COSEL

参考資料

TEST DATA OF PLA150F-24

Regulated DC Power Supply
May 23, 2013

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COSEL CO.,LTD.

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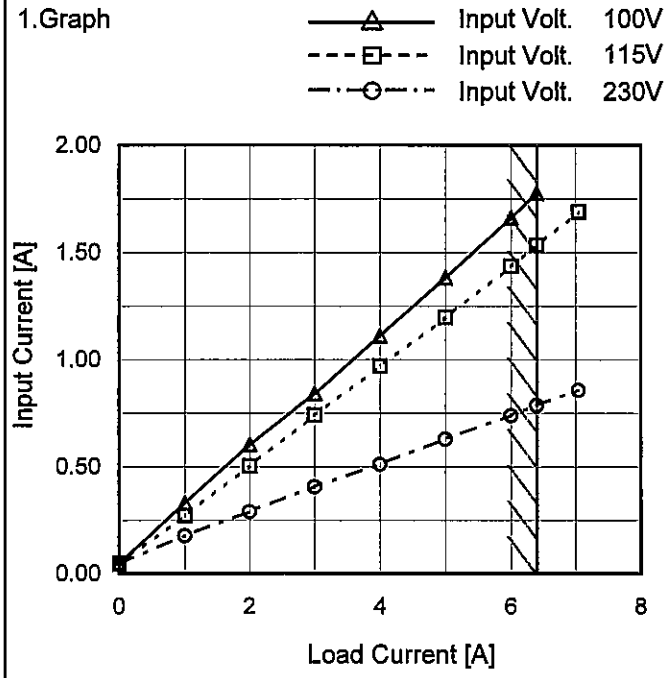

Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	0.046	0.047	0.046
1.00	0.332	0.270	0.178
2.00	0.604	0.503	0.290
3.00	0.842	0.740	0.407
4.00	1.112	0.968	0.512
5.00	1.384	1.196	0.630
6.00	1.662	1.436	0.740
6.40	1.777	1.533	0.788
7.04	-	1.688	0.858
--	-	-	-
--	-	-	-

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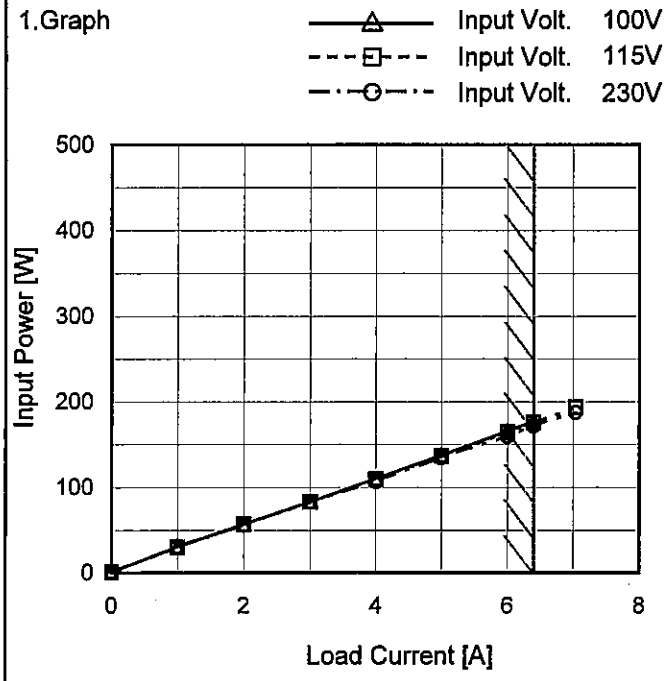
Model	PLA150F-24
Item	Input Power (by Load Current)
Object	———————

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. 115[V]	Input Volt. 230[V]
0.00	1.1	1.0	0.6
1.00	30.5	29.5	31.0
2.00	57.0	56.3	56.0
3.00	83.4	82.5	83.0
4.00	110.4	109.5	107.0
5.00	138.0	136.5	135.0
6.00	165.9	164.4	160.0
6.40	177.3	175.5	172.0
7.04	-	193.2	188.0
--	-	-	-
--	-	-	-

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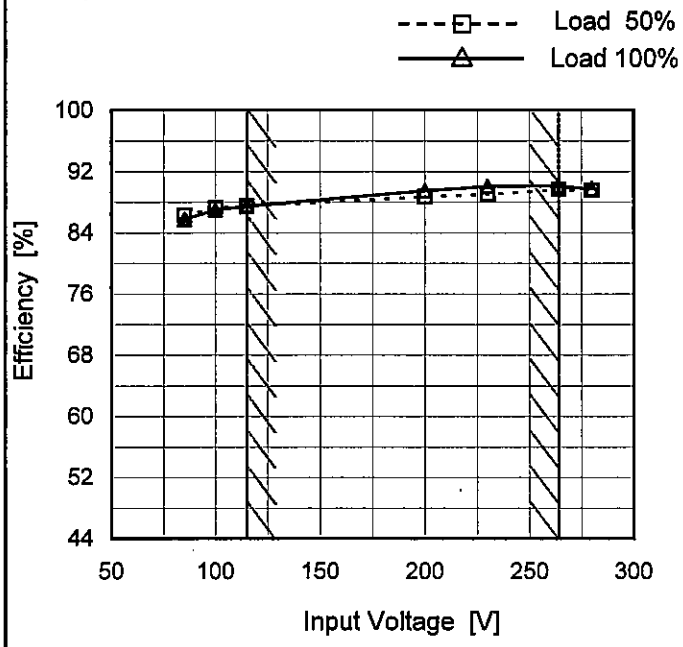
Model	PLA150F-24
Item	Efficiency (by Input Voltage)
Object	――――――――

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%
85	86.2	85.8 ※1
100	87.2	87.0 ※2
115	87.5	87.5
200	88.7	89.5
230	89.0	90.1
264	89.6	90.1
280	89.5	89.8
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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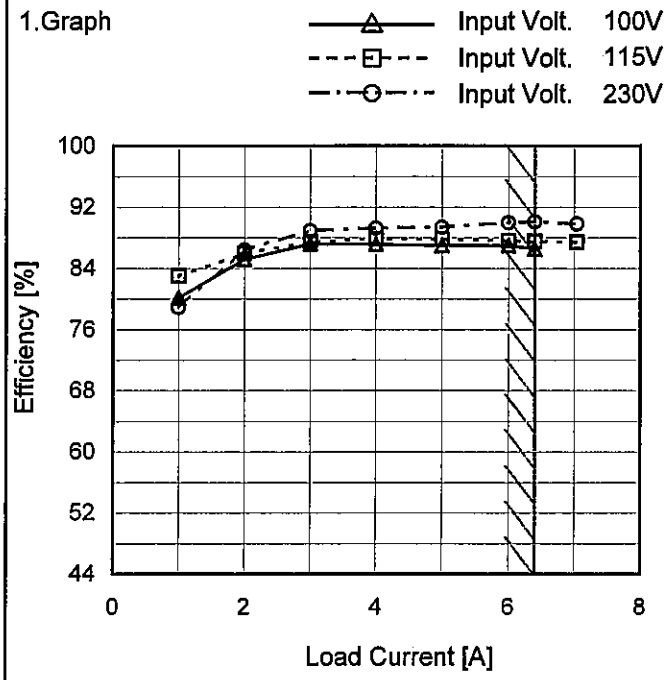
Model	PLA150F-24
Item	Efficiency (by Load Current)
Object	————————

