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Cover glass

System solutions

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Custom Display

Production Custom designs Installation

Mechanical design



Project No. 项目编号	ET101WS07-TT
Customer 客户名称	
Module No. 客户型号	
Product type 产品内容	Standard LCD Module TFT: 800*RGBx1280Dots 10.1" TFT LCD+CTP

客户确认Customer Approval	
项目负责人Project Manager	
品质主管Director of Quality	
采购工程师Purchasing Engineer	

PREPARED BY	CHECKED BY	APPROVED BY



1. Introduction

1.1 Scope of application

This specification applies to the LCD module that is supplied by YOURITECH TECHNOLOGY.

LCD specification: Dots 800xRGBx1280

As to basic specification of the driver IC, refer to the IC (ILI9881C) specification and data book.

All material & processing of the LCD module should be Lead Free.

1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL+CTP

ALL Viewing Type LCD

800 dot-segment and 1280 dot-common outputs;

16.7M Color can be selected by software;

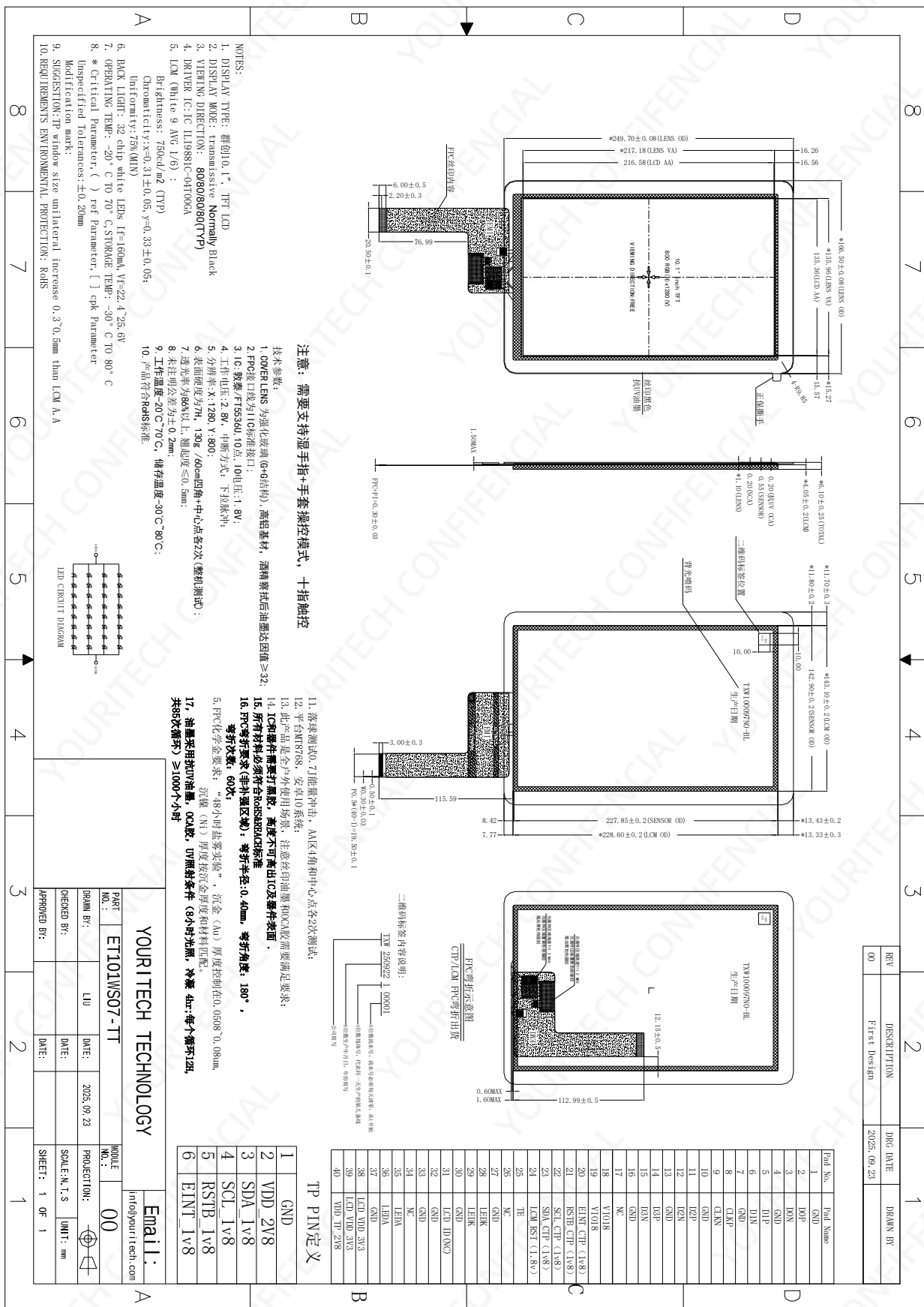
White LED back light;

