

Display Elektronik GmbH

DATA SHEET

TFT MODULE

DEM 19201080K VM-PW-N

23,8“ TFT

Product Specification

Version: 1

16.04.2026

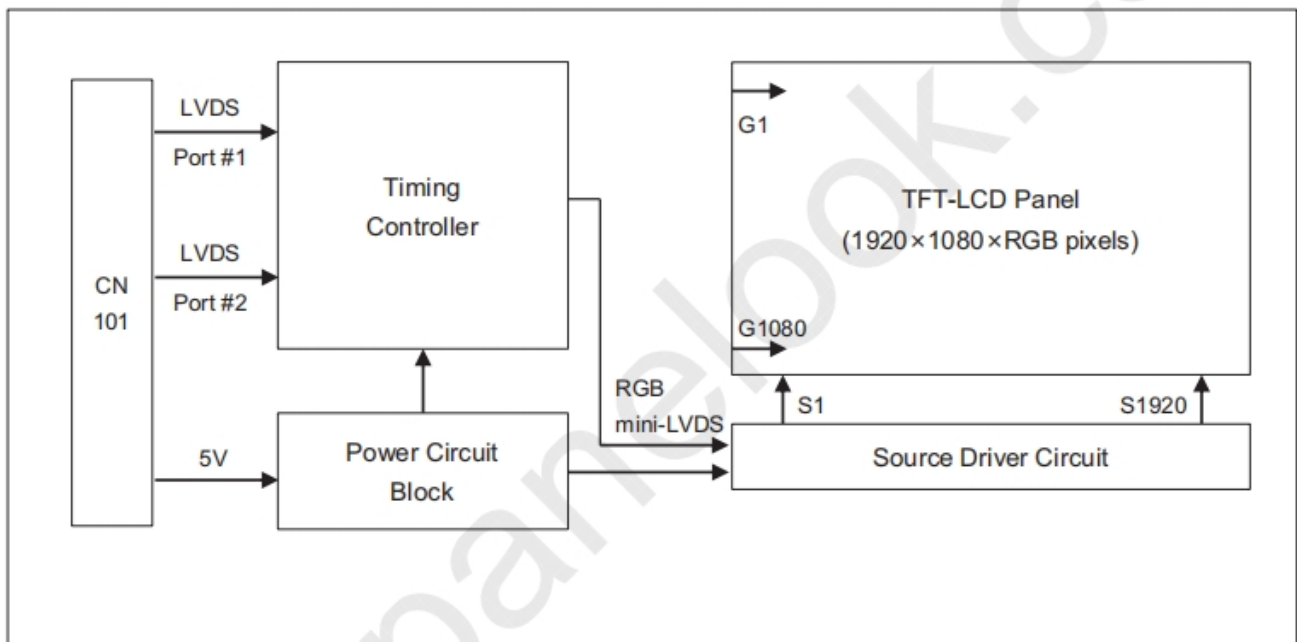
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1. General Description

1.1 Introduction

It is a color active matrix TFT LCD module using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 23.8 Inch diagonally measured active area with FHD resolutions (1920 horizontal by 1080 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors. The TFT-LCD panel used for this module is adapted for a low reflection and higher color type.



