TFT-LCD MODULE SPECIFITON
FOR APPROVAC

CUSTOMER MODEL NO.:

FXMODEL NO.: HLT090WSB60I031-D

ALL MATERIAL AGREE WITH ROHS

FOR CUSTOMER APPROVAL	SUPPLIER SIGNATURE
APPROVED BY:	APPROVED BY:
REVIEEDE BY:	REVIEEDE BY:
PEREPARED BY:	PEREPARED BY:
APPROVAL DATE:	MAKE DATE:

Revision Notice	Description	Page	Rev.Date
0.0	First revision (Tentative)	--	2023.02.22

TABLE OF CONTENTS

No. CONTENTS

REVISION STATUS.....2

TABLE OF CONTENTS.....3

1.GENERAL DESCRIPTION.....4

2.MECHANICAL SPECIFICATION.....5

3.PIN DESCRIPTION.....6

4.ELECTRICAL CHARACTERISTICS.....7

5.INPUT SIGNAL TIMING.....10

6.DC CHARACTERISTICS.....13

7.OPTICAL CHARACTERISTICS.....15

8.HANDLING PRECATION.....17

1.GENERAL DESCRIPTION

1.1 DESCRIPTION

HLT090WSB60I031-D 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.

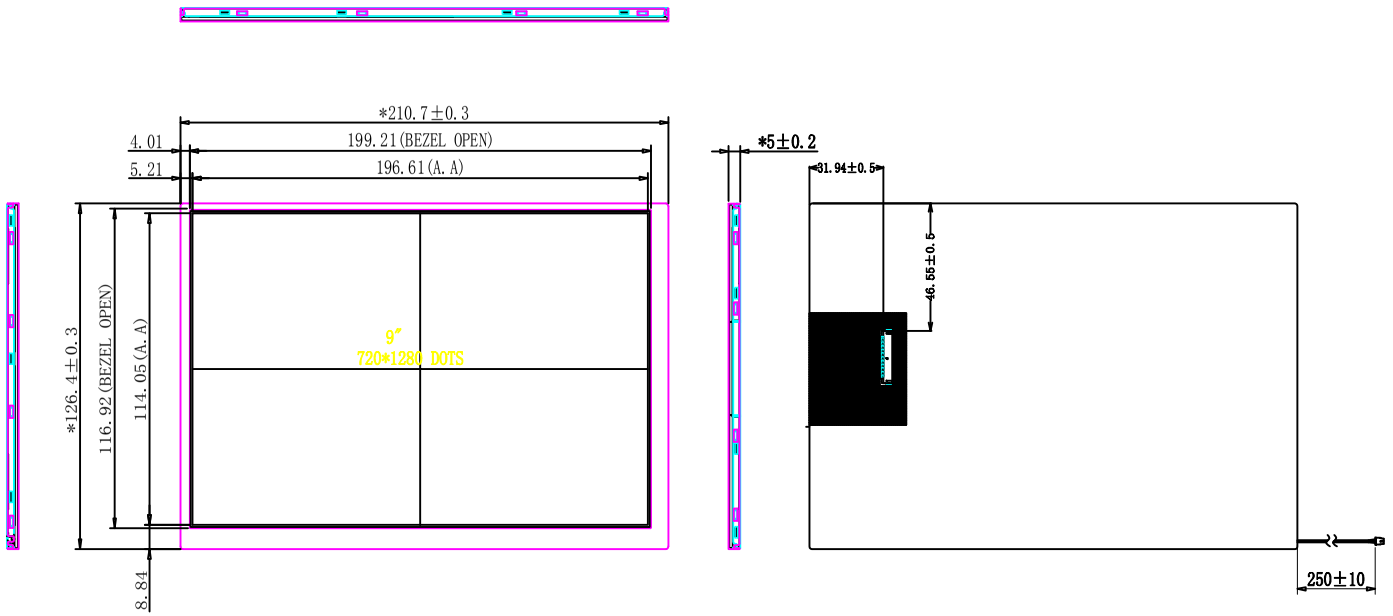
1.2 FEATURES:

NO.	Item	Specification	Unit
1	Panel Size	9”	inch
2	Number of Pixels	720X1280	Pixels
3	Active Area	114.048(H)X196.608(V)	mm
4	Pixel Pitch	0.1584(H)X0.1536(V)	mm
5	Outline Dimension	126.4(H)X210.7(W)X5.0(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	Operation Temperature	-10~50	℃
16	Storage Temperature	-20~60	℃
17	Weight	TPD	g

2.MECHANICAL SPECIFICATION

量产图

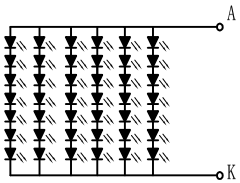
第三视角



PIN	Explanation
1	NC
2	IOVCC(NC)
3	IOVCC(NC)
4	VDD(NC)
5	RESET
6	NC
7	GND
8	MIPI_TDN0
9	MIPI_TDP0
10	GND
11	MIPI_TDN1
12	MIPI_TDP1
13	GND
14	MIPI_TCN
15	MIPI_TCP
16	GND
17	MIPI_TDN2
18	MIPI_TDP2
19	GND
20	MIPI_TDN3
21	MIPI_TDP3
22	GND
23	NC
24	AVDD
25	NC
26	NC
27	NC
28	NC
29	NC
30	NC

NOTES:

1. DISPLAY TYPE: 9″;
2. VIEWING DIRECTION: IPS ;
3. LCM Chromaticity(White): X 0.28+/-0.03;Y 0.30+/-0.03;
4. OPERATING TEMP: -10° C TO 50° C;
   STORAGE TEMP: -20° C TO 60° C;
5. BACK LIGHT: 42 CHIP WHITE LED;
6. LUMINANCE(9 AVG): 450 cd/㎡ (MIN),500 cd/㎡ (TYP);
7. Uniformity(%):75%(MIN)80(TYP);
8. Dimensions with mark ″*″ are important,
   with mark ″()″ are referenced;
9. Genral Tolerance:±0.2
10. Requirements Environmental Protection: RoHS;
11. 铁框材质：镀铝锌板 T=0.3mm



