



Test Report : NPF-40D-48

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°C	V1 : 38 mVp-p (Max)	PASS
2	CONSTANT CURRENT REGION	V1: 28.8V ~ 48 V	I/P : 230VAC O/P:LED MODE Ta:25°C	OP= 28.8V / 0.847A OP= 47V / 0.847A	PASS
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1 %~ 1 % (Max)	I/P : 90 VAC / 305 VAC O/P : FULL/ NO LOAD Ta : 25°C	V1 : -0.02 %~ 0.15 %	PASS
4	LINE REGULATION	V1 : -0.5 %~ 0.5 % (Max)	I/P : 100 VAC ~ 305 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 %~ 0 %	PASS
5	LOAD REGULATION	V1 : -0.5 %~ 0.5 % (Max)	I/P : 230 VAC O/P : FULL~NO LOAD Ta : 25°C	V1 : -0.02 %~ 0.04 %	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°C	230VAC/ 228 ms 115VAC/ 224 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°C	230VAC/ 43 ms 115VAC/ 43 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°C	230VAC/ 30 ms 115VAC/ 21 ms	PASS
9	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : < 5 %	PASS
10	DYNAMIC LOAD	V1 : 4800 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°C	(1) 328 mVp-p (2) 696 mVp-p	PASS

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DIMMER TEST

SPEC:

*Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM + and DIM - .

*Reference resistance value for output current adjustment (Typical)

Resistance value	Single driver	Short	10 K Ω	20 K Ω	30 K Ω	40 K Ω	50 K Ω	60 K Ω	70 K Ω	80 K Ω	90 K Ω	100 K Ω	OPEN
	Multiple drives (N=driver quantity for synchronized dimming operation)	Short	10 K Ω /N	20 K Ω /N	30 K Ω /N	40 K Ω /N	50 K Ω /N	60 K Ω /N	70 K Ω /N	80 K Ω /N	90 K Ω /N	100 K Ω /N	
Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

*0 ~ 10V dimming function for output current adjustment (Typical)

Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

*10V PWM signal for output current adjustment (Typical): Frequency range: 100Hz~3KHz

Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

TEST RESULT: I/P : 230 VAC; Ta : 25℃

1	Resistance value	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output current	0A	0.081A	0.167A	0.252A	0.337A	0.423A	0.508A	0.593A	0.678A	0.768A	0.846A	0.867A
	%	0%	9.64%	19.88%	30.00%	40.12%	50.36%	60.48%	70.60%	80.71%	91.43%	100.71%	103.21%
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
	Output current	0A	0.084A	0.171A	0.255A	0.342A	0.429A	0.517A	0.603A	0.688A	0.775A	0.858A	0.867A
	%	0%	10.00%	20.36%	30.36%	40.71%	51.07%	61.55%	71.79%	81.90%	92.26%	102.14%	103.21%
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output current	0A	0.080A	0.159A	0.240A	0.320A	0.401A	0.481A	0.561A	0.642A	0.722A	0.801A	0.867A
	%	0%	9.52%	18.93%	28.57%	38.10%	47.74%	57.26%	66.79%	76.43%	85.95%	95.36%	103.21%

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°C	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°C	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°C	PF= 0.997 / 115 VAC PF= 0.978 / 230 VAC PF= 0.945 / 277 VAC	PASS
4	EFFICIENCY	90% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	90.44%	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°C	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) Twidh =270 us measured at 50% Ipeak COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 42.2 A Twidh = 182 us	PASS
7	LEAKAGE CURRENT	< 0.25 mA / 277 VAC	I/P : 305 VAC O/P : NO LOAD Ta : 25°C	L-CASE : 0.003 mA N-CASE : 0.003 mA	PASS
8	NO LOAD CONSUMPTION	< 0.5 W	I/P : 230VAC O/P : NO LOAD Ta : 25°C	0.18 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°C	THD : 5.85% /115VAC THD : 13.76% /230VAC THD : 13.88% /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°C	100.9 %/ 100 VAC 100.9 %/ 230 VAC 100.9 %/ 305 VAC Constant current limiting, recovers automatically after fault condition is removed	PASS
2	OVER VOLTAGE PROTECTION	CH1 : 54 V ~ 60 V	I/P : 90 VAC I/P : 230 VAC I/P : 305 VAC O/P : NO LOAD Ta : 25°C	57.0 V/ 90 VAC 57.0 V/ 230 VAC 57.0 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°C	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°C	(1) 612 V (2) 496 V (3) 606 V	PASS
2	Diode Peak Voltage	D100 Rated 300 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°C	(1) 201 V (2) 150 V (3) 200 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°C	(1) 442 V (2) 446 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°C	(1) 17.5 V (2) 17.7 V (3) 17.7 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°C	(1) 440 V (2) 442 V (3) 442 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°C	I/P-O/P : 2.621 mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ	I/P-O/P : 500 VDC Ta : 25°C /70%RH	I/P-O/P : >9999 MΩ NO DAMAGE	PASS

