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TITLE : HX121WX1-100

Preliminary Product Specification

Rev. P2

FOR MORE INFORMATION:
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BOE HYDIS TECHNOLOGY

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REVISION HISTORY

REV.	ECN NO.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0		▪ Initial Release	'07. 08. 08	H. R. Park
P1		-.Add the surface treatment_AR(4page) -.Add the life time test condition (8page) -.Add the color reproduction(9page) -.Change the reflectance(9page)	'07. 08. 10	H. R. Park
P2		-.Change the Power Consumption, CR, Gamut, Chromaticity, Reflectance	'08. 01. 14	H. R. Park

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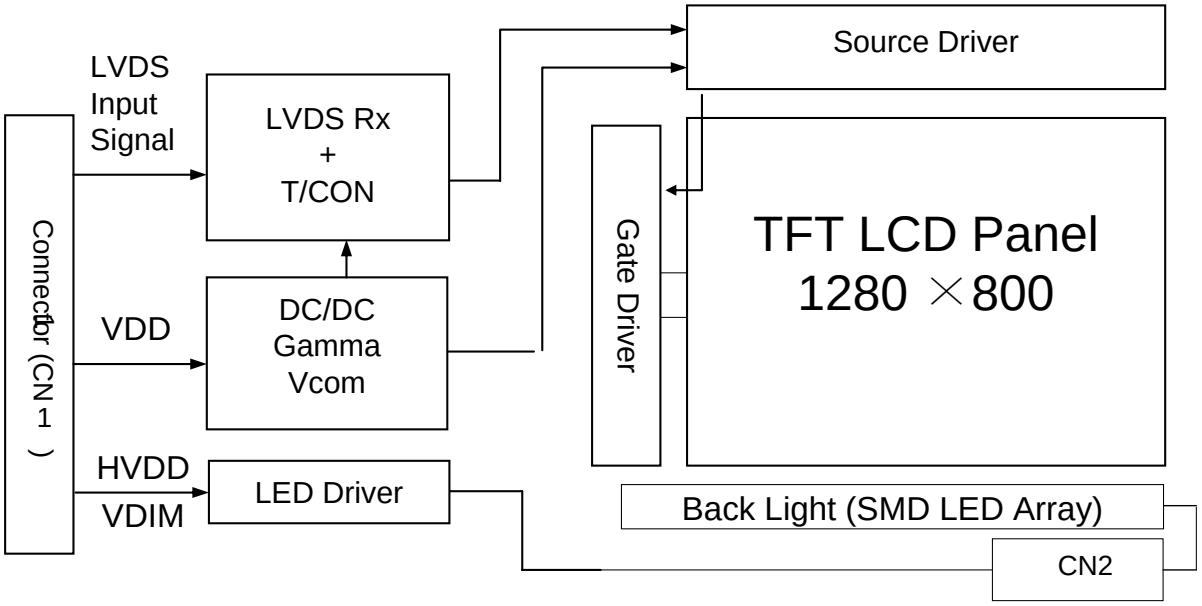
1.0 GENERAL DESCRIPTION

1.1 Introduction

HX121WX1-100 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 12.1 inch diagonally measured active area with WXGA resolutions (1280 horizontal by 800 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical Stripe and this module can display 262,144 colors. The TFT-LCD panel used for this module is a low reflection and higher color type.



1.2 Features

- Thin and Light Weight
- 3.3 V Logic Power Supply
- 12V Back-light Power Supply
- 1 Channel LVDS Interface
- SMD LED (48EA) Array (Bottom Side/Horizontal Direction)
- 262,144 Colors
- Data Enable Signal Mode
- Side Mounting Frame
- Green Product (RoHS)
- Anti-Reflection polarizer product for sunlight readability

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1.3 Application

- Tablet PC (Wide type)

1.4 General Specifications

Parameter	Specification	Unit	Remarks
Active area	261.12(H) ×163.20(V)	mm	
Number of pixels	1280(H) ×800(V)	pixels	
Pixel pitch	0.204(H) ×0.204(V)	mm	
Pixel arrangement	RGB Vertical Stripe		
Display colors	262,144	colors	
Display mode	Normally Black		
Outline dimension	276.8±0.3(H) ×180.0±0.3(V) ×6.8(D:Max.)	mm	Note 1
Weight	265(Typ.) / 275(Max.)	g	Note 2
Back-light	SMD LED (48EA) Array		
Surface treatment	Anti-Reflection, 2H		

Note 1 : At PCB side (LED Side: 4.6mm Max.)
Note 2 : Without digitizer

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2.0 ABSOLUTE MAXIMUM RATINGS

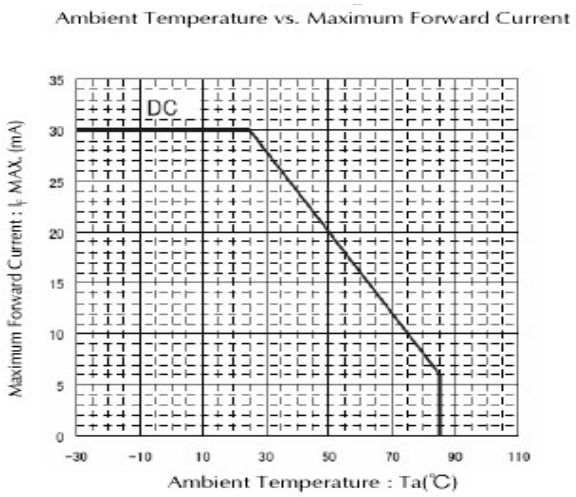
The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

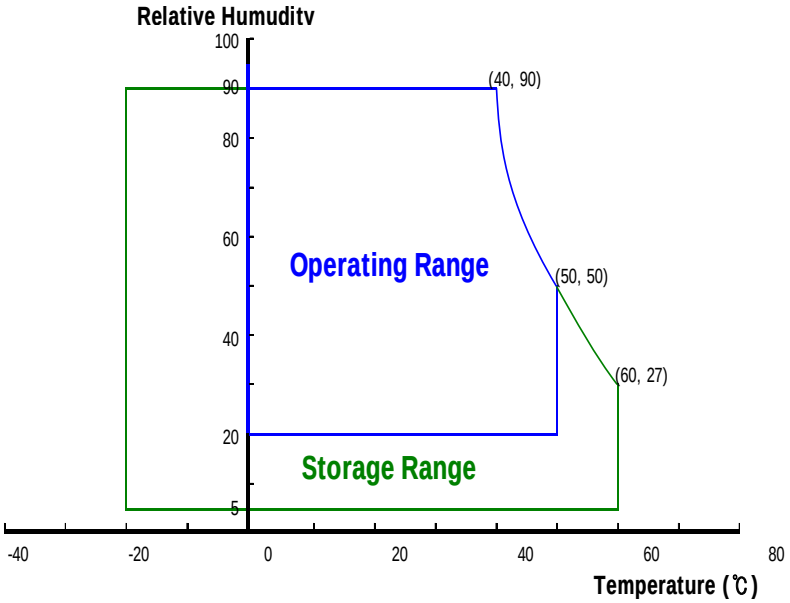
Ta=25+/-2°C

Parameter	Symbol	Min.	Max.	Unit	Remarks
Logic Power Supply Voltage	V_{DD}	-0.3	4.0	V	
Logic Power Supply Voltage	V_{IN}	-0.3	V_{DD}+0.3	V	
Back-light Power Supply Voltage	HV_{DD}	-0.3	40	V	
Back-light LED Current	I_{LED}	-	30	mA	Note 1
Back-light LED Reverse Voltage	V_R	-	5	V	
Operating Temperature	T_{OP}	0	+50	℃	Note 1, Note 2
Storage Temperature	T_{SP}	-20	+60	℃	

Note 1. Ambient temperature vs allowable forward current are shown in the figure below.

Note 2. Temperature and relative humidity range are shown in the figure below.
90% RH Max. (40℃ ≥ Ta)
Maximum wet - bulb temperature at 39℃ or less. (> 40℃) No condensation.





