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B2 15.6FHD EV156FHM-N13-2HP0

Product Specification Rev.P0

SUPPLIER	Chengdu BOE Optoelectronics Technology CO., LTD
FG-Code	EV156FHM-N13-2HP0 (PRODUCT MODE: LCM)

ITEM	BUYER SIGNATURE	DATE
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_____	_____	_____

ITEM	SUPPLIER SIGNATURE	DATE
Prepared	_____	_____
Reviewed	_____	_____
Approved	_____	_____

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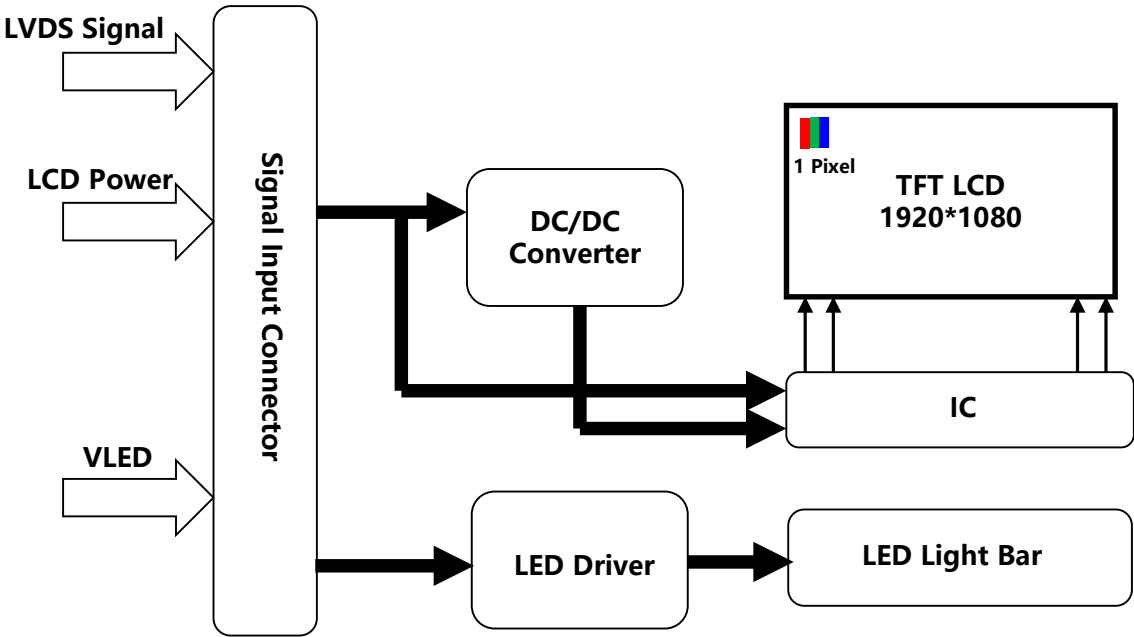
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1.0 GENERAL DESCRIPTION

1.0.1 Introduction

EV156FHM-N13-2HP0 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 15.6 inch diagonally measured active area with FHD resolutions (1920 horizontal by1080 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7 M colors.



1.0.2 Features

- Wide viewing angle (U/D/L/R) : Typ85/85/85/85,CR>10:1,@25°C.
- LVDS Interface with 2 pixel / clock
- Display 16.7M colors depth
- DE (Data Enable) Mode
- LED back-light
- RoHS Compliant

1.0.3 Application

- Industrial display or HMI etc

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1.0.4 General Specification

< Table 1. General Specifications >

Parameter	Specification	Unit	Remarks
Active Area	345.6(W) x 194.4(H)	mm	16:9
Number Of Pixels	1920 x RGB x 1080	pixels	
Pixel Pitch	0.18(W) x 0.18(H)	mm	
Pixel Arrangement	RGB Vertical stripe		
Display Mode	Normally black		
Display Colors	16.7M	colors	8bits
Surface Treatment	HC		CF POL
Contrast Ratio	Typ. 1200 Min.1000		
Viewing Angle(CR> 10)	Typ.85/85/85/85	deg.	
Color Gamut	Typ 72% , Min 67%NTSC		
Brightness	Typ500 , Min 425	cd/m2	
Brightness Uniformity	Typ80% , Min75%		9 point
Power Consumption	Max.10.65W Typ. 9.55 W	watt	
Outline Dimension	363.8*215.9*8.1	mm	
Weight	Typ. 850g	gram	

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2.0 ABSOLUTE MAXIMUM RATINGS

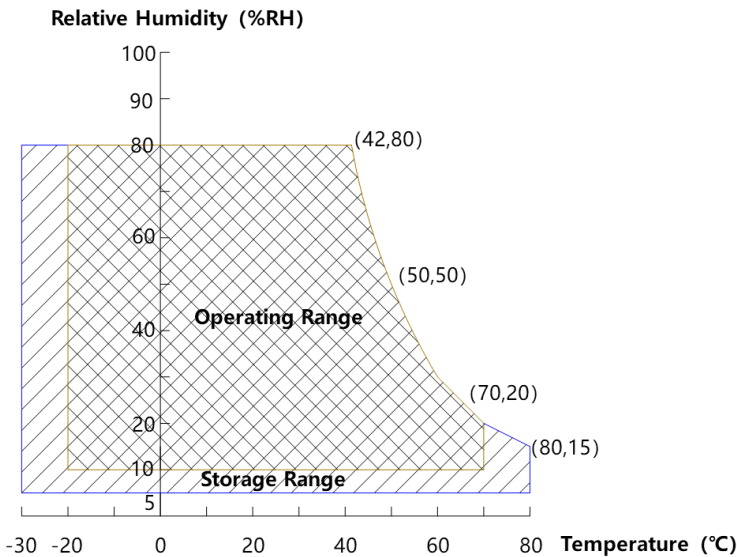
The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage values are listed in Table 2.

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

Parameter	Symbol	Min.	Max.	Unit	Remarks
LCD Module	VDD	0.3	4	V	Ta = 25 °C
Back-light Power Supply Voltage	V _{BLU}	5	24	V	
Operating Temperature (Ambient)	T _{OP}	-20	70	°C	Note 1
Storage Temperature (Ambient)	T _{ST}	-30	80	°C	
Operating Ambient Humidity	Hop	10	80	%RH	
Storage Humidity	Hst	5	80	%RH	

Note:
1. Temperature and relative humidity range are shown in the figure below.

