



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



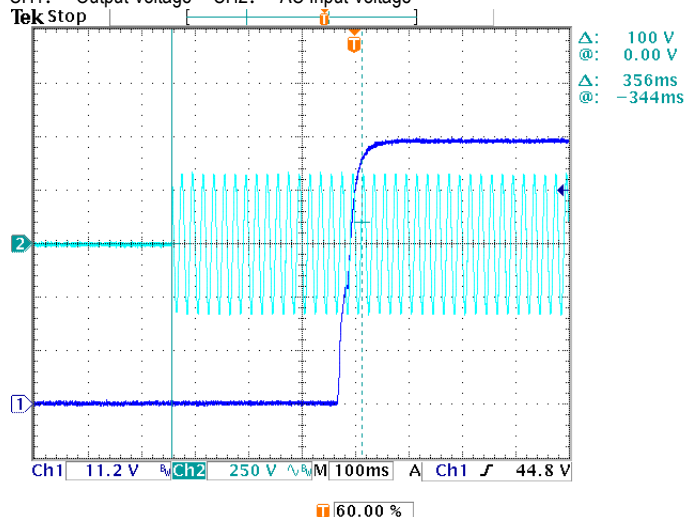
■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	$\pm 5\%$	I/P: 180 VAC / 295 VAC O/P: FULL/ MIN LOAD Ta: 25°C	$< \pm 5\%$
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: $V_o \times I_o$	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

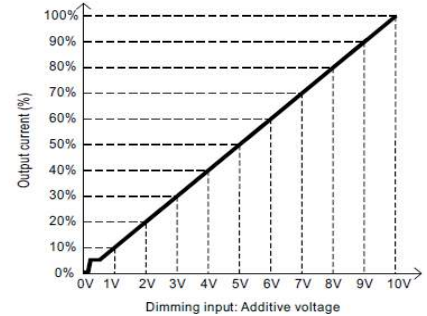
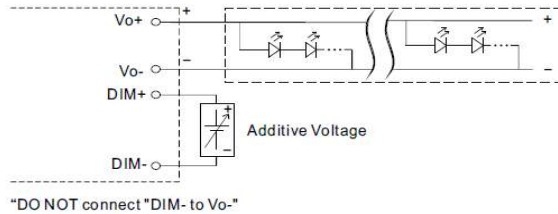


7 DIMMING OPERATION (for B-Type)

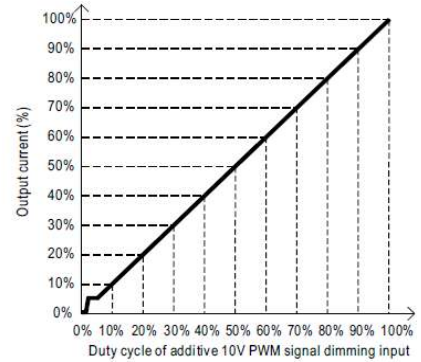
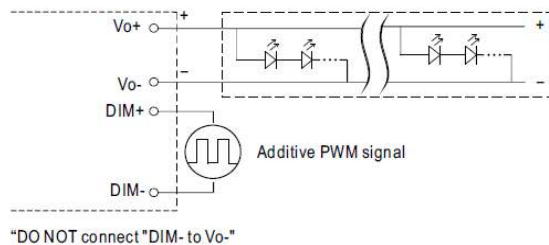
※ 3 in 1 dimming function(for B-Type)

- 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 μ A (typ.)

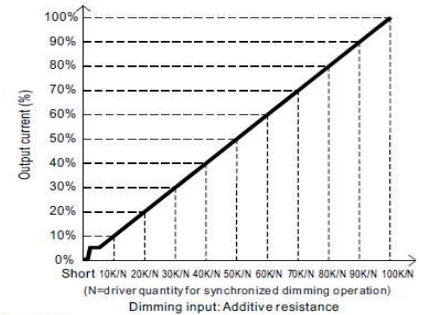
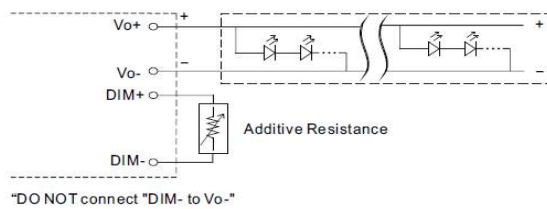
◎ Applying additive 0 ~ 10VDC



◎ 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_{out} < 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°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%

