REV	00

高展工业智能显示科技有限公司

IIDWay Technology Co. Ltd

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APPROVAL SHEET

PRODUCT MODEL	**GZ80109-DIT070WU**		
REMARKS	**TFT MODULE, 1200(RGB) * 1920 PIXELS**		
APPROVED SIGNATURE BY CUSTOMER	**PROJECT**	**QUALITY**	**APPROVED**

PREPARED BY	CHECKED BY	APPROVED BY

RECORDS OF REVISION

REV.	DATE	PAGE	DESCRIPTION OF CHANGES
00	2022.11.25		First issue.

CONTENT

1. GENERAL SPECIFICATION

1.1 Description

The GZ80109-DIT070WU is a color active matrix Thin Film Transistor (TFT) Liquid Crystal Display (LCD) that uses amorphous silicon(a-Si) TFT as a switching device. This model is composed of a single 7.0 inches transmissive type main TFT-LCD panel. The resolution of the panel is 1200RGBx1920 pixels and can display up to 16.2M color.

1.2 Feature

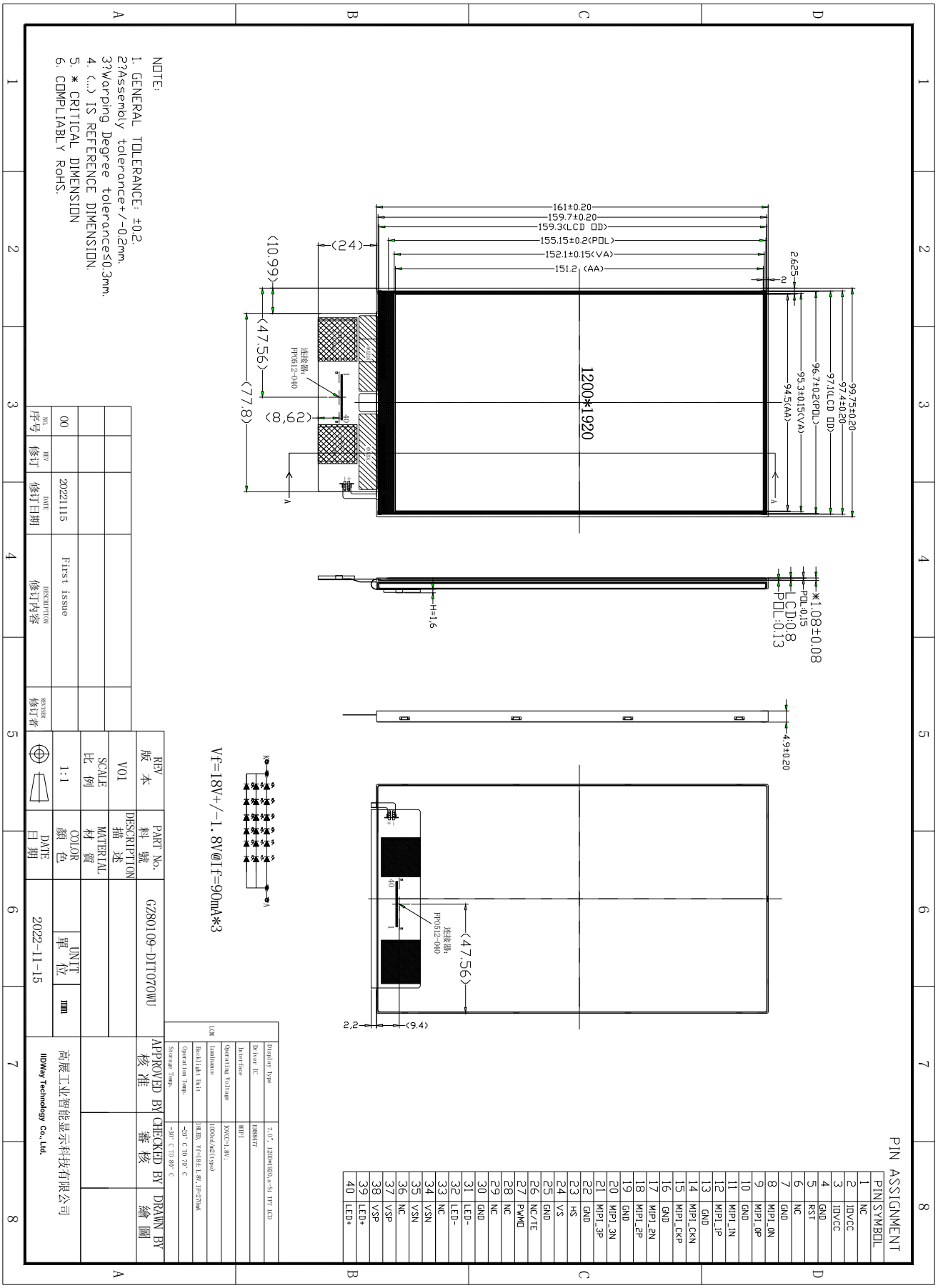
-IPS type for main TFT-LCD panel
-Structure COG+FPC
-Full, Normal (Still), Partial, Sleep mode are available

