

ZWS150BP

SPECIFICATIONS

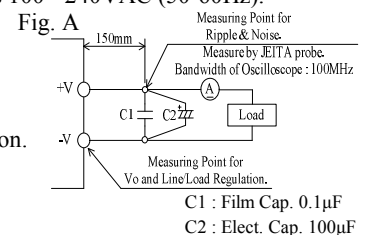
A252-01-01B

ITEMS		MODEL	ZWS150BP	ZWS150BP	ZWS150BP	
			-24	-36	-48	
1	Nominal Output Voltage	V	24	36	48	
2	Average Output Current	A	6.3	4.2	3.2	
3	Peak Output Current (*1)	A	12.6	8.4	6.4	
4	Average Output Power	W	151.2	151.2	153.6	
5	Peak Output Power (*1)	W	302.4	302.4	307.2	
6	Efficiency (Typ)	100VAC	%			
		(*2) 200VAC	%			
7	Input Voltage Range (*3)(*13)	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC			
8	Input Current (Typ) (*2)	A	1.9/0.95			
9	Inrush Current (Typ) (*2)(*4)	-	15A at 100VAC, 30A at 200VAC, Ta=25°C, Cold Start			
10	PFHC	-	Designed to meet IEC61000-3-2			
11	Power Factor (Typ) (*2)	-	0.98/0.93			
12	Output Voltage Range	V	21.6 - 27.5	32.4 - 39.6	39.6 - 52.8	
13	Maximum Ripple & Noise (*5)	0≤Ta≤70°C	mV	240	360	480
		-10≤Ta<0°C	mV	360	540	720
14	Maximum Line Regulation (*5)(*6)	mV	96	144	192	
15	Maximum Load Regulation (*5)(*7)	mV	192	288	384	
16	Temperature Coefficient (*5)	-	Less than 0.02% / °C			
17	Over Current Protection (*8)	A	12.66 -	8.44 -	6.43 -	
18	Over Voltage Protection (*9)	V	28.8 - 33.6	41.4 - 48.6	55.2 - 64.8	
19	Hold-up Time (Typ) (*2)	-	20ms			
20	Leakage Current (*10)	-	Less than 0.5mA. 0.2mA(Typ) at 100VAC / 0.4mA(Typ) at 230VAC			
21	Remote Control	-	Option			
22	Parallel Operation	-	-			
23	Series Operation	-	Possible			
24	Operating Temperature (*11)	-	Convection : -10 - +70°C (-10 - +50°C:100%, +60°C:75%, +70°C:50%)			
25	Operating Humidity	-	30 - 90%RH (No Condensing)			
26	Storage Temperature	-	-30 - +75°C			
27	Storage Humidity	-	10 - 90%RH (No Condensing)			
28	Cooling	-	Convection Cooling			
29	Withstand Voltage	-	Input - FG : 2kVAC (10mA), Input - Output : 3kVAC (10mA) Output - FG : 500VAC (20mA) for 1min			
30	Isolation Resistance	-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC			
31	Vibration	-	At no operating, 10 - 55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.			
32	Shock	-	Less than 196.1m/s ²			
33	Safety	-	Approved by UL60950-1, CSA60950-1, EN60950-1, EN50178(OV II), Designed to meet DENAN at 100VAC only.			
34	Conducted Emission (*12)	-	Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B			
35	Radiated Emission (*12)	-	Designed to meet EN55011/EN55022-B, FCC-B, VCCI-B			
36	Immunity	-	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11			
37	Weight (Typ)	g	360			
38	Size (W x H x D)	mm	75 x 37 x 160 (Refer to Outline Drawing)			

*Read instruction manual carefully, before using the power supply unit.

