



LN80480T050IA9098-TR

5.0 inch, 800×480, TN screen with normal viewing angle, air bonding RTP

DWIN Technology Technical Document

Disclaimer: The product design is subject to alternation and improvement without prior notice.

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1 General Feature

1.1 LCD Parameters

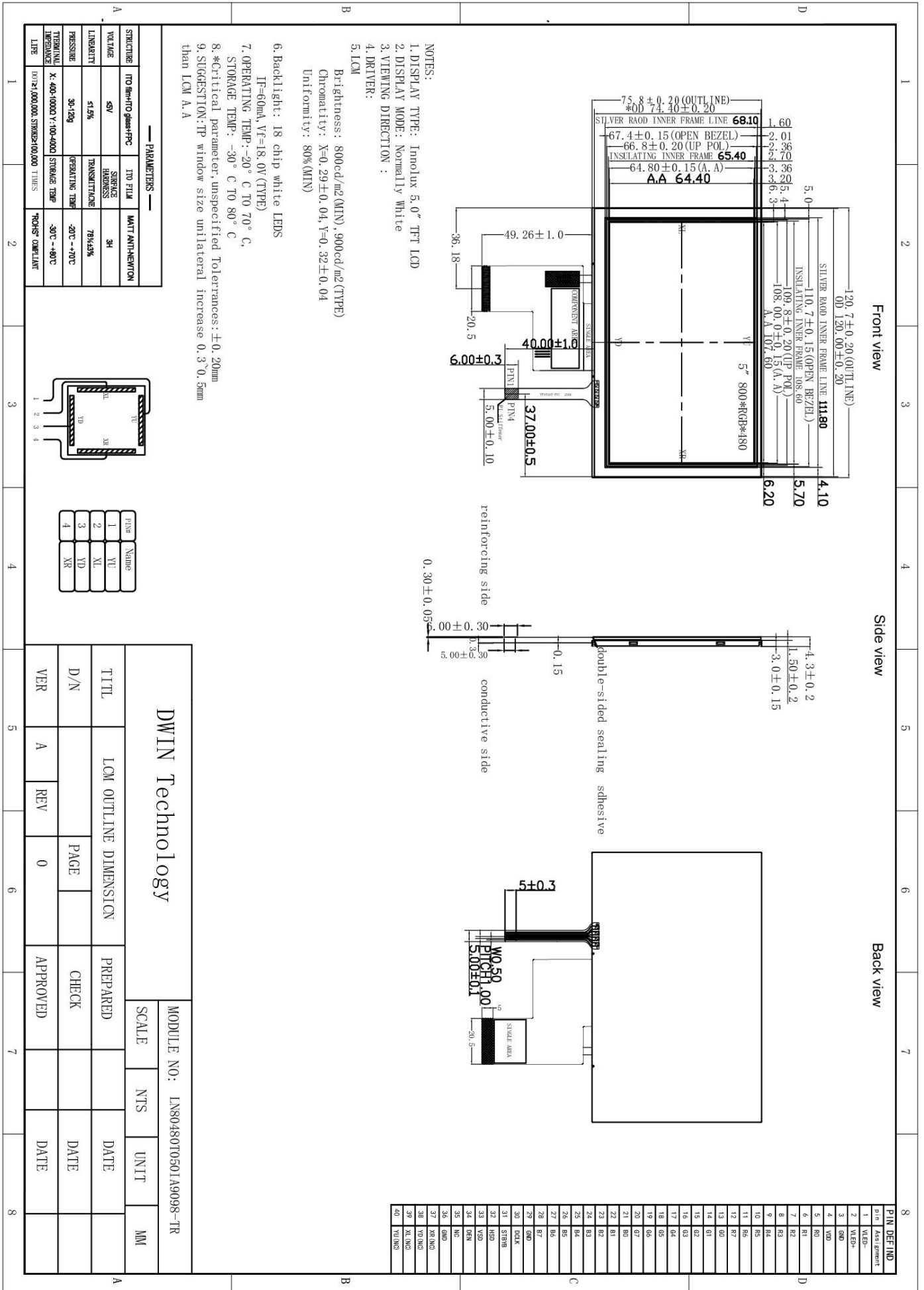
Feature		Description	Unit
Display Spec.	Size	5.0	inch
	Resolution	800(H)*480(V)	pixels
	Pixel Configuration	RGB stripe	-
	Pixel Pitch	0.135(W)*0.135(H)	mm
	Viewing Direction	6 o'clock	-
Mechanical Characteristics	Outside Dimension	120.7(W)*75.8(H)*3.0(D)	mm
	Active Area	108.0(W)*64.8(H)	mm
	Luminance	600	cd/m ²
	LED Numbers	20 LEDS	-
	Pin Order	From left to right 40PIN_0.5mm	-
Electrical Characteristics	Interface	RGB_24bit	-
	Color Depth	16.7M	colors
	Driver Condition	3.3(Type)	V
	Driver IC	ILI6122+ILI5960	-
Temperature Range	Operating Temp.	-20~70	°C
	Storage Temp.	-30~80	°C

