

**HWS150A/HD**

SPECIFICATIONS

A259-01-01/HD-B

ITEMS		MODEL	HWS150A -3/HD	HWS150A -5/HD	HWS150A -12/HD	HWS150A -15/HD	HWS150A -24/HD	HWS150A -48/HD	
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	99.0	150.0	156.0	150.0	156.0	158.4	
4	Efficiency (Typ.) (*1)	100VAC	%	82	85	85	86	88	89
		200VAC	%	84	87	88	89	90	91
5	Input Voltage Range (*2)	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC						
6	Input Current (Typ.) (*1)	A	1.3/0.65	1.9/0.95					
7	Inrush Current (Typ.) (*1)(*3)	-	14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start						
8	PFHC	-	Designed to meet IEC61000-3-2						
9	Power Factor (Typ.) (*1)	-	0.96/0.89	0.98/0.93					
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<71°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	150	240	
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.) (*1)	-	20ms						
18	Leakage Current (*9)	-	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 (*10)	-	-10 to +71°C (-10 to +50°C:100%, +60°C:60%, +71°C:20%) Guarantee Start up at -40 to -10°C						
23	Operating Humidity	-	30 to 90%RH (No Condensing)						
24	Storage Temperature	-	-40 to +85°C						
25	Storage Humidity	-	10 to 95%RH (No Condensing)						
26	Cooling	-	Convection Cooling						
27	Withstand Voltage	-	Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min						
28	Isolation Resistance	-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
29	Vibration (*11)	-	At no operating, 10 - 55Hz (Sweep for 1min) 19.6m/s <sup>2</sup> Constant, X,Y,Z 1hour each. Designed to meet MIL-STD-810F 514.5 Category 4, 10						
30	Shock	-	Less than 196.1m/s <sup>2</sup> Designed to meet MIL-STD-810F 516.5 Procedure I, VI						
31	Safety	-	Approved by UL/CSA/EN62368-1, EN62477-1 (OVCI)(24V only), UL/CSA60950-1, EN60950-1 (Expire date of 60950-1 : 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only.						
32	Line DIP	-	Designed to meet SEMI-F47 (200VAC Line only)						
33	Conducted Emission (*12)	-	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
34	Radiated Emission (*12)	-	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
35	Immunity (*12)	-	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11						
36	Weight (Typ)	-	470g						
37	Size (W x H x D)	mm	37 x 82 x 160 ( Refer to Outline Drawing )						

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

=NOTES=

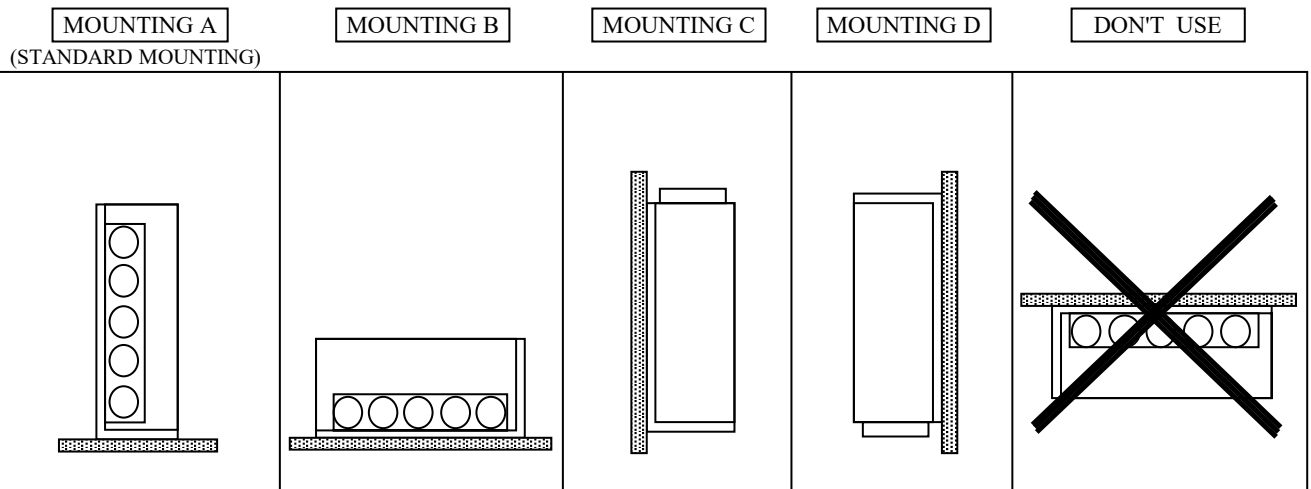
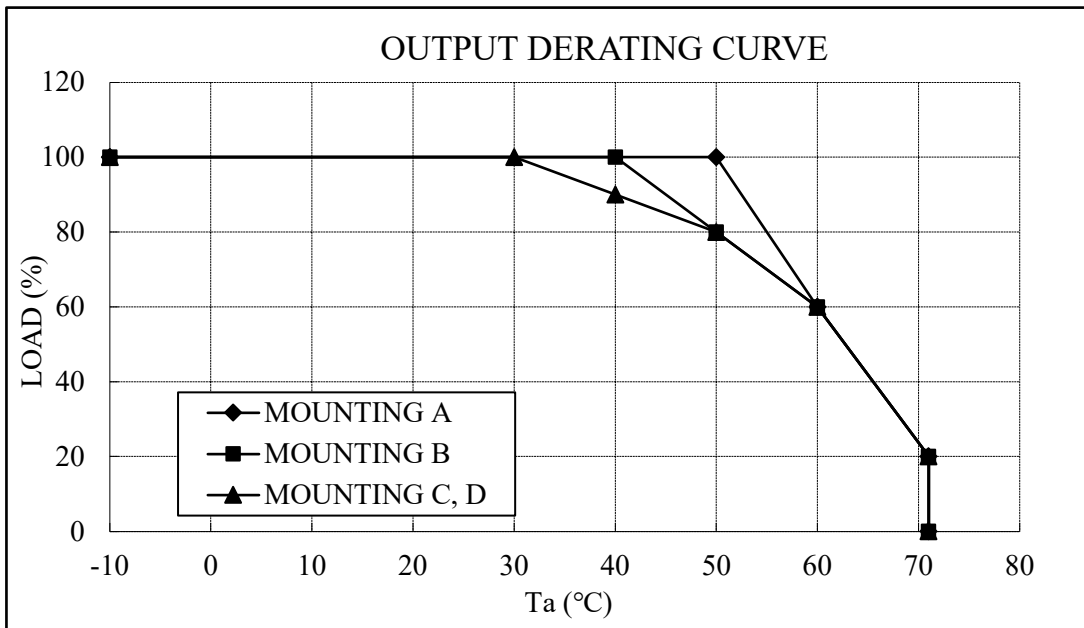
- \*1. At 100VAC/200VAC, Ta=25°C, nominal output voltage and maximum output power.
- \*2. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).
- \*3. Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- \*4. Measure with JEITA RC-9131B 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. Avoid to operate at over load or short circuit condition.
- \*8. OVP circuit will shut down output, manual reset (Re power on).
- \*9. Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C.
- \*10. Output Derating
  - Derating at standard mounting. Refer to OUTPUT DERATING CURVE (A259-01-02/HD- ).
  - Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
  - For conditions of start up at -40°C to -10°C, refer to derating curve (A259-01-03/HD- ).
- \*11. Category 4 exposure levels : Track transportation over U.S. highways, Composite two-wheeled trailer.
- \*12. The power supply is considered a component which will be installed into a final equipment.  
The final equipment should be re-evaluated that it meets EMC directives.

