

BOE

To : _____

BOE	REQ. Date	2022-1-24
	REF. No.	

APPROVAL

INSPECTED BY	
CHECKED BY	
APPROVED BY	
DATE	

No	PART NO.	DESCRIPTION	SPECIFICATION
	ET104S0M-N15	10.4 Inch MDL	B3 ET104S0M-N15 Product Specification Rev.P0 VISUAL INSPECTION CRITERIA FOR ALL CUSTOMERS (10.4" A Grade)

PLEASE KINDLY FIND AND APPROVE THE SPECIFICATIONS INSERTED
HEREIN AND RETURN ONE COPY HERE OF WITH YOUR SIGNATURE OF
APPROVAL.

CONFIRMED BY MEDICAL BU

CONFIRMED BY QA

CONFIRMED BY R&D

HEFEI BOE OPTOELECTRONICS TECHNOLOGY CO.,LTD

PROPRIETARY NOTE

THIS SPECIFICATION IS THE PROPERTY OF BOE HF AND SHALL NOT BE REPRODUCED OR COPIED WITHOUT THE WRITTEN PERMISSION OF BOE HF AND MUST BE RETURNED TO BOE HF UPON ITS REQUEST



SPEC. NUMBER S8-*	PRODUCT GROUP TFT- LCD	REV. 0	ISSUE DATE 2022-01-21	PAGE 1 OF 33
----------------------	---------------------------	-----------	--------------------------	-----------------

B3 ET104S0M-N15 Product Specification Rev.P0

BUYER	
SUPPLIER	HEFEI BOE Optoelectronics Technology CO., LTD
FG-Code	ET104S0M-N15-3HP0

ITEM	BUYER SIGNATURE	DATE
_____	_____	_____
_____	_____	_____
_____	_____	_____

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

PRODUCT GROUP	REV	ISSUE DATE	BOE
TFT- LCD PRODUCT	0	2022-01-21	

SPEC. NUMBER S8-*	SPEC . TITLE B3 ET104S0M-N15 Product Specification	PAGE 2 OF 33
----------------------	---	-----------------

REVISION HISTORY

() Preliminary specification

() Final specification

REV.	ECN No.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0		Initial Release	2021-12-12	Zhou Jie
0		Update drawing (Add conductive tape to improve ESD)	2022-01-21	Zhou Jie

--	--	--	--	--

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			3 OF 33

Contents

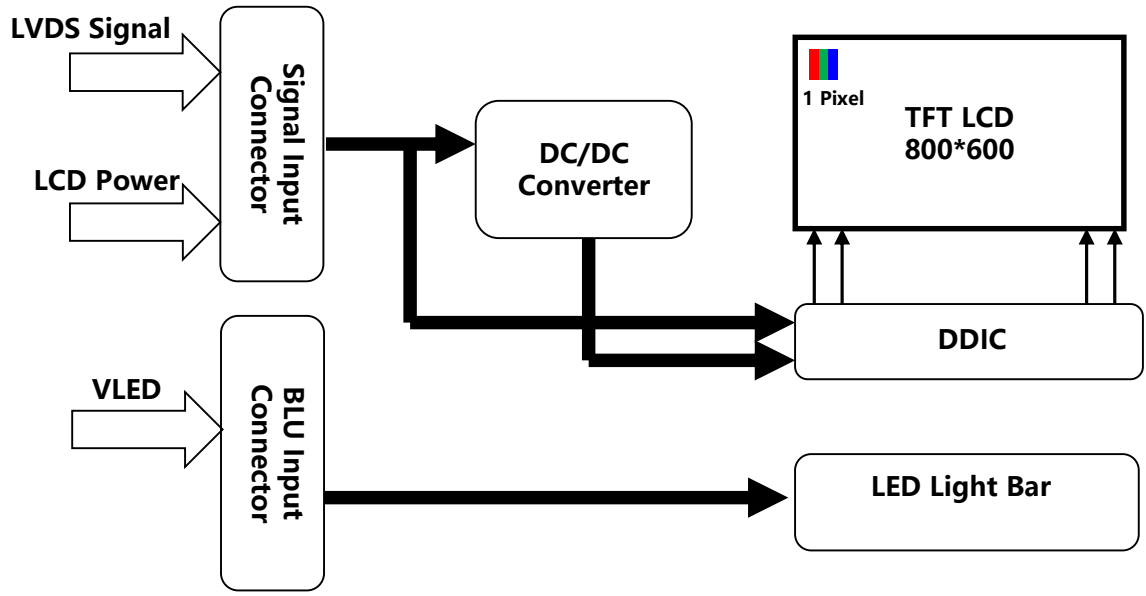
No.	Items	Page
1.0	General Description	4
2.0	Absolute Maximum Ratings	6
3.0	Electrical Specifications	7
4.0	Optical Specifications	16
5.0	Reliability Test	21
6.0	Packing Information	22
7.0	Product Label	24
8.0	Handling & Cautions	25
9.0	Appendix	29

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			4 OF 33

1.0 GENERAL DESCRIPTION

1.1 Introduction

ET104S0M-N15 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 10.4 inch diagonally measured active area with SVGA resolutions (800 horizontal by 600 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.



1.2 Features

- 0.5T Glass (Single)
- Reverse Type
- 6bit+2bit FRC LVDS data input selection
- Frame Frequency: 60hz
- High luminance and contrast ratio, low reflection and wide viewing angle
- RoHS compliant

1.3 Application

- Medical & Industrial application

1.4 General Specification

The followings are general specifications at the ET104S0M-N11

<Table 1. LCD Module Specifications>

Parameter	Specification	Unit	Remarks
Active Area	211.2x158.4	mm	
Number Of Pixels	800*600	pixels	
Pixel Pitch	88x264	μm	
Pixel Arrangement	Pixels RGB stripe arrangement		
Display Mode	TN, Normally White		
Display Colors	16.7M	colors	6bit+2bit FRC
Surface Treatment	AG25		
Contrast Ratio	typ 800:1		
Viewing Angle(CR>10)	typ 80/80/65/75	deg.	L/R/U/D
Response Time	typ 30, max 35	ms	
Color Gamut	55%		
Brightness	min 300, typ 350	cd/m2	
Brightness Uniformity	min 70%, typ 80%		9point
Power Consumption	LCD 0.495W Typ. BLU 1.92W Typ.	watt	
Outline Dimension	236.0(H)×176.9(V) ×5.6(Body)	mm	
Weight	300g Max	gram	
Display Orientation	Landscape Only		

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			6 OF 33

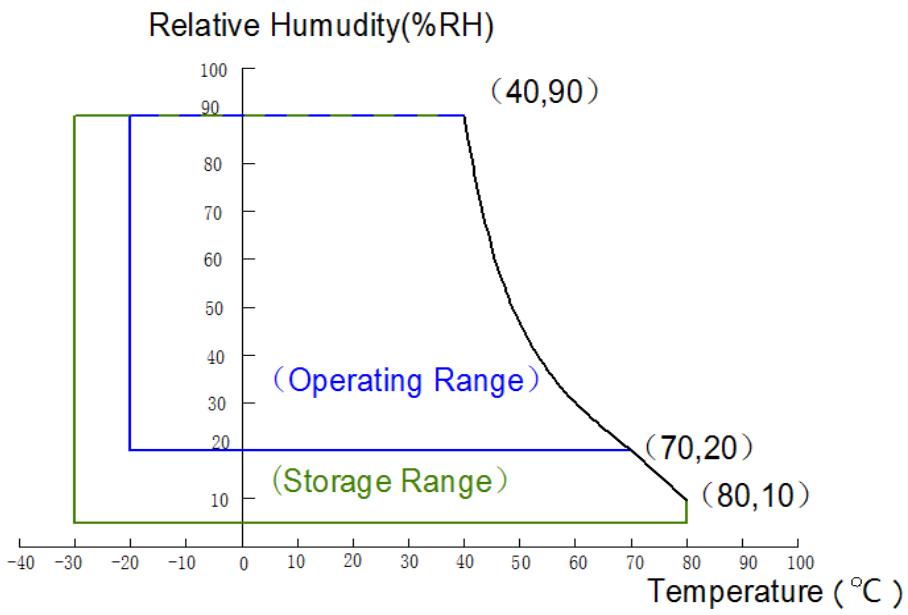
2.0 ABSOLUTE MAXIMUM RATINGS

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. Absolute Maximum Ratings >

Parameter		Symbol	Min.	Max.	Unit	Remarks
Power Supply	LCD Module	VDD	0	3.6	V	Ta = 25 °C
	BLU	V _{LED}	-	19.8	V	
		I _{LED}	-	100	mA	
Operating Temperature		T _{OP}	-20	+70	°C	Note 1
Storage Temperature		T _{ST}	-30	+80	°C	

Note : 1) Temperature and relative humidity range are shown in the figure below. Wet bulb temperature should be 39 °C max. and no condensation of water.



PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			7 OF 33

3.0 ELECTRICAL SPECIFICATIONS

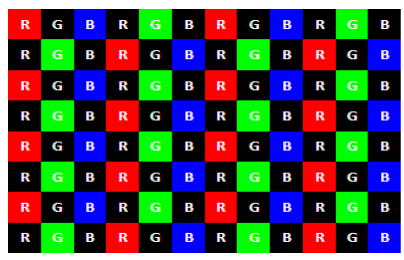
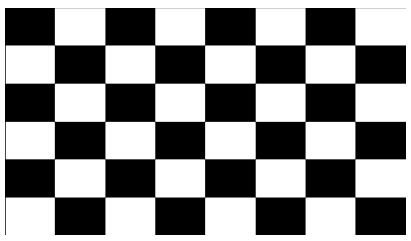
3.1 TFT LCD Module

[Ta =25±2 °C]

< Table 3. LCD Module Electrical specifications >

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	120	150	180	mA	
BLU Supply Voltage	V _{LED}	-	19.2	19.8	V	
BLU Supply Current	I _{LED}	-	100	-	mA	
Power Consumption	P _D	0.4	0.495	0.59	W	Note 2
	P _{LED}	-	-	1.98	W	
	P _{total}	-	-	2.57	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 VBAT=3.8V, Frame rate f_v=60Hz and Clock frequency = 156.8MHz. Test Pattern of power supply current
 a) Typ : Mosaic 8 x 6 Pattern(L0/L255) b) Max : skip subPixel(L255)



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

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			8 OF 33

3.2 Back-Light Unit

Table 4. LED Bar Electrical Specifications >

[Ta =25±2 °C]

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
LED Supply Voltage	V _{LED}	-	19.2	19.8	V	
LED Supply Current	I _{LED}	-	100	-	mA	Note 1
Power Consumption	P _{LED}	-	1.92	1.98	W	
LED Quantity	QLED	-	24	-	EA	
LED Life Time	TLED	30000	-	-	Hrs	Note 2/3

Notes: 1. LED Bar:4Parallel*6String) , I_{LED}=25mA*4=100mA

$$P_{LED} = V_{LED} \times I_{LED} \text{ (Without LED converter transfer efficiency)}$$

- The life time of LED, 30,000Hrs, 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.
- Only under the above operating conditions could the life time of LED be guaranteed.

3.3 INPUT TERMINAL PIN ASSIGNMENT

This LCD employs two interface connections, a 20 pin connector is used for the LCD module electronics interface and a 2 pin connector is used for the backlight system.

3.3.1 Pin assignment for LCD module

Connector : MSB24013P20 _HA(STM) or equivalent

< Table5. Pin Assignment for LCD Module Connector >

Pin No.	Symbol	Description	I/O
1	VCC	Logic Power 3.3V(Panel logic)	P
2	VCC	Logic Power 3.3V(Panel logic)	P
3	NC	Reserved for BOE VDD_MTP	-
4	SEL	VCC:8Bit;GND/NC:6Bit	-
5	RIN0-	LVDS receiver negative signal channel 0	I
6	RIN0+	LVDS receiver positive signal channel 0	I
7	GND	Ground	-
8	RIN1-	LVDS receiver negative signal channel 1	I
9	RIN1+	LVDS receiver positive signal channel 1	I
10	GND	Ground	-
11	RIN2-	LVDS receiver negative signal channel 2	I
12	RIN2+	LVDS receiver positive signal channel 2	I
13	GND	Ground	-
14	CLKIN-	LVDS receiver negative signal clock	I
15	CLKIN+	LVDS receiver positive signal clock	I
16	GND	Ground	-
17	RIN3-	LVDS receiver negative signal channel 3 (NC for 6bit LVDS input)	I
18	RIN3+	LVDS receiver positive signal channel 3 (NC for 6bit LVDS input)	I
19	NC	Reserved for BOE I2C_SDA	-
20	NC	Reserved for BOE I2C_SCL	-

