■ Tentative Specification

☐ Preliminary Specification

☐ Approval Specification

MODELNAME:YH119BH4001

Version:MA01

Customer: Common

APPROVED BY **SIGNATURE**

Name / Title _____

Note

Please return 1 copy for your confirmation with your signature and comments.

Approved By	Checked By	Prepared By

REVISION HISTORY

REV.	ECN No.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0		Initial Release	2023.05.10	heyong

Contents

1. GENERAL DESCRIPTION

1.1 DESCRIPTION

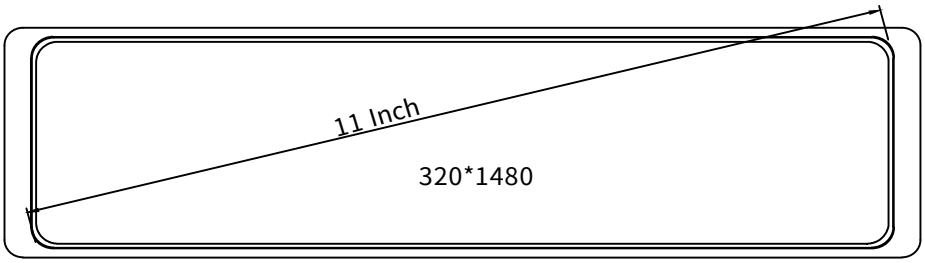
This LCM is a color active matrix thin film transistor (TFT) IPS liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, Driver IC, FPC and Backlight, This TFT LCD has a11.88-inch diagonally measured active display area with (1480horizontal by 320 vertical pixel) resolution.

1.2 FEATURES:

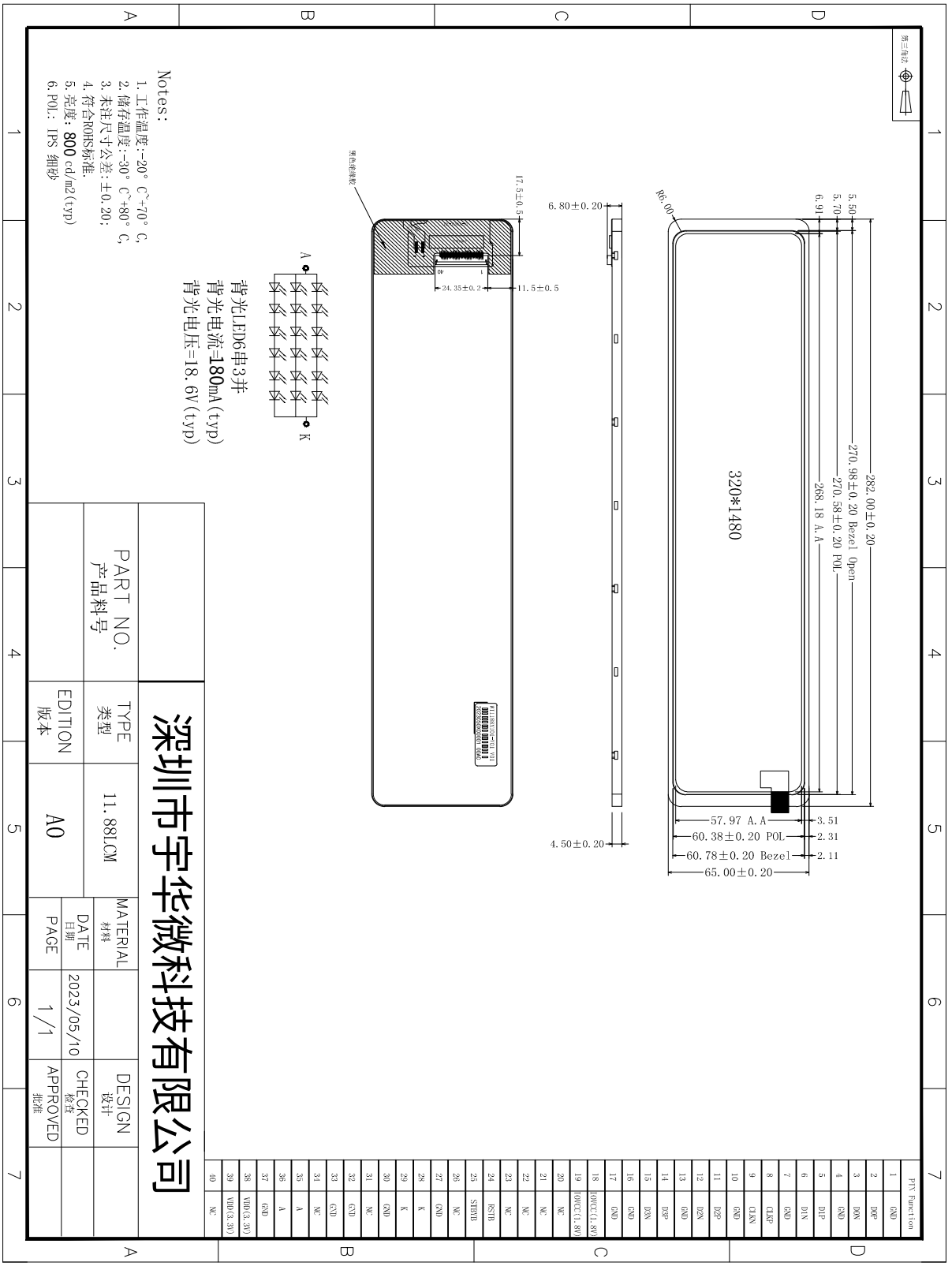
No.	Item	Specification	Unit
1	Panel Size	11.88”	inch
2	Number of Pixels	320(H)×1480(V)	pixels
3	Active Area	57.984(H) ×268.176(V)	mm
4	Pixel Pitch	0.1812(H)×0.1812(V) x RGB	mm
5	Outline Dimension	65.00(W)×282.00(H)×4.50 (D)	mm
6	Number of Colors	16.7M	-
7	Display Mode	Transmission mode, normally black	-
8	Viewing Direction	Full viewing	-
9	Display Format	RGB vertical stripe	-
10	Surface Treatment	Glare	-
11	Interface	MIPI	-
12	Backlight	White LED	-
13	Operation Temperature	-20~70	℃
14	Storage Temperature	-30~80	℃
15	Weight	120	g

