BOE

TV080WXM-AD0

Product Specification

Rev. P1

HEFEI BOE OPTOELECTRONICS TECHNOLOGY CO.,LTD

REVISION HISTORY

REV.	ECN No.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0	-	Initial Release	2015.5.29	Hua zhengxin
P1			2015.8.18	Hulingxiao

Contents

1.0 General Description

1.1 Application

- Tablet PC With Touch function

1.2 General Specification

1.2.1.General Total Solution Specification(Table 1.)

<Table 1. General Specifications>

Parameter	Specification	Unit	Remarks
Active area	107.64(H) x 172.224(V)	mm	
Number of pixels	800(H) ×1280(V)	pixels	
Pixel pitch	44.85(H) ×RGB×134.55(V)	㎛	
Pixel arrangement	Pixels RGB stripe arrangement		
Display colors	16.7M(8bits)	colors	
Display mode	Normally Black		
Outline Dimension	114.6(H) × 184.6(V)	mm	Tolerance: ±0.3 mm
Thickness	2.15(max.)	mm	LCM
Weight	130g (max.) (TP 55g max., LCM 75g max.)	gram	
Power Consumption	P_D : 0.4(max.)	Watt	
	P_{BL} : 1.36(max.)		
	P_{total} : 1.76(max.)		
Surface Treatment	HC+HC		

1.2 .2. Mechanical Characteristics(Table 2.)

<Table 2. Mechanical Characteristics>

Parameter	Specification	Unit	Remarks
TP Technology	PCT	-	
Touch Structure	OGS		
OGS Overall Size	X:212.4±0.1/Y:126.4±0.1	[mm]	
TP View Area	X:173.22 Y:108.64	[mm]	
TP Active Area	X:172.22 Y:107.64	[mm]	
Total Thickness	3.1Max	[mm]	
Surface Hardness	7H	-	
Surface Treatment	AS	-	
OGS Sensor Thickness	0.7	[mm]	
Bonding Mode	Direct-bonding	-	
ASF (Anti-Split Film)	No		
Anti-Water	No		
Transmittance	>90	%	After Bonding
Strength	500	mpa	

1.2 .3.LCM Electrical characteristics(Table 3.)

<Table 3. LCM Electrical characteristics>

Parameter	Specification	Unit	Remarks
Control Board Form	FPCA	-	
Type of Master IC	NT35523B		1chip
Number of channels	2400		
VDD	3.3	[V]	
Interface	MIPI	-	
Touch Points (min)	10	-	
Auto Calibration	Yes		
Power Consumption (max.)	0.4	[Watts]	

1.2 .4. TP Electrical characteristics (Table 4.)

<Table 4. TP Electrical characteristics>

Parameter	Specification	Unit	Remarks
TP Technology	PCT	-	
Touch Structure	OGS	-	
System OS	Win7, MS OS after Win8.1	-	
Control Board Form	PCBA	-	Wacom provide
Control Board Size	33*14	[mm]	
Control Board Thickness	1.9	[mm]	
Type of Master IC	W9006	-	
Number of Tx / Rx	28/44	-	
VDD	3.3	[V]	
Interface	I2C	-	
Touch Points (min)	10	-	
Active pen	Yes	-	
Auto Calibration	Yes	-	
Power Consumption (max.)	< 0.120 W active； < 0.010 W idle	[Watts]	

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> Ta=25+/-2°C

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	V_{DD}	-0.3	5	V	Note 1
Operating Temperature	T_{OP}	-20℃~70℃		℃	
Storage Temperature	T_{ST}	-30℃~80℃		℃	

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.

3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 3. 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}	-	75	111	mA	Note 1
Differential Input Voltage	V_{ID}	70	-	-	mV	
Power Consumption	P_D	-	0.25	0.4	W	Note 1
	P_{BL}	-	-	1.36	W	Note 2
	P_{total}	-	-	1.76	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 at 25℃.
a) Typ : Mosaic Pattern
b) Max :R/G/B Pattern
2. Calculated value for reference (V_{LED} × I_{LED})

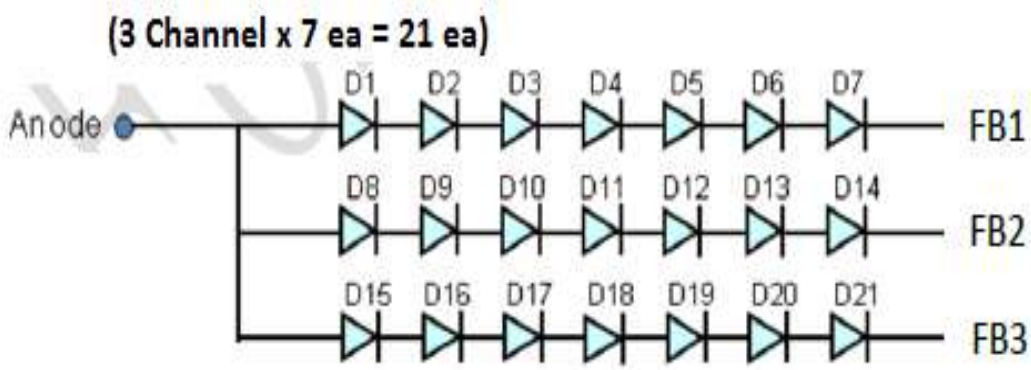
3.2 Backlight Unit

< Table 4. LED Driving guideline specifications > Ta=25+/-2°C

Parameter		Min.	Typ.	Max.	Unit	Remarks
LED Forward Voltage	V_F	-	-	3.0	V	-
LED Forward Current	I_F	-	21.5	-	mA	-
LED Power Consumption	P_{LED}	-	-	1.36	W	
LED Life-Time	N/A	15,000	-	-	Hour	I_F = 20mA Note 1
Power supply voltage for LED Driver	V_{LED}	-	-	-	V	

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

3.3 LED structure



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.

