COSEL

TEST DATA OF WBA150B-48

Regulated DC Power Supply
June 22, 2021

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

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

    —△— Input Volt. 170V
    - - -□- - - Input Volt. 277V
    — —⊖— — Input Volt. 305V
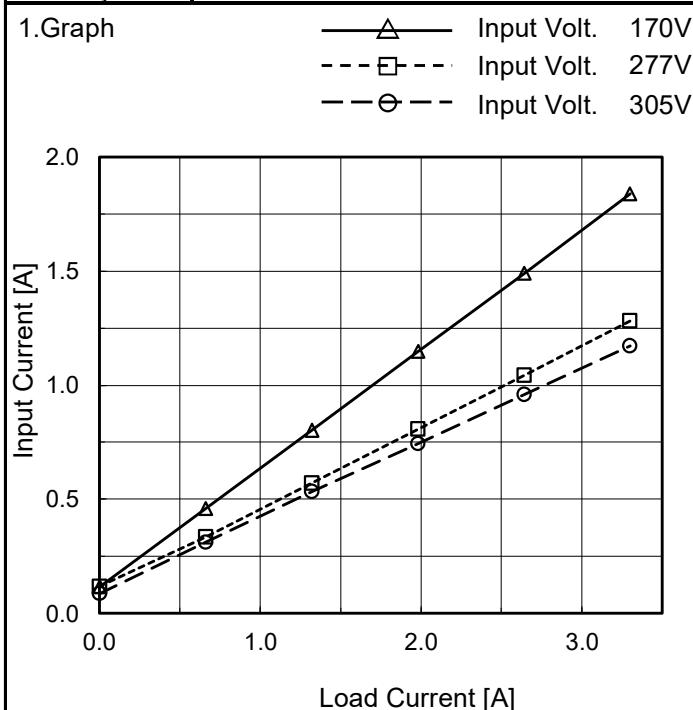
Input Current [A] (y-axis)
Load Current [A] (x-axis)

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	0.116	0.119	0.086
0.66	0.458	0.336	0.312
1.32	0.802	0.572	0.533
1.98	1.148	0.807	0.744
2.64	1.490	1.044	0.958
3.30	1.838	1.282	1.172
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA150B-48
Item	Efficiency (by Load Current)
Object	

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

— △ — Input Volt. 170V
- - - ▢ - - - Input Volt. 277V
— — ⊖ — — Input Volt. 305V
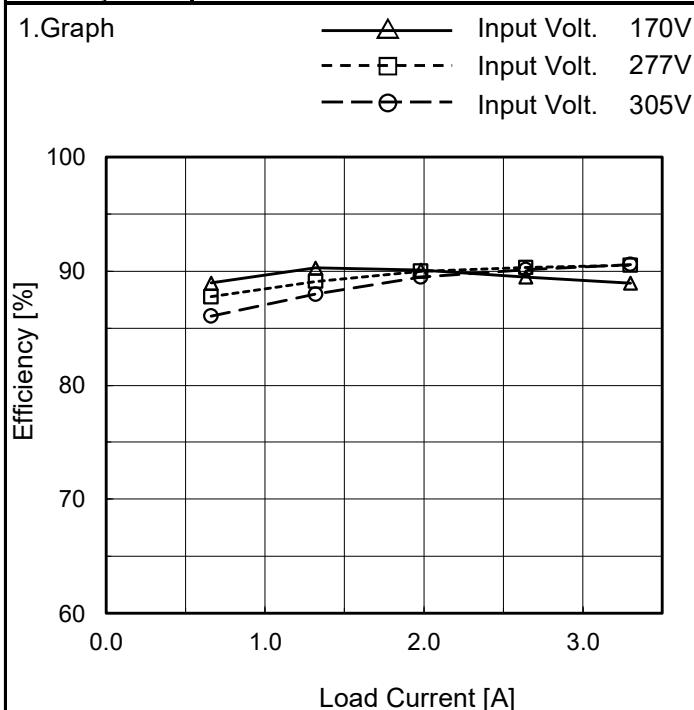
Efficiency [%] vs Load Current [A]

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	-	-	-
0.66	89.0	87.8	86.1
1.32	90.3	89.1	88.0
1.98	90.1	90.0	89.5
2.64	89.5	90.3	90.1
3.30	88.9	90.5	90.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA150B-48
Item	Power Factor (by Load Current)
Object	————

