Rocktech Displays Limited

LCD Module Specification

Module P/N: RK101IZ062

Version: 1.0

Description : 10.1 inch TFT 1200*1920 Pixels with
LED backlight,All viewing angle
500 nits brightness

TEL: 0086-755-26065260

Fax: 0086-755-26065261

E-mail: Sales@rocktech.com.hk

Web: www.rocktech.com.hk

Revision History

Date	Rev.	Page	Description
2023-04-15	1.0	All	First issue

CONTENTS

1.General Features

Item	Spec	Remark
Display Mode	Normally Black transmissive	
Viewing Direction	Free	IPS
Input Signals	MIPI	
Outside Dimensions	142.96(W)×228.56(H)×2.54(D)	
Active Area	135.36(W)×216.58(H)	
Number of Pixels	1200(RGB)×1920	
Dot Pitch	0.1128mm(W) ×0.1128mm(H)	
Pixel Arrangement	RGB Vertical stripes	
Driver IC	HX8279D*2	

2.Absolute Maximum Ratings

The following are maximum values which, if exceeded may cause operation or damage to the unit.

ITEM	Sym.	Min.	Typ.	Max.	Unit	Remark
Power for Circuit Driving	VDD	-0.3	-	3.6	V	
Storage Temperature	T_{ST}	-30	-	80	℃	
Operating Ambient Humidity	H_{OP}	10	-		%RH	
Operating Ambient temperature	T_{OP}	-20	-	70	℃	

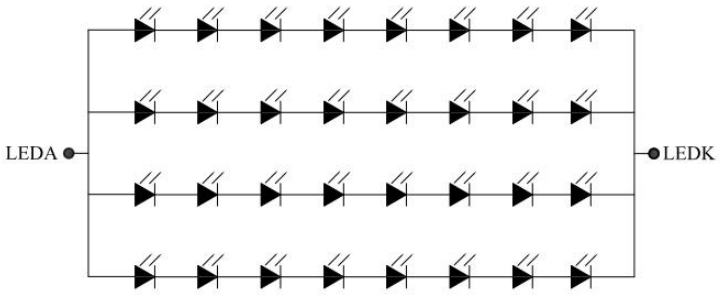
3.Electrical Specification

3.1 Driving TFT LCD Panel

Item		Sym.	Min	Typ.	Max	Unit	Note
Power for Circuit Driving		VDD	-	3.3	-	V	
Logic Input Voltage	Low Voltage	VIL	0.0	-	0.2 IOVCC	V	
	High Voltage	VIH	0.8 IOVCC	-	IOVCC	V	
Logic Output Voltage	Low Voltage	VOL	0	-	0.2IOVCC	V	
	High Voltage	VOH	0.8IOVCC	-	IOVCC	V	

3.2 Driving Backlight

Item	Sym.	Min	Typ.	Max	Unit	Note
Backlight driving voltage	VF	-	25.6	-	V	
Backlight driving current	IF	80	100	120	mA	
Backlight Power Consumption	WBL	-	2560	-	mW	
Life Time	-	-	50,000	-		Note 3



Note 1: (Unless specified, the ambient temperature Ta=25℃)
Note 2: The recommended operating conditions refer to a range in which operation of this product is guaranteed. Should this range is exceeded, the operation cannot be guaranteed even if the values may be without the absolute maximum ratings.
Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

4. Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25 ℃. The values specified are at an approximate distance 500mm from the LCD surface at a viewing angle of Φ and θ equal to 0°.

Item	Sym.	Values			Unit	Note
		Min.	Typ.	Max.		
1)Contrast Ratio	C/R	800	1000	-		FIG.1
2)Module Luminance	L	450	500	-	cd/m^2	FIG.1
3)Response time	Tr+Tf	-	25	-	ms	FIG.2
4)Viewing Angle	θ_T	80	85	-	Degree	FIG.3
	θ_B	80	85	-		
	θ_L	80	85	-		
	θ_R	80	85	-		
5)Chromaticity	Wx	0.26	0.30	0.34		
	Wy	0.29	0.33	0.37		
	Rx	-	-	-		
	Ry	-	-	-		
	Gx	-	-	-		
	Gy	-	-	-		
	Bx	-	-	-		
	By	-	-	-		

◆ Measurement System

Notes:

1. Contrast Ratio(CR) is defined mathematically as :

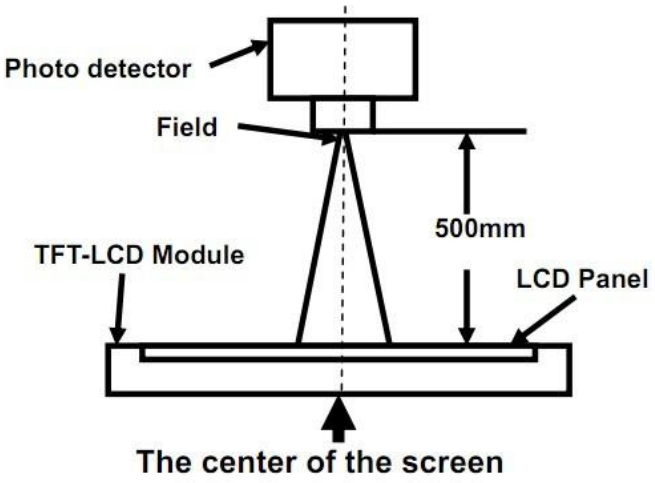
$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

2. Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white. For more information see FIG 1.