4lane MIPI interface

2. LCM General specification

ITEM	Standard value	Unit
LCD Type	Normally Black	--
Drive element	TFT active matrix	--
Number of pixels	800*3RGB(H)X1280(V)	Dots
Pixel arrangement	RGB Vertical Stripe	--
Pixel Pitch (W*H)	0.0564(H)×0.1692(V)	mm
Active area	135.36(H)x216.58(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	ILI9881C	--
TFT interface	4lane MIPI interface	--
Approx. Weight	TBD	g
LCM Size(W*H*T)	143.10(W) ×228.60(H) ×4.05(T)	mm
LCM+CTP Size(W*H*T)	166.50(W)x 249.70(H) x 6.10(T)	mm
Touch structure	G+G	--
Touch Driver IC	FT5536U	--
Touch Interface	I2C	--





NOTES:

1. DISPLAY TYPE: 群创0.1", TFT LCD
2. DISPLAY MODE: transmissive Normally Black
3. VIEWING DIRECTION: 80/80/80(TTP)
4. DRIVER IC: IL1988C-041006A
5. LCM (White 9 AVG 1/6):
Brightness: 750cd/m² (TTP)
Chromaticity: x=0.31±0.05, y=0.33±0.05, z=0.35±0.05
Uniformity: 75%(MIN)
6. BACK LIGHT: 32 chip white LEDs 1F=1600mA, VF=22.4~25.6V
7. OPERATING TEMP: -20°C TO 70°C, STORAGE TEMP: -30°C TO 80°C
8. * Critical Parameter: () ref Parameter, [] opt Parameter
9. Unspecified Tolerances: ±0.20mm
10. Modification mark:
11. SUGGESTION: TP window size unilateral increase 0.3~0.5mm than LCM A.A
12. REQUIREMENTS ENVIRONMENTAL PROTECTION: RoHS

注意: 需要支持湿手指+手套操控模式, 十指触控

技术参数:

1. COVER LENS: 为强化玻璃(G+G结构), 高铝基材, 酒精擦拭后油墨达因值≥32;
2. FPC接口线为110标准接口;
3. IC 封装: FT5534U, 10点, 10电压: 1.8V;
4. 工作电压: 2.8V, 中频方式: 下拉脉冲;
5. 分辨率: X:1280, Y:800;
6. 表面硬度为7H, 130g/100mm²中心点各2次(整机测试);
7. 透光率≥98%, 130g/100mm²中心点各2次(整机测试);
8. 来料公差为±0.2mm;
9. 工作温度: -20°C~70°C, 储存温度: -30°C~80°C;
10. 产品符合RoHS标准;

11. 跌落测试: 7J能量冲击, AA区4角和中心点各2次测试;

12. 平台MT8768, 安卓10系统;

13. 此产品是全户外使用场景, 注意丝印油墨和OCA胶需要满足要求;

14. IC零件需要打盖胶, 高度不可高出IC及零件表面;

15. 所有材料必须符合RoHS和REACH标准;

16. FPC零件要求(零件外区域): 弯折半径: 0.40mm, 弯折角度: 180°, 弯折次数: 60K;

17. 油墨采用UV油墨, OCA胶, UV胶零件(8小时光照, 冷藏 4h); 每个循环12次, 共86次循环) ≥1000个小时

YOURiTECH TECHNOLOGY			
PART NO.:	ET101WS07-TT	MO.:	00
DESIGN BY:	LIU	DATE:	2025.09.23
CHECKED BY:		DATE:	
APPROVED BY:		DATE:	
SCALE: N.T.S		UNIT: mm	
SHEET: 1 OF 1			



3. Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T _{OPR}	-20	+70	°C
LCM Storage Temperature	T _{STG}	-30	+70	°C
TP Operating Temperature & Humidity(20% ~ 90%RH)	T _{OPR}	-20	+70	°C
TP SStorage Temperature & Humidity(20% ~ 90%RH)	T _{STG}	-30	+70	°C
Humidity	RH	-	90	%

4. Electrical Characteristics

4.1 TFT DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for I/O	I/O	--	1.8	3.3	V
Supply Voltage for(DC/DC)	VDD	2.8	3.3	3.3	V