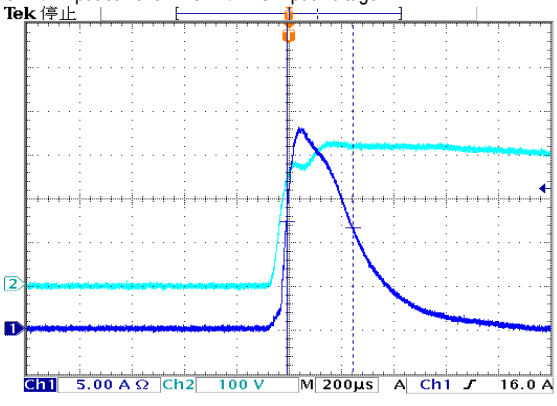
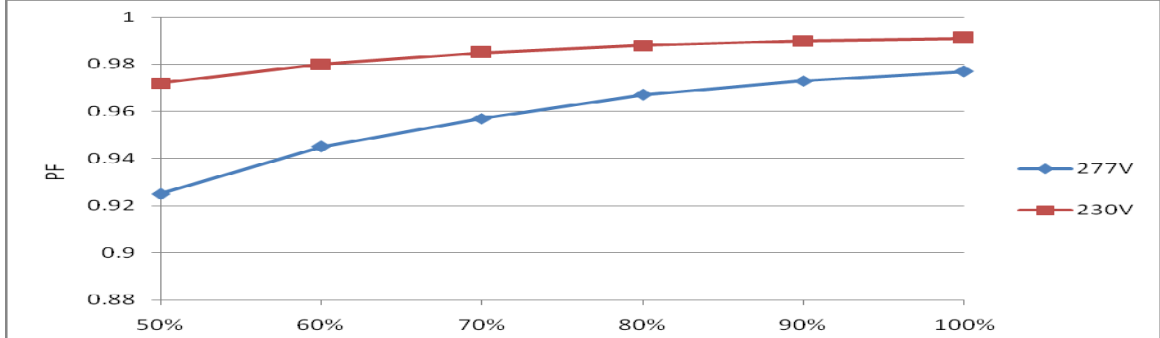
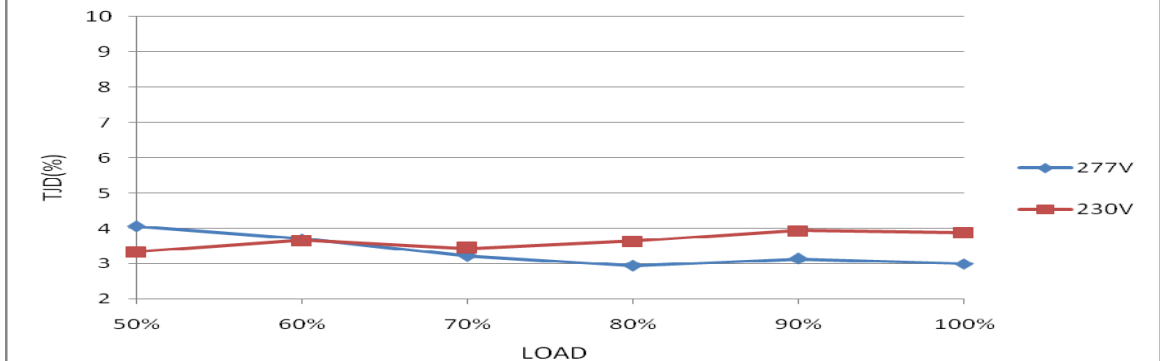
TEST RESULT: OK

