

Quality Engineering Test Report

V1 : 24 V/ 37.6A/ 902.4 W AC-DC

Single Output Switching Power Supply

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: 48 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 20V~ 26.4 V (TYP)	I/P: 230 VAC O/P: MIN LOAD Ta: 25°C	19.1V~ 27.5V/ 230 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: + 1 % ~ - 1 % (Max)	I/P: 180 VAC / 264 VAC O/P: FULL / % LOAD Ta: 25°C	V1: 0 % ~ 0.2 %	P
4	LINE REGULATION	V1: + 0.2 % ~ - 0.2 % (Max)	I/P: 180 VAC ~ 264 VAC O/P: FULL LOAD Ta: 25°C	V1: 0 % ~ 0 %	P
5	LOAD REGULATION	V1: + 0.5 % ~ - 0.5 % (Max)	I/P: 230 VAC O/P: FULL ~ MIN LOAD Ta: 25°C	V1: -0.02 % ~ 0.1 %	P
6	SET UP TIME	230VAC/ 1500 ms (Max) 115 VAC/ 1500 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230 VAC/ 445 ms 115 VAC/ 815 ms	P
7	RISE TIME	230VAC/ 50 ms (Max) 115 VAC/ 50 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230 VAC/ 5.8 ms 115 VAC/ 14.3 ms	P
8	HOLD UP TIME	230VAC/ 15 ms (Max) 115 VAC/ 1.5 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230 VAC/ 33 ms 115 VAC/ 30 ms	P
9	OVER/UNDERSHOOT TEST	< $\pm 5\%$	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	750 mVp-p	P
11	TRANSIENT RECOVERY TIME	V1: 480 mVp-p	I/P: 230 VAC O/P: 40% LOAD CHANGE 50% DUTY/120HZ 1.25A/us	328 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180 VAC~264 VAC (Typ)	I/P:TESTING O/P:FULL LOAD Ta:25°C	78 V~ 264 V	P
			I/P: LOW-LINE-3V= 177 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 (Typ) NO DAMAGE OSC	I/P: 180 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	POWER FACTOR	0.95/ 230 VAC(TYP) 0.95/ 115 VAC(TYP)	I/P: 230 VAC I/P:115 VAC O/P:FULL LOAD Ta:25°C	PF= 0.97 / 230 VAC PF= 0.98 / 115 VAC	P
4	EFFICIENCY	86 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	86.3 %	P
5	INPUT CURRENT	230 V/ 7 A (Max) 115 V/ 14 A (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 4.7 A/ 230 VAC I = 8.4 A/ 115 VAC	P
6	INRUSH CURRENT	230 V/ 70 A (Max) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 36 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P: 230 VAC O/P:Min LOAD Ta:25°C	L-FG: 1.05 mA N-FG: 1.05 mA	P

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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	115 %~ 140 % (Typ)	I/P: 230 VAC I/P: 180 VAC O/P: TESTING Ta: 25°C	128 % / 230 VAC 129 % / 180 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1: 27.6 V~ 32.4 V (Typ)	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	31.6 V / 230 VAC 31.7 V / 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1 > 95 °C O.T.P. NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active NO DAMAGE Shunt down 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
3	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 ~ 2.2 V POWER ON 2.4V ~ 10 V POWER OFF	P
6	CURRENT SHARING	PSU1-PSU2 < 80W	I/P: 230 VAC O/P: FULL/50% LOAD Ta: 25°C	PSU1-PSU2 < 80W	P

