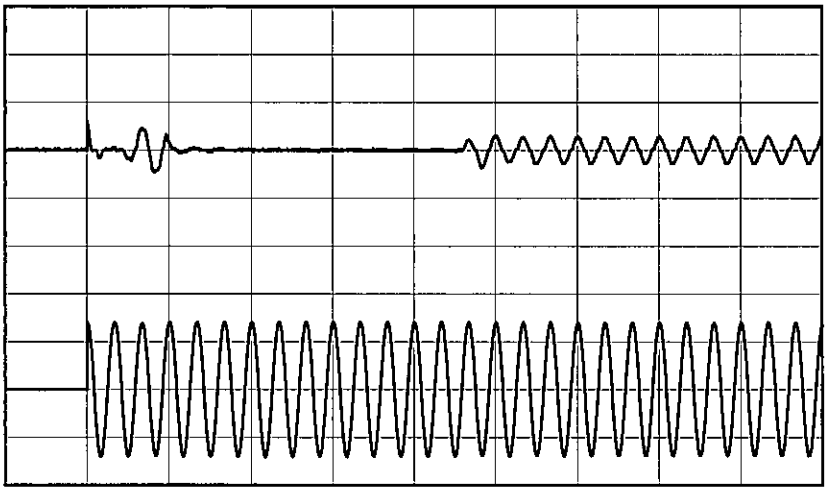
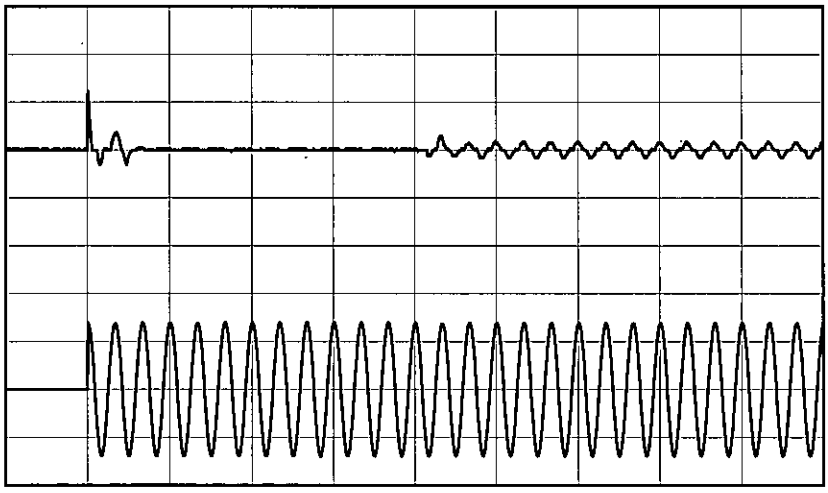
Model	LFP240F-24-Y
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



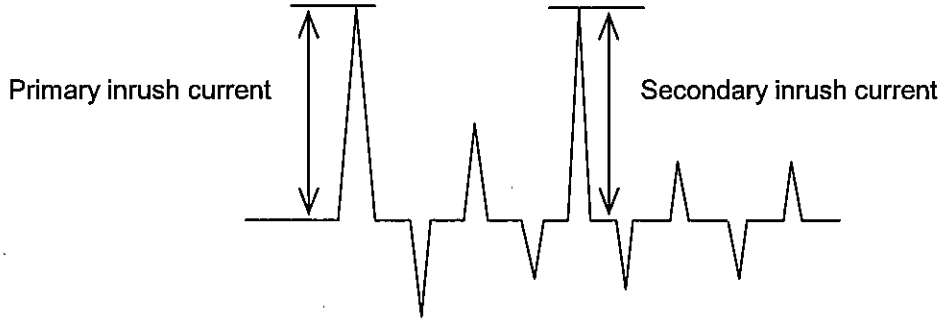
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
12.2 A
Secondary inrush current :
9.9 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
25.4 A
Secondary inrush current :
7.5 A



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Model	LFP240F-24-Y	
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	0.20	0.35	0.45	Operation
	One of phases	0.30	0.65	0.80	Stand by
IEC60950-1	Both phases	0.19	0.40	0.46	Operation
	One of phases	0.31	0.66	0.77	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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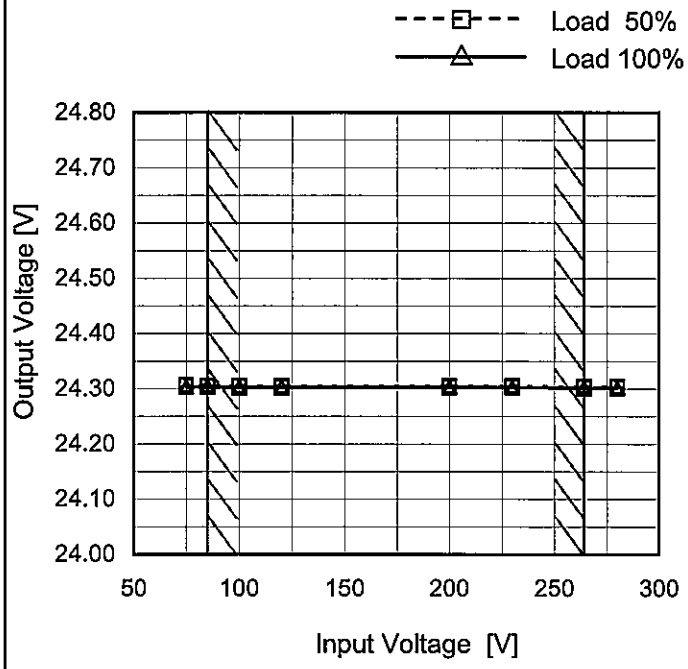
Model	LFP240F-24-Y
Item	Line Regulation
Object	+24V12.5A