<Figure 2. RA Condition>



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3.0 ELECTRICAL SPECIFICATIONS

3.0.1 TFT LCD Module

< Table 3. LCD Module Electrical Specifications >

[Ta = 25 ± 2 °C]

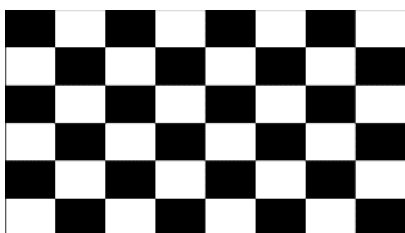
Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
Power Supply Voltage	VDD	3.0	3.3	3.6	V	Note 1
Power Supply Current	IDD		200	473	mA	
BLU Supply Voltage	V _{BLU}	11.5	12	12.5	V	
BLU Supply Current	I _{BLU}	-	766	-	mA	
Power Consumption	P _D	-	0.66	1.56	W	Note 2
	P _{LED}	-	8.89	9.19	W	
	P _{total}	-	9.55	10.65	W	

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

The current draw and power consumption specified is for VDD=3.3V, Frame rate $f_v=60\text{Hz}$ and Clock frequency = **65.71MHz**. Test Pattern of power supply current

a) Typ : Mosaic 8 x 6 Pattern(L0/L255)

b) Max : H1L



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3.0 ELECTRICAL SPECIFICATIONS

3.02 Back-Light Unit

Table 4. LED Bar Electrical Specifications >

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
LED Supply Voltage	V _{LED}	28	30	31	V	
LED Supply Current	I _{LED}	-	252	-	mA	Note 1
Power Consumption	P _{LED}	-	8.89	9.19	W	
LED Quantity	QLED	-	40	-	EA	
LED Life Time	TLED	50000	-	-	Hrs	Note 2/3

- Notes: 1. LED Bar:4Parallel*10String) , I_{LED}=63mA*4=252mA
 $P_{LED} = V_{LED} \times I_{LED}$ / transfer efficiency
2. The life time of LED, 50,000Hrs, is determined as the time at which luminance of the LED is 50% compared to that of initial value at the typical LED current on condition of continuous operating at 25 ± 2°C.
3. Only under the above operating conditions could the life time of LED be guaranteed.

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4.0 INTERFACE CONNECTION.

4.0.1 Electrical Interface Connection

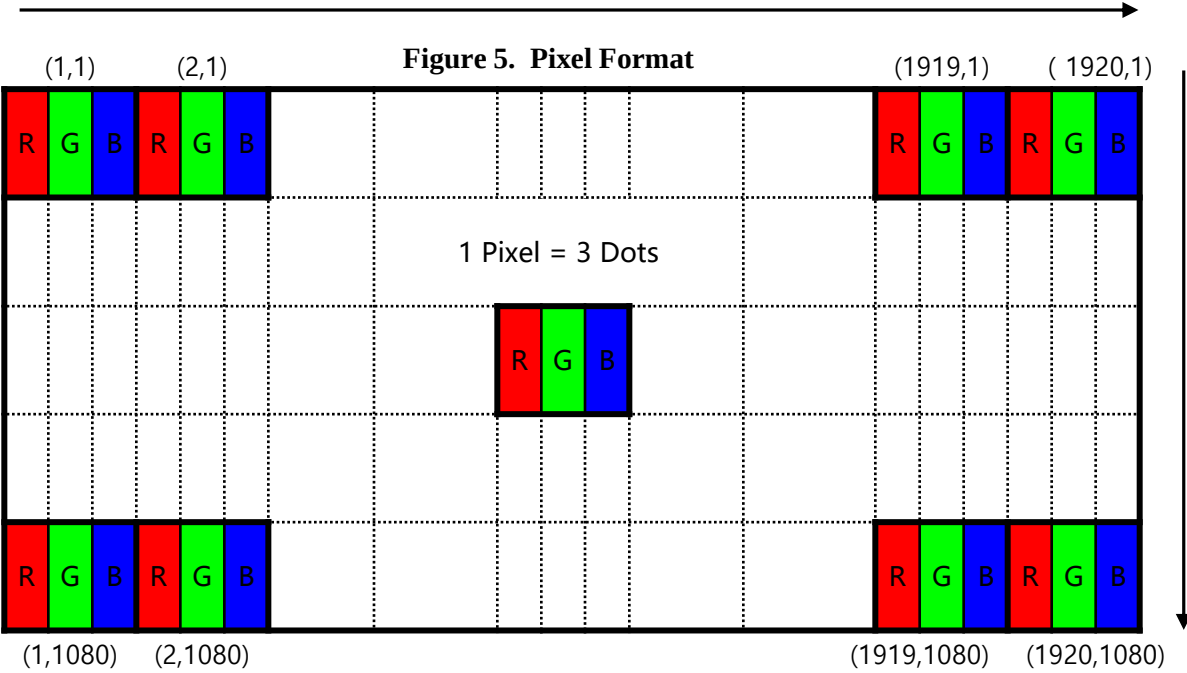
Connector : I-PEX 20455-040E-66 or Compatible

< Table5. Pin Assignment for LCD Module Connector >

No.	Symbol		No.	Symbol	
1	RE3P	Positive LVDS differential data input Channel E3(Even)	21	RO1N	Negative LVDS differential data input Channel O1(Odd)
2	RE3N	Negative LVDS differential data input Channel E3(Even)	22	RO0P	Positive LVDS differential data input Channel O0(Odd)
3	RECLKP	Positive LVDS differential clock input (Even)	23	RO0N	Negative LVDS differential data input Channel O0(Odd)
4	RECLKN	Negative LVDS differential clock input(Even)	24	GND	LCD Ground
5	RE2P	Positive LVDS differential data input Channel E2(Even)	25	NC	SDA for BOE use, this pin should be open
6	RE2N	Negative LVDS differential data input Channel E2(Even)	26	NC	SCL for BOE use, this pin should be open
7	GND	LCD Ground	27	NC	MTP for BOE use, this pin should be open
8	RE1P	Positive LVDS differential data input Channel E1(Even)	28	LCD_VCC	LCD Power 3.3V
9	RE1N	Negative LVDS differential data input Channel E1(Even)	29	LCD_VCC	LCD Power 3.3V
10	RE0P	Positive LVDS differential data input Channel E0(Even)	30	LCD_VCC	LCD Power 3.3V
11	RE0N	Negative LVDS differential data input Channel E0(Even)	31	LED_PW M	Backlight Adjust, 3.3V(3V~3.6V)
12	RO3P	Positive LVDS differential data input Channel O3(Odd)	32	LED_EN	Enable pin, 3.3V(3V~3.6V)
13	RO3N	Negative LVDS differential data input Channel O3(Odd)	33	GND	Ground
14	GND	LCD Ground	34	STBYB	Deep standby mode setting pin.
15	ROCLKP	Positive LVDS differential clock input (Odd)	35	RSTB	Device Reset for LCD driver IC, Low active
16	ROCLKN	Negative LVDS differential clock input(Odd)	36	GND	Ground
17	GND	LCD Ground	37	BL_POWER	+12V Vi power supply
18	RO2P	Positive LVDS differential data input Channel O2(Odd)	38	BL_POWER	+12V Vi power supply
19	RO2N	Negative LVDS differential data input Channel O2(Odd)	39	BL_POWER	+12V Vi power supply
20	RO1P	Positive LVDS differential data input Channel O1(Odd)	40	BL_POWER	+12V Vi power supply

