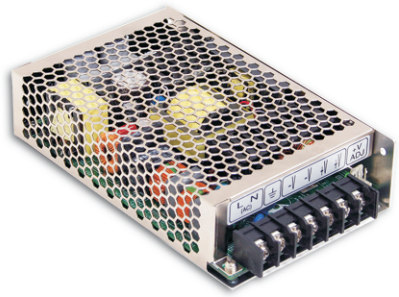
JAMECO ELECTRONICS **Jameco SKU Number: 2101905**

MEAN WELL

150W Single Output with PFC Function

HRP-150 series



■ Features :

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- High efficiency up to 89% (typ.)
- Withstand 300VAC surge input for 5 seconds
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Built-in constant current limiting circuit
- 1U low profile 38mm
- Built-in remote sense function
- 5 years warranty

SPECIFICATION

MODEL		HRP-150-3.3	HRP-150-5	HRP-150-7.5	HRP-150-12	HRP-150-15	HRP-150-24	HRP-150-36	HRP-150-48
OUTPUT	DC VOLTAGE	3.3V	5V	7.5V	12V	15V	24V	36V	48V
	RATED CURRENT	30A	26A	20A	13A	10A	6.5A	4.3A	3.3A
	CURRENT RANGE	0 ~ 30A	0 ~ 26A	0 ~ 20A	0 ~ 13A	0 ~ 10A	0 ~ 6.5A	0 ~ 4.3A	0 ~ 3.3A
	RATED POWER	99W	130W	150W	156W	150W	156W	154.8W	158.4W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	100mVp-p	120mVp-p	150mVp-p	150mVp-p	200mVp-p	240mVp-p
	VOLTAGE ADJ. RANGE	2.8 ~ 3.8V	4.3 ~ 5.8V	6.8 ~ 9V	10.2 ~ 13.8V	13.5 ~ 18V	21.6 ~ 28.8V	28.8 ~ 39.6V	40.8 ~ 55.2V
	VOLTAGE TOLERANCE Note.3	±2.5%	±2.5%	±2.5%	±1.5%	±1.5%	±1.5%	±1.5%	±1.5%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.3%	±0.3%	±0.2%	±0.2%	±0.2%
	LOAD REGULATION	±1.0%	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	3000ms, 50ms/230VAC 3000ms, 50ms/115VAC at full load							
	HOLD UP TIME (Typ.)	16ms/230VAC 16ms/115VAC at full load							
INPUT	VOLTAGE RANGE Note.5	85 ~ 264VAC 120 ~ 370VDC							
	FREQUENCY RANGE	47 ~ 63Hz							
	POWER FACTOR (Typ.)	PF>0.95/230VAC PF>0.99/115VAC at full load							
	EFFICIENCY (Typ.)	78.5%	85%	87%	88%	88%	88%	89%	89%
	AC CURRENT (Typ.)	2.3A/115VAC 1.3A/230VAC							
	INRUSH CURRENT (Typ.)	35A/115VAC 70A/230VAC							
	LEAKAGE CURRENT	<1mA / 240VAC							
PROTECTION	OVERLOAD	105 ~ 135% rated output power							
		Protection type : Constant current limiting, recovers automatically after fault condition is removed							
	OVER VOLTAGE	3.96 ~ 4.62V	6 ~ 7V	9.4 ~ 10.9V	14.4 ~ 16.8V	18.8 ~ 21.8V	30 ~ 34.8V	41.4 ~ 48.6V	57.6 ~ 67.2V
		Protection type : Shut down o/p voltage, re-power on to recover							
	OVER TEMPERATURE	95℃(3.3V ~ 7.5V) , 85℃(12V ~ 48V) (TSW1 : detect on heatsink Q1 of power transistor)							
		105℃(3.3V ~ 7.5V), 100℃(12V ~ 48V) (TSW2 : detect on heatsink HS4 of power transistor)							
		Protection type : Shut down o/p voltage, recovers automatically after temperature goes down							
ENVIRONMENT	WORKING TEMP.	-40 ~ +70℃ (Refer to output load derating curve)							
	WORKING HUMIDITY	20 ~ 90% RH non-condensing							
	STORAGE TEMP., HUMIDITY	-50 ~ +85℃, 10 ~ 95% RH							
	TEMP. COEFFICIENT	±0.04%/℃ (0 ~ 50℃)							
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes							
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved							
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC							
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH							
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B							
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3							
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, EN61000-6-2, heavy industry level, criteria A							
OTHERS	MTBF	238.8K hrs min. MIL-HDBK-217F (25℃)							
	DIMENSION	159*97*38mm (L*W*H)							
	PACKING	0.61Kg; 24pcs/15.6Kg/0.76CUFT							

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
5. Derating may be needed under low input voltages. Please check the derating curve for more details.

