TV123WAM-ND0

Product Specification

Rev. P0

HEFEI BOE OPTOELECTRONICS TECHNOLOGY CO.,LTD

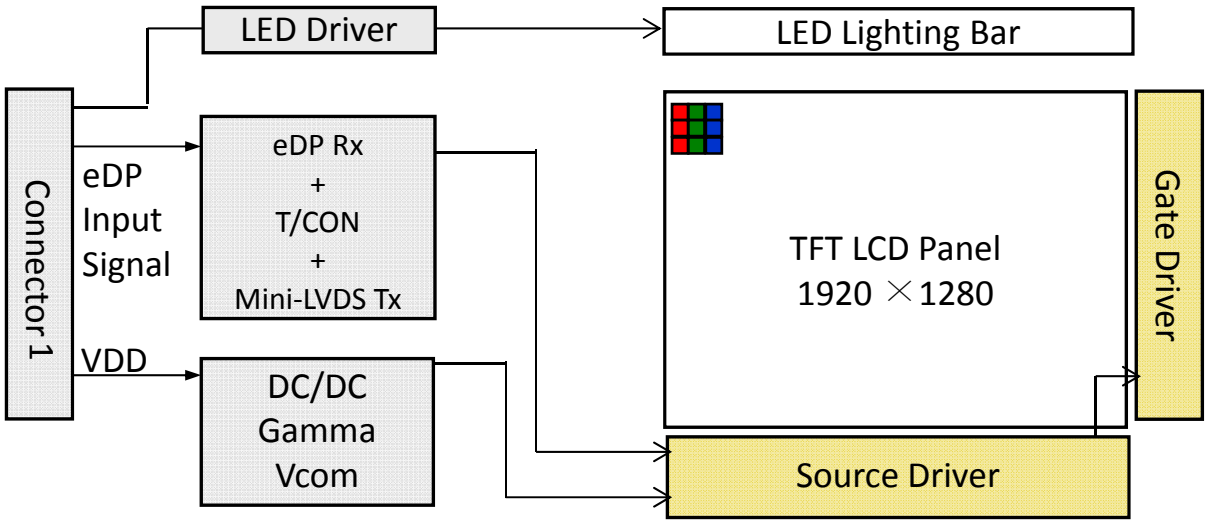
REV.	ECN No.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0	-	Initial version	2016/9/5	Tian Wei

Contents

1.0 GENERAL DESCRIPTION

1.1 Introduction

12.3 ‘s TFT LCD module uses amorphous silicon TFT‘s (Thin Film Transistors) as an actives witching devices. This module has a 12.3 inch diagonally measured active area with WUXGA+ resolutions (1920 horizontal by 1280 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical Stripe. The TFT-LCD panel used for this module is a low re-flection and higher color type. Therefore, this module is suitable for TPC. The LED Driver for back-light driving is not built in this model. All input signals are eDP1.4 interface compatible.



1.2 Features

- 2-in-1Business Tablet
- Thin and light weight——156g Max;1.96mm Max
- High color gamut——sRGB100% coverage
- Green Product (RoHS & Halogen free product)
- On board LED Driving circuit

1.3 Application

- TPC with touch function

1.4 General Specification

The followings are general specifications at the model TV123WAM-ND0. (listed in Table 1.)

<Table 1. General Specifications>

Parameter	Specification	Unit	Remarks
Active area	259.2(H) x 172.8(V)	mm	
Number of pixels	1920 (H) ×1280 (V)	pixels	
Pixel pitch	0.135(H) ×0.135 (V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display mode	Normally Black		
Dimensional outline	265.26 (H)×184.76(V) *1.96(Max)	mm	
Weight	161 (max)	g	
Surface treatment	HC		
Back-light	1-LED Lighting Bar type		Note 1
Power consumption	P_D :0.9 (max)	W	
	P_{BL} :3.31 (max)	W	
	P_{total} :4.21 (max)	W	

Notes : 1. LED Lighting Bar (8P6S, 48*LED Array)

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 3.

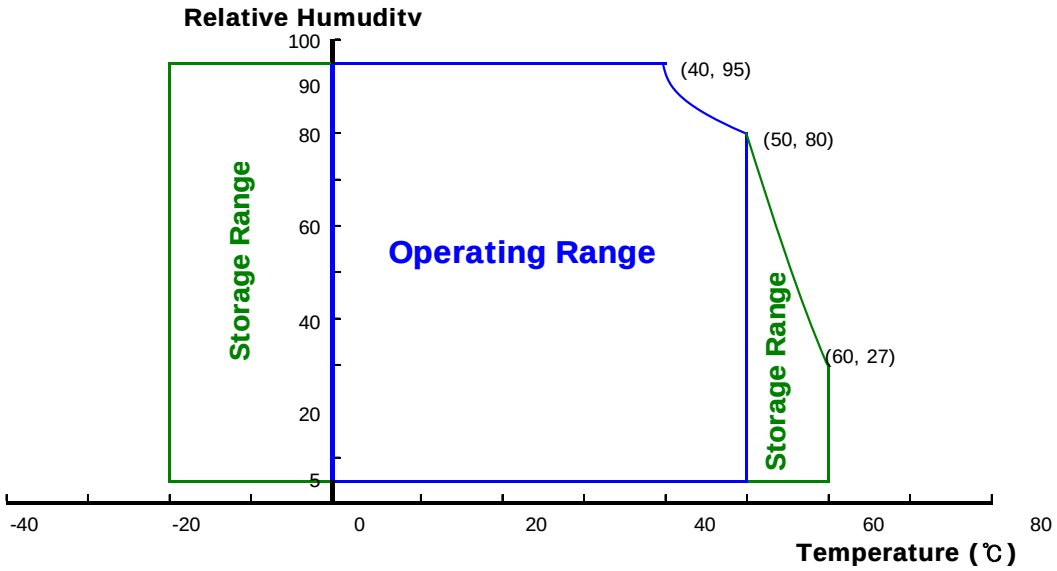
< Table 3. Absolute Maximum Ratings>

Ta=25+/-2˚C

Parameter	Symbol	Min.	Max.	Unit	Remarks
LCM Power Supply Voltage	V_{DD}	-0.3	4.0	V	Note 1
LCM Logic Supply Voltage	V_{IN}	V_{ss}-0.3	V_{DD}+0.3	V	
Operating Temperature	T_{OP}	0	+50	℃	Note 2
Storage Temperature	T_{ST}	-20	+60	℃	

Notes : 1. Permanent damage to the device may occur if maximum values are exceeded functional operation should be restricted to the condition described under normal operating conditions.

2. Temperature and relative humidity range are shown in the figure below.
   95 % RH Max. (40 ^{O}C ≥ Ta)
   Maximum wet - bulb temperature at 39 ^{O}C or less. (Ta > 40 ^{O}C) No condensation.



3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 4. Electrical specifications > Ta=25+/-2°C

Parameter		Min.	Typ.	Max.	Unit	Remarks
Power Supply Voltage	V_{DD}	3.0	3.3	3.6	V	Note 1
Permissible Input Ripple Voltage	V_{RF}	-	-	300	mV	At V_{DD} = 3.3V
Power Supply Current	I_{DD}	-	191	242	mA	Note 1
Positive-going Input Threshold Voltage	V_{IT+}	-	-	100	mV	Vcm = 1.2V typ.
Negative-going Input Threshold Voltage	V_{IT-}	-100	-	-	mV	
Differential Input Voltage	V_{ID}	-	-	600	mV	
Power Consumption	P_D	-	0.63	0.8	W	Note 1
	P_{BL}	-	3.28	3.31	W	
	P_{total}	-	3.91	4.21	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 3.3V 60Hz at 25℃. (Max: 8*6 Mosaic pattern)

