



BOE	PRODUCT GROUP	REV	ISSUE DATE
	Customer SPEC	Rev. P0	July.16,21'

TITLE :QV185FHB-N81
Product Specification
Rev. P0

Customer		Recipient's recognition	
Take charge		Establishment	MR.HO
Audit		Audit	
Approved		Approved	

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REVISION HISTORY

(●) preliminary specification

() Final specification

Revision No.	Page	Description of changes	Date	Prepared
Rev.0		Initial Release	July.16,21'	MR.HO

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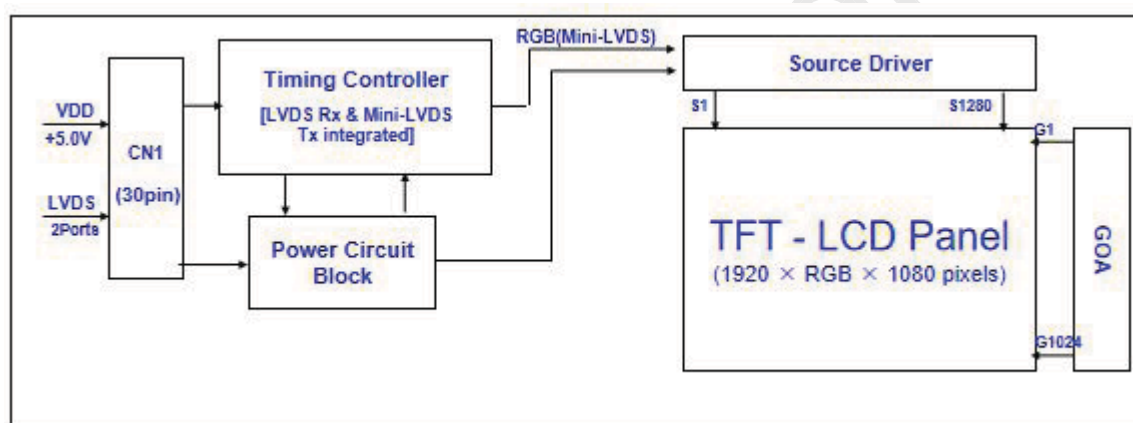
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1.0 GENERAL DESCRIPTION

1.1 Introduction

QV185FHB-N81 is a color active matrix TFT LCD MDL using amorphous silicon TFT's

(Thin Film Transistors) as an active switching devices. This Open Cell has a 18.5 inch diagonally measured active area with FHD resolutions (1920 horizontal by 1080 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. The TFT-LCD panel is adapted for a low reflection and higher color type.



1.2 Features

- .LVDS interface with 2 pixel / clock
- .High-speed response
- .Low color shift image quality
- .8-bit color depth, display 16.7M colors
- Wide viewing angle
- DE (Data Enable) only mode
- HADS technology is applied for high display quality
- RoHS compliant

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1.3 Application

Commercial Digital Display

Display Terminals for Control System

Landscape and Portrait Display

1.4 General Information

Parameter	Specification	Unit	Remarks
Active area	408.96 (H) * 230.04 (V)	MM	
Number of pixels	1920(H) × 1080(V)	pixels	
Pixel pitch	213(H) x 213(V)	MM	
Pixel arrangement	Pixels RGB Vertical stripe		
BLU Brightncs	500	Cd/m ²	
Display colors	16.7M	colors	
Display mode	Normally Black		
Dimensional outline	430.4(H) × 254.6(V) × 9.5(D) typ.		
Sealing Area	6.69/5/6.62/6.62	mm	U/D/L/R
Surface Treatment	Haze : 25%		
Back-light	1-LED Lighting Bar type		

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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. The operational and non-operational maximum voltage and current values are listed in Table 2

