CheFree

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: CH101ILFL-CT3

(Complied with RoHS)

ISSUE:FEB.25.2014

Spec Condition: preliminary

CUSTOMER	CHEFREE		
APPROVAL	APPROVAL	CHECKER	PREPARE
	ch lee	kevin	kevin

2.RECORD OF REVISION

Rev	DATE	PAGE	SUMMARY
0.1	2014.02.25	ALL	Preliminary specification was first issued.
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3.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1024(R.G.B) X 600
(2)	Module Size(mm)	256.0(W) X 166.0(H) X 15.19(D)
(3)	Active Area(mm)	222.72(H) X 125.28(V)
(4)	Pixel Pitch(mm)	0.2175 (H) X 0.2088(V)
(5)	LCD Model	TFT , Transmissive, Normally/White
(6)	Polarizer Model	3H Anti-glare (PCAP is 7H anti-reflection glass)
(7)	LED Backlight Color	White
(8)	Viewing Direction	Wide Viewing Angle
(9)	Gray Scale Inversion Direction	12 O'CLOCK
(10)	Color Configuration	R.G.B Stripe
(12)	Integration of LCM and Touch	Air gap tapes
(13)	PCAP Touch Function	4 fingers multi-touch
(14)	Module Weight(g)	TBD

		1	2	3	4	5	6	7	8 樣式 QT2-RD02-008

文件題目		圖號			頁	次頁
發行日		舊版日		登入號碼	機密等級	

No.	修定區塊	修 訂 內 容	作 成	修訂日期
		新版	Swallow	2014.02.25

256.00(T/P OUTLINE)
244±0.5 (LCM OUTLINE)
225.72±0.3 (LCM OPENING)
223.30(T/P A.A)
222.72±0.2 (LCM A.A)
128.00

8.49
15.14
16.35
16.64

11.35
18.86
20.10
20.36
83.00

166.00(T/P OUTLINE)
143±0.5 (LCM OUTLINE)
128.28±0.3 (LCM OPENING)
125.80(T/P A.A)
125.28±0.2 (LCM A.A)

A.A Center

IC parts

37.50
77.50
27.75
72.75

15.19 ±0.5
12.40
4-R5.00
7.2
MAX:2.5
0.34
6.00(STIFFENER)

A VIEW(8:1)
0.3
5
PIN1
0.5
44.00
P0.5*(10-1)=4.5

6.50
243.00(SENSOR) AREA)
11.35
6.50
37.6
42.5
153.00(SENSOR) AREA)

CN2 CN1
1 5   20   1
119.568
157.426
8.49

0.2175
0.0725
0.2088
R G B
R
Detail DOT

CONNECTOR PINOUT	
PIN NO.	DESIGNATION
1	RESET
2	I2C_SCL
3	I2C_SDA
4	INT
5	GND
6	VCC
7	VCC
8	GND
9	GND
10	GND

NOTE:
1. Unit: mm
2. Tolerance is ±0.3 mm unless noted。
3.Cover Glass:Black Silk Printing
4.Cover Glass:Anti Reflective Treatment

備考			單位:mm	投影法:	比例尺:
入庫	製圖 Swallow 140225	名稱: TFT+TP			圖號 CH101ILFL-CT1
	審查				
	承認				

5. INTERFACE PIN CONNECTION

5.1 LCM PANEL DRIVING SECTION

CN1:STM MSB240420HD or equivalent

PIN NO	SYMBOL	FUNCTION	REMARK
1	VDD	Power Supply,3.3V(typical)	
2	VDD	Power Supply,3.3V(typical)	
3	VSS	Ground	
4	REV	Reverse Scan selection"*N<pqto cñwug"="N"<Tgxgtug"uetggp+	
5	Rin1-	LVDS receiver negative signal channel 0(G0,R5~R0)	
6	Rin1+	LVDS receiver positive signal channel 0(G0,R5~R0)	
7	VSS	Ground	
8	Rin2-	LVDS receiver negative signal channel 1(B1,B0,G5~G1)	
9	Rin2+	LVDS receiver positive signal channel 1(B1,B0,G5~G1)	
10	VSS	Ground	
11	Rin3-	LVDS receiver negative signal channel 2(DE,VS,HS,B5~B2)	
12	Rin3+	LVDS receiver positive signal channel 2(DE,VS,HS,B5~B2)	
13	VSS	Ground	
14	ClkIN-	LVDS receiver negative signal clock	
15	ClkIN+	LVDS receiver positive signal clock	
16	GND	Ground	
17	Rin4-	LVDS receiver negative signal channel 3(B6,B7,G6,G7,R6,R7)	
18	Rin4+	LVDS receiver positive signal channel 3(B6,B7,G6,G7,R6,R7)	
19	SEL68	6/8 bits LVDS data input, selection(H:8bit ;L/Floating:6bit)	Table 7
20	NC	No connection	

