



PRODUCT GROUP

REV

REV.P0

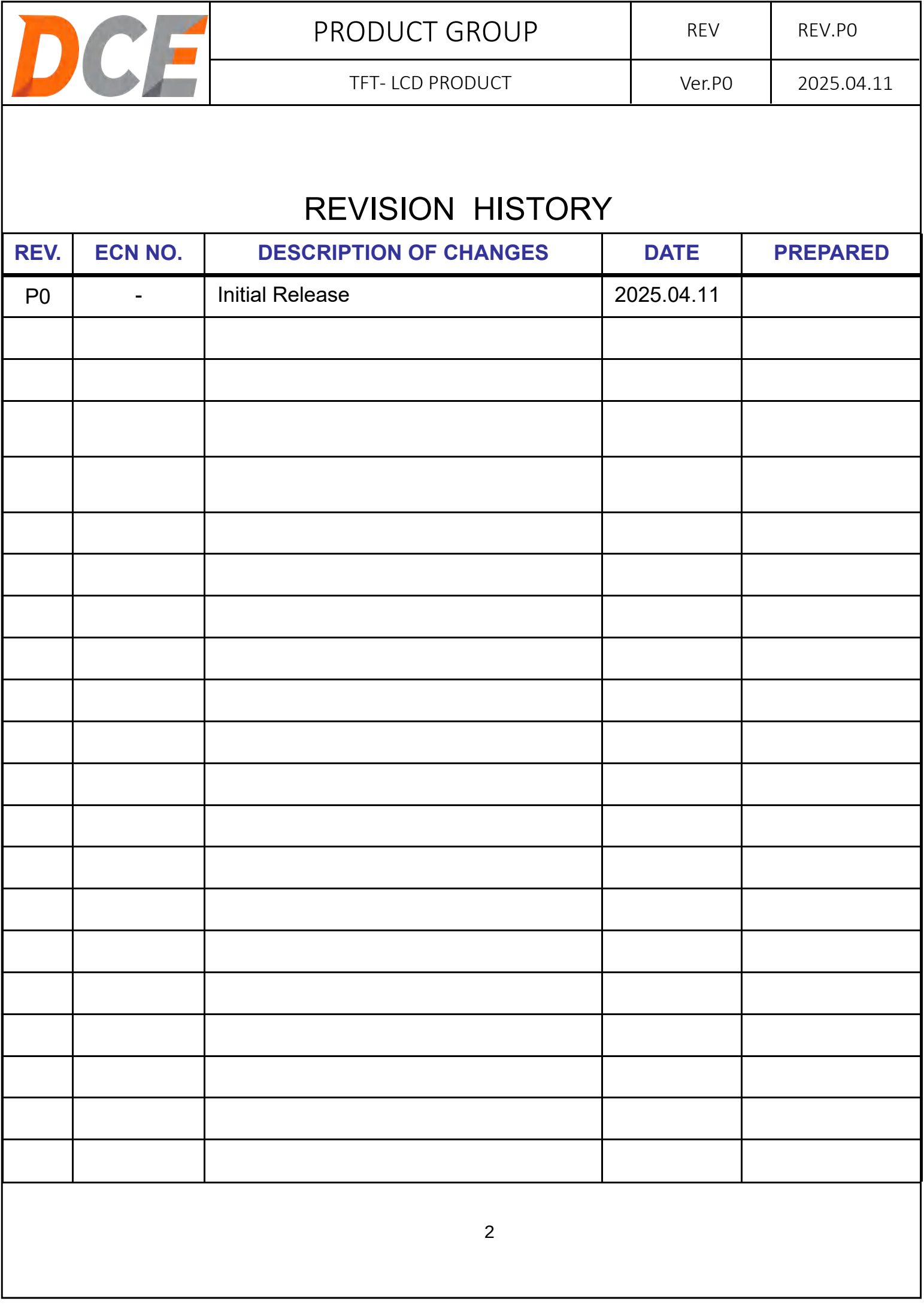
TFT- LCD PRODUCT

Ver.P0

2025.04.11

客户名称 Customer	深圳市戴维营电子有限公司
产品型号 Part NO.	DCE185FHM8401
产品内容 Product type	Mode: TFT LCD Module
备注栏 Remarks	☐ APPROVAL FOR SEPCIFICATIONS ONLY ☒ APPROVAL FOR SEPCIFICATIONS AND SAMPLE
客户确认签章 Signature by Customer:	
备注/ Notes:	

PREPARED BY	CHECKED BY	APPROVED BY

[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]



