



# Test Report: HRP-75-12

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75W Single Output with PFC Function

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

**DESIGN VERIFY TEST**
**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 : 57 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 11 V ~ 13.8 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	10.759 V~ 14.945 V / 230 VAC 10.754 V~ 14.945 V / 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : 1.5 %~ -1.5 % (Max)	I/P : 100 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.47 %~ -0.47 %	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 %	P
5	LOAD REGULATION	V1 : 1 %~ -1 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 0.47 %~ -0.42 %	P
6	SET UP TIME	230VAC : 1800 ms (Max) 115 VAC : 1800 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 800 ms 115VAC/ 800 ms	P
7	RISE TIME	230VAC : 25 ms (Max) 115VAC : 25 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 6.4 ms 115VAC/ 6.8 ms	P
8	HOLD UP TIME	230VAC : 50 ms (TYP) 115VAC : 20 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 89 ms 115VAC/ 36 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	197 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	74 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	0.9 / 230 VAC(TYP) 0.95 / 115 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.91 / 230 VAC PF= 0.98 / 115 VAC	P
4	EFFICIENCY	87% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	89.6 %	P
5	INPUT CURRENT	230V/ 0.7 A (TYP) 115V/ 1.2 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.39 A/ 230 VAC I = 0.74 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 65 A (TYP) 115V/ 35 A (TYP) COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 53 A/ 230 VAC I = 27 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.43 mA N-FG : 0.31 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	118%/ 230 VAC 118%/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 14.4 V~ 16.8 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	15.22V/ 230 VAC 15.22V/ 115 VAC Shut down Re- power ON	P
3	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	REMOTE CONTROL	Rc+ / Rc- 0 V~ 0.8 V POWER ON 4 V~ 10 V POWER OFF	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	0 V~1.7 V POWER ON 1.8 V~10 V POWER OFF	P
2	NO LOAD POWER CONSUMPTION	<0.5 W / 240VAC	I/P : 240 VAC O/P : NO LOAD Ta : 25°C	0.4 W	P

### COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) Peak Voltage	Q 3 Rated 2SK3673-01MR 10A/700V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25°C	(1) 626 V (2) 600 V	P
2	Diode Peak Voltage	Q101 Rated IRFB3607PBF 80A/75V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25°C	(1) 68 V (2) 64.4 V	P
3	PFC Transistor ( D to S) or (C to E) Peak Voltage	Q1 Rated : 2SK4106 12A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load (2)Output Short Ta : 25°C	(1) 490 V (2) 430 V	P
4	Input Capacitor Voltage	C5 Rated 100u/400V 105°C KMG	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) 400 V (2) 377 V (3) 387 V	P
5	Control IC Voltage Test	U 2 Rated TEA 1751 14V~38V	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) 27.7 V (2) 21.6 V (3) 27.7 V	P

### ■ SAFETY & E.M.C. TEST

#### SAFETY TEST

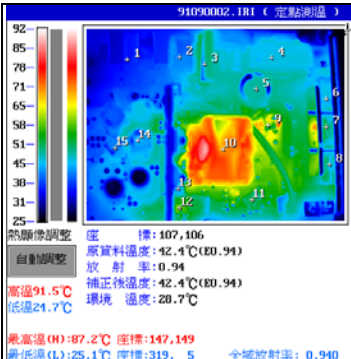
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 1.5 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 1.8 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 4.56 mA I/P-FG : 3.26 mA O/P-FG : 2.139 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	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 : 19.9 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	7 mΩ	P
4	APPROVAL	TUV : Certificate NO : R50163746 UL : File NO : E183223			P

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	I/P : 230/240/220 VAC/50HZ O/P : 100/75/50/25%LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 EN55011 CLASS B	I/P: 230 VAC (50HZ)/115V60(HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 EN55011 CLASS B	I/P: 230 VAC (50HZ)/115V60(HZ) O/P : FULL/50% 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 PrepareP				