1.3 General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	7.0	inch	-
2	Panel Type	a-Si TFT active matrix	-	-
3	Resolution	1200 x (RGB) x 1920	pixel	-
4	Display Mode	Normally Black,Transmissive	-	-
5	Display Number of Colors	16.2M	-	-
6	Viewing Direction	Free	-	Note
7	Contrast Ratio	1000(TYP)	-	-
8	Luminance	/	cd/m^2	-
9	Module Size	99.75(W) x161(L) x4.9(T)	mm	Note
10	Active Area	94.5(W) x 151.2(L)	mm	Note
11	Pixel Pitch	0.07875(W) x 0.07875（L）	mm	-
12	Driver IC	ER88477	-	-
13	Light Source	18LEDs White	-	-
14	Interface	MIPI	-	-
15	Operating Temperature	-20~70	℃	-
16	Storage Temperature	-30~80	℃	-

Note: Please refer to the mechanical drawing.

2. MECHANICAL DRAWING

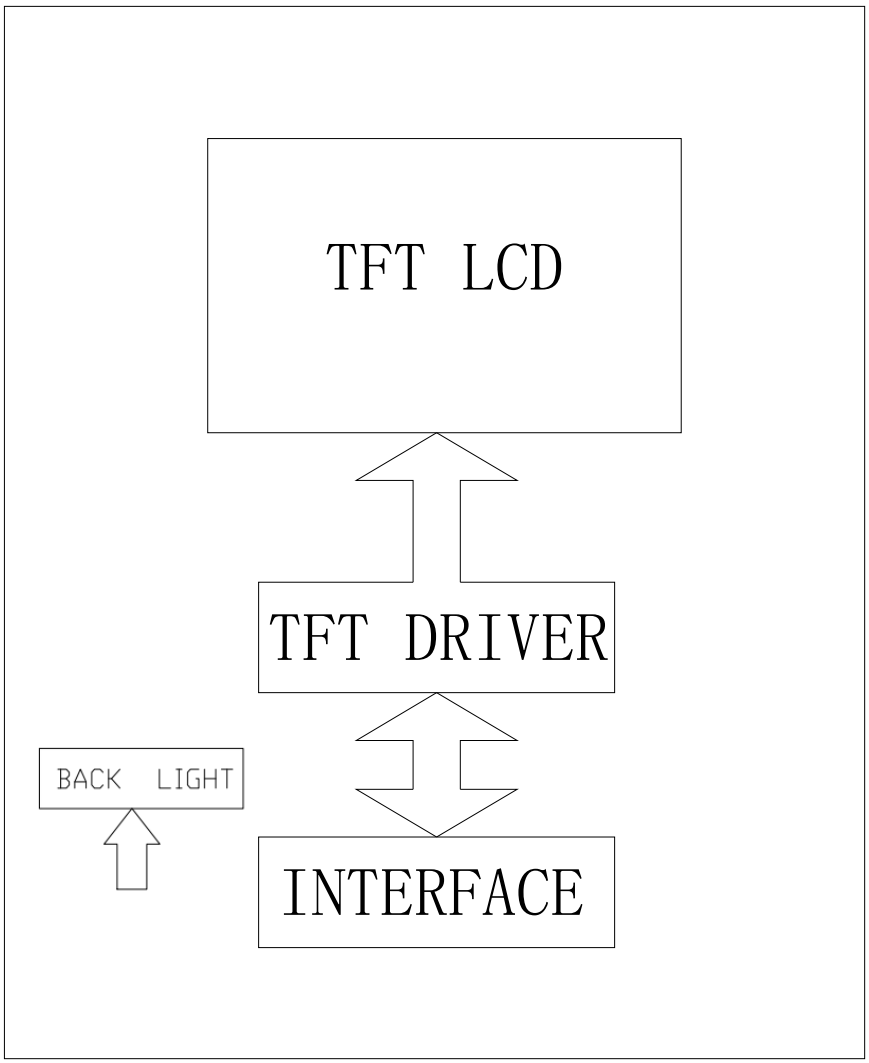


3. INTERFACE ASSIGNMENT

1	NC	No connection
2	IOVCC	POWER supply for system
3	IOVCC	
4	GND	Ground
5	RST	Global reset pin
6	NC	No connection
7	GND	Ground
8	MIPI-0N	MIPI DSI : Data differential signal input pins.
9	MIPI-0P	MIPI DSI : Data differential signal input pins.
10	GND	Ground
11	MIPI-1N	MIPI DSI : Data differential signal input pins.
12	MIPI-1P	MIPI DSI : Data differential signal input pins.
13	GND	Ground
14	MIPI-CKN	MIPI DSI : clock differential signal input pins.
15	MIPI-CKP	MIPI DSI : clock differential signal input pins.
16	GND	Ground
17	MIPI-2N	MIPI DSI : Data differential signal input pins.
18	MIPI-2P	MIPI DSI : Data differential signal input pins.
19	GND	Ground
20	MIPI-3N	MIPI DSI : Data differential signal input pins.
21	MIPI-3P	MIPI DSI : Data differential signal input pins.
22	GND	Ground
23	HS	Line synchronizing signal for RGB interface operation
24	VS	Frame synchronizing signal for RGB interface operation
25	GND	Ground
26	NC/TE	Tearing effect output
27	PWM0	Backlight on/off control pin
28	NC	No connection
29	NC	No connection
30	GND	Ground
31	LED-	Cathodic power supply for backlight (LED-).
32	LED-	