**HWS150A/HD**

OUTPUT DERATING

A259-01-02/HD

Ta (°C)	LOAD (%)		
	MOUNTING A	MOUNTING B	MOUNTING C, D
-10 - +30	100	100	100
40	100	100	90
50	100	80	80
60	60	60	60
71	20	20	20

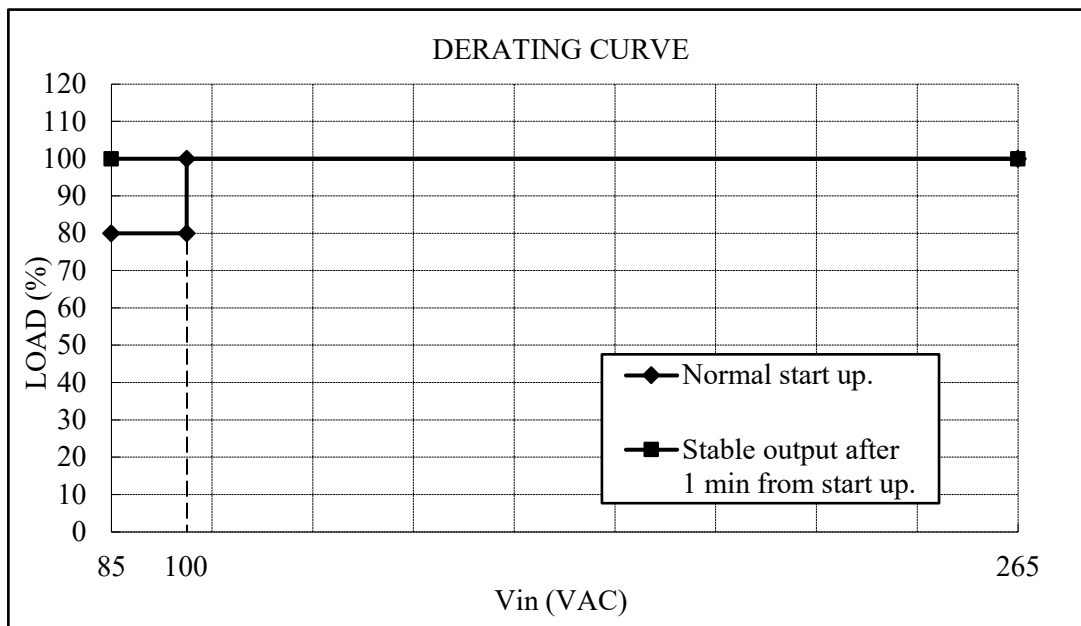


**HWS150A/HD**

DERATING TO START UP AT Ta : -40 to -10°C

A259-01-03/HD

Input Voltage : Vin (VAC)	LOAD (%)	
	Normal start up.	Stable output after 1 min from start up.
$85 \leq V_{in} < 100$	80	100
$100 \leq V_{in} \leq 265$	100	100



=NOTES=

- \*At Ta : -40 to -10°C.
- \*Input voltage : Not gradual start up.
- \*Do not use the load that is constant current mode.
- \*Avoid forced air cooling. It is assumed that inside of power supply is heated by self-heating within 1 minutes.
- \*No condensing.
- \*Pay attention to above items before using the unit. Incorrect usage could lead to unstable output voltage.