

**HWS600/HD**

**SPECIFICATIONS**

A232-01-01/HD-B

MODEL		HWS600	HWS600	HWS600	HWS600	HWS600	HWS600		
ITEMS		-3/HD	-5/HD	-12/HD	-15/HD	-24/HD	-48/HD		
1	Nominal Output Voltage	V	3.3	5	12	15	24	48	
2	Maximum Output Current (*1)	A	120	120	53	43	27(31)	13	
3	Maximum Output Power	W	396	600	636	645	648	624	
4	Efficiency (Typ) (*2)	100VAC	%	75	80	80	81	82	83
		200VAC	%	78	83	83	84	85	86
5	Input Voltage Range (*3)	-	85 - 265VAC (47 - 63Hz) or 120 - 330VDC						
6	Input Current (100/200VAC)(Typ) (*2)	A	5.4/2.6	7.5/3.6	8.1/3.9				
7	Inrush Current (Typ) (*4)	-	20A at 100VAC, 40A at 200VAC						
8	PFHC	-	Designed to meet IEC61000-3-2						
9	Power Factor (100/200VAC)(Typ) (*2)	-	0.99/0.95						
10	Output Voltage Range	V	2.64-3.96	4.0-6.0	9.6-14.4	12.0-18.0	19.2-28.8	38.4-52.8	
11	Maximum Ripple & Noise (*5)	0≤Ta≤71°C	mV	120	120	150	150	150	350
		-10≤Ta<0°C	mV	180	180	200	200	200	400
12	Maximum Line Regulation (*6)	mV	20	20	48	60	96	192	
13	Maximum Load Regulation (*7)	mV	30	30	72	90	144	288	
14	Temperature Coefficient	-	Less than 0.02% / °C						
15	Over Current Protection (*8)	A	126 ≤	126 ≤	55.7 ≤	45.2 ≤	31.4 ≤	13.7 ≤	
16	Over Voltage Protection (*9)	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) (*10)	-	20ms						
18	Leakage Current (*11)	-	Less than 0.75mA. 0.2mA(Typ) at 100VAC / 0.44mA(Typ) at 230VAC						
19	Remote Sensing	-	Possible						
20	Remote ON/OFF control	-	Possible						
21	Monitoring Signal	-	PF(Open Collector Output)						
22	Parallel Operation	-	Possible						
23	Series Operation	-	Possible						
24	Operating Temperature (*12,*13)	-	-10 to +71°C (-10 to +50°C:100%,+71°C:50%) Guarantee Start up at -40°C to -10°C						
25	Operating Humidity	-	10 to 90%RH (No dewdrop)						
26	Storage Temperature	-	-40 to +85°C						
27	Storage Humidity	-	10 to 95%RH (No dewdrop)						
28	Cooling	-	Forced Air By Blower Fan						
29	Withstand Voltage	-	Input - FG : 2.5kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (100mA),Output - CNT : 100VAC(100mA) for 1min						
30	Isolation Resistance	-	More than 100MΩ Output - FG : 500VDC More than 10MΩ Output - CNT : 100VDC at 25°C and 70%RH						
31	Vibration (*14)	-	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						
32	Shock (In package)	-	Less than 196.1m/s <sup>2</sup> Designed to meet MIL-STD-810F 516.5 Procedure I, VI						
33	Safety (*15)	-	Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1 (Expire date of 60950-1 : 20/12/2020), EN50178, Designed to meet DENAN						
34	Line DIP	-	Designed to meet SEMI-F47 (200VAC Line only)						
35	Conducted Emission	-	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
36	Radiated Emission	-	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
37	Immunity	-	Designed 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						
38	Weight(Typ.)	-	1.6kg						
39	Size (W x H x D)	mm	100 x 82 x 165 ( Refer to Outline Drawing )						

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

=NOTES=

- \*1. ( ) : Peak output current at 200VAC. Operating time at peak output is less than 10sec, duty is less than 35%.
- \*2. At 100/200VAC, Ta=25°C and maximum 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.  
Inrush Current is 30A(Typ) when PFHC start-up.
- \*5. Measure with JEITA RC-9131A probe, Bandwidth of scope : 100MHZ.
- \*6. 85 - 265VAC, constant load.
- \*7. No load - Full load, constant input voltage.
- \*8. 3V and 5V model: Constant current limit and hiccup with automatic recovery.  
12 - 48V model: Constant current limit with automatic recovery.  
Avoid to operate at over load or short circuit condition for more than 30seconds.
- \*9. OVP circuit will shut the output down, manual reset (CNT reset or Re-power on).
- \*10. At 100/200VAC, nominal output voltage and maximum output current.
- \*11. Measured by the each measuring method of UL, CSA, EN and DENAN(at 60Hz), Ta=25°C.
- \*12. Ratings - Derating at standard mounting. /Refer to output derating curve.(A232-01-02/HD- )  
- Load (%) is percent of maximum output power or maximum output current, whichever is greater.
- \*13. For -40°C - -10°C need 3minutes to stabilize the output voltage.
- \*14. Category 4 exposure levels : Truck transportation over U.S. highways, Composite two-wheeled trailer.
- \*15. As for DENAN, designed to meet at 100VAC.

OUTPUT DERATING

A232-01-02/HD

Ta(°C)	LOAD(%)	
	MOUNTING A	MOUNTING B
-10 to +50	100	
71	50	