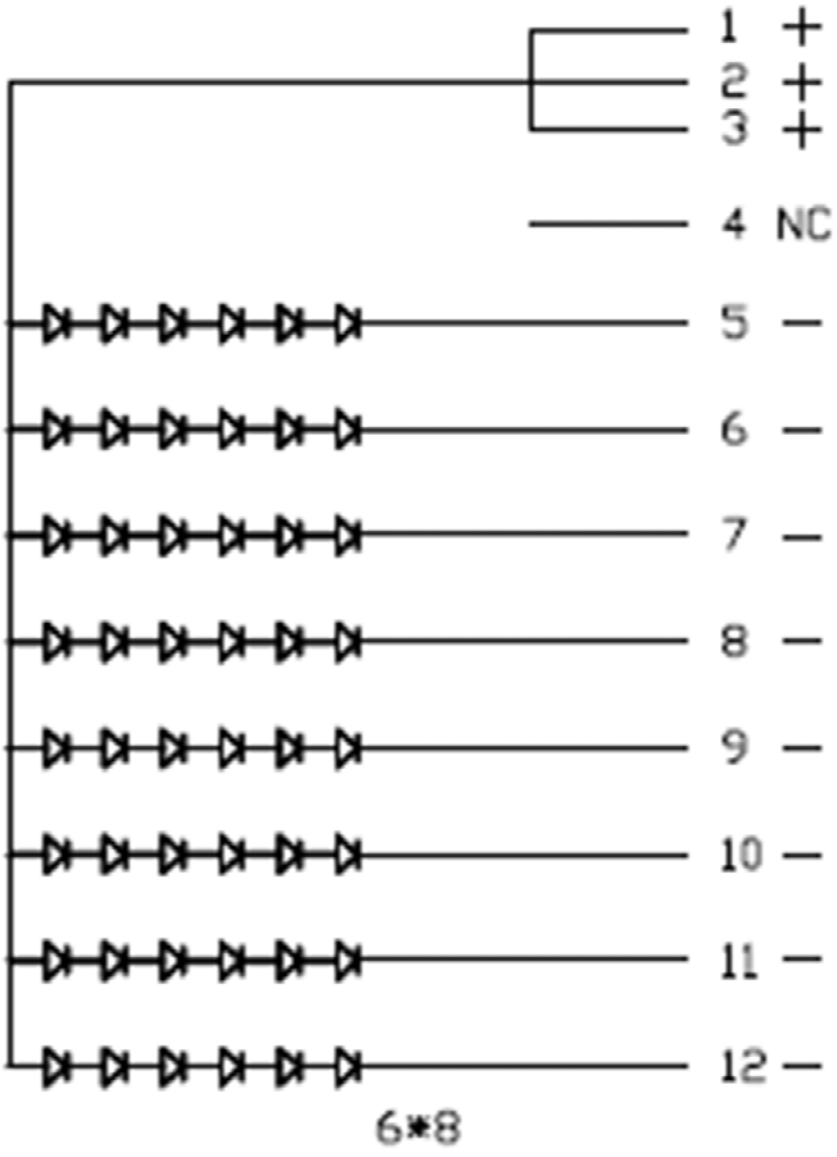
3.2 Backlight Unit

< Table 5. LED Driving guideline specifications > Ta=25+/-2˚C

Parameter		Min.	Typ.	Max.	Unit	Remarks
LED Forward Voltage	V_F	-	-	6.2	V	IF = 11.1mA
LED Forward Current	I_F	-	11.1		mA	-
LED Power Consumption	P_{LED}			3.31	W	Note 1
LED Life-Time	N/A	15,000	-	-	Hour	

Notes : 1. The LED Life-time define as the estimated time to 50% degradation of initial luminous.

3.3 LED structure 8P*6S



4.0 OPTICAL SPECIFICATION

4.1 Overview

The test of Optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = 25±2℃) with the equipment of Luminance meter system (Goniometer 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 θØ=0 (=θ3) as the 3 o'clock direction (the "right"), θØ=90 (= θ12) as the 12 o'clock direction ("upward"), θØ=180 (= θ9) as the 9 o'clock direction ("left") and θØ=270(= θ6) as the 6 o'clock direction ("bottom"). While scanning θand/or Ø, the center of the measuring spot on the Display surface shall stay fixed. The backlight should be operating for 30 minutes prior to measurement. VDD shall be 3.3+/- 0.3V at 25°C. Optimum viewing angle direction is 6 'clock.

4.2 Optical Specifications

<Table 6. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	80	85	-	Deg.	Note 1
		Θ_9		80	85	-	Deg.	
	Vertical	Θ_{12}		80	85	-	Deg.	
		Θ_6		80	85	-	Deg.	
Luminance Contrast ratio		CR	Θ = 0°	-	1200	-		Note 2
Luminance of White	5 Points	Y_w	Θ = 0° ILED = 11.1mA	360	400	-	cd/m^2	Note 3
White Luminance uniformity	5 Points	ΔY5		80%	-	-		Note 4
	13 Points	ΔY13		65%	-	-		
White Chromaticity		x_w	Θ = 0°	0.28	0.31	0.34	-	Note 5
		y_w		0.3	0.33	0.36	-	
Reproduction of color	Red	x_R	Θ = 0°	-0.03	0.646	+0.03	-	
		y_R			0.334		-	
	Green	x_G			0.295		-	
		y_G			0.612		-	
	Blue	x_B			0.150		-	
		y_B			0.064		-	
Color Gamut				-	73.5	-	%	NTSC
Response Time (Rising + Falling)		T_{RT}	Ta= 25° C Θ = 0°	-	25	30	ms	Note 6
Cross Talk		CT	Θ = 0°	-	-	2.0	%	Note 7

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 Θ= 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. (with TP)Center Luminance of white is defined as luminance values of 5 point average across 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.

4. The White luminance uniformity on LCD surface is then expressed as : ΔY =Minimum Luminance of 5(or 13) points / Maximum Luminance of 5(or 13) points.
(see FIGURE 2 and FIGURE 3).

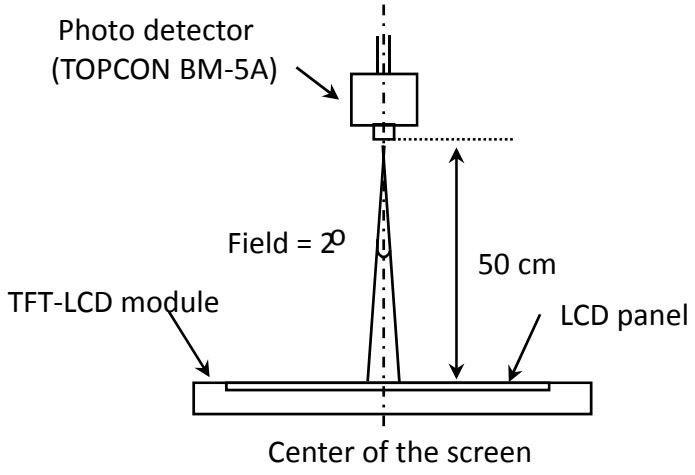
5. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

6. The electro-optical response time measurements shall be made as FIGURE 4 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

7. Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance (YA) of a 25mm diameter area, with all display pixels set to a gray level, to the luminance (YB) of that same area when any adjacent area is driven dark.
(See FIGURE 5).