4.2 TTL Optical Specifications

<Table 5. TTL Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	80	-	-	Deg.	Note 1
		Θ_9		80	-	-	Deg.	
	Vertical	Θ_{12}		80	-	-	Deg.	
		Θ_6		80	-	-	Deg.	
Luminance Contrast ratio		CR	Θ = 0°	-	800:1	-		Note 2
Luminance of White	5 Points	Y_w	Θ = 0° I_{LED} = 21.5mA	340	400	-	cd/m²	LCD Only Note 3
White Luminance uniformity	5 Points	ΔY5		80	-	-		Note 4
	13 Points	ΔY13		65	-	-		
White Chromaticity		x_w	Θ = 0°	0.283	0.313	0.343		Note 5
		y_w		0.299	0.329	0.359		
Reproduction of color	Red	x_R	Θ = 0°	-0.03	0.609	+0.03		
		y_R			0.353			
	Green	x_G			0.334			
		y_G			0.588			
	Blue	x_B			0.158			
		y_B			0.096			
Gamut				-	57.2		%	
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. Center Luminance of white is defined as luminance values of 5 point (33,37,73,77) 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 : ΔY13 and ΔY5. ΔY13 =1- Minimum Luminance of 13 points /Maximum Luminance of 13 points , ΔY5 =1- Minimum Luminance of 5 points /Maximum Luminance of 5 points
(see FIGURE 2 and FIGURE 3).

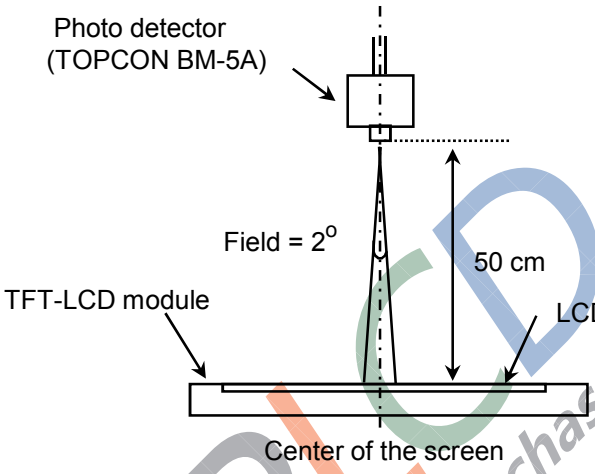
5. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

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).

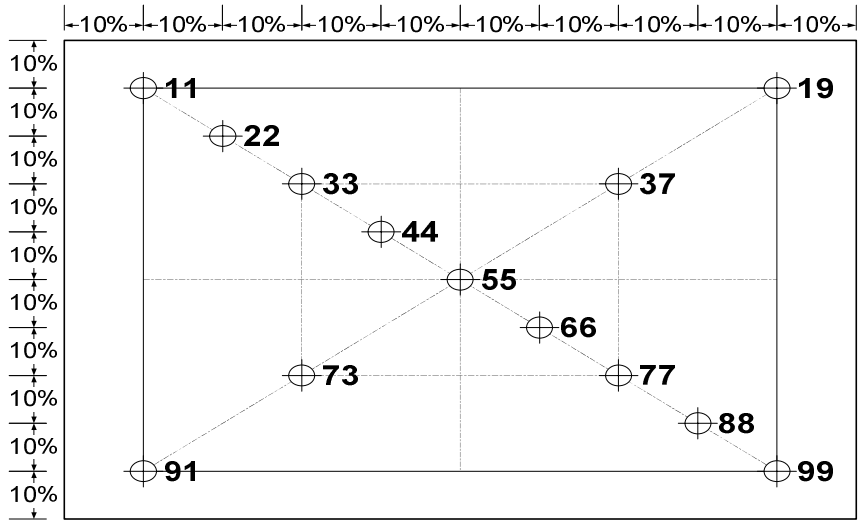
4.3 Optical measurements

Figure 1. Measurement Set Up



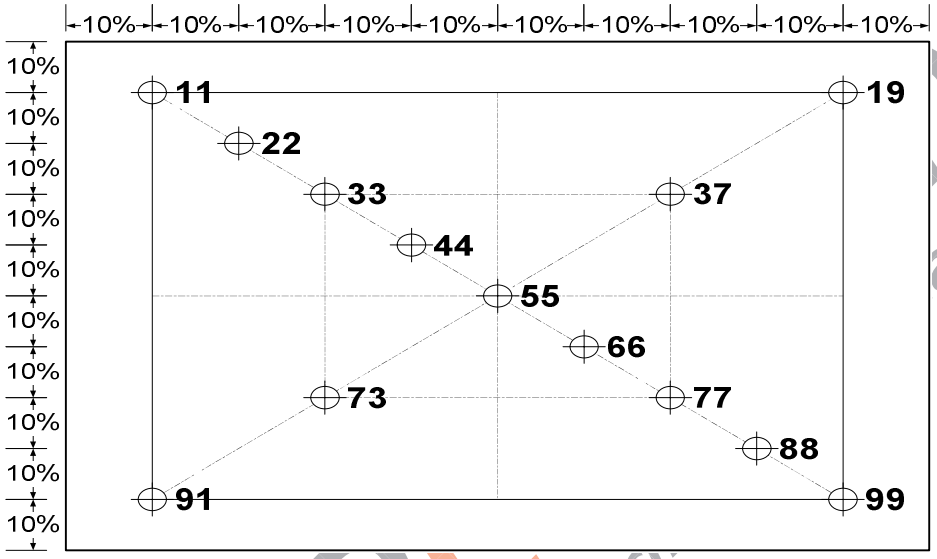
Optical characteristics measurement setup

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



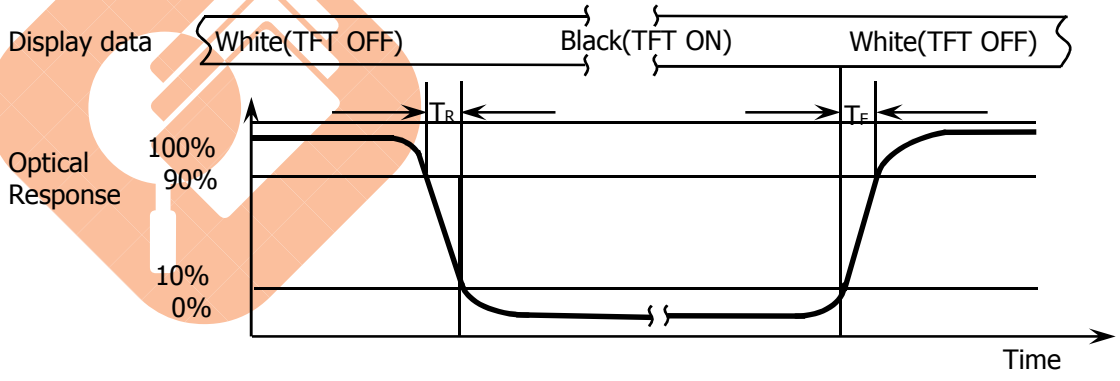
Center Luminance of white is defined as luminance values of center 5 points (33,37,55,73,77)across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.

