

LCD MODULE SPECIFICATION

Model:	UE101FH-RB40-A063A
Version:	V1.0
Date:	20250304

Customer Confirmation 客户确认

Approved by	Notes

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

请贵司在收到规格书的两周内，将签好字的规格书原件或者复印件寄回.如果没有返回，我司将会认为贵司已经默认接受产品规格书中的全部资料和规范.

VIEWE Confirmation 优奕确认

Prepared by	Reviewed by	Approved by

REVISION HISTORY

Revision 版本号	Date 日期	Contents of Revision Change 修改内容	Remark 备注
V1.0	20250304	Preliminary release	

TABLE of CONTENTS

1. GENERAL INFORMATION	4
1.1 Features	4
1.2 Mechanical Specification	4
2. ABSOLUTE MAXIMUM RATINGS	5
3.ELECTRICAL SPECIFICATIONS	6
3.1 TFT LCD Module	6
3.2 LED driver	6
4. MECHANICAL DRAWING	7
5. INTERFACE CONNECTIONM	8
5.1 Interface Input Signal & Power	8
6. INTERFACE TIMING PARAMETER	9
6.1 MIPI AC Characteristics.....	9
6.2 Low Speed Mode.....	10
6.3 Dsi Bursts.....	11
6.4 Reset input timing.....	12
7. POWER SEQUENCE.....	15
7.1 Power on Timing.....	15
7.2 Power off Timing.....	16
8. OPTICAL CHARACTERISTICS	17
9. RELIABILITY	20
10. PACKAGE DRAWING	21

1. GENERAL INFORMATION

1.1 Features

- 1) Pixel Arrangement: RGB Vertical Stripe
- 2) Interface Mode: 4-Lane MIPI
- 3) Driver IC: FL7707N , TOUCH IC: GT911
- 4) Operation Temperature: -20~70℃
- 5) Storage Temperature: -30~80℃
- 6) Backlight Type: White LED
- 7) Display mode: Normally Black
- 8) LED life time: 30,000 Hours

1.2 Mechanical Specification

Item 项目	Specification 规格	Unit 单位	Remark 备注
Pixel Driving element	IPS TFT	-	-
Screen Size	10.11	Inch	Diagonal
Resolution	440(H) RGB x 1920(V)	Dots	-
Interface	4-Lane MIPI	-	-
Module Power Consumption	TBD	Watt	Typ.
Active Area	57.948(H) × 252.864 (V)	mm	Typ
Pixel pitch (W*H)	43.9(H) × 3 × 131.7(V)	mm	Typ
Module Size (W*H*D)	64.98(W)*266.09 (H)*7.25(D)	mm	Typ
LCM Luminance	420	cd/m ²	Typ.
Viewing Direction	85/85/85/85	O'clock	(CR>10) Typ.
Display Color	16.7M	Colors	

2. ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

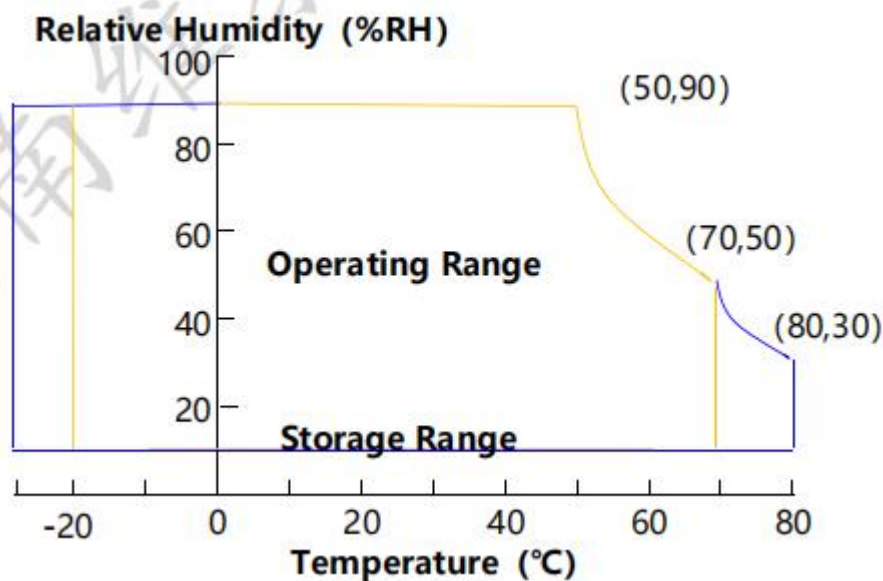
< Table 2. Environment Absolute Maximum Ratings>

[Ta = 25 ± 2 °C]

Item 项目	Symbo l 符号	Min. 最小值	Max. 最大值	Unit 单位	Remark 备注
Power Supply Voltage	VDD	3	3.6	V	Ta=25°C
Operating Temperature	T _{OP}	-20	+70	°C	Note1
Storage Temperature	T _{ST}	-30	+80	°C	
Operating Ambient Humidity	H _{OP}	10	90	%RH	
Storage Humidity	H _{st}	10	90	%RH	

Note : 1) Temperature and relative humidity range are shown in the figure below.

Wet bulb temperature should be 39 °C max. and no condensation of water.