1.2 Touch Parameters

Feature	Description
Type	RTP (Resistive touch panel)
Structure	ITO Film+ ITO Glass+ FPC
Outline Size(mm)	120.20(W)*74.4(H)*1.5(T)
Active Area(mm)	107.6(W)*64.4(H)
Surface Hardness	3H
Light Transmittance	78%±3%
Operating Temperature	-20~70℃
Storage Temperature	-30~80℃

Note: Requirements on Environmental Protection: RoHS

2 Mechanical Drawing



3 Input/Output Terminals

3.1 LCD Input/Output Terminals

Pin NO.	Symbol	Function	Remark
1	VLED-	Power for LED backlight cathode	
2	VLED+	Power for LED backlight anode	
3	GND	Power Ground	
4	DVDD	Power voltage	
5	R0	Red data(LSB)	
6-11	R1-R6	Red data	
12	R7	Red data(MSB)	
13	G0	Green data(LSB)	
14-19	G1-G6	Green data	
20	G7	Green data(MSB)	
21	B0	Blue data(LSB)	
22-27	B1-B6	Blue data	
28	B7	Blue data(MSB)	
29	GND	Power Ground	
30	PCLK	Pixel clock	
31	DISP	Standby mode, Normally pull high STBYB="1", normal operation; STBYB="0", timing control, source driver will turn off, all output are high-Z	
32	HSYNC	Horizontal sync input in digital parallel RGB. Negative polarity.	
33	VSYNC	Vertical sync input in digital parallel RGB. Negative polarity.	
34	DE	Input data enable control. When DE mode, active High to enable data input.(Normally pull low)	
35	NC	Not connection	
36	GND	Power Ground	
37	XR(NC)	Right electrode-differential analog	
38	YD(NC)	Bottom electrode-differential analog	
39	XL(NC)	Left electrode-differential analog	
40	YU(NC)	Top electrode-differential analog	

3.2 TP Input/Output Terminals

Pin NO.	Logic	Remark
1	YU	
2	XL	
3	YD	
4	XR	

4 Electrical Characteristics

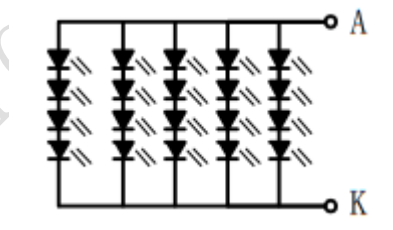
4.1 Driving TFT LCD Panel

Item	Symbol	Min	Typ.	Max	Unit	Remark
Digital Power Voltage	VDD	3.0	3.3	3.6	V	
Digital Operation Current	IVDD	-	25	-	mA	
Power Voltage	VDD	-0.5	-	5	V	
TFT Gate on Voltage	VGH	12	-	18	V	
TFT Gate off Voltage	VGL	-12	-	17	V	
TFT Common Voltage	VCOM	-2	-	5	V	

4.2 LED Backlight Specification

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Forward Voltage	V_F	11.2	12	13.2	V	$I_f=100\text{mA}$
Luminance	L_v	550	600	-	cd/m ²	$I_f=100\text{mA}$
Connection Mode	P	4chips serial*5				

Note: 20 LEDs (4 LEDs Serial, 5 ways Parallel)