3.3.2 Pin assignment for LED Bar

Connector : JST BHSR-02VS-1 or equivalent

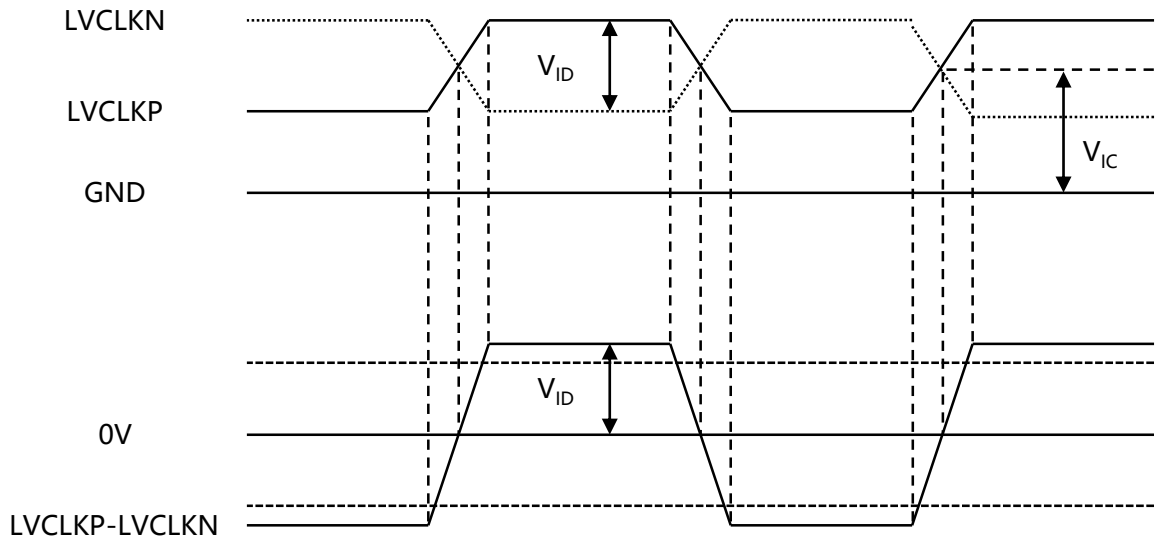
< Table6. Pin assignment for LED Bar >

Pin No	Symbol	Description	Remarks
1	VLED+	Power supply	
2	VLED-	Power supply	

3.4 DC Specification

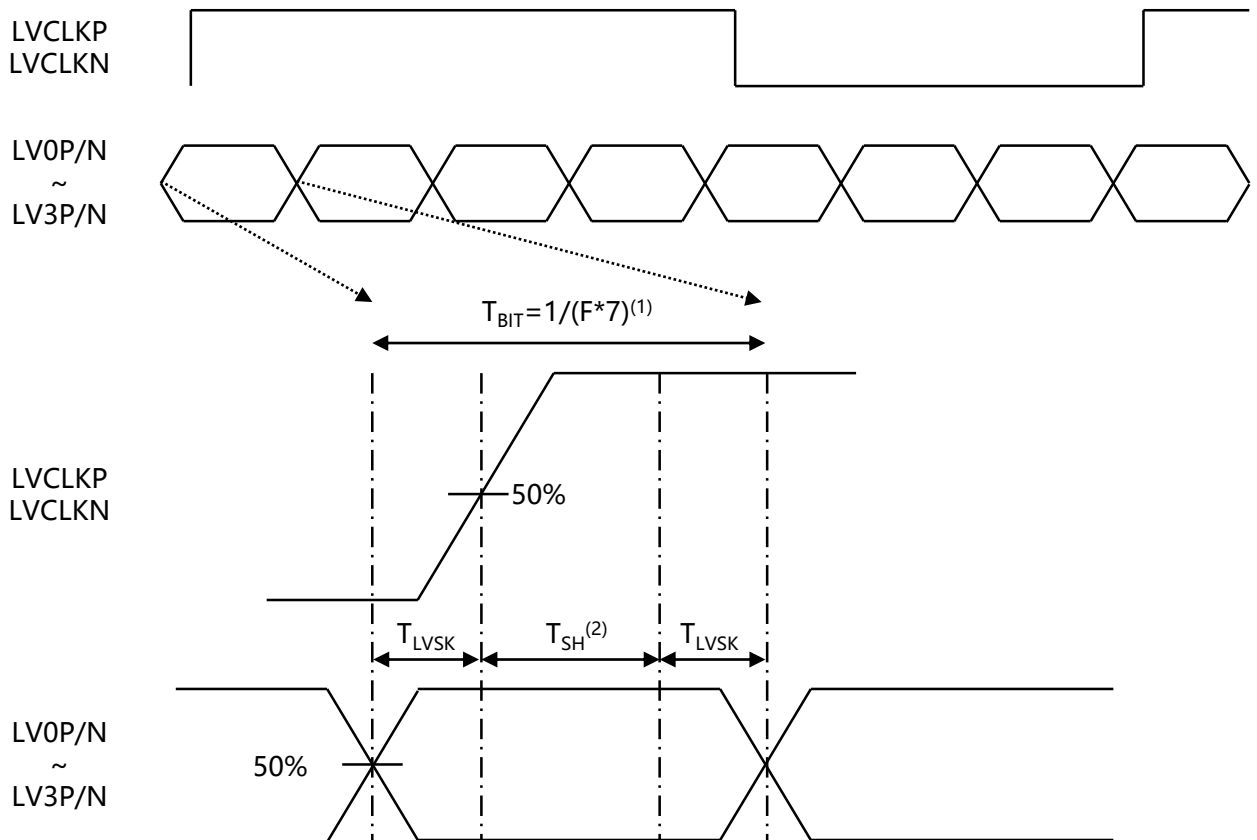
< Table7. DC Specification >

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Supply current	I_{DD}	120	150	180	mA	
LVDS DC specifications						
Differential input high threshold	V_{TH}	-	-	+100	mV	$V_{IC}=1.2V$
Differential input low threshold	V_{TL}	-100	-	-	mV	
LVDS common mode voltage	V_{IC}	0.7	-	1.6	V	
LVDS swing voltage	V_{ID}	± 100	-	± 600	mV	



< LVDS V_{ID} and V_{IC} definition >

3.5 AC Specification



Note:

- (1) T_{BIT} : Data period
- (2) Internal CLK sampling data window

< LVDS channel to channel skew >

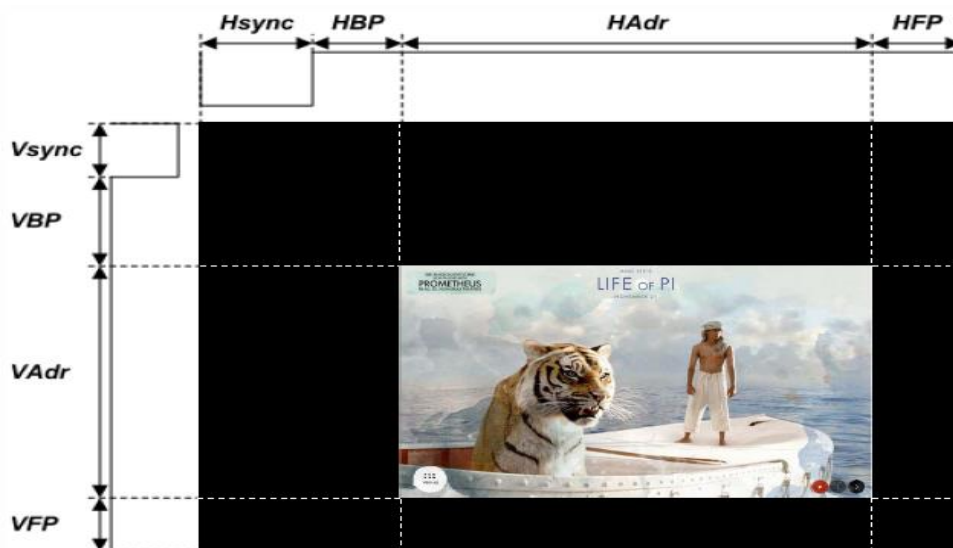
< Table8. AC Specification >

Description	Symbol	Condition	Min	Typ	Max	Unit
LVDS Input frequency	F	-	20	-	85	MHz
LVDS channel to channel skew	T_{LVSK}	F=65MHz $V_{IC}=1.2V$ $V_{ID}=\pm 200mV$	-600	-	+600	ps

3.6 Interface timing Parameter

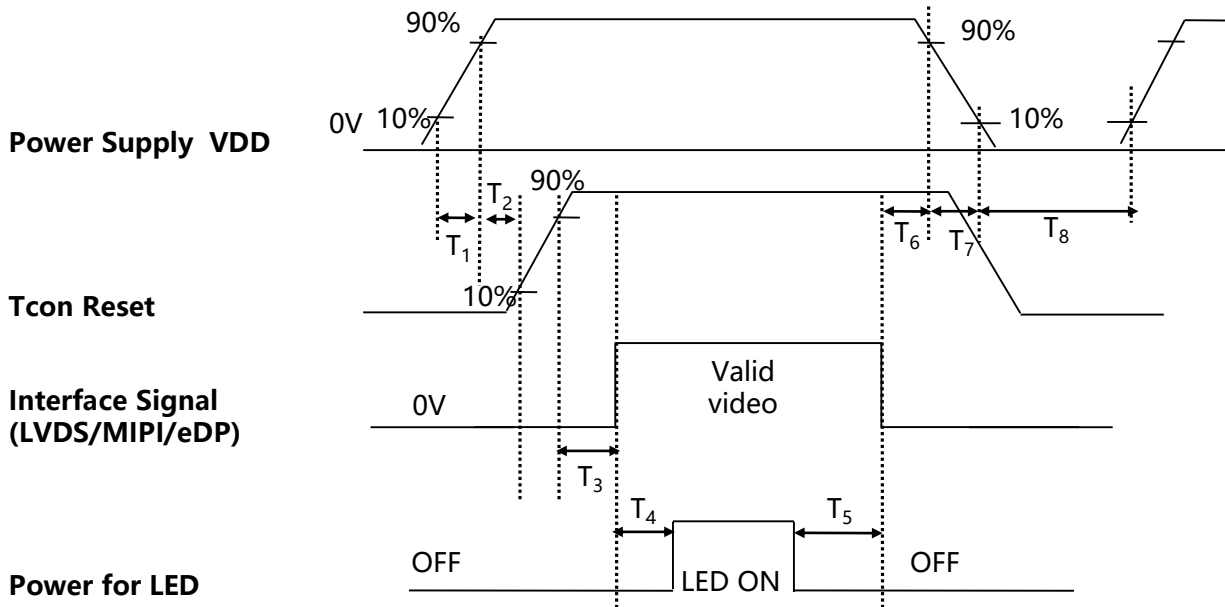
< Table9. Timing Parameter >

Item		Symbol	min	typ	max	UNIT	
LCD	Frame Rate	-	-	60	-	Hz	
	Pixels Rate	-	37.69	33	68.1	MHz	
Timing	Horizontal	Horizontal total time	tHP	-	860	1300	t _{CLK}
		Horizontal Active time	tHadr	800			t _{CLK}
		Horizontal Back Porch	tHBP	-	30	255	t _{CLK}
		Horizontal Front Porch	tHFP	-	30	245	t _{CLK}
	Vertical	Vertical total time	tvp	620	640	806	t _H
		Vertical Active time	tVadr	600			t _H
		Vertical Back Porch	tVBP	10	20	100	t _H
		Vertical Front Porch	tVFP	10	20	106	t _H
Lane			-	1	-	Lane	



3.7 Power Sequence

[Ta =25±2 °C]



< Table10. Sequence Table >

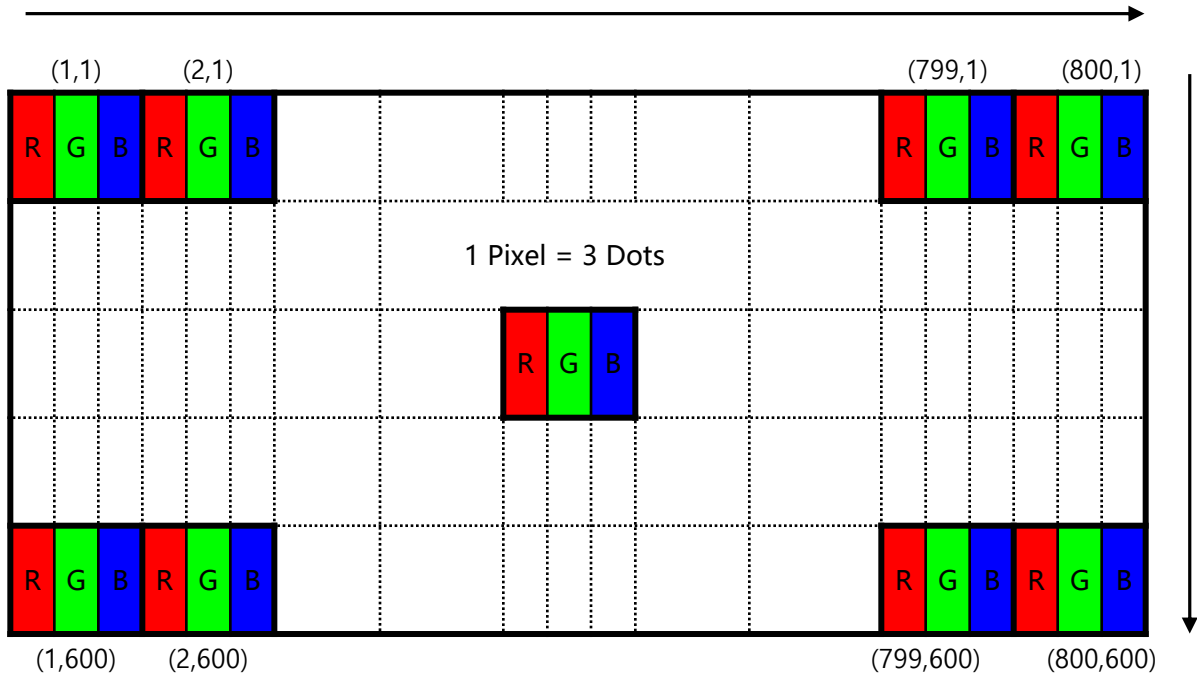
Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.1	-	5	(ms)
T2	10	-	30	(ms)
T3	5	-	100	(ms)
T4	200	-	-	(ms)
T5	200	-	-	(ms)
T6	0	-	50	(ms)
T7	0	-	10	(ms)
T8	500	-	-	(ms)