PRODUCT GROUP

REV

REV.P0

TFT- LCD PRODUCT

Ver.P0

2025.04.11

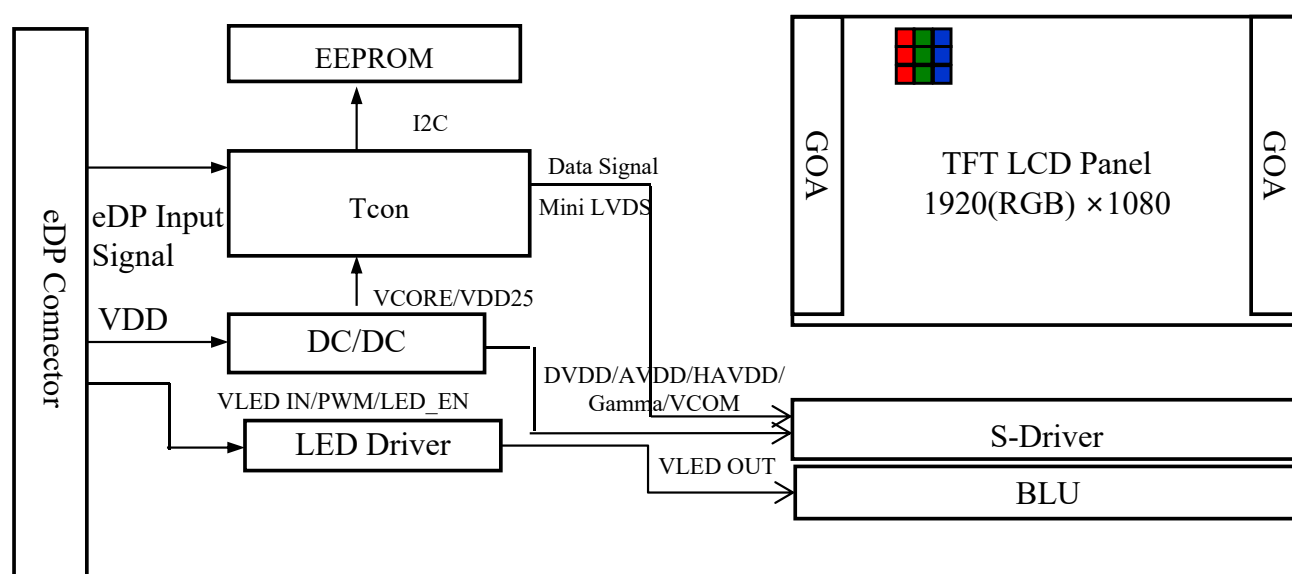
Contents

No.	Items	Page
1.0	General Description	4
2.0	Absolute Maximum ratings	6
3.0	Electrical specifications.	7
4.0	Interface Connection	8
5.0	Signal Timing Specifications	10
6.0	Optical specifications.	12
7.0	Mechanical Outline Dimension	15
9.0	Reliability Test	16
10.0	Precautions	17

1.0 GENERAL DESCRIPTION

1.0.1 Introduction

DCE185FHM8401 is a color active matrix TFT LCD module using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 18.5 inch diagonally measured active area with FHD resolutions (1920 horizontal by 1080 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors.



1.0.2 Features

- eDP 1.2 interface with 2 Lane
- Display 16.7M colors (6+FRC)
- RoHS Compliant

1.0.3 Application

- Video Phone/IP Phone/Smart Key/ e-cigarettes etc.



PRODUCT GROUP

REV

REV.P0

TFT- LCD PRODUCT

Ver.P0

2025.04.11

1.0.4 General Specification

< Table 1. General Specifications >

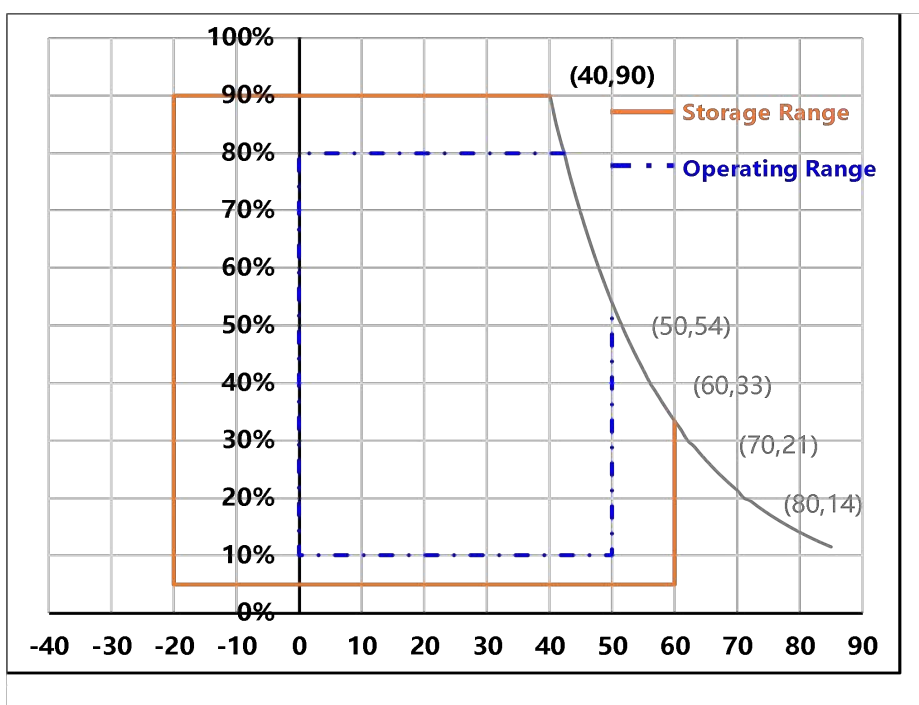
Parameter	Specification	Unit	Remarks
Active area	408.96 (H) × 230.04(V)	mm	
Number of pixels	1920(H) × 1080(V)	Pixels	
Pixel pitch	0.213(H) × 0.213 (V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	16.7M	Colors	6bit+FRC
Display mode	Normally black		
Dimensional outline	418.02(H) ×243.9(V)×3.2(D)	mm	W/O PCB
Weight	TBD	g	
Surface treatment	Haze 25% , 3H		

