

MODEL : HRP-300-12

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 90 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 10.2 V~ 13.8 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	9.1 V~ 14.822 V/230 VAC 9.07 V~ 14.817 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1 %~ -1 % (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0 %~ 0.05 %	P
4	LINE REGULATION	V1: 0.3%~ -0.3 % (Max)	I/P: 100 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ -0.05 %	P
5	LOAD REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0 %~ -0.05 %	P
6	SET UP TIME	230VAC: 1000 ms (Max) 115 VAC: 2500 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 253 ms 115VAC/ 506 ms	P
7	RISE TIME	230VAC: 50 ms (Max) 115VAC: 50 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 13.4 ms 115VAC/ 13.59 ms	P
8	HOLD UP TIME	230VAC: 16 ms (TYP) 115VAC: 16 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 29.1 ms 115VAC/ 23.9 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: < 5 %	P
10	DYNAMIC LOAD	V1: 1200 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	674 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	67.1 V~264V	P
			I/P: LOW-LINE-3V= 97 V HIGH-LINE+15%=300 V O/P: FULL/MIN LOAD ON: 30 Sec. OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P: 100 VAC ~ 264 VAC O/P: FULL-MIN LOAD Ta: 25°C	TEST: OK	P
3	POWER FACTOR	0.95 / 230 VAC(TYP) 0.99 / 115 VAC(TYP)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.983 / 230 VAC PF= 1 / 115 VAC	P
4	EFFICIENCY	88% (TYP)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	88.9 %	P
5	INPUT CURRENT	230V/ 2.5 A (TYP) 115V/ 4.5 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 1.621 A / 230 VAC I = 3.26 A / 115 VAC	P
6	INRUSH CURRENT	230V/ 70 A (TYP) 115V/ 35 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 62 A / 230 VAC I = 31 A / 115 VAC	P
7	LEAKAGE CURRENT	< 1.2 mA / 240 VAC	I/P: 264 VAC O/P: Min LOAD Ta: 25°C	L-FG: 0.85 mA N-FG: 0.8 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 135 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	126 %/ 230 VAC 126 %/ 115 VAC Constant current limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1: 14.4V~ 16.8 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	15.9 V/ 230 VAC 15.9 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1: 90 ± 5°C detect on heatsink of power transistor TSW2: 95 ± 5°C detect on O/P CHOCK NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Constant current limiting, recovers automatically after fault condition is removed	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DC OK SIGNAL	PSU turn on : 3.3 ~ 5.6V ; PSU turn off : 0 ~ 1V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	PSU turn on : 5.133 V PSU turn off : 0.026 V	P
2	REMOTE SENSE	>0.5V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	>0.19	P
3	FAN ON/OFF control test	-----	I/P: 230 VAC O/P: TESTING Ta: 25°C	> 35 %LOAD FAN ON < 34 %LOAD FAN OFF	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																											
1	TEMPERATURE RISE TEST	MODEL : HRP-300-5 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 230VAC O/P: FULL LOAD Ta= 31.8 °C 2. HIGH AMBIENT BURN-IN : 5.5 HRS I/P: 230VAC O/P: FULL LOAD Ta= 52.9 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 31.8 °C</th><th>HIGH AMBIENT Ta= 52.9 °C</th></tr><tr><td>1</td><td>U1</td><td>FAN4801NY</td><td>56.2°C</td><td>81.6°C</td></tr><tr><td>2</td><td>C5</td><td>100u/400V 105°C KMG</td><td>42.4°C</td><td>65.9°C</td></tr><tr><td>3</td><td>Q1</td><td>IRFP460A 20A/500V</td><td>44.7°C</td><td>67.2°C</td></tr><tr><td>4</td><td>D1</td><td>BYC8-600 8A/600V</td><td>42.0°C</td><td>63.5°C</td></tr><tr><td>5</td><td>L3</td><td>TR838</td><td>41.4°C</td><td>63.9°C</td></tr><tr><td>6</td><td>BD1</td><td>10A/800V US10KB80R</td><td>43.3°C</td><td>65.9°C</td></tr><tr><td>7</td><td>Q101</td><td>STP85N3LH5 80A/30V</td><td>75.2°C</td><td>103.0°C</td></tr><tr><td>8</td><td>T1 COIL</td><td>TF1867</td><td>83.1°C</td><td>112.0°C</td></tr><tr><td>9</td><td>L100</td><td>TR840</td><td>56.7°C</td><td>83.6°C</td></tr><tr><td>10</td><td>C106</td><td>4700u/10V 10Kh ZLH</td><td>41.1°C</td><td>66.1°C</td></tr><tr><td>11</td><td>TSW1</td><td>ST-22 90°C</td><td>44.2°C</td><td>66.5°C</td></tr><tr><td>12</td><td>TSW2</td><td>ST-22 100°C</td><td>70.0°C</td><td>97.2°C</td></tr><tr><td>13</td><td>C152</td><td>47u/25V UL10Kh 5*11 YXM</td><td>57.5°C</td><td>84.1°C</td></tr><tr><td>14</td><td>D22</td><td>SBYV26C 1A/600V</td><td>68.2°C</td><td>95.9°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 31.8 °C	HIGH AMBIENT Ta= 52.9 °C	1	U1	FAN4801NY	56.2°C	81.6°C	2	C5	100u/400V 105°C KMG	42.4°C	65.9°C	3	Q1	IRFP460A 20A/500V	44.7°C	67.2°C	4	D1	BYC8-600 8A/600V	42.0°C	63.5°C	5	L3	TR838	41.4°C	63.9°C	6	BD1	10A/800V US10KB80R	43.3°C	65.9°C	7	Q101	STP85N3LH5 80A/30V	75.2°C	103.0°C	8	T1 COIL	TF1867	83.1°C	112.0°C	9	L100	TR840	56.7°C	83.6°C	10	C106	4700u/10V 10Kh ZLH	41.1°C	66.1°C	11	TSW1	ST-22 90°C	44.2°C	66.5°C	12	TSW2	ST-22 100°C	70.0°C	97.2°C	13	C152	47u/25V UL10Kh 5*11 YXM	57.5°C	84.1°C	14	D22	SBYV26C 1A/600V	68.2°C	95.9°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 120 % LOAD Ta:25°C	TEST : OK	P																																																																											
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100 % LOAD Ta= -40 °C	TEST : OK	P																																																																											
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																											
5	TEMPERATURE COEFFICIENT	± 0.03 % (0~50°C)	I/P: 230 VAC O/P: 120 % LOAD Ta:25°C	TEST : OK	P																																																																											