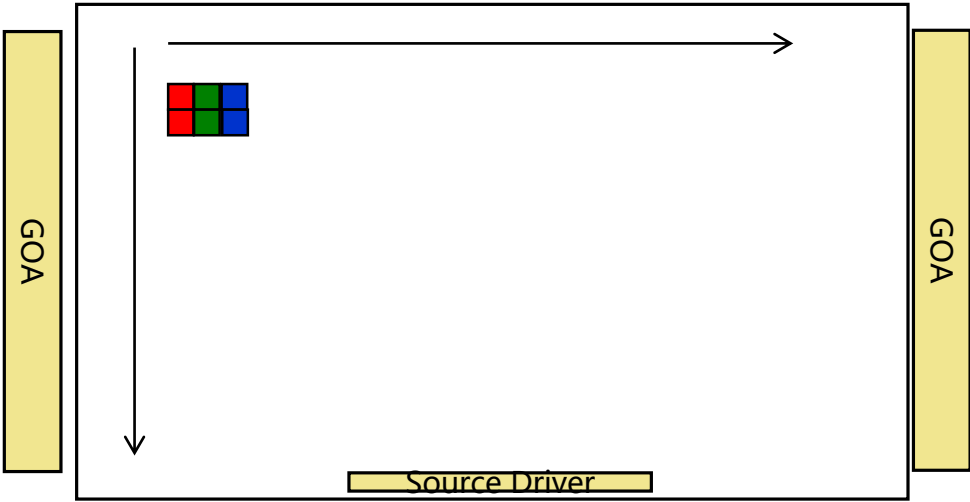
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4.02 Data Input Format



Display Position of Input Data (V-H)

Figure 6. Scan direction



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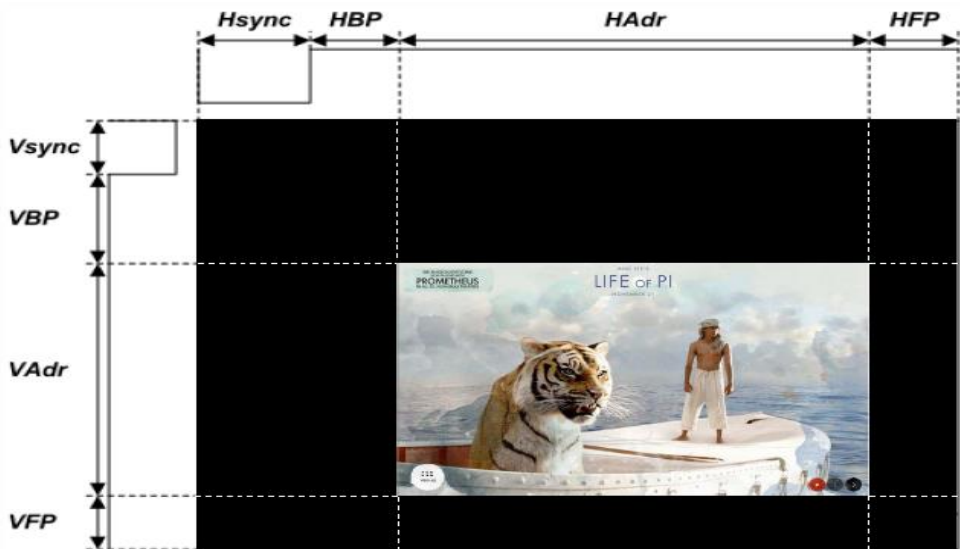
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5.0 SIGNAL TIMING SPECIFICATION

5.0.1 The EV156FHM-N13-2HP0 is operated by the DE only.

< Table6. Timing Parameter >

Item			Symbol	min	typ	max	UNIT
LCD	Frame Rate		-	-	60	-	Hz
	Pixels Rate/port		-	66.8	68.2	75.3	MHz
Timing	Horizontal	Horizontal total time	tHP	1010	1012	1061	t _{CLK}
		Horizontal Active time	tHadr	960			t _{CLK}
		Horizontal blanking time	tHBP+tHFP	48	50	99	t _{CLK}
		Horizontal pulse width	tHPW	2	2	2	t _{CLK}
	Vertical	Vertical total time	tvp	1102	1122	1182	t _H
		Vertical Active time	tVadr	1080			t _H
		Vertical blanking time	tVBP+tVFP	20	40	100	t _H
		Vertical pulse width	tVPW	2	2	2	t _H
port			-	2	-	port	



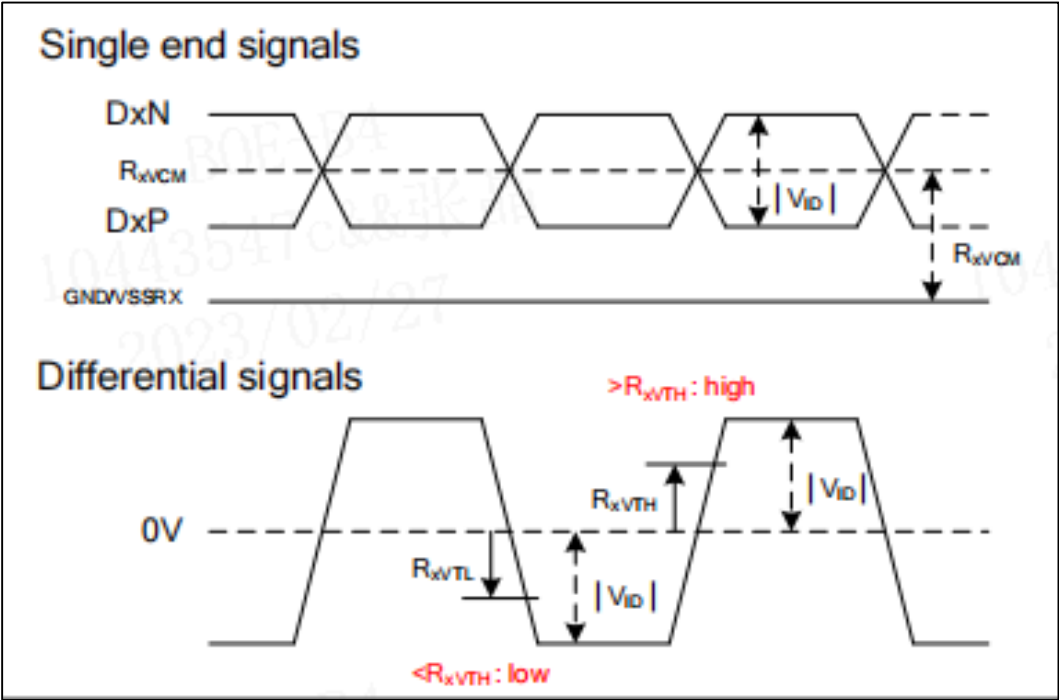
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5.02 LVDS Rx Interface Timing Parameter

