



# Test Report: LDC-55

---

55W Constant Power output linear LED Driver

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

Environment Test



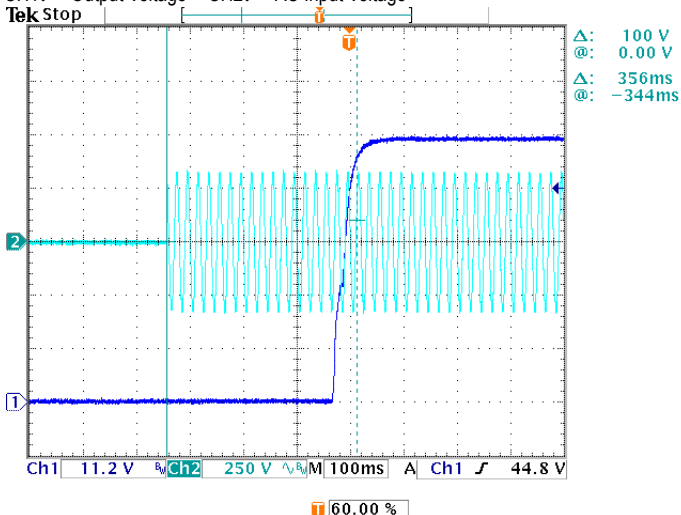
DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P: 180 VAC / 295 VAC O/P: FULL/ MIN LOAD Ta: 25°C	<±5%
2	OUTPUT VOLTAGE REGION	27 V~ 56 V	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	17.56 V~ 58.23 V
3	OPEN CIRCUIT VOLTAGE	60 V	I/P: 230 VAC O/P:NO LOAD	58.33 V
4	LOW FREQUENCY CURRENT RIPPLE	3.0% max. @rated current	I/P: 230 VAC O/P: FULL LOAD Ta:25°C	1.75%
5	CONSTANT POWER	O/P: 55W	I/P: 230 VAC O/P:Vo×Io	TEST: OK
6	SET UP TIME(Max)	500ms/230VAC	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	356ms/230 VAC

INPUT=230VAC/50HZ @ FULL LOAD

CH1: Output Voltage CH2: AC Input Voltage

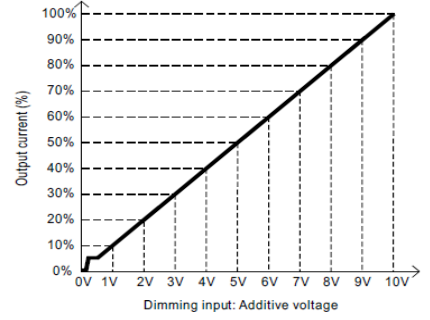
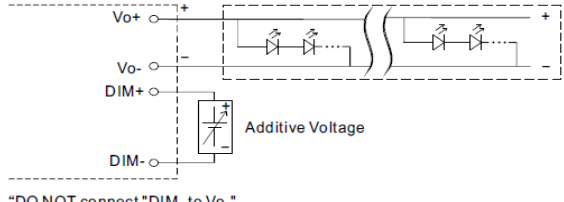


7 DIMMING OPERATION (for B-Type)

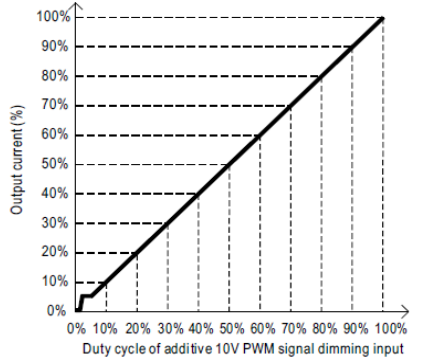
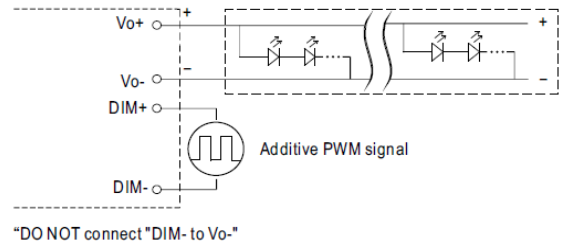
※ 3 in 1 dimming function(for B-Type)

- Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10VDC, or 10V PWM signal or resistance.
- Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
- Dimming source current from power supply: 100 $\mu$ A (typ.)