=NOTES=

- *1. Operating time at peak output is less than 5sec, duty is less than 40%. For details, refer to peak output condition (A252-01-03_).
When the peak output more than 5 sec is continued, the output is shut down, manual reset.
- *2. At 100VAC/200VAC, Ta=25°C, nominal output voltage and average output power.
- *3. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC (50-60Hz).
- *4. Not applicable for the in-rush current to Noise Filter for less than 0.2ms.
- *5. Please refer to Fig. A for measurement of Vo, line & load regulation and ripple voltage.
- *6. 90 - 265VAC, constant load.
- *7. No load-Average load, constant input voltage.
- *8. Constant current limit with automatic recovery. Avoid to operate at over load or short circuit condition.
- *9. OVP circuit will shut down output, manual reset (Re power on).
- *10. Measured by the each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
- *11. Output Derating - Derating at standard mounting. Refer to output derating curve (A252-01-02_).
- When forced air cooling, refer to forced air cooling specifications (A252-01-04_, A252-01-05_, A252-01-06_).
- Load (%) is percent of average output power or average output current, do not exceed its derating of average load.
- *12. At Ta=25°C and average output power.
- *13. Output derating needed when input voltage less than 90VAC. Refer to output derating vs. input voltage (A252-01-02_).



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OUTPUT DERATING

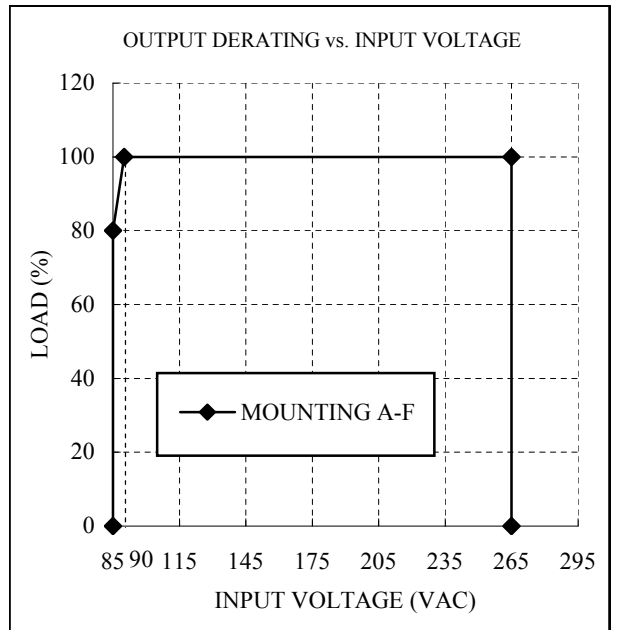
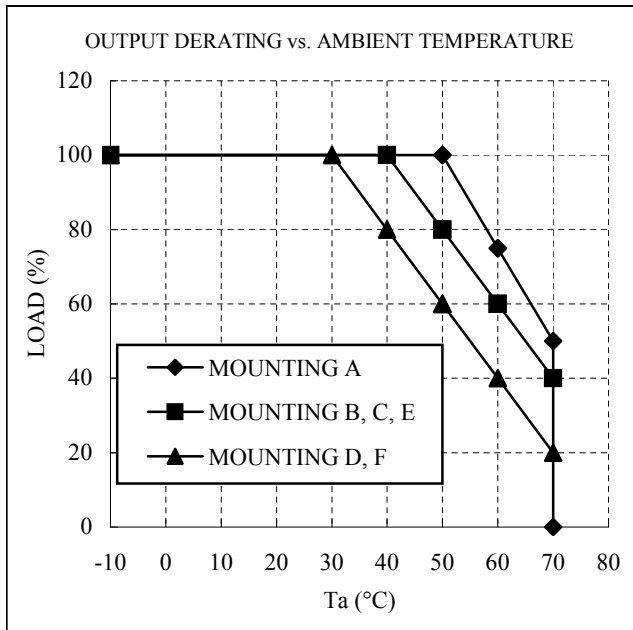
A252-01-02A

*COOLING : CONVECTION COOLING

Ta (°C)	LOAD (%)		
	MOUNTING A	MOUNTING B,C,E	MOUNTING D,F
-10 - +30	100	100	100
40	100	100	80
50	100	80	60
60	75	60	40
70	50	40	20

