



Test Report: EPS-25-3.3

25W Single Output Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 60 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 41 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 3.1 V ~ 3.6 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	3.0267 V ~ 3.6851 V/ 230 VAC 3.0257 V ~ 3.6851 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 : 0.37 %~ -0.37 %	P
4	LINE REGULATION	V1 : -0.5%~ 0.5 % (Max)	I/P : 100VAC ~ 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 : 0.37 %~ -0.37 %	P
6	SET UP TIME	230VAC : 1000 ms (Max) 115VAC : 1000 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 562 ms 115VAC/ 570 ms	P
7	RISE TIME	230VAC : 30 ms (Max) 115VAC : 30 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 4.8 ms 115VAC/ 5.2 ms	P
8	HOLD UP TIME	230VAC : 50 ms (TYP) 115VAC : 16 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 154 ms 115VAC/ 33 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 : 660 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)312 mVp-p (2) 364 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	41.3 V~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	47HZ ~63 HZ NO DAMAGE OSC	I/P : 100VAC ~ 264 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK	P
3	EFFICIENCY	79% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	80.69 %	P
4	INPUT CURRENT	230V/ 0.4 A (TYP) 115V/ 0.6 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.20 A/ 230 VAC I = 0.32 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 35 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 31 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.2 mA N-FG : 0.14 mA	P
7	NO LOAD CONSUMPTION	< 0.3 W	I/P : 240VAC O/P : NO LOAD Ta : 25°C	< 0.13 W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	115% ~ 160 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	131.2 %/ 230 VAC 136.6 %/ 115 VAC Hiccup mode,recovers automatically after fault condition is removed.	P
2	OVER VOLTAGE PROTECTION	CH1 : 3.7 V ~ 4.6 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	4.02 V/ 230 VAC 4.02 V/ 115 VAC Shut down Re- power ON	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup Mode	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : STF6N62K3 5.5A/620V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 526 V (2) 494 V (3) 522 V	P
2	Diode Peak Voltage	D100 Rated : PFR30L30CT 30A/30V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 28.5 V (2) 27.2 V (3) 25.3 V	P
3	Clamp Diode Peak Voltage	D1 Rated : 2A/800V GP20K	I/P : High-Line +3V = 267 V O/P : (1) Dynamic Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1) 472 V (2) 470 V	P
4	Input Capacitor Voltage	C5 Rated : 56u/400V 105°C 18*25 VZ	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) 378.72 V (2) 377.97 V (3) 380.28 V	P
5	Control IC Voltage Test	U1 Rated : LD7750R 11V~25V	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) 17.404 V (2) 13.225 V (3) 17.383 V	P

SAFETY & E.M.C. TEST

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 : 0.870 mA I/P-FG : 1.801 mA O/P-FG : 0.237 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 : 30 GΩ I/P-FG : 30 GΩ O/P-FG : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	14 mΩ	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) 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				

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																							
1	TEMPERATURE RISE TEST	MODEL : EPS-25-5 1. ROOM AMBIENT BURN-IN : 0.5 HRS I/P : 230VAC O/P : FULL LOAD Ta=28.1 °C 2. HIGH AMBIENT BURN-IN : 5 HRS I/P : 230VAC O/P : FULL LOAD Ta=52.5 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 28.1 °C</th><th>HIGH AMBIENT Ta= 52.5 °C</th></tr><tr><td>1</td><td>LF1</td><td>LF LF901 OTC-17 0.5A 11mH</td><td>54.1°C</td><td>72.1°C</td></tr><tr><td>2</td><td>C1</td><td>C/X2 474/275VAC 20% P=15 R.46</td><td>47.6°C</td><td>66.5°C</td></tr><tr><td>3</td><td>BD1</td><td>BD 4A/800V SILICON UR4KB80</td><td>56.3°C</td><td>74.0°C</td></tr><tr><td>4</td><td>Q1</td><td>FET STF6N62K3 5.5A/620V</td><td>84.7°C</td><td>107.8°C</td></tr><tr><td>5</td><td>C5</td><td>56u/400V 105°C 18*25 VZ</td><td>52.6°C</td><td>72.2°C</td></tr><tr><td>6</td><td>D1</td><td>RD 2A/800V GP20K T-52mm</td><td>71.0°C</td><td>91.9°C</td></tr><tr><td>7</td><td>D40</td><td>RD 1A/1KV 1N4007 T-52mm</td><td>64.1°C</td><td>83.2°C</td></tr><tr><td>8</td><td>C40</td><td>C/E 33u/50V L5Kh 6.3*11 KY</td><td>49.0°C</td><td>68.3°C</td></tr><tr><td>9</td><td>T1</td><td>MT TF2405 PQ-2020 EPS-25-5 B</td><td>71.9°C</td><td>92.0°C</td></tr><tr><td>10</td><td>U1</td><td>LD7750R</td><td>65.9°C</td><td>85.1°C</td></tr><tr><td>11</td><td>D100</td><td>SBD PFR30L45CT 30A/45V</td><td>68.1°C</td><td>90.2°C</td></tr><tr><td>12</td><td>C105</td><td>C/FPCON 1500u/6.3V C 10*10 FV</td><td>69.1°C</td><td>90.9°C</td></tr><tr><td>13</td><td>C106</td><td>C/E 1000u/16V UL10Kh 10*16 ZLH</td><td>60.4°C</td><td>84.1°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 28.1 °C	HIGH AMBIENT Ta= 52.5 °C	1	LF1	LF LF901 OTC-17 0.5A 11mH	54.1°C	72.1°C	2	C1	C/X2 474/275VAC 20% P=15 R.46	47.6°C	66.5°C	3	BD1	BD 4A/800V SILICON UR4KB80	56.3°C	74.0°C	4	Q1	FET STF6N62K3 5.5A/620V	84.7°C	107.8°C	5	C5	56u/400V 105°C 18*25 VZ	52.6°C	72.2°C	6	D1	RD 2A/800V GP20K T-52mm	71.0°C	91.9°C	7	D40	RD 1A/1KV 1N4007 T-52mm	64.1°C	83.2°C	8	C40	C/E 33u/50V L5Kh 6.3*11 KY	49.0°C	68.3°C	9	T1	MT TF2405 PQ-2020 EPS-25-5 B	71.9°C	92.0°C	10	U1	LD7750R	65.9°C	85.1°C	11	D100	SBD PFR30L45CT 30A/45V	68.1°C	90.2°C	12	C105	C/FPCON 1500u/6.3V C 10*10 FV	69.1°C	90.9°C	13	C106	C/E 1000u/16V UL10Kh 10*16 ZLH	60.4°C	84.1°C		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 137 % LOAD Ta : 25°C	TEST : OK	P																																																																							
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -35 °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	± 0.00 %(0~50°C)	P																																																																							
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																																							
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35°C~ +55°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P																																																																							

8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25℃	TEST : OK	P
9	CAPACITOR LIFE CYCLE	EPS-25-5: SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME	(1) 147585HRS (2) 30188HRS (3) 57508HRS (4) 78553HRS	P
10	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 655.3 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50℃		P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2012/2/3	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

2009/08/04 A50-F023