2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. Environment Absolute Maximum Ratings> [Ta =25±2 °C]

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	VDD	VSS-0.3	+3.6	V	Environment Temperature
Operating Temperature	TOP	0	50	°C	
Storage Temperature	TST	-20	60	°C	
Operating Ambient Humidity	Hop	10	80	%RH	
Storage Humidity	Hst	5	90	%RH	



3.0 ELECTRICAL SPECIFICATIONS

3.0.1 TFT LCD Module

< Table 3. LCD Module Electrical Specifications >

[Ta =25±2 °C]

Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
Power Supply Input Voltage	V _{DD}	3.0	3.3	3.6	V	Note 1
Power Supply Current	I _{DD}	-	637	1100	mA	
Power Consumption	P _{DD}	-	2.1	3.6	W	
Rush current	I _{Rush}	-	-	2	A	Note 2
LED Driver Power Supply Voltage	V _{LED}	10.8	12	13.2	V	
LED Driver Power Supply Current	I _{LED}	-	-	700	mA	
LED Power Consumption	P _{LED}	-	-	8.4	W	

Notes : 1. The supply voltage is measured and specified at the interface connector of FOB.

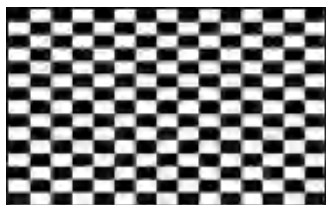
The current draw and power consumption specified is for 3.3V at 25 °C

Max value at R/G/B Pattern

a) Typ : Mosaic Pattern

b) Max : H1L Pattern

2. The duration of rush current is about 2ms and rising time of Power Input is 1ms(min)



(a)



(b)



PRODUCT GROUP

REV

REV.P0

TFT- LCD PRODUCT

Ver.P0

2025.04.11

4.0 INTERFACE CONNECTION.

4.0.1 Electrical Interface Connection

The electronics interface connector is MSAK24025P30 or Equivalent.

The LED connector is PF040-B09B-C09

The connector interface pin assignments are listed in Table 6 and 7.

<Table 6. Pin Assignments for the Interface Connector>

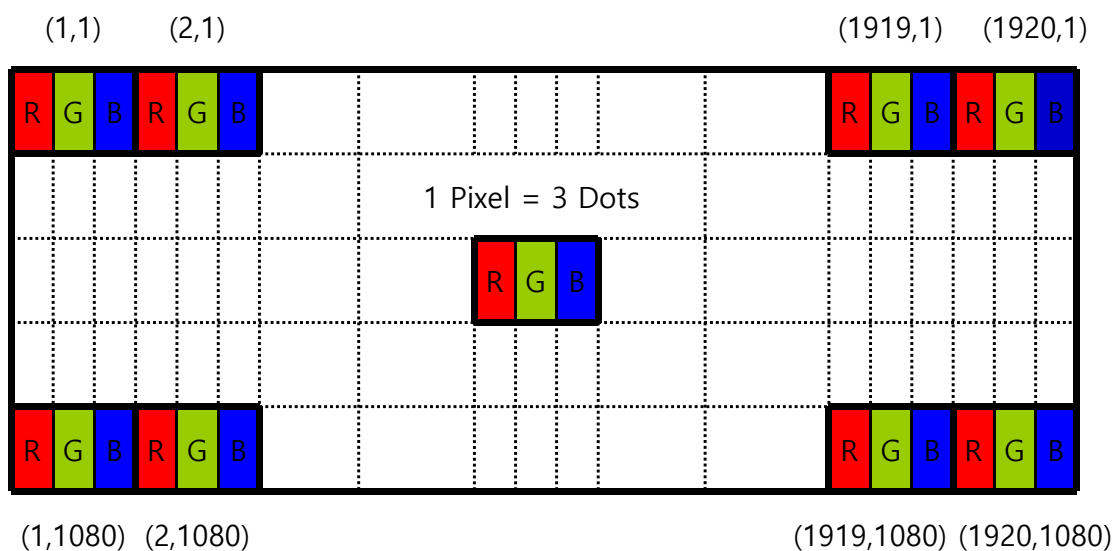
PIN #	Symbol	Description Remark	PIN #	Symbol	Description Remark
1	NC	NC	16	H_GND	Ground
2	H_GND	Ground	17	HPD	Hot Plug Detect Output
3	LANE1_N	eDP RX Channel 1 Negative	18	BL_GND	LED Ground
4	LANE1_P	eDP RX Channel 1 Positive	19	BL_GND	LED Ground
5	H_GND	Ground	20	BL_GND	LED Ground
6	LANE0_N	eDP RX Channel 0 Negative	21	BL_GND	LED Ground
7	LANE0_P	eDP RX Channel 0 Positive	22	BL_ENABL E	LED Enable Pin(+3.3V Input)
8	H_GND	Ground	23	BL_PWM	System PWM Signal Input
9	AUX_CH_P	eDP AUX CH Positive	24	NC	No Connection
10	AUX_CH_N	eDP AUX CH Negative	25	NC	No Connection
11	H_GND	Ground	26	BL_POWER	LED Power Supply 10.8V~13.2V
12	LCD_VCC	Power Supply, 3.3V (typ.)	27	BL_POWER	LED Power Supply 10.8V~13.2V
13	LCD_VCC	Power Supply, 3.3V (typ.)	28	BL_POWER	LED Power Supply 10.8V~13.2V
14	NC	No Connection	29	BL_POWER	LED Power Supply 10.8V~13.2V
15	H_GND	Ground	30	NC	No Connection

