



Test Report: EPP-100-27

100W Single Output with PFC Function

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control 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 : 240 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 35.6 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 26.46 V ~ 28.35V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	25.620 V ~ 29.368 V/ 230 VAC 25.620 V ~ 29.368 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : 1 % ~ -1 % (Max)	I/P : 100VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.03 %~ -0.03 %	P
4	LINE REGULATION	V1 : 0.5 %~ -0.5 % (Max)	I/P : 100VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0.02 %~ -0.02 %	P
5	LOAD REGULATION	V1 : 1 %~ -1 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 0.03 %~ -0.03 %	P
6	SET UP TIME	230VAC : 1000 ms (Max) 115VAC : 2000 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 293 ms 115VAC/ 430 ms	P
7	RISE TIME	230VAC : 30 ms (Max) 115VAC : 30 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 5.7 ms 115VAC/ 5.8 ms	P
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/ 24 ms 115VAC/ 23 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 : 2700 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)277 mVp-p (2)195 mVp-p (3)209 mVp-p (4)1750 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	58V~264V	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	47HZ ~63 HZ NO DAMAGE OSC	I/P : 100 VAC ~ 264 VAC O/P : FULL ~MIN LOAD Ta : 25°C	TEST : OK	P
3	POWER FACTOR	0.94 / 230 VAC(TYP) 0.98 / 115 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.947 / 230 VAC PF= 0.994 / 115 VAC	P
4	EFFICIENCY	92.5% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	92.986 %	P
5	INPUT CURRENT	230V/ 0.7 A (TYP) 115V/ 1.4 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I= 0.51 A/ 230 VAC I= 1 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 80 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I= 69 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.11 mA N-FG : 0.11 mA	P
8	NO LOAD CONSUMPTION	< 0.5 W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25°C	< 0.39 W < 0.41 W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105% ~ 145 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	127 %/ 230 VAC 127 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 30.2V ~ 34.5 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	32.01V/ 230 VAC 32.01V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : RTH2 : 110± 10°C TSW1 : 110± 5°C O.T.P. NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup Mode	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	AUXILIARY POWER (AUX)	12V@0.3A for driver a fan, tolerance ± 10% at main output 100% load	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	FAN VOLTAGE : 12.5 V	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q6 Rated : STD10NM60N 8A/650V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 442 V (2) 440 V (3) 432 V	P
2	Diode Peak Voltage	Q100 Rated : STPS30M100ST 30A/100V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 66.4 V (2) 20.8 V (3) 68.4 V	P
3	Input Capacitor Voltage	C5 Rated : 82u/420V 105°C 18*25 PT	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 408 V (2) 406 V (3) 406 V	P
4	Control IC Voltage Test	U 1 Rated : NCP1605 10V~20V U900 Rated : L6599AD 8.85V~16V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 18.2 V (2) 18.2 V (3) 14 V (4) 15 V (5) 15.3 V (6) 14 V	P
5	Power Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated : STF28NM50N 21A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 482 V (2) 472 V (3) 460 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 2 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 1.669 mA I/P-FG : 0.779 mA O/P-FG : 0.289 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 /70%RH	I/P-O/P : 30 GΩ I/P-FG : 30 GΩ O/P-FG : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	27 mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	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 certified Lab & Test Report Prepare				