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3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 3. Electrical Specifications >

Parameter		Min.	Typ.	Max.	Unit	Remarks
Logic Power Supply Voltage	V_{DD}	3.0	3.3	3.6	V	Note 1
Logic Power Supply Current	I_{DD}	-	364	TBD	mA	Note 1
Back-light Power Supply Voltage	HV_{DD}	7.0	12.0	20	V	Note 2
Back-light Power Supply Current	I_{HVDD}	-	255	305	mA	Note 2, 3
Back-light Power Consumption	P_{BL}	-	3.06	3.66	W	Note 2, 3
LED Driver's Efficiency	η	-	82	-	%	Note 2, 3
Back-light PWM Frequency	F_{PWM}	200	280	350	Hz	
High Level PWM Signal Voltage	V_{PWMH}	2.1	3.3	5.0	V	
Low Level PWM Signal Voltage	V_{PWML}	-	0	0.6	V	
High Level Differential Input Signal Voltage	V_{IH}	-	-	+100	mV	V_{CM} = 1.2V
Low Level Differential Input Signal Voltage	V_{IL}	-100	-	-	mV	
Back-light LED Voltage / Back-light LED Total Voltage	V_{LED} /V_{BL}	-	3.1 / 37.2	3.5/ 42.0	V	Note 4
Back-light LED Current / Back-light LED Total Current	I_{LED} /I_{BL}	-	16.9 / 67.6	17.8/7 1.2	mA	Note 4
Life Time		10,000	-	-	Hrs	Note 6
EBL (Extended Battery Life)	P_D		0.95	TBD		Note 1, 2, 3
	P_{LED}		0.50	0.88		
	P_{total}		1.45	TBD		
Power Consumption	P_D	-	1.0	TBD	W	Note 1
	P_{LED}	-	2.51	2.99	W	Note 4
	P_{total}	-	3.51	TBD	W	Note 1, 4

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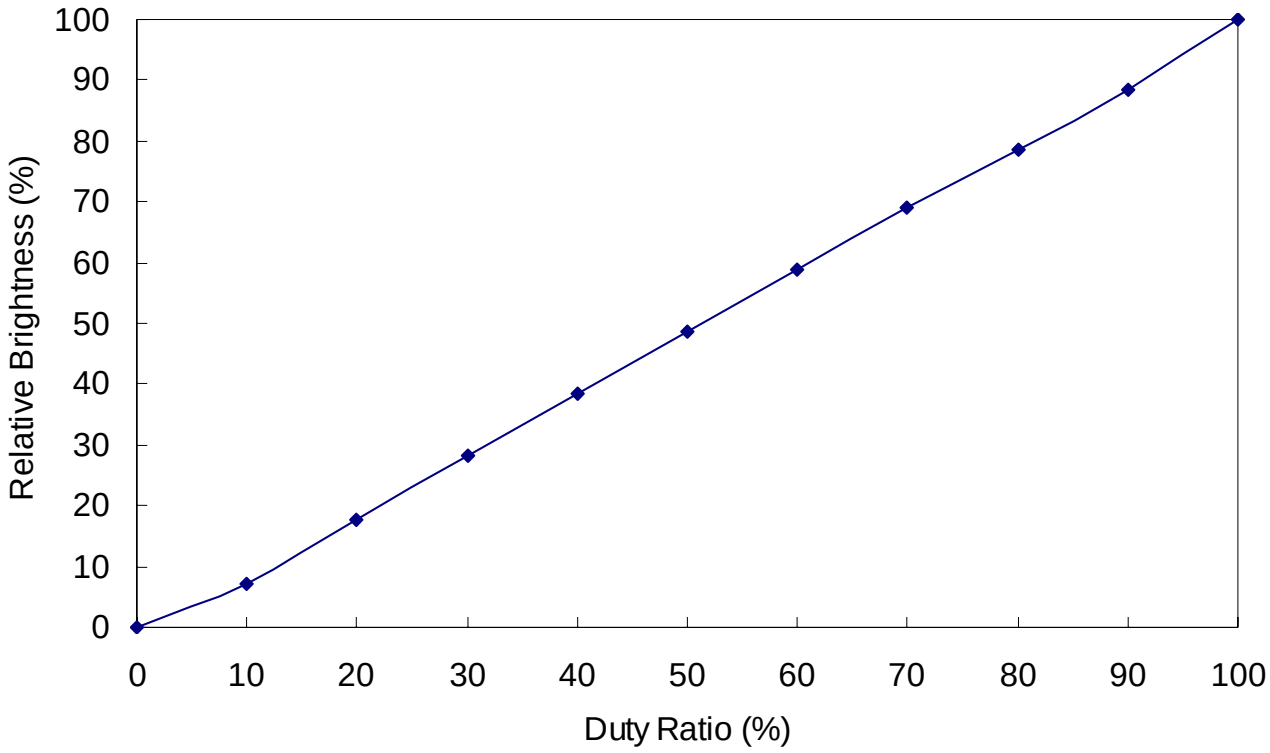
Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.
The current draw and power consumption specified is for 3.3V at 25℃.
a) Typ : Window XP pattern, b) Max : Vertical Sub line pattern
c) EBL : Mosaic pattern (32 X 32)
2. The power supply voltage and current is measured and specified at the interface connector of LCM including LED Driver.
3. Reference value, which is measured with LED Driver for 12V.
4. Reference value, which is measured without LED Driver.
5. Calculated value for reference (V_{LED} × I_{LED} × # of LEDs (48EA)).
6. End of Life shall be determined by the time when any of the following is satisfied under continuous lighting at 25℃ and I_{LED} = 16.9mA.
-. Intensity drops to 50% of the Initial Value (Luminance Spec.)
-. Based on LED

3.2 PWM Duty Ratio vs Brightness



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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±2℃) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5A) 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 $\Theta_{Ø=0}$ (=Θ3) as the 3 o'clock direction (the "right"), $\Theta_{Ø=90}$ (= Θ12) as the 12 o'clock direction ("upward"), $\Theta_{Ø=180}$ (= Θ9) as the 9 o'clock direction ("left") and $\Theta_{Ø=270}$(= Θ6) 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 backlight should be operating for 30 minutes prior to measurement. V_{DD} shall be 3.3+/- 0.3V at 25°C. Optimum viewing angle direction is 6 o'clock.

4.2 Optical Specifications

<Table 4. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks
Viewing Angle Range	Horizontal	Θ_3	CR > 10	-	90	-	Deg.	Note 1
		Θ_9		-	90	-	Deg.	
	Vertical	Θ_{12}		-	90	-	Deg.	
		Θ_6		-	90	-	Deg.	
Luminance Contrast Ratio		CR	Θ = 0°	500	700	-		Note 2
Luminance of White	5 Points	Y_w		250	300	-	cd/m²	
White Luminance Uniformity	5 Points	ΔY5		80	-	-	%	Note 3
	13 Points	ΔY13		60	-	-		
Color Chromaticity	White	W_x		0.273	0.313	0.353		Note 4
		W_y		0.289	0.329	0.369		
	Red	R_x		0.540	0.580	0.620		
		R_y		0.333	0.373	0.413		
	Green	G_x		0.304	0.344	0.384		
		G_y		0.525	0.565	0.605		
	Blue	B_x		0.109	0.149	0.189		
		B_y		0.097	0.137	0.177		
Color Reproduction					42		%	
Response Time		Total ($T_r + T_d$)	Ta= 25° C Θ = 0°	-	30	-	ms	Note 5
Cross Talk		CT	Θ = 0°	-	-	2.0	%	Note 6
Outdoor Spec.	Brightness	Center	Θ = 0°	-	500	-	ms	Note 7
	Reflectance	Ri		3.0	3.5	-	%	Note 8

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Note : 1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing 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 shown in page 11).

2. Contrast measurements shall be made at viewing angle of $\Theta = 0°$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (See FIGURE 1 shown in page 11)
Luminance Contrast Ratio (CR) is defined mathematically.

