

SPECIFICATIONS

Version: V0

This module uses ROHS material

PRODUCT: TFT LCD MODULE

MODEL NO: HT1010KI12A

SUPPLIER: HTDisplay

ISSUED DATE: 2023-09-06

- Preliminary Specification**
- Final Product Specification**

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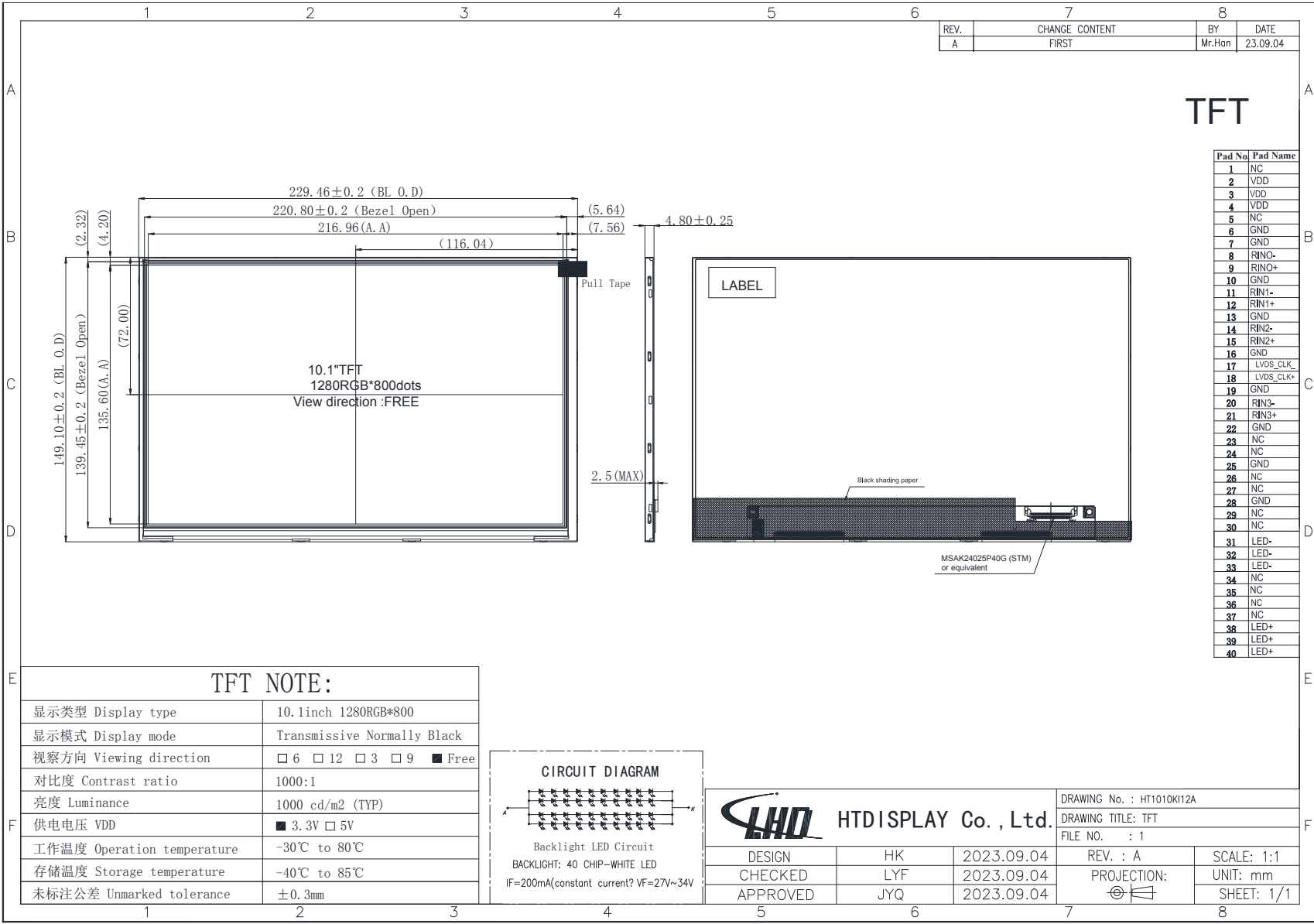
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1. General information

