TITLE : TV080WXM-TW0 Product Specification

Rev.01

HEFEI BOE OPTOELECTRONICS TECHNOLOGY

REV.	ECN NO.	DESCRIPTION OF CHANGES	DATE	PREPARED
0	-	Initial Release	2015.07.07	马成序

Contents

1.0 General Description

Parameter	Specification	Unit	Remarks
LCD Size	8	inch	-
Active area	107.64*172.224	mm	-
Number of pixels	800*1280	pixels	-
Pixel pitch	44.85*134.55	um	-
Pixel arrangement	RGB	-	-
Display colors	16.7M	colors	-
Display mode	Normal black	-	-
LCM Outline Dimension	114.7*184.6(Typ.)	mm	Tolerance:±0.3 mm
TLCM Outline Dimension	126.87*198.47*3.45(Typ.)	mm	Thickness Tolerance:±0.3 mm
TLCM Transmittance	4.37%（MD）	-	Without APF
NTSC	Min 50%, Typ. 55%	-	-
TTL Weight	160 (Max)	gram	-
Back-light	LED, Horizontal - 21LEDS	-	-
Panel Thickness	0.4	mm	Single layer
Upper pol size	112.04*176.774	mm	Tolerance:±0.15mm
Lower pol size	112.04*177.874	mm	Tolerance:±0.15mm
Surface Treatment	HC	-	-
Interface	MIPI	-	-
Driver IC	HX8394C	-	

1.1 Touch General Description

Parameter	Specification		Unit	Remarks
TP Structure	Multi Layers On-cell		-	-
Sensing Method	Mutual Capacitance		-	-
T-IC	FT3617		-	-
TP Interface	I2C		-	Fast Mode:400KHZ
Finger	10		Point	
SNR(Φ7mm)	30:1			
Report Rate	1 finger 90Hz, Multi finger 80Hz		Hz	
Respond Time	MAX: 20ms, AVG: 15ms		ms	Active
Cover LENS	Glass	AGC Sodalime	mm	Pantone Black C
Surface Property	-		Angle	None
Touch Panel Hardness	7		H	
Lamination Material	Mitsubishi G(6.2)(OCA)		-	
Transmittance	92		%	
Accuracy	Edge area<2 Center area<1		mm	Φ7mm
Precision	Edge area <2 Center area <1		mm	Φ7mm
Jitter	<0.5		mm	Φ 7mm
Linearity	Edge area <2 Center area <1		mm	Φ8mm
TP Power Consumption	Active:100(max) Sleep:5		mW	

1.2 BOM List

Parameter	Vendor	Description
Glass (TFT/CF)	东旭	Glass 1500X1850 0.4t TFT EXG 10K
Polarizer	LGC	HC/Clear
source IC (embedding T-con)	Himax	8394C
power IC	IML	IML8207
Main FPCA	上达	TV080WXM-TW0_FPCA
Light bar FPC	ROE	TV070WXM-TW0_Light bar
B/L	ROE	TV070WXM-TW0_B/L
LED	首尔半导体	首尔半导体 3810,21 LEDs
Cover lens	-	AGC Sodalime
OCA	-	Mitsubishi G(6.2)
Touch IC	墩泰	FT3617(47-7090061)
TP FPCA	上达	TV080WXM-TW0_TP_FPC(44-9741469)

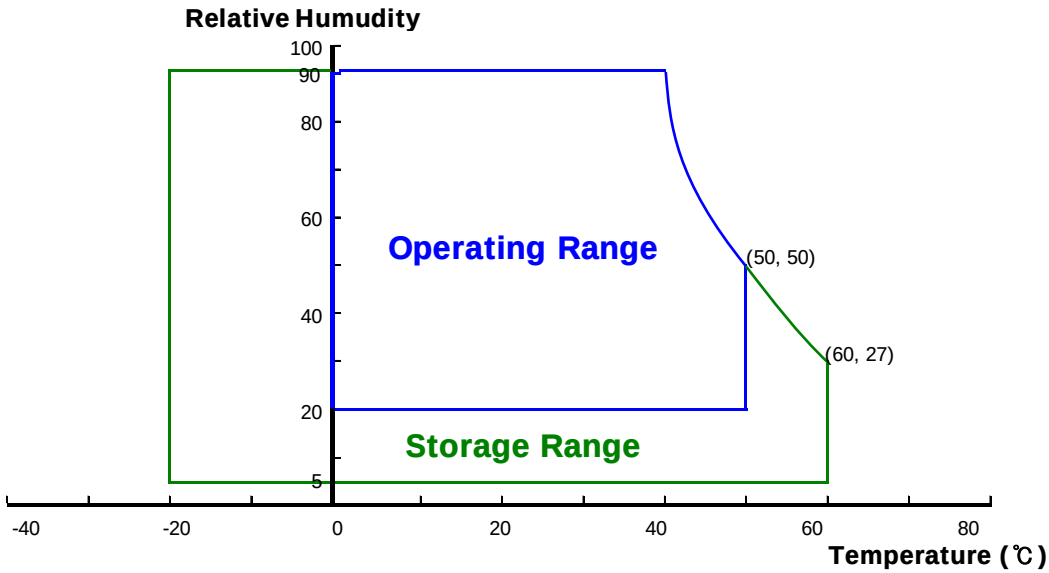
2.0 ABSOLUTE MAXIMUM RATINGS

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.