6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:5G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25℃	TEST : OK	P
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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: 7.18 mA I/P-FG: 5.57 mA O/P-FG: 4.46 mA NO DAMAGE	P
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: 30 GΩ I/P-FG: 30 GΩ O/P-FG: 1.55 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C / 70%RH	4 mΩ	P
4	APPROVAL	TUV: Certificate NO : R 50156798 UL: File NO : E183223			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2,-3 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	HRP-300-5 :SUPPOSE C106 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 917137 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 157735 HRS I/P: 230VAC O/P:75% LOAD Ta= 50 °C LIFE TIME= 265188 HRS I/P: 230VAC O/P:50% LOAD Ta= 50 °C LIFE TIME= 404784HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 176K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q4 Rated 2SK4106 : 12A/500V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 476 V (2) 498 V	P
2	Diode Peak Voltage	Q101 Rated STP65NF06 : 60A/60V Q103 Rated STP65NF06 : 60A/60V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 58 V (2) 58 V (1) 58 V (2) 58 V	P
3	Input Capacitor Voltage	C5 Rated 100u/400V 105°C PEAK 450V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on /Off (2) Min load Turn on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 399 V (2) 388 V (3) 385 V	P
4	Control IC Voltage Test	U1 Rated FAN4801NY: 9.3V ~ 30V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on /Off (2) Min load Turn on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 15.695 V (2) 16.206 V (3) 16.285 V	P
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated IRFP460A : 20A/500V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 474 V (2) 468 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/4/29	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/6/12	PRODUCT SAMPLE W0905B34	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023