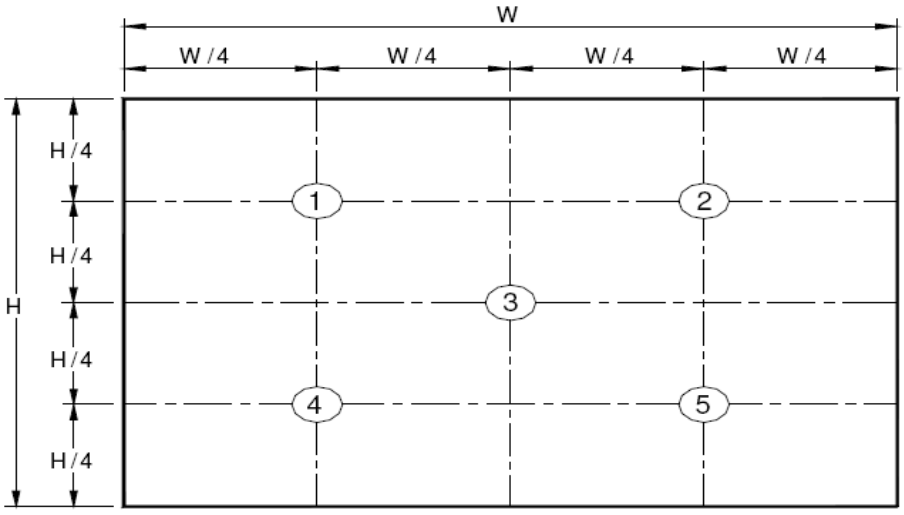
4.3 Optical measurements

Figure 1. Measurement Set Up



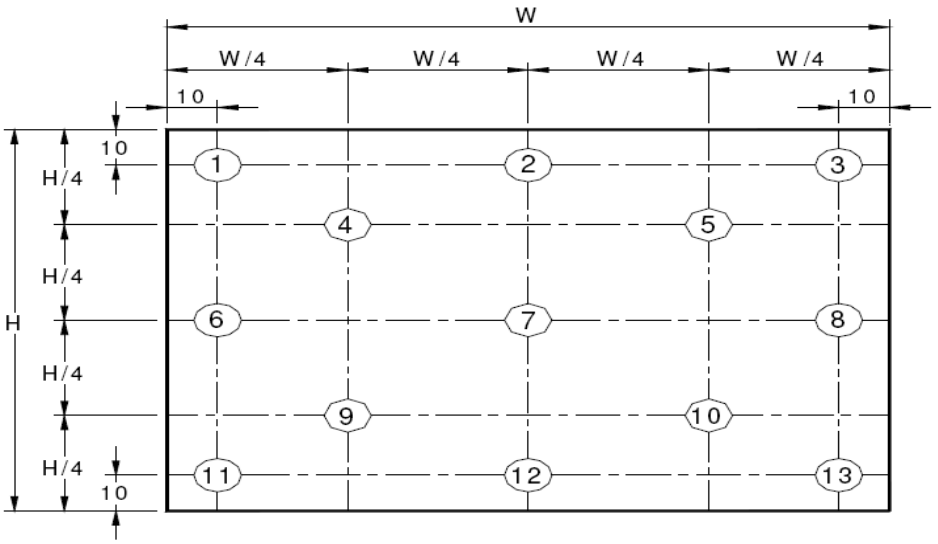
Optical characteristics measurement setup

Figure 2. White Luminance and Uniformity Measurement Locations (5 points)



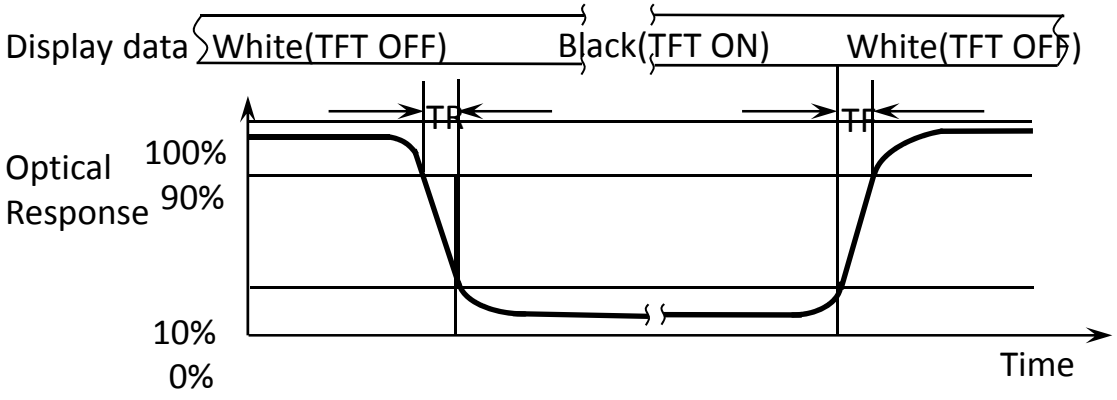
Center Luminance of white is defined as luminance values of center 5 points across the LCD surface. Luminance shall be measured with all pixels in the vie w field set first to white. This measurement shall be taken at the locations sho wn in FIGURE 2 for a total of the measurements per display.

Figure 3. Uniformity Measurement Locations (13 points)



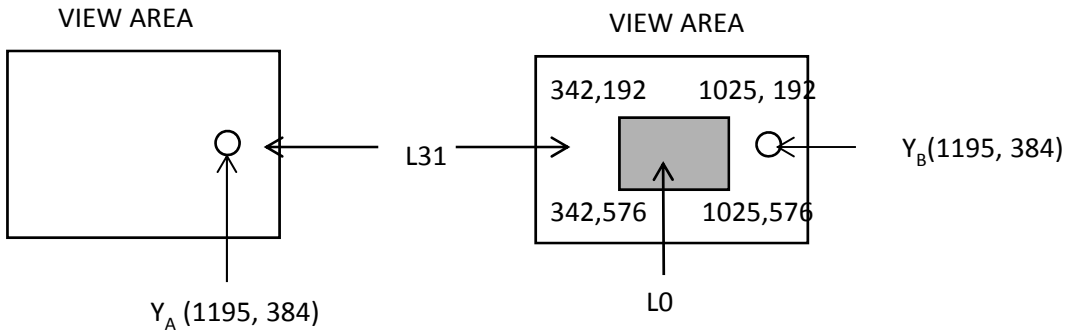
The White luminance uniformity on LCD surface is then expressed as : ΔY5 = Minimum Luminance of five points / Maximum Luminance of five points (see FIGURE 2) , ΔY13 = Minimum Luminance of 13 points /Maximum Luminance of 13 points (see FIGURE 3).

Figure 4. Response Time Testing



The electro-optical response time measurements shall be made as shown in FIGURE 4 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Td and 90% to 10% is Tr.

Figure 5. Cross Modulation Test Description



$$\text{Cross-Talk (\%)} = \left| \frac{Y_B - Y_A}{Y_A} \right| \times 100$$

Where:

Y_A = Initial luminance of measured area (cd/m^2)

Y_B = Subsequent luminance of measured area (cd/m^2)

The location measured will be exactly the same in both patterns

Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance (YA) of a 25mm diameter area, with all display pi xels set to a gray level, to the luminance (YB) of that same area when any a djacent area is driven dark (Refer to FIGURE 5).

5.0 INTERFACE CONNECTION.

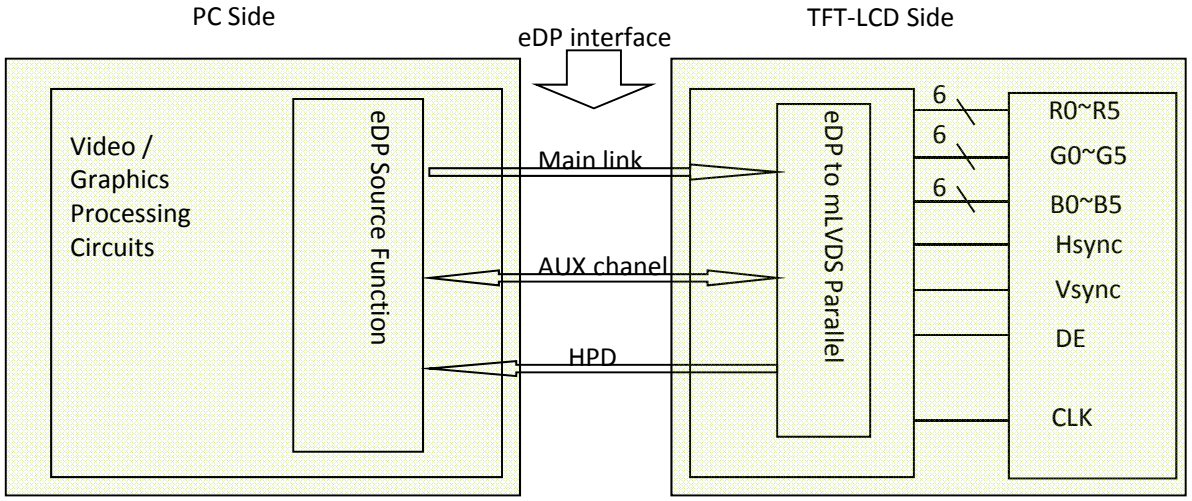
5.1 Electrical Interface Connection

The electronics interface connector is STM or Compatible or equivalent. The mating connector part number is I-PEX 20682-040E-02 or Compatible. The connector interface pin assignments are listed in Table 6.