7*6=36LEDS If=120mA

REV 修改	DATE 日期	DESCRIPTION 修改内容	REVISER 修改者

TYPE 类型	LCM	EDITION 版本号	A0	APPROVED 承认	
MODEL NO. 模组号	HLT090WSB60I031-D	PAGE 页次	1/1	CHECK 核对	
PART NO. 料号	HLT090WSB60I031-D	DATE 日期	23.02.21	DESIGNED 制定者	

由 Autodesk 教育版产品制作

3.PIN DESCRIPTION

NO.	Symbol	Function	Remark
1	NC	No connect	
2	IOVCC(NC)	No connect	
3	IOVCC(NC)	No connect	
4	VDD(NC)	No connect	
5	RESET	Global reset pin	
6	NC	No connect	
7	GND	Ground	
8	D0N	MIPI data 0 negative signal	
9	D0P	MIPI data 0 positive signal	
10	GND	Ground	
11	D1N	MIPI data 1 negative signal	
12	D1P	MIPI data 1 positive signal	
13	GND	Ground	
14	CLKN	MIPI CLK negative signal	
15	CLKP	MIPI CLK positive signal	
16	GND	Ground	
17	D2N	MIPI data 2 negative signal	
18	D2P	MIPI data 2 positive signal	
19	GND	Ground	
20	D3N	MIPI data 3 negative signal	
21	D3P	MIPI data 3 positive signal	
22	GND	Ground	
23	NC	No connect	
24	AVDD	Power supply(3.5v16v)	
25~30	NC	No connect	

4. ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Voltage	AVDD,	GND=0	-0.3	24	V	
Power Voltage	Vin	GND=0	-0.3	AVDD+0.3	V	NOTE
Logic Output Voltage	VOUT	GND=0	-0.3	AVDD+0.3	V	NOTE
Storage Temperature(Ambient)	-	-20	+60	℃		
Operation Temperature(Ambient)		-	0	+50	℃	
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	AVDD	3.5	9.6	16	V	
Current consumption	IVDD Current	-	-	TBD	mA	Note 1
	ILED Current	-	120	140	mA	Note 2

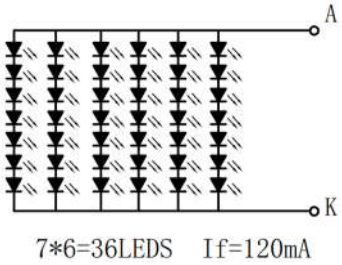
Note 1:Maximum Measurement Condition:White Pattern at 3.3V driving voltage.(Pmax=V3.3xlwhite)

Note 2:Measure Condition

4.3LED BACK Light section cation

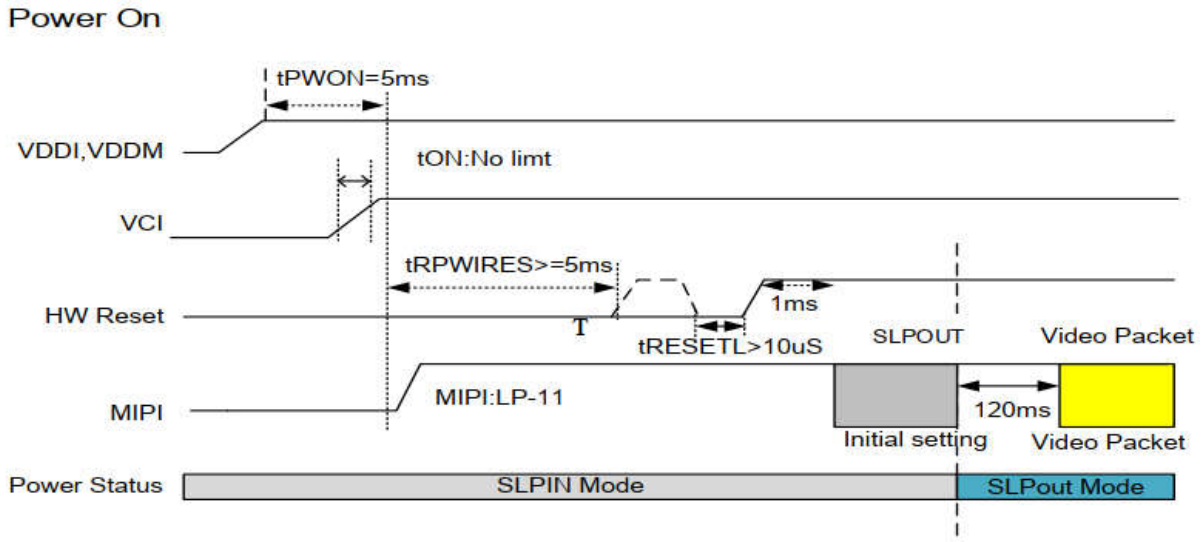
Item	Symbol	condition	Min.	Typ.	Max.	Unit
Forward Voltage	**VF**	**IF=120mA**	**21**	**21.7**	**24.1**	**V**
Uniformity(with L/G)	**△Bp**	**IF=120mA**	**75**	**80**	**-**	**%**
Luminance for LCM	**/**	**IF=120mA**	**450**	**500**	**-**	**cd/㎡**