4.2 Back-Light Unit Characteristics

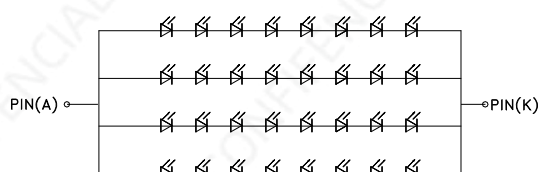
The back-light system is an edge-lighting type with 32 white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V _F	22.4	--	25.6	V	--
Forward current	I _F	--	160	--	mA	--
Luminance(With LCD+CTP)	L _v	--	750	--	cd/m ²	--
LED life time	N/A	--	30,000	--	Hr	Note 1

Note:

- (1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I_L=20mA/LED. The LED life time could be decreased if operating I_L is larger than 25mA/LED.

Backlight circuit diagram shown in below:

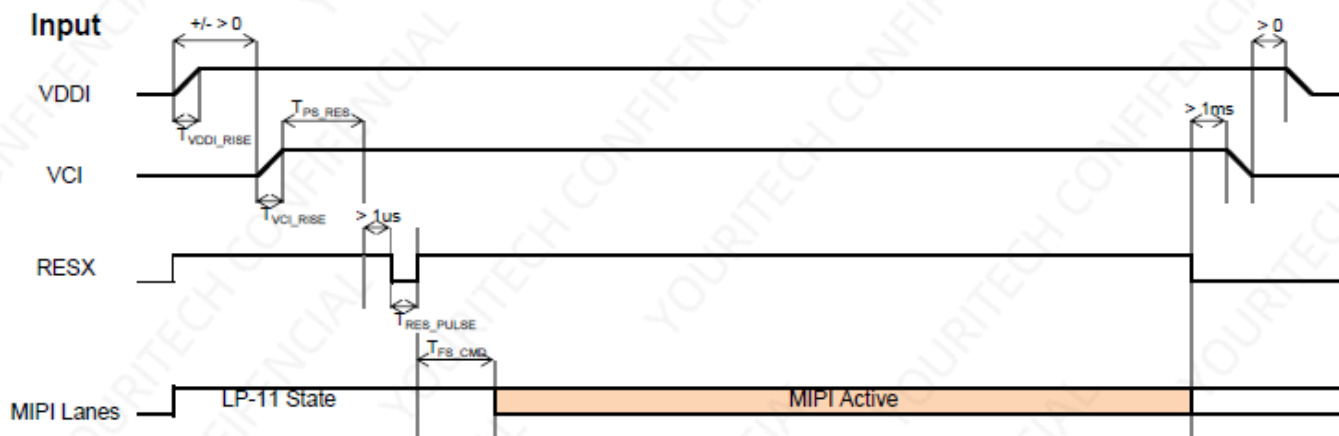


5. Module Function Description

Pin No.	Symbol	LCM Functional	Notes
1	GND	Power Ground	
2	MIPI_D0P	Positive polarity of low voltage differential data 0 signal	
3	MIPI_D0N	Negative polarity of low voltage differential data 0 signal	
4	GND	Power Ground	
5	MIPI_D1P	Positive polarity of low voltage differential data 1 signal	
6	MIPI_D1N	Negative polarity of low voltage differential data 1 signal	
7	GND	Power Ground	
8	MIPI_CLKP	Positive polarity of low voltage differential clock signal	
9	MIPI_CLKN	Negative polarity of low voltage differential clock signal	
10	GND	Power Ground	
11	MIPI_D2P	Positive polarity of low voltage differential data 2 signal	
12	MIPI_D2N	Negative polarity of low voltage differential data 2 signal	
13	GND	Power Ground	
14	MIPI_D3P	Positive polarity of low voltage differential data 3 signal	
15	MIPI_D3N	Negative polarity of low voltage differential data 3 signal	
16	GND	Power Ground	
17	NC	No Connection.	
18	IOVCC 1.8V	power supply for DC/DC circuit	
19	IOVCC 1.8V	power supply for DC/DC circuit	
20	CTP_INT/1.8V	CTP_STOP Singnal	
21	CTP_RST 1.8V	CTP_Reset Signal input pin.	
22	CTP_SCL 1.8V	CTP_Clock Singnal	
23	CTP_SDA/3.3V	CTP_Data Singnal	
24	LCM_RESET 1.8V	Reset pin. Setting either pin low initializes the LSI	
25	TE	Tearing effect output pin to synchronies MCU to frame rate.	
26	NC	No Connection.	
27	GND	Power Ground	
28	LEDK	Power supply for backlight cathode input terminal.	
29	LEDK	Power supply for backlight cathode input terminal.	
30	GND	Power Ground	
31	LCD_ID(NC)		
32	GND	Power Ground	
33	GND	Power Ground	
34	NC	No Connection.	
35	LEDA	Power supply for backlight anode input terminal.	
36	LEDA	Power supply for backlight anode input terminal.	
37	GND	Power Ground	
38	VDD/3.3V	power supply for DC/DC circuit	
39	VDD/3.3V	power supply for DC/DC circuit	
40	CTP_VDD	CTP power supply for DC/DC circuit 2.8~3.3V	