< Table 2. Absolute Maximum Ratings >

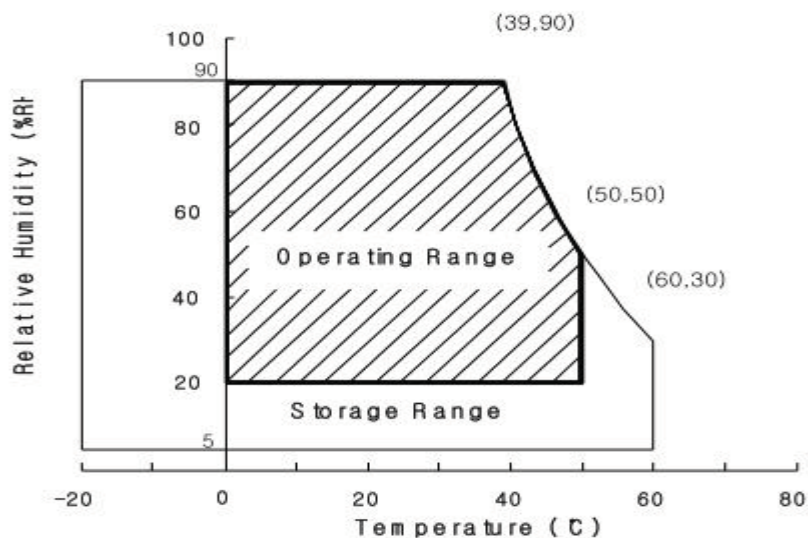
Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	V DD	-0.3	5.5	V	Ta = 25 °C
Logic Supply Voltage	V IN	VSS-0.3	V DD +0.3	V	
Operating Temperature	T OP	0	50	°C	1)
Storage Temperature	T ST	-20	60	°C	1)

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.

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3. Electrical Specifications

3.1 Open Cell Power Consumption (TA = 25 ± 2 °C)

Parameter		Min.	Typ.	Max.	Unit	Remarks
Power Supply Voltage	V DD	4.5	5.0	5.5	V	Note1
Power Supply Current	I DD	-	500	720	MA	
In-Rush Current	I RUSH	-	2.0	3.0	A	Note2
Permissible Input Ripple Voltage	V RF	-	-	300	MV	Note1,3
High Level Differential Input Threshold Voltage	V IH	-	-	100	MV	
Low Level Differential Input Threshold Voltage	V IL	-100	-	-	MV	
Differential input voltage	V ID	200	-	600	MV	
Differential input common mode voltage	Vcm	1.0	1.2	1.5		V IH =100mV, V IL =-100mV
Power Consumption	P D	-	2.5	3.6	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 VDD=5.0V, Frame rate=60Hz

Clock frequency 75.4MHz. Test Pattern of power supply current

a) Typ : Color Test

b) Max : Skip Sub-pixel

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- Duration of rush current is about 2 ms and rising time of VDD is $520 \mu\text{s} \pm 20\%$
- Ripple Voltage should be covered by Input voltage Spec.

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 = $25 \pm 2^\circ\text{C}$) with the equipment of Luminance meter system (Goniometer system and TOPCONE PR730) 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 $\theta = 0^\circ$ ($=\theta = 3^\circ$) as the 3 o'clock direction (the "right"), $\theta = 90^\circ$ ($=\theta = 12^\circ$) as the 12 o'clock direction ("upward"), $\theta = 180^\circ$ ($=\theta = 9^\circ$) as the 9 o'clock direction ("left") and $\theta = 270^\circ$ ($=\theta = 6^\circ$) as the 6 o'clock direction ("bottom"). While scanning θ and/or Φ , 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 o'clock.

4.2 Optical Specifications

[VDD = 5.0V, Frame rate = 60Hz, Clock = 74.25MHz, $T_a = 25 \pm 2^\circ\text{C}$]

< Table 5. Module Optical >

5.0 INTERFACE CONNECTION.

5.1 Electrical Interface Connection

- CN1 Module Side Connector : UJU IS100-L30R-C23or Equivalent
User Side Connector : JAE FI-X30H or Equivalent

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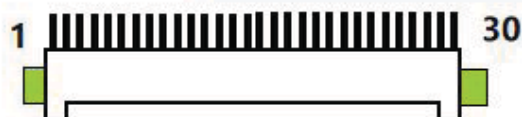
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5.2 LVDS Interface (Tx; THC63LVDF83A or Equivalent)

