PRODUCT SPECIFICATION
FOR LCD MODULE

Product Model	**ST70IPS1024600-C-M051**
Remarks	
Date	**2021/4/30**

Customer Approval

☐ Approved Product Specification only

☐ Approved Product Specification and Samples

Date & Remarks	

The above signature represents that the product specifications, testing regulation, and warranty in the specifications are accepted

PREPARED BY	CHECKED BY	APPROVED BY
陈潇潇	雷新金	侯育博

Contents

Page

3.Record of Revision

Date	Ver.	Description	Page

4. General Specifications

It is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses the amorphous silicon TFT as a switching devices. This model is composed of a Transmissive type TFT-LCD Panel, a driver circuit and a back-light unit. The resolution of a 7.0 inch LCD contains 1024RGB x 600 pixels, and can display up to 16.7M colors.

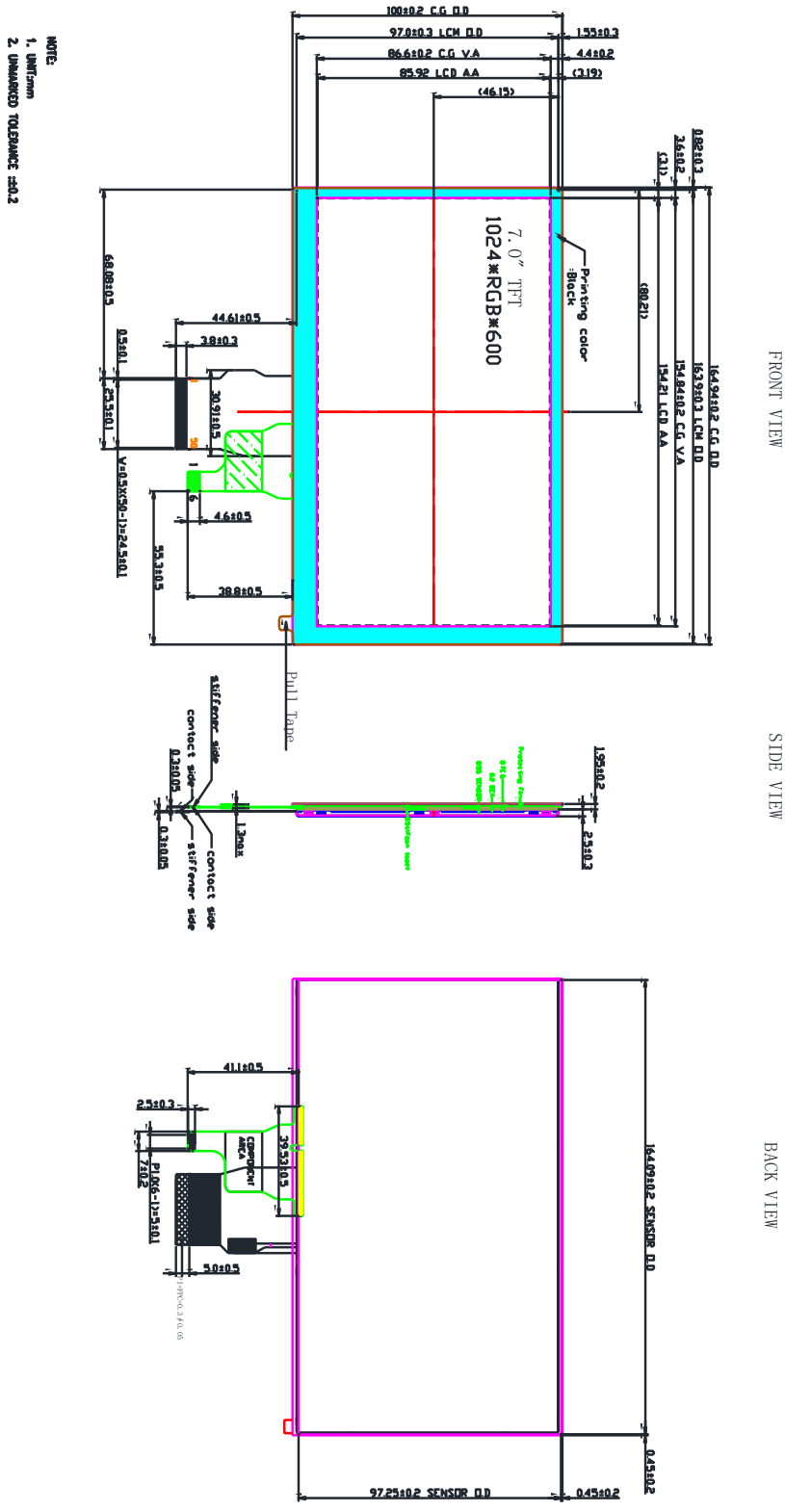
4.1 Features

--Wide viewing angle
--High contrast ratio
--High color saturation
--High Brightness

4.2 General Specifications

Item	Standard Value	Unit
Screen Size	7.0 (WSVGA)	Inch
Dot Matrix	1024(RGB)*600	-
Color Number	16.7M colors	-
Module Dimension	164.94(W)*100.0(H)*4.45(T)	mm
Active Area	154.21(W)*85.92(H)	mm
Viewing Area	154.84(W)*86.6(H)	mm
Pixel Pitch	0.1505(W)*0.1432(H)	mm
Color Arrangement	RGB-stripe	-
LCD Type	a-Si TFT,TRANSMISSIVE, Normally Black	-
Viewing Direction	ALL	-
Backlight type	LED,WHITE	-
Interface	TTL	-
Weight	TBD	-
Interface of CTP	IIC	

5.Mechanical Drawing and Interface



5.1 Interface Pin Description

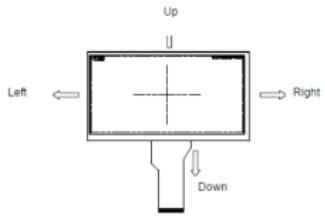
5.1.1 Interface for TFT Module

PIN NO	SYMBOL	FUNCTIONS	REMARK
1~2	VA+	Power Supply for LED Anode	-----
3~4	VK-	Power Supply for LED Cathode	-----
5	GND	Ground	-----
6	VCOM	Common Voltage	-----
7	DVDD	Power Supply for Digital Voltage	-----
8	MODE	H:DE/L:SYNC mode select	-----
9	DE	Data Input Enable	-----
10	VS	Vertical Sync Input	-----
11	HS	Horizontal Sync Input	-----
12~19	B7~B0	Blue Data	-----
20~27	G7~G0	Green Data	-----
28~35	R7~R0	Red Data	-----
36	GND	Ground	-----
37	DCLK	Dot Clock	-----
38	GND	Ground	-----
39	L/R	Left/Right Selection	-----
40	U/D	Up/Down Selection	-----
41	VGH	Gate ON Voltage	-----
42	VGL	Gate OFF Voltage	-----
43	AVDD	Power Supply for Analog Voltage	-----
44	RESET	RESET	-----
45	NC	No Connector	-----
46	VCOM	Common Voltage	-----
47	DITHB	Dithering Function	-----
48	GND	Ground	-----
49~50	NC	No Connector	-----

【Note1】L/R：left or right setting
U/D：up or down setting

L/R	U/D	Data shifting
DVDD	GND	Left → Right，Up → Down(default)
GND	GND	Right → Left，Up → Down
DVDD	DVDD	Left → Right，Down → Up
GND	DVDD	Right → Left，Down → Up

Definition of scanning direction:



6.Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit	Note
Operating Temperature	Top		-20	70	℃	
Storage Temperature	Tst		-30	80	℃	
LC operating Voltage	VOP	Ta=25℃	-0.3	4.2	V	(1)

Note(1) Liquid Crystal driving voltage

Due to the characteristics of LC Material, this voltage varies with environmental temperature.