Parameter	Symbol	Min.	Max.	Unit
Power Supply Voltage (LCD Module)	V_{DDIO}	-0.3	5	V
LED string Reverse Voltage	V_R	-	15	V
Operating Temperature	T_{OP}	-20	+70	℃
Operating Humidity	H_{OP}	10	90	%(RH)
Storage Temperature	T_{STG}	-30	+80	℃
Storage Temperature	H_{STG}	10	90	%(RH)

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

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



3.0 Electrical Specifications

[Ta =25±2 ℃]

Parameter	Symbol	Values			Unit
		Min	Typ	Max	
Power Supply Input Voltage	VDD3V3	3.0	3.3	3.6	Vdc
Power Supply Ripple Voltage	VRP	-	300	360	mV
Power Supply Current	IVDD3V3	-	100	120	mA
Power Supply Input Voltage	VDD1V8	1.7	1.8	1.9	Vdc
Power Supply Ripple Voltage	VRP	-	200	300	mV
Power Supply Current	IVDD1V8	-	20	25	mA
LED Forward Voltage of every LED string	V_{LED}	-	21	23.1	V
LED Forward Current of every LED string	I_{LED}	-	22	-	mA

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=3.3V, Frame rate fV=60Hz and Clock frequency = 51.2MHz. Test pattern of power supply current is : max. @White
2. The duration of rush current is about 2ms and rising time of Power input is 1ms(min)

4.0 INTERFACE CONNECTION

4.1 Module Input Signal & Power

- FPC Signal interface : 39 Pin.(Connector Panasonic AYF313933 in HOST)

<Table 4. 1. Pin Assignments for the Interface Connector>

Pin Number	pin name			content	Voltage	Current	BOE SPEC	
1	LEDA	P		LED Anode(+)			21V	66mA
2	LEDA	P		LED Anode(+)				
3	NC			Dummy Pin				
4	LEDK	P		LED Cathode(-)			LED-	66mA
5	LEDK	P		LED Cathode(-)				
6	LEDK	P		LED Cathode(-)				
7	NC			Dummy Pin			NC	
8	TP-RST	I		TSP Reset signal (Low active)			1.8V	
9	TP-INT	I		TSP interrupt signal			1.8V	
10	TP-SDA	I		I2C Data I/O signal for TSP			1.8V	
11	TP-SCL	I		I2C Clock input signal for TSP			1.8V	
12	GND	P		TSP Ground				
13	VDDTP	P		TP Power Supply,3.3V			3.3V	
14	NC	P		Dummy Pin				
15	GND	P		Ground				
16	RESET	I		REST PIN			1.8V	
17	LEDPWM	O		Backlight Control			1.8V	
18	NC			Dummy Pin				
19	NC			BOE use for MTP			7.5V	
20	NC			Dummy Pin				
21	GND	P		Ground				
22	VDD3V3	P		Power Supply, 3.3V(Typical)	3.3V		3.3V	
23	VDD3V3	P		Power Supply, 3.3V(Typical)	3.3V		3.3V	
24	GND	P		Ground				

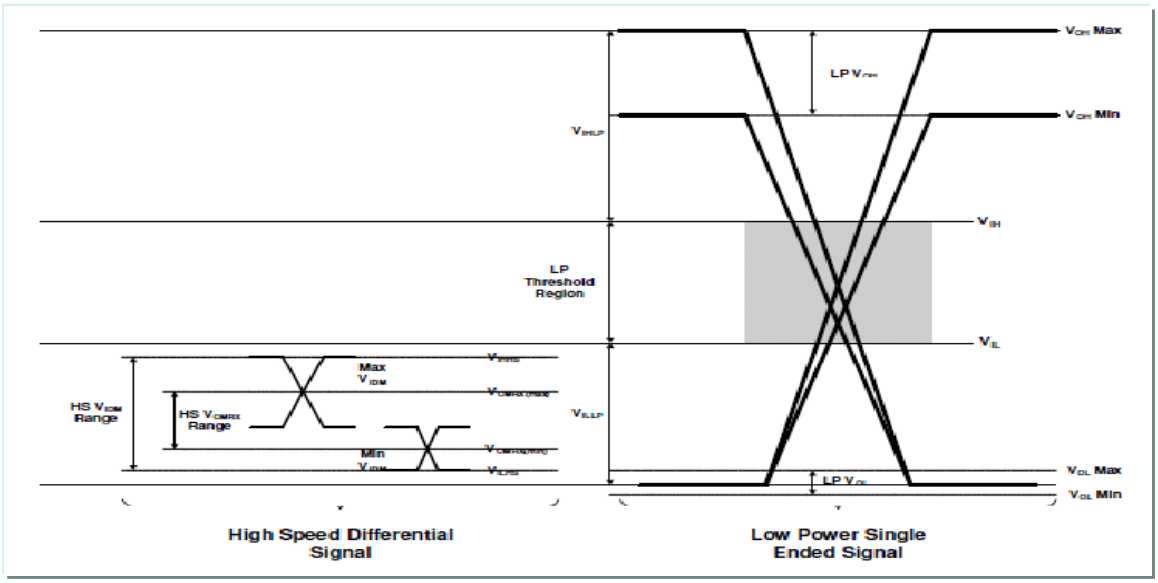
<Table 4.2. Pin Assignments for the Interface Connector>

