

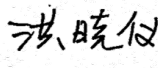
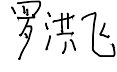
PRODUCT SPECIFICATION

CDTECH Model: **S070SWV169EP-FC176-1**

CUSTOMER Model: **-**

Description: **7.0 " TFT-LCD Module with CTP**

Version: **1.0**

CDTECH	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
DATE	2025.3.4	2025.3.4	2025.3.4

CUSTOMER APPROVAL	SIGNATURE	DATE



Record of Revisions

[illegible]



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1. General Specifications

1.1 LCM General Information

Item	Specification	Unit
LCD Size	7.0	inch
Number of Pixels	800 (H) RGB x 480 (V)	pixels
Display Mode	Normally Black	-
Viewing Direction	-	-
Interface	RGB	-
Display Colors	16M	colors
Outline Dimension	174.98 (H) x 114.02 (V) x 5.6 (D)	mm
Active Area	152.4 (H) x 91.44 (V)	mm
Pixel Pitch	0.1905 (H) x 0.1905 (V)	mm
Driver IC	HX8249+HX8678	-
Operation Temperature	-30~80	°C
Storage Temperature	-40~85	°C

1.2 Touch Panel Information

Item	Specification
Touch Structure	G+G
Bonding Type with LCM	OCA Optical Bonding
Driver IC	GT911
Interface	I ² C
Touch Count Max	5 Points
Surface treatment	-
Surface hardness	6H
I2C slave address	0x28
Origin of coordinate	Top Left Corner

Note1: Requirements on environmental protection RoHS compliant.

2. Absolute Maximum Ratings

Item	Symbol	MIN.	MAX.	Unit	Note
Analog Supply voltage	VDD	-0.3	4.0	V	Note 1

Note 1: Permanent damage may occur to the LCD module if beyond this specification.

Functional operation should be restricted to the conditions described under normal operating conditions.

3. Electrical Characteristics

3.1 Recommended Operating Condition for TFT LCD

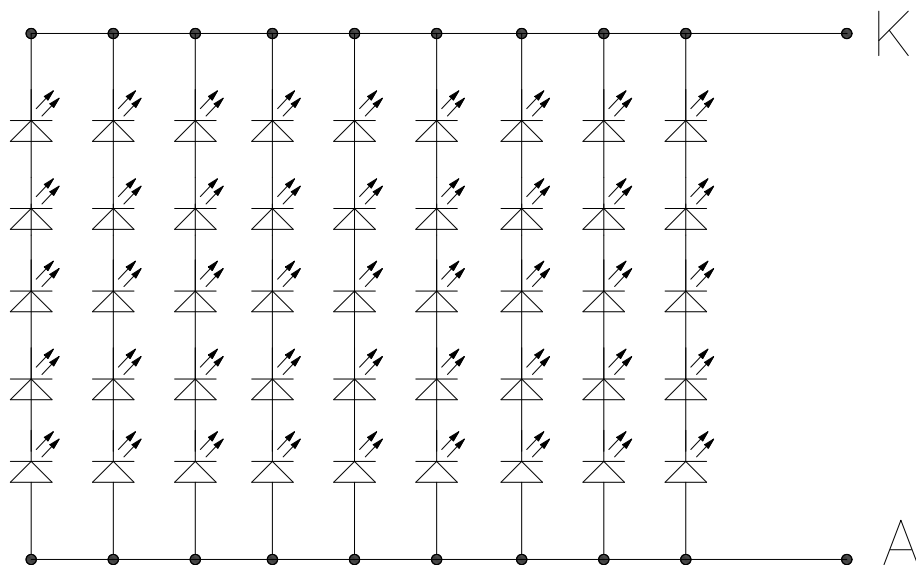
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Analog Supply voltage	VDD	3.0	3.3	3.6	V	
Analog supply current	I_{VDD}	30	45	60	mA	VDD=3.3V (White picture)
Logic input voltage	V_{IH}	$0.7 \cdot VDD$	-	VDD	V	
	V_{IL}	GND	-	$0.3 \cdot VDD$	V	

3.2 Recommended Driving Condition for Backlight

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Driving Current	I_F	-	180	-	mA	
Driving Voltage	V_F	13.5	-	17.0	V	
Power consumption	W_{BL}	2.43	-	3.06	W	
LED Life-Time	N/A	-	50,000	-	Hours	Ta=25°C Note 1

Note 1: LED lifetime is defined as the module brightness decay 50% of original brightness at Ta=25 degree, typical current.

Note 2:LED circuit :



3.3 Touch Panel

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply voltage	VDD_TP	-	3.3	-	V	
Analog supply current	I _{VDD_TP}	5	15	25	mA	VDD_TP=3.3V
Input high-level voltage	VIH	0.7*VDD_TP	-	VDD_TP	V	
Input low -level voltage	VIL	GND	-	0.3*VDD_TP	V	

4. Interface Pin Assignment

4.1 LCM Pin Assignment

No.	Symbol	Description
1	LEDK	Power for LED backlight (Cathode)
2	LEDA	Power for LED backlight (Anode)
3	GND	Ground
4	VDD	Power supply
5-12	R0-R7	Data bus
13-20	G0-G7	Data bus
21-28	B0-B7	Data bus
29	GND	Ground
30	CLK	Data/clock input pins for TTL mode.
31	DISP	Standby mode setting pin. The chip is in standby mode when DISP=0.
32	HSYNC	Horizontal sync signal for TTL mode.
33	VSYNC	Vertical sync signal for TTL mode.
34	DEN	Data enable signal for TTL mode.
35	NC	No connection
36	GND	Ground
37	XR(NC)	No connection
38	YD(NC)	No connection
39	XL(NC)	No connection
40	YU(NC)	No connection