Figure 3. Uniformity Measurement Locations (13 points)



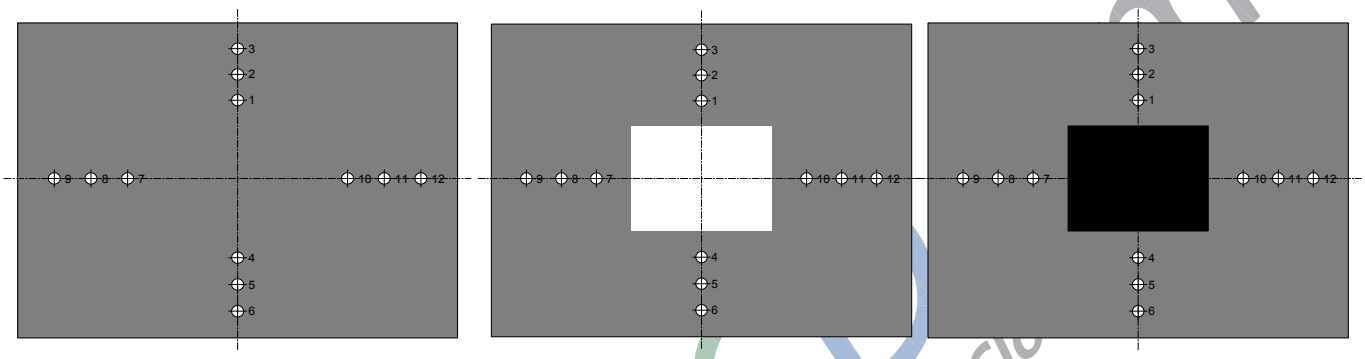
The White luminance uniformity on LCD surface is then expressed as : ΔY5 = 1- Minimum Luminance of five points / Maximum Luminance of five points (see FIGURE 2) , ΔY13 =1- Minimum Luminance of 13 points /Maximum Luminance of 13 points (see FIGURE 3).

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



$$CrossTalk_{WonG} = (L_{WonG} - L_{Gray}) / L_{Gray} * 100\%$$
$$CrossTalk_{BonG} = (L_{BonG} - L_{Gray}) / L_{Gray} * 100\%$$

Where:

L_{Gray}= the luminance of full mid gray screen at that point (cd/m^2)

$L_{WonG\ or\ Bon\ G}$ = Subsequent luminance of that point with the white box displayed or with the black box displayed(cd/m^2)

The location measured will be exactly the same in both patterns

Point	x	y
1	0	3/12 h
2	0	4/12 h
3	0	5/12 h
4	0	-3/12 h
5	0	-4/12 h
6	0	-5/12 h
7	-3/12 w	0
8	-4/12 w	0
9	-5/12 w	0
10	0	3/12 w
11	0	4/12 w
12	0	5/12 w

Calculate shadowing for each point by comparing the luminance of full mid gray screen at that point to the luminance of the same point with the white box display ed and to the luminance of the same point with the black box displayed. (Refer to FIGURE 5).

5.0 INTERFACE CONNECTION.

5.1 Electrical Interface Connection

PCB Signal interface : 45 Pin.(20584-045E-01)

The connector interface pin assignments are listed in Table 6.

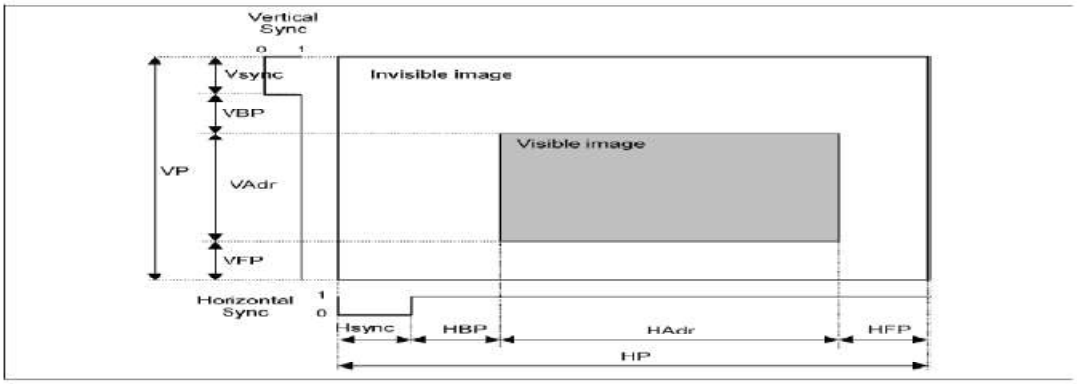
<Table 6. Pin Assignments for the Interface Connector>