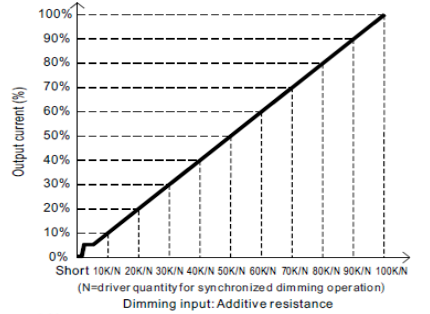
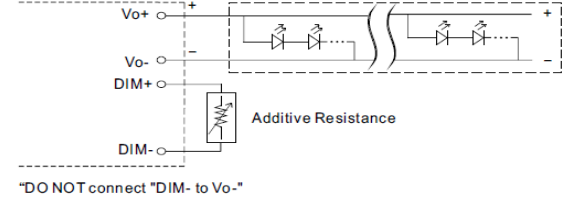
◎ Applying additive 0 ~ 10VDC



◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



◎ Applying additive resistance:



- Note : 1. Min. dimming level is about 8% and the output current is not defined when 0% < I<sub>out</sub> < 8%.  
 2. The output current could drop down to 0% when dimming input is about 0Vdc or 10V PWM signal with 0% duty cycle.  
 3. Dimmer minimum current  $\geq$  75mA

I/P: 230 VAC  
 O/P: DIMMING TEST  
 Ta: 25 $^{\circ}$ C

	DIMMING	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
1	Output Current	0	0.100	0.200	0.300	0.4	0.506	0.607	0.706	0.800	0.904	1.004
	%	0%	9.96%	19.92%	29.88%	39.84%	50.40%	60.46%	70.32%	79.68%	90.04%	100.00%
2	PWM	0V	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Output Current	0	0.119	0.217	0.316	0.413	0.513	0.609	0.705	0.805	0.901	0.988
	%	0%	11.89%	21.68%	31.57%	41.26%	51.25%	60.84%	70.43%	80.42%	90.01%	98.70%
3	R	0%	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K
	Output Current	0	0.105	0.214	0.322	0.432	0.541	0.648	0.737	0.833	0.925	0.997
	%	0%	10.47%	21.34%	32.10%	43.07%	53.94%	64.61%	73.48%	83.05%	92.22%	99.40%

TEST RESULT: OK  
 TEST RESULT: OK

8	<p>PUSH DIMMING OPERATION (primary side;for DA-Type)</p>	<p>※PUSH dimming(primary side)</p> <table border="1" data-bbox="343 347 1332 470"> <thead> <tr> <th>Action</th> <th>Action duration</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Short push</td> <td>0.1~1 sec.</td> <td>Turn ON-OFF the driver</td> </tr> <tr> <td>Long push</td> <td>1.5~10 sec.</td> <td>Every Long Push changes the dimming direction, dimming up or down</td> </tr> <tr> <td>Reset</td> <td>&gt;11 sec.</td> <td>Set up the dimming level to 100%</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>The factory default dimming level is at 100%.</li> <li>If the push action lasts less than 0.05 sec., it will not lead to a change for the status of the driver.</li> <li>Up to 10 drivers can perform the PUSH dimming at the same time when utilizing one common push button.</li> <li>The maximum length of the cable from the push button to the last driver is 20 meters.</li> <li>The additive push button can be connected only between the PUSH terminal, as displayed in the diagram, and AC/L (in brown or black); it will lead to short circuit if it is connected to AC/N.</li> </ul> <p>I/P: 230 VAC O/P: PUSH DIMMING TEST Ta: 25°C TEST RESULT:</p>	Action	Action duration	Function	Short push	0.1~1 sec.	Turn ON-OFF the driver	Long push	1.5~10 sec.	Every Long Push changes the dimming direction, dimming up or down	Reset	>11 sec.	Set up the dimming level to 100%
Action	Action duration	Function												
Short push	0.1~1 sec.	Turn ON-OFF the driver												
Long push	1.5~10 sec.	Every Long Push changes the dimming direction, dimming up or down												
Reset	>11 sec.	Set up the dimming level to 100%												
9	<p>DALI DIMMING OPERATION (primary side; for DA-Type)</p>	<p>※DALI Interface(primary side)</p> <ul style="list-style-type: none"> <li>Apply DALI signal between DA+ and DA-.</li> <li>DALI protocol comprises 16 groups and 64 addresses.</li> <li>First step is fixed at 8% of output.</li> </ul> <p>I/P: 230 VAC O/P: DIMMING TEST Ta: 25°C TEST RESULT: OK</p>												

