TV126WTM-NU0

Preliminary Product Specification

Rev. P1

BEIJING BOE DISPLAY TECHNOLOGY

REVISION HISTORY

(●)Preliminary Specification
( )Final Specification

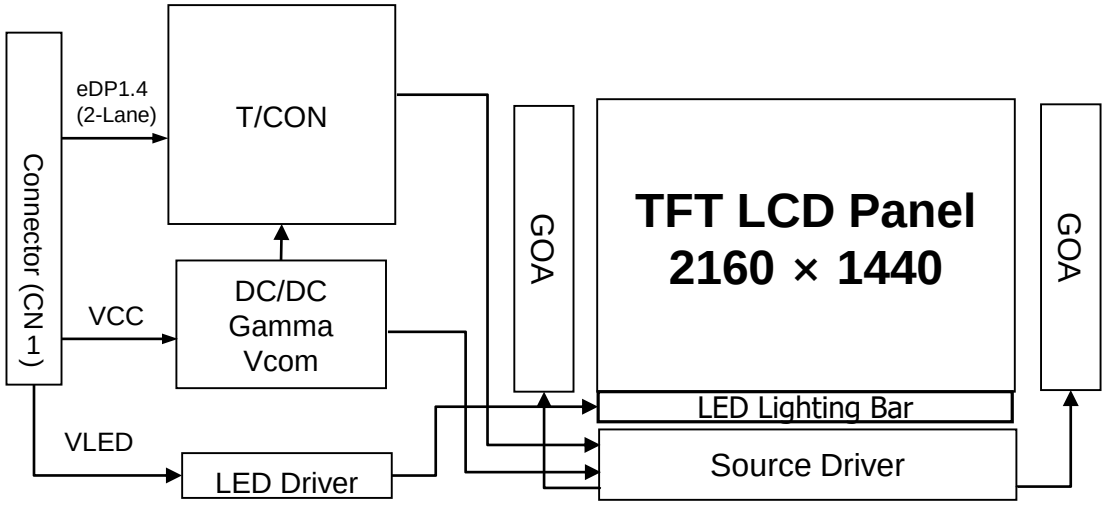
REV.	ECN NO.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0		Initial Release	Jul.14. 16’	Sun Peng
P1		TFT Pol增加APF	Sep.23. 16’	Sun Peng

Contents

1.0 GENERAL DESCRIPTION

1.1 Introduction

TV126WTM-NU0 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 12.6 inch diagonally measured active area with FHD+ resolutions (2160 horizontal by 1440 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

- eDP 1.4 2Lane Interface support 5.4Gbps/lane
- High-speed response
- 8-bit color depth, display 16. 7M colors
- High luminance and contrast ratio and wide viewing angle
- RoHS/Halogen Free
- CABC/PSR/ sDRRS support

1.3 Application

- 2 in 1 Notebook PC

1.4 General Specification

The followings are general specifications at the model TV126WTM-NU0

<Table 1. General Specifications>

Parameter	Specification	Unit	Remarks
Active area	265.68(H) x 177.12(V)	mm	
Number of pixels	2160(H) ×1440(V)	pixels	
Pixel pitch	0.123 (H) ×0.123 (V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	16.7M	colors	
Display mode	Normally Black		
Dimensional outline	271.28(H) x188.52(V) x1.95(D) TYP	mm	
Weight	163 (Max.)(Without Polaroid Protect Film)	g	
Surface Treatment	HC, 3H		
Back-light	Lower Down side ,1-LED Lighting Bar type		Note 1
Power Consumption	P_D : 1.1W (max)		
	P_{BL} : 2.3W (max)		Note 2
	P_{total} : 3.4W(max)		

Notes : 1. LED Lighting Bar (50EA Array ,5P10S)

2. P_{BL}=LED Quantity * VPIN×IPIN/ LED Driver Eff.

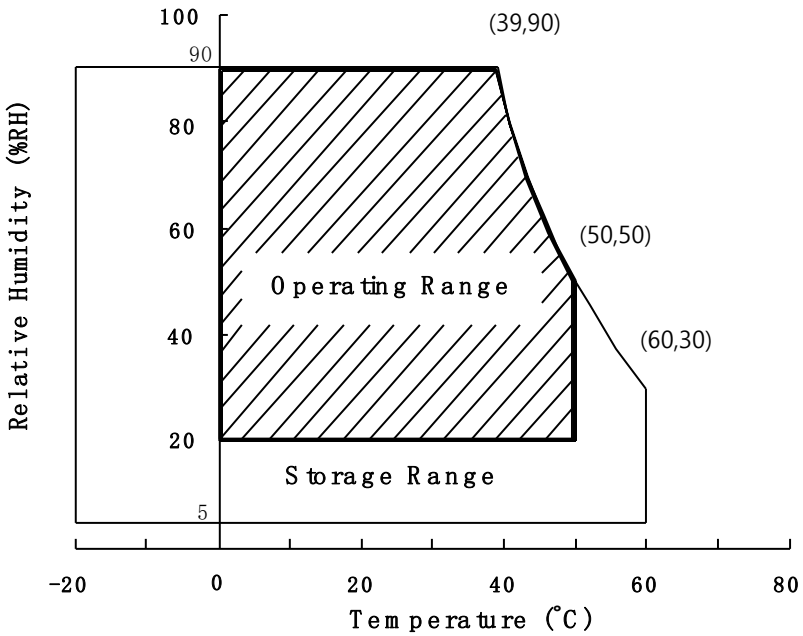
2.0 ABSOLUTE MAXIMUM RATINGS

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> [VSS=GND=0V]

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Power Supply Voltage	V_{CC}	-0.3	3.3	4.0	V	Ta = 25 ℃
LED Input Current	I_{LED}	100	120	230	mA	
LED Input Voltage	V_{LED}	10	19	24	V	
Operating Temperature	T_{OP}	0	-	50	℃	1)
Storage Temperature	T_{ST}	-20	-	+60	℃	1)

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.



3.0 ELECTRICAL SPECIFICATIONS

3.1Electrical Specifications

< Table 3. Electrical specifications > [Ta =25±2 ℃]

Parameter		Min.	Typ.	Max.	Unit	Remarks
Power Supply Voltage	V_{DD}	3.15	3.3	3.45	V	Note1
Power Supply Current	I_{DD}	-	305	-	mA	
In-Rush Current	I_{RUSH}	-	2.0	3.0	A	Note 2
Permissible Input Ripple Voltage	V_{RF}	-	-	300	mV	
High Level Differential Input Threshold Voltage	V_{IH}	1.8	-	-	V	VDD=2.5V
Low Level Differential Input Threshold Voltage	V_{IL}	-	-	0.75	V	
Power Consumption	P_D	-	1.0	1.1	W	Note 2
	P_{BL}	-	2.15	2.3	W	Note 3
	P_{total}	-	3.15	3.4	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℃.
2. Mosaic Pattern: 1.1(W) Max
3. Calculated value for reference (V_{LED} × I_{LED} / Efficiency)