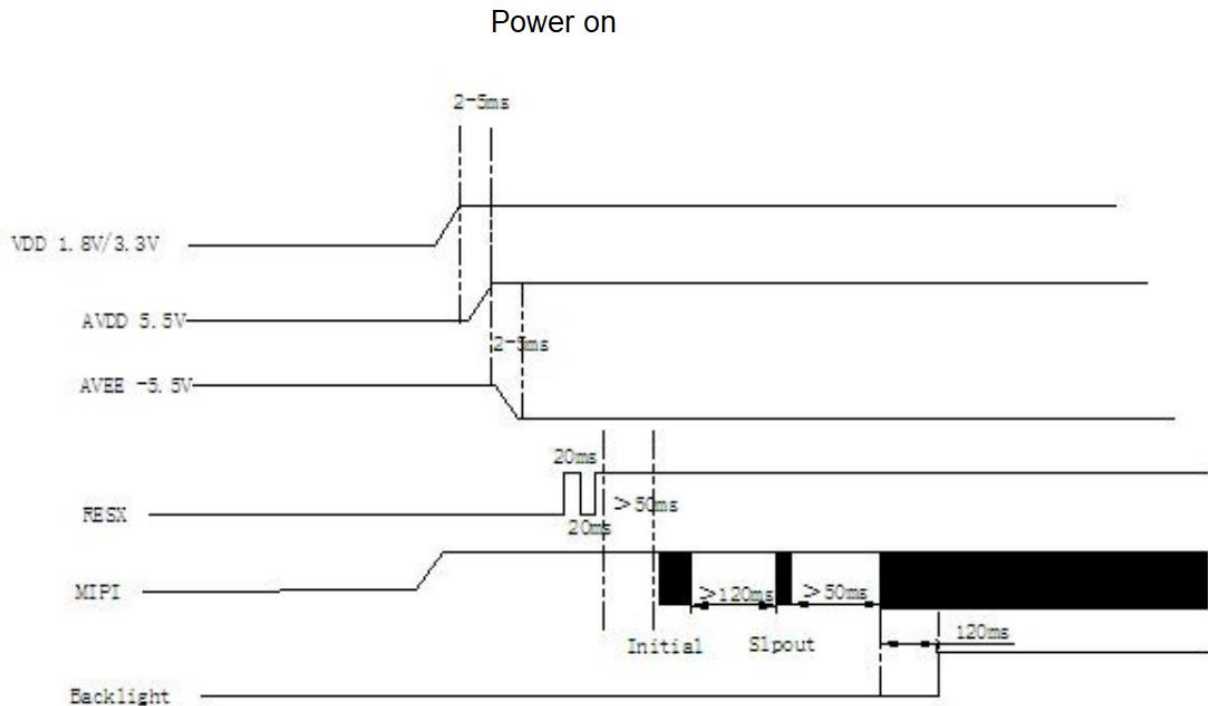
5 Timing Characteristics

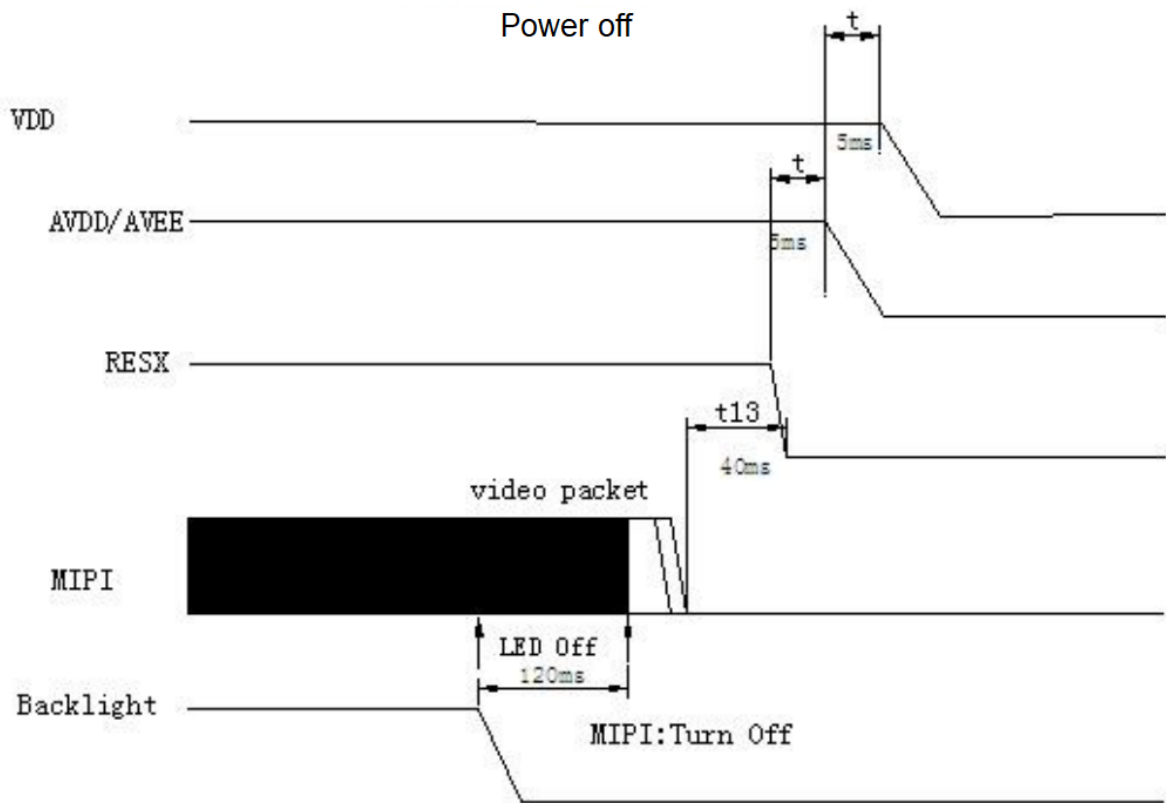
5.1 MIPI Electrical Characteristics

HV Mode

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Horizontal Display Area	thd	800			DCLK
DLCK Frequency	Fclk	26.4	33.3	46.1	MHZ
HSD Period	Th	862	1056	1200	DCLK
HSD Pulse Width	thpw	1	36	40	DCLK
HSD Back Porch	thbp	48			DCLK
HSD Front Porch	tfbp	16	210	354	DCLK
Vertical Display Area	tvd	480			H
VSD Period	tv	510	525	650	H
VSD Pulse Width	Tvpw	1	4	20	H
VSD Back Porch	Tvbp	12			H
VSD Front Porch	tvfp	7	22	147	H