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ENVIRONMENT TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT																																																																																
1	TEMPERATURE RISE TEST	<div>MODEL : PSP-1000-24</div> <div>1. ROOM AMBIENT BURN-IN : 16 HRS</div> <div>I/P: 230 VAC O/P: 100% LOAD Ta= 27.5 °C</div> <div>2. HIGH AMBIENT BURN-IN : HRS</div> <div>I/P: 230 VAC O/P: 100% LOAD Ta= 49.1 °C</div> <table><thead><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.5 °C</th><th>HIGH AMBIENT Ta= 49.1 °C</th></tr></thead><tbody><tr><td>1</td><td>BD1</td><td>GBJ2506 25A/600V</td><td>60.5°C</td><td>78.0°C</td></tr><tr><td>2</td><td>LF1</td><td>ET-35 6mH</td><td>40.4°C</td><td>59.1°C</td></tr><tr><td>3</td><td>Q1</td><td>IRFP460 20A/500V</td><td>63.7°C</td><td>81.3°C</td></tr><tr><td>4</td><td>Q7</td><td>IRFP460 20A/500V</td><td>64.5°C</td><td>82.2°C</td></tr><tr><td>5</td><td>D2</td><td>RHRP1506 15A/600V</td><td>61.1°C</td><td>78.7°C</td></tr><tr><td>6</td><td>Q3</td><td>IRFP460 20A/500V</td><td>71.9°C</td><td>90.9°C</td></tr><tr><td>7</td><td>Q2</td><td>IRFP460 20A/500V</td><td>64.2°C</td><td>82.4°C</td></tr><tr><td>8</td><td>D63</td><td>D92-02 20A/200V</td><td>48.8°C</td><td>68.1°C</td></tr><tr><td>9</td><td>C64</td><td>1000U/35V YXG 105°C</td><td>44.3°C</td><td>63.9°C</td></tr><tr><td>10</td><td>L1COIL</td><td>TF-655</td><td>54.9°C</td><td>72.4°C</td></tr><tr><td>11</td><td>L1CORE</td><td>TF-655</td><td>51.1°C</td><td>67.5°C</td></tr><tr><td>12</td><td>D1</td><td>1N5406 3A/600V</td><td>59.2°C</td><td>76.8°C</td></tr><tr><td>13</td><td>T1COIL</td><td>TF-646</td><td>67.3°C</td><td>82.0°C</td></tr><tr><td>14</td><td>T1CORE</td><td>TF-646</td><td>56.4°C</td><td>73.6°C</td></tr><tr><td>15</td><td>U6</td><td>4803 CP2</td><td>44.0°C</td><td>60.3°C</td></tr></tbody></table>			NO	Position	P/N	ROOM AMBIENT Ta= 27.5 °C	HIGH AMBIENT Ta= 49.1 °C	1	BD1	GBJ2506 25A/600V	60.5°C	78.0°C	2	LF1	ET-35 6mH	40.4°C	59.1°C	3	Q1	IRFP460 20A/500V	63.7°C	81.3°C	4	Q7	IRFP460 20A/500V	64.5°C	82.2°C	5	D2	RHRP1506 15A/600V	61.1°C	78.7°C	6	Q3	IRFP460 20A/500V	71.9°C	90.9°C	7	Q2	IRFP460 20A/500V	64.2°C	82.4°C	8	D63	D92-02 20A/200V	48.8°C	68.1°C	9	C64	1000U/35V YXG 105°C	44.3°C	63.9°C	10	L1COIL	TF-655	54.9°C	72.4°C	11	L1CORE	TF-655	51.1°C	67.5°C	12	D1	1N5406 3A/600V	59.2°C	76.8°C	13	T1COIL	TF-646	67.3°C	82.0°C	14	T1CORE	TF-646	56.4°C	73.6°C	15	U6	4803 CP2	44.0°C	60.3°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 128% 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= -10 °C	TEST : OK	P																																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 25 °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 25 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.02 %(0~50°C)	P																																																																																
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:3G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25°C		TEST : OK	P																																																																																

Quality Engineering Test Report

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.6 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: 8.53 mA I/P-FG: 6.54 mA O/P-FG: 29.9 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: 2.43G Ω I/P-FG: 1.3G Ω O/P-FG: 1.07G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	30 A / 2min Ta:25°C	18 mΩ	P
4	APPROVAL	TUV: Certificate NO : R50011970 UL: File NO : E183223			

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 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) 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				

Quality Engineering Test Report

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C 64 IS THE MOST CRITICAL COMPONENT I/P: 230 VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 473747 HRS I/P: 230 VAC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 86696 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 59666 HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated IRFP460 : 500 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) 400 V (2) 408 V (3) 458 V	P
2	Diode Peak Voltage	D 63 Rated D92-02 : 200 V 60 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) 83 V (2) 162 V (3) 167 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2003/08/13	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN

2003/7/14 A50-F023