Pin Number	pin name			Content	Voltage	Current	BOE SPEC	
25	D0N	I		MIPI Input Data Pair				
26	D0P	I		MIPI Input Data Pair				
27	GND	P		Ground				
28	D1N	I		MIPI Input Data Pair				
29	D1P	I		MIPI Input Data Pair				
30	GND	P		Ground				
31	CLKN	I		MIPI Input Clock Pair				
32	CLKP	I		MIPI Input Clock Pair			MIPI and GND	
33	GND	P		Ground				
34	D2N	I		MIPI Input Data Pair				
35	D2P	I		MIPI Input Data Pair				
36	GND	P		Ground				
37	D3N	I		MIPI Input Data Pair				
38	D3P	I		MIPI Input Data Pair				
39	GND	P		Ground				

5. Signal Timing Specifications

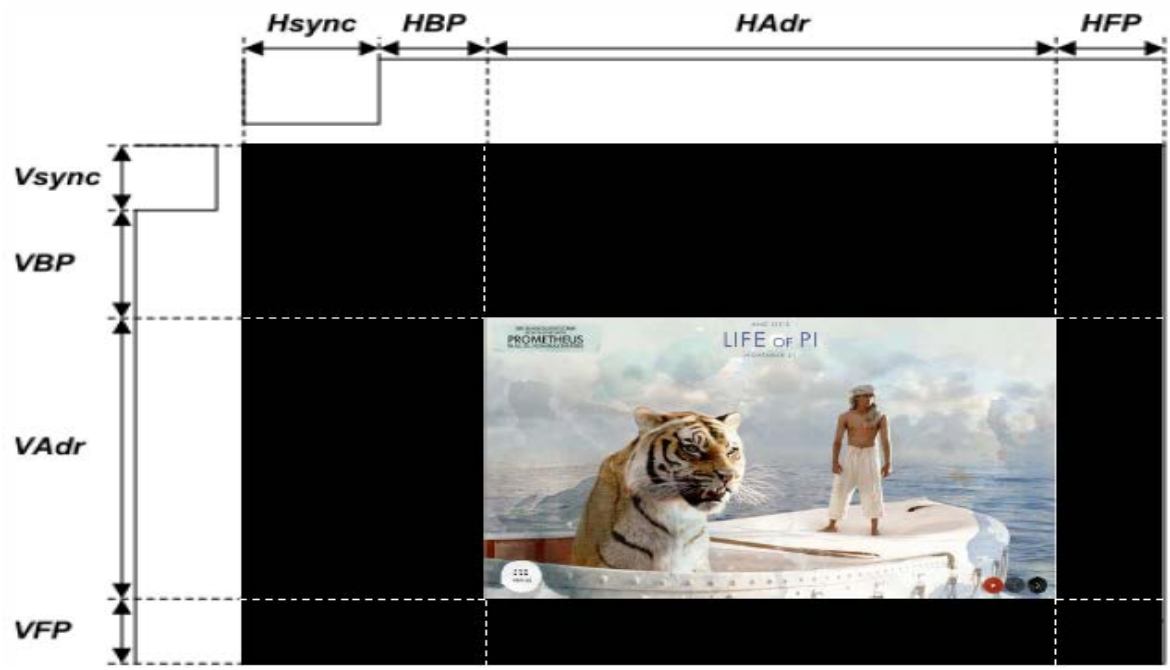
5.1 MIPI Input Signal SPEC

Parameter	Symbol	Min	Typ	Max	Unit	Condition
MIPI digital operation current	I_{VCCIF}	-	20	-	mA	-
MIPI digital stand-by current	$I_{VCCIFST}$	-	10	-	uA	-
MIPI Characteristics for High Speed Receiver						
Single-ended input low voltage	V_{ILHS}	-40	-	-		
Single-ended input high voltage	V_{IHHS}	-	-	460	mV	
Common-mode voltage	V_{CMRXDC}	70	-	330	mV	
Differential input impedance	Z_{ID}	80	100	125	Ω	
HS transmit differential voltage(V_{OD}=V_{DP}-V_{DN})	$\|V_{OD}\|$	140	200	250	mV	
MIPI Characteristics for Low Power Receiver						
Pad signal voltage range	V_I	450	-	1350	mV	
Ground shift	V_{GNDSH}	-50	-	50	mV	
Output low level	V_{OL}	-50	-	50	mV	
Output high level	V_{OH}	1.1	1.2	1.3	V	