7.Electrical Characteristics

7.1 DC Characteristics for logic and LCD Ta=25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for Digital Voltage	DVDD	-	3.0	3.3	3.6	V
Gate ON Voltage	VGH	-	16.0	18.0	20.0	V
Gate OFF Voltage	VGL	-	-5.0	-6.0	-7.0	V
Power Supply for Analog Voltage	AVDD	-	-	9.6	-	V
Common Voltage Note(4)	VCOM	-	-	(3.0)	-	V
Input High Voltage	VIH	-	0.7DVDD	-	DVDD	V
Input Low Voltage	VIL	-	0	-	0.3DVDD	V
Input High Voltage	VOH	-	VDD-0.4	-	-	V
Input Low Voltage	VOL	-	-	-	GND+0.4	V

Note(1):HSYNC,VSYNC,DE,Digital Data

Note(2):Be sure to apply the power voltage as the power sequence spec.

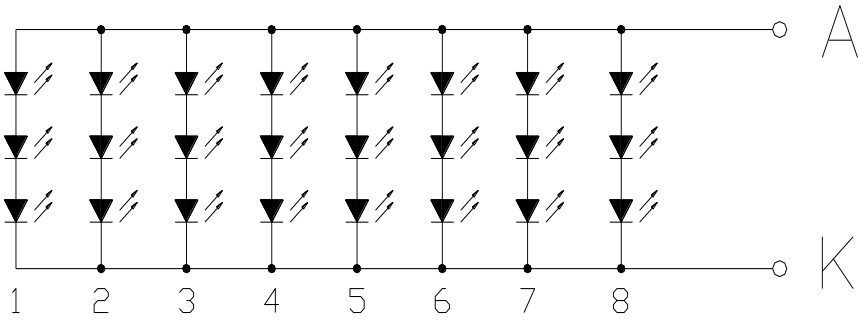
Note(3):DGND=AGND=GND=0V

Note(4):VCOM is only a reference value,it must be optimized according to each LCM.BE sure to use VR.

7.2 DC Characteristics for Backlight(B/L) Ta=25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage for LED Backlight	VAK	ILED=160mA	8.4	9.6	10.2	V
Supply Current for LED Backlight	ILED	-	-	160	-	mA
LED Life Time(Note2)	-	ILED≦160mA	-	30,000	-	Hr

LED Circuit:

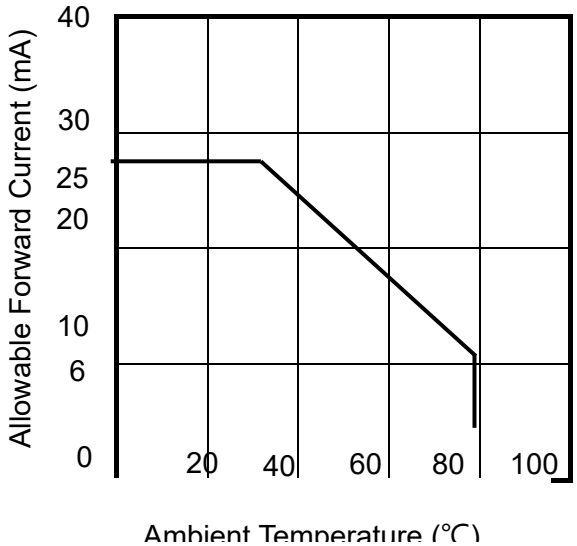


Note1:

(1) The LED of B/L is drive by current only, drive voltage is for reference only. drive voltage can make driving current under safety area.(under maximum).

(2) The "LED Life Time" is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and ILED=160mA.the LED life time could be decreased if the operating ILED is larger than 160mA.

Note2: Current reduction rate of LED backlight is according to the graph indicated below:



8.Optical Characteristics and Definitions

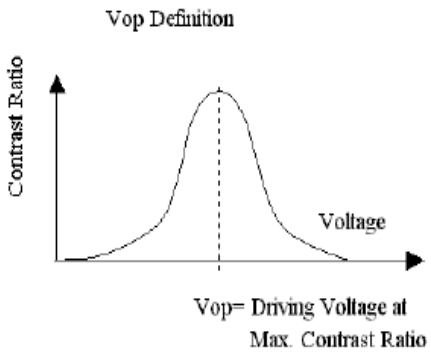
8.1 Optical Characteristics

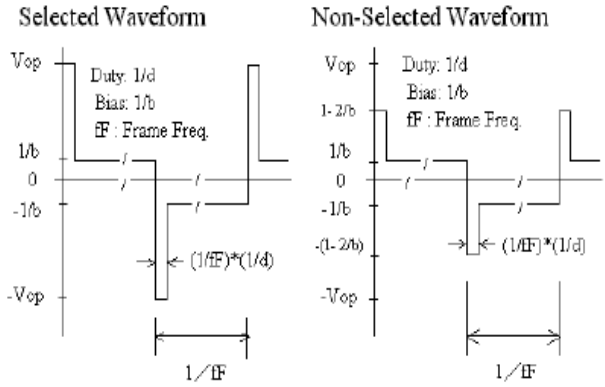
Ta = 25℃

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Brightness		B	θ=0° Normal viewing angle At the center of panel	-	330	-	cd/m^2	(1)
Contrast Ratio		C/R		500	800	-	--	(2)
Response Time		Tr		-	10	20	ms	(3)
		Tf		-	15	30	ms	
Color chromaticity (CIE)	White	Wx		(0.25)	(0.31)	(0.36)	-	-
		Wy		(0.28)	(0.33)	(0.38)		
Viewing Angle	Top	θ_U	CR≧10 Backlight On	-	85	-	degrees	(4)
	Bottom	θ_D		-	85	-		
	Left	θ_L		-	85	-		
	Right	θ_R		-	85	-		
Color Gamut		S%		-	50	-	%	-
Uniformity		Un	θ=0° Normal viewing angle	75	-	--	%	(5)