6. Timing Characteristics



Symbol	Characteristics	Min.	Typ.	Max.	Units
T_{VDDI_RISE}	VDDI Rise time	20	-	-	us
T_{VCI_RISE}	Case A: VCI Rise time	200	-	-	us
	Case B: VCI Rise time	40			
T_{PS_RES}	VDDI/VCI on to Reset high	5	-	-	ms
T_{RES_PULSE}	Reset low pulse time	10	-	-	us
T_{FS_CMD}	Reset to first command	10	-	-	ms



High Speed Mode – Data Clock Channel Timing

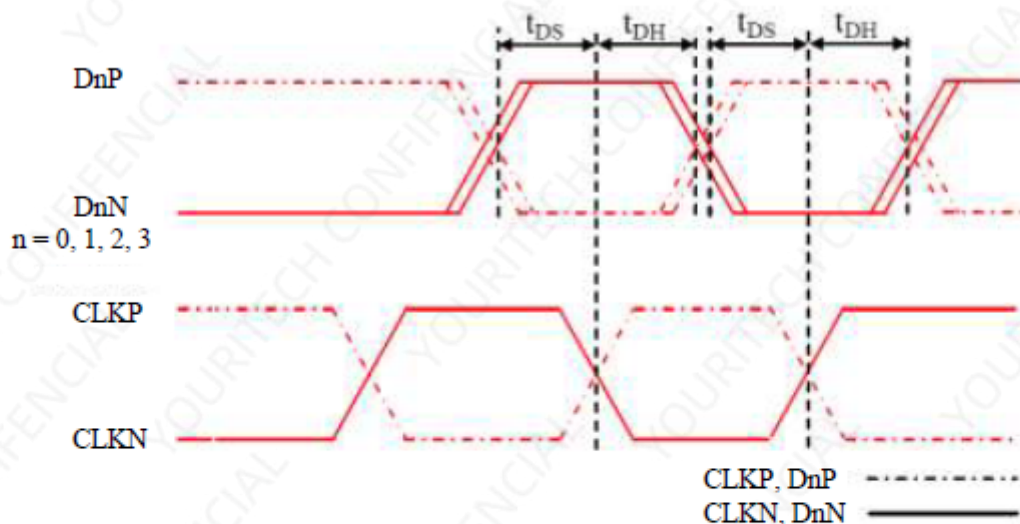


Figure 117: DSI Data to Clock Channel Timings

Table 40: DSI Data to Clock Channel Timings

Signal	Symbol	Parameter	Min	Max
DnP/N , n=0 and 1	t_{DS}	Data to Clock Setup time	0.15xUI	-
	t_{DH}	Clock to Data Hold Time	0.15xUI	-



Low Speed Mode – Bus Turn Around

Lower Power Mode and its State Periods on the Bus Turnaround (BTA) from the MCU to the Display Module (ILI9881C-0D) are illustrated for reference purposes below.

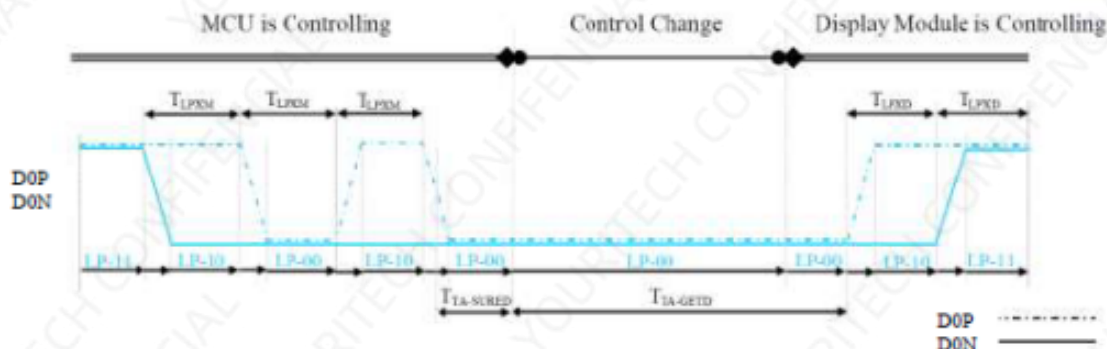


Figure 119: BTA from the MCU to the Display Module

Lower Power Mode and its State Periods on the Bus Turnaround (BTA) from the Display Module (ILI9881C-0D) to the MCU are illustrated for reference purposes below.