Pin No.	Symbol	Function	DELL request	Remark
1	NC	NC		
2	Dell ID Pin2	NC	For LCD supplier ID Pin	
3	Dell ID Pin1	GND	For LCD supplier ID Pin	
4	H Sync	H Sync output	H Sync output	
5	SDA	For LCD supplier use only	For LCD supplier use only	
6	SCL	For LCD supplier use only	For LCD supplier use only	
7	OTP_VPP	For LCD supplier use only	For LCD supplier use only	
8	GND	Ground	Ground	
9	Dell ID Pin3	NC	NC = WXGA ; GND = WUXGA	
10	BIST	Aging Mode Power Supply	Aging Mode Power Supply	
11	GND	Ground	Ground	
12	IOVCC	Power supply (1.8V)	Power supply (1.8V)	
13	IOVCC	Power supply (1.8V)	Power supply (1.8V)	
14	NC	NC		
15	NC	NC		
16	VDD3V3	Power supply (3.3V)	Power supply (3.3V)	
17	VDD3V3	Power supply (3.3V)	Power supply (3.3V)	
18	GND	Ground	Ground	
19	XRES	Reset, Low active(1.8V)	Reset, Low active(1.8V)	
20	NC	NC		
21	GND	Ground	Ground	
22	MIPI_0P	MIPI data 0 positive signal	MIPI data 0 positive signal	
23	MIPI_0N	MIPI data 0 negative signal	MIPI data 0 negative signal	
24	GND	Ground	Ground	
25	MIPI_1P	MIPI data 1 positive signal	MIPI data 1 positive signal	
26	MIPI_1N	MIPI data 1 negative signal	MIPI data 1 negative signal	
27	GND	Ground	Ground	
28	MIPI_CLKP	MIPI CLK positive signal	MIPI CLK positive signal	
29	MIPI_CLKN	MIPI CLK negative signal	MIPI CLK negative signal	
30	GND	Ground	Ground	
31	MIPI_2P	MIPI data 2 positive signal	MIPI data 2 positive signal	

Pin No.	Symbol	Function	DELL request	Remark
32	MIPI_2N	MIPI data 2 negative signal	MIPI data 2 negative signal	
33	GND	Ground	Ground	
34	MIPI_3P	MIPI data 3 positive signal	MIPI data 3 positive signal	
35	MIPI_3N	MIPI data 3 negative signal	MIPI data 3 negative signal	
36	GND	Ground	Ground	
37	LED_FB3	LED Cathode	LED Cathode	
38	LED_FB2	LED Cathode	LED Cathode	
39	LED_FB1	LED Cathode	LED Cathode	
40	GND	Ground	Ground	
41	V_LED	LED Anode	LED Anode	
42	V_LED	LED Anode	LED Anode	
43	V_LED	LED Anode	LED Anode	
44	GND	Ground	Ground	
45	NC	NC		

5.2 MIPI Input signal Timing Specifications

Item	Symbol	Min	Typ	Max	Unit
Frame frequency	Frequency		60		Hz
Pixel CLK	CLK		68.43		MHz
CLK	Period		4		ns
	Frequency		225		MHz
Hsync	Period		16		t_{pCLK}
	Frequency		77.76		KHz
Vsync	Period		4		Line
	Frequency	-	60	-	Hz
Horizontal Active Display Term rgbvporch 8 4 4 rgbhporch 16 48 16	HAdr	-	800	-	t_{pCLK}
	HBP		48		t_{pCLK}
	HFP		16		t_{pCLK}
	Total		880		t_{pCLK}
Vertical Active Display Term	Vadr	-	1280	-	Line
	VBP		4		Line
	VFP		8		Line
	Total		1296		Line



5.4 Back-light & LCM Interface Connection

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

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	NC	NC	6	FB1	LED cathode connection
2	VBL	LED anode connection	7	FB2	LED cathode connection
3	VBL	LED anode connection	8	FB3	LED cathode connection
4	NC	NC	9	NC	NC
5	NC	NC			

5.5 TP Interface Connection

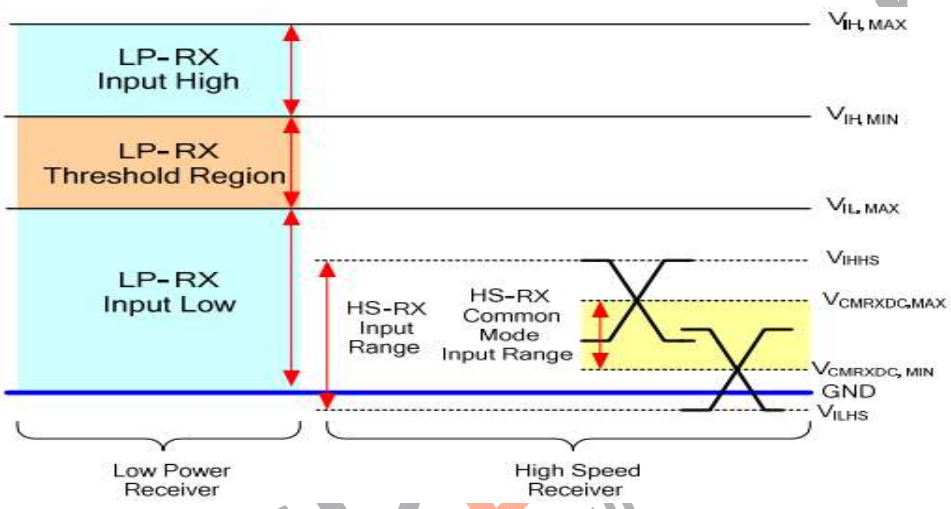
PIN	1-2	3-4	5-48	49-50	51-52	53-80
Function	Dum	ESD GND	RX44-RX1	GND	Guard	TX28-TX1
PIN	81-82	83-84				
Function	ESD GND	GND				

The electronics interface connector is FH29DJ-80S-0.2SHW or Compatible.
The connector interface pin assignments are listed :

Pin No.	Symbol	Description
1	ESDRING1	NC
2	GND	Ground
3-30	TX1-TX28	Touch operation:TX
31	Guard	ESD Protection
32-33	GND	Ground
34-77	RX1-RX44	Touch operation:RX
78-79	GND	Ground
80	GNDRING	NC

