COSEL

TEST DATA OF WBA35B-48

Regulated DC Power Supply
May 24, 2021

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COSEL CO.,LTD.

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Model	WBA35B-48

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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	0.017	0.025	0.022
0.16	0.129	0.103	0.093
0.32	0.218	0.165	0.153
0.48	0.304	0.225	0.210
0.64	0.388	0.283	0.267
0.80	0.472	0.341	0.320
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA35B-48
Item	Efficiency (by Load Current)
Object	

Temperature	25°C
Testing Circuitry	Figure A

1.Graph
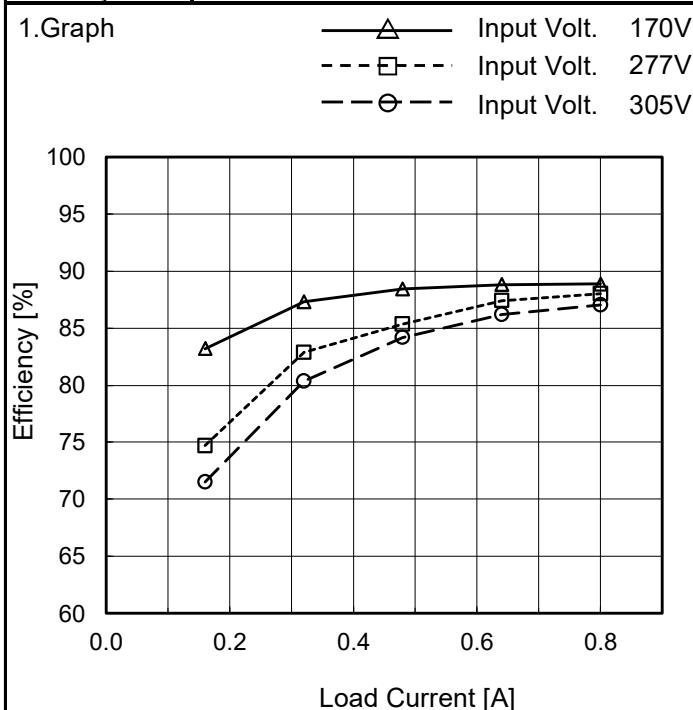
△——— Input Volt. 170V
--⊟--- Input Volt. 277V
——⊖—— Input Volt. 305V

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	-	-	-
0.16	83.2	74.7	71.5
0.32	87.3	82.9	80.4
0.48	88.5	85.4	84.2
0.64	88.8	87.4	86.2
0.80	88.9	88.0	87.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA35B-48
Item	Power Factor (by Load Current)
Object	————

Temperature	25°C
Testing Circuitry	Figure A

1.Graph
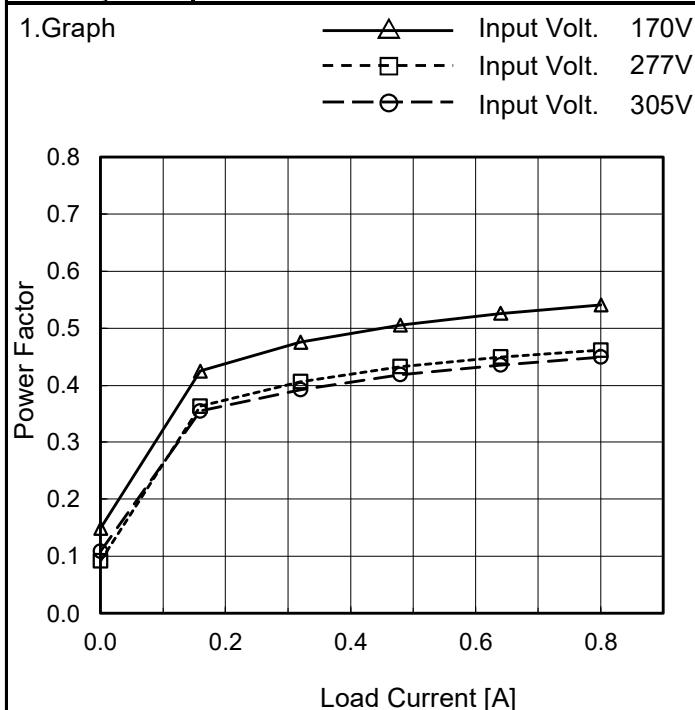
△ Input Volt. 170V
□ Input Volt. 277V
⊖ Input Volt. 305V

