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Project No. 项目编号	ET101WU11-TT
Customer 客户名称	
Module No. 客户型号	
Product type 产品内容	**Standard LCD Module** **TFT：1200*RGBx1920Dots** **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 CO., LTD.
LCD specification: Dots 1200xRGBx1920
As to basic specification of the driver IC, refer to the IC (HX8279D) specification and data book.
All material & processing of the LCD module should be Lead Free.

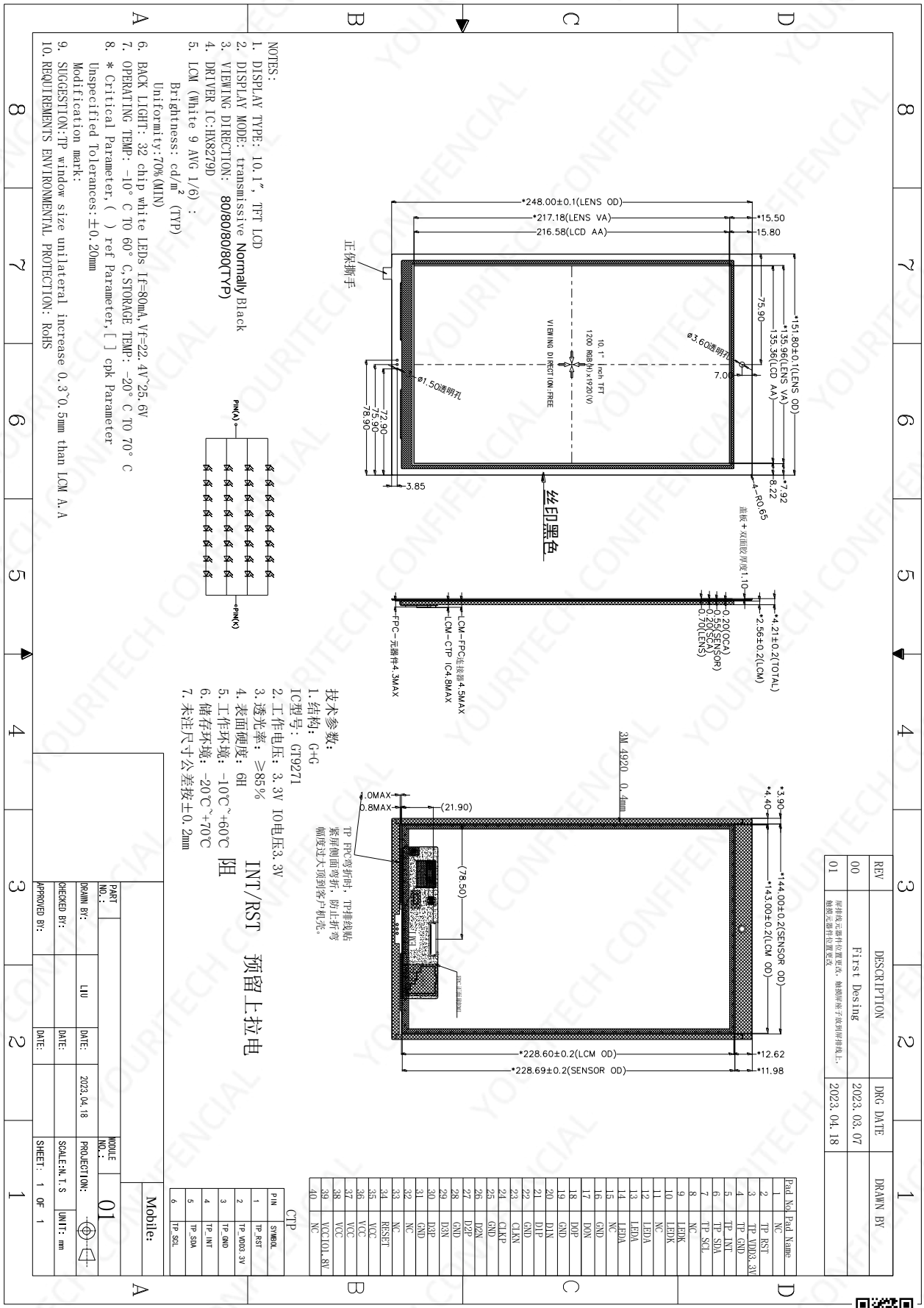
1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL+CTP
ALL Viewing Type LCD
1200 dot-segment and 1920 dot-common outputs;
16.7M Color can be selected by software;
White LED back light;
4lane MIPI interface