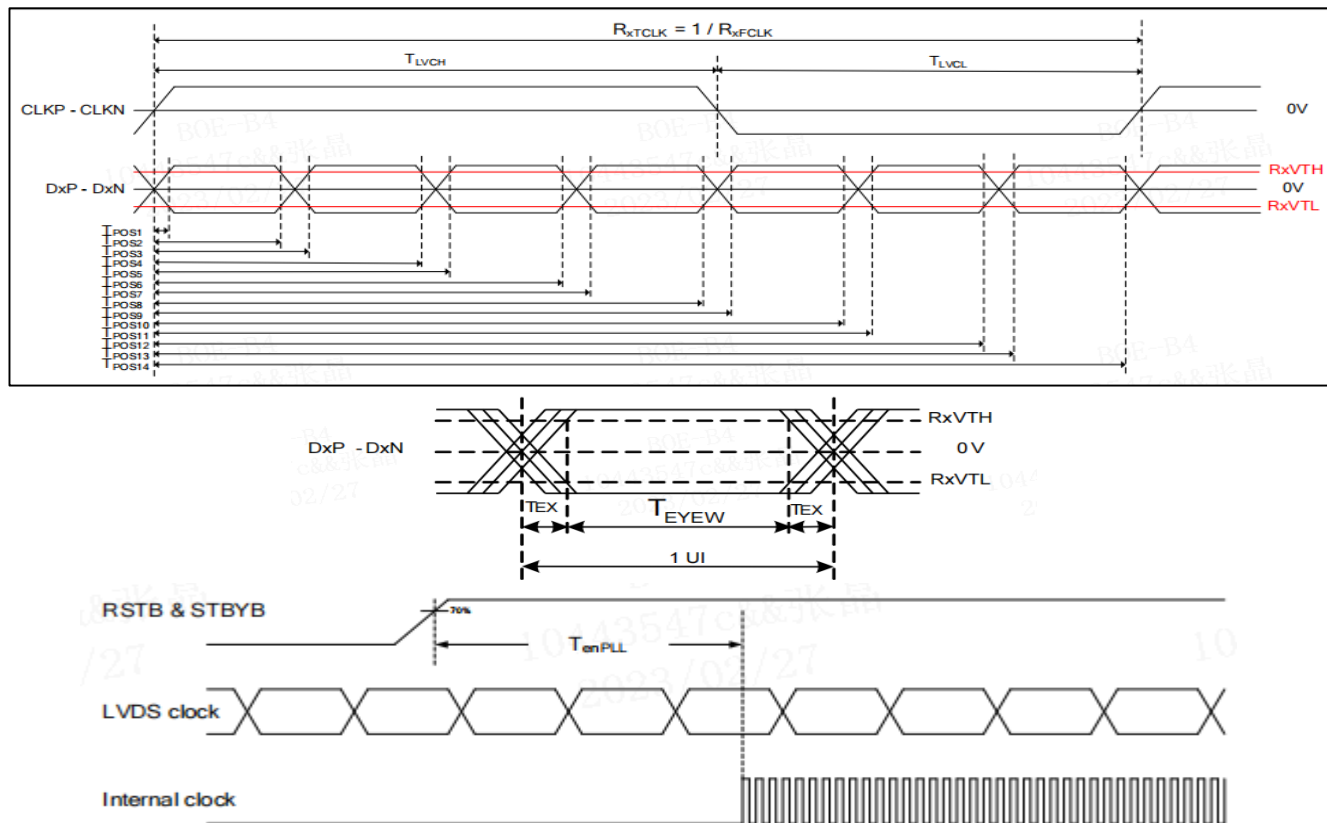
The specification of the LVDS Rx interface timing parameter is shown in Table 4.

< Table7. DC Specification >

Parameter	Symbol	Min	Typ	Max	Unit	Condition
LVDS DC specifications						
Differential input high threshold	RxVTH	-	-	+100	mV	V _{IC} =1.2V
Differential input low threshold	RxVTL	-100	-	-	mV	
LVDS common mode voltage	RxVCM	0.6	1.2	2.4- VID /21.6	V	
LVDS swing voltage	VID	±200	±400	±600	mV	



