

MODEL : USP-500-24

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: 16 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 21.6V-27 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	19.25 V- 27.64 V/ 230 VAC 19.25 V- 27.64 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: 0.05 %- -0.05 %	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 %- 0 %	P
5	LOAD REGULATION	V1:1 %- -1 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.05 %- -0.05 %	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/ 1058 ms 115VAC/ 2116 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/ 34 ms 115VAC/ 31 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/ 29.8 ms 115VAC/ 29.7 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: 2400 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	835 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	75.8V-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= 0.97 / 230 VAC PF= 0.99 / 115 VAC	P
4	EFFICIENCY	89 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	89.7 %	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 = 2.54 A/ 230 VAC I = 5.12 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: 1.2 mA N-FG: 1.2 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	117 %/ 230 VAC 115 %/ 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: 27.8V~ 32.4V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	29.5 V/ 230 VAC 29.5 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 : 5.22V PSU turn off : 0 V	P
4	CURRENT SHARING (Optional)	PSU1-PSU2 < 10%	I/P: 230 VAC O/P:FULL / 50% LOAD Ta:25°C	O/P:100% PSU1: 522 W PSU2: 499 W O/P:50% PSU1: 296W PSU2: 277 W	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : USP-500-24 WITH FAN 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 230VAC O/P: FULL LOAD Ta= 35.5 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 55.1 °C			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 114 % LOAD Ta:25°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	± 0.03 %(0-50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0 %(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

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: 9.43 mA I/P-FG: 7.59 mA O/P-FG: 9.48 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: 3 GΩ I/P-FG: 2 GΩ O/P-FG: 14 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	11 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) Peak Voltage	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) 428 V (2) 408 V (3) 434 V	P
2	Diode Peak Voltage	Q100 Rated SF20NC15M 20A/150V Q108 MBR20H100CT 20A/100V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 121 V (2) 121 V (3) 123 V (1) 88 V (2) 78 V (3) 89 V	P
3	Input Capacitor Voltage	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) 394 V (2) 392 V (3) 394 V	P
4	Control IC Voltage Test	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) 14.4 V (2) 12.7 V (3) 14.4 V	P
5	PFC Power Transistor (D to S) or (C to E) Peak Voltage	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) 456 V (2) 456 V (3) 456 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

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