4.2 Touch FPC Pin Assignment

No.	Symbol	Description
1	GND	Ground
2	SDA	I2C data input and output for CTP
3	SCL	I2C clock input for CTP
4	VDD	Power supply for CTP
5	INT	Interrupt signal for CTP
6	RST	Reset Pin for CTP

5. Interface Characteristics

5.1 Power on/off Sequence

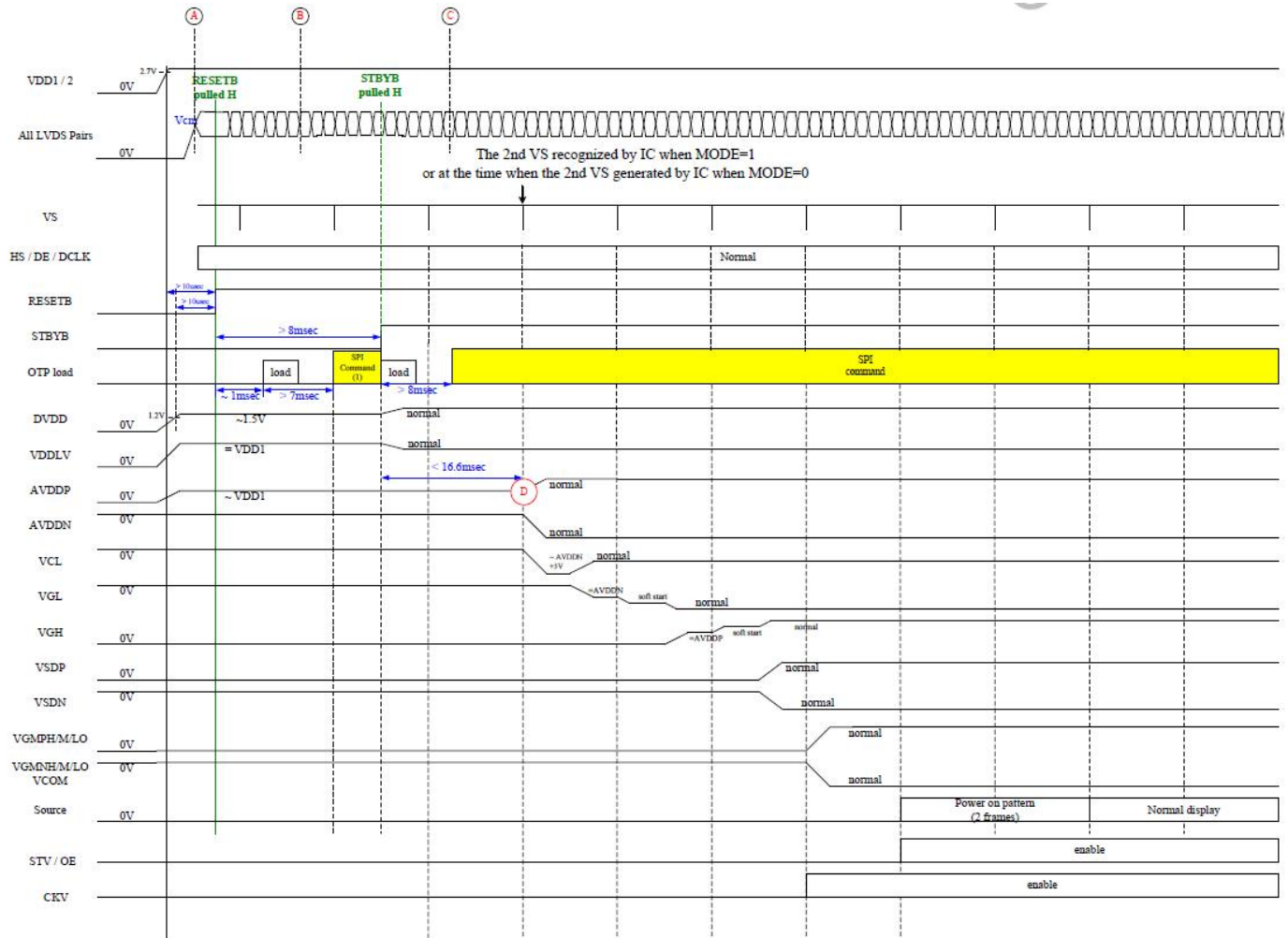


Figure 6.3: Power on sequence with external AVDDP/AVDDN

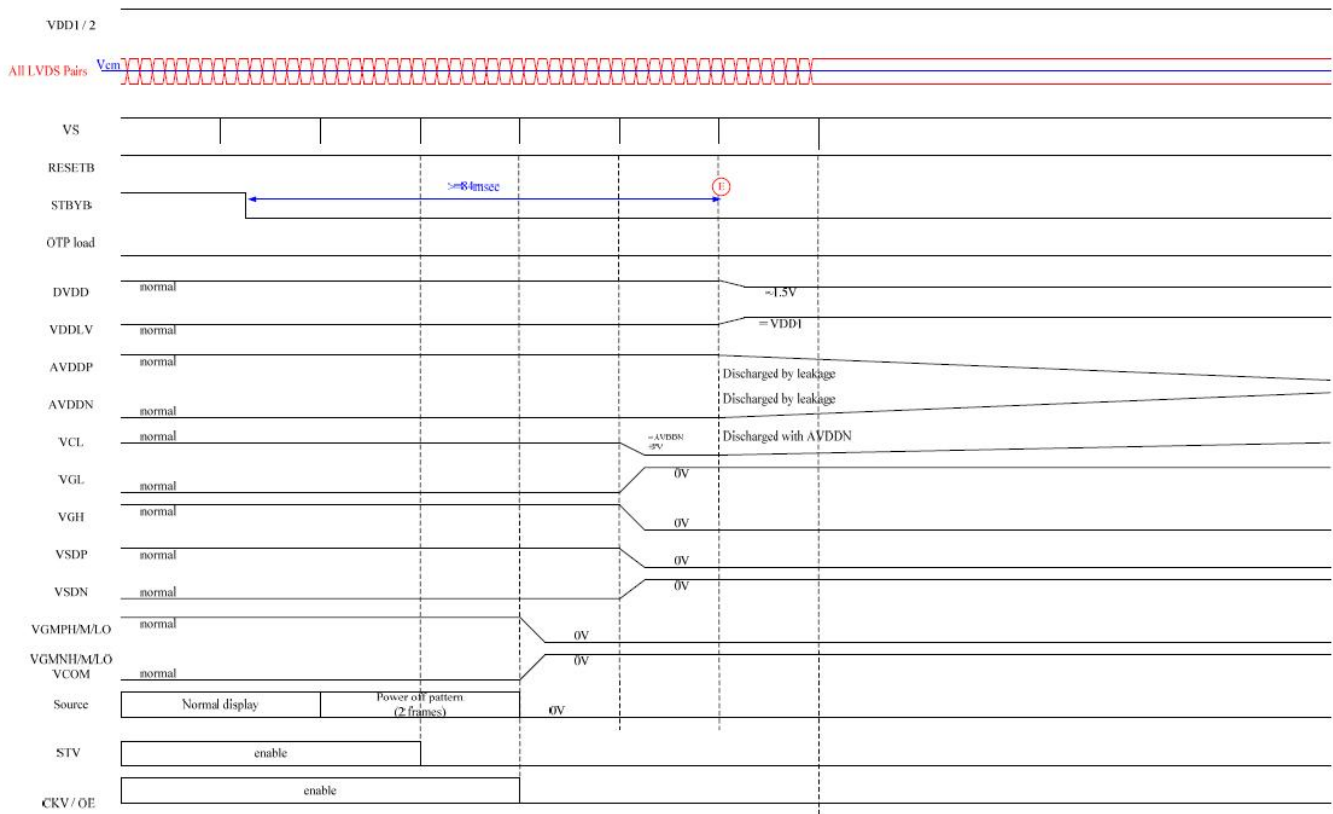


Figure 6.4: Power off sequence with external AVDDP/AVDDN

5.2 AC/DC Characteristics

TTL interface

(VDD1=VDD2=2.7 to 3.6V, VSS1=VSS2=VSSA=0V, T_{OP}=25°C)

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
Operating frequency, TTL mode	F _{TTL}	-	5.25	-	60	MHz
Operating frequency, LVDS mode	F _{LVDS}	-	10	-	85	MHz
Supply voltage for main power and digital I/O	VDD1 VDD2	-	2.7	-	3.6	V