5.03 AC Specification



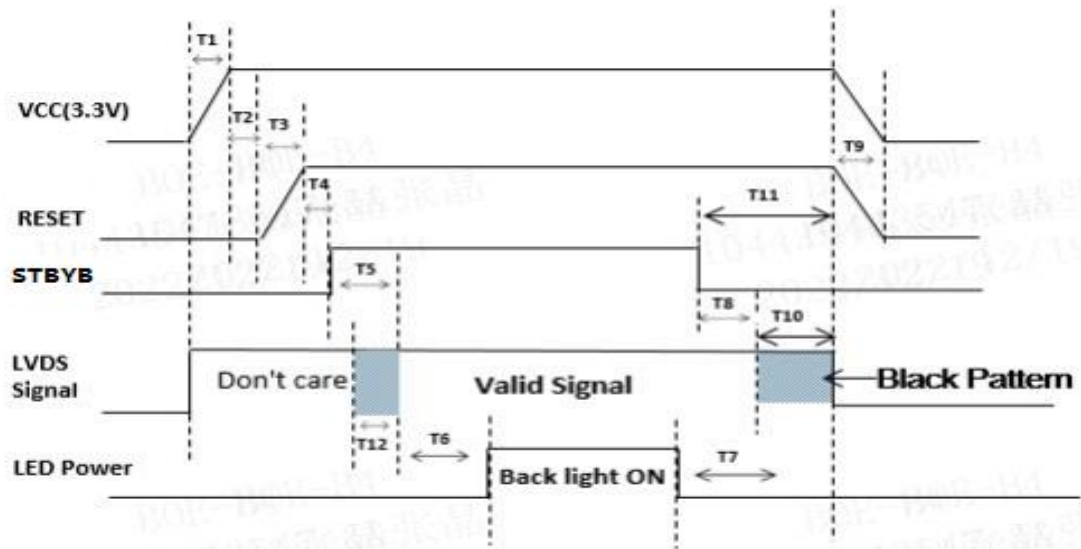
< Table7. AC Specification >

Item	Signal	Symbol	Rating			Unit
			Min.	Typ.	Max.	
Clock Frequency	CLK	R_{XFCLK}	20	-	100	MHz
Clock Period		R_{XTCLK}	10	-	50	ns
1 data bit time		UI	-	1/7	-	R_{XTCLK}
Clock high time	CLK	T_{LVCH}		4		UI
Clock low time		T_{LVCL}		3		UI
Position 1	DATA	T_{POS1}	-0.25	0	0.25	UI
Position 2		T_{POS2}	0.75	-	1.25	
Position 3		T_{POS3}	0.75	1	1.25	
Position 4		T_{POS4}	1.75	-	2.25	
Position 5		T_{POS5}	1.75	2	2.25	
Position 6		T_{POS6}	2.75	-	3.25	
Position 7		T_{POS7}	2.75	3	3.25	
Position 8		T_{POS8}	3.75	-	4.25	
Position 9		T_{POS9}	3.75	4	4.25	
Position 10		T_{POS10}	4.75	-	5.25	
Position 11		T_{POS11}	4.75	5	5.25	
Position 12		T_{POS12}	5.75	-	6.25	
Position 13		T_{POS13}	5.75	6	6.25	
Position 14		T_{POS14}	6.75	-	7.25	
Input eye width		T_{EYEW}	0.5	-	-	us
Input eye border		T_{EX}	-	-	0.25	
PLL wake-up time		T_{enPLL}	-	-	150	us

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6.0 POWER SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



Parameter	Value			Unit	Note
	Min	Typ	Max		
T1	-	-	20	ms	
T2	1	-	-	ms	
T3	-	-	20	ms	
T4	20	-	-	ms	
T5	50	-	-	ms	
T6	120	-	-	ms	
T7	90	-	-	ms	
T8	50	-	-	ms	
T9	-	-	20	ms	
T10	150	-	-	ms	
T11	200	-	-	ms	
T12	35	-	-	ms	

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7.0 OPTICAL SPECIFICATION

7.0.1 Overview

The test of view angle range shall be measured in a dark room (ambient luminance ≤ 1lux and temperature = 25±2°C) with the equipment of Luminance meter system 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°. The center of the measuring spot on the Display surface shall stay fixed.

The backlight should be operating for 30 minutes prior to measurement.

<Table 10. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	-	85	-	Deg.	Note 1
		Θ_9		-	85	-	Deg.	
	Vertical	Θ_{12}		-	85	-	Deg.	
		Θ_6		-	85	-	Deg.	
Luminance Contrast ratio		CR	$\Theta = 0^\circ$	1000	1200	-		Note 2
Luminance of White	Center	Y_w	$\Theta = 0^\circ$	425	480	-	cd/m ²	Note 3
White Luminance uniformity	9 Points	$\Delta Y9$		75	80	-	%	Note 4
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		Tr+Td	Ta= 25° C $\Theta = 0^\circ$	-	-	30	ms	Note 6

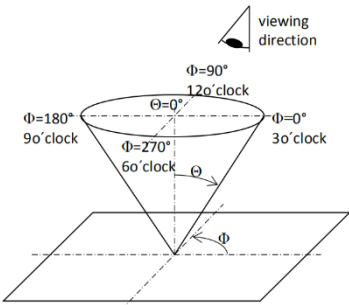
Note :

- These items are measured using the following equipment:
- View angle range/Response Time : Westar
 - Contrast ratio: EYE2-400
 - Luminance @ room temperature/9 points luminance uniformity : CA-210
 - Response time @ room temperature: TRD-100A
 - Area scan uniformity: LMK4

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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 .



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 . Contrast Ratio (CR) is defined mathematically

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

3. Luminance of white is defined as luminance values of center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display. The luminance is measured by CS2000/CA310 when the LED current is set at 60mA.

4. The White luminance uniformity on LCD surface is then expressed as : $\Delta Y = \text{Minimum Luminance of 9 Points} / \text{Maximum Luminance of 9 Points}$ (See FIGURE 2).

5. 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.

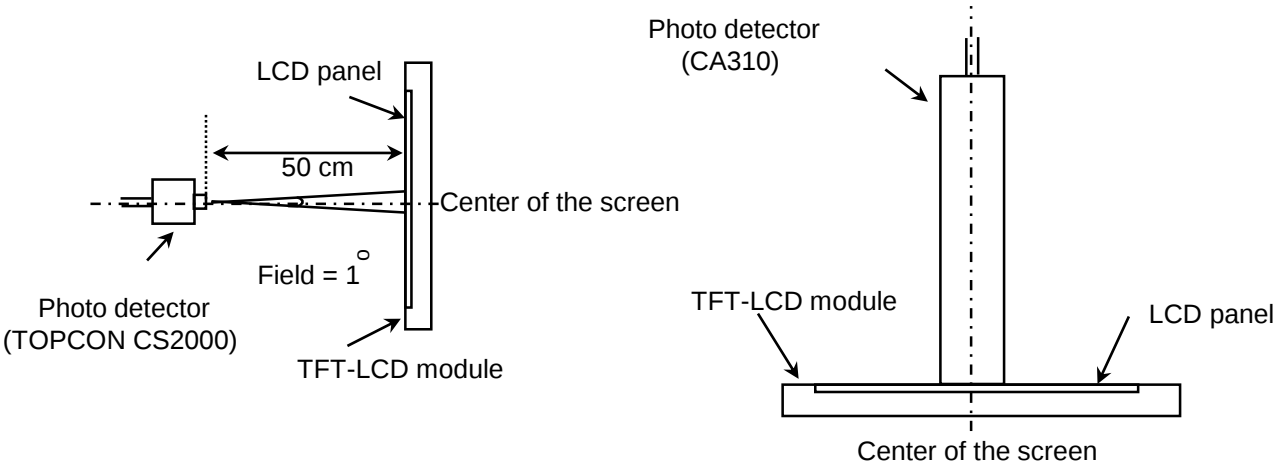
6. Response time (black to white): $Tr + Tf$ White(90%) to Black(10%). As shown in figure 4-3, the time needed for the transmittance to change from 10% to 90% is Tr , and 90% to 10% is Tf .