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																					
1	TEMPERATURE RISE TEST	MODEL : EPP-100-24 1. ROOM AMBIENT BURN-IN : 12 HRS I/P : 230VAC O/P : FULL LOAD Ta=30.1 °C 2. HIGH AMBIENT BURN-IN : 4 HRS I/P : 230VAC O/P : FULL LOAD Ta=53.4 °C <table><thead><tr><th>NO</th><th>Position</th><th>PART NUMBER</th><th>ROOM AMBIENT Ta=30.1 °C</th><th>HIGH AMBIENT Ta=53.4 °C</th></tr></thead><tbody><tr><td>1</td><td>BD1</td><td>6A/800V SILICON GBU608</td><td>43.4°C</td><td>64.5°C</td></tr><tr><td>2</td><td>L1</td><td>TF2383</td><td>41.1°C</td><td>63.4°C</td></tr><tr><td>3</td><td>Q1</td><td>STF28NM50N 21A/500V TO220FP</td><td>39.6°C</td><td>61.6°C</td></tr><tr><td>4</td><td>D5</td><td>BYV29X-600 7A/600V TO220F</td><td>44.7°C</td><td>65.7°C</td></tr><tr><td>5</td><td>C5</td><td>82u/420V 105°C 18*25 PT</td><td>35.2°C</td><td>56.8°C</td></tr><tr><td>6</td><td>Q6</td><td>STD10NM60N 8A/650V DPAK</td><td>32.7°C</td><td>56.1°C</td></tr><tr><td>7</td><td>U900</td><td>L6599AD SO-16N</td><td>37.6°C</td><td>60.5°C</td></tr><tr><td>8</td><td>C36</td><td>150u/25V UL8Kh 6.3*11 ZLH</td><td>34.9°C</td><td>57.8°C</td></tr><tr><td>9</td><td>T1</td><td>TF2386</td><td>45.7°C</td><td>68.3°C</td></tr><tr><td>10</td><td>Q101</td><td>PFR30L100CT 30A/100V TO220</td><td>42.2°C</td><td>65.4°C</td></tr><tr><td>11</td><td>Q100</td><td>PFR30L100CT 30A/100V TO220</td><td>37.5°C</td><td>60.8°C</td></tr><tr><td>12</td><td>C105</td><td>470u/35V UL7Kh 10*20 KY</td><td>33.6°C</td><td>57.2°C</td></tr><tr><td>13</td><td>C201</td><td>100u/25V UL10Kh 6.3*11 YXM</td><td>37.2°C</td><td>60.8°C</td></tr><tr><td>14</td><td>RTH2</td><td>100KΩ 3Φ TTC3A104F4193EY 1%</td><td>35.5°C</td><td>58.4°C</td></tr><tr><td>15</td><td>TSW2</td><td>BW-DCP-R0 115°C 40mm P</td><td>40.3°C</td><td>63.4°C</td></tr><tr><td>16</td><td>U1</td><td>NCP1605DR2G SOIC-16</td><td>37.8°C</td><td>60.0°C</td></tr></tbody></table>			NO	Position	PART NUMBER	ROOM AMBIENT Ta=30.1 °C	HIGH AMBIENT Ta=53.4 °C	1	BD1	6A/800V SILICON GBU608	43.4°C	64.5°C	2	L1	TF2383	41.1°C	63.4°C	3	Q1	STF28NM50N 21A/500V TO220FP	39.6°C	61.6°C	4	D5	BYV29X-600 7A/600V TO220F	44.7°C	65.7°C	5	C5	82u/420V 105°C 18*25 PT	35.2°C	56.8°C	6	Q6	STD10NM60N 8A/650V DPAK	32.7°C	56.1°C	7	U900	L6599AD SO-16N	37.6°C	60.5°C	8	C36	150u/25V UL8Kh 6.3*11 ZLH	34.9°C	57.8°C	9	T1	TF2386	45.7°C	68.3°C	10	Q101	PFR30L100CT 30A/100V TO220	42.2°C	65.4°C	11	Q100	PFR30L100CT 30A/100V TO220	37.5°C	60.8°C	12	C105	470u/35V UL7Kh 10*20 KY	33.6°C	57.2°C	13	C201	100u/25V UL10Kh 6.3*11 YXM	37.2°C	60.8°C	14	RTH2	100KΩ 3Φ TTC3A104F4193EY 1%	35.5°C	58.4°C	15	TSW2	BW-DCP-R0 115°C 40mm P	40.3°C	63.4°C	16	U1	NCP1605DR2G SOIC-16	37.8°C	60.0°C	P
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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 : 264VAC/100VAC O/P : 100 % LOAD Ta= -35 °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	± 0.03 %/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.005 %/°C (0~50°C)	P																																																																																					
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°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	P																																																																																					

7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35℃~ +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	OK	P
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25℃	TEST : OK	P
9	CAPACITOR LIFE CYCLE	EPP-100-24: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) 1722289HRS (2) 298239HRS (3) 307414HRS (4) 340170HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 249.6 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50℃		P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2012/5/7	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2013/5/30	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

2009/08/04 A50-F023