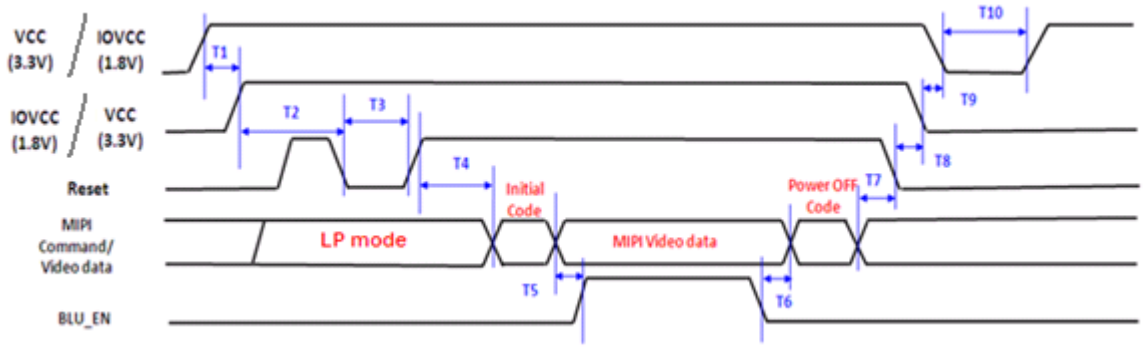
5.2 Signal Timing Spec

Item	Symbol	Min	Typ	Max	Unit
Pixel CLK	Tpixclk	-	68.4	-	MHz
MIPI CLK	Period	-	4	-	ns
	Frequency	-	225	-	MHz
Hsync	Period	-	16	-	t_{pCLK}
	Frequency	-	77.6	-	KHz
Vsync	Period	-	4	-	Line
	Frequency	-	60	-	Hz
Horizontal Active Display Term rgb vporch 8 4 4 rgb hporch 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 Power sequence (NT35523B)

Power on/off



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

Note: 1、Power on

T1: VCC is on and IOVCC is off or IOVCC is on and VCC is off (BOE suggest the time between VCC and IOVCC power should more than 0.5ms, because it may have a Venture of high current inrush if VCC and IOVCC power on at the same)

T2: IOVCC（VCC）is on and Reset is not low

T3: VCC IOVCC are on and Reset is low

T4: Reset is High and LP mode

T5: MIPI normal operation and BLU_EN is off

2、Power off

T6: BLU_EN is off and MIPI normal operation

T7: MIPI Video off and reset is not low

T8: Reset is low and IOVCC（VCC） is on

T9: IOVCC is off and VCC is on or VCC is off and IOVCC is on

T10: Power off to next Power on

6.0 Optical Specifications

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 (CA-310、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 $\theta_{Ø=0}$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta_{Ø=90}$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta_{Ø=180}$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta_{Ø=270}$($=\theta_6$) 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 3.3V +/-10% at 25°C. Optimum viewing angle direction is 6 'clock.

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle range	Horizontal	Θ_3	CR > 10	80	85	89	Deg.
		Θ_9		80	85	89	Deg.
	Vertical	Θ_{12}		80	85	89	Deg.
		Θ_6		80	85	89	Deg.
Color Gamut				50	55	60	%
Brightness				240	300	-	Nit
Luminance Contrast ratio		CR	Θ = 0°	700:1	800:1	-	-
Luminance of White	Center Point	Y_w	Θ = 0°	240	300	-	cd/m²
White Luminance uniformity	9 Points	ΔY5		70	-	-	%
White balance		Wx	Θ = 0°	0.27	0.30	0.33	-
		Wy		0.28	0.31	0.34	-
flicker						10%	
gamma				2.0	2.2	2.4	
Reproduction of color	Red	Rx	Θ = 0°	Typ. - 0.03	0.613	Typ. + 0.03	-
		Ry			0.354		
	Green	Gx			0.327		
		Gy			0.568		
	Blue	Bx			0.152		
		By			0.093		
Color shift(Δuv)	white			-	-	0.02	60°
Response Time (Rising + Falling)		TRT	Ta= 25° C Θ = 0°	-	35	40	ms
VA		平均穿透率	400~700nm	90	-	-	%
		HAZE	-	-	-	1.5	%

Note :

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 1point 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. The luminance is measured by CA310 when the LED current is set at 16.8mA.

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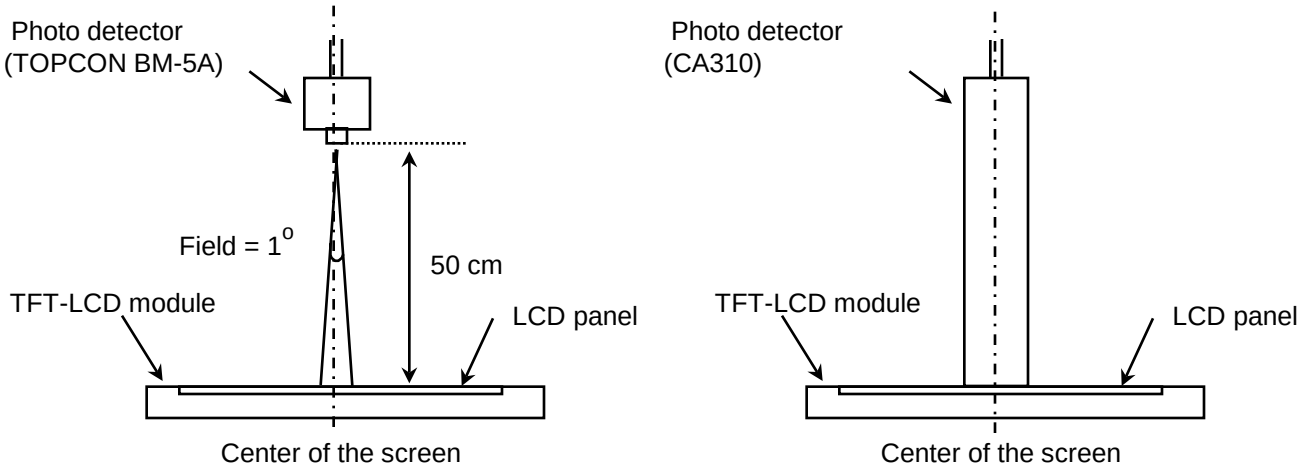
4. The White luminance uniformity on LCD surface is then expressed as : ΔY = Minimum Luminance of 9points / Maximum Luminance of 9points (see FIGURE 2).