Table 7 SEL68 Power Voltage Specifications

Signal Name	SYMBOL	MIN.	TYP.	MAX.	UNIT
SEL68	VH	2.0	3.3	5.0	V
	VL	-	-	0.8	V

5.2 BACKLIGHT SECTION

CN2:STM MSB24038P5A or equivalent

PIN NO	SYMBOL	FUNCTION	REMARK
1	VLED	Power Supply,12V(typical)	
2	GND	Ground	
3	EN	3.3V(typical)	
4	PWM	3.3V(typical)	
5	NC	Not connection	

6. BLOCK DIAGRAM
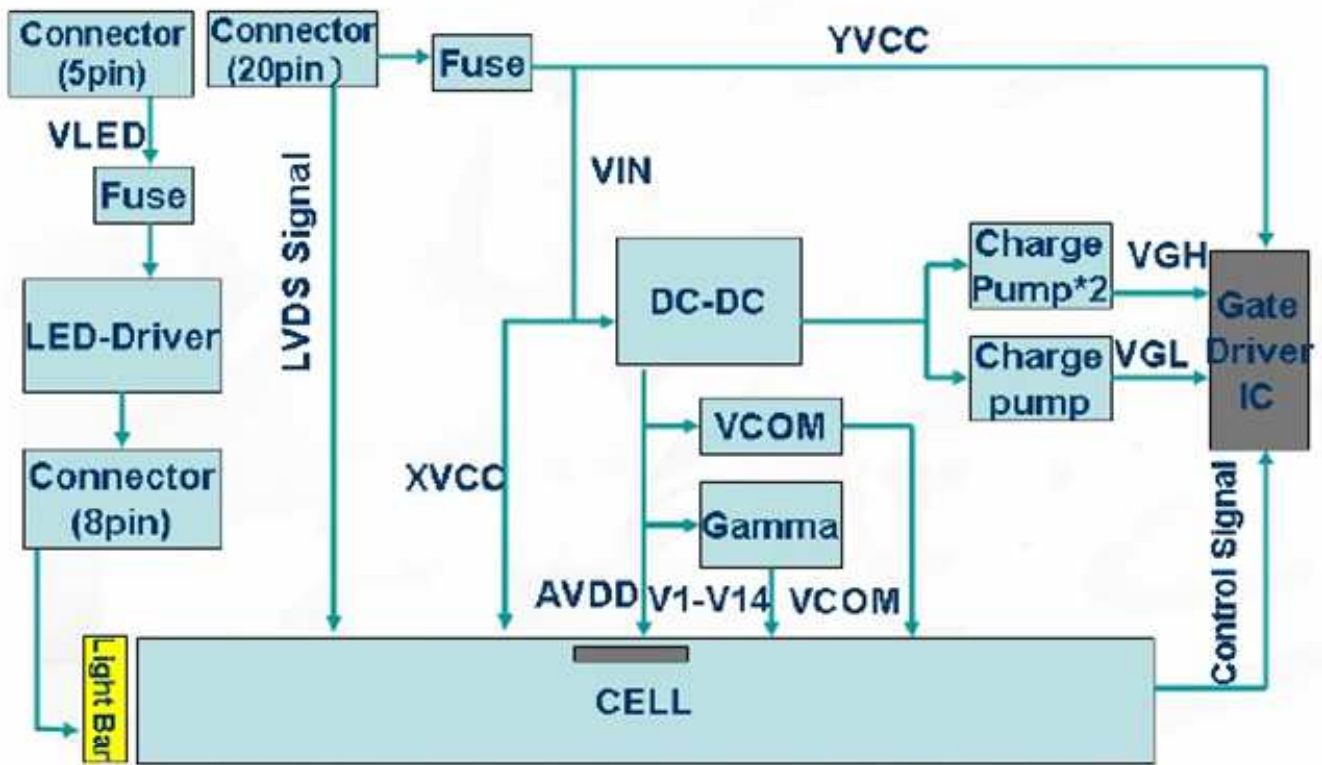
7. ABSOLUTE MAXIMUM RATINGS

7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Logic Power Supply Voltage	VDD	3.0	3.6	V	
LED Backlight Drive Voltage	VLED	8.0	16.0	V	
LVDS Input Signal	V_S	-	3.6	V	
PWM Dimming Voltage	V_{PWM}	0.8	5.0	V	

7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN	MAX	MIN	MAX	
Ambient Temperature(℃)	-30	80	-30	80	Note 1,2

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

CTP Electrical Characteristic

Symbol Descri	ption	Min	Typ	Max	Unit	Notes
VCC	Supply voltage	3.3	-	5.0	V	

8. ELECTRICAL CHARACTERISTICS

8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For Digital	VDD	3.0	3.3	3.6	V	
	IDD**	-	-	153	mA	
Input Inrush Current	I_{RUSH}	-	-	1.5	A	
Input Power Voltage Ripple	V_{RPL}	-	-	200	mA	Vp-p
REV	VH	2.0	3.3	5.0	V	
	VL	-	-	0.8	V	