<Table 7. Pin Assignments for the LED Connector>

PIN #	Symbol	Description Remark
1	LED1	LED-
2	LED2	
3	LED3	
4	LED4	
5	NC	NC
6	NC	
7	VLEDOUT	LED+
8	VLEDOUT	
9	VLEDOUT	

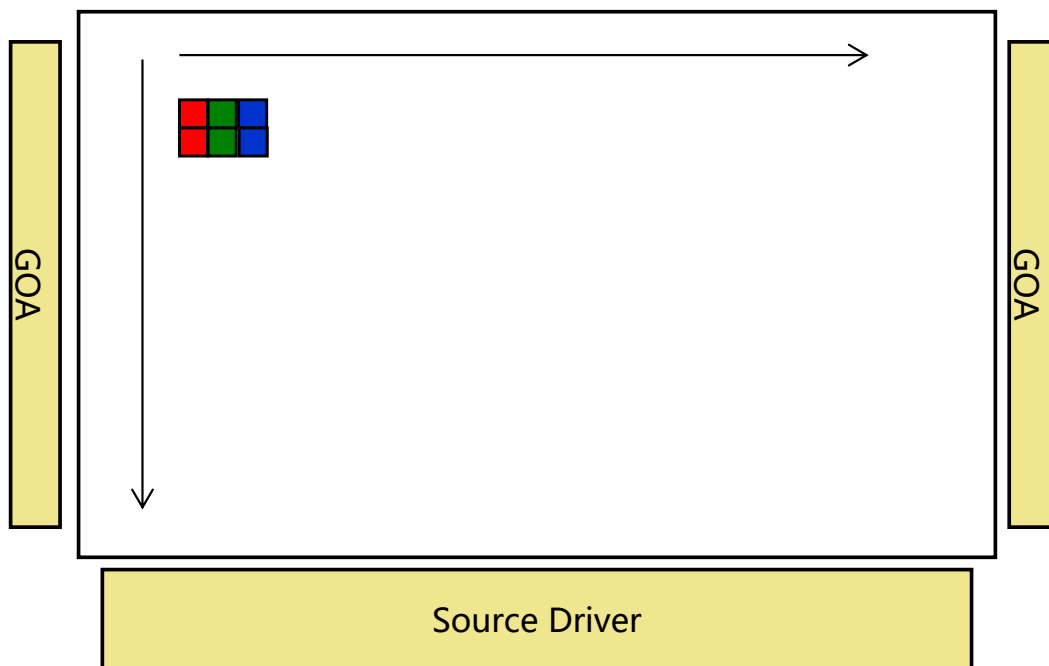
4.2 Data Input Format

Figure 5. Pixel Format



Display Position of Input Data (V-H)

Figure 6. Scan direction



5.0 SIGNAL TIMING SPECIFICATION

5.0.1 The QV185FHB-N84 is operated by the DE only.

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	138.5	148.5	153.2	MHz
Horizontal display area	thd	1920			pixel
HSYNC period time	th	2080	2200	2240	pixel
HSYNC blanking	thb+ thfp	160	280	320	pixel
Vertical display area	Tvd	1080			H
Frequency	fV	57	60	63	Hz
VSYNC period time	Tv	1110	1125	1140	H
VSYNC blanking	Tvb+ Tvfp	30	45	60	H

