Quality Engineering Test Report

V1 : 48 V / 1.56 A AC-DC Single Output Switching Power Supply

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 8 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 45 V~ 54 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	39.34V~ 54.91V/230 VAC 39.34V~54.91 V/115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: +2%~ -2 % (Max)	I/P: 264 VAC / 90 VAC O/P:FULL/ 0 % LOAD Ta:25℃	V1:0.007 %~ ±0.007 %	P
4	LINE REGULATION	V1: +1 %~ -1 % (Max)	I/P: 264 VAC ~ 90 VAC O/P:FULL LOAD Ta:25℃	V1: 0 %~ ± 0 %	P
5	LOAD REGULATION	V1: +1 %~ -1 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0 %~ ±0 %	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℃	230 VAC/ 67 ms 115 VAC/ 52 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℃	230 VAC/ 21 ms 115 VAC/ 21 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℃	230 VAC/ 93 ms 115 VAC/ 21 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	241mVp-p	P
11	TRANSIENT RECOVERY TIME	V1: 1920 mVp-p	I/P: 230 VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	121 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℃	58.4V~ 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:	
2	INPUT FREQUENCY RANGE	47 HZ ~ 63 HZ NO DAMAGE OSC	I/P: 264 VAC ~ 90 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST:	P
3	EFFICIENCY	83 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	86.596 %	P
4	INPUT CURRENT	230 V/ 1.1 A(TYP) 115 V/ 1.9 A(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 0.87 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℃	I = 36 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℃	L-FG: 0.7 mA N-FG: 0.7 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℃	129 %/ 230 VAC 129 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 57.6V~ 67.2 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	57.71V/ 230 VAC 57.71V/ 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℃	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℃	0V ~ 2.6 V POWER ON 2.8V ~ 10 V POWER OFF	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： LPS-75-24V
1. ROOM AMBIENT BURN-IN： 2 HRS
I/P: 230 VAC O/P: 100% LOAD Ta=31.9 ℃
2. HIGH AMBIENT BURN-IN： HRS
I/P: 230 VAC O/P: 100% LOAD Ta=48.6
<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta=31.9℃</th><th>HIGH AMBIENT Ta= 48.6 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>ET-24</td><td>45..2℃</td><td>57.9℃</td></tr>
<tr><td>2</td><td>BD1</td><td>D3SB60 4A/600V</td><td>54.5℃</td><td>68.0℃</td></tr>
<tr><td>3</td><td>C5</td><td>CAPXON 150U/400V 85℃</td><td>51.9℃</td><td>65.4℃</td></tr>
<tr><td>4</td><td>U1</td><td>NCP1203P60</td><td>61.0℃</td><td>72.2℃</td></tr>
<tr><td>5</td><td>Q1</td><td>2SK1507 9A/600V</td><td>70.4℃</td><td>86.5℃</td></tr>
<tr><td>6</td><td>D1</td><td>EPG20J 2A/600V</td><td>73.9℃</td><td>91.3℃</td></tr>
<tr><td>7</td><td>D2</td><td>FR104 1A/400V</td><td>77.5℃</td><td>85.3℃</td></tr>
<tr><td>8</td><td>T1CORE</td><td>TF925</td><td>73.1℃</td><td>87.4℃</td></tr>
<tr><td>9</td><td>T1COIL</td><td>TF925</td><td>73.7℃</td><td>85.3℃</td></tr>
<tr><td>10</td><td>D51</td><td>E83004 60A/40V</td><td>67.5℃</td><td>80.6℃</td></tr>
<tr><td>11</td><td>C54</td><td>2200U/10V GL 105℃</td><td>50.7℃</td><td>65.8℃</td></tr>
<tr><td>12</td><td>R52</td><td>33/2W</td><td>63.2℃</td><td>77.2℃</td></tr>
<tr><td>13</td><td>C12</td><td>22U/50V 105℃</td><td>81.3℃</td><td>94.3℃</td></tr>
<tr><td>14</td><td>R11</td><td>0.24/2W</td><td>64.4℃</td><td>79.0℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P: 230VAC
O/P: 131% LOAD
Ta:25℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 230
O/P: 100% LOAD
Ta= -21.4℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 50 ℃
NO DAMAGE</td><td>I/P: 230VAC
O/P:FULL LOAD
Ta= 51℃
HUMIDITY=95% R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.04 %(0~50℃)</td><td>I/P: 230 VAC
O/P:FULL LOAD</td><td>+0.01%(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set Operating at I/P: 230VAC 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℃</td><td>TEST： OK</td><td>P</td></tr>
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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℃	I/P-O/P: 4.1 mA I/P-FG: 4.9 mA O/P-FG: 2.1 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℃	I/P-O/P: 10.2 GΩ I/P-FG: 18 GΩ O/P-FG: 11 GΩ 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℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	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℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	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℃	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 54 IS THE MOST CRITICAL COMPONENT I/P:230 VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 380786 HRS I/P: 230 VAC O/P:FULL LOAD Ta= 50 ℃ LIFE TIME= 75226 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 335 K 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 K2645: 600V 9A	I/P:High-Line +3V = 267V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 506V (2) 464V (3) 532V	P
2	Diode Peak **Voltage**	D51 Rated F10LC40: 400V 10A	I/P:High-Line +3V = 267V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 274V (2) 311V (3) 326V	P
3	Clamp Diode Peak **Voltage**	D1 Rated EGP20J: 600V 2A	I/P:High-Line +3V = 267V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 460V (2) 458V	P

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