3.8 Input Color Data Mapping

< Table11. Input Signal and Display Color Table >

Color & Gray Scale		Input Data Signal																							
		Red Data								Green Data				Blue Data											
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	↑								↑				↑											
	▽	↓								↓				↓											
	Brighter	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	▽	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	△	↑								↑				↑											
	▽	↓								↓				↓											
	Brighter	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	▽	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	△	↑								↑				↑											
	▽	↓								↓				↓											
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Gray Scale of White	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
	△	↑								↑				↑											
	▽	↓								↓				↓											
	Brighter	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1
	▽	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

3.9 Input Color Data Mapping



Display Position of Input Data (V-H)

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			17 OF 33

4.0 OPTICAL SPECIFICATIONS

4.1 Overview

The test of optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = $25 \pm 2^\circ\text{C}$) with the equipment of Luminance meter system (Gonio meter system and TOPCON BM-5) 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.

4.2 Optical Specifications

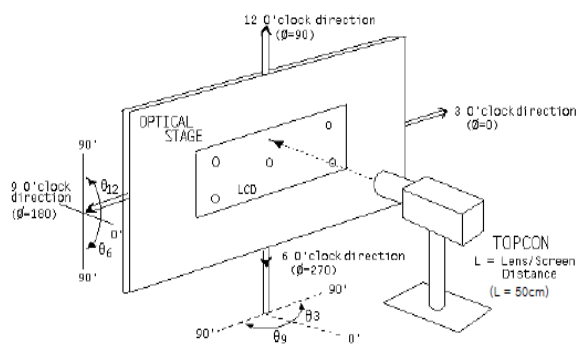
< Table11. Optical Table >

Item	Symbol	Condition	Min	Typ.	Max	Unit	Note
luminance	Bp	$\theta=0^\circ$	300	350	--	cd/m2	Note 1
Brightness Uniformity	ΔBp		70	80	--	%	Note 2
Viewing Angle	θ_L	$Cr \geq 10$	70	80	--	deg	Note 3
	θ_R		70	80	--		
	ψ_T		55	65	--		
	ψ_B		65	75	--		
Contrast Ratio	Cr	$\theta=0^\circ$	600	800		-	Note 4
Response Time	Tr+Tf	FF= 0°	-	30	35	ms	Note 5
Color Coordinate of CIE1931	Rx	$\theta=0^\circ$	0.587	0.617	0.647	-	Note 6
	Ry		0.321	0.351	0.381		
	Gx		0.282	0.312	0.342		
	Gy		0.561	0.591	0.621		
	Bx		0.120	0.150	0.180		
	By		0.095	0.125	0.155		
	Wx		0.254	0.284	0.314		
	Wy		0.290	0.320	0.350		
NTSC Ratio	NTSC	CIE1931	50	55	--	%	Note 7
Polarization Direction of Front Polarizer	PdF			45°		deg	Note 8
Polarization Direction of Rear Polarizer	PdR			45°		Deg	
Gray inversion angle				6点钟			Note 9

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			18 OF 33

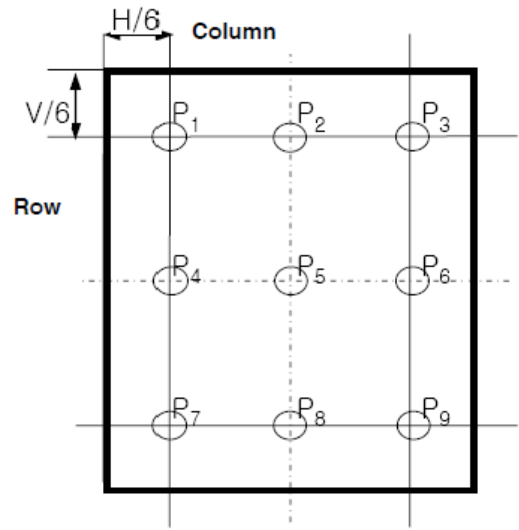
Note1:Luminance measurement

- The test condition is at ILED=100mA and measured on the surface of LCD module at 25°C.
- The data are measured after LEDs are lighted on for more than 5 minutes and LCM displays are fully white. The brightness is the center of the LCD. Measurement equipment CS2000 or similar equipments (Field of view:1deg,Distance:50cm)
 - Measuring surroundings: Dark room.
 - Measuring temperature: Ta=25°C.
 - Adjust operating voltage to get optimum contrast at the center of the display.
 - Measured value at the center point of LCD panel must be after more than 5 minutes while backlight turning on.



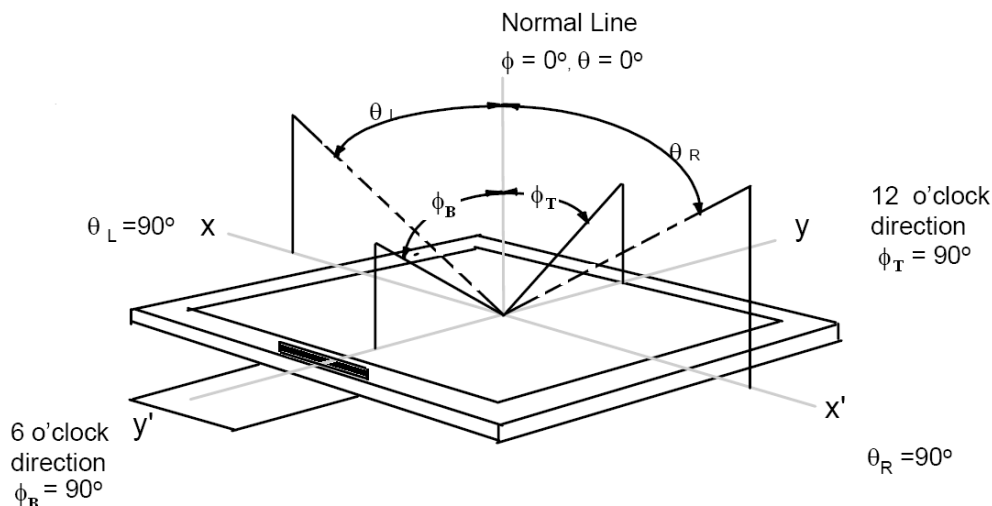
Note2:Uniformity

- The test condition is at ILED=100mA and measured on the surface of LCD module at 25°C.
- Measurement equipment:CS2000 or similar equipments
- The luminance uniformity is calculated by using following formula:
- $\Delta Bp = Bp (\text{Min.}) / Bp (\text{Max.}) \times 100 (\%)$
- $Bp (\text{Max.}) = \text{Maximum brightness in 9 measured spots}$
- $Bp (\text{Min.}) = \text{Minimum brightness in 9 measured spots.}$



Note 3: The definition of Viewing Angle

Refer to the graph below marked by θ and ϕ .