Note

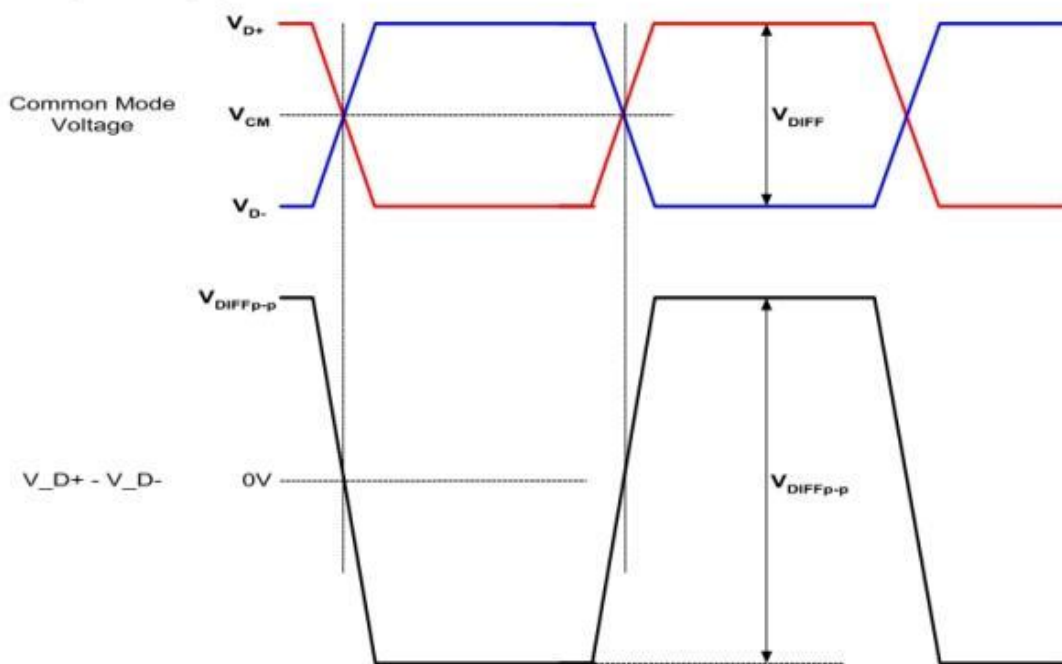
1. Best operation clock frequency is 148.5Mhz.
2. Frequency] = [H Total] * [V Total] * [vertical Frame rate]
H Total, V Total and Frame rate]should operate within the range between Frequency_Min and Frequency_Max
3. Except Best operation clock frequency, FOS(Flicker & Brightness & Crosstalk, Etc.) are not guaranteed.
4. Main frequency Max is 63Hz

5.02 eDP Rx Interface Timing Parameter

The specification of the eDP Rx interface timing parameter is shown in Table 4.

<Table 4. eDP Rx Interface Timing Specification>

Item	Symbol	Min	Typ	Max	Unit	Remark
Spread spectrum clock	ssc			0.5	%	
Differential peak-to-peak input voltage at package pins	VRX-DIFFp-p	100	0	1320	mV	
Rx input DC common mode voltage	VRX_DC_CM	0	-	2	V	
Differential termination resistance	RRX-DIFF	80	-	120	Ω	
Single-ended termination resistance	RRX-SE	40	-	60	Ω	
Rx short circuit current limit	IRX_SHORT	-	-	50	mA	
Intra-pair skew at Rx package pins (HBR) RX intra-pair skew tolerance at HBR	LRX_SKEW_INTRA_PAIR	-	-	50	ps	



8.0 OPTICAL SPECIFICATION

8.0.1 Overview

The test of view angle range shall be measured in a dark room (ambient luminance $\leq 1\text{lux}$ and temperature = $25\pm 2^{\circ}\text{C}$) with the equipment of Luminance meter system (Goniometer system and PR788) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0° . We refer to $\theta\emptyset=0$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta\emptyset=90$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta\emptyset=180$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta\emptyset=270$ ($=\theta_6$) as the 6 o'clock direction ("bottom"). While scanning θ and/or $\emptyset$, the center of the measuring spot on the Display surface shall stay fixed. The luminance, color and uniformity (etc) should be tested by CS2000/CA310. The backlight should be operating for 10 minutes prior to measurement. VDD shall be $3.3 \pm 0.3\text{V}$ at 25°C . Optimum viewing angle direction is 6 'clock

<Table 5. Optical Specifications>

Parameter			Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal		Θ_3	CR > 10	80	89	-	Deg.	Note 1
			Θ_9		80	89	-	Deg.	
	Vertical		Θ_{12}		80	89	-	Deg.	
			Θ_6		80	89	-	Deg.	
Luminance Contrast ratio			CR	$\Theta = 0^\circ$	800:1	1000:1	-		Note 2
Color Gamut	NTSC		CIE1931	$\Theta = 0^\circ$	67	72	-	%	Note 5
Reproduction of color	White		W_x	$\Theta = 0^\circ$	Typ -0.03	0.313	Typ +0.03		
			W_y			0.329			
Response Time			GTG	-	-	14	-	ms	Note 6
Gamma Scale					2.0	2.2	2.4		
Cell Transmittance					3.3	3.7	-	%	
Recommend Brightness			Lv		-	300	-	Nit	LCM

Notes : 1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).