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Input Volt. 170V
□ Input Volt. 277V
⊖ Input Volt. 305V
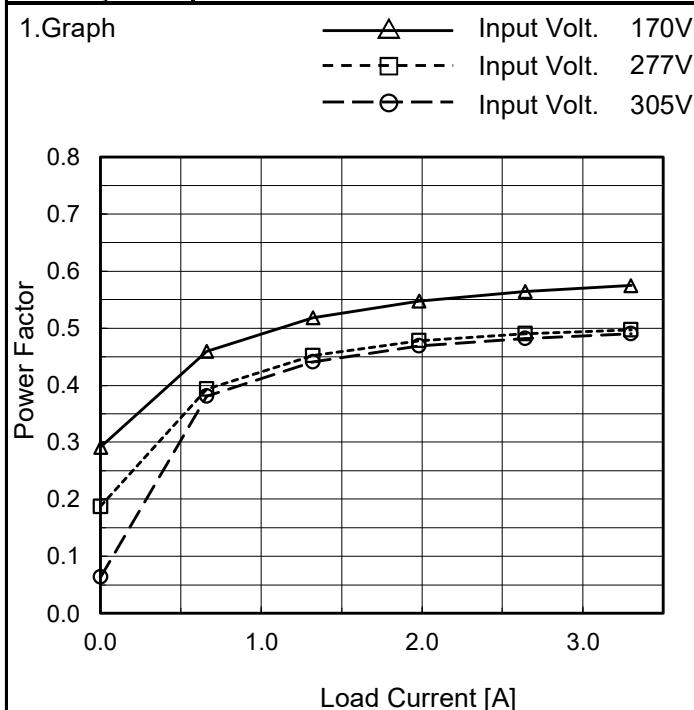
Power Factor vs Load Current [A]

2.Values

Load Current [A]	Power Factor		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	0.291	0.188	0.063
0.66	0.460	0.393	0.381
1.32	0.519	0.452	0.441
1.98	0.548	0.479	0.469
2.64	0.564	0.490	0.482
3.30	0.575	0.497	0.491
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA150B-48
Item	Inrush Current
Object	———————

Temperature	25°C
Testing Circuitry	Figure A

Input
Current
[20A/div]

Input
Voltage
[200V/div]

Time   [50ms/div]

Input Voltage	277 V
Frequency	60 Hz
Load	100 %
Primary inrush current	43.0 A
Secondary inrush current	3.8 A

Primary inrush current   Secondary inrush current

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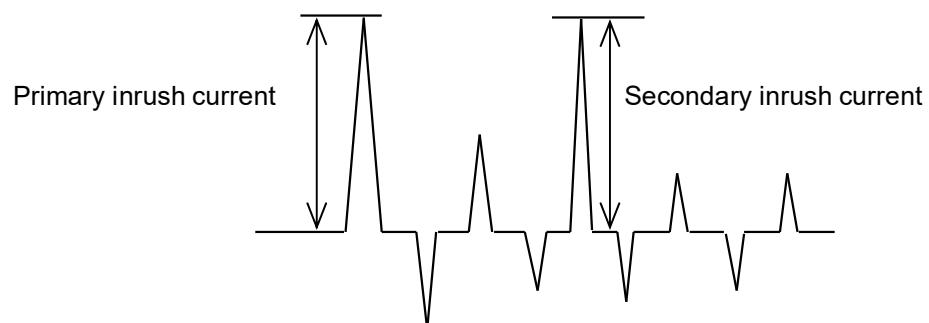
Model	WBA150B-48		
Item	Leakage Current	Temperature	25°C
		Testing Circuitry	Figure C
Object	———————		

