MODEL：PB-1000-12

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	BOOST CHARGE VOLTAGE	14.4V ± 0.3V	I/P: 230 VAC I/P: 115 VAC O/P: BAT LOAD Ta:25℃	14.35 V/ 230 VAC 14.35 V/ 115 VAC	P
2	FLOAT CHARGE VOLTAGE	13.8V ± 0.3V	I/P: 230 VAC I/P: 115 VAC O/P: BAT LOAD Ta:25℃	13.92 V/ 230 VAC 13.92 V/ 115 VAC	P
3	OUTPUT CURRENT	60A	I/P: 230 VAC O/P: BAT LOAD Ta:25℃	58.1 A/ 230 VAC	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC)	I/P:TESTING O/P:FULL LOAD Ta:25℃	83V~264V	P
			I/P: LOW-LINE=80VAC (+7VAC,-5VAC) 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: 90VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK	P
3	POWER FACTOR	0.95 / 230 VAC (TYP) 0.98 / 115 VAC (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	PF= 0.978 / 230 VAC PF= 0.99 / 115 VAC	P
4	EFFICIENCY	85 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	85.9%	P
5	INPUT CURRENT	230V/ 5.2 A (TYP) 115V/ 12 A(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 4.05 A/ 230 VAC I = 8.42 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 50 A (TYP) 230V/ 25 A (TYP) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I = 49 A/ 230 VAC I = 24 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 3.5 mA / 240 VAC	I/P: 254 VAC O/P: Min LOAD Ta:25℃	L-FG: 0.9 mA N-FG: 0.9 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER VOLTAGE PROTECTION	CH1:16V~18V NO CHARGE MODE TEST	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25℃	16.7 V/ 230 VAC 16.7 V/ 115 VAC PROTECTION RESULT (1) CHARGE OFF (2) BANK 1&2 RED LED LIGHT (3) RY13/ RY14/ RY15 RELAY POINT OPEN (4) FAN OFF (5) SHUT DOWN Re-POWER ON	P
2	OVER TEMPERATURE PROTECTION	Automatically dreate charge current until zero	I/P: 230 VAC O/P:BAT. LOAD	O.T.P. Active PROTECTION RESULT (1) CHARGE OFF (2) BANK 1&2 RED LED LIGHT (3) RY13/ RY14/ RY15 RELAY POINT OPEN (4) FAN ON (5) Shut down o/p voltage，recovers automatically after temperature goes down	P
3	O/P SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE +A AND –V SHORT +B AND –V SHORT	I/P: 264 VAC O/P: NO LOAD Ta:25℃	PROTECTION RESULT (1) CHARGE OFF (2) BANK 1&2 RED LED LIGHT (3) RY13/ RY14 RELAY POINT OPEN (4) RY15 RELAY POINT SHORT (5) FAN OFF (6) SHUT DOWN Re-POWER ON	P
4	BATTERY REVERSE POLARITY	Yes. Protected by internal circuit	I/P: 230 VAC O/P:BAT. LOAD Ta:25℃	PROTECTION RESULT (1) CHARGE OFF (2) BANK 1&2 RED LED LIGHT (3) RY13/ RY14 RELAY POINT OPEN (4) RY15 RELAY POINT SHORT (5) FAN OFF (6) SHUT DOWN Re-POWER ON	P

CONTROL FUNCTION 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>FAN SPEED CONTROL</td><td><table><tr><td colspan="3">FAN VOLTAGE</td></tr><tr><td>10%~25% LOAD</td><td>40%~60% LOAD</td><td>80%~100% LOAD</td></tr><tr><td>7.3V~8.5V</td><td>9.7V~10.9V</td><td>11.4V~12.6V</td></tr></table></td><td>I/P:230 VAC
O/P:BAT LOAD</td><td>6.7V-6.74V 8.76V-8.96V 11.81V-11.88V<table><tr><td colspan="3">FAN VOLTAGE</td></tr><tr><td>10%~25% LOAD</td><td>40%~60% LOAD</td><td>80%~100% LOAD</td></tr><tr><td>7.97-8.46V</td><td>10.5-10.42V</td><td>12.16-12.18V</td></tr></table></td><td>P</td></tr>
<tr><td>2</td><td>REMOTE CONTROL</td><td>Rc+ / Rc-
SHORT: CHARGING OFF
OPEN: CHARGING ON</td><td>I/P: 230 VAC
O/P:BAT. LOAD
Ta:25℃</td><td>SHORT: CHARGING OFF
OPEN: CHARGING ON</td><td>P</td></tr>
<tr><td>3</td><td>CHARGING OK (RY15)</td><td>RY15:
SHORT: NORMAL WORK
OPEN: Failure or the protection function is activating</td><td>I/P: 230 VAC
O/P:BAT. LOAD
Ta:25℃</td><td>RY15:
SHORT: NORMAL WORK
OPEN: Failure or the protection function is Activating</td><td>P</td></tr>
<tr><td>4</td><td>OUTPUT OK</td><td>1.BANK A OK (RY13)<table><tr><td>BANK A</td><td>Between Pin1&Pin2 (RY13)</td><td>Color of LED A</td></tr><tr><td>Battery A full</td><td>On (short)</td><td>Green</td></tr><tr><td>Charging</td><td>Off (open)</td><td>Orange</td></tr></table>2. BANK B OK (RY14)<table><tr><td>BANK B</td><td>Between Pin3&Pin4 (RY14)</td><td>Color of LED B</td></tr><tr><td>Battery B full</td><td>On (short)</td><td>Green</td></tr><tr><td>Charging</td><td>Off (open)</td><td>Orange</td></tr></table></td><td>I/P: 230 VAC
O/P:BAT. LOAD
Ta:25℃</td><td>1.BANK A OK (RY13)<table><tr><td>BANK A</td><td>Between Pin1&Pin2 (RY13)</td><td>Color of LED A</td></tr><tr><td>Battery A full</td><td>On (short)</td><td>Green</td></tr><tr><td>Charging</td><td>Off (open)</td><td>Orange</td></tr></table>2. BANK B OK (RY14)<table><tr><td>BANK B</td><td>Between Pin3&Pin4 (RY14)</td><td>Color of LED B</td></tr><tr><td>Battery B full</td><td>On (short)</td><td>Green</td></tr><tr><td>Charging</td><td>Off (open)</td><td>Orange</td></tr></table></td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE SENSE</td><td>Temperature sensor comes along with the charger can be connected to the unit to allow temperature compensation of the charging voltage
If the sensor is not used ,the charger still works normally<table><tr><td colspan="3">Constant voltage point(V)</td></tr><tr><td>Ta=0℃</td><td>Ta=25℃</td><td>Ta=50℃</td></tr><tr><td>14.8±0.2V</td><td>14.4±0.2V</td><td>13.9±0.2V</td></tr></table></td><td>I/P: 230 VAC
O/P:BAT. LOAD
Ta:25℃</td><td><table><tr><td colspan="3">Constant voltage point(V)</td></tr><tr><td>Ta=0℃</td><td>Ta=25℃</td><td>Ta=50℃</td></tr><tr><td>14.89V</td><td>14.3V</td><td>13.86V</td></tr></table></td><td>P</td></tr>
</table>