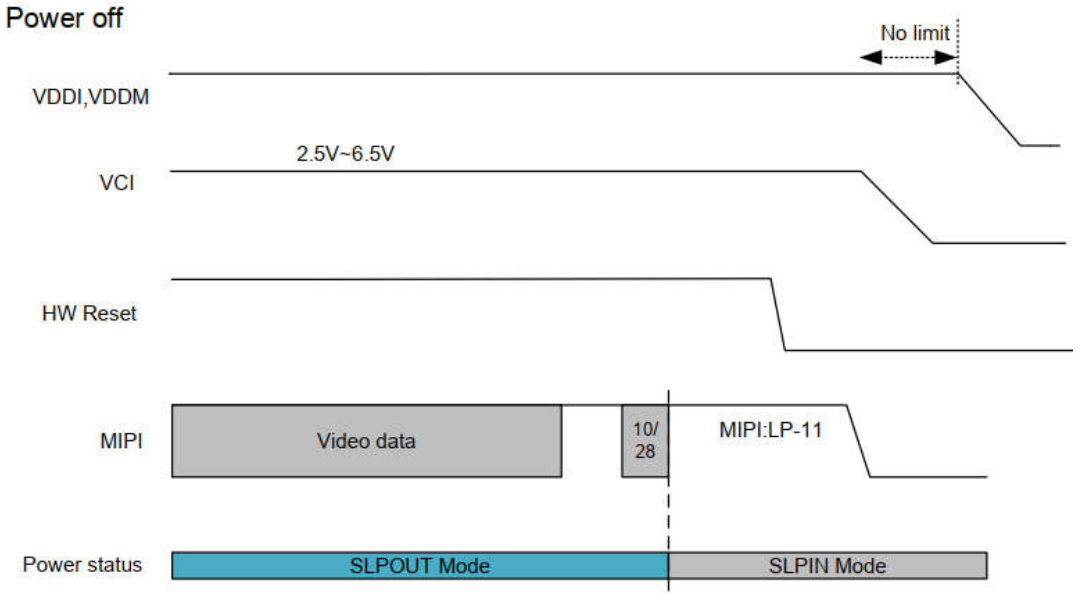
LED back light circuit:



5.Signal timing diagram power sequence

5.1 Power on/off sequence





5.2 MIPI High Speed Date-clock Timing

Host send a differential clock signal to the IC for data sampling.This signal is a DDR(half-rate) clock and has one transition per data bit time.The timing relationship of the DDR Clock differential signal to the Data differential signal is shown in following figure

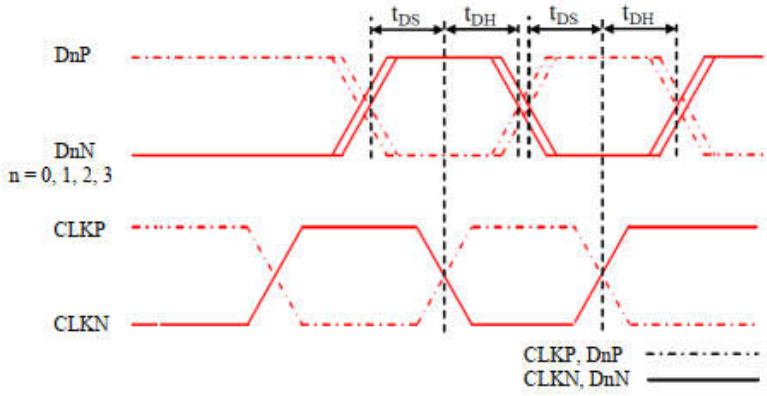


Figure 106: DSI Data to Clock Channel Timings

Table 40: DSI Data to Clock Channel Timings

Signal	Symbol	Parameter	Min	Max
DnP/N , n=0 and 1	t_{DS}	Data to Clock Setup time	0.15xUI	-
	t_{DH}	Clock to Data Hold Time	0.15xUI	-

5.3 High Speed Mode –Rising and Falling Timings

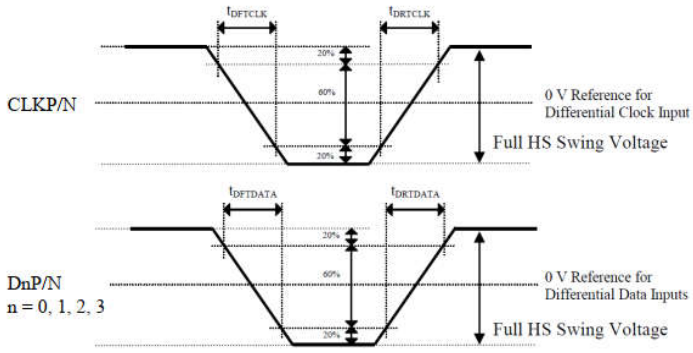


Figure 107: Rising and Falling Timings on Clock and Data Channels

Table 41: Rise and Fall Timings on Clock and Data Channels

Parameter	Symbol	Condition	Specification		
			Min	Typ	Max
Differential Rise Time for Clock	t_{DRTCLK}	CLKP/N	150 ps	-	0.3UI (Note)
Differential Rise Time for Data	$t_{DRTDATA}$	DnP/N n=0 and 1	150 ps	-	0.3UI (Note)
Differential Fall Time for Clock	t_{DFTCLK}	CLKP/N	150 ps	-	0.3UI (Note)
Differential Fall Time for Data	$t_{DFTDATA}$	DnP/N n=0 and 1	150 ps	-	0.3UI (Note)

Note: *The display module has to meet timing requirements, which are defined for the transmitter (MCU) on MIPI D-Phy standard.*