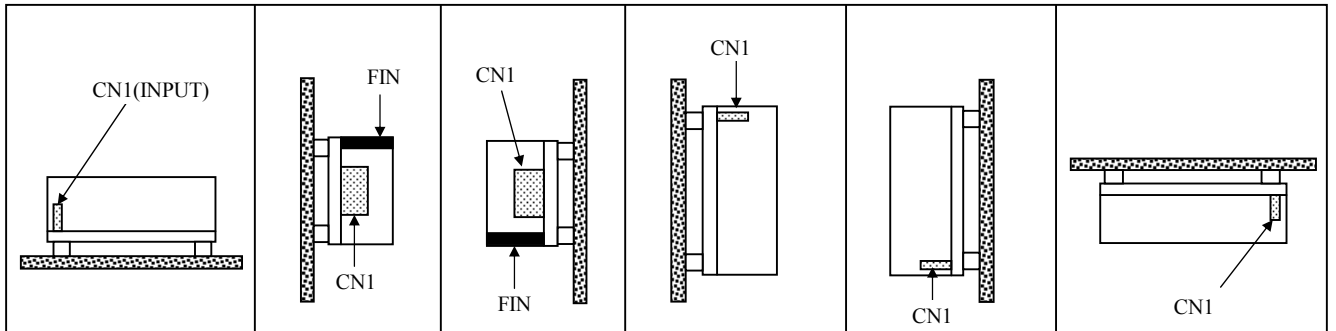
*COOLING : CONVECTION / FORCED AIR COOLING

INPUT VOLTAGE (VAC)	LOAD (%)
	MOUNTING A-F
85	80
90 - 265	100



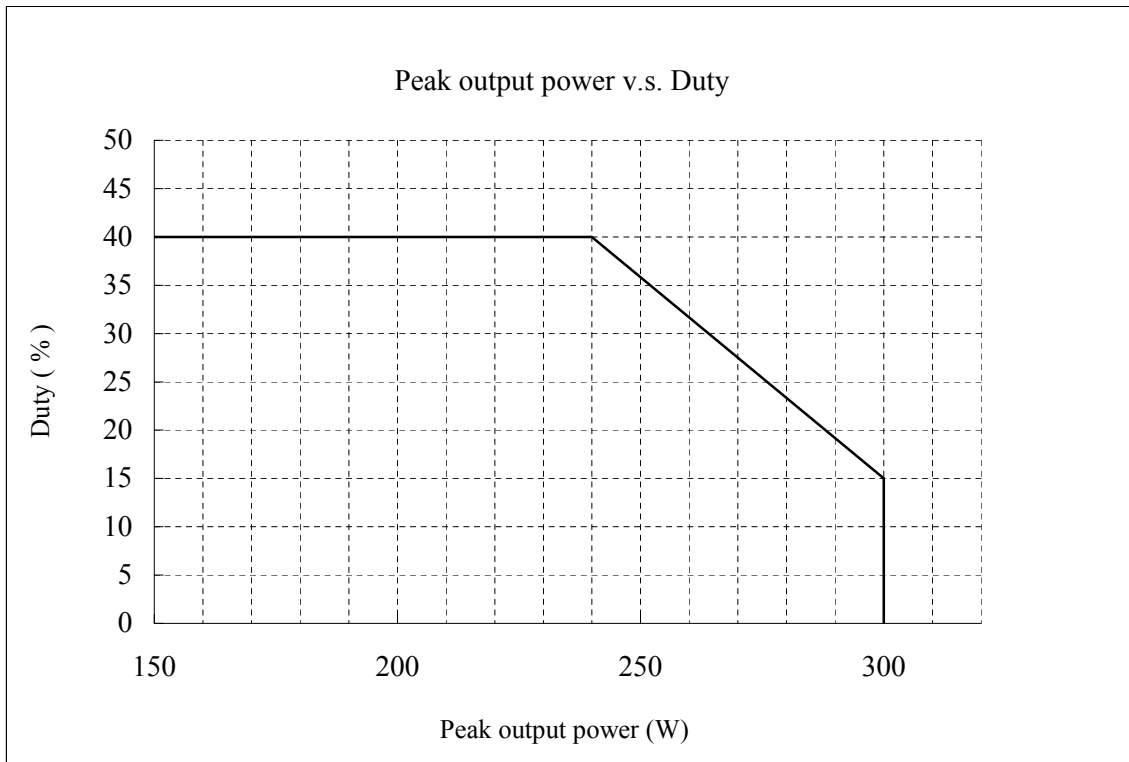
MOUNTING A MOUNTING B MOUNTING C MOUNTING D MOUNTING E MOUNTING F

(STANDARD MOUNTING)



