

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LS080I12-MP-V1

Module Type: COG+FPC+B/L

APPROVED SIGNATURE

- ☒ Approved Product Specification only
- ☐ Approved Product Specification and Samples

<u>Prepared By</u>	<u>Checked By</u>	<u>Approved By</u>

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1.GENERAL DESCRIPTION

1.1 DESCRIPTION

LS080I12-MP-V1 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.

1.2 FEATURES:

NO.	Item	Specification	Unit
1	Panel Size	8"	inch
2	Number of Pixels	1200X1920	Pixels
3	Active Area	107.64(H)X172.20(V)	mm
4	Pixel Pitch	0.0299(H)X0.0897(V)	mm
5	Outline Dimension	114.6(H)X184.1(W)X2.3(D)	mm
6	Number of Colors	16.7M	-
7	Display Mode	Normally Black	-
8	Viewing Direction	IPS	
9	Pixel Arrangement	RGB vertical stripe	-
10	Luminance (cd/m^2)	500 (TYP.)	nit
11	Contrast Ratio	1000(TRP.)	nit
12	Surface Treatment	Anti-Glare	-
13	Interface	MIPI	-
14	Backlight	White LED	-
15	Driver IC	HX8279D	
16	Driver element	BOE ,a-SI TFT active matrix	
17	Operation Temperature	-10~60	℃
18	Storage Temperature	-20~70	℃

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量产图

第三视角

PIN SYMBOL
1 VDD
2 VDD
3 VDD
4 VDD
5 NC
6 NC
7 NC
8 NC
9 NC
10 NC
11 GND
12 MIP1-D0P
13 MIP1-D0N
14 GND
15 MIP1-D1P
16 MIP1-D1N
17 GND
18 MIP1-CLAP
19 MIP1-CLAN
20 GND
21 MIP1-D2P
22 MIP1-D2N
23 GND
24 MIP1-D3P
25 MIP1-D3N
26 GND
27 GND
28 ID(NO)
29 NC
30 LEDK
31 LEDK
32 LEDK
33 NC
34 NC
35 NC
36 NC
37 NC
38 LEDA
39 LEDA

Top view of the display module. Dimensions include: *114.600±0.2, 109.640 POL, 107.640 A/A, 2.47, -3.470, 2.500, 3.500, *184.100±0.2, 174.200 POL, 172.200 A/A, (89.522), 57.310. Internal text: TFT 8.0", 1200RGBX1920 DOTS, ALL DIRECTION. A small inset shows the module's side profile with a height of 14.5mm.

Bottom view of the display module. Dimensions include: *2.6±0.1, 最厚元件1.2, 麦拉胶0.05, 元件1.05, 麦拉胶24.5, FPC 16.2, 56.7, 2. 内部标注: 元件区内只有IC, IC 1.2MM球余示元件高度, 小于1.2mm, 插接方向, PIN9, PIN1, 麦拉胶内为元件区域.

LED pinout diagram showing a row of LEDs with pins labeled A and K.

IF=140MA, VF=12±0.8V

NOTES:

1. DISPLAY TYPE: BOE 8";
2. VIEWING DIRECTION: IPS ;
3. LCM Chromaticity(White): X 0.29+/-0.03;Y 0.30+/-0.03;
4. OPERATING TEMP: -20° C TO 60° C;
5. STORAGE TEMP: -30° C TO 70° C;
6. BACK LIGHT: 28 CHIP WHITE LED;
7. LUMINANCE(9 AVG): 500 cd/m² (MIN), 350 cd/m² (TYP) ;
8. Uniformity(%):75%(MIN)80%(TYP) ;
9. Dimensions with mark "*" are important, with mark "(" are referenced;
10. General Tolerance:±0.2
11. Requirements Environmental Protection

REV	DATE	DESCRIPTION	REVISOR	REVISION	TYPE	LCM	EDITION	APPROVED
1	2022.04.11	首版打样					A0	
2								
3								
4								
5								
6								
7								
8								
9								
10								

3.PIN DESCRIPTION

NO.	Symbol	Function	Remark
1~4	VDD	Power Supply(3.3V)	
5~10	NC	No connect	
11	GND	Ground	
12	D0P	MIPI data positive signal	
13	D0N	MIPI data negative signal	
14	GND	Ground	
15	D1P	MIPI data positive signal	
16	D1N	MIPI CLK negative signal	
17	GND	Ground	
18	CLKP	MIPI CLK negative signal	
19	CLKN	MIPI data negative signal	
20	GND	Ground	
21	D2P	MIPI data positive signal	
22	D2N	MIPI data negative signal	
23	GND	Ground	
24	D3P	MIPI data positive signal	
25	D3N	MIPI data negative signal	
26~27	GND	Ground	
28	ID(NC)	No connect	
29	NC	No connect	
30~32	LEDK	LED Cathode	
33~37	NC	No connect	
38~39	LEDA	LED Anode	

