



Test Report: PB-120P-27

120W Single Output Power Supply or Battery Charger

■ 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
1	OUTPUT VOLTAGE	27.6V	I/P: 230 VAC O/P: 0% LOAD Ta:25°C	27.88 V
2	OUTPUT CURRENT	4.3A	I/P: 230 VAC O/P:C.V MODE-1V Ta:25°C	4.04A
3	LED INDICATOR	46%±10% ↓ : Green 46%±10% ↑ : Red	I/P: 230V O/P:TESTING LOAD Ta:25°C	TEST : <u>OK</u>

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	88VAC~132VAC 176VAC~264VAC 248VDC~370VDC (switch on 230VAC)	(1) I/P:TESTING O/P:FULL LOAD Ta:25°C	(1) 82 Vac~132Vac (2) 168 Vac~264Vac (3) 238Vdc~370Vdc
			I/P: LOW-LINE-3V=85 V HIGH-LINE+15%= 300 V O/P:BAT. LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 88VAC~132VAC 176VAC~264VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK
3	INPUT CURRENT (TYP)	230 V/ 1.5 A 115 V/ 3.0 A	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta:25°C	I =1.16A/ 230VAC I =2.41A/ 115VAC
4	POWER FACTOR (TYP)	0.65/ 230 VAC	I/P: 230 VAC O/P: FULL LOAD Ta:25°C	0.73/ 230VAC
5	EFFICIENCY (TYP)	79%	I/P: 230 VAC O/P: FULL LOAD Ta:25°C	80.4%
6	INRUSH CURRENT (TYP)	230 V/ 50 A 115V/25A COLD START	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta:25°C	43A/ 230VAC 23A/ 115VAC
7	LEAKAGE CURRENT	< 1.5 mA / 240 VAC	I/P: 240 VAC O/P:MIN LOAD Ta:25°C	0.78mA

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	CH1:30V~35V PROTECTION RESULT Hiccup mode, recovers automatically after fault condition is removed	I/P: 264 VAC I/P: 88 VAC O/P:TESTING Ta:25°C	33.31V/ 264VAC 33.31V/ 88VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER TEMPERATURE PROTECTION	RTH2 \geq 70°C \pm 10°C detect on RTH2 thermistor Shut down O/P voltage, recovers automatically after temperature goes down	I/P: 264 VAC I/P: 88 VAC O/P: BAT. LOAD	O.T.P. Active PROTECTION TYPE : Shut down O/P voltage, recovers automatically after temperature goes down
3	OVER LOAD PROTECTION	90 ~ 110% Constant current limiting, recovers automatically after fault condition is removed	I/P: 115 VAC/230VAC O/P: TESTING Ta:25°C	103 %/ 230 VAC 102 %/ 115 VAC PROTECTION TYPE : Constant current limiting, recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 900 V /75A	I/P:High-Line +3V = 267 V VDS : O/P: (1)CV-1V AC ON/OFF (2)CV-1V (3)OUTPUT SHORT Ta:25°C	VDS : (1) 816V (2) 788V (3) 804V
2	Diode Peak Voltage	D20 Rated : 400 V / 20A	I/P:High-Line +3V = 267 V VDS : O/P: (1)CV-1V AC ON/OFF (2)CV-1V (3)OUTPUT SHORT Ta:25°C	(1) 342V (2) 329V (3) 340V
3	Clamp Diode Peak Voltage	D2 Rated : 2 A/ 1K V	I/P:High-Line +3V = 267 V VDS : O/P: (1)CV-1V AC ON/OFF (2)CV-1V (3)OUTPUT SHORT Ta:25°C	(1) 811V (2) 799V (3) 657V
4	Input Capacitor Voltage	C5 Rated : 220uF/250 V	I/P:High-Line +3V = 267 V VDS : O/P: (1)CV-1V AC ON/OFF (2)CV-1V (3)Min Load AC ON/OFF (4)OUTPUT SHORT Ta:25°C(2)CV(min)	(1) 201V (2) 201V (3) 202V (4) 196V

5	Control IC Voltage Test	U1 Rated : 30V	I/P:High-Line +3V = 267 V VDS : O/P: (1)CV-1V AC ON/OFF (2)CV-1V (3)OUTPUT SHORT Ta:25°C	(1) 21.2V (2) 20.8V (3) 20.6V
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■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG:2 KVAC/min O/P-FG:0.5KVAC/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: 2.666 mA I/P-FG: 2.550 mA O/P-FG: 1.977 mA NO DAMAGE
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	I/P-O/P: 10 GΩ I/P-FG: 10 GΩ O/P-FG 10 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	14mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55032 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55032 CLASS B	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 AIR : 8KV / Contact : 4KV	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	■ CRITERIA A
5	E.F.T	EN61000-4-4 INPUT: 1KV	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	■ CRITERIA A
6	SURGE	IEC61000-4-5 L-N :1KV L,N-PE:2KV	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	■ CRITERIA A
7	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report			

■ **RELIABILITY TEST**

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																
1	TEMPERATURE RISE TEST	MODEL : PB-120P-54C 1.ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 27.8 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 42.8 °C																																																																		
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 105%LOAD Ta : 25°C	TEST : OK																																																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC/100VAC O/P : 80 %LOAD Ta= -10°C	TEST : OK																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H	TEST : OK																																																																
5	TEMPERATURE COEFFICIENT	± 0.05 %/ (0°C~45°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.013 %/°C(0~45°C)																																																																
6	STORAGE TEMPERATURE TEST	-20~85°C	1. Thermal shock Temperature : -30°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10CYCLE 5. Input/Output condition : STATIC																																																																	

7	THERMAL SHOCK TEST	0~45°C	1. Thermal shock Temperature : -5°C~ +50°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16 CYCLE 5. Input/Output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test	
8	VIBRATION TEST	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C	
9	CAPACITOR LIFE CYCLE	SUPPOSE C27 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= 45 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 45 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 45 °C LIFE TIME	(1) 287201HRS (2) 84209.8HRS (3) 155493.4HRS (4) 226758.5HRS	
10	MTBF	Conducted by Parts Stress Analysis Prediction 149.6K hrs min. MIL-HDBK-217F (25°C)		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		Wangdz

2018.4.30 GP-A50-F010