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. 115[V]	Input Volt. 230[V]
0.00	-	-	-
1.00	80.2	83.0	78.9
2.00	85.2	85.9	86.4
3.00	87.2	87.4	88.9
4.00	87.2	87.9	89.2
5.00	87.0	87.8	89.4
6.00	87.0	87.6	90.0
6.40	86.6	87.5	90.1
7.04	-	87.4	89.8
--	-	-	-
--	-	-	-

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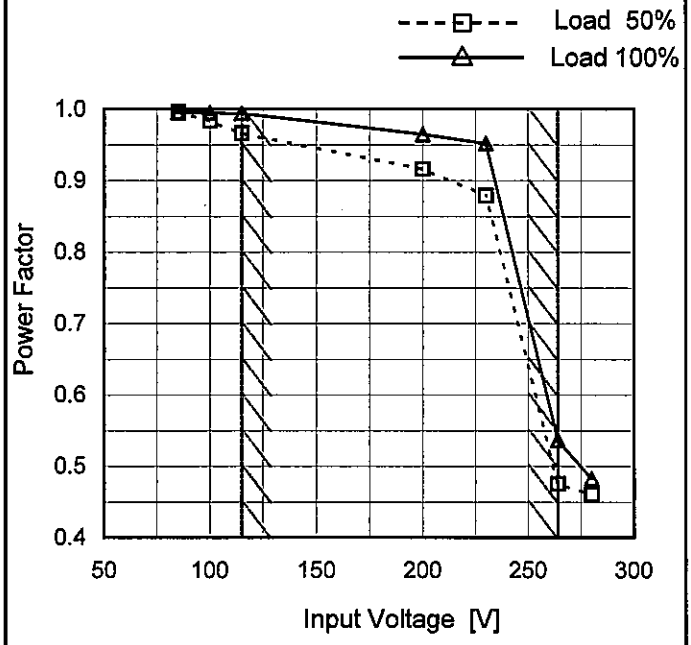
Model	PLA150F-24
Item	Power Factor (by Input Voltage)
Object	————————

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%
85	0.996	0.995 ※1
100	0.983	0.995 ※2
115	0.966	0.994
200	0.916	0.965
230	0.879	0.952
264	0.475	0.537
280	0.460	0.483
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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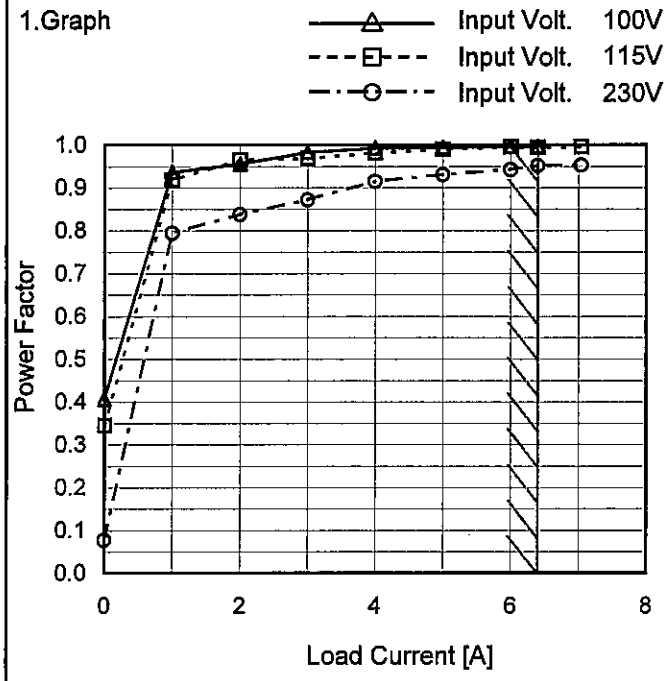
Model	PLA150F-24
Item	Power Factor (by Load Current)
Object	————————

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. 115[V]	Input Volt. 230[V]
0.00	0.407	0.345	0.078
1.00	0.937	0.918	0.795
2.00	0.956	0.965	0.838
3.00	0.984	0.969	0.872
4.00	0.993	0.981	0.915
5.00	0.994	0.989	0.931
6.00	0.996	0.995	0.942
6.40	0.997	0.994	0.952
7.04	-	0.995	0.953
--	-	-	-
--	-	-	-

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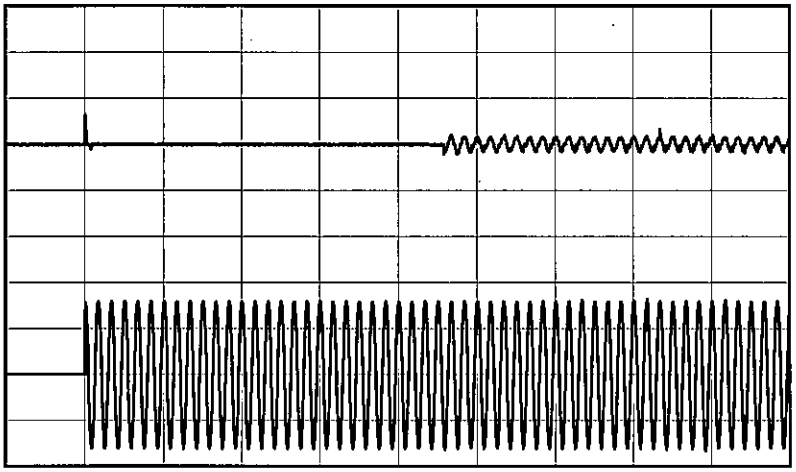
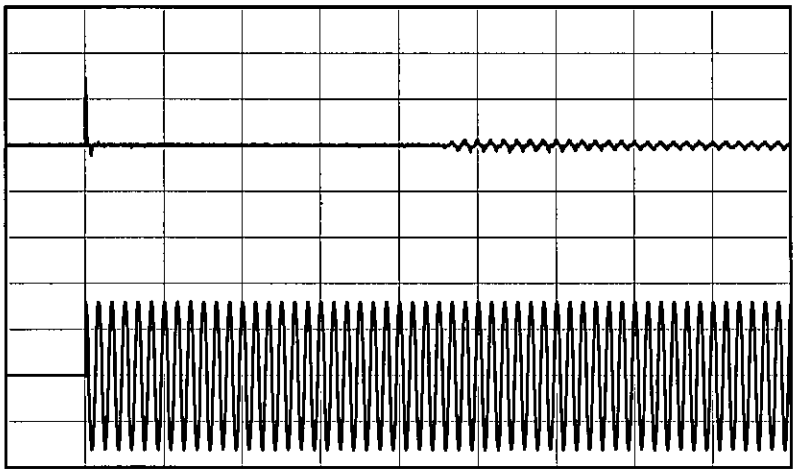
Model	PLA150F-24		
Item	Inrush Current	Temperature	25°C
Object	————————	Testing Circuitry	Figure A