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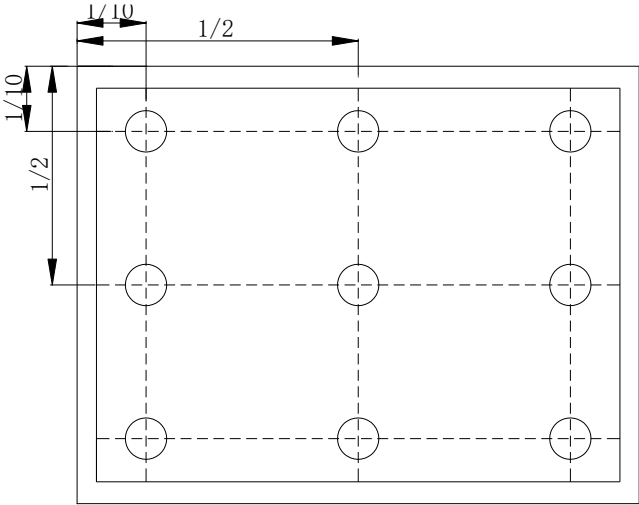
8.0.2 Optical measurements

Figure 1. Measurement Set Up



View angel range, uniformity, etc. measurement setup Flicker, measurement setup

Figure 2. White Luminance and Uniformity Measurement Locations (9 points)

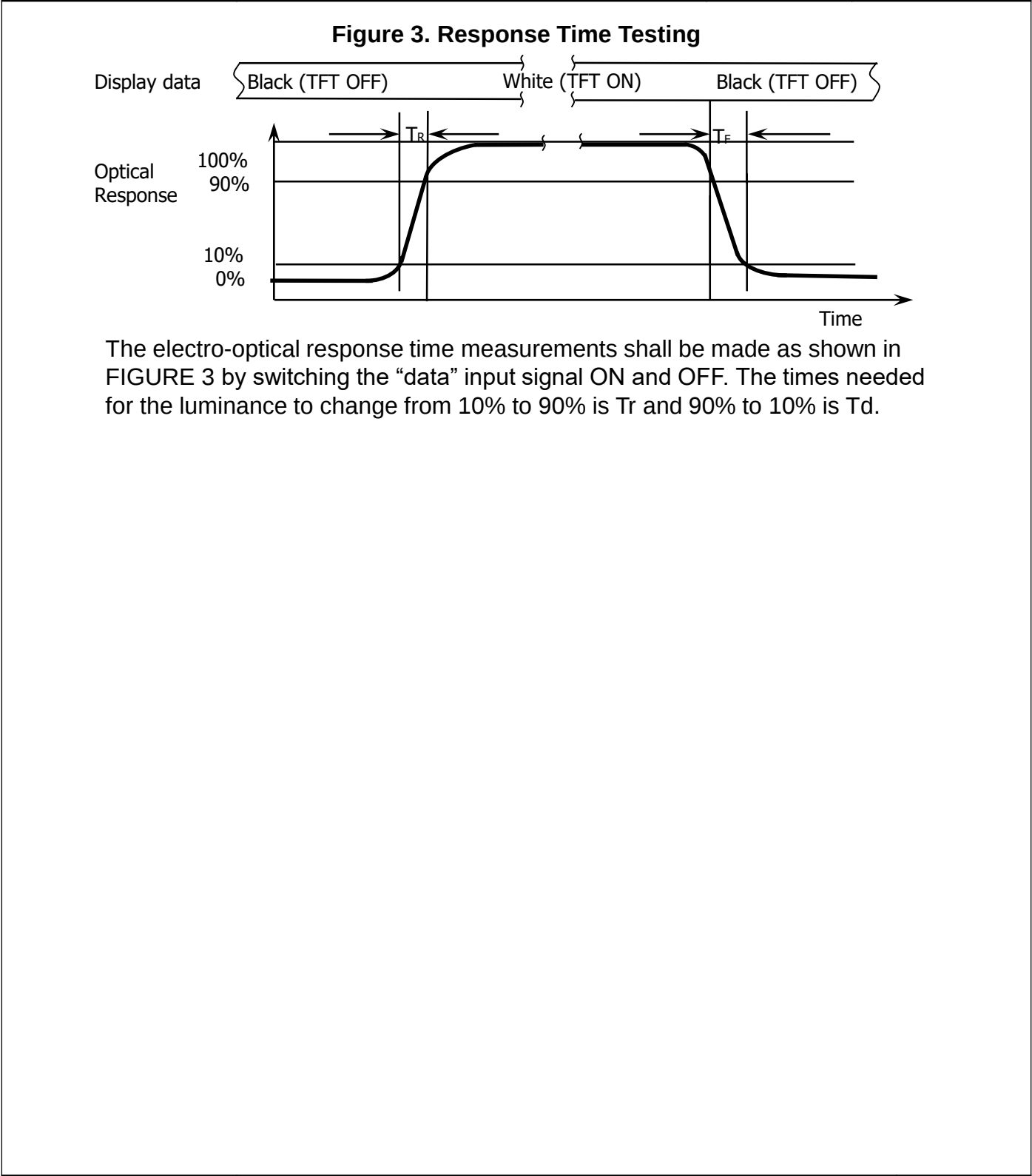


Luminance of white is defined as luminance values of center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.

The White luminance uniformity on LCD surface is then expressed as : $\Delta Y9 = \text{Minimum Luminance of 9 points} / \text{Maximum Luminance of 9points}$ (see FIGURE 2).

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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 .

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9.0 MECHANICAL OUTLINE DIMENSION

Figure 1. TFT-LCD Module Outline Dimension (Front View)

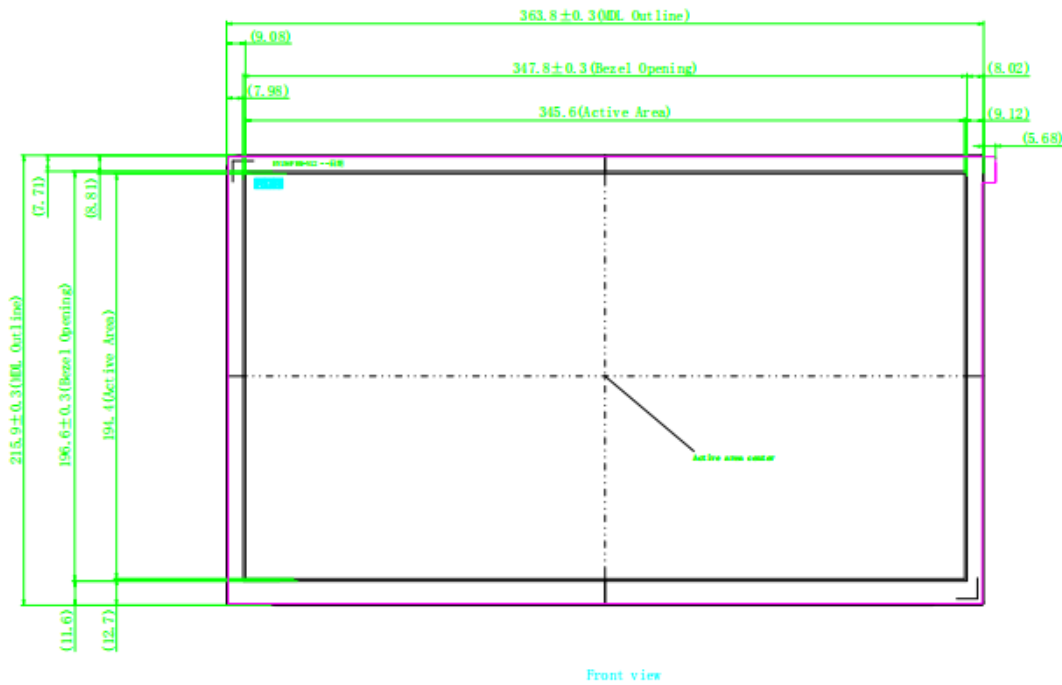
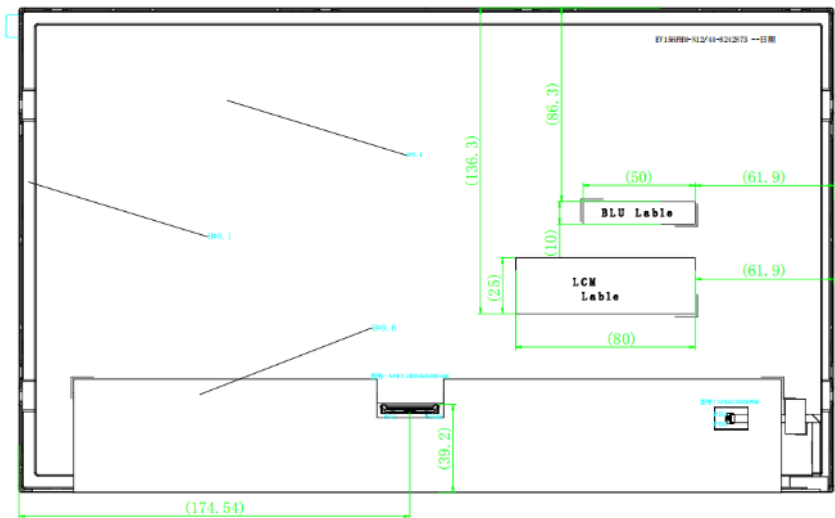