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	-	2.85	3.0	V	-
LED Forward Current		I_F	-	13.5	14	mA	-
LED Power Consumption		P_{LED}	-	2.15	2.3	W	Note 1
LED Life-Time		N/A	15,000	-	-	Hour	I_F = 13.5mA
Power supply voltage for LED Driver		V_{LED}	10	19	24	V	-
EN Control Level	Backlight on	-	1.2	-	-	V	-
	Backlight off	-	-	-	0.6	V	-
PWM Control Level	PWM High Level	-	1.2	-	-	V	-
	PWM Low Level	-	-	-	0.6	V	-
PWM Control Frequency		F_{PWM}	200	-	25,000	Hz	-
Duty Ratio		-	1	-	100	%	Note3

Note1: Power supply voltage 24V for LED Driver
Calculator Value for reference IF × VF ×50/ efficiency = PLED
Note2: The LED Life-time define as the estimated time to 50% degradation of initial luminous.
Note3: 1% duty cycle is achievable for the frequency range from 200Hz to1KHz
Note4: The lifetime is determined as the time at which luminance of LED become 50% of the initial brightness or not normal lighting at IPIN=20mA on condition of continuous operating at 25 ±2 ℃

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 TOPCONE 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 $\theta_{Ø=0}$ (=θ_3) as the 3 o'clock direction (the "right"), $\theta_{Ø=90}$ (= θ_{12}) as the 12 o'clock direction ("upward"), $\theta_{Ø=180}$ (= θ_9) as the 9 o'clock direction ("left") and $\theta_{Ø=270}$(= θ_6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the Display surface shall stay fixed. The measurement shall be executed after 30 minutes warm-up period. VDD shall be 5.0V +/-10% at 25°C. Optimum viewing angle direction is 6 'clock.

4.2 Optical Specifications

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	80	85	89	Deg.	Note 1
		Θ_9		80	85	89	Deg.	
	Vertical	Θ_{12}		80	85	89	Deg.	
		Θ_6		80	85	89	Deg.	
Luminance Contrast ratio		CR	Θ = 0° (Center) Normal Viewing Angle	600	800	-		Note 2
Luminance of White		Y_w		212.5	250	-	cd/m^2	Note 3
White luminance uniformity	5 Point	ΔY5		80	-	-	%	Note 4
	13 Point	ΔY13		66	-	-		
Reproduction of color	White	W_x		Typ.-0.03	0.305	Typ.+0.03	-	Note 5
		W_y			0.325		-	
	Red	R_x			0.642		-	
		R_y			0.362		-	
	Green	G_x			0.312		-	
		G_y			0.638		-	
	Blue	B_x			0.152		-	
		B_y			0.072		-	
Gamut				67	72	-	%	
Response Time (Rising+Falling)		T_{RT}	Ta= 25° C Θ = 0°		30	35	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 center point 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 center point of 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).

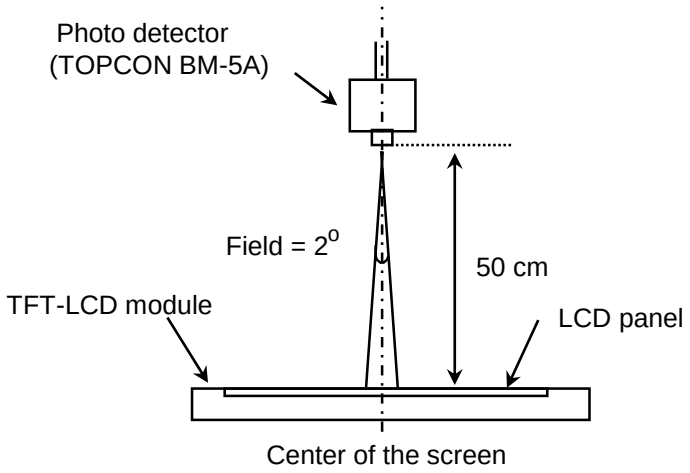
5. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

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).

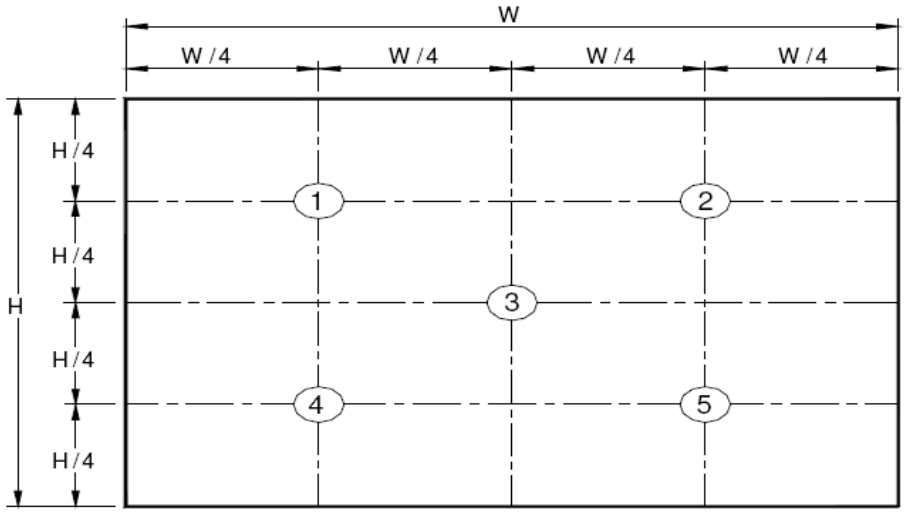
4.3 Optical measurements

Figure 1. Measurement Set Up



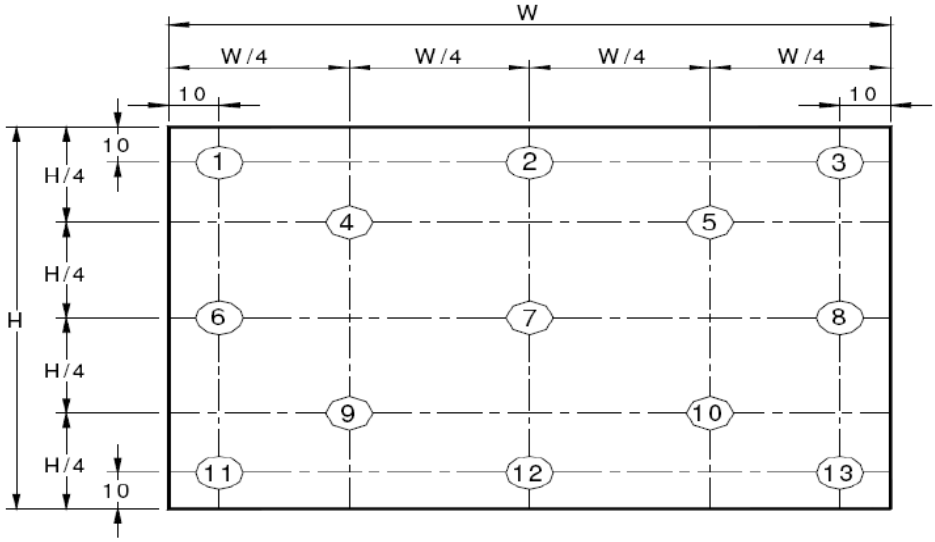
Optical characteristics measurement setup