Feature	Spec	Unit
LCD size	10.1	inch
Resolution	1280 RGB x 800Dots	---
Pixel pitch (WxH)	0.0565*3x0.1695	mm
Active area	216.96(W) x 135.6 (H)	mm
Viewing area	220.80 x139.45	mm
Display Mode	IPS,NB	---
LCM Outline(with TP) (WxHxT)	229.46 × 149.10 × 4.8	mm
With/Without TP	Without	---
Weight (g)	TDB	g
TFT Interface	LVDS	---
TFT Input voltage	3.3	V
LCM brightness	1000	Cd/m ²
TFT Power Consumption	0.6	W
BL Power Consumption	6	W

2. Mechanical drawing



3. Absolute maximum ratings

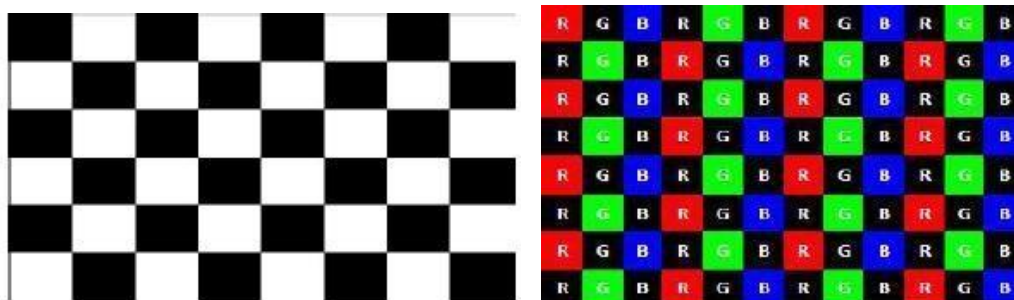
Item	Symbol	Min.	Max.	Unit
Power voltage	VDD	VSS-0.3	+3.6	V
Operating temperature	TOP	-30	80	°C
Storage temperature	TST	-40	85	°C
Humidity	RH	10%	90%(Max60 °C)	RH

4. Electrical characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power voltage	VDD	3.0	3.3	3.6	V	
Current of power supply	IDD	--	182	243	mA	Note 1
Power Consumption	PLCD	--	0.6	0.8	mA	Note 1
Rush current	IRUSH	--	--	3.0	A	Note 2
Output Voltage	VOH	2.7	--	3.3	mA	
	VOL	0	--	0.5	mA	
Input Voltage	VIH	2.7	--	3.3	V	
	VIL	0	--	0.5	V	

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 = 72.4MHz. Test Pattern of power supply current

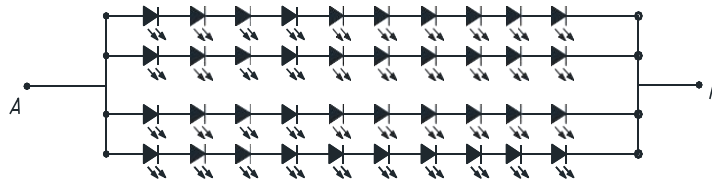
a) Typ : Mosaic 8 x 6 Pattern(L0/L255) b) Max : skip subPixel(L255)



2. The duration of rush current is about 2ms and rising time of Power Input is 1ms(min)

5. Backlight characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	I _f	--	200	--	mA	
Forward Voltage	V _f	27	30	34	V	
LED Life Time	L _L	--	30000	--	Hrs	T _a =25°C



Backlight LED Circuit

BACKLIGHT: 40 CHIP-WHITE LED

Figure 2

Note1: Under LCM operating, the stable forward current should be inputted. And forward voltage is for reference only.

