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Cover glass

System solutions

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Custom Display

Production Custom designs Installation

Mechanical design



SPECIFICATION
FOR
LCM+RTP Module

MODULE No:	ET070WV06-KT
CUSTOMER:	

YOURITECH	INITIAL	DATE
WPREPARED BY		
CHECKED BY		
APPROVED BY		

CUSTOMER	INITIAL	DATE
APPROVED BY		

Shenzhen Youritech Technology Co.,Ltd.

Revision History

[illegible]

Part. No	ET070WV06-KT	REV	V1.0	Page 2 of 31
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* Description

This is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This module is composed of a Transmissive type TFT-LCD Panel, driver circuit, 4 wires resistance touch screen back-light unit. The resolution of a 7.0" TFT-LCD contains 800X480 pixels, and can display up to 16.7M colors.

* Features

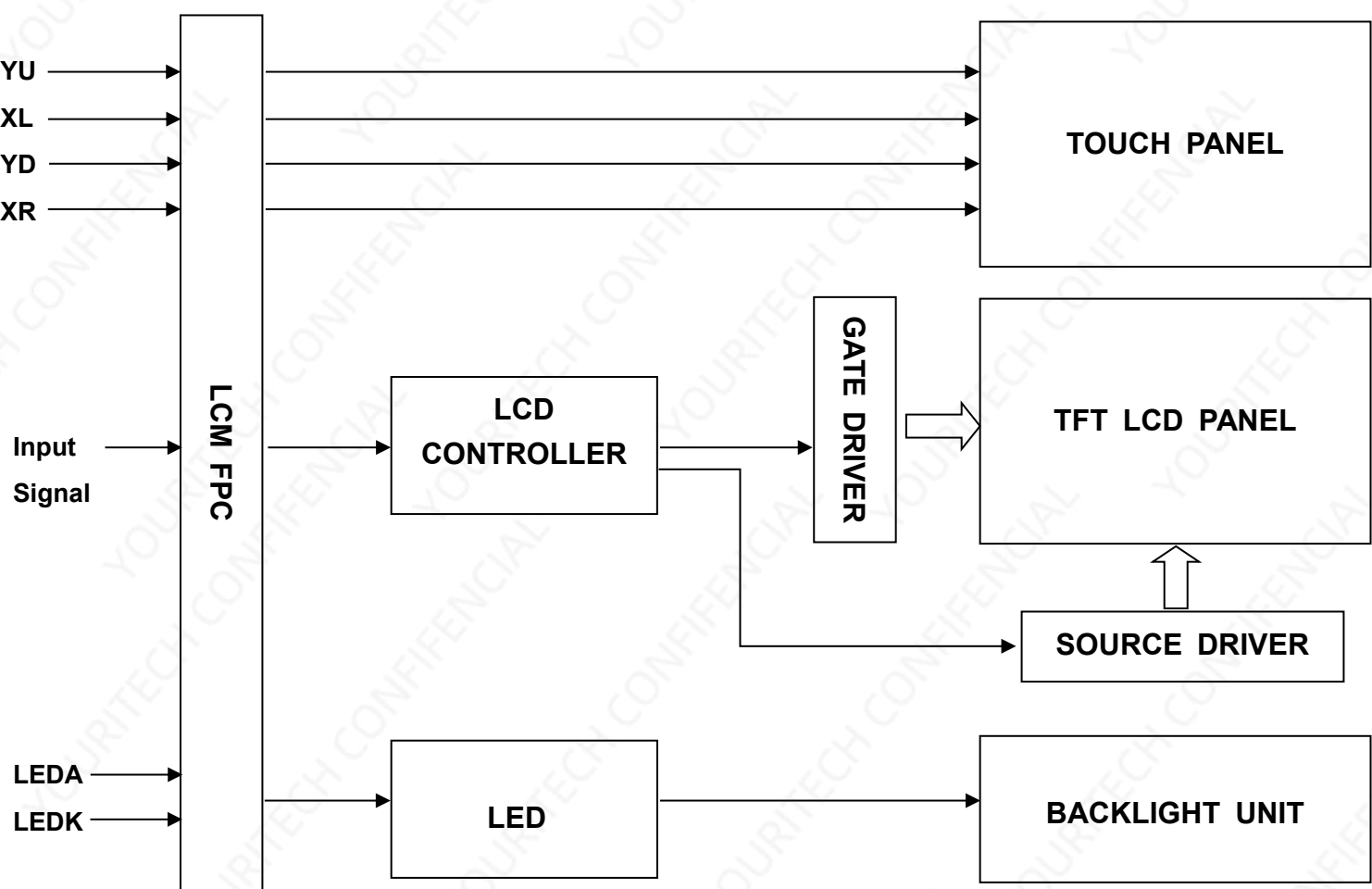
General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	152.40(H)*91.44(V) (7.0 inch)	mm	
Driver element	TFT active matrix	-	
Display colors	65K/262K/16.7M	colors	
Number of pixels	800(RGB)*480	dots	
Pixel arrangement	RGB vertical stripe	-	
Pixel pitch	0.1905(H)*0.1905(V)	mm	
Viewing angle	Free	o'clock	
Controller IC	RM533C0+RM577C1	-	
Display mode	Transmissive /Normally Black	-	
LCM Interface	16/18/24bit RGB	-	
Operating temperature	-30~+85	°C	
Storage temperature	-40~+90	°C	
Module bonding technology	Use Tape bonding between LCM and RTP	-	

* Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	165.40	-	mm	
	Vertical(V)	-	104.59	-	mm	
	Depth(D)	-	6.85	-	mm	
Weight		-	175	-	g	

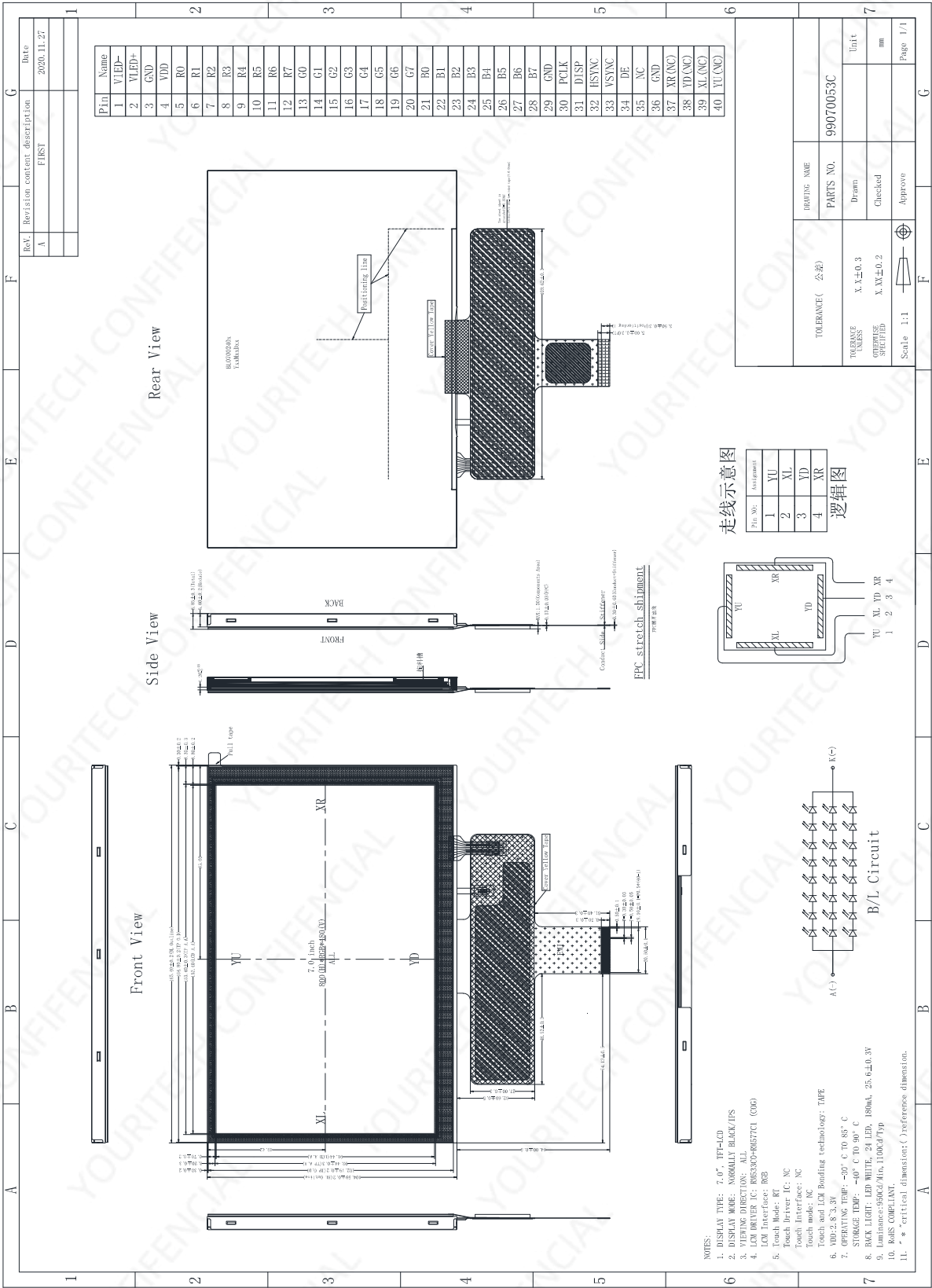
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1. Block Diagram



