

MODEL : SPV-1500-48

## OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 200 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 150 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 45.6V- 50.4V Adjustment by VR	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	44.27 V- 52.46 V/ 230 VAC 44.28 V- 52.47 V/ 115 VAC	P
3	OUTPUT VOLTAGE ADJUST RANGE	CH1: 20%V-110% Adjustment by 1V-6VDC external control	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	9.78 V- 56.14 V/ 230 VAC 9.81 V- 56.04 V/ 115 VAC	P
4	OUTPUT VOLTAGE TOLERANCE	V1: 1%- -1% (Max)	I/P: 100VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.05 %- -0.05 %	P
5	LINE REGULATION	V1: 0.5 %- -0.5 % (Max)	I/P: 100VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0.02 %- -0.02 %	P
6	LOAD REGULATION	V1: 0.5 %- -0.5 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.03 %- -0.03 %	P
7	SET UP TIME	230VAC: 1500 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 549 ms	P
8	RISE TIME	230VAC: 100 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 47 ms	P
9	HOLD UP TIME	230VAC: 16 ms (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 20.7 ms	P
10	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: < 5 %	P
11	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	410 mVp-p	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°C	88V~264V	P
			I/P: LOW-LINE-3V= 87 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: 90VAC ~ 264 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= 0.966 / 230 VAC PF= 0.998 / 115 VAC	P
4	EFFICIENCY	90 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	90.5%	P
5	INPUT CURRENT	230V/ 8 A (TYP) 115V/ 17 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 7.76 A/ 230 VAC I = 16.07 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 60 A (TYP) 115V/ 30 A(TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 50 A/ 230 VAC I = 25 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.85 mA N-FG: 0.85 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	122.8 %/ 230 VAC 116%/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1: 57.6V~ 67.2V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	60.3V/ 230 VAC 60.3V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW2: 105 ± 5°C 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°C	NO DAMAGE Constant Current Limiting	P

## CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT														
1	AUXILIARY POWER (AUX)	12V @ 0.1A (Only for Remote ON/OFF control )	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	12.429V	P														
2	REMOTE CONTROL	Table1.1 Fig1.2(a)(b)(c) Specification of Remote ON/OFF	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	<table border="1"> <thead> <tr> <th colspan="2">Connection Method</th> <th>Fig1.2(a)</th> <th>Fig1.2(b)</th> <th>Fig1.2(c)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">SW Logic</td> <td>Output on</td> <td>SW Open</td> <td>SW Open</td> <td>SW Close</td> </tr> <tr> <td>Output off</td> <td>SW Close</td> <td>SW Close</td> <td>SW Open</td> </tr> </tbody> </table>	Connection Method		Fig1.2(a)	Fig1.2(b)	Fig1.2(c)	SW Logic	Output on	SW Open	SW Open	SW Close	Output off	SW Close	SW Close	SW Open	P
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3	ALARM SIGNAL OUTPUT	Table2.1 Explanation of alarm <table border="1"> <thead> <tr> <th>Pin</th> <th>POK Alarm</th> </tr> </thead> <tbody> <tr> <td>P OK</td> <td rowspan="2">The signal is "LOW"when ther power supply is above 65%of the rated output voltage</td> </tr> <tr> <td>P OK GND</td> </tr> <tr> <td></td> <td>The signal turns to be "HIGH" when ther power supply is under 65%of the rated output voltage</td> </tr> </tbody> </table>	Pin	POK Alarm	P OK	The signal is "LOW"when ther power supply is above 65%of the rated output voltage	P OK GND		The signal turns to be "HIGH" when ther power supply is under 65%of the rated output voltage	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	<table border="1"> <thead> <tr> <th colspan="2">Output of alarm</th> </tr> </thead> <tbody> <tr> <td>Good:Low</td> <td>(0.5V max at 10mA)</td> </tr> <tr> <td>Fail:High or open</td> <td>(50V 10mA max)</td> </tr> </tbody> </table>	Output of alarm		Good:Low	(0.5V max at 10mA)	Fail:High or open	(50V 10mA max)	P	
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4	CURRENT SHARING	PSU1-PSU2 < 10%	I/P: 230 VAC O/P:FULL/50% LOAD Ta:25°C	PV=5V: 1.O/P:100% PSU1: 1520 W (PIN W) PSU2: 1510 W (PIN W) PSU3: 1510 W (PIN W) 2.O/P:50% PSU1: 780 W (PIN W) PSU2: 766 W (PIN W) PSU3: 798 W (PIN W)  PV=3V: 1.O/P:100% PSU1: 940 W (PIN W) PSU2: 964 W (PIN W) PSU3: 954 W (PIN W) 2.O/P:50% PSU1: 480 W (PIN W) PSU2: 487 W (PIN W) PSU3: 487 W (PIN W)  PV=1V: 1.O/P:100% PSU1: 380 W (PIN W) PSU2: 385 W (PIN W) PSU3: 376 W (PIN W) 2.O/P:50% PSU1: 180 W (PIN W) PSU2: 200 W (PIN W) PSU3: 190 W (PIN W)	P														
5	REMOTE SENSE	>0.25V	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	> 0.25 V	P														
6	OUTPUT VOLTAGE TRIM	9.6 V- 56 V	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	OK	P														

## ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																									
1	TEMPERATURE RISE TEST	MODEL : SPV-1500-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 230VAC O/P: FULL LOAD Ta= 33.8 °C 2. HIGH AMBIENT BURN-IN : 3 HRS I/P: 230VAC O/P: FULL LOAD Ta= 51.8 °C																																																																																																												
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P: 230 VAC O/P: O/P SHORT TEST Ta:37.6°C	TEST : OK	P																																																																																																									
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100% LOAD Ta= -20°C	TEST : OK	P																																																																																																									
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	P																																																																																																									
5	TEMPERATURE COEFFICIENT	± 0.05 % (0-50°C)	I/P: 230 VAC O/P: O/P SHORT TEST Ta:37.6°C	± 0.01 % (0-50°C)	P																																																																																																									
6	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°C		TEST : OK	P																																																																																																									

## LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 109K HRS			P
2	CAPACITOR LIFE CYCLE	SPV-1500-24 : SUPPOSE C118 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 1228729 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 220279 HRS			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°C	I/P-O/P: 11.86 mA I/P-FG: 8.7 mA O/P-FG: 14.91 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: 2.03 GΩ I/P-FG: 1 GΩ O/P-FG: 1.36 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 : R50063850 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 : FULL LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ)/115V(60HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ)/115V(60HZ) O/P : FULL/50% 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				



COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) Peak Voltage	Q900 Rated FOA24N50 : 500V 24 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) 418 V (2) 408 V (3) 442 V	P
2	Diode Peak Voltage	D102 Rated S20LC30 20A/300V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 185 V (2) 173 V (3) 272 V	P
3	Input Capacitor Voltage	C15 Rated : 150 u / 450V/ 105°C	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) 379 V (2) 392 V (3) 402 V	P
4	Control IC Voltage Test	U100 Rated UCC2895W : 9.8V-18.5 V	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) 12.08 V (2) 12.49-12.56 V (3) 12.59 V	P
5	PFC Power Transistor ( D to S) or (C to E) Peak Voltage	Q1 Rated SPW20N60C3 20.7A/600V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 466 V (2) 464 V (3) 436 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/6/5	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/7/31	PRODUCT SAMPLE W0906D50	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023