2.Values

Load Current [A]	Power Factor		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	0.149	0.092	0.109
0.16	0.425	0.363	0.355
0.32	0.475	0.406	0.392
0.48	0.506	0.432	0.418
0.64	0.526	0.449	0.435
0.80	0.541	0.461	0.450
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA35B-48		
Item	Inrush Current	Temperature	25°C
		Testing Circuitry	Figure A
Object	————		

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	2.3 A

Primary inrush current   Secondary inrush current

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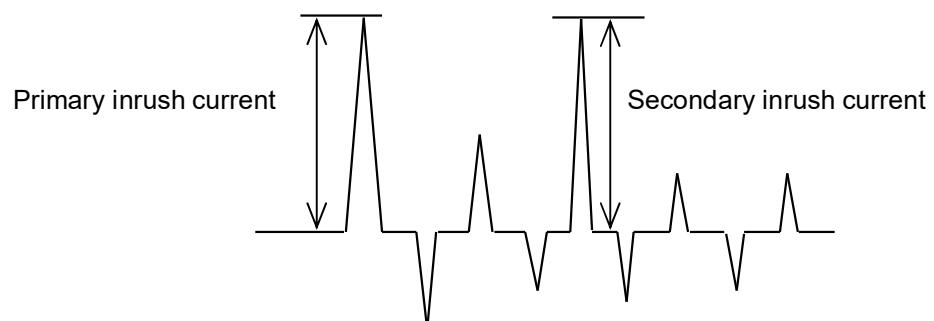
Model	WBA35B-5		
Item	Leakage Current	Temperature	25°C
Object		Testing Circuitry	Figure C

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	0.40	0.68	0.75	Stand by
IEC62368-1	Figure C-2	Both phases	0.21	0.36	0.40	Operation
		One of phases	0.40	0.67	0.75	Stand by
	Figure C-3	Both phases	0.21	0.36	0.39	Operation
		One of phases	0.40	0.67	0.74	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	WBA35B-48
Item	Line Regulation
Object	+48V0.8A

Temperature	25°C
Testing Circuitry	Figure A

1.Graph
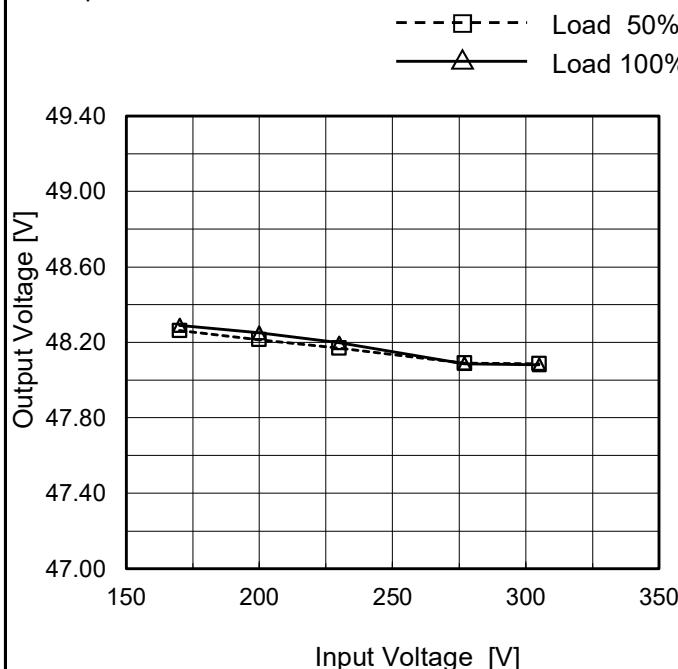
- - -☐- - - Load 50%
──△── Load 100%

