

MODEL : USP-500-48

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 21 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 43.2V-52.8 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	41.54 V- 54.19 V/ 230 VAC 41.54 V- 54.19 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 2 %- -2 % (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.4 %- -0.4 %	P
4	LINE REGULATION	V1: 0.5 %- -0.5 % (Max)	I/P: 100 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0.02 %- -0.02 %	P
5	LOAD REGULATION	V1:1 %- -1 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.4 %- -0.4 %	P
6	SET UP TIME	230VAC: 1500 ms (Max) 115VAC 3100 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 1068 ms 115VAC/ 2136 ms	P
7	RISE TIME	230VAC: 80 ms (Max) 115VAC 80 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 44 ms 115VAC/ 42 ms	P
8	HOLD UP TIME	230VAC: 20 ms (TYP) 115VAC 20 ms (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 34.4 ms 115VAC/ 34.3 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: 4800 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	1204 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	100VAC-264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	77V-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: 90 VAC ~ 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= 0.972 / 230 VAC PF= 0.996 / 115 VAC	P
4	EFFICIENCY	90 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	91%	P
5	INPUT CURRENT	230V/ 2.6 A (TYP) 115V/ 6 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 2.53 A/ 230 VAC I = 5.09 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 50 A (TYP) 115V/ 30 A(TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 42 A/ 230 VAC I = 21 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25°C	L-FG: 1.35 mA N-FG: 1.35 mA	P

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 130 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	116 %/ 230 VAC 116 %/ 115 VAC Constant Current Limiting unit will shut down o/p voltage after 3sec Re-power on to recover	P
2	OVER VOLTAGE PROTECTION	CH1: 53V~ 64.8V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	59 V/ 230 VAC 59 V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1 : 85 ± 5°C O.T.P TSW2 : 100 ± 5°C O.T.P NO DAMAGE	I/P: 264 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 unit will shut down o/p voltage after 3sec Re-power on to recover	P

### CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	RC+/RC-: 0~0.8V POWER ON RC+/RC-: 4~10V POWER OFF	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	RC+/RC-: 0~ 1.3V POWER ON RC+/RC-: 1.4V~10V POWER OFF	P
2	REMOTE SENSE	>0.25V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	> 0.25V	P
3	DC-OK SIGNAL	PSU turn on : 3.3V~5.6V PSU turn off : 0V~1V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	PSU turn on : 5.23 V PSU turn off : 0V	P
4	CURRENT SHARING (Optional)	PSU1-PSU2 < 10%	I/P: 230 VAC O/P: FULL / 50% LOAD Ta: 25°C	O/P: 100% PSU1: 498 W PSU2: 510 W	P
				O/P: 50% PSU1: 281 W PSU2: 291 W	



### 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: 9.74 mA I/P-FG: 8.02 mA O/P-FG: 8.84 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	I/P-O/P: 2.3 GΩ I/P-FG: 1.4 GΩ O/P-FG: 15 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	10 mΩ	P
4	APPROVAL	TUV: Certificate NO : R 50112380 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 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 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	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°C	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	USP-500-24 WITH FAN : SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25°C LIFE TIME= 432640 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50°C LIFE TIME= 148835 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 129.8K HRS			P
3	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure : Above 30,000 hours @ TA 45°C			P



## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) <b>Peak Voltage</b>	Q3 Rated SPW20N60C3 20.7A/650V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 494 V (2) 426 V (3) 474 V	P
2	Diode <b>Peak Voltage</b>	Q100 Rated SF20LC30 20A/300V  Q108 ESAC92-02 10A/200V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 265 V (2) 264 V (3) 264 V  (1) 146 V (2) 126 V (3) 147 V	P
3	<b>Input Capacitor Voltage</b>	C5 Rated 150u/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) 406 V (2) 402 V (3) 406 V	P
4	<b>Control IC Voltage Test</b>	U1 Rated CM6800GIP : 18V	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) 15.7 V (2) 13.8 V (3) 15.7 V	P
5	PFC Power Transistor (D to S) or (C to E) <b>Peak Voltage</b>	Q2 Rated SPW20N60C3 20.7A/650V	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) 466 V (3) 458 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2007/6/14	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/8/10	PRODUCT SAMPLE W0707A39	PASS	VINCENT TSENG	MAX LIN
2007/11/16	PRODUCT SAMPLE W0710C59	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023