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	24.306	24.304
85	24.306	24.304
100	24.305	24.303
120	24.305	24.303
200	24.305	24.303
230	24.305	24.303
264	24.304	24.302
280	24.304	24.302
--	-	-

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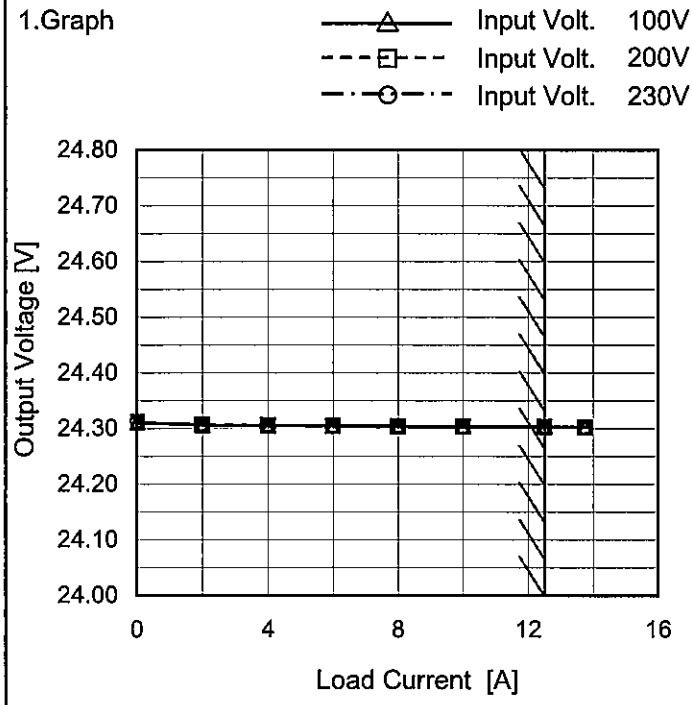
Model	LFP240F-24-Y
Item	Load Regulation
Object	+24V12.5A

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	24.311	24.312	24.312
2.00	24.306	24.307	24.306
4.00	24.305	24.306	24.305
6.00	24.305	24.305	24.304
8.00	24.305	24.304	24.303
10.00	24.304	24.303	24.303
12.50	24.303	24.303	24.303
13.75	24.303	24.302	24.302
--	-	-	-
--	-	-	-
--	-	-	-

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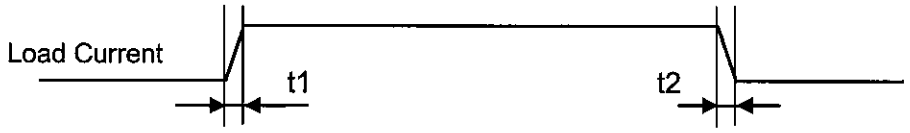
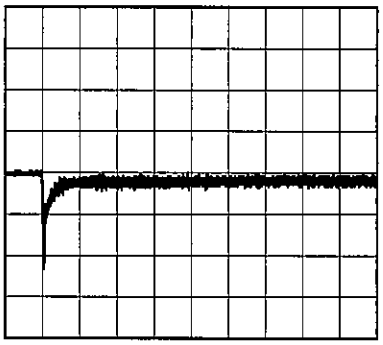
Model	LFP240F-24-Y		
Item	Dynamic Load Response	Temperature Testing Circuitry	25˚C Figure A
Object	+24V12.5A		

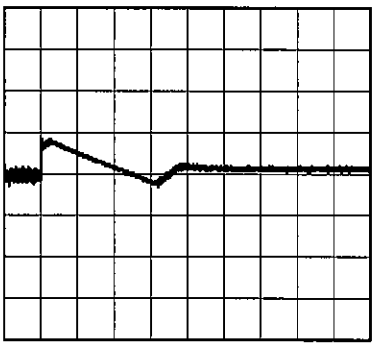
Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50us. Typ

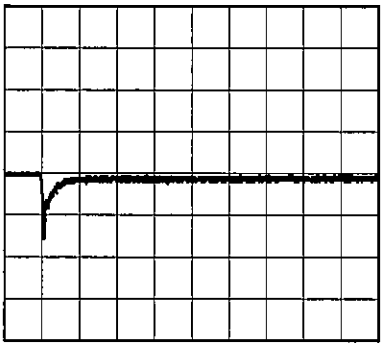


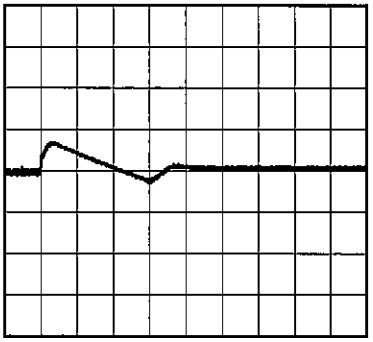
Min. Load (0A) ⟷
Load 100% (12.5A)





Min. Load (0A) ⟷
Load 50% (6.25A)