5.4 Data lanes from low power mode to High speed mode

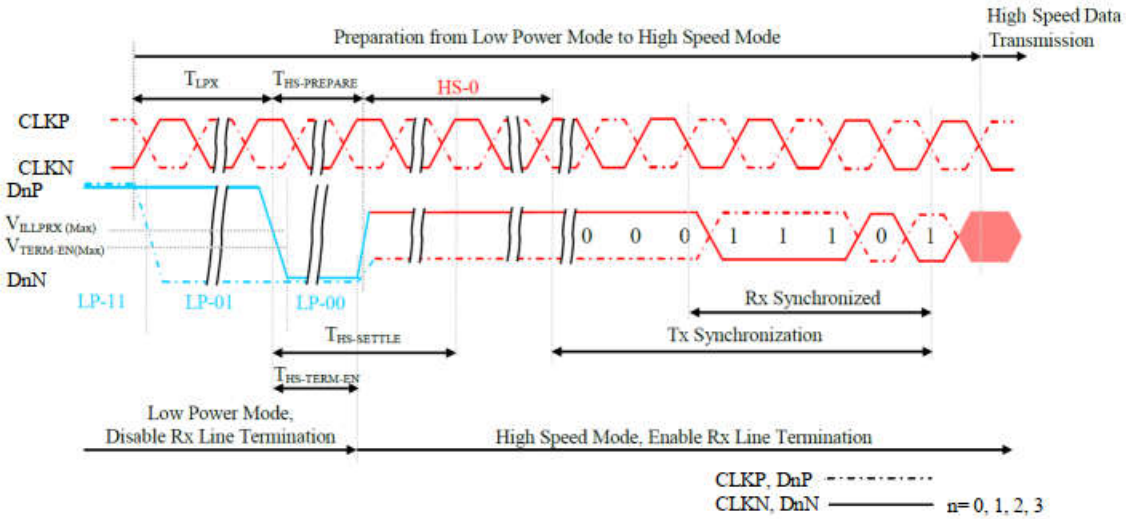


Figure 110: Data Lanes - Low Power Mode to High Speed Mode Timings

Table 44: Data Lanes - Low Power Mode to High Speed Mode Timings

Signal	Symbol	Description	Min	Max	Unit
DnP/N, n = 0 and 1	T_{LPX}	Length of any Low Power State Period	50	-	ns
DnP/N, n = 0 and 1	$T_{HS-PREPARE}$	Time to drive LP-00 to prepare for HS Transmission	40+4xUI	85+6xUI	ns
DnP/N, n = 0 and 1	$T_{HS-TERM-EN}$	Time to enable Data Lane Receiver line termination measured from when Dn crosses VILMAX	-	35+4xUI	ns

5.4 Data lanes from speed mode to low power mode

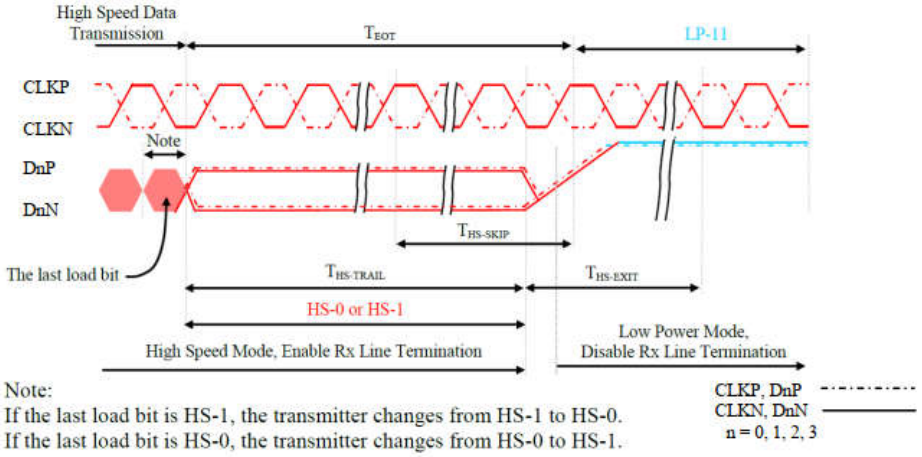


Figure 111: Data Lanes - High Speed Mode to Low Power Mode Timings

Table 45: Data Lanes - High Speed Mode to Low Power Mode Timings

Signal	Symbol	Description	Min	Max	Unit
DnP/N, n = 0 and 1	$T_{HS-SKIP}$	Time-Out at Display Module (ILI9881C-04) to ignore transition period of EoT	40	55+4xUI	ns
DnP/N, n = 0 and 1	$T_{HS-EXIT}$	Time to driver LP-11 after HS burst	100	-	ns

5.5 Reset timing

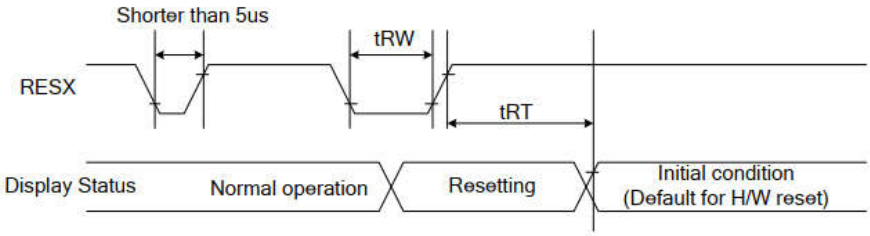


Figure 113: Reset Timing

Table 47: Reset Timing

Signal	Symbol	Parameter	Min	Max	Unit
RESX	tRW	Reset pulse duration	10		uS
	tRT	Reset cancel		5 (note 1,5)	mS
				120 (note 1,6,7)	mS

Notes:

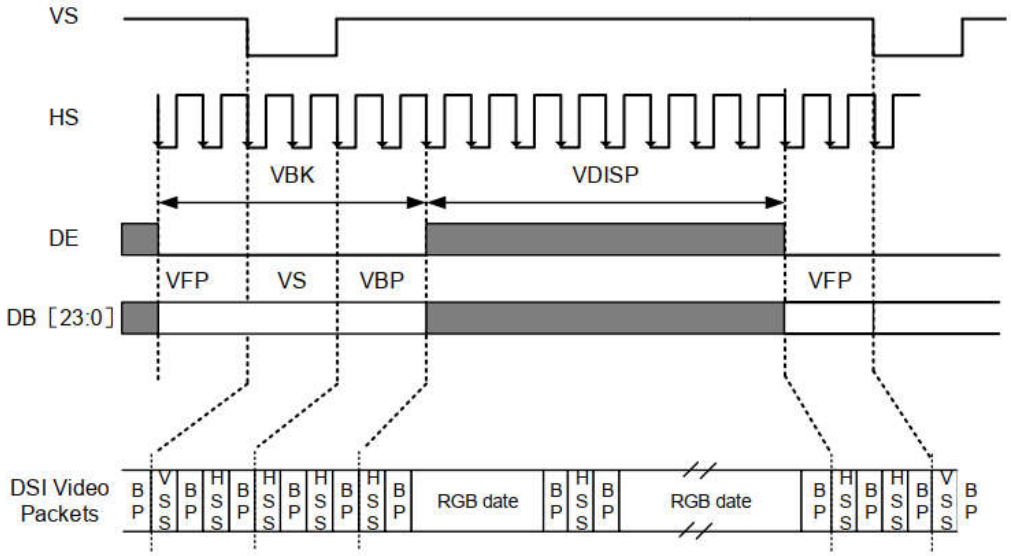
1. *The reset cancel also includes required time for loading ID bytes, VCOM setting and other settings from EEPROM to registers. This loading is done every time when there is H/W reset cancel time (tRT) within 5 ms after a rising edge of RESX.*
2. *Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the Table 48.*