8.2 Definition of Optical Characteristics

Note: Definition of LCD driving voltage and waveform



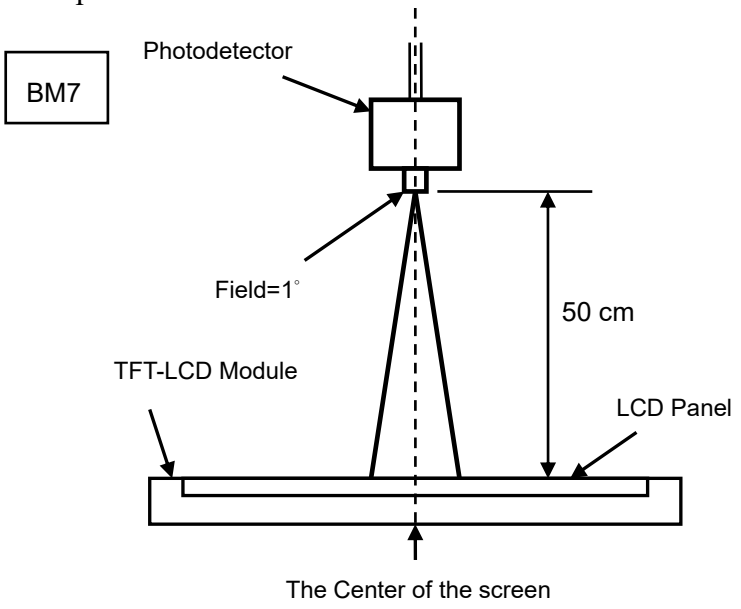


Note 1: The brightness test equipment setup

ILED=160mA, Field=1°

(As measuring "black" image, field=1°

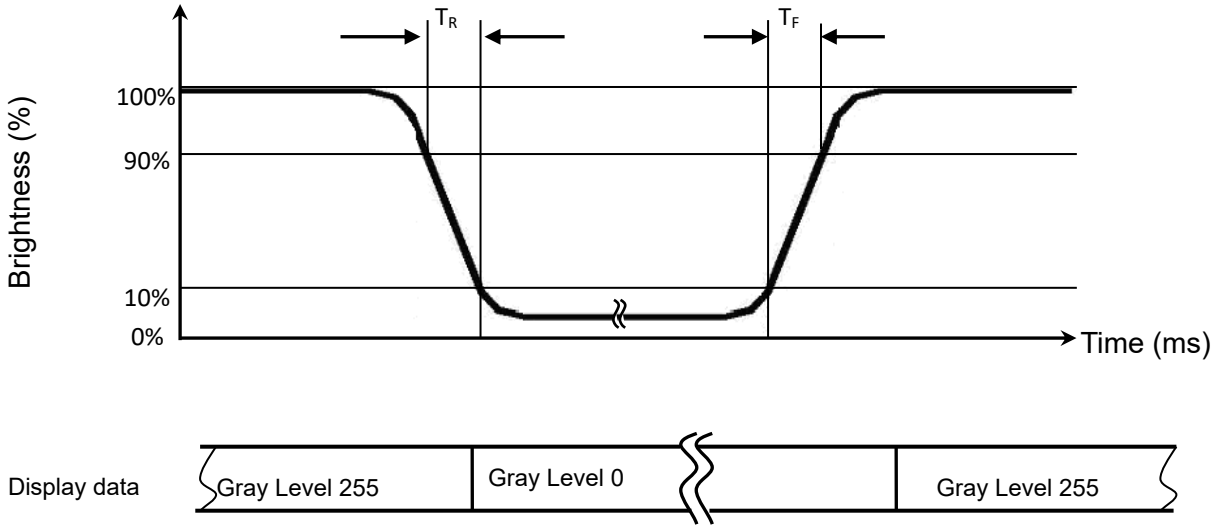
Is the best testing condition.)



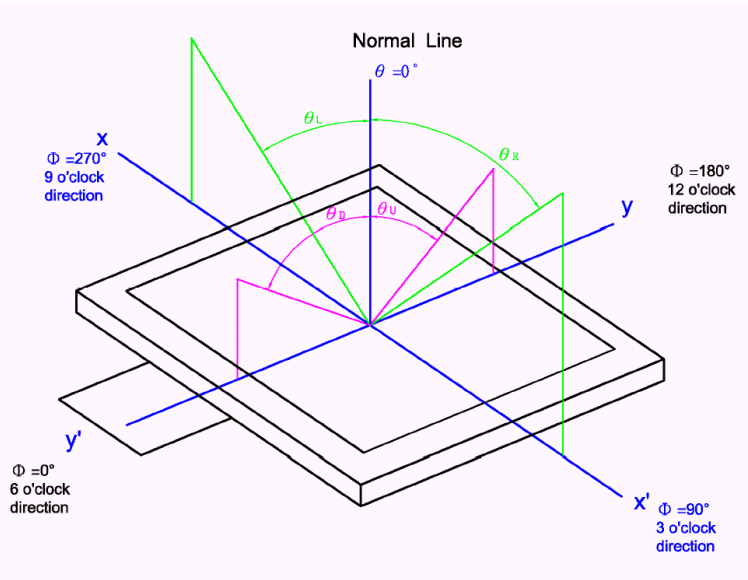
Note 2: Definition of contrast Ratio (C.R)

$$C.R = \frac{\text{Brightness When LCD is at "White" State}}{\text{Brightness When LCD is at "Black" State}}$$