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
170	48.262	48.290
200	48.214	48.251
230	48.168	48.198
277	48.091	48.087
305	48.086	48.081
--	-	-
--	-	-
--	-	-
--	-	-

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Model	WBA35B-48
Item	Load Regulation
Object	+48V0.8A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
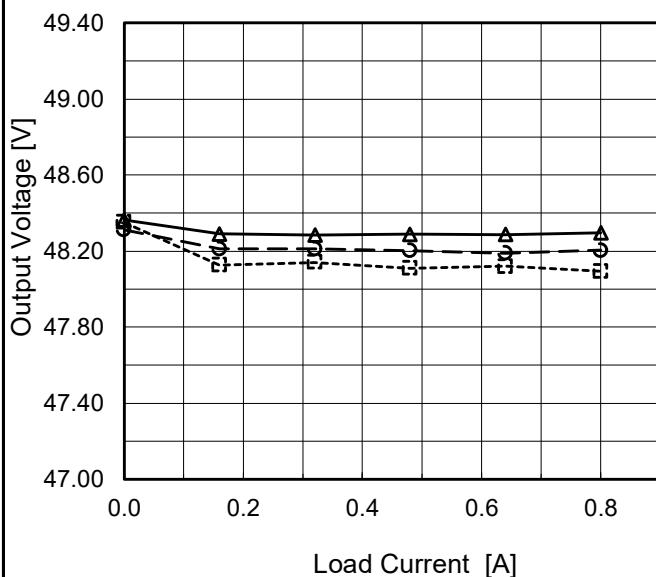
— △ — Input Volt. 170V
--- ⊟ --- Input Volt. 277V
— ⊖ — Input Volt. 305V

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	48.364	48.351	48.311
0.16	48.291	48.126	48.212
0.32	48.285	48.140	48.213
0.48	48.288	48.109	48.203
0.64	48.286	48.119	48.188
0.80	48.296	48.094	48.204
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Item	Ripple-Noise
Object	+48V0.8A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

Input Voltage 277V
Load 100%

20[mV/div]

20[ms/div]

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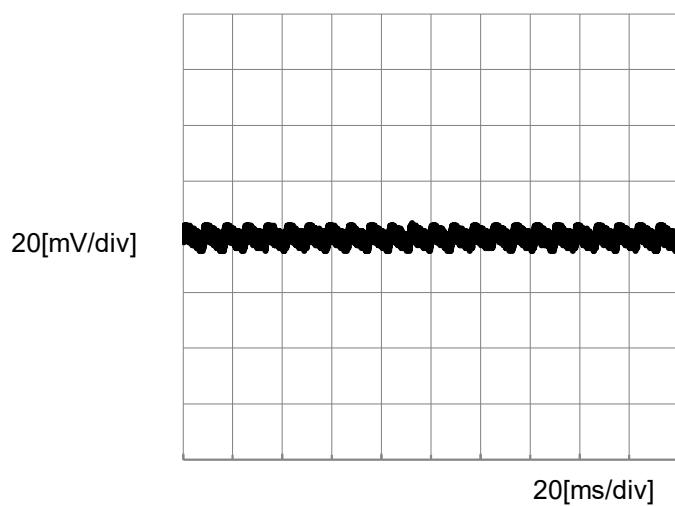
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Model	WBA35B-48
Item	Dynamic Load Response
Object	+48V0.8A

Temperature	25°C
Testing Circuitry	Figure A

Input Volt. 277 V

Cycle 1000 ms

Response. t1=t2=50μs. Typ

Load Current

t1

t2
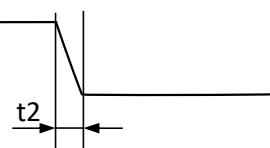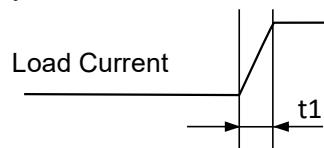
Load 0%(0A) ←→

