



Test Report: LDH-25-700

DC-DC Step-Up Constant Current LED driver

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

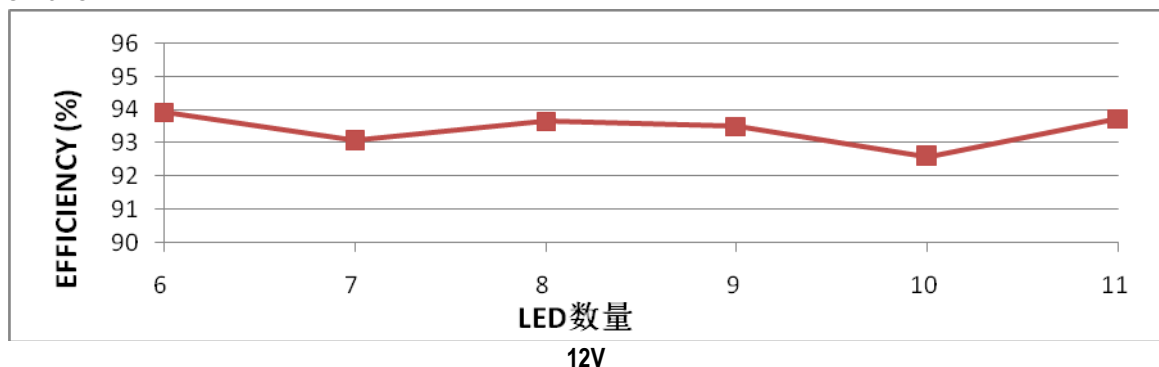
OUTPUT FUNCTION TEST

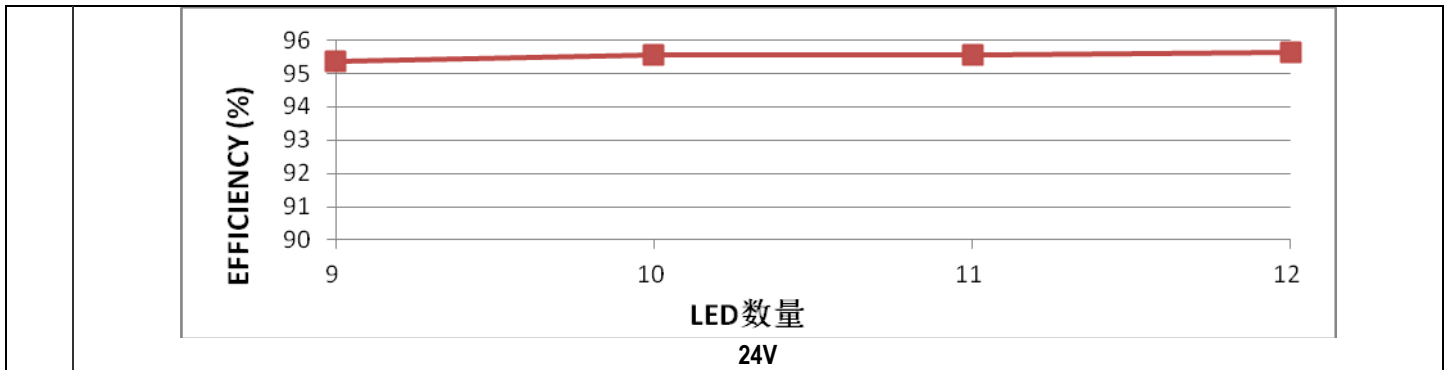
| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|------------------|--------------------|---|---|
| 1 | CURRENT ACCURACY | $\pm 5\%$ | I/P: 12VDC/24VDC O/P: LED min/LED max Ta:25°C | -2.17%~-1.63%/12VDC -1.7%~-1.54%/24VDC |
| 2 | CURRENT RIPPLE | 5%(@rated current) | I/P: 12VDC / 24VDC O/P: LED min~LED max Ta:25°C | 2.66%/12VDC 1.78%/24VDC |
| 3 | SUGRE CURRENT | $< \pm 110\%$ | I/P: 12VDC / 24VDC O/P:-LED min/LED max Ta:25°C | 107.3%/12VDC 105.3%/24VDC |
| 4 | VOLTAGE RANGE | 12.5V~36V | I/P: 12VDC/24VDC O/P:-250mA Ta:25°C | 15V~47.5V/12VDC 27V~47.3V/24VDC |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|---------------------|------------------------------|---|---|
| 1 | INPUT VOLTAGE RANGE | 9.5VDC~32VDC | I/P:TESTING O/P:FULL LOAD Ta:25°C | 9.3V~35V |
| | | | I/P: LOW-LINE-0.2= 9.3 V HIGH-LINE+3V= 35 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec . OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE) | TEST(1) <u> OK </u> (2) <u> OK </u> (3) <u> OK </u> |
| 2 | INPUT CURRENT(TYP) | 12VDC/ 2.5A 24VDC/ 1.2A | I/P: 12VDC/24VDC O/P:FULL LOAD Ta:25°C | I=2.36A/VDC I=1.14A/VDC |
| 3 | DIMMING OFF | INPUT CURRENT <7mA Vo=Vi | I/P:12VDC O/P:FULL LOAD Ta:25°C | 1.34mA Vo=12Vi |
| 4 | EFFICIENCY(TYP) | 92.5% /12VDC 95.5% /24VDC | I/P: 12VDC/24VDC O/P:FULL LOAD Ta:25°C | 93.73% /12VDC 95.65% /24VDC |

