



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°C	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°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 : ±1.83 %	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°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	91 % (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	92.20 %	PASS
3	DC CURRENT	12VDC/ 2.8 A (TYP)	I/P : 12 VDC O/P : FULL LOAD Ta : 25°C	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°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>6.3%</td> <td>18%</td> <td>28%</td> <td>39%</td> <td>49%</td> <td>60%</td> <td>70%</td> <td>81%</td> <td>90%</td> <td>96%</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%	6.3%	18%	28%	39%	49%	60%	70%	81%	90%	96%	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"> <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>18.80%</td> <td>34.09%</td> <td>45.31%</td> <td>53.26%</td> <td>59.11%</td> <td>63.63%</td> <td>71.40%</td> <td>82.91%</td> <td>93.20%</td> <td>98.80%</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%</td> <td>6.74%</td> <td>22.17%</td> <td>36.60%</td> <td>50.97%</td> <td>61.94%</td> <td>78.63%</td> <td>90.06%</td> <td>96.60%</td> <td>98.86%</td> </tr> </table>	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%	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%	
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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) 98.4 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°C	(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°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			PASS
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	PASS
3	TEMPERATURE COEFFICIENT	+ 0.03 %(0-50°C)	I/P : 12VDC O/P : LED LOAD=84V	+ 0.0003%(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=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°C		TEST : OK	PASS



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	PASS
8	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 1179.3KHRS		PASS
9	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 70°C ; 50,000 hours @ Tcase 60°C		PASS

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

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