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

3. The White luminance uniformity on LCD surface is then expressed.
(See FIGURE 2~3 shown in page 12)

$$\text{Uniformity } \Delta Y = \frac{\text{Minimum Luminance of 5(or 13) points}}{\text{Maximum Luminance of 5(or 13) points}} \quad X\ 100\ (\%)$$

4. The color chromaticity coordinates specified in Table 4 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.

5. The electro-optical response time measurements shall be made as FIGURE 4 shown in page 13 by switching the "data" input signal OFF and ON. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td. (See FIGURE 4 shown in page 13)

6. 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 shown in page 13)

7. Measure condition: Light source is 5,000nits, 15 degree position & BLU on
(See FIGURE 1 shown in page 11)

8. Reference : Standard White Plate (BaSO4)

$$\text{Reflectance} = \frac{\text{Light intensity of the reflected light on LCD Module}}{\text{Output intensity of the reflected light on Reference}} \times 100\%$$

Measure condition: Light source is 5,000nits, 15 degree position & BLU off
(See FIGURE 1 shown in page 11)

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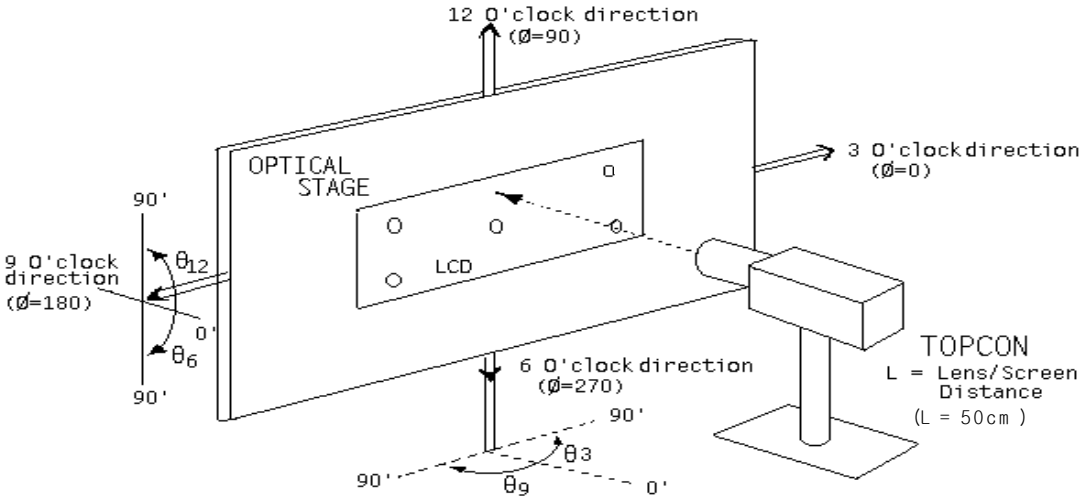
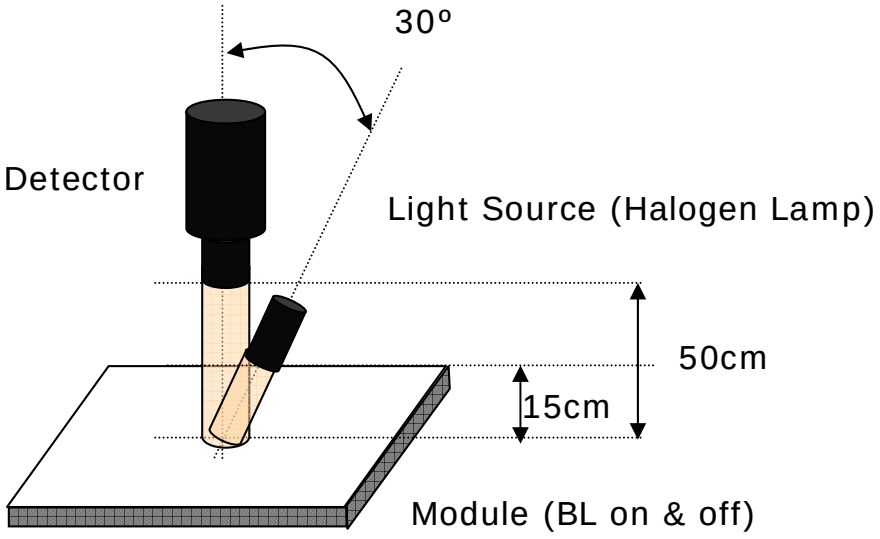
4.3 Optical Measurements

Figure 1. Measurement Set Up



<Indoor>



<Outdoor>

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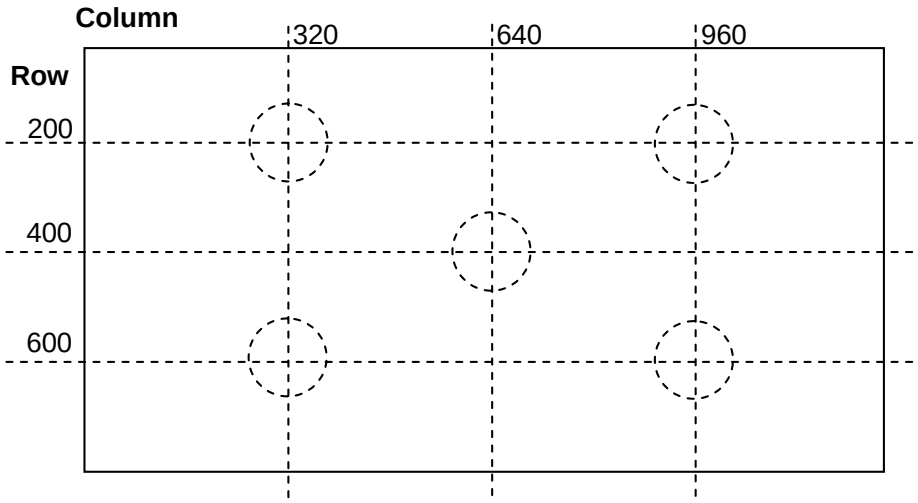
Figure 2. White Luminance and Uniformity Measurement Locations (5 points)



Note.

Luminance of white is defined as luminance values of 5 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 locations shown in Figure 2 for a total of the measurements per display.

* Yw = (Sum of 5 Points Luminance / 5)

Figure 3. Uniformity Measurement Locations (13 points)

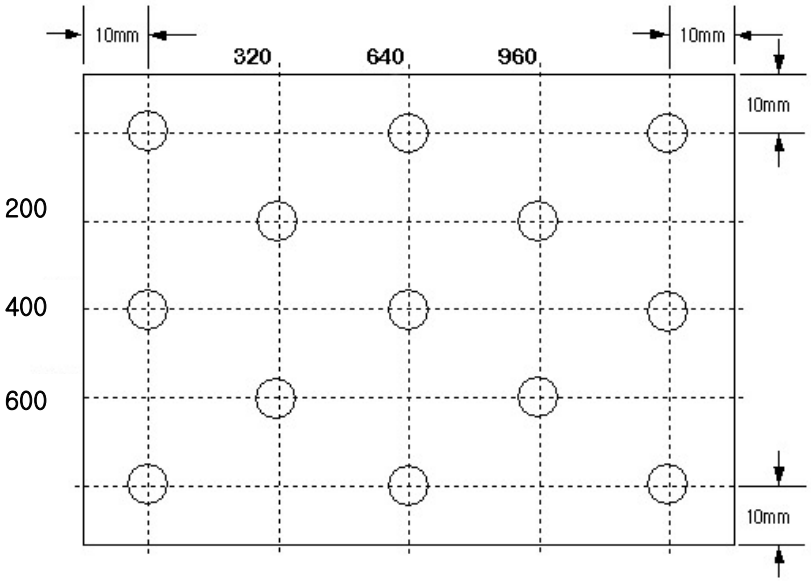


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Figure 4. Response Time Testing