5.2.1 LVDS Interface

Pin No	Symbol	Description	Pin No	Symbol	Description
1	RX00-	Negative Transmission data of Pixel 0 (ODD)	16	RXE1+	Positive Transmission data of Pixel 1 (EVEN)
2	RX00+	Positive Transmission data of Pixel 0 (ODD)	17	GNG	Power Ground
3	RX01-	Negative Transmission data of Pixel 1 (ODD)	18	RXE2-	Negative Transmission data of Pixel 2 (EVEN)
4	RX01+	Positive Transmission data of Pixel 1 (ODD)	19	RXE2+	Positive Transmission data of Pixel 2 (EVEN)
5	RX02-	Negative Transmission data of Pixel 2 (ODD)	20	RXEC-	Negative Transmission Clock (EVEN)
6	RX02+	Positive Transmission data of Pixel 2 (ODD)	21	RXEC+	Positive Transmission Clock (EVEN)
7	GND	Power Ground	22	RXE3-	Negative Transmission data of Pixel 3 (EVEN)
8	RXOC-	Negative Transmission Clock (ODD)	23	RXE3+	Positive Transmission data of Pixel 3 (EVEN)
9	RXOC+	Positive Transmission Clock (ODD)	24	GND	Power Ground
10	RX03-	Negative Transmission data of Pixel 3 (ODD)	25	NC	No. Connection
11	RX03+	Positive Transmission data of Pixel 3 (ODD)	26	NC	No. Connection
12	RXE0-	Negative Transmission data of Pixel 0 (EVEN)	27	NC	No. Connection
13	RXE0+	Positive Transmission data of Pixel 0 (EVEN)	28	VDD	Power Supply: +5V
14	GND	Power Ground	29	VDD	
15	RXE1-	Negative Transmission data of Pixel 1 (EVEN)	30	VDD	

Note : Pin 24 should be connected with GND.

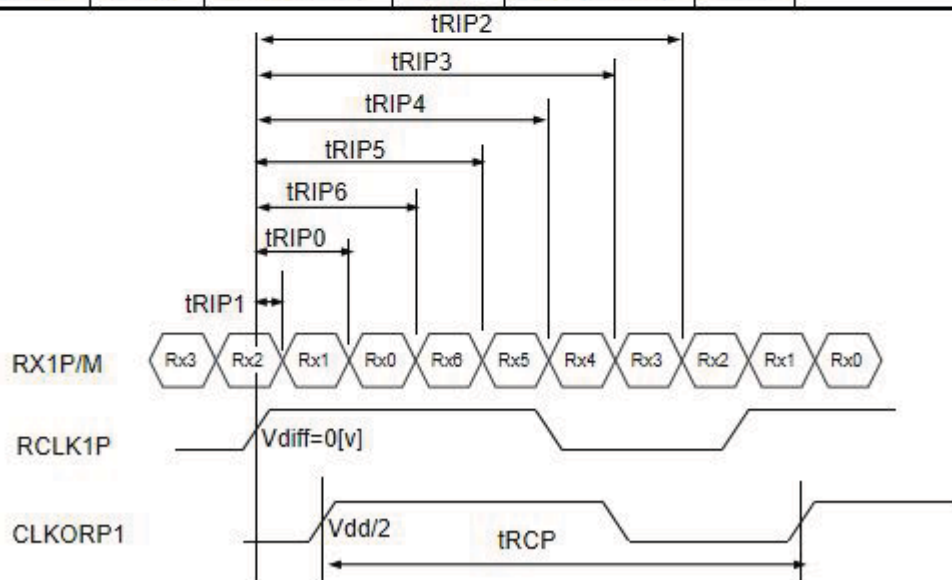


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5.2.2LVDS Rx Interface Timing Parameter

Item	Symbol	Min	Typ	Max	Unit	Remark
CLKIN Period	tRCP	14.8	18.5	22.2	nsec	
Receiver Data Input Margin	tRMG	-0.35	-	0.35	nsec	fCLKIN=110MHz
		-0.40	-	0.40	nsec	fCLKIN=95MHz
		-0.45	-	0.45	nsec	fCLKIN=85MHz
		-0.60	-	0.60	nsec	fCLKIN=65MHz
Input Data 0	tRIP1	- tRMG	0.0	tRMG	Clock	
Input Data 1	tRIP0	T/7- tRMG	T/7	T/7+ tRMG	Clock	
Input Data 2	tRIP6	2 T/7- tRMG	2T/7	2T/7+ tRMG	Clock	
Input Data 3	tRIP5	3T/7- tRMG	3T/7	3T/7+ tRMG	Clock	
Input Data 4	tRIP4	4T/7- tRMG	4T/7	4T/7+ tRMG	Clock	
Input Data 5	tRIP3	5T/7- tRMG	5T/7	5T/7+ tRMG	Clock	
Input Data 6	tRIP2	6T/7- tRMG	6T/7	6T/7+ tRMG	Clock	