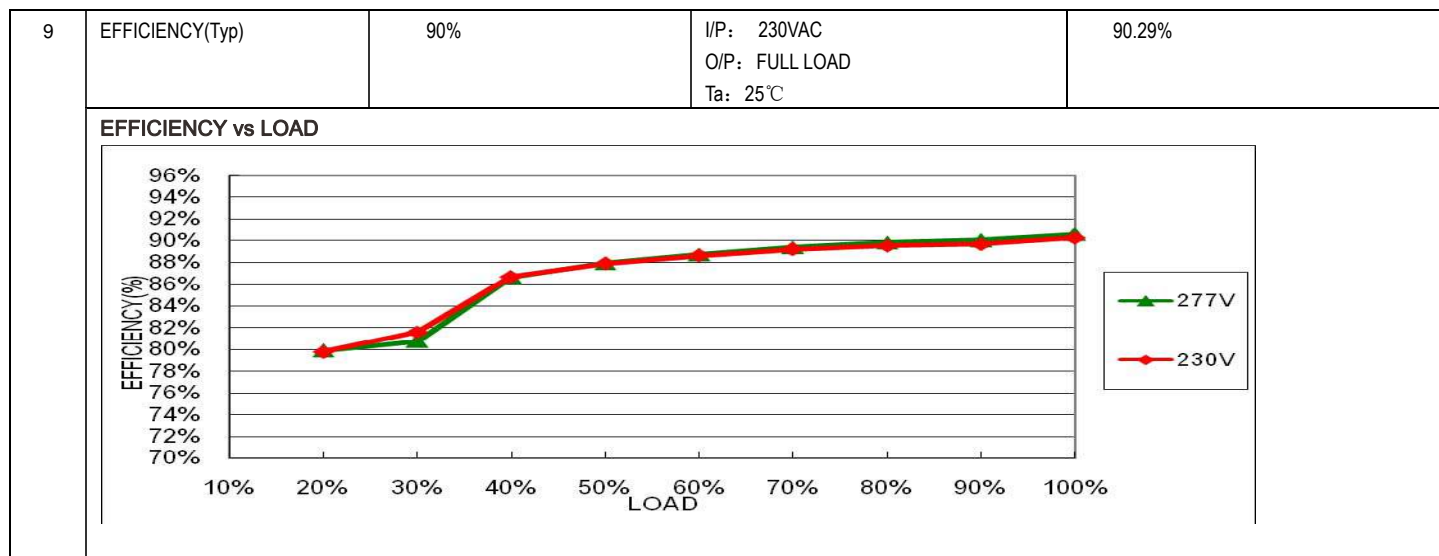
TEST RESULT: OK

8	PUSH DIMMING OPERATION (primary side;for DA-Type)	※PUSH dimming(primary side) <table border="1"> <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>>11 sec.</td><td>Set up the dimming level to 100%</td></tr> </tbody> </table> - The factory default dimming level is at 100%. - If the push action lasts less than 0.05 sec., it will not lead to a change for the status of the driver. - Up to 10 drivers can perform the PUSH dimming at the same time when utilizing one common push button. - The maximum length of the cable from the push button to the last driver is 20 meters. - 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. I/P: 230 VAC O/P: PUSH DIMMING TEST Ta: 25°C TEST RESULT:	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%
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Reset	>11 sec.	Set up the dimming level to 100%												
9	DALI DIMMING OPERATION (primary side; for DA-Type)	※DALI Interface(primary side) - Apply DALI signal between DA+ and DA-. - DALI protocol comprises 16 groups and 64 addresses. - First step is fixed at 8% of output. I/P: 230 VAC O/P: DIMMING TEST Ta: 25°C TEST RESULT: OK												

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 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)	177V~305V 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

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
	INPUT=230VAC/50HZ @ FULL LOAD CH2: Input current CH1: AC Input Voltage  Δ: 700mA $@$: 12.2 A Δ: 252μs $@$: -8.00μs Ch1 最大 23.0 A			
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
	PF vs LOAD 			
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
	THD vs LOAD 			



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 μ / 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 Ω I/P-FG: 500VDC>100M Ω O/P-FG:500VDC>100M Ω	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: >9999G Ω I/P-FG: >9999 G Ω O/P-FG: >9999 G Ω 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

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

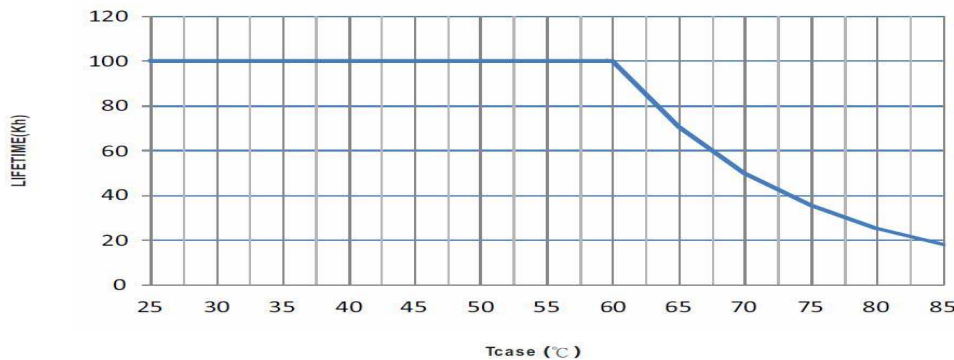
ENVIRONMENT TEST

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



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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