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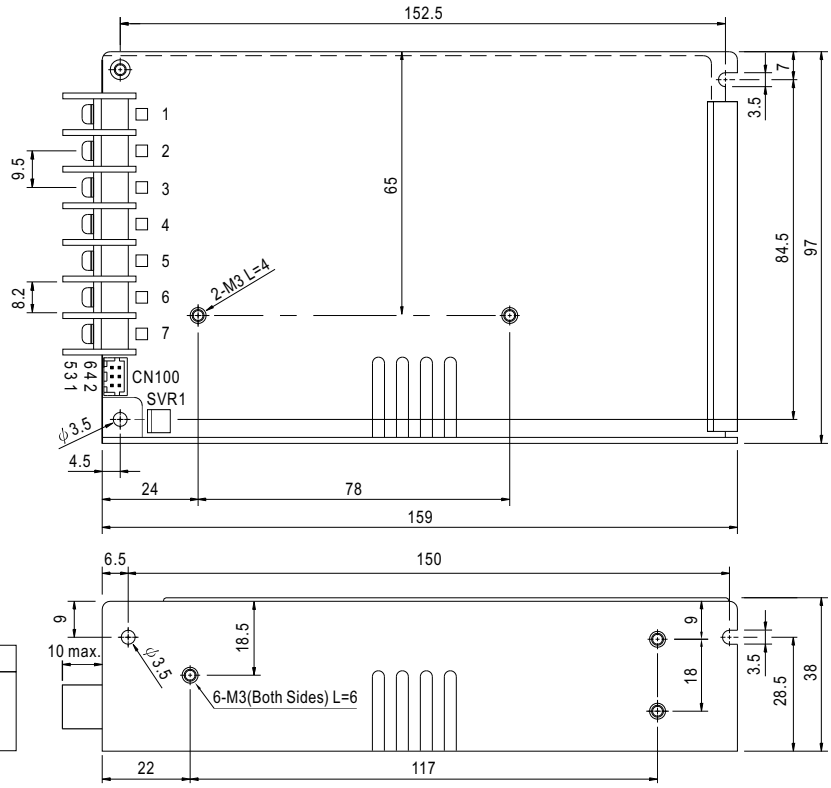
■ Mechanical Specification

Case No.901I Unit:mm



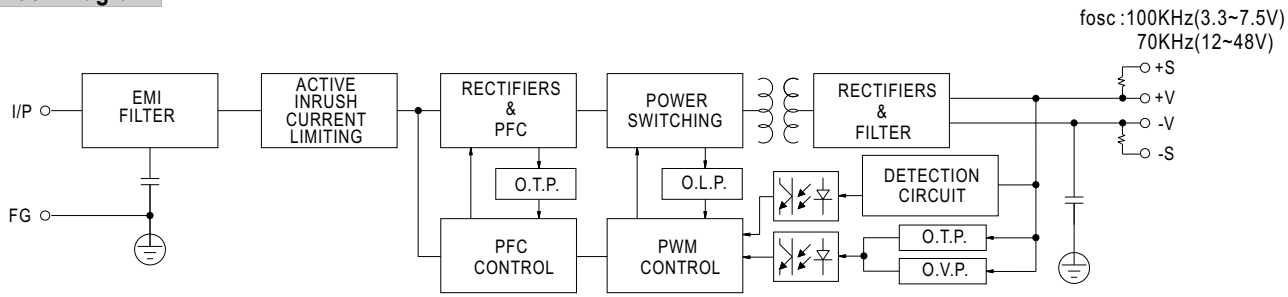
Terminal Pin No. Assignment :

Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4,5	DC OUTPUT -V
2	AC/N	6,7	DC OUTPUT +V
3	FG ⏚		

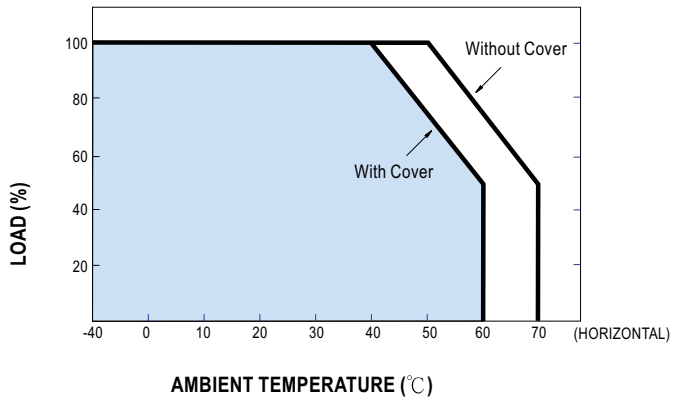
Connector Pin No. Assignment (CN100) :
HRS DF11-6DP-2DS or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	-S	HRS DF11-6DS or equivalent	HRS DF11-**SC or equivalent
2	+S		
3~6	NC		