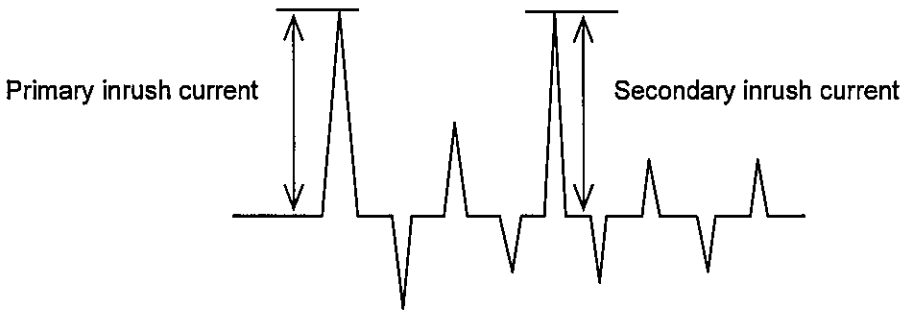
Input Voltage 115 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
12.9 A
Secondary inrush current :
6.6 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
29.1 A
Secondary inrush current :
2.7 A



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Model	PLA150F-24		
Item	Leakage Current	Temperature	25°C
Object	———	Testing Circuitry	Figure B

1.Results

[mA]

Standards		Input Volt.			Note
		100[V]	115[V]	240[V]	
DEN-AN	Both phases	0.45	0.50	0.65	Operation
	One of phases	0.30	0.35	0.78	Stand by
IEC60950-1	Both phases	0.30	0.31	0.55	Operation
	One of phases	0.27	0.31	0.72	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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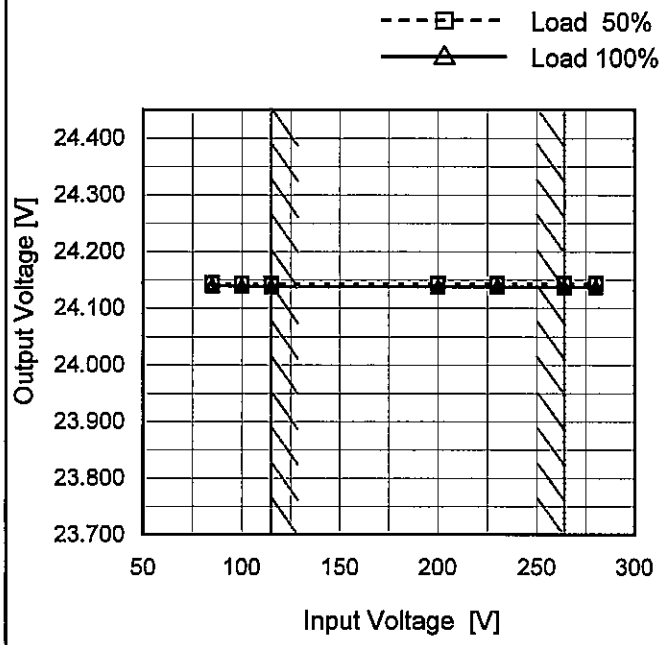
Model	PLA150F-24
Item	Line Regulation
Object	+24V6.4A

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%
85	24.144	24.140 ※1
100	24.143	24.140 ※2
115	24.143	24.139
200	24.143	24.139
230	24.143	24.138
264	24.143	24.138
280	24.143	24.138
--	-	-
--	-	-

※1:Load 80%
※2:Load 90%

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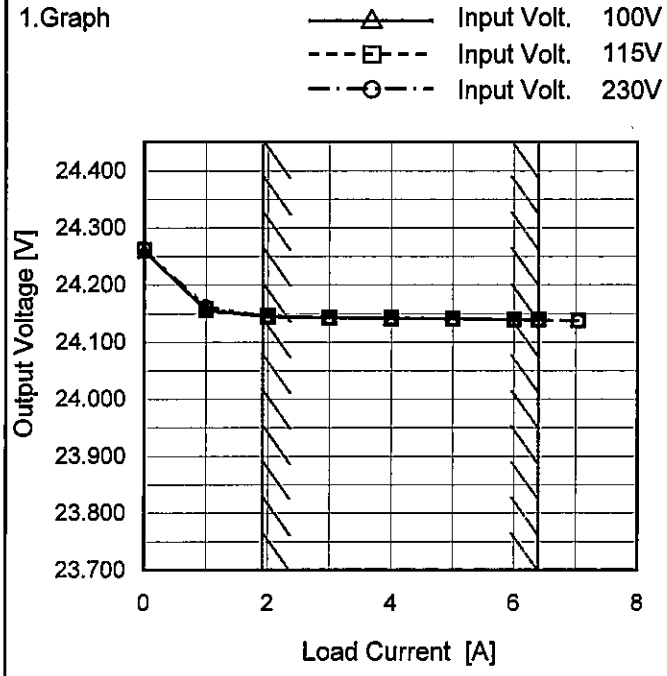
Model	PLA150F-24
Item	Load Regulation
Object	+24V6.4A

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. 115[V]	Input Volt. 230[V]
0.00	24.261	24.262	24.264
1.00	24.156	24.157	24.162
2.00	24.144	24.145	24.145
3.00	24.143	24.143	24.143
4.00	24.141	24.142	24.142
5.00	24.141	24.141	24.140
6.00	24.140	24.139	24.138
6.40	24.140	24.139	24.138
7.04	-	24.137	24.137
---	-	-	-
---	-	-	-