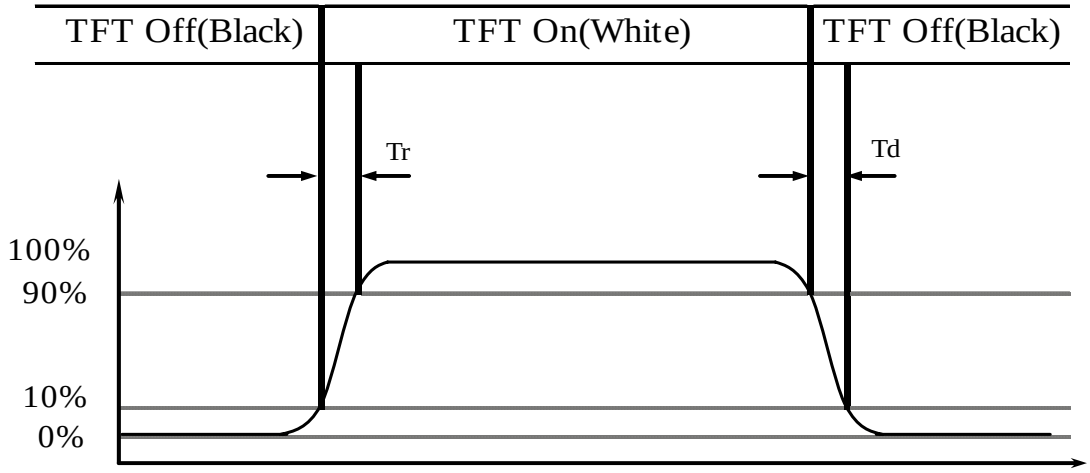
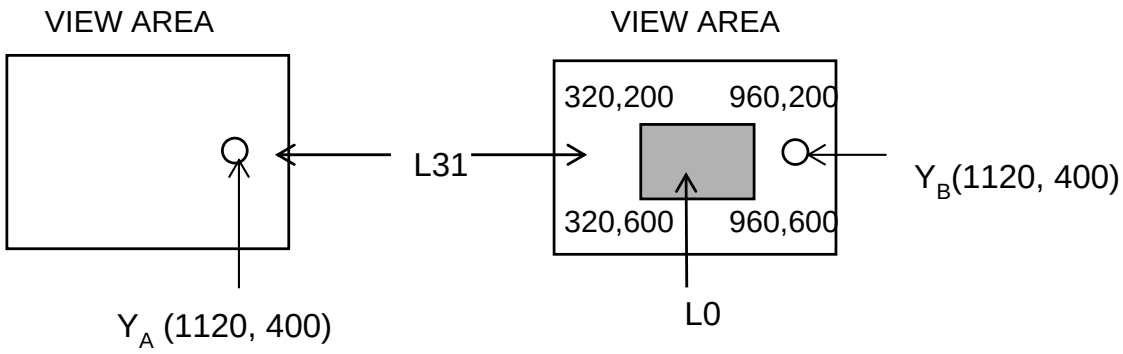


Figure 5. Cross Modulation Test Description



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

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

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5.0 INTERFACE CONNECTIONS

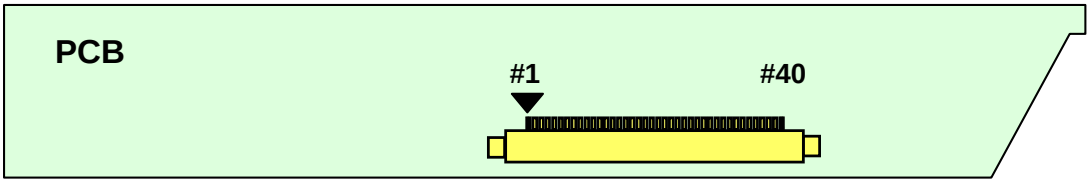
5.1 Electrical Interface Connection

CN1 Interface Connector (FI-JH40S-HF10, Manufactured by JAE)

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	GND1	GROUND	21	GND6	GROUND
2	CONNTST	Connector Test	22	RCLKIN-	LVDS Negative clock signal (-)
3	LVDD1	Logic Power Supply : +3.3V	23	RCLKIN+	LVDS Positive clock signal (+)
4	LVDD2	Logic Power Supply : +3.3V	24	GND7	GROUND
5	LVDD3	Logic Power Supply : +3.3V	25	VDIM	PWM Brightness Control
6	VDD_DEID	EDID Power Supply : +3.3V	26	Reserved	NON-CONNECTION
7	TEST	NON-CONNECTION	27	Reserved	NON-CONNECTION
8	CLK_EDID	EDID Clock	28	HVGND1	GROUND
9	DATA_EDID	EDID Data	29	HVGND2	GROUND
10	GND2	GROUND	30	HVGND3	GROUND
11	GND3	GROUND	31	HVGND4	GROUND
12	NC	NON-CONNECTION	32	HVGND5	GROUND
13	RIN0-	LVDS Negative data signal (-)	33	NC	NON-CONNECTION
14	RIN0+	LVDS Positive data signal (+)	34	HVDD1	Back-light Power Supply: +12V
15	GND4	GROUND	35	HVDD2	Back-light Power Supply: +12V
16	RIN1-	LVDS Negative data signal (-)	36	HVDD3	Back-light Power Supply: +12V
17	RIN1+	LVDS Positive data signal (+)	37	HVDD4	Back-light Power Supply: +12V
18	GND5	GROUND	38	HVDD5	Back-light Power Supply: +12V
19	RIN2-	LVDS Negative data signal (-)	39	CONNTST	Connector Test
20	RIN2+	LVDS Positive data signal (+)	40	GND8	GROUND

Note 1. Connected with No. 2 & 39

Note 2. Start from left side



CN1 (FI-JH40S-HF10)

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5.2 LVDS Interface

LVDS Transmitter : THC63LVDM83A

Input signal	Transmitter		Interface		FI-JH40S-HF10	Remark
	Pin No	Pin No	System (Tx)	TFT-LCD (Rx)	Pin No.	
R0	51	48 47	OUT0- OUT0+	IN0- IN0+	13 14	
R1	52					
R2	54					
R3	55					
R4	56					
R5	3					
G0	4					
G1	6	46 45	OUT1- OUT1+	IN1- IN1+	16 17	
G2	7					
G3	11					
G4	12					
G5	14					
B0	15					
B1	19					
B2	20	42 41	OUT2- OUT2+	IN2- IN2+	19 20	
B3	22					
B4	23					
B5	24					
HSYNC	27					
VSYNC	28					
DE	30					
MCLK	31	40	CLKOUT-	CLKIN-	22	
		39	CLKOUT+	CLKIN+	23	

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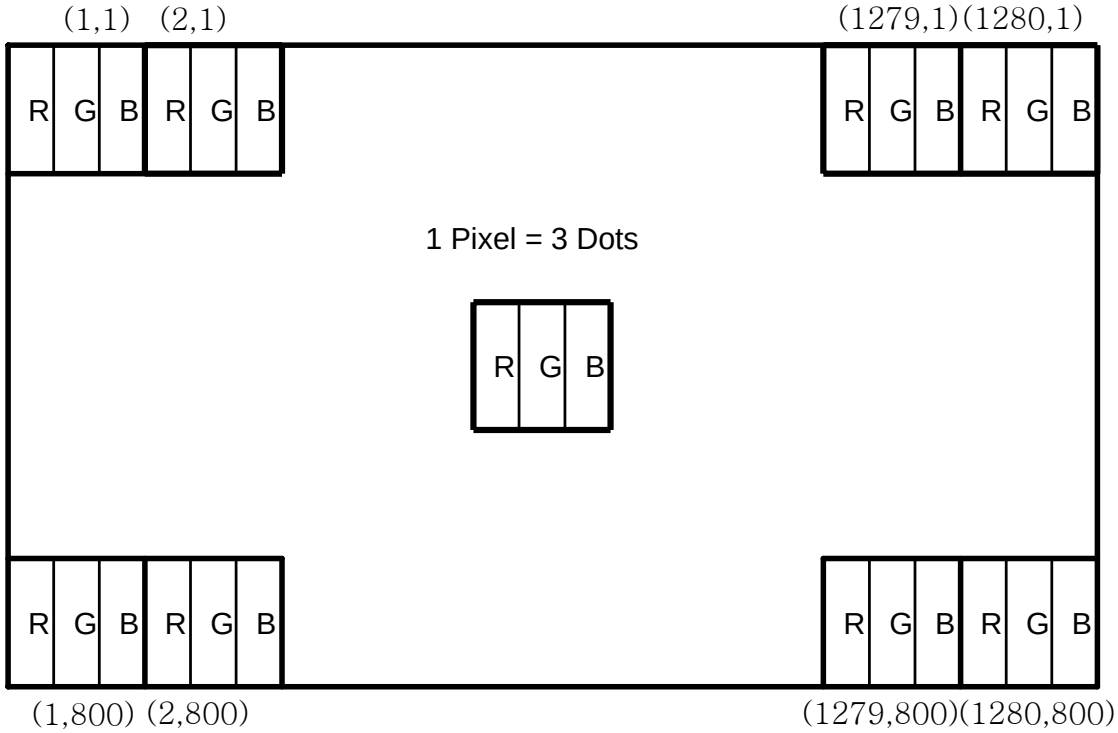
5.3 Back-light Interface