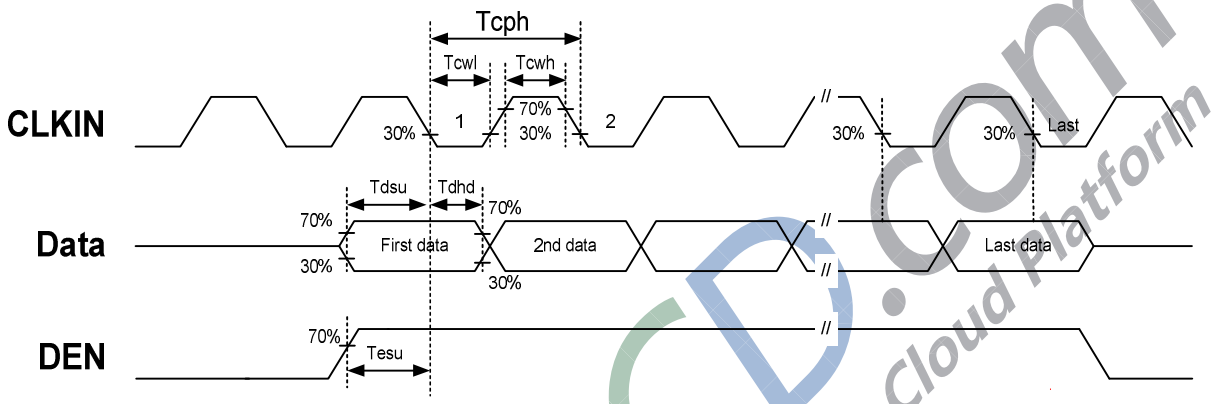
6.0 SIGNAL TIMING SPECIFICATION

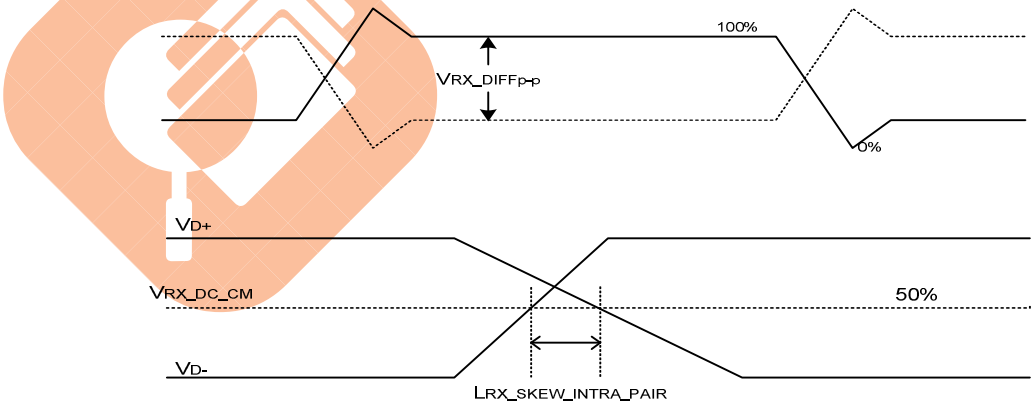
6.1 MIPI Rx Interface Timing Parameter



Item		Parameter	Min.	Typ.	Max.	Unit
HS_RX	Common-mode voltage HS receive mode	VCMRX(DC)	155	—	330	mV
	Differential input high threshold	VIDTH	—	—	70	mV
	Differential input low threshold	VIDTL	70	—	—	mV
	Single-ended input high voltage	VIHHS	—	—	460	mV
	Single-ended input low voltage	VILHS	-40	—	—	mV
	Differential input impedance	ZID	60	75	95	Ω
LP_RX	Logic 1 input voltage	VIH	1100	1200	1300	mV
	Logic 0 input voltage. not in ULPState	VIL	-150	—	150	mV

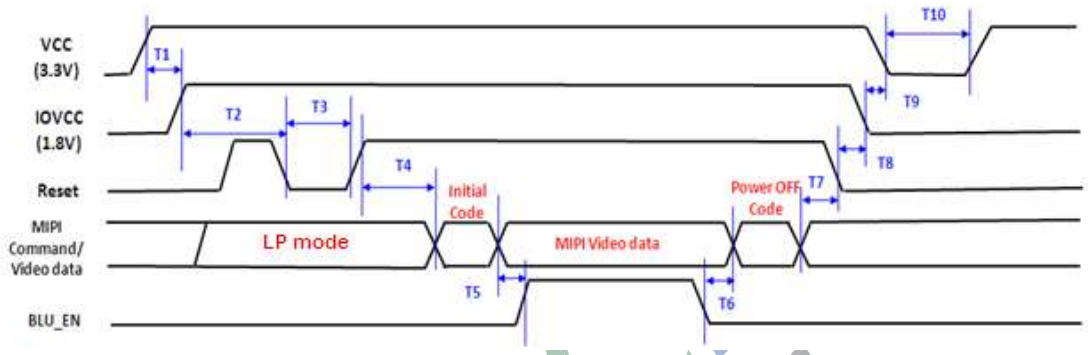
6.2 SIGNAL TIMING WAVEFORMS OF INTERFACE SIGNAL





7.0 POWER SEQUENCE

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



POWER ON/OFF Timing			
paremeters	Value		Unit
	Min.	Max.	
T1	0.5	10	ms
T2	15	100	
T3	0.02	0.5	
T4	20	200	
T5	200	500	
T6	40	200	
T7	100	200	
T8	1	100	
T9	No Limit	No Limit	
T10	500	No Limit	

8.0 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.

8.1 LCD Module

Connector Name /Description	Manufacturer
MIPI Connector	I-PEX 20584-045E-01
B/L Connector	UJU PF040-B09B-C09

9.0 RELIABILITY TEST

No		Conditions
1	High temperature storage test	Ta = 60 ℃, 240 hrs
2	Low temperature storage test	Ta = -20 ℃, 240 hrs
3	High temperature & high humidity operation test	Ta = 50 ℃, 90%RH, 240 hrs
4	High temperature operation test	Ta = 50 ℃, 240 hrs
5	Low temperature operation test	Ta = 0 ℃, 240 hrs
6	Thermal shock	Ta = -20 ℃ ↔ 60 ℃ (0.5 hr), 100 cycle
7	Power on/off	2s on/2s off 20000cycles
8	Vibration test (non-operating)	1.5G, 10~500Hz Sign X,Y,Z / Sweep rate : 0.5hour
9	Shock test (non-operating)	220G, Half Sine Wave 2msec ±X,±Y,±Z Once for each direction
10	Electro-static discharge test (non-operating)	Air : 150 pF, 330Ω, 15 KV Contact : 150 pF, 330Ω, 8 KV

10.0 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.