3.ELECTRICAL SPECIFICATIONS

3.1 TFT LCD Module

< Table 3. Open Cell Electrical Specifications >

[Ta = 25 ± 2 °C]

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
Power Supply Voltage	VDD	3.0	3.3	3.6	V	Note 1
Power Supply Ripple Voltage	VRP	-	-	100	mV	
Power Supply Current	IDD	-	40	-	mA	
Analog Operating voltage	VSP	4.5	5	5	V	
Analog Operating voltage	VSN	-6	-5	-4.5	V	
Analog Operating voltage	VCOM	-3.5	-1.6	0	V	

Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.
The current draw and power consumption specified is for VBAT = 3.3V, Frame rate fV = 60Hz
and Clock frequency = 66MHz. Test Pattern of power supply current
a) Typ : Mosaic 8 x 3 Pattern(L0/L255)
b) Max : White

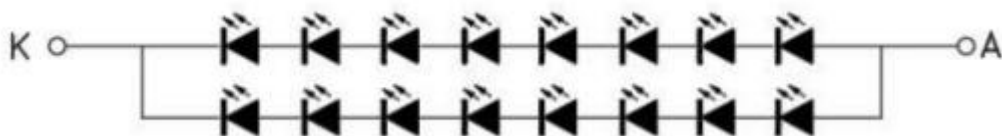


3.2 LED driver

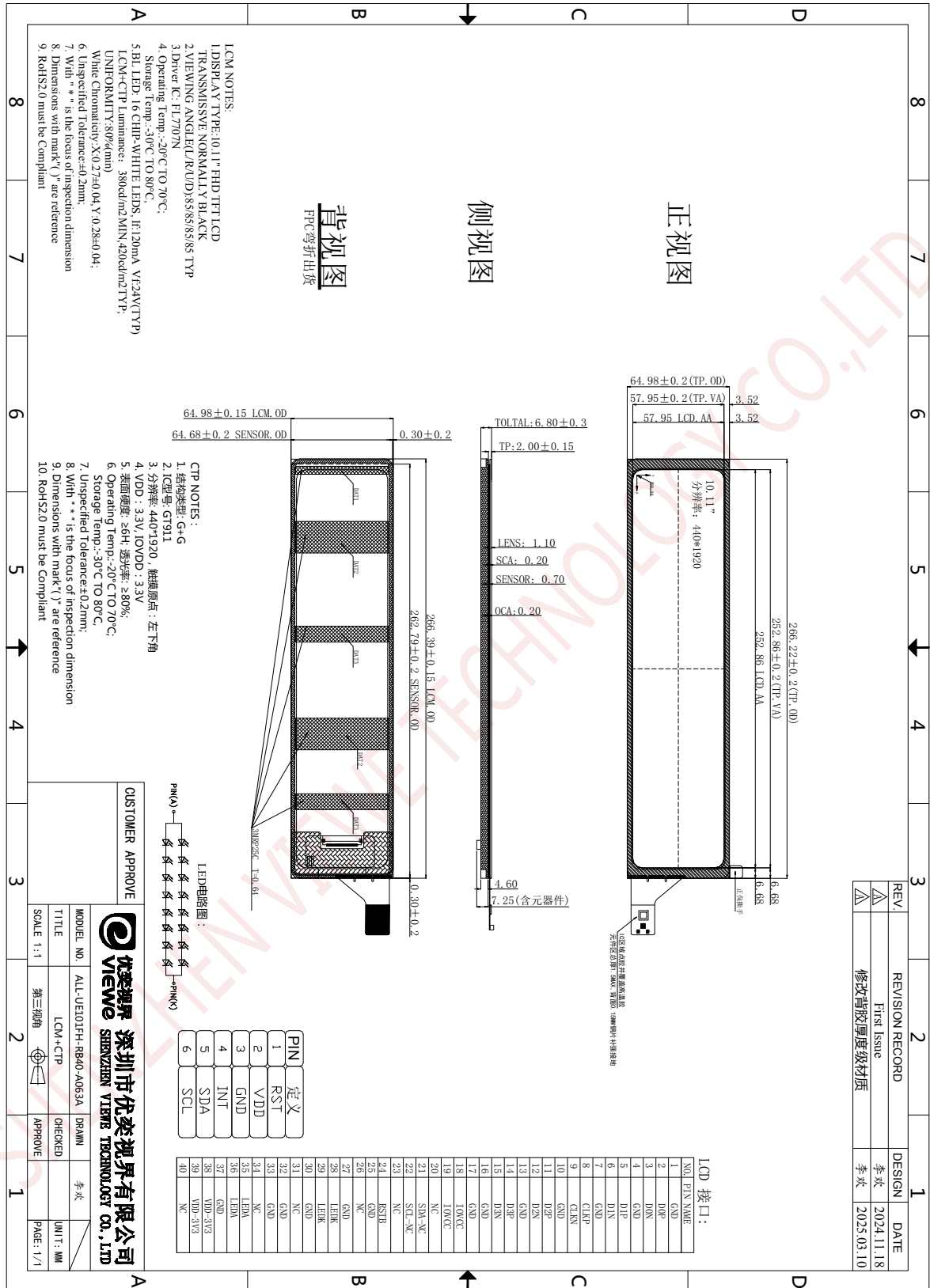
< Table 4. LED Driving guideline specifications >

Ta = 25 ± 2 °C

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
BLU Supply Voltage	Vled		24		V	
BLU Supply Current	Iled		120		mA	
Number of LED	-	16			Piece	