Note2: Optical performance should be evaluated at T_a=25°C. if LED is driven by high current, high ambient temperature & Humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

6. Electro-optical characteristics

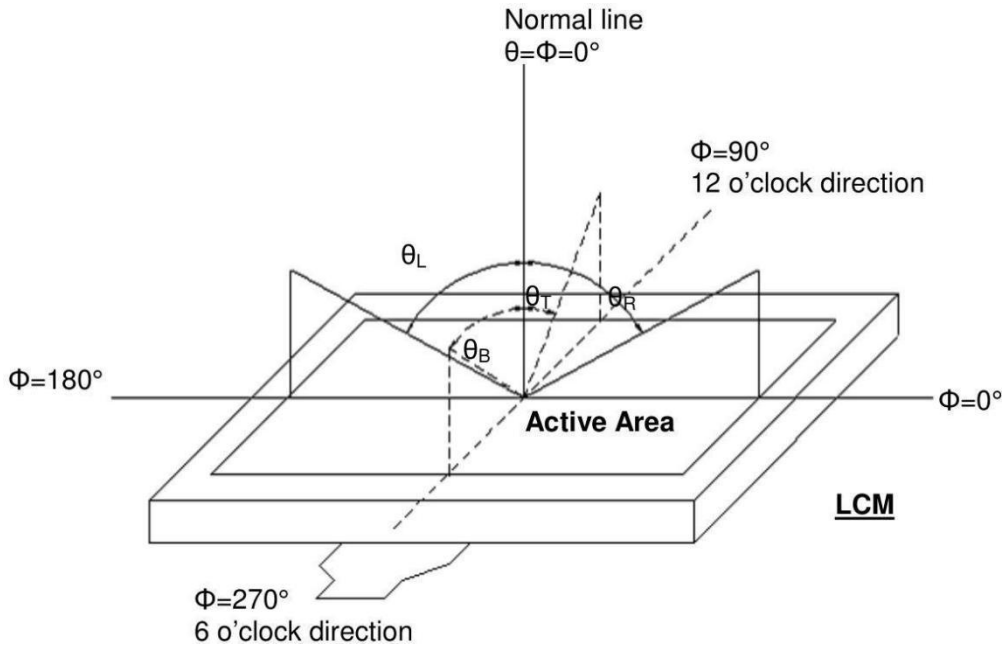
Optical Specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Contrast Ratio	CR	$\Theta=0$ Normal Viewing angle	—	1000	—	—	Note 4 Note 7	
Response Time	TON+TOFF			35	40	msec	Note 3	
White luminance (Center)	YL		—	1000	—	Cd/m ²	(IL=200mA)	
Color Chromaticity (CIE1931)	Red	R _X	CR>10	TBD	TBD	TBD	—	Note 2 Note 5 Note 6 Note 7
		R _Y		TBD	TBD	TBD	—	
	Green	G _X		TBD	TBD	TBD	—	
		G _Y		TBD	TBD	TBD	—	
	Blue	B _X		TBD	TBD	TBD	—	
		B _Y		TBD	TBD	TBD	—	
	White	W _X		TBD	TBD	TBD	—	
		W _Y		TBD	TBD	TBD	—	
Viewing Angle	Hor.	Θ_L	70	80	—	—	Note 1	
		Θ_R	70	80	—			
	Ver.	Θ_U	70	80	—			
		Θ_D	70	80	—			
NTSC Ratio	%		45	50	—	—	CIE1931	
Optimal View Direction	Free							