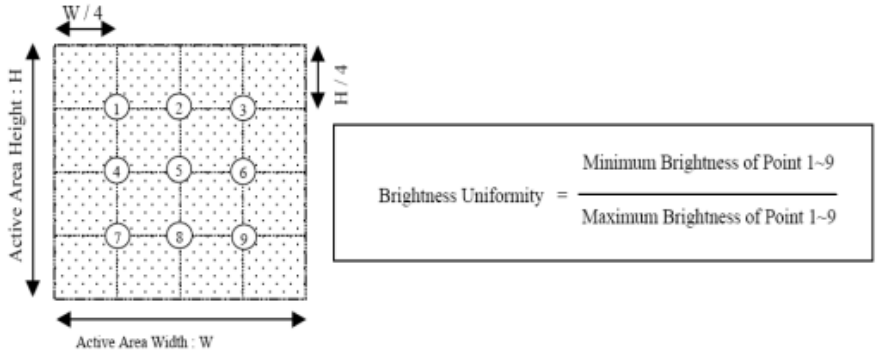
Note 3: Definition of response time



Note 4: Definition of viewing angle

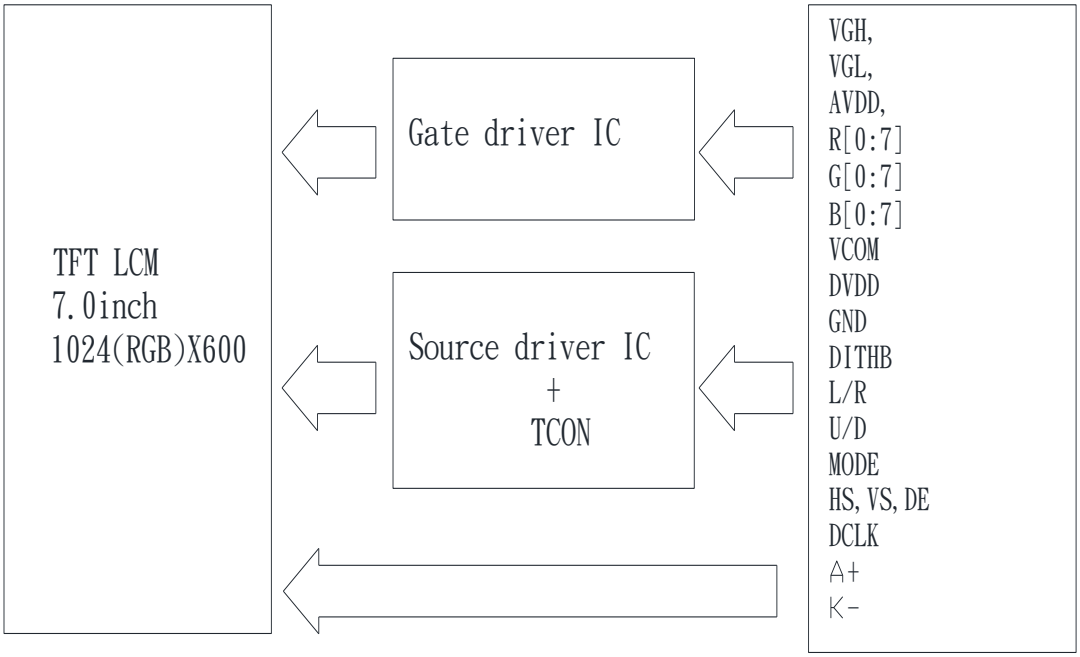


Note 5: Definition of uniformity (Un)



Note 6: In a Dark Room.

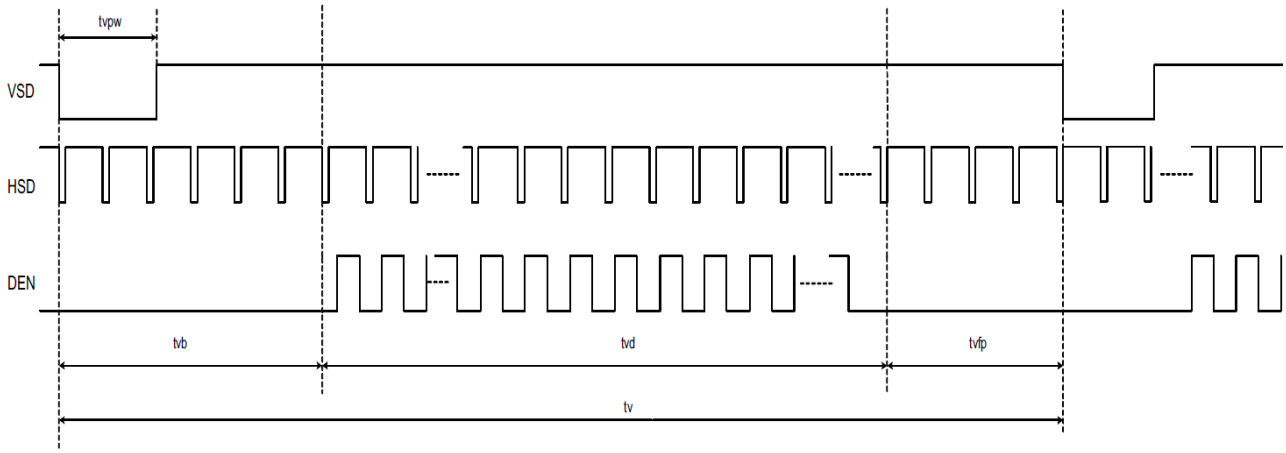
9. Block Diagram



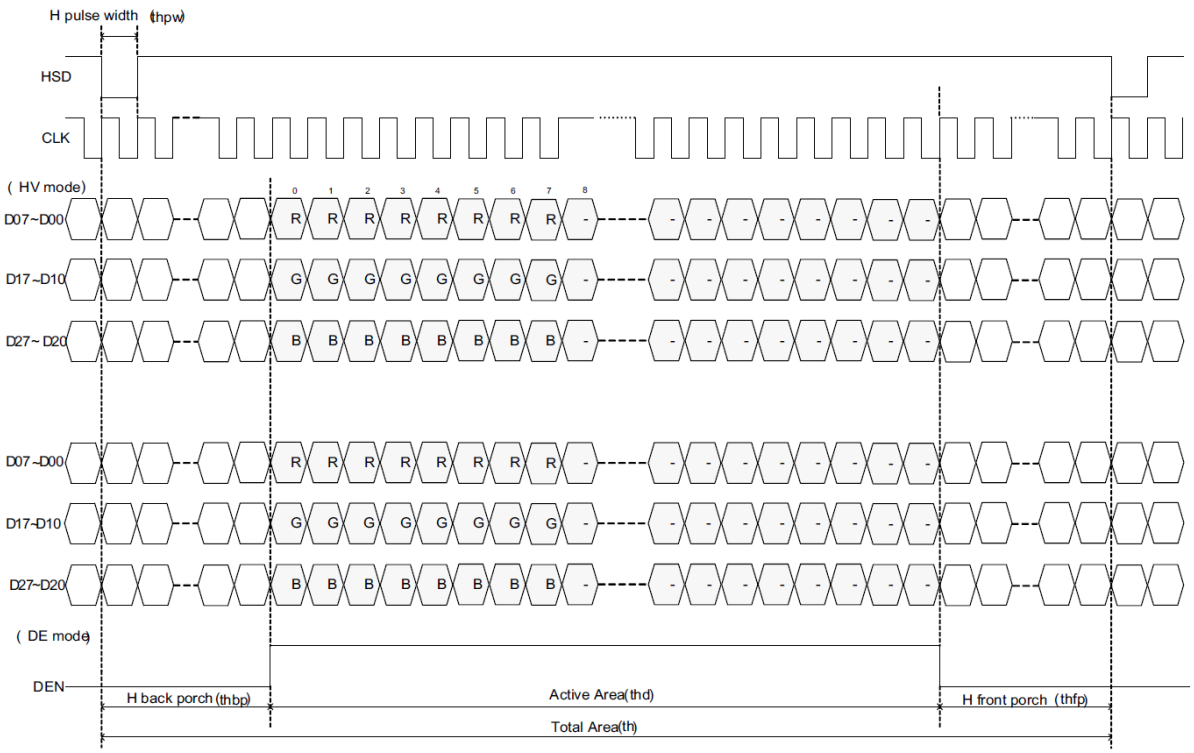
10. Timing Chart

10.1 Data Input Format for TTL

Vertical input timing



Horizontal input timing



10.2 Parallel RGB Timing Characteristic

DE mode

DE mode					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd		1024		DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

HV mode(1)

HV mode Horizontal input timing						
Parameter		Symbol	Value			Unit
Horizontal display area		thd	1024			DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	
			44.9	51.2	63	Mhz
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw	1			
	Typ.		—			
	Max.		140			
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