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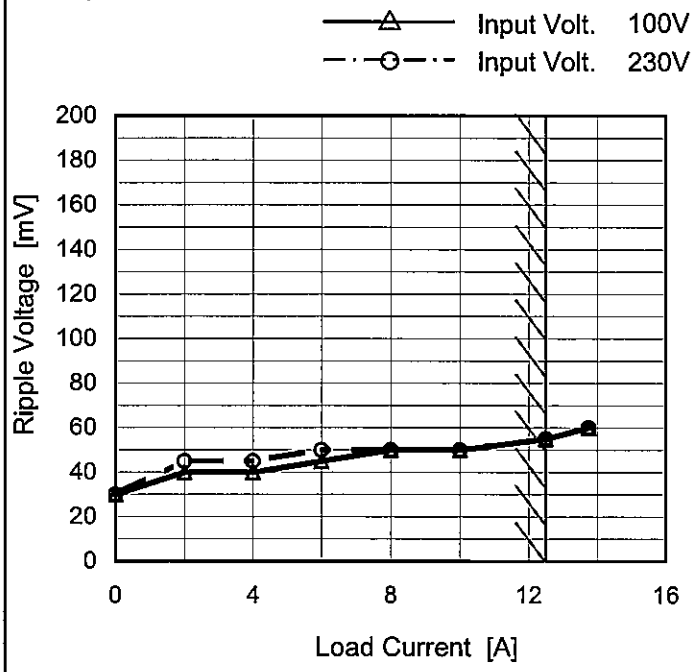
Model	LFP240F-24-Y
Item	Ripple Voltage (by Load Current)
Object	+24V12.5A

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

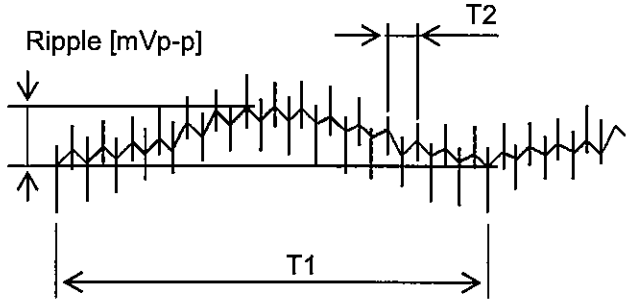


Fig. Complex Ripple Wave Form

2.Values

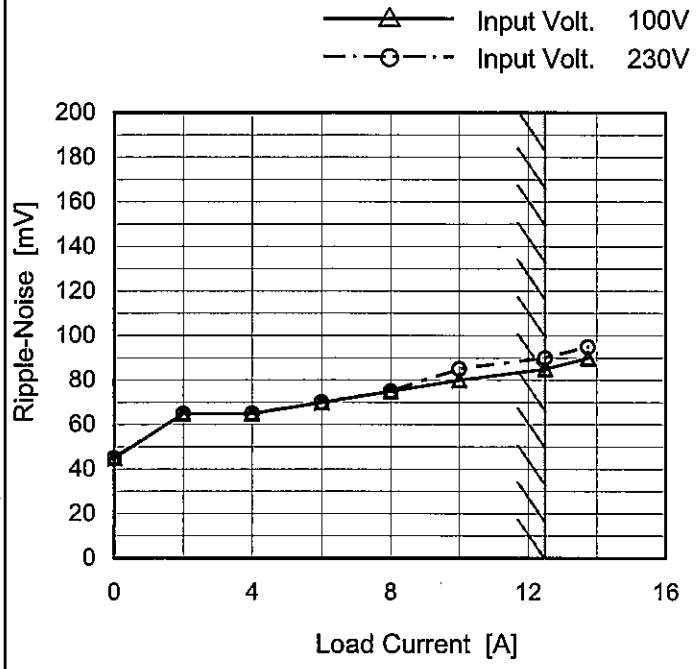
Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 230 [V]
0.00	30	30
2.00	40	45
4.00	40	45
6.00	45	50
8.00	50	50
10.00	50	50
12.50	55	55
13.75	60	60
--	-	-
---	-	-
--	-	-

COSEL

Model	LFP240F-24-Y
Item	Ripple-Noise
Object	+24V12.5A

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

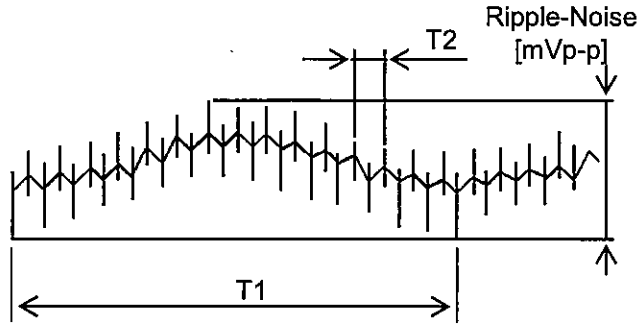


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.00	45	45
2.00	65	65
4.00	65	65
6.00	70	70
8.00	75	75
10.00	80	85
12.50	85	90
13.75	90	95
--	-	-
--	-	-
--	-	-