1.3 Applications:

2. LCM General specification

ITEM	Sandard value	Unit
LCD Type	Normally Black	--
Drive element	TFT active matrix	--
Number of pixels	1200*3RGB(H)X1920(V)	Dots
Pixel arrangement	RGB Vertical Stripe	--
Pixel Pitch (W*H)	0.1128(H)×0.1128(V)	mm
Active area	135.36(H)x216.58(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	HX8279D	--
TFT interface	4lane MIPI interface	--
Approx. Weight	TBD	g
LCM Size(W*H*T)	143.00(W) ×228.60(H) ×2.56(T)	mm
LCM+CTP Size(W*H*T)	158.70(W)x 244.60(H) x 4.21(T)	mm
Touch structure	G+G	--
Touch Driver IC	GT9271	--
Touch Interface	I2C	--


NOTES:
1. DISPLAY TYPE: 10.1", TFT LCD
2. DISPLAY MODE: transmissive Normally Black
3. VIEWING DIRECTION: 80/80/80/80(TYP)
4. DRIVER IC:HX8279D
5. LCM (White 9 AVG 1/6) :
Brightness: cd/m² (TYP)
Uniformity:70%(MIN)
6. BACK LIGHT: 32 chip white LEDs If=80mA, Vf=22.4V~25.6V
7. OPERATING TEMP: -10° C TO 60° C,STORAGE TEMP: -20° C TO 70° C
8. * Critical Parameter,( ) ref Parameter,[ ] cpk Parameter
Unspecified Tolerances:±0.20mm
Modification mark:
9. SUGGESTION:TP window size unilateral increase 0.3~0.5mm than LCM A.A
10. REQUIREMENTS ENVIRONMENTAL PROTECTION: RoHS
PIN(A)
PIN(K)
*248.00±0.1(LENS OD)
*217.18(LENS VA)
216.58(LCD AA)
*15.50
15.80
*151.80±0.1(LENS OD)
*135.96(LENS VA)
135.36(LCD AA)
75.90
正保撕手
ø3.60透明孔
ø1.50透明孔
10.1" inch TFT
1200 RGB(H)×1920(V)
VIEWING DIRECTION:FREE
7.0
72.90
75.90
78.90
3.85
*7.92
8.22
4-R0.65
丝印黑色
盖板+双面胶厚度1.10
*4.21±0.2(TOTAL)
*2.56±0.2(LCM)
0.20(OCA)
0.55(SENSOR)
0.70(LENS)
FPC一元器件4.3MAX
LCM-FPC连接器4.5MAX
LCM-CTP IC4.8MAX
3M 4920 0.4mm
1.0MAX
0.8MAX
(21.90)
(78.50)
*3.90
*4.40
*144.00±0.2(SENSOR OD)
*143.00±0.2(LCM OD)
*228.60±0.2(LCM OD)
*228.69±0.2(SENSOR OD)
*12.62
*11.98
TP FPC弯折时，TP排线贴紧屏侧面弯折，防止折弯幅度过大顶到客户机壳。
技术参数:
1.结构: G+G
IC型号: GT9271
2.工作电压: 3.3V IO电压3.3V
3.透光率: ≥85%
4.表面硬度: 6H
5.工作环境: -10℃~+60℃ 阻
6.储存环境: -20℃~+70℃
7.未注尺寸公差按±0.2mm
INT/RST 预留上拉电
CTP
PIN | SYMBOL
1 | TP_RST
2 | TP_VDD3.3V
3 | TP_GND
4 | TP_INT
5 | TP_SDA
6 | TP_SCL
Pad No. | Pad Name
1 NC
2 TP_RST
3 TP_VDD3.3V
4 TP_GND
5 TP_INT
6 TP_SDA
7 TP_SCL
8 NC
9 LEDK
10 LEDK
11 NC
12 LEDA
13 LEDA
14 LEDA
15 NC
16 GND
17 DON
18 DOP
19 GND
20 DIN
21 DIP
22 GND
23 CLKN
24 CLKP
25 GND
26 D2N
27 D2P
28 GND
29 D3N
30 D3P
31 GND
32 NC
33 NC
34 RESET
35 VCC
36 VCC
37 VCC
38 VCC
39 VCC(1.8V)
40 NC
REV | DESCRIPTION | DRG DATE | DRAWN BY
00 | First Desing | 2023.03.07
01 | 屏排线元器件位置变改，触摸屏座子改到屏排线上，铁框元器件位置更改 | 2023.04.18
PART NO.:
DRAWN BY: LIU DATE: 2023.04.18
CHECKED BY: DATE:
APPROVED BY: DATE:
MODULE NO.: 01
PROJECTION:
SCALE:N.T.S
UNIT: mm
SHEET: 1 OF 1
Mobile:

3.Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T_{OPR}	-10	+60	°C
LCM Storage Temperature	T_{STG}	-20	+70	°C
TP Operating Temperature & Humidity(20% ~ 90%RH)	T_{OPR}	-10	+60	°C
TP SStorage Temperature & Humidity(20% ~ 90%RH)	T_{STG}	-20	+70	°C
Humidity	RH	--	90	%

4.Electrical Characteristics

4.1 TFT DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for I/O	VDDIO	--	1.8	--	V
Supply Voltage for(DC/DC)	VDD	--	3.3	--	V
Current Consumption	I_{DD}	--	--	--	mA
	$I_{DD-SLEEP}$	--	--	--	uA