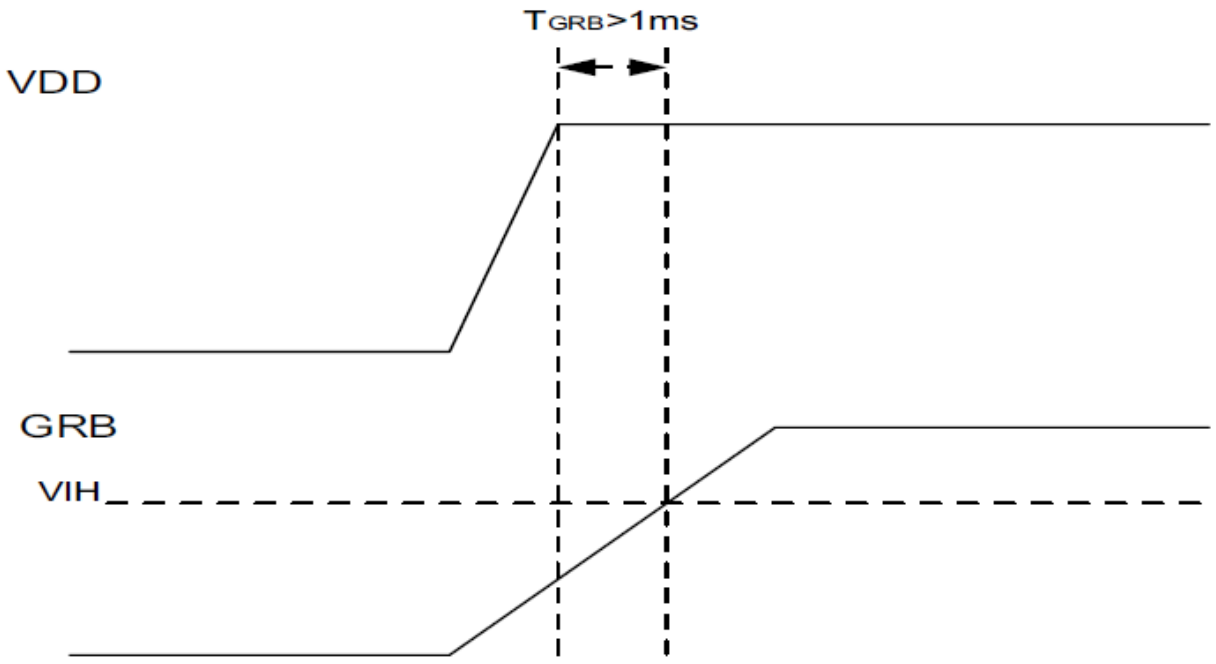
HV mode(2)

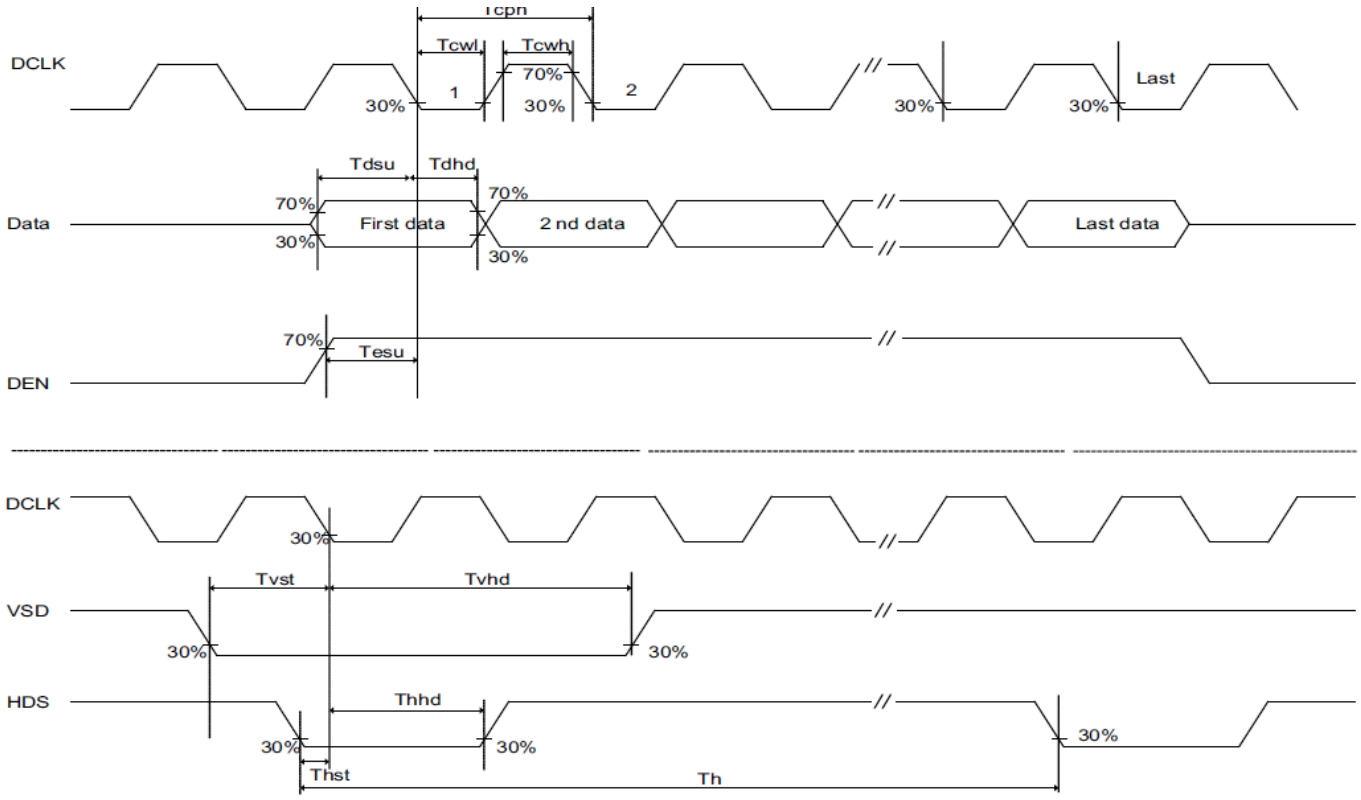
Vertical input timing					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd		600		H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

10.3 AC Electrical Characteristics

TTL mode

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
VDD Power On Slew rate	TPOR	From 0V to 90% VDD	-	-	20	ms
RSTB pulse width	TRST	DCLK = 65MHz	50	-	-	us
DCLK cycle time	Tcph	-	14	-	-	ns
DCLK pulse duty	Tcwh	-	40	50	60	%
VSD setup time	Tvst	-	5	-	-	ns
VSD hold time	Tvhd	-	5	-	-	ns
HSD setup time	Thst	-	5	-	-	ns
HSD hold time	Thhd	-	5	-	-	ns
Data set-up time	Tdsu	D0[7:0], D1[7:0], D2[7:0] to DCLK	5	-	-	ns
Data hold time	Tdhd	D0[7:0], D1[7:0], D2[7:0] to DCLK	5	-	-	ns
DE setup time	Tesu	-	5	-	-	ns
DE hold time	Tehd	-	5	-	-	ns
Output stable time	Tsst	10% to 90% target voltage. CL=90pF, R=10K ohm(Cascade)	-	-	6	us
		Dual gate			3	