Load 100%(0.8A)

200[mV/div]

20[ms/div]

20[ms/div]

Load 50%(0.4A) ←→

Load 100%(0.8A)

200[mV/div]

20[ms/div]

20[ms/div]

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Model	WBA35B-48
Item	Rise and Fall Time
Object	+48V0.8A

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]
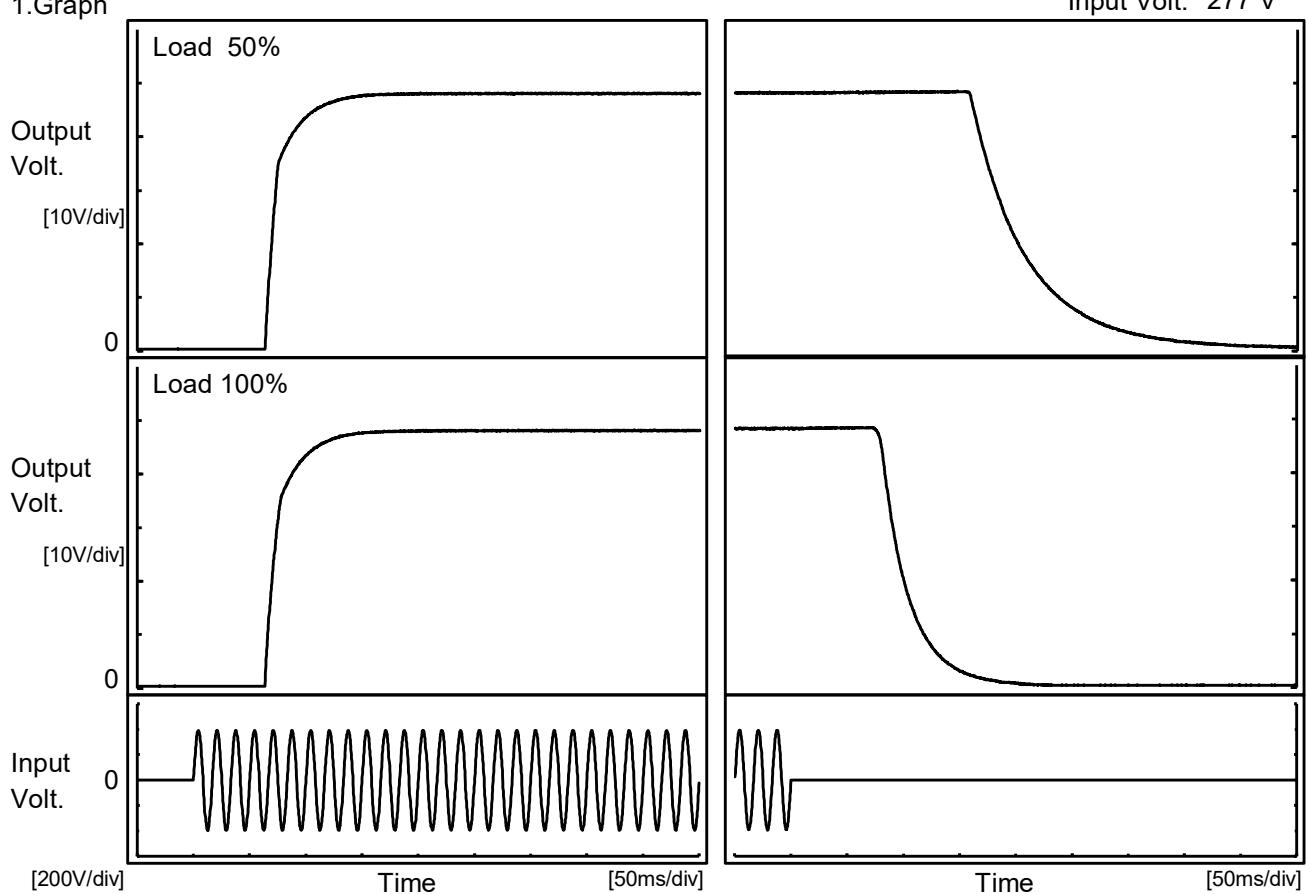
2.Values

[ms]

Load ╲ Time	Td	Tr	Ts	Th	Tf
50 %	64.8	35.3	100.1	164.0	110.8
100 %	64.5	36.0	100.5	81.3	54.3

Output Volt.