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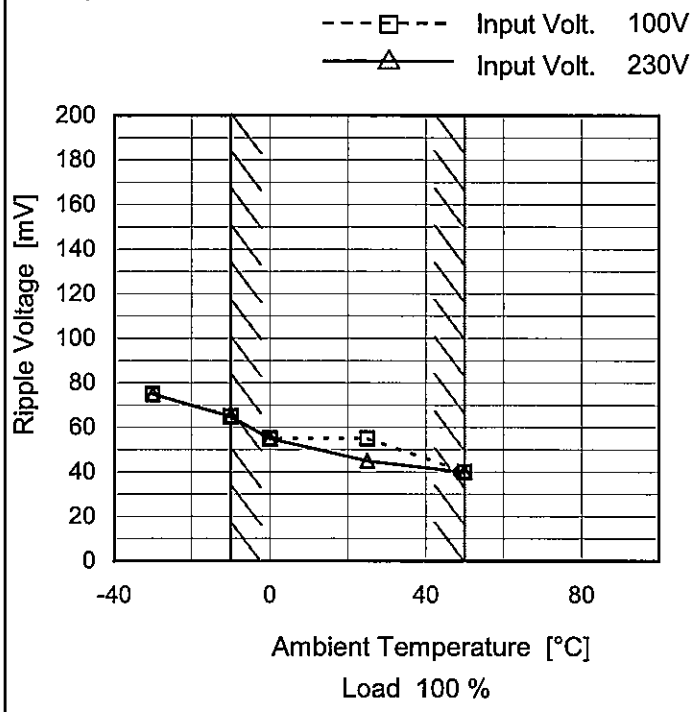
Model	LFP240F-24-Y
Item	Ripple Voltage (by Ambient Temp.)
Object	+24V12.5A

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	75	75
-10	65	65
0	55	55
25	55	45
50	40	40
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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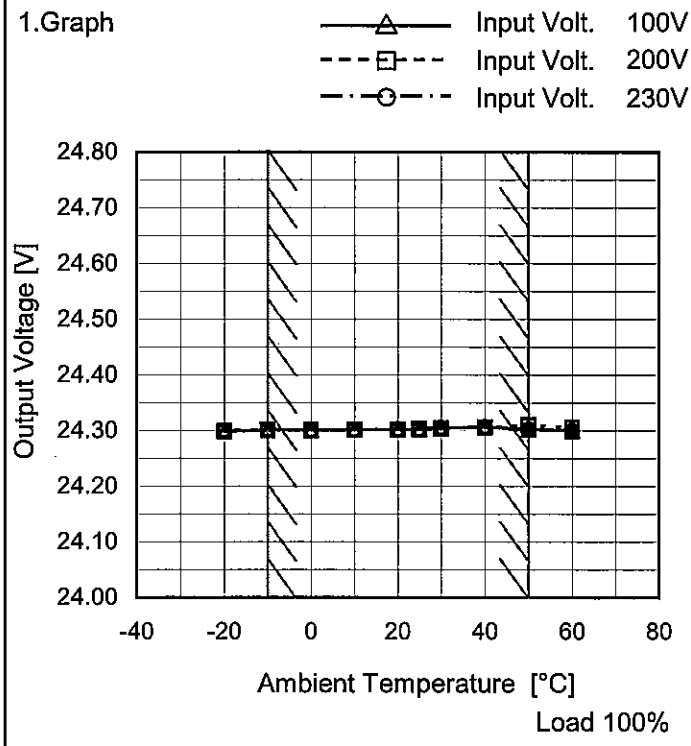
Model	LFP240F-24-Y
Item	Ambient Temperature Drift
Object	+24V12.5A

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	24.299	24.299	24.300
-10	24.301	24.301	24.302
0	24.301	24.301	24.301
10	24.302	24.302	24.302
20	24.302	24.302	24.303
25	24.303	24.303	24.303
30	24.305	24.304	24.305
40	24.307	24.306	24.307
50	24.303	24.310	24.303
60	24.300	24.306	24.300
--	-	-	-

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Model	LFP240F-24-Y	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+24V12.5A	

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 - 60°C
Input Voltage : 85 - 264V
Load Current : 0 - 12.5A

* 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	24.316	±8	±0.1
Minimum Voltage	0	264	12.5	24.301		

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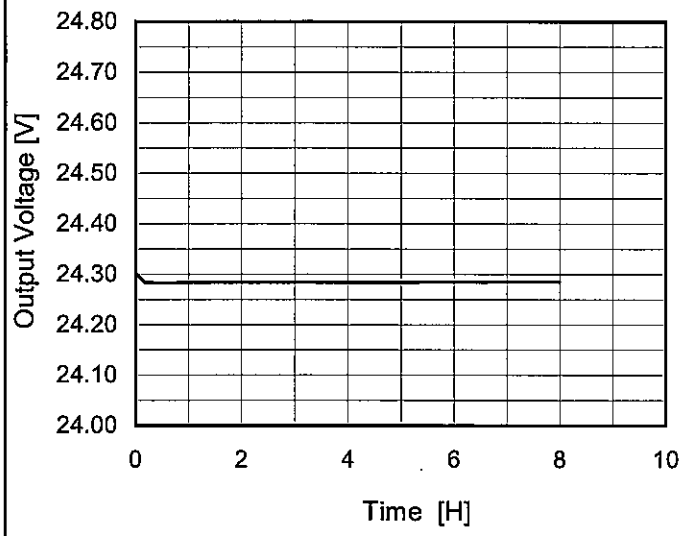
Model	LFP240F-24-Y
Item	Time Lapse Drift
Object	+24V12.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 24V
Load 100%