■ Block Diagram

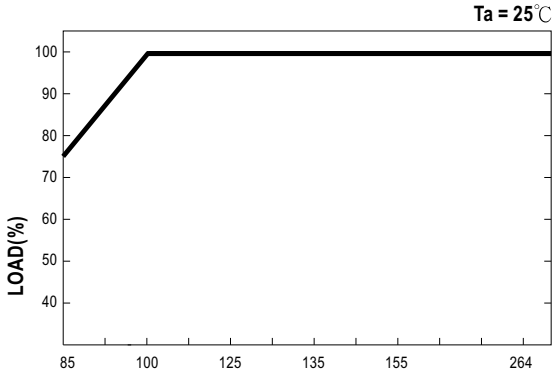


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage



INPUT VOLTAGE (V) 60Hz

MODEL：HRP-150-7.5

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1： 100 mVp-p (Max)	I/P：230VAC O/P：FULL LOAD Ta：25℃	V1： 12 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1： 6.8 V ~ 9 V	I/P：230 VAC I/P：115 VAC O/P：MIN LOAD Ta：25℃	6.347 V~ 9.735 V/ 230 VAC 6.344 V~ 9.735 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1： 2.5 %~ -2.5 % (Max)	I/P：100 VAC / 264 VAC O/P：FULL/ MIN LOAD Ta：25℃	V1： 0.6 %~ -0.6 %	P
4	LINE REGULATION	V1： 0.5 %~ -0.5 % (Max)	I/P：100VAC ~ 264 VAC O/P：FULL LOAD Ta：25℃	V1： 0 %~ 0 %	P
5	LOAD REGULATION	V1： 1 %~ -1 % (Max)	I/P：230 VAC O/P：FULL ~MIN LOAD Ta：25℃	V1： 0.6 %~ -0.6 %	P
6	SET UP TIME	230VAC： 3000 ms (Max) 115 VAC： 3000 ms (Max)	I/P：230 VAC I/P：115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 1759 ms 115VAC/ 1759 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℃	230VAC/ 15 ms 115VAC/ 15 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℃	230VAC/ 29 ms 115VAC/ 27 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P：230 VAC O/P：FULL LOAD Ta：25℃	TEST： < 5 %	P
10	DYNAMIC LOAD	V1： 1500 mVp-p	I/P：230 VAC O/P：FULL /Min LOAD 90%DUTY/1KHZ Ta：25℃	382 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℃	66 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℃	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℃	PF= 0.979 / 230 VAC PF= 1 / 115 VAC	P
4	EFFICIENCY	87% (TYP)	I/P：230 VAC O/P：FULL LOAD Ta：25℃	88.6 %	P
5	INPUT CURRENT	230V/ 1.3 A (TYP) 115V/ 2.3 A (TYP)	I/P：230 VAC I/P：115 VAC O/P：FULL LOAD Ta：25℃	I = 0.787 A/ 230 VAC I = 1.564 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℃	I = 70 A/ 230 VAC I = 35 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P：264 VAC O/P：Min LOAD Ta：25℃	L-FG： 0.52 mA N-FG： 0.44 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℃	117 %/ 230 VAC 117 %/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1： 9.4 V~ 10.9 V	I/P：230 VAC I/P：115 VAC O/P：MIN LOAD Ta：25℃	10.1 V/ 230 VAC 10.1 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC： TSW1： 95 ± 5℃ O.T.P. TSW2： 105 ± 5℃ O.T.P. 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℃	NO DAMAGE Constant Current Limiting	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE SENSE	>0.3V	I/P：230 VAC O/P：FULL LOAD Ta：25℃	>0.3V	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL：HRP-150-5
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 31.8 ℃
2. HIGH AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 47.9 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 31.8 ℃</th><th>HIGH AMBIENT Ta= 47.9 ℃</th></tr>
<tr><td>1</td><td>LF2</td><td>TR-781</td><td>63.7℃</td><td>80.3℃</td></tr>
<tr><td>2</td><td>BD1</td><td>4A/600V GLASS D3SB60</td><td>71.5℃</td><td>87.1℃</td></tr>
<tr><td>3</td><td>L3</td><td>TF-1592</td><td>61.1℃</td><td>76.6℃</td></tr>
<tr><td>4</td><td>Q1</td><td>IRFP460A 20A/500V TO247</td><td>60.1℃</td><td>75.3℃</td></tr>
<tr><td>5</td><td>D1</td><td>BYC8-600 8A/600V TO220</td><td>66.7℃</td><td>82.2℃</td></tr>
<tr><td>6</td><td>C5</td><td>100u/400V 105℃ 18*25 KMG</td><td>74.5℃</td><td>91.1℃</td></tr>
<tr><td>7</td><td>CN2</td><td>TSW1 ST 95℃</td><td>63.8℃</td><td>80.0℃</td></tr>
<tr><td>8</td><td>C61</td><td>470u/16V 105℃ KY</td><td>81.5℃</td><td>103.4℃</td></tr>
<tr><td>9</td><td>T2</td><td>TR435-R3</td><td>78.9℃</td><td>96.4℃</td></tr>
<tr><td>10</td><td>Q3</td><td>2SK4106 12A/500V</td><td>88.8℃</td><td>106.8℃</td></tr>
<tr><td>11</td><td>U1</td><td>FAN4801</td><td>85.1℃</td><td>106.0℃</td></tr>
<tr><td>12</td><td>T1</td><td>TF1585</td><td>93.8℃</td><td>111.3℃</td></tr>
<tr><td>13</td><td>Q101</td><td>STP80NF03L-04 80A/30V</td><td>83.6℃</td><td>100.4℃</td></tr>
<tr><td>14</td><td>Q103</td><td>IRL3103PbF 64A/30V</td><td>87.0℃</td><td>103.7℃</td></tr>
<tr><td>15</td><td>L100</td><td>TR-820</td><td>94.7℃</td><td>112.2℃</td></tr>
<tr><td>16</td><td>C105</td><td>3900uf/10V 10Kh ZLH</td><td>74.4℃</td><td>92.2℃</td></tr>
<tr><td>17</td><td>CN101</td><td>TSW2 ST 105℃</td><td>78.1℃</td><td>95.9℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P：230 VAC
O/P：110 % LOAD
Ta：25℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P：230 VAC
O/P：100 % LOAD
Ta= -40 ℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 40 ℃
NO DAMAGE</td><td>I/P：272 VAC
O/P：FULL LOAD
Ta= 40 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.04 %(0~50℃)</td><td>I/P：230 VAC
O/P：FULL LOAD</td><td>± 0.014 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">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℃</td><td>TEST：OK</td><td>P</td></tr>
</table>