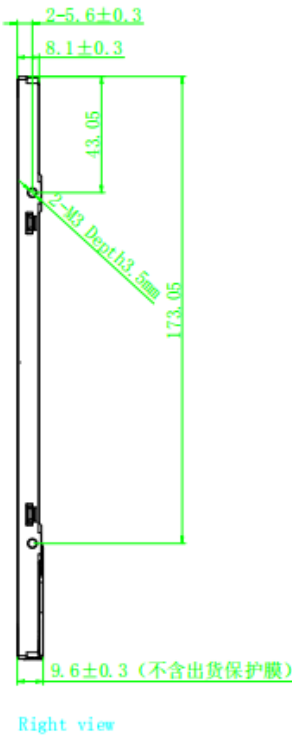
Figure 2. TFT-LCD Module Outline Dimensions (Rear view)



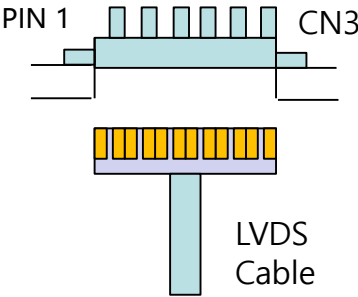
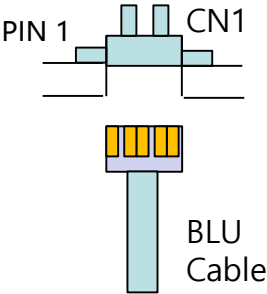
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Figure 3. TFT-LCD Module Outline Dimensions (Side view)



APP.: LVDS &BLU Cable Lead Direction



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10.0 RELIABILITY TEST

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

<Table 11. Reliability test>

No	Test Items	Conditions	Remark
1	High temperature storage test	Ta = 80℃, 240 hrs	The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours. These defects can't be accepted: 1.Air bubble 2.Seal leak 3.Non-display segments 4.Missing 5.Glass crack
2	Low temperature storage test	Ta = -30 ℃, 240 hrs	
3	High temperature operation test	Ta = 70℃, 240 hrs	
4	Low temperature operation test	Ta = -20 ℃, 240 hrs	
5	High temperature & high humidity operation test	Ta = 50 ℃, 80%RH, 240 hrs	
6	High temperature & high Humidity storage test	Ta = 50 ℃, 80%RH, 240 hrs	
7	Thermal shock(Non-operation)	-20℃(30min)~+60℃(30min) 100cycles (No Operation)	
8	Image Sticking	Burn in 5*5 Chess,1h@25C. Inspection Pattern:50% grey, Perpendicular view, after 5min,the mura must disappear	-
9	ESD test	Air Voltage:±15KV Contact Voltage:±8KV Class B, OK R: 330Ω C: 150pF 5 time	

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.

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• 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. Do not contact the ITO pad area with HCFC, Soldering flux, Chlorine, Sulfur,saliva or fingerprint. To prevent the ITO corrosion, customers are recommended that the ITO area would be covered by UV or silicon.			
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DAS-RD-2020006-O

A4(210 X 297)

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT LCD PRODUCT	P0	2024.3.7
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 (GOA Panel Q /Single/OC出货时填写) 注： ①(1)涉及到Pol相关条目适用于OC/MDL出货产品， ②(6)(7)涉及到connector相关适用于OC/MDL出货产品 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.此条适用于Q/Single/OC出货			
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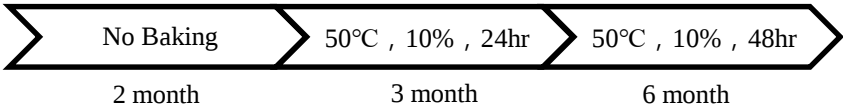
11.4 Precautions for Strong Light Exposure

It is not allowed to store or Operate 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: under XX hours a day. (Please contract BOE in advance for 7*24hrs or more than suggested Operating time,每天可使用的小时数需根据不同产品填写)
 - 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.