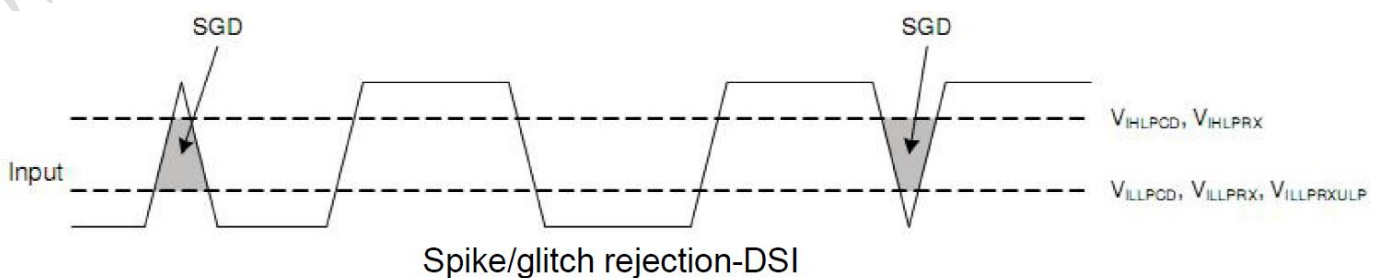
5.1.1 Up-down Time Sequence





5.2 Mode DC Electrical Characteristics

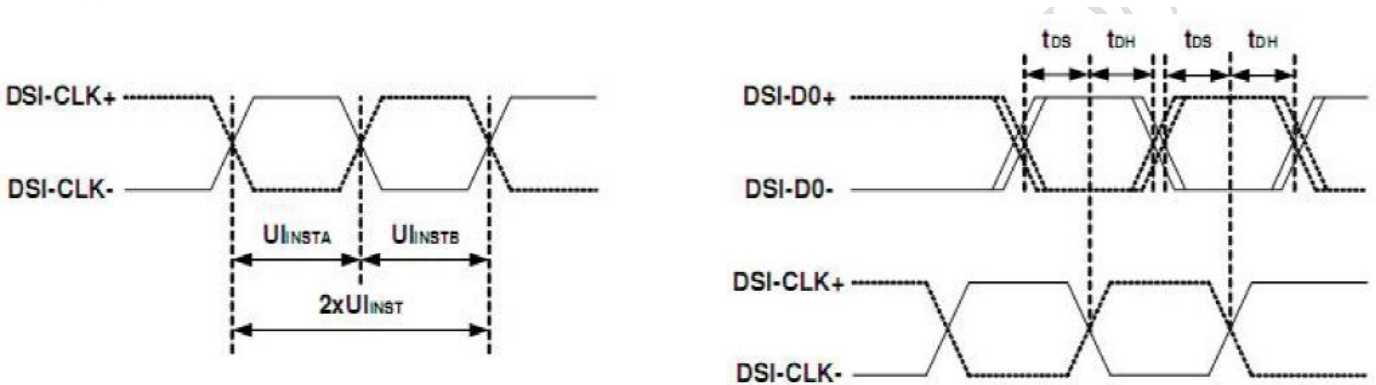
Parameter	Symbol	Conditions	Specification			UNIT
			MIN	TYP	MAX	
Logic high level input voltage	V_{IHLPCD}	LP-CD	450	-	1350	mV
Logic low level input voltage	V_{ILLPCD}	LP-CD	0	-	200	mV
Logic high level input voltage	V_{IHLPRX}	LP-RX (CLK, D0, D1)	880	-	1350	mV
Logic low level input voltage	V_{ILLPRX}	LP-RX (CLK, D0, D1)	0	-	550	mV
Logic low level input voltage	$V_{ILLPRXULP}$	LP-RX (CLK ULP mode)	0	-	300	mV
Logic high level output voltage	V_{OHLPTX}	LP-TX (D0)	1.1	-	1.3	V
Logic low level output voltage	V_{OLLPTX}	LP-TX (D0)	-50	-	50	mV
Logic high level input current	I_{IH}	LP-CD, LP-RX	-	-	10	μA
Logic low level input current	I_{IL}	LP-CD, LP-RX	-10	-	-	μA
Input pulse rejection	SGD	DSI-CLK+/-, DSI-Dn+/- (Note 3)	-	-	300	Vps



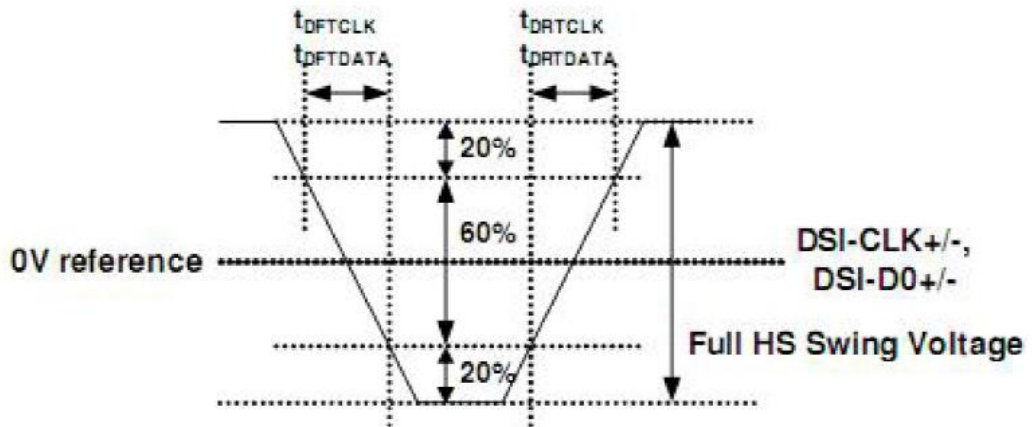
5.3 AC Characteristics

(VSS=VSSI=DVSS=0V, VDDI=1.65V to 3.6V, VDD=2.5V to 3.6V, Ta = -30 to 70 °C)