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



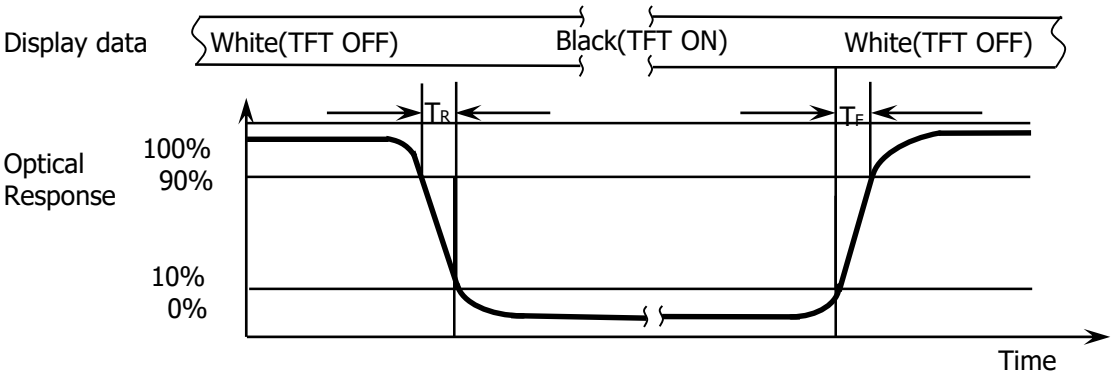
Center Luminance of white is defined as luminance values of center points across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the center point of the locations shown in FIGURE 2 for a total of the measurements per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

Figure 3. Uniformity Measurement Locations (13 points)



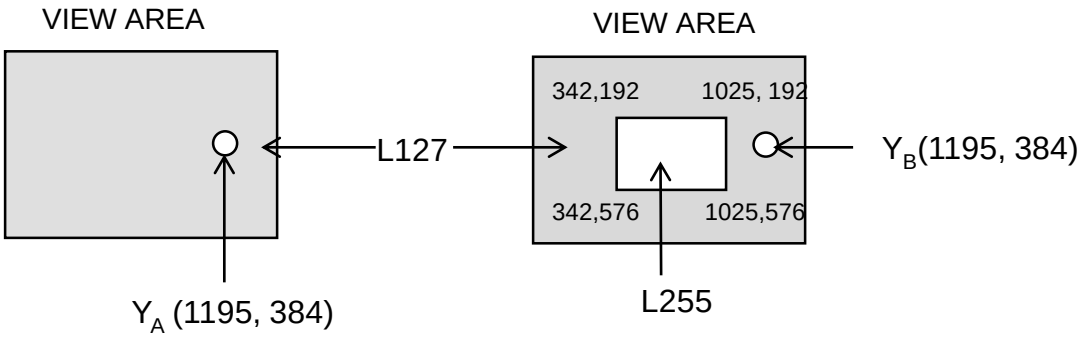
The White luminance uniformity on LCD surface is then expressed as : ΔY5 = Minimum Luminance of five points / Maximum Luminance of five points (see FIGURE 2) , ΔY13 = Minimum Luminance of 13 points /Maximum Luminance of 13 points (see FIGURE 3).

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 pixels set to a gray level, to the luminance (YB) of that same area when any adjacent area is driven dark (Refer to FIGURE 5).

5.0 INTERFACE CONNECTION.

5.1 Electrical Interface Connection

5.1.1 LED Light Bar

< Table 1. LED Light Bar>

Pin No	Symbol	Description
1	LED+	LED power supply
2	LED+	LED power supply
3	NC	NC
4	LED_FB1	LED-
5	LED_FB2	LED-
6	LED_FB3	LED-
7	LED_FB4	LED-
8	LED_FB5	LED-
9	NC	NC
	CONNECTOR	PF040-B09B-C09

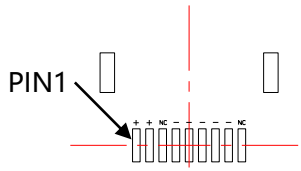


Figure1. Top View of LED Bar Connector

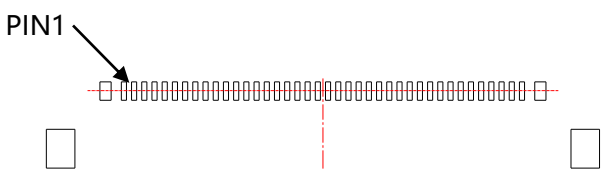


Figure2. Back Side of Module

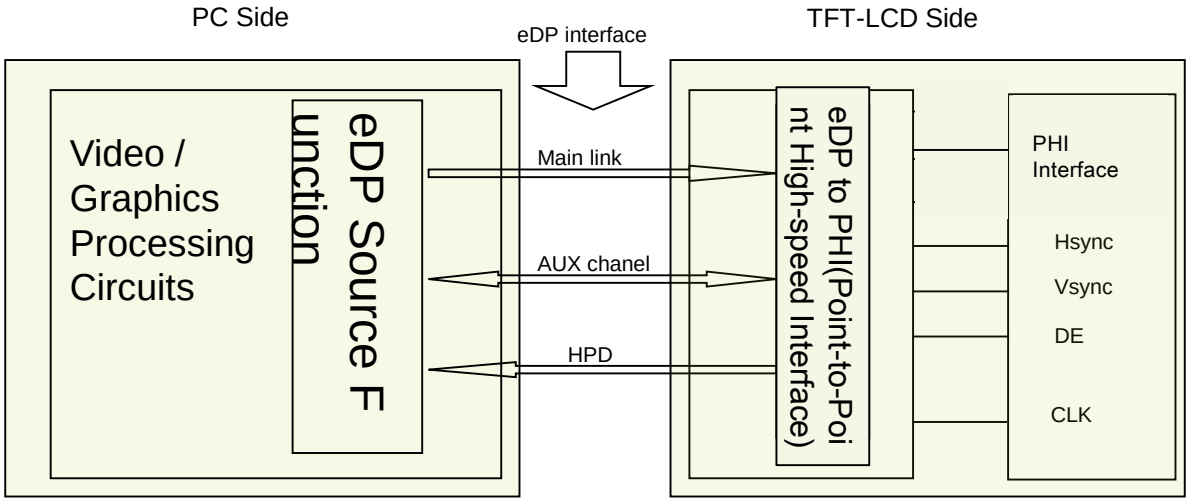
5.0 INTERFACE CONNECTION.