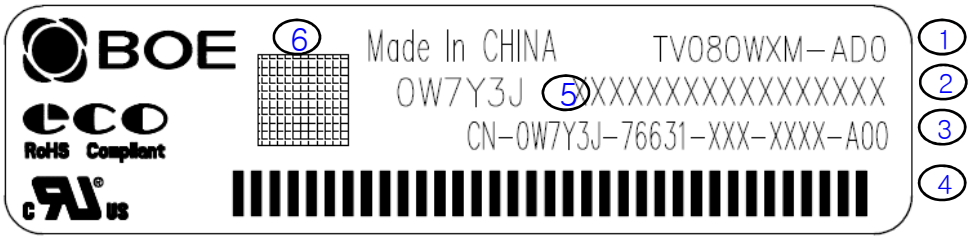
(4) Cautions for the atmosphere
- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

(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.

11.0 LABEL

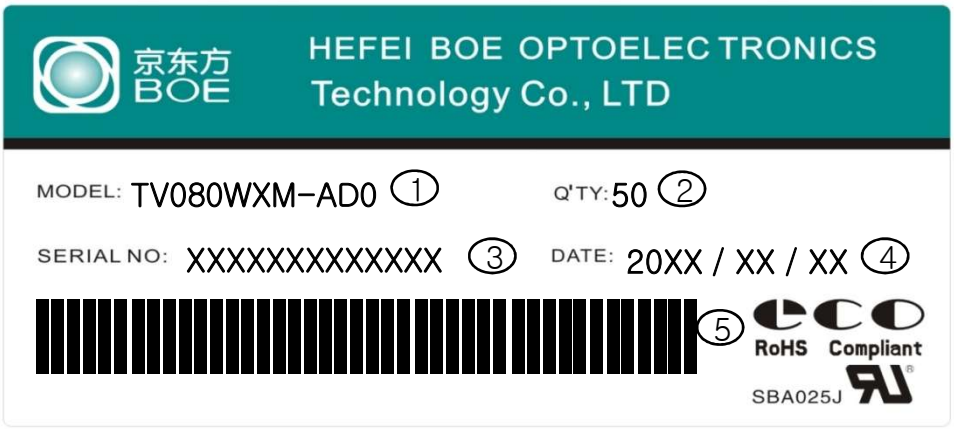
(1) TLCM label



Label Size:
48 mm (L) ×12mm (W)
1. FG-CODE
2. MDL ID
3. PPID
4. MDL ID Barcode
5. Dell P/N: W7Y3J
6. PPID Barcode

序列号	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
代码	4	F	P	3	1	2	7	3	8	3	0	0	0	1	E	E	J
描述	GBN代码		等级	B3	年份		月	FG Code后四位				序列号					

(3) Box label



Label Size:
110 mm (L) × 56 mm (W)

1. FG-CODE
2. Packing Q'TY
3. Box ID
4. Box Packing Date
5. Box ID Barcode

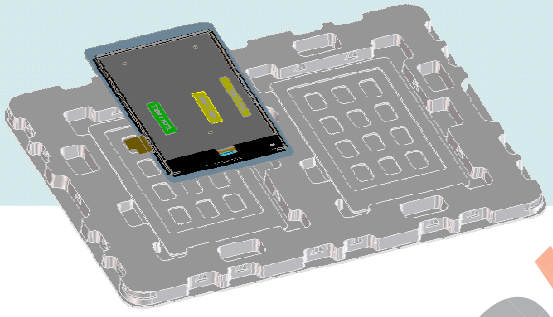
序列号	1	2	3	4	5	6	7	8	9	10	11	12	13
代码	S	L	S	T	1	4	3	D	0	0	1	H	D
描述	GBN代码		等级	TM1	年份		月	Rev	Serial Number				