4 ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Voltage	VDD,	GND=0	-0.3	6.6	V	
Power Voltage	Vin	GND=0	-0.3	VDD+0.3	V	NOTE
Logic Output Voltage	VOUT	GND=0	-0.3	VDD+0.3	V	NOTE
Storage Temperature(Ambient)		-	-20	+60	°C	
Operation Temperature(Ambient)		-	0	+50	°C	
Storage Humidity		-	10	90	%RH	
Operation Ambient Humidity		-	10	90	%RH	

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

4.2 TFT LCD MODULE

4.2 Operating Conditions

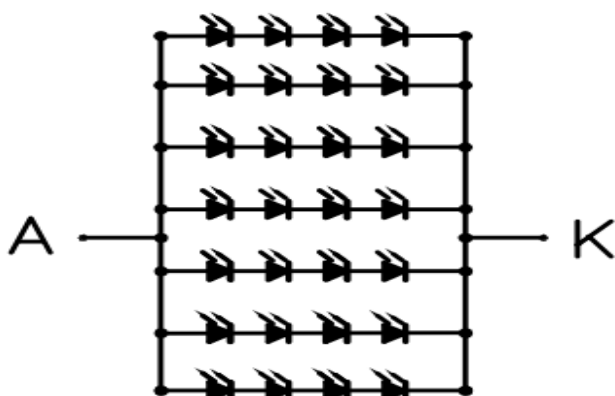
Item	Symbol	Valves			Unit	Remark
		Min.	Typ.	Max.		
Power Supply Voltage	VDD	2.8	3.3	4.8	V	
Current consumption	I _{VDD}	-	-	TBD	mA	Note 1

Note 1: Maximum Measurement Condition: White Pattern at 3.3V driving voltage. (P_{max}=V_{3.3}×I_{white})