5. The color chromaticity coordinates specified 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 color chromaticity coordinates specified 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.

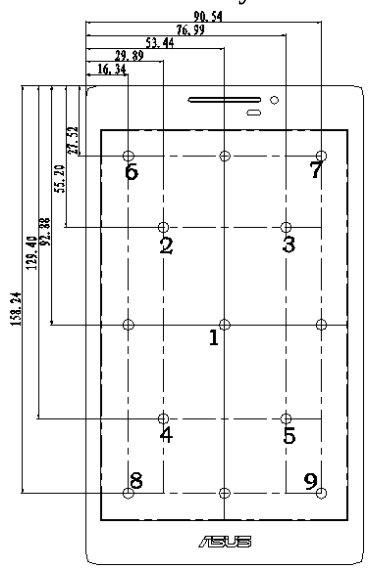
7. The electro-optical response time measurements shall be made as FIGURE 4 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

Figure 1. Measurement Set Up



View angel range measurement setup Luminance , uniformity and color measurement setup

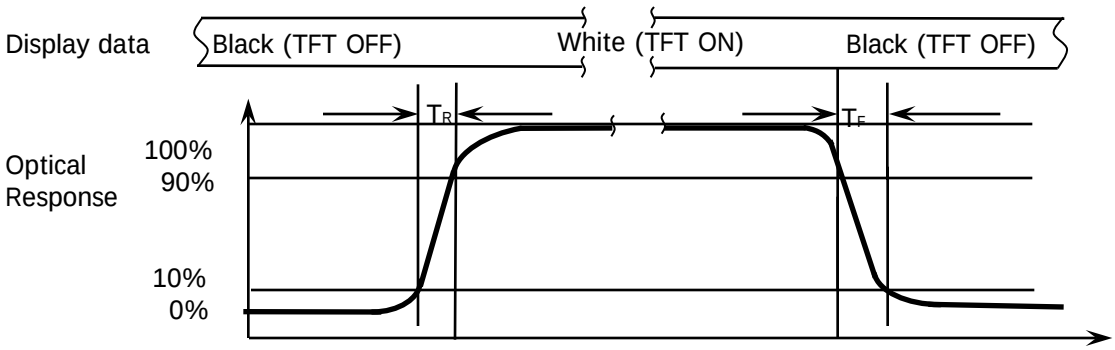
Figure 2. White Luminance and Uniformity Measurement Locations 9 points)



Center Luminance of white is defined as luminance values of center 9 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.

The White luminance uniformity on LCD surface is then expressed as : ΔY9= Minimum Luminance of 9 points / Maximum Luminance of 9points (see FIGURE 2).

Figure 4. Response Time Testing



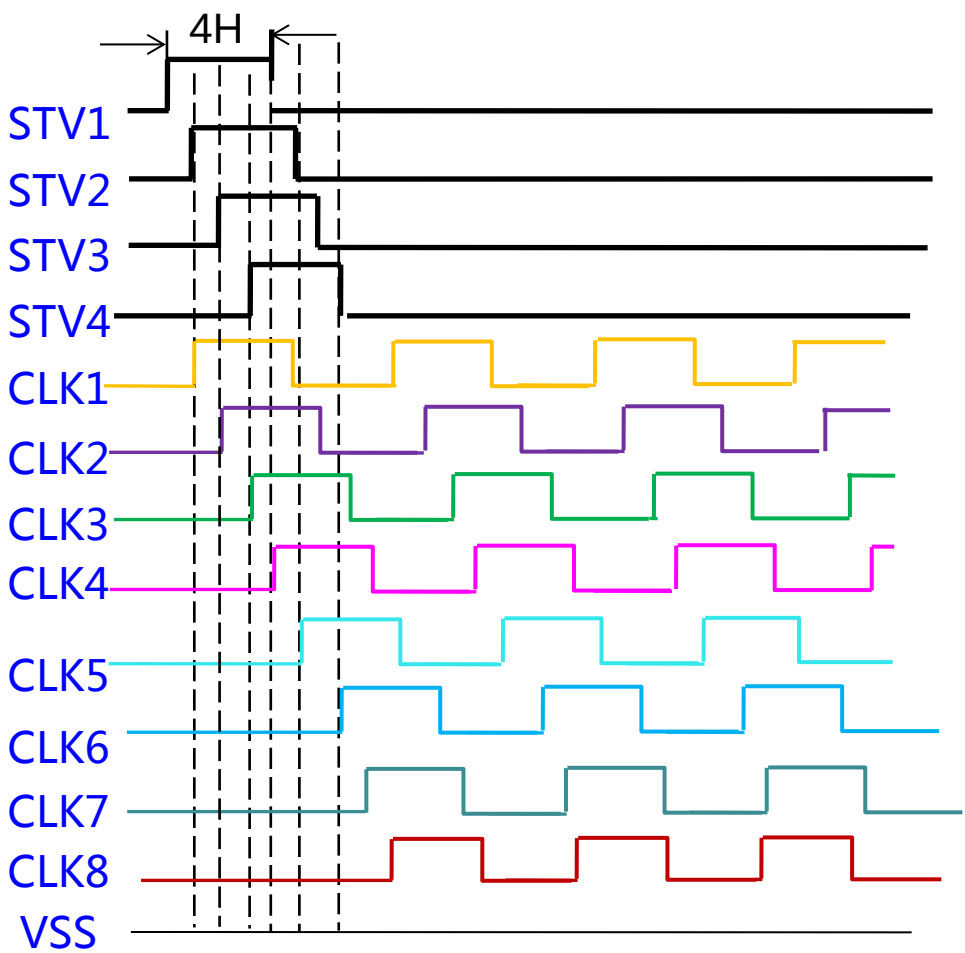
The electro-optical response time measurements shall be made as shown in FIGURE 3 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr and 90% to 10% is Td.