12.0 PACKING INFORMATION

13.1 Packing order

-. 将 2pcs TLCM 平放入Tray

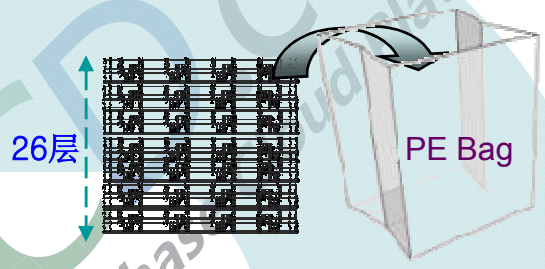
-. CG 向下放置



-. 将26pcs PET Tray 平放入PE Bag

-. Tray 不旋转码放

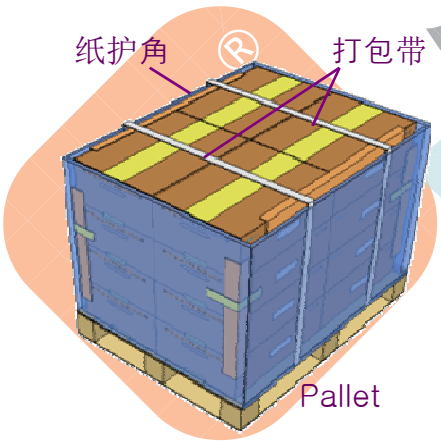
-. 顶部1pcs 空Tray



-. 每个Pallet上放3层Box, 1层4箱,共计12ea Box

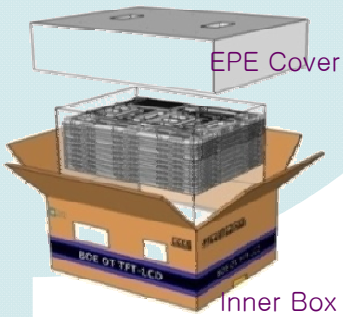
-. Pallet外进行缠膜包装

-. 600pcs Panel / Pallet



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

-. 50pcs/Box

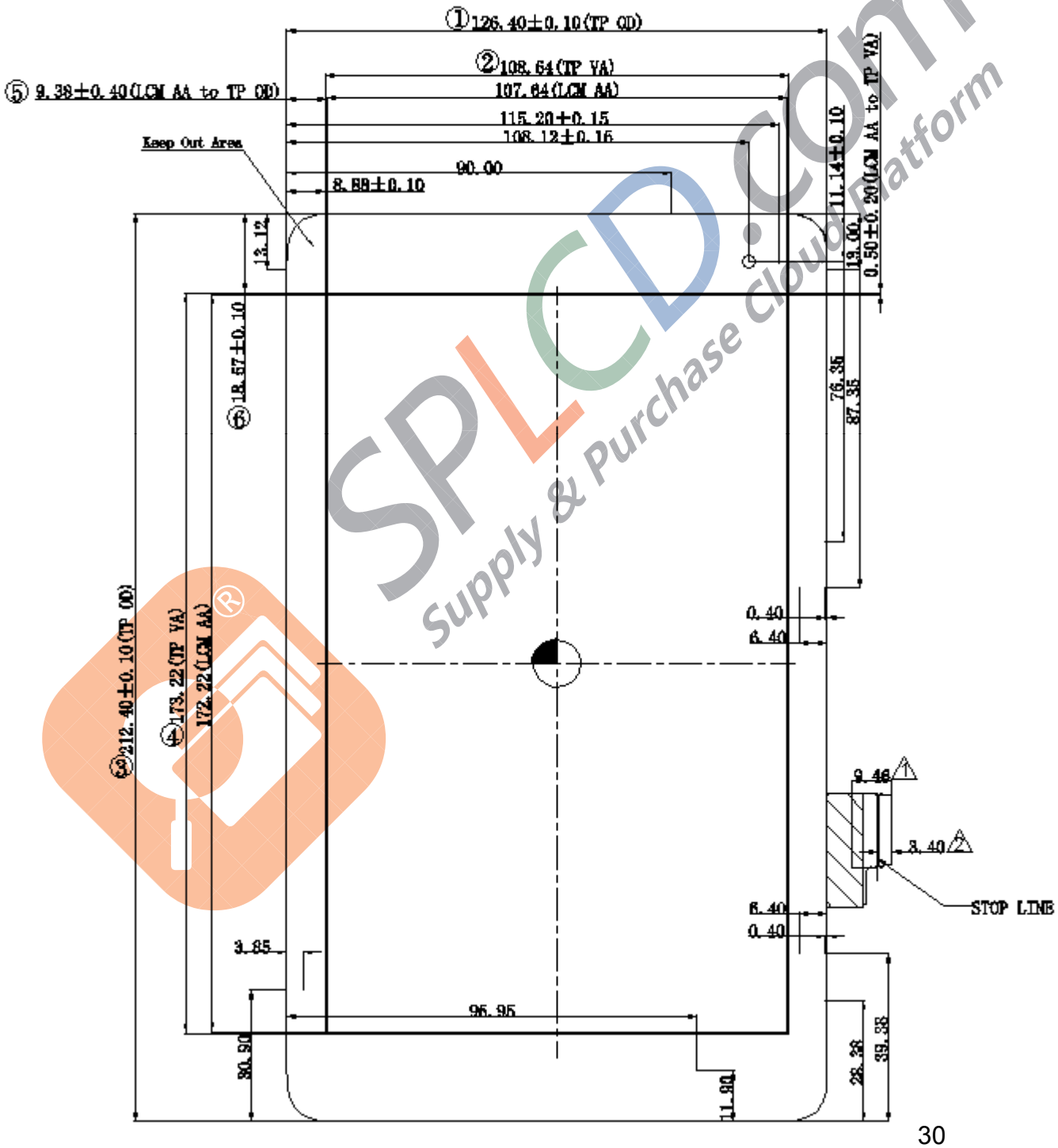


13.2 Notes

- Box Dimension: 500mm(W) x 400mm(D) x 300mm(H)
- Package Quantity in one Box: 50pcs MDL/Box