* The characteristic of AC230V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	24.303
0.5	24.284
1.0	24.283
2.0	24.284
3.0	24.284
4.0	24.284
5.0	24.284
6.0	24.285
7.0	24.285
8.0	24.286

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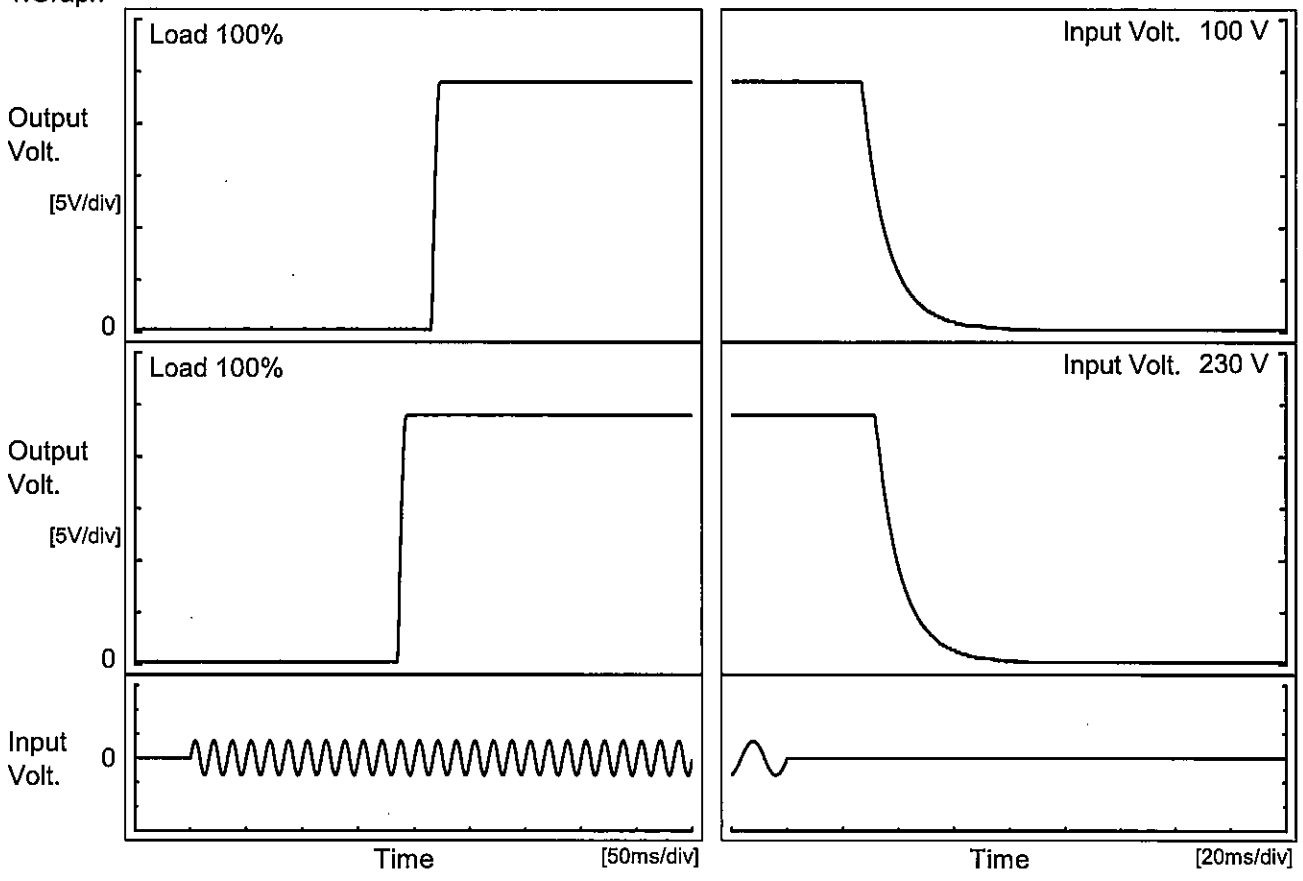
Model	LFP240F-24-Y
Item	Rise and Fall Time
Object	+24V12.5A

Temperature 25°C
Testing Circuitry Figure A

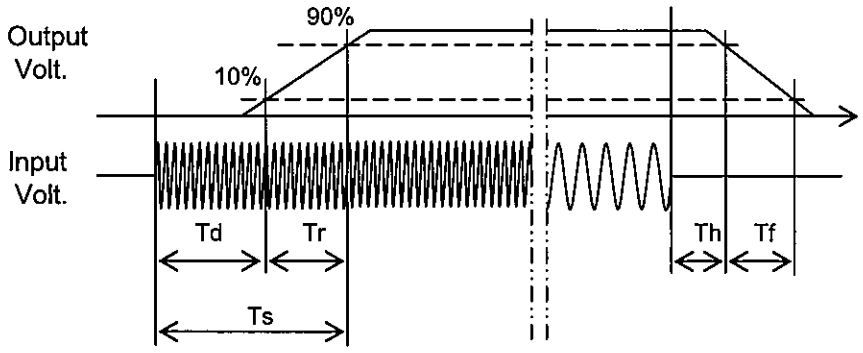
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	216.3	5.3	221.6	27.8	20.4
230 V	186.3	5.0	191.3	32.6	20.6