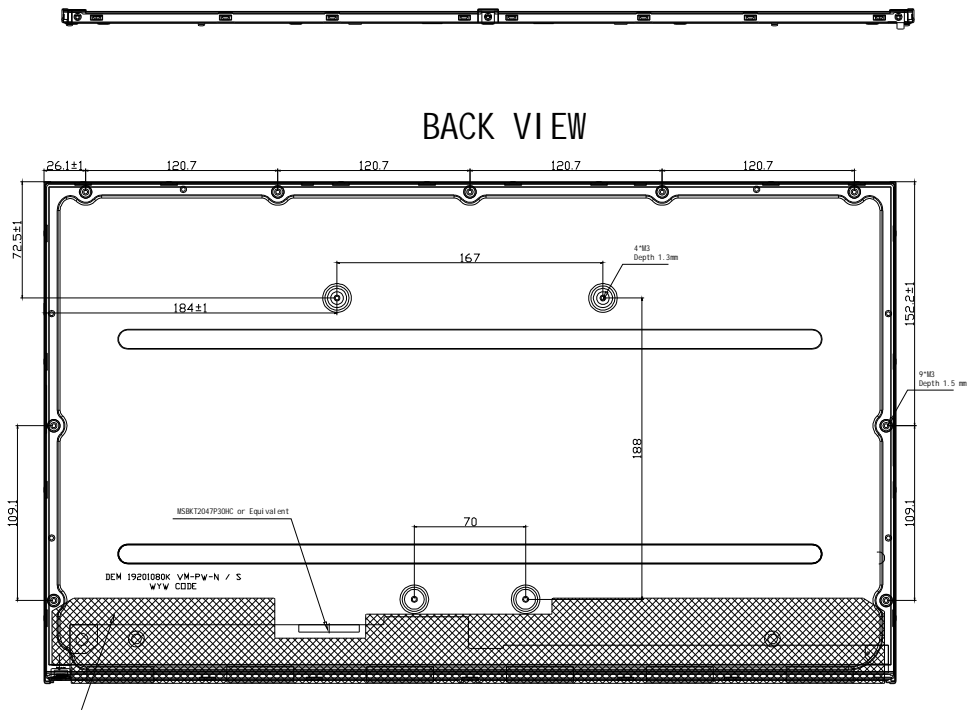
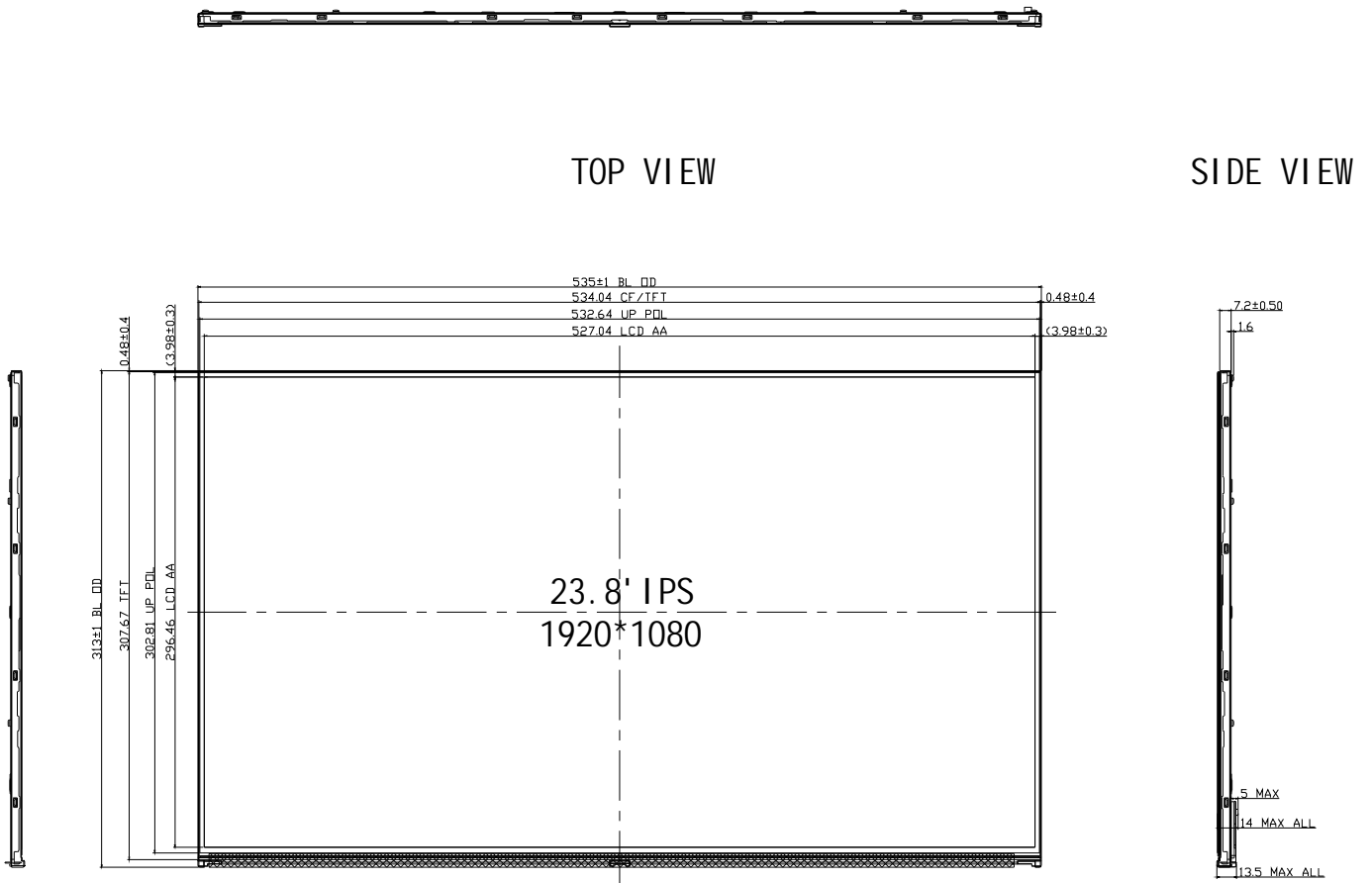
1.2 Features