Signal	Symbol	Parameter	MIN	TYP	MAX	Unit	Description
DSI-CLK+/-	2xUI _{INST}	Double UI instantaneous	4	-	8	ns	4 Lane (Note 2)
			3	-	8	ns	3 Lane (Note 2)
			2.352	-	8	ns	2 Lane (Note 3)
DSI-CLK+/-	UI _{INSTA} UI _{INSTB}	UI instantaneous halves (UI = UI _{INSTA} = UI _{INSTB})	2	-	4	ns	4 Lane (Note 2)
			1.5	-	4	ns	3 Lane (Note 2)
			1.176	-	4	ns	2 Lane (Note 3)
DSI-Dn+/-	t _{DS}	Data to clock setup time	0.15xUI	-	-	ps	
DSI-Dn+/-	t _{DH}	Data to clock hold time	0.15xUI	-	-	ps	
DSI-CLK+/-	t _{DRTCLK}	Differential rise time for clock	150	-	0.3xUI	ps	
DSI-Dn+/-	t _{DRTDATA}	Differential rise time for data	150	-	0.3xUI	ps	
DSI-CLK+/-	t _{DFTCLK}	Differential fall time for clock	150	-	0.3xUI	ps	
DSI-Dn+/-	t _{DFTDATA}	Differential fall time for data	150	-	0.3xUI	ps	