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2. Outline dimension



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3. Input terminal Pin Assignment

NO.	SYMBOL	DISCRIPTION	I/O
1	VLED-	LED Cathode	P
2	VLED+	LED Anode	P
3	GND	Ground	P
4	VDD	Power supply for digital circuits	P
5-12	R0-R7	Red data input	I
13-20	G0-G7	Green data input	I
21-28	B0-B7	Blue data input	I
29	GND	Ground	P
30	PCLK	Dot clock signal for RGB interface operation.	I
31	DISP	Standby mode, Normally pulled high. STBYB = "1", power on STBYB = "0", power off.	I
32	HSYNC	Horizontal Sync input for TTL mode. Negative polarity	I
33	VSYNC	Vertical Sync input for TTL mode. Negative polarity	I
34	DE	Data Input Enable.	I
35	NC	--	--
36	GND	Ground	P
37	XR(NC)	Touch panel Right Glass Terminal	I
38	YD(NC)	Touch panel Bottom Film Terminal	I
39	XL(NC)	Touch panel LEFT Glass Terminal	I
40	YU(NC)	Touch panel Top Film Terminal	--

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4. LCD Optical Characteristics

4.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit.	Note
Contrast Ratio		CR	$\Theta=0$ Normal viewing angle	600	1000	--		(1)(2)
Response time	Rising	T_R+T_F		--	25	30	msec	(1)(3)
	Falling							
Color Gamut		S(%)		55	60	--	%	C- light
Color Filter Chromaticity	White	W_X		0.2774	0.3174	0.3574		(1)(4)
		W_Y		0.2994	0.3394	0.3794		CA- 310
	Red	R_X		0.6071	0.6271	0.6471		
		R_Y		0.3251	0.3451	0.3651		
	Green	G_X		0.2896	0.3096	0.3296		
		G_Y		0.5375	0.5575	0.5775		
	Blue	B_X		0.1328	0.1528	0.1728		
		B_Y		0.0544	0.0744	0.0944		
Viewing angle	Hor.	Θ_L	CR>10	--	80	--		(1)(4)
		Θ_R		--	80	--		
	Ver.	Θ_U		--	80	--		
		Θ_D		--	80	--		
Option View Direction		Free						

*The data comes from the LCD specification.

Measuring Condition

Measuring surrounding : dark room

Ambient temperature : 25±2°C

15min. warm-up time.

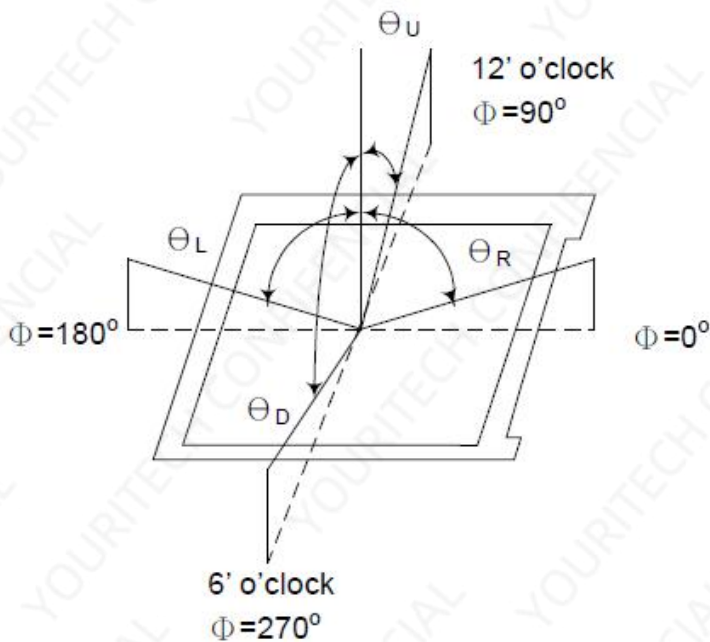
Measuring Equipment

FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

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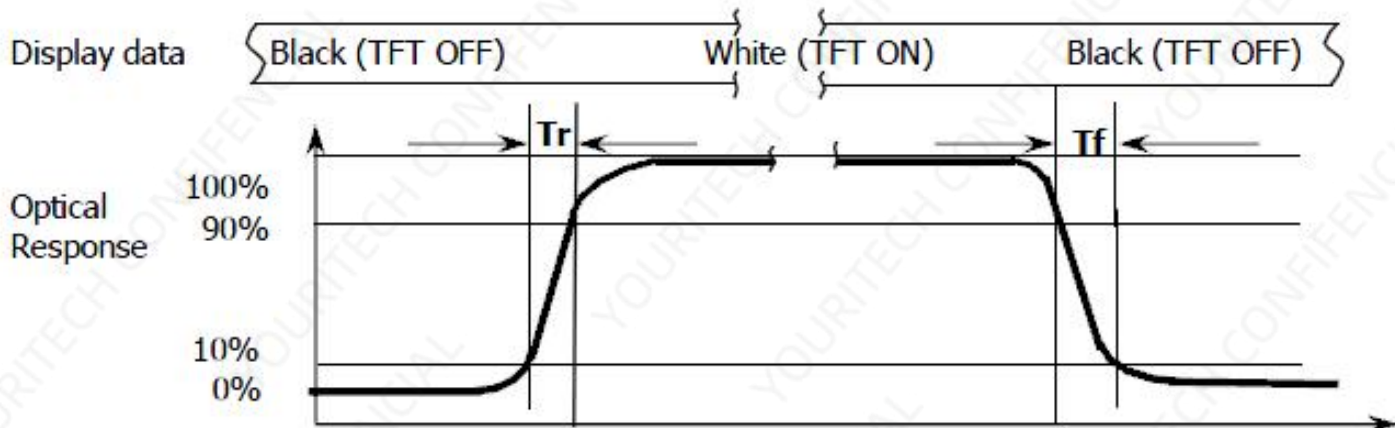
Note (1): Definition of Viewing Angle :