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			170 [V]	277 [V]	305 [V]	
DEN-AN	Figure C-1	Both phases	0.21	0.36	0.40	Operation
		One of phases	0.42	0.72	0.79	Stand by
IEC62368-1	Figure C-2	Both phases	0.21	0.35	0.38	Operation
		One of phases	0.41	0.68	0.75	Stand by
	Figure C-3	Both phases	0.20	0.33	0.37	Operation
		One of phases	0.39	0.66	0.73	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	WBA150B-48
Item	Line Regulation
Object	+48V3.3A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph
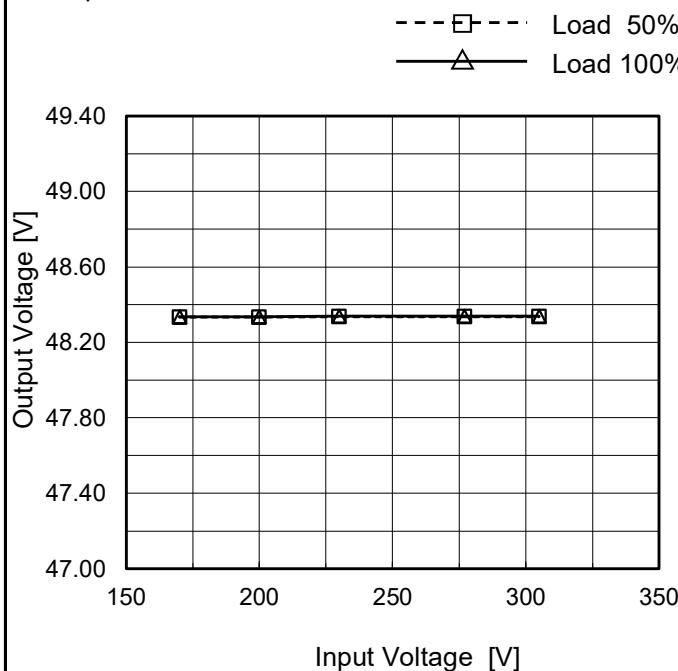
- - -⊡- - - Load 50%
———△——— Load 100%

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
170	48.333	48.336
200	48.335	48.337
230	48.335	48.338
277	48.336	48.339
305	48.336	48.339
--	-	-
--	-	-
--	-	-
--	-	-

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Model	WBA150B-48

Item	Load Regulation

Temperature   25°C
Testing Circuitry   Figure A

Object	+48V3.3A

1.Graph
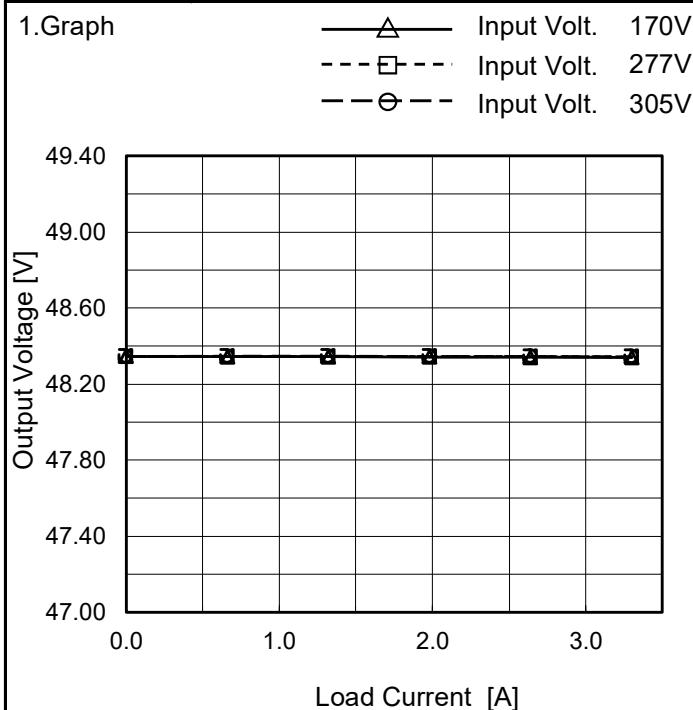
		Input Volt.	170V
		Input Volt.	277V
		Input Volt.	305V

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	48.345	48.345	48.346
0.66	48.345	48.345	48.346
1.32	48.344	48.346	48.346
1.98	48.343	48.345	48.345
2.64	48.342	48.344	48.345
3.30	48.340	48.343	48.344
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Output Voltage [V] vs Load Current [A]

Item	Ripple-Noise

Temperature   25°C
Testing Circuitry   Figure B

Object	+48V3.3A

1.Graph

Input Voltage   277V
Load   100%

20[mV/div]

20[ms/div]