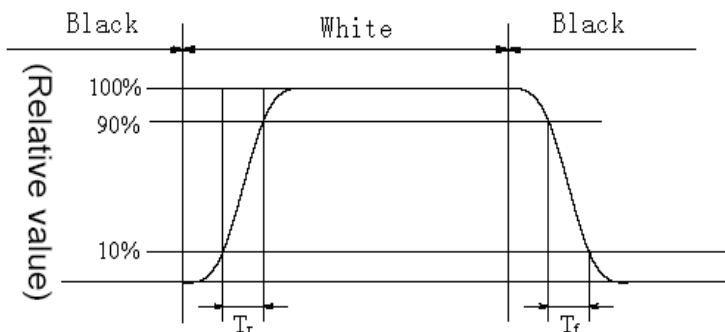
Note 4: The definition of Contrast Ratio (Test LCM using CS2000 or similar equipments):

$$\text{Contrast Ratio(CR)} = \frac{\text{Luminance When LCD is at "White" state}}{\text{Luminance When LCD is at "Black" state}}$$

(Contrast Ratio is measured in optimum common electrode voltage)

Note 5: Definition of Response time. (Test LCD using DMS501 or similar equipments):

The output sign also photo detector are measured when the input sign also are changed from "black" to "white" (Voltage falling time) and from "white" to "black" (Voltage rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figures below.



	L0	L1	L2	L3	L4	L5	L6	L7
L0								
L1								
L2								
L3								
L4								
L5								
L6								
L7								

Response time of gray to gray:

Measurement equipment: DMS501 or similar equipments.

Test method: we define 8 grays L0-L7, the grays of L0-L7 were defined as: 0, 36, 73, 109, 146, 182, 219, 255. The output signals of photodetector are measured when the input signals are changed from "Lx" to "Ly", $x, y \in [0, 7]$. The response time is defined as the time interval between the 10% and 90% of amplitudes. The result of the test can be noted as below:

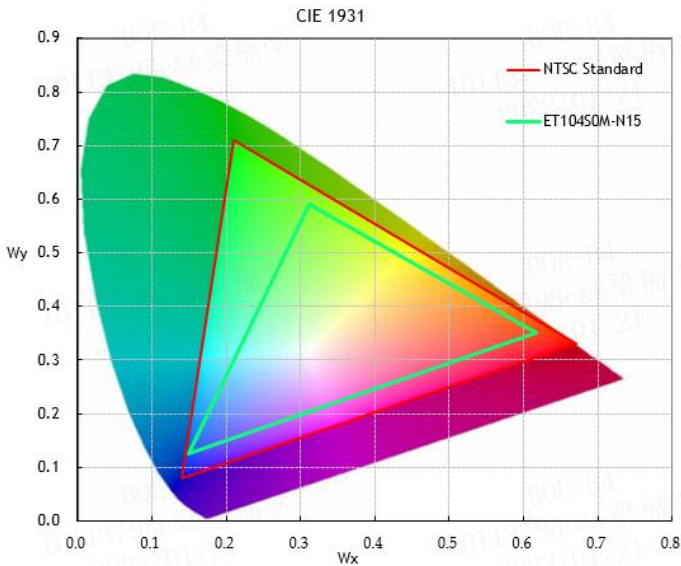
PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			20 OF 33

Note 6: Color Coordinates of CIE 1931

The test condition is at ILED=100mA and measured on the surface of LCD module at 25°C.
 Measurement equipment:CS2000 or similar equipments
 The Color Coordinate (CIE 1931) is the measurement of the center of the display shown in below figure.

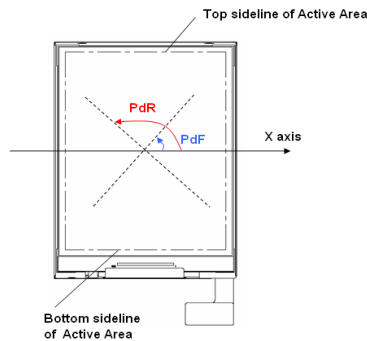
Note 7: Definition of Color of CIE Coordinate and NTSC Ratio.

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$



Note 8: Polarization Direction Definition

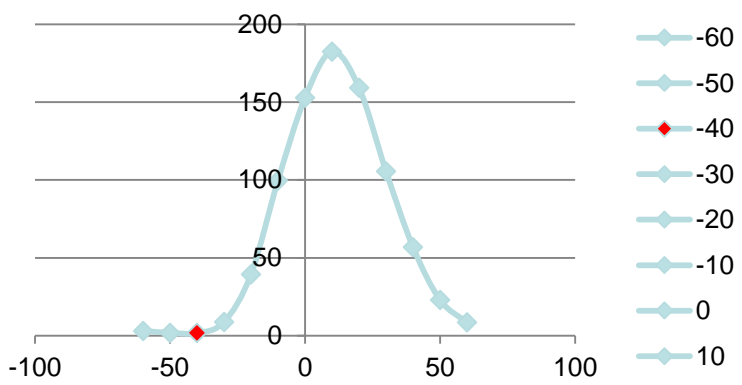
- Viewing direction is normal user viewing direction which is vertical to the display surface
- The polarizer which is closer to viewer is defined as Front Polarizer
- The polarizer which is on the rear side of viewer is defined as Rear Polarizer
- The X axis is defined as parallel line to top & bottom sidelines of the Active Area
- PdF which is marked in blue arrow is polarization degree of Front polarizer
- PdR which is marked in red arrow is polarization degree of Back polarizer
- The polarization degree parameter must be indicated in range of 0deg to 180deg according to above definition



PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			21 OF 33

Note 9: Definition of gray inversion angle

- Refer to the graph of note 9.
- Using luminance test method.
- Test pattern : 128 gray
- If the viewing direction is 12 o' clock ,then test the luminance while $\theta = -60^\circ, \theta = -50^\circ, \theta = -40^\circ, \theta = -30^\circ, \theta = -20^\circ, \theta = -10^\circ, \theta = 0^\circ, \theta = 10^\circ, \theta = 20^\circ, \theta = 30^\circ, \theta = 40^\circ, \theta = -50^\circ, \theta = 60^\circ$. The luminance test as figure below:



5.0 RELIABILITY TEST

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

<Table 12. Reliability Test Parameters >

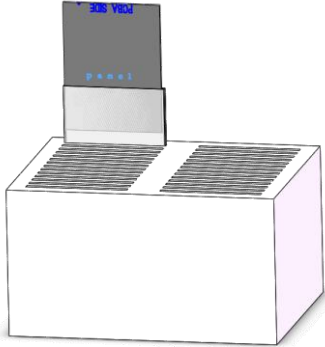
No	Test Items	Conditions
1	HAST	110°C、85%RH、0.122Mpa, 8hr
2	High temperature & high humidity (storage test)	60°C, 90%RH, 240hr
3	High temperature storage test	80°C, 240hr
4	Low temperature storage test	-30°C, 240hr
5	High temperature & high humidity (operation test)	60°C, 90%RH, 240hr
6	Low temperature operation test	-20°C, 240hr
7	High temperature operation test	70°C, 240hr
8	Thermal Shock Test	-40°C~85°C, 1hr/cycle, 100cycle
9	PCT	121°C, 100%RH, 2atm, 12hr
10	ESD	150pF, 330Ω, ±6kV(Contact), ±8kV (Air)
11	Packing VIB	1.47G, 1-200hz, X, Y, ±Z, 30min/Axis

Remark : Vertical line appear when the temperature is below 10°C

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			23 OF 33

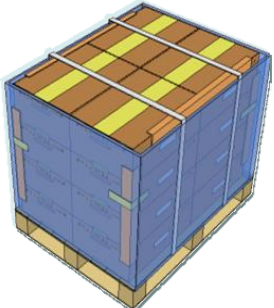
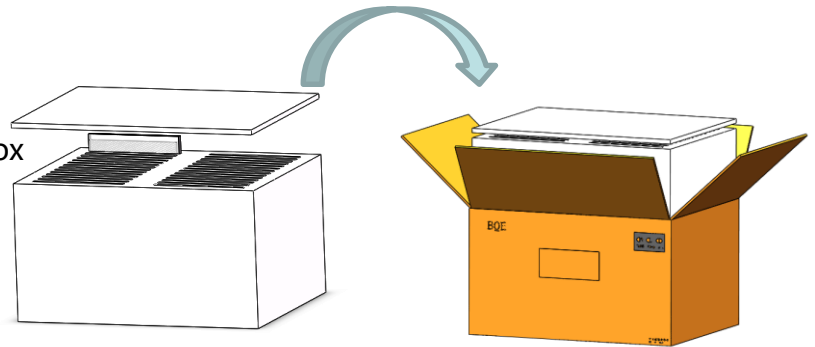
6.0 PACKING INFORMATION(产品形态: LCM)

Packing procedure:



- Put 1pcs Panel into PE Bag
- Crimp PE Bag opening
- Insert 1pcs panel horizontally into the slot
- 28pcs Panel /EPE Box

- Put 1pcs EPE cover upon EPE box
- Put EPE Box& EPE cover into Inner Box
- 28pcs Panel /Inner Box



- 4 layers/ Pallet
- 4 boxes/ Layer
- 448pcs Panel / Pallet

6.1 Packing Note(产品形态: LCM)

- Box Dimension: 500mm(W) x 400mm(D) x 300mm(H)
- Package Quantity in one Box: 28pcs

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			24 OF 33

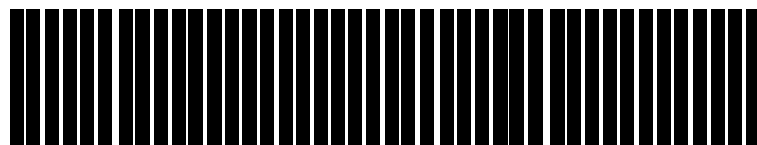
6.2 Box label (产品形态: LCM)

- Label Size :110mm*55mm
- Contents
 1. FG-CODE(Before 12 bit)
 2. Product Quantity
 3. Serial No. : Box Serial No. as shown below.
 4. Date : Packing Date
 5. The client section material number(The client)
 6. FG-Code After four


BOE BOE Technology Group Co., Ltd.