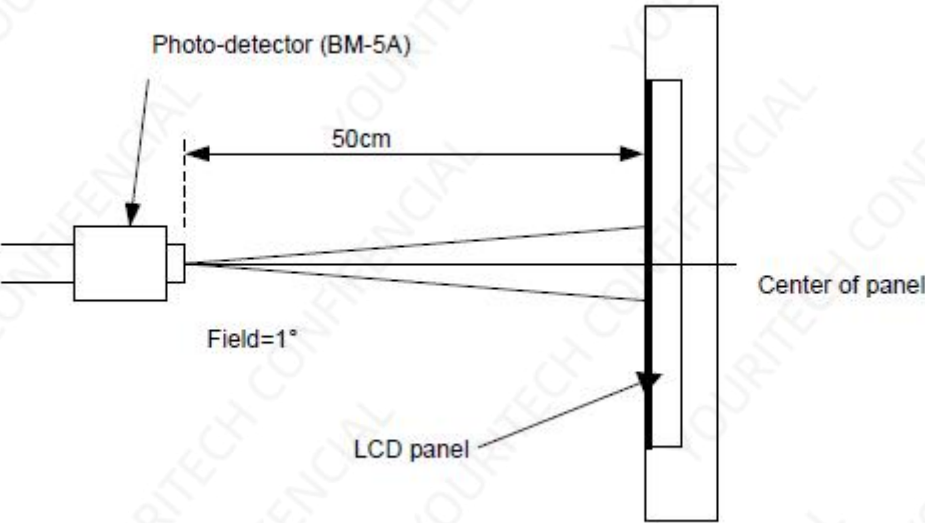
Note (2): Definition of Contrast Ratio(CR) :measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3): Response Time



Note (4): Definition of optical measurement setup



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5. Electrical Characteristics

5.1 Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit	Note
Digital Supply Voltage	VDD	-0.3	7.7	V	Note1
Operating temperature	T _{OP}	-30	+85	°C	
Storage temperature	T _{ST}	-40	+90	°C	

NOTE1: If the absolute maximum rating of even is one of the above parameters is exceeded even momentarily, the quality of the product may be degraded. Absolute maximum ratings, therefore, specify the values exceeding which the product may be physically damaged. Be sure to use the product within the range of the absolute maximum ratings.

5.2 DC Electrical Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Note
Digital Supply Voltage	VDD	2.7	3.3	3.6	V	
Normal mode Current	IDD	--	75	150	mA	
Level input voltage	V _{IH}	0.7*VDD	--	VDD	V	
	V _{IL}	GND	--	0.3* VDD	V	
Level output voltage	V _{OH}	VDD-0.4	--	--	V	
	V _{OL}	GND	--	GND+0.4	V	

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5.3 LED Backlight Characteristics

The back-light system is edge-lighting type with 24 chips LED

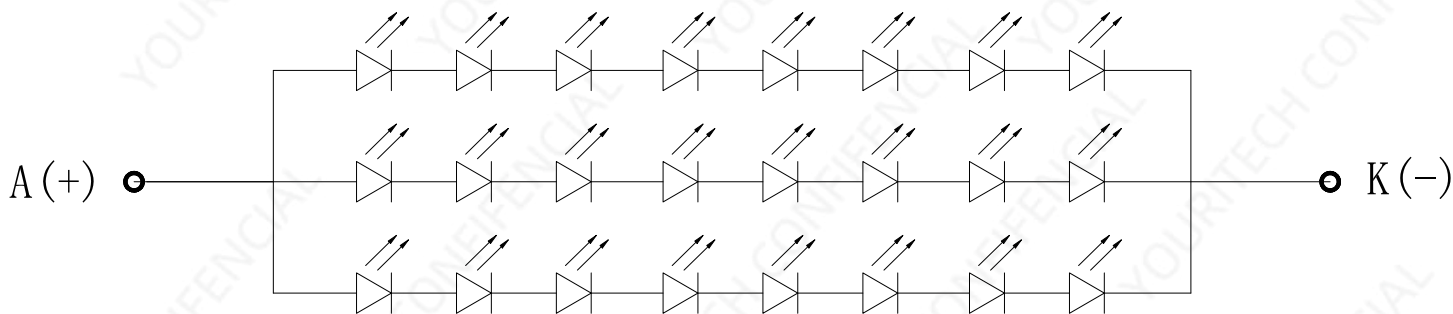
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I_F	--	180	--	mA	
Forward Voltage	V_F	--	25.6	--	V	
LCM Luminance	LV	950	1100	--	cd/m ²	Note3
LED life time	Hr	--	50000	--	Hour	Note1,2
Uniformity	Avg	80	--	--	%	Note3

Note1: LED life time (Hr) can be defined as the time in which it continues to operate under the condition:

$T_a=25\pm3\text{ }^{\circ}\text{C}$, typical IL value indicated in the above table until the brightness becomes less than 50%.

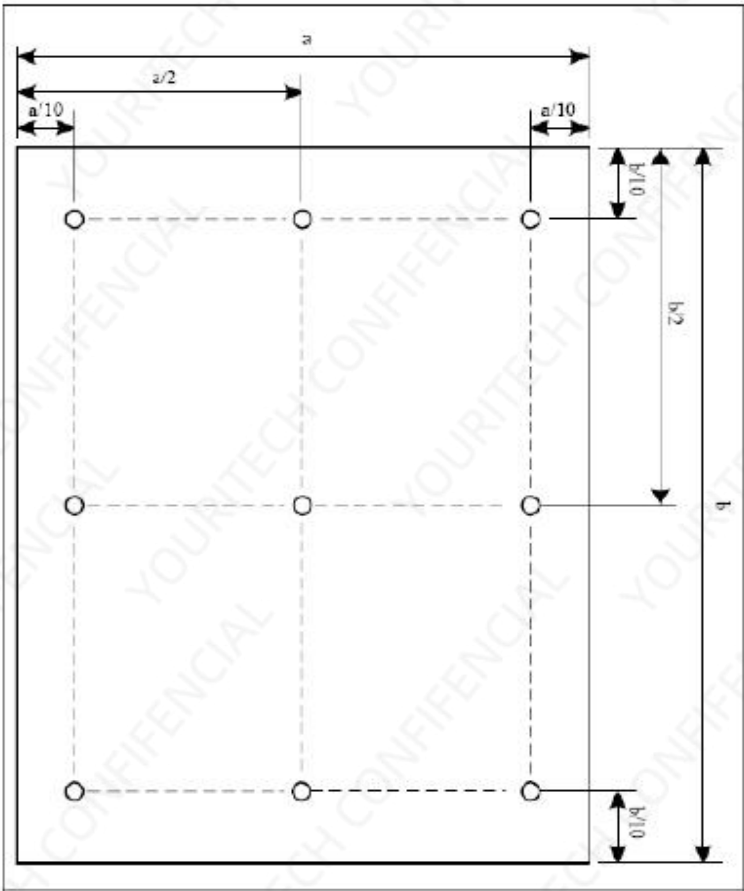
Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at

$T_a=25^{\circ}\text{C}$ and $I_L=180\text{mA}$. The LED lifetime could be decreased if operating I_L is larger than 180mA. The constant current driving method is suggested.