* Vdiff = (RXz+)-(RXz-),.....,(RXCLK+)-(RXCLK-)

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5.2.3 SIGNAL TIMING SPECIFICATION

Item		Symbols	Min	Typ	Max	Unit	
Clock	Frequency	1/Tc	60	74.25	78	MHz	
	High Time	Tch	-	4/7Tc	-		
	Low Time	Tcl	-	3/7Tc	-		
Frame Period		Tv	1100	1125	1149	lines	
			48.5	60	63	Hz	
Horizontal Active Display Term		Valid	t _{HV}	-	960	-	t _{CLK}
		Total	t _{HP}	1060	1100	1200	t _{CLK}
Vertical Active Display Term		Valid	t _{VV}	-	1080	-	t _{HP}
		Total	t _{VP}	1100	1125	1149	t _{HP}

Notes: This product is DE only mode. The input of Hsync & Vsync signal does not have an effect on normal operation.

Symbol	Parameter	Condition	Min	Typ	Max	Unit
F	LVDS Input frequency	-	60	74.25	78	MHz
T _{LVSK}	LVDS channel to channel skew	F=100MHz V _{IC} =1.2V V _{ID} =±400mV	-380	-	+380	ps
F _{LVMOD}	Modulating frequency of input clock during SSC		60	-	85	KHz
F _{LVDEV}	Maximum deviation of input clock frequency during SSC		-3	-	+3	%
T _{CYCY}	Cycle to Cycle jitter		-	-	100	ps

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6.0 Backlight Unit

Parameter		Min.	Typ.	Max.	Unit	Remarks
LED Light Bar Input Voltage Per Input Pin	VPIN	-	36	42	V	Duty 100%
LED Light Bar Input Current Per Input Pin	IPIN	80	80	80	MA	Note1,2,
LED Power Consumption	P BL	-	11.52	13.44	W	Note 3
LED Life-Time	-	30000			Hrs	Note 4

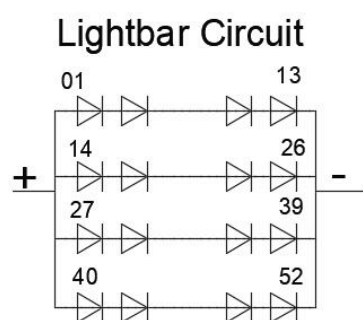
LED bar consists of 52 LED packages, 4 strings (parallel) * 13 packages (serial)

Note1: There are One light bar, and the specified current is input LED chip 100% duty current

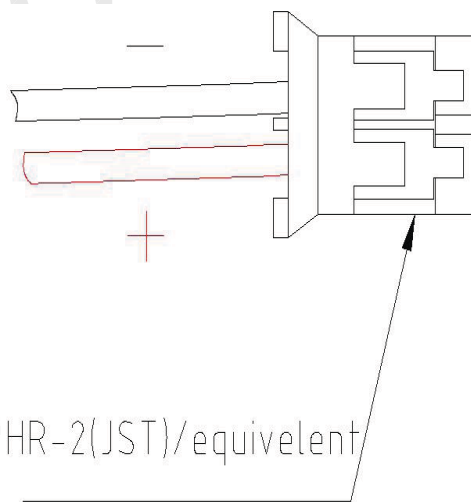
Note2: The sense current of each input pin is 80mA

Note3: $P_{BL} = 4 \text{ Input pins} \times V_{PIN} \times I_{PIN}$

Note4: The lifetime is determined as the time at which luminance of LED become 50% of the initial brightness or not normal lighting at $I_{PIN} = 80\text{mA}$ on condition of continuous operating at $25 \pm 2 \text{ }^\circ\text{C}$