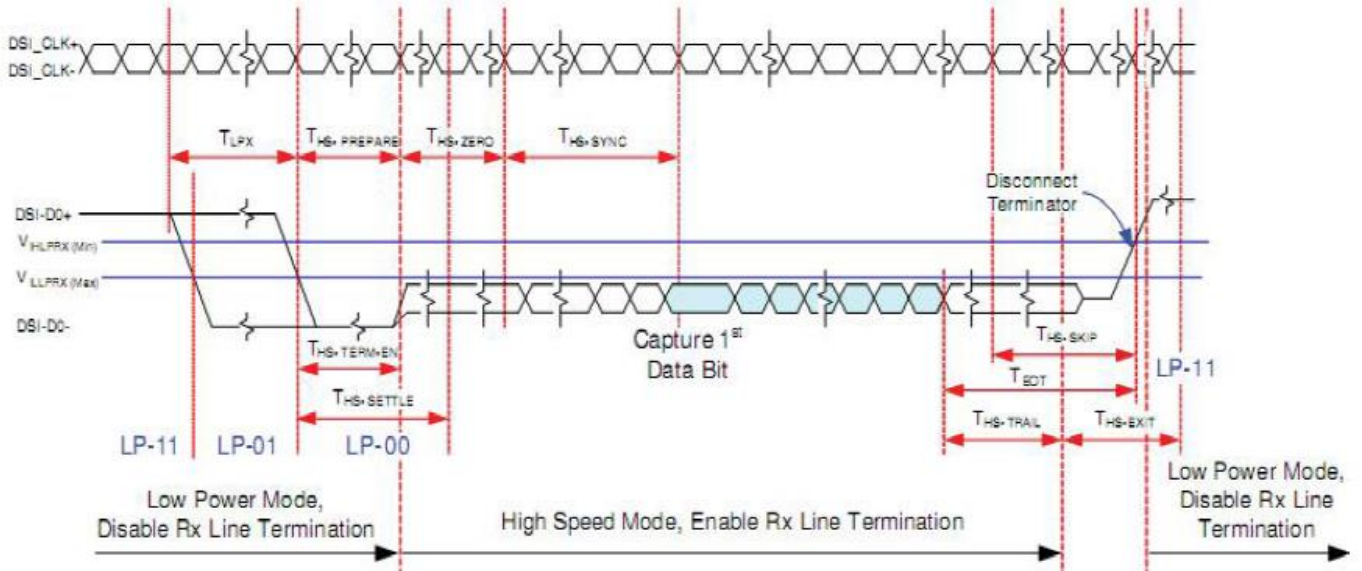


DSI clock channel timing

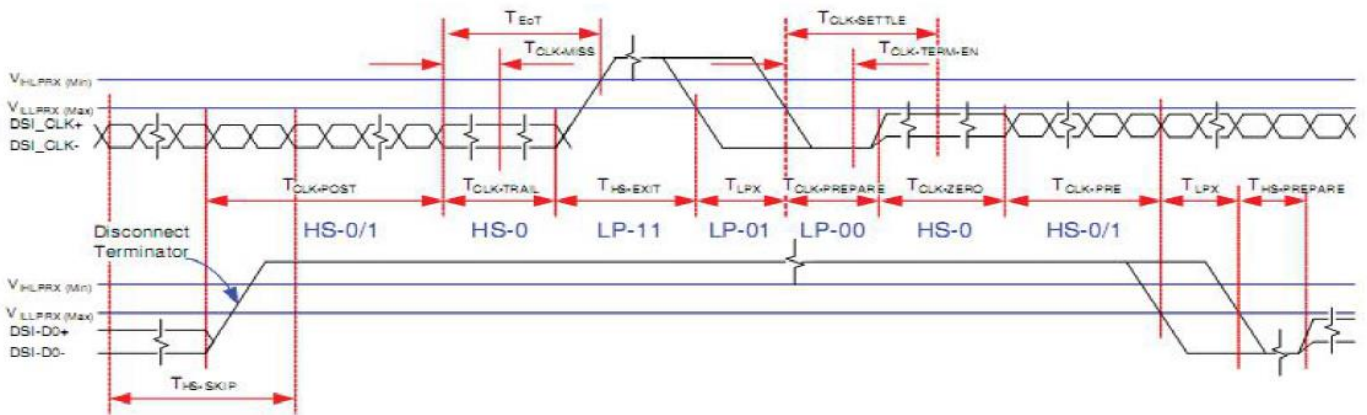


Rising and fall time on clock and data channel

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5.3.1 Clock Lanes-high Speed Mode to/from Low Power Mode Timing



6 Optical Characteristics

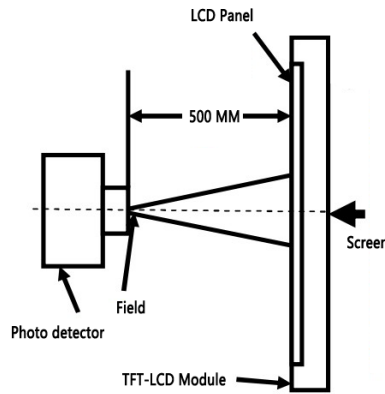
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle	Top	$CR \geq 10$	40	50	-	Deg.	Note 2
	Bottom		60	70	-		
	Left		60	70	-		
	Right		60	70	-		
Response Time	T_r+T_f	$\theta=0^\circ$	-	35	50	ms	Note 4
Contrast Ratio	CR	$\theta=0^\circ$	600	800	-		
Color Chromaticity	Wx	$\theta=0^\circ$	0.260	0.290	0.320		Note 5
	Wy		0.290	0.320	0.350		
	Rx		TBD	TBD	TBD		
	Ry		TBD	TBD	TBD		
	Gx		TBD	TBD	TBD		
	Gy		TBD	TBD	TBD		
	Bx		TBD	TBD	TBD		
	By		TBD	TBD	TBD		

Test conditions:

IF= 100 mA, and the ambient temperature is 25°C.

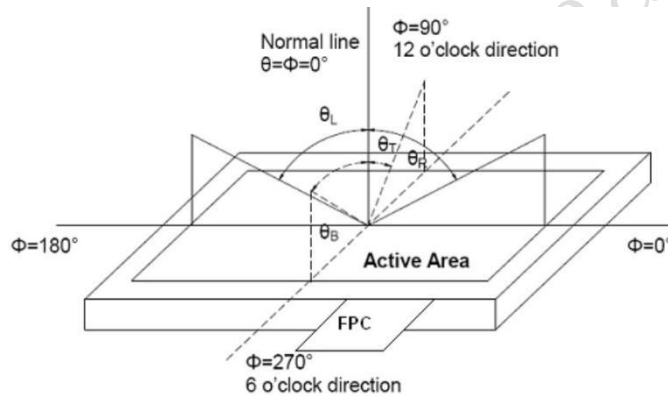
Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of LCD.



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

The viewing angle is measured at the center point of the LCD by BM-7A.

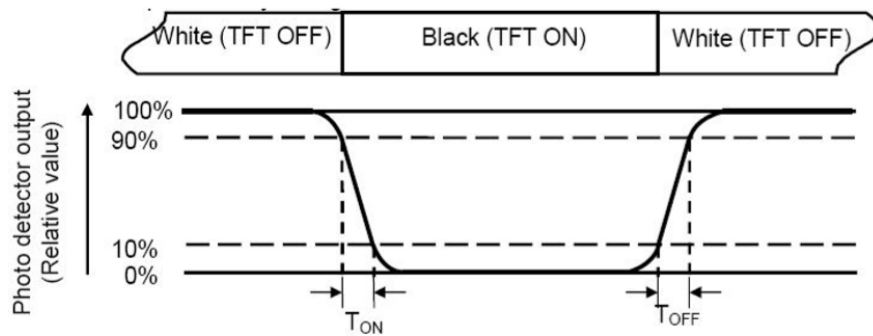


Note 3: Definition of color temperature.