Low level input voltage	V _{IL}	-	VSS1-0.3	-	0.3*VDD1	V
High level input voltage	V _{IH}	-	0.7*VDD1	-	VDD1+0.3	V
High level output voltage	V _{OH}	-	VDD1-0.4	-	-	V
Low level output voltage	V _{OL}	-	VSS1	-	VSS1+0.4	V
Pull low / high resistor	R _I	For digital input pins	200	350	850	KΩ
Low level input leakage current	I _{LKGL}	For digital input pins with pull high resistor	-18	-	2	μA
		For digital input pins without pull high resistor	-2	0	2	μA
High level input leakage current	I _{LKGH}	For digital input pins with pull low resistor	-2	-	18	μA
		For digital input pins without pull low resistor	-2	0	2	μA

5.3 Reset Timing

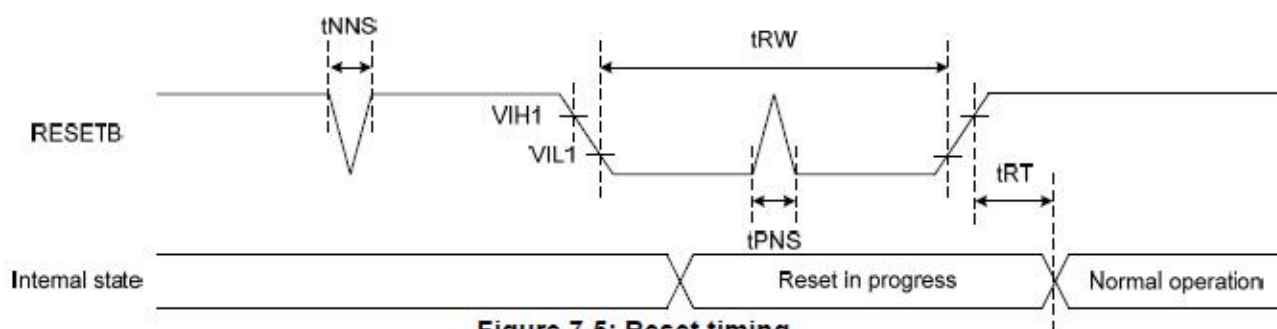


Figure 7.5: Reset timing

(VDD1=VDD2=2.7 to 3.6V, GND=0V, T_A= -40 to +105 °C)