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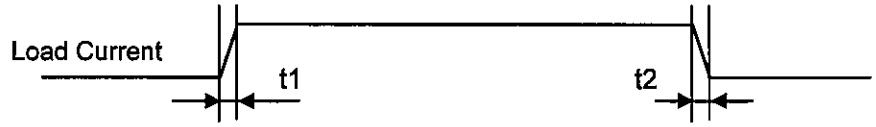
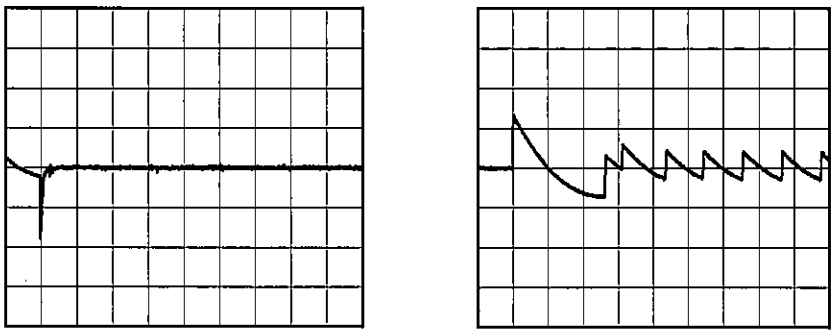
Model	PLA150F-24		
Item	Dynamic Load Response	Temperature Testing Circuitry	25˚C Figure A
Object	+24V6.4A		

Input Volt. 115 V
Cycle 1000 ms

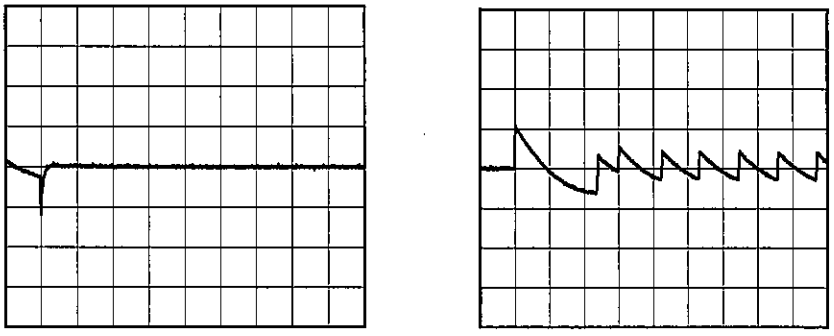
Response. t1=t2=50us. Typ



Min. Load (0A) ⟷
Load 100% (6.4A)



Min. Load (0A) ⟷
Load 50% (3.2A)



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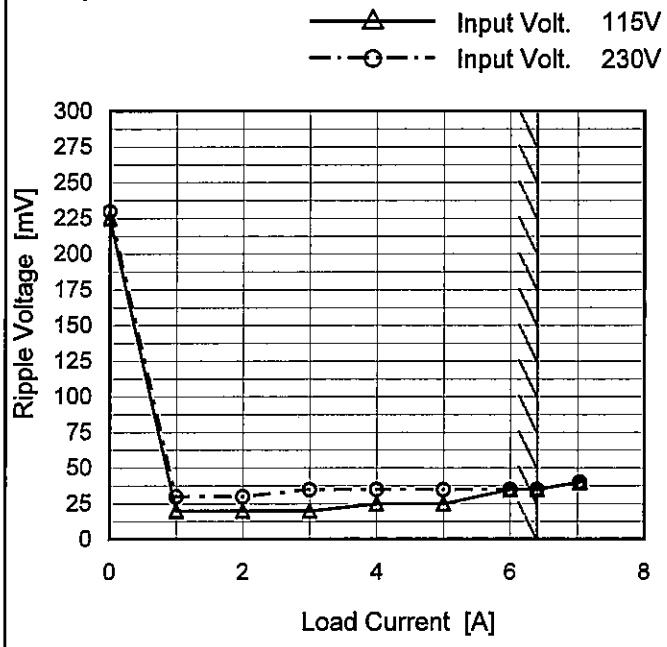
Model	PLA150F-24
Item	Ripple Voltage (by Load Current)
Object	+24V6.4A

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

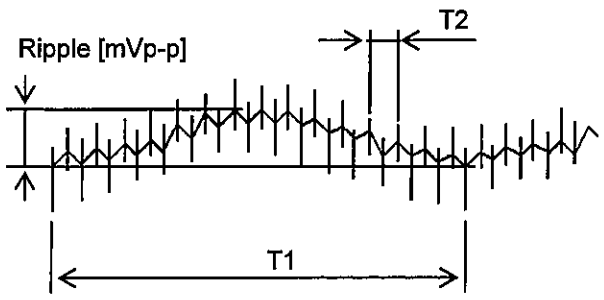


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
0.00	225	230
1.00	20	30
2.00	20	30
3.00	20	35
4.00	25	35
5.00	25	35
6.00	35	35
6.40	35	35
7.04	40	40
--	-	-
--	-	-

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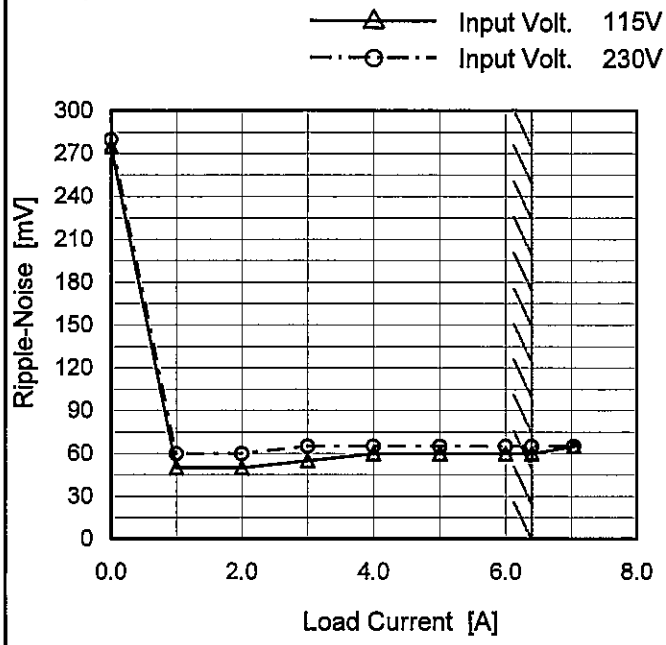
Model	PLA150F-24
Item	Ripple-Noise
Object	+24V6.4A

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. 115 [V]	Input Volt. 230 [V]
0.00	275	280
1.00	50	60
2.00	50	60
3.00	55	65
4.00	60	65
5.00	60	65
6.00	60	65
6.40	60	65
7.04	65	65
--	-	-
--	-	-