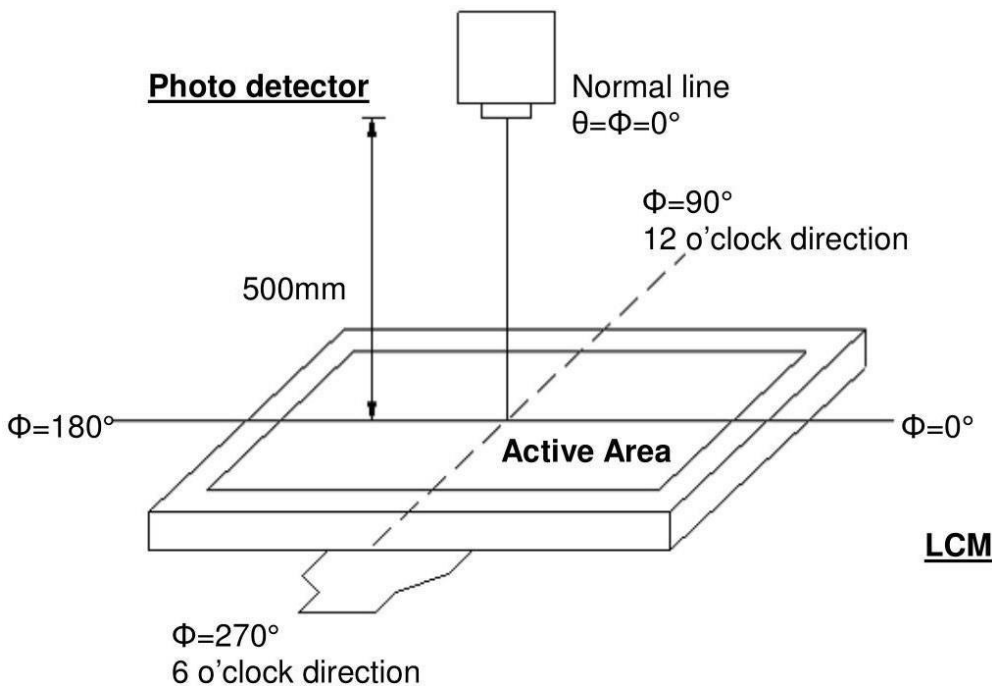
Test Conditions: .

1. $DV_{DD}=3.3V$, the ambient temperature is $25^{\circ} C$.
2. The test systems refer to Note 2.

Note 1: Definition of viewing angle range

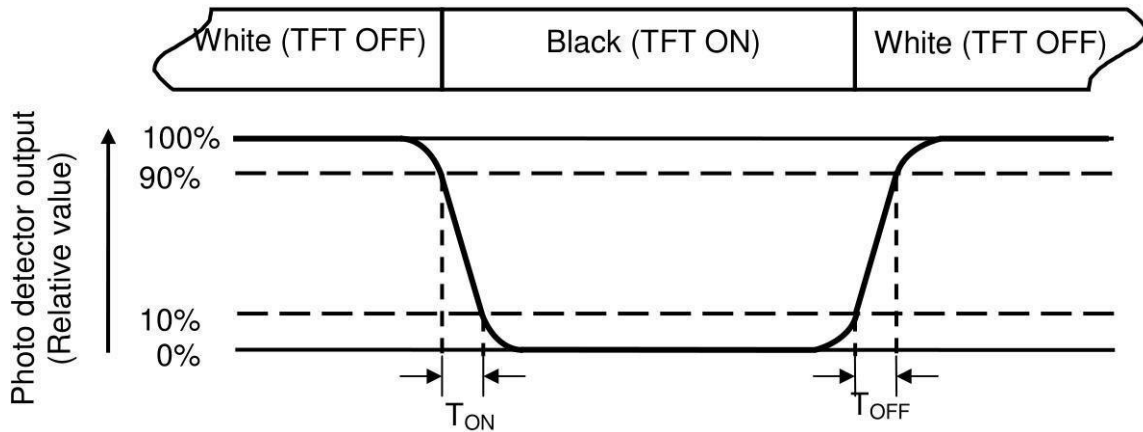


Note 2: Definition of optical measurement system. The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by SR3-AR/Field of view: 1° /Height: 500mm.)



Note 3: Definition of Response time The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo

detect or output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931) Color coordinates measured at center point of LCD.