4.2 Back-Light Unit Characeristics

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	--	80	--	mA	--
Luminance(With LCD+CTP)	Lv	--	TBD	--	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

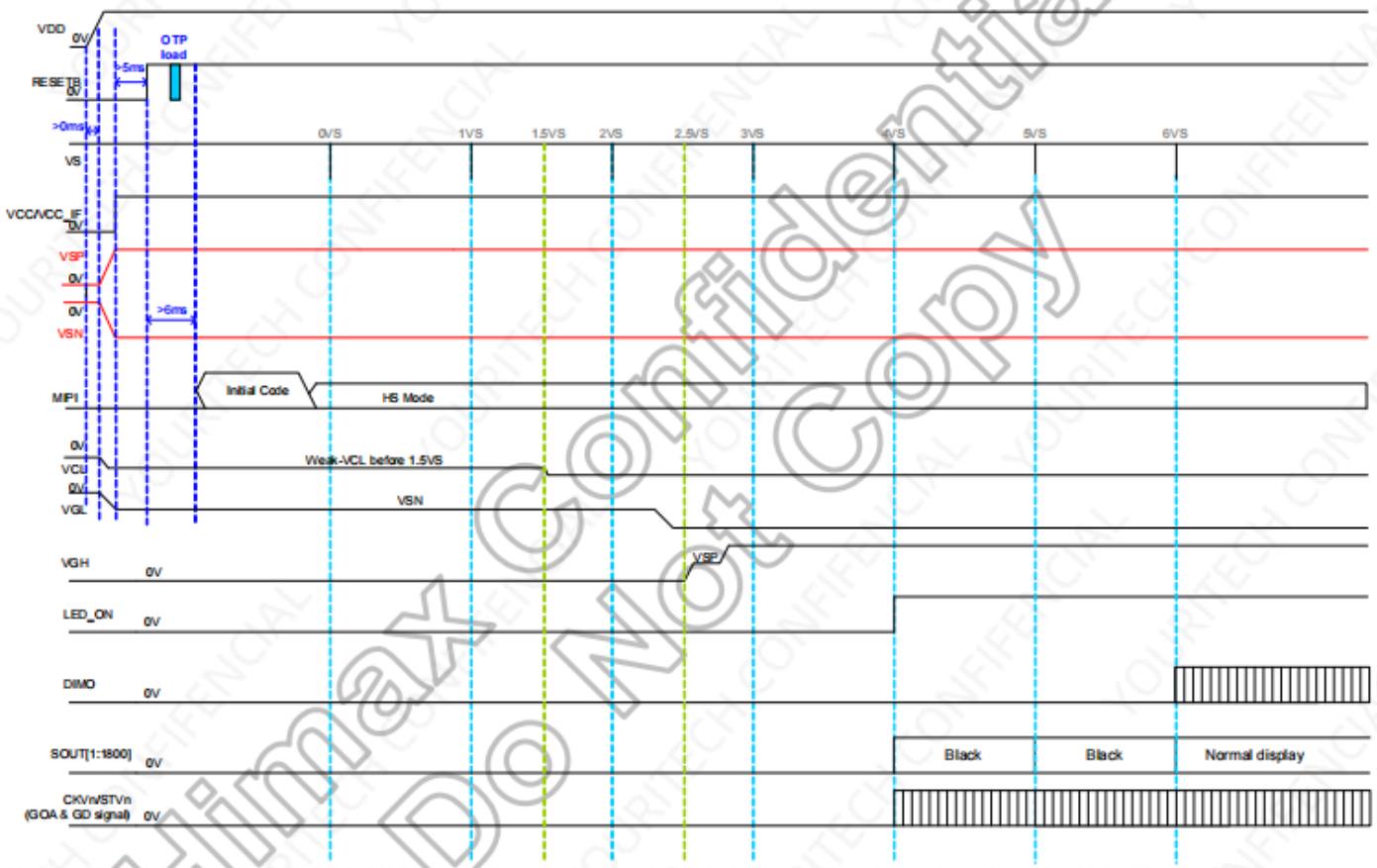
Pin No.	Symbol	LCM Functional	Notes
1	NC	No Connection.	
2	CTP_RESET 3.3V	CTP_Reset Signal input pin.	
3	CTP_VDD 3.3V	power supply for DC/DC circuit	
4	GND	Power Ground	
5	CTP_INT 3.3V	CTP_STOP Singnal	
6	CTP_SDA 3.3V	CTP_Data Singnal	
7	CTP_SCL 3.3V	CTP_Clock Singnal	
8	NC	No Connection.	
9	LEDK	Power supply for backlight cathode input terminal.	
10	LEDK	Power supply for backlight cathode input terminal.	
11	NC	No Connection.	
12	LEDA	Power supply for backlight anode input terminal.	
13	LEDA	Power supply for backlight anode input terminal.	
14	LEDA	Power supply for backlight anode input terminal.	
15	NC	No Connection.	
16	GND	Power Ground	
17	MIPI_D0N	High speed interface data differential signal input/output pins	
18	MIPI_D0P	High speed interface data differential signal input/output pins	
19	GND	Power Ground	
20	MIPI_D1N	High speed interface data differential signal input/output pins	
21	MIPI_D1P	High speed interface data differential signal input/output pins	
22	GND	Power Ground	
23	MIPI_CLKN	High speed interface clock differential signal input/output pins	
24	MIPI_CLKP	High speed interface clock differential signal input/output pins	
25	GND	Power Ground	
26	MIPI_D2N	High speed interface data differential signal input/output pins	
27	MIPI_D2P	High speed interface data differential signal input/output pins	
28	GND	Power Ground	
29	MIPI_D3N	High speed interface data differential signal input/output pins	
30	MIPI_D3P	High speed interface data differential signal input/output pins	
31	GND	Power Ground	
32	NC	No Connection.	
33	NC	No Connection.	
34	RESET 1.8V	Reset pin. Setting either pin low initializes the LSI	
35	VCC 3.3V	power supply for DC/DC circuit	
36	VCC 3.3V	power supply for DC/DC circuit	
37	VCC 3.3V	power supply for DC/DC circuit	
38	VCC 3.3V	power supply for DC/DC circuit	
39	IOVCC 1.8V	Power Supply For I/O.	
40	NC	No Connection.	

