

## Quality Engineering Test Report

V1 : 3.3 V / 15 A / 49.5W AC-DC Single Output Switching Power Supply

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 80 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 17 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 3 V~ 3.5 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	2.92V~ 3.65V/230 VAC 2.921V~3.65 V/115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: +3 %~ -3 % (Max)	I/P: 264 VAC / 90 VAC O/P:FULL/ 0 % LOAD Ta:25°C	V1: +0.8 %~ -0.8 %	P
4	LINE REGULATION	V1: +1 %~ -1 % (Max)	I/P: 264 VAC ~ 90 VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ 0 %	P
5	LOAD REGULATION	V1: +3 %~ -3 % (Max)	I/P: 230 VAC O/P:FULL -MIN LOAD Ta:25°C	V1: +0.75 %~ -0.75 %	P
6	SET UP TIME	230 VAC/ 100 ms (Max) 115 VAC/ 100 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 62 ms 115 VAC/ 72 ms	P
7	RISE TIME	230VAC/ 35 ms (Max) 115VAC/ 35 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 1.8 ms 115 VAC/ 2 ms	P
8	HOLD UP TIME	230VAC/ 50 ms (TYP) 115VAC/ 12 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 99 ms 115 VAC/ 19 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 O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	282 mVp-p	P
11	TRANSIENT RECOVERY TIME	V1: 660 mVp-p	I/P: 230 VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	184 mVp-p	P

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	264VAC~ 90VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	58 V- 264 V	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	47 HZ ~ 63 HZ NO DAMAGE OSC	I/P: 264 VAC ~ 90 VAC O/P:FULL-MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	69 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	69.8 %	P
4	INPUT CURRENT	230 V/ 1.1 A(TYP) <u>115</u> V/ 1.9 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.7 A/ 230VAC I = 1.1 A/ 115VAC	P
5	INRUSH CURRENT	230 V/ 40 A (TYP) 115 V/ 24 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 36 A/ 230 VAC I = 20 A/ 115 VAC	P
6	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.56 mA N-FG: 0.56 mA	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	115 %~ 150 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta:25°C	122 %/ 230 VAC 126 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 3.8 V~ 4.45 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta:25°C	4.22 V/ 230 VAC 4.14 V/ 115 VAC Hiccup Model	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 267 VAC O/P: 100% LOAD Ta:25°C	NO DAMAGE Hiccup Mode	P

**CONTROL FUNCTION TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	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 ~ 2.4 V POWER ON 2.6V ~ 10V POWER OFF	P