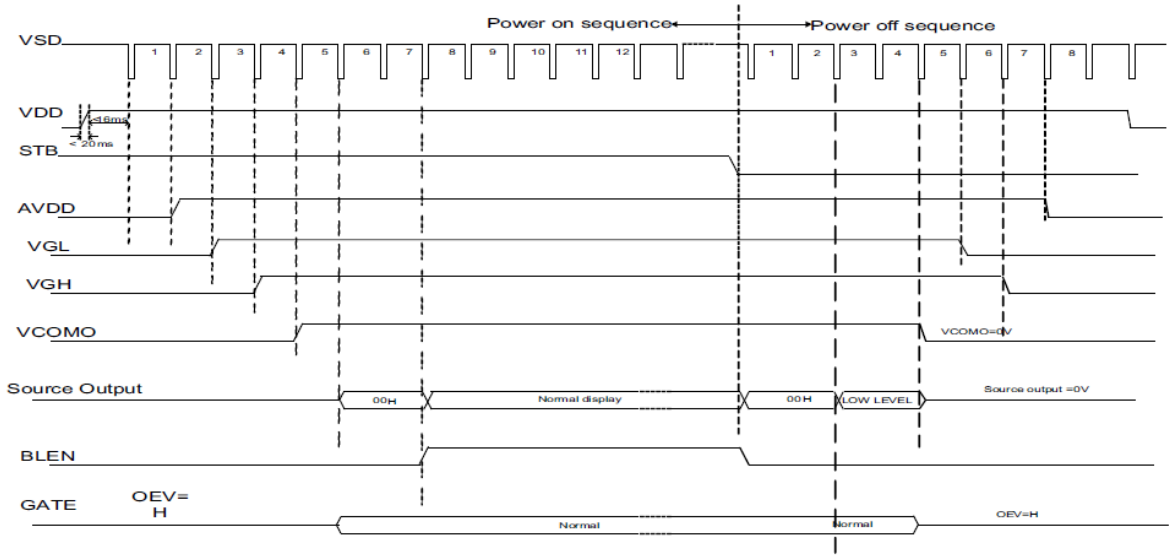


Parallel Input Clock and Data timing

10.4 Power ON/OFF Sequence

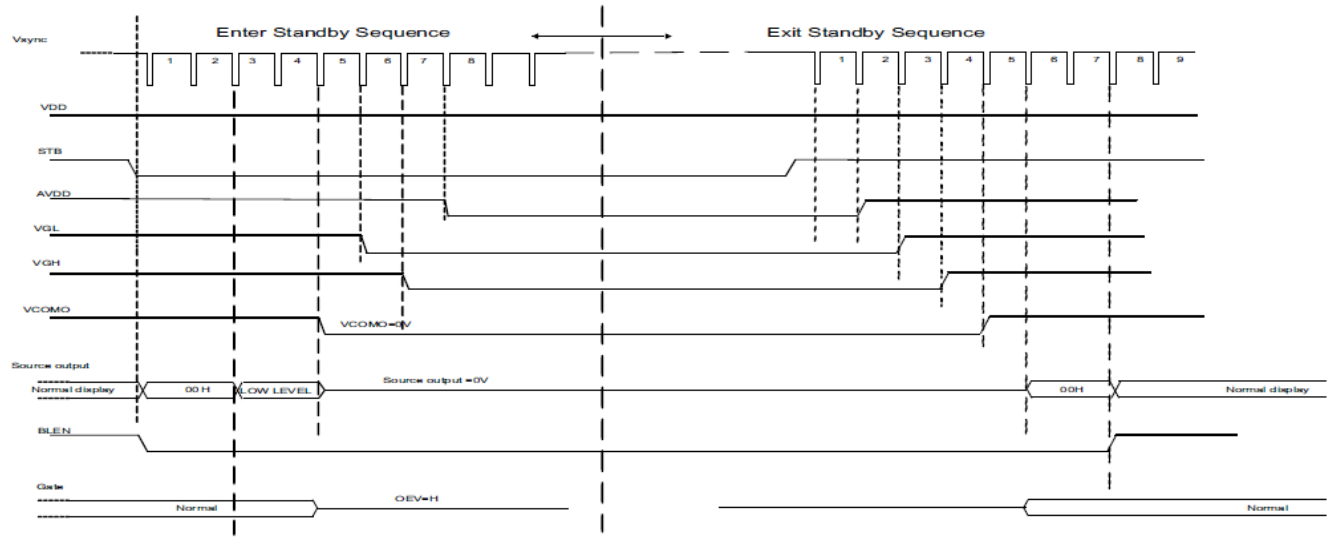
In order to prevent IC from power on reset fail, the rising time (TPOR) of the digital power supply VDD should be maintained within the given specifications. Refer to “AC Characteristics” for more detail on timing.

Power -On/Off Timing Sequence



Power On/Off timing chart

Enter and Exit Standby Mode timing chart



Note: Low level=3Fh,when NBW=L(Normally white)

Low level=00h,when NBW=H(Normally black)

11. Reliability Test

No	Items	Condition	INSPECTION AFTER TEST
1	High temperature operating	70℃,240 hours	Inspection after 2~4hours storage at room temperature, the samples should be free from defects: 1, Air bubble in the LCD. 2, Seal leak. 3, Non-display. 4, Missing segments. 5, Glass crack. 6, Current IDD is twice higher than initial value. 7, The surface shall be free from damage. 8, The electric characteristic requirements shall be satisfied.
2	Low temperature operating	-20℃,240 hours	
3	High temperature storage	80℃,240 hours	
4	Low temperature storage	-30℃,240 hours	
5	High temperature and humidity storage	60℃,90%RH,96 hours	
6	Thermal Shock storage	-20℃←————→70℃ 30min 5min 30min after 5 cycle, Restore 2H at 25℃Power off	
7	Vibration test	10Hz~150Hz, 100m/s^2 , 120min	
8	Drop test	Packed,100cm free fall, 6side,1corner,3edges	
9	Room temperature and humidity storage	25℃,60%,no dew	

NOTE:

1.The Test samples should be applied to only one test item.

2.Sample side for each test item is 5~10pcs.

3.For Damp Proof Test, Pure water(Resistance＞10MΩ)should be used.

4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.

5.Failure Judgment Criterion: Basic Specification Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

12.Precautions in Use of TFT LCM

12.1 Safety

1.If the LCD panel breaks,be careful not to get the liquid crystal to touch your skin.
2.If the liquid crystal touches your skin or clothes,please wash it off immediately by using Soap and water.

12.2 Handling

1.Avoid any strong mechanical shock which can break the glass.
2.Do not remove the panel or frame from the module.
3.The polarizing plate of the display is very fragile.So,please handle it very carefully and do not touch,push or rub the exposed polarizing.
4.Do not touch the display area with bare hands,this will stain the display area.
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 and Aromatic solvent,use with a soft cloth soaked with a cleaning Naphtha solvent.
7.To avoid organic solvent(include liquid)stained on LCM.

12.3 Storage

1.Store the panel or module in a dark place where the temperature is 25℃±5℃ and in a relative Humidity of 40~60%RH.
2.Store in a clean environment ,do not place the module near organics solvent or corrosive gases.
3.Do not crush,shake,or jolt the module.
4.Store in anti-static electricity container.

12.4 Soldering

1.Use a no leakage soldering iron and the high quality solder.
2.To control temperature and time of soldering conditions is 280±10℃ and 3~5sec.
3.Soldering:only to the I/O terminals.
4.Rewiring:no more than 3 times.