33	NC	No connection
34	VSN	Analog supply negative voltage
35	VSN	
36	NC	No connection
37	VSP	Analog supply positive voltage
38	VSP	
39	LED+	Anode power supply for backlight (LED+).
40	LED+	

4. ELECTRICAL SPECIFICATION

4.1. Block Diagram



4.2. Tft Absolute Maximum Ratings

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Power Supply for Analog	IOVCC	Ta=25 ºC	-0.3	-	3.6	V
Supply voltage	VSP	Ta=25 ºC	-0.3	-	6.6	V
Supply voltage	VSN		-6.6	-	0.3	

Note: Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is applied.

4.3. Tft Typical Operation Condition

4.3.1 TFT DC Characteristics

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Power Supply for Analog	IOVCC	Ta=25 ºC	1.7	1.8	1.9	V
Power Supply for Analog	VSP		5.3	5.5	5.7	
Power Supply for Analog	VSN	Ta=25 ºC	-5.7	-5.5	-5.3	V
Input Signal “H” Level	V_{IH}	-	0.7IOVCC	-	IOVCC	V
Input Signal “L” Level	V_{IL}	-	0	-	0.3IOVCC	V
Output Signal “H” Level	V_{OH}	I_{OH}=-1.0mA	0.8IOVCC	-	IOVCC	V
Output Signal “L” Level	V_{OL}	I_{OL}=1.0mA	0	-	0.2IOVCC	V
Frame Frequency	FRAME	-	50	60	80	Hz

Note: To prevent IC latch up or DC operation in LCD panel, the power on/off sequence should follow the driver IC specification.

4.3.2 TFT Current Consumption(MIPI 4-Lane Interface)

Item	Symbol	Values		Unit	Remark
		type	Max.		
Current for Driver	IOVCC	35	53	mA	Note1
	VSP	11	16.5	mA	Note1
	VSN	10	15	mA	Note1

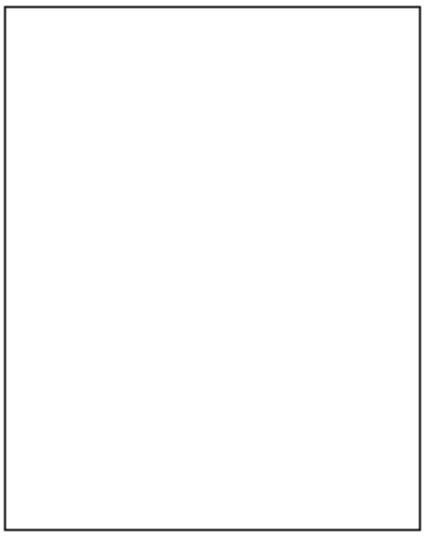
Note1: Test Condition

Typ: IOVCC=1.8V

Display Pattern: All Pixel White

Frame Rate=60Hz at column Inversion

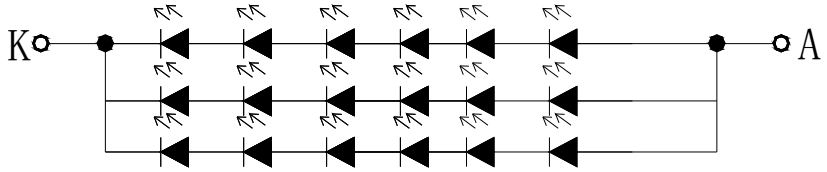
Max. current check pattern:



White

4.4. Backlight Specification

4.4.1 Backlight Circuit



Vf=18V+/-1.8V@If=90mA*3

4.4.2 ELECTRICAL CHARACTERISTICS **(T=25℃)**

PARAMETER	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYPE	MAX	
FORWARD VOLTAGE	VF	IF=270MA	16.2	18	19.8	V

4.5.Timings for DSI Video mode:

4.5.1 Vertical Timings for DSI video mode

Condition: Ta=25°C, Resolution= 1200(RGB)*1920

Parameter	Symbol	Conditions	Specification			Unit	Notes
			Min.	Typ.	Max.		
Vertical Total	V_{TOTAL}		1952		2047	Line	
Vertical low pulse width	VSW		2			Line	1
Vertical front porch	VFP		16			Line	
Vertical back porch	VBP		14			Line	1
Vertical data start point		VSW+VBP	2			Line	1
Vertical blanking period	VPT	VSW+VBP+VFP	32			Line	
Vertical active area		VDISP		1920		Line	
Vertical Frame rate	VFR			60		Hz	

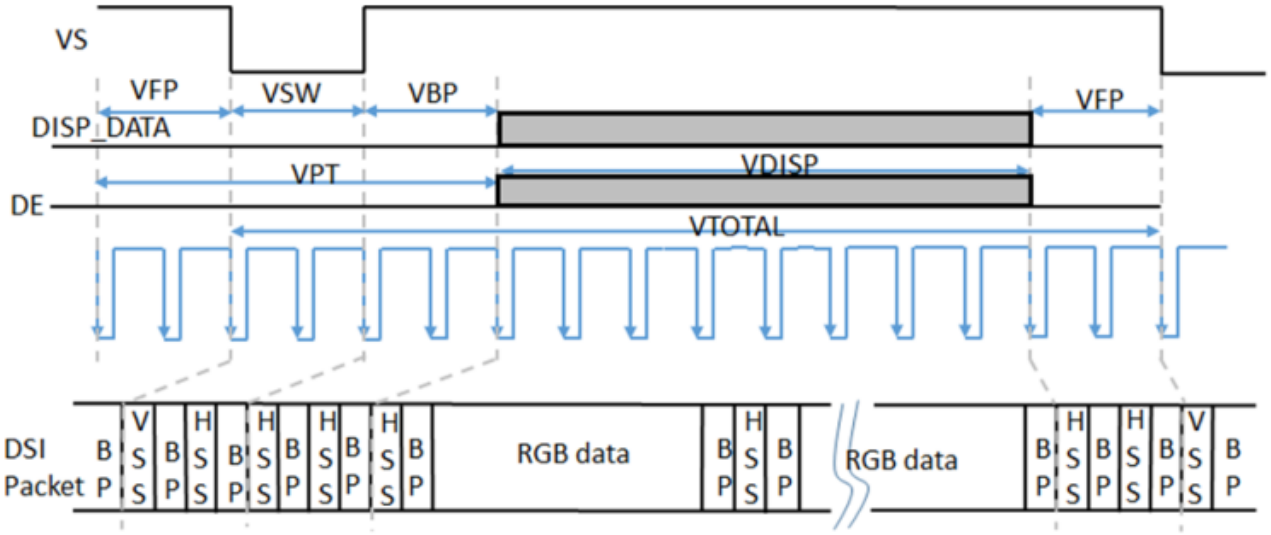


Figure 4.4.1 - 1 Vertical timings for DSI interface

4.5.2 Horizontal Timings for DSI video mode

Condition: Ta =25°C, Resolution = 1200(RGB)*1920

Parameter	Symbol	Conditions	Specification			Unit	Notes
			Min.	Typ.	Max.		
Horizontal total	Htotal		1264		2047	DCK	
HS low pulse width	HSW		2			DCK	
Horizontal back porch	HBP		30			DCK	
Horizontal front porch	HFP		32			DCK	
Horizontal data start point		HSW+HBP	32			DCK	
Horizontal blanking period	HBLK	HSW+HBP+HFP	64			DCK	
Horizontal active area	HDISP			1200		DCK	