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL：PB-1000-12 1. HIGH AMBIENT BURN-IN：39HRS I/P: 230VAC O/P: BAT 190AH Ta= 48.9 ℃ SELECT: 8STAGE 2. HIGH AMBIENT BURN-IN：8HRS I/P: 264VAC O/P: BAT 190AH Ta= 49.9 ℃ SELECT: 8STAGE 3. HIGH AMBIENT BURN-IN：24HRS I/P: 100VAC O/P: BAT 190AH Ta= 45.4 ℃ SELECT: 8STAGE 4. HIGH AMBIENT BURN-IN：22HRS I/P: 90VAC O/P: BAT 190AH Ta= 40.3 ℃ SELECT: 8STAGE 5. HIGH AMBIENT BURN-IN：24HRS I/P: 90VAC O/P: BAT 190AH Ta= 45.9 ℃ SELECT: 2STAGE			P
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: BAT 190AH Ta= -25 ℃	TEST：OK	P
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H	TEST：OK	P
4	TEMPERATURE COEFFICIENT	± 0.05 %(0~50℃)	I/P: 230 VAC O/P: BAT 190AH	± 0.02 %(0~50℃)	P
5	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25℃		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: 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: 8.17 mA I/P-FG: 6.1 mA O/P-FG: 0.002 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℃	I/P-O/P: 1.5 GΩ I/P-FG: 1.2 GΩ O/P-FG: 5 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	15 mΩ	P
4	APPROVAL	TUV: Certificate NO：R50127896 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 VAC (50HZ) O/P:BAT. LOAD Ta:25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:BAT. LOAD Ta:25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:BAT. LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC (50HZ) O/P:BAT. LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC (50HZ) O/P:BAT. LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 230 VAC (50HZ) O/P:BAT. 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	PB-1000-12:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 607894 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 ℃ LIFE TIME= 107501 HRS			P
2	MTBF	Conducted by Parts Stress Analysis Prediction 127.4K hrs min. MIL-HDBK-217F (25℃)			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 900 Rated IRGP20B60PDPbF 20A/600V	I/P:High-Line +3V = 267 V O/P: (1) BAT LOAD INPUT (2) Output Short Ta:25℃	(1) 406 V (2) 224 V	P
2	Diode Peak Voltage	D 100 Rated ESAD83-006 30A/60V	I/P:High-Line +3V = 267 V O/P: (1) BAT LOAD INPUT (2) Output Short Ta:25℃	(1) 46 V (2) 0 V	P
3	Input Capacitor Voltage	C 5 Rated 330u/420V 105℃	I/P:High-Line +3V = 267 V O/P: (1) BAT LOAD (2) Output Short Ta:25℃	(1) 386 V (2) 378 V	P
4	Control IC Voltage Test	U 150 Rated SG3525AN : 35 V	I/P:High-Line +3V = 267 V O/P: (1) BAT LOAD (2) Output Short Ta:25℃	(1) 12.9 V (2) 12.9 V	P
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated IRFPS38N60LPBF 38A/600V	I/P:High-Line +3V = 267 V O/P: (1) BAT LOAD INPUT (2) Output Short Ta:25℃	(1) 426 V (2) 394 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/1/21	RD SMAPLE	PASS	SANFORD SU	VINCENT TSENG
2008/5/28	PRODUCT SAMPLE W0803A75	PASS	SANFORD SU	VINCENT TSENG
2008/6/30	PRODUCT SAMPLE W0805E68	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023