Test Report：NPF-40-30

40W 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	V1：200 mVp-p (Max)	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	V1： 32 mVp-p (Max)	PASS
2	CONSTANT CURRENT REGION	V1： 18V ~ 30 V	I/P：230VAC O/P:LED MODE Ta:25℃	OP= 18V / 1.364A OP= 29V / 1.371A	PASS
3	OUTPUT VOLTAGE TOLERANCE	V1： -3 %~ 3 % (Max)	I/P：90 VAC / 305 VAC O/P：FULL/ NO LOAD Ta：25℃	V1： -0.07 %~ 0.08 %	PASS
4	LINE REGULATION	V1： -0.5 %~ 0.5 % (Max)	I/P：100 VAC ~ 305 VAC O/P：FULL LOAD Ta：25℃	V1： 0 %~ 0 %	PASS
5	LOAD REGULATION	V1： -0.5 %~ 0.5 % (Max)	I/P： 230 VAC O/P：FULL~NO LOAD Ta：25℃	V1： -0.05 %~ 0.08 %	PASS
6	SET UP TIME	230VAC： 500 ms (Max) 115VAC： 500 ms(Max)	I/P： 230 VAC I/P： 115 VAC O/P：95% LOAD Ta：25℃	230VAC/ 392 ms 115VAC/ 416 ms	PASS
7	RISE TIME	230VAC： 80 ms (Max) 115VAC： 80 ms (Max)	I/P： 230 VAC I/P： 115 VAC O/P：95% LOAD Ta：25℃	230VAC/ 48 ms 115VAC/ 49 ms	PASS
8	HOLD UP TIME	230VAC： 16 ms (TYP) 115VAC： 16 ms (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 19 ms 115VAC/ 19 ms	PASS
9	OVER/UNDERSHOOT TEST	＜ ±5%	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	TEST： ＜ 5 %	PASS
10	DYNAMIC LOAD	V1： 3000 mVp-p	I/P： 230 VAC (1).O/P：FULL /NO LOAD 90%DUTY/ 1KHZ (2).O/P：FULL /NO LOAD 50%DUTY/ 120HZ Ta：25℃	(1) 263 mVp-p (2) 458 mVp-p	PASS

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90 VAC~305 VAC	I/P：TESTING O/P：FULL LOAD Ta：25℃	87 V~305 V	PASS
			I/P： (1)LOW-LINE-3V=87 V HIGH-LINE+10V=315 V O/P：FULL/MIN LOAD ON： 30 Sec OFF：30 Sec 10MIN (2)230VAC ON：0.5 Sec OFF：0.5 Sec 20MIN (3)230VAC ON：3Sec OFF：3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST： (1) OK (2) OK (3) OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P： 90 VAC ~ 305 VAC O/P：FULL ~NO LOAD Ta：25℃	TEST： OK	PASS
3	POWER FACTOR	115V/ 0.97 (TYP) 230V/ 0.95 (TYP) 277V/ 0.92 (TYP)	I/P： 115 VAC I/P： 230 VAC I/P： 277 VAC O/P：FULL LOAD Ta：25℃	PF= 0.997 / 115 VAC PF= 0.977 / 230 VAC PF= 0.943 / 277 VAC	PASS
4	EFFICIENCY	89% (TYP)	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	90.16%	PASS
5	INPUT CURRENT	115V/ 0.6 A (TYP) 230V/ 0.3 A (TYP) 277V/ 0.25 A (TYP)	I/P： 115 VAC I/P： 230 VAC I/P： 277 VAC O/P：FULL LOAD Ta：25℃	I = 0.392 A/ 115 VAC I = 0.198 A/ 230 VAC I = 0.170 A/ 277 VAC	PASS
6	INRUSH CURRENT	230V/ 50 A (TYP) Twidth =270 us measured at 50% Ipeak COLD START	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	I = 43.4 A Twidth = 208 us	PASS
7	LEAKAGE CURRENT	< 0.25 mA / 277 VAC	I/P： 305 VAC O/P：NO LOAD Ta：25℃	L-CASE： 0.003 mA N-CASE： 0.003 mA	PASS
8	NO LOAD CONSUMPTION	< 0.15 W	I/P：230VAC O/P：NO LOAD Ta：25℃	0.11 W	PASS
9	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 60% or higher at 230V/115VAC Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 277VAC	I/P： 115 VAC I/P： 230 VAC O/P：60% LOAD I/P： 277 VAC O/P：75%LOAD Ta：25℃	THD： 6.38% /115VAC THD： 15.27% /230VAC THD： 15.49% /277VAC	PASS

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	95 % ~ 108 %	I/P : 100 VAC I/P : 230 VAC I/P : 305 VAC O/P : TESTING Ta : 25℃	102.1 %/ 100 VAC 102.3 %/ 230 VAC 102.4 %/ 305 VAC Constant current limiting, recovers automatically after fault condition is removed	PASS
2	OVER VOLTAGE PROTECTION	CH1 : 34 V ~ 40 V	I/P : 90 VAC I/P : 230 VAC I/P : 305 VAC O/P : NO LOAD Ta : 25℃	37.7 V/ 90 VAC 37.7 V/ 230 VAC 37.7 V/ 305 VAC Shut down o/p voltage , re-power on to recover	PASS
3	OVER TEMPERATURE PROTECTION	SPEC : O.T.P. NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage , re-power on to recover	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 305 VAC O/P : FULL LOAD Ta : 25℃	NO DAMAGE Hiccup mode , recovers automatically after fault condition is removed	PASS