PEAK OUTPUT CONDITION

A252-01-03



Peak output power

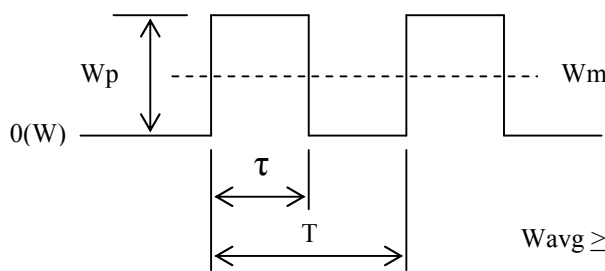
Use this product so that relationship among Duty, average output power (W_m) and peak output power (W_p) satisfy conditions defined by expression below.

This product must be used less than average output power of specification (W_{avg}).

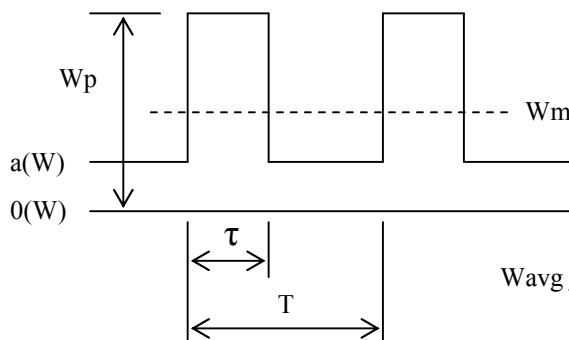
Also operating duration at peak output power should be less than 5 sec.

$$\text{Duty} = \frac{\tau}{T} \times 100 (\%) \quad \tau \leq 5 (\text{sec})$$

- W_p : Peak output power (W)
- W_{avg} : Average output power of Specification (W)
- W_m : Average output power (W)
- τ : Pulse width of peak output power (sec)
(Operating time at peak output)
- T : Period (sec)
- Duty : The duty is pulse width of peak output power of one period (%)



$$W_{avg} \geq W_m = \frac{W_p \times \tau}{T}$$



$$W_{avg} \geq W_m = \frac{(W_p - a) \times \tau}{T} + a$$

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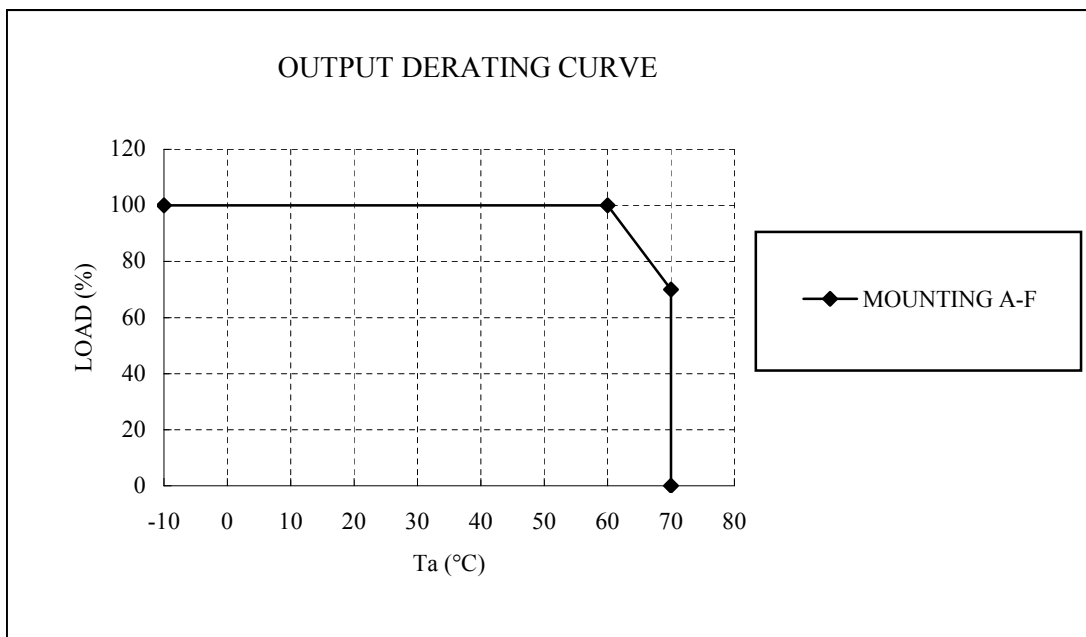
OUTPUT DERATING