12.5 Static electricity warning

1.The TFT Module uses CMOS LSI technology. Therefore strict measures to avoid static electricity discharge are followed through all processes from manufacturing through shipping. So attention to the following:

(1)Always use a ground strap when handling a TFT Module

Always use a ground strap while working with the module, from the time it is taken out of the anti-static bag until it is assembled. When it is necessary to transfer the LCM, once it has been taken out of the bag, always place it in an electric conductive container. Avoid wearing clothes made of chemical fibers, the use of cotton or conductive treated fiber clothing is recommended.

(2)Do not take the TFT Module from its anti-static bag until it's to be assembled. LCM's are individually packaged in bags specially treated to resist static electricity.
When storing, keep the TFT Module packed in the original bags, or store them in a container processed to be resistant to static electricity, or in an electric conductive container.

(3)Always ground electrical apparatuses required for assembly.

Electrical apparatuses required to assemble the TFT Module into a product, i.e. electrical screw drivers are to be first grounded to avoid transmitting spike noises from the motor.

(4) Use a no-leak iron for soldering the TFT Module

The soldering iron to be used for soldering the I/O terminals to the TFT Module are to be insulated or grounded at the iron tip.

(5) Pay attention to the humidity in the work area,50~60% RH is recommended.

(6) Peel off the TFT Module protective film slowly. The module is attached with a film to protect the display surface from contamination, damage, adhesion of flux, etc. Peeling off this film abruptly could case static electricity to be generated, so peel the tape slowly.

(7) Assure that the work bench is properly grounded.

12.6 Precaution:

Please pay attention to the following items when you use the LCD Module with back-light unit.

(1)Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.

(2)Adopt measures in adequately ventilated environment. Be sure to use the module in the specified temperature range.

(3)Avoid dust or oil mist during assembly.

(4)Follow the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.

(5) Try to avoid the electrical magnetic interference, and it will be more safety and less noise.

(6)Please operate module in suitable temperature. The response time & brightness will drift by different temperature.

(7) Avoid displaying the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image sticking.

(8) Be sure to turn off the power when connecting or disconnecting the circuit.

(9) Display surface Polarizer scratches easily, please avoid dirt and stains carefully.

(10) A dewdrop may lead to destruction. Please wipe off any moisture before using module.

(11) Sudden temperature changes cause condensation, and it will cause polarizer damaged.

(12) High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.

(13) Avoid any acid or chlorine compounds, which are harmful to the LCD module.

(14) Static electricity will damage the modules; please do not touch the module without any grounded device connected.

(15) Do not disassemble and reassemble the module by self.

(16) Do not touch the rear side directly to avoid the electrical shock by the backlight high voltage.

(17) Avoid strong vibration or shock. or it will cause the module broken.

(18) Store the modules in suitable environment with regular packing.

(19) Be careful of injury from a broken display module. Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the non-uniformity or other function issue to display.

13.Specification of Quality Assurance

13.1 Purpose

This standard for Quality Assurance should affirm the quality of TFT Module (TFT LCM) products.

13.2 Standard Quality Test

1.Inspection:

Before delivering, the supplier should take the following tests, and affirm the quality of product.

2.Electro-Optical Characteristics:

According to the individual specification to test the product.

3.Test of Appearance Characteristics:

According to the individual specification to test the product.

4.Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

13.3 Nonconforming Analysis and Deal with manners

1.Purchaser should supply the detail data of non-conforming sample and the non-suitable state.

2.After accepting the detail data from purchaser, the analysis of nonconforming should be finished in two weeks.

3.If supplier cannot finish analysis on time, must announce purchaser before one weeks.

4.If find any product defect of supplier during assembly time, supplier must change the good Product for every defect after recognition.

5.Both supplier and customer should analyze the reason and discuss the disposition of Nonconforming when the reason of nonconforming is not sure.

13.4 Agreement items

Both sides should discuss together when the following problems happen.

1.There is any problem of standard of quality assurance, and both sides think that it must be modified.

2.There is any argument item which does not record in standard of quality assurance.

3.Any other special problem.

13.5 Inspection Specification for assembly

1.Inspection Standard:MIL-STD-105E table normal inspection single sampling level II.

2.Test condition: Ambient temperature: 25 ± 5℃ //Humidity: 55 ± 10% RH

3.The defects classify of AQL(%) as following:

Major defect: AQL=0.65

Minor defect: AQL=2.5

4.Manner of appearance test:

(1)The test must be under 40W fluorescent light, and the distance of view must be at 30cm.

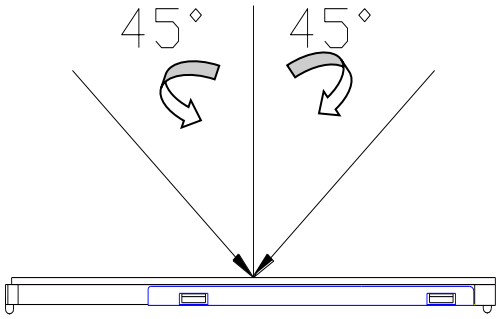
(2)The test direction is base on about around 45° of vertical line.

(3)Definition of area:

A area: Active area.

B area: Viewing area.

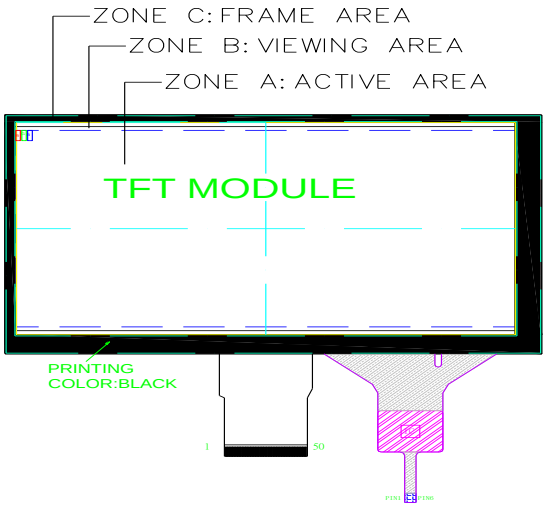
C area: Out of viewing area.(Outside viewing area)>>Do not count



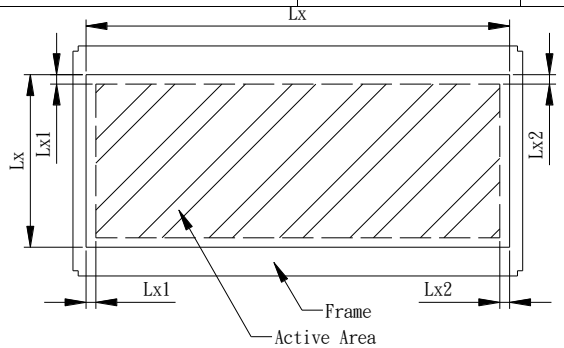
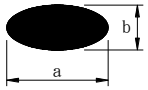
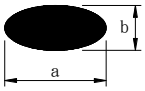
5.It will accord to AQL when the standard cannot be described.

6.The sample of the lowest acceptable quality level must be discussed by both supplier and Customer when any dispute happened.

7.Must add new item on time when it is necessary.