<Table 7. Pin Assignments for the Interface Connector>

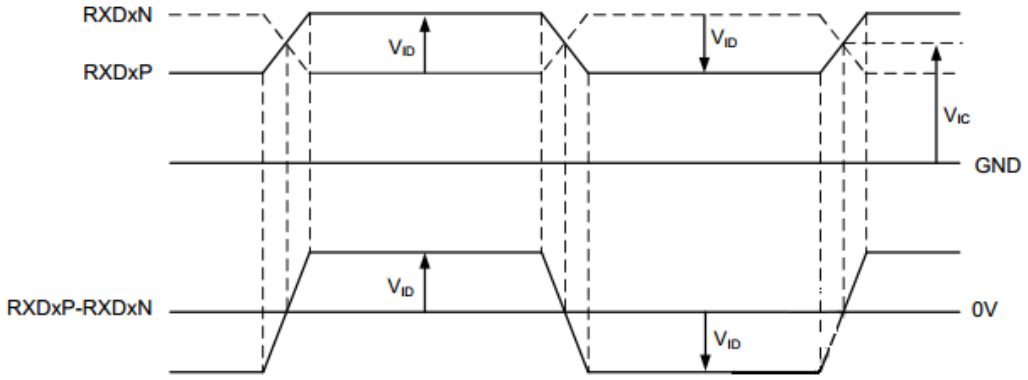
PIN	Symbol	Function	PIN	Symbol	Function
1	Gnd	Ground	21	NC(SCL) (System side will NC)	For BOE internal use
2	eDP TX1_N	eDP RX channel 1 negative	22	BKLT_FB8	Feed Back for LED Power
3	eDP TX1_P	eDP RX channel 1 positive	23	BKLT_FB7	LED -
4	Gnd	Ground	24	BKLT_FB6	LED -
5	eDP TX0_N	eDP RX channel 0negative	25	BKLT_FB5	LED -
6	eDP TX0_P	eDP RX channel 0 positive	26	BKLT_FB4	LED -
7	Gnd	Ground	27	BKLT_FB3	LED -
8	eDP Aux_P	eDP RX channel 0 negative	28	BKLT_FB2	LED -
9	eDP Aux_N	eDP RX channel 0 positive	29	BKLT_FB1	LED -
10	Gnd	Ground	30	NC	NC
11	LCD_VCC	Power Supply, 3.3V (typ.)	31	BL_PWMO (system Side will NC)	TCON PWM Feedback
12	LCD_VCC	Power Supply, 3.3V (typ.)	32	BL_PWMI (system Side will NC)	TCON PWMI Feedback
13	Gnd	Ground	33	NC	NC
14	Bist Enable	Panel self test enable	34	Hsync(NC)	Hsync
15	Gnd	Ground	35	Gnd	Ground
16	HPD	Hot plug detect output	36	Gnd	Ground
17	Gnd	Ground	37	NC	NC
18	ID0 (pull high 3.3V)	ID for System	38	BL_PWR	LED +
19	ID1 (pull low)	ID for System	39	BL_PWR	LED +
20	NC(SDA) (System side will NC)	For BOE internal use	40	BL_PWR	LED +

5.2. eDP Interface

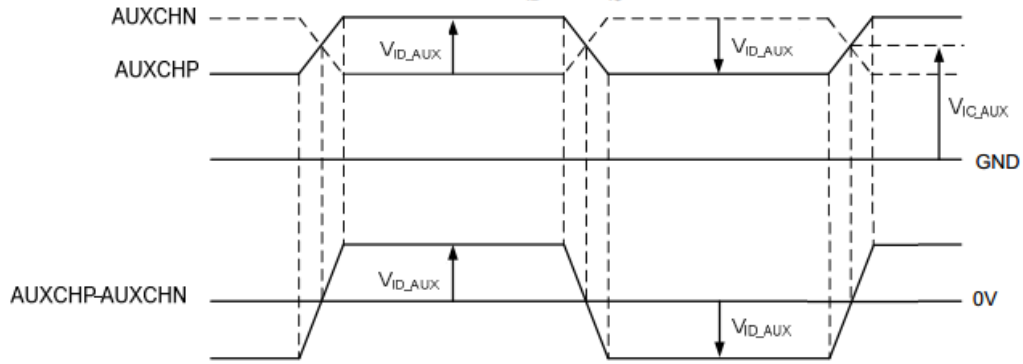


Note. Transmitter : Parade DP693 Transmitter is not contained in Module.

5.3.eDP Input signal



Main Link V_{ID} and V_{IC} definition



AUX CH V_{ID_AUX} and V_{IC_AUX} definition

5.4 Back-light & LCM Interface Connection

Interface Connector: Aces 50521-01201-001 or Equivalent

<Table 7. Pin Assignments for the BLU & LCM Connector>

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	Vout	LED cathode connection	7	LED	LED anode connection
2	Vout	LED cathode connection	8	LED	LED anode connection
3	Vout	LED cathode connection	9	LED	LED anode connection
4	NC	No Connection	10	LED	LED anode connection
5	LED	LED anode connection	11	LED	LED anode connection
6	LED	LED anode connection	12	LED	LED anode connection

6.0 SIGNAL TIMING SPECIFICATION

6.1 The TV123WAM-ND0 is operated by the DE only.

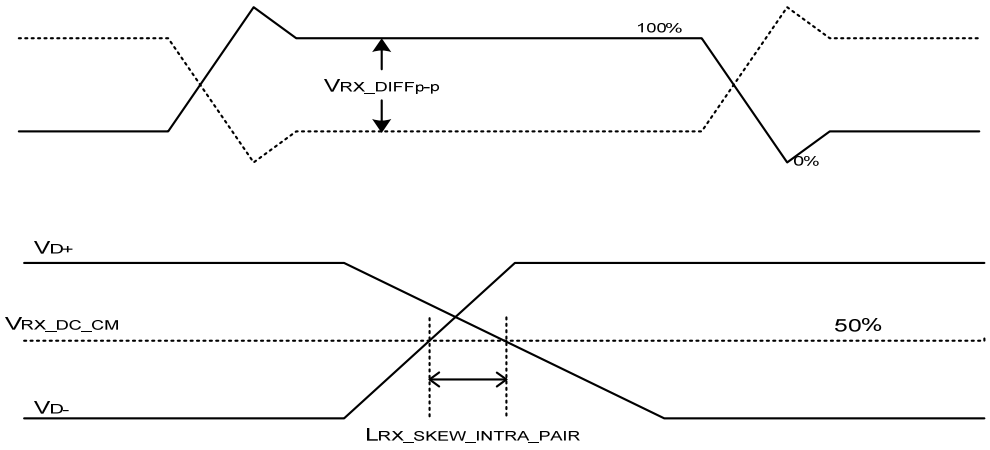
ITEM	Symbol		Min	Typ	Max	Unit	Note
CLK	Period	t_{CLK}	-	6.16	-	ns	
	Frequency	-	-	162.24	-	Mbps	
Hsync	Period	t_{HP}	-	2080	-	t_{CLK}	
	Frequency	f_H	-	124.8	-	KHz	
Vsync	Period	t_{VP}	-	1300	-	t_{HP}	
	Frequency	f_V	-	78	-	KHz	
Horizontal Active Display Term	Valid	t_{HV}	-	1920	-	t_{CLK}	
	Total	t_{HP}	-	2080	-	t_{CLK}	
Vertical Active Display Term	Valid	t_{VV}	-	1280	-	t_{HP}	
	Total	t_{VP}	-	1300	-	t_{HP}	

6.2 eDP Rx Interface Timing Parameter

The specification of the eDP Rx interface timing parameter is shown in Table 9.