90%

10%

0V

Input Volt.   0V

Td   Tr   Th   Tf

Ts

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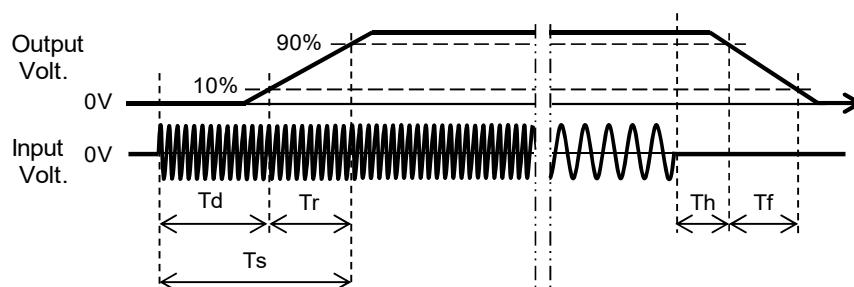
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Model	WBA35B-48
Item	Hold-Up Time
Object	+48V0.8A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -◻- - - Load 50%
——△—— Load 100%

Hold-Up Time [ms]

Input Voltage [V]

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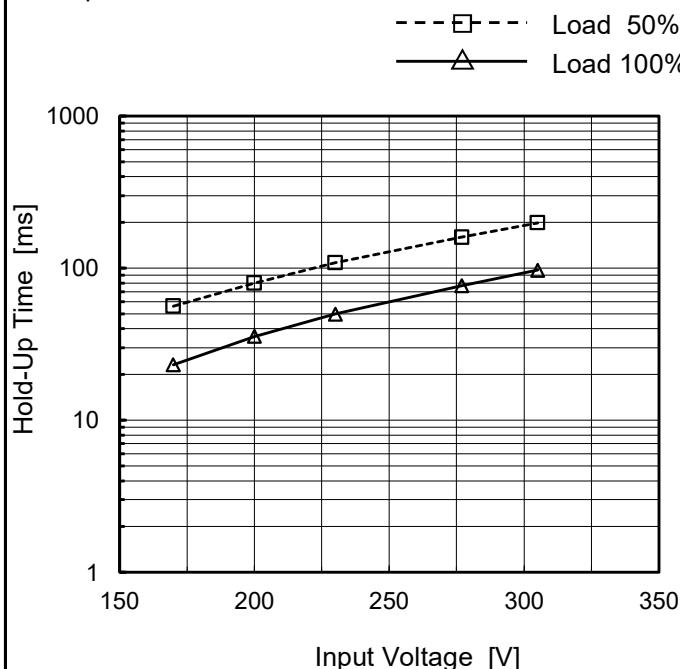
2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
170	56	23
200	80	35
230	108	50
277	160	77
305	198	97
--	-	-
--	-	-
--	-	-
--	-	-