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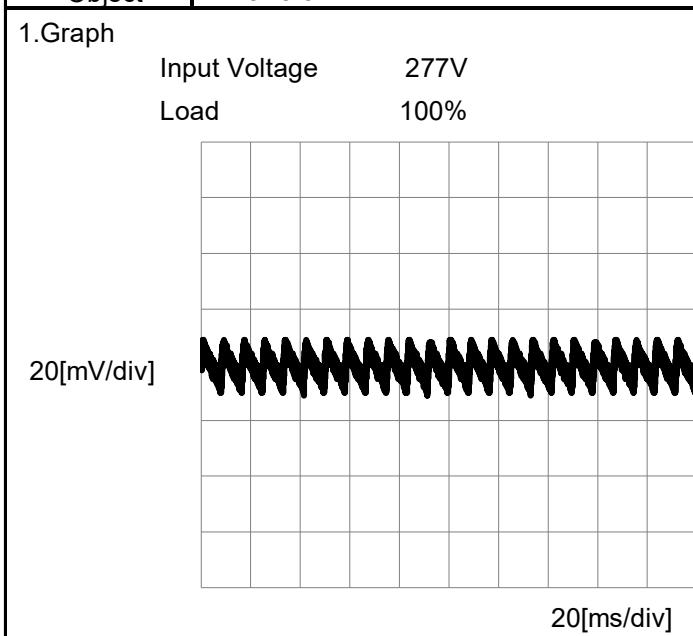
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Model	WBA150B-48
Item	Dynamic Load Response
Object	+48V3.3A

Temperature	25°C
Testing Circuitry	Figure A

Input Volt.   277 V

Cycle   1000 ms

Response. t1=t2=50μs. Typ

Load Current

t1

t2
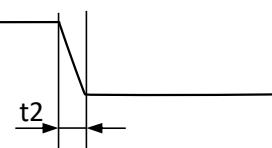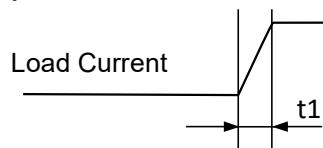
Load 0%(0A) ←→
Load 100%(3.3A)

200[mV/div]

5[ms/div]

20[ms/div]

Load 50%(1.65A) ←→
Load 100%(3.3A)

200[mV/div]

5[ms/div]

20[ms/div]

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Model	WBA150B-48
Item	Rise and Fall Time
Object	+48V3.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 277 V

Load 50%

Output Volt.

[10V/div]

0

Load 100%

Output Volt.

[10V/div]

0

Input Volt.

0

[200V/div] Time [50ms/div] Time [50ms/div]
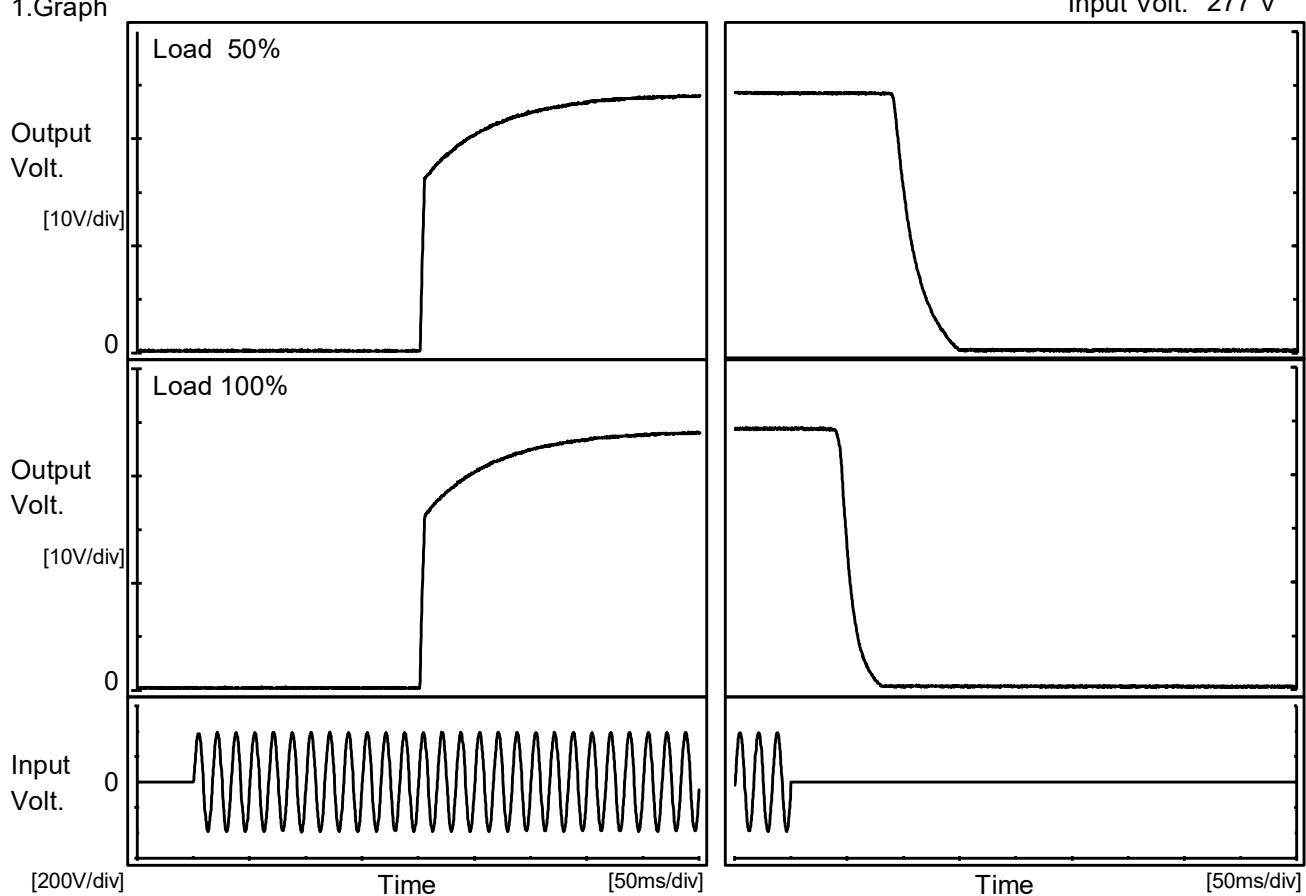
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	202.3	76.3	278.6	93.0	38.3
100 %	202.0	77.3	279.3	44.0	22.0