MODEL: XXXXXXXXXX ① QTY: 28 ②

SERIAL NO: XXXXXXXXXX ③ DATE: 20XX / XX / XX ④



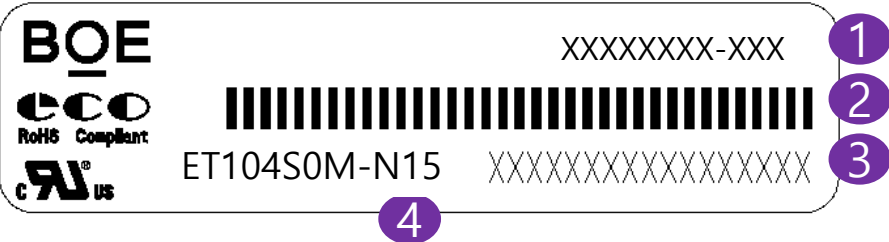
XXXXXXXX ⑤ XXXX ⑥



No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Code	X	X	S	3	1	8	B	0	0	0	1	H	D
	GBN		Grade	B3	Year	Month	Rev	Serial number					

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			25 OF 33

7.0 Product Label



- 1. Customer Code
- 2. MDL ID bar code
- 3. MDL ID
- 4. FG-CODE First 12 digits

BOE MDL ID rule

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Code	X	X	S	3	8	3	2	D	8	5	0	0	0	0	0	2	1
	GBN		Grade	B3	Year	Month	Day	FG Code last four digits				Serial number					

PRODUCT GROUP		REV	ISSUE DATE	BOE —
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE		PAGE	
S8-*	B3 ET104S0M-N15 Product Specification		20F 33	

8.0 Handling & Cautions

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

8.1 Mounting Precautions

- Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- You must mount a module using specified mounting holes (Details refer to the drawings).
- You should consider the mounting structure so that uneven force (ex. Twisted stress, Concentrated stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- Do not apply mechanical stress or static pressure on module; Abnormal display cause by pressing some parts of module during assembly process, do not belong to product failure, the press should be agreed by two sides.
- Determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.
- Do not apply mechanical stress or static pressure on module, and avoid impact, vibration and falling.
- Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
- Protection film for polarizer on the module should be slowly peeled off before display.
- Be careful to prevent water & chemicals contact the module surface.
- You should adopt radiation structure to satisfy the temperature specification.
- 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.

Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			27 OF 33

- When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzine. Normal-hexane & alcohol is recommended for cleaning the adhesives used to attach front / rear polarizers. Do not use acetone, toluene , because they cause chemical damage to the polarizer.
- Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- This module has its circuitry PCB' s on the rear side and Driver IC, should be handled carefully in order not to be stressed.
- Avoid impose stress on PCB and Driver IC during assembly process ,Do not drawing, bending, COF package & wire.
- Do not disassemble the module.

8.2 Operating Precautions

- Do not connector or disconnect the cable to/from the Module at the "Power On" Condition.
- When the module is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the module would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.
- Do not allow to adjust the adjustable resistance or switch.
- The electrochemical reaction caused by DC voltage will lead to LCD module degradation, so DC drive should be avoided.
- 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 equipment to protect against static electricity.
- 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.
- 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.

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			28 OF 33

- The cables should be as short as possible between System Board and PCB interface.
- Connectors are precision devices to transmit electrical signals, and operators should plug in parallel.
- 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.

8.3 Electrostatic Discharge Precautions

- Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.
- 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.
- Do not close to static electricity to avoid product damage.
- Do not touch interface pin directly.

8.4 Precautions for Strong Light Exposure

- Do not leave the module operation or storage in Strong light . Strong light exposure causes degradation of polarizer and color filter.

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			29 OF 33

8.5 Precautions for Storage

A. Atmosphere Requirement

ITEM	UNIT	MIN	MAX
Storage Temperature	(°C)	5	40
Storage Humidity	(%rH)	40	75
Storage Life	6 months		
Storage Condition	<ul style="list-style-type: none"> • The storage room should be equipped with a dark and good ventilation facility. • Prevent products from being exposed to the direct sunlight, moisture and water. • The product need to keep away from organic solvent and corrosive gas. • Be careful for condensation at sudden temperature change. • Storage condition is guaranteed under packing conditions. 		

B. Package Requirement

- The product should be placed in a sealed polythene bag.
- Product Should be placed on the pallet, Which is away from the floor, Be cautions not to pile the product up.
- 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.
- As the original protective film, do not use the adhesive protective film to avoid change of Pol color and characteristic.

8.6 Precautions for protection film

- 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.
- People who peeled off the protection film should wear anti-static strap and grounded well.

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			30 OF 33

8.7 Appropriate Condition for Commercial Display

-Generally large-sized LCD modules are designed for consumer applications . Accordingly, long-term display like in Commercial Display application, can cause uneven display including image sticking. To optimize module's lifetime and function, several operating usages are required.

1. Normal operating condition

- Temperature: 20±15°C
- Operating Ambient Humidity : 55±20%
- Display pattern: dynamic pattern (Real display)
- Well-ventilated place is recommended to set up Commercial Display system

2. Special operating condition

a. Ambient condition

- Well-ventilated place is recommended to set up Commercial Display system.

b. Power and screen save

- Periodical power-off or screen save is needed after long-term display.

c. As the low temperature, the response time is greatly delayed. As the high temperatures (higher than the operating temperature) the LCD module may turn black screen. The above phenomenon cannot explain the failure of the display. When the temperature returns to the normal operating temperature, the LCD module will return to normal display.

d. When expose to drastic fluctuation of temperature (hot to cold or cold to hot) ,the LCD module may be affected; Specifically, drastic temperature fluctuation from cold to hot ,produces dew on the LCD module 's surface which may affect the operation of the polarizer and LCD module .

e. Do not exceed the absolute maximum rating value. (supply voltage variation, input v oltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.

f. Product reliability and functions are only guaranteed when the product is used under right operation usages. If product will be used in extreme conditions such as high temperature, high humidity, high altitude, special display images, running time, long time operation, outdoor operation, etc. It is strongly recommended to contact BOE for filed application engineering advice. Otherwise, its reliability and function may not be guaranteed. Extreme conditions are commonly found at airports, transit stations, banks, stock market and controlling systems.

PRODUCT GROUP		REV	ISSUE DATE	BOE
TFT- LCD PRODUCT		0	2022-01-21	
SPEC. NUMBER	SPEC. TITLE			PAGE
S8-*	B3 ET104S0M-N15 Product Specification			31 OF 33

3. Operating usages to protect against image sticking due to long-term static display.
 - a. Suitable operating time: under 20 hours a day.
 - b. Static information display recommended to use with moving image.
 - Cycling display between 5 minutes' information(static) display and 10 seconds' moving image.
 - c. Background and character (image) color change
 - Use different colors for background and character, respectively.
 - Change colors themselves periodically.
 - d. Avoid combination of background and character with large different luminance.
 - 1) Abnormal condition just means conditions except normal condition.
 - 2) Black image or moving image is strongly recommended as a screen save
4. Lifetime in this spec. is guaranteed only when Commercial Display is used according to operating usages.

8.8 Other Precautions

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.
- If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. 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.