13Series, 4Parallels



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7.0 APPENDIX

Figure 1. Measurement Set Up

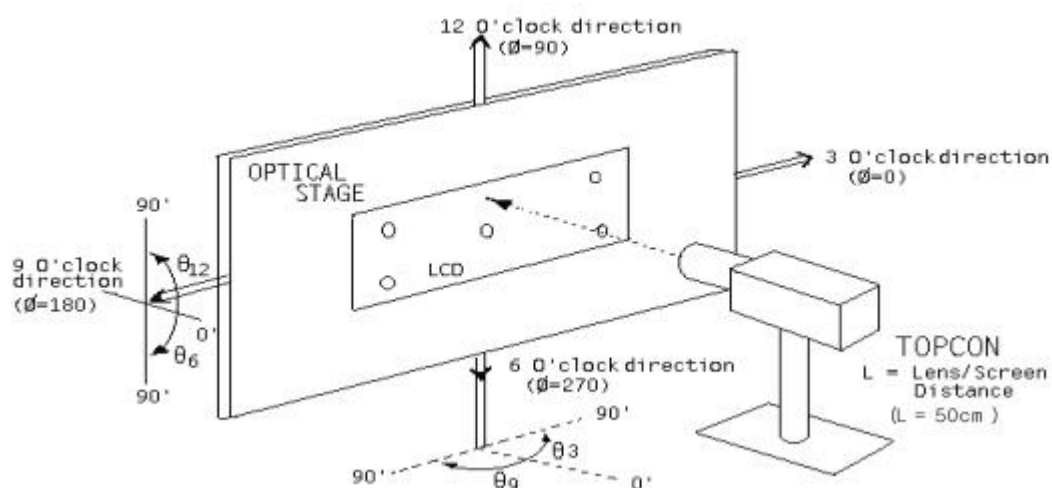
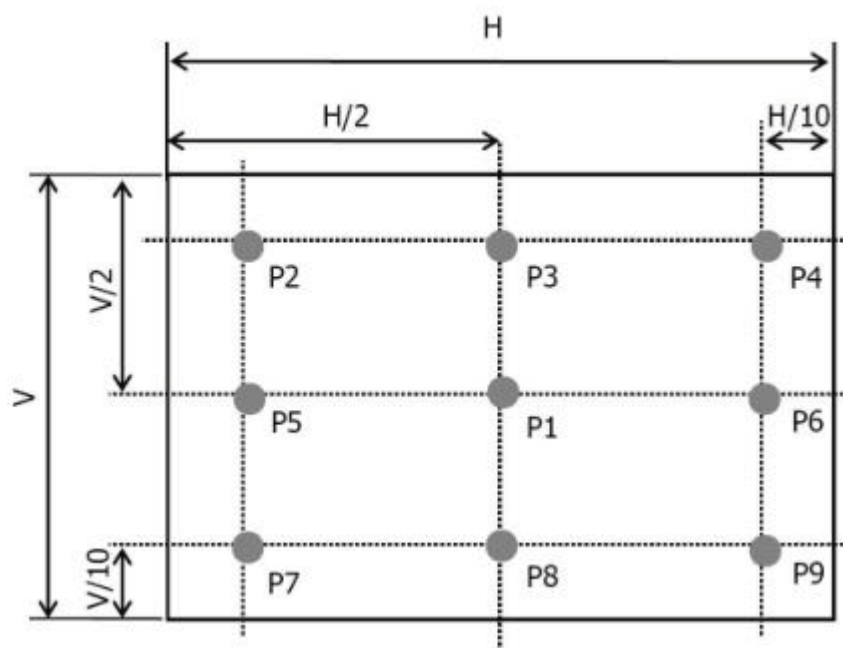


Figure 2. White Luminance and Uniformity Measurement Locations (9 points)



