

MODEL : HRPG-300-24

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 61.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 21.6 V~ 28.8 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	20.27 V~ 30.14 V/ 230 VAC 20.25 V~ 30.13 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: 0.26 %~ -0.26 %	P
4	LINE REGULATION	V1: 0.2%~ -0.2 % (Max)	I/P: 100 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0.05 %~ -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: 0.26 %~ -0.26 %	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/ 152 ms 115VAC/ 350 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/ 8.3 ms 115VAC/ 8.3 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/ 33 ms 115VAC/ 21 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: 2400 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	573 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	73 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= 0.981 / 230 VAC PF= 1 / 115 VAC	P
4	EFFICIENCY	87% (TYP)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	87.3 %	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 = 1.7 A/ 230 VAC I = 3.45 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 = 68 A/ 230 VAC I = 34 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: 1 mA N-FG: 0.6 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	117%/ 230 VAC 117%/ 115 VAC Constant current limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1: 30V~ 34.8V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	32.53 V/ 230 VAC 32.52 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 : 5.213 V PSU turn off : 0 V	P
2	REMOTE CONTROL	Rc+ / Rc- 4 ~ 10V or open = power on 0 ~ 0.8V or short = power off	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	3V ~ 10 V POWER ON 0V ~ 2.9 V POWER OFF	P
3	REMOTE SENSE	>0.5V	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	>0.5	P
4	AUX POWER	4.75V~5.25V / 0.3A Ripple:50mV	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	4.904V/0.3A Ripple: 16 mV	P
5	No load power consumption	<0.5W	I/P: 240 VAC O/P:NO LOAD RC+&RC- SHORT Ta:25°C	0.4W	P
6	FAN ON/OFF control test	LOAD 35±15% OR RTH2 >= 50°C FAN ON	I/P: 230 VAC O/P:TESTING Ta:25°C	> 29.6 %LOAD FAN ON < 29.5 %LOAD FAN OFF	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																					
1	TEMPERATURE RISE TEST	MODEL : HRPG-300-24 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>54.1°C</td><td>76.8°C</td></tr><tr><td>2</td><td>C5</td><td>100u/400V 105°C 18*25 KMG</td><td>38.8°C</td><td>62.0°C</td></tr><tr><td>3</td><td>Q1</td><td>IRFP460A 20A/500V</td><td>43.3°C</td><td>65.8°C</td></tr><tr><td>4</td><td>D1</td><td>BYC8-600 8A/600V</td><td>42.1°C</td><td>64.3°C</td></tr><tr><td>5</td><td>L3</td><td>TR838</td><td>40.1°C</td><td>63.7°C</td></tr><tr><td>6</td><td>BD1</td><td>10A/800V SILICON US10KB80R</td><td>41.9°C</td><td>63.7°C</td></tr><tr><td>7</td><td>Q101</td><td>FME-220B 20A/150V</td><td>51.6°C</td><td>74.0°C</td></tr><tr><td>8</td><td>Q105</td><td>FME-220B 20A/150V</td><td>46.7°C</td><td>67.4°C</td></tr><tr><td>9</td><td>T1 COIL</td><td>TF1871 130°C</td><td>79.8°C</td><td>103.9°C</td></tr><tr><td>10</td><td>L100</td><td>TR844 155°C</td><td>50.1°C</td><td>74.2°C</td></tr><tr><td>11</td><td>C106</td><td>1000u/35V UL10Kh 12.5*25 KY</td><td>34.1°C</td><td>57.0°C</td></tr><tr><td>12</td><td>TSW1</td><td>ST-22 90°C</td><td>44.2°C</td><td>66.4°C</td></tr><tr><td>13</td><td>TSW2</td><td>ST-22 95°C</td><td>54.3°C</td><td>76.4°C</td></tr><tr><td>14</td><td>D22</td><td>SBYV26C 1A/600V</td><td>56.9°C</td><td>80.9°C</td></tr><tr><td>15</td><td>U900</td><td>TNY275PN</td><td>56.1°C</td><td>80.2°C</td></tr><tr><td>16</td><td>C911</td><td>22u/50V UL10Kh 5*11 YXM</td><td>52.4°C</td><td>75.2°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 31.8 °C	HIGH AMBIENT Ta= 52.9 °C	1	U1	FAN4801NY	54.1°C	76.8°C	2	C5	100u/400V 105°C 18*25 KMG	38.8°C	62.0°C	3	Q1	IRFP460A 20A/500V	43.3°C	65.8°C	4	D1	BYC8-600 8A/600V	42.1°C	64.3°C	5	L3	TR838	40.1°C	63.7°C	6	BD1	10A/800V SILICON US10KB80R	41.9°C	63.7°C	7	Q101	FME-220B 20A/150V	51.6°C	74.0°C	8	Q105	FME-220B 20A/150V	46.7°C	67.4°C	9	T1 COIL	TF1871 130°C	79.8°C	103.9°C	10	L100	TR844 155°C	50.1°C	74.2°C	11	C106	1000u/35V UL10Kh 12.5*25 KY	34.1°C	57.0°C	12	TSW1	ST-22 90°C	44.2°C	66.4°C	13	TSW2	ST-22 95°C	54.3°C	76.4°C	14	D22	SBYV26C 1A/600V	56.9°C	80.9°C	15	U900	TNY275PN	56.1°C	80.2°C	16	C911	22u/50V UL10Kh 5*11 YXM	52.4°C	75.2°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 111 % 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= 49.9 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																					
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.017 %(0~50°C)	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°C		TEST : OK	P																																																																																					

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: 6.54 mA I/P-FG: 5.56 mA O/P-FG: 4.29 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: 25.4 GΩ I/P-FG: 24.6 GΩ O/P-FG: 22.7 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C / 70%RH	13 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 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	HRPG-300-24:SUPPOSE C106 IS THE MOST CRITICAL COMPONENT I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME= 1994965 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME= 298605 HRS I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME= 360111 HRS I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME= 413658 HRS			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) 472 V (2) 438 V	P
2	Diode Peak Voltage	Q101 Rated FME-220B : 20A/150V Q104 Rated FME-220B : 20A/150V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 150 V (2) 138 V (1) 149 V (2) 146 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) 369.9 V (2) 374 V (3) 371.9 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) 15.917 V (2) 13.371 V (3) 13.371 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) 494 V (2) 392 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
2009/9/1	PRODUCT SAMPLE W0908B05	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023