4. MECHANICAL DRAWING



5. INTERFACE CONNECTIONM

5.1 Interface Input Signal & Power

Pin No	Symbol	Description	Pin No	Symbol	Description
1	GND	Ground	21	NC	No Connect
2	D0P	MIPI data input	22	NC	No Connect
3	D0N	MIPI data input	23	NC	No Connect
4	GND	Ground	24	RESET	RESET pin
5	D1P	MIPI data input	25	GND	Ground
6	D1N	MIPI data input	26	NC	No Connect
7	GND	Ground	27	GND	Ground
8	CLKP	MIPI clock input	28	LEDK	LED Negative
9	CLKN	MIPI clock input	29	LEDK	LED Negative
10	GND	Ground	30	GND	Ground
11	D2P	MIPI data input	31	NC	No Connect
12	D2N	MIPI data input	32	GND	Ground
13	GND	Ground	33	GND	Ground
14	D3P	MIPI data input	34	NC	No Connect
15	D3N	MIPI data input	35	LEDA	LED Positive
16	GND	Ground	36	LEDA	LED Positive
17	GND	Ground	37	GND	Ground
18	IOVCC	Power supply for digital circuits +1.8V input	38	VCC	Power supply for digital circuits +3.3V input
19	IOVCC	Power supply for digital circuits +1.8V input	39	VCC	Power supply for digital circuits +3.3V input
20	NC	No Connect	40	NC	No Connect

TP PIN .	Symbol	I/O	Description
1	RST	I	The signal will reset the TP,Signal is active low
2	VCD	P	Power supply for TP
3	GND	P	Power Ground
4	INT	O	Interrupt signals for TP
5	SDA	I/O	I2C data signal for TP
6	SCL	I	I2C clock signals for TP

I: Input; O: Output; P: Power

6. Interface timing Parameter

6.1 MIPI AC Characteristics

High Speed Mode - Clock Timings

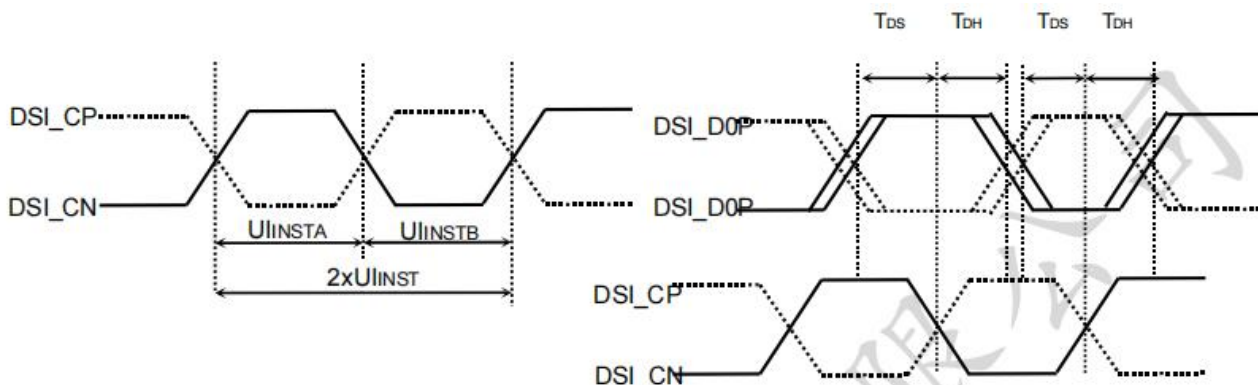


Figure 6.1: DSI clock timing Characteristics

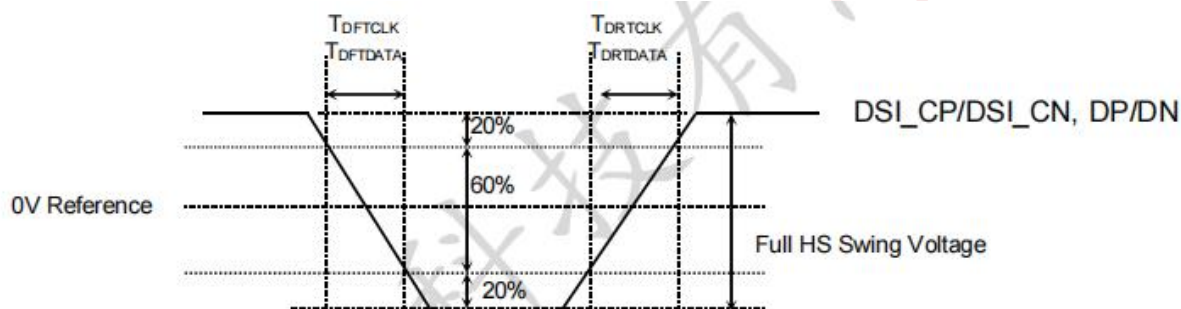


Figure 6.1: Rising and falling time on clock and data channel

(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, TA = -30 to 70°C)

Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_CP/ DSI_CN	Double UI instantaneous	2xUINST	TBD	-	25	ns
	UI instantaneous	UINSTA UINSTB	TBD	-	12.5	ns
DP/DN	Data to clock setup time	TDS	0.15xUI	-	-	ps
	Data to clock hold time	TDH	0.15xUI	-	-	ps
DSI_CP/ DSI_CN	Differential rise time for clock	TDRTCLK	150	-	0.3UI	ps
	Differential fall time for clock	TDFTCLK	150	-	0.3UI	ps
DP/DN	Differential rise time for data	TDRTDATA	150	-	0.3UI	ps
	Differential fall time for data	TDFTDATA	150	-	0.3UI	ps