5.6Initial CODE

DTB

5.7.Timings for DSI

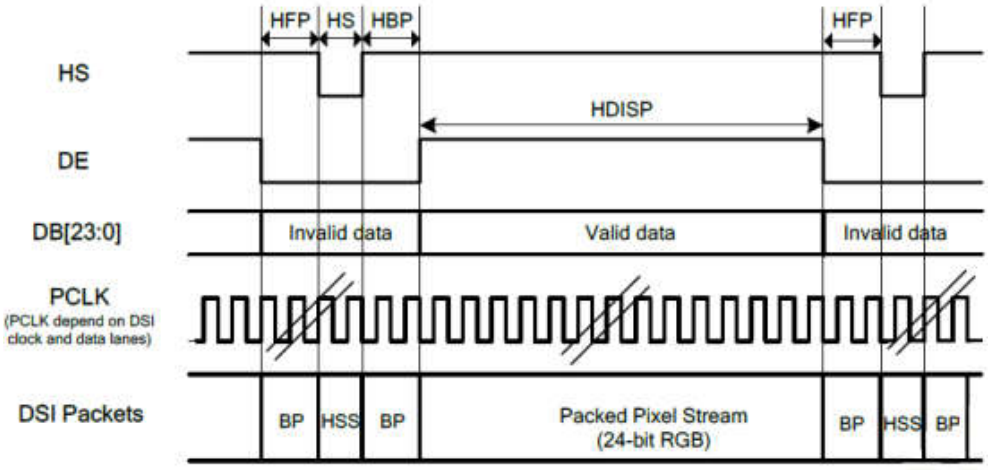
5.7-1 **Video mode vertical timings**



Item	Symbol	condition	Min.	Typ.	Max.	Unit
Vertical low pulse width	**VS**	-	2	8	Note1	Line
Vertical front porch	**VFP**	-	2	20	-	Line
Vertical back porch	**VBP**	-	2	8	Note1	Line
Vertical active area		**VDISP**	-	1280		Line
Vertical Refresh rate	**VRR**			60		HZ

Note1: the VS and VBP pulse width are related to GIP pulse and clock pulse timing, the GIP start pulse and GIP clock pulse must be set at corresponding position for LCD normal display

5.7-2 **Horizontal timings**



Item	Symbol	condition	Min.	Typ.	Max.	Unit
Horizontal low pulse width	**HS**	-	6	20	-	Line
Horizontal back porch	**HBP**	-	5	20	-	Line
Horizontal front porch	**HFP**	-	5	80	-	Line
Horizontal active area		**HDISP**	-	720		Line

6.DC CHARACTERISTICS

6.1 DC Characteristic for DSI LP Mode

Parameter	Symbol	Condition	Specification			Unit
			Min.	Typ.	Max.	
Logic 1 input voltage	V_{IHLPCD}	LP-CD	450	-	1350	mV
Logic 0 input voltage	V_{ILLPCD}	LP-CD	0.0	-	200	mV
Logic 1 input voltage	V_{IHLPRX}	LP-RX (CLK, D0 ,D1, D2, D3)	880	-	1350	mV
Logic 0 input voltage	V_{ILLPRX}	LP-RX (CLK, D0 ,D1, D2, D3)	0.0	-	550	mV
Logic 0 input voltage	$V_{ILLPRXULP}$	LP-RX (CLK ULP mode)	0.0	-	300	mV
Logic 1 output voltage	V_{OHLPTX}	LP-TX (D0)	1.1	-	1.3	V
Logic 0 output voltage	V_{OLLPTX}	LP-TX (D0)	-50	-	50	mV
Logic 1 input current	I_{IH}	LP-CD, LP-RX	-	-	10	uA
Logic 0 input current	I_{IL}	LP-CD, LP-RX	-10	-	-	uA

Notes:

1.Ta = -30℃ to 70℃ (to +85℃ no damage)

2. DSI High Speed mode is off.

6.2 DC Characteristic for DSI HS Mode

Parameter	Symbol	Condition	Specification			Unit
Input Common Mode Voltage for Clock	V_{CMCLK}	CLKP/N Note 2, Note 3	70	-	330	mV
Input Common Mode Voltage for Data	V_{CMDATA}	DnP/N Note 2, Note 3, Note 5	70	-	330	mV
Common Mode Ripple for Clock Equal or Less than 450MHz	$V_{CMRCLKL450}$	CLKP/N Note 4	-50	-	50	mV
Common Mode Ripple for Data Equal or Less than 450MHz	$V_{CMRDATAL450}$	DnP/N Note 4, Note 5	-50	-	50	mV
Common Mode Ripple for Clock More than 450MHz (peak sine wave)	$V_{CMRCLKM450}$	CLKP/N	-	-	100	mV
Common Mode Ripple for Data More than 450MHz (peak sine wave)	$V_{CMRDATAM450}$	DnP/N Note 5	-	-	100	mV
Differential Input Low Level Threshold Voltage for Clock	$V_{THLCLK-}$	CLKP/N	-70	-	-	mV
Differential Input Low Level Threshold Voltage for Data	$V_{THLDATA-}$	DnP/N Note 5	-70	-	-	mV
Differential Input High Level Threshold Voltage for Clock	$V_{THHCLK+}$	CLKP/N	-	-	70	mV
Differential Input High Level Threshold Voltage for Data	$V_{THHDATA+}$	DnP/N Note 5	-	-	70	mV
Single-ended Input Low Voltage	V_{ILHS}	CLKP/N, DnP/N Note 3, Note 5	-40	-	-	mV
Single-ended Input High Voltage	V_{IHHS}	CLKP/N, DnP/N Note 3, Note 5	-	-	460	mV
Differential Termination Resistor	R_{TERM}	CLKP/N, DnP/N Note 5	80	100	125	Ω
Single-ended Threshold Voltage for Termination Enable	$V_{TERM-EN}$	CLKP/N, DnP/N Note 5	-	-	450	mV
Termination Capacitor	C_{TERM}	CLKP/N, DnP/N Note 5, Note 6	-	-	60	pF