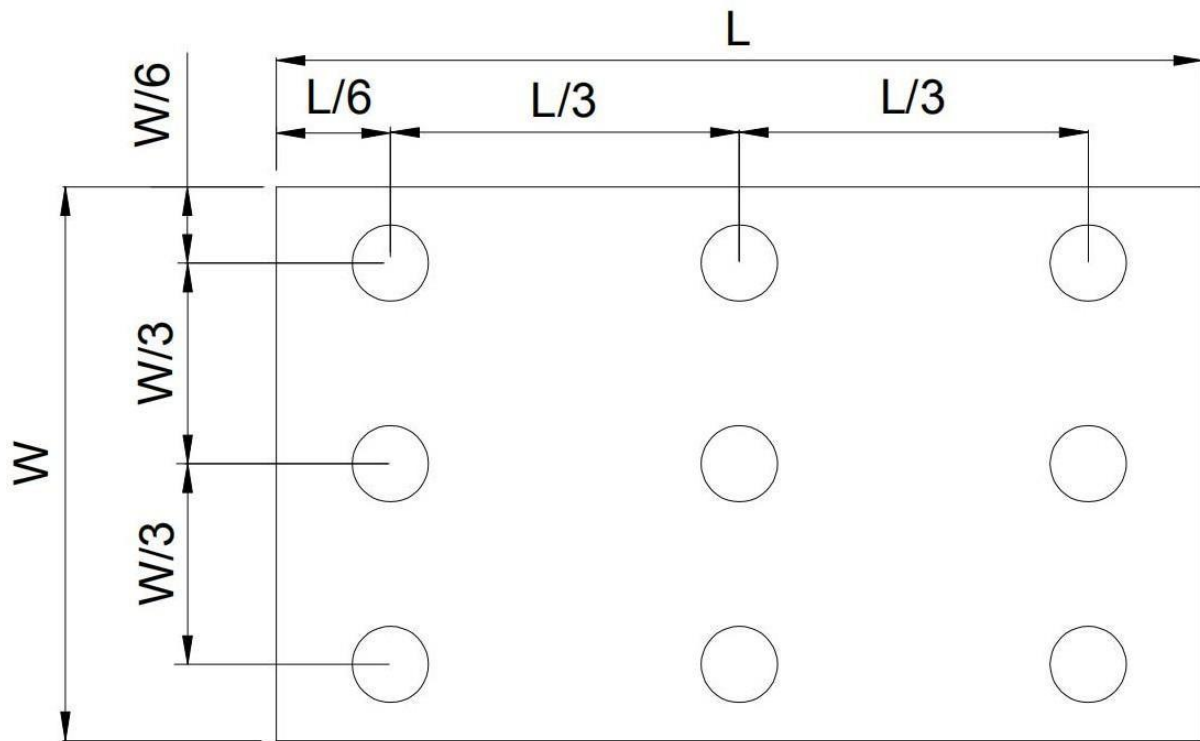
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

Note 7: Definition of Luminance Uniformity

Active area is divide into 9 measuring areas (Refer to Fig.4-4). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (YU)} = \frac{B \text{ min}}{B \text{ max}}$$

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



B max: The measured maximum luminance of all measurement position.

B min: The measured minimum luminance of all measurement position..