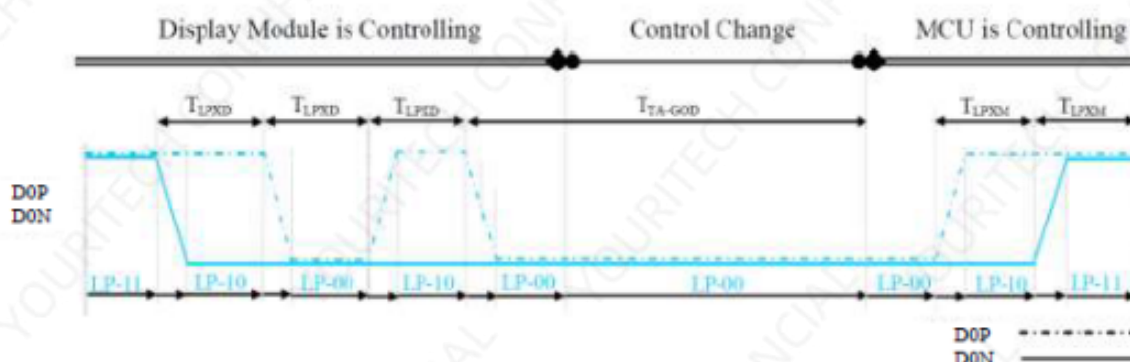


Figure 120: BTA from the Display Module to the MCU

Table 42: Low Power State Period Timings – A

Signal	Symbol	Description	Min	Max	Unit
D0P/N	T_{LPXM}	Length of LP-00, LP-01, LP-10 or LP-11 periods MCU → Display Module (ILI9881C-0D)	50	75	ns
D0P/N	T_{LPXD}	Length of LP-00, LP-01, LP-10 or LP-11 periods Display Module (ILI9881C-0D) → MCU	50	75	ns
D0P/N	$T_{TA-SURED}$	Time-out before the Display Module (ILI9881C-0D) starts driving	T_{LPXD}	$2 \times T_{LPXD}$	ns

Table 43: Low Power State Period Timings – B

Signal	Symbol	Description	Time	Unit
D0P/N	$T_{TA-GETD}$	Time to drive LP-00 by Display Module (ILI9881C-0D)	$5 \times T_{LPXD}$	ns
D0P/N	T_{TA-GOD}	Time to drive LP-00 after turnaround request - MCU	$4 \times T_{LPXD}$	ns