General Information Items	Specification	Unit	Note
	Main Panel		
Display Area(AA)	527.04 x 296.46	mm	-
Driver Element	TFT Active Matrix	-	-
Display Colors	16.7 Million	Colors	-
Number of Pixels	1920 x (RGB) x 1080	Dots	-
Pixel Arrangement	RGB Vertical Stripe	-	-
Pixel Pitch	0.2745 x 0.2745	mm	-
LCM Interface	LVDS	-	-
Display Mode	Normally Black	-	-
Operating Temperature	0 ~ +50	°C	-
Storage Temperature	-20 ~ +60	°C	-
Surface Treatment	Anti-Glare, 3H	-	-

1.3 Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	-	535.00	-	mm	-
	Vertical(V)	-	313.00	-	mm	-
	Depth(D)	-	7.20	-	mm	-
Weight		-	t.b.d.	-	g	-

2. Outline Dimension



3. Input terminal Pin Assignment

3.1 Electrical Interface Connection

Module Side Connector: UJU IS100-L300-C23 or Equivalent

NO.	SYMBOL	DISCRIPTIONs	I/O
1	RXO0-	Negative Transmission data of Pixel 0 (ODD)	--
2	RXO0+	Positive Transmission data of Pixel 0 (ODD)	I
3	RXO1-	Negative Transmission data of Pixel 1 (ODD)	I
4	RXO1+	Positive Transmission data of Pixel 1 (ODD)	I
5	RXO2-	Negative Transmission data of Pixel 2 (ODD)	I
6	RXO2+	Positive Transmission data of Pixel 2 (ODD)	I
7	NC	NC	--
8	RXOC-	Negative Transmission Clock (ODD)	I
9	RXOC+	Positive Transmission Clock (ODD)	I
10	RXO3-	Negative Transmission data of Pixel 3 (ODD)	I
11	RXO3+	Positive Transmission data of Pixel 3 (ODD)	I
12	RXE0-	Negative Transmission data of Pixel 0 (EVEN)	I
13	RXE0+	Positive Transmission data of Pixel 0 (EVEN)	I
14	GND	Power Ground	P
15	RXE1-	Negative Transmission data of Pixel 1 (EVEN)	I
16	RXE1+	Positive Transmission data of Pixel 1 (EVEN)	I
17	GND	Power Ground	P
18	RXE2-	Negative Transmission data of Pixel 2 (EVEN)	I
19	RXE2+	Positive Transmission data of Pixel 2 (EVEN)	I
20	RXEC-	Negative Transmission Clock (EVEN)	I
21	RXEC+	Positive Transmission Clock (EVEN)	I
22	RXE3-	Negative Transmission data of Pixel 3 (EVEN)	I
23	RXE3+	Positive Transmission data of Pixel 3 (EVEN)	I
24	GND	Power Ground	P
25	NC	No connection.	--
26	NC	No connection.	--
27	NC	No connection.	--
28	VDD	Power Supply: +5V	P
29	VDD		P
30	VDD		P

4. LCD Optical Characteristics

4.1 Optical specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.	Note
Contrast Ratio	CR	$\Theta=0$	--	1000	--	--	(1)(2)
Response Time	GTG	Normal	--	14	20	Msec	--
		Viewing Angle	--				(1)(3)
Color Gamut	S(%)	--	--	70	--	%	
Color Filter Chromaticity	White	W_X	--	-0.04	0.291	+0.04	(1)(4) CF glass
		W_Y	--		0.323		
	Red	R_X	--		0.645		
		R_Y	--		0.352		
	Green	G_X	--		0.325		
		G_Y	--		0.621		
	Blue	B_X	--		0.150		
		B_Y	--		0.065		
Viewing Angle	Hor.	Θ_L	CR>10	85	89	--	--
		Θ_R		85	89	--	
	Ver.	Θ_U		85	89	--	
		Θ_D		85	89	--	
Option View Direction	--						--

*The data comes from the LCD specification.