Table 6.1: DSI High Speed Mode characteristics

6.2 Low Speed Mode

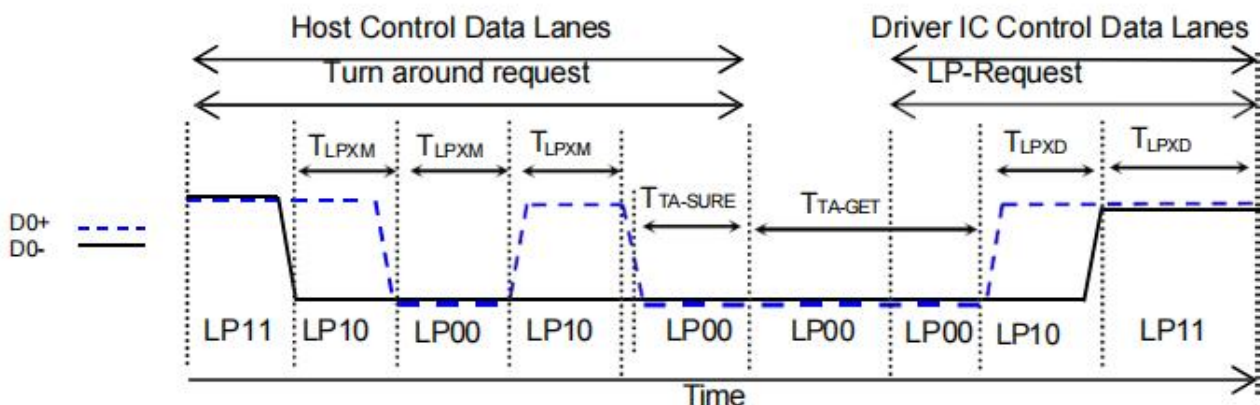


Figure 6.2: BTAfrom HOST to Display module Timing

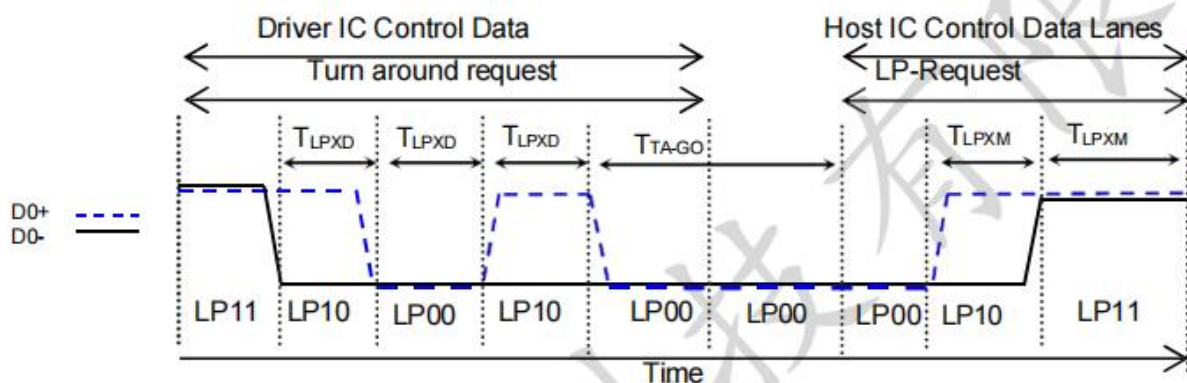


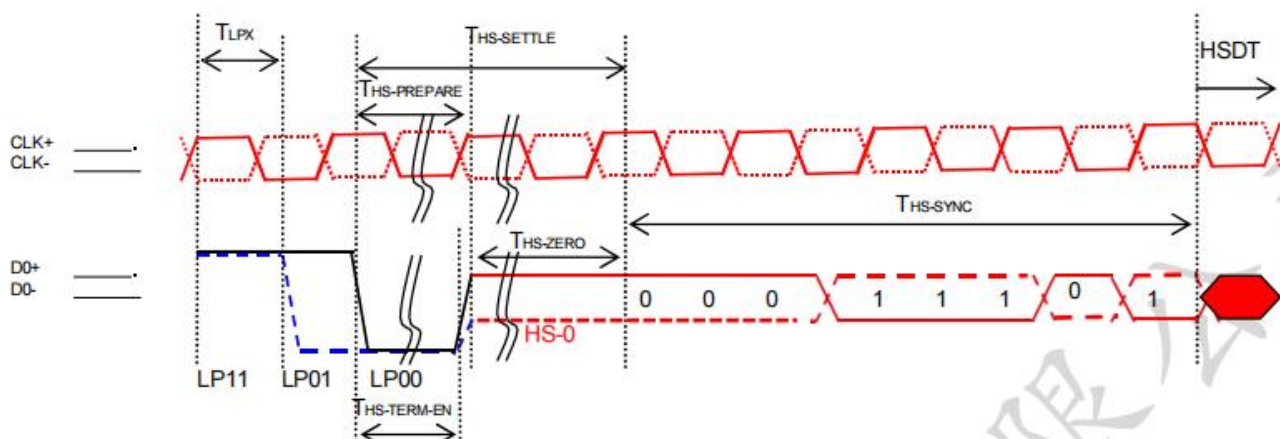
Figure 6.2: BTA from Display module Timing to HOST

(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.3V to 3.3V, TA = -30 to 70°C)

Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_D0P/ DSI_D0P	Length of LP-00/LP01/LP10/LP11 Host Display module	TLPXM	50	-	-	ns
	Length of LP-00/LP01/LP10/LP11 Display module Host	TLPXD	50	-	-	ns
	Time-out before the MPU start driver	TTA-SURE	TLPXD	-	2xTLPXD	ns
	Time to drive LP-00 by display module	TTA-GET	5xTLPXD	-	-	ns
	Time to drive LP-00 after turnaround request Host	TTAGO	4xTLPXD	-	-	ns