B/L Circuit

Note (3) Luminance Uniformity of these 9 points is defined as below:



$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

$$\text{Luminance} = \frac{\text{Total Luminance of 9 points}}{9}$$

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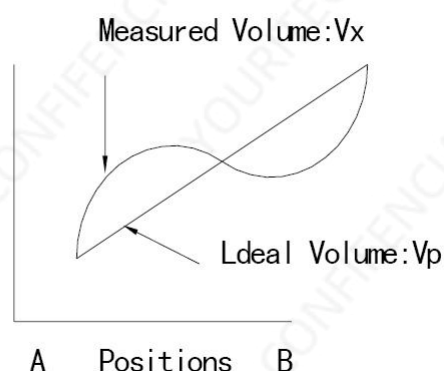
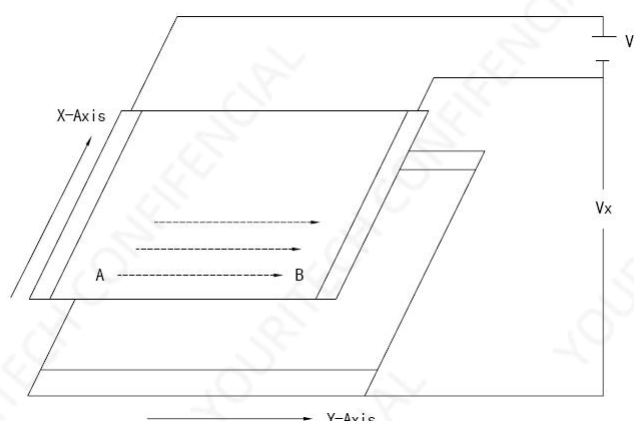
6. TP Feature

6.1 Conditions of use and storage

Item	Value(condition)	Note
Temperature range upon operation	Humidity: 20%~90% non dew, condensation -30℃~85℃	In a simple substance
Temperature range upon storage	Humidity: 20%~90% non dew, condensation -40℃~90℃	In a simple substance

6.2 Electrical property

Item	Value	Note
Maximum voltage	DC5V	
Resistance between terminals	X direction[Film side]:200-600Ω Y direction [Glass side]:300-900Ω	
Insulation resistance	DC 25V 20MΩor above	Connect X + ~X- and Y+ ~Y-, apply 25VDC Between X and Y for perform measurements
Chattering	10 msec or below	
Rating	Voltage is DC 5V	



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6.3 Mechanical property

Item	Performance		Note
Input method	Used of an exclusive pen or finger		
Load upon operation	Exclusive pen	60-100g or below	Operation and measurement with a pen must be carried out under the following tip conditions: Stylus pen material : POM(polyacetal) . Tip : Diameter 3.0mm, SR 0.8 mm
	Finger	60-100g or below	Operations and measurement methods simulated for a finger must be carried out under the following tip conditions. Material :Silicon rubber (Hardness : 30°Hs) Tip : Diameter 12.0 mm, SR 12.5mm
Surface hardness	Pencil hardness : 3H or above		It complies with the way of test method JIS K5400.

6.4 Optical property

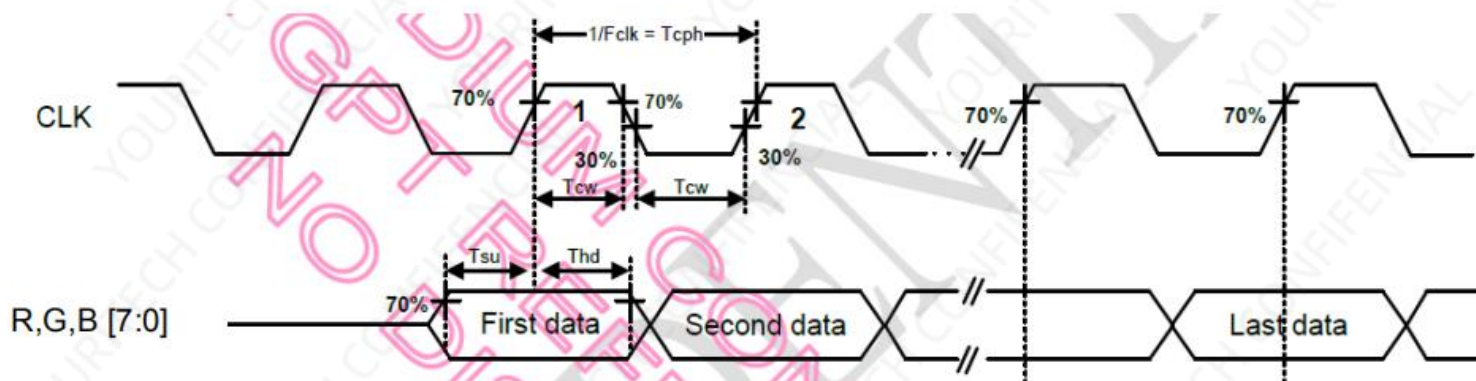
Item	Performance	Note
Total light transmittance	80% or above	JIS K7105
Haze	5% or below	JIS K7136
Film specification	Polished type with hard coated surface	

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7. AC Characteristic

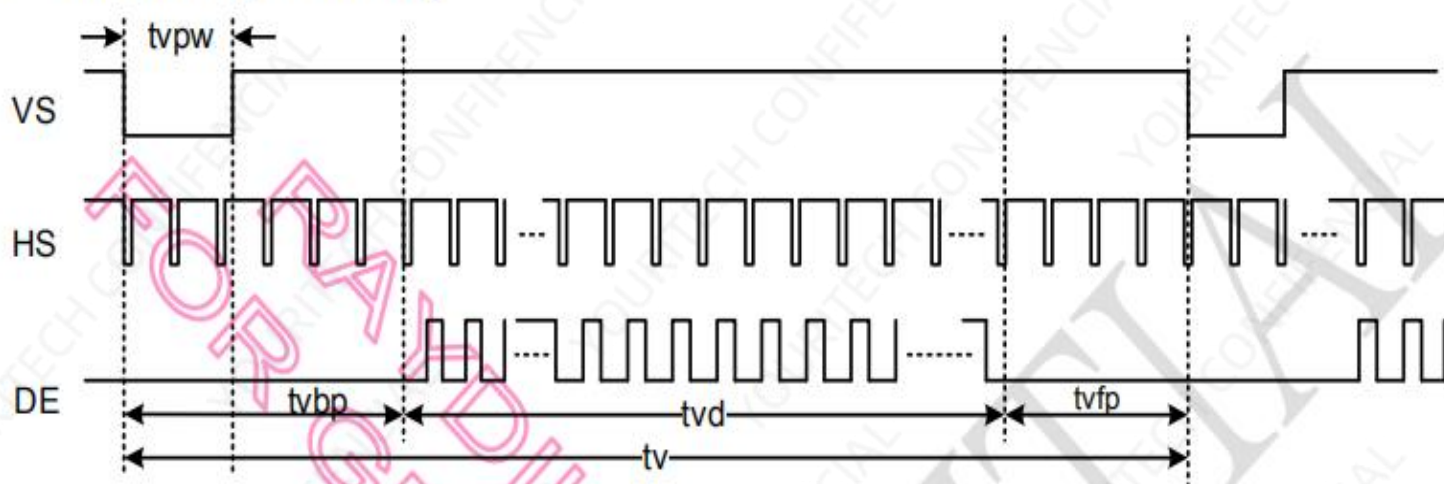
7.1 TTL mode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK frequency	Fclk	-	16	55	MHz	
CLK pulse width	Tcw	40%	-	60%	Tcph	
Data set-up time	Tsu	6	-	-	ns	D00 ~ D27
						to CLK
Data hold time	Thd	6	-	-	ns	D00 ~ D27
						to CLK