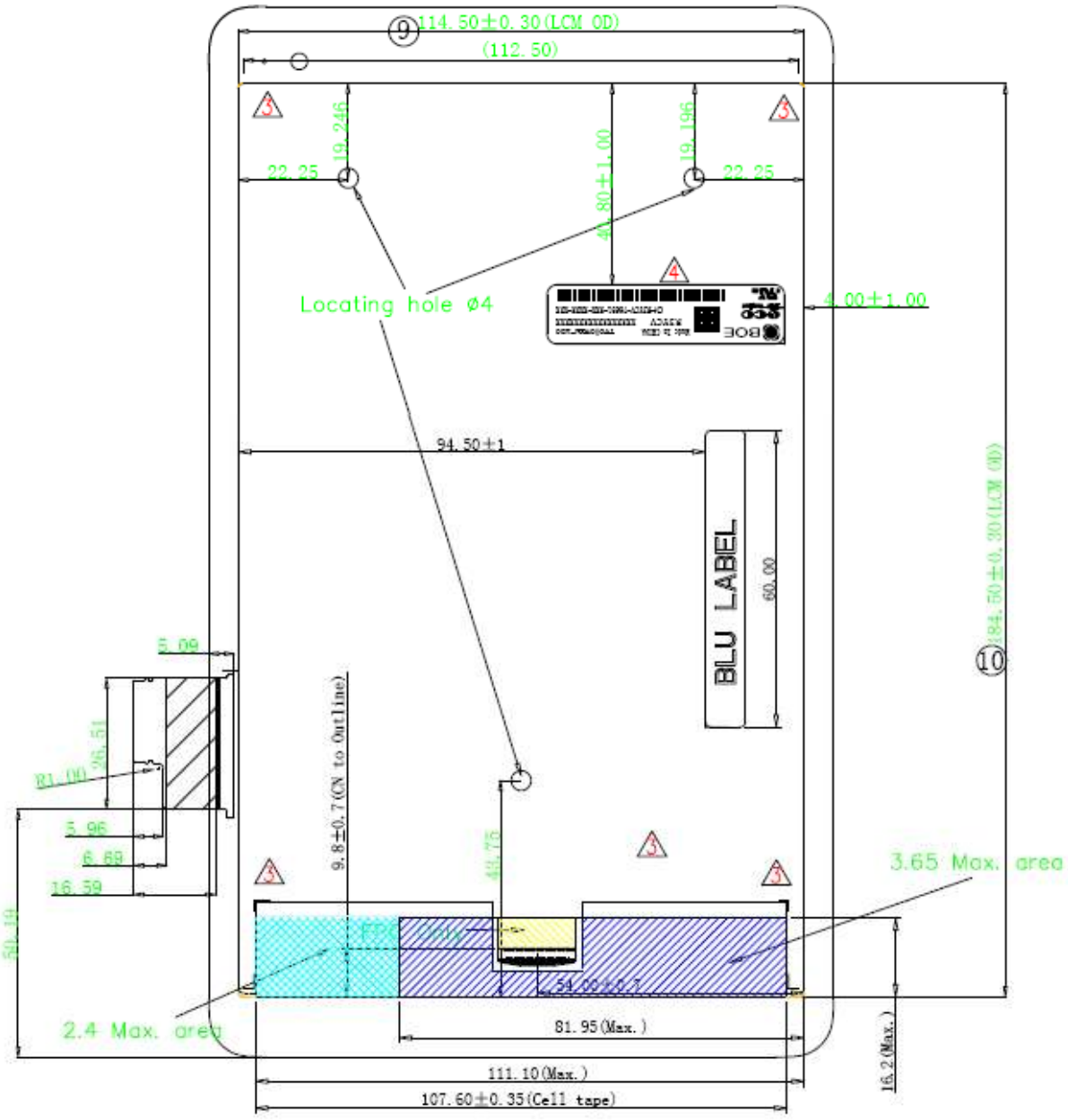
14. MECHANICAL OUTLINE DIMENSION

14.1 Total Solution Outline Dimension



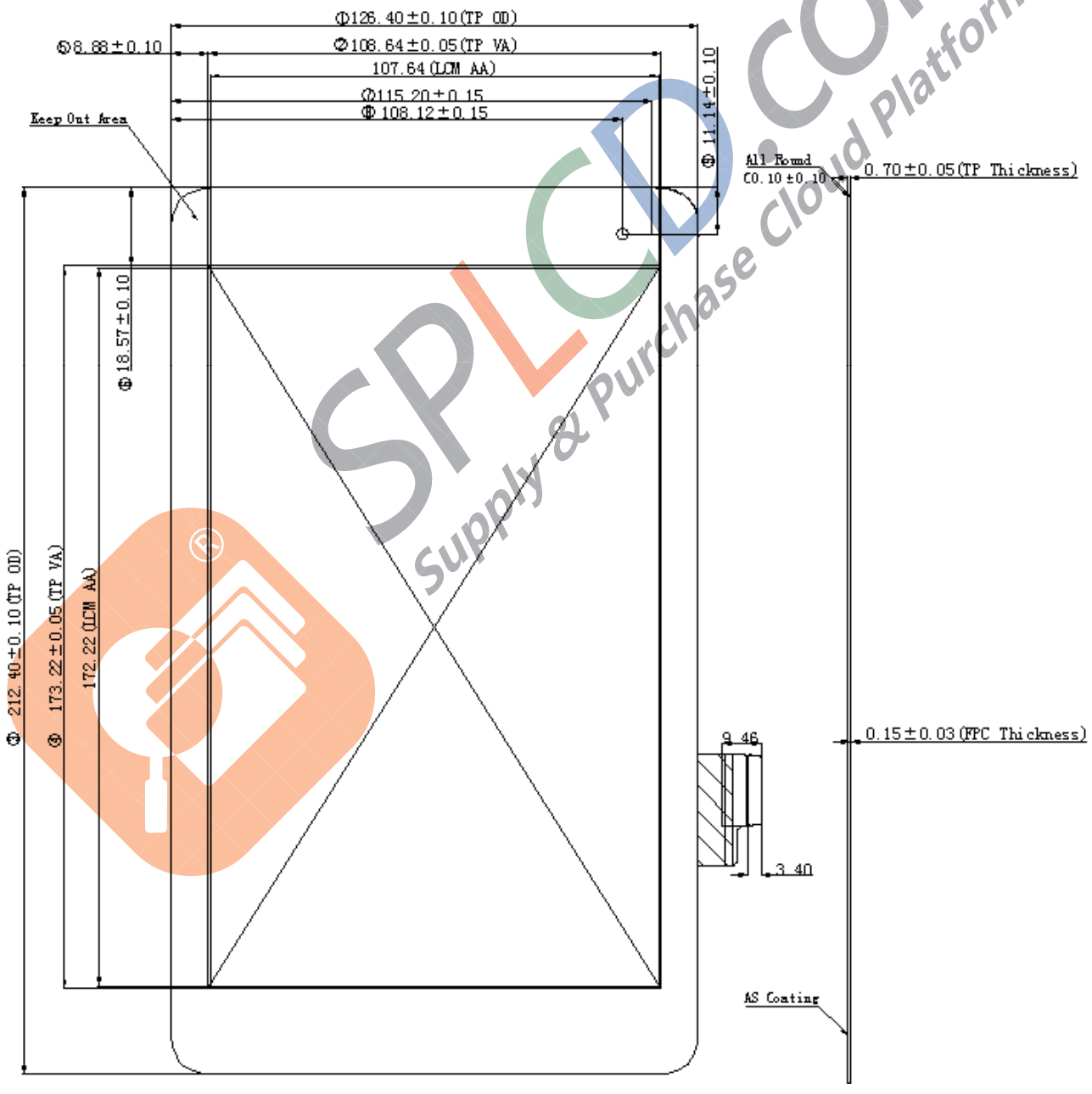
14.2 Total Solution Outline Dimension

Figure 7. Total Solution Outline Dimensions (Rear view)



14.3 Touch Panel Outline Dimension

Figure 8. Touch Panel Outline Dimensions (Front view)



14.4 Touch Panel Outline Dimension

Figure 9. Touch Panel Outline Dimensions (Rear view)