7.0 Reliability Test

No	Test Item	Test Condition	Remark
1	High temperature storage	70C/240h	-
2	Low temperature storage	-20C/240h	
3	High temperature/High humidity Storage	60C/90%RH/240h	
4	High temperature operating	60C/240h	
5	Low temperature operating	-10℃/240h	
6	High temperature/High humidity operating	40C/95%RH/240h	
7	Thermal Shock Storage	-20℃ (30 min)~ +70 ℃(30 min) , Slop 8℃/min, 27 cycles	

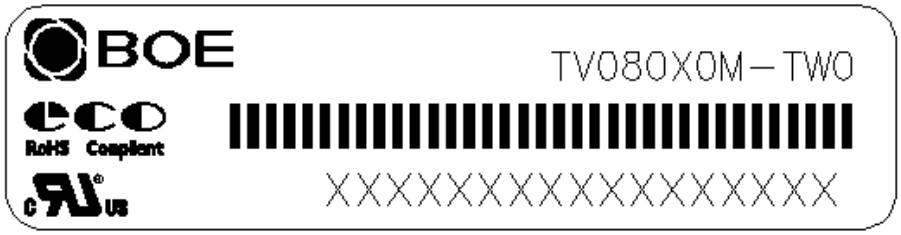
Figure 8. TFT-LCD Cell Test 时序图及电压

CLK duty cycle 50%, GOE time 2.5us, VGH/VGL=15V/ -11V(recommended values), VSS=VGL,1H=13.02us。



9.0 LABEL

(1) Product label



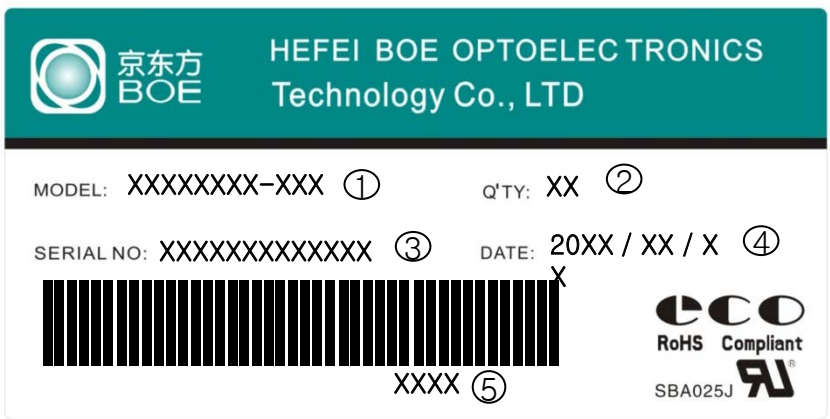
Label Size: 48mm × 12mm

>1. FG-CODE: TV080WXM-TW0

>2. MDL ID 及对应条纹码

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

(2) Box label



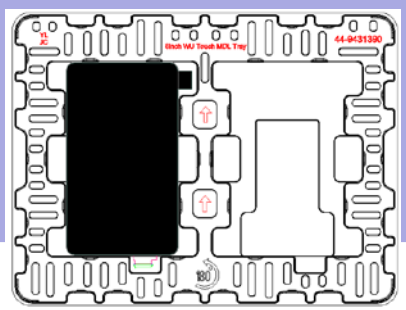
1. **FG-CODE**
2. **Box 产品数量**
3. **Box ID, 编码规则如下**
4. **Box Packing 日期**
5. **FG-CODE 后四位**

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

10.0 PACKING INFORMATION

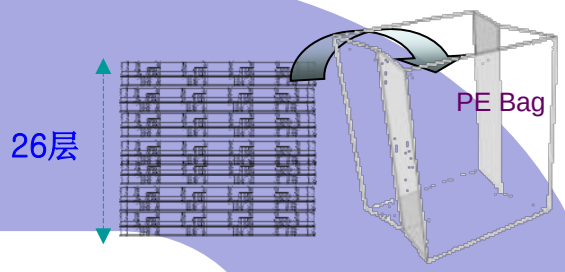
-. Cover Lens 向上放置

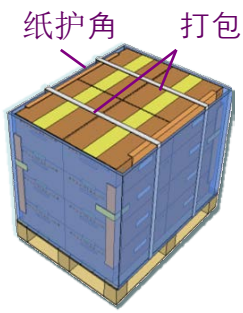
-. 2pcs TLCM /Tray



-. 将26pcs PET Tray 平放入PE Bag;