CN2 LED FPC Connector (04-6298-009, Manufactured by Kyocera)

Pin No.	Symbol	Function	Remark
1	Anode1	LED Anode Power Supply	LED Anode Power Supply (3.25V X 12EA = 39V)
2	Anode2	LED Anode Power Supply	
3	Anode3	LED Anode Power Supply	
4	Anode4	LED Anode Power Supply	
5	NC	Non-Connection	
6	Cathode1	LED Cathode Power Supply	LED Cathode Power Supply
7	Cathode2	LED Cathode Power Supply	
8	Cathode3	LED Cathode Power Supply	
9	Cathode4	LED Cathode Power Supply	

5.4 Data Input Format



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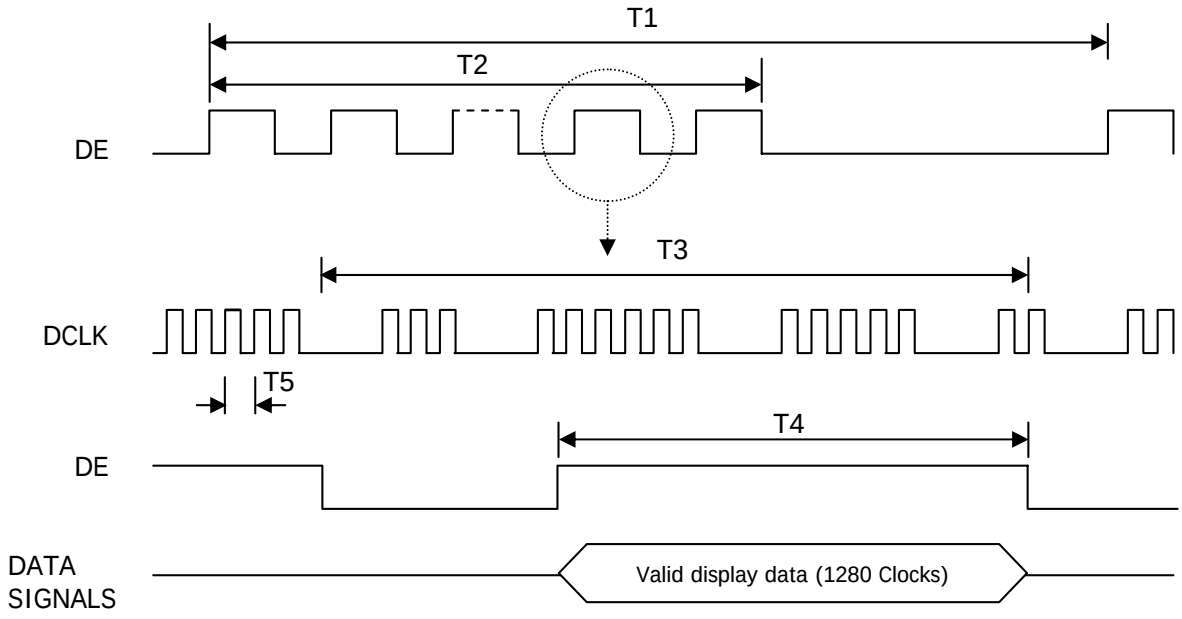
6.0. SIGNAL TIMING SPECIFICATIONS

6.1 The 12.1" WXGA LCM is operated by the only DE (Data enable) mode (LVDS Transmitter Input)

Item	Symbol	Min.	Typ.	Max.	Unit
Frame Period	T1	810	823	-	Lines
Vertical Display Period	T2	-	800	-	Lines
One line Scanning Period	T3	1350	1440	-	Clocks
Horizontal Display Period	T4	-	1280	-	Clocks
Clock Frequency	1/T5	-	69.3	-	MHz

7.0 SIGNAL TIMING WAVEFORMS

7.1 Timing Waveforms of Interface Signal



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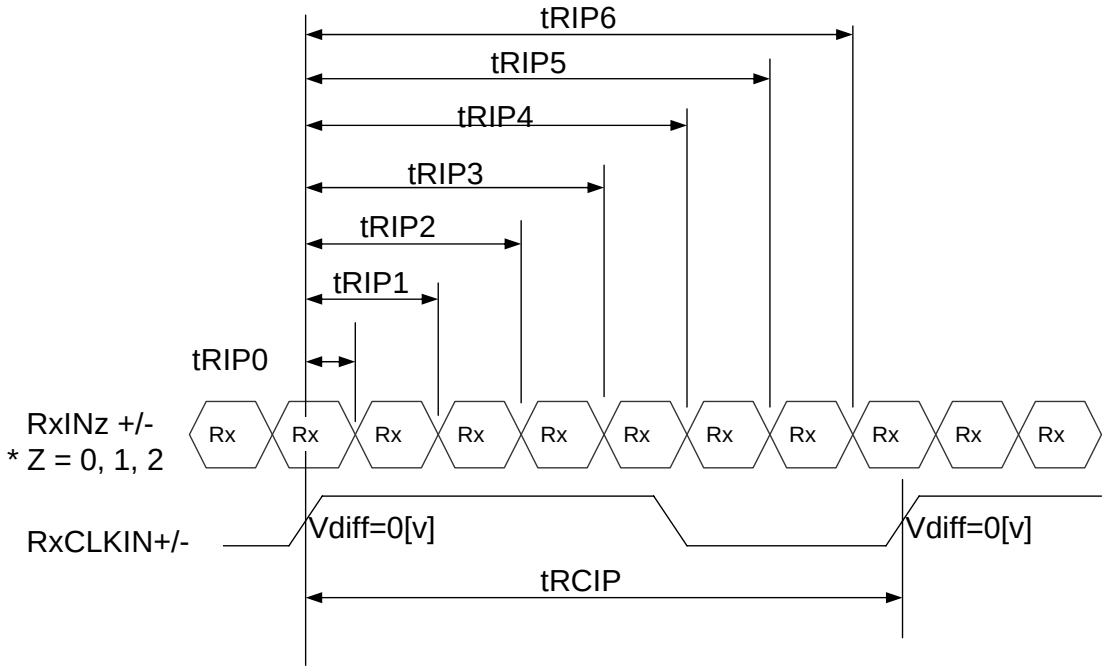
7.2 LVDS Rx Interface Timing Parameter

The specification of the LVDS Rx interface timing parameter

< LVDS Rx Interface Timing Specification>

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
CLKIN Period	tRCIP	12.50	14.43	25.00	nsec	
Input Data 0	tRIP0	-0.4	0.0	+0.4	nsec	
Input Data 1	tRIP1	tRICP/7-0.4	tRICP/7	tRICP/7+0.4	nsec	
Input Data 2	tRIP2	2 ×tRICP/7-0.4	2 ×tRICP/7	2 ×tRICP/7+0.4	nsec	
Input Data 3	tRIP3	3 ×tRICP/7-0.4	3 ×tRICP/7	3 ×tRICP/7+0.4	nsec	
Input Data 4	tRIP4	4 ×tRICP/7-0.4	4 ×tRICP/7	4 ×tRICP/7+0.4	nsec	
Input Data 5	tRIP5	5 ×tRICP/7-0.4	5 ×tRICP/7	5 ×tRICP/7+0.4	nsec	
Input Data 6	tRIP6	6 ×tRICP/7-0.4	6 ×tRICP/7	6 ×tRICP/7+0.4	nsec	



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

Each color is displayed in sixty-four gray scales from a 6 bit data signal input. A total of 262,144 colors are derived from the resultant 18 bit data.