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

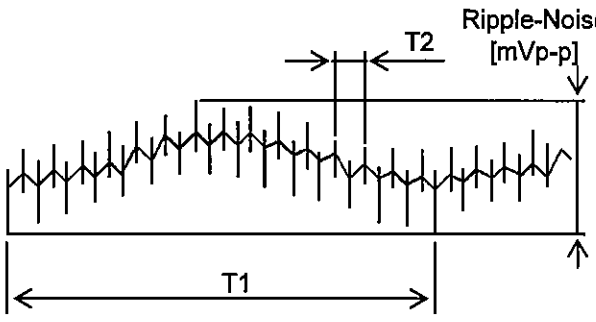


Fig. Complex Ripple Wave Form

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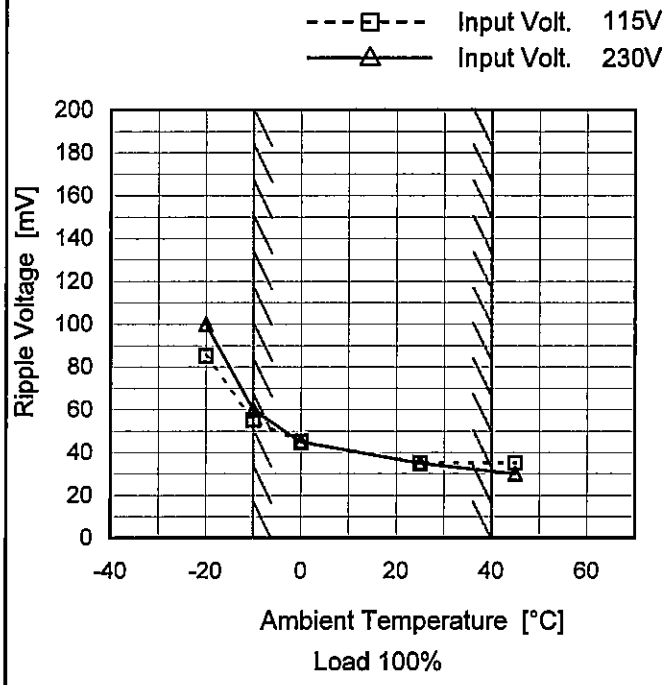
COSEL

Model	PLA150F-24
Item	Ripple Voltage (by Ambient Temp.)
Object	+24V6.4A

Testing Circuitry Figure C

1.Graph



Load 100%

Measured by 20 MHz Oscilloscope.

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

2.Values

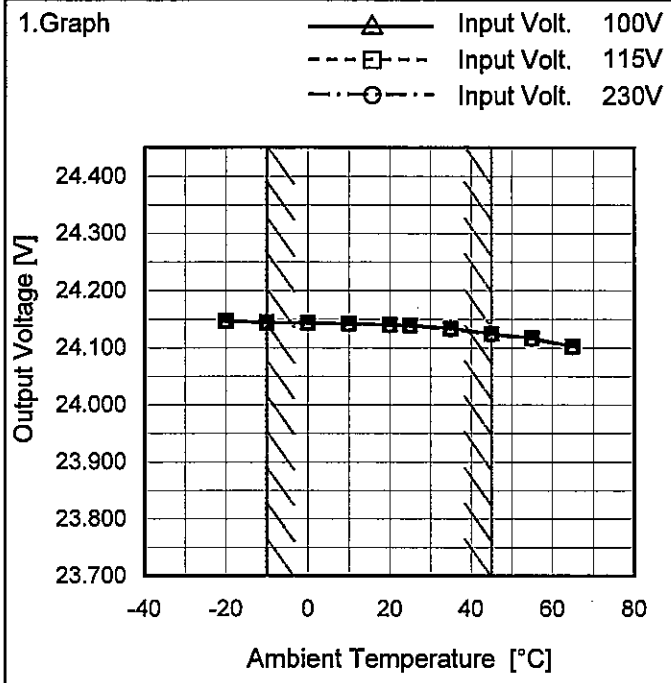
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
-20	85	100
-10	55	60
0	45	45
25	35	35
45	35	30
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PLA150F-24
Item	Ambient Temperature Drift
Object	+24V6.4A

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. 115[V]	Input Volt. 230[V]
-20	24.147	24.147	24.146
-10	24.145	24.144	24.144
0	24.144	24.143	24.142
10	24.143	24.142	24.141
20	24.141	24.140	24.139
25	24.140	24.139	24.138
35	24.135	24.133	24.132
45	24.125	24.124	24.123
55	24.117	24.116	24.115
65	24.103	24.102	24.101
---	-	-	-

Note: In case of Input Volt. 100V, Load 90%.
Other case Load 100%.

COSEL

Model	PLA150F-24	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+24V6.4A	

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 - 45°C
Input Voltage : 115 - 264V
Load Current : 1.92 - 6.4A

* 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	230	1.92	24.151	±14	±0.1
Minimum Voltage	45	264	6.4	24.123		

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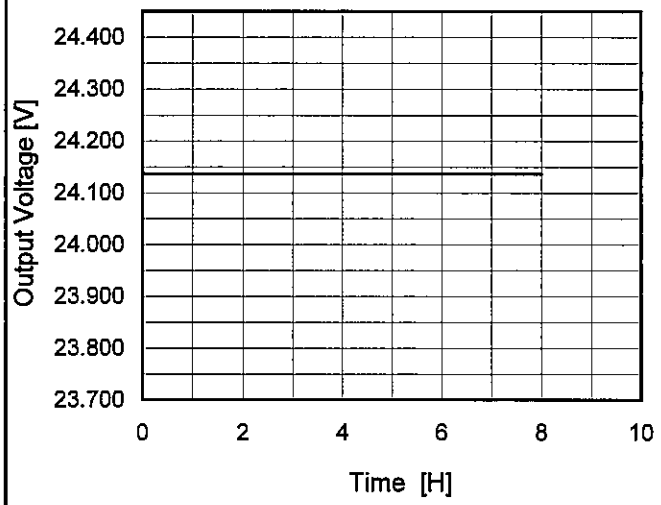
Model	PLA150F-24
Item	Time Lapse Drift
Object	+24V6.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 230V
Load 100%

* The characteristic of AC115V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	24.138
0.5	24.137
1.0	24.137
2.0	24.137
3.0	24.137
4.0	24.137
5.0	24.137
6.0	24.137
7.0	24.137
8.0	24.137