When the radiation of the light source is exactly the same in the visible region and the absolute blackbody, the temperature of the blackbody is called the color temperature of the light source. Color temperature is an index to measure the degree of light source color (cold color, warm color). Warm color < 3300K, intermediate color 3300 ~ 5000K, cold color > 5000K.

Note 4: Definition of response time.

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

Measure the luminance of white state at center point.

7 Environmental Reliability Test

NO	Test Item	Condition	Remarks
1	High Temperature Operation	Ta=+70°C, 96hours	
2	Low Temperature Operation	Ta=-20°C, 96hours	
3	High Temperature Storage	Ta=+80°C, 96hours	
4	Low Temperature Storage	Ta=-30°C, 96hours	
5	Storage at High Temperature and Humidity	Ta=+60°C, 90% RH max, 96hours	
6	Thermal Shock (non-operation)	-20°C 30 min~+60°C 30 min, after 10cycle, Restore 2H at 25°C Power off	

8 Packing Capacity & Dimension

Dimension			
Dimension(mm)	120.7(W)*75.8(H)*4.3(D)		
Net Weight	-		
Packing Capacity			
Size	LCD Size and Resolution	Layer	Quantity (Pcs)
220mm(L)x160mm(W)x47mm(H)	5.0 inch 800*480	1	1
450mm(L)x350mm(W)x300mm(H)	5.0 inch 800*480	2	120

Packing instruction:

The LCD+TP is placed in the grid, covered with a PE static bag and compactly assembled, the upper and the lower layers of the grid are protected by buffer spaces.

The LCD covered with a PE static bag and compactly assembled



placed in the grid



The upper and the lower layers of the grid are protected by buffer spaces



Packed



9 Appearance Inspection

9.1 General rules for inspection

9.1.1 Anti-static wearables (anti-static wristbands, gloves) must be worn during the inspection.

9.1.2 Do not use bare hands to touch the position of the device, golden fingers, and the surface of the screen to prevent the sweat from human hands from causing oxidation and affecting the appearance.

9.1.3 It is forbidden to stack products out of specification and handle them with care to avoid damage to components.

9.1.4 The repaired products need to be inspected to prevent rosin and tin slag from exceeding the specifications.

9.1.5 When technical documents and process documents have specific requirements for products, the technical documents and process documents shall be the main requirements.

9.2 Inspection conditions

9.2.1 The conditions of display function check

Angle: $\pm 5^\circ$;

Inspection method: visual inspection. The inspection object is 30-40cm away from the light source, and the eye is 30-40cm away from the inspection object;

Illumination: 300-500Lux;

Inspection time: 5-10S.

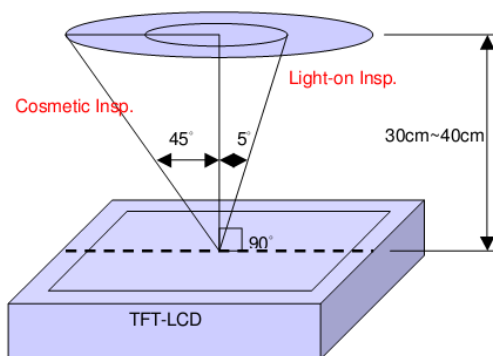
9.2.2 Visual inspection conditions

Angle: $\pm 45^\circ$;


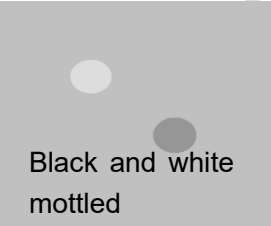
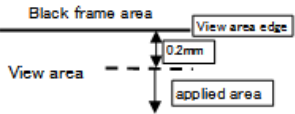
Inspection method: visual inspection. The inspection object is 30-40cm away from the light source, and the eye is 30-40cm away from the inspection object;


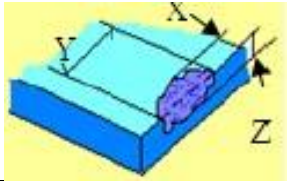
Illumination: 800-1500Lux;

Inspection time: 5-10S.