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℃	I/P-O/P： 3.82 mA I/P-FG： 2.797 mA O/P-FG： 2.02 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℃/70%RH	I/P-O/P： 30 GΩ I/P-FG： 23.6 GΩ O/P-FG： 11.4 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta：25℃ / 70%RH	2 mΩ	P
4	APPROVAL	TUV： Certificate NO ：R50147701 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℃	PASS	P
2	CONDUCTION	EN55022 EN55011 CLASS B	I/P：230 VAC (50HZ)/115V60(HZ) O/P：FULL/50% LOAD Ta：25℃	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℃	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℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT： 2KV	I/P：230 VAC/50HZ O/P：FULL LOAD Ta：25℃	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℃	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-150-5：SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME= 157781 HRS I/P： 230VAC O/P：FULL LOAD Ta= 40 ℃ LIFE TIME= 49602 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE： 238.8K 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	Q 3 Rated 2SK4106 12A/500V	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on (2) Output Short Ta：25℃	(1) 454 V (2) 422 V	P
2	Diode Peak Voltage	Q101 Rated IRF1405Z 75A/55V Q103 Rated IRF1010E 84A/60V	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on (2)Output Short O/P：(1)Full Load Turn on (2)Output Short Ta：25℃	(1) 42.4 V (2) 38.4 V (1) 57.2 V (2) 57.6 V	P
3	PFC 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 (2) Dynamic Load 90%Duty/1KHz Ta：25℃	(1) 444 V (2) 444 V	P
4	Input Capacitor Voltage	C5 Rated 100u/400V 105℃ 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℃	(1) 377.8 V (2) 379.3 V (3) 379.4 V	P
5	Control IC Voltage Test	U 2 Rated FAN4801：12V~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℃	(1) 14.82 V (2) 14.08 V (3) 14.82 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/12/1	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/3/25	PRODUCT SAMPLE W0812D43	PASS	SANFORD SU	VINCENT TSENG
2009/6/16	PRODUCT SAMPLE W0905A31	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023