Measuring Condition

Measuring Surrounding: Dark Room

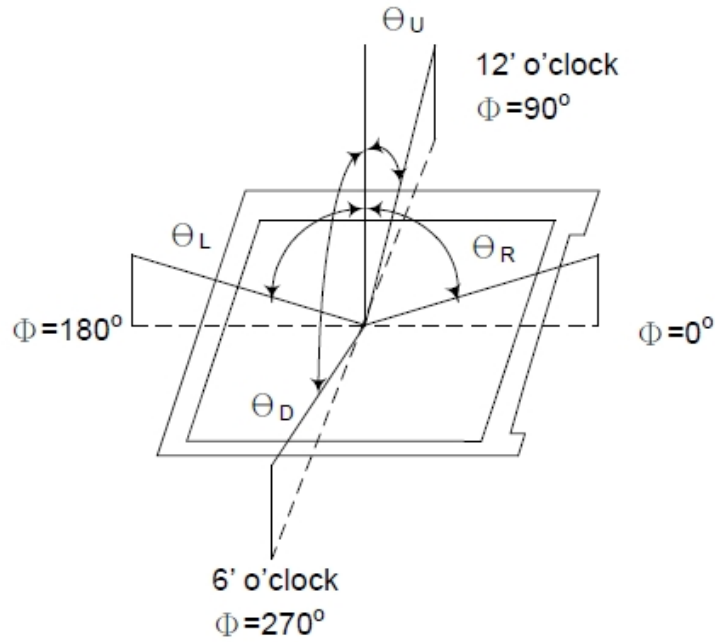
Ambient Temperature: 25°C±2°C

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.

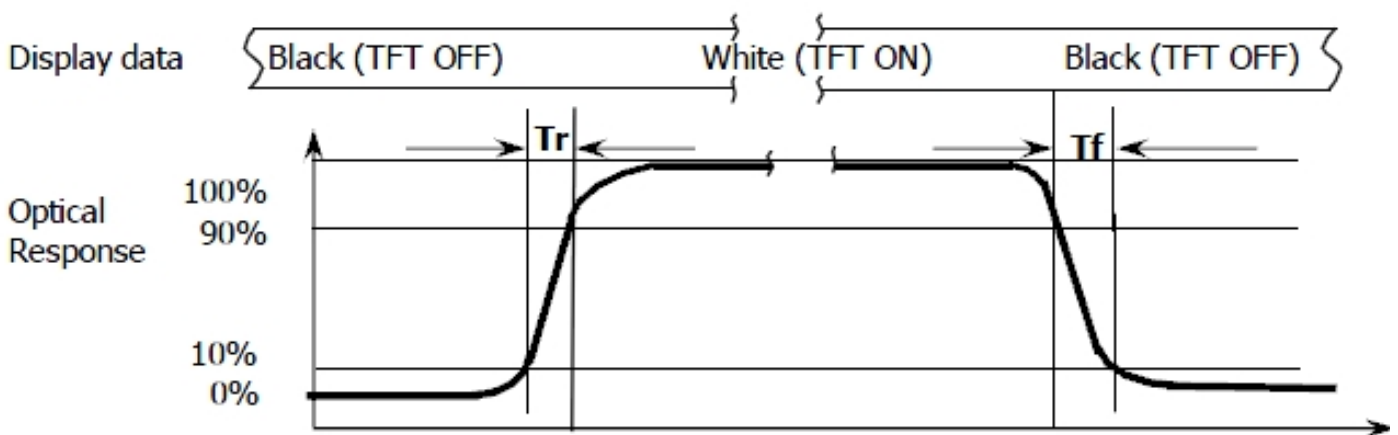
Note (1): Definition of Viewing Angle:



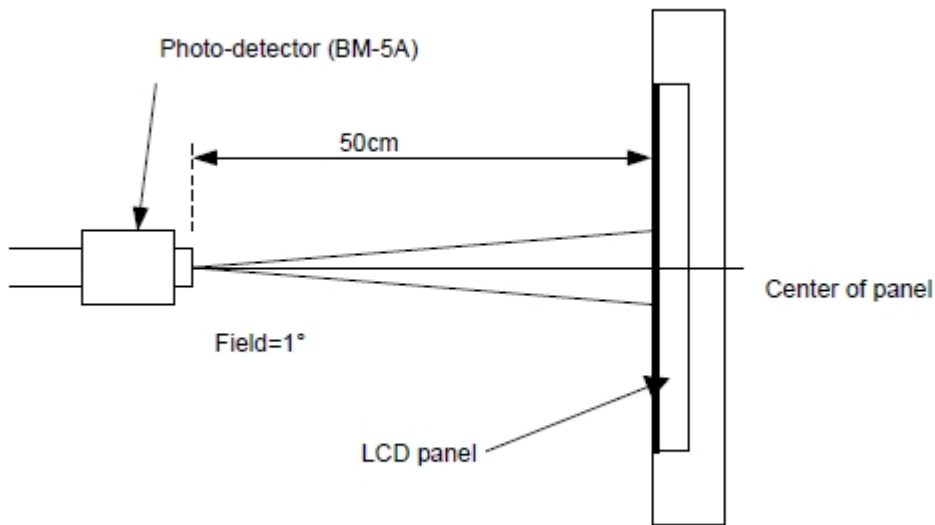
Note (2): Definition of Contrast Ratio (CR): measured at the center point of panel

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

Note (3): Response Time



Note (4): Definition of optical measurement setup



5. Electrical Characteristics

5.1 Absolute Maximum Rating

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.