Logic Input Voltage (LVDS: Rin+, Rin-)	V_{CM}	1.0	1.2	1.4	V	V_{TH}-V_{TL}=200mV
	$\triangle V_{CM}$	-50	-	+50	mV	V_{TH}-V_{TL}=200mV
	|VID|	200	-	600	mV	
	V_{TH}	-	-	+100	mV	V_{CM}=+1.2V
	V_{TL}	-100	-	-	mV	V_{CM}=+1.2V

**Test pattern is Black at 60Hz

8.2 BACKLIGHT UNITS

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage	VLED	8	12	16	V	
LED Driving Current	ILED	-	-	543	mA	
Brightness Control	VIH	2	3.3	5	V	
	VIL	0	-	0.8	V	
PWM Frequency	F_{PWM}	100		1K	Hz	
LED Life Time	-	50000	-	-	Hr	Note1

Note1 : The LED life time define as the estimated time to 50% degradation of the initial value.

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9. OPTICAL CHARACTERISTICS

Ta=25℃

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle $\Theta x=\Theta y$ =0°	(400)	(500)	-	-	Note (1)
Response Time		$T_{R+}T_F$		-	16	20	ms	Note (2)
Chromaticity	White	x		(0.255)	(0.305)	(0.355)	-	Note (4)
		y		(0.275)	(0.325)	(0.375)		
Viewing Angle	Hor.	$\Theta x+$	Viewing Angle $\Theta x=\Theta y$ =0° CR$\geq$10	(70)	(80)	-	Deg.	Note (3)
		$\Theta x-$		(70)	(80)	-		
	Ver.	$\Theta Y+$		(50)	(60)	-		
		$\Theta Y-$		(70)	(80)	-		
Luminance		L	Center	(340)	(430)	-	cd/m2	Note (4)
Luminance uniformity		YU	PWM=100%	70	80	-	%	Note (5)