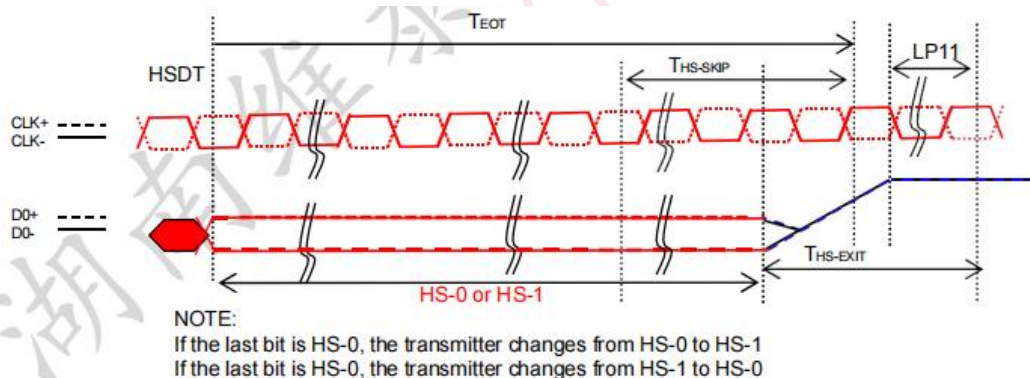
Table 6.2: DSI Low Power Mode characteristics

6.3 DSI BURSTS



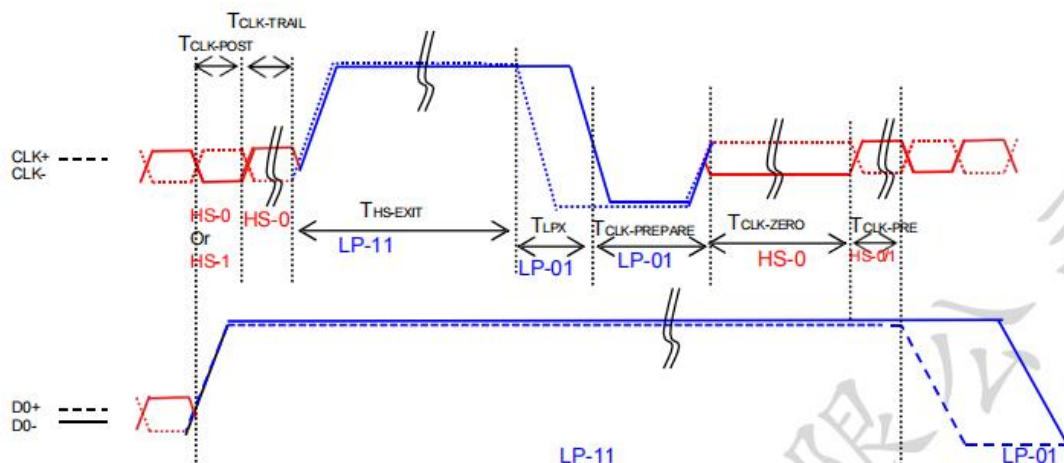
Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_D0P/ DSI_D0P	Length of LP-00/LP01/LP10/LP11	TLPX	50	-	-	ns
	Time to Driver LP-00 to prepare for HS transmission	THS-PREPARE	40+4UI	-	85+6UI	ns
	Time to enable data receiver line termination	THS-TERM-EN	-	-	35+4xUI	ns
	Time to drive LP-00 by display module	Tta-GET	5xTLPXD	-	-	ns
	Time to drive LP-00 after turnaround request Host	Ttago	4xTLPXD	-	-	ns

Table 6.3: DSI Low Power Mode to High Speed Mode Timing



Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_D0P/ DSI_D0P	Time-Out at Display Module to Ignore Transition Period of EoT	THS-SKIP	40	-	55+4xUI	ns
	Time to Driver LP-11 after HS Burst	THS-EXIT	100	-	-	ns

Table 6.3: DSI Low Power Mode to High Speed Mode Timing



Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_CP/ DSI_CN	Time that the MCU shall continue sending HS clock after the last associated Data Lane has transitioned to LP mode	TCLK-POST	60+52xUI	-	-	ns
	Time to drive HS differential state after last payload clock bit of a HS transmission burst	TCLK-TRAIL	60	-	-	ns
	Time to drive LP-11 after HS burst	THS-EXIT	100	-	-	ns
	Time to drive LP-00 to prepare for HS transmission	TCLK-PREPARE	38	-	95	ns
	Time-out at Clock Lane Display Module to enable HS Termination	TCLK-TERMEN	-	-	38	ns
	Minimum lead HS-0 drive period before starting Clock	TCLK-PREPARE + TCLK-ZERO	300	-	-	ns
	Time that the HS clock shall be driven prior to any associated data Lane beginning the transition from LP to HS mode	TCLK-PRE	8xUI			