Data Lanes from Low Power Mode to High Speed Mode

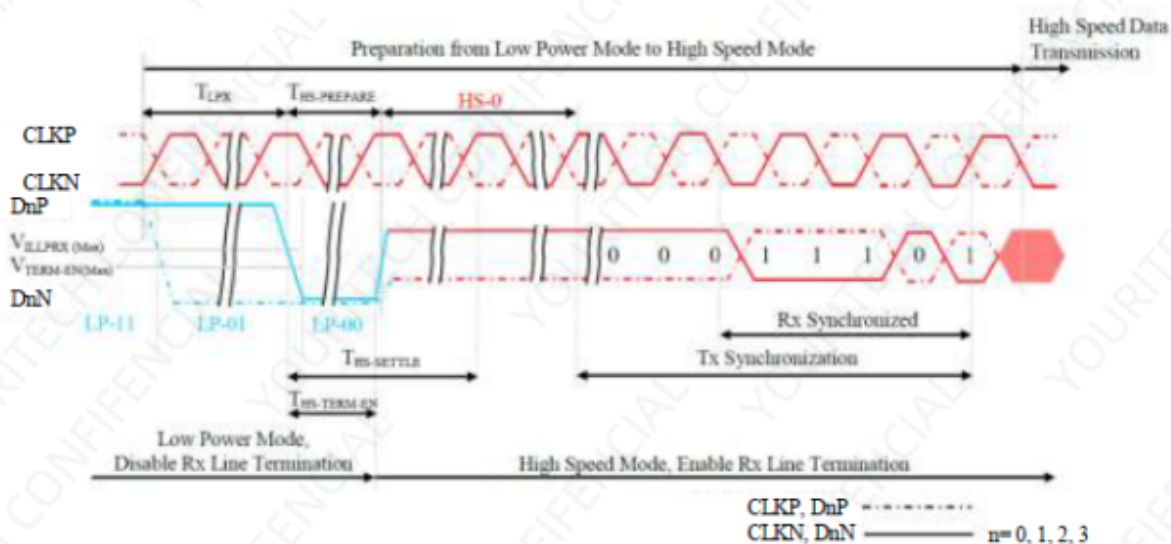


Figure 121: Data Lanes - Low Power Mode to High Speed Mode Timings

Table 44: Data Lanes - Low Power Mode to High Speed Mode Timings

Signal	Symbol	Description	Min	Max	Unit
DnP/N, n = 0 and 1	T_{LPX}	Length of any Low Power State Period	50	-	ns
DnP/N, n = 0 and 1	$T_{HS-PREPARE}$	Time to drive LP-00 to prepare for HS Transmission	$40+4 \times UI$	$85+6 \times UI$	ns
DnP/N, n = 0 and 1	$T_{HS-TERM-EN}$	Time to enable Data Lane Receiver line termination measured from when Dn crosses VILMAX	-	$35+4 \times UI$	ns

Reset Timing



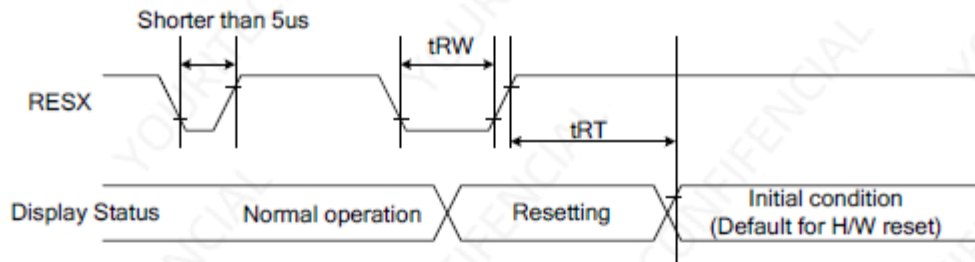


Figure 124: Reset Timing

Table 47: Reset Timing

Signal	Symbol	Parameter	Min	Max	Unit
RESX	tRW	Reset pulse duration	10		uS
	tRT	Reset cancel		5 (note 1,5) 120 (note 1,6,7)	mS

Notes:

1. The reset cancel also includes required time for loading ID bytes, VCOM setting and other settings from EEPROM to registers. This loading is done every time when there is H/W reset cancel time (tRT) within 5 ms after a rising edge of RESX.
2. Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the Table 48.

Table 48: Reset Descript

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 10us	Reset
Between 5us and 10us	Reset starts

3. During the Resetting period, the display will be blanked (The display enters the blanking sequence, which maximum time is 120 ms, when Reset Starts in the Sleep Out mode. The display remains the blank state in the Sleep In mode.) and then return to Default condition for Hardware Reset.
4. Spike Rejection can also be applied during a valid reset pulse, as shown below:

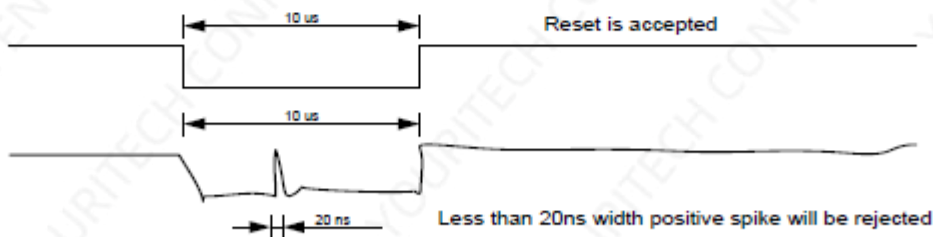


Figure 125: Positive Noise Pulse during Reset Low

5. When Reset applied during Sleep In Mode.
6. When Reset applied during Sleep Out Mode.
7. It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.