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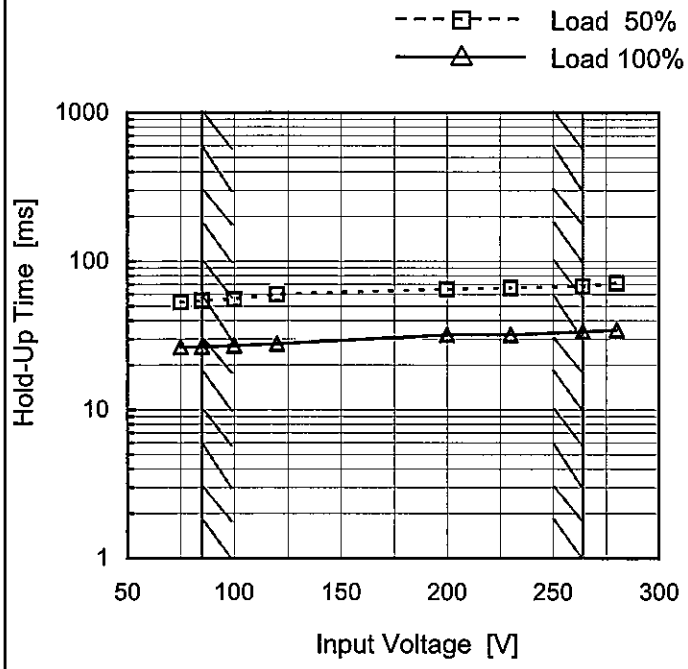
Model	LFP240F-24-Y
Item	Hold-Up Time
Object	+24V12.5A

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	53	26
85	54	27
100	56	27
120	60	28
200	65	32
230	66	32
264	68	34
280	71	35
--	-	-

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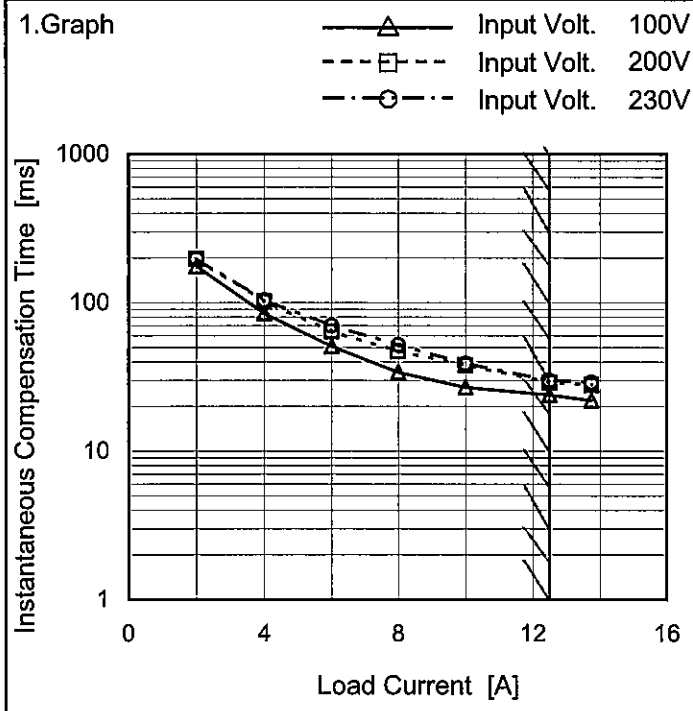
Model	LFP240F-24-Y
Item	Instantaneous Interruption Compensation
Object	+24V12.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

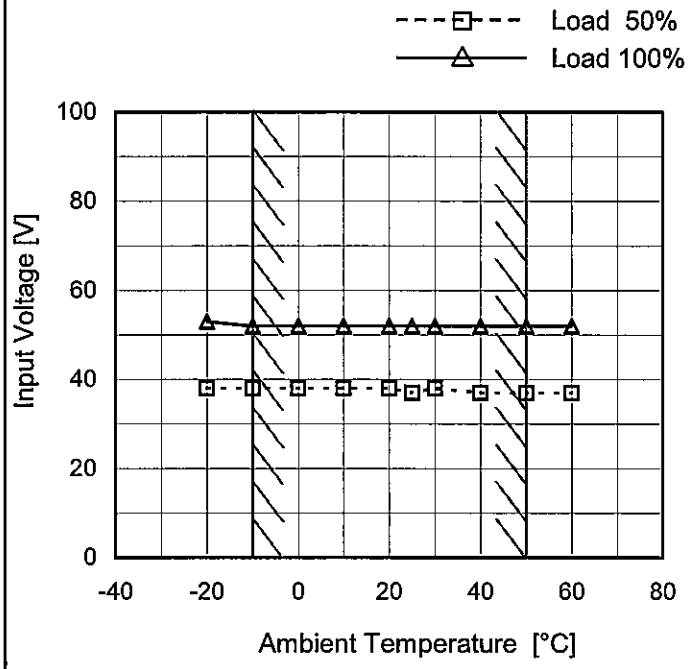
Load Current [A]	Time [ms] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
2.00	176	197	197
4.00	85	102	104
6.00	51	64	70
8.00	34	47	52
10.00	27	38	39
12.50	24	29	30
13.75	22	28	29
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LFP240F-24-Y
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V12.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