9.3 Inspection standard

Type	Test Items	Judgement Standard	Defect Category
Display state	Dead pixels	No dead pixels	
	mura	From different angles, the brightness is required to be uniform. Under the 64-level grayscale or pure black interface, there should be no uneven display brightness within the viewing angle range of 45° through 6% ND FILTER. Y series (TV film) LCD screen does not have specific requirements, and the picture inspection does not affect the display as qualified. <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div>	Slight defect
	Light leakage	Under the 64-level grayscale or pure black interface, there should be no obvious light leakage within the viewing angle range of 45° by visual inspection or through 6% ND FILTER. Y series (TV LCD screen) series can be without obvious visual defects.	Slight defect
	Linear foreign bodies	1. $W \leq 0.05$, $L \leq 2\text{mm}$, negligible; 2. $0.05\text{mm} < W \leq 0.1\text{mm}$, $L \leq 2\text{mm}$, $N \leq 3$; 3. $W > 0.1\text{mm}$, $L > 2\text{mm}$, not allowed.	Slight defect
	Bubble in OCA	1. $D < 0.20\text{mm}$, negligible; 2. $0.20\text{mm} < D \leq 0.30\text{mm}$, $N \leq 4$ and, $DS > 10\text{mm}$; 3. $0.30\text{mm} < D \leq 0.35\text{mm}$, $N \leq 3$ and, $DS > 10\text{mm}$; 4. $0.35\text{mm} < D$, fault. (Guarantee area: within 0.2mm outside VA) <div style="text-align: right; margin-top: 10px;">  </div>	Slight defect
Screen surface	Within the effective area	Spotted: 1. $D \leq 0.2\text{mm}$ and it is not a piece, it is not counted; 2. $0.2\text{mm} < D \leq 0.5\text{mm}$, $N \leq 3$; 3. $D > 0.5\text{mm}$, $L > 0.5\text{mm}$, $W > 0.5\text{mm}$ are not allowed; (The spotted foreign objects shall not exceed the point-line gauge $D=0.5$, and the black dot coverage shall be checked, and the spotted foreign objects shall be judged within the range of $D=0.5$)	Slight defect
		Linear: 1. $W \leq 0.05$, $L \leq 2\text{mm}$, ignored; 2. $0.05 < W \leq 0.1\text{mm}$, $L \leq 2\text{mm}$, $N \leq 3$; 3. $W > 0.1\text{mm}$, $L > 2\text{mm}$, not allowed.	
	Outside the effective area Foreign objects Scratches Air bubbles	Foreign objects are not checked, and bubbles are not allowed to $D > 1\text{mm}$; Non-inductive scratches of no more than $0.1 \times 8\text{mm}$ are allowed.	Slight defect

	Crack	Not allowed.		Slight defect
	Notch	1. Does not affect the appearance from the front; 2. Does not affect the relevant alignment; 3. $X \leq 1\text{mm}$, $Y \leq 1\text{mm}$, $N \leq 2$.		Slight defect
	Glass side Foreign objects Dirty	1. The foreign body on the side is not controlled; 2. The paint pen marks on the side are not controlled; 3. Side oily note printing is not allowed.		Slight defect
FPC	Cracks Goldfinger crease	Not allowed.		Heavy deficit
	Crease	Slight creases are not controlled; The crease is whitish and has lines, which is not allowed.		Heavy deficit
	Top wound, stab wound	No damage to the line, $D \leq 0.2\text{mm}$; Damage to the line is not allowed.		Heavy deficit
	Scratch	Slight scratches on the surface are not controlled; Damage to the line is not allowed.		Heavy deficit
	Goldfinger scratch	$W \leq 0.05\text{mm}$, no control; $W > 0.05\text{mm}$, not allowed; Test probe tip marks are not controlled.		Heavy deficit
	Component	Under-soldering, over-soldering and false soldering are not allowed.		Heavy deficit

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, Can only use LCD dedicated cleaner, the following organic solvent can not be used:

- Isopropyl alcohol
- Ethyl alcohol
- Ketone
- 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

10.1.9 optimum work environment.

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

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

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

10.1.9.4 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°C ~ 40°C 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

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

11 Laminated Screen Introduction

11.1 Laminated screen classification

The laminated screen is mainly composed of cover glass, TP and LCD. The lamination methods can be either frame lamination or full lamination. The frame lamination process fixes TP with the four sides of LCD by 3M adhesive, which is one of the most common lamination methods. Full lamination is to seamlessly bond LCD and TP by optical adhesive. Compared to frame lamination, full lamination features by moisture-proof, dust-proof, high stability, high quality display, and can achieve the visible display under strong light.

11.2 ODM service

DWIN technology has built the Huan DWIN Science Park with a construction area of 250000 square meters (In addition, another 148000 square meters are under construction), integrating industrial chain of LCM, SMT, CTP, RTP, mold injection, and Sheet metal punching. DWIN can guarantee the production of LCM, CTP and RTP with first-class technology, highly automated and intelligent manufacturing equipment.

The production capacity of LCM lines is 2.5 million. The LCM lines support the production of LCM with high luminance(1200 nit), wide operating temperature(-40~85°C), anti-electromagnetic interference, sunlight readability and HDMI interface .

The production capacity of RTP lines is 5 hundred thousand. The RTP lines support the production of customized 4-wire RTP and 5-wire RTP, anti-UV material and AG material.

The production capacity of CTP lines is 1 million. The CTP lines support the production of customized CTP, including 1.3~21.5 inches (unconventional size), circular CTP, the shape, color and logo of cover plate, anti-UV, anti- fingerprint and AG material. They can also support the customization of various kinds of technologies, such as OCA lamination, ultrathin GFF, optical bonding, 2.5D and sunlight readability.

SMT lines



CTP lines

LCM lines



RTP lines

IQC lines



Final inspection lines



Laboratories

Record of Revision

Rev	Date	Description	Editor
00	2023-04-19	First Release	Chen
01	2023-06-05	Update Luminance	Chen
02	2023-06-07	Revised Specifications	Chen

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Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!