



Test Report: LDH-45A-500

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°C	940 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°C	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°C	TEST : < 100 V	PASS
4	CURRENT ACCURACY	± 5%	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	TEST : ±1.60 %	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°C 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)	8.8 V~ 18 V TEST : OK	PASS
2	EFFICIENCY	90 % (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	90.65 %	PASS
3	DC CURRENT	12VDC/ 4.1 A (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	I = 3.882 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°C	TEST : 4 mA	PASS																																											
2	ANALOG DIMMING	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) During analog dimming operation, IO will change with DC input voltage			PASS																																											
		<p>tolerance:±10%</p> <p>TEST RESULT: I/P : 12 VDC ;Ta : 25°C</p> <table border="1"> <thead> <tr> <th>DIMMING</th> <th>0.2V</th> <th>0.3V</th> <th>0.4V</th> <th>0.5V</th> <th>0.6V</th> <th>0.7V</th> <th>0.8V</th> <th>0.9V</th> <th>1.0V</th> <th>1.1V</th> <th>1.2V</th> <th>1.3V</th> <th>8.0V</th> </tr> </thead> <tbody> <tr> <td>O/P LOAD</td> <td>0%</td> <td>6.8%</td> <td>18%</td> <td>29%</td> <td>39%</td> <td>50%</td> <td>60%</td> <td>71%</td> <td>81%</td> <td>90%</td> <td>97%</td> <td>99%</td> <td>99%</td> </tr> </tbody> </table>	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%	6.8%	18%	29%	39%	50%	60%	71%	81%	90%	97%	99%	99%																	
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3	PWM DIMMING	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) During PWM dimming operation, IO will change with the PWM duty (PWM Signal: 1K~10KHz)			PASS																																											
		<p>tolerance:±10%</p> <p>TEST RESULT:</p> <p>I/P : 12 VDC ;PWM Signal:1KHz ; Ta : 25°C</p> <table border="1"> <thead> <tr> <th>DIMMING</th> <th>10%</th> <th>20%</th> <th>30%</th> <th>40%</th> <th>50%</th> <th>60%</th> <th>70%</th> <th>80%</th> <th>90%</th> <th>100%</th> </tr> </thead> <tbody> <tr> <td>O/P LOAD</td> <td>18.34%</td> <td>33.26%</td> <td>44.38%</td> <td>52.32%</td> <td>0.2911%</td> <td>62.76%</td> <td>72.28%</td> <td>83.64%</td> <td>93.74%</td> <td>99.06%</td> </tr> </tbody> </table> <p>I/P : 12 VDC ;PWM Signal:10KHz ; Ta : 25°C</p> <table border="1"> <thead> <tr> <th>DIMMING</th> <th>10%</th> <th>20%</th> <th>30%</th> <th>40%</th> <th>50%</th> <th>60%</th> <th>70%</th> <th>80%</th> <th>90%</th> <th>100%</th> </tr> </thead> <tbody> <tr> <td>O/P LOAD</td> <td>0%</td> <td>7.82%</td> <td>22.90%</td> <td>37.28%</td> <td>51.54%</td> <td>65.46%</td> <td>79.14%</td> <td>90.44%</td> <td>96.84%</td> <td>99.10%</td> </tr> </tbody> </table>	DIMMING	10%		20%	30%	40%	50%	60%	70%	80%	90%	100%	O/P LOAD	18.34%	33.26%	44.38%	52.32%	0.2911%	62.76%	72.28%	83.64%	93.74%	99.06%	DIMMING	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	O/P LOAD	0%	7.82%	22.90%	37.28%	51.54%	65.46%	79.14%	90.44%	96.84%	99.10%	
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4	DALI DIMMING (DA-Type)	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°C TEST RESULT : OK			PASS																																											

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°C	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°C	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°C	(1) 98.0 V (2) 96.8 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°C	(1) 87.6 V (2) 87.2	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°C	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°C	CRITERIA A	PASS
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	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 °C 2. HIGH AMBIENT BURN-IN : 1.0 HRS I/P : 12VDC O/P : LED LOAD=85.3V Ta=64.4 °C			P
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 18VDC/9VDC O/P : LED LOAD=84V Ta= -45°C	TEST : OK	P
3	TEMPERATURE COEFFICIENT	+ 0.03 %(0~50°C)	I/P : 12VDC O/P : LED LOAD=84V	+ 0.0003%(0~50°C)	P
4	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
5	THERMAL SHOCK TEST	1. Thermal shock Temperature : -45°C~ +65°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 : 12VDC/ LED LOAD=84V DC ON/OFF TEST turn on 58sec : turn off 2sec		OK	P
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°C		TEST : OK	P

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

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

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