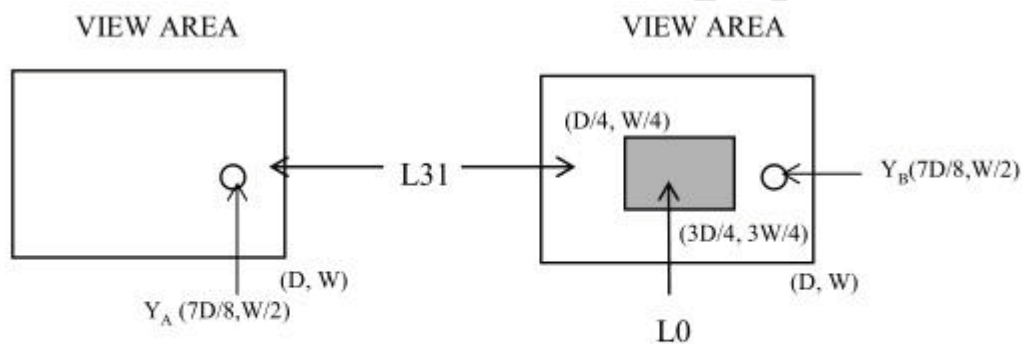
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Figure 3. Response Time Testing



Figure 4. 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)

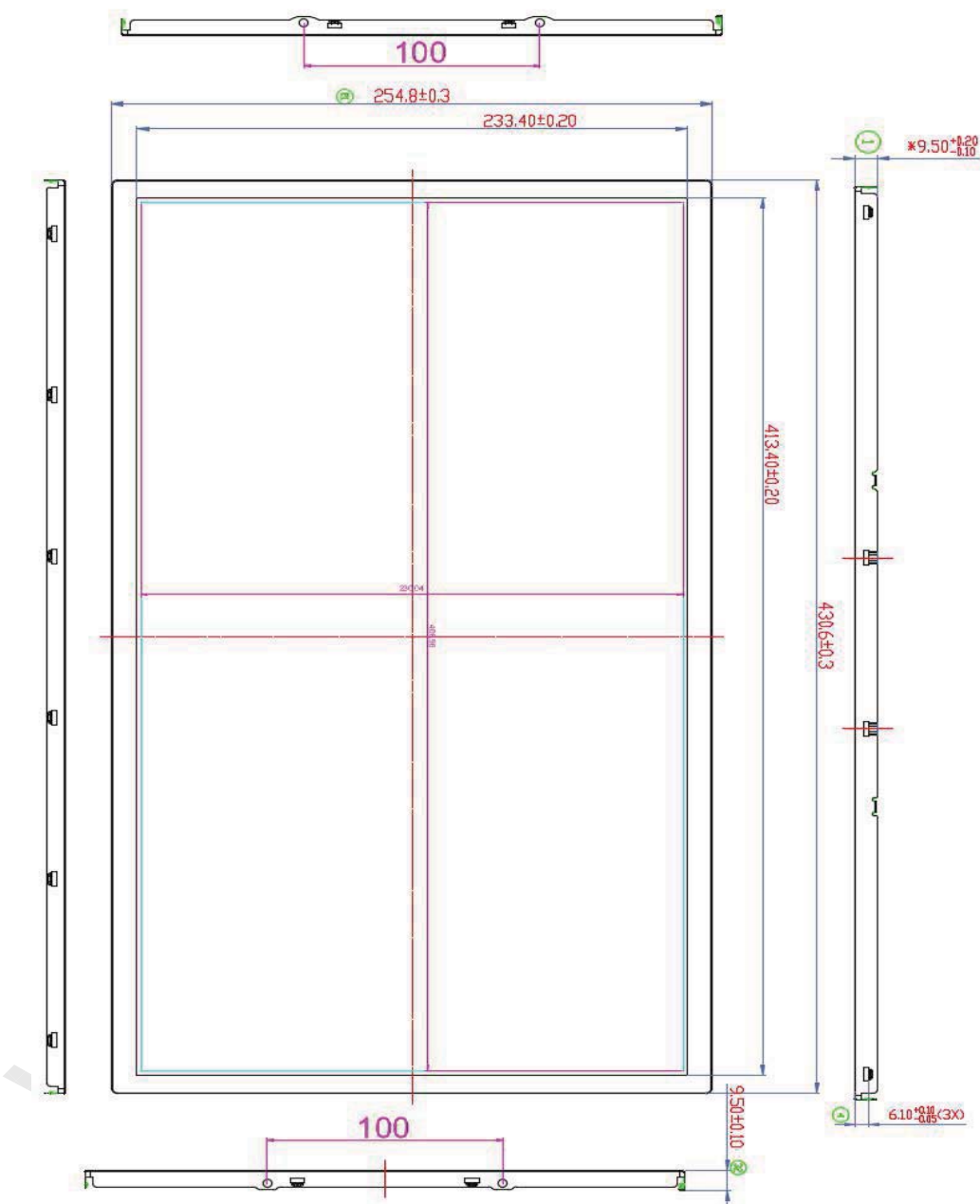
Y B = Subsequent luminance of measured area (cd/m 2)