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Model	WBA35B-48
Item	Instantaneous Interruption Compensation
Object	+48V0.8A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
— △ — Input Volt. 170V
- - □ - - Input Volt. 277V
— ⊖ — Input Volt. 305V
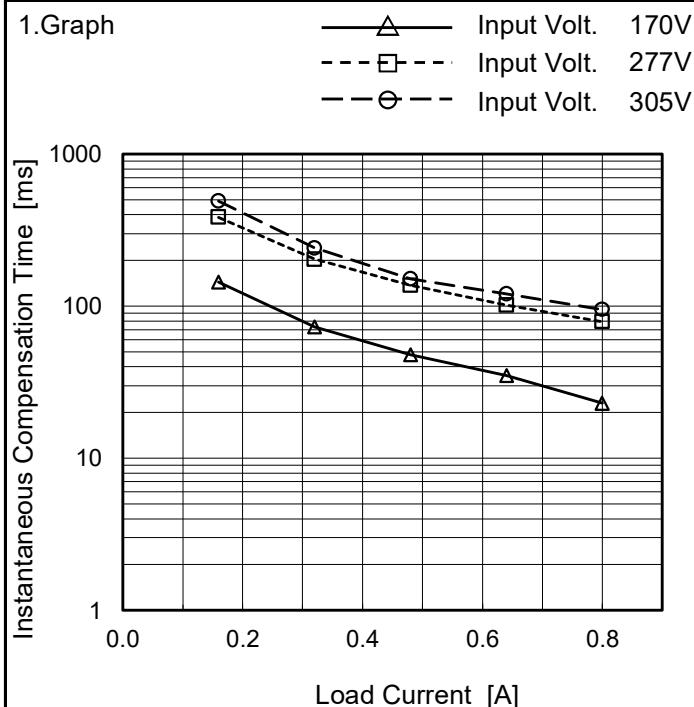
2.Values

Load Current [A]	Time [ms]		
	Input Volt. 170[V]	Input Volt. 277[V]	Input Volt. 305[V]
0.00	-	-	-
0.16	144	384	490
0.32	73	204	241
0.48	48	137	151
0.64	35	102	120
0.80	23	79	95
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA35B-48
Item	Overcurrent Protection
Object	+48V0.8A

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	0.93	1.05	1.07
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	WBA35B-48	
Item	Ambient Temperature Drift	Testing Circuitry Figure A
Object	+48V0.8A	

1.Values   Load 100%

Ambient Temperature[℃]	Output Voltage [V]		
	Input Volt. 170V	Input Volt. 277V	Input Volt. 305V
-20	48.090	47.860	48.159
25	48.283	48.081	48.234
50	48.340	48.147	48.312

Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+48V0.8A	

1.Values

Ambient Temperature[℃]	Input Voltage [V]	
	Load 50%	Load 100%
-20	45	97
25	45	96
50	45	95

Item	Overvoltage Protection	Testing Circuitry Figure A
Object	+48V0.8A	

1.Values   Load 0%

Ambient Temperature[℃]	Operating Point [V]	
	Input Volt. 170V	Input Volt. 305V
-20	58.31	58.20
25	58.97	58.98
50	59.37	59.43

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Temperature
Chamber

| AC Power Supply | Electronic Switch | Power Meter | Power Supply | Electronic DC Load | Oscilloscope |

