

## Quality Engineering Test Report

V1 : 12 V / 6.2 A / 74.4W    AC-DC    Single    Output Switching Power Supply

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 100 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 5 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 11 V- 13.5 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	10.1V- 13.7V/230 VAC 10.1V- 13.7V/115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: +2%~ -2 % (Max)	I/P: 264 VAC / 90 VAC O/P:FULL/ 0 % LOAD Ta:25°C	V1: +0.1 %~ -0.1 %	P
4	LINE REGULATION	V1: +1 %~ -1 % (Max)	I/P: 264 VAC ~ 90 VAC O/P:FULL LOAD Ta:25°C	V1: +0.05%~ -0.05%	P
5	LOAD REGULATION	V1: +2 %~ -2 % (Max)	I/P: 230 VAC O/P:FULL -MIN LOAD Ta:25°C	V1: +0.1 %~ -0.1 %	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/ 71 ms 115 VAC/ 82 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/ 11 ms 115 VAC/ 14 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/ 75 ms 115 VAC/ 15 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: 1200 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	278 mVp-p	P

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	264VAC~ 90VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	66 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	80 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	81.6 %	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 = 0.8 A/ 230VAC I =1.4 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 = 32 A/ 230 VAC I = 21 A/ 115 VAC	P
6	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.68 mA N-FG: 0.68 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	123 %/ 230 VAC 124%/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 13.8V~ 16.2 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta:25°C	14.7 V/ 230 VAC 15.0V/ 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 ~ 2.6 V POWER ON 2.8V ~10V POWER OFF	P

## Quality Engineering Test Report

### 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" style="width: 100%; border-collapse: collapse; margin: 10px auto;"> <thead> <tr style="background-color: #cccccc;"> <th style="width: 5%;">NO</th> <th style="width: 15%;">Position</th> <th style="width: 25%;">P/N</th> <th style="width: 15%;">ROOM AMBIENT Ta= 29.1°C</th> <th style="width: 15%;">HIGH AMBIENT Ta= 46.5 °C</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td style="text-align: center;">LF1</td><td style="text-align: center;">ET-24</td><td style="text-align: center;">44.7°C</td><td style="text-align: center;">56.7°C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">BD1</td><td style="text-align: center;">D3SB60 4A/600V</td><td style="text-align: center;">59.2°C</td><td style="text-align: center;">71.9°C</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">C5</td><td style="text-align: center;">CAPXON 150U/400V 85°C</td><td style="text-align: center;">52.6°C</td><td style="text-align: center;">67.6°C</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">U1</td><td style="text-align: center;">NCP1203P60</td><td style="text-align: center;">56.8°C</td><td style="text-align: center;">72.9°C</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">Q1</td><td style="text-align: center;">2SK1507 9A/600V</td><td style="text-align: center;">81.3°C</td><td style="text-align: center;">93.9°C</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">D1</td><td style="text-align: center;">EPG20J 2A/600V</td><td style="text-align: center;">87.4°C</td><td style="text-align: center;">103.1°C</td></tr> <tr><td style="text-align: center;">7</td><td style="text-align: center;">D2</td><td style="text-align: center;">FR104 1A/400V</td><td style="text-align: center;">69.6°C</td><td style="text-align: center;">89.6°C</td></tr> <tr><td style="text-align: center;">8</td><td style="text-align: center;">T1CORE</td><td style="text-align: center;">TF925</td><td style="text-align: center;">83.4°C</td><td style="text-align: center;">96.1°C</td></tr> <tr><td style="text-align: center;">9</td><td style="text-align: center;">T1COIL</td><td style="text-align: center;">TF925</td><td style="text-align: center;">62.6°C</td><td style="text-align: center;">76.5°C</td></tr> <tr><td style="text-align: center;">10</td><td style="text-align: center;">D51</td><td style="text-align: center;">E83004 60A/40V</td><td style="text-align: center;">93.0°C</td><td style="text-align: center;">105.4°C</td></tr> <tr><td style="text-align: center;">11</td><td style="text-align: center;">C52</td><td style="text-align: center;">2200U/10V GL 105°C</td><td style="text-align: center;">72.3°C</td><td style="text-align: center;">88.6°C</td></tr> <tr><td style="text-align: center;">12</td><td style="text-align: center;">R52</td><td style="text-align: center;">33/2W</td><td style="text-align: center;">75.5°C</td><td style="text-align: center;">92.0°C</td></tr> <tr><td style="text-align: center;">13</td><td style="text-align: center;">R6</td><td style="text-align: center;">82/2W</td><td style="text-align: center;">78.3°C</td><td style="text-align: center;">92.2°C</td></tr> <tr><td style="text-align: center;">14</td><td style="text-align: center;">C12</td><td style="text-align: center;">22U/50V 105°C</td><td style="text-align: center;">61.3°C</td><td style="text-align: center;">81.5°C</td></tr> <tr><td style="text-align: center;">15</td><td style="text-align: center;">R11</td><td style="text-align: center;">0.24/2W</td><td style="text-align: center;">62.2°C</td><td style="text-align: center;">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
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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: 4.1 mA I/P-FG: 5.0 mA O/P-FG: 2 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: 15 G Ω I/P-FG: 8.3 G Ω O/P-FG: 16.6G Ω NO DAMAGE	P
4	APPROVAL	TUV: Certificate NO : UL: File NO :			N/A

**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

**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>	Q 1 Rated K2645: 600V 9A	I/P:High-Line +3V = 267V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 496V (2) 480V (3) 534V	P
2	Diode Peak <b>Voltage</b>	D51 Rated BYQ28X: 200V 10A	I/P:High-Line +3V = 267V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 90V (2) 115V (3) 104V	P
3	Clamp Diode Peak <b>Voltage</b>	D1 Rated EGP20J: 600V 2A	I/P:High-Line +3V = 267V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 480V (2) 478V	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