3. Response time is the time required for the display to transition from white to black (Rising Time, Tr) and from black to white (Falling Time, Tf). For additional information see FIG 2.

4. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 3.

FIG. 1 Optical Characteristic Measurement Equipment and Method



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

FIG. 2 The definition of Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for “black” and “white”.

Response Time = Rising Time(Tr) + Falling Time(Tf)

- Rising Time(Tr) : Full White 90% → Full White 10% Transmittance.
- Falling Time(Tf) : Full White 10% → Full White 90% Transmittance.

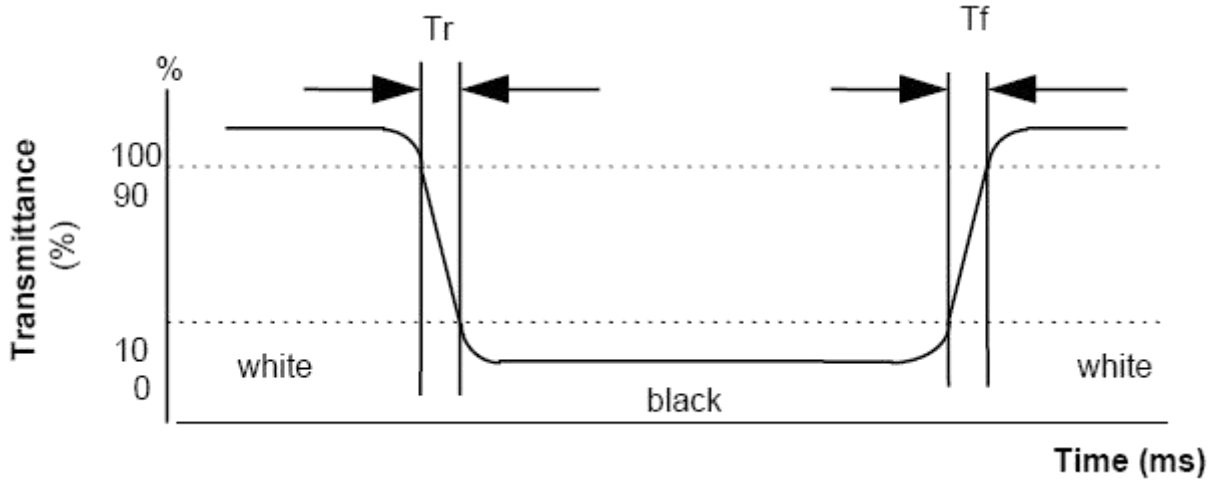
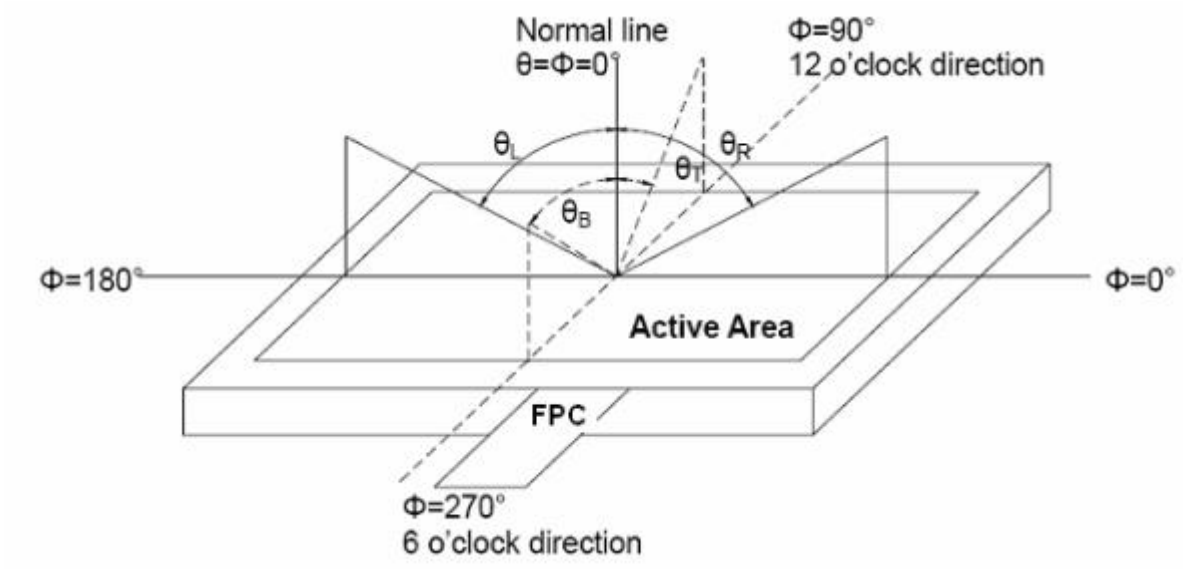
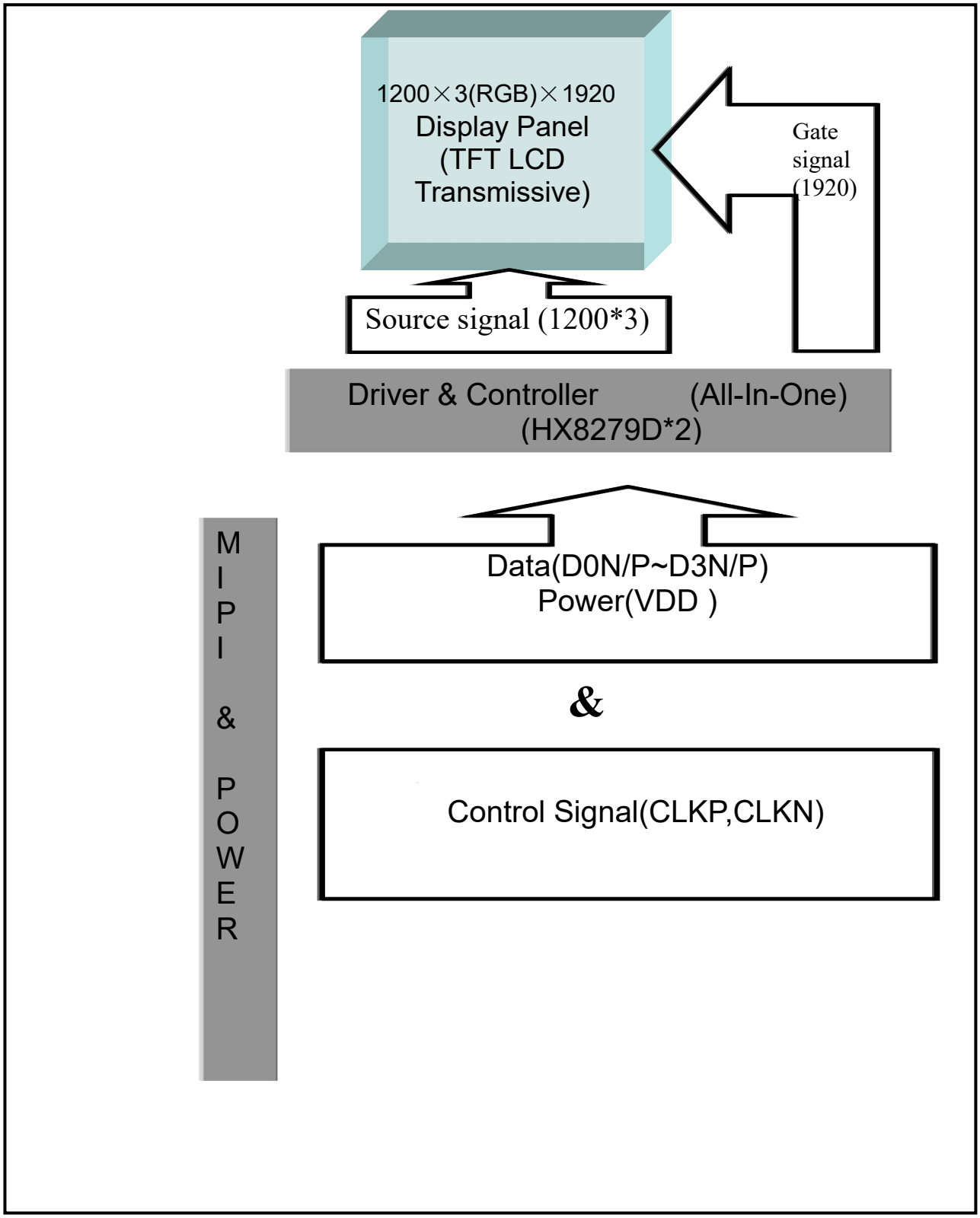


FIG. 3 The definition of Viewing Angle

Use Fig. 1(Test Procedure) under Measurement System to measure the contrast from the measuring direction specified by the conditions as the following figure.