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																				
1.	THERMO TRACER TEST (ROOM AMBIENT)	MODEL:HRP-75-12 		<table border="1"> <thead> <tr> <th>Position</th> <th>P/N</th> <th>Temp</th> <th>VERDICT</th> </tr> </thead> <tbody> <tr><td>P1</td><td>LF1</td><td>TR733-R3</td><td>35.8°C PASS</td></tr> <tr><td>P2</td><td>LF2</td><td>TR653-R2</td><td>41.5°C PASS</td></tr> <tr><td>P3</td><td>BD1</td><td>D3SB80</td><td>45.3°C PASS</td></tr> <tr><td>P4</td><td>L3-CORE</td><td>TF1906</td><td>46.1°C PASS</td></tr> <tr><td>P5</td><td>C5</td><td>100u/400V 105°C</td><td>48.4°C PASS</td></tr> <tr><td>P6</td><td>D1</td><td>BYV29X-600</td><td>43.7°C PASS</td></tr> <tr><td>P7</td><td>Q1</td><td>FET 2SK4106</td><td>51.2°C PASS</td></tr> <tr><td>P8</td><td>Q3</td><td>SPA11N65C3</td><td>45.4°C PASS</td></tr> <tr><td>P9</td><td>D2</td><td>1N5406</td><td>61.1°C PASS</td></tr> <tr><td>P10</td><td>T1-core</td><td>TF1901-R1</td><td>70.4°C PASS</td></tr> <tr><td>P11</td><td>C18</td><td>47u/50V</td><td>52.1°C PASS</td></tr> <tr><td>P12</td><td>C150</td><td>47u/50V</td><td>59.6°C PASS</td></tr> <tr><td>P13</td><td>Q101</td><td>IRFB3607PBF</td><td>42.9°C PASS</td></tr> <tr><td>P14</td><td>C105</td><td>1200u/16V</td><td>43.5°C PASS</td></tr> <tr><td>P15</td><td>L100</td><td>RB010E-R2</td><td>41.1°C PASS</td></tr> </tbody> </table>	Position	P/N	Temp	VERDICT	P1	LF1	TR733-R3	35.8°C PASS	P2	LF2	TR653-R2	41.5°C PASS	P3	BD1	D3SB80	45.3°C PASS	P4	L3-CORE	TF1906	46.1°C PASS	P5	C5	100u/400V 105°C	48.4°C PASS	P6	D1	BYV29X-600	43.7°C PASS	P7	Q1	FET 2SK4106	51.2°C PASS	P8	Q3	SPA11N65C3	45.4°C PASS	P9	D2	1N5406	61.1°C PASS	P10	T1-core	TF1901-R1	70.4°C PASS	P11	C18	47u/50V	52.1°C PASS	P12	C150	47u/50V	59.6°C PASS	P13	Q101	IRFB3607PBF	42.9°C PASS	P14	C105	1200u/16V	43.5°C PASS	P15	L100	RB010E-R2	41.1°C PASS	P																																				
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2	TEMPERATURE RISE TEST	MODEL : HRP-75-5 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 30 °C 2. HIGH AMBIENT BURN-IN : 2.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 40.7 °C		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 24.2 °C</th> <th>HIGH AMBIENT Ta= 41 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>TR-733</td><td>55.1°C</td><td>63.3°C</td></tr> <tr><td>2</td><td>LF2</td><td>TR-653</td><td>60.1°C</td><td>68.5°C</td></tr> <tr><td>3</td><td>BD1</td><td>4A/800V GLASS D3SB80</td><td>64.2°C</td><td>72.6°C</td></tr> <tr><td>4</td><td>L1</td><td>TR623-R3</td><td>55.0°C</td><td>63.9°C</td></tr> <tr><td>5</td><td>L3</td><td>TF1906</td><td>62.4°C</td><td>71.1°C</td></tr> <tr><td>6</td><td>C5</td><td>100u/400V 105°C 18*25 KM</td><td>69.6°C</td><td>78.6°C</td></tr> <tr><td>7</td><td>D1</td><td>BYV29X-600 7A/600V</td><td>59.3°C</td><td>68.0°C</td></tr> <tr><td>8</td><td>Q1</td><td>2SK4106 12A/500V</td><td>63.6°C</td><td>72.3°C</td></tr> <tr><td>9</td><td>Q3</td><td>2SK3673-01MR 10A/700V</td><td>72.1°C</td><td>81.2°C</td></tr> <tr><td>10</td><td>C61</td><td>47u/50V