7. Optical Characteristics

Item		Symbol	Conditions	Specifications			Unit	Note	
				Min.	Typ.	Max.			
Transmittance (w/o APCF, w/o DBEF)		T%	Viewing normal angle $\theta_X = \theta_Y = 0^\circ$	4.65	5.41	--	%	All left side data are based on Innolux's following condition – 1.LC : AAS 2.Light Source : Innolux Silicate LED 3. Polarizer : CF: SRW062FPN1HC5 TFT: SRW062FPN1HC5 4.Machine :DMS-803/DMS-900 5. By quick VLC dark = 0.3V, VLC white = 4.6V	
Contrast Ratio		CR		800	1000	--	--		
Response Time		T _{on} + T _{off}		-	25	35	ms		
Viewing Angle	Hor.	θ_{X+}	Center CR>10		80	--	deg.		
		θ_{X-}			80	--			
	Ver.	θ_{Y+}			80	--			
		θ_{Y-}			80	--			
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0^\circ$	0.621	0.641	0.661	-	Under C light Simulation	
		Ry		0.313	0.333	0.353	-		
	Green	Gx		0.264	0.284	0.304	-		
		Gy		0.529	0.549	0.569	-		
	Blue	Bx		0.120	0.140	0.160	-		
		By		0.081	0.101	0.121	-		
	White	Wx		0.282	0.302	0.322	-		
		Wy		0.309	0.329	0.349	-		
	Color Gamut					60	--		%

*Note(1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L255 : Luminance of gray level 255

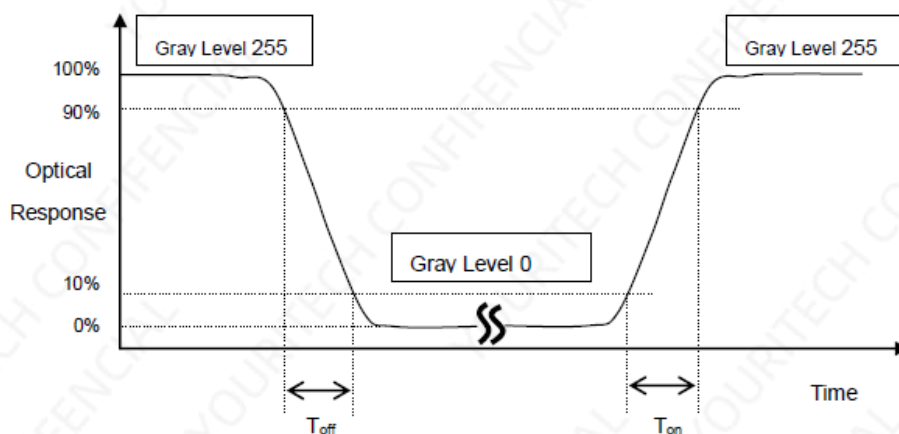
L 0: Luminance of gray level 0

CR = CR (5)

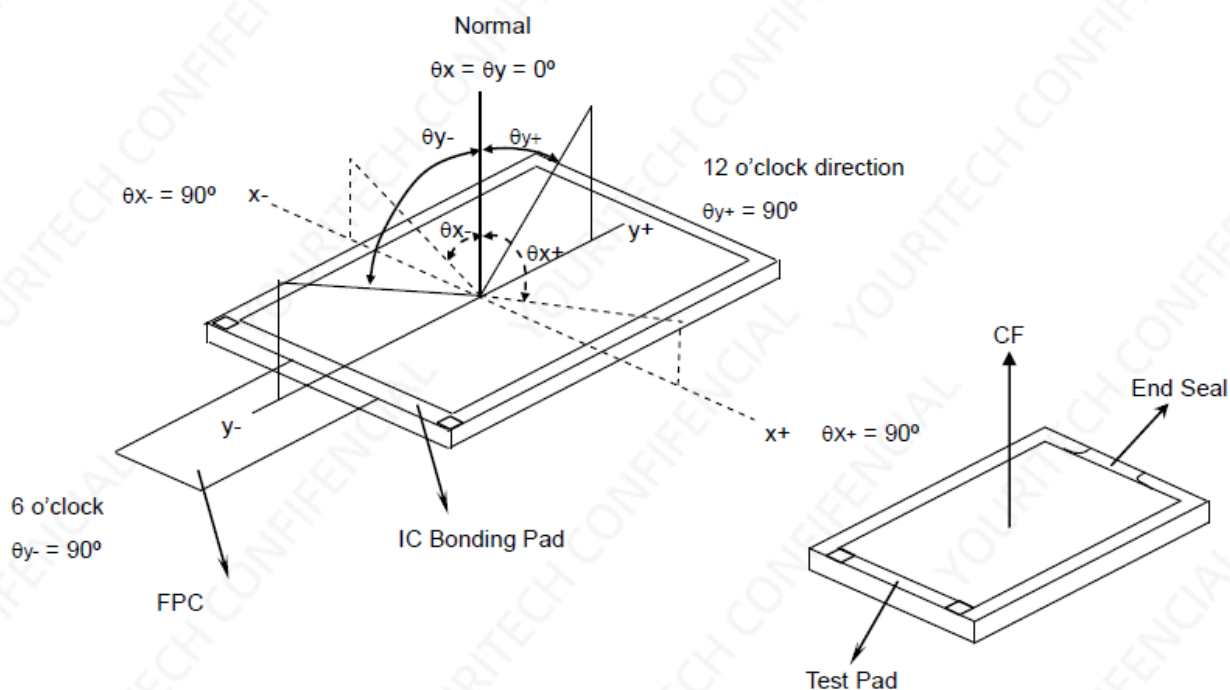
CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).