EFFICIENCY vs LOAD





PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|--------------------------|---------------|--|--|
| 1 | OVER VOLTAGE PROTECTION | CH: 37V~60V | I/P: 9.3VDC I/P: 35VDC O/P: MIN LOAD Ta: 25°C | 47.06V/93VDC 47.28V/32 VDC PROTECTION TYPE : Output voltage rise to OVP, and drop equal to input voltage, re-power to recovery |
| 2 | SHORT CIRCUIT PROTECTION | NO DAMAGE | I/P: 12VDC O/P: FULL LOAD Ta: 25°C | PROTECTION TYPE : Output short circuit, the power supply will be damaged |
| 3 | NO LOAD PROTECTION | NO LOAD | I/P: 12VDC/24VDC O/P: NO LOAD Ta: 25°C | PROTECTION TYPE : Output voltage rise to OVP, and drop equal to input voltage, re-power to recovery |

COMPONENT STRESS TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|---|----------------------|---|---|
| 1 | PWM Transistor (D to S) or (C to E) Peak Voltage | Q1 Rated 75A/100V | DC ON/OFF I/P: High-Line +3V = 35V O/P: (1) CVmax (2) CVmax continue (3) CVmin (4) No Load (5) DIMMING off I/P: Low-Line -0.2V = 9.3V O/P: (1) CVmax (2) CVmax continue (3) CVmin (4) No Load (5) DIMMING off Ta: 25°C | VDS: (1) 42.8V (2) 40.8V (3) 42.4V (4) 53.3V (5) 35.2V VDS: (1) 57.7V (2) 50.4V (3) 19.5V (4) 63.3V (5) 9.4V |

| | | | | | |
|---|-------------------------|---|---|--|---|
| 2 | Diode Peak Voltage | D5 Rated 10A/60V | DC ON/OFF I/P:High-Line +3V = 35V VO: 設定 SPEC 輸出電壓上限 O/P: (1)CVmax (2) CVmax continue (3) CVmin (4) No Load (5) DIMMING off VO: 設定出貨輸出電壓 O/P: (1)CVmax (2) CVmax continue (3) CVmin (4) No Load (5) DIMMING off Ta:25°C | VO: 設定 SPEC 輸出電壓上限 (1) 45.2V (2) 44.8V (3) 44V (4) 55.3V (5) 19.1V VO: 設定出貨輸出電壓 (1) 40.4V (2) 40.2V (3) 15.9V (4) 55.3V (5) 30.7V | |
| 3 | Input Capacitor Voltage | C5 Rated: 56 μ / 50V | I/P:High-Line +3V =35V O/P: (1)Full Load input on/off (2)Full load continue Ta:25°C | (1)36.8V (2)36.4V | |
| 4 | Control IC Voltage Test | U1 Rated 9.0 V~ 40V U500 Rated 0.3V~ 60V | DC ON/OFF I/P:High-Line +3V = 35V O/P: (1)CVmax– (2) CVmax continue (3) CVmin (4) No Load (5) DIMMING off (6)OVP Ta:25°C | U1: (1) 35.6V (2) 35.2V (3) 36.4V (4) 36V (5) 36V (6) 36V | U500: (7) 5.33V (8) 5.24V (9) 5.24V (10) 5.2V (11) 5.29V (12) 5.20V |

E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|---|--|--|-----------------------------------|
| 1 | RADIATION | EN55015 CLASS B | I/P: 12VDC O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab |
| 2 | CONDUCTION | EN55015 CLASS B | I/P: 12VDC O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab |
| 3 | E.S.D | EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV | I/P: 12VDC O/P:FULL LOAD Ta:25°C | CRITERIA A |
| 4 | E.F.T | EN61000-4-4 LIGHT INDUSTRY INPUT: 0.5KV | I/P: 12VDC O/P:FULL LOAD Ta:25°C | CRITERIA A |
| 5 | Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report | | | |