<Table 9. eDP Rx Interface Timing Specification>

Item	Symbol	Min	Typ	Max	Unit	Remark
Differential peak-to-peak input voltage at package pins	VRX-DIFFp-p	120	-	-	mV	
Rx input DC common mode Voltage	VRX_DC_CM	0	-	2.0	V	
Differential termination resistance	RRX-DIFF		100		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	-	-	60	ps	

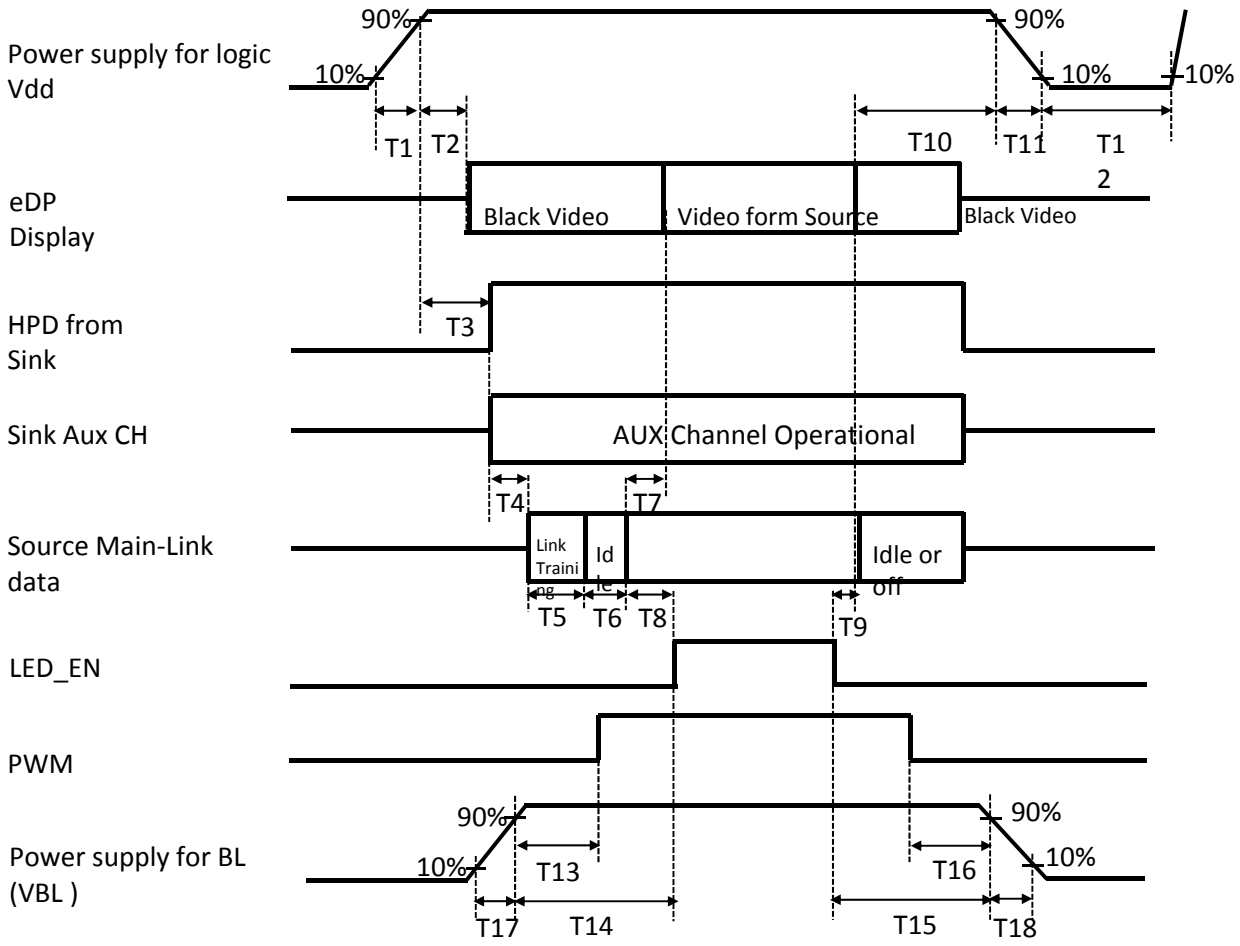


7.0 INPUT SIGNALS, BASIC DISPLAY COLORS & GRAY SCALE OF COLORS

Color & Gray Scale		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	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	0	1	0	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	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	0	1	0	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	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	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	0
	△	↑								↑								↑							
	▽	↓								↓								↓							
	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	0	1	0	0	0	0	0	0	0	1	0	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	0
	△	↑								↑								↑							
	▽	↓								↓								↓							
	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

8.0 POWER SEQUENCE

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



- 0.5ms ≤ T1 ≤ 10 ms
- 0ms ≤ T2 ≤ 200 ms
- 0ms ≤ T3 ≤ 200 ms
- 50ms ≤ T7
- 0ms ≤ T13
- 0ms ≤ T14
- 0ms ≤ T17
- 0ms ≤ T7 ≤ 50ms
- 0ms ≤ T10 ≤ 500 ms
- 0 ms ≤ T11 ≤ 10 ms
- 150ms ≤ T12
- 0ms ≤ T15
- 0ms ≤ T16
- 0ms ≤ T18

Notes:

1. When the power supply VDD is 0V, keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on back Light must be turn on after power for logic and interface signal are valid.

9.0 Connector Description

Physical interface is described as for the connector on LCM.
These connectors are capable of accommodating the following signals and will be following components.

9.1 TFT LCD Module

Connector Name /Description	For Signal Connector
Manufacturer	IPEX
Type/ Part Number	I-PEX 20682-040E-02
Mating housing/ Part Number	-

10.0 MECHANICAL CHARACTERISTICS

10.1 Dimensional Requirements

FIGURE 6 shows mechanical outlines for the model NV116WHM-N41.
Other parameters are shown in Table 10.

<Table 10. Dimensional Parameters>

Parameter	Specification	Unit
Active Area	259.2 (H) ×172.8 (V)	
Number of pixels	1920 (H) X 1280 (V) (1 pixel = R + G + B dots)	
Pixel pitch	0.135 (H) X 0.135 (V)	
Pixel arrangement	sRGB Vertical stripe	
Display colors	262K	
Display mode	Normally black	
Dimensional outline	265.26 (H)×184.76 (V)	mm
Weight	161 Max.	g
Back Light	Connector : 51614-01201-001	
	8p*6s	

10.2 Mounting

See FIGURE 6.

10.3 Light Leakage

There shall not be visible light from the back-lighting system around the edges of the screen as seen from a distance 50cm from the screen with an overhead light level of 350lux.

11.0 RELIABILITY TEST

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

<Table 11. Reliability test>

No	**Test Items**	**Conditions**
1	Temperature Humidity Bias	Ta = 50 ℃, 80%RH, 240 hrs
2	High Temperature Operation	Ta = 60 ℃, 240 hrs
3	Low Temperature Operation	Ta = 0 ℃, 240 hrs
4	High Temperature Storage	Ta = 60 ℃, 240 hrs
5	Low Temperature Storage	Ta = -20 ℃, 240 hrs
6	Thermal Shock Test	Ta = -20 ℃ ↔ 60 ℃ (0.5 hr), 100 cycles
7	ESD	Contact : 150 pF, 330Ω, 4 KV Air : 150 pF, 330Ω, 8 KV

12.0 HANDLING & CAUTIONS

(1) Cautions when taking out the module
- Pick the pouch only, when taking out module from a shipping package.

(2) Cautions for handling the module
- As the electrostatic discharges may break the LCD module, handle the LCD module with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.
- As the LCD panel and back - light element are made from fragile glass material, impulse and pressure to the LCD module should be avoided.
- As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.
- Do not pull the interface connector in or out while the LCD module is operating.
- Put the module display side down on a flat horizontal plane.
- Handle connectors and cables with care.

(3) Cautions for the operation
- When the module is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.

(4) Cautions for the atmosphere

- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

(5) Cautions for the module characteristics

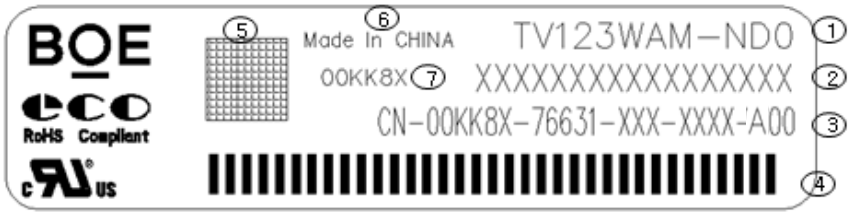
- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

(6) Other cautions

- Do not disassemble and/or re-assemble LCD module.
- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