Signal	Parameter	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
RESETB	Reset pulse width	tRW	10	-	-	μs
	Reset complete time	tRT	-	-	5	μs
	Positive spike noise width	tPNS	-	-	100	ns
	Negative spike noise width	tNNS	-	-	100	ns

Table 7.4: Reset timing parameters

5.4 input Timing

5.4.1 Input signal timing

TTL interface

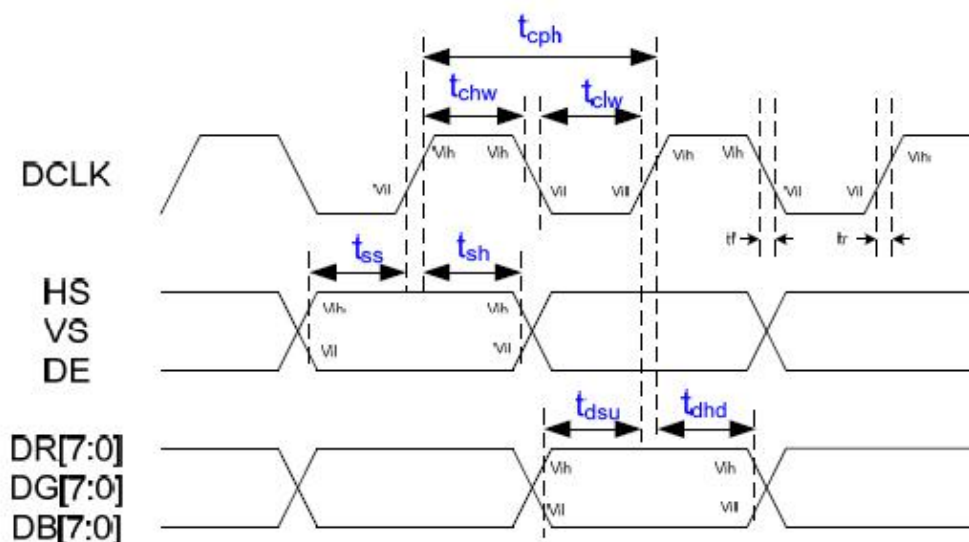


Figure 7.1: TTL input timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK period	T_{cph}	16.8	-	-	ns
DCLK clock high width	T_{chw}	6	-	-	ns
DCLK clock low width	T_{clw}	6	-	-	ns
VS setup time	T_{ss}	5	-	-	ns
VS hold time	T_{sh}	5	-	-	ns
HS setup time	T_{ss}	5	-	-	ns
HS hold time	T_{sh}	5	-	-	ns
DE setup time	T_{ss}	5	-	-	ns
DE hold time	T_{sh}	5	-	-	ns
Data setup time	T_{dsu}	5	-	-	ns
Data hold time	T_{dhd}	5	-	-	ns
Input signal rising time	T_r	-	-	10	ns
Input signal falling time	T_f	-	-	10	ns