Note.

1. 11.88 is the name of our company's internal project, which is not directly related to the actual size. The actual size is subject to the drawing.



2. MECHANICAL SPECIFICATION



3. PIN DESCRIPTION

FPC Connector is used for the module electronics interface.

No.	Symbol	Function	Remark
1	GND	Ground	
2	D0P	Positive MIPI differential data input	
3	D0N	Negative MIPI differential data input	
4	GND	Ground	
5	D1P	Positive MIPI differential data input	
6	D1N	Negative MIPI differential data input	
7	GND	Ground	
8	CLKP	Positive MIPI differential clock input	
9	CLKN	Negative MIPI differential clock input	
10	GND	Ground	
11	D2P	Positive MIPI differential data input	
12	D2N	Negative MIPI differential data input	
13	GND	Ground	
14	D3P	Positive MIPI differential data input	
15	D3N	Negative MIPI differential data input	
16	GND	Ground	
17	GND		
18	IOVCC1.8V-3.3V	A power supply for the analog power.	
19	IOVCC1.8V-3.3V		
20	NC	No connection	
21	NC	No connection	
22	NC	No connection	
23	NC	No connection	
24	RSTB	Reset pin.	
25	STBYB	Standby mode control.	
26	NC	No connection	
27	GND	Ground	
28	K	LED Cathode	
29	K		
30	GND	Ground	
31	NC	No connection	
32	GND	Ground	
33	GND	Ground	
34	NC	No connection	
35	A	LED Anode	
36	A		
37	GND	Ground	
38	VDD(3.3V)	A power supply for the analog power.	
39	VDD(3.3V)		
40	NC	No connection	

4. ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Digital Supply Voltage	VCI	-0.3	4.0	V	
Digital Supply Voltage	IOVCC	-0.3	4.0	V	

4.2 TFT LCD MODULE

4.2.1 Operating Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Digital Supply Voltage	VDD	3.0	3.3	3.6	V	
Digital Supply Voltage	IOVCC	1.6	-	3.6	V	
Logic Input Voltage	VIH	0.7VDD	-	VDD	V	
	VIL	GND	-	0.3VDD	V	

Note1: Please adjust VCOM to make the flicker level be minimum

Note2:TYP VCOM is only reference value. It must be optimized according to each LCM. Be sure to use VR and OP buffer on VCOM output. Please adjust VCOM to make the flicker level be minimum for getting excellent image

.

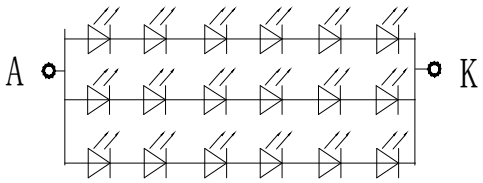
4.2.2 Current Consumption

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Digital Current	IVCI	VDD= 3.3V	-	130	-	mA	Note1

Note1: Typ. specification : Gray-level test Pattern

4 3 BACKLIGHT UNIT

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LED Current	Iled	-	180	240	mA	Total LED
Forward voltage	VF	-	18.6	-	V	