5.Block Diagram



6.Pin Description

Item	Terminal	Functions
1	NC	NC
2	VDD	Interface power supply3.3V
3	VCCIO(NC)	NC
4	GND	NC
5	RESET(NC)	NC
6	NC	NC
7	GND	Ground
8	D0N	Differential data pairs for MIPI interface.
9	D0P	Differential data pairs for MIPI interface.
10	GND	Ground
11	D1N	Differential data pairs for MIPI interface.
12	D1P	Differential data pairs for MIPI interface.
13	GND	Ground
14	CLKN	Differential clock or strobe pair for MIPI interfaces.
15	CLKP	Differential clock or strobe pair for MIPI interfaces.
16	GND	Ground
17	D2N	Differential data pairs for MIPI interface.
18	D2P	Differential data pairs for MIPI interface.
19	GND	Ground
20	D3N	Differential data pairs for MIPI interface.
21	D3P	Differential data pairs for MIPI interface.
22	GND	Ground
23	NC	NC
24	NC	NC
25	GND	Ground
26	ID	NC
27	PWMO	NC
28	NC	NC
29	NC	NC
30	GND	Ground
31	LED-K	B/L Power input PIN negative
32	LED-K	B/L Power input PIN negative
33	NC	NC
34	NC	NC
35	NC	NC
36	NC	NC
37	NC	NC
38	NC	NC
39	LED-A	B/L Power input PIN anode
40	LED-A	B/L Power input PIN anode

7. Timing Characteristics

7.1. MIPI AC characteristics

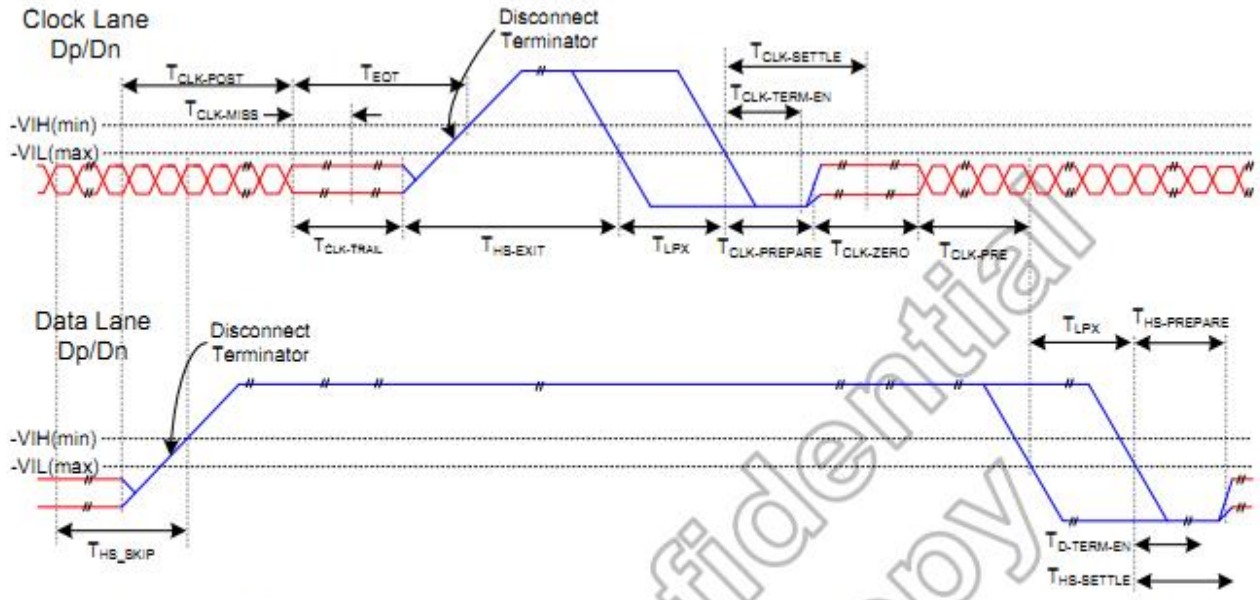


Figure 13.1: Switching the clock lane between clock transmission and low-power mode