Table 7.1: TTL input timing parameters

5.5 SYNC Mode

Parallel RGB at Sync mode

- Horizontal

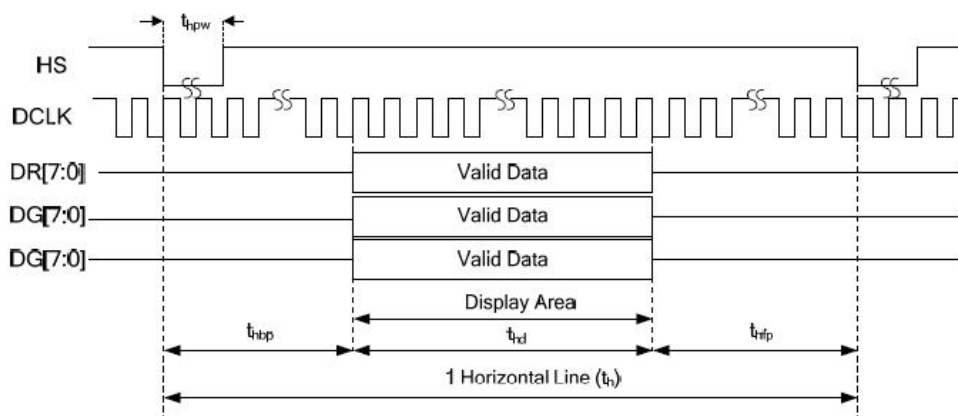


Figure 7.7: Horizontal input timing at Sync mode

- Vertical

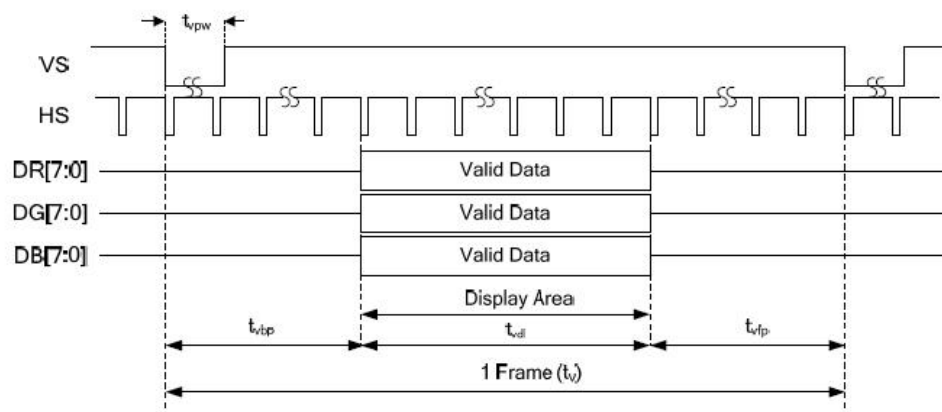


Figure 7.8: Vertical input timing at Sync mode

Parameter	Symbol	Panel resolution									Unit
		800xRGBx480 (RS[3:0]=6h)			800xRGBx1280 (RS[3:0]=7h)			960xRGBx160 (RS[3:0]=8h)			
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
DCLK frequency	F _{DCLK}	25.2	27.2	30.5	66.3	69.4	77.7	10.4	11.8	14.8	MHz
Horizontal valid data	t _{hd}	800			800			960			DCLK
Hsync pulse width	t _{hpw}	1	2	100	1	2	100	1	2	124	DCLK
Hsync back porch	t _{hbp}	5	16	101	5	16	101	5	16	125	DCLK
Hsync front porch	t _{hfp}	19	44	115	19	44	115	19	44	139	DCLK
1 horizontal line	t _h	856	860	920	856	860	920	1016	1020	1104	DCLK
Vertical valid data	t _{vd}	480			1280			160			H
Vsync pulse width	t _{vpw}	1	2	66	1	2	122	1	2	58	H
Vsync back porch	t _{vbp}	5	5	67	5	5	123	5	5	59	H
Vsync front porch	t _{vfp}	5	43	67	5	59	123	5	27	59	H
1 vertical field	t _v	490	528	552	1290	1344	1408	170	192	224	H

6. Optical Specifications

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR≥10) B/L ON	θ_T	$\Phi=90^\circ$ (12 o'clock)	70	80	-	deg	Note2
	θ_B	$\Phi=270^\circ$ (6 o'clock)	70	80	-	deg	Note2
	θ_L	$\Phi=180^\circ$ (9 o'clock)	70	80	-	deg	Note2
	θ_R	$\Phi=0^\circ$ (3 o'clock)	70	80	-	deg	Note2
Response Time	T_{ON}	Normal $\theta=\Phi=0^\circ$	-	12	17	msec	Note4
	T_{OFF}		-	12	17	msec	Note4
Contrast Ratio	CR		800	1000	-	-	Note1 Note3
Color Chromaticity	W_X		TBD	TBD	TBD	-	Note1 Note5
	W_Y		TBD	TBD	TBD	-	Note1 Note5
Luminance	L		750	850	-	cd/m ²	Note1 Note7
Luminance Uniformity	Y_U		75	80	-	%	Note1 Note6
NTSC	-		67	70	-	%	-

Note 1:Definition of optical measurement system

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.