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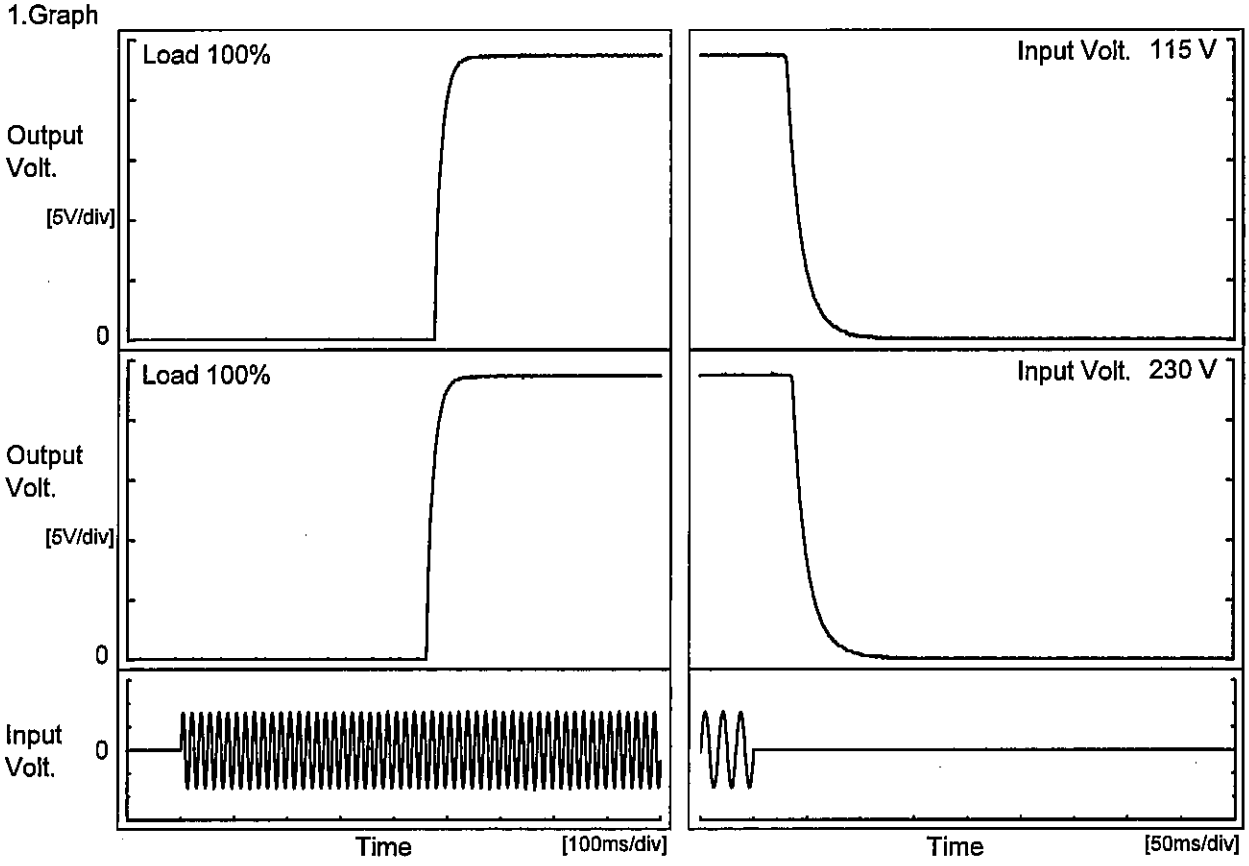
Model	PLA150F-24	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+24V6.4A	

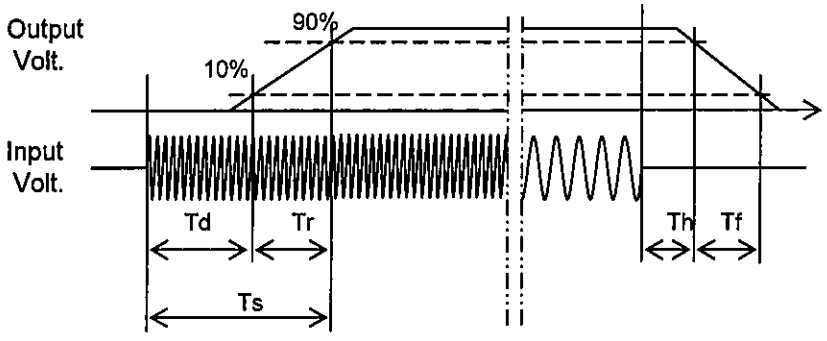
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
115 V	475.5	30.0	505.5	32.5	31.3
230 V	462.0	30.0	492.0	38.5	37.3



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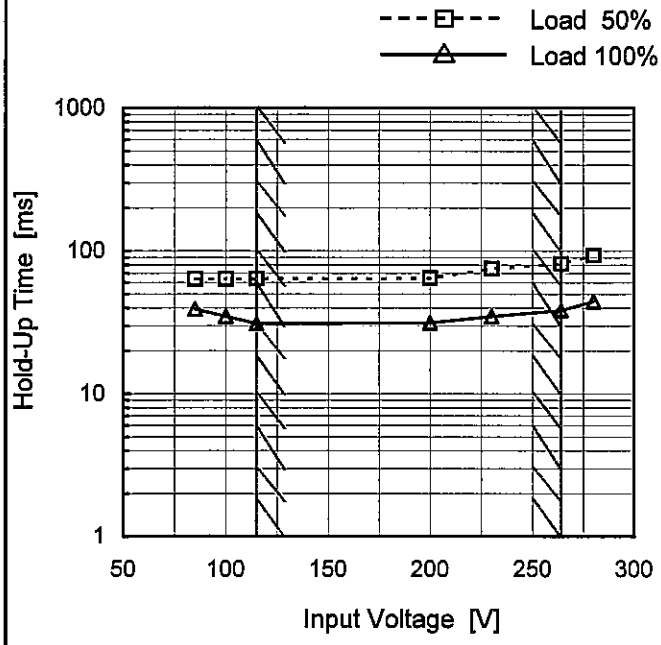
Model	PLA150F-24
Item	Hold-Up Time
Object	+24V6.4A

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%
85	63	39 ※1
100	63	35 ※2
115	64	31
200	64	31
230	75	35
264	81	39
280	93	45
—	-	-
—	-	-