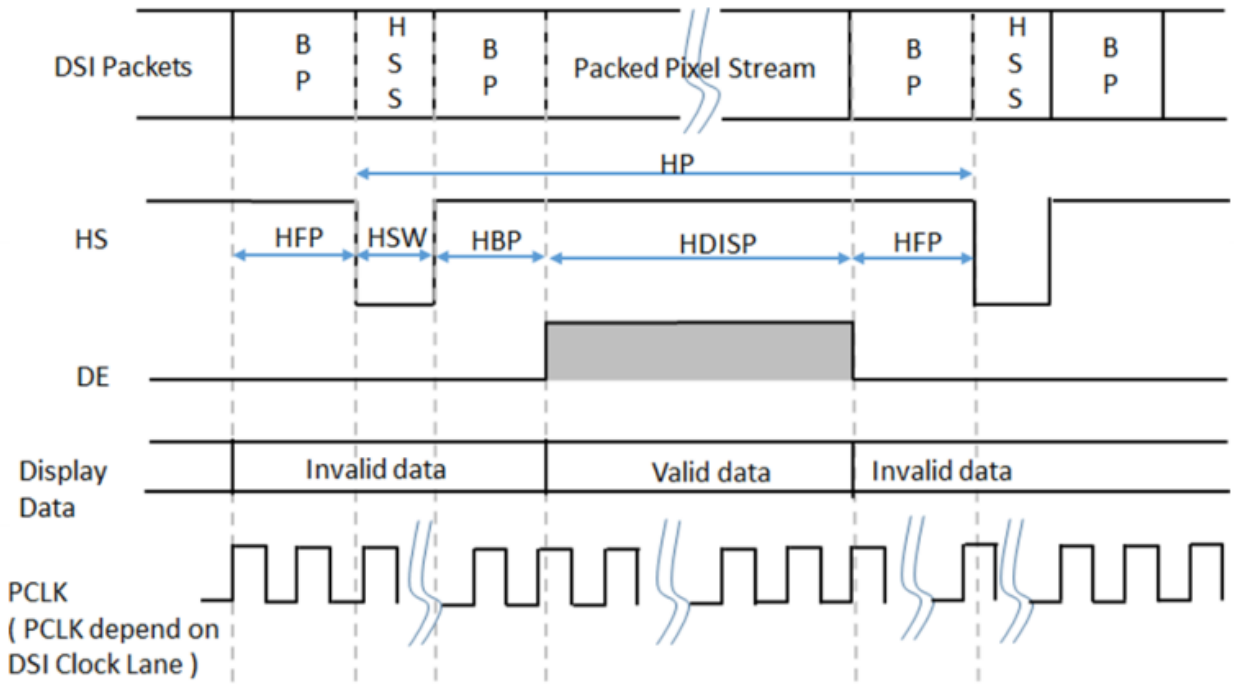
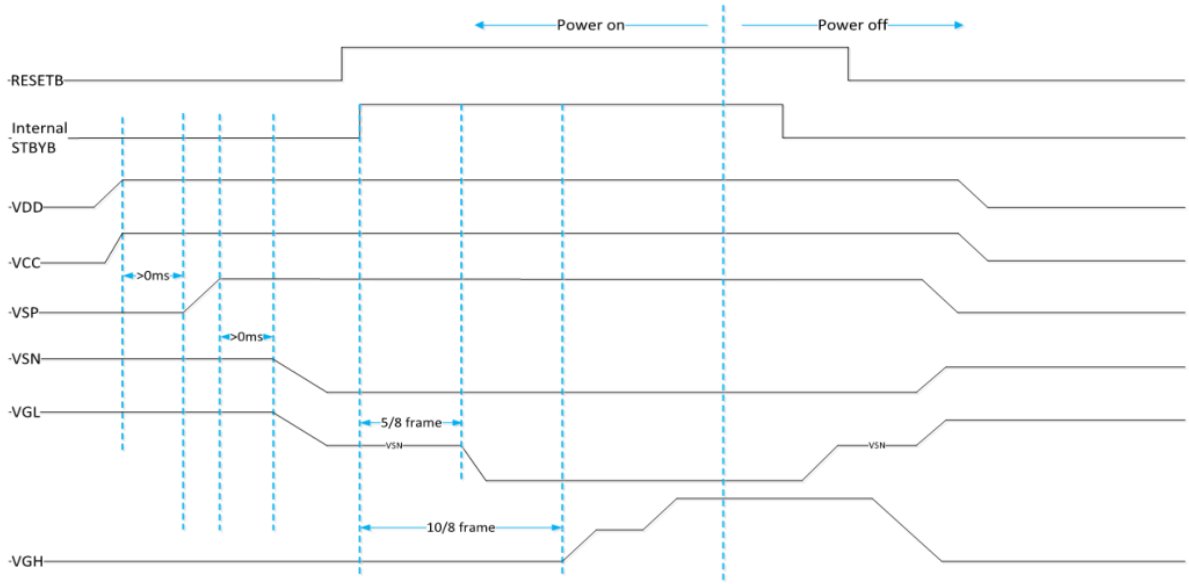


Figure 4.4.2 - 1 Horizontal timings for DSI video mode

4.6 Power On/ OFF Sequence



4.7 Reset Input Timing:

Signal	Symbol	Parameter	Description	Specification			Unit	Notes
				Min.	Typ.	Max.		
RESET	t_{RESW}	Reset "L" pulse width		10			uS	1
	t_{RESET}	Reset complete time	When reset applied during Sleep in mode			5	mS	2
		Reset complete time+ SLPOUT time	When reset applied during Sleep out mode			120	mS	5