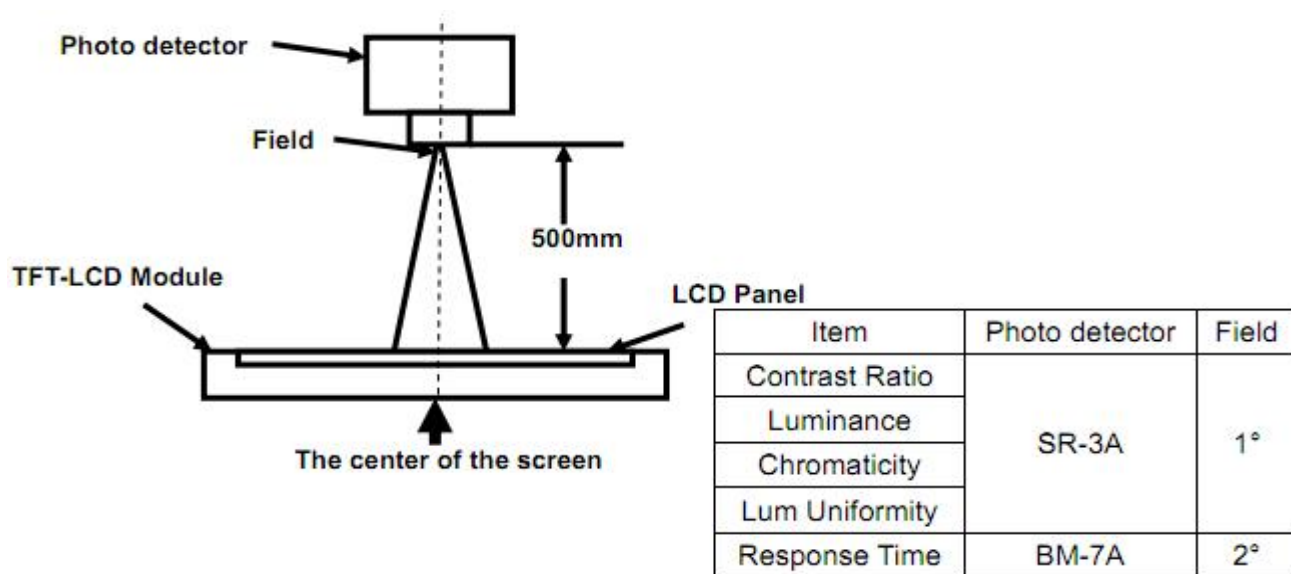


Fig 1

Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

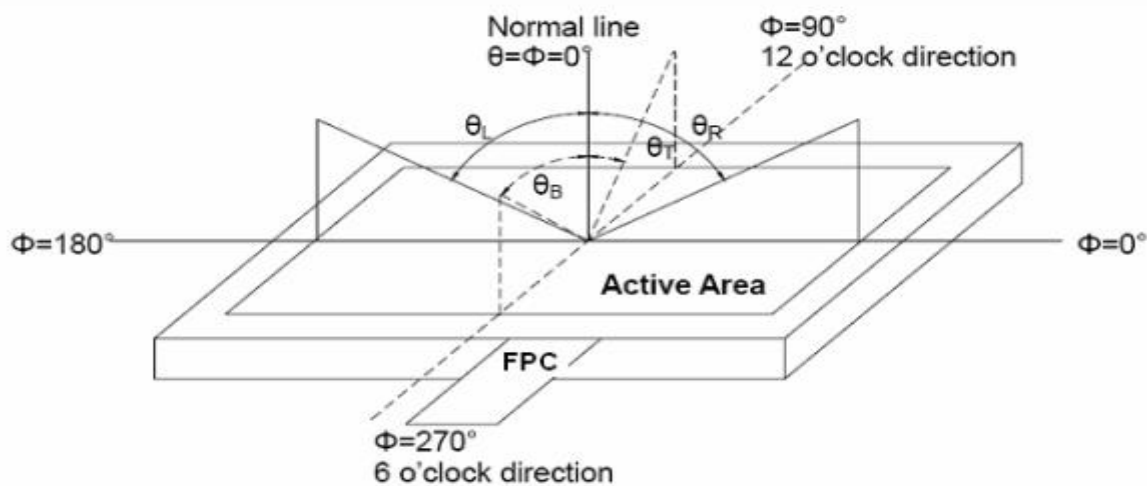


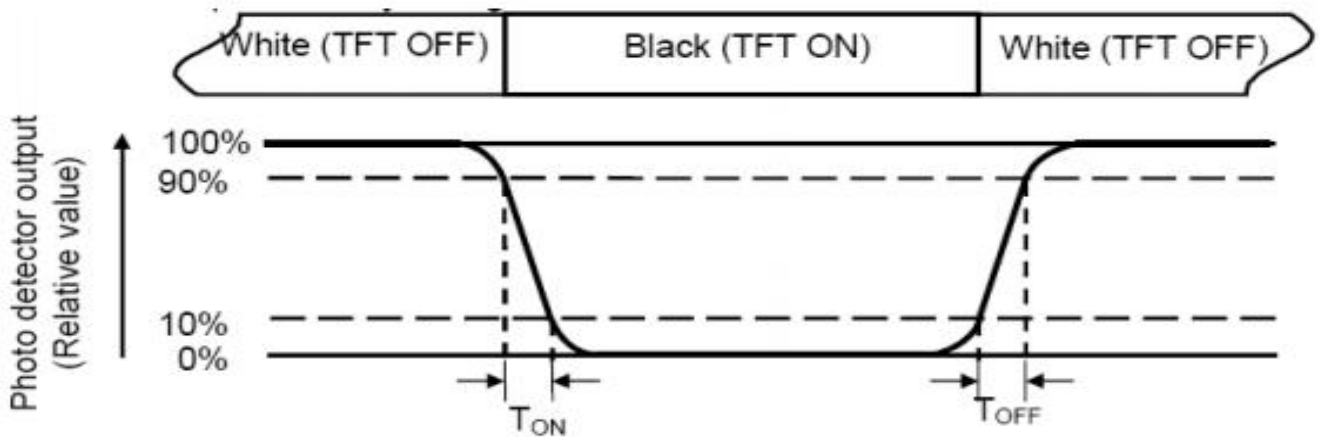
Fig 2 Definition of viewing angle

Note 3: Definition of contrast ratio

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

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

The luminance uniformity in surface luminance is determined by measuring luminance at each test position 1 through n, and then dividing the maximum luminance of n points luminance by minimum luminance of n points luminance. For more information see FIG.3-a/b

Note 7: Surface luminance is the luminance with all pixels displaying white.

L_v = Average Surface Luminance with all white pixels ($P_1, P_2, P_3, \dots, P_n$)

For more information see FIG.3-a/b

Note 8:

H,V : Active area(see Figure b)

Light spot size $\varnothing = 5\text{mm}$ (BM-5) or $\varnothing = 7.7\text{mm}$ (BM-7) 50cm distance or compatible distance from the LCD surface to detector lens. test spot position : see Figure b.

measurement instrument : TOPCON's luminance meter SR-3A or BM-7 or compatible (see Figure 1).