Characteristics	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V _{DD}	-0.3	5.5	V	T _a = 25°C
Logic Supply Voltage	V _{IN}	-0.3	3.3+0.3	V	
Operating Temperature	T _{OP}	0	+50	°C	-
Storage Temperature	T _{ST}	-20	+60	°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
Power Supply Input Voltage	V _{DD}	4.5	5.0	5.5	V	(1)
Power Supply Current	I _{DD}	--	600	900	mA	
In-Rush Current	I _{RUSH}	--	2.0	3.0	A	V _{DD} =5V
Permissible Input Ripple Voltage	V _{RF}	--	--	300	mV	--
High Level Differential Input Threshold Voltage	V _{IH}	--	--	+100	mV	--
Low Level Differential Input Threshold Voltage	V _{IL}	-100	--	--	mV	--
Differential Input voltage	V _{ID}	200	--	600	mV	--
Differential Input Common Mode Voltage	V _{cm}	1.0	1.2	1.5		
Power Consumption	P _D	-	3.5	4.5	W	--

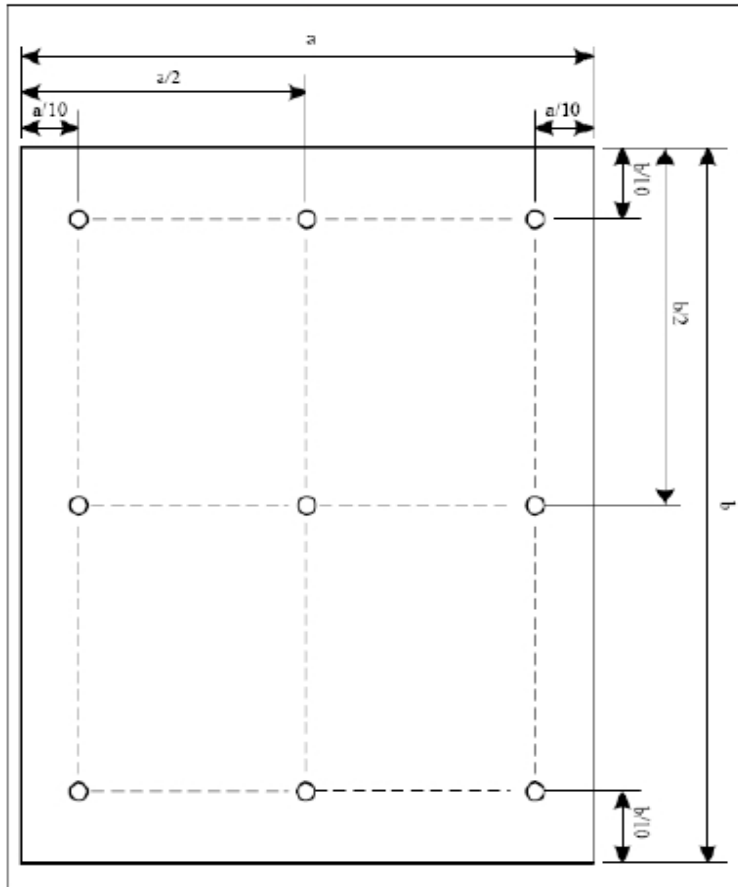
5.3 LED Backlight Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I _F	--	400	--	mA	--
Forward Voltage	V _F	46.8	--	63.0	V	--
LCM Luminance	LV	--	500	--	cd/m ²	Note3
LED life time	Hr	--	30000	--	Hour	Note1,2

Note1: LED life time (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25°C±3°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 Ta=25°C and IL=400mA. The LED lifetime could be decreased if operating IL is larger than 400mA. The constant current driving method is suggested.

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



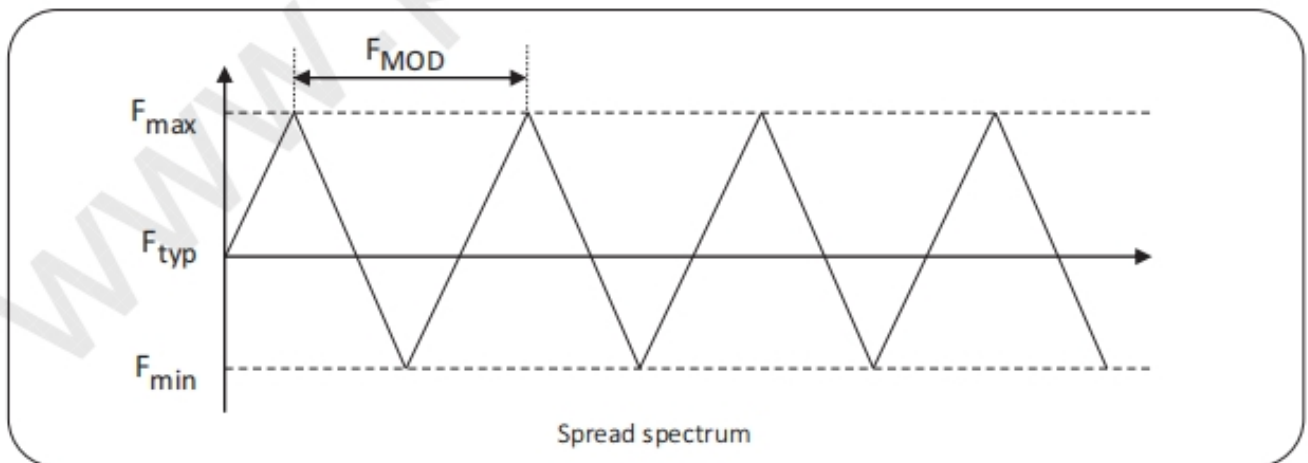
$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

