Test Report: LDH-45A-350

DC-DC Step-Up Constant Current LED Driver

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Control Function Test
Protection Function Test
Component Stress Test

■ E.M.C. 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	2500 mVp-p (Max)	I/P : 12VDC O/P : FULL LOAD Ta : 25℃	600 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE RANGE	12V ~ 86V (Non-DALI) 24V ~ 86V (DALI)	I/P : 9 VDC I/P : 12 VDC I/P : 18 VDC O/P : CV MODE Ta : 25℃	12V ~ 86V (Non-DALI) 24V ~ 86V (DALI)	PASS
3	NO LOAD OUTPUT VOLTAGE	< 100 V	I/P : 12 VDC O/P : NO LOAD Ta : 25℃	TEST : < 100 V	PASS
4	CURRENT ACCURACY	± 5%	I/P : 12 VDC O/P : FULL LOAD Ta : 25℃	TEST : ±1.83 %	PASS

INPUT FUNCTION TEST

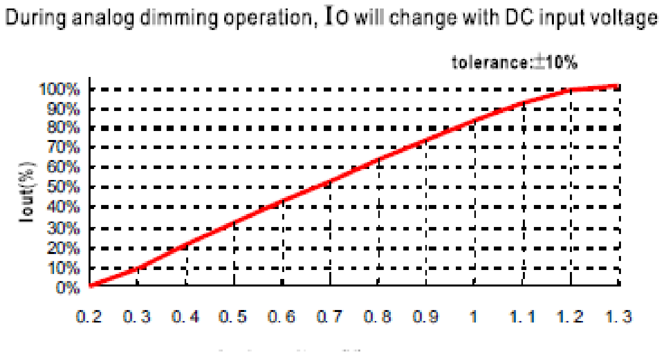
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	9VDC~18VDC	I/P : TESTING O/P : FULL LOAD Ta : 25℃	8.8 V~ 18 V	PASS
			I/P : LOW-LINE-0.2V=8.8 V HIGH-LINE =18 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST : OK	
2	EFFICIENCY	91 % (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25℃	92.20 %	PASS
3	DC CURRENT	12VDC/ 2.8 A (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25℃	I = 2.685 A/ 12 VDC	PASS

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DIMMING OFF	INPUT CURRENT＜ 7mA	I/P:12VDC O/P:FULL LOAD Ta:25℃	TEST： 4 mA	PASS
2	ANALOG DIMMING	See below			PASS
3	PWM DIMMING	See below			PASS
4	DALI DIMMING (DA-Type)	See below			PASS

2 ANALOG DIMMING — PASS

SPEC:
*Output constant current level can be adjusted through output cable by 0.2V~8Vdc DIM (+) and DIM (-).
*0.2V~8V dimming function for output current adjustment (Typical)

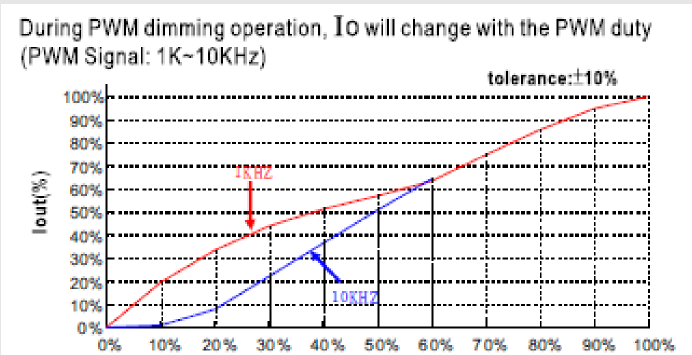


TEST RESULT: I/P：12 VDC ;Ta：25℃

DIMMING	0.2V	0.3V	0.4V	0.5V	0.6V	0.7V	0.8V	0.9V	1.0V	1.1V	1.2V	1.3V	8.0V
O/P LOAD	0%	6.3%	18%	28%	39%	49%	60%	70%	81%	90%	96%	99%	99%

3 PWM DIMMING — PASS

SPEC:
*Output constant current level can be adjusted through output cable by PWM signal DIM (+) and DIM (-).
*2V~8V 1KHz~10KHz PWM signal for output current adjustment (Typical)



TEST RESULT:

I/P：12 VDC ;PWM Signal:1KHz ; Ta：25℃

DIMMING	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
O/P LOAD	18.80%	34.09%	45.31%	53.26%	59.11%	63.63%	71.40%	82.91%	93.20%	98.80%

I/P：12 VDC ;PWM Signal:10KHz ; Ta：25℃

DIMMING	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
O/P LOAD	0%	6.74%	22.17%	36.60%	50.97%	61.94%	78.63%	90.06%	96.60%	98.86%

4 DALI DIMMING (DA-Type) — PASS

SPEC:
·DALI protocol including 16 groups and 64 addresses.
·Min.dimming level is about 8% of output.