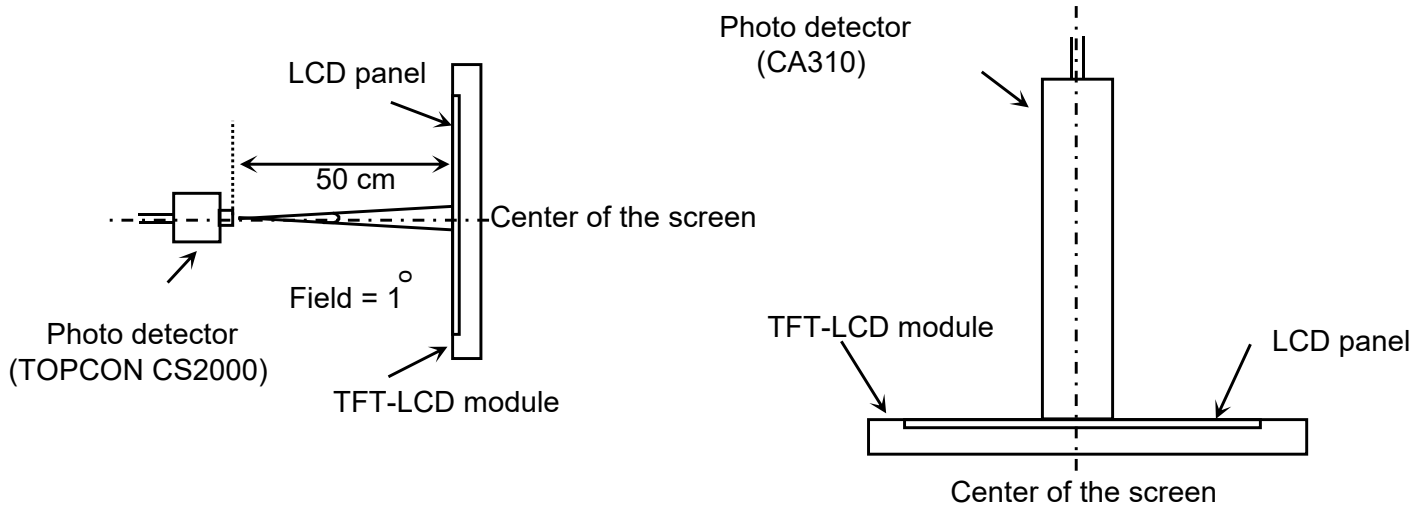
2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. The color chromaticity coordinates specified in Table 5. shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
4. The electro-optical response time measurements shall be made as FIGURE 2 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_d .

8.0.2 Optical measurements

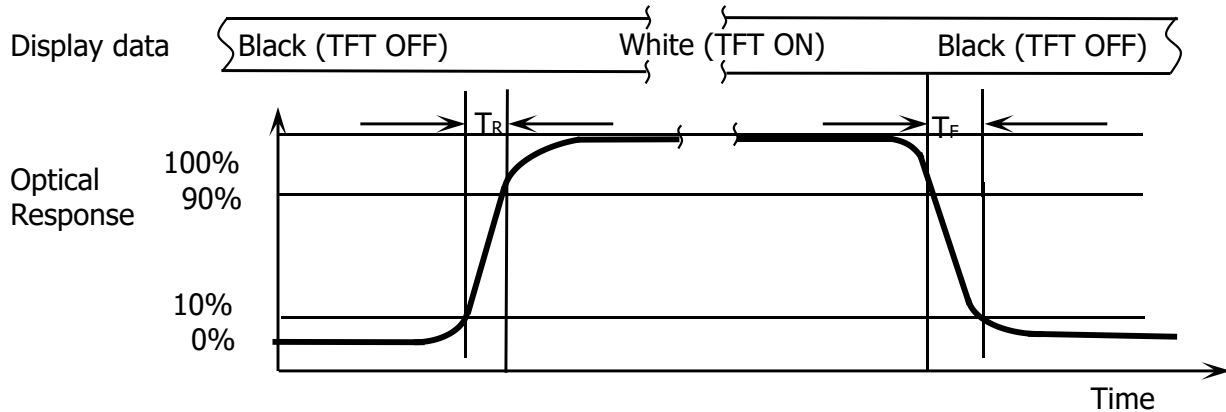
Figure 1. Measurement Set Up



View angel range, uniformity, etc. measurement setup

Flicker, measurement setup

Figure 2. Response Time Testing



The electro-optical response time measurements shall be made as shown in FIGURE 3 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r and 90% to 10% is T_d .