Relay Unit

DVM

Data Acquisition/Control Unit

Figure A

Temperature Chamber

Measuring board

| AC Power Supply | Power Meter | Power Supply | C1 | C2 | Electronic DC Load |

Oscilloscope
BW:20MHz

150mm
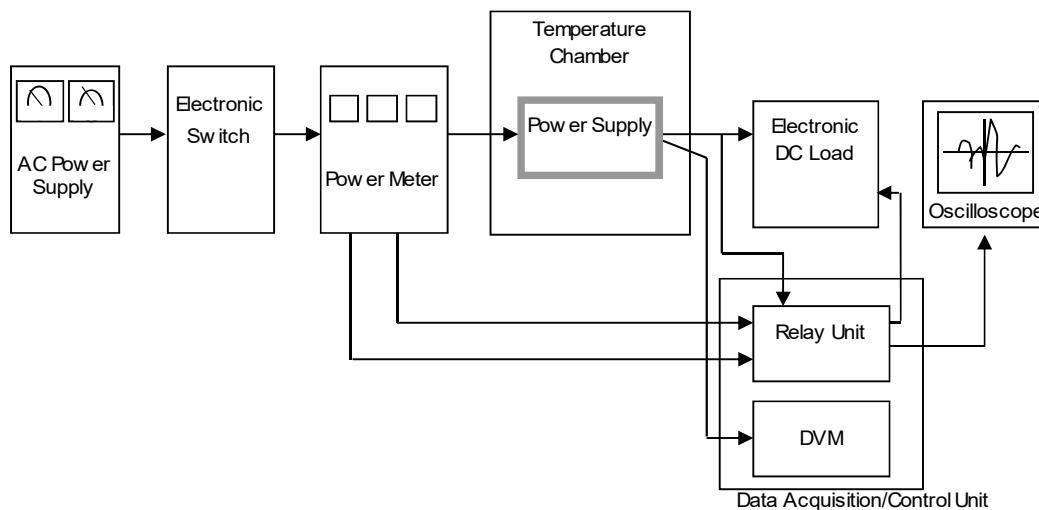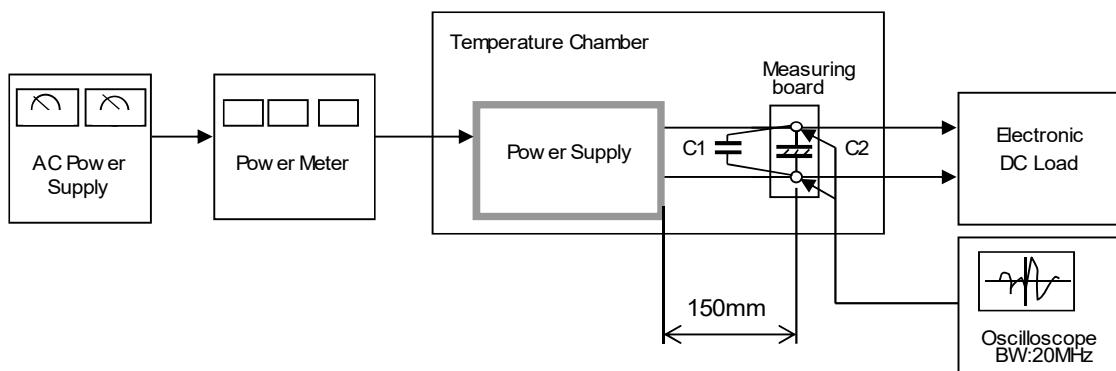
C1= 0.1 μF
(Ceramic capacitor)

C2= 47 μF
(Electrolytic capacitor)

Figure B

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Figure C-1 (DEN-AN)