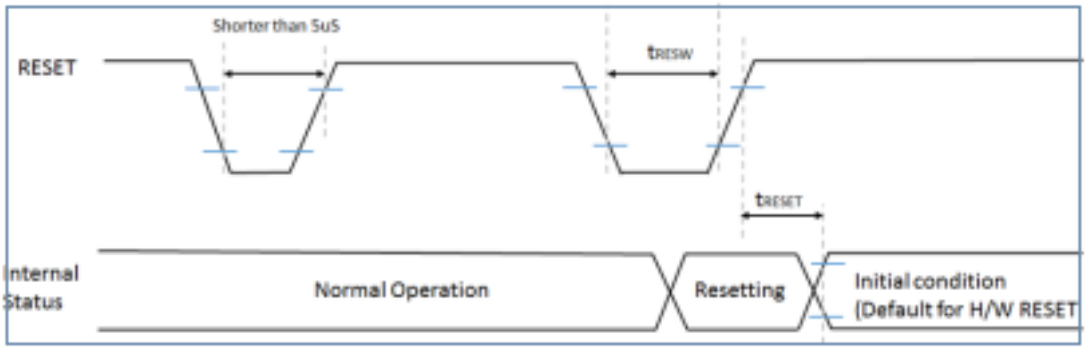


Figure 4.6 - 1 Reset Input Timing

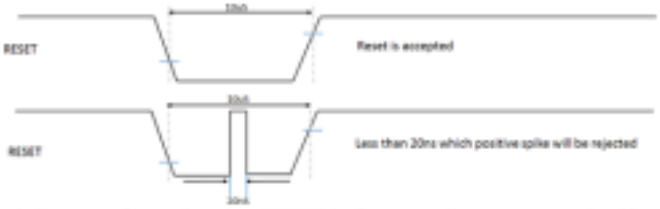
Note 1 : Spike due to an electrostatic discharge on RESET line does not cause irregular system reset according to the table below.

RESET Pulse	Action
Short than 5us	Reset Rejected
Long than 10uS	Reset
Between 5us and 10uS	Reset Start

Note 2 : During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120ms, when Reset Starts in sleep out mode. The display remains the blank state in sleep in mode) and then return to Default condition for H/W RESET.

Note 3 : During Reset Complete Time, values in MTP memory will be latched to internal register during this period. This loading is done every time when there is H/W RESET complete time(tRESET) within 5ms after a rising edge of RESET.

Note 4 : Spike Rejection also applies during a valid reset pulse as shown below:



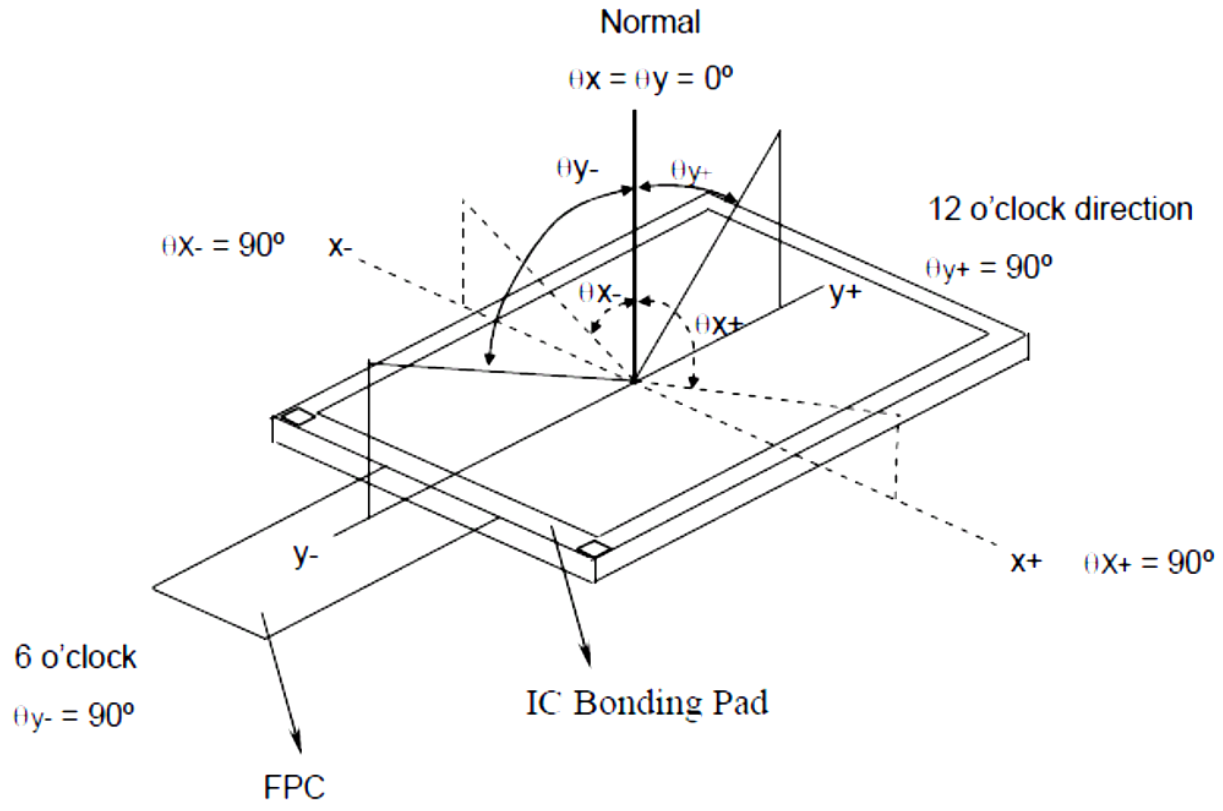
Note 5 : It is necessary to wait 5msec after releasing RESET before sending commands. Also Sleep Out command can not be sent for 120msec.