Note 2: Measure Condition

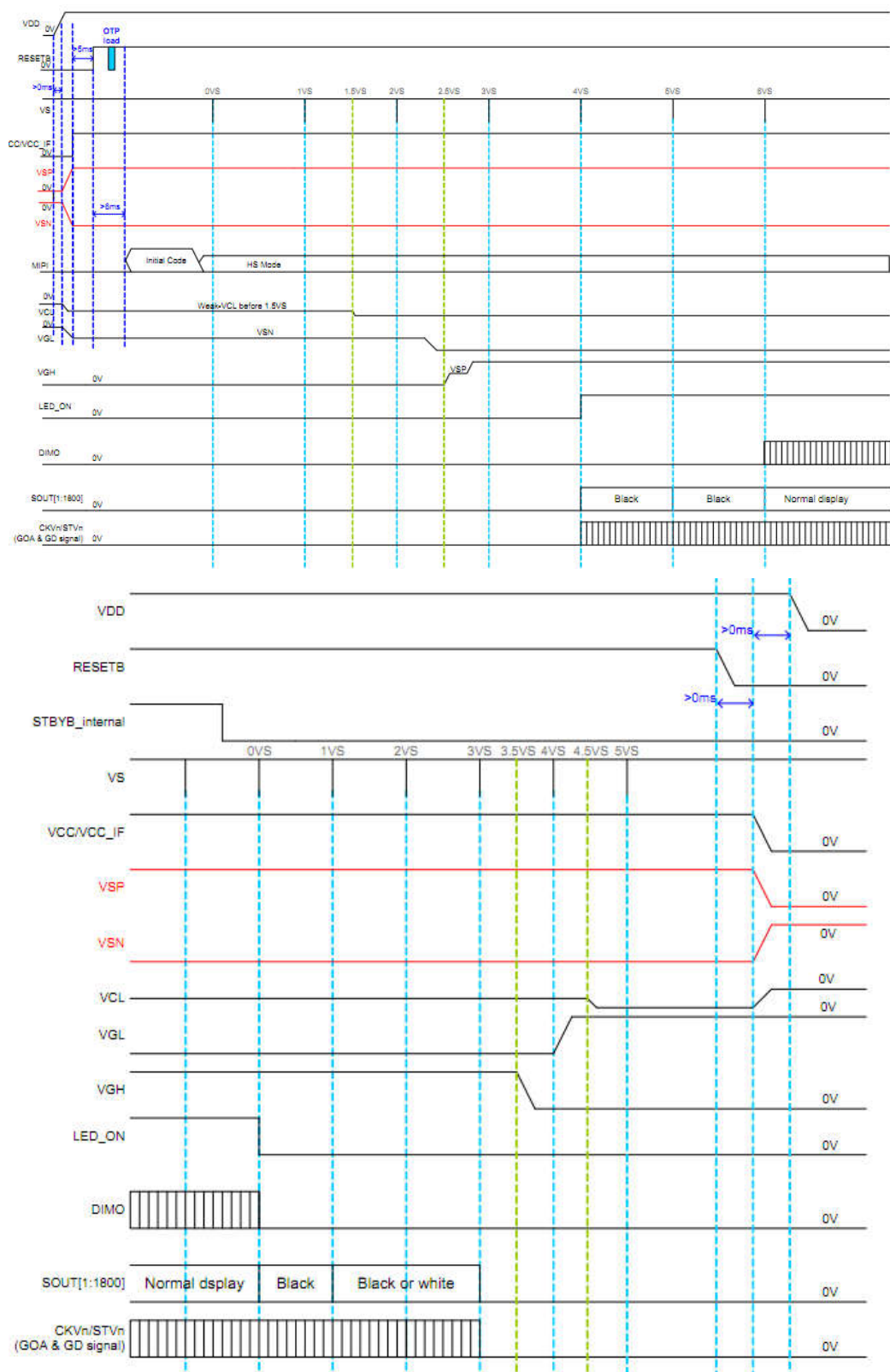
4.3 LED BACK Light section cation

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I _{LED}		140		mA	Total LED
For ward Voltage	V _F	11.2	12.0	12.8	V	I _F =140mA