6. Timing Characteristics

Power on sequence PWRMD=0 ➔ max. Power on time=7VS

After reset state or exit STB mode, the power on sequence will start.

To prevent the device from damage due to latch up, The VGL will be earlier than VGH. At 2.25VS the VGL negative high voltage will be generated via the external charge pump circuit. Then at 2.5VS the VGH positive high voltage can be generated via the external charge pump circuit. One SCHOTTKY diode is necessary between VGL and GND when VDD and VSP start at the same time.



Note: (1) Finish to write the GOA MUX (page1 registers) and GOA timing setting (page3 registers) within 50ms after reset pulls to high.

Figure 5.5: Power on sequence with PWRMD=0 and repair OP disable

Power off sequence PWRMD=0 ➔ max. Power off time=5VS

When enter STB mode, the STBYB signal will be set to low. The power off sequence will start.

Power-off sequence
External VSP/VSN. Internal VGH/VGL.

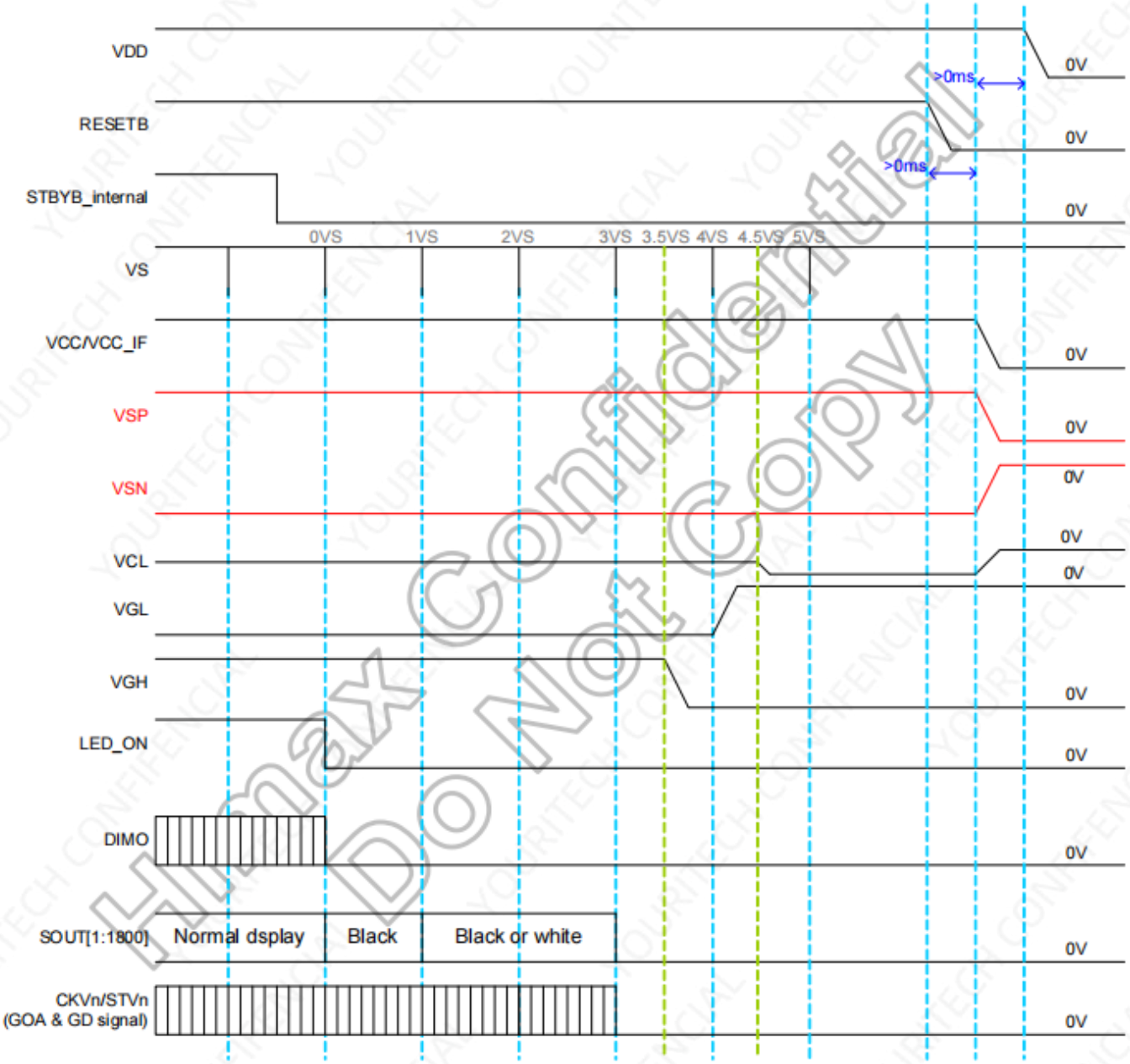
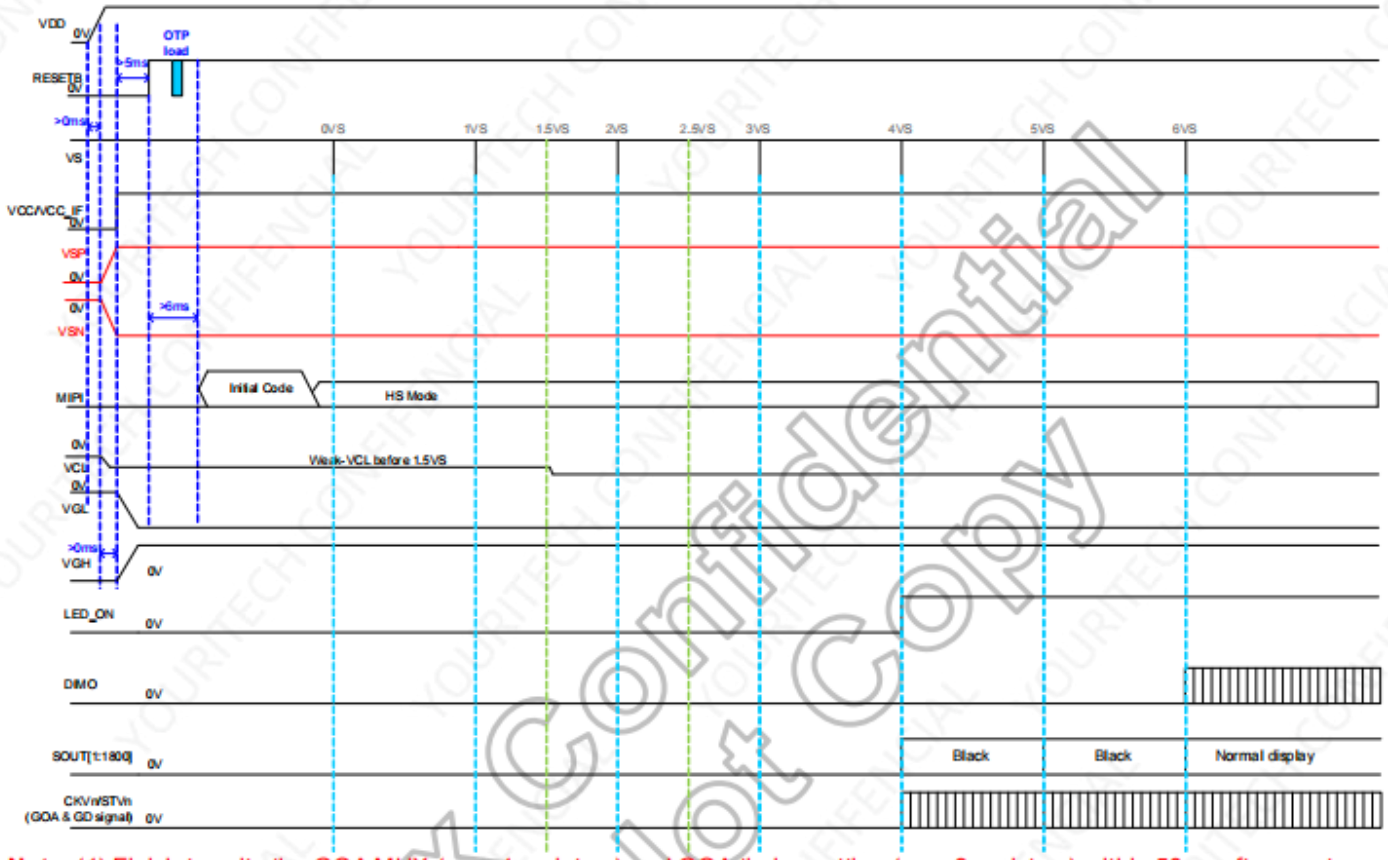