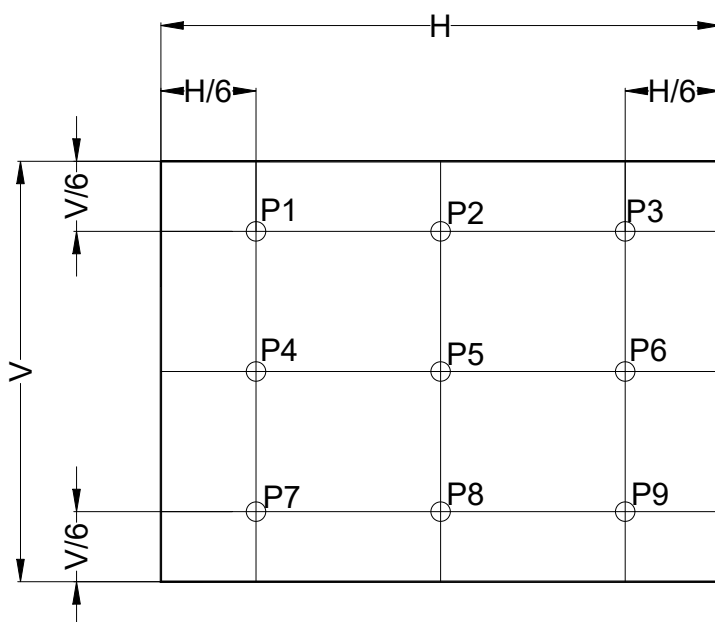


Fig. 3-b Definition of points

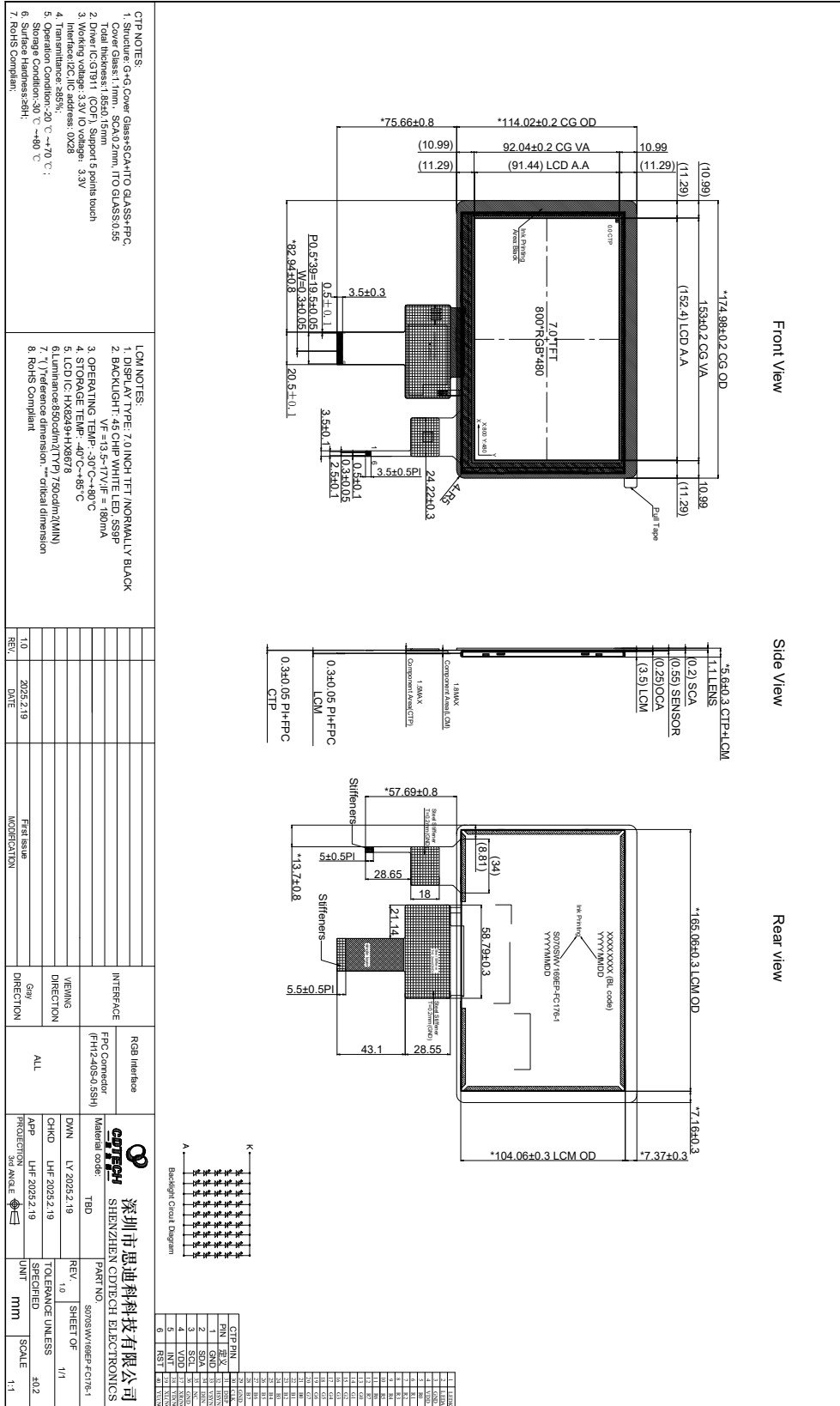
7. Reliability Test Items

Test Item	Test Conditions
High Temperature Storage	Ta= +85℃ 96hrs
Low Temperature Storage	Ta= -40℃ 96hrs
High Temperature Operation	Ta= +80℃ 96hrs
Low Temperature Operation	Ta= -30℃ 96hrs
High Temperature and Humidity Storage	Ta= +60℃, 90% RH 96hrs
Thermal Shock (Non-operation)	-40℃/30 min ~ +85℃/30 min for 20 cycles Start with cold temperature end with high temperature
Electro Static Discharge	Contact = ± 4 kV, class B Air = ± 8 kV, class B R=330Ω,C=150pF
Vibration	Sweep: 10Hz~55Hz~10Hz Stroke: 1.5mm 2 hrs for each direction of X .Y. Z.
Mechanical Shock	60G 6ms,±X,±Y,±Z 3 times for each direction
Package Drop Test	Height: 60 cm 1 corner, 3 edges, 6 surfaces