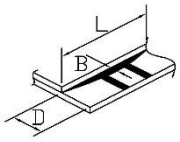
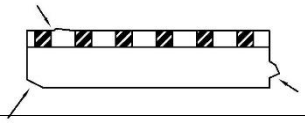
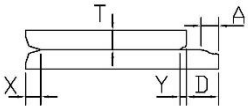
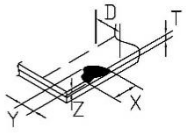


13.6 Inspection Quality Criterion

ITEM	*DESCRIPTION OF DEFECTS*	*Class of defects*	*Acceptable level (%)*
DIMENSION	Refer to individual acceptance specification	Major	2.5
SLANT	Viewing Area / | Lx1-Lx2 | / Judgment Lx≦100mm / ≦ 0.2mm / ACC 100mm < Lx ≦ 150mm / ≦ 0.3mm / ACC 150mm < Lx ≦200mm / ≦ 0.4mm / ACC 200mm < Lx / ≦0.5mm / ACC 	Minor	2.5
LINEAR DEFECT (particle, black/white linears, stain & dust.)	(a) L≦5mm & W≦0.05mm, disregard (b) L≦5mm & 0.05mm < W≦0.07mm, N≦3 (d) L >5mm or W >0.07mm, REJ (e) Distance between 2 lines ≧ 10mm 	Minor	2.5
SPOT DEFECT (particle, black/white stain & dust.)	Average diameter, D (a) D≦0.3mm, disregard (b) 0.3mm < D ≦0.5mm, N≦3,ACC (c) D>0.5mm, REJ (d) Distance between 2 spots ≧ 10mm  $D=\frac{a+b}{2}$	Minor	2.5
Bubble/ DENT ON SURFACE	Average diameter D (a) D≦0.3mm, disregard (b) 0.3mm < D ≦ 0.5mm, N≦3,ACC (c) D>0.5mm, REJ (d) Distance between 2 protrude dot/ dent ≧ 10mm  $D=\frac{a+b}{2}$	Minor	2.5
RIFT	Not allowed.	Major	0.65
LIFTED ON POLIZER EDGE SIDE	Average diameter D (a) D > 1.0mm, REJ (b) L >5mm, W > 1.0mm, REJ	Minor	2.5
CHROMA MURA	Not allowed if it can be observed through ND Filter 6%. Refer to individual acceptance limited sample	Minor	2.5

<table>
<tr><td>COLOR NOT ACCORD</td><td>Not allowed if it can be observed through ND Filter 6%.
Refer to individual acceptance limited sample</td><td>Minor</td><td>2.5</td></tr>
<tr><td>BRIGHT/ DARK POINT</td><td>
<table>
<tr><th colspan="2">Item</th><th>Allow number in Area A</th></tr>
<tr><td rowspan="4">(a) Bright point</td><td>Single point</td><td>2</td></tr>
<tr><td>Two adjacent point</td><td>1 pair</td></tr>
<tr><td>Three adjacent point</td><td>0</td></tr>
<tr><td>Total point</td><td>0</td></tr>
<tr><td rowspan="4">(b) Dark point</td><td>Single point</td><td>3</td></tr>
<tr><td>Two adjacent point</td><td>1 pair</td></tr>
<tr><td>Three adjacent point</td><td>0</td></tr>
<tr><td>Total point</td><td>3</td></tr>
</table>
※ Point：A sub pixel 1R or 1G or 1B
※ The distance of dark point >15mm</td><td>Minor</td><td>2.5</td></tr>
<tr><td rowspan="4">LINE DEFECT ON SURFACE (SCRATCHES, BLACK/ WHITE LINE)</td><td>Width W, Length L</td><td>A</td><td>B</td></tr>
<tr><td>W ≦ 0.05mm, L≦15mm</td><td colspan="2">disregard</td></tr>
<tr><td>0.05mm ＜ W ≦ 0.08mm, L ≦10.0mm</td><td>3</td><td>4</td></tr>
<tr><td>0.08mm＜ W , 10.0mm<L</td><td>0</td><td>1</td></tr>
<tr><td></td><td></td><td>Minor</td><td>2.5</td></tr>
<tr><td>DISPLAY ABNORMAL</td><td>(a) Non display
(b) Line defect
(c) Response time, contrast ratio, brightness or viewing angle abnormal
(d) Water ripple
(e) Flicker</td><td>Major</td><td>0.65</td></tr>
</table>

NOTE：(1) ACC：Accept (2) REJ：Reject

ITEM	*DESCRIPTION OF DEFECTS*		*Class of defects*	*Acceptable level (%)*
POOR CUTTING	(a) 	According to Engineering drawing	Major	0.65
	(b) 	According to Engineering drawing		
	(c) 	1.X,Y damage touch 1/3 width 2.A>1/4D, REJ		
DAMAGE		1. Z<T and X<15mm Y≦1.0mm, ACC 2. Z=T and X>15mm Y>1.0mm,REJ	Minor	2.5

14. Terms of Warranty

1.Applicable warranty period

The period is within thirteen months since the date of shipping out under normal using and Storage conditions.

2.Unaccepted responsibility

This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in aerospace, unclear power control equipment, fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

15.Material List of Components for ROHS

TRICOMTEK CO.,LTD.hereby declares that our company do not intentionally contain any of the substances listed in applicable EU directives and regulations and all our products will conform to content requirement of 6 substances
(Pb, Cd, Hg, Cr^{6+}, PBB, PBDE) of RoHS directive, and we will not use these 6 substances in the manufacturing process, and guarantee that the content of these substances in our products won't exceed the limit value of RoHS as followings:

Hazardous Substance	Limit value of RoHS (ppm, mg/kg)
Lead and its compounds (Pb)	＜1000
Cadmium and its compounds (Cd)	＜100
Mercury and its compounds (Hg)	＜1000
Chromium VI and its compounds (Cr^{6+})	＜1000
Polybrominated Biphenyls (PBB)	＜1000
Polybromodiphenyl Ether (PBDE)	＜1000
Packaging: PB + Cd+Hg+Cr^{6+}	＜100

Remarks:

(1) In addition to the basic restricted items in the above list, if any individual customers have any other special item requirement, please specify, so that we can specially try to conform.

(2)If any individual customers really need to have RoHS compliant earlier than the above schedule, please specify on Purchase Order so that we can specially try to conform.

16.Touch Panel Section

16.1 General Specifications

Item	Standard Value	Unit
CTP Module Dimension	164.94(W)*100.0(H)*1.45(T)	mm
Viewing Area	154.84(W)*86.6(H)	mm
Structure	COVER LENS:GLASS/SENSOR:GLASS	-
Transmittance	≧86	%
Driver IC	GT911 or Equivalent	-
Operating Temperature	-20~70	℃
Storage Temperature.	-30~80	℃
Precision(%)	+/-1.0mm@10mm	-

16.2 Interface Pin Description (IIC)

Pin No	Symbol	I/O	Function
1	GND	PWR	Ground
2	RST	I	Reset
3	INT	I	Interrput signal
4	SCL	I	IIC clock signal
5	SDA	I/O	IIC data signal
6	VCC	PWR	Power supply

16.3 Timing Chart and CTP Command

Please refer to GT911 or Equivalent DATASHEET.