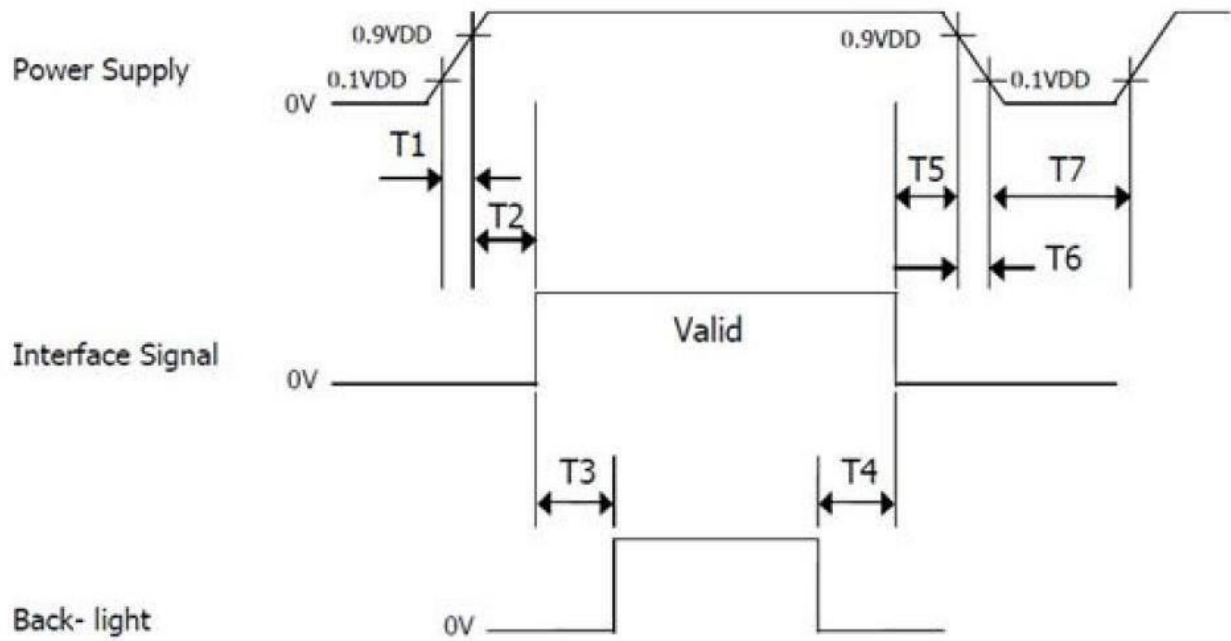
7. Read/Write timing

Timing Characteristics

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK Frequency	Fdclk	66.3	72.4	78.9	MHz
Horizontal display area	Thd	1280			pixel
HSYNC period time	Th	1380	1440	1500	pixel
HSYNC blanking	thbp+ thfp	100	160	220	pixel
Vertical display area	Tvd	800			H
Frequency	fV	55	60	65	Hz
VSYNC period time	Tv	824	838	872	H
VSYNC blanking	Tvbp+ Tvfp	24	38	72	H



Power Sequence



Parameter	Values			Units
	Min	Typ	Max	
T1	0	-	10	ms
T2	0	-	50	ms
T3	200	-	-	ms
T4	500	-	-	ms
T5	0	-	50	ms
T6	0	-	10	ms
T7	500	-	-	ms

8. Interface description

TFT interface

Connector : MSAK24025P40G (STM) or equivalent

No.	SYMBOL	Description
1	NC	Non Connection
2-4	VDD	Power for Analog Circuit
5	NC	Non Connection
6-7	GND	System ground
8	RXIN0-	- LVDS differential data input
9	RXIN0+	+ LVDS differential data input
10	GND	System ground
11	RXIN1-	- LVDS differential data input
12	RXIN1+	+ LVDS differential data input
13	GND	System ground
14	RXIN2-	- LVDS differential data input
15	RXIN2+	+ LVDS differential data input
16	GND	System ground
17	RXCLKIN-	- LVDS differential clk input
18	RXCLKIN+	+ LVDS differential clk input
19	GND	System ground
20	RXIN3-	- LVDS differential data input
21	RXIN3+	+ LVDS differential data input
22	GND	System ground
23-24	NC	Non Connection
25	GND	System ground
26-27	NC	Non Connection
28	GND	System ground
29-30	NC	Non Connection
31-33	LED-	LED Cathode
34-37	NC	Non Connection
38-40	LED+	LED Anode

