



Test Report: LDH-45A-500

45W 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

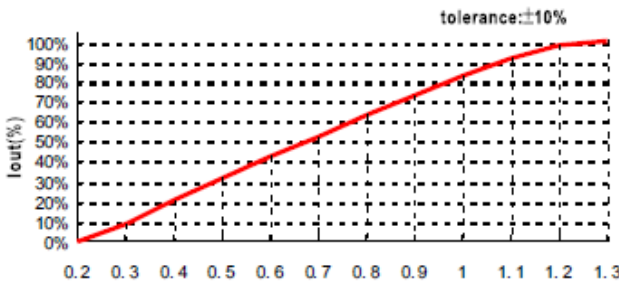
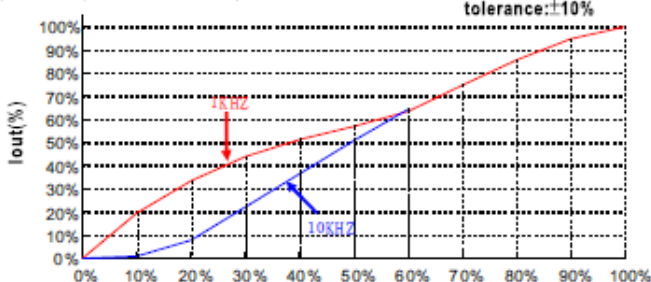
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 2500 mVp-p (Max)	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	V1 : 940 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE RANGE	V1 = 12 V ~ 86 V	I/P : 9 VDC I/P : 12 VDC I/P : 18 VDC O/P : CV MODE Ta : 25°C	O/P= 12V: 0.5096 A 9VDC O/P= 86V: 0.4920 A 9VDC O/P= 15V: 0.5099 A 12VDC O/P= 86V: 0.4953 A 12VDC O/P= 21V: 0.5102 A 18VDC O/P= 86V: 0.4990 A 18VDC	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, I_O will change with DC input voltage tolerance:±10%  TEST RESULT: I/P : 12 VDC ;Ta : 25°C <table><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>6.8%</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></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%	PASS																
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O/P LOAD	0%	6.8%	18%	29%	39%	50%	60%	71%	81%	90%	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, I_O will change with the PWM duty (PWM Signal: 1K~10KHz) tolerance:±10%  TEST RESULT: I/P : 12 VDC ;PWM Signal:1KHz ; Ta : 25°C <table><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>18.34%</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></table> I/P : 12 VDC ;PWM Signal:10KHz ; Ta : 25°C <table><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>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></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%	PASS
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER VOLTAGE PROTECTION	CH1: < 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 <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 30.2 °C</th><th>HIGH AMBIENT Ta= 64.4 °C</th></tr><tr><td>1</td><td>LF1</td><td>44.9°C</td><td>77.5°C</td></tr><tr><td>2</td><td>C3</td><td>47.7°C</td><td>80.1°C</td></tr><tr><td>3</td><td>L1</td><td>52.9°C</td><td>85.3°C</td></tr><tr><td>4</td><td>U1</td><td>45.4°C</td><td>77.4°C</td></tr><tr><td>5</td><td>Q2</td><td>61.7°C</td><td>94.4°C</td></tr><tr><td>6</td><td>R18</td><td>47.8°C</td><td>79.7°C</td></tr><tr><td>7</td><td>D2</td><td>47.6°C</td><td>79.5°C</td></tr><tr><td>8</td><td>D1</td><td>47.7°C</td><td>79.5°C</td></tr><tr><td>9</td><td>C5</td><td>53.1°C</td><td>85.3°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 30.2 °C	HIGH AMBIENT Ta= 64.4 °C	1	LF1	44.9°C	77.5°C	2	C3	47.7°C	80.1°C	3	L1	52.9°C	85.3°C	4	U1	45.4°C	77.4°C	5	Q2	61.7°C	94.4°C	6	R18	47.8°C	79.7°C	7	D2	47.6°C	79.5°C	8	D1	47.7°C	79.5°C	9	C5	53.1°C	85.3°C		P
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9	C5	53.1°C	85.3°C																																											
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	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 1179.3KHRS		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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