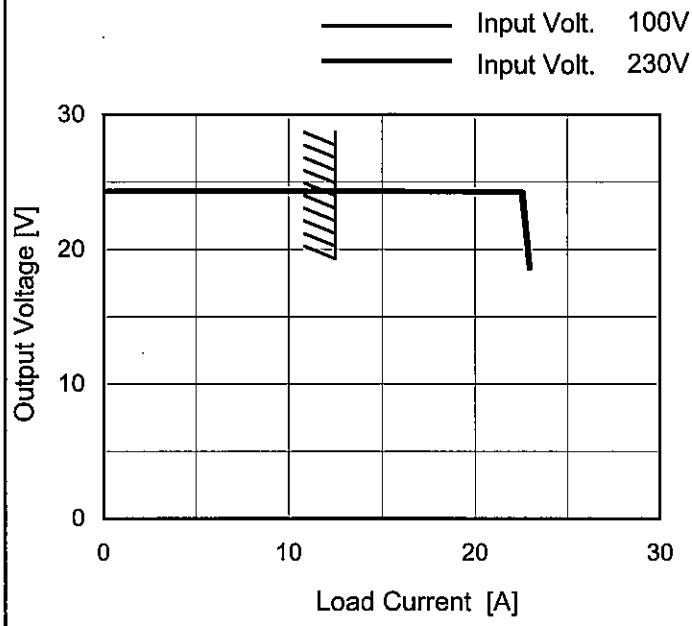
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	38	53
-10	38	52
0	38	52
10	38	52
20	38	52
25	37	52
30	38	52
40	37	52
50	37	52
60	37	52
--	-	-

COSEL

Model	LFP240F-24-Y
Item	Overcurrent Protection
Object	+24V12.5A

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 19V to 0V.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
22.8	22.77	22.63
21.6	22.85	22.74
19.2	23.01	22.92
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

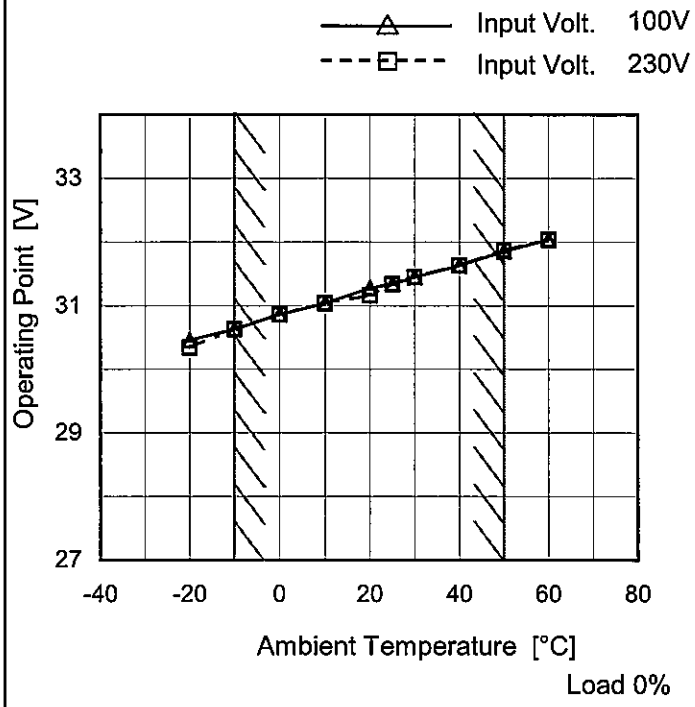
BC-10685

COSEL

Model	LFP240F-24-Y
Item	Overvoltage Protection
Object	+24V12.5A

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. 230[V]
-20	30.46	30.34
-10	30.63	30.63
0	30.86	30.86
10	31.04	31.04
20	31.28	31.16
25	31.34	31.34
30	31.45	31.45
40	31.63	31.63
50	31.86	31.87
60	32.04	32.04
--	-	-