■ RELIABILITY TEST

ENVIRONMENT TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|---|---|--|-----------------------|-------------------------|-------------------------|---|-----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|-----|--------|--------|---|-----|--------|--------|---|-----|--------|--------|----|------|--------|--------|----|-------|--------|--------|----|-----|--------|--------|----|----|--------|--------|--|--|
| 1 | TEMPERATURE RISE TEST | MODEL : LDH-25-700 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 12VDC O/P : FULL LOAD Ta=25.4 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 12VDC O/P : FULL LOAD Ta=60.7 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=25.4 °C</th> <th>HIGH AMBIENT Ta=60.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>44.8°C</td><td>77.8°C</td></tr> <tr><td>2</td><td>L1</td><td>49.6°C</td><td>83.1°C</td></tr> <tr><td>3</td><td>C5</td><td>47.0°C</td><td>79.8°C</td></tr> <tr><td>4</td><td>U1</td><td>47.7°C</td><td>80.9°C</td></tr> <tr><td>5</td><td>Q1</td><td>52.9°C</td><td>85.9°C</td></tr> <tr><td>6</td><td>D5</td><td>55.2°C</td><td>87.7°C</td></tr> <tr><td>7</td><td>C13</td><td>50.8°C</td><td>83.5°C</td></tr> <tr><td>8</td><td>R13</td><td>56.1°C</td><td>89.0°C</td></tr> <tr><td>9</td><td>R22</td><td>52.8°C</td><td>85.6°C</td></tr> <tr><td>10</td><td>U500</td><td>41.9°C</td><td>74.5°C</td></tr> <tr><td>11</td><td>LF500</td><td>43.3°C</td><td>75.7°C</td></tr> <tr><td>12</td><td>BC1</td><td>56.1°C</td><td>88.5°C</td></tr> <tr><td>13</td><td>TC</td><td>46.2°C</td><td>76.7°C</td></tr> </tbody> </table> | NO | Position | ROOM AMBIENT Ta=25.4 °C | HIGH AMBIENT Ta=60.7 °C | 1 | LF1 | 44.8°C | 77.8°C | 2 | L1 | 49.6°C | 83.1°C | 3 | C5 | 47.0°C | 79.8°C | 4 | U1 | 47.7°C | 80.9°C | 5 | Q1 | 52.9°C | 85.9°C | 6 | D5 | 55.2°C | 87.7°C | 7 | C13 | 50.8°C | 83.5°C | 8 | R13 | 56.1°C | 89.0°C | 9 | R22 | 52.8°C | 85.6°C | 10 | U500 | 41.9°C | 74.5°C | 11 | LF500 | 43.3°C | 75.7°C | 12 | BC1 | 56.1°C | 88.5°C | 13 | TC | 46.2°C | 76.7°C | | |
| NO | Position | ROOM AMBIENT Ta=25.4 °C | HIGH AMBIENT Ta=60.7 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | LF1 | 44.8°C | 77.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | L1 | 49.6°C | 83.1°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | C5 | 47.0°C | 79.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | U1 | 47.7°C | 80.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Q1 | 52.9°C | 85.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | D5 | 55.2°C | 87.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | C13 | 50.8°C | 83.5°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | R13 | 56.1°C | 89.0°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | R22 | 52.8°C | 85.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | U500 | 41.9°C | 74.5°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | LF500 | 43.3°C | 75.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | BC1 | 56.1°C | 88.5°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | TC | 46.2°C | 76.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P : 12VDC / 32VDC O/P : 100 % LOAD Ta= -45°C | TEST : OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST | AFTER 12 HOURS IN CHAMBER ON CONTROL 60 °C / 95 %R.H NO DAMAGE | I/P : 12VDC O/P : FULL LOAD Ta= 60 °C HUMIDITY= 95 %R.H | TEST : OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | TEMPERATURE COEFFICIENT | ±0.03 %/°C (0~50°C) | I/P : 12VDC O/P : FULL LOAD | ±0.0047 %/°C (0~50°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | STORAGE TEMPERATURE TEST | -40~85°C | 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 : 10 CYCLE 5. Input/Output condition : STATIC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | THERMAL SHOCK TEST | -40~60°C | 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 : 16 CYCLE 5. Input/Output condition : 15cycle: 24VDC / FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle: 24VDC / FULL LOAD Burn In Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| | | | |
|----|--------------------------|--|---|
| 7 | VIBRATION TEST | 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes | 1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C |
| 8 | CAPACITOR LIFE CYCLE | SUPPOSE C13 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=60 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=60 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=60 °C LIFE TIME | (1) 653167HRS (2) 69133HRS (3) 95142HRS (4) 121307HRS |
| 9 | MTBF | Conducted by Parts Stress Analysis Prediction 12369.5K hrs min. Telcordia SR-332 (Bellcore); 896.4K hrs min. MIL-HDBK-217F (25°C) | |
| 10 | Ongoing Reliability Test | I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30000 hours | |

| TEST RESULT | TESTER | REVIEW | APPROVAL |
|-------------|--------------|--------|----------|
| PASS | WUWQ/HUANGMK | WENF | LIUWY |

2018.4.30 GP-A50-F010