Notes:

1. Ta = -30℃ to 70℃ (to +85℃ no damage) , VCI = 2.5V to 6.6V, VDDI = 1.65V to 3.6V

2. Includes 50mV (-50mV to 50mV) ground difference

3. Without VCMRCLKM450/VCMRDATAM450

4. Without 50mV (-50mV to 50mV) ground difference

6.3 DC Characteristic for Panel drive

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Power & Operation Voltage							
Analog operating voltage	VCI	-	2.5	2.8	6.6	V	
Analog operating voltage	VCIREF		2.5	2.8	6.6	V	
Digital operating voltage	VDDI	-	1.65	2.8	3.6	V	
Digital operating voltage	VCC1		1.65	2.8	6.6	V	
Digital operating voltage	VCC2		1.65	2.8	6.6	V	
DSI operating voltage	VDDAM	-	1.65	1.8	3.6	V	
OTP Supply voltage	MTP_PWR	-	8.4	8.5	8.6	V	
Analog operating voltage	VSP	-	4.5		6.6	V	
Analog operating voltage	VSN	-	-6.6		-4.5	V	
Logic High level input voltage	VIH	-	0.7*VDDI		VDDI	V	Note1
Logic Low level input voltage	VIL	-	-0.3		0.3*VDDI	V	Note1
Logic High level output voltage TE , LEDPWM	VOH	IOH = -1.0mA	0.8*VDDI		VDDI	V	Note1
Logic Low level output voltage TE , LEDPWM	VOL	IOL = +1.0mA	0		0.2*VDDI	V	Note1
Gate Driver High Voltage	VGH	-	8.0	-	18	V	
Gate Driver Low Voltage	VGL	-	-18.0	-	-7.0	V	
Driver Supply Voltage	-	|VGH-VGL|	15	-	32	V	
VCOM Operation							
DC VCOM Amplitude Voltage	VCOM	-	-4.0	-	0	V	Note3
Source Driver							
Source Output Range	VSOUT(+)	-	0.3	-	VREG1OUT-0.1	V	Note4
	VSOUT(-)	-	VREG2OUT +0.1	-	-0.3	V	Note4
Positive Gamma Reference Voltage	VREG1OUT	-	3.5	-	VSP-0.5 (VSP<=6.1) 5.6 (VSP>6.1)	V	
Negative Gamma Reference Voltage	VREG2OUT	-	VSN+0.5 (VSN>=-6.1) -5.6 (VSN<-6.1)	-	-3.5	V	
Source Output Setting Time	Tr	Below with 99% precision	-	10	-	uS	Note3.4
Output Deviation Voltage (Source Output channel)	Vdev	Sout>=4.2V Sout<=0.8V	-	-	20	mV	Note3
		4.2V>Sout>0.8V	-	-	15	mV	
Output Offset Voltage	VOFFSET	-	-	-	35	mV	Note3
Standby mode current consumption							
Sleep In mode	I(VDDI SLP IN)	Ta = 25 °C VCI=2.8V VDDI=1.8V	-	35	-	uA	
	I(VCI SLP IN)		-	25	-	uA	

Notes:

1. Ta = -30 to 70 °C (to 85 °C no damage) , VCI = 2.5V to 6.6V, VDDI = 1.65V to 3.6V

2. Supply digital VDDI voltage equal or less than analog VCI voltage.

3. Source channel loading = 9KΩ,70pF/channel

4. The maximum value is between with Note 3 and Gamma setting value

7.OPTICAL CHARACTERISTICS

Item		Symbol	Min.	Typ.	Max.	Unit	Remarks
Contrast Ratio		C/R	800	1000	-		Fig.1
Brightness			450	500	-	cd/m2	Full White Pattern 5 Point
Brightness Uniformity			75%	80%	-	%	Full White Pattern Fig.1,2
Response Time		Tr+Tf	-	30	35	ms	Fig.3
Color Coordinate	WHITE	Wx	0.25	0.28	0.31		Full White Pattern
		Wy	0.27	0.30	0.33		
View angle		θl	-	80	-	Degree	Fig.4 Center (C/R>10)
		θr	-	80	-		
		θu	-	80	-		
		θd	-	80	-		
Transmittance Ratio		TR	-	3.7	-	%	LCD With POL

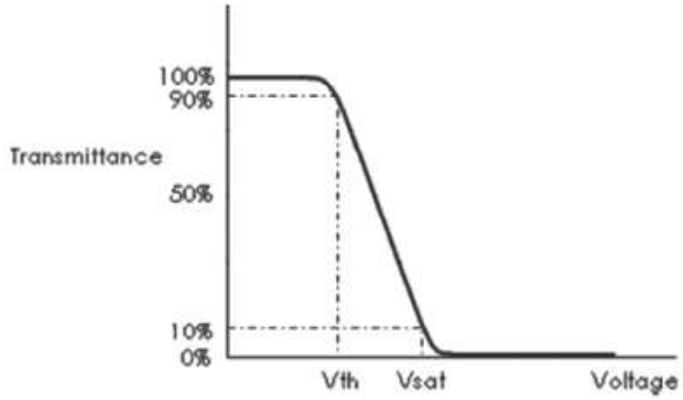
Note:

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

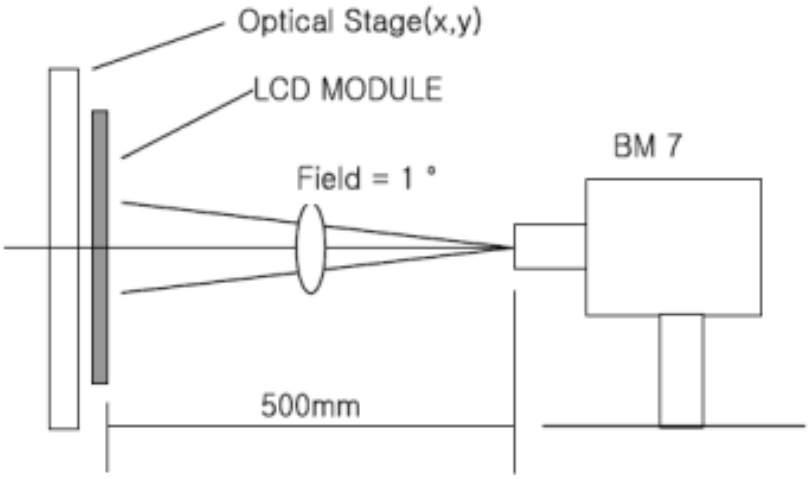
$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

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)

The Definition of Vth & Vsat



7.2 Optical Characteristic Measurement Equipment and Method



<Transmissive Mode>

FIG. 1 Optical Characteristic Measurement Equipment and Method

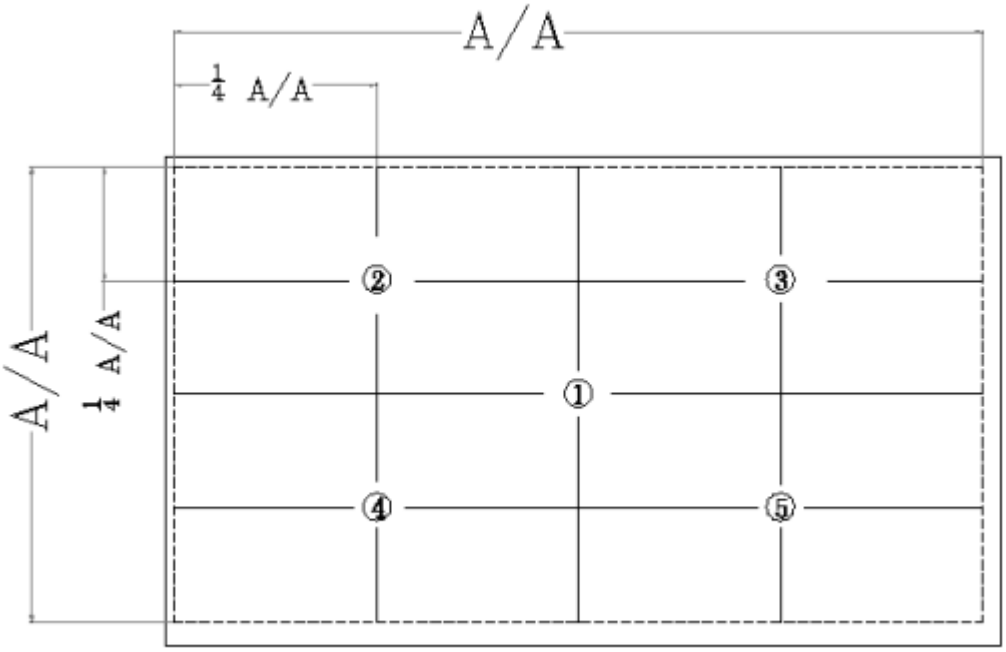


FIG.2 Brightness Uniformity:The brightness uniformity of the five main measuring points