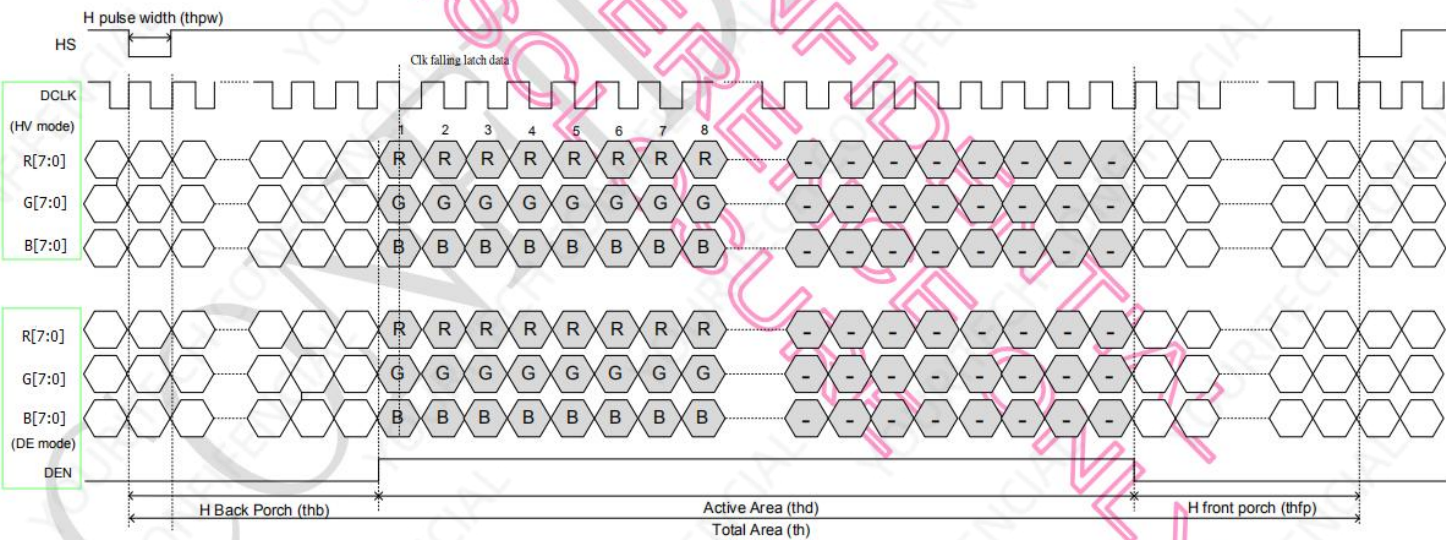
7.2 TTL_HVDE (with HV or DE) with TCON mode timing diagram

◆ Vertical input timing

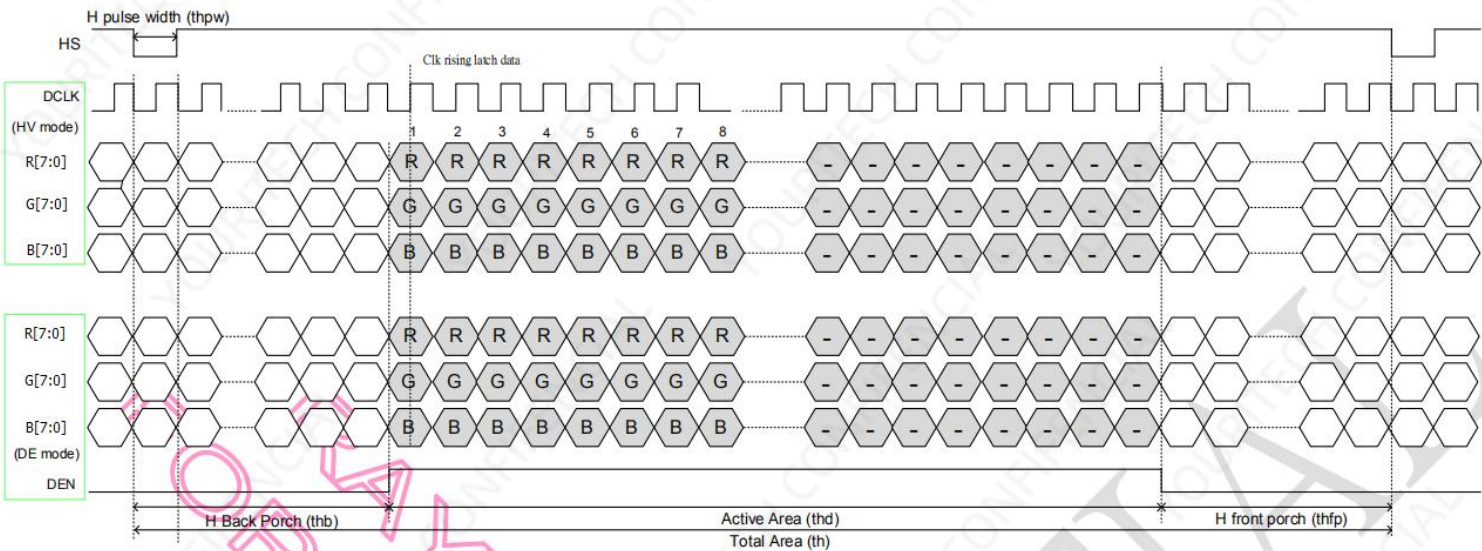


◆ Horizontal input timing

when CLKPOL = HI:



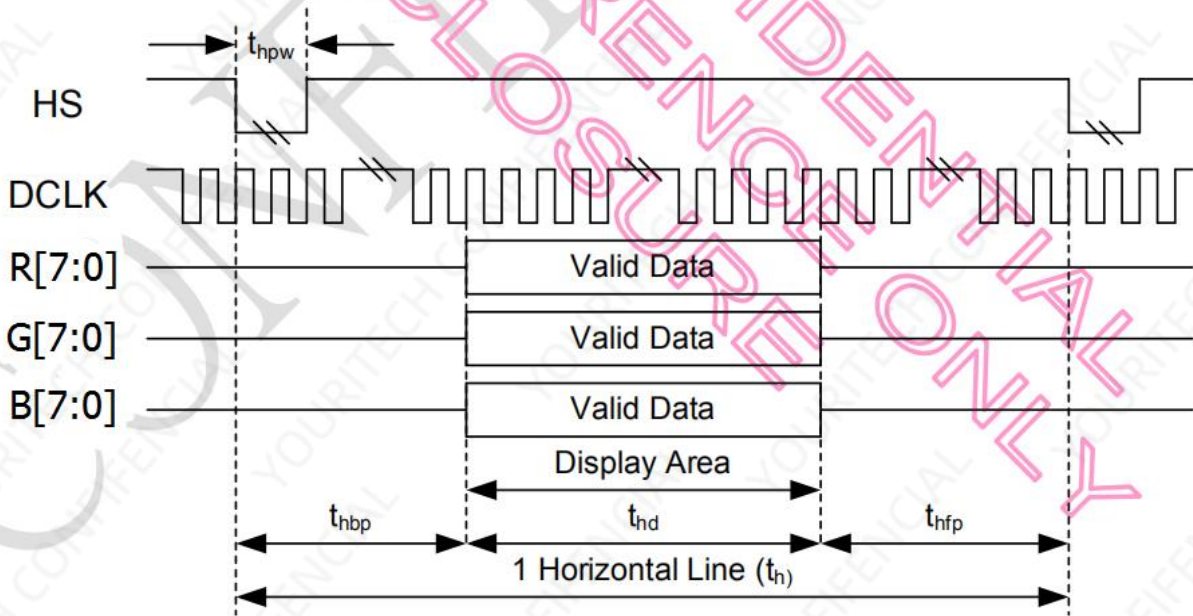
when CLKPOL = LO:



7.3 TIMING CHARACTERISTIC

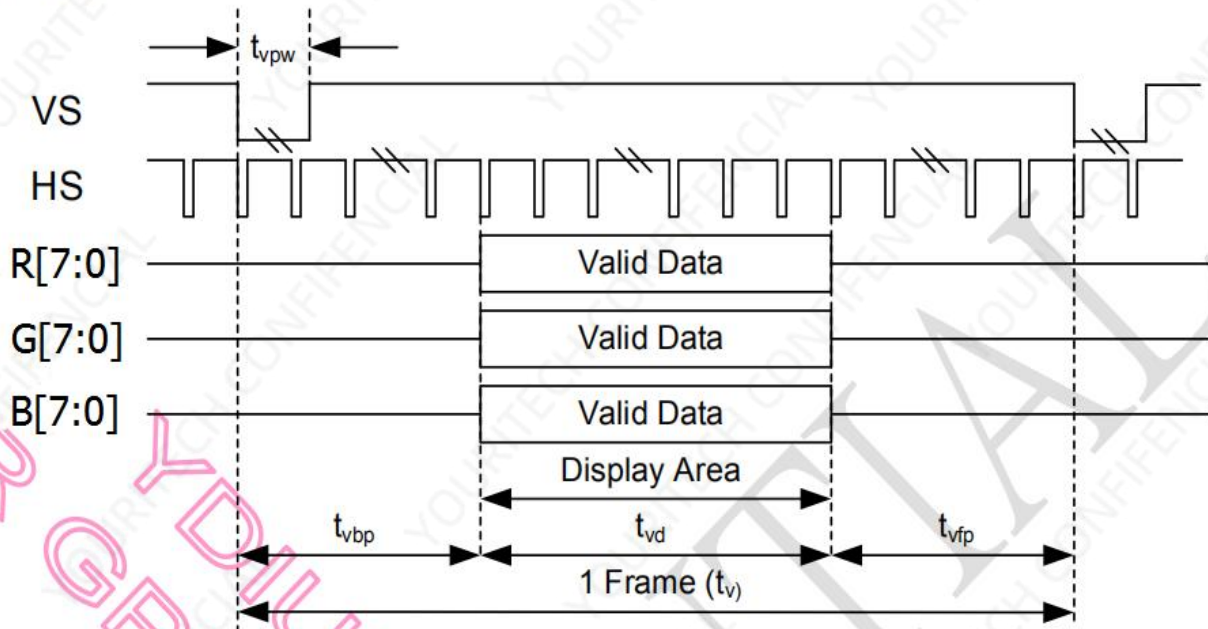
7.3.1 HV Mode Data Input Format for IC as source driver with timing controller

◆ Horizontal



Horizontal input timing at Sync mode

◆ Vertical



Vertical input timing at Sync mode

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Parameter	Symbol	800×RGB×480 (RES[3:0]=0x6h)		
		Min.	Typ.	Max.
DCLK Frequency	F_{DCLK}	25.2	27.2	30.5
Horizontal valid data	t_{hd}	800		
Hsync Pulse Width	t_{hpw}	1	2	100
Hsync back porch	t_{hbp}	5	16	101
Hsync front porch	t_{hfp}	19	44	115
1 Horizontal Line	t_h	856	860	920
Vertical valid data	t_{vd}	480		
Vsync Pulse Width	t_{vpw}	1	2	66
Vsync back porch	t_{vbp}	5	5	67
Vsync front porch	t_{vfp}	5	43	67
1 Vertical field	t_v	490	528	552

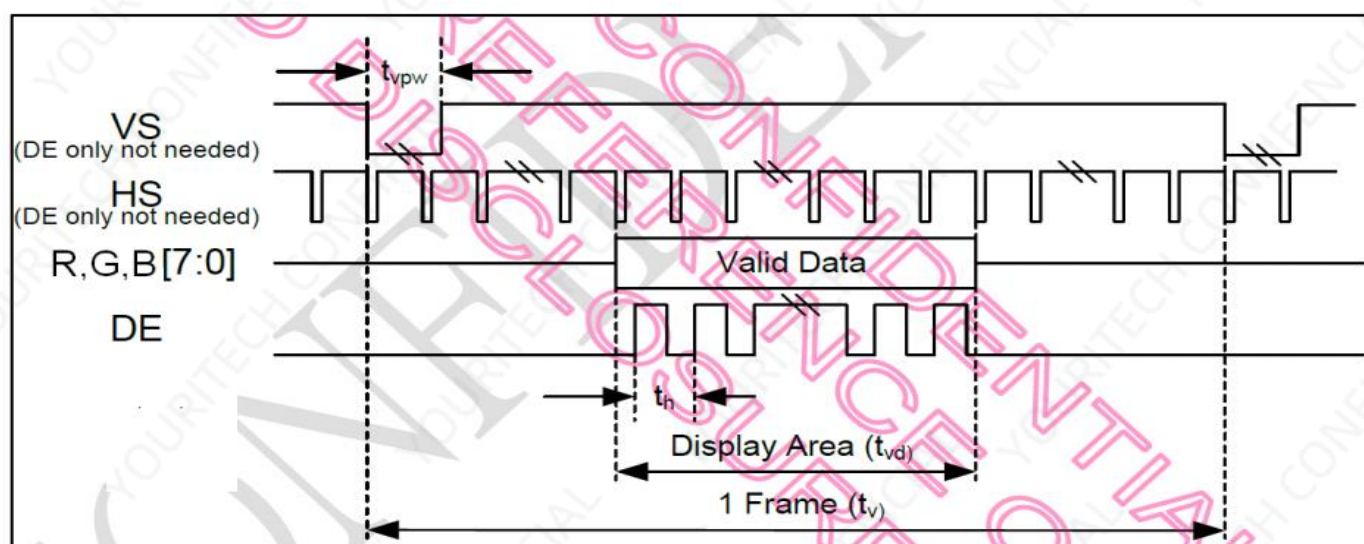
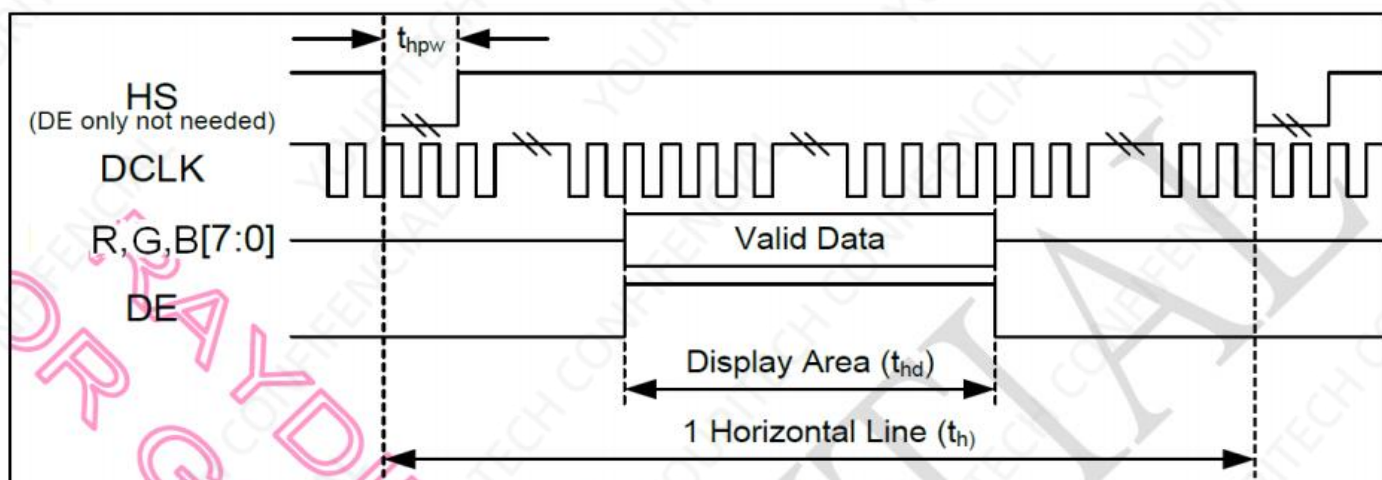
Note: (1) t_{hd} is same to Hactive, and t_{vd} is same to Vactive in chapter 5.1.

(2) DCLK frequency min/max value is base on frame rate 60 Hz.