5.Signal timing diagram power sequence

5.1 Power on/off sequence



5.2 Burst mode data transmission

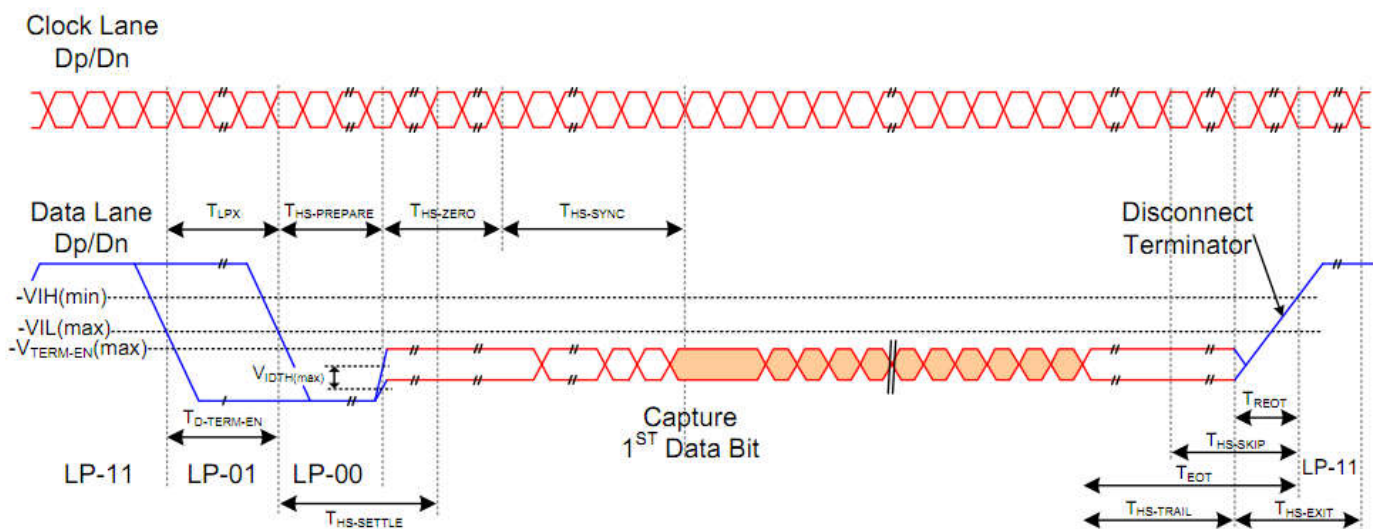


Figure 13.2: Timing of high-speed data transmission in bursts

5.3 Switching the clock lane between clock transmission and low power mode

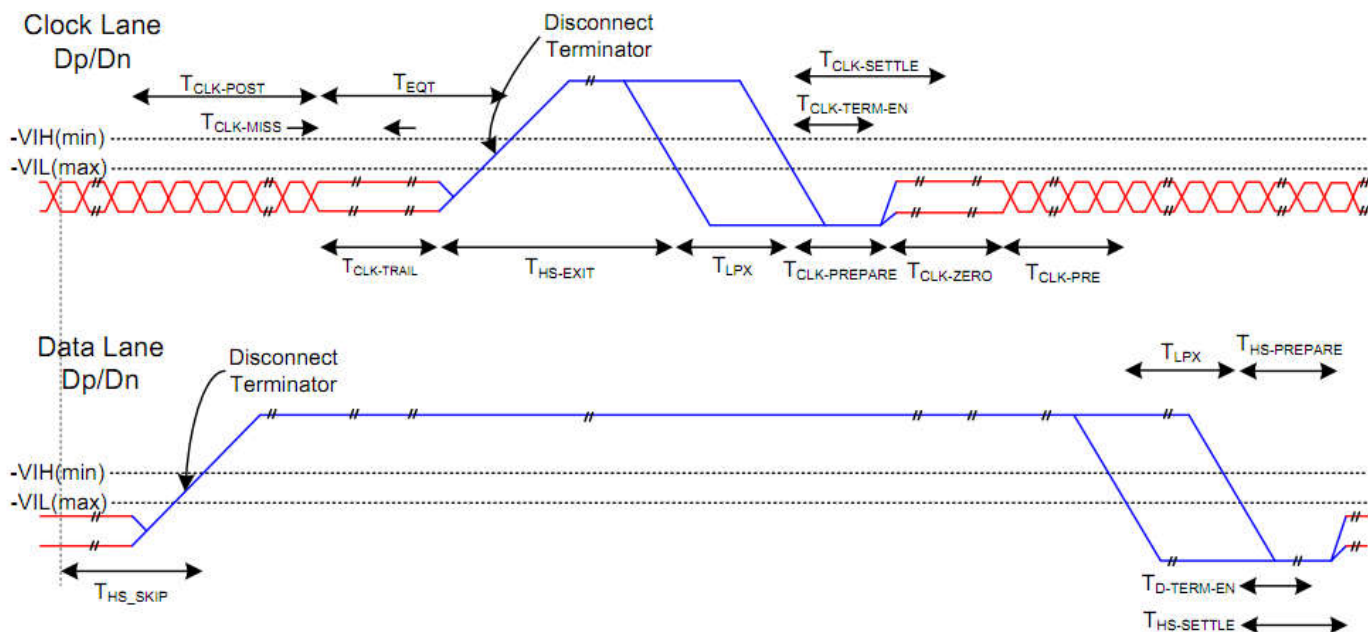


Figure 13.1: Switching the clock lane between clock transmission and low-power mode

