



Test Report: LDH-45B-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	1200 mVp-p (Max)	I/P : 24VDC O/P : FULL LOAD Ta : 25°C	434 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE RANGE	21V ~ 43V (Non-DALI) 36V ~ 43V (DALI)	I/P : 18 VDC I/P : 24 VDC I/P : 32 VDC O/P : CV MODE Ta : 25°C	21V ~ 43V (Non-DALI) 36V ~ 43V (DALI)	PASS
3	NO LOAD OUTPUT VOLTAGE	< 50 V	I/P : 24 VDC O/P : NO LOAD Ta : 25°C	TEST : < 50 V	PASS
4	CURRENT ACCURACY	± 5%	I/P : 24 VDC O/P : FULL LOAD Ta : 25°C	TEST : ± 0.24 %	PASS

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	18VDC~32VDC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE-0.2V=17.8 V HIGH-LINE =32 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	17.8V~33.6V TEST : OK	PASS
2	EFFICIENCY	95 % (TYP)	I/P : 24 VDC O/P : FULL LOAD Ta : 25°C	96.15 %	PASS
3	DC CURRENT	24VDC/ 2.0 A (TYP)	I/P : 24 VDC O/P : FULL LOAD Ta : 25°C	I = 1.905 A/ 24 VDC	PASS

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																												
1	DIMMING OFF	INPUT CURRENT < 7mA	I/P:24 VDC 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 : 24 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>7.5%</td> <td>19%</td> <td>29%</td> <td>40%</td> <td>50%</td> <td>61%</td> <td>72%</td> <td>82%</td> <td>91%</td> <td>97%</td> <td>99%</td> <td>99%</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%	7.5%	19%	29%	40%	50%	61%	72%	82%	91%	97%	99%	99%																		
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O/P LOAD	0%	7.5%	19%	29%	40%	50%	61%	72%	82%	91%	97%	99%	99%																																				
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 : 24 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>18.55%</td> <td>33.84%</td> <td>45.11%</td> <td>53.20%</td> <td>59.16%</td> <td>63.68%</td> <td>71.70%</td> <td>83.34%</td> <td>93.70%</td> <td>99.26%</td> </tr> </table> <p>I/P : 24 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%</td> <td>5.94%</td> <td>20.90%</td> <td>35.60%</td> <td>50.30%</td> <td>64.70%</td> <td>78.71%</td> <td>90.32%</td> <td>96.88%</td> <td>99.29%</td> </tr> </table>	DIMMING	10%		20%	30%	40%	50%	60%	70%	80%	90%	100%	O/P LOAD	18.55%	33.84%	45.11%	53.20%	59.16%	63.68%	71.70%	83.34%	93.70%	99.26%	DIMMING	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	O/P LOAD	0%	5.94%	20.90%	35.60%	50.30%	64.70%	78.71%	90.32%	96.88%	99.29%		
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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 : 24 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: 18 VDC I/P: 24VDC I/P: 32VDC O/P:MIN LOAD Ta:25°C	46.128V /18 VDC 46.158V /24VDC 46.194V/32VDC Hold ON	PASS
2	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 32 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 = 35 V O/P : (1)Full Load Turn on (2)Full load continue Ta : 25°C	(1) 53.6 V (2) 50.8 V	PASS
2	Diode Peak Voltage	D1 Rated 150 V/ 10 A	I/P : High-Line +3V = 35 V O/P : (1)Full Load Turn on (2)Full load continue Ta : 25°C	(1) 49.2 V (2) 47.8	PASS

■ **E.M.C. TEST**

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55015	I/P: 24 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: 24 VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	PASS
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 24 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-45B-1050 1. ROOM AMBIENT BURN-IN : 1.0 HRS I/P : 24VDC O/P : LED LOAD=42.22V Ta=30.2 °C 2. HIGH AMBIENT BURN-IN : 1.0 HRS I/P : 24VDC O/P : LED LOAD=42.22V Ta=69.9 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 30.2 °C</th> <th>HIGH AMBIENT Ta= 69.9 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>C1</td><td>38.2°C</td><td>72.6°C</td></tr> <tr><td>2</td><td>LF1</td><td>39.8°C</td><td>73.9°C</td></tr> <tr><td>3</td><td>C3</td><td>41.8°C</td><td>75.3°C</td></tr> <tr><td>4</td><td>L1</td><td>43.7°C</td><td>77.5°C</td></tr> <tr><td>5</td><td>U1</td><td>44.5°C</td><td>77.9°C</td></tr> <tr><td>6</td><td>Q2</td><td>47.5°C</td><td>80.8°C</td></tr> <tr><td>7</td><td>R7</td><td>45.4°C</td><td>78.9°C</td></tr> <tr><td>8</td><td>R18</td><td>45.9°C</td><td>79.5°C</td></tr> <tr><td>9</td><td>D2</td><td>43.6°C</td><td>77.4°C</td></tr> <tr><td>10</td><td>C5</td><td>43.7°C</td><td>77.0°C</td></tr> <tr><td>11</td><td>D1</td><td>48.0°C</td><td>81.4°C</td></tr> <tr><td>12</td><td>C8</td><td>43.2°C</td><td>76.8°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 30.2 °C	HIGH AMBIENT Ta= 69.9 °C	1	C1	38.2°C	72.6°C	2	LF1	39.8°C	73.9°C	3	C3	41.8°C	75.3°C	4	L1	43.7°C	77.5°C	5	U1	44.5°C	77.9°C	6	Q2	47.5°C	80.8°C	7	R7	45.4°C	78.9°C	8	R18	45.9°C	79.5°C	9	D2	43.6°C	77.4°C	10	C5	43.7°C	77.0°C	11	D1	48.0°C	81.4°C	12	C8	43.2°C	76.8°C		P
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 32VDC/18VDC O/P : LED LOAD=43V Ta= -45°C	TEST : OK	P																																																				
3	TEMPERATURE COEFFICIENT	± 0.03 % (0~50°C)	I/P : 24VDC O/P : LED LOAD=43V	± 0.0005% (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 ~ +75°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 : 24VDC / LED LOAD=43V 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-45B-1050:SUPPOSE C5 IS THE MOST CRITICAL COMPONENT (1) I/P : 24VDC O/P : FULL LOAD Ta=25 °C LIFE TIME (2) I/P : 24VDC O/P : FULL LOAD Ta=70 °C LIFE TIME (3) I/P : 24VDC O/P : 75% LOAD Ta=70 °C LIFE TIME	(1) 1204155.7 HRS (2) 70741 HRS (3) 82970.8 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 75°C ; 50,000 hours @ Tcase 65°C		P

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

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