A252-01-04

*COOLING : FORCED AIR COOLING

Ta (°C)	LOAD (%)
	MOUNTING A-F
-10 - +60	100
70	70

Air velocity $\geq 0.7\text{m/s}$: Air must flow through component side.



MOUNTING A

MOUNTING B

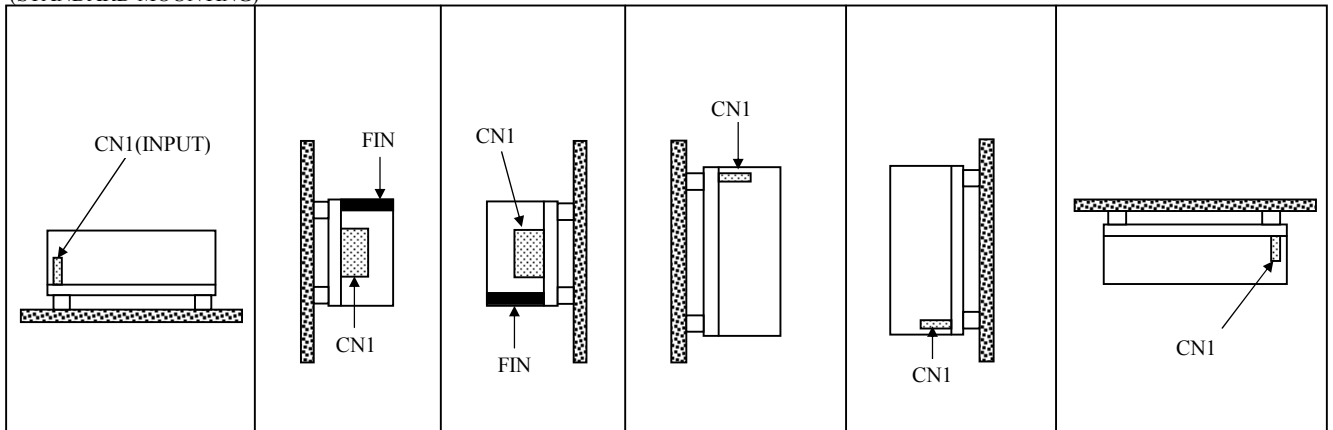
MOUNTING C

MOUNTING D

MOUNTING E

MOUNTING F

(STANDARD MOUNTING)



ZWS150BP

SPECIFICATIONS (FORCED AIR COOLING)

A252-01-05

ITEMS		MODEL	ZWS150BP -24	ZWS150BP -36	ZWS150BP -48
1	Nominal Output Voltage	V	24	36	48
2	Average Output Current	A	8.4	5.6	4.3
3	Peak Output Current (*1)	A	12.6	8.4	6.4
4	Average Output Power	W	201.6	201.6	206.4
5	Peak Output Power (*1)	W	302.4	302.4	307.2
6	Efficiency (Typ)	100VAC	%		
		(*2) 200VAC	%		
7	Input Voltage Range (*3)(*4)	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC		
8	Input Current (Typ) (*2)	A	2.5/1.3		
9	Hold-up Time (Typ) (*2)	-	16ms(typ) at 100VAC & Rated O/P Power, 20ms(typ) at 100VAC & 75% Load		
10	Operating Temperature (*5)	-	-10 - +70°C (-10 - +60°C:100%, +70°C:70%)		
11	Cooling (*6)	-	Forced Air Cooling		
12	Conducted Emission (*7)	-	Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A		
13	Radiated Emission (*7)	-	Designed to meet EN55011/EN55022-A, FCC-A, VCCI-A		

*Read instruction manual carefully, before using the power supply unit.