UL10Kh 6.3*11 YXM</td><td>67.4°C</td><td>77.2°C</td></tr> <tr><td>11</td><td>T1</td><td>TF1899 PQ-2625 155°C</td><td>102.2°C</td><td>112.3°C</td></tr> <tr><td>12</td><td>C18</td><td>47u/50V UL10Kh 6.3*11 YXM</td><td>75.3°C</td><td>84.3°C</td></tr> <tr><td>13</td><td>D2</td><td>SBYV26C 1A/600V</td><td>78.7°C</td><td>87.6°C</td></tr> <tr><td>14</td><td>U1</td><td>TEA1751T</td><td>82.1°C</td><td>90.3°C</td></tr> <tr><td>15</td><td>C150</td><td>47u/50V L5Kh 6.3*11 YXF</td><td>87.3°C</td><td>95.3°C</td></tr> <tr><td>16</td><td>Q102</td><td>IRF1405Z 75A/55V</td><td>79.2°C</td><td>88.0°C</td></tr> <tr><td>17</td><td>CN2</td><td>ST-22 95°C</td><td>65.1°C</td><td>74.1°C</td></tr> <tr><td>18</td><td>C106</td><td>3900u/10V UL10Kh 12.5*25 ZLH</td><td>79.3°C</td><td>87.3°C</td></tr> <tr><td>19</td><td>L100</td><td>RB-COIL RB010E-R2</td><td>78.3°C</td><td>86.7°C</td></tr> </tbody> </table>	NO	Position	P/N	ROOM AMBIENT Ta= 24.2 °C	HIGH AMBIENT Ta= 41 °C	1	LF1	TR-733	55.1°C	63.3°C	2	LF2	TR-653	60.1°C	68.5°C	3	BD1	4A/800V GLASS D3SB80	64.2°C	72.6°C	4	L1	TR623-R3	55.0°C	63.9°C	5	L3	TF1906	62.4°C	71.1°C	6	C5	100u/400V 105°C 18*25 KM	69.6°C	78.6°C	7	D1	BYV29X-600 7A/600V	59.3°C	68.0°C	8	Q1	2SK4106 12A/500V	63.6°C	72.3°C	9	Q3	2SK3673-01MR 10A/700V	72.1°C	81.2°C	10	C61	47u/50V UL10Kh 6.3*11 YXM	67.4°C	77.2°C	11	T1	TF1899 PQ-2625 155°C	102.2°C	112.3°C	12	C18	47u/50V UL10Kh 6.3*11 YXM	75.3°C	84.3°C	13	D2	SBYV26C 1A/600V	78.7°C	87.6°C	14	U1	TEA1751T	82.1°C	90.3°C	15	C150	47u/50V L5Kh 6.3*11 YXF	87.3°C	95.3°C	16	Q102	IRF1405Z 75A/55V	79.2°C	88.0°C	17	CN2	ST-22 95°C	65.1°C	74.1°C	18	C106	3900u/10V UL10Kh 12.5*25 ZLH	79.3°C	87.3°C	19	L100	RB-COIL RB010E-R2	78.3°C	86.7°C	P
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3	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 122 % LOAD Ta : 25°C	TEST : OK	P																																																																																																				

4	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230 VAC O/P : 100 % LOAD Ta= -25 °C	TEST : OK	P
5	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 40 °C HUMIDITY= 95 %R.H	TEST : OK	P
6	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.01 %(0~50°C)	P
7	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P
8.	THERMAL SHOCK TEST	1. Thermal shock Temperature : -25°C~ +45°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 : 230VAC/Full Load		OK	P
9	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 : 60min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P
10	CAPACITOR LIFE CYCLE	HRP-75-5 : SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 40 °C LIFE TIME		(1) 103152HRS (2) 43962.4HRS	P
11	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 394.8 HRS			P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/6/16	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/7/31	PRODUCT SAMPLE W0907C32	PASS	SANFORD SU	VINCENT TSENG
2009/10/5	PRODUCT SAMPLE W0909C38	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023