PRODUCT GROUP

REV

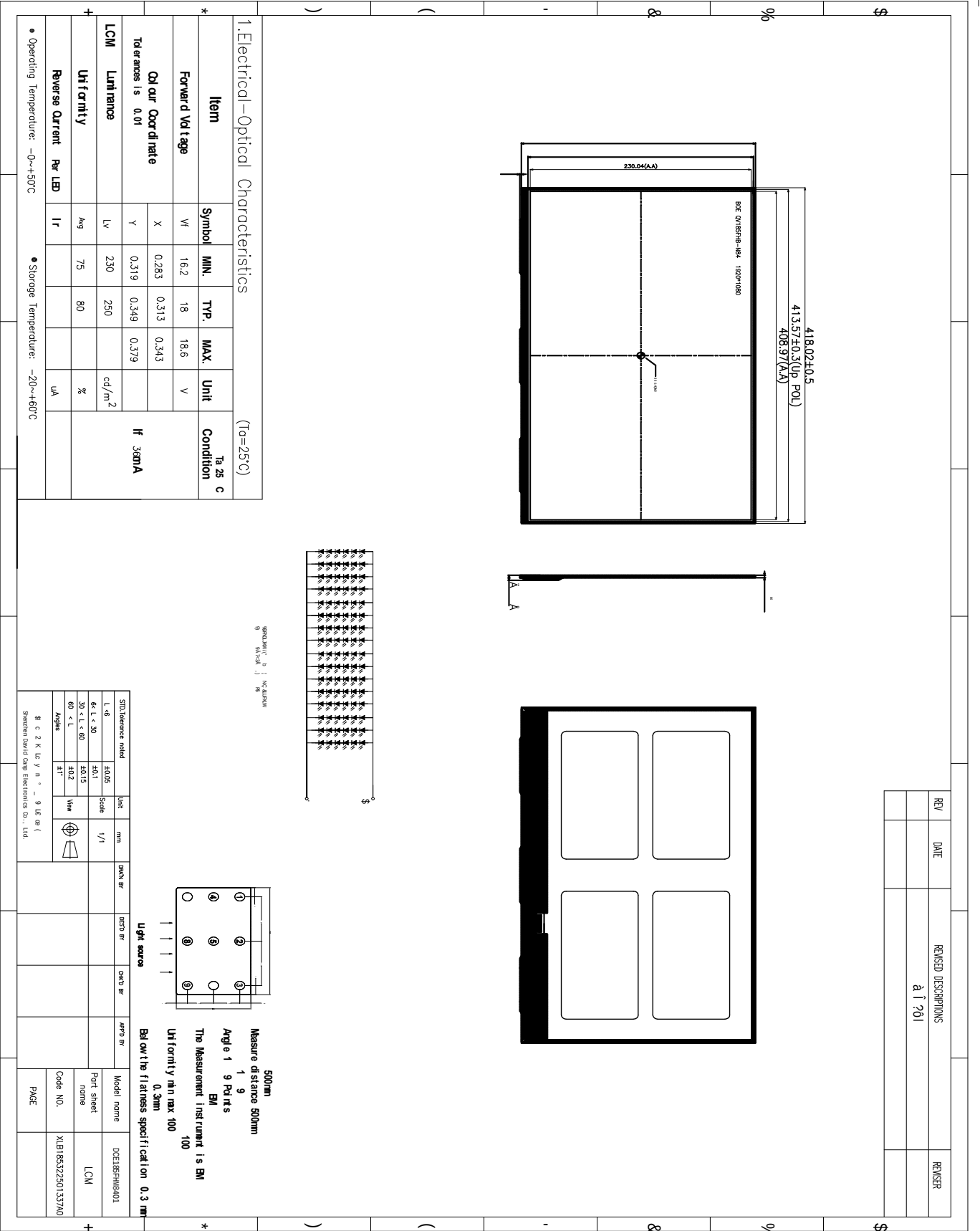
REV.PO

TFT- LCD PRODUCT

Ver.PO

2025.04.11

9.0 MECHANICAL OUTLINE DIMENSION



10.0 RELIABILITY TEST

The Reliability test items and its conditions are shown in below.

<Table 9. Reliability test>

No	Test Items	Conditions
1	High temperature storage test	Ta = 60 °C, 72 hrs
2	Low temperature storage test	Ta = -20 °C, 72 hrs
3	High temperature & high humidity operation test	Ta = 40 °C, 80%RH, 72 hrs
4	High temperature operation test	Ta = 50 °C, 72 hrs
5	Low temperature operation test	Ta = 0°C, 72 hrs
6	Thermal shock	Ta = - 0 °C ↔ 50 °C (per 0.5 hr), 24 cycle

Note : After the reliability test, the product only guarantee function normally without any fatal defect (non-display, line defect, abnormal display etc). All the cosmetic specification is judged before the reliability test.