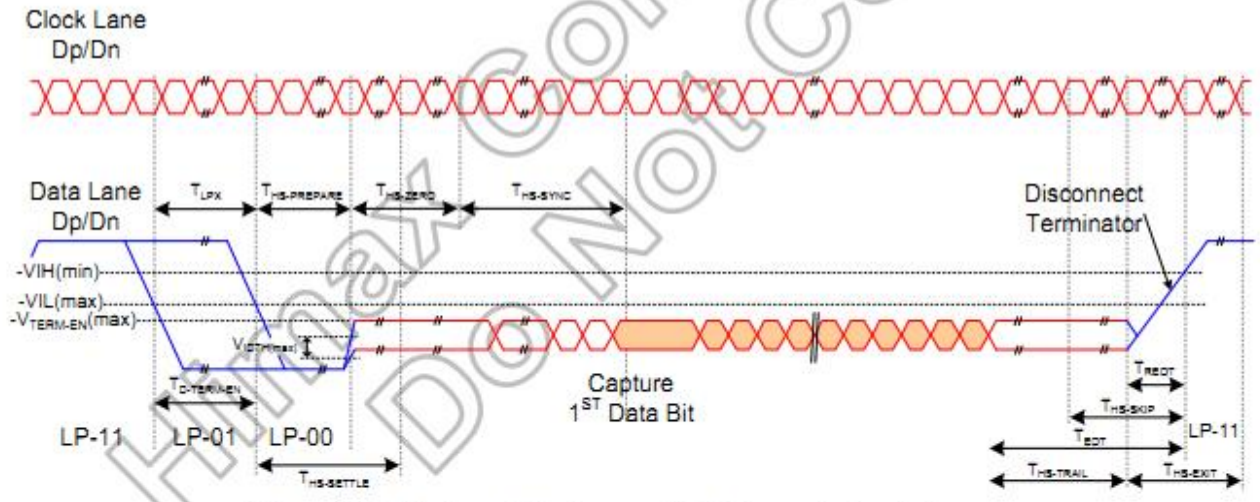
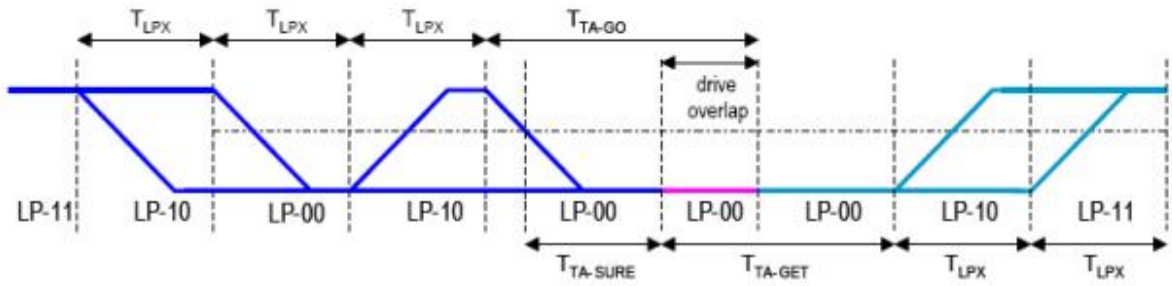
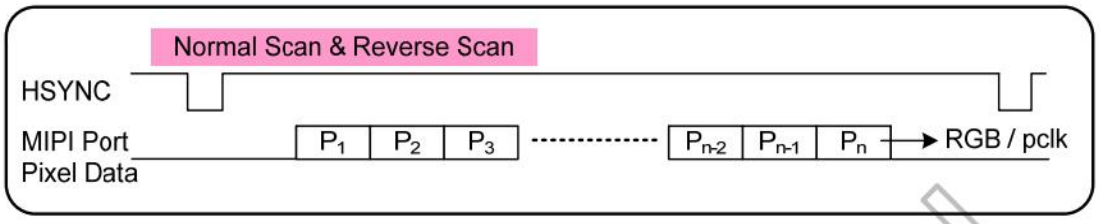


Figure 13.2: Timing of high-speed data transmission in bursts



7.2. Input Timing for Multi-Drop type

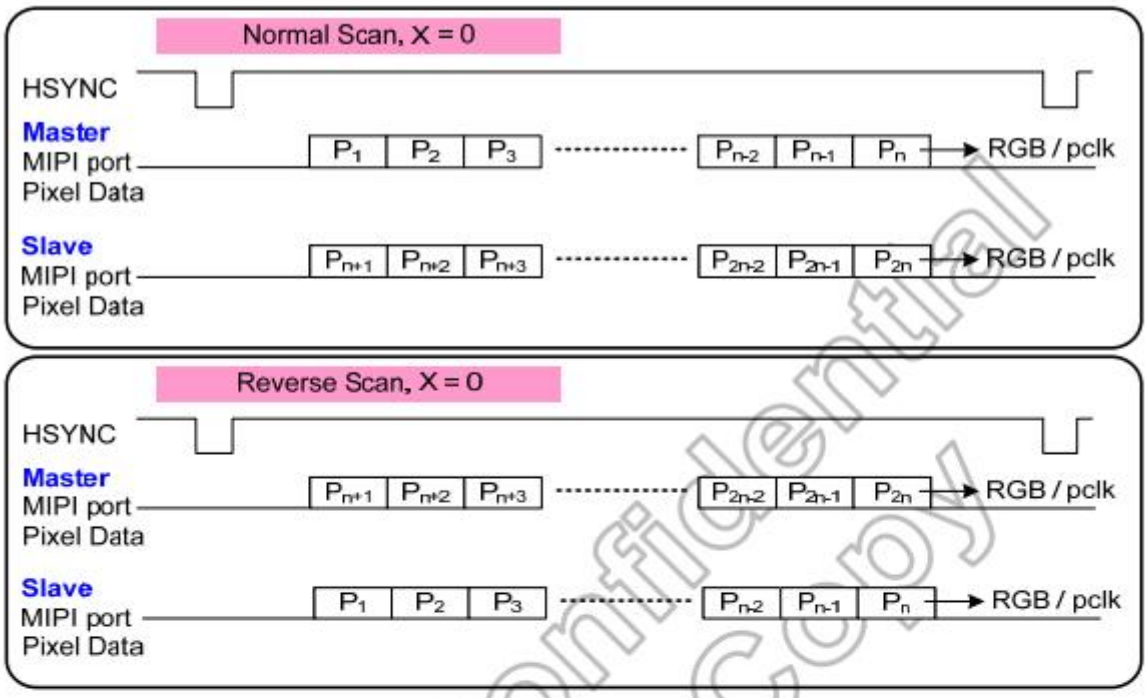
MIPI Multi-Drop type when normal or reverse scan.



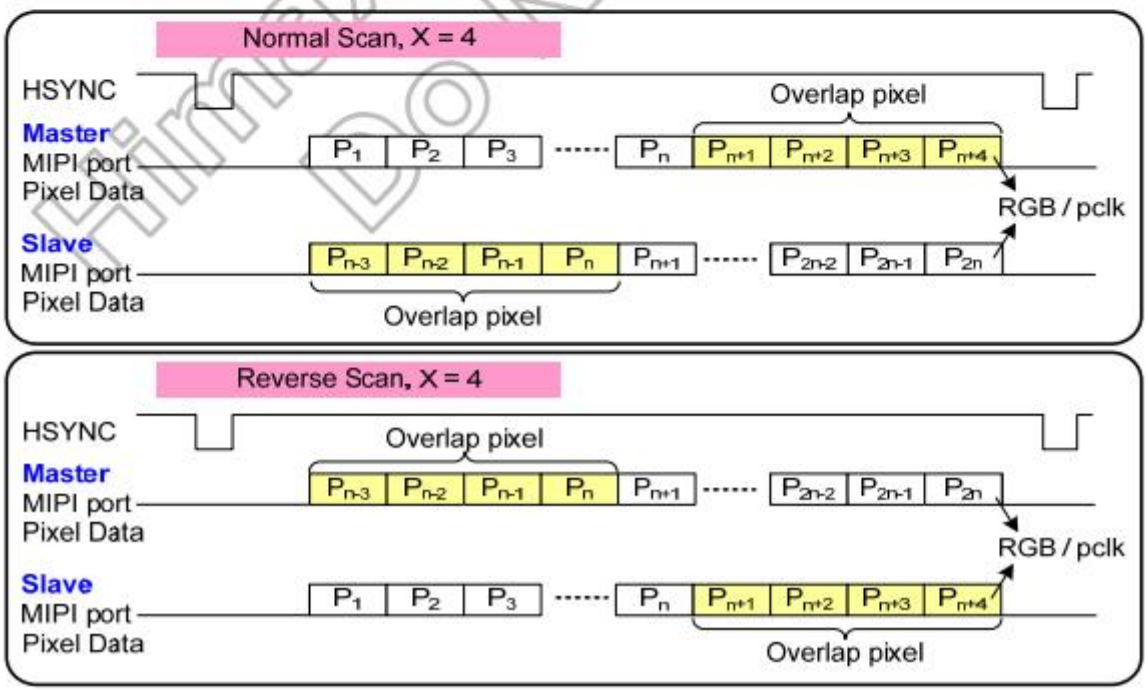
Input Timing	Symbol	1200RGBx1920			1200RGBx1600			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
PCLK Frequency	-	-	156	-	-	131	-	MHz
Horizontal Total	THT	-	1340	2047	-	1340	2047	DCLK
Horizontal Synchronization	THS	-	24	-	-	24	-	DCLK
Horizontal Back Porch	THB	-	80	-	-	80	-	DCLK
Horizontal Address	THA	-	1200	-	-	1200	-	DCLK
Horizontal Front Porch	THF	-	60	-	-	60	-	DCLK
Vertical Frequency	-	-	60	-	-	60	-	Hz
Vertical Total(1)	TVT	-	1944	2047	-	1624	1750	THT
Vertical Synchronization	TVS	-	2	-	-	2	-	THT
Vertical Back Porch	TVB	-	10	-	-	10	-	THT
Vertical Address	TVA	-	1920	-	-	1600	-	THT
Vertical Front Porch	TVF	-	14	-	-	14	-	THT

7.3. Input Timing for Multi-Drop type

MIPI R/L type timing when normal and reverse scan. Below figure is no overlap X=0 between left and right display data. The value of X can be setting by page0 0xB7[2:1].



At MIPI R/L type, it supports overlap X= 2,4 between left and right display data. Below figure is example for overlap X=4. The value of X can be setting by REG OVERLAP (page0 0xB7[2:1]). **The overlap pixel must be sent in the zigzag panel application.**



Input Timing	Symbol	1200RGBx1920			1200RGBx1600			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
PCLK Frequency	-	-	86	-	-	72	-	MHz
Horizontal Total	THT	-	740	1200	-	740	1200	DCLK
Horizontal Synchronization	THS	-	24	-	-	24	-	DCLK
Horizontal Back Porch	THB	-	80	-	-	80	-	DCLK
Horizontal Address	THA		600	-	-	600	-	DCLK
Horizontal Front Porch	THF	-	60	-	-	60	-	DCLK
Vertical Frequency	-	-	60	-	-	60	-	Hz
Vertical Total	TVT	-	1944	2047	-	1624	2047	THT
Vertical Synchronization	TVS	-	2	-	-	2	-	THT
Vertical Back Porch	TVB	-	10	-	-	10	-	THT
Vertical Address	TVA	-	1920	-	-	1600	-	THT
Vertical Front Porch	TVF	-	14	-	-	14	-	THT

7.4. Reset Timing

When RESETB of the reset pin equals to Low, it will be in the condition of reset. When it is in the condition of reset, it will make the device recover the initial set.

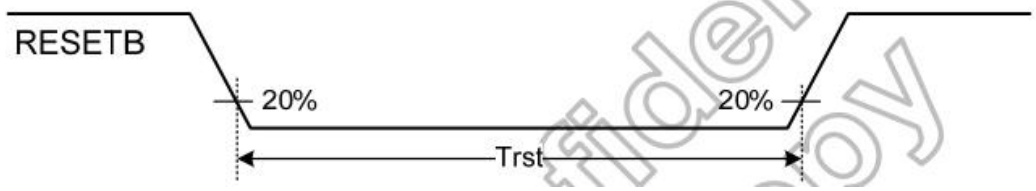
However, in order to avoid the reset noise cause reset, there is a mechanism to judge about whether the reset is needed or not.

The closed interval of low can be shown as the following.

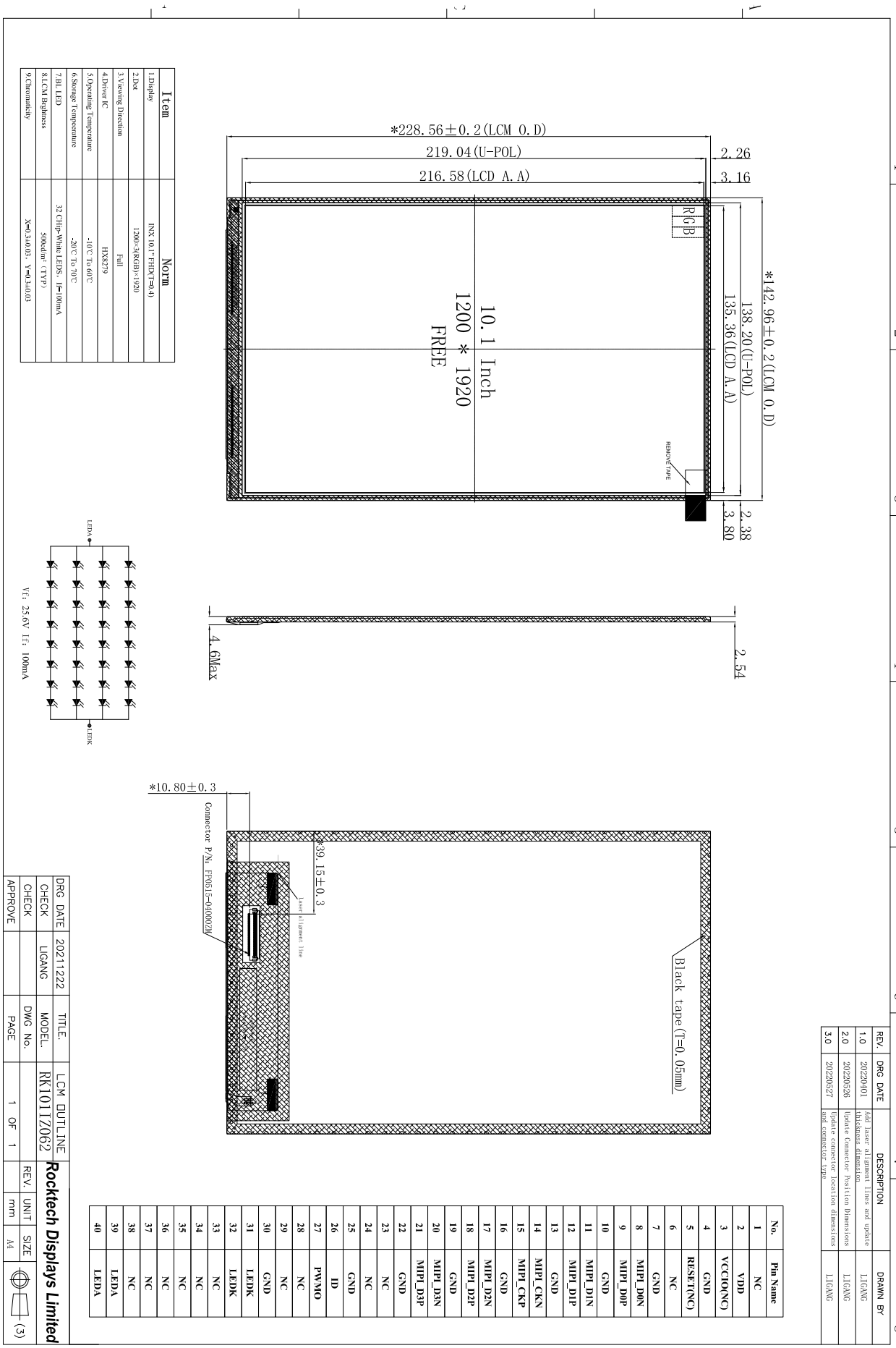
(VDD=1.7V~2.0V, VSS=0V, T_A=-20℃~+85℃)

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
Reset low pulse width	Trst	-	20	-	-	μs

Table 13.5: Reset timing



8. Outline Dimension



Item	Norm
1.Display	INX 10.1" FHD(T=0.4)
2.Dot	1200×3(RGB)×1920
3.Viewing Direction	Full
4.Driver IC	HX8279
5.Operating Temperature	-10℃ To 60℃
6.Storage Temperature	-20℃ To 70℃
7.BL LED	32 Chip-White LEDS, I=100mA
8.LCM Brightness	500cd/m² (TYP)
9.Chromaticity	X=0.3±0.03, Y=0.3±0.03

No.	Pin Name
1	NC
2	VDD
3	VCCIO(NC)
4	GND
5	RESET(NC)
6	NC
7	GND
8	MIPI_D0N
9	MIPI_D0P
10	GND
11	MIPI_D1N
12	MIPI_D1P
13	GND
14	MIPI_CKN
15	MIPI_CKP
16	GND
17	MIPI_D2N
18	MIPI_D2P
19	GND
20	MIPI_D3N
21	MIPI_D3P
22	GND
23	NC
24	NC
25	GND
26	ID
27	PWMO
28	NC
29	NC
30	GND
31	LEDK
32	LEDK
33	NC
34	NC
35	NC
36	NC
37	NC
38	NC
39	LEDA
40	LEDA

REV.	DRG DATE	DESCRIPTION	DRAWN BY
1.0	20220401	Add laser alignment lines and update thickness dimension	LIGANG
2.0	20220526	Update Connector Position Dimensions	LIGANG
3.0	20220527	Update connector location dimensions and connector type	LIGANG

DRG DATE	20211222	TITLE.	LCM OUTLINE
CHECK	LIGANG	MODEL.	RK101IZ062
CHECK		DWG No.	
APPROVE		PAGE	1 OF 1

Rocktech Displays Limited

REV.		
UNIT	mm	SIZE
		A4

(3)

9. Reliability and Inspection Standard

No.	Test Item		Test Conditions	Remark
1	High Temperature	Storage	80℃, 120Hr	Note
		Operation	70℃, 120Hr	Note
2	Low Temperature	Storage	-30℃, 120Hr	Note
		Operation	-20℃, 120Hr	
3	High Temperature and High Humidity		40℃, 90%RH, 120Hr	Note
4	Thermal Cycling Test(No operation)		-20℃ for 30min, 70℃ for 30 min. 100 cycles. Then test at room temperature after 1 hour	Note
5	Vibration Test(No operation)		Frequency :10~55 HZ; Stroke :1.5 mm;Sweep:10HZ~55HZ~10HZ; 2hours for each direction of X, Y, Z(6 hours for total)	
6	Package Drop Test		Height:60 cm,1 corner, 3 edges, 6 surfaces	
7	Electro Static Discharge		±2KV,Human Body Mode, 100pF/1500Ω	

Note:

1) Sample quantity for each test item is 5~10pcs.
2) Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

10.PRECAUTIONS FOR USING LCD MODULES

Handing Precautions

(1) The display panel is made of glass and polarizer. As glass is fragile, it tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.
(2) If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
(3) Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).
(4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.
(5) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
- Isopropyl alcohol
- Ethyl alcohol
Do not scrub hard to avoid damaging the display surface.
(6) Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
- Water
- Ketone
- Aromatic solvents
Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contacting oil and fats.
(7) Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
(8) Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
(9) Do not attempt to disassemble or process the LCD module.
(10) NC terminal should be open. Do not connect anything.
(11) If the logic circuit power is off, do not apply the input signals.
(12) Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.
- Do not alter, modify or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal

connector.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend or twist LCM.

Storage Precautions

When storing the LCD modules, the following precaution is necessary.
(1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the dessicant.
(2) Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C.
(3) The polarizer surface should not come in contact with any other objects. (We advise you to store them in the container in which they were shipped).

Others

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.
- Exposed area of the printed circuit board.
-Terminal electrode sections.