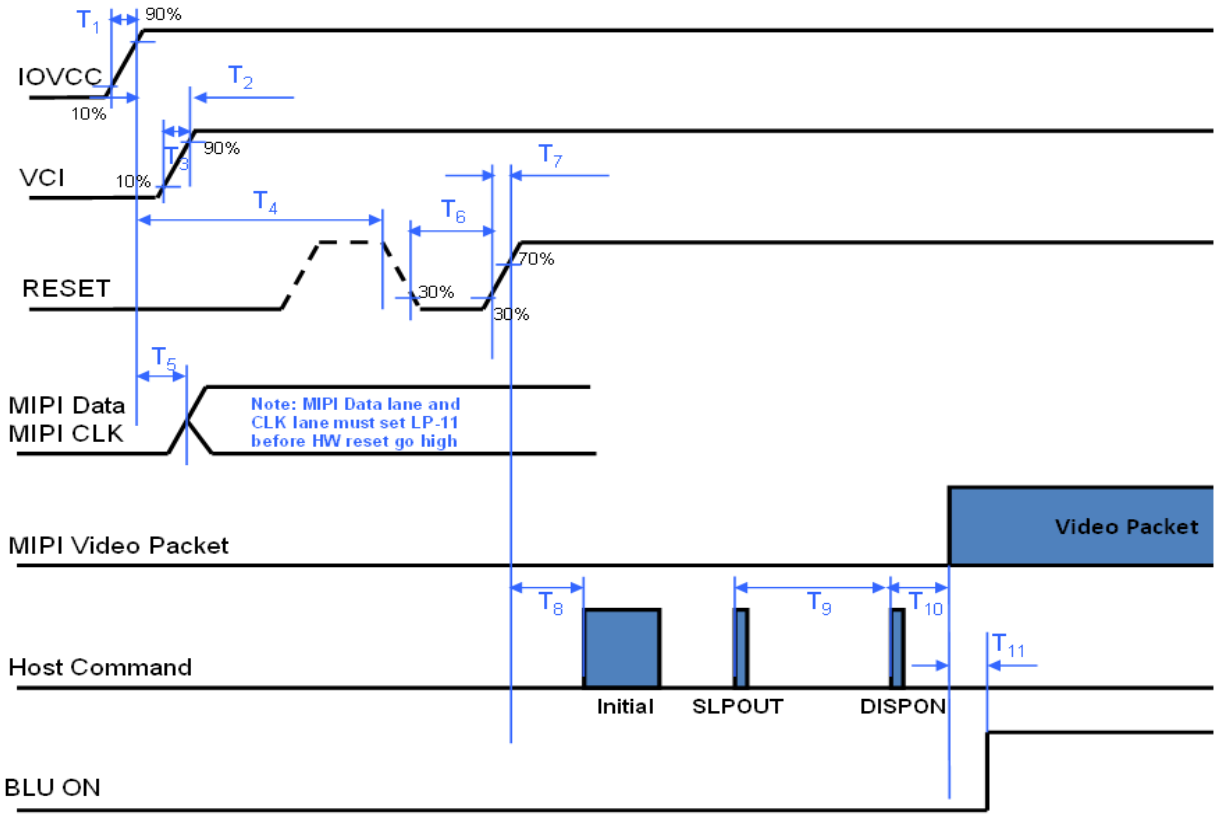


80*3=180mA(typ)

3.1V*6=18.6V(typ)

4.4 POWER ON/OFF SEQUENCE

POWER ON SEQUENCEC

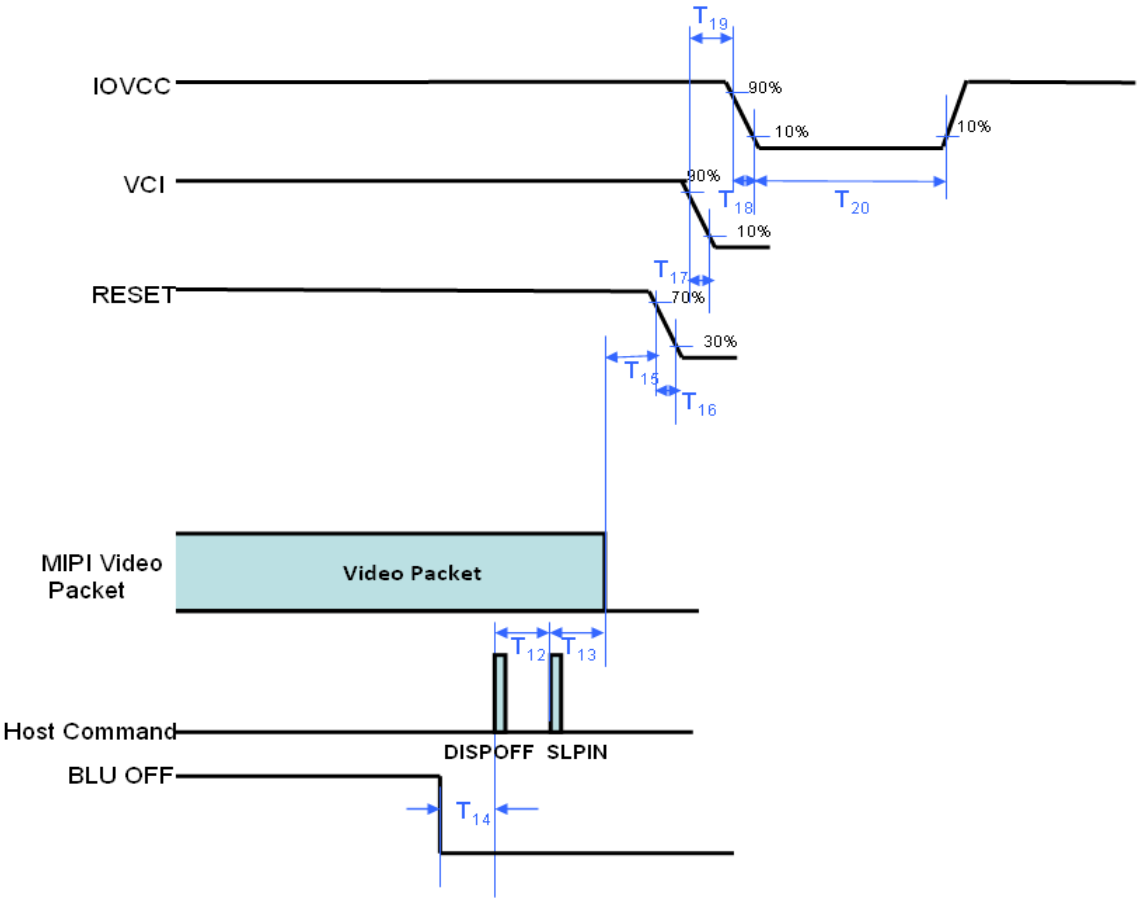


DSI Power On Sequence of Power IC Mode

	Min.	Typ.	Max.	Unit
T1	0.01	-	10	ms
T2		No Limit		ms
T3	0.01	-	10	ms
T4	1	-	-	ms
T5	1	-	-	ms
T6	10	-	-	us
T7		No Limit		ns
T8	15	-	-	ms
T9	120	-	-	ms
T10		No Limit		ms
T11	100	150	-	ms