Notes: The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample will not be accepted if appear these defects:

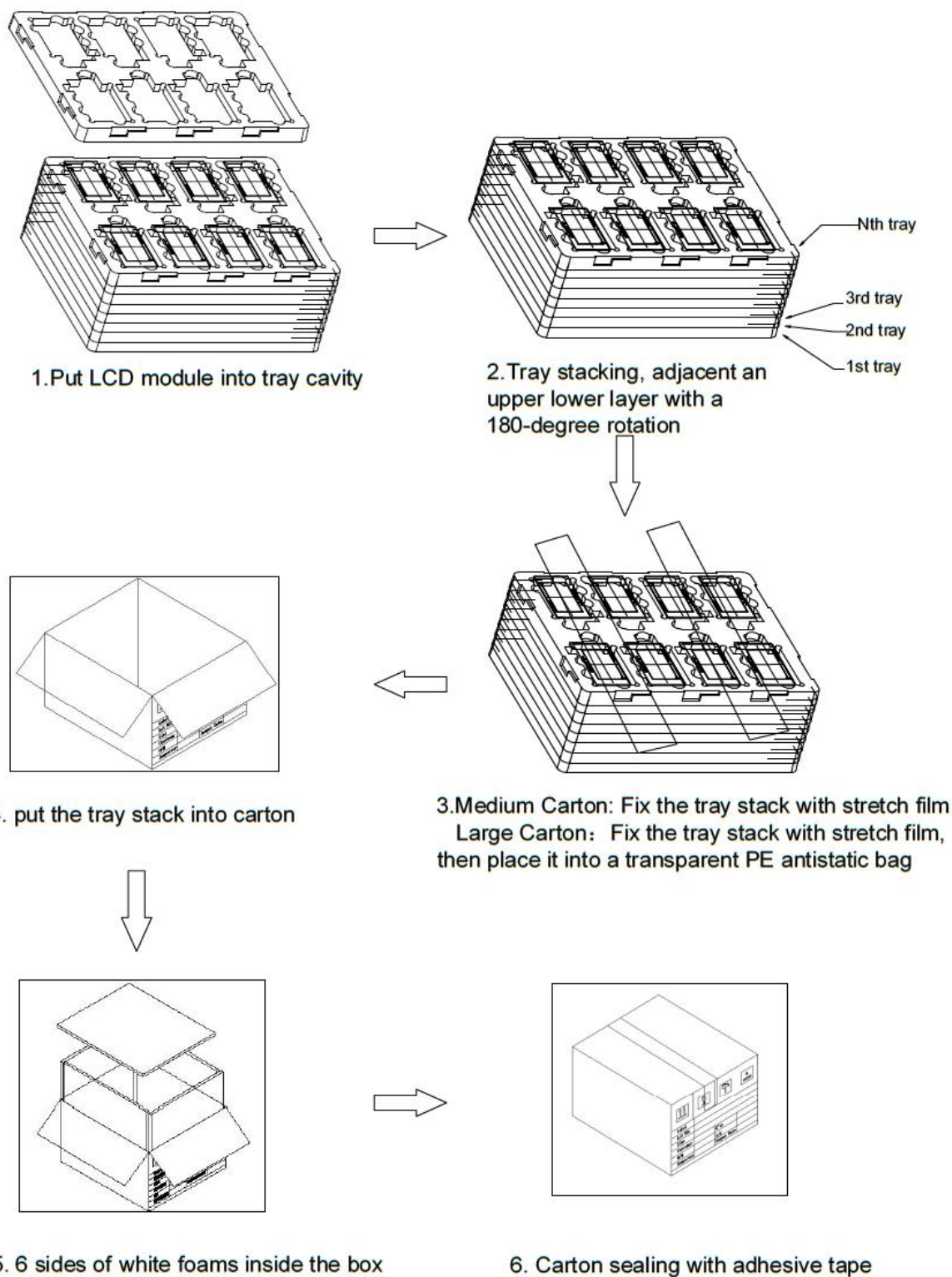
- 1). Air bubble in the LCD
- 2). Seal leak or Glass crack
- 3). Non display or abnormal display
- 4). Brightness reduction >50%

8. Mechanical Drawing



9. Packing

Packing Method



10. Precautions for Use of LCD modules

10.1 Handling Precautions

10.1.1. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2. 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.

10.1.3. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketene
- Aromatic solvents

10.1.6. Do not attempt to disassemble the LCD Module.

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

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

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

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

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

10.1.8.4. 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.

10.2 Storage Precautions

10.2.1. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

10.2.2. The LCD modules should be stored under the storage temperature range if the LCD modules will be stored for a long time, the recommend condition is :

Temperature : 0℃ ~40℃ Relatively humidity: ≤80%

10.2.3. The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.

10.4 Packaging instructions

When the customers using trays, they have to stack the adjacent trays in a 180° staggered to prevent pressure that could cause product damage.