Output Volt.

90%

10%

0V

Input Volt. 0V

Td Tr Th Tf

Ts

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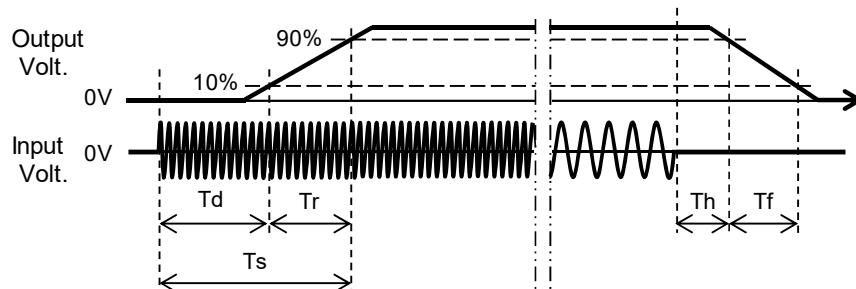
Model	WBA150B-48
Item	Hold-Up Time
Object	+48V3.3A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

- - -◻- - - Load 50%
——△—— Load 100%

Hold-Up Time [ms] vs Input Voltage [V]
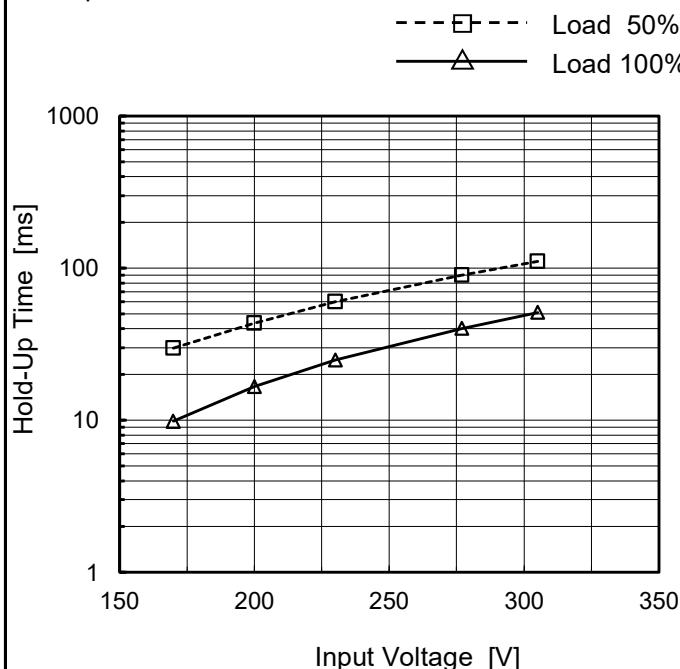
2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
170	30	10
200	44	17
230	60	25
277	90	40
305	111	51
--	-	-
--	-	-
--	-	-
--	-	-