DSI Power On Timing of Power IC Mode

POWER OFF SEQUENCEC



DSI Power Off Sequence of Power IC Mode

	Min.	Typ.	Max.	Unit
T12	2	-	-	Frame
T13	2	-	-	Frame
T14	40	100	-	ms
T15	10	-	-	ms
T16	No Limit			ms
T17	No Limit			ms
T18	No Limit			ms
T19	No Limit			ms
T20	100			ms

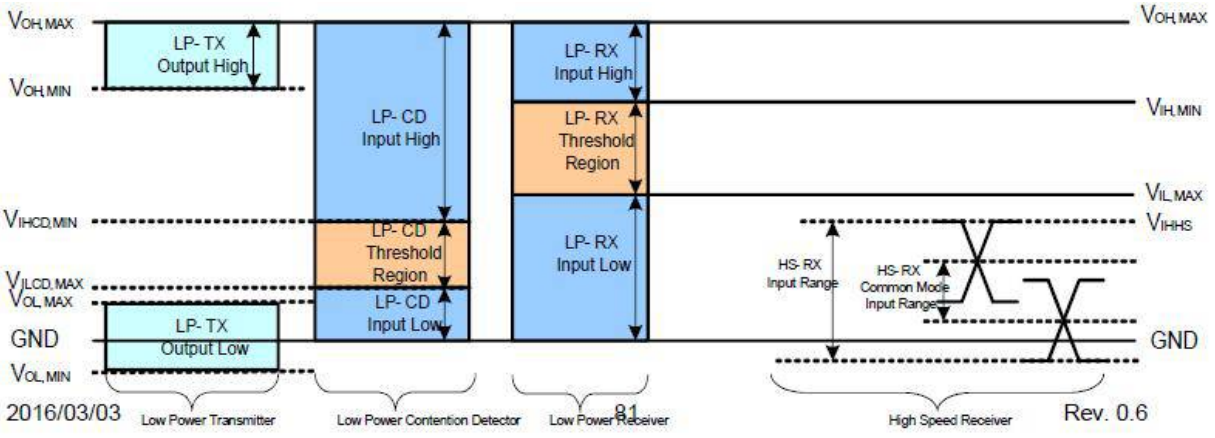
DSI Power Off Timing of Power IC Mode

5. Input Signal Timing

5.1 Mode DC Electrical Characteristics

(Test condition: VCI=1.6~3.6V, TA=-20℃~+85℃,VSS=VSSA=0V)

Parameter		Symbol	Spec.			Unit	Note
			Min.	Typ.	Max.		
VDDIO Input high level voltage		VIH	0.8 x VDDIO		VDDIO	V	
VDDIO input low level voltage		VIL	VSS		0.2 x VDDIO	V	
Input Leakage Current		Ileak	(-1)		(+1)	μA	
VGL_REG2 output voltage		VGL_REG2		TBD		V	
VGMP output voltage		VGMP		TBD		V	
VGMN output voltage		VGMN		TBD		V	
VCI1 output voltage		VCI1		TBD		V	
VGL output voltage		VGL_O	-16		-6	V	
VGH output voltage		VGH_O	8		19	V	
VCL output voltage		VCL	-2.1	-2.4	-3	V	
VOM output voltage		VCOM	-2.75	-1.48	-0.2	V	
Input terminal resistance		ZID		100		ohm	
Source output level deviation	Graycode = 0 ~ 14 Graycode = 241 ~ 255			TBD		mV	
	Graycode = 15 ~ 31 Graycode = 208 ~ 240			TBD		mV	
	Graycode = 32 ~ 207			TBD		mV	
Source output offset deviation	Graycode = 0 ~ 14 Graycode = 241 ~ 255	-		TBD		mV	
	Graycode = 15 ~ 31 Graycode = 208 ~ 240	-		TBD		mV	
	Graycode = 32 ~ 207	-		TBD		mV	
Current consumption	Analog Operating	IAOP		TBD		mA	
	Analog Stand-by	IAST		TBD		mA	
Rush current		Ivddpeak		TBD		mA	
VOTP operation current		Ivpp		TBD		mA	