Figure 5.6: Power off sequence with PWRMD=0

Power on sequence PWRMD=1 ➔ Max. Power on time=6VS

After reset state or exit STB mode, the power on sequence will start. One SCHOTTKY diode is necessary between VGL and GND when VDD and VSP start at the same time.



Note: (1) Finish to write the GOA MUX (page1 registers) and GOA timing setting (page3 registers) within 50ms after reset pulls to high

Figure 5.7: Power on sequence with PWRMD=1 and repair OP disable

Power off sequence PWRMD=1 ➔ max. Power off time=4.5VS

When enter STB mode, the STBYB signal will be set to low then the power off sequence will start.

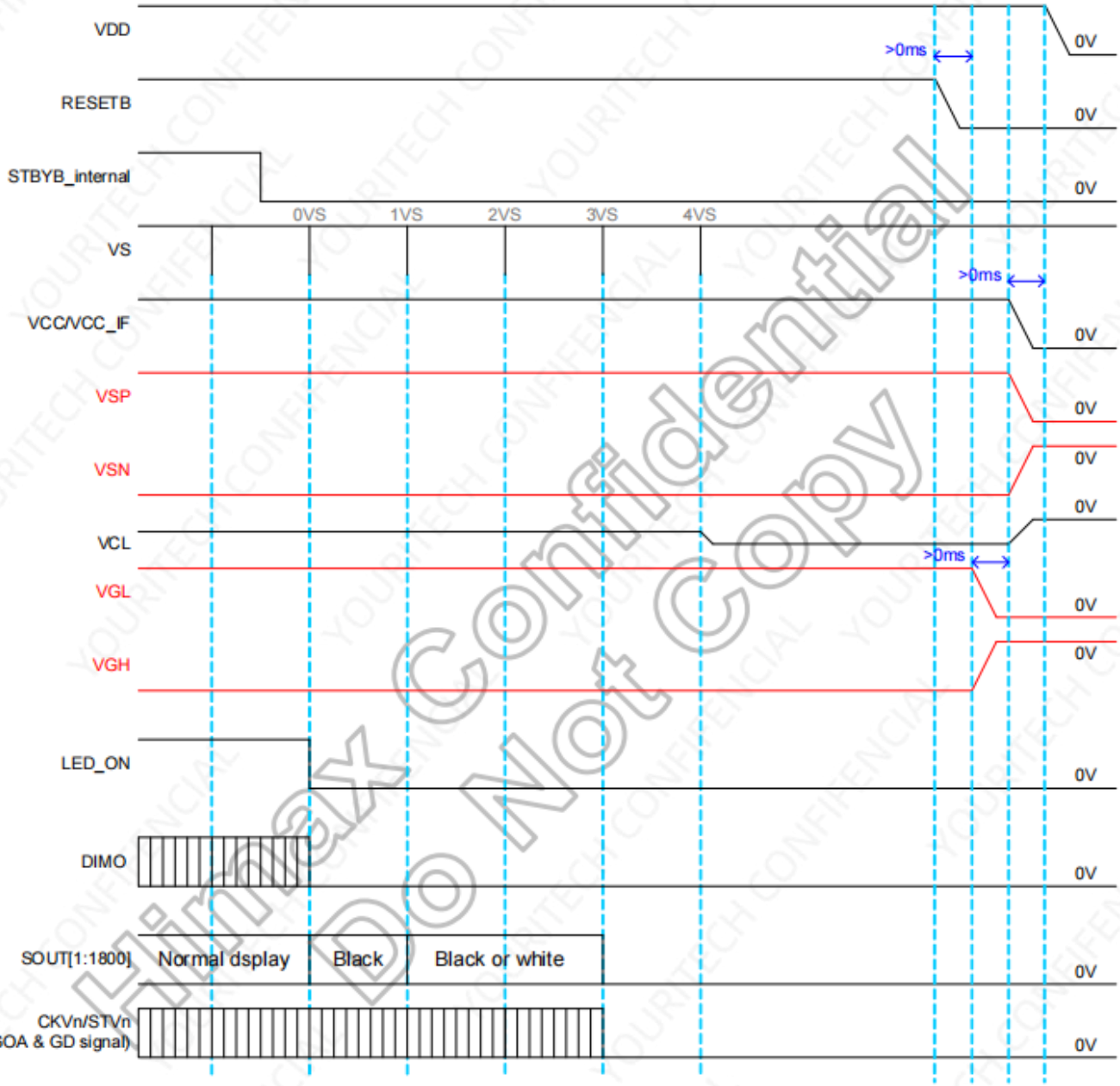


Figure 5.8: Power off sequence with PWRMD=1

MIPI AC characteristics

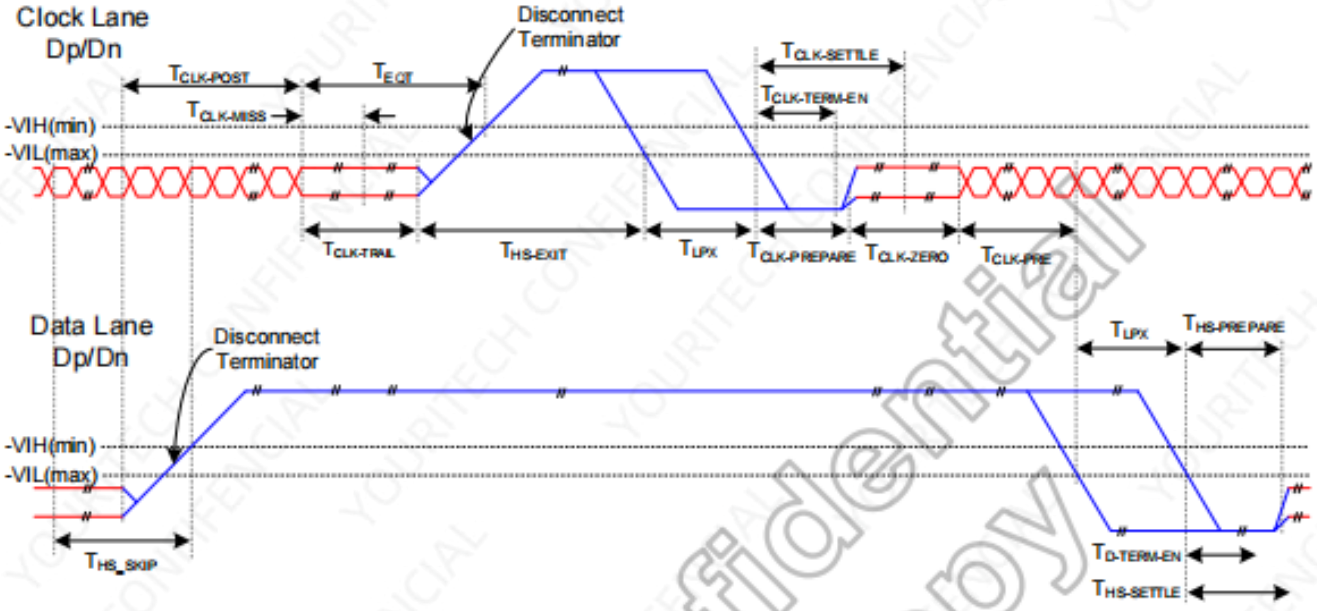


Figure 13.1: Switching the clock lane between clock transmission and low-power mode