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	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°C	OK	PASS
2	CONDUCTION	EN55015	I/P : 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	OK Test by certified Lab	PASS
3	RADIATION	EN55015	I/P : 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	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°C	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°C	CRITERIA A	PASS
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV	I/P : 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	PASS
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 : NPF-40D-48 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=28.4 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=49.5 °C <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 28.4 °C</th><th>HIGH AMBIENT Ta= 49.5 °C</th></tr></thead><tbody><tr><td>1</td><td>L3</td><td>47.6°C</td><td>66.7°C</td></tr><tr><td>2</td><td>Q1</td><td>54.7°C</td><td>74.0°C</td></tr><tr><td>3</td><td>Q2</td><td>56.3°C</td><td>75.9°C</td></tr><tr><td>4</td><td>D6</td><td>52.1°C</td><td>71.4°C</td></tr><tr><td>5</td><td>C5</td><td>51.3°C</td><td>69.9°C</td></tr><tr><td>6</td><td>T1</td><td>54.0°C</td><td>75.2°C</td></tr><tr><td>7</td><td>C45</td><td>50.8°C</td><td>69.5°C</td></tr><tr><td>8</td><td>D100</td><td>49.7°C</td><td>69.0°C</td></tr><tr><td>9</td><td>C105</td><td>49.4°C</td><td>68.6°C</td></tr><tr><td>10</td><td>R5</td><td>54.0°C</td><td>73.0°C</td></tr><tr><td>11</td><td>U1</td><td>51.3°C</td><td>70.4°C</td></tr><tr><td>12</td><td>U100</td><td>47.5°C</td><td>67.0°C</td></tr><tr><td>13</td><td>RTH2</td><td>50.1°C</td><td>68.9°C</td></tr><tr><td>14</td><td>Tc</td><td>44.6°C</td><td>64.8°C</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta= 28.4 °C	HIGH AMBIENT Ta= 49.5 °C	1	L3	47.6°C	66.7°C	2	Q1	54.7°C	74.0°C	3	Q2	56.3°C	75.9°C	4	D6	52.1°C	71.4°C	5	C5	51.3°C	69.9°C	6	T1	54.0°C	75.2°C	7	C45	50.8°C	69.5°C	8	D100	49.7°C	69.0°C	9	C105	49.4°C	68.6°C	10	R5	54.0°C	73.0°C	11	U1	51.3°C	70.4°C	12	U100	47.5°C	67.0°C	13	RTH2	50.1°C	68.9°C	14	Tc	44.6°C	64.8°C	PASS
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/100VAC O/P : FULL LOAD Ta= -45°C /-30°C	TEST : OK	PASS																																																												
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 315 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95% R.H	TEST : OK	PASS																																																												
4	TEMPERATURE COEFFICIENT	±0.03 %(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	±0.004 %(0~50°C)	PASS																																																												
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C ~ +85°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	PASS																																																												
6	THERMAL SHOCK TEST	1. Thermal shock Temperature : -45°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	PASS																																																												

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-40D-48 : 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) 512431 HRS (2) 103327 HRS (3) 122894 HRS (4) 127271 HRS	PASS
9	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 368KHRS		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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