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

6. SIGNAL TIMING SPECIFICATION

6.1 TIMING TABLE (DE Only Mode)

Item	Symbols		Min	Typ	Max	Unit	Note
DCLK	Period	tCLK	8.92	14.87	18.58	ns	
	Frequency	-	53.81	67.27	112.11	MHz	
Hsync	Period	tHP	1005	1010	1020	tCLK	
	Horizontal Valid	tHV	960	960	960	tCLK	
	Horizontal Blank	tHB	45	50	60		
	Frequency	fH	53.28	66.6	111	KHz	
Vsync	Period	tVP	1105	1110	1251	tHP	
	Vertical Valid	tVV	1080	1080	1080	tHP	
	Vertical Blank	tVB	25	30	171	tHP	
	Frequency	fV	48	60	100	Hz	
LVDS Receiver clock	Input spread spectrum ratio	SSr	-0.5	-	0.5	%	
	Module Frequency	F _{MOD}	30	-	200	KHz	

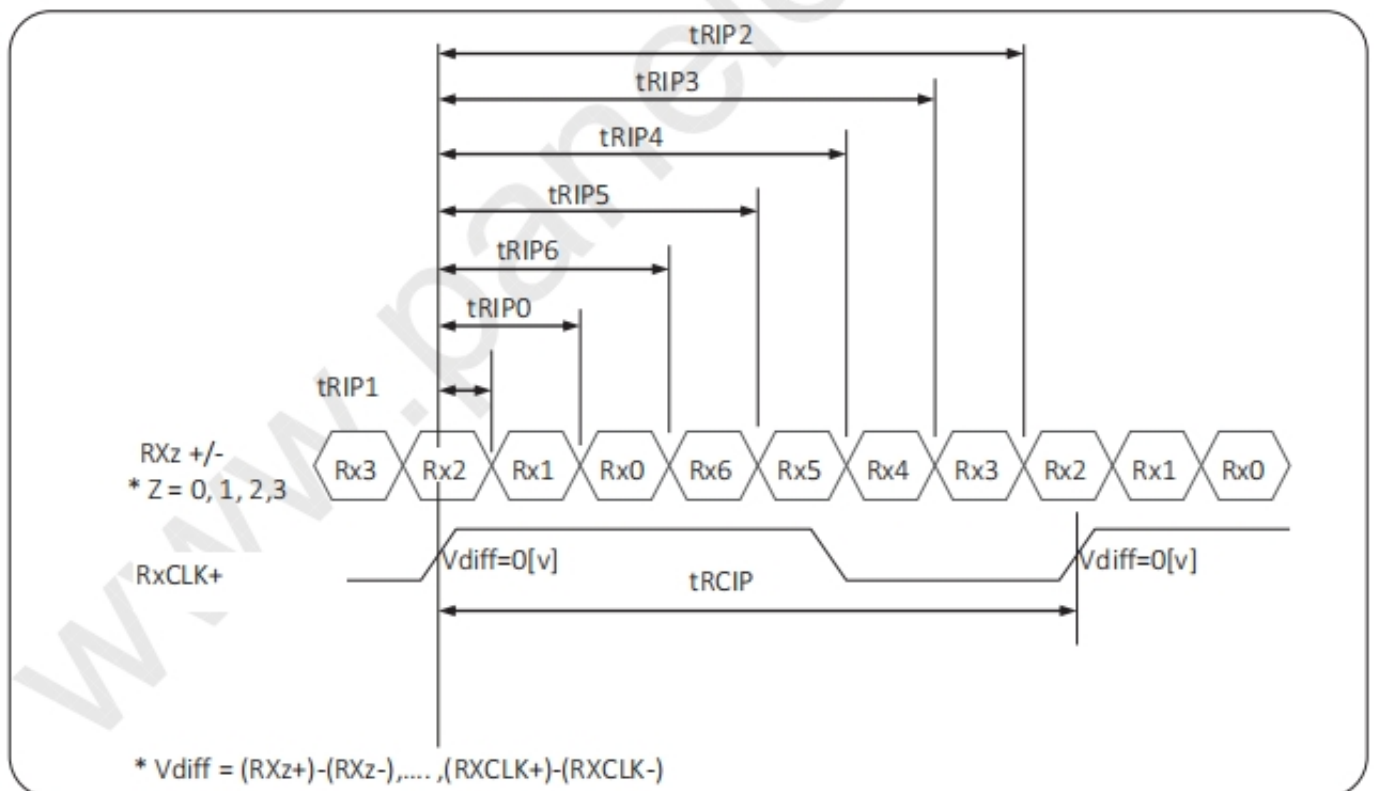


6.2 LVDS Rx Interface Timing Parameter