Table 6.3: Clock Lanes High Speed Mode to/from Low Power Mode Timings

6.4 Reset input timing

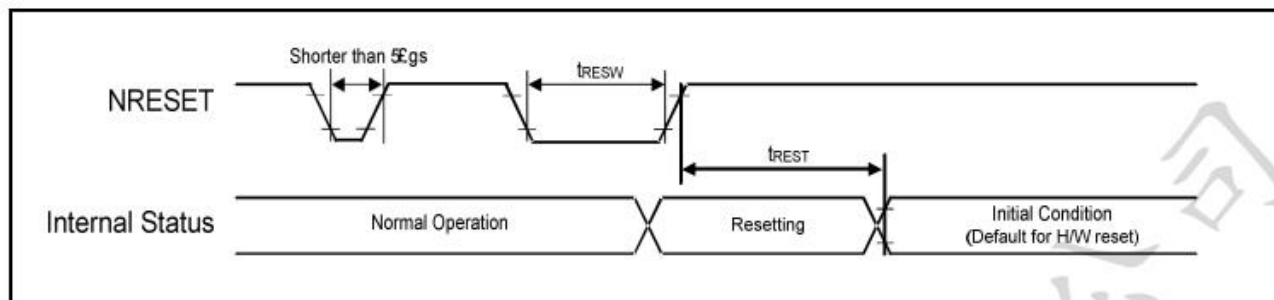


Figure 6.4: Reset input timing

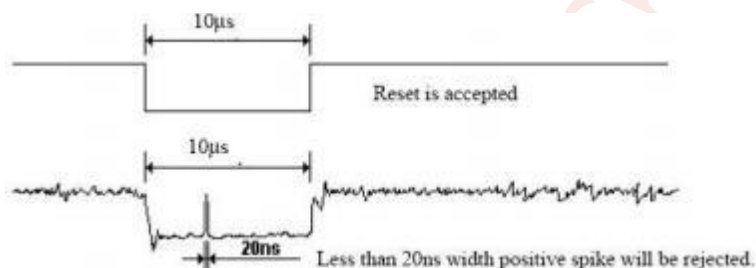
Symbol	Parameter	Related Pins	Spec.			Note	Unit
			Min.	Typ.	Max.		
tRESW	Reset low pulse width ⁽¹⁾	NRESET	10	-	-	-	μs
tREST	Reset complete time ⁽²⁾	-	5	-	-	When reset applied during SLPIN mode	ms
		-	120	-	-	When reset applied during SLPOUT mode	ms

Figure 6.4: Reset input timing

Note: (1) Spike due to an electrostatic discharge on NRESET line does not cause irregular system reset according to the following table.

NRESET Pulse	Action
Shorter than 5 μ s	Reset Rejected
Longer than 10 μ s	Reset
Between 5 μ s and 10 μ s	Reset Start

- (2) During the resetting period, the display will be blanked (The display is entering blanking sequence, which Maximum time is 120 ms, 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.
- (3) During Reset Complete Time, ID and VCOM value in OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (t_{REST}) within 5ms after a rising edge of NRESET.
- (4) Spike Rejection also applies during a valid reset pulse as shown as below:



- (5) It is necessary to wait 5msec after releasing NRESET before sending commands. Also Sleep Out command cannot be sent for 120msec.

< Timing Parameter >

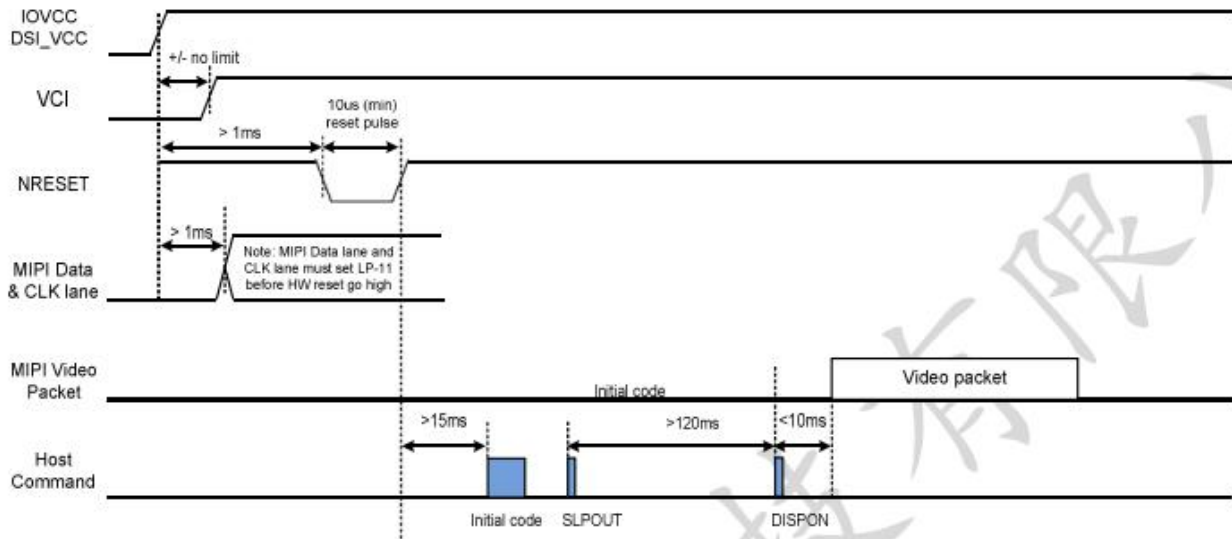
Item			Symbol	min	typ	max	UNIT
LCD	Frame Rate		-	-	60	-	Hz
Timing	DCLK	Frequency	fCLK	-	66	-	MHz
	Horizontal	Horizontal total time	tHP	-	510	-	tCLK
		Horizontal Active time	tHadr	440			tCLK
		Horizontal Pulse Width	tHsync	-	20	-	tCLK
		Horizontal Back Porch	tHBP	-	50	-	tCLK
		Horizontal Front Porch	tHFP	-	50	-	tCLK
	Vertical	Vertical total time	typ	-	1975	-	tH
		Vertical Active time	tVadr	1920			tH
		Vertical Pulse Width	tVsync	-	5	-	tH
		Vertical Back Porch	tVBP	-	25	-	tH
Vertical Front Porch		tVFP	-	25	-	tH	
Lane				-	4	-	Lane