*For other specification items, refer to specifications(A252-01-01_).

=NOTES=

- *1. Operating time at peak output is less than 5sec, duty is less than 40%. For details, refer to peak output condition (A252-01-03_).
When the peak output more than 5 sec is continued, the output is shut down, manual reset.
- *2. At 100VAC/200VAC, Ta=25°C, nominal output voltage and average output power.
- *3. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC (50-60Hz).
- *4. Output derating needed when input voltage less than 90VAC. Refer to output derating vs. input voltage (A252-01-02_).
- *5. Output Derating - Derating at standard mounting. Refer to output derating curve (A252-01-06_).
- Load (%) is percent of average output power or average output current, do not exceed its derating of average load.
- *6. Forced air cooling with air velocity more than 1.5m/s (measured at component side of PCB, air must flow through component side)
- *7. At Ta=25°C and average output power.

ZWS150BP

OUTPUT DERATING

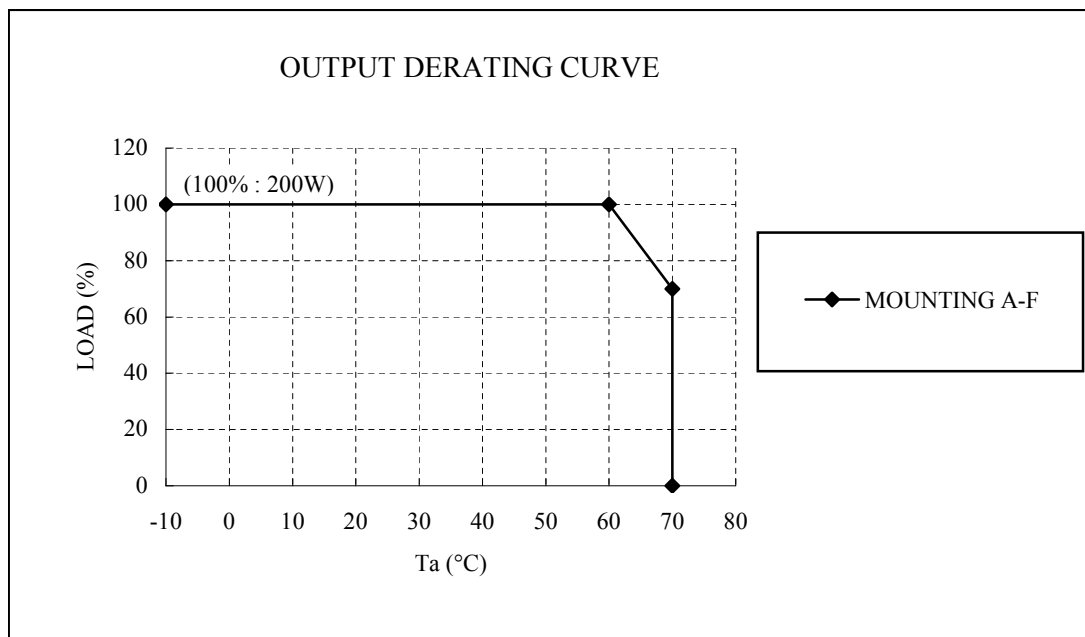
A252-01-06

*AVERAGE OUTPUT POWER : 200W

*COOLING : FORCED AIR COOLING

Ta (°C)	LOAD (%)
	MOUNTING A-F
-10 - +60	100
70	70

Air velocity $\geq 1.5\text{m/s}$: Air must flow through component side.



MOUNTING A

MOUNTING B

MOUNTING C

MOUNTING D

MOUNTING E

MOUNTING F

(STANDARD MOUNTING)