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated 800 V 9A	I/P : High-Line +3V = 308 V O/P : (1)FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta : 25℃	(1) 624 V (2) 488 V (3) 608 V	PASS
2	Diode Peak Voltage	D100 Rated 150 V 20 A	I/P : High-Line +3V = 308 V O/P : (1) FULL LOAD Turn on (2)Output Short (3) FULL LOAD continue Ta : 25℃	(1) 125 V (2) 93.6 V (3) 125 V	PASS
3	Input Capacitor Voltage	C5 Rated 33uF / 450 V	I/P : High-Line +3V = 308 V O/P : (1) FULL LOAD Turn on /Off (2) NO LOAD Turn on /Off (3) FULL LOAD /Min load Change Ta : 25℃	(1) 444 V (2) 448 V (3) 446 V	PASS
4	Control IC Voltage Test	U1 Rated 28V	I/P : High-Line +3V = 308 V O/P : (1) FULL LOAD Turn on /Off (2) NO LOAD Turn on /Off (3) FULL LOAD /Min load Change Ta : 25℃	(1) 17.1 V (2) 17.0 V (3) 17.3 V	PASS
5	PFC Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 600 V 10A	I/P : High-Line +3V = 308 V O/P : (1)FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta : 25℃	(1) 456 V (2) 442 V (3) 460 V	PASS

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P： 3.75 KVAC/min	I/P-O/P： 4.2 KVAC/min Ta：25℃	I/P-O/P： 2.681 mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-O/P：500VDC>100MΩ	I/P-O/P： 500 VDC Ta：25℃/70% RH	I/P-O/P： >9999 MΩ NO DAMAGE	PASS

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS C	I/P：115VAC/230VAC/50HZ O/P：60%/FULL LOAD I/P：277VAC/50HZ O/P：75%/FULL LOAD Ta:25℃	OK	PASS
2	CONDUCTION	EN55015	I/P：230 VAC/50HZ O/P:FULL LOAD Ta:25℃	OK Test by certified Lab	PASS
3	RADIATION	EN55015	I/P：230 VAC/50HZ O/P:FULL LOAD Ta:25℃	OK Test by certified Lab	PASS
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P：230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT：1KV	I/P：230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	PASS
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV	I/P：230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	PASS
7	Test by certified Lab & Test Report Prepare				

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</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： NPF-40-24
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=28.4 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=49.5 ℃

<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT
Ta= 28.4 ℃</th><th>HIGH AMBIENT
Ta= 49.5 ℃</th></tr>
<tr><td>1</td><td>L3</td><td>46.3℃</td><td>65.1℃</td></tr>
<tr><td>2</td><td>Q1</td><td>53.8℃</td><td>72.7℃</td></tr>
<tr><td>3</td><td>Q2</td><td>55.3℃</td><td>74.2℃</td></tr>
<tr><td>4</td><td>D6</td><td>52.0℃</td><td>70.8℃</td></tr>
<tr><td>5</td><td>C5</td><td>50.7℃</td><td>69.1℃</td></tr>
<tr><td>6</td><td>T1</td><td>55.4℃</td><td>74.0℃</td></tr>
<tr><td>7</td><td>C45</td><td>50.1℃</td><td>68.7℃</td></tr>
<tr><td>8</td><td>D100</td><td>52.0℃</td><td>71.1℃</td></tr>
<tr><td>9</td><td>C105</td><td>50.8℃</td><td>69.6℃</td></tr>
<tr><td>10</td><td>R5</td><td>52.8℃</td><td>71.6℃</td></tr>
<tr><td>11</td><td>U1</td><td>50.8℃</td><td>69.8℃</td></tr>
<tr><td>12</td><td>U100</td><td>47.4℃</td><td>66.2℃</td></tr>
<tr><td>13</td><td>RTH2</td><td>49.1℃</td><td>67.7℃</td></tr>
<tr><td>14</td><td>Tc</td><td>46.8℃</td><td>66.0℃</td></tr>
</table></td><td>PASS</td></tr>
<tr><td>2</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P：305VAC/100VAC
O/P：FULL LOAD
Ta= -45℃/-30℃</td><td>TEST：OK</td><td>PASS</td></tr>
<tr><td>3</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：315 VAC
O/P：FULL LOAD
Ta= 50 ℃
HUMIDITY= 95% R.H</td><td>TEST：OK</td><td>PASS</td></tr>
<tr><td>4</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.03 %(0~50℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>±0.004 %(0~50℃)</td><td>PASS</td></tr>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +85℃
2. Temperature change rate ：25℃ / MIN
3. Dwell time low and high temperature ： 30 MIN/EACH
4. Total test cycle：5 CYCLE
5. Input/Output condition： STATIC</td><td>OK</td><td>PASS</td></tr>
<tr><td>6</td><td>THERMAL SHOCK TEST</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +55℃
2. Temperature change rate ：25℃ / 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</td><td>OK</td><td>PASS</td></tr>
</table>

7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：12min/sweep cycle (4) Acceleration：5G (5) Test Time：90min in each axis (X.Y.Z) (6) Ta：25℃	TEST：OK	PASS
8	CAPACITOR LIFE CYCLE	NPF-40-24：SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta=25℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta=50℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta=50℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta=50℃ LIFE TIME	(1) 459368 HRS (2) 95281 HRS (3) 121390 HRS (4) 129189 HRS	PASS
9	MTBF	Conducted by Parts Stress Analysis Prediction 3084.3K hrs min. Telcordia SR-332 (Bellcore) ; 288.2K hrs min. MIL-HDBK-217F (25℃)		PASS
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) ： 50000 hours @ Tcase 70℃		PASS

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ ZHUOKB	SKY	LIUWY

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