(3) If thermal function is enabled Minimum Vsync front porch + Vsync back porch should be greater than 6lines + 300us

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7.3.2 DE Mode Data Input Format for IC as source driver with timing controller



Parameter	Symbol	800×RGB×480		
		Min.	Typ.	Max.
DCLK Frequency	F_{DCLK}	25.2	27.2	30.5
Horizontal valid data	t_{hd}		800	
1 Horizontal Line	t_h	856	860	920
Vertical valid data	t_{vd}		480	
1 Vertical field	t_v	490	528	552

Input timing table for DE mode

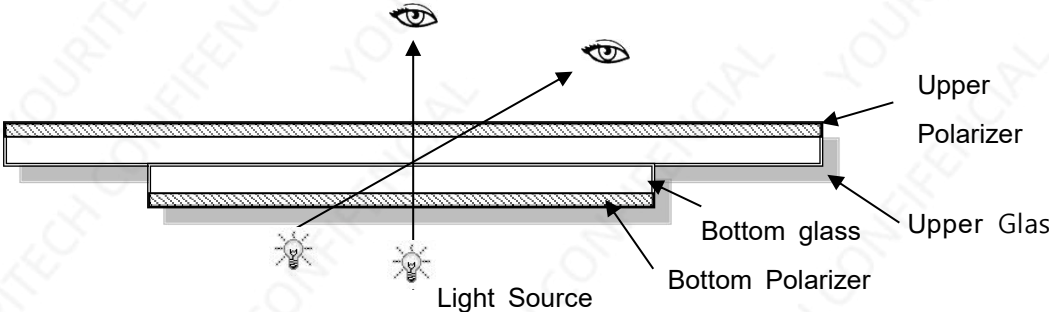
8. LCD Module Out-Going Quality Level

8.1 VISUAL & FUNCTION INSPECTION STANDARD

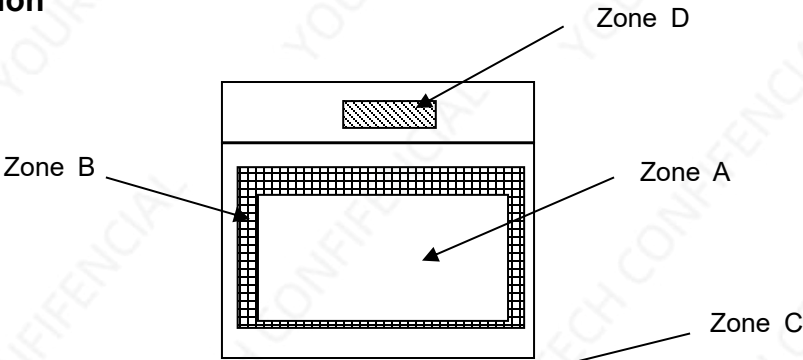
8.1.1 Inspection conditions

Inspection performed under the following conditions is recommended.

- Temperature : $25\pm5^{\circ}\text{C}$
- Humidity : $65\%\pm10\%\text{RH}$
- Viewing Angle : Normal viewing Angle.
- Illumination: Single fluorescent lamp (300 to 700Lux)
- Viewing distance:30-50cm



8.1.2 Definition



- Zone A : Effective Viewing Area(Character or Digit can be seen)
- Zone B : Viewing Area except Zone A
- Zone C : Outside (Zone A+Zone B) which can not be seen after assembly by customer .)
- Zone D : IC Bonding Area

Note:

As a general rule ,visual defects in Zone C can be ignored when it doesn't effect product function or appearance after assembly by customer

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8.1.3 Sampling Plan

According to GB/T 2828-2003 ; , normal inspection, Class II

AQL:

Major defect	Minor defect
0.65	1.5

LCD: Liquid Crystal Display , LCM: Liquid Crystal Module, RTP: Resistance Touch Panel

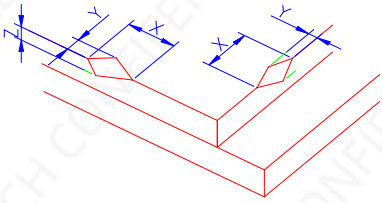
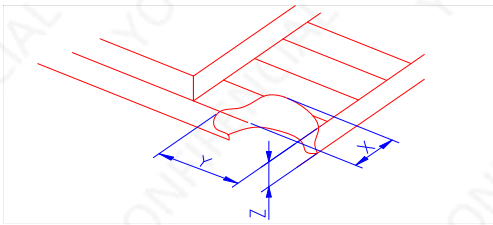
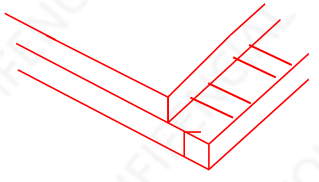
No	Items to be inspected	Criteria	Classification of defects
1	Functional defects	1) No display, Open or miss line 2) Display abnormally, Short 3) Backlight no lighting, abnormal lighting. etc...	Major
2	Missing	Missing components and etc...	
3	Outline dimension	Overall outline dimension beyond the drawing is not allowed, deformation and etc	
4	Color tone	Color unevenness, refer to limited sample	Minor
5	Spot/Line defect	Light dot, Dim spot, (Note1) Polarizer Air Bubble, Polarizer accidented spot and etc.	
6	Soldering appearance	Good soldering , Peeling off is not allowed and etc	
7	LCD/Polarizer/RTP	Black/White spot/line, scratch, crack, etc.	

Note1: a) Light dot: Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern.

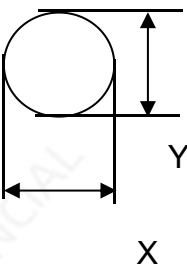
b) Dim dot: Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green, blue picture.

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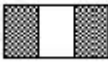
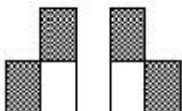
8.1.4 Criteria (Visual)

Number	Items	Criteria(mm)						
1.0 LCD Crack/Broken NOTE: X: Length Y: Width Z: Height L: Length of IT O, T: Height of LCD	(1) The edge of LCD broken	 <table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤3.0mm</td><td><Inner border line of the seal</td><td>≤T</td></tr></table>	X	Y	Z	≤3.0mm	<Inner border line of the seal	≤T
X	Y	Z						
≤3.0mm	<Inner border line of the seal	≤T						
	(2)LCD corner broken	 <table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤3.0mm</td><td>≤L</td><td>≤T</td></tr></table>	X	Y	Z	≤3.0mm	≤L	≤T
X	Y	Z						
≤3.0mm	≤L	≤T						
	(3) LCD crack	 Crack Not allowed						

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2.0	Spot defect  $\Phi=(X+Y)/2$	① light dot (black/white spot , pinhole, stain, etc.)			
		Zone Size (mm) $\Phi \leq 0.15$ $0.15 < \Phi \leq 0.25$ $0.25 < \Phi \leq 0.4$ $\Phi > 0.4$	Acceptable Qty		
			A	B	C
			Ignore		
			3(distance $\geq 10\text{mm}$)		
			2(distance $\geq 10\text{mm}$)		
			0		
			Ignore		
			Ignore		
			Ignore		
			0		
			② Dim spot (light leakage、dent、dark spot, etc)		
		Zone Size (mm) $\Phi \leq 0.15$ $0.15 < \Phi \leq 0.25$ $0.25 < \Phi \leq 0.4$ $\Phi > 0.4$	Acceptable Qty		
			A	B	C
			Ignore		
			3(distance $\geq 10\text{mm}$)		
			2(distance $\geq 10\text{mm}$)		
			0		
			Ignore		
			Ignore		
			Ignore		
			0		
			③ Polarizer accidented spot		
		Zone Size (mm) $\Phi \leq 0.2$ $0.2 < \Phi \leq 0.5$ $\Phi > 0.5$	Acceptable Qty		
			A	B	C
			Ignore		
			2(distance $\geq 10\text{mm}$)		
			0		
			Ignore		
			Ignore		
			Ignore		
			0		
			④Polarizer Bubble		
		Zone Size (mm) $\Phi \leq 0.2$ $0.2 < \Phi \leq 0.4$ $0.4 < \Phi \leq 0.5$ $\Phi > 0.5$	Acceptable Qty		
			A	B	C
			Ignore		
			2(distance $\geq 10\text{mm}$)		
			1		
			0		
			Ignore		
			Ignore		
			Ignore		
			0		