※1:Load 80%
※2:Load 90%

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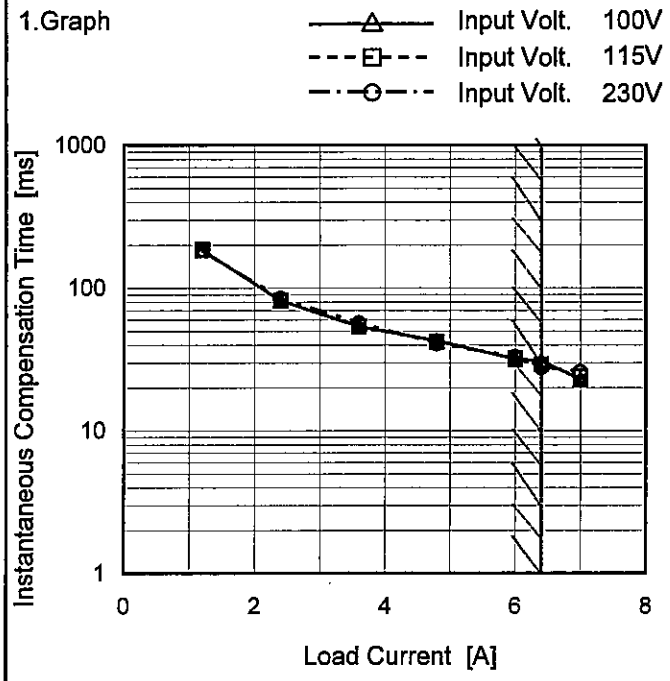
Model	PLA150F-24
Item	Instantaneous Interruption Compensation
Object	+24V6.4A

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. 115[V]	Input Volt. 230[V]
0.0	-	-	-
1.2	185	185	184
2.4	82	82	85
3.6	54	54	57
4.8	43	42	41
6.0	32	32	33
6.4	31	29	28
7.0	23	24	26
--	-	-	-
--	-	-	-
--	-	-	-

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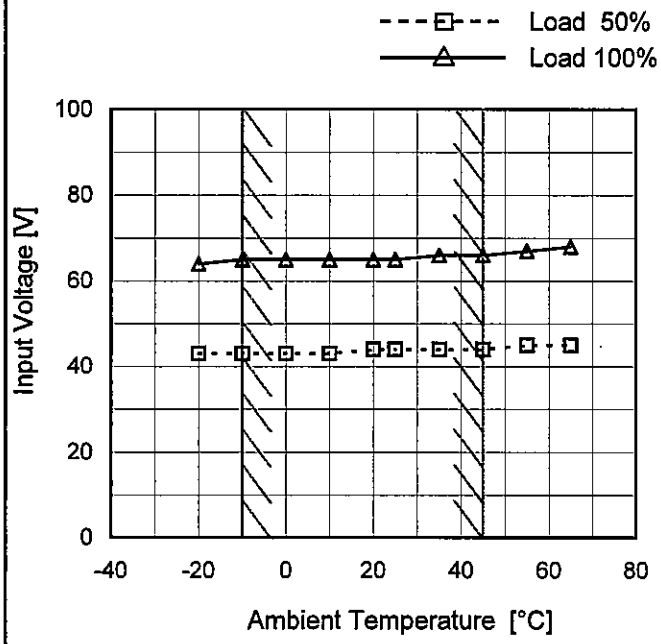
Model	PLA150F-24
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V6.4A

Testing Circuitry Figure A

1.Graph



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

2.Values

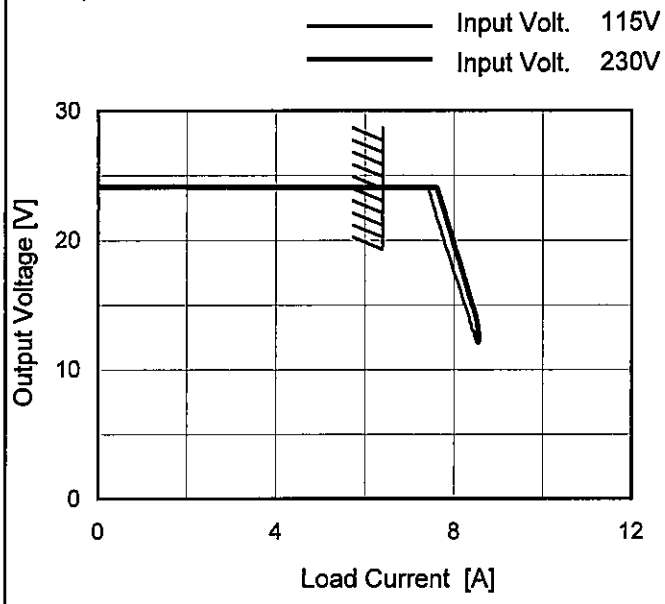
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	43	64
-10	43	65
0	43	65
10	43	65
20	44	65
25	44	65
35	44	66
45	44	66
55	45	67
65	45	68
--	-	-

COSEL

Model	PLA150F-24
Item	Overcurrent Protection
Object	+24V6.4A

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 12V to 0V.

2.Values

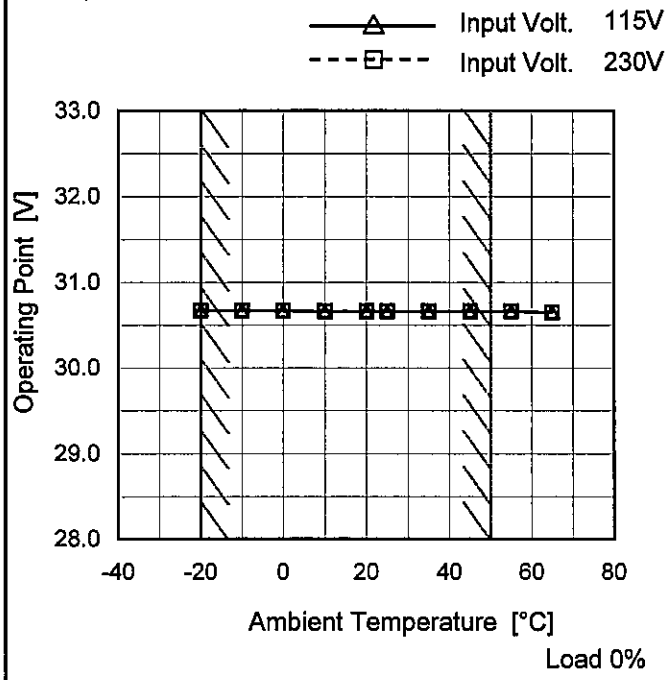
Output Voltage [V]	Load Current [A]	
	Input Volt. 115[V]	Input Volt. 230[V]
22.8	7.53	7.72
21.6	7.42	7.62
19.2	7.83	8.04
16.8	8.06	8.25
14.4	8.30	8.46
12.0	8.50	8.55
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PLA150F-24
Item	Overvoltage Protection
Object	+24V6.4A

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. 115[V]	Input Volt. 230[V]
-20	30.67	30.67
-10	30.67	30.67
0	30.67	30.67
10	30.66	30.66
20	30.66	30.66
25	30.66	30.66
35	30.66	30.66
45	30.66	30.66
55	30.66	30.66
65	30.65	30.65
--	-	-