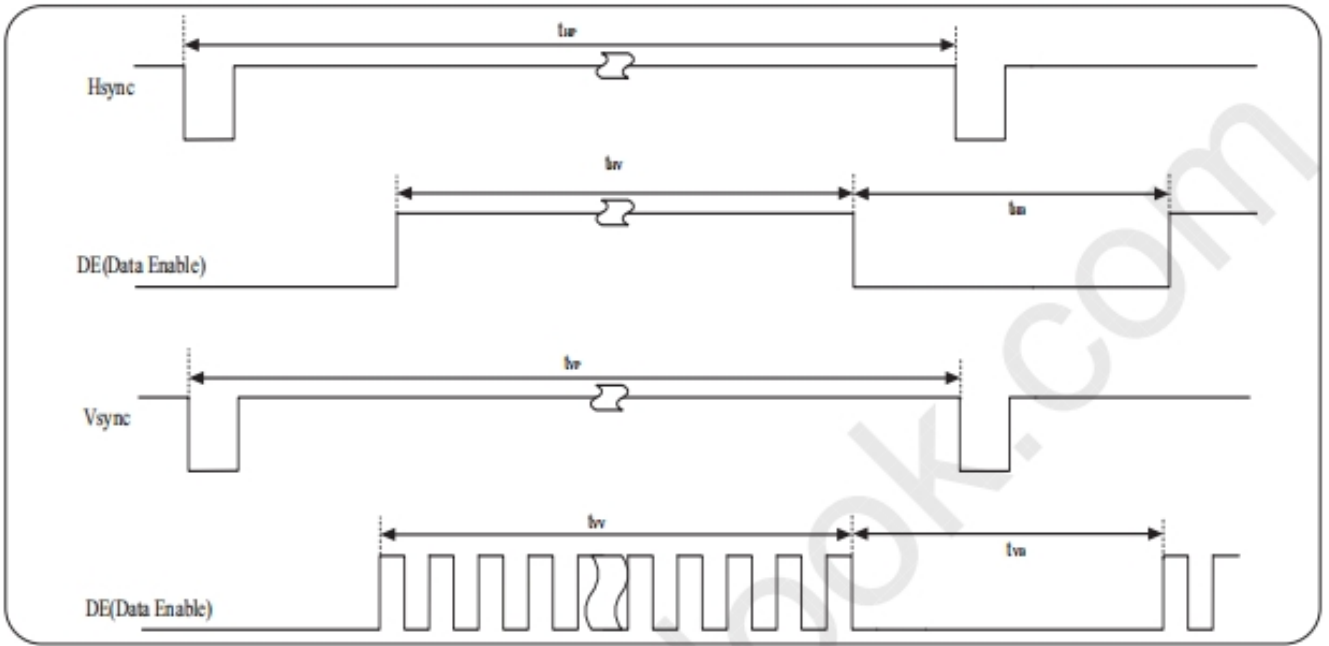
The specification of the LVDS Rx interface timing parameter is shown in Table 4.

<Table 4. LVDS Rx Interface Timing Specification>

Item	Symbol	Min	Typ	Max	Unit	Remark
CLKIN Period	tRCIP	8.92	14.87	18.58	nsec	
Input Data 0	tRIP1	-0.4	0.0	+0.4	nsec	
Input Data 1	tRIP0	tRCIP/7-0.4	tRCIP/7	tRCIP/7+0.4	nsec	
Input Data 2	tRIP6	2 × tRCIP/7-0.4	2 × tRCIP/7	2 × tRCIP/7+0.4	nsec	
Input Data 3	tRIP5	3 × tRCIP/7-0.4	3 × tRCIP/7	3 × tRCIP/7+0.4	nsec	
Input Data 4	tRIP4	4 × tRCIP/7-0.4	4 × tRCIP/7	4 × tRCIP/7+0.4	nsec	
Input Data 5	tRIP3	5 × tRCIP/7-0.4	5 × tRCIP/7	5 × tRCIP/7+0.4	nsec	
Input Data 6	tRIP2	6 × tRCIP/7-0.4	6 × tRCIP/7	6 × tRCIP/7+0.4	nsec	