9. Reliability test conditions

No.	Test Item	Test condition	Remark
1	High Temperature Storage	85°C±2°C 240H	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Storage	-40°C±2°C 240H	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Operation	80°C±3°C 240H	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Operation	-30°C±3°C 240H	IEC60068-2-1:2007 GB2423.1-2008
5	High Temperature /Humidity Storage	60°C±3°C 90%RH 300H	IEC60068-2-78:2007 GB2423.3-2006
6	Temperature Cycle	-30°C↔25°C↔85°C 5min 30min ↔25°C, 5min after 100cycle, Restore 4H at 25°C	IEC60068-2-14:1984 GB2423.22-2002
7	Vibration Test	Frequencyrange:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hoursforeachdirectionofX Y Z (6 hoursfortotal)	IEC60068-2-6:1982 GB/T2423.10 -1995
8	Mechanical shock	100G ±X,±Y,±Z 3times for each direction	IEC60068-2-27:1987 GB/T2423.5 -1995
9	Packing vibration test	0.015G ² /Hz from 50~200Hz- 6dB/Octavefrom 200~500Hz 2hoursforeach direction of X,Y,Z	IEC60068-2-34 GB/T2423.11
10	Dropping test	Drop to the ground from 0.5m height, one time, every side of carton. (Packing condition)	IEC60068-2-32:1990 GB/T2423.8 -1995
11	ESD test	±200V,200pF(0Ω) 1 time/connector	

Note1:

The component placed on a vibrating platform as it is assembled in the machine, wires included, is subjected to sinusoidal vibration in all directions XYZ

Note2:

After completing the reliability test, leave the samples under the room temperature and for the following inspection items:

1. No clearly visible defects or deterioration of display quality allowed.
2. No function-related abnormalities.
3. Connected parts still connecting tightly.
4. Display characteristics fulfill initial value contrast ratio should be at least 30% of initial value.

10. Storage and use precautions

When storing and using the LCD modules, the following precaution are necessary:

- 10.1 Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
- 10.2 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C, and keep the relative humidity between 40%RH and 60%RH.
- 10.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.
- 10.4 The polarizer surface should not come in contact with any other objects (We advise you to store them in the anti-static electricity container in which they were shipped).
- 10.5 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.
- 10.6 Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
- 10.7 If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be gained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
- 10.8 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- 10.9 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- 10.10 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- 10.11 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- 10.12 If the display surface is contaminated, gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcoholSolvents other than those mentioned above may damage the polarizer. Especially, do not use the following:
 - Water
 - Ketone

— Aromatic solvents

10.13 Do not attempt to disassemble the LCD Module.

10.14 If the logic circuit power is off, do not apply the input signals.

10.15 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

--Be sure to ground the body when handling the LCD Modules.

--Tools required for assembly, such as soldering irons, must be properly ground.

--To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions

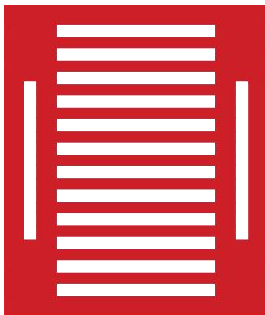
--The LCD Module is coated with a film to protect the display surface. -

--Be care when peeling off this protective film since static electricity may be generated.

--Exposed area of the printed circuit board.

--Terminal electrode sections

11. Packing

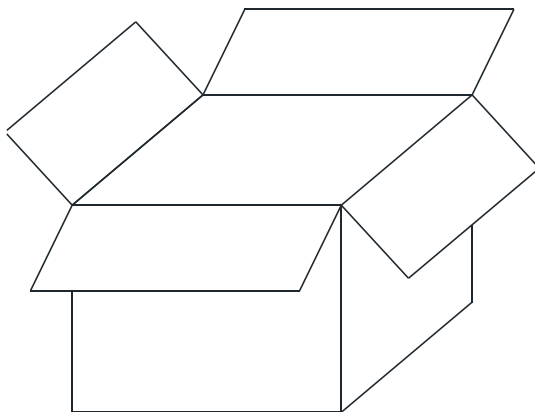


(1)

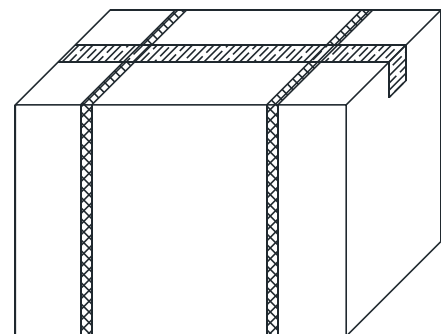
(1) Place the module into the pearl cotton tray.

(2) Place the pear cotton tray into the carton.

(3) Wrap the carton well.



(2)



(3)