INPUT FUNCTION TEST

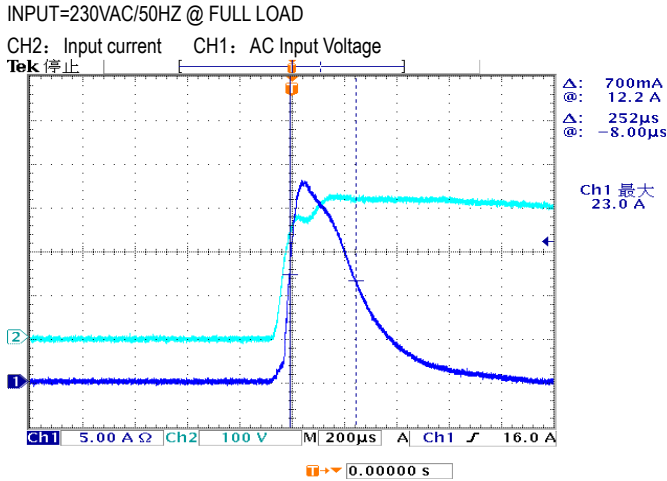
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~295 VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	177V~305V
			I/P: (1)LOW-LINE-3V=177 V HIGH-LINE+10V=305 V O/P: FULL/NO LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5 Sec 20MIN ( POWER ON/OFF NO DAMAGE )	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 180 VAC ~295 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.32A/230VAC 0.23A/277VAC	I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I = 0.272A/ 230VAC I = 0.226A/ 277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.226 mA N-FG: 0.221 mA
5	NO LOAD/STANDBY POWER CONSUMPTION	<0.5W	I/P: 230VAC O/P: NO LOAD/STANDBY Ta: 25°C	0.372W



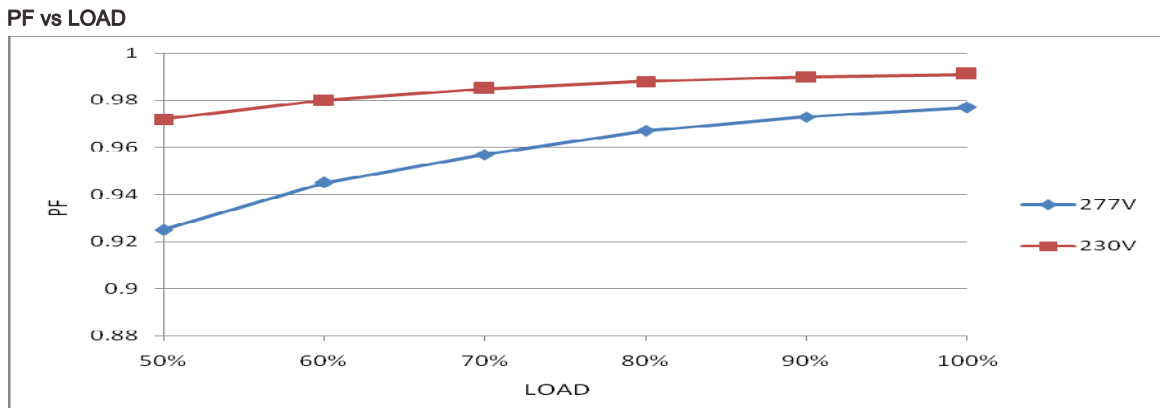
55W Constant Power output linear LED Driver