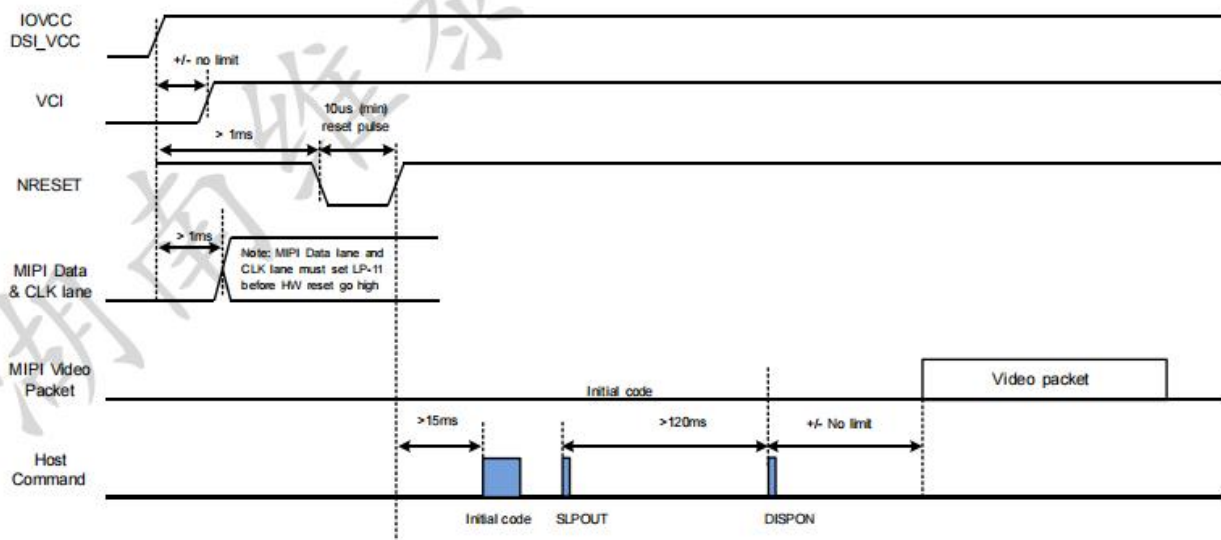
7. POWER SEQUENCE

7.1 POWER on Timing

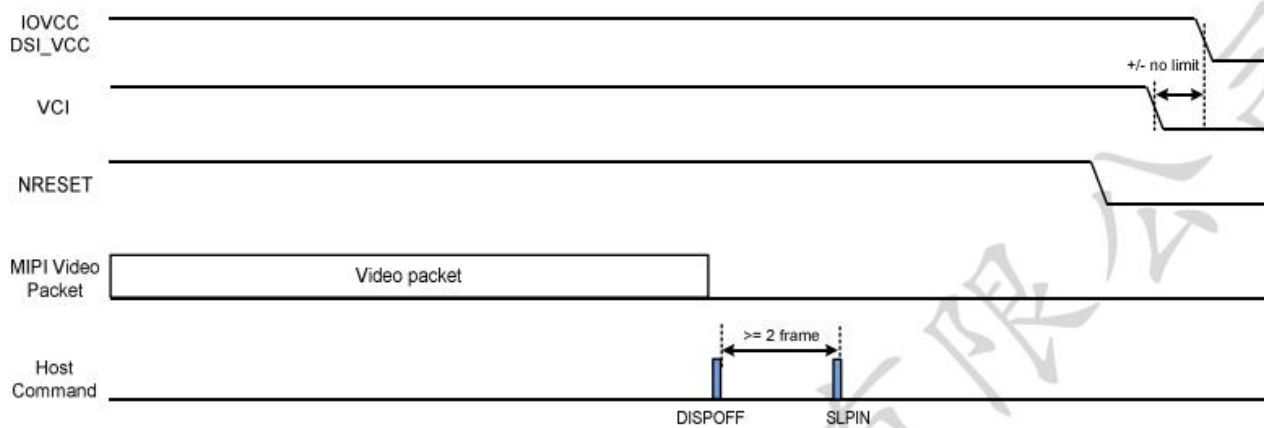
ESD_WHITE_EN=0



ESD_WHITE_EN=1



7.2 POWER off Timing



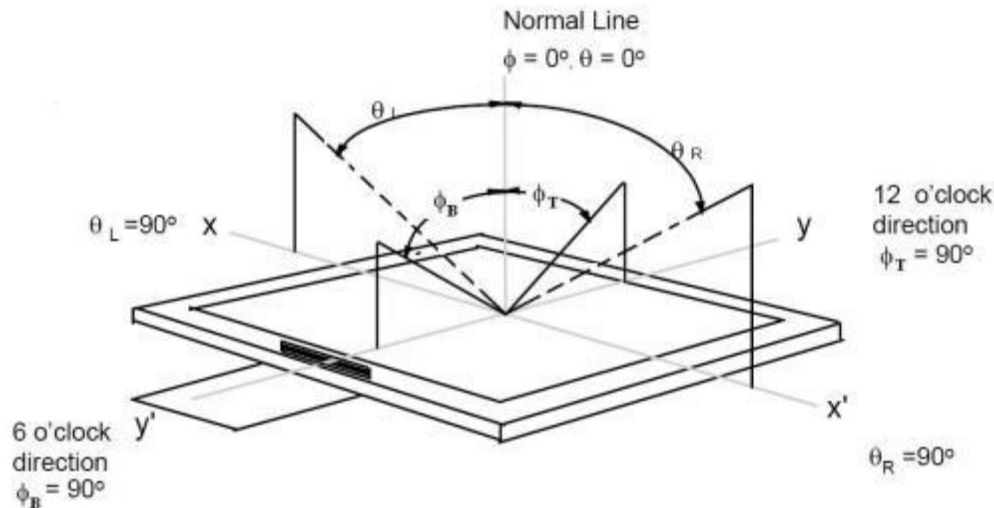
8. OPTICAL CHARACTERISTICS

Parameter 参数	Symbol 符号	Condition 条件	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Contrast Ratio	C/R	$\theta = 0^\circ$	800	1000	-	-	Note(4)
Luminance	L	$\theta = 0^\circ$	-	500	-	cd/m ²	Note(5)
Luminance uniformity	U _W	$\theta = 0^\circ$	65	70	-	%	Note(3)
Response Time	T _R + T _F	25 °C	-	30	35	ms	Note(2)
Color Coordination	W _X	$\theta = 0^\circ$ (Center) Normal viewing angle B/L On	-0.03	0.305	+0.03	NTSC (x,y)	Note(6)
	W _Y			0.333			
	R _X			0.659			
	R _Y			0.318			
	G _X			0.263			
	G _Y			0.568			
	B _X			0.137			
	B _Y			0.084			
Viewing Angle	θ_L	C/R>10	80	85	-	Degree	Note(1)
	θ_R		80	85	-		
	θ_U		80	85	-		
	θ_D		80	85	-		