5.1 Electrical Interface Connection

- CN1 Module Side Connector : I-PEX 20455-040E-66

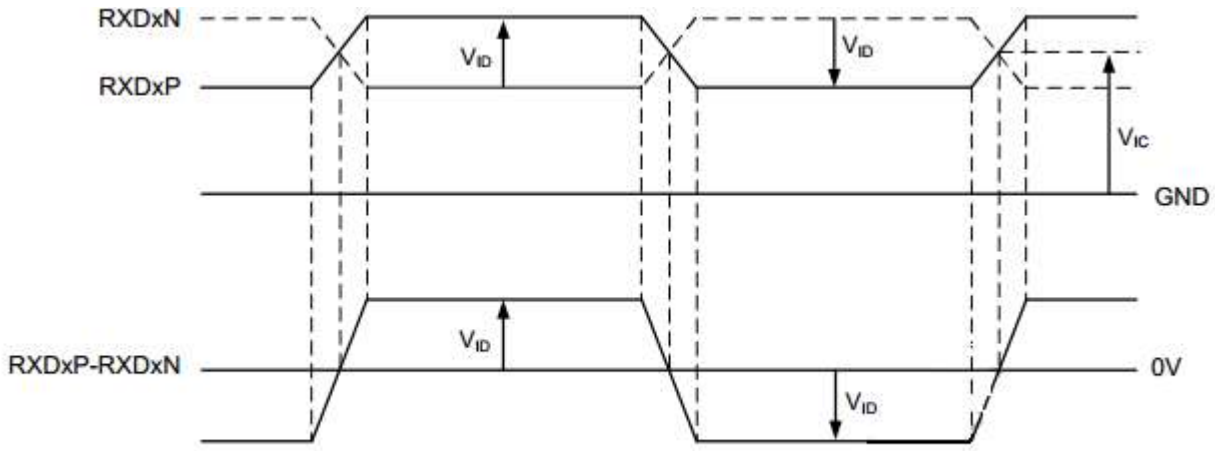
Pin No	Symbol	Function	Remark
1	DBC	Content Adaptive Brightness Control function	
2	H_GND	Ground	
3	NC	NC	
4	NC	NC	
5	H_GND	Ground	
6	NC	NC	
7	NC	NC	
8	H_GND	Ground	
9	LANE1N	eDP RX channel 1 negative	
10	LANE1P	eDP RX channel 1 positive	
11	H_GND	Ground	
12	LANE0N	eDP RX channel 0 negative	
13	LANE0P	eDP RX channel 0 positive	
14	H_GND	Ground	
15	AUX_CH_P	eDP AUX CH positive	
16	AUX_CH_N	eDP AUX CH negative	
17	H_GND	Ground	
18	VCC	Power Supply, 3.3V (typ.)	
19	VCC	Power Supply, 3.3V (typ.)	
20	VCC	Power Supply, 3.3V (typ.)	
21	VCC	Power Supply, 3.3V (typ.)	
22	BIST	Panel self test enable	
23	GND	LCD Ground	
24	GND	LCD Ground	
25	GND	LCD Ground	
26	GND	LCD Ground	
27	HPD	Hot plug detect output	
28	BL_GND	LED Ground	
29	BL_GND	LED Ground	
30	BL_GND	LED Ground	
31	BL_GND	LED Ground	
32	BL_EN	LED enable pin	
33	BL_PWM	System PWM Signal Input	
34	NC	No Connector	
35	NC	No Connector	
36	BL_PWR	LED Power Supply 10V-24V	
37	BL_PWR	LED Power Supply 10V-24V	
38	BL_PWR	LED Power Supply 10V-24V	
39	BL_PWR	LED Power Supply 10V-24V	
40	NC	No Connection	

5.2 eDP Interface

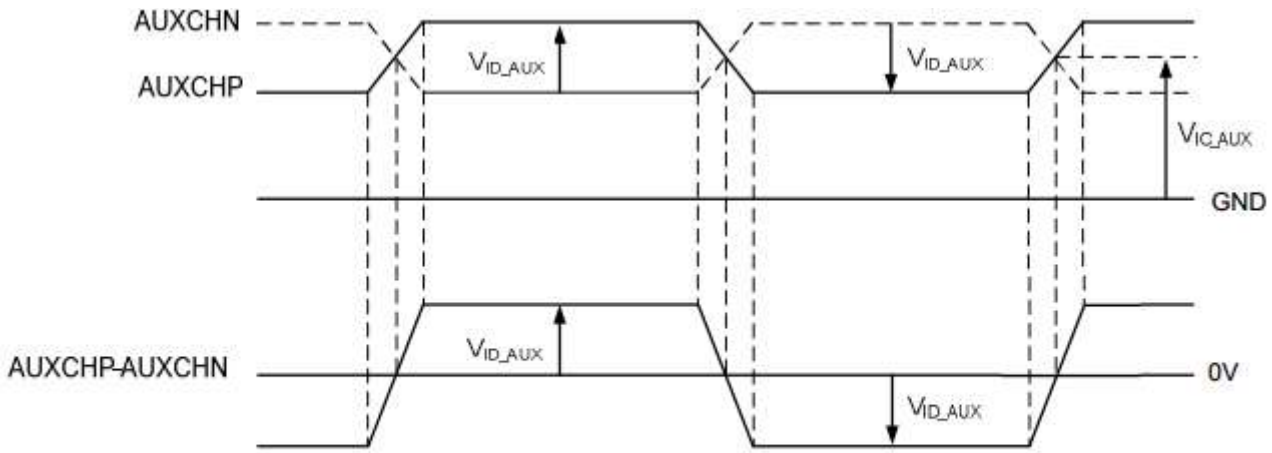


Note. Transmitter : HX8879-D03 or equivalent.
Transmitter is not contained in Module.