LDC-55 series

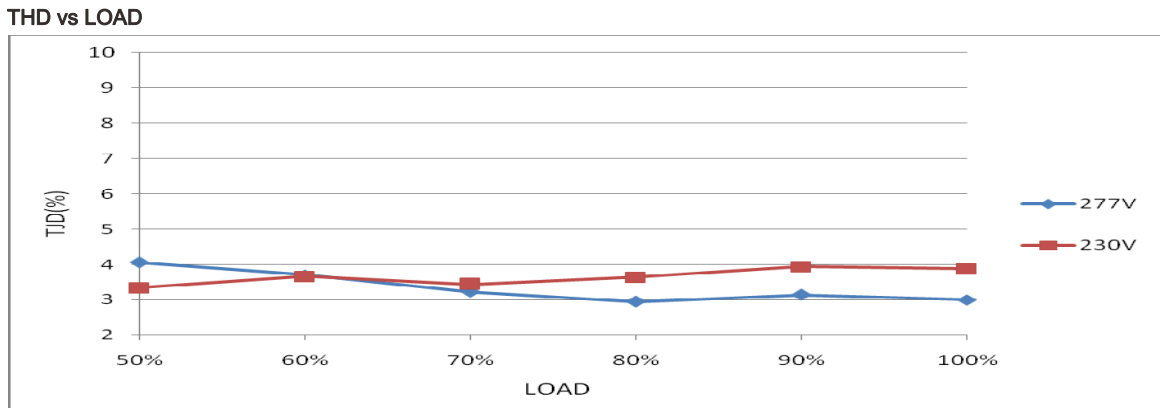
6	INRUSH CURRENT(Typ)	230 V/ 65 A COLD START (twidth=650us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=23 A/ 230VAC Twidth = 252us
---	---------------------	---	--	----------------------------------