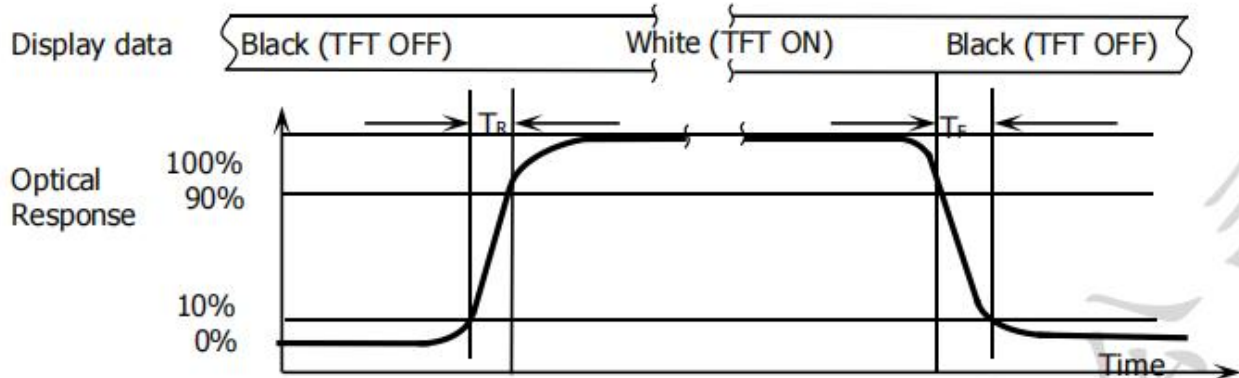
Test Conditions:

1. the ambient temperature is +25°C.
2. The test systems refer to Note 8.

Note1: Definition of Viewing Angle: The viewing angle range that the CR>10

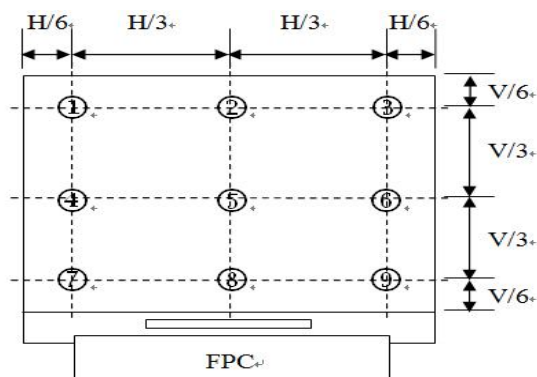


Note2: Definition of Response time: Sum of T_R and T_F



Note 3: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas, every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \times 100\%$$



Note4: Definition of Contrast Ratio (CR): measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

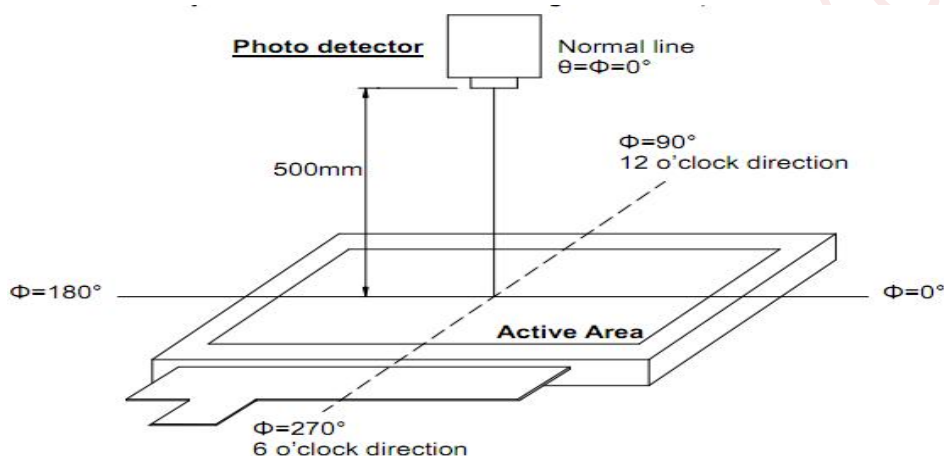
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1 point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

Color coordinates of white & red, green, blue measured at center point of LCD.

Note 7: 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. (Response time is measured by Photo detector TOPCON BM-7, Field of view: 1°/Height: 500mm.)



9. RELIABILITY

Item 项目	Test Condition 测试条件	Remark 备注
High Temperature Storage	Ta =+80°C / 72Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 72Hours	Note1,2,3
High Temperature Operating	Ta =+70°C / 72Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 72Hours	Note1,2,3
Temperature Cycle storage Test	-30°C/30min Δ+80°C /30min for 30cycles,Transfer time less than 5min	Note2,3
Thermal humidity storage Test	60°C x 90%RH / 72Hours	Note2,3

Inspection after Test:

Note1: Ta is the ambient temperature of samples.

Note 2: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

Note 3: Before cosmetic and function tests, the product must have enough recovery time, at least 2 hours at room temperature.

10. PACKAGE DRAWING