5.2 AC CHARACTERISTICS

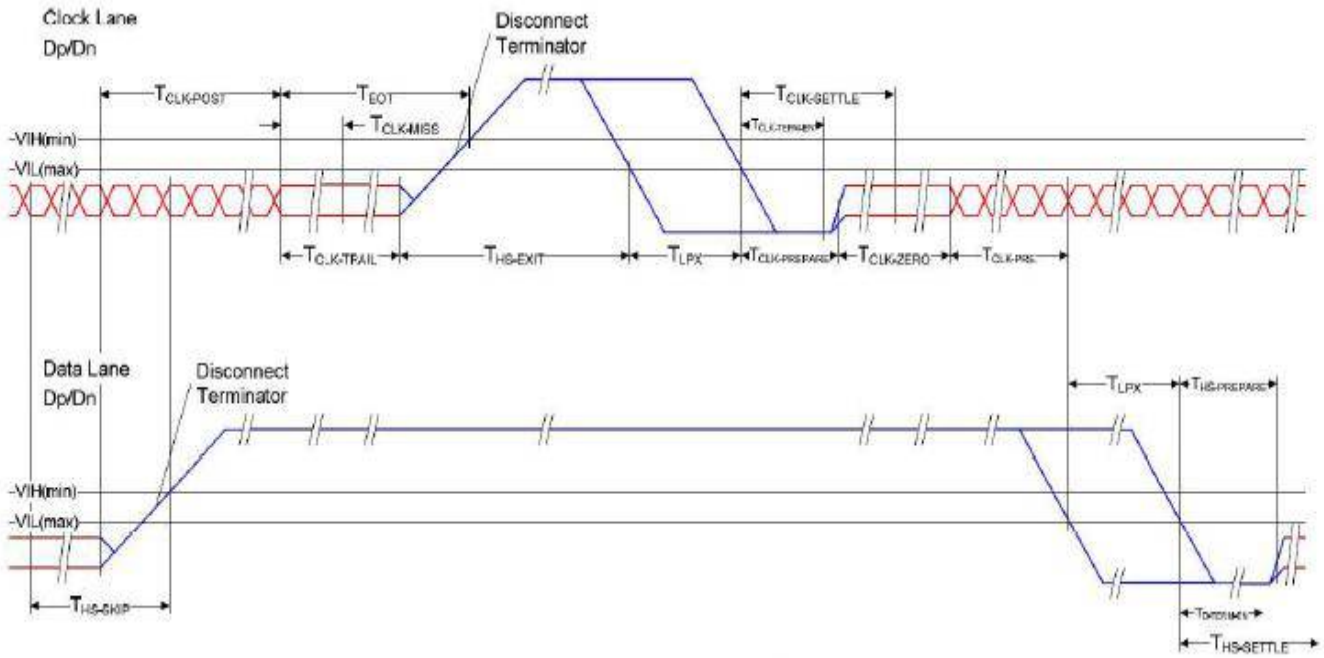


Figure 13.1: Switching the clock lane between clock transmission and low-power mode

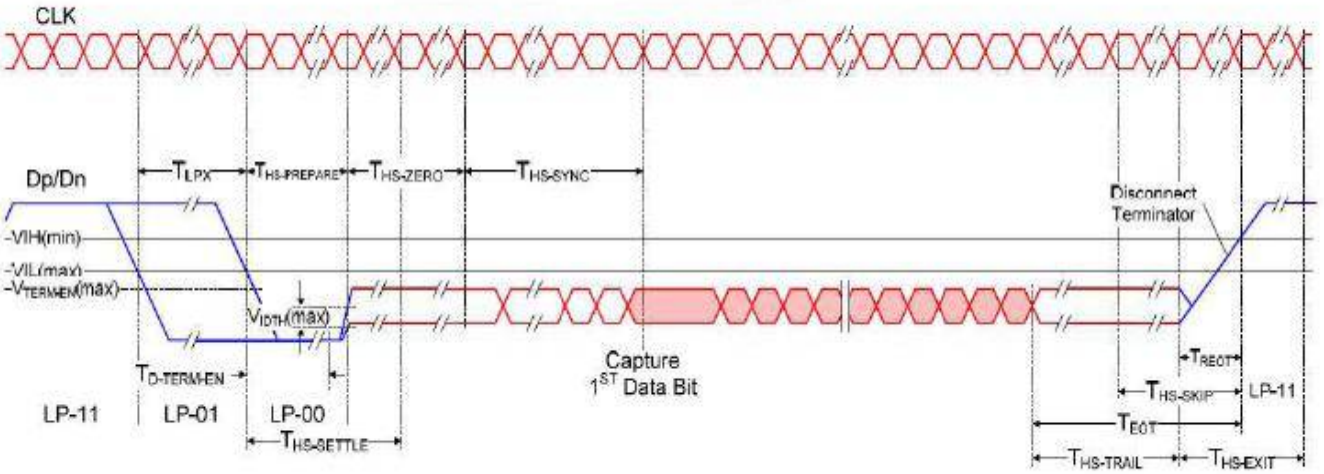


Figure 13.2: Timing of high-speed data transmission in bursts

5.3 PARALLEL RGB INPUT TIMING TABLE

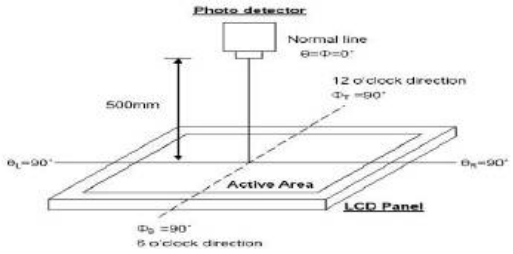
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Horizontal Display Area	thd		320		DCLK
HS pulse width(HSYNC)	thpw	-	30	-	DCLK
Hs Back Porch(Blanking)	thbp		120		DCLK
Hs Front Porch	thfp		120		DCLK
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd		1480		TH
VS Pulse Width(VSYNC)	tvpw	-	3	-	TH
VS Back Porch(Blanking)	tvbp		12		TH
VS Front Porch	tvfp	-	16	-	TH
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
MIPI(4 Lane)@Frame rate=60Hz			386		Mbps
MIPI(3 Lane)@Frame rate=60Hz			515		Mbps
DCLK frequency@Frame rate=60Hz	F_{DCLK}		60		MHz