*Note (1)   Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63

L 0: Luminance of gray level 0

CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2)   Definition of Response Time (T_R, T_F):
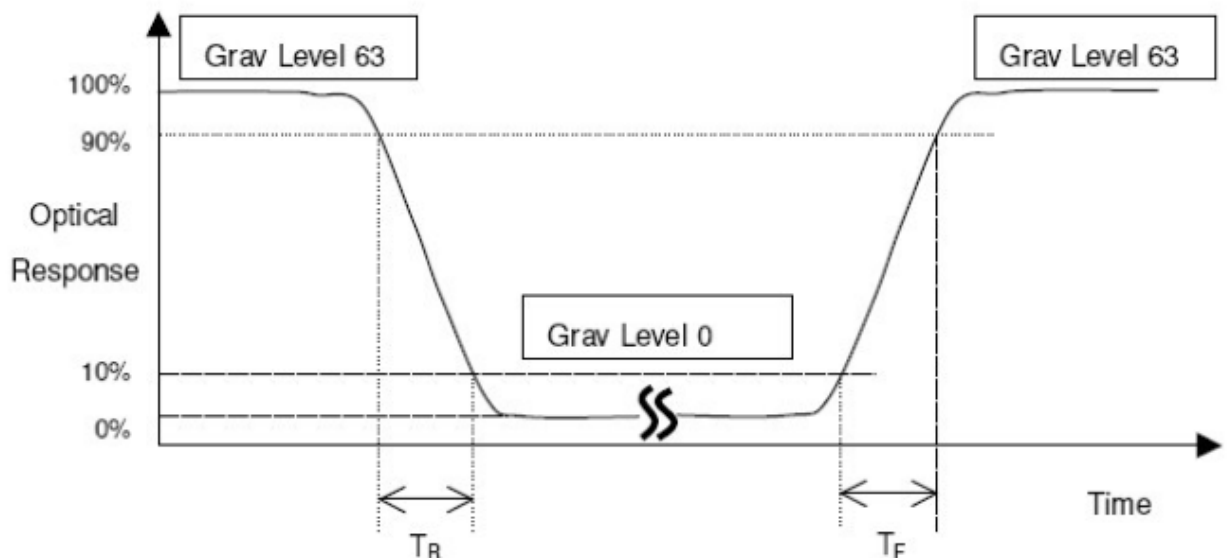
*Note(3)   Definition of Viewing Angle