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT																																																																																
1	TEMPERATURE RISE TEST	MODEL : LPS-75-5V 1. ROOM AMBIENT BURN-IN : 2.5 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 29.1 °C 2. HIGH AMBIENT BURN-IN : 12 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 46.5 °C			P																																																																																
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 29.1°C</th> <th>HIGH AMBIENT Ta= 46.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>ET-24</td><td>44.7°C</td><td>56.7°C</td></tr> <tr><td>2</td><td>BD1</td><td>D3SB60 4A/600V</td><td>59.2°C</td><td>71.9°C</td></tr> <tr><td>3</td><td>C5</td><td>CAPXON 150U/400V 85°C</td><td>52.6°C</td><td>67.6°C</td></tr> <tr><td>4</td><td>U1</td><td>NCP1203P60</td><td>56.8°C</td><td>72.9°C</td></tr> <tr><td>5</td><td>Q1</td><td>2SK1507 9A/600V</td><td>81.3°C</td><td>93.9°C</td></tr> <tr><td>6</td><td>D1</td><td>EPG20J 2A/600V</td><td>87.4°C</td><td>103.1°C</td></tr> <tr><td>7</td><td>D2</td><td>FR104 1A/400V</td><td>69.6°C</td><td>89.6°C</td></tr> <tr><td>8</td><td>T1CORE</td><td>TF925</td><td>83.4°C</td><td>96.1°C</td></tr> <tr><td>9</td><td>T1COIL</td><td>TF925</td><td>62.6°C</td><td>76.5°C</td></tr> <tr><td>10</td><td>D51</td><td>E83004 60A/40V</td><td>93.0°C</td><td>105.4°C</td></tr> <tr><td>11</td><td>C52</td><td>2200U/10V GL 105°C</td><td>72.3°C</td><td>88.6°C</td></tr> <tr><td>12</td><td>R52</td><td>33/2W</td><td>75.5°C</td><td>92.0°C</td></tr> <tr><td>13</td><td>R6</td><td>82/2W</td><td>78.3°C</td><td>92.2°C</td></tr> <tr><td>14</td><td>C12</td><td>22U/50V 105°C</td><td>61.3°C</td><td>81.5°C</td></tr> <tr><td>15</td><td>R11</td><td>0.24/2W</td><td>62.2°C</td><td>79.7°C</td></tr> </tbody> </table>	NO	Position	P/N	ROOM AMBIENT Ta= 29.1°C	HIGH AMBIENT Ta= 46.5 °C	1	LF1	ET-24	44.7°C	56.7°C	2	BD1	D3SB60 4A/600V	59.2°C	71.9°C	3	C5	CAPXON 150U/400V 85°C	52.6°C	67.6°C	4	U1	NCP1203P60	56.8°C	72.9°C	5	Q1	2SK1507 9A/600V	81.3°C	93.9°C	6	D1	EPG20J 2A/600V	87.4°C	103.1°C	7	D2	FR104 1A/400V	69.6°C	89.6°C	8	T1CORE	TF925	83.4°C	96.1°C	9	T1COIL	TF925	62.6°C	76.5°C	10	D51	E83004 60A/40V	93.0°C	105.4°C	11	C52	2200U/10V GL 105°C	72.3°C	88.6°C	12	R52	33/2W	75.5°C	92.0°C	13	R6	82/2W	78.3°C	92.2°C	14	C12	22U/50V 105°C	61.3°C	81.5°C	15	R11	0.24/2W	62.2°C	79.7°C	
NO	Position	P/N	ROOM AMBIENT Ta= 29.1°C	HIGH AMBIENT Ta= 46.5 °C																																																																																	
1	LF1	ET-24	44.7°C	56.7°C																																																																																	
2	BD1	D3SB60 4A/600V	59.2°C	71.9°C																																																																																	
3	C5	CAPXON 150U/400V 85°C	52.6°C	67.6°C																																																																																	
4	U1	NCP1203P60	56.8°C	72.9°C																																																																																	
5	Q1	2SK1507 9A/600V	81.3°C	93.9°C																																																																																	
6	D1	EPG20J 2A/600V	87.4°C	103.1°C																																																																																	
7	D2	FR104 1A/400V	69.6°C	89.6°C																																																																																	
8	T1CORE	TF925	83.4°C	96.1°C																																																																																	
9	T1COIL	TF925	62.6°C	76.5°C																																																																																	
10	D51	E83004 60A/40V	93.0°C	105.4°C																																																																																	
11	C52	2200U/10V GL 105°C	72.3°C	88.6°C																																																																																	
12	R52	33/2W	75.5°C	92.0°C																																																																																	
13	R6	82/2W	78.3°C	92.2°C																																																																																	
14	C12	22U/50V 105°C	61.3°C	81.5°C																																																																																	
15	R11	0.24/2W	62.2°C	79.7°C																																																																																	
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P: 230 VAC O/P:129% 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= -21.0 °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	± 0.04 % (0-50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.01 % (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:2G (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: 0.5 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: 4.23 mA I/P-FG: 4.97 mA O/P-FG: 1.99 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: 13.4 G Ω I/P-FG: 7.24 G Ω O/P-FG: 17G Ω NO DAMAGE	P

### E.M.C TEST

NO	TEST ITEM	SPECICATION	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 Certificate Lab & Test Report Prepare				P

## 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 52 IS THE MOST CRITICAL COMPONENT I/P:230 VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 61407 HRS I/P: 230 VAC O/P:FULL LOAD Ta= 40 °C LIFE TIME=23423 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 335000 HRS			P

**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q1 Rated K2645 : 600 V 9 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) 466 V (2) 578 V (3) 566 V	P
2	Diode <b>Peak Voltage</b>	D 51 Rated D83004 : 30 V 40 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) 19.4 V (2) 21.7 V (3) 20.1 V	P
3	Clamp Diode <b>Peak Voltage</b>	D1 Rated EGP20J : 600 V 2 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 568 V (2) 568 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2003/06/10	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2003/07/23	PRODUCT SAMPLE A306C14A	PASS	VINCENT TSENG	MAX LIN

2003/7/14 A50-F023