6.OPTICAL CHARACTERISTICS

Ta=25±2℃

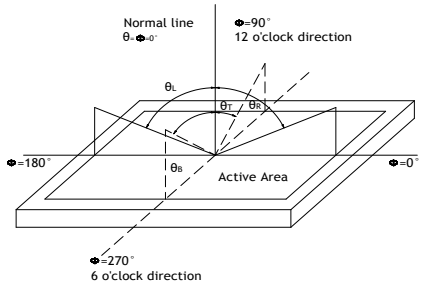
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	-	900	-		Note1 Note3
Luminance(center)		L	800	-	-	cd/m2	Note1 Note5 Note7
Luminous tolerance		LU	80	85		%	Note7
Response Time		Rising + Falling	-	30	35	ms	Note1 Note4
Viewing Angle K=Contrast Ratio>10	Horizontal	θx^+	80	85	-	degree	Note2
		θx^-	80	85	-		
	Vertical	θy^+	80	85	-		
		θy^-	80	85	-		
Color Chromaticity (CIE1931)	Red	x	Typ- 0.05	0.592	Typ+ 0.05		Note1 Note5 Note7
		y		0.321			
	Green	x		0.289			
		y		0.609			
	Blue	x		0.139			
		y		0.076			
	White	x		0.270			
		y		0.298			
Color gamut (NTSC ratio)			-	65		%	

Note1: Definition of optical measurement system (BM-7)



Note2: Definition of viewing angle range and measurement system

Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).



Note3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.

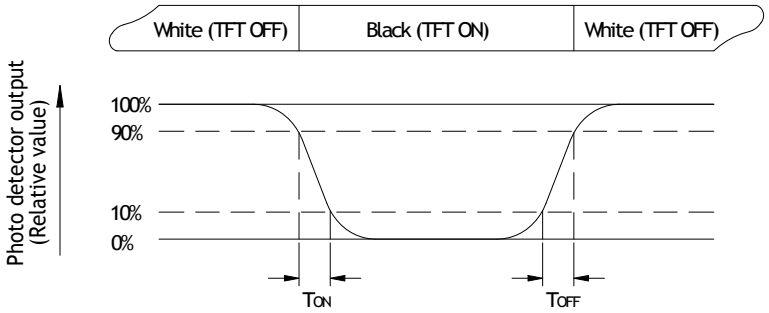


Fig. 6-3 Definition of response time

Note4: Definition of contrast ratio

$$\text{Contrast ratio(CR)}=\frac{\text{Luminance measured when LCD on the Whitestate}}{\text{Luminance measured when LCD on the Blackstate}}$$

"White state ": The state is that the LCD should drive by Vwhite.

"Black state": The state is that the LCD should drive by Vblack.

Vwhite: To be determined Vblack: To be determined.

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

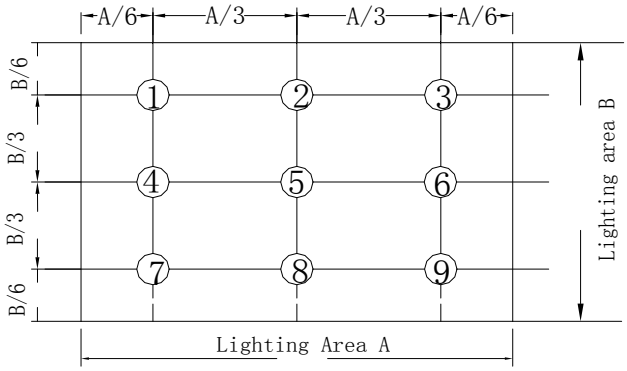
Note6: All input terminals LCD panel must be ground while measuring the center area of the

Note7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas.Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/ Lmax

L----Active area length, W---- Active area width



Bmax: The measured maximum luminance of all measurement position.

Bmin: The measured minimum luminance of all measurement position.

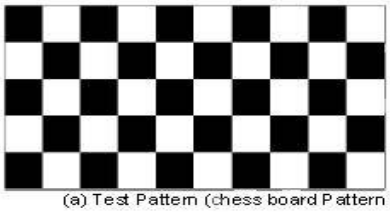
7.RELIABILITY TEST ITEMS

7.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition	Remark
High Temperature Storage	Ta=80℃; 96hrs	IEC60068-2-1：2007 GB2423.2-2008
Low Temperature Storage	Ta=-30℃;96hrs	IEC60068-2-1：2007 GB2423.1-2008
High Temperature Operation	Ta=70℃; 96Hrs	IEC60068-2-1：2007 GB2423.2-2008
Low Temperature Operation	Ta=-20℃; 96hrs	IEC60068-2-1：2007 GB2423.1-2008
High Temperature High Humidity Operation	Ta=60℃，90%RH， 96Hrs(no condensation)	IEC60068-2-78：2001 GB/T2423.3-2006
Thermal Shock	-30℃(0.5h) ~ 80℃(0.5h) / 72 cycles	Start with cold temperature ， End with high temperature， IEC60068-2-14:1984,GB2423.22-2002
Image Sticking	25℃ ; 1hrs	Note1

Note1:Condition of image sticking test :25℃±2℃

Operation with test pattern sustained for 1 hrs,then change to gray pattern immediately.after 5 mins,the mura must be disappeared completely


(a) Test Pattern (chess board Pattern)


(b) Gray Pattern

7.2 VIBRATION&SHOCK

Test item	Conditions	Remark
Packing Shock (non-operation)	980m/s2,6ms, ±x,y,z 3times for direction	IEC60068-2-27：1987 GB/T2423.5-1995
Packing Vibration (non-operation)	Frequency range:10 HZ~50HZ Stroke:1.0mm,sweep:10 HZ ~50HZ x,y,z 2 hours for each direction	IEC60068-2-32：1990 GB/T2423.8-1995

7.3ESD

Test item	Conditions	Remark	
Electro Static Discharge Test (non-operation)	150pF，330Ω， Contact:±4KV,Air:±8KV	1	Class C
	200pF，0Ω，±200V contact test	2	

Note: Measure point :
1. LCD glass and metal bezel
2. IF connector pins
3. ESD class B:some performance degradation allowed. Self-recoverable. No data lost,no hardware failures.

