

MODEL : SP-480-15

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 39 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 13.5 V- 18 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	12.45V- 19.22 V/230VAC 12.45V- 19.22 V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: +1.5 %~ -1.5 % (Max)	I/P: 264 VAC / 85 VAC O/P:FULL/ 0 % LOAD Ta:25°C	V1: 0.06 %~ -0.06 %	P
4	LINE REGULATION	V1: +0.3 %~ -0.3 % (Max)	I/P: 264 VAC ~ 165 VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ -0.04 %	P
5	LOAD REGULATION	V1: +0.5 %~ -0.5 % (Max)	I/P: 230 VAC O/P:FULL -MIN LOAD Ta:25°C	V1: 0.04 %~ -0.04%	P
6	SET UP TIME	230 VAC/ 1000 ms (Max) 115 VAC/ 2500 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 486 ms 115 VAC/ 845 ms	P
7	RISE TIME	230VAC/ 80 ms (Max) 115VAC/ 80 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 10 ms 115 VAC/ 10 ms	P
8	HOLD UP TIME	230 VAC/ 18 ms(TYP) 115 VAC/ 18 ms(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 26 ms 115 VAC/ 27 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: 1500 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	762 mVp-p	P

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	264 VAC~ 85 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	68V~ 264V	P
			I/P: LOW-LINE-3V= 82 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	47 HZ ~ 63 HZ NO DAMAGE OSC	I/P: 264 VAC ~ 165 VAC O/P:FULL-MIN LOAD Ta:25°C	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°C	PF= 0.98 / 230 VAC PF= 1 / 115 VAC	P
4	EFFICIENCY	85 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	86.8 %	P
5	INPUT CURRENT	230 V/ 3.5 A(TYP) 115 V/ 6.5 A(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 2.5 A/ 230 VAC I = 5.1 A/ 115 VAC	P
6	INRUSH CURRENT	230 V/ 40 A(TYP) 115 V/ 25 A(TYP) COLD START	I/P: 230 VAC I/P:115 VAC O/P:FULL LOAD Ta:25°C	I = 31 A/ 230 VAC I = 14 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25°C	L-FG: 1.3 mA N-FG: 1.3 mA	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	36.75A ~ 47.25A	I/P: 230 VAC I/P: 165 VAC O/P: TESTING Ta: 25°C	40.6 A / 230 VAC 40.6 A / 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1: 18 V ~ 21 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	19.8 V / 230 VAC 19.8 V / 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1: 80°C TSW2: 90°C NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active NO DAMAGE Shunt down o/p voltage Recovery Automatically After temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 267 VAC O/P: 100% LOAD Ta: 25°C	NO DAMAGE Constant Current Limiting	P

**CONTROL FUNCTION TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	FAN SPEED CONTROL	-----	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	Fan Voltage = 11.94V	P
2	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	0V ~ 1.1 V POWER ON 1.6V ~ 10 V POWER OFF	P

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT	
1	TEMPERATURE RISE TEST	MODEL : SP-480-5 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: FULL LOAD Ta= 29.2°C 2. HIGH AMBIENT BURN-IN : HRS I/P: 230 VAC O/P: FULL LOAD Ta=40.6°C			<b>P</b>	
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P: 230 VAC O/P:93.5 A Ta:25°C	TEST : OK	<b>P</b>	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100 % LOAD Ta= -20 °C	TEST : OK	<b>P</b>	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta=50°C HUMIDITY= 95 %R.H	TEST : OK	<b>P</b>	
5	TEMPERATURE COEFFICIENT	<u>+0.03</u> %(0-50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.01 %(0-50°C)	<b>P</b>	
6	VIBRATION TEST	1 Carton & 1 Set Operating at I/P: 230 VAC NO LOAD (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°C		TEST : OK	<b>P</b>	

**SAFETY TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.0 KVAC/min I/P-FG: 1.5 KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P: 12.53 mA I/P-FG: 9.69 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC Ta:25°C	I/P-O/P: 5 G Ω I/P-FG: 5 G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	24 mΩ	P
4	APPROVAL	TUV: Certificate NO : R50039121 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 LIGHT 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 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	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 &amp; LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C52 IS THE MOST CRITICAL COMPONENT I/P:230 VAC O/P:FULL LOAD Ta=25 °C LIFE TIME=689318HRS I/P:230 VAC O/P:FULL LOAD Ta=40 °C LIFE TIME=209217 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 120.5K HRS			P

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) <b>Peak Voltage</b>	Q3 Rated IRFP450 : 500 V 14 A	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1)290 V (2)424 V (3)476 V	P
2	Diode <b>Peak Voltage</b>	D53Rated S20LC20U :200 V 20 A	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1)57.6V (2)74.8V (3)76.4V	P
3	Clamp Diode <b>Peak Voltage</b>	D9 Rated SF5408 : 1K V 3 A	I/P:High-Line +3V =267V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25°C	(1)408 V (2)422 V	P
4	<b>Input Capacitor Voltage</b>	C5 Rated : 220 u / 400 V 85°C/HP3 Series	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)376 V (2) 420 V (3) 400 V	P
5	<b>Control IC Voltage Test</b>	U 1 Rated 4800 : 16 V	I/P:High-Line +3V =267V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25°C	(1)154 V (4) 152 V (5) 154 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2003/10/28	RD SMAPLE	PASS	VINCENT TSENG	MAX LIN
2003/12/18	PRODUCT SAMPLE A311B18	PASS	VINCENT TSENG	MAX LIN
	PRODUCT SAMPLE A405A24	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023