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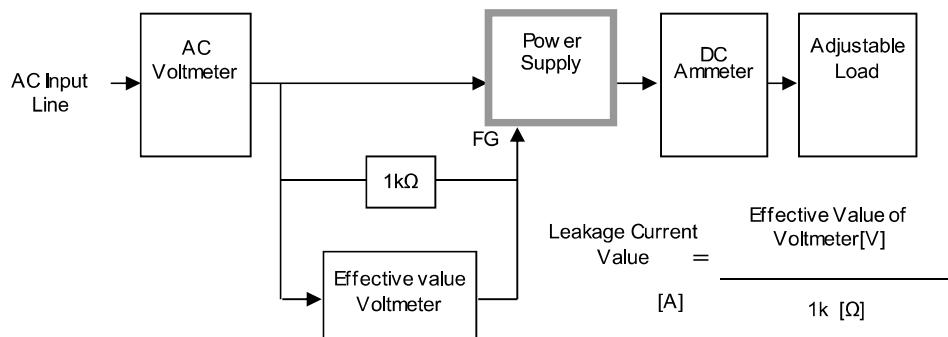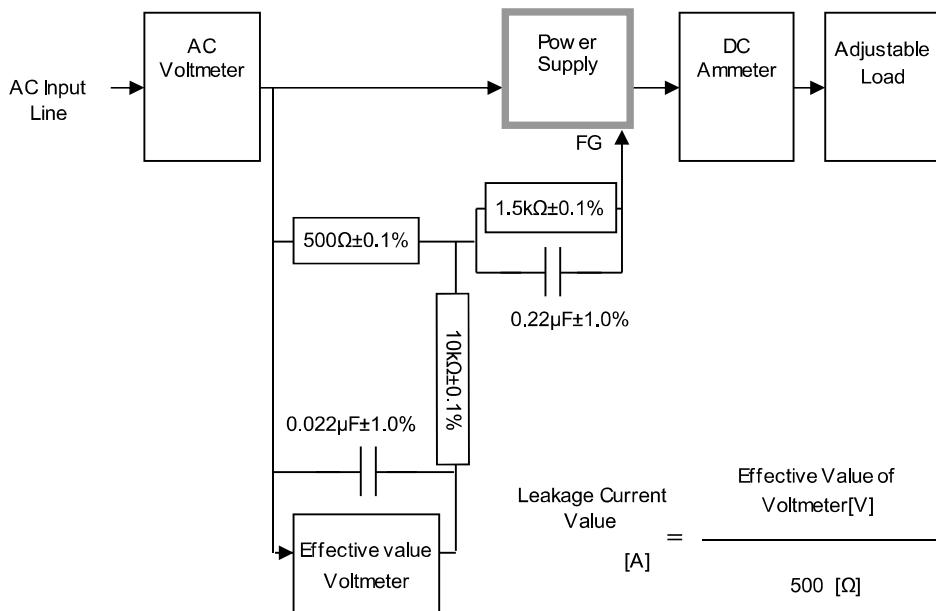
Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

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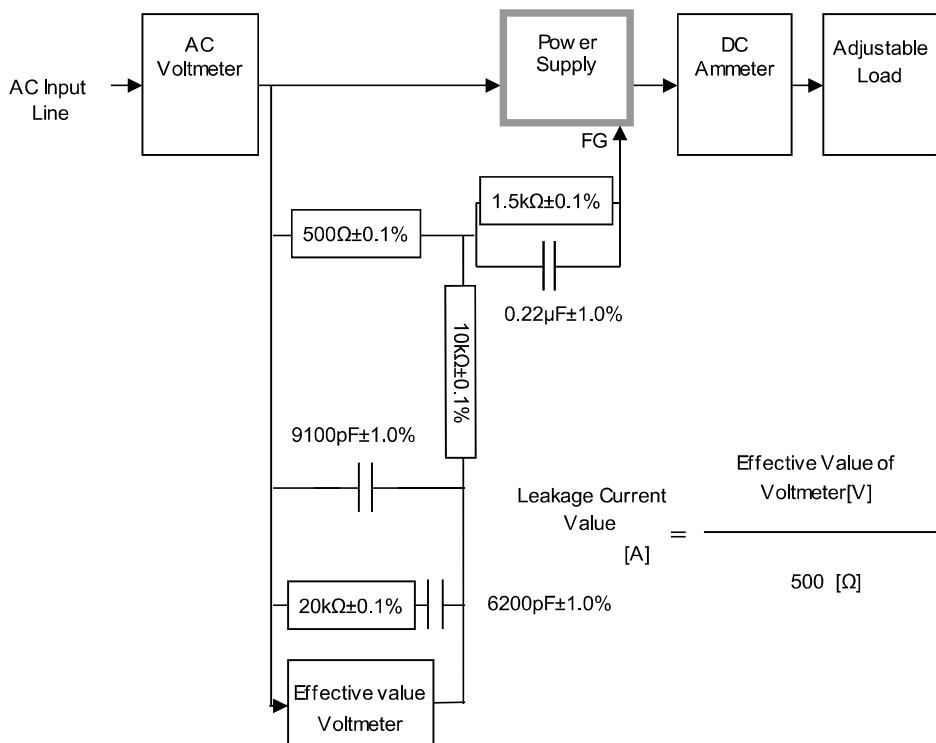
Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$

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