



Test Report: HSN-200-5A

200W Single Output Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 150 mVp-p (Max)	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	V1 : 22 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE ADJUST RANGE	V1 : 4.5 V ~ 5.5 V	I/P : 115 VAC O/P : NO LOAD Ta : 25°C	V1 : 4.302V~ 5.606V / 115 VAC	PASS
3	OUTPUT VOLTAGE TOLERANCE	V1 : -2%~ 2% (Max)	I/P : 90 VAC / 132 VAC O/P : FULL/ NO LOAD Ta : 25°C	V1 : -0.326 %~ 0.591 %	PASS
4	LINE REGULATION	V1 : -0.5%~ 0.5% (Max)	I/P : 90 VAC ~ 132 VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.005 %~ 0.005 %	PASS
5	LOAD REGULATION	V1 : -2%~ 2% (Max)	I/P : 115 VAC O/P : FULL~NO LOAD Ta : 25°C	V1 : -0.326 %~ 0.326 %	PASS
6	SET UP TIME	115VAC : 2500 ms (Max)	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	115VAC/ 1103 ms	PASS
7	RISE TIME	115VAC : 100 ms (Max)	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	115VAC/ 3.7 ms	PASS
8	HOLD UP TIME	115VAC : 16 ms (TYP)	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	115VAC/ 26.5 ms	PASS
9	OVER/UNDERSHOOT TEST	< ±10%	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	TEST : < ±10 %	PASS
10	DYNAMIC LOAD	V1 : 1000 mVp-p	I/P : 115 VAC (1).O/P : FULL /NO LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /NO LOAD 50%DUTY/ 120HZ Ta : 25°C	(1) 530 mVp-p (2) 700 mVp-p	PASS

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90 VAC~132 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	87 V~132 V	PASS
			I/P : (1)LOW-LINE-3V=87 V HIGH-LINE+15%=150 V O/P : FULL/MIN LOAD ON : 30 Sec OFF : 30 Sec 10MIN (2)230Vac ON : 0.5 Sec OFF : 0.5 Sec 20MIN (3)230Vac ON : 3Sec OFF : 3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST : OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 90 VAC ~ 132 VAC O/P : FULL ~NO LOAD Ta : 25°C	TEST : OK	PASS
3	EFFICIENCY	86.5% (TYP)	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	87.0%	PASS
4	INPUT CURRENT	115V/ 3.0 A (TYP)	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 2.848 A/ 115 VAC	PASS
5	INRUSH CURRENT	115V/ 80 A (TYP) Twidth =1000 us measured at 50% Ipeak COLD START	I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 27.5 A	PASS
6	LEAKAGE CURRENT	< 1 mA	I/P : 132 VAC O/P : NO LOAD Ta : 25°C	L-CASE : 0.526 mA N-CASE : 0.519 mA	PASS

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 185 %	I/P : 100 VAC I/P : 115 VAC I/P : 132 VAC O/P : TESTING Ta : 25°C	161.3 %/ 100 VAC 165.1 %/ 115 VAC 168.7 %/ 132 VAC Hiccup mode,recovers automatically after fault condition is removed	PASS
2	OVER VOLTAGE PROTECTION	CH1 : 5.7 V ~ 7.0 V	I/P : 90 VAC I/P : 115 VAC I/P : 132 VAC O/P : NO LOAD Ta : 25°C	6.48 V/ 90 VAC 6.44 V/ 115 VAC 6.56 V/ 132 VAC Hiccup mode,recovers automatically after fault condition is removed	PASS
3	OVER TEMPERATURE PROTECTION	SPEC : O.T.P. NO DAMAGE	I/P : 115 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 132 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup mode,recovers automatically after fault condition is removed.	PASS

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated 600 V 11A	I/P : High-Line +3V = 135 V O/P : (1)FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta : 25°C	(1) 388 V (2) 372 V (3) 374 V	PASS
2	Diode Peak Voltage	Q100 Rated 40 V 32 A Q102 Rated 40 V 120 A	I/P : High-Line +3V = 135 V O/P : (1) FULL LOAD Turn on (2)Output Short (3) FULL LOAD continue Ta : 25°C	(1) 26.4 V (2) 24.2 V (3) 26.6 V (1) 26.2 V (2) 25.0 V (3) 26.0 V	PASS
3	Input Capacitor Voltage	C5 Rated 330uF / 200 V	I/P : High-Line +3V = 135 V O/P : (1) FULL LOAD Turn on /Off (2) NO load Turn on /Off (3) FULL LOAD /Min load Change Ta : 25°C	(1) 192 V (2) 193 V (3) 197 V	PASS
4	Control IC Voltage Test	U1 Rated 30V	I/P : High-Line +3V = 135 V O/P : (1) FULL LOAD Turn on /Off (2) NO load Turn on /Off (3) FULL LOAD /Min load Change Ta : 25°C	(1) 20.3 V (2) 20.3 V (3) 20.3 V	PASS

SAFETY TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 2 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 2.156 mA I/P-FG : 2.382 mA O/P-FG : 1.329 mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ I/P-FG : 500VDC>100MΩ O/P-FG : 500VDC>100MΩ	I/P-O/P : 500 VDC I/P-FG : 500 VDC O/P-FG : 500 VDC Ta : 25°C /70%RH	I/P-O/P : > 9999MΩ I/P-FG : > 9999MΩ O/P-FG : > 9999MΩ NO DAMAGE	PASS
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta : 25°C	8 mΩ	PASS

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : HSN-200-5A 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 115VAC O/P : FULL LOAD Ta=33.0℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 115VAC O/P : FULL LOAD Ta=53.3℃			PASS
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 132VAC/100VAC O/P : FULL LOAD Ta= -30℃	TEST : OK	
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P : 136 VAC O/P : FULL LOAD Ta= 50 ℃ HUMIDITY= 95% R.H	TEST : OK	PASS
4	TEMPERATURE COEFFICIENT	±0.03 %(0~60℃)	I/P : 115 VAC O/P : FULL LOAD	±0.01 %(0~60℃)	PASS
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45℃~ +90℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	PASS

6	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30°C~ +55°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 115VAC/FULL LOAD AC ON/OFF TEST turn on 58sec ; turn off 2sec	OK	PASS
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 4G (5) Test Time : 90min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK	PASS
8	CAPACITOR LIFE CYCLE	HSN-200-5A: SUPPOSE C107 IS THE MOST CRITICAL COMPONENT (1) I/P : 115VAC O/P : FULL LOAD Ta=25 °C LIFE TIME (2) I/P : 115VAC O/P : FULL LOAD Ta=50 °C LIFE TIME (3) I/P : 115VAC O/P : 75% LOAD Ta=50 °C LIFE TIME (4) I/P : 115VAC O/P : 50% LOAD Ta=50 °C LIFE TIME	(1) 579485 HRS (2) 100330 HRS (3) 159638 HRS (4) 277893 HRS	PASS
9	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 283.069KHS		PASS
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 20000 hours @ Tcase 80°C		PASS

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY