



Test Report: LDH-45A-1050

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	1900 mVp-p (Max)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	960 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE RANGE	12V ~ 43V (Non-DALI) 24V ~ 43V (DALI)	I/P : 9 VDC I/P : 12 VDC I/P : 18 VDC O/P : CV MODE Ta : 25°C	12V ~ 43V (Non-DALI) 24V ~ 43V (DALI)	PASS
3	NO LOAD OUTPUT VOLTAGE	< 50 V	I/P : 12 VDC O/P : NO LOAD Ta : 25°C	TEST : < 50 V	PASS
4	CURRENT ACCURACY	± 5%	I/P : 12 VDC O/P : CV MODE Ta : 25°C	TEST : ±2.03 %	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)	8.8V~18V TEST : OK	PASS
2	EFFICIENCY	91 % (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	92.53 %	PASS
3	DC CURRENT	12VDC/ 4.2 A (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	I = 3.99 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"> <tr> <td>DIMMING</td> <td>0.2V</td> <td>0.3V</td> <td>0.4V</td> <td>0.5V</td> <td>0.6V</td> <td>0.7V</td> <td>0.8V</td> <td>0.9V</td> <td>1.0V</td> <td>1.1V</td> <td>1.2V</td> <td>1.3V</td> <td>8.0V</td> </tr> <tr> <td>O/P LOAD</td> <td>0%</td> <td>8.8%</td> <td>20%</td> <td>30%</td> <td>41%</td> <td>52%</td> <td>62%</td> <td>72%</td> <td>83%</td> <td>92%</td> <td>98%</td> <td>100%</td> <td>100%</td> </tr> </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%	8.8%	20%	30%	41%	52%	62%	72%	83%	92%	98%	100%	100%																	
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O/P LOAD	0%	8.8%	20%	30%	41%	52%	62%	72%	83%	92%	98%	100%	100%																																			
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"> <tr> <td>DIMMING</td> <td>10%</td> <td>20%</td> <td>30%</td> <td>40%</td> <td>50%</td> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> <td>100%</td> </tr> <tr> <td>O/P LOAD</td> <td>20.10%</td> <td>35.11%</td> <td>46.31%</td> <td>54.34%</td> <td>60.11%</td> <td>64.44%</td> <td>72.63%</td> <td>84.02%</td> <td>93.78%</td> <td>99.58%</td> </tr> </table> <p>I/P : 12 VDC ;PWM Signal:10KHz ; Ta : 25°C</p> <table border="1"> <tr> <td>DIMMING</td> <td>10%</td> <td>20%</td> <td>30%</td> <td>40%</td> <td>50%</td> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> <td>100%</td> </tr> <tr> <td>O/P LOAD</td> <td>0.63%</td> <td>8.53%</td> <td>23.59%</td> <td>37.63%</td> <td>51.86%</td> <td>65.73%</td> <td>79.26%</td> <td>90.70%</td> <td>97.27%</td> <td>99.71%</td> </tr> </table>	DIMMING	10%		20%	30%	40%	50%	60%	70%	80%	90%	100%	O/P LOAD	20.10%	35.11%	46.31%	54.34%	60.11%	64.44%	72.63%	84.02%	93.78%	99.58%	DIMMING	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	O/P LOAD	0.63%	8.53%	23.59%	37.63%	51.86%	65.73%	79.26%	90.70%	97.27%	99.71%	
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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	< 50 V	I/P: 9 VDC I/P: 12VDC I/P: 18VDC O/P:MIN LOAD Ta:25°C	46.022V /9 VDC 46.039V /12VDC 46.059V/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) 51.6 V (2) 48.4 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) 45.4 V (2) 44.6	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-1050 1. ROOM AMBIENT BURN-IN : 1.0 HRS I/P : 12VDC O/P : LED LOAD=42.48V Ta=30.2 °C 2. HIGH AMBIENT BURN-IN : 1.0 HRS I/P : 12VDC O/P : LED LOAD=42.47V Ta=65.1 °C			PASS
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 18VDC/9VDC O/P : LED LOAD=43V Ta= -45°C	TEST : OK	PASS
3	TEMPERATURE COEFFICIENT	± 0.03 % (0~50°C)	I/P : 12VDC O/P : LED LOAD=43V	± 0.0007% (0~50°C)	PASS
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	PASS
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=43V 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°C		TEST : OK	PASS
7	CAPACITOR LIFE CYCLE	LDH-45A-1050: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) 298910.7 HRS (2) 23140.7 HRS (3) 44123.2 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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