The location measured will be exactly the same in both patterns

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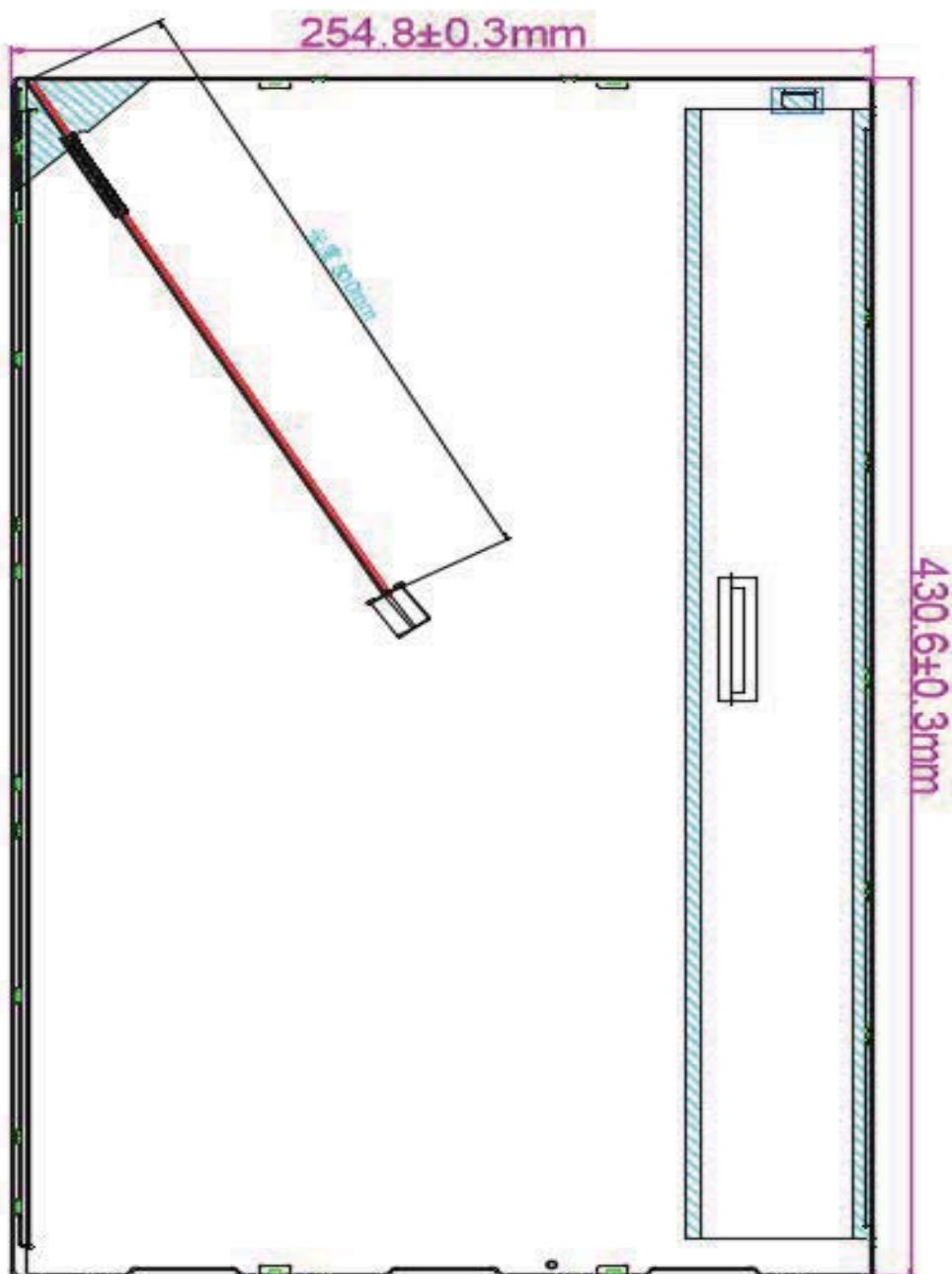
Figure 5. TFT-LCD Module Outline Dimensions (Front view)