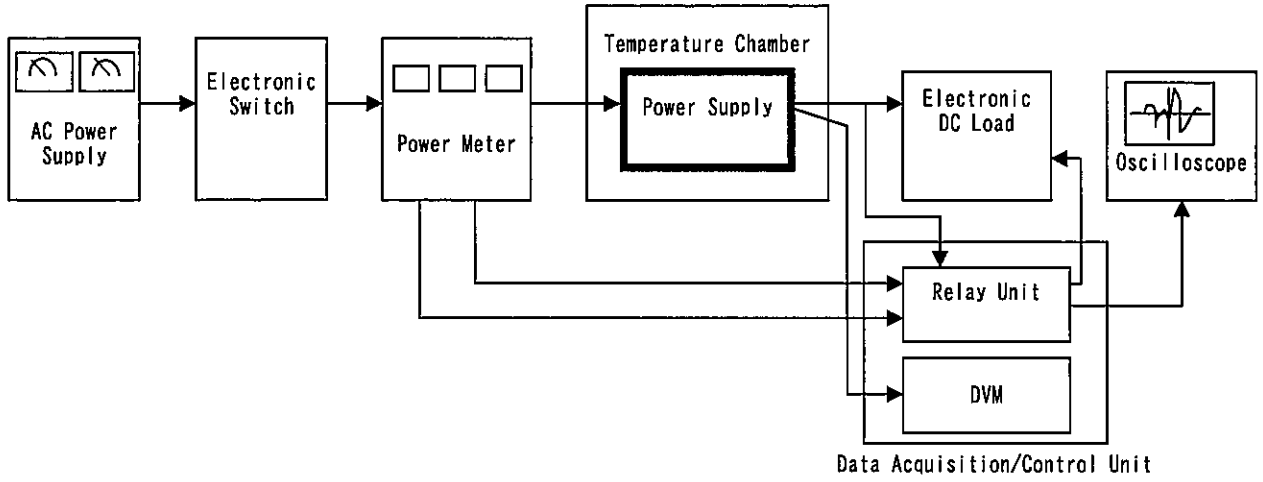


Figure A

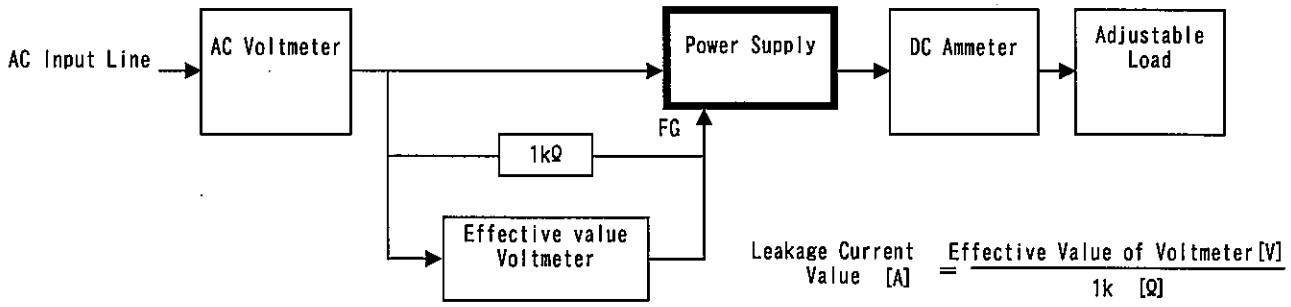


Figure B (DEN-AN)

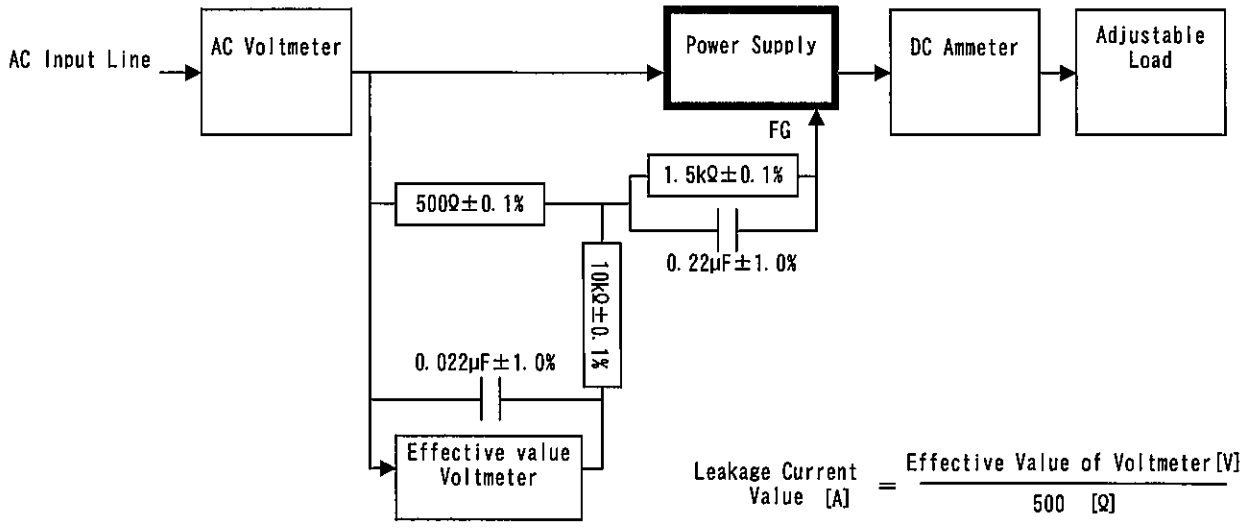


Figure B (IEC60950-1)

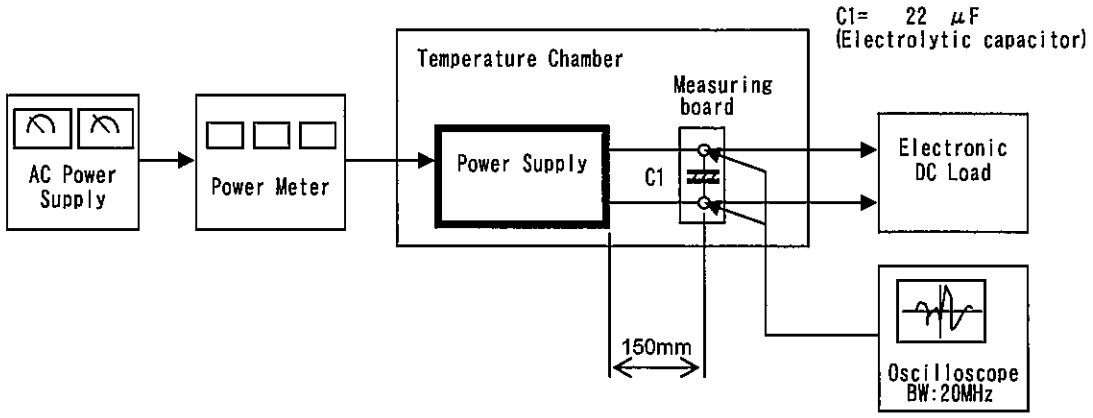

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope BW:20MHz

Figure C