5.3.eDP Input signal

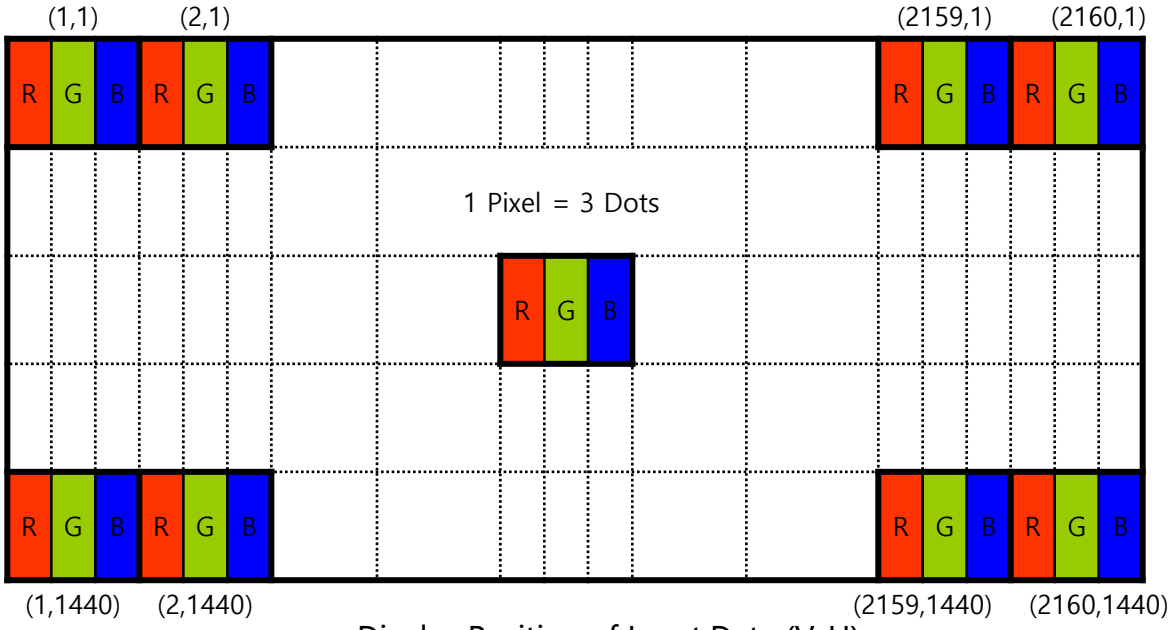


Main Link V_{ID} and V_{IC} definition



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

5.4 Data Input Format

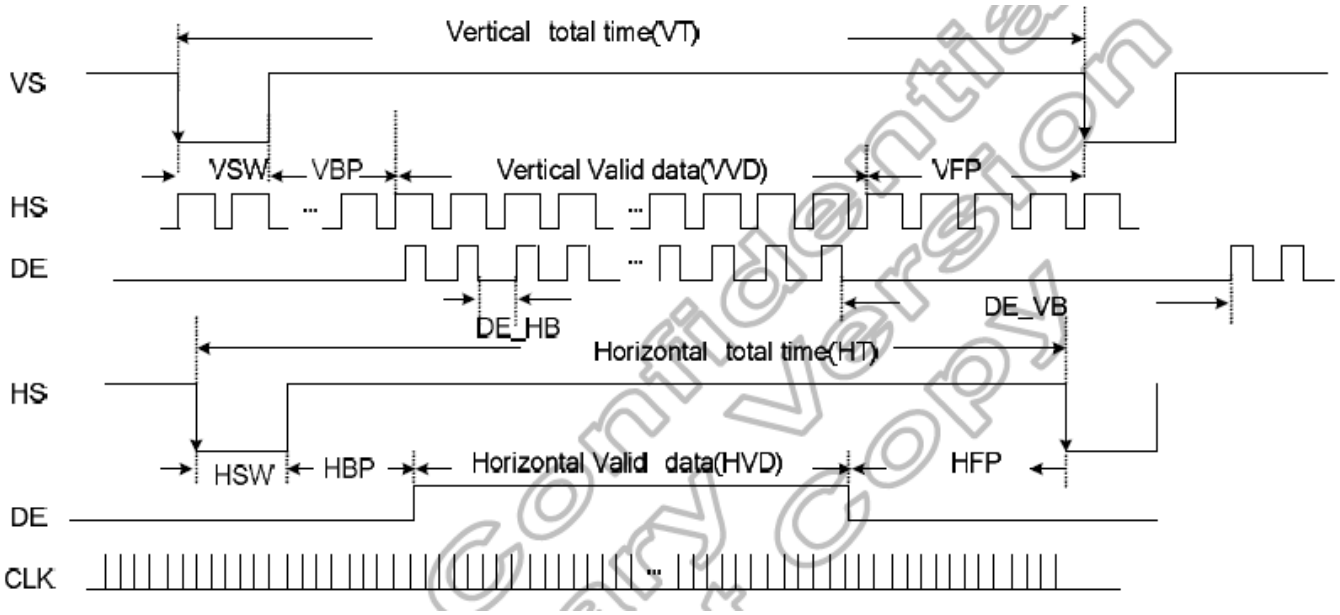


Display Position of Input Data (V-H)

6.0 SIGNAL TIMING SPECIFICATION

6.1 The TV126WTM-NU0 is operated by the DE only.

ITEM	Symbol		Min	Typ.	Max	Unit	Note
CLK	Period	t_{CLK}	-	4.82	-	ns	
	Frequency	-	-	207.4	-	Mbps	
Hsync	Period	t_{HP}	-	2320	-	t_{CLK}	
	Frequency	f_H	-	139.2	-	KHz	
Vsync	Period	t_{VP}	-	1490	-	t_{HP}	
	Frequency	f_V	-	89.4	-	KHz	
Horizontal Active Display Term	Valid	t_{HV}	-	2160	-	t_{CLK}	
	Total	t_{HP}	-	2320	-	t_{CLK}	
Vertical Active Display Term	Valid	t_{VV}	-	1440	-	t_{HP}	
	Total	t_{VP}	-	1490	-	t_{HP}	

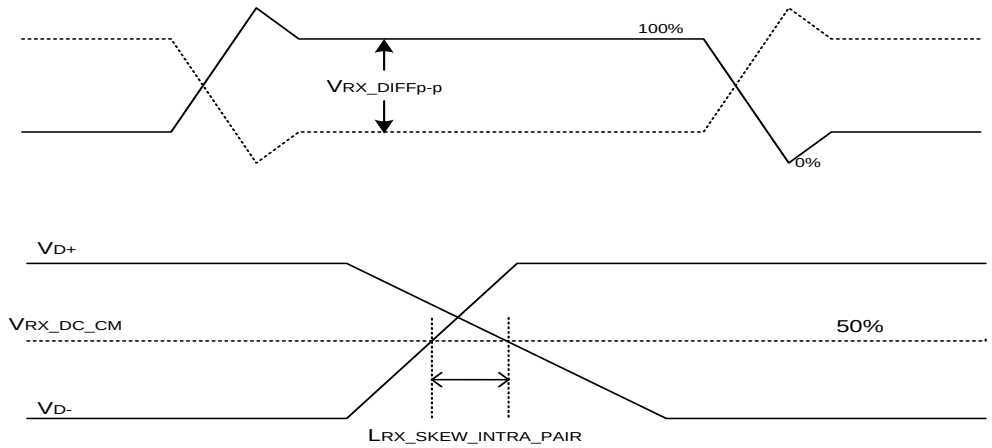


6.2 eDP Rx Interface Timing Parameter

The specification of the eDP Rx interface timing parameter is shown in Table 8.

<Table 8. eDP Rx Interface Timing Specification>

Item	Symbol	Min	Typ	Max	Unit	Remark
Differential peak-to-peak input voltage at package pins	$V_{RX-DIFFp-p}$	120	-	-	mV	
Rx input DC common mode Voltage	$V_{RX\_DC\_CM}$	0	-	2.0	V	
Differential termination resistance	$R_{RX-DIFF}$		100		Ω	
Rx short circuit current limit	I_{RX_SHORT}			50	mA	
Intra-pair skew at Rx package pins (HBR) RX intra-pair skew tolerance at HBR	$L_{RX\_SKEW\_INTRA\_PAIR}$	-	-	60	ps	