Normal

$\theta x = \theta y = 0°$

$\theta y-$ $\theta y+$

$\theta X- = 90°$ x-

12 o'clock direction

y+ $\theta y+ = 90°$

$\theta x-$ $\theta x+$

6 o'clock   y-
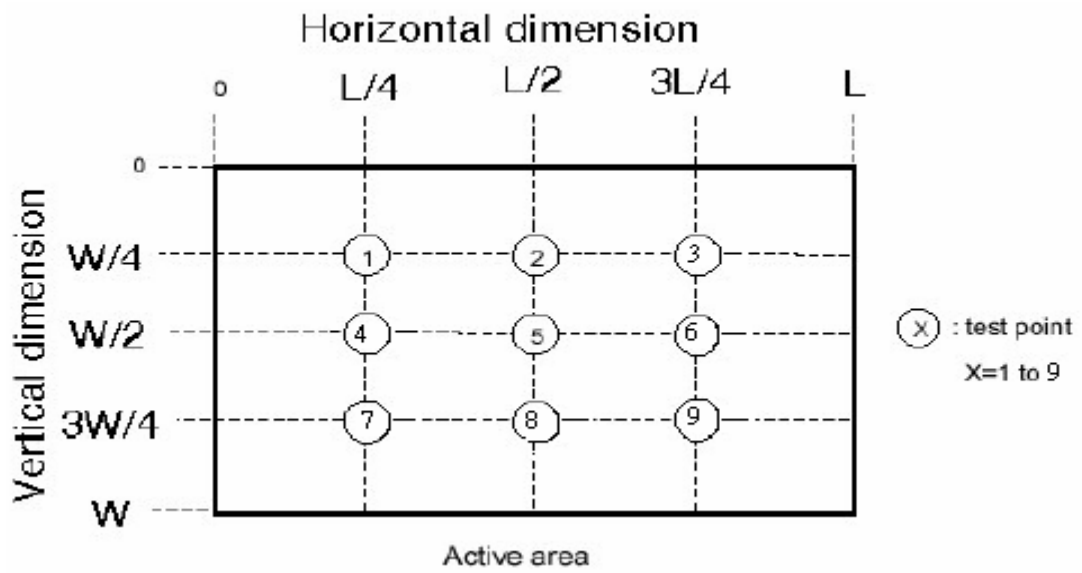
$\theta y- = 90°$

x+ $\theta X+ = 90°$
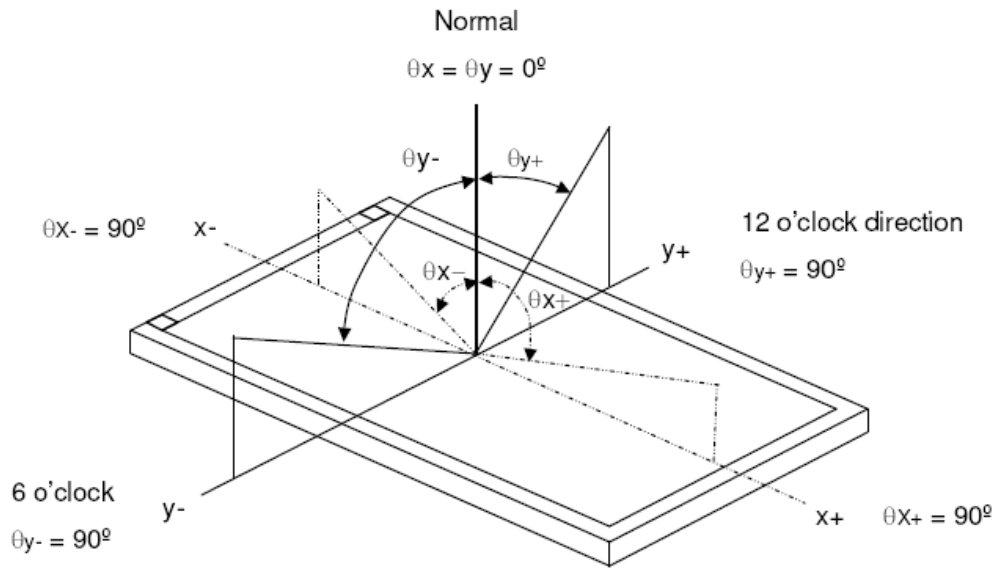
*Note (4)   Measurement Set-Up:

    The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.

LCD Module

LCD Panel

Center of the Screen

Photometer
(TOPCON BM-5A)

Field of View = 2°

180 mm

Light Shield Room
(Ambient Luminance < 2 lux)
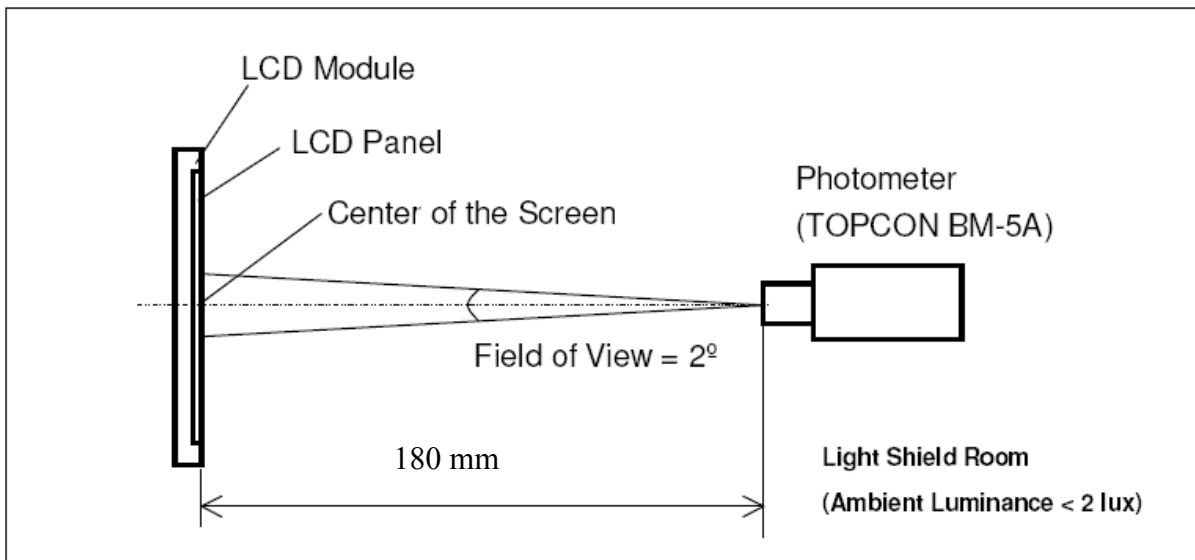
*Note (5)

$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right) \times 100\% > 70\%$$

