Test Report: GSC40B-1400

40W Single Output LED 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	SPECICATION	TEST CONDITION	RESULT
1	RIPPLE & NOISE**(Max)**	V1: 2.9Vp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1:~~3.06~~ Vp-p 2
2	CURRENT ACCURACY	±8%	I/P: 230 VAC I/P:115VAC O/P:FULL LOAD Ta:25℃	1.373A /230VAC@CV MAX-1V 1.4220A /230VAC@CV MIN 1.329A/115VAC@CV MAX-1V 1.368A/115VAC@CV MIN
3	SET UP TIME	230VAC/ 500 ms (Max) 115VAC/ 1000ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/121ms 115 VAC/184ms
4	OVER/UNDERSHOOT TEST	< ±15%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <1.72%
5	NO LOAD OUTPUT VOLTAGE (max.)	40V	I/P: 230 VAC O/P:NO LOAD Ta:25℃	34.34 V

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~277 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	50.6V~277 V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE) (2) I/P:230Vac ON: 0.5 Sec . OFF: 0.5 Sec 20MIN	(1).TEST: OK (2).TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~277VAC O/P:FULL~MIN LOAD Ta:25℃	OK
3	POWER FACTOR(TYP)	0.92/230 VAC FULL LOAD 0.98/115 VAC FULL LOAD 0.91/277 VAC FULL LOAD	I/P: 230 VAC/115VAC/277VAC O/P:FULL LOAD Ta:25℃	PF=0.9690/ 230V/100%LOAD PF=0.9879/ 115V/100%LOAD PF=0.9367/ 277V/100%LOAD
4	EFFICIENCY (TYP)	87 %	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	88.24%
5	INPUT CURRENT (TYP)	277VAC/ 0.25A 230 VAC/ 0.35A 115 VAC/ 0.7 A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25℃	I= 0.171 mA / 277VAC I =0.195mA/ 230VAC I =0.370mA/ 115VAC
6	INRUSH CURRENT (TYP)	230 V/ 15 A COLD START (twidth=110us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I =10.3A/ 230VAC T50= 24.8 us

7	TOTAL HARMONIC DISTORTION	`Total harmonic distortion will be lower than 20% when output loading is 75% or higher	I/P： 230VAC I/P： 277VAC I/P： 115VAC O/P：75% LOAD Ta：25℃	THD: 15.432 % THD: 16.976 % THD: 11.959 %
8	NO LOAD POWER CONSUMPTION	< 0.15 W	I/P：240VAC O/P：NO LOAD Ta：25℃	< 0.0914 W

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT
1	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 277VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE Hiccup Mode

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 6A/650V	I/P:High-Line +3V =280V O/P: (1)Full Load input on/off (2)Output Short Ta:25℃	Q1 VDS (1)582V (2)448V
2	Diode Peak Voltage	D100 Rated 20A/150V	I/P:High-Line +3V = 280 V O/P: (1)Full Load input on/off (2)Output Short (3)NO LOAD Ta:25℃	(1) 131V (2) 100V (3) 130V
3	Control IC Voltage Test	U 1 Rated 9V~30V	I/P:High-Line +3V =280 V O/P:(1) FULL LOAD (2)SHORT (3)NO LOAD (4)NO LOAD(LOW LINE) Ta:25℃	(1)25.1V (2)16.2V (3)26.7V (4)26.2V

■ SAFETY & EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.125 KVAC/min Ta:25℃	I/P-O/P:1.509 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25℃	I/P-O/P: >30 GΩ NO DAMAGE
3	LEAKAGE CURRENT	IEC60950-1 < 0.5mA / 240VAC	I/P: 240 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.002 mA N-FG: 0.002 mA

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C	I/P: 230VAC/50HZ O/P:100%/50% LED LOAD I/P :277VAC 60HZ O/P:100/75% LED LOAD Ta:25℃	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab
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
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL：GSC40B-1400 1. ROOM AMBIENT BURN-IN：2.5 HRS I/P： 230VAC O/P： FULL LOAD Ta= 29 ℃ 2. HIGH AMBIENT BURN-IN： 1.5 HRS I/P： 230VAC O/P： FULL LOAD Ta= 47.8 ℃		
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 230VAC/90VAC O/P： 100 % LOAD Ta= -35 ℃	TEST：OK
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P： 305 VAC O/P：FULL LOAD Ta= 50 ℃ HUMIDITY= 95 %R.H	TEST：OK

NO	Position	ROOM AMBIENT Ta=29℃	HIGH AMBIENT Ta=47.8℃
1	Q1	77.4℃	92.3℃
2	T1	82.0℃	96.2℃
3	C101	65.2℃	80.4℃
4	D100	68.0℃	83.2℃
5	L2	69.3℃	84.1℃
6	D3	69.1℃	84.3℃
7	C40	68.1℃	83.3℃
8	U1	67.3℃	81.9℃

4	TEMPERATURE COEFFICIENT	±0.03%/℃(0~50℃)	I/P： 230 VAC O/P：FULL LOAD	±0.00153 %/℃(0~50℃)
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature： -45℃~ +90℃ 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		OK
6	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
7	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：72min in each axis (X.Y.Z) (6) Ta：25℃		TEST：OK
8	CAPACITOR LIFE CYCLE	SUPPOSE C101 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) 175883 HRS (2) 36486 HRS (3) 49839 HRS (4) 73908 HRS
9	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE： 358.9 KHRS		
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 75℃; 50,000 hours @ Tcase70℃		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT ZENG

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