8. GENERAL PRECAUTION

8.1 SAFETY

1. Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
2. If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
3. If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

8.2 STORAGE CONDITIONS

1. Store the panel or module in a dark place where the temperature is 23±5°C and The humidity is below 50±20%RH.
2. Store in anti-static electricity container.
3. Store in clean environment, free from dust, active gas, and solvent.
4. Do not place the module near organics solvents or corrosive gases.
5. Do not crush, shake, or jolt the module.

8.3 HANDLING PRECAUTIONS

1. Avoid static electricity which can damage the CMOS LSI.
2. The polarizing plate of the display is very fragile. So, please handle it very carefully.
3. Do not give external shock.
4. Do not apply excessive force on the surface.
5. Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
6. Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a

cleaning naphtha solvent.

7. Do not operate it above the absolute maximum rating.
8. Do not remove the panel or frame from the module.
9. When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
10. Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining and discoloration may occur.
11. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth in case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

8.4 WARRANTY

1. The period is within twelve months since the date of shipping out under normal using and storage conditions.
2. Do not repaired or modified the LCM. It may cause function to lose efficacy, Starry does not warrant the LCM.
3. All process and material comply ROHS.

1. Incoming inspection right

(1) The Incoming Inspection Standard will be agreed and signed by both sides(Customer an starry)

2. Inspection condition is as follows

(1) Viewing distance is approximately 35~40 cm
(2) Viewing angle is normal to the LCD panel as Fig-1(30°)
(3) Ambient temperature is approximately 25±5℃
(4) Ambient humidity is 60±5%RH
(5) Ambient illuminance is from 300~500 Lux
(6) Input signal timing should be typical value
(7) Mura & Light leakage inspection an ND-Filter 5%

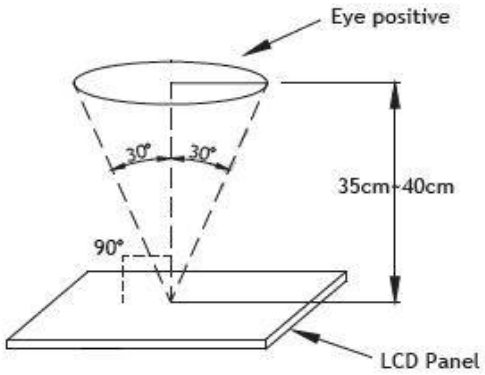


Fig-1

3. Special condtion

(1) Viewing distance is close for inspection of adjacent dots and distance between defect Dots
(2) Viewing condition of " Shot block non-uniformity from oblique angle"is as Fig-2
(3) Exceptional case:Veiw angle±40°while inspected image-sticking

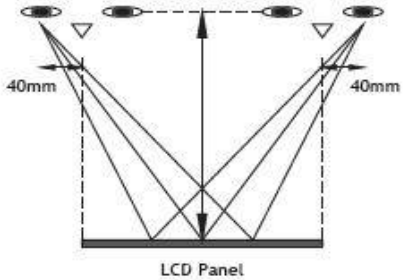
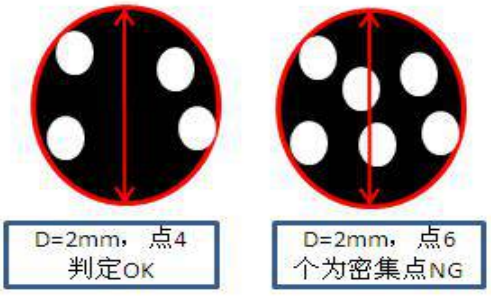
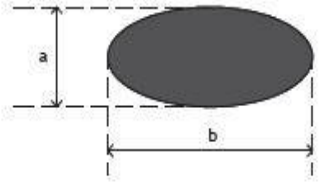