This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

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Model	WBA150B-48
Item	Instantaneous Interruption Compensation
Object	+48V3.3A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

— △ — Input Volt. 170V
- - ☐ - - Input Volt. 277V
— ⊖ — Input Volt. 305V

Instantaneous Compensation Time [ms] vs Load Current [A]
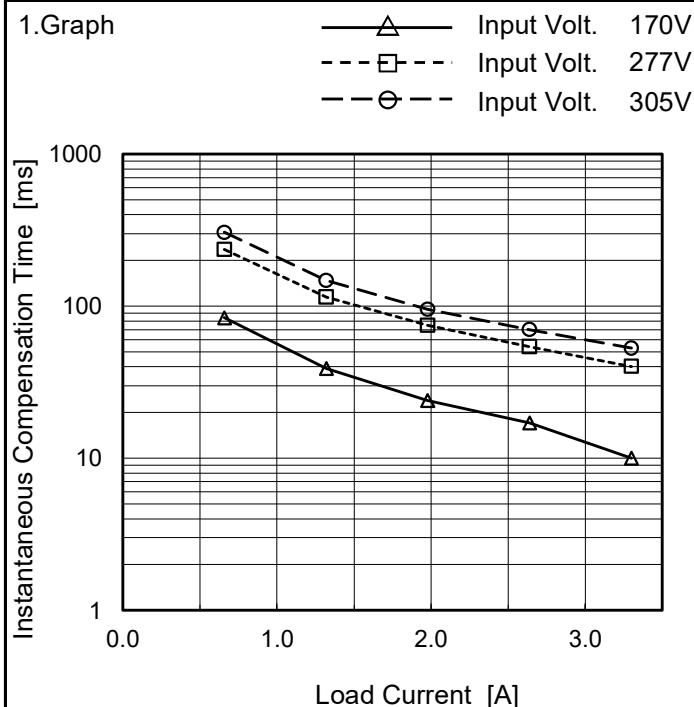
2.Values

Load Current [A]	Time [ms]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	-	-	-
0.66	84	236	306
1.32	39	115	147
1.98	24	75	95
2.64	17	54	70
3.30	10	40	53
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA150B-48
Item	Overcurrent Protection
Object	+48V3.3A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

————	Input Volt. 170V
————	Input Volt. 277V
————	Input Volt. 305V

Load Current [A]

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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
48	3.93	4.65	4.86
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA150B-48	
Item	Ambient Temperature Drift	Testing Circuitry Figure A
Object	+48V3.3A	

1.Values   Load 100%

Ambient Temperature[°C]	Output Voltage [V]		
	Input Volt. 170V	Input Volt. 277V	Input Volt. 280V
-20	48.150	48.153	48.115
25	48.315	48.318	48.182
50	48.387	48.389	48.382

Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+48V3.3A	

1.Values

Ambient Temperature[°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	63	119
25	62	118
50	62	116

Item	Overvoltage Protection	Testing Circuitry Figure A
Object	+48V3.3A	

1.Values   Load 0%

Ambient Temperature[°C]	Operating Point [V]	
	Input Volt. 170V	Input Volt. 305V
-20	60.62	60.17
25	59.23	59.91
50	59.88	60.65