Colors & Gray Scale		Red Data						Green Data						Blue Data					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	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
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	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
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	1	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	↓						↓						↓					
	▽	↓						↓						↓					
	Brighter	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	▽	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	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	1	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	△	↓						↓						↓					
	▽	↓						↓						↓					
	Brighter	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	▽	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	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	1
	Darker	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	1	1	1	1	0	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Gray Scale Of White & Black	Black	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	1	0	0	0	0	0	1
	Darker	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
	△	↓						↓						↓					
	▽	↓						↓						↓					
	Brighter	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1
	▽	1	1	1	1	1	0	1	1	1	1	1	0	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

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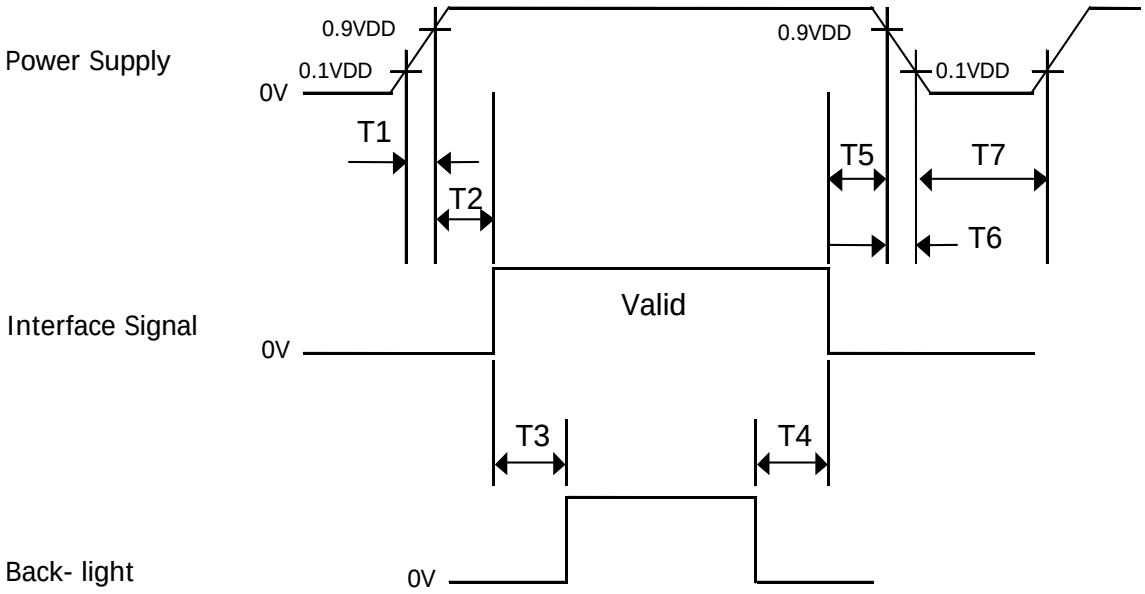
9.0 POWER SEQUENCE

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



- T1 ≤ 10 ms
- 0 ≤ T2 ≤ 50 ms
- 200 ms ≤ T3
- 200 ms ≤ T4
- 0 ≤ T5 ≤ 50 ms
- 0 ≤ T6 ≤ 10ms
- 500ms ≤ T7

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.
3. Back Light must be turn on after power for logic and interface signal are valid.

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10.0 MECHANICAL CHARACTERISTICS

10.1 Dimensional Requirements

Figure 6 & 7 (located in 11.0) shows mechanical outlines for the model

Parameter	Specification	Unit
Active Area	261.12(H) X 163.20(V)	mm
Number of pixels	1280(H) X 800(V) (1 pixel = R + G + B dots)	
Pixel pitch	0.204(H) X 0.204(V)	
Pixel arrangement	RGB Vertical stripe	
Display colors	262,144	
Display mode	Normally Black	
Outline dimension	276.8±0.3(H)×180.0(V)±0.3×6.8(D:Max.)	mm
Weight	265(Typ.) / 275(Max.)	g
Back-light	SMD LED (48EA) Array	

10.2 Mounting

See Figure 6 & 7 & 8. (shown in 11.0)

Parameter	Specification	Unit
Torque of side mounting screw	2.5(Max.)	kgf
Torque of ground plate screw	1.5(Max.)	kgf
Torque of top side screw	2.5(Max.)	kgf

10.3 Anti-Glare and Polarizer Hardness.

The surface of the LCD has an anti-glare coating to minimize reflection and a coating to reduce scratching.

10.4 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 150lux. The manufacture shall furnish limit samples of the panel showing the light leakage acceptable.

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11.0 Mechanical Drawing

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

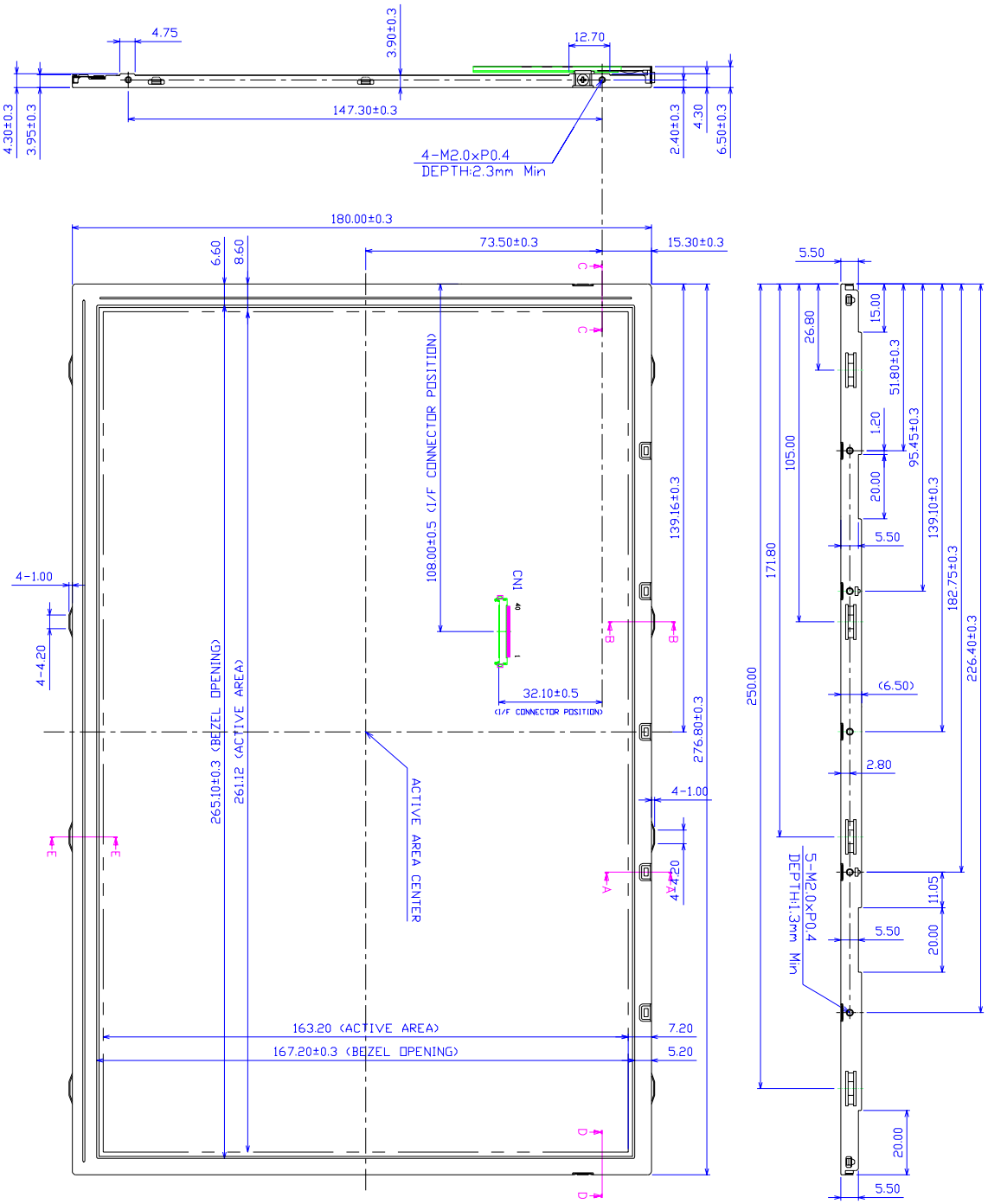

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Figure 7. TFT-LCD Module Outline Dimensions (Rear view)