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

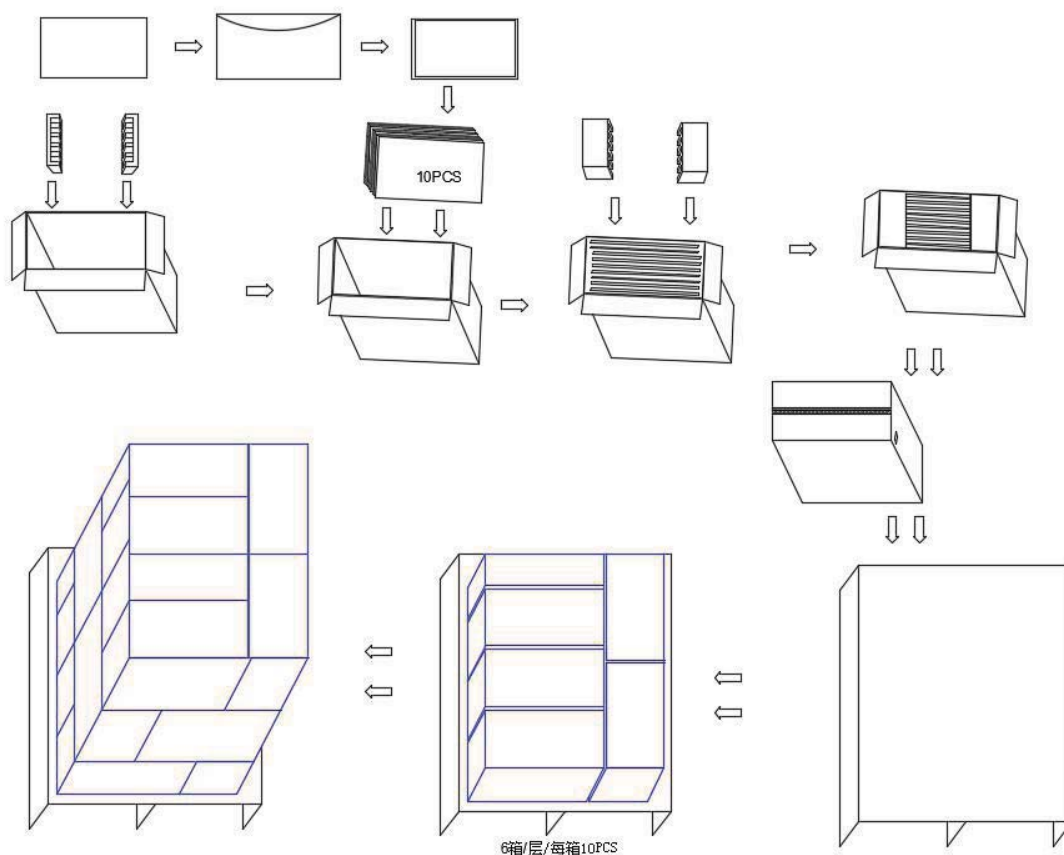


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8.0 Packing

8.1 Packing Order



9.0 General Precautions

9.1 Storage

1. Store the module in a dark room where must keep at $25 \pm 10^\circ\text{C}$, $55 \pm 10\% \text{RH}$, the module shall be exposed under strong light such as direct sunlight.
2. Do not store the produce in surroundings containing organic solvent or corrosive gas
3. Store the module in an anti-electrostatic container or film .

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9.2 Handing

1. Do not subject the module to mechanical shock or to excessive force
On its surface
2. To avoid contamination on the display surface, do not touch the module
Surface with bare hands
3. Must be the correct way to connec the power cable, otherwise it will
Cause damage

9.3 transportation

1. In transporting, Goods are strictly prohibited during the ultra-high stacking
Extrusion, upside down, entire vehicle liading and unloading.
2. Persons who handle the module should be grounded through adequate methods.

9.4 Other

1. About this specification, if any question, go through both sides agreement
Post-processing.
2. Any changes must get into contant with each other, get tht agreement then
To change , and update the contents to record.

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