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3.0	LCD Pixel defect	Pixel bad points																							
		<table> <tr> <th>Item</th><th>Zone A</th><th>Acceptable Qt</th></tr> <tr> <td rowspan="3">Bright dot</td><td>Random</td><td>$N \leq 2$</td></tr> <tr> <td>2 dots adjacent</td><td>$N \leq 0$</td></tr> <tr> <td>3 dots adjacent</td><td>$N \leq 0$</td></tr> <tr> <td rowspan="3">Dark dot</td><td>Random</td><td>$N \leq 3$</td></tr> <tr> <td>2 dots adjacent</td><td>$N \leq 0$</td></tr> <tr> <td>3 dots adjacent</td><td>$N \leq 0$</td></tr> <tr> <td>Distance</td><td> 1. Minimum Distance Between Bright dots. 2. Minimum Distance Between dark dots 3. Minimum Distance Between dark and bright dot. </td><td>5mm</td></tr> <tr> <td colspan="2">Total bright and dark dot</td><td>$N \leq 4$</td></tr> </table> Note: A) Bright dot: Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern. B) Dark dot: Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green, blue picture. C) 2 dot adjacent = 1 pair = 2 dots Picture:   2 dot adjacent 2 dot adjacent (vertical)   2 dot adjacent 2 dot adjacent (slant)	Item	Zone A	Acceptable Qt	Bright dot	Random	$N \leq 2$	2 dots adjacent	$N \leq 0$	3 dots adjacent	$N \leq 0$	Dark dot	Random	$N \leq 3$	2 dots adjacent	$N \leq 0$	3 dots adjacent	$N \leq 0$	Distance	1. Minimum Distance Between Bright dots. 2. Minimum Distance Between dark dots 3. Minimum Distance Between dark and bright dot.	5mm	Total bright and dark dot		$N \leq 4$
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4.0	Line defect (LCD/RTP /Polarizer backlight black/white line, scratch, stain)  W: width, L : length N : Count	Width(mm)	Length(m)	Acceptable Qty		
				A	B	C
		$\Phi \leq 0.05$	Ignore	Ignore		Ignore
		$0.05 < W \leq 0.06$	$L \leq 5.0$	$N \leq 3$		
		$0.06 < W \leq 0.08$	$L \leq 4.0$	$N \leq 2$		
$W > 0.08$	Define as spot defect					
5.0	Electronic Components SMT.	Not allow missing parts, solderless connection, cold solder joint, mismatch, The positive and negative polarity opposite				
6.0	Display color& Brightness.	1. Color: Measuring the color coordinates, The measurement standard according to the datasheet or samples. 2. Brightness: Measuring the brightness of White screen, The measurement standard according to the datasheet or Samples.				
7.0	LCD Mura/Waving/ Hot spot	Not visible through 5% ND filter in 50% gray or judge by limit sample if necessary.				

8.0	RTP Related	RTP film bubble/ accidented spot	<table><tr><td rowspan="2">Size Φ(mm)</td><td colspan="3">Acceptable Qty</td></tr><tr><td>A</td><td>B</td><td>C</td></tr><tr><td>$\Phi \leq 0.1$</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>$0.1 < \Phi \leq 0.25$</td><td colspan="2">4 (distance $\geq 10\text{mm}$)</td></tr><tr><td>$0.25 < \Phi \leq 0.35$</td><td colspan="2">3 (distance $\geq 10\text{mm}$)</td></tr><tr><td>$\Phi > 0.35$</td><td colspan="2">0</td></tr></table>				Size Φ (mm)	Acceptable Qty			A	B	C	$\Phi \leq 0.1$	Ignore		Ignore	$0.1 < \Phi \leq 0.25$	4 (distance $\geq 10\text{mm}$)		$0.25 < \Phi \leq 0.35$	3 (distance $\geq 10\text{mm}$)		$\Phi > 0.35$	0							
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		RTP film scratch	<table><tr><td rowspan="2">Width(mm)</td><td rowspan="2">Length</td><td colspan="3">Acceptable Qty</td></tr><tr><td>A</td><td>B</td><td>C</td></tr><tr><td>$\Phi \leq 0.05$</td><td>Ignore</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>$0.05 < W \leq 0.06$</td><td>$L \leq 5.0$</td><td colspan="2">$N \leq 3$</td></tr><tr><td>$0.06 < W \leq 0.08$</td><td>$L \leq 4.0$</td><td colspan="2">$N \leq 2$</td></tr><tr><td>$0.08 < W$</td><td colspan="3">Define as spot defect</td></tr></table>				Width(mm)	Length	Acceptable Qty			A	B	C	$\Phi \leq 0.05$	Ignore	Ignore		Ignore	$0.05 < W \leq 0.06$	$L \leq 5.0$	$N \leq 3$		$0.06 < W \leq 0.08$	$L \leq 4.0$	$N \leq 2$		$0.08 < W$	Define as spot defect			
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		Assembly deflection	beyond the edge of backlight $\leq 0.2\text{mm}$					
		Bulge (undulation included)	The ITO film plumped below 0.40mm, it's ok. 					
		Newton Ring	Newton Ring area>1/3 TP area NG Newton Ring area $\leq$ 1/3 TP area OK					
		RTP corner broken X : length Y : width Z : height	<table border="1"><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>X$\leq$3mm</td><td>Y$\leq$3mm</td><td>Z<COVER thickness</td></tr></tbody></table> * *Circuitry broken is not allowed.	X	Y	Z	X $\leq$ 3mm	Y $\leq$ 3mm
X	Y	Z						
X $\leq$ 3mm	Y $\leq$ 3mm	Z<COVER thickness						

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Criteria (functional items)

Number	Items	Criteria (mm)
1	No display	Not allowed
2	Missing segment	Not allowed
3	Short	Not allowed
4	Backlight no lighting	Not allowed
5	TP no function	Not allowed

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9. Reliability Test Result

Item	Condition	Inspection after test
High Temperature Operating	85°C,96H	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD; 2.Non-display; 3.Missing segments/line; 4.Glass crack; 5.Current IDD is twice higher than initial value.
Low Temperature Operating	-30°C, 96HR	
High Temperature Storage	90°C, 96HR	
Low Temperature Storage	-40°C, 96HR	
High Temperature & High Humidity Operating	+60°C, 90% RH ,96 hours.	
Thermal Shock (Non-operation)	-10°C,30 min ↔ 60°C,30 min, Change time:5min 20CYC.	
ESD test	C=150pF, R=330,5points/panel Air:±8KV, 5times; Contact:±6KV, 5 times; (Environment: 15°C~35°C, 30%~60%).	
Vibration (Non-operation)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition).	
Box Drop Test	1 Corner 3 Edges 6 faces,80cm(MEDIUM BOX)	

Remark:

- 1.The test samples should be applied to only one test item.
- 2.Sample size 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 judged as a good part.
- 5.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.
6. The color fading mura of polarizing filter should not care.

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10. Cautions and Handling Precautions

10.1 Handling and Operating the Module

(1) When the module is assembled, it should be attached to the system firmly.

Do not warp or twist the module during assembly work.

(2) Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.

(3) Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.

(4) Do not allow drops of water or chemicals to remain on the display surface.

If you have the droplets for a long time, staining and discoloration may occur.

(5) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

(6) The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane.

Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

(7) 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) Protect the module from static; it may cause damage to the CMOS ICs.

(9) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

(10) Do not disassemble the module.

(11) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

(12) Pins of I/F connector shall not be touched directly with bare hands.

(13) Do not connect, disconnect the module in the "Power ON" condition.

(14) Power supply should always be turned on/off by the item 6.1 Power On Sequence & 6.2 Power Off Sequence

10.2 Storage and Transportation.

(1) Do not leave the panel in high temperature, and high humidity for a long time.

It is highly recommended to store the module with temperature from 0 to 35 °C and relative humidity of less than 70%

(2) Do not store the TFT-LCD module in direct sunlight.

(3) The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.

(4) It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module.

In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.

(5) This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.

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11. Packing