5. LCD OPTICAL CHARACTERISTICS

(T_a=+25ºC, IOVCC=+1.8V)

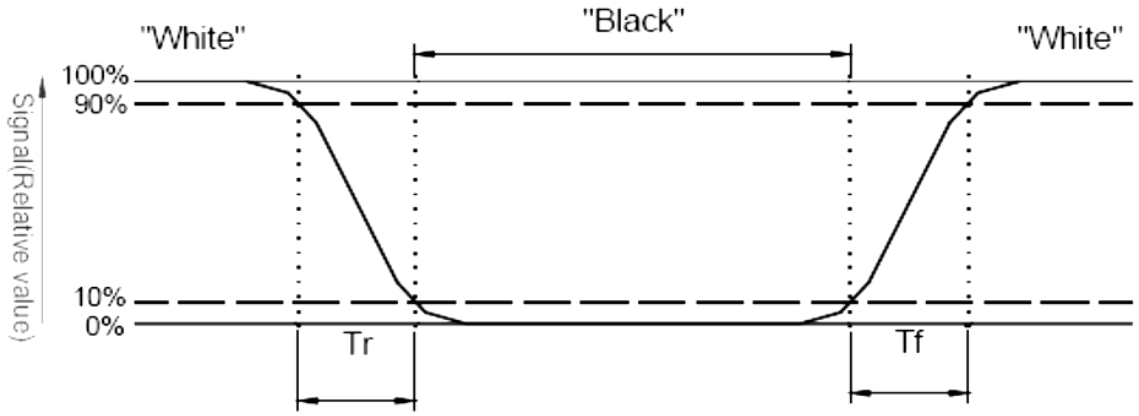
Item		Symbol	Condition	Values			Unit	Remark
				Min.	Typ.	Max.		
Viewing Angle Range	Left	θ_L	CR≧10	70	80	-	degree	Note 1
	Right	θ_R		70	80	-		
	Top	Φ_T		70	80	-		
	Botto	Φ_B		70	80	-		
Response Time		T_{on} +T_{off}	Normal θ=Φ=0˚	-	25	35	ms	Note 2
Contrast Ratio		CR	Normal θ=Φ=0˚	800	1000	-	-	Note 3
Color Chromaticity (CF only with C light, CIE 1931)		Rx	Normal θ=Φ=0˚	-	0.641	-		Note5
		Ry		-	0.316	-		
		Gx		-	0.261	-		
		Gy		-	0.566	-		
		Bx		-	0.145	-		
		By		-	0.08	-		
		Wx		-	0.300	-		
		Wy		-	0.319	-		
Color Gamut (CF only with C light, CIE 1931)		NTSC	θ= 0°, Φ=0° CIE1931	62.5%	67.5%	-	%	
Luminance		L	Normal θ=Φ=0˚	900	1000	-	cd/m2	Note 4

Note 1: Definition of viewing angle range



Note 2: Definition of response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{on}) is the time between photo detector output intensity changed from 90% to 10%, and fall time (T_{off}) is the time between photo detector output intensity changed from 10% to 90%.



Note 3: Definition of contrast ratio

Contrast ratio is calculated by the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

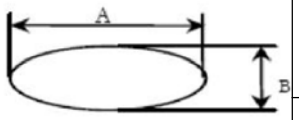
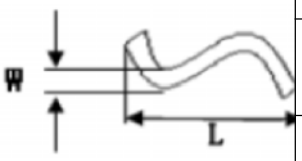
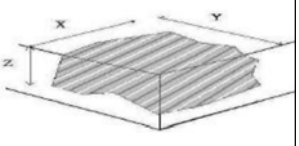
Note 4: Definition of luminance

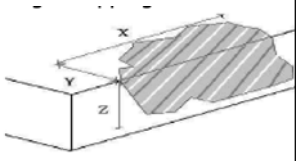
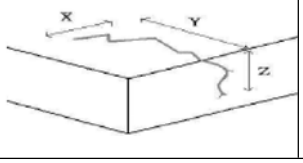
Measured at the center area of the panel when LCD panel is driven at “white” state.