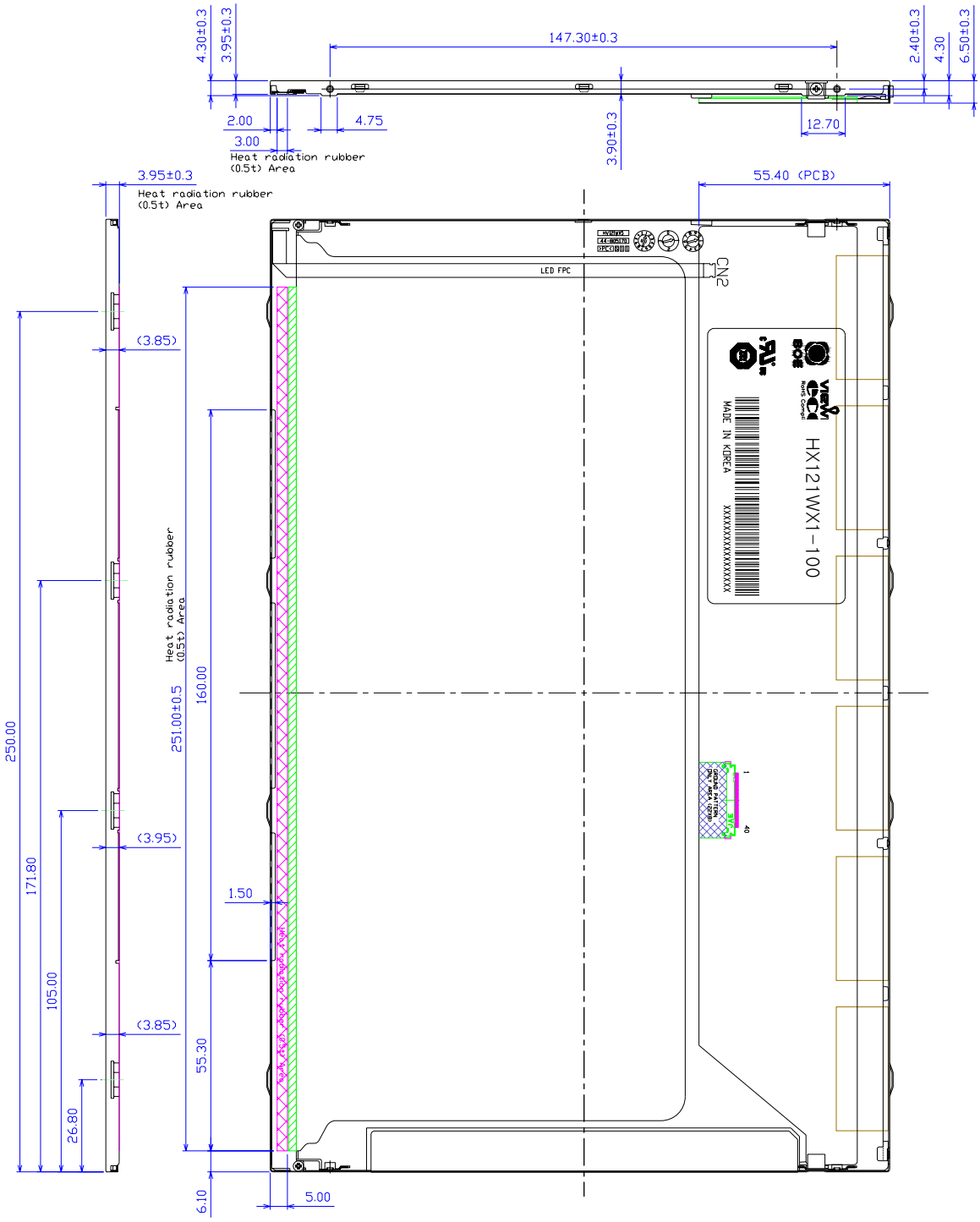

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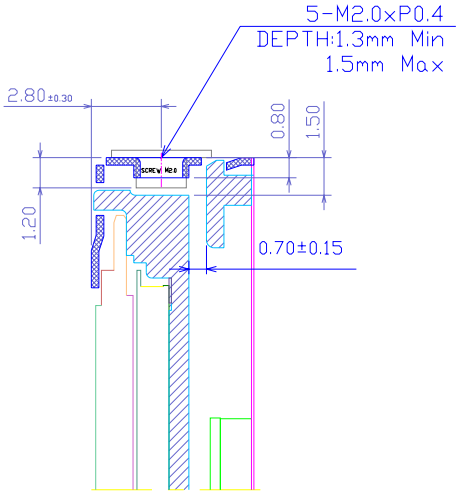
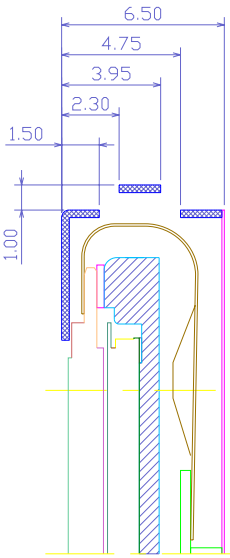
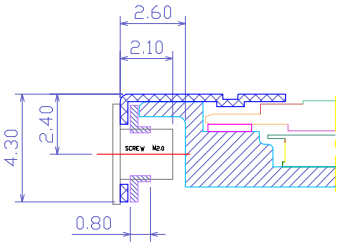
Figure 8. TFT-LCD Module Section for Mounting



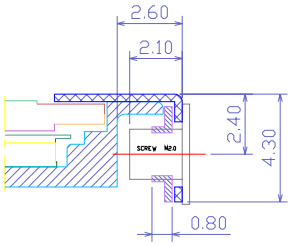
SECTION A-A(S:5/1)



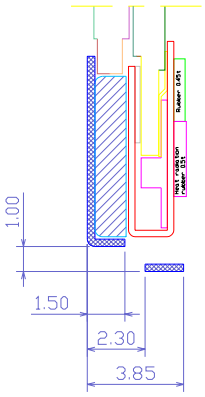
SECTION B-B(S:5/1)



SECTION C-C(S:5/1)



SECTION D-D(S:5/1)



SECTION E-E(S:5/1)

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12.0 RELIABLITY TEST

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

<Table 12. Reliability Test>

No	Test Item	Conditions
1	High temperature storage test	Ta = 60 °C, 240 hrs
2	Low temperature storage test	Ta = -20 °C, 240 hrs
3	High temperature & high humidity operation test	Ta = 50 ℃, 80%RH, 240hrs
4	High temperature operation test	Ta = 50 °C, 240 hrs
5	Low temperature operation test	Ta = 0 °C, 240 hrs
6	Thermal shock	Ta = -20 °C ↔ 60 °C (30 min), 100 cycle
7	Vibration test (non-operating)	Frequency : 10~500Hz Gravity/AMP : 1.5G Period : X,Y,Z 30min
8	Shock test (non-operating)	Gravity : 220G Pulse width : 2ms, half sine wave ±X, ±Y, ±Z Once for each direction
9	Electro-static discharge test (non-operating)	Air : 150pF, 330ohm, 15KV Contact : 150pF, 330ohm, 8KV

13.0 HANDLING & CAUTIONS

13.1 Cautions when taking out the module

- Pick the pouch only, when taking out module from a shipping package.