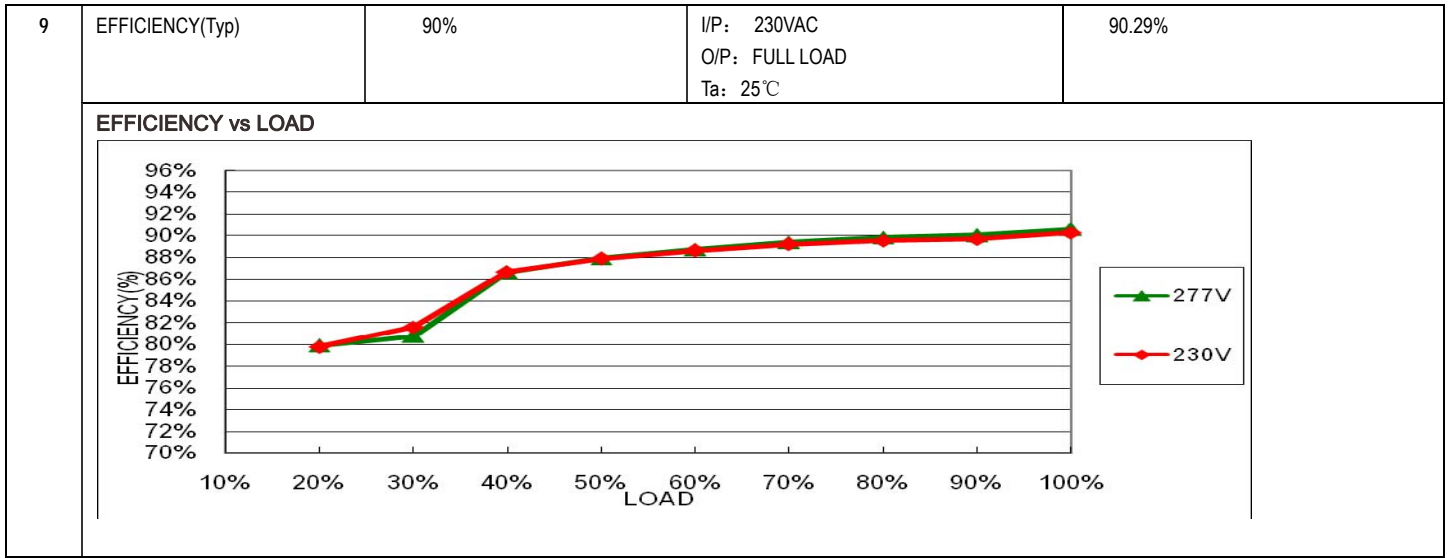


7	POWER FACTOR	0.95/ 230VAC@load≥50% 0.9/ 277VAC@load≥75%	I/P: 230 VAC I/P: 277 VAC O/P: 50% /75% LOAD Ta: 25°C	PF=0.972 @50% load /230VAC PF=0.963 @75% load /277VAC
---	--------------	---	--	--



8	TOTAL HARMONIC DISTORTION	THD<10% (@load≥50%/230VAC; @load≥75%/277VAC)	I/P: 230 VAC I/P: 277 VAC O/P: 50% /75% LOAD Ta: 25°C	THD=3.34% @50% load /230VAC THD=3.07% @75% load /277VAC
---	---------------------------	--	--	--





### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	61V-80V	I/P: 295 VAC I/P: 180 VAC O/P: NO LOAD	69.3V / 295VAC 69.3V /180VAC Shut down o/p voltage with auto-recovery or re-power on to recovery
2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 295 VAC I/P: 180 VAC O/P:FULL LOAD	O.T.P. Active Shut down o/p voltage, with auto-recover
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 295 VAC I/P: 180 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode or constant current limiting ,recovers automatically after fault condition is removed

### COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor ( D to S) or (C to E) Peak Voltage	Q2 Rated 6.8A/600V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 484V (2) 496V (3) 460V
2	Diode Peak Voltage	D100 Rated 10A/200V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 122V (2) 16V (3) 122V



55W Constant Power output linear LED Driver

LDC-55 series

3	Input Capacitor Voltage	C5 Rated: 22 $\mu$ / 450 V	I/P: High-Line +3V =308 V O/P: (1) FULL LOAD input on/off (2) NO LOAD input on /Off (3) FULL LOAD /NO LOAD Change Ta: 25°C	(1) 448V (2) 448V (3) 442V
4	Control IC Voltage Test	U2 Rated 9 V~18.5 V	I/P: High-Line +3V =298V O/P: (1) Full Load input on/off (2) NO load input on /Off (3) Full Load /NO load Change Ta: 25°C	(1) 16.4V (2) 16.3V (3) 16.1V
5	P.F.C Transistor ( D to S) or (C to E) Peak Voltage	Q1 Rated 6.8A/600V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 534V (2) 508V (3) 472V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min I/P-FG: 2 KVAC/min<4.5mA O/P-FG:1.5KVAC/min	I/P-O/P: 4.125 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P: 1.982 mA I/P-FG: 1.513mA O/P-FG: 1.675mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100M $\Omega$ I/P-FG: 500VDC>100M $\Omega$ O/P-FG:500VDC>100M $\Omega$	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: >9999G $\Omega$ I/P-FG: >9999 G $\Omega$ O/P-FG: >9999 G $\Omega$ NO DAMAGE

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50HZ O/P: FULL/50% LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
3	RADIATION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY Air: 8KV Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS



55W Constant Power output linear LED Driver

LDC-55 series

6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N :1KV L -PE:2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
7	Test by certified Lab & Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

