Test Report: LDH-45B-1050

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

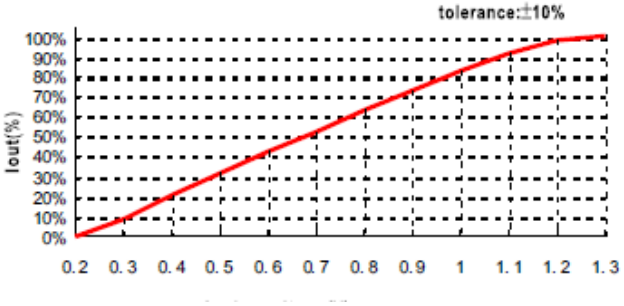
OUTPUT FUNCTION TEST

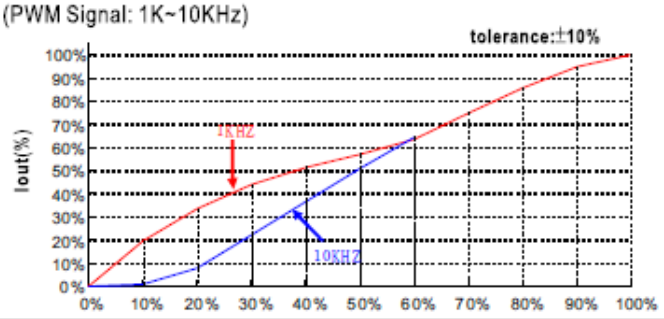
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1：1200 mVp-p (Max)	I/P： 24VDC O/P：FULL LOAD Ta：25℃	V1： 434 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE RANGE	V1 = 21 V ~ 43 V	I/P： 18 VDC I/P： 24 VDC I/P： 32 VDC O/P：CV MODE Ta：25℃	O/P= 21V 1.0475 A 18VDC O/P= 43V 1.0478 A 18VDC O/P= 27V 1.0482 A 24VDC O/P= 43V 1.0485 A 24VDC O/P= 35V 1.0481 A 32VDC O/P= 43V 1.0484 A 32VDC	PASS
3	NO LOAD OUTPUT VOLTAGE	< 50 V	I/P： 24 VDC O/P：NO LOAD Ta：25℃	TEST： < 50 V	PASS
4	CURRENT ACCURACY	± 5%	I/P：24 VDC O/P：FULL LOAD Ta：25℃	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℃	17.8V~33.6V	PASS
			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)	TEST： OK	
2	EFFICIENCY	95 % (TYP)	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	96.15 %	PASS
3	DC CURRENT	24VDC/ 2.0 A (TYP)	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	I = 1.905 A/ 24 VDC	PASS

CONTROL FUNCTION TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>DIMMING OFF</td><td>INPUT CURRENT＜ 7mA</td><td>I/P:24 VDC
O/P:FULL LOAD
Ta:25℃</td><td>TEST： 4 mA</td><td>PASS</td></tr>
<tr><td>2</td><td>ANALOG DIMMING</td><td colspan="3">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
 

TEST RESULT: I/P：24 VDC ;Ta：25℃
<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>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></td><td>PASS</td></tr>
<tr><td>3</td><td>PWM DIMMING</td><td colspan="3">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)
 

TEST RESULT:
I/P：24 VDC ;PWM Signal:1KHz ; Ta：25℃
<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>18.55%</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>
I/P：24 VDC ;PWM Signal:10KHz ; Ta：25℃
<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>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></td><td>PASS</td></tr>
</table>

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER VOLTAGE PROTECTION	CH1: ＜ 50 V	I/P: 18 VDC I/P: 24VDC I/P: 32VDC O/P:MIN LOAD Ta:25℃	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℃	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℃	(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℃	(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℃	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℃	CRITERIA A	PASS
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 24 VDC O/P:FULL LOAD Ta:25℃	CRITERIA A	PASS
4	Test by certified Lab & Test Report Prepare				

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： LDH-45B-1050
1. ROOM AMBIENT BURN-IN：1.0 HRS
I/P： 24VDC O/P： LED LOAD=42.22V Ta=30.2 ℃
2. HIGH AMBIENT BURN-IN： 1.0 HRS
I/P： 24VDC O/P： LED LOAD=42.22V Ta=69.9 ℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 30.2 ℃</th><th>HIGH AMBIENT Ta= 69.9 ℃</th></tr>
<tr><td>1</td><td>C1</td><td>38.2℃</td><td>72.6℃</td></tr>
<tr><td>2</td><td>LF1</td><td>39.8℃</td><td>73.9℃</td></tr>
<tr><td>3</td><td>C3</td><td>41.8℃</td><td>75.3℃</td></tr>
<tr><td>4</td><td>L1</td><td>43.7℃</td><td>77.5℃</td></tr>
<tr><td>5</td><td>U1</td><td>44.5℃</td><td>77.9℃</td></tr>
<tr><td>6</td><td>Q2</td><td>47.5℃</td><td>80.8℃</td></tr>
<tr><td>7</td><td>R7</td><td>45.4℃</td><td>78.9℃</td></tr>
<tr><td>8</td><td>R18</td><td>45.9℃</td><td>79.5℃</td></tr>
<tr><td>9</td><td>D2</td><td>43.6℃</td><td>77.4℃</td></tr>
<tr><td>10</td><td>C5</td><td>43.7℃</td><td>77.0℃</td></tr>
<tr><td>11</td><td>D1</td><td>48.0℃</td><td>81.4℃</td></tr>
<tr><td>12</td><td>C8</td><td>43.2℃</td><td>76.8℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 32VDC/18VDC
O/P：LED LOAD=43V
Ta= -45℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %(0~50℃)</td><td>I/P： 24VDC
O/P：LED LOAD=43V</td><td>± 0.0005%(0~50℃)</td><td>P</td></tr>
<tr><td>4</td><td>STORAGE TEMPERATURE TEST</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +90℃
2. Temperature change rate ：25℃ / MIN
3. Dwell time low and high temperature ： 30 MIN/EACH
4. Total test cycle：5 CYCLE
5. Input/Output condition： STATIC</td><td>OK</td><td>P</td></tr>
<tr><td>5</td><td>THERMAL SHOCK TEST</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +75℃
2. Temperature change rate ：25℃ / 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</td><td>OK</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">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℃</td><td>TEST：OK</td><td>P</td></tr>
</table>

7	CAPACITOR LIFE CYCLE	LDH-45B-1050:SUPPOSE C5 IS THE MOST CRITICAL COMPONENT (1) I/P： 24VDC O/P：FULL LOAD Ta=25℃ LIFE TIME (2) I/P： 24VDC O/P：FULL LOAD Ta=70℃ LIFE TIME (3) I/P： 24VDC O/P：75% LOAD Ta=70℃ LIFE TIME	(1) 1204155.7 HRS (2) 70741 HRS (3) 82970.8 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 75℃ ; 50,000 hours @ Tcase 65℃		P

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

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