

## SPECIFICATIONS

A228-01-01/A-C

ITEMS		MODEL	HWS150 -3/A	HWS150 -5/A	HWS150 -12/A	HWS150 -15/A	HWS150 -24/A	HWS150 -48/A	
1	Nominal Output Voltage	V	3.3	5	12	15	24	48	
2	Maximum Output Current	A	30	30	13	10	6.5	3.3	
3	Maximum Output Power	W	99	150	156	150	156	158.4	
4	Efficiency (Typ) (*1)	100VAC	%	78	83	83	83	85	85
		200VAC	%	81	86	86	86	88	88
5	Input Voltage Range (*2)	-	85 ~ 265VAC (47 ~ 63Hz) or 120 ~ 370VDC						
6	Input Current (100/200VAC)(Typ) (*1)	A	1.3/0.65	1.9/0.95					
7	Inrush Current(Typ) (*3)	-	14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start						
8	PFHC	-	Built to meet IEC61000-3-2						
9	Power Factor (100/200VAC)(Typ) (*1)	-	0.98/0.90	0.99/0.95					
10	Output Voltage Range	V	2.97~3.96	4.0~6.0	9.6~14.4	12.0~18.0	19.2~28.8	38.4~52.8	
11	Maximum Ripple & Noise (*4)	0≤Ta<60°C	mV	120	120	150	150	150	200
		-10≤Ta<0°C	mV	160	160	180	180	180	240
12	Maximum Line Regulation (*5)	mV	20	20	48	60	96	192	
13	Maximum Load Regulation (*6)	mV	40	40	96	120	192	384	
14	Temperature Coefficient	-	Less than 0.02% / °C						
15	Over Current Protection (*7)	A	31.5 ~	31.5 ~	13.6 ~	10.5 ~	6.82 ~	3.46 ~	
16	Over Voltage Protection (*8)	V	4.13~4.95	6.25~7.25	15.0~17.4	18.8~21.8	30.0~34.8	55.2~64.8	
17	Hold-up Time (Typ) (*9)	-	20ms						
18	Leakage Current (*10)	-	Less than 0.5mA. 0.2mA(Typ) at 100VAC / 0.4mA(Typ) at 230VAC						
19	Remote Sensing	-	Possible						
20	Parallel Operation	-	-						
21	Series Operation	-	Possible						
22	Operating Temperature (*11)	-	-10 ~+60°C (-10 ~+40°C:100%,+50°C:60%,+60°C:20%)						
23	Operating Humidity	-	30 ~ 90%RH (No dewdrop)						
24	Storage Temperature	-	-30 ~ +85°C						
25	Storage Humidity	-	10 ~ 95%RH (No dewdrop)						
26	Cooling	-	Convection Cooling						
27	Withstand Voltage	-	Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (100mA) for 1min						
28	Isolation Resistance	-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
29	Vibration	-	At no operating, 10 ~ 55Hz (Sweep for 1min) 19.6m/s <sup>2</sup> Constant, X,Y,Z 1hour each.						
30	Shock (In package)	-	Less than 196.1m/s <sup>2</sup>						
31	Safety (*12)	-	Approved by UL60950-1, CSA60950-1, EN60950-1, EN50178 Built to meet UL508, DENAN						
32	Line DIP	-	Built to meet SEMI-F47 (200VAC Line only)						
33	Conducted Emission	-	Built to meet EN55011/EN55022-B, FCC-B, VCCI-B						
34	Radiated Emission	-	Built to meet EN55011/EN55022-B, FCC-B, VCCI-B						
35	Immunity	-	Built to meet IEC61000-4-2(Level 2,3), -3(Level 3), -4(Level 3), -5(Level 3,4), -6(Level 3), -8(Level 4), -11						
36	Weight(Typ.)	-	550g						
37	Size (W x H x D)	mm	42 x 82 x 160 ( Refer to Outline Drawing )						

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

=NOTES=

- \*1. At 100/200VAC, Ta=25°C and maximum output power.
- \*2. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 ~ 240VAC(50/60Hz).
- \*3. Not applicable for the in-rush current to Noise Filter for less than 0.2ms.
- \*4. Measure with JEITA RC-9131A probe, Bandwidth of scope :100MHz.
- \*5. 85 ~ 265VAC , constant load.
- \*6. No load-Full load, constant input voltage.
- \*7. Constant current limit and Hiccup with automatic recovery.  
Not operate at over load or dead short condition for more than 30seconds.
- \*8. OVP circuit will shutdown output, manual reset (Re power on).
- \*9. At 100/200VAC , nominal output voltage and maximum output current.
- \*10. Measured by the each measuring method of UL,CSA,EN and DENAN(at 60Hz).
- \*11. Ratings - Derating at standard mounting.  
- Load (%) is percent of maximum output power or maximum output current, whichever is greater.  
- As for other mountings, refer to derating curve (A228-01-02/A\_).
- \*12. As for DENAN, built to meet at 100VAC.

OUTPUT DERATING

A228-01-02/A

Ta(°C)	LOAD(%)	
	MOUNTING A	MOUNTING B,C,D
-10 ~ +25	100	100
40	100	76
50	60	60
60	20	20