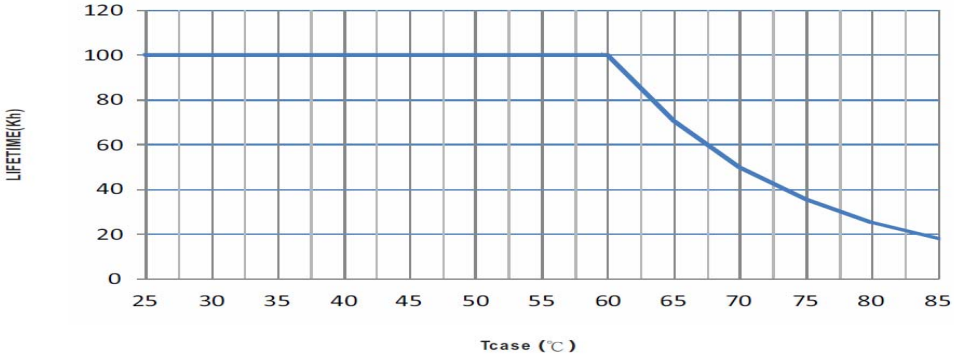
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																								
1	TEMPERATURE RISE TEST	MODEL: LDC-55 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 26.1°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=50.5°C																																																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 26.1 °C</th> <th>HIGH AMBIENT Ta=50.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1</td><td>59.1°C</td><td>77.4°C</td></tr> <tr><td>2</td><td>ZNR1</td><td>46.3°C</td><td>68.2°C</td></tr> <tr><td>3</td><td>C2</td><td>61.7°C</td><td>83.9°C</td></tr> <tr><td>4</td><td>BD1</td><td>69.6°C</td><td>91.1°C</td></tr> <tr><td>5</td><td>L1</td><td>69.3°C</td><td>91.1°C</td></tr> <tr><td>6</td><td>L3</td><td>62.6°C</td><td>84.5°C</td></tr> <tr><td>7</td><td>C5</td><td>68.1°C</td><td>89.8°C</td></tr> <tr><td>8</td><td>D6</td><td>72.2°C</td><td>94.3°C</td></tr> <tr><td>9</td><td>Q1</td><td>66.4°C</td><td>88.1°C</td></tr> <tr><td>10</td><td>Q2</td><td>70.3°C</td><td>92.7°C</td></tr> <tr><td>11</td><td>Q3</td><td>69.0°C</td><td>91.3°C</td></tr> <tr><td>12</td><td>U2</td><td>73.8°C</td><td>95.6°C</td></tr> <tr><td>13</td><td>Q4</td><td>86.2°C</td><td>106.5°C</td></tr> <tr><td>14</td><td>L2</td><td>77.2°C</td><td>98.5°C</td></tr> <tr><td>15</td><td>C42</td><td>64.7°C</td><td>86.4°C</td></tr> <tr><td>16</td><td>T1</td><td>69.9°C</td><td>91.5°C</td></tr> <tr><td>17</td><td>D100</td><td>69.3°C</td><td>90.9°C</td></tr> <tr><td>18</td><td>U102</td><td>52.3°C</td><td>74.3°C</td></tr> <tr><td>19</td><td>Q100</td><td>45.7°C</td><td>68.4°C</td></tr> <tr><td>20</td><td>C101</td><td>59.5°C</td><td>80.9°C</td></tr> <tr><td>21</td><td>C103</td><td>49.6°C</td><td>71.8°C</td></tr> <tr><td>22</td><td>U600</td><td>50.7°C</td><td>73.0°C</td></tr> <tr><td>23</td><td>C201</td><td>61.6°C</td><td>83.0°C</td></tr> <tr><td>24</td><td>RTH2</td><td>64.1°C</td><td>85.8°C</td></tr> <tr><td>25</td><td>TC</td><td>51.7°C</td><td>74.4°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 26.1 °C	HIGH AMBIENT Ta=50.5 °C	1	RTH1	59.1°C	77.4°C	2	ZNR1	46.3°C	68.2°C	3	C2	61.7°C	83.9°C	4	BD1	69.6°C	91.1°C	5	L1	69.3°C	91.1°C	6	L3	62.6°C	84.5°C	7	C5	68.1°C	89.8°C	8	D6	72.2°C	94.3°C	9	Q1	66.4°C	88.1°C	10	Q2	70.3°C	92.7°C	11	Q3	69.0°C	91.3°C	12	U2	73.8°C	95.6°C	13	Q4	86.2°C	106.5°C	14	L2	77.2°C	98.5°C	15	C42	64.7°C	86.4°C	16	T1	69.9°C	91.5°C	17	D100	69.3°C	90.9°C	18	U102	52.3°C	74.3°C	19	Q100	45.7°C	68.4°C	20	C101	59.5°C	80.9°C	21	C103	49.6°C	71.8°C	22	U600	50.7°C	73.0°C	23	C201	61.6°C	83.0°C	24	RTH2	64.1°C	85.8°C	25	TC	51.7°C	74.4°C
NO	Position	ROOM AMBIENT Ta= 26.1 °C	HIGH AMBIENT Ta=50.5 °C																																																																																																									
1	RTH1	59.1°C	77.4°C																																																																																																									
2	ZNR1	46.3°C	68.2°C																																																																																																									
3	C2	61.7°C	83.9°C																																																																																																									
4	BD1	69.6°C	91.1°C																																																																																																									
5	L1	69.3°C	91.1°C																																																																																																									
6	L3	62.6°C	84.5°C																																																																																																									
7	C5	68.1°C	89.8°C																																																																																																									
8	D6	72.2°C	94.3°C																																																																																																									
9	Q1	66.4°C	88.1°C																																																																																																									
10	Q2	70.3°C	92.7°C																																																																																																									
11	Q3	69.0°C	91.3°C																																																																																																									
12	U2	73.8°C	95.6°C																																																																																																									
13	Q4	86.2°C	106.5°C																																																																																																									
14	L2	77.2°C	98.5°C																																																																																																									
15	C42	64.7°C	86.4°C																																																																																																									
16	T1	69.9°C	91.5°C																																																																																																									
17	D100	69.3°C	90.9°C																																																																																																									
18	U102	52.3°C	74.3°C																																																																																																									
19	Q100	45.7°C	68.4°C																																																																																																									
20	C101	59.5°C	80.9°C																																																																																																									
21	C103	49.6°C	71.8°C																																																																																																									
22	U600	50.7°C	73.0°C																																																																																																									
23	C201	61.6°C	83.0°C																																																																																																									
24	RTH2	64.1°C	85.8°C																																																																																																									
25	TC	51.7°C	74.4°C																																																																																																									
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/180VAC O/P: FULL LOAD Ta= -30°C	TEST: OK																																																																																																								
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=50 °C HUMIDITY= 95% R.H	TEST: OK																																																																																																								