I/P： 12 VDC
O/P：DIMMING TEST
Ta：25℃
TEST RESULT：OK

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER VOLTAGE PROTECTION	＜ 100 V	I/P: 9 VDC I/P: 12VDC I/P: 18VDC O/P:MIN LOAD Ta:25℃	93.3 V /9 VDC 93.4 V /12VDC 93.5 V/18VDC Hold ON	PASS
2	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 18 VDC O/P：FULL LOAD Ta：25℃	NO DAMAGE Fuse Open	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 150 V/ 33 A	I/P：High-Line +3V = 21 V O/P： (1)Full Load Turn on (2)Full load continue Ta：25℃	(1) 98.4 V (2) 97.2 V	PASS
2	Diode Peak Voltage	D1 Rated 150 V/ 10 A	I/P：High-Line +3V = 21 V O/P： (1)Full Load Turn on (2)Full load continue Ta：25℃	(1) 89.2 V (2) 88.8	PASS

■ E.M.C. TEST

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55015	I/P: 12 VDC O/P: FULL LOAD Ta:25℃	PASS Test by certified Lab	PASS
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 12 VDC O/P:FULL LOAD Ta:25℃	CRITERIA A	PASS
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 12 VDC O/P:FULL LOAD Ta:25℃	CRITERIA A	PASS
4	Test by certified Lab ＆ Test Report Prepare				

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL：LDH-45A-350 1. ROOM AMBIENT BURN-IN：1.0 HRS I/P：12VDC O/P：LED LOAD=85.3V Ta=30.2 ℃ 2. HIGH AMBIENT BURN-IN：1.0 HRS I/P：12VDC O/P：LED LOAD=85.3V Ta=64.4 ℃			PASS
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P：18VDC/9VDC O/P：LED LOAD=84V Ta= -45℃	TEST：OK	PASS
3	TEMPERATURE COEFFICIENT	+ 0.03 %(0~50℃)	I/P：12VDC O/P：LED LOAD=84V	+ 0.0003%(0~50℃)	PASS
4	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	PASS
5	THERMAL SHOCK TEST	1. Thermal shock Temperature：-45℃ ~ +65℃ 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：12VDC/ LED LOAD=84V DC ON/OFF TEST turn on 58sec；turn off 2sec		OK	PASS
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform：Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：10min/sweep cycle (4) Acceleration：3G (5) Test Time：90min in each axis (X.Y.Z) (6) Ta：25℃		TEST：OK	PASS

Temperature rise test results (item 1):

NO	Position	ROOM AMBIENT Ta= 30.2 ℃	HIGH AMBIENT Ta= 64.4 ℃
1	LF1	44.9℃	77.5℃
2	C3	47.7℃	80.1℃
3	L1	52.9℃	85.3℃
4	U1	45.4℃	77.4℃
5	Q2	61.7℃	94.4℃
6	R18	47.8℃	79.7℃
7	D2	47.6℃	79.5℃
8	D1	47.7℃	79.5℃
9	C5	53.1℃	85.3℃

7	CAPACITOR LIFE CYCLE	LDH-45A-350:SUPPOSE C5 IS THE MOST CRITICAL COMPONENT (1) I/P： 12VDC O/P：FULL LOAD Ta=25 ℃ LIFE TIME (2) I/P： 12VDC O/P：FULL LOAD Ta=60 ℃ LIFE TIME (3) I/P： 12VDC O/P：75% LOAD Ta=60 ℃ LIFE TIME	(1) 637099.5 HRS (2) 64622.7 HRS (3) 88962.7 HRS	PASS
8	MTBF	Conducted by Parts Stress Analysis Prediction 12195.2K hrs min. Telcordia SR-332 (Bellcore) ; 1179.3K hrs min. MIL-HDBK-217F (25℃)		PASS
9	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 70℃ ; 50,000 hours @ Tcase 60℃		PASS

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	ZHUOKB/ZOULF	LIUWY

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