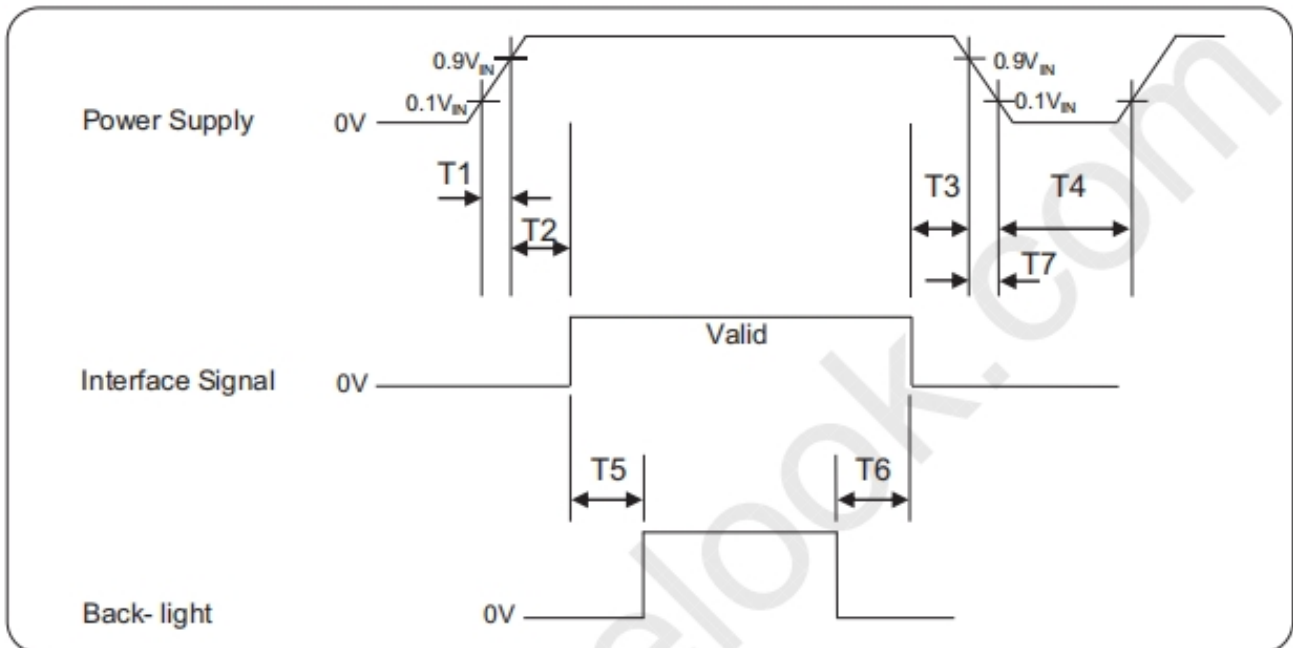


6.3 Signal Timing Waveforms of Interface Signal



6.4 POWER SEQUENCE

The power on/off sequence shall be as shown in below.



Parameter.	Min.	Typ.	Max.	Unit
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	0.1	-	50	ms
T4	1000	-	-	ms
T5	500	-	-	ms
T6	200	-	-	ms

- Notes: (1) When the power supply V_{IN} is 0V, keep the level of input signals on the low or keep high impedance.
 (2) Do not keep the interface signal high impedance when power is on.
 (3) Back Light must be turn on after power for logic and interface signal are valid.
 (4) T7 decreases smoothly, there is none re-bouncing voltage.
 (5) The above power sequence should be satisfied at these case
 - AC/DC power On/Off
 - Mode Change (Resolution, frequency, timing, sleep mode, color depth change etc.)
 If not to follow power sequence, there is a risk of abnormal display.
 (6) If T3=0ms, there is a risk of flicker when power On/Off.
 (7) If T6=0ms, there is a risk of abnormal display when power off.

7. Reliability Test Result

Remark:

Item	Condition	Inspection after test
High Temperature Operating	60°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	-5°C, 96h	
High Temperature Storage	60°C, 96h	
Low Temperature Storage	-20°C, 96h	
High Temperature & High Humidity Operating	+50°C, 80% RH ,240h	
Thermal Shock (Non-operation)	-20°C, 30 min ↔ +60°C, 30 min 100 cycle	
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)	

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.

8. Cautions and Handling Precautions

8.1 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

8.2 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°C 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.