-. Tray 无需旋转放置, 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

-. 容量: 600pcs/Pallet

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

-. 容量：50pcs/Inner Box

- Box Dimension: 500mm×400mm×300mm
- Package Quantity in one Box: 50pcs/Box
- Pallet Dimension: 1030mm×830mm×1030mm

11.0 Handing & 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 MECHANICAL OUTLINE DIMENSION

Figure 14. TLCM Module Outline Dimension (Front View)

12.0 MECHANICAL OUTLINE DIMENSION

Figure 14. TLCM Module Outline Dimension (Front View)

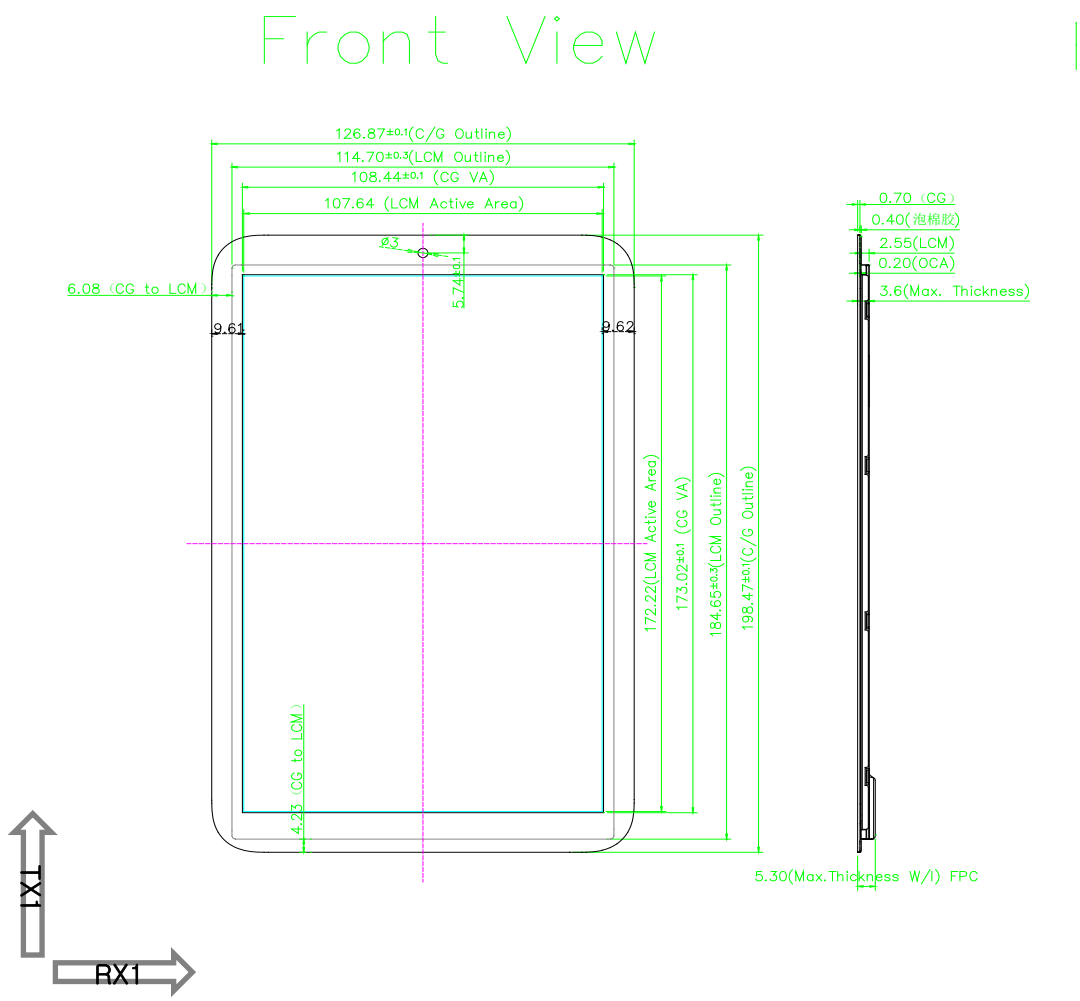
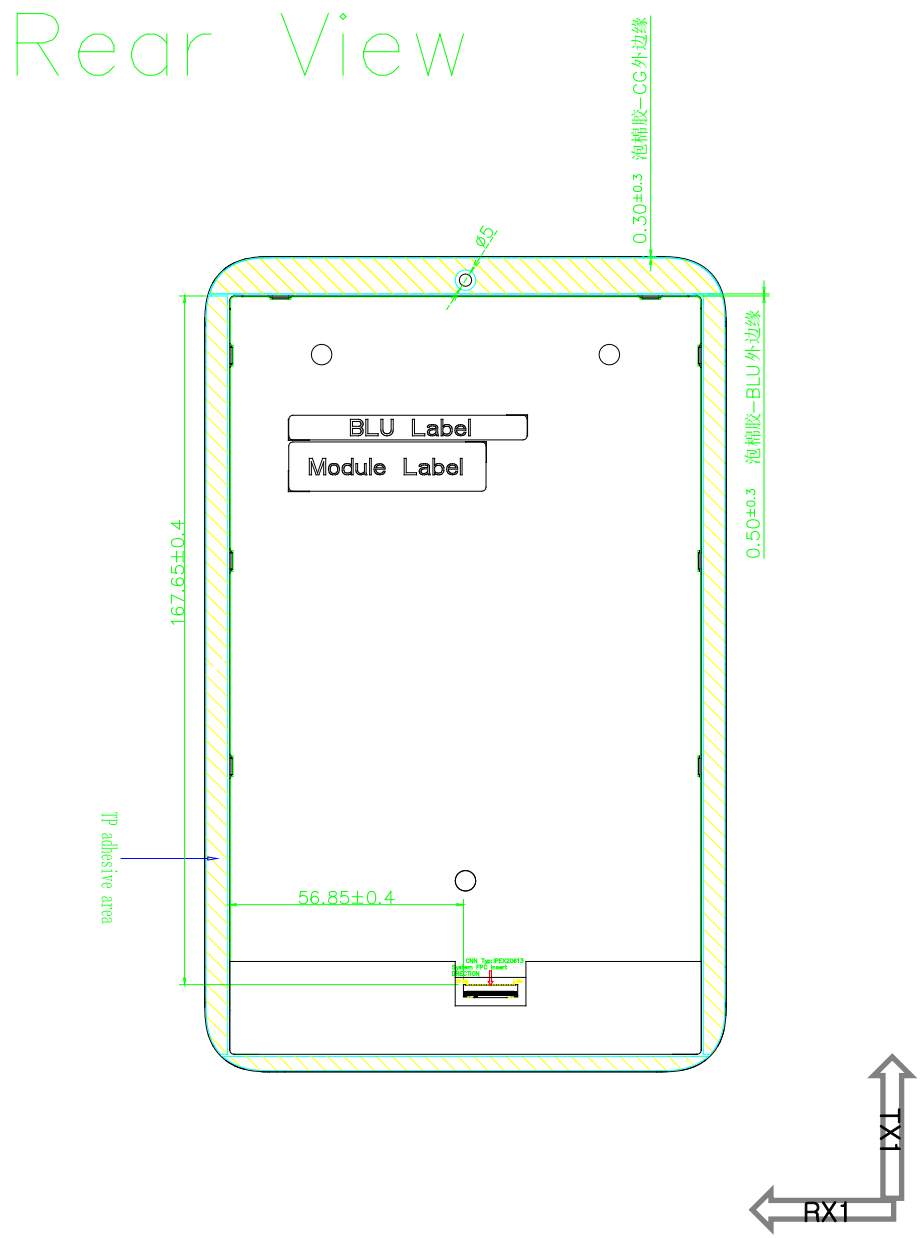