13.0 LABEL

(1) Product label



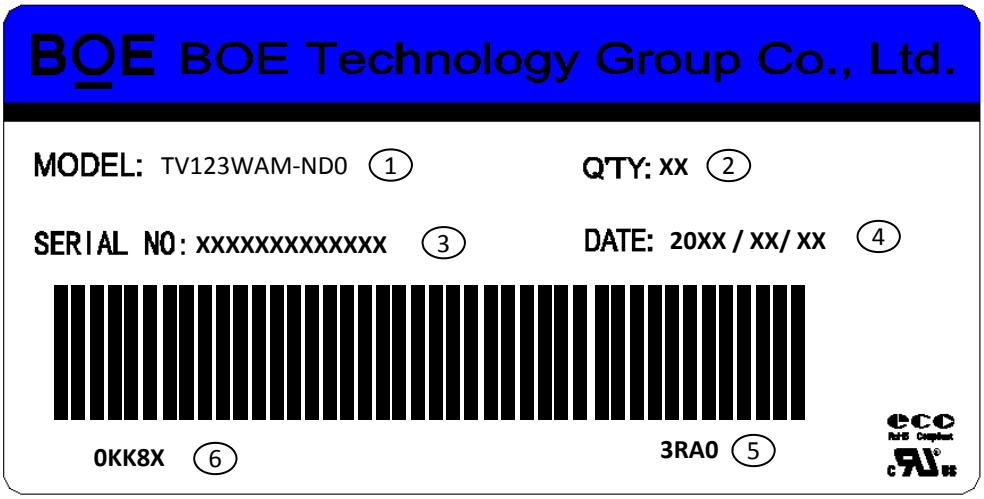
Label Size: 48mm × 12mm

1. FG-CODE
2. MDL ID
3. PPID
4. MDL ID 条纹码
5. PPID 二维码
6. Made In CHINA (产地)
7. 物料号: 00KK8X

序列号	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
代码	X	X	P	3	1	2	7	3	R	A	0	0	0	1	E	E	J
描述	GBN 代码		等级	B 3	年份		月	FG Code后四位				序列号					

(2) Box label

Label Size: 110 mm (L) × 56 mm (W)
Contents
Model: TV123WAM-ND0-3RA0
Q`ty: Module Q`ty in one box
Serial No.: Box Serial No. See next figure for detail description.
Date: Packing Date
Internal use of Product



1. FG-CODE
2. Box 产品数量
3. Box ID
4. Box Packing 日期
5. FG-CODE 后四位
6. 产品料号

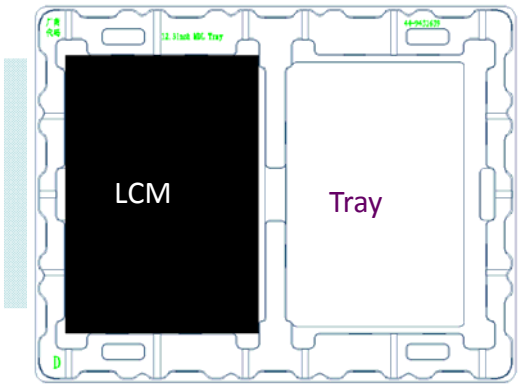
序列号	1	2	3	4	5	6	7	8	9	10	11	12	13
代码	X	X	P	3	1	6	7	0	0	0	1	H	D
描述	GBN代码		等级	B3	年份		月	Rev	序列号				

14.0 PACKING INFORMATION

14.1 Packing order

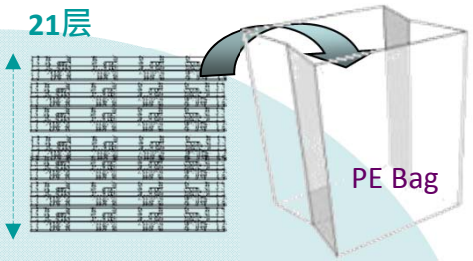
-. 将 2pcs MDL 平放入Tray

-. 上下放置1pcs EPE Spacer



-. 将21pcs PET Tray 平放入PE Bag

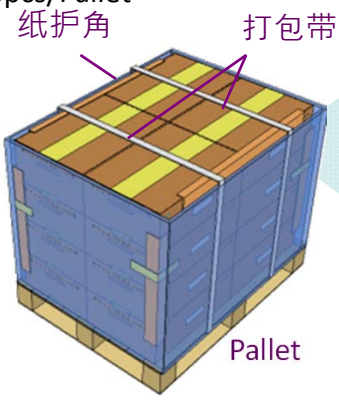
-. 顶部1pcs 空Tray



-. 每个Pallet上放4层Box, 1层4箱,共计12ea Box

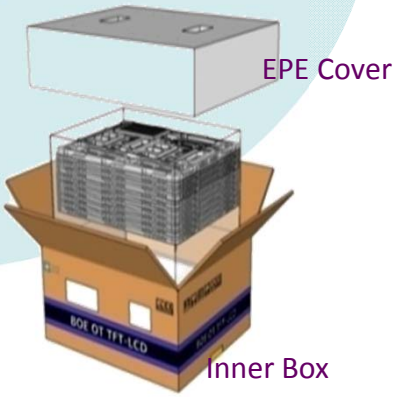
-. Pallet 四边及打包带位置放置纸护角后,
以缠绕膜包裹

-. 容量: 640pcs/Pallet



-.将PET Tray堆码后平放入Inner Box
上下放置EPE Cover

-. 容量：40pcs/Inner Box



14.2 Notes

- Box Dimension: 510mm(W) x 410mm(D) x 250mm(H)
- Package Quantity in one Box: 40pcs

15.0 MECHANICAL OUTLINE DIMENSION

Figure 6. TFT-LCD Module Outline Dimension (Front View)