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at the center point of LCD when panel is driven at “White”, “Red”, “Green” and “Blue” state respectively.

6.THE STANDARD OF INSPECTION

Item NO.	Inspection Item	Inspection Standard		Classification of defects
1	LCD Electrical function testing	1) No display 2) Missing line 3) No backlight 4) shadow 5) black/blue display 6) Irregular operating 7) visual angle is wrong		Major
2	CTP function test	No open and No short for ALL X/Y sensors, test of accuracy/linearity/sensitivity/separation/ Jitter/anti-moisture is OK		Major
3	Outline dimension	All outline dimension beyond the drawing is not allowed		Major
4	White/Black spot (in LCD or Backlight)  D=(A+B)/2	D≤0.10mm	Ignore.	Minor
		0.10mm<D≤0.25mm	To be max 3points. (distance≥5mm)	
		D>0.25mm	Not allowed.	
5	Color/bright/dark dot	Color not allowed Bright/dark dot as same as White/Black spot		Minor
6	Dirt in CTP	as same as White/Black spot		Minor
7	Dent at CTP	as same as White/Black spot		Minor
8	Bubble	as same as White/Black spot		Minor
9	Scratch /Lines defect:  	W≤0.02mm,L≤5mm	Ignore.	Minor
		0.02mm<W≤0.05mm; L≤5.00mm	N≤3（distance≥10mm）	
		W>0.05mm，L＞5mm	Not allowed.	
10	Particle lines defect	W≤0.02mm,L≤2.5mm	Ignore.	Minor
		0.02mm<W≤0.05mm; L≤2.50mm	N≤2（distance≥10mm）	
		W>0.05mm，L＞2.5mm	Not allowed.	
11	Conner Chipping:  	Length X<1.0 mm Width Y<1.0mm Thickness Z ≤ Glass thickness (Sealant area could not be broken)		Minor

12	Edge Chipping: 	Length X<1.5 mm Width Y<1.5 mm Thickness Z ≤ Glass thickness (Sealant area could not be broken)	Minor
13	Crack: 	Not allowed.	Minor

Note: 1. Viewing distance: 30 +/- 2 cm

2. Inspection angle: 45 degrees in 6 o’ clock direction (all defects in viewing area should be inspected from this direction),Rotate 30° about the vertical axis.

3. Light Source: 500~700Lux +/- 20%, black background.

7.RELIABILITY TESTS

ITEM	CONDITION	CRITERION
Operating Temperature Test	High Temperature: +70 ºC, 240 hrs	No defects in display and operational functions
	Low Temperature: -20 ºC,240 hrs	
Storage Temperature Test	High Temperature: +80 ºC, 240 hrs	No defects in display and operational functions
	Low Temperature: -30 ºC, 240 hrs	
Humidity Endurance Test	60ºC, 90%RH, 240 hrs	No defects in display and operational functions
Thermal Shock Test	-20 ºC (30mins)～ +70 ºC (30mins) 100 cycles	No defects in display and operational functions

NOTE:

1) The samples must be free from defect before test, must be restored at room condition at least for 2 hours after reliability test before any inspection.

2) Before test the function of TP, the sample must be placed in room temperature for 24hrs after RA test.

8. PRECAUTIONS

8.1. Handling

9.1.1. Polarizer Cleaning, Petroleum ether (or N-hexane) is recommended for cleaning the front/rear polarizers and reflectors, acetone, toluene and ethanol are not allowed to avoid damaging the surface.

9.1.2. Body grounding, must wear Anti-ESD wrist strap while pick up LCDs.

9.1.3. FPC Soldering, less than 300℃/3S, solder must be grounding on grounding bench.

9.1.4. If use electric Screwdriver to do assembly, screwdriver must be grounding.

8.2. Storage

9.2.1. Keep in a sealed polyethylene bag.

9.2.2. Keep in a dark place.

9.2.3. Keep in temperature between 0ºC and 35ºC.

NOT allowed at 70ºC for more than 160 Hours, or at -20ºC for more than 48 Hrs.

8.3. Safety

If liquid crystal leak out of a damaged glass cell, DO NOT put it in your mouth or touch eyes, if the liquid crystal touch your skin or clothes, please wash it off immediately using soap and water.

9. LIMITED WARRANTY

Unless otherwise agreed between IIDWay and customer, IIDWay will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with IIDWay LCD acceptance standards (copies available upon request) for a period of one year from date of shipments. Cosmetic/visual defects over specs must be returned to IIDWay within 30 days of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of IIDWay limited to repair and/or replacement on the terms set forth above. IIDWay shall not be responsible for any subsequent or consequential events.

9.1. Returning Lcm Under Warranty – Terms And Conditions

10.1.1. No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :

- Broken LCD glass.
- Circuit modified in any way, including addition of components.

10.1.2. Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB’s eyelet, conductors and terminals.