Fig-2

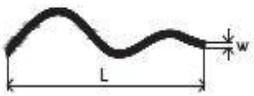
4. INSPECTION CRITERIA

<table>
<tr><th colspan="3">Defecttype</th><th colspan="4">Limit</th><th>Note</th></tr>
<tr><td rowspan="11">Visual defect</td><td colspan="2" rowspan="3">Scratch</td><td colspan="3">W≦0.05mm</td><td>Ignore</td><td rowspan="3">Note1</td></tr>
<tr><td colspan="3">0.05mm≦w≦0.1m
L≦10mm</td><td>N≦3</td></tr>
<tr><td colspan="3">20mm < l，0.1mm < w</td><td>N=0</td></tr>
<tr><td rowspan="9">Internal</td><td rowspan="3">Spot</td><td colspan="3">Φ < 0.3mm</td><td>Ignore</td><td rowspan="3">Note 1</td></tr>
<tr><td colspan="3">0.3mm≦φ≦0.4mm</td><td>N≦3</td></tr>
<tr><td colspan="3">0.4≦φ</td><td>N=0</td></tr>
<tr><td rowspan="2">Fiber</td><td colspan="3">0.1mm≦w≦0.2m
L≦2.5mm</td><td>N≦4</td><td rowspan="2">Note 1</td></tr>
<tr><td colspan="3">0.2mm < w，2.5mm < l</td><td>N=0</td></tr>
<tr><td rowspan="3">Polarizer bubble</td><td colspan="3">Φ < 0.3mm</td><td>Ignore</td><td rowspan="3">Note 1</td></tr>
<tr><td colspan="3">0.25mm≦φ≦0.5mm</td><td>N≦2</td></tr>
<tr><td colspan="3">0.5≦φ</td><td>N=0</td></tr>
<tr><td rowspan="3">Dent</td><td colspan="3">Φ < 0.25mm</td><td>Ignore</td><td rowspan="3">Note 1</td></tr>
<tr><td colspan="3">0.25mm≦φ≦0.5mm</td><td>N≦4</td></tr>
<tr><td colspan="3">0.5≦φ</td><td>N=0</td></tr>
<tr><td rowspan="4">Electrical Defect</td><td colspan="2">Bright dot</td><td>C area</td><td>O area</td><td>Total</td><td rowspan="4">Note 2
Note 3
use of ND5 % invisible OK</td></tr>
<tr><td colspan="2"></td><td>N≦1</td><td>N≦2</td><td>N≦3</td></tr>
<tr><td colspan="2">Dark dot</td><td>N≦2</td><td>N≦4</td><td>N≦4</td></tr>
<tr><td colspan="2">Total dot</td><td>N≦3</td><td>N≦4</td><td>N≦4</td></tr>
<tr><td colspan="2">Dense point</td><td colspan="4">Using ND5 % visible by intensive foreign standard judgement, ND5 % invisible OK
 
</td><td>Note 4</td></tr>
<tr><td colspan="8">(1) One pixel consists of 3 sub-pixel,including r,g,ang b dot.(sub-pixel=dot)
(2) Panel is acceptable if distance between 2 dot defects are greater or equal to 5mm.</td></tr>
</table>

Note1 : W : Width[mm], L : Length[mm], N : Number, φ: Average Diameter

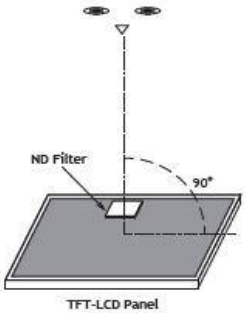


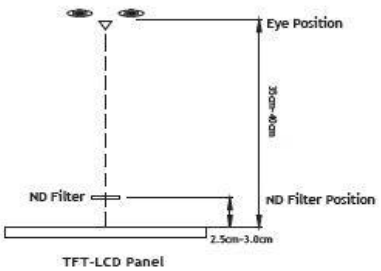
1.(White ,Black) Spot
2.Polarizer Bubble



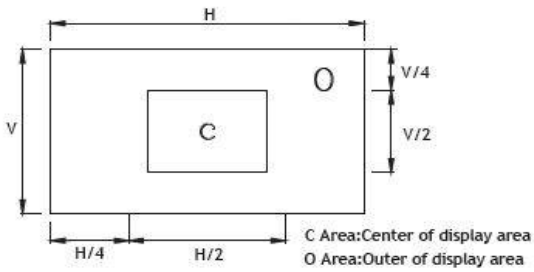
Scratch & Fiber

Note2 : Bright dot is defined as the defective area of the dot is larger than 50% of one sub-pixelarea.



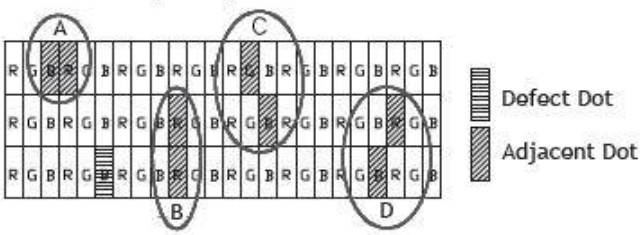


Note3 :



C Area:Center of display area
O Area:Outer of display area

Note4 : Judge defect dot and adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dart adjacent dot. And they will be counted 2defect dots in total quantity.



Note5 : Other condition

(1) The defects that are not defined above and considered to be problem shall be reviewed anddiscussed by both parties.

(2) Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.

5. HANDLING PRECAUTION

(1) Don't disassemble and reassemble the module by self.
(禁止自行拆解)
(2) Acid, alkali, alcohol or touched directly by hand will damage the display.
(酸性、碱性、酒精或手的直接接触将会损伤显示面)
(3) Static electricity will damage the module. Please configure grounding device.
(静电会损伤模组，请装配接地设备)
(4)The strong vibration, shock, twist or bend will cause material damage, even module broken.
(强烈的撞击、震动、扭转或弯曲将会造成原材损伤，甚至面板破裂)
(5) It is easy to cause image sticking while displaying the same pattern for very long time.
(长期显示同一画面会造成影像残留)
(6) The response time, brightness and performance will vary from different temperature.
(响应时间、亮度与均匀性会因温度而有所改变)
(7)The Period is within 12 months since the date of shipping out under normal using and Storage conditions.
(从出货之日开始,在正常使用和存储条件下，产品保质期为 12 个月)

9. 纸箱包装方式