10. TIMING SPECIFICATIONS
10.1 POWER ON/OFF SEQUENCE

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
VDD rising Time from 10% to 90%	T1	0.5	-	10	ms	
Delay from VDD to valid data at power ON	T2	0	-	50	ms	
Delay from valid data OFF to VDD OFF at power OFF	T3	0	-	50	ms	
VDD OFF time for Windows restart	T4	500	-	-	ms	
Delay from valid data to B/L enable at power ON	T5	200	-	-	ms	
Delay from valid data off to B/L disable at power OFF	T6	200	-	-	ms	
VDD falling time from 90% to 10%	T7	0	-	10	ms	
LED Vin rising time from 10% to 90%	T8	0.5	-	10	ms	
LED Vin falling time from 90% to 10%	T9	0.5	-	10	ms	
Delay from LED driver Vin rising time 90% to PWM ON	T10	0	-	10	ms	
Delay from PWM Off to LED Driver Vin falling time 10%,Must Keep rule	T11	0	-	-	ms	
Delay from PWM ON to B/L Enable ON, Must Keep rule	T12	0	-	-	ms	
Delay from B/L Enable Off to PWM Off	T13	0	-	-	ms	
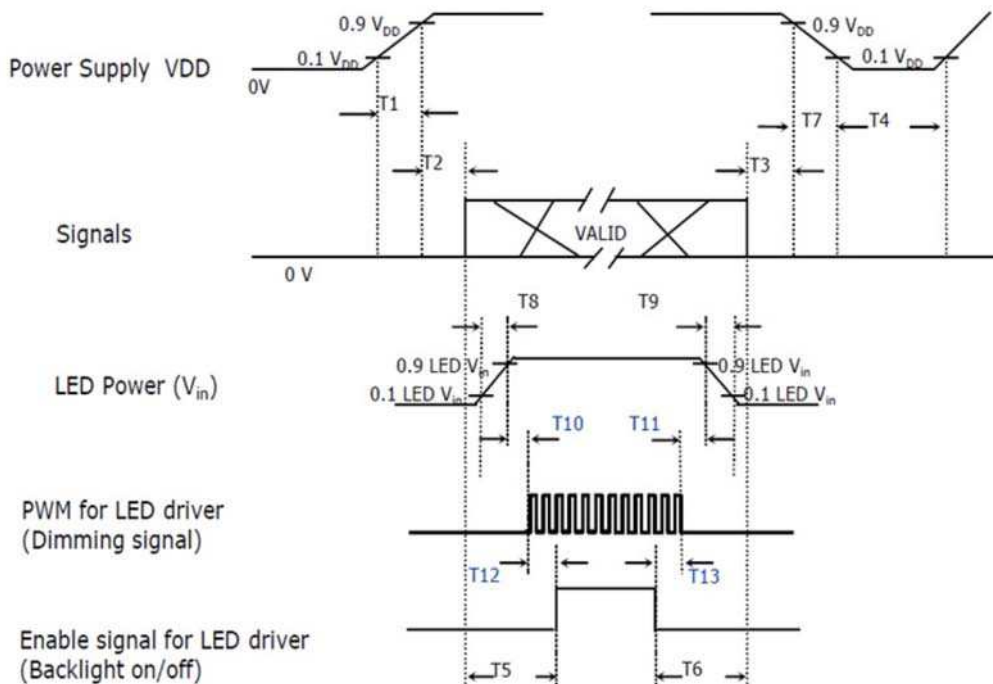
10.2 TIMING CHARACTERISTICS