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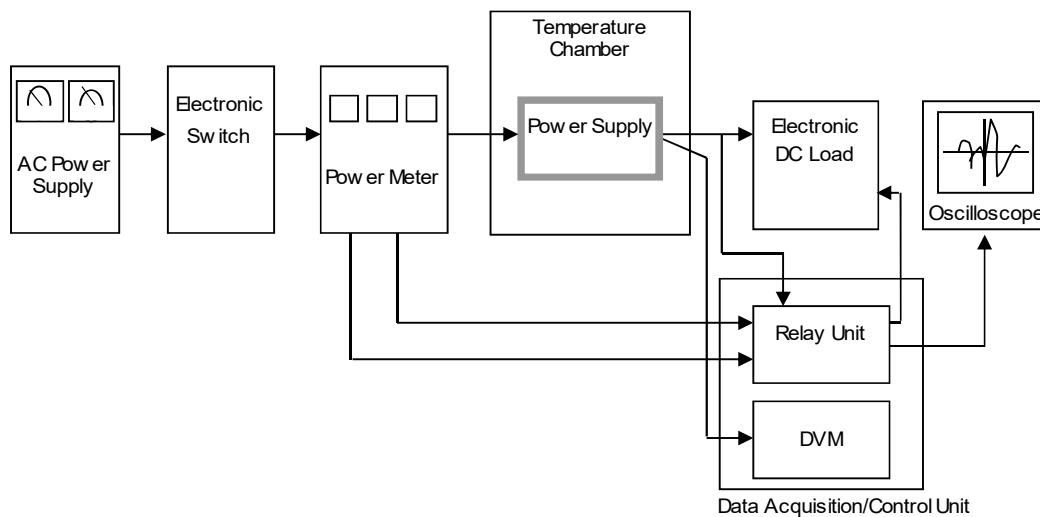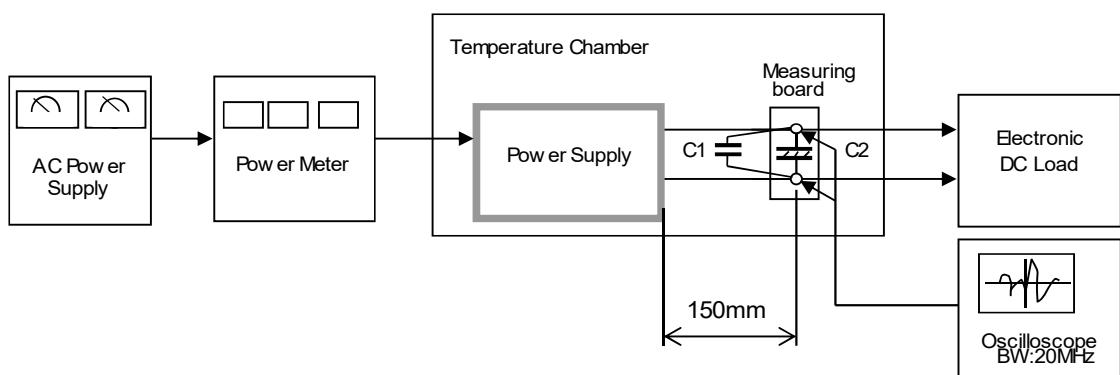
Figure A

C1= 0.1 μF
(Ceramic capacitor)

C2= 22 μF
(Electrolytic capacitor)

Figure B

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AC Input Line → AC Voltmeter → Power Supply → DC Ammeter → Adjustable Load

FG

1kΩ

Effective value Voltmeter

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{1k \ [\Omega]}$$

Figure C-1 (DEN-AN)