5.4 MIPI data_clock timing specification

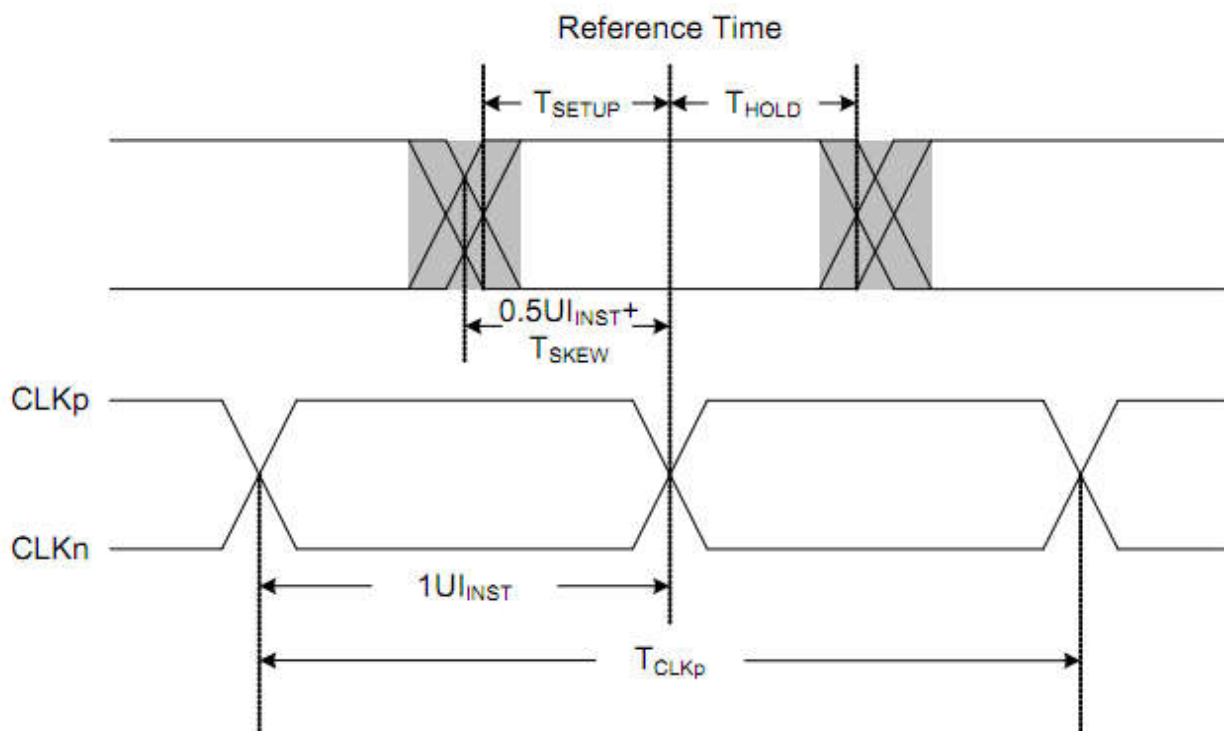


Figure 13.4: Data to clock timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
UI instantaneous	UI_{INST}	1.0	-	12.5 ⁽¹⁾	ns
Data to clock setup time	T_{SETUP}	0.3	-	-	UI_{INST}
Data to clock hold time	T_{HOLD}	0.3	-	-	UI_{INST}

Note: (1) This value corresponds to a minimum 80 Mbps data rate.

5.5 Reset timing

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
Reset low pulse width	$Trst$	-	20	-	-	μs

Table 13.5: Reset timing



Figure 13.6: Reset timing

5.6 Initial CODE

6.DC CHARACTERISTICS

6.1 DC Characteristic

Parameter		Symbol	Spec.			Unit	Note
			Min.	Typ.	Max.		
VDD input high level voltage		VIH1	0.8 x VDD	-	VDD	V	-
VDD input low level voltage		VIL1	VSS	-	0.2 x VDD	V	-
VCC input high level voltage		VIH2	0.8 x VCC	-	VCC	V	-
VCC input low level voltage		VIL2	VSS	-	0.2 x VCC	V	-
Input leakage current		IL1	-1	-	+1	μA	-
SDAO output high level voltage		VOH	0.8 x VDD	-	VDD	V	-
SDAO output low level voltage		VOL	VSS	-	0.2 x VDD	V	-
VLPH output voltage		VLPH	1.1	1.2	1.4	V	I _{VLPH} <10mA
VCL output voltage		VCL	-2.1	-2.4	-3.00	V	I _{VCCRE} <60mA
VGH output voltage		VGH	8.7	-	18	V	I _{VGH} <5mA
VGL output voltage		VGL	-16	-	-6.7	V	I _{VGL} <5mA
VGPH output voltage		VGPH	4.0	4.5	5.5	V	-
VGPL output voltage		VGPL	0.1	0.2	1.6	V	-
VGNH output voltage		VGNH	-5.5	-4.5	-4.0	V	-
VGNL output voltage		VGNL	-1.6	-0.2	-0.1	V	-
Driving current of GOUT outputs		IGOS	1	-	-	mA	GOUT1~20 VO=15V vs 14.7V VGH=15V,VGL=-13V
Sinking current of GOUT outputs		IGOD	1	-	-	mA	GOUT1~20 VO=-13V vs -12.7V VGH=15V,VGL=-13V
VCOM output voltage		VCOM	-2.75	-	-0.20	V	-
Input terminal pull-high resistance		RPU	-	300	-	KΩ	VDD=1.8V
Input terminal pull-low resistance		RPD	-	300	-	KΩ	
Source output level deviation	Gray code= 0 ~ 14	-	40	-	-	mV	-
	Gray code= 241 ~ 255	-	-	-	-	mV	
	Gray code= 15 ~ 31	-	30	-	-	mV	
	Gray code= 208 ~ 240	-	20	-	-	mV	
Source output offset deviation	Gray code= 0 ~ 14	-	50	-	-	mV	-
	Gray code= 241 ~ 255	-	-	-	-	mV	
	Gray code= 15 ~ 31	-	40	-	-	mV	
	Gray code= 208 ~ 240	-	30	-	-	mV	
Withstanding current capability	IVDD capability	-	-	-	40	mA	-
	IVSP capability	-	-	-	50		
	IVSN capability	-	-	-	-50		
VSP current consumption	Standby mode	I _{vsps}	-	-	1.2	mA	Note ⁽²⁾
VSN current consumption	Standby mode	I _{vsns}	-	-	0.15	mA	Note ⁽²⁾
VDD current consumption	Normal mode	I _{vdd}	-	-	30	mA	Note ⁽¹⁾
	Standby mode	I _{vdds}	-	-	1.1	mA	Note ⁽²⁾
VPP operation current		I _{vpp}	-	-	8	mA	-