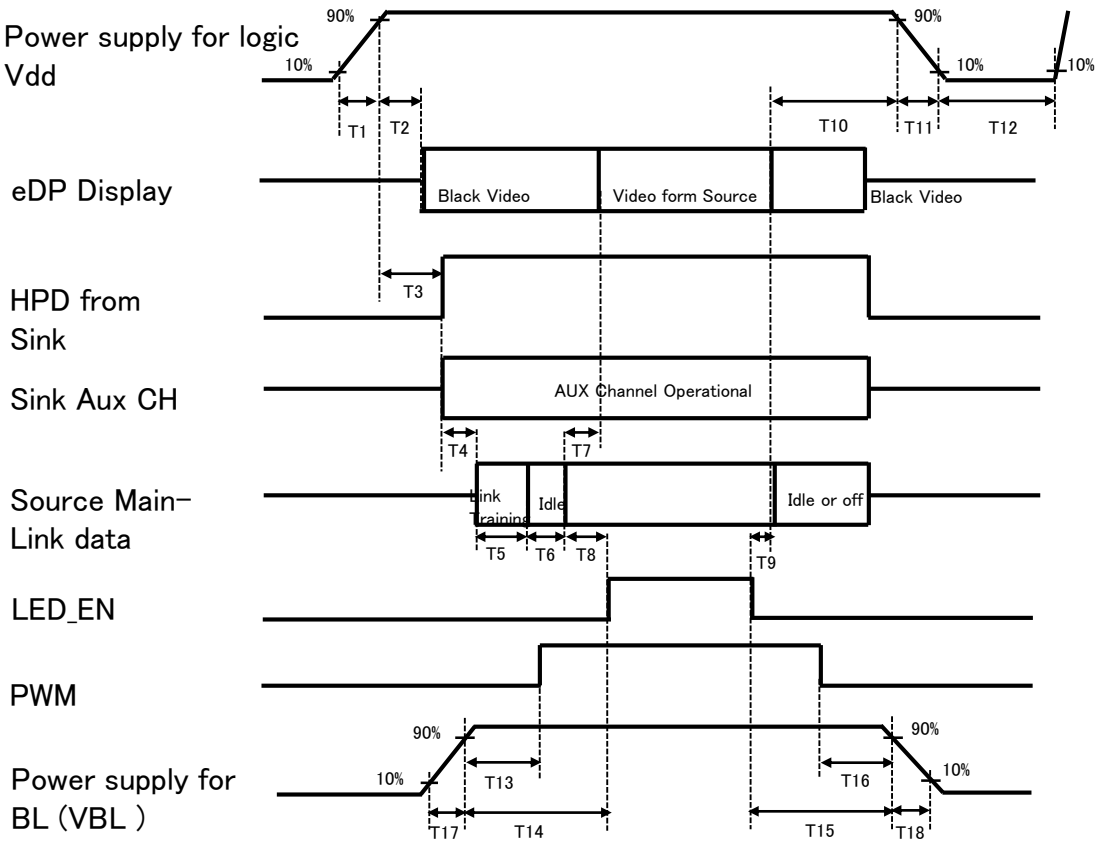


7.0 INPUT SIGNALS, BASIC DISPLAY COLORS & GRAY SCALE OF COLORS

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 seq uence shall be as shown in below



- 0.5ms ≤ T1 ≤ 10 ms
- 0ms ≤ T2 ≤ 200 ms
- 0ms ≤ T3 ≤ 200 ms
- 0ms ≤ T13
- 0ms ≤ T14
- 0ms ≤ T17
- 0ms ≤ T7 ≤ 50ms
- 200ms ≤ T8
- 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 MECHANICAL CHARACTERISTICS

9.1 Dimensional Requirements

<Table 5. Dimensional Parameters>

Parameter	Specification	Unit
Dimensional outline	271.28(H) x188.52(V) x1.95(D) TYP	mm
Weight	163 (Max.)(Without Polaroid Protect Film)	gram
Active area	265.68(H) x 177.12(V)	mm
Pixel pitch	0.123(H) ×0.123(V)	mm
Number of pixels	2160(H)×1440 (V) (1 pixel = R + G + B dots)	pixels
Back-light	Lower Down side ,1-LED Lighting Bar type	

10.0 RELIABLITY TEST

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

<Table 6. Reliability Test Parameters >

No	Test Item	Test Condition	Remark
1	High temperature storage	60C/240h	-
2	Low temperature storage	-20C/240h	
3	High temperature/High humidity Storage	50C/80%RH/240h	
4	High temperature operating	50C/240h	
5	Low temperature operating	0℃/240h	
6	Thermal Shock Storage	-20℃ (30 min)~ +60 ℃(30 min) , 100 cycles	

No	Other Test Item	Test Condition
1	Vibration test (non-operating)	1.5G, 10~500Hz,Half Sine X,Y,Z / Sweep rate : 1 hour
2	Shock test (non-operating)	220G, Half Sine Wave 2msec ±X,±Y,±Z Once for each direction
3	Package Drop test	Height: 60cm, 1 corner, 3 edges, 6 surfaces: 1 time for each direction
4	FPC Bending test	Bending degree is 180, bending 30 times and the bending radius is 1.0mm
5	FPC Insert/Remove test	30 time FPC insert/remove
6	ESD test (Component-LCD MDL)	【HM Air】150pF, 330Ω,±15KV 【HM Contact】150pF,330Ω,±8KV SPEC.: No abnormal display

11.0 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.

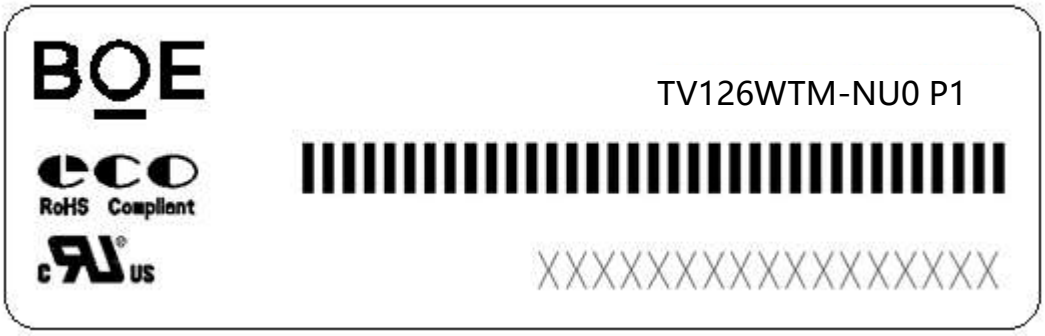
(3) Cautions for the operation
- When the module is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.

(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.

12.0 PRODUCT SERIAL NUMBER



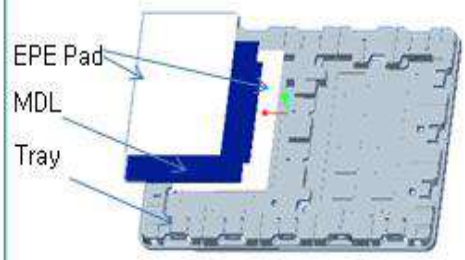
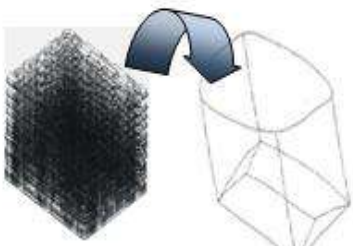
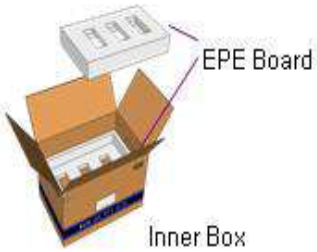
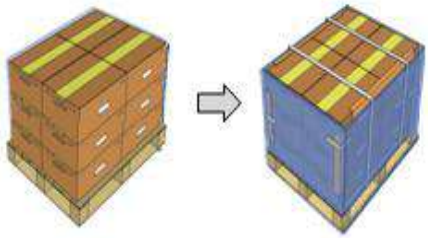
- Label Size : 80 mm (L) × 25 mm (W)

1		2	3	4		5	6				7						
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

1. Control Number
2. Rank / Grade
3. Line Classification
4. Year (2001 : 01, 2002 : 02, …)
5. Month (1,2,3, … , 9, X, Y, Z)
6. Internal Use
7. Serial Number

13.0 Packing

13.1 Packing Order

-. 将 2pcs MDL 平放入Tray, Panel 面向上放置，然后每个Panel 上下各放1pcs EPE Pad(tray 不旋转叠放) -. 容量: 2pcs/Tray	-. 将24pcs PET Tray 平放入PE Bag -. 容量: 46pcs/PE Bag
 Step 1	 Step 2
-.将PET Tray堆码后平放入Inner Box,上下放置EPE Board -. 容量 : 46pcs/Inner Box	-. 每个Pallet上放3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: 552pcs/Pallet
 Step 3	 Step 4

13.2 Packing Note

- Box Dimension : 550mm(W) × 470mm(L) × 296mm(H）
- Package Quantity in one Box : 46 pcs

Item	Specification			Remark
	Q'ty	Dimension(mm)	Weight (kg)	
Panel	1	271.28(H)×188.52(V)×1.95(D)	0.163	-
Tray	1	490(L)×410(W)×18(H)	0.298	-
Inner Box	1	550(L)×470(W)×296(H)	1.5	-
Packing Box	46pcs/Box	550(L)×470(W)×296(H)	15.9	-
Pallet	1	1140(L)×980(W)×130(H)	18	-
Packing Pallet	12Box/Pallet	1140(H)×980(W)×1014(H)	223.4	-

13.3 Box label

- Label Size : 108 mm (L) × 56 mm (W)
- Contents

  Model : TV126WTM-NU0

  Q`ty : Module  46 Q`ty in one box

  Serial No. : Box Serial No. See next page for detail description.