13.2 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 (epoxy) 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.

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13.3 Cautions for the operation

- When the module is operating, do not lose MCLK, DE signals. If any one of these signals were lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.

13.4 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.

13.5 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.

13.6 Cautions for the digitizer assembly

- When assembling FPC connector, do not flip connector past 90° due to possible damage to connector.
- When positioning digitizer underneath driver IC, do not lift driver IC past 90° due to possible damage to drive IC pattern.
- Please be warned that during assembly of digitizer, the opening or closing of FPC will result in possible electrostatic discharge damage to the LED

13.7 Other cautions

- 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.

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14.0 LABELS

14.1 Product Label

BOE HYDIS Barcode

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

No 1. Control Number

No 2. Rank / Grade

No 3. Line Classification
(BOE HYDIS : H, LCM : L, BOE OT : A/B/C)

No 4. Year (5 : 2005, 6 : 2006, …)

No 5. Month (1, 2, 3,…, 9, X, Y, Z)

No 6. FG Code

No 7. Serial Number

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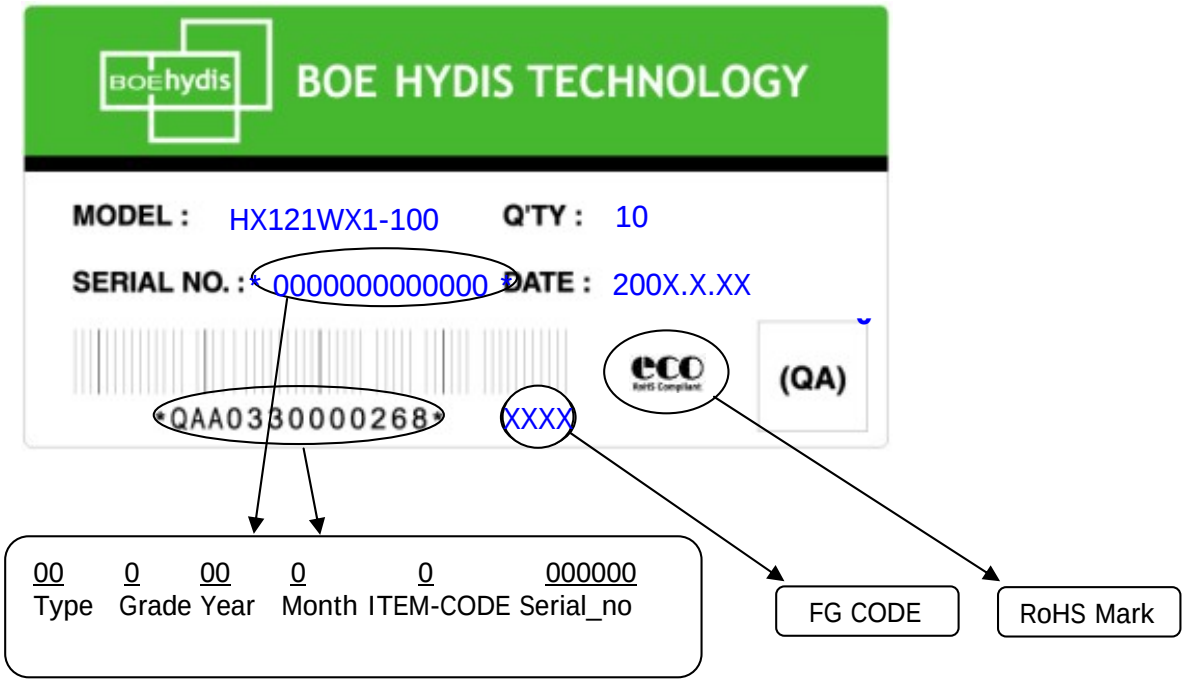
14.2 Packing Label

Label Size: 108 mm (L) × 56 mm (W)
Contents
Model: HX121WX1-100
Q`ty: Module Q`ty in one box
Serial No.: Box Serial No. See next figure for detail description.
Date: Packing Date
FG Code: FG Code of Product



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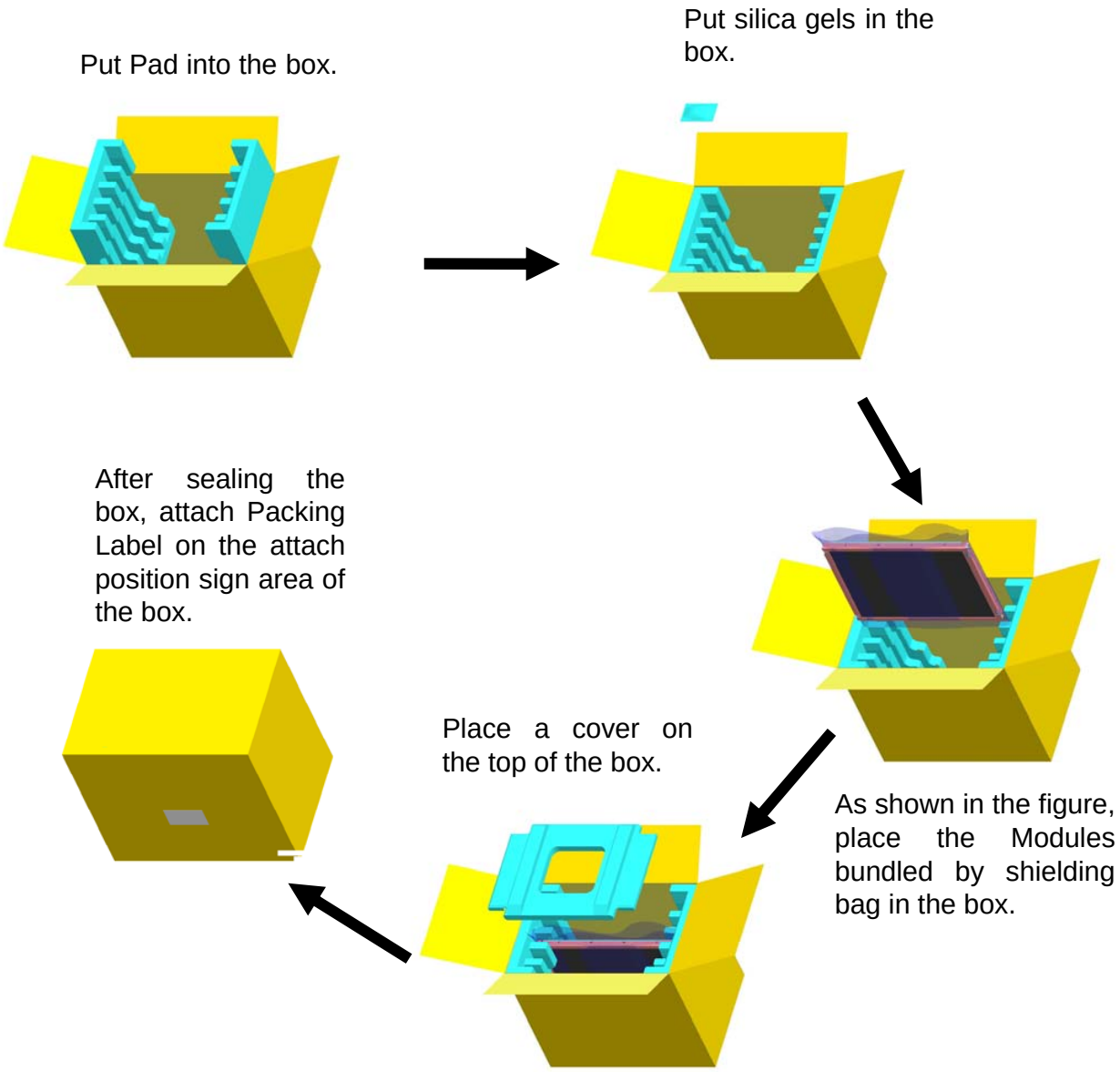
15.0 PACKING INFORMATION

15.1 Packing order



15.2 Notes

- Box Dimension : 349.0mm(W) X 261.0mm(D) X 311.0mm(H)
- Package Quantity in one Box : 10pcs

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