Note: (1) Condition: one chip current, VDD=1.8V, 1200RGBx1920 resolution, MIPI frequency 950mbps, frame rate 60Hz, all setting are default.

(2) Condition: one chip current, all function and MIPI input stop. And let MIPI input state keep ULPS to reduce more current consumption in standby mode.

7.OPTICAL CHARACTERISTICS

Item	Symbo l	Min.	Typ.	Max.	Unit	Remarks
Contrast Ratio	C/R	800	1000	-		Fig.1
Brightness		330	500	-	cd/m2	Full White Pattern 5 Point
Brightness Uniformity		75%	80%	-	%	Full White Pattern Fig.1,2
Response Time	Tr+Tf	-	30	40	ms	Fig.3
Color Coordinate	WHITE	Wx	0.26	0.29	0.32	Full White Pattern
		Wy	0.27	0.30	0.33	
View angle	θl	-	85	-	Degree	Fig.4 Center (C/R>10)
	θr	-	85	-		
	θu	-	85	-		
	θd	-	85	-		
Transmittance Ratio	TR	-	-	4	%	LCD With POL

Note:

1. Contrast Ratio(CR) is defined mathematically as:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

2. Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white. For more information see FIG 1.
3. Response time is the time required for the display to transition from black to white(Rise Time, Tr) and from white to black(Decay Time, Tf). For additional information see FIG 3.
4. Viewing angle is the angle at which the contrast ratio is greater than 5. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 4.
5. Optimum contrast is obtained by adjusting the LCD Threshold voltage (Vth& Vsat)