PRODUCT GROUP

REV

ISSUE DATE

BOE

TFT- LCD PRODUCT

0

2022-01-21

SPEC. NUMBER

SPEC. TITLE

PAGE

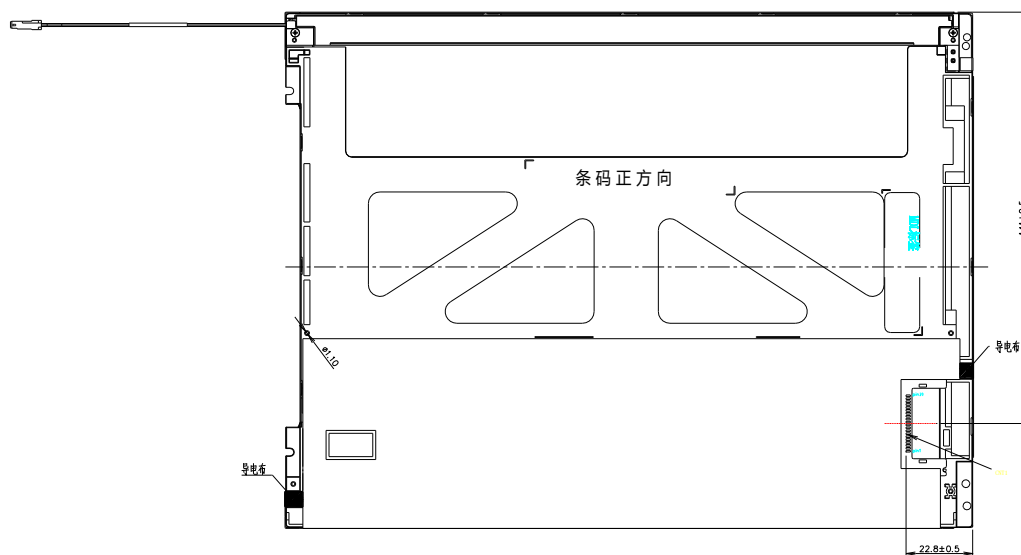
S8-*

B3 ET104S0M-N15 Product Specification

33 OF 33

Mechanical Drawing

Drawing Attachment: Landscape Back View



- 1.Connector 1: MSB24013P20 _HA
- 2.OPERATING TEMP: -20°C TO 70°C
- 3.STORAGE TEMP: -30°C TO 80°C

Incoming Inspection Spec Approval Sheet

Product Description: TFT-LCD MDL

Product Name:

Customer :

Customer Signature	Date	BOE Signature	Date

Content

A: Incoming Inspection Specification

1. Introduction
 - 1.1. Scope
 - 1.2. Incoming Inspection Right
 - 1.3. Operation Instruction
2. Generals
 - 2.1. Sampling Method
 - 2.2. Inspection Environment
 - 2.3. Definitions
3. Inspection Criteria
 - 3.1. Visual Inspection Criteria
 - 3.2. Appearance Inspection Criteria

B: Customer Quality Service Process

A: Incoming Inspection Specification

1.0 Introduction

1.1. Scope

This incoming Inspection Standard is limited to the TFT-LCD LCD which supplied by BOE Technology Group Co.,Ltd. (hereinafter called the "Supplier") to its Customer.

1.2. Incoming inspection Right

The buyer (customer) shall inspect the LCD within twenty days from receiving as inspection period at its own cost. The results of the inspection, acceptance or rejection shall be notified to Supplier .

The buyer may, under commercially reasonable reject procedures, reject an entire lot within inspection period, define unacceptable LCD number in accordance with incoming inspection standard. Should the buyer fail to notify the result of the inspection to supplier within the inspection period, the buyer's right to reject the LCD shall lapse and whole lot shall be deemed to have been accepted by the buyer.

1.3. Operation Instruction

1.3.1 Mounting Method

- As the panel of LCD which consists of two thin glasses with polarizers was easily get Damaged, please handling LCD cautiously.
- Excessive stress or pressure on the glass of the LCD should be avoided. Please insure that no torsional or compressive forces are applied to the LCD unit when it is mounted.
- Abnormal display may occur under press setting problem from customer, which does not mean the malfunction of the LCD and should be verified by both party.
- Optimum mounting angle was determined based on specified viewing angle range.
- Please assemble LCD module in accordance with the specification.
- Please mark condition of humiture.

1.3.2 Caution of LCD Handling and Cleaning

- 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.
- The polarizers on the surface of panel are made from organic substances. Be very careful for chemicals that not to touch the polarizers or it may leads the polarizers to be deteriorated.
- If the use of a chemical is unavoidable, use soft cloth with solvent (recommended below) to clean the LCD's surface with wipe lightly.
-IPA(Isopropyl Alcohol),Ethyl Alcohol, Trichlorotrifloroethane
- Do not wipe the LCD's surface with dry or hard materials that will damage the polarizers

and others. Do not use the following solvent.

-Water, Ketone, Aromatics

- It is recommended that the LCD be handled with soft material during assembly, etc. The polarizers on the LCD's surface are vulnerable to scratch and thus to be damaged by sharp particles.
- Do not drop water or any chemicals onto the LCD's surface.
- A protective film is supplied on the LCD and should be left in place until the LCD is required for operation.
- The ITO pad area needs special careful caution because it could be easily corroded. 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.
LCD should be stored in static-protective & vacuum polythene bag, please assemble it
When it expose to the air within 3 days to avoid ITO corrosion
- Please clean the LCD without ultrasonic to avoid line open.
- Temperature of clean and bake should be less than 80°C.

1.3.3 Caution Against Static Charge

- 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.
- 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.
- Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.
- 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.

1.3.4 Caution For operation

- It is indispensable to drive the LCD within the specified voltage limit since the higher Voltage than the limit causes the shorter LCD's life. An electro-chemical reaction due to DC causes undesirable deterioration of the LCD so that the use of DC drive should avoid.
- Do not connect or disconnect the LCD to or from the system when power is on.
- Never use the LCD under abnormal conditions of high temperature and high humidity.
- 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.
- 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.

- Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD structure. If the screen is displayed with fixed pattern, use a screen saver.
- Static electricity (ESD) will damage the panel,. Please make sure that operators wear static-protective glove effectively and working tables & device are effectively grounded during operation and other ESD protective method
- Please place LCD on the tray provided by BOE while moving it, in order to avoid mechanical damage.
- LCD should be stored in required humidity. Low humidity may add static, while high humidity may corrode the ITO circuit of LCD product.
- Before use the LCD. Please check the Engineering specification.
- Please keep the LCD in the specified, original packing boxes when storage.
- LCD contain a small amount of Liquid Crystal and Mercury. Please follow local ordinances or regulations for disposal.
- DO NOT press the area covered with PET or such materials. These are weak point of LCD since of TCPs (Driver ICs) and PWBs.
- Please DO NOT touch the surface of glass (Polarizer).

2.0 Generals

2.1. Sampling Method

Unless otherwise agreed upon in writing ,the sampling inspection shall be applied to the customer's Incoming inspection.

2.1.1. Lot Size: 1 pallet per same model;

2.1.2. Sampling type: Random sampling;

2.1.3. Inspection level: II

2.1.4. Sampling table: MIL-STD-105E

Major Defect: AQL=0.65

Minor Defect: AQL=1.5

2.2. Inspection Environment

2.2.1. Inspection environment conditions:

a. Room temperature: 25±5 °C ;

b. Humidity: 65 ± 5% RH;

c. Inspection Ambient Illumination : 300~700 Lux (150~250 Lux for function test);

2.2.2. Viewing Distance

The distance between the panel and the inspector's eyes shall be at 30CM~50CM;

2.2.3. Viewing Angle

performing in front of the panel All directions for inspecting the sample should be:

ADS Production: within 45° to perpendicular line.;

TN Production: within 10° to perpendicular line.;

2.2.4. Inspection Area :

Display Area (Active Area)

2.3. Main Defect Definitions

2.3.1 Black / White Spots

Points on display which appear Black/ white at L0/L127/L255 .

2.3.2. Dark / Bright Lines

Lines on display which appear dark/bright at R/G/B. such as vertical, horizontal, or cross lines.

2.3.3. Bright Dot Defects

Dots(sub-pixels) on display which appear bright in the display area at R/G/B.

2.3.4. Dark Dot Defects

Dots(sub-pixels) on display which appear dark in the display area at R,G,B Color Pattern.