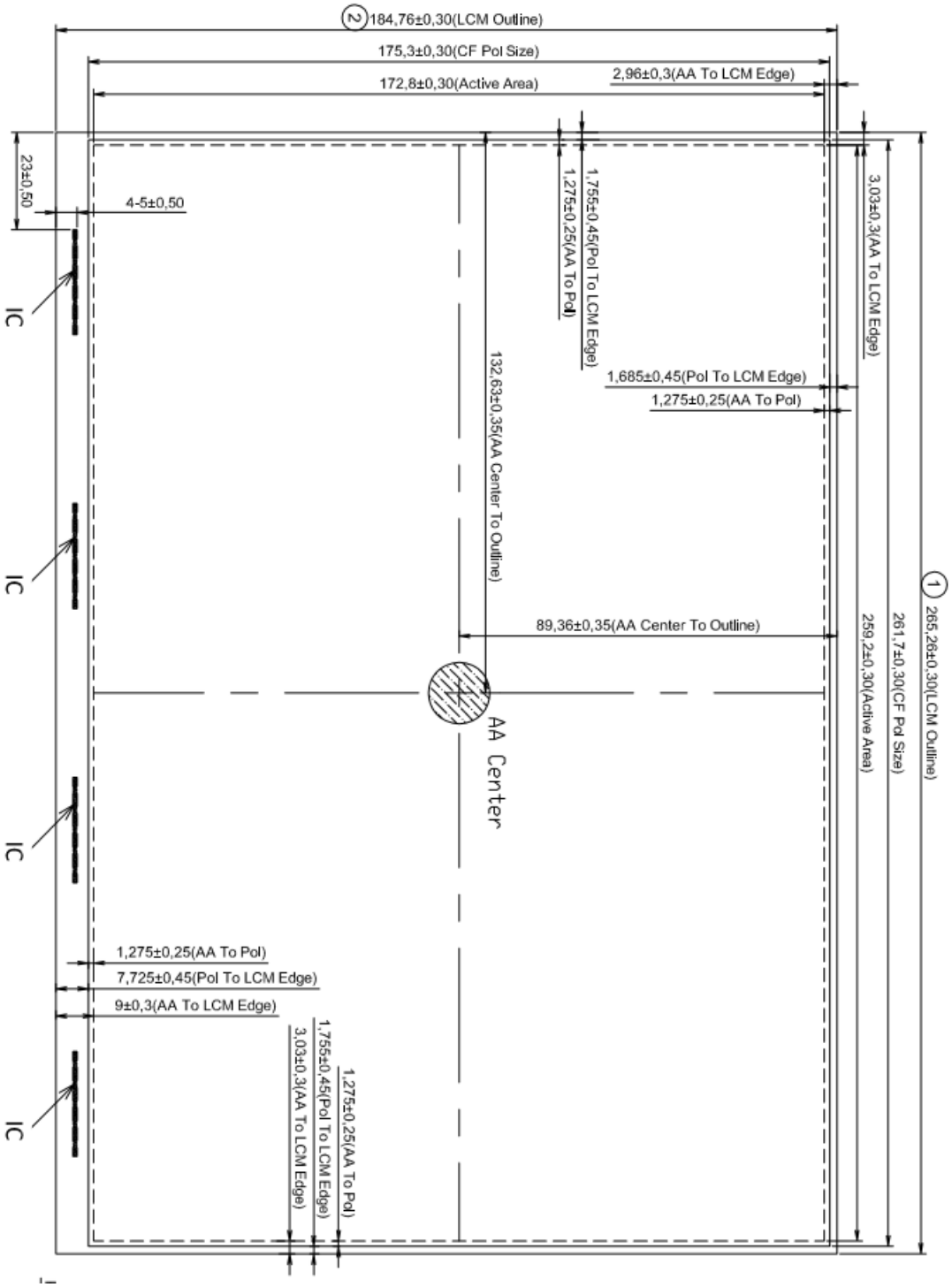
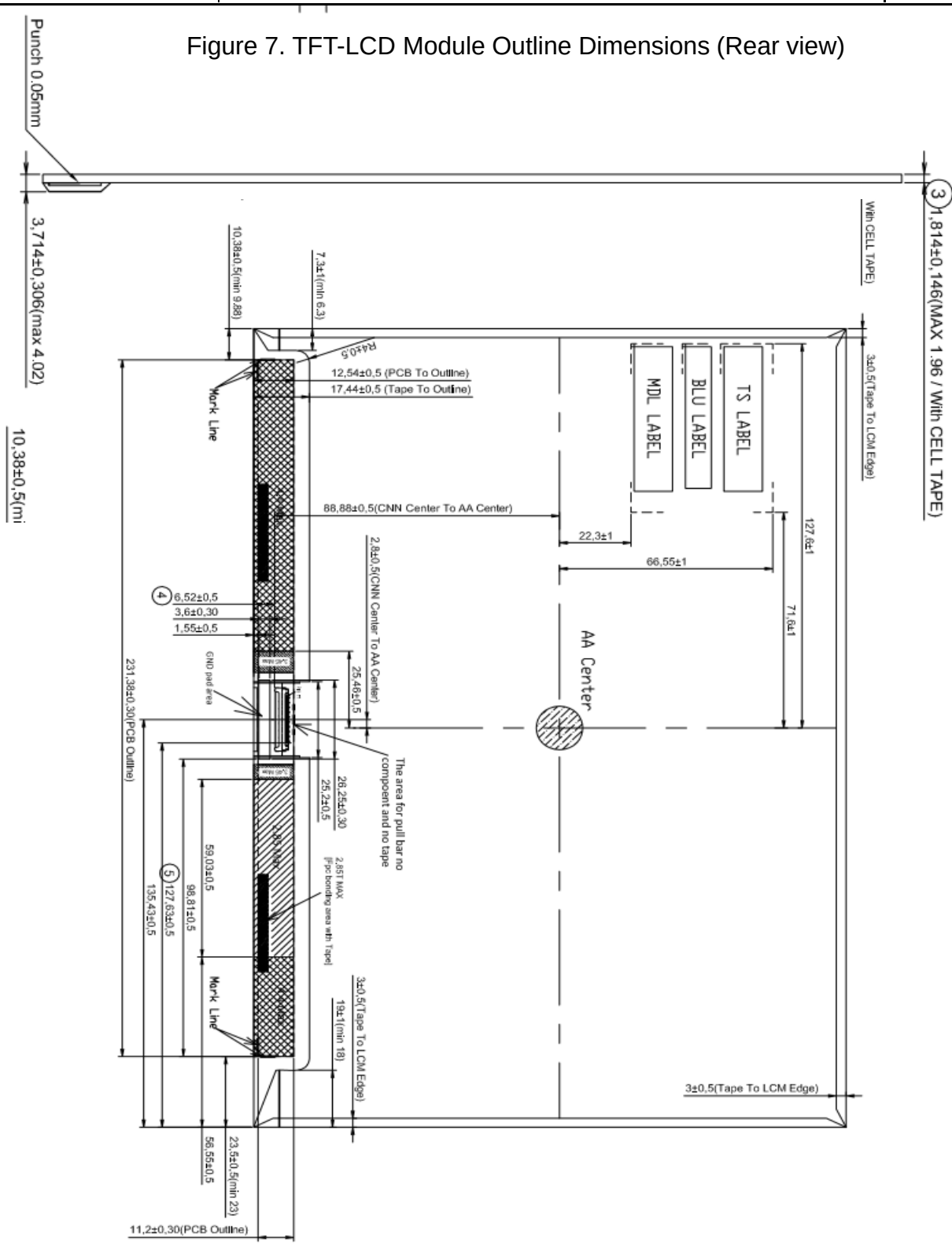


Figure 7. TFT-LCD Module Outline Dimensions (Rear view)



16.0 EDID Table

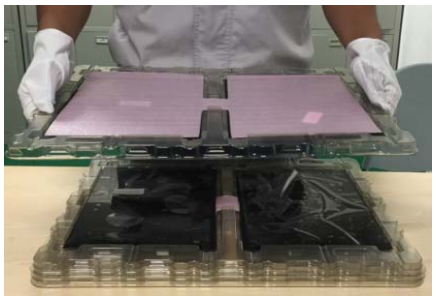
Address (HEX)	Function	Hex	Dec	crc	Input values.	Notes
00	Header	00	0		0	EDID Header
01		FF	255		255	
02		FF	255		255	
03		FF	255		255	
04		FF	255		255	
05		FF	255		255	
06		FF	255		255	
07		00	0		0	
08	ID Manufacturer Name	09	9		BOE	ID = BOE
09		E5	229			
0A	ID Product Code	**DC**	**220**		**1756**	ID = 1756
0B		**06**	**6**			
0C	32-bit serial No.	00	0			
0D		00	0			
0E		00	0			
0F		00	0			
10	Week of manufacture	1	1		1	
11	Year of Manufacture	**1A**	**26**		**2016**	Manufactured in 2016
12	EDID Structure Ver.	01	1		1	EDID Ver 1.0
13	EDID revision #	**04**	**4**		**4**	**EDID Rev. 0.4**
14	Video input definition	**A5**	165		-	
15	Max H image size	1A	26		26	26 cm (Approx)
16	Max V image size	11	17		17	17 cm (Approx)
17	Display Gamma	78	120		2.2	Gamma curve = 2.2
18	Feature support	0A	10			RGB display, Preferred Timming mode
19	Red/Green low bits	**DE**	**222**		-	**Red / Green Low Bits**
1A	Blue/White low bits	**50**	**80**		-	**Blue / White Low Bits**
1B	Red x high bits	**A3**	**163**	**655**	0.640	**Red (x) = 10100011 (0.64)**
1C	Red y high bits	**54**	**84**	**337**	0.330	**Red (y) = 01010100 (0.33)**
1D	Green x high bits	**4C**	**76**	**307**	0.300	**Green (x) = 01001100 (0.3)**
1E	Green y high bits	**99**	**153**	**614**	0.600	**Green (y) = 10011001 (0.6)**
1F	Blue x high bits	**26**	**38**	**153**	0.150	**Blue (x) = 00100110 (0.15)**
20	BLue y high bits	**0F**	**15**	**61**	0.060	**Blue (y) = 00001111 (0.06)**
21	White x high bits	**50**	**80**	**320**	0.313	**White (x) = 01010000 (0.313)**
22	White y high bits	**54**	**84**	**336**	0.329	**White (y) = 01010100 (0.329)**
23	Established timing 1	00	0		-	
24	Established timing 2	00	0		-	
25	Established timing 3	00	0		-	
26	Standard timing #1	01	1			Not Used
27		01	1			
28	Standard timing #2	01	1			Not Used
29		01	1			
2A	Standard timing #3	01	1			Not Used
2B		01	1			
2C	Standard timing #4	01	1			Not Used
2D		01	1			
2E	Standard timing #5	01	1			Not Used
2F		01	1			