• 11.0 Precautions

Please pay attention to the followings when you use this TFT LCD Panel.

• 11.1 Mounting Precautions

- (1) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (2) You must mount a module using specified mounting holes (Details refer to the drawings).
- (3) Please make sure to avoid external forces applied to the Source PCB or FPC and D-IC during the process of handling or assembling. If not, It causes panel damage or malfunction.
- (4) Note that polarizers are very fragile and could be easily damaged. Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
- (5) Do not pull or fold the source D-IC which connect the source PCB or FPC and the panel.
- Do not pull or fold the LED wire.
- (6) After removing the protective film, when the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with alcohol or purified water.
- Do not strong polar solvent because they cause chemical damage to the polarizer.
- (7) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (8) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
- (9) Since the LCD is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it falls from a high place or receives a strong shock, the glass may be broken.
- (10) Do not disassemble the module.
- (11) To determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.
- (12) If the customer's set presses the main parts of the LCD, the LCD may show the abnormal display. But this phenomenon does not mean the malfunction of the LCD and should be pressed by the way of mutual agreement.
- (13) Do not drop water or any chemicals onto the LCD's surface.

11.2 Operating Precautions

- (1) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (2) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimized the interference.
- (3) The electrochemical reaction caused by DC voltage will lead to LCD degradation, so DC drive should be avoided.
- (4) The LCD modules use C-MOS LSI drivers, so customers are recommended that any unused input terminal would be connected to Vdd or Vss, do not input any signals before power is turn on, and ground you body, work/assembly area, assembly equipments to protect against static electricity.
- (5) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.
- (6) Design the length of cable to connect between the connector for back-light and the converter as short as possible and the shorter cable shall be connected directly.
The longer cable between that of back-light and that of converter may cause the luminance of LED to lower and need a higher startup voltage(Vs).
- (7) Connectors are precise devices for connecting PCB and transmitting electrical signals. Operators should insert and unplug MDL in parallel when assembling MDL.
- (8) Do not connect or disconnect the cable to/ from the module at the "Power On" condition.
- (9) When the module is operating, do not lose CLK, ENAB signals. If any one these signals is lost, the LCD panel would be damaged.
- (10) Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.
- (11) Do not re-adjust variable resistor or switch etc.
- (12) Long Side LED Bar design is recommended when using E-LED type Back Light

11.3 Electrostatic Discharge Control

- (1) Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly. Keep products as far away from static electricity as possible.
- (2) Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.
- (3) In order to prevent potential problems, Flicker should be adjusted by Optimizing the Vcom value in customer LCM line through the I2C interface.

11.4 Precautions for Strong Light Exposure

It is not allowed to store or run directly in strong light or in high temperature and humidity for a long time; Strong light exposure causes degradation of polarizer and color filter.

11.5 Storage Precautions

When storing modules as spares for a long time, the following precautions are necessary.

- (1) The polarizer surface should not come in contact with any other object.

It is recommended that they be stored in the container in which they were shipped.

Temperature : 5 ~ 40 °C

- (2) Humidity : 35 ~ 75 %RH

- (3) Period : 6 months

- (4) Control of ventilation and temperature is necessary.

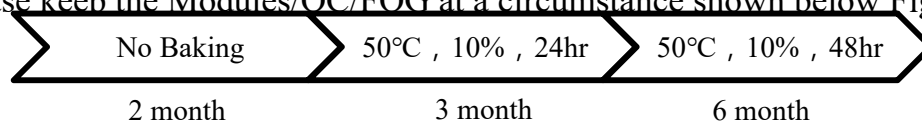
- (5) Please make sure to protect the product from strong light exposure, water or moisture.

Be careful for condensation.

- (6) Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.

- (7) Do not store the LCD near organic solvents or corrosive gasses.

- (8) Please keep the Modules/OC/FOG at a circumstance shown below Fig.



11.6 Precautions for Protection Film (适用通用产品, 含Q/Single Production)

- (1) Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from panel surface, If possible, under ESD control device like ion blower, and the humidity of working room should be kept over 50%RH to reduce the risk of static charge.
- (2) In handling the LCD, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary.

11.7 Appropriate Condition for Display

- (1) Normal operating condition

- Temperature: 0 ~ 40°C

- Operating Ambient Humidity : 10 ~ 90 %

- Display pattern: dynamic pattern (Real display)

- Suitable operating time: 非 under 7*24 hours a day.

- Long-term lighting products recommended regular shutdown

- (2) Special operating condition

If the product will be used in extreme conditions such as high temperature, humidity, display patterns or 7*24hrs operation time etc., It is strongly recommended to contact BOE for Application engineering advice. Otherwise, its reliability and function may not be guaranteed.

- (3) Black image or moving image is strongly recommended as a screen save.