7.2 Optical Characteristic Measurement Equipment and Method

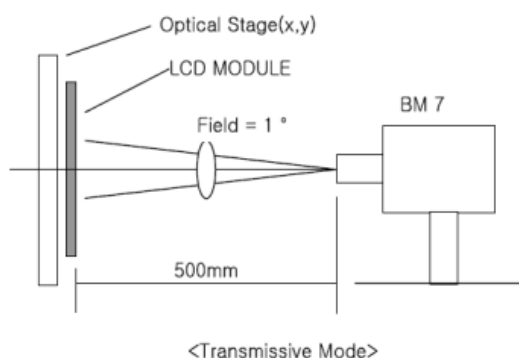


FIG. 1 Optical Characteristic Measurement Equipment and Method

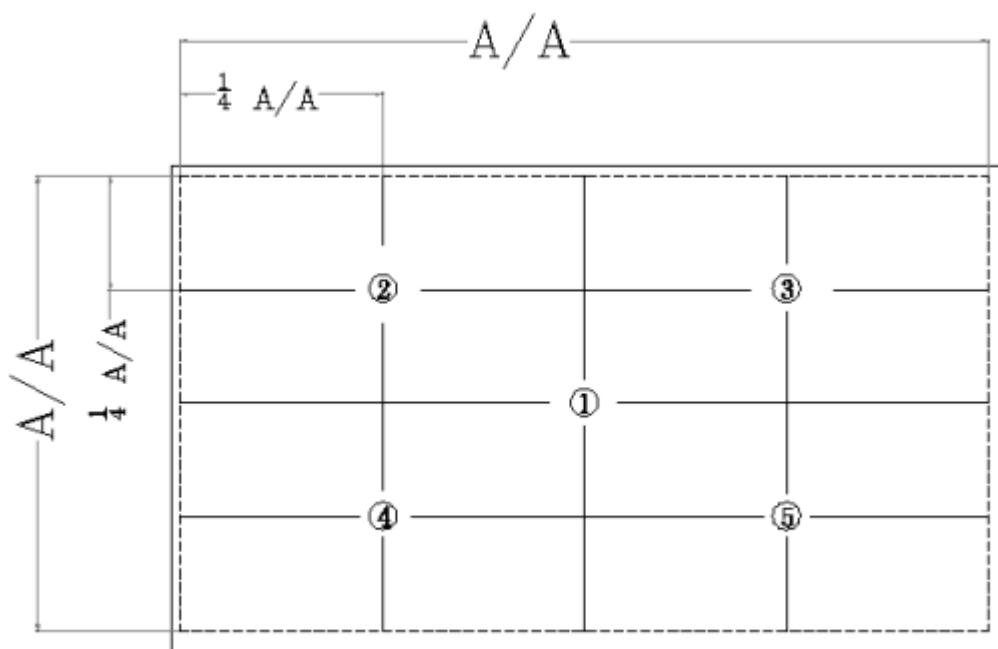
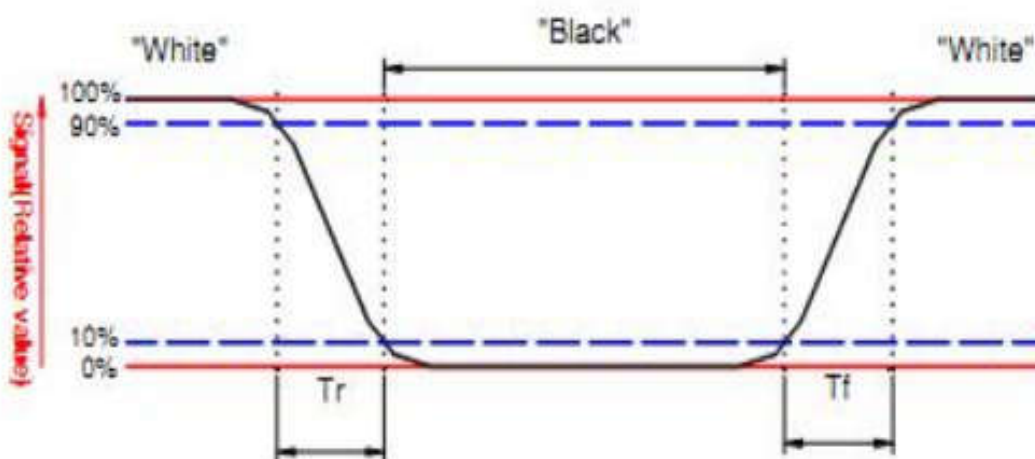


FIG.2 Brightness Uniformity: The brightness uniformity of the five main measuring points

The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (falling time) and from "White" to "Black" (rising time), respectively. The response time interval between the 10% and 90% of amplitudes. Refer to figure as below



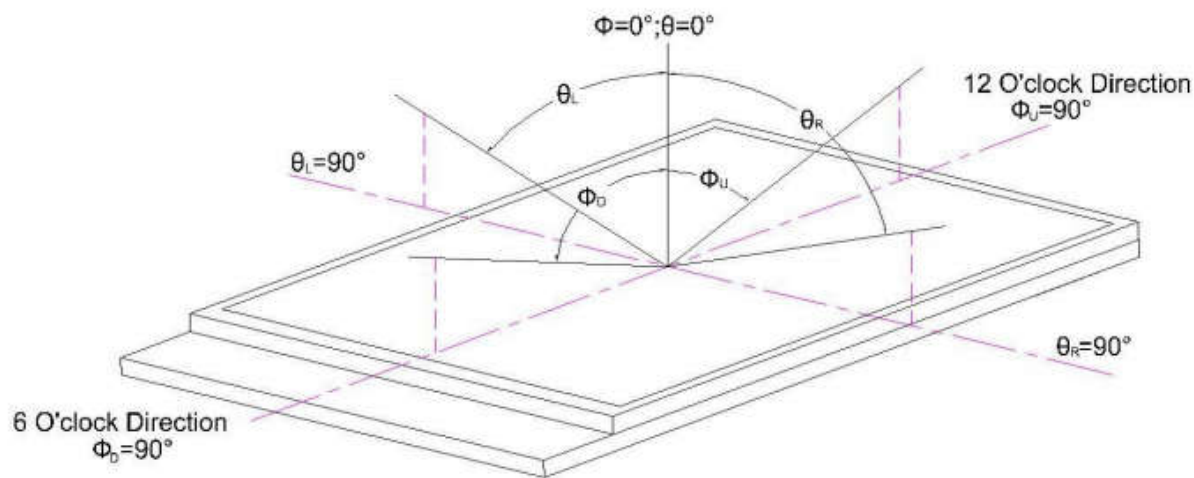
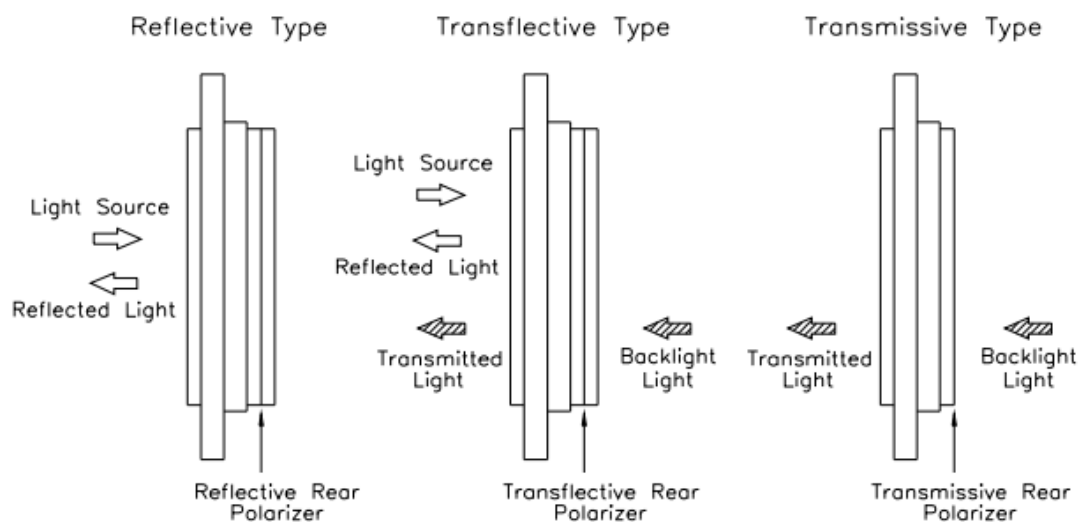