  Date : Packing Date

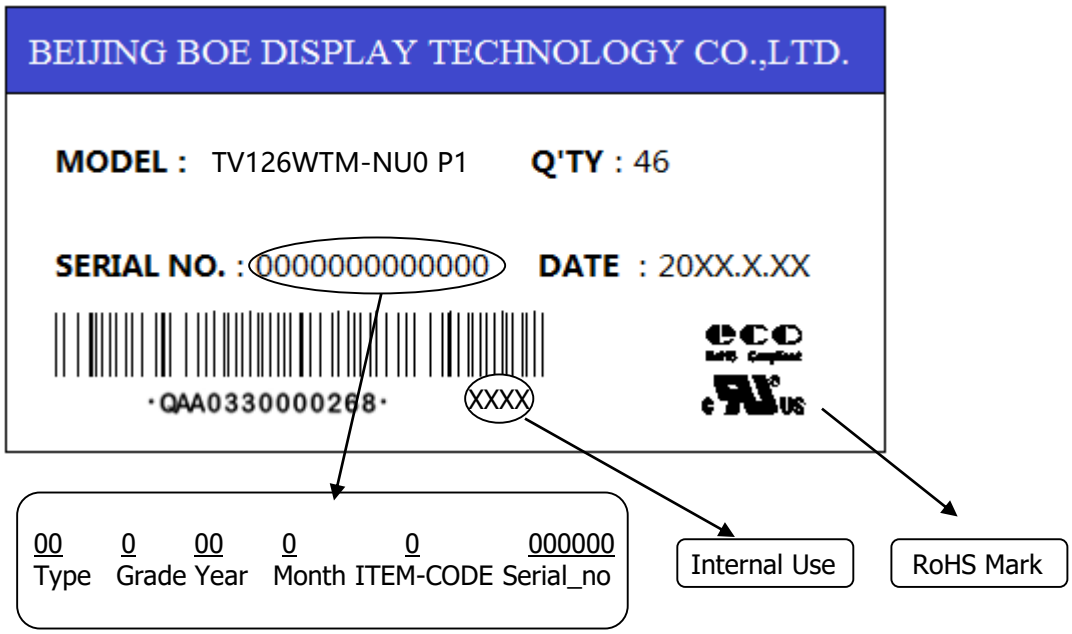


Figure 5. TFT-LCD Module Outline Dimensions (Front view)

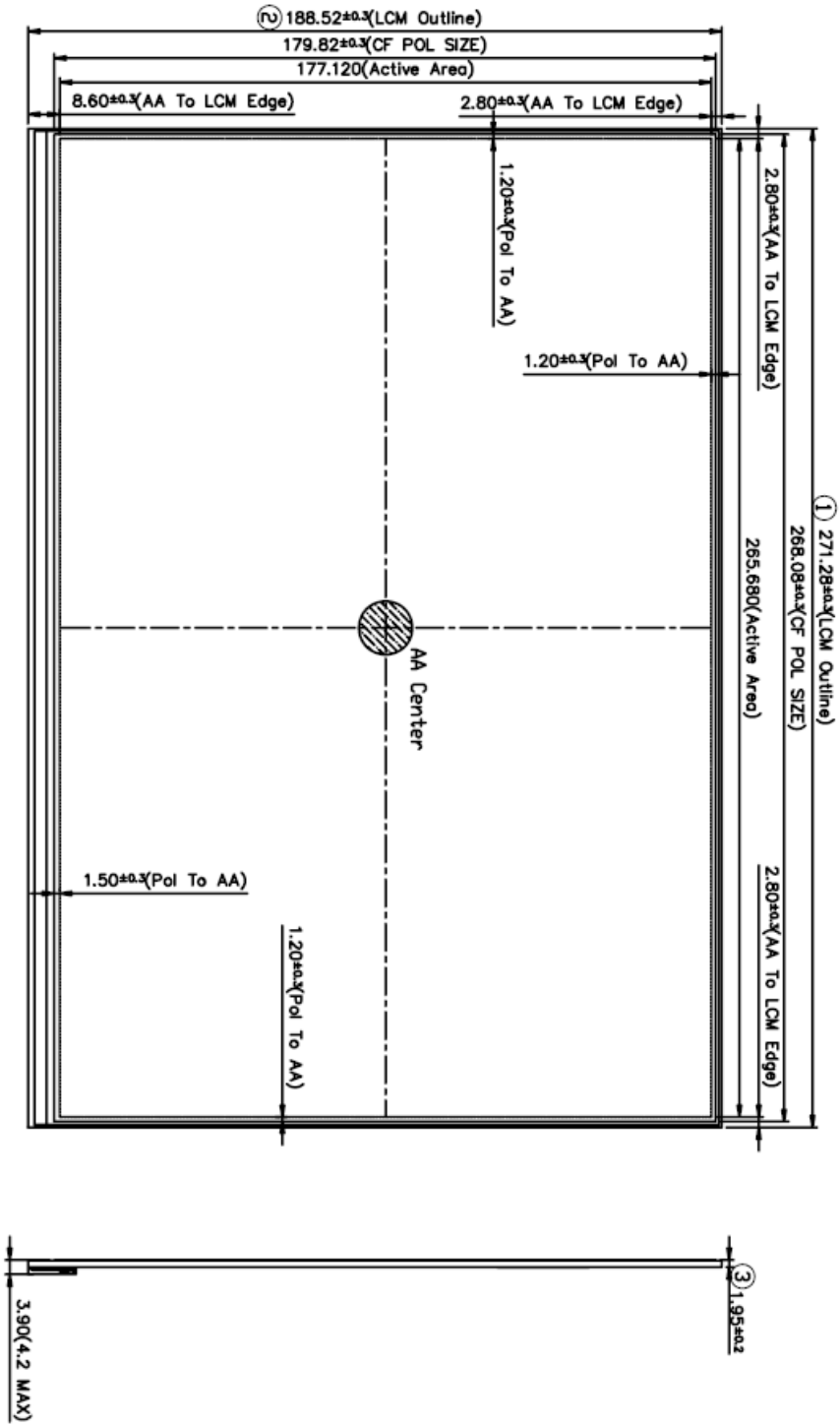
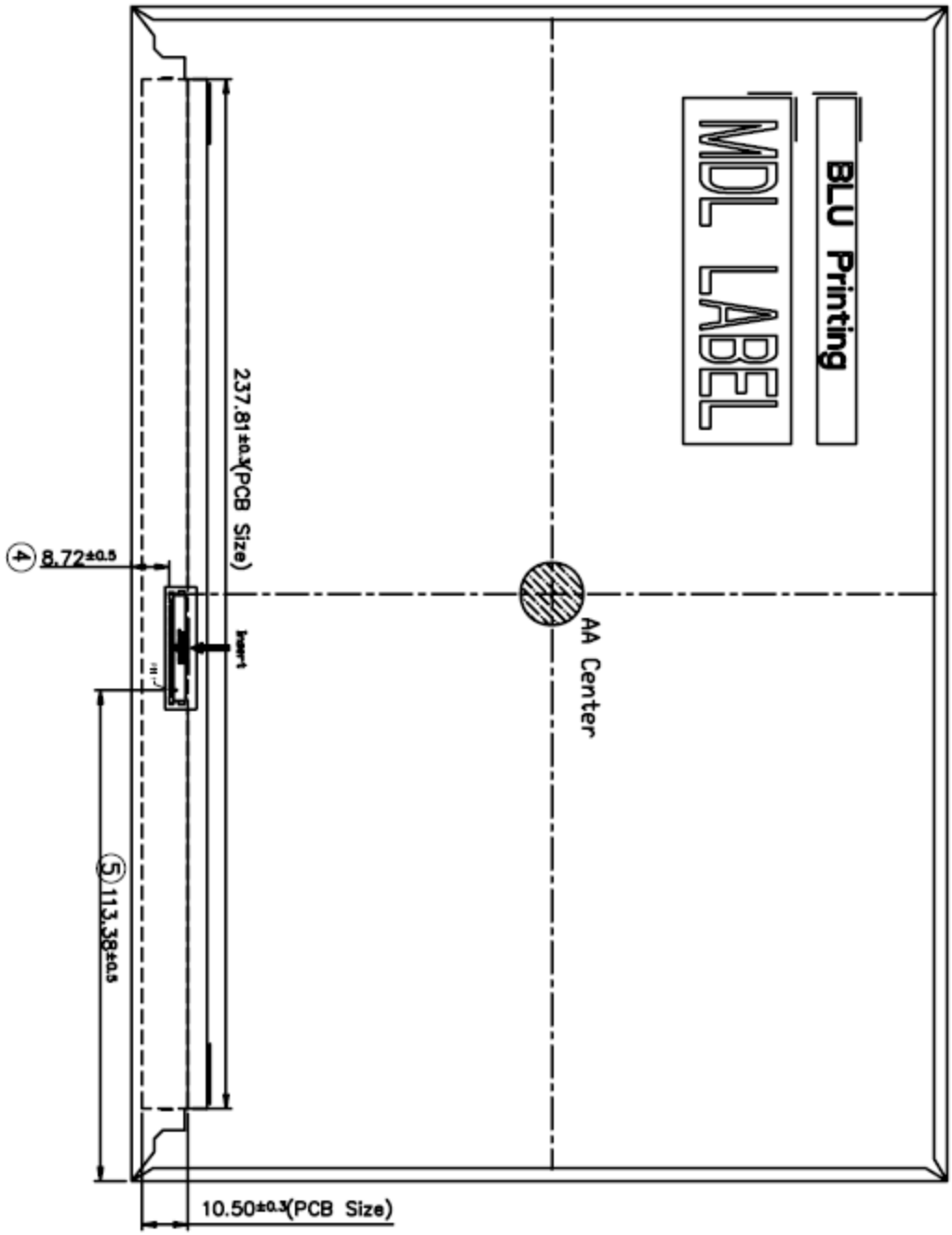