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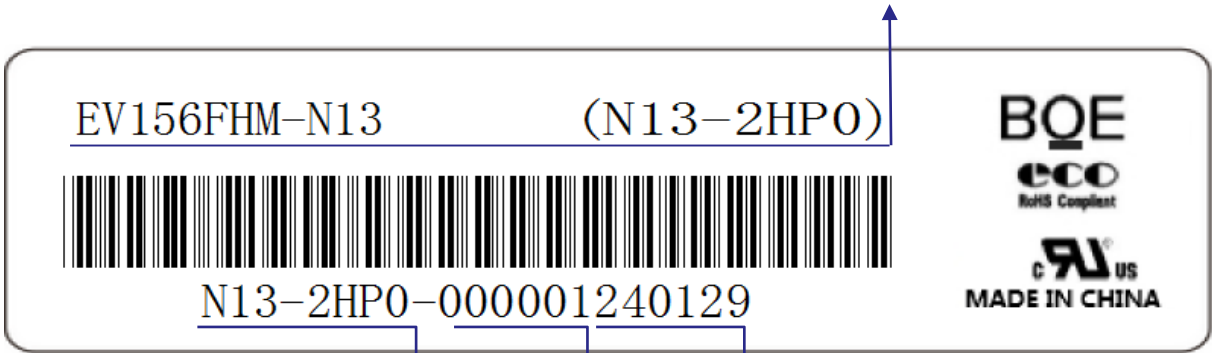
	PRODUCT GROUP	REV	ISSUE DATE
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• (4) Lifetime in this spec. is guaranteed only when commercial display is used according to operating usages. • (5) Please contract BOE in advance when you want to switch between portrait and landscape screen • (6) Please contact BOE in advance for outdoor operation. • (7) Please contact BOE in advance when you display the same pattern for a long time. • (8) If the Module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen. To avoid image sticking, it is recommended to use a screen saver. • (9) 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. • (10) Dew drop atmosphere should be avoided. • (11) The storage room should be equipped with a good ventilation facility and avoid to expose to corrosive gas , which has a temperature controlling system. • (12) When expose to drastic fluctuation of temperature (hot to cold or cold to hot) ,the LCD may be affected; Specifically, drastic temperature fluctuation from cold to hot ,produces dew on the LCD's surface which may affect the operation of the polarizer and the LCD. • (13) Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD may turn black at temperature above its operational range. However those phenomena do not mean malfunction or out of order with the LCD. The LCD will revert to normal operation once the temperature returns to the recommended temperature range for normal operation 11.8 Others A. LC Leak • If the liquid crystal material leaks from the panel, it is recommended to wash the LC with acetone or ethanol and then burn it. • In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap. • If LC in mouth, mouth need to be washed, drink plenty of water to induce vomiting and follow medical advice. • If LC touch eyes, eyes need to be washed with running water at least 15 minutes. B. Rework • When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.			
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12.0 LABEL

(1) Product label

Product Code : EV156FHM-N13-2HP0



Year, Month, Day

Serial number (six digits)

Fixed code:N13-2HP0

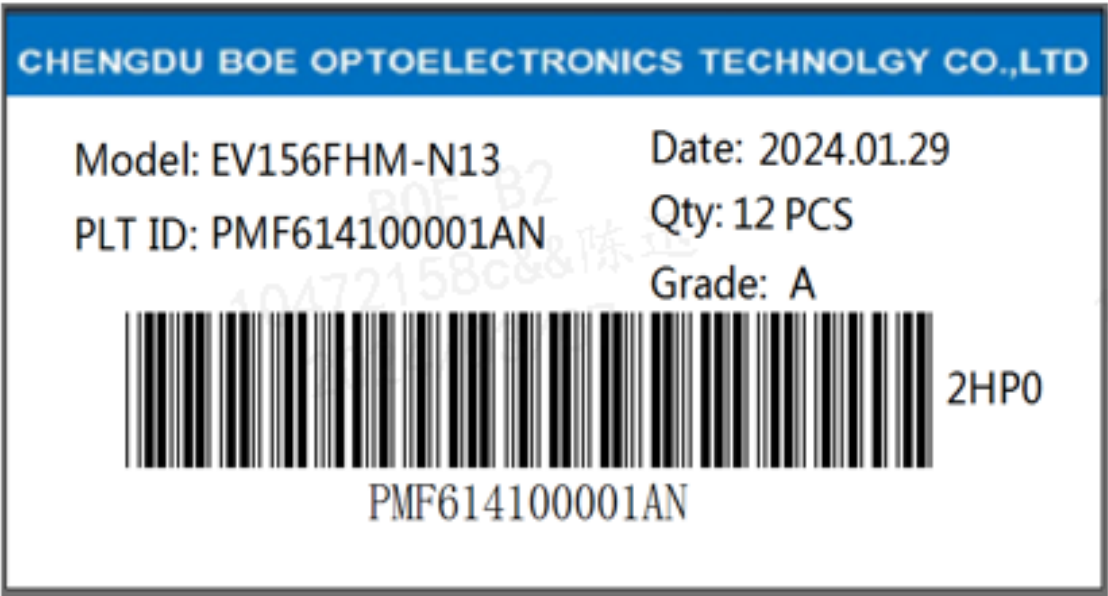
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(3) Box label

Label Size: 100 mm (L) × 50 mm (W)

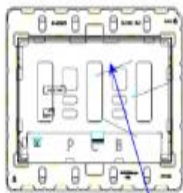
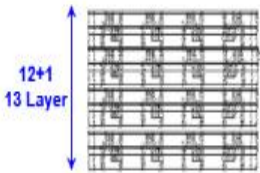
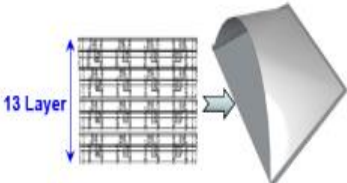
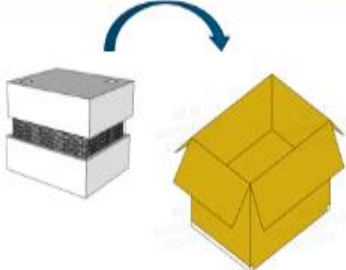
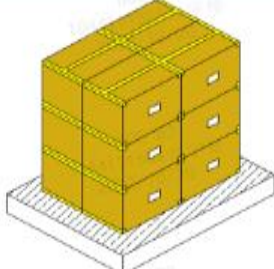
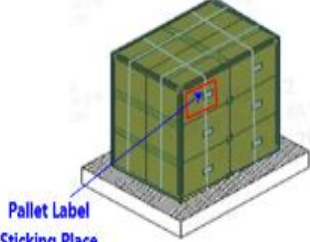
Contents
Model: **EV156FHM-N13-2HP0**
Q`ty: Module Q`ty in one box
Date: Packing Date
Internal use of Product



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13.0 PACKING INFORMATION

Put 1 MDL in the Tray.	Put 12 full Tray with MDL , Put 1 dummy Tray on the top.(Straight fold)	Put the 13 Tray in a shielding bag vacuum .
1 MDL/1 Tray	12 MDL/13 Tray	12 MDL/ Shielding Bag
 MDL Step 1	 12+1 13 Layer Step 2	 13 Layer Step 3
Put 2 Cushion & 13 Tray into 1 Box , sealing box with type "H" .	Put 12 Outer Box on Pallet,2x2x3.	Put 8 Paper Corner , belt pack with total 4 line , 3 layers stretch film wind 5 surface , paste Label.
2 Cushion/Box ; 12 MDL/Box	12 Outer Box/Pallet	144 FOG/Pallet
 Step 4	 Step 5	 Pallet Label Sticking Place Step 6

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