30	Standard timing #6	01	1			Not Used
31		01	1			
32	Standard timing #7	01	1			Not Used
33		01	1			
34	Standard timing #8	01	1			Not Used
35		01	1			
36	Detailed timing/monitor descriptor #1	**60**	**96**		**162.24**	**162.24MHz Main clock**
37		**3F**	**63**			
38		80	128		1920	Hor Active = 1920
39		**A0**	**160**		**160**	**Hor Blanking = 160**
3A		70	112		-	4 bits of Hor. Active + 4 bits of Hor. Blanking
3B		00	0		1280	Ver Active = 1280
3C		**14**	**20**		**20**	**Ver Blanking = 20**
3D		50	80		-	4 bits of Ver. Active + 4 bits of Ver. Blanking
3E		30	48		48	Hor Sync Offset = 48
3F		20	32		32	H Sync Pulse Width = 32
40		84	132		8	V sync Offset = 8 line
41		00	0		4	V Sync Pulse width : 4 line
42		03	3		259	Horizontal Image Size = 259 mm (Low 8 bits)
43		AD	173		173	Vertical Image Size = 173 mm (Low 8 bits)
44		10	16		-	4 bits of Hor Image Size + 4 bits of Ver Image Size
45		00	0		0	Hor Border (pixels)
46		00	0		0	Vertical Border (Lines)
47		1A	26			Refer to right table
48	Detailed timing/monitor descriptor #2	**B3**	**179**		**129.79**	**129.792MHz Main clock**
49		**32**	**50**			
4A		80	128		1920	Hor Active = 1920
4B		**A0**	**160**		**160**	**Hor Blanking = 160**
4C		70	112		-	4 bits of Hor. Active + 4 bits of Hor. Blanking
4D		00	0		1280	Ver Active = 1080
4E		**14**	**20**		**20**	**Ver Blanking = 20**
4F		50	80		-	4 bits of Ver. Active + 4 bits of Ver. Blanking
50		30	48		48	Hor Sync Offset = 48
51		20	32		32	H Sync Pulse Width = 32
52		84	132		8	V sync Offset = 8 line
53		00	0		4	V Sync Pulse width : 4 line
54		03	3		259	Horizontal Image Size = 259 mm (Low 8 bits)
55		AD	173		173	Vertical Image Size = 173 mm (Low 8 bits)
56		10	16		-	4 bits of Hor Image Size + 4 bits of Ver Image Size
57		00	0		0	Hor Border (pixels)
58		00	0		0	Vertical Border (Lines)
59		1A	26			

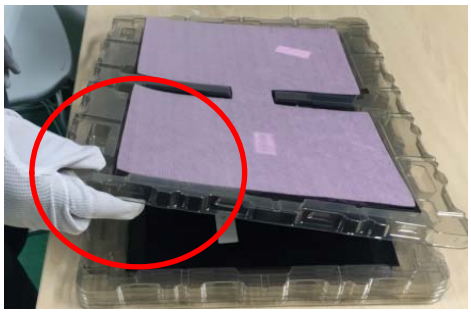
5A	Detailed timing/monitor descriptor #3	00	0			ASCII Data Sting Tag
5B		00	0			
5C		00	0			
5D		FE	254			
5E		00	0			
5F		**30**	**48**		**0**	D/PN:0KK8X
60		**4B**	**75**		**K**	
61		**4B**	**75**		**K**	
62		**38**	**56**		**8**	
63		**58**	**88**		**X**	
64		14	20		10000000	**EDID:A00**
65		54	84		T	BOE PN
66		56	86		V	
67		31	49		1	
68		32	50		2	
69		4E	78		N	
6A		44	68		D	
6B		**30**	**48**		0	
6C	Detailed timing/monitor descriptor #4	00	0			Product Name Tag (ASCII)
6D		00	0			
6E		00	0			
6F		00	0			
70		00	0			
71		**02**	**2**		**00000010**	**8-bit Color Depth & no FRC**
72		**41**	**65**		**01000001**	**WLED & singal light bar & one light bar**
73		**01**	**1**		**00000001**	**Frame rate 40Hz~65Hz, Support**
74		**28**	**40**		**00101000**	Light Controller:PWM & Max. Luminance 400
75		**05**	**5**		**00000101**	**Front Surface:True Life& RGB v-stripe**
76		**01**	**1**		**00000001**	with DBC
77		**00**	**0**		**00000000**	**no Motion Blur & no Active Gamma**
78		**00**	**0**		**00000000**	**no Wireless Enhancement & no In-Cell Scanner**
79		**0A**	**10**		**00001010**	2 Lane edp1.4
7A		**01**	**1**		**00000001**	**Built-In Self Test**
7B		0A	10			
7C		20	32			
7D		20	32			
7E	Extension flag	00	0			
7F	Checksum	15	21	21	-	

17.0 HANDLING SOP

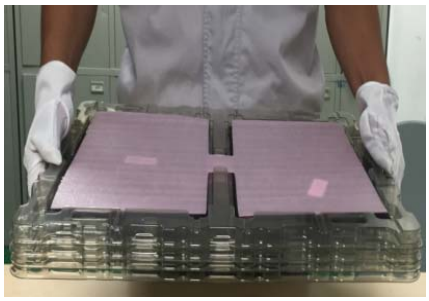
a. Tray 盘拿取动作：使用双手拿住Tray盘短边的中心位置， 不要使用一只手进行拿取



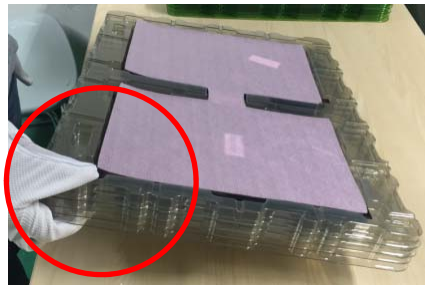
正确



错误



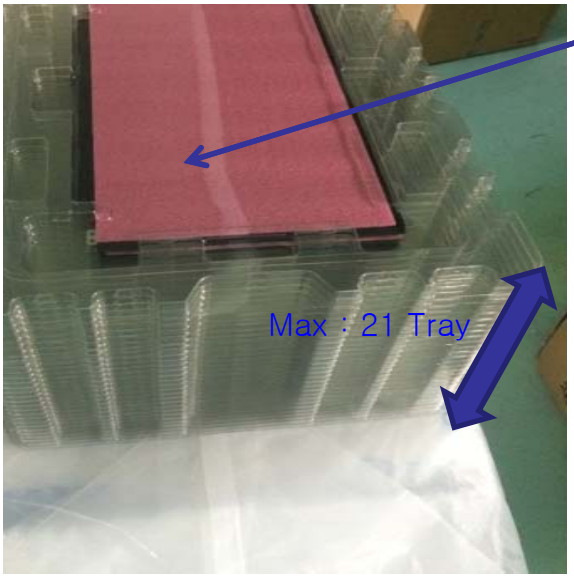
正确

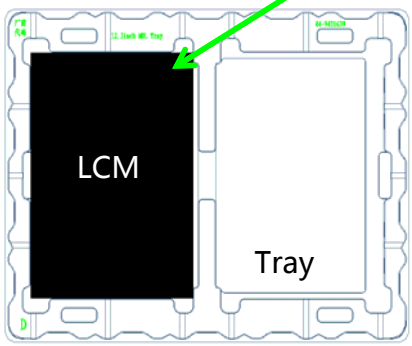


错误

b. Tray 盘要一直放在平坦的支撑面且Tray盘摞在一起时， 最多不允许超过21个Tray盘；

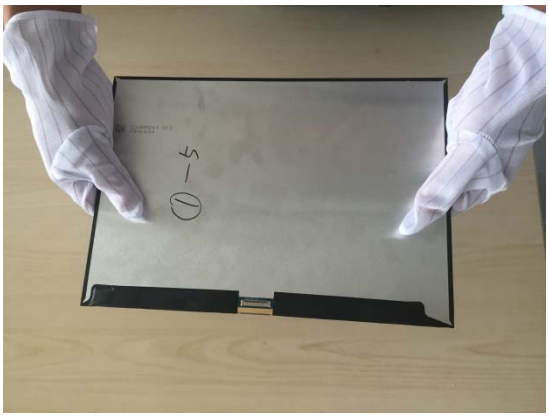
c. 模组在Tray中放置 必须确保 PCBA侧朝Tray内侧放置， 且每个Tray中的模组要有上下两个红色垫片对模组进行保护；





17.0 HANDLING SOP

d. 模组拿取动作：使用双手拿住模组短边的中心位置，不要使用一只手进行拿取；



正确

错误

模组最佳拿取方式为吸球拿取