AC Input Line → AC Voltmeter → Power Supply → DC Ammeter → Adjustable Load

FG

500Ω±0.1%

1.5kΩ±0.1%

0.22μF±1.0%

10kΩ±0.1%

0.022μF±1.0%

Effective value Voltmeter

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$
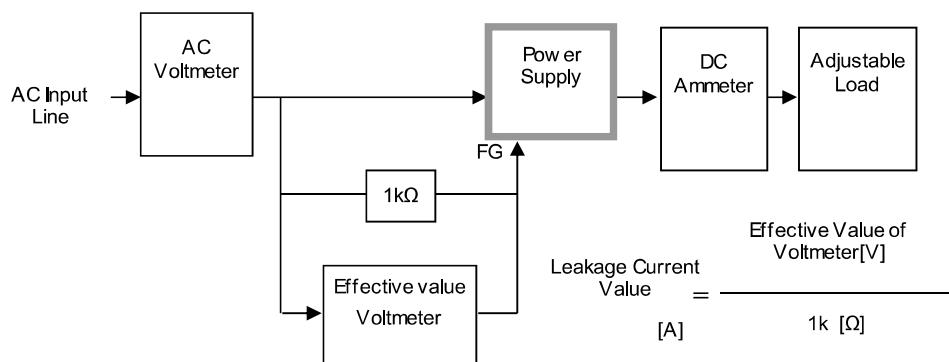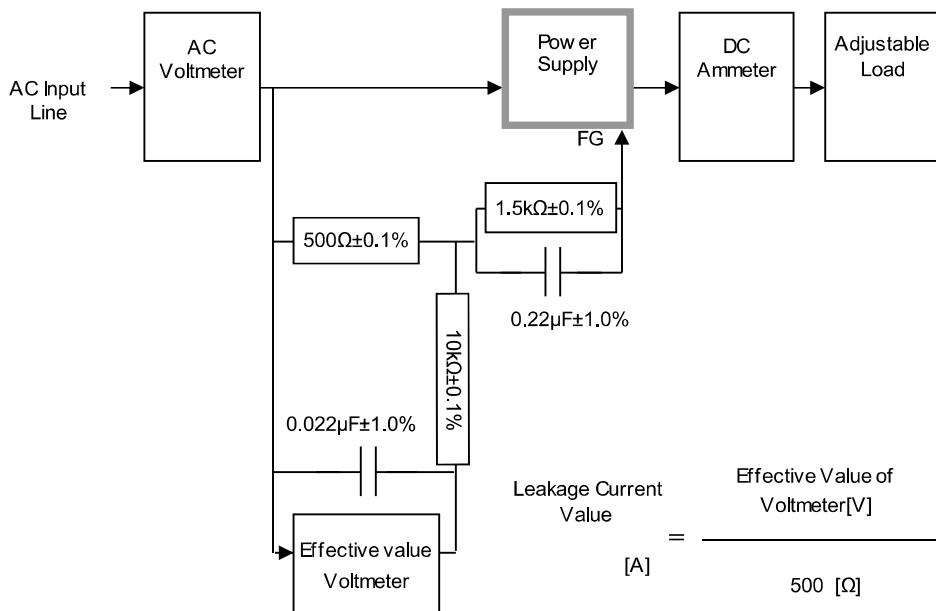
Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

AC Input Line → AC Voltmeter → Power Supply → DC Ammeter → Adjustable Load

FG

500Ω±0.1%

1.5kΩ±0.1%

0.22μF±1.0%

10kΩ±0.1%

9100pF±1.0%

20kΩ±0.1%   6200pF±1.0%

Effective value Voltmeter

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$
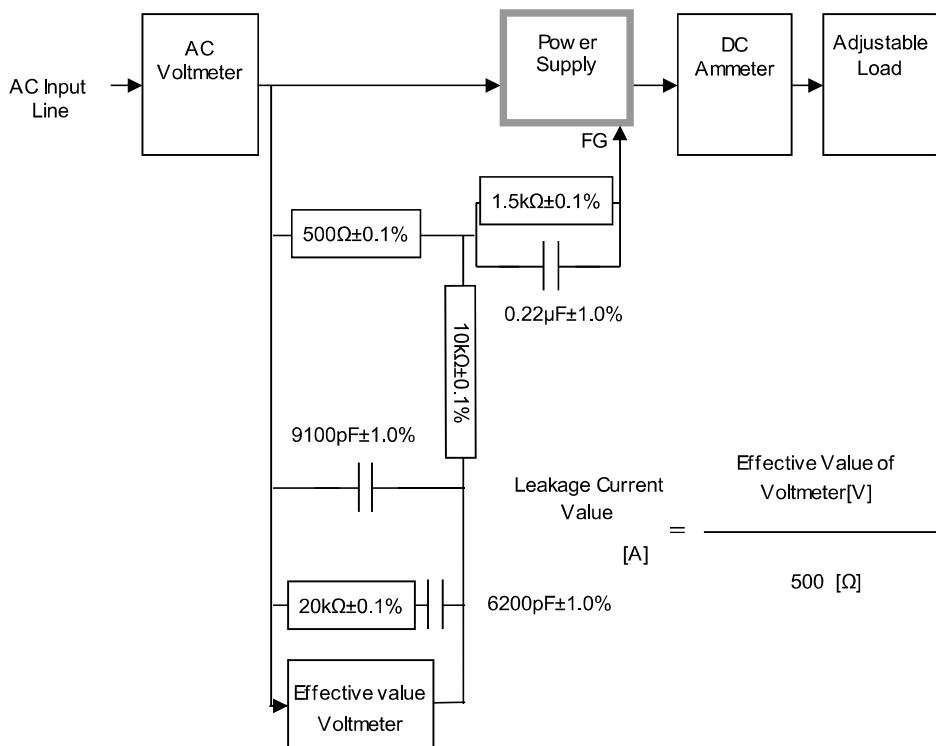
Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)

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