*Note (2) Definition of Response Time (T_{on} , T_{off}):

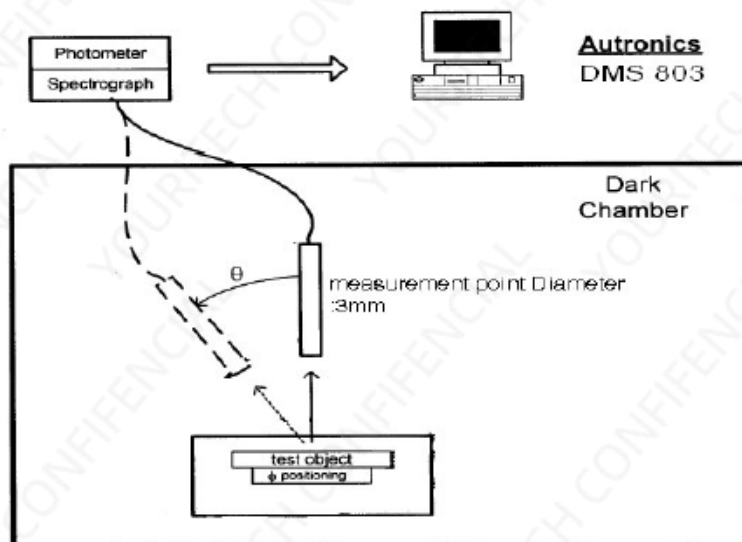


*Note(3) Definition of Viewing Angle

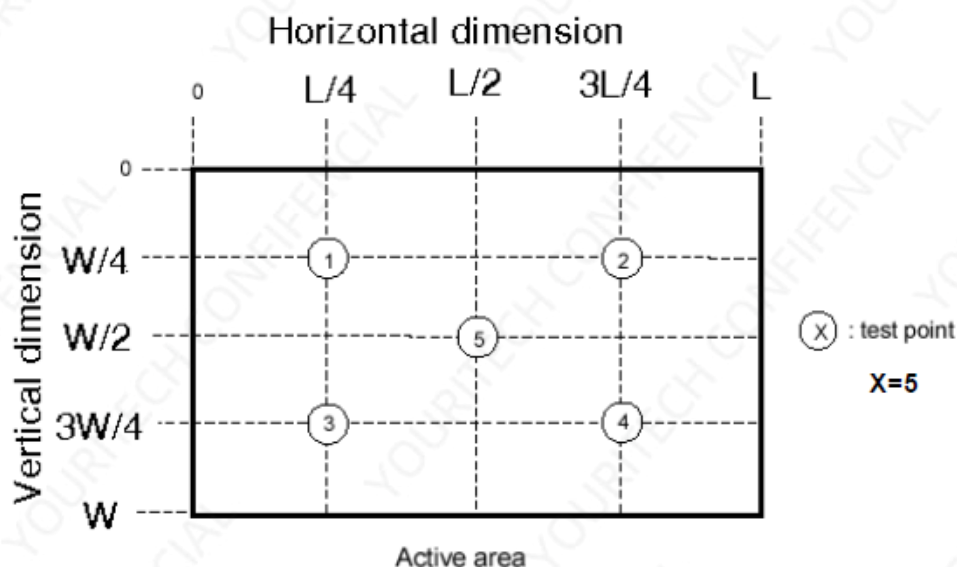


***Note (4) Measurement Set-Up:**

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



***Note (5)**



8. Reliability Test Item

No.	Test Item	Test Condition	Notes
1	High Temp. Storage	+70°C / 96H	1. Functional test is OK. Missing Segment, short, unclear segment non-display, display abnormally and liquid crystal leakage un-allowed. 2. No low temperature bubbles, end seal loose and fall, frame rainbow.
2	Low Temp. Storage	-30°C / 96H	
3	High Temp. Operating	+70°C / 96H	
4	Low Temp. Operating	-20°C / 96H	
5	High Temperature / Humidity storage	60°C x 90%RH / 96H	
6	Thermal and cold shock	Static state, -20°C (30min) ~70°C (30min), 10 cycles	