Figure 15. TFT-LCD Module Outline Dimensions (Rear view)



14.0 POWER ON/Reset Sequence

Reset should be pulled down to be low before powering on and powering down. I2C shouldn't be used by other devices during Reset time after VDD powering on (Trtp). INT signal will be sent to the host after initializing all parameters and then start to report points to the host. If Power is down, the voltage of supply must be below 0.3V and Tpdt is more than 1ms.

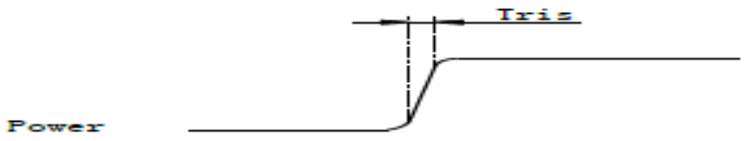


Figure 3-3 Power on time

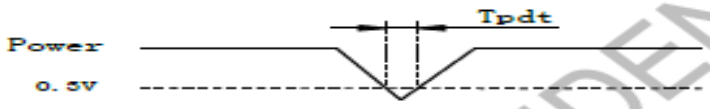


Figure 3-4 Power Cycle requirement

Figure 3-5 Power on Sequence

Reset time must be enough to guarantee reliable reset, the time of starting to report point after resetting approach to the time of starting to report point after powering on.

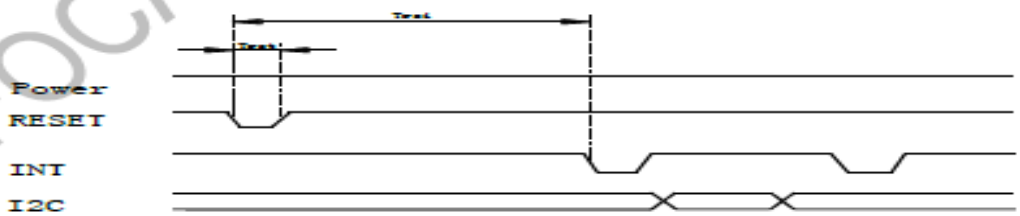


Figure 3-6 Reset Sequence

Parameter	Description	Min	Max	Units
Tris	Rise time from 0.1VDD to 0.9VDD	--	5	ms
Tpdt	Time of the voltage of supply being below 0.3V	5	--	ms
Trtp	Time of resetting to be low before powering on	100	--	μs
Tpon	Time of starting to report point after powering on	200	--	ms
Tvdr	Reset time after VDD powering on	1	--	ms
Trsi	Time of starting to report point after resetting	200	--	ms
Trst	Reset time	1	--	ms