Figure 6. TFT-LCD Module Outline Dimensions (Rear view)



14.0 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	EC	236		1772	ID = 1772
0B		06	6			
0C	32-bit serial No.	00	0			
0D		00	0			
0E		00	0			
0F		00	0			
10	Week of manufacture	06	6		6	
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	1B	27		27	27 cm (Approx)
16	Max V image size	12	18		18	18 cm (Approx)
17	Display Gamma	78	120		2.2	Gamma curve = 2.2
18	Feature support	2	2			RGB display, Preferred Timming mode
19	Red/Green low bits	6D	109		-	Red / Green Low Bits
1A	Blue/White low bits	D0	208		-	Blue / White Low Bits
1B	Red x high bits	A4	164	657	0.642	Red (x) = 10100100 (0.642)
1C	Red y high bits	5C	92	370	0.362	Red (y) = 01011100 (0.362)
1D	Green x high bits	4F	79	319	0.312	Green (x) = 01001111 (0.312)
1E	Green y high bits	A3	163	653	0.638	Green (y) = 10100011 (0.638)
1F	Blue x high bits	27	39	155	0.152	Blue (x) = 00100111 (0.152)
20	BLue y high bits	12	18	73	0.072	Blue (y) = 00010010 (0.072)
21	White x high bits	4E	78	312	0.305	White (x) = 01001110 (0.305)
22	White y high bits	53	83	332	0.325	White (y) = 01010011 (0.325)
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			

Address (HEX)	Function	Hex	Dec	crc	Input values.	Notes
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	04	4		207.4	207.408MHz Main clock
37		51	81			
38		70	112		2160	Hor Active = 2160
39		A0	160		160	Hor Blanking = 160
3A		80	128		-	4 bits of Hor. Active + 4 bits of Hor. Blanking
3B		A0	160		1440	Ver Active = 1440
3C		32	50		50	Ver Blanking = 50
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		22	34		2	V sync Offset = 2 line
41		00	0		2	V Sync Pulse width : 2 line
42		0A	10		266	Horizontal Image Size = 266 mm (Low 8 bits)
43		B1	177		177	Vertical Image Size = 177 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	D0	208		165.9	165.9264MHz Main clock
49		40	64			
4A		70	112		2160	Hor Active = 2160
4B		A0	160		160	Hor Blanking = 160
4C		80	128		-	4 bits of Hor. Active + 4 bits of Hor. Blanking
4D		A0	160		1440	Ver Active = 1440
4E		32	50		50	Ver Blanking = 50
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		22	34		2	V sync Offset = 2 line
53		00	0		2	V Sync Pulse width : 2 line
54		0A	10		266	Horizontal Image Size = 266 mm (Low 8 bits)
55		B1	177		177	Vertical Image Size = 177 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			

Address (HEX)	Function	Hex	Dec	crc	Input values.	Notes
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		42	66		B	Manufacture name : BOEBJ
60		4F	79		O	
61		45	69		E	
62		20	32			
63		42	66		B	
64		4A	74		J	
65		0A	10			
66		20	32			
67		20	32			
68		20	32			
69		20	32			
6A		20	32			
6B		20	32			
6C	Detailed timing/monitor descriptor #4	00	0			Product Name Tag (ASCII)
6D		00	0			
6E		00	0			
6F		FE	254			
70		00	0			
71		54	84		T	Model name : TV126WTM-NU0
72		56	86		V	
73		31	49		1	
74		32	50		2	
75		36	54		6	
76		57	87		W	
77		54	84		T	
78		4D	77		M	
79		2D	45		-	
7A		4E	78		N	
7B		55	85		U	
7C		30	48		0	
7D		0A	10			
7E	Extension flag	00	0			
7F	Checksum	98	152	152	-	