2.3.5. Mura

Mura on display which appears darker / brighter against background brightness on parts of display area at L0/L127/L255

2.3.6. Visual Inspection

Inspect PNL in operation

2.3.7. Appearance Inspection

External inspection for Panel in Non Operation

3.0 Inspection Criteria

3.1. Visual Inspection Criteria

Dimensional unit: mm

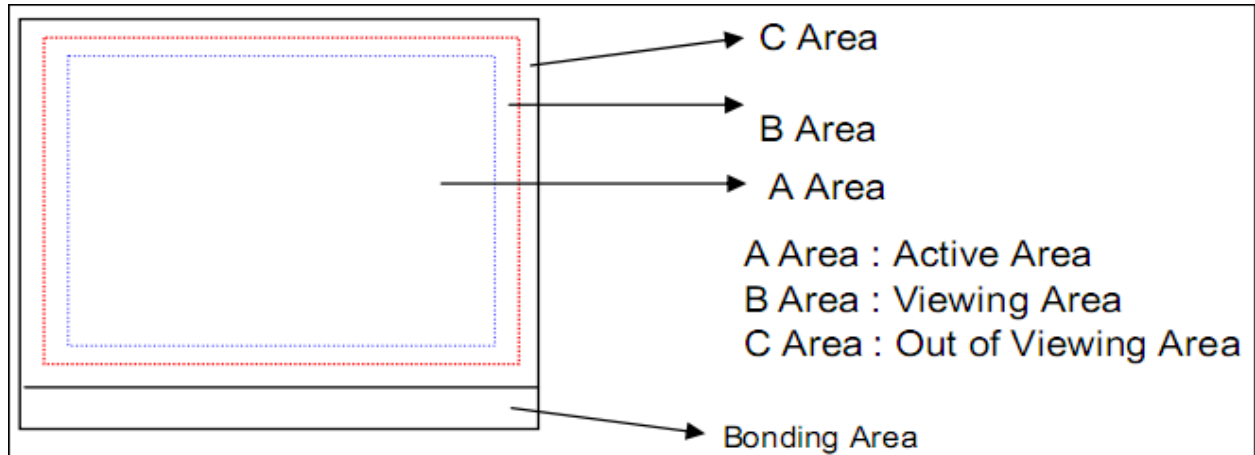
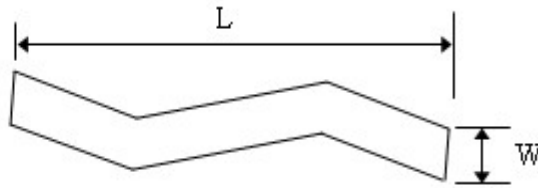
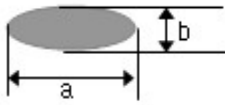
Items		Details	Inspection Criteria			Type
			A Area	B/C Area	DS	
Visual (Function) Inspection	Foreign Material /Dent/ Bubble/ Spots//Extraneous Substances/Dot	Circular Type	$0.1 < D \leq 0.3, N \leq 4$	Ignore	\geq 15mm	Minor
		Linear Type	$W \leq 0.05 \ \& \ L \leq 2$ $N \leq 4$			
	Pixel Defects	Bright Dot	$N \leq 2$	Ignore	\geq 15mm	Minor
		Dark Dot	$N \leq 3$			
		Bright + Dark Dot	$N \leq 3$			
		2S	0			
	Line Defects	Bright Line, Dark Line	Not Allowed		-	Major
	No Display		Not Allowed		-	
	Abnormal Display		Not Allowed		-	
	L0 Light leakage & Mura		5%ND not visible, or reference limit samples		-	Minor
	Zara		10mm X 10mm area ≤ 15		-	
Cross talk		2%	-			

Remark: The determination of all defects is based on the panel with Polarizer.

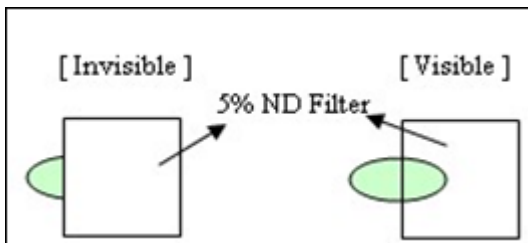
※ Note 1) D = Diameter, L = Length, W = Width, N = Number

※ Note 2) Definition of the Area A Area: Display area B/C Area: No display area

$$D = (a + b) / 2$$

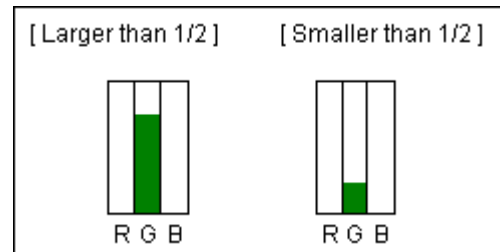


※Note 3) For pixel defect, dot means a sub-pixel. Dot defects should be larger than half size of a sub-pixel. Dot which is invisible through 5% ND filter or smaller than 1/2 of sub-pixel size will not counted as "1 dot" defect.



"No dot defect"
(=ignored)

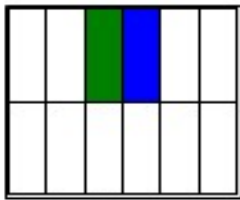
"1 dot defect"
(=counted)



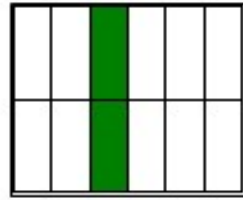
"1 dot defect"
(=counted)

"No dot defect"
(=ignored)

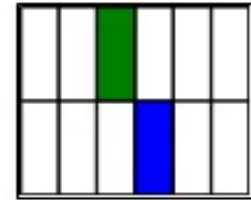
[2 adjacent dots defect]



Type 1


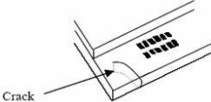
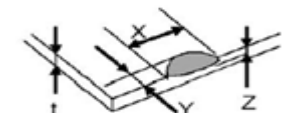
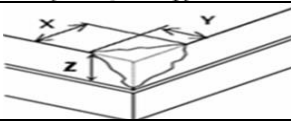
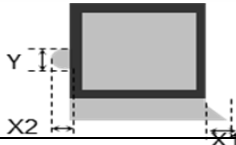

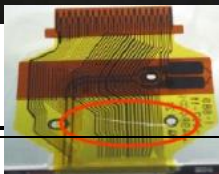


Type 2



Type 3

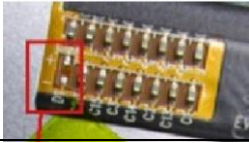
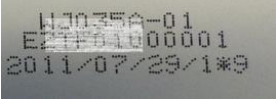


3.2. Appearance Inspection Criteria

location	Items	Criterion for Defects		Type	scope
All	Stain		Slightly not Wipeable ignored	-	All
Be related to PNL	Crack		Not Allowed	Major	Shipment status: Single Cell/FOG /MDL Production
	Side Chipping		Function and assembly are not affected	Minor	
	Corner Chipping		Function and assembly are not affected	Minor	
	Burr		Function and assembly are not affected	Minor	
	Scratch		PNL with POL, based on point/line foreign (scratch) standard to determine.	Minor	
Be related to FPC/PCB	short circuit / open circuit		Not Allowed	Major	Shipment status: FOG/MDL

File Name

Incoming Inspection Spec For Customer

Effective date: 2020.11.16

	components and parts		Component missing is not allowed	Minor	Production
Be related to Backlight	Code-spurting		Key information can be identified is OK	Minor	Shipment status: MDL Production
	Scratch		Function and assembly are not affected	Minor	
	Stain		Slightly not Wipeable ignored	Minor	
Bezel	Inkjet defect	-	Steel seal/Ink marking clearly visible	Minor	
	Scratches / dents	-	Function and assembly are not affected,		
Screw	Missing/damaged/sliding wire		not allowed		
Tape	Missing, damaged	-	damaged :2*2mm, not affected lighting,ignored Missing ,not allowed		
Connector	PIN missing/damaged/deformation	-	not allowed	Minor	
POL	Deviation	-	No access to AA area No access to glass edge		
	Dirty	-	Erasable ok		
	POL Bubble Line	-	Distance from AA area $\geq 0.65\text{mm}$		
	Scratch/Dent	-	Followed Circular/Linear spec		

B : BOE Customer Quality Service Process

In order to provide better service to Customer, BOE shall apply the after-sales product quality service process as below:

- 1.0.** According to the P/O from Customer, BOE should deliver required product to the place appointed by Customer.
- 2.0.** Customer will do IQC for the incoming product.
- 3.0.** Inspection standard should be provided by BOE, and it will be valid after confirmed by Customer. Inspection and Defects determination should be carried out according to the standard agreed by both Parties.
- 4.0.** In order to guarantee in-time communication of product quality information and effective service, QA staff on Customer side should send Weekly Quality Report to the appointed CS staff in BOE.
- 5.0.** BOE should cooperate with Customer for special quality requirement.
- 6.0.** After confirmed by both side, BOE should be responsible for the defect products which caused by its quality problem.
- 7.0.** Customer should use the LCD product according to the instruction. BOE will not be responsible for the defect product caused by violation of Users' Instruction.
- 8.0.** Both parties should deal with the quality problem with friendly cooperative policy. And both parties should negotiate to deal with the defect products of which the responsibility is not very clear.
- 9.0.** The warranty of the product is 12 months after the delivery date.

The warranty will be avoided in cases of below:

- a. When the warranty period is expired.
- b. When the LCMs were repaired by 3rd party without Supplier's approval.
- c. When the LCMs were treated like disassemble and rework by the Customer and/or customer's representatives without Supplier's approval.