COSEL

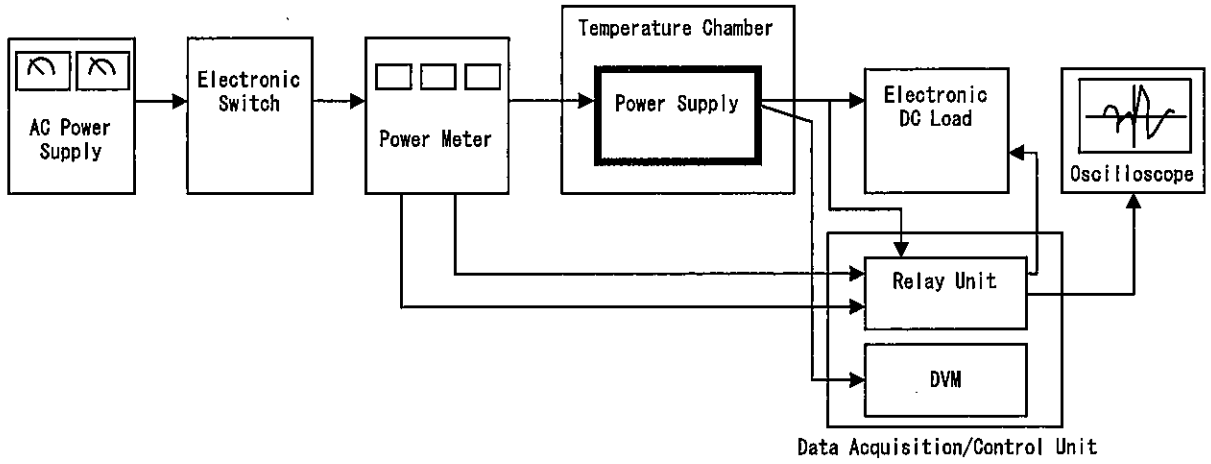


Figure A

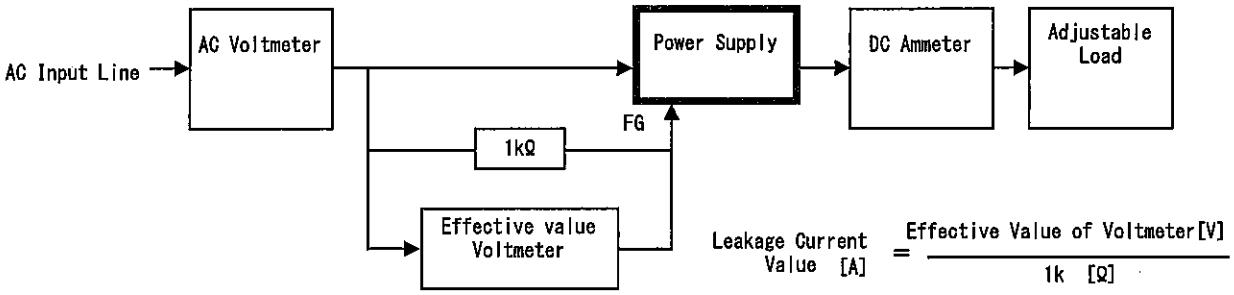


Figure B (DEN-AN)

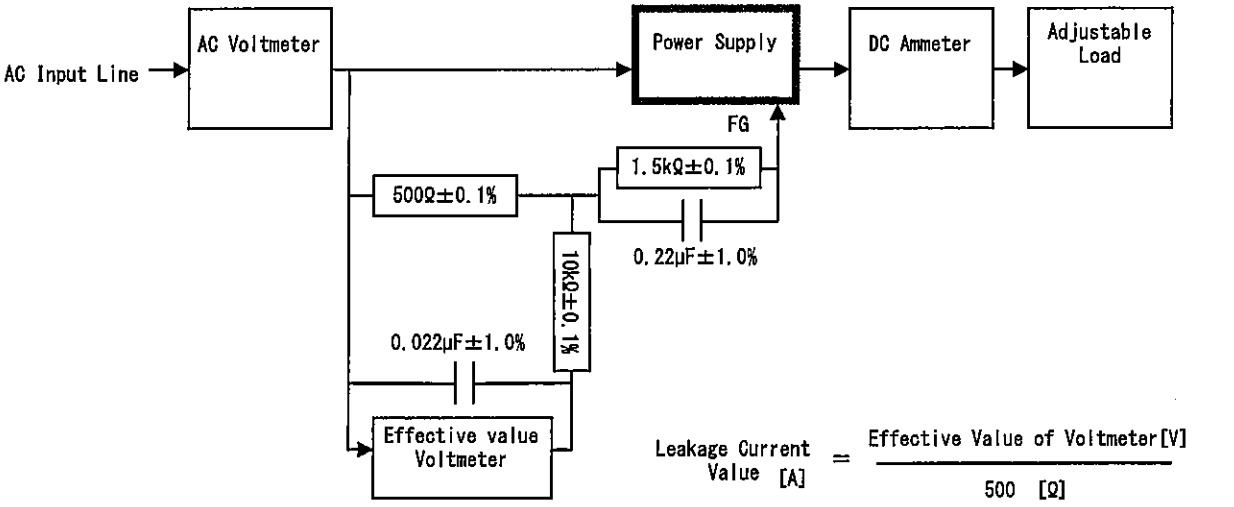


Figure B (IEC60950-1)

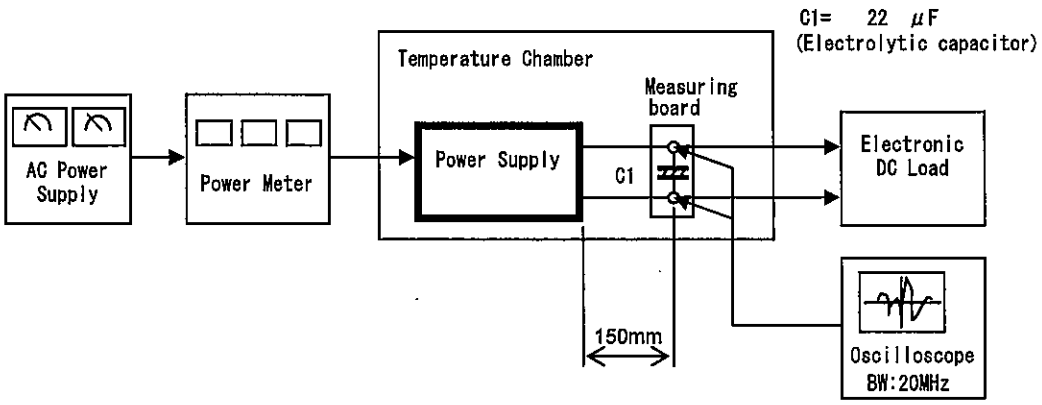

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope
BW:20MHz

Figure C