55W Constant Power output linear LED Driver

LDC-55 series

4	TEMPERATURE COEFFICIENT	$\pm 0.03\%/^{\circ}\text{C}$ (0~60 $^{\circ}\text{C}$ )	I/P: 230 VAC O/P: FULL LOAD	$\pm 0.015\%/^{\circ}\text{C}$ (0~60 $^{\circ}\text{C}$ )
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -45 $^{\circ}\text{C}$ ~ +85 $^{\circ}\text{C}$ 2. Temperature change rate : 25 $^{\circ}\text{C}$ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 5 CYCLE 5. Input/Output condition: STATIC		TEST: OK
6	THERMAL SHOCK TEST	1. Thermal shock Temperature: -30 $^{\circ}\text{C}$ ~ +85 $^{\circ}\text{C}$ 2. Temperature change rate : 25 $^{\circ}\text{C}$ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 10 CYCLE 5. Input/Output condition: 230VAC/Full Load AC ON/OFF TEST AC on 3 sec/AC off 1 sec TEST		TEST: OK
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 10min/sweep cycle (4) Acceleration: 2G (5) Test Time: 180min in each axis (X.Y.Z) (6) Ta: 25 $^{\circ}\text{C}$		TEST: OK
8	CAPACITOR LIFE CYCLE	LDC-55: SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Ta= 25 $^{\circ}\text{C}$ LIFE TIME (2) I/P: 230VAC O/P: FULL LOAD Ta= 50 $^{\circ}\text{C}$ LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 50 $^{\circ}\text{C}$ LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta= 50 $^{\circ}\text{C}$ LIFE TIME		(1) 357712 HRS (2) 77825 HRS (3) 104979 HRS (4) 131239 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 226.1K hrs min MIL-HDBK-217F (25 $^{\circ}\text{C}$ )		
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 50,000 hours @ Tcase 70 $^{\circ}\text{C}$ 		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIANGQW/ZHUOKB	SKY	LIUWY