FIG.4 The definition of Viewing Angle

Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 luminance meter 1.0° field of view at a distance of 50cm and normal direction

7.3 Viewing Modes



The viewing mode of the LCM is “Transmissive Type”

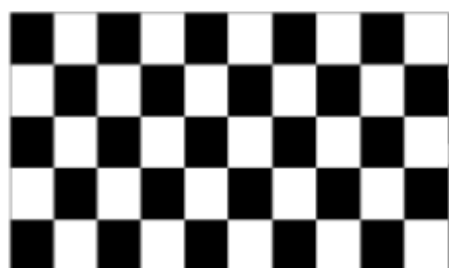
8. RELIABILITY TEST ITEMS

8.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition	Remark
High Temperature Storage	Ta=60℃; 240hrs	IEC60068-2-1 : 2007 GB2423.2-2008
Low Temperature Storage	Ta=-30℃; 240hrs	IEC60068-2-1 : 2007 GB2423.1-2008
High Temperature Operation	Ta=60℃ , 240Hrs	IEC60068-2-1 : 2007 GB2423.2-2008
Low Temperature Operation	Ta=-20℃; 240hrs	IEC60068-2-1 : 2007 GB2423.1-2008
High Temperature High Humidity Operation	Ta=60℃ , 90%RH , 240Hrs(no condensation)	IEC60068-2-78 : 2001 GB/T2423.3-2006
Thermal Shock	-30℃ (0.5h) ~ 60℃ (0.5h) / 100cycles	Start with cold temperature , End with high temperature , IEC60068-2-14:1984,GB2423.22-2002
Image Sticking	25℃ ; 4hrs	Note1

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

Operation with test pattern sustained for 4hrs,then change to gray pattern immediately.afer5 miens, themura must be disappeared completely



(a) Test Pattern (chess board Pattern)



(b) Gray Pattern

8.2 VIBRATION& SHOCK

Test item	Conditions	Remark
Packing Shock (non-operation)	980m/s ² ,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	IEC60068-2-27:1990 GB/T2423.8-1995

8.3 VIBRATION& SHOCK

Test item	Conditions	Remark	
Electro Static Discharge Test (non-operation)	180pF • 330 Ω • Contact:±4KV,Air:±8KV	1	IEC61000-4-2:2001 GB/T17626.2-2006
	200pF • 0 Ω • ±200V contact test	2	

Note:Measure point:

1.LCD glass and metal bezel

2.IF connector pins

9. GENERAL PRECAUTION

9.1 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.

9.2 STORAGE CONDITIONS

1. Store the panel or module in a dark place where the temperature is $23 \pm 5^{\circ}\text{C}$ and The humidity is below $50 \pm 20\%\text{RH}$
- 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.

9.3 STORAGE CONDITIONS

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 tectonics 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.

9.4 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.