Synchronization Method：DE only

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LVDS Clock Frequency (single)	f_{dck}	45	51.2	57	MHz	
H Total Time	T_{hp}	1324	1344	1364	clocks	
H Active Time	HA	1024	1024	1024	clocks	
H Blanking Time	TH_{BLANK}	300	320	340	clocks	
V Total Time	T_{VP}	625	635	645	lines	
V Active Time	VA	600	600	600	lines	
V Blanking Time	TV_{BLANK}	25	35	45	lines	
V Frequency	f_V	55	60	65	Hz	
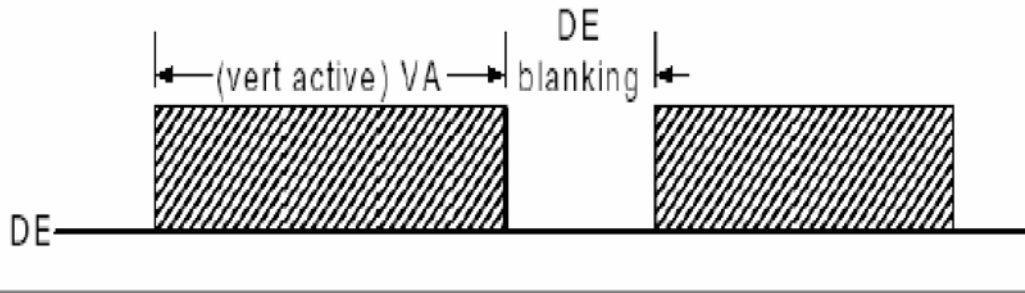
10.3 TIMING DIAGRAM OF INTERFACE SIGNAL

LVDS Mapping

6 bit LVDS input

8 bit LVDS input

10
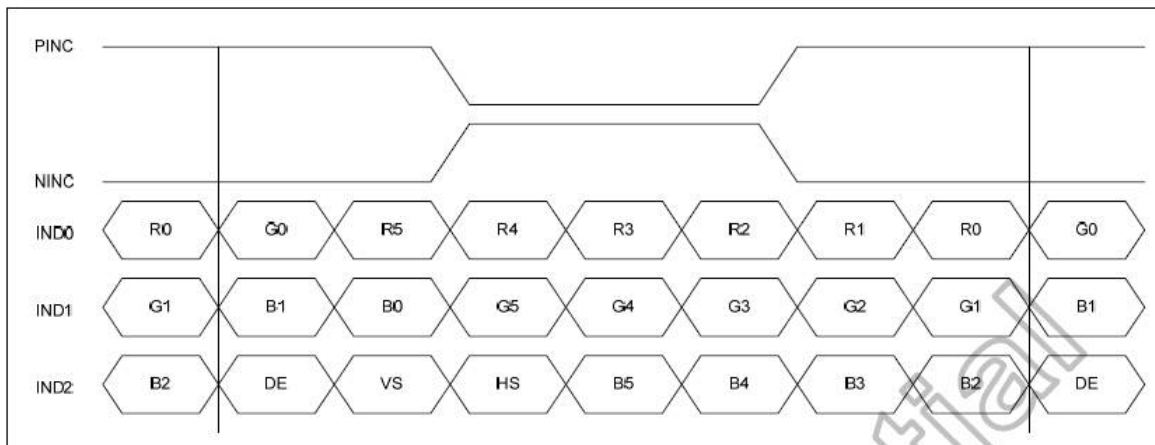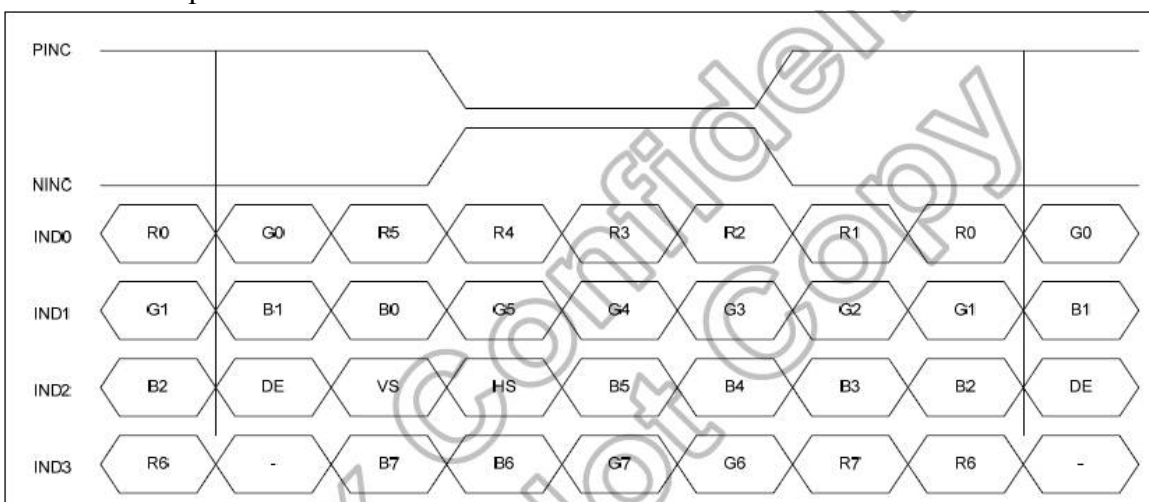
11. RELIABILITY TEST

NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
	ENVIRONMENTAL TEST FOR LCM			
1	High Temperature Storage	80℃	500HRS	Note1,4
2	Low Temperature Storage	-30℃	500HRS	Note1,4
3	High Temperature Operation	80℃	500HRS	Note2,4
4	Low Temperature Operation	-30℃	500HRS	Note1,4
5	High Temperature Humidity Storage	50℃ 85%RH	500HRS	Note2,4
6	Temperature Cycle	-30℃→80℃ (30min) (30min)	200CYCLE	Note1,4

Note1 : Ta is the ambient temperature of samples.

Note2 : Ts is the temperature of panel's surface.

Note3 : In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note4 : Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Thermal Shock Test	-20℃~60℃, 1h/each cycle,100cycles	
Shock Test (Non-Operating)	50G,20ms,Half Sine Wave, (±X, ±Y,±Z)	
Vibration Test (Non-Operating)	1.5G ,10~200 Hz, x、y、z each axis/30min	
ESD test	Contact Discharge: ±8KV,150pF(330Ω) ; Air Discharge: ±15KV,150pF(330Ω)	Note 1

Note1: ESD class C: Performance could be recovered by reset if temporary failure happened.

12. PRECAUTIONS FOR USE

12.1 USE RESTRICTION

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

12.2 HANDING PRECAUTION

(1) Please mount LCD module by using mounting holes arranged in four corners tightly.

(2) Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. CHEFREE does not warrant the module, if customers disassemble or modify the module.

(3) If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid Crystal, and do not contact liquid crystal with skin. If liquid crystal contacts mouth or eyes, rinse out with water immediately. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and Rinse thoroughly with water.

(4) Disconnect power supply before handling LCD module

(5) Refrain from strong mechanical shock and /or any force to the module.

(6) Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature; etc otherwise LCD module may be damaged. It's recommended employing protection circuit for power supply.

(7) Do not touch, push or rub the polarizer with anything harder than HB pencil lead. Use fingerstalls of soft gloves in order to keep clean display quality, when Persons handle the LCD module for incoming inspection or assembly.

(8) When the surface is dusty, please wipe gently with absorbent cotton or other soft Material. When cleaning the adhesives, please use absorbent cotton wetted with a little Petroleum benzene or other adequate solvent.

(9) Wipe off saliva or water drops as soon as possible. If saliva or water drops Contact with polarizer for a long time, they may causes deformation or color Fading.

(10) Protection film must remove very slowly from the surface of LCD module to Prevent from electrostatic occurrence.

(11) Because LCD module uses CMOS-IC on circuit board and TFT-LCD panel, it is Very weak to electrostatic discharge, Please be careful with electrostatic Discharge .Persons who handle the module should be grounded through adequate methods.

(12) Do not adjust the variable resistor located on the module.

12.3 STORAGE PRECAUTION

(1) Please do not leave LCD module in the environment of high humidity and high temperature for a long time.

(2) The module shall not be exposed under strong light such as direct sunlight. Otherwise, Display characteristics may be changed.

(3) The module should be stored in a dark place. It is prohibited to apply sunlight or fluorescent light in storage.

12.4 OPERATION PRECAUTION

    (1) Do not connect or disconnect the module in the "Power On" condition.

    (2) Power supply should always be turned on/off by 9.0 "Power on/off sequence"

    (3) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference should be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.

    (4) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.

12.5 OTHERS

    (1) Ultra-violet ray filter is necessary for outdoor operation.

    (2) Avoid condensation of water which may result in improper operation or disconnection of electrode

    (3) If the module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen.

    (4) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.

12.6 DISPOSAL

When disposing LCD module, obey the local environmental regulations.