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

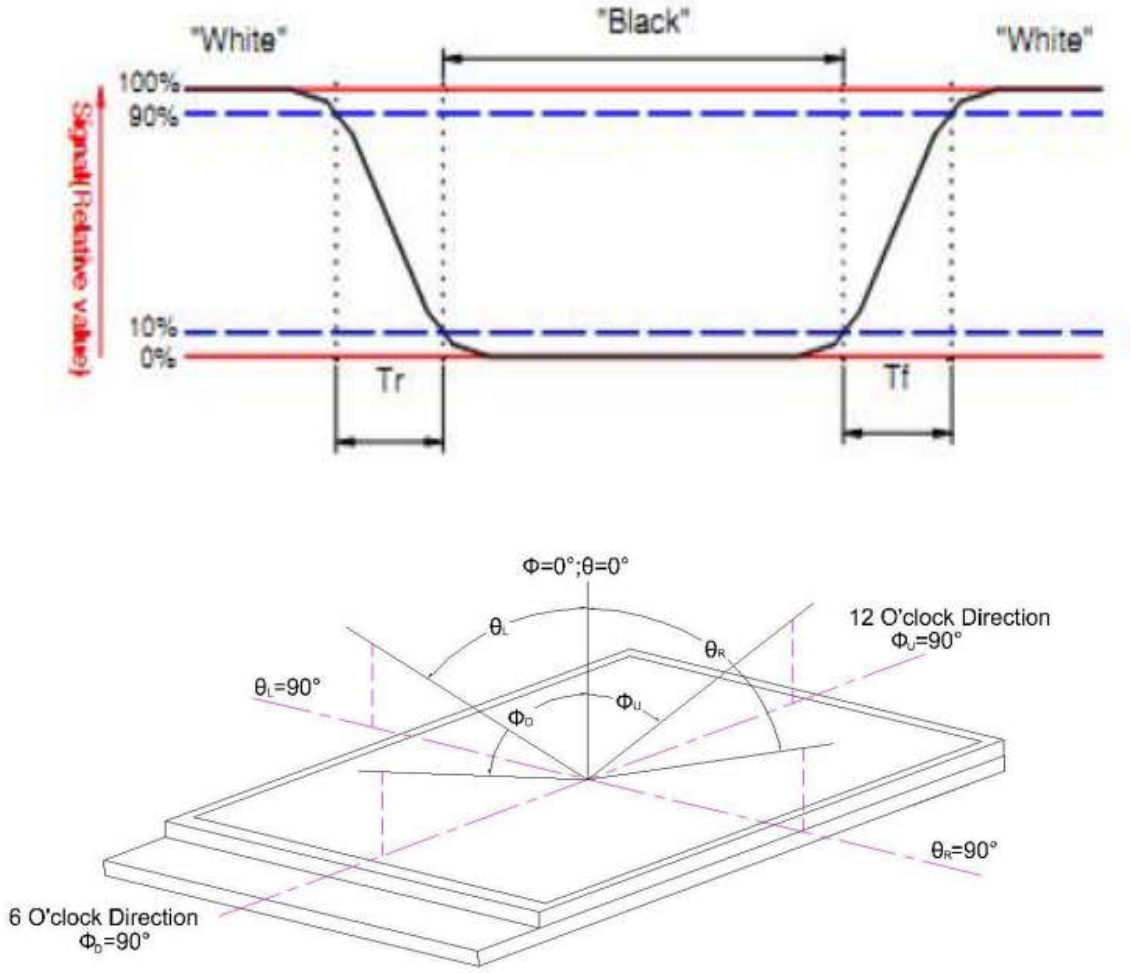
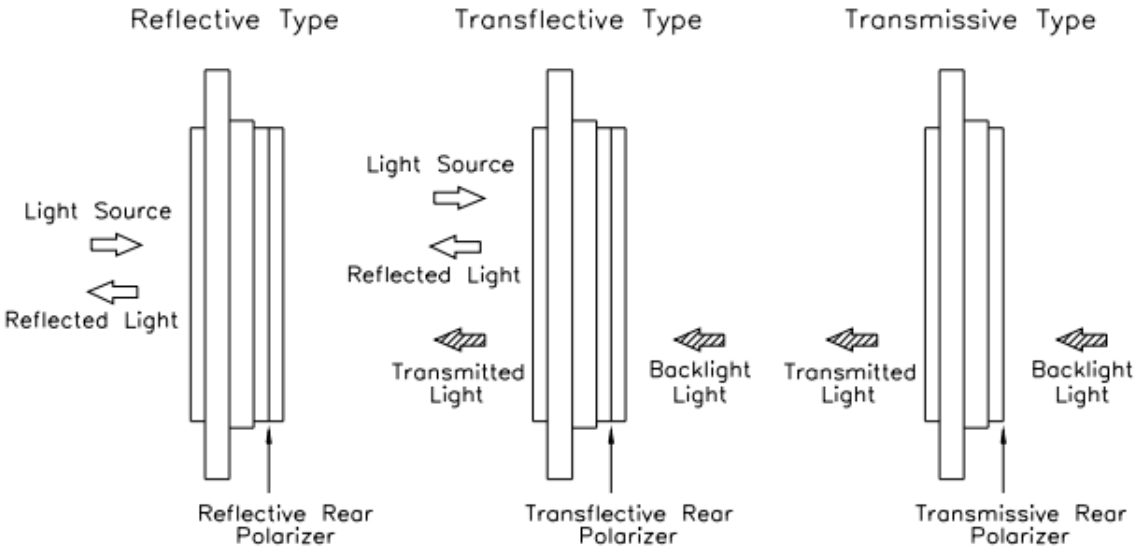


FIG.4 The definition of Viewing Angle

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



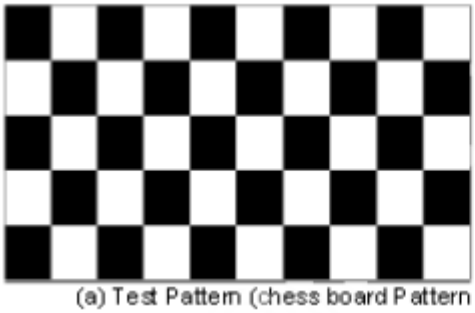
The viewing mode of the LCM is "Transmissive Type"

8. RELIABILITY TEST ITEMS

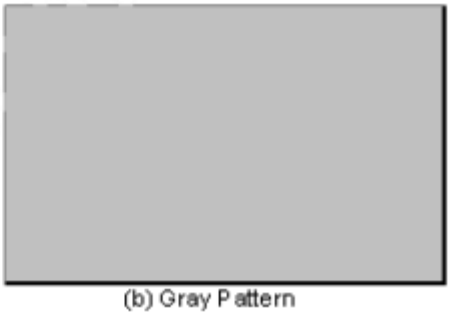
8.1TEMPERATURE AND HUMIDITY

Test Item	Test Ccodition	Remark
High Temperature Storage	**Ta = 60℃;240hrs**	**IEC60068-2-1:2007 GB2423.2-2008**
Low Temperature Storage	**Ta = -20℃;240hrs**	**IEC60068-2-1:2007 GB2423.2-2008**
High Temperature Operation	**Ta = 50℃;240hrs**	**IEC60068-2-1:2007 GB2423.2-2008**
Low Temperature Operation	**Ta = 50℃;240hrs**	**IEC60068-2-1:2007 GB2423.2-2008**
High Temperature High Humidity Operation	**Ta = 50 ℃ , 90%RH, 240hrs(no condensation)**	**IEC60068-2-78:2001 GB/T2423.3-2006**
Thermal Shock	**Ta = -10℃(0.5H)~ 50℃ (0.5H) / 100cycles,**	**Start with cold temperature,Ende with high temperature,IEC60068-2-14;1984,GB2423-22-2002**
Image Sticking	**25℃;24hrs**	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/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	IEC60068-2-27:1990 GB/T2423.8-1995

8.3 VIBRATION& SHOCK

Test item	Conditions	Remark	
Electro Static Discharge Test (non-operation)	180pF • 330Ω • Contact:±4KV,Air:±8KV	1	IEC61000-4-2:2001 GB/T17626.2-2006
	200pF • 0Ω • ±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±5℃ 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.

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.