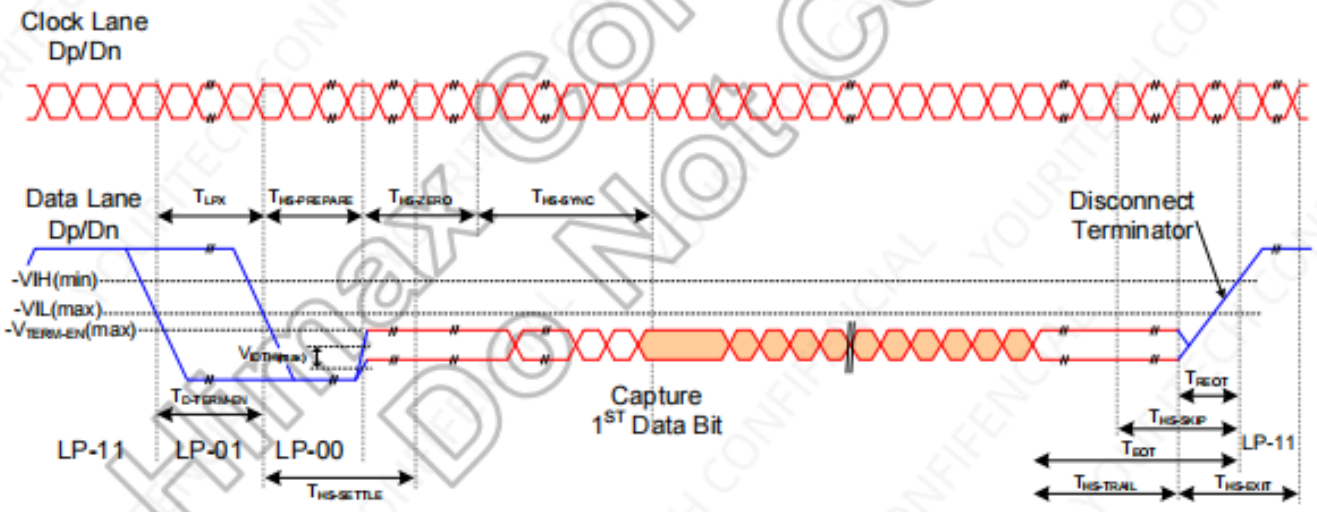


Figure 13.2: Timing of high-speed data transmission in bursts

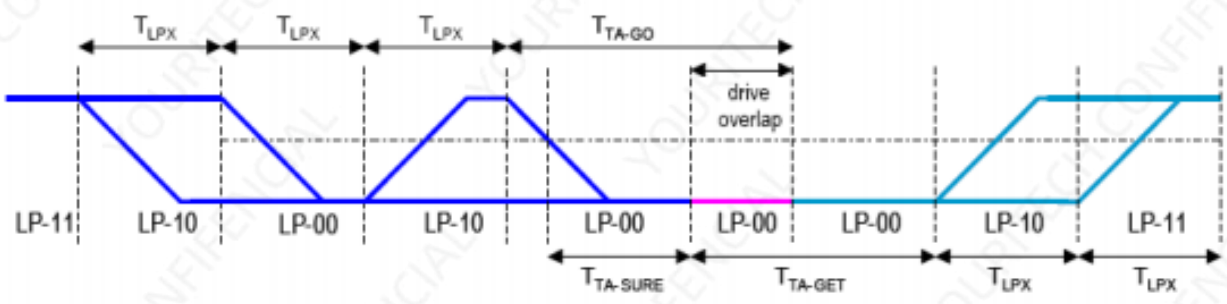


Figure 13.3: Turnaround Procedure

MIPI AC Characteristics

Parameter	Description	Spec.			Unit
		Min.	Typ.	Max.	
T_{REOT}	30%-85% rise time and fall time	-	-	35	ns
$T_{CLK-MISS}$	Timeout for receiver to detect absence of Clock transitions and disable the Clock Lane HS-RX.	-	-	60	ns
$T_{CLK-POST}$*1	Time that the transmitter continues to send HS clock after the last associated Data Lane has transitioned to LP Mode. Interval is defined as the period from the end of THS-TRAIL to the beginning of $T_{CLK-TRAIL}$.	60 ns + 52*UI **(For DCS)**	-	-	ns
$T_{CLK-PRE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	8	-	-	ns
$T_{CLK-SETTLE}$	Time interval during which the HS receiver shall ignore any Clock Lane HS transitions, starting from the beginning of $T_{CLK-PRE}$.	95	-	300	ns
$T_{CLK-TERM-EN}$	Time for the Clock Lane receiver to enable the HS line termination, starting from the time point when Dn crosses $V_{IL,MAX}$.	Time for Dn to reach $V_{TERM-EN}$	-	38	ns
$T_{HS-SETTLE}$	Time interval during which the HS receiver shall ignore any Data Lane HS transitions, starting from the beginning of $T_{HSPREPARE}$.	85 ns + 6*UI		145 ns + 10*UI	ns
T_{EOT}	Time from start of $T_{HS-TRAIL}$ or $T_{CLK-TRAIL}$ period to start of LP-11 state	-	-	105ns+48*UI	-
$T_{HS-EXIT}$ (1)	time to drive LP-11 after HS burst	100	-	-	ns
$T_{HS-PREPARE}$	Time to drive LP-00 to prepare for HS transmission	40ns + 4*UI	-	85ns+6*UI	ns
$T_{HS-PREPARE}$ + $T_{HS-ZERO}$	$T_{HS-PREPARE}$ + Time to drive HS-0 before the Sync sequence	145ns + 10*UI	-	-	ns
$T_{HS-SKIP}$	Time-out at RX to ignore transition period of EoT	40	-	55ns+4*UI	ns
$T_{HS-TRAIL}$	Time to drive flipped differential state after last payload data bit of a HS transmission burst	60 + 4*UI	-	-	ns
T_{LPX}	Length of any Low-Power state period	50	-	-	ns
Ratio T_{LPX}	Ratio of $T_{LPX(MASTER)}/T_{LPS(SLAVE)}$ between Master and Slave side	2/3	-	3/2	-
T_{TA-GET}	Time to drive LP-00 by new TX		$5*T_{LPX}$		ns
T_{TA-GO}	Time to drive LP-00 after Turnaround Request		$4*T_{LPX}$		ns
$T_{TA-SURE}$	Time-out before new TX side starts driving	T_{LPX}	-	$2*T_{LPX}$	ns

Note: (1) For image transmission:
$T_{CLK-POST}$ min value =164 when MIPI max frequency per lane = 0.53Gbps.
$T_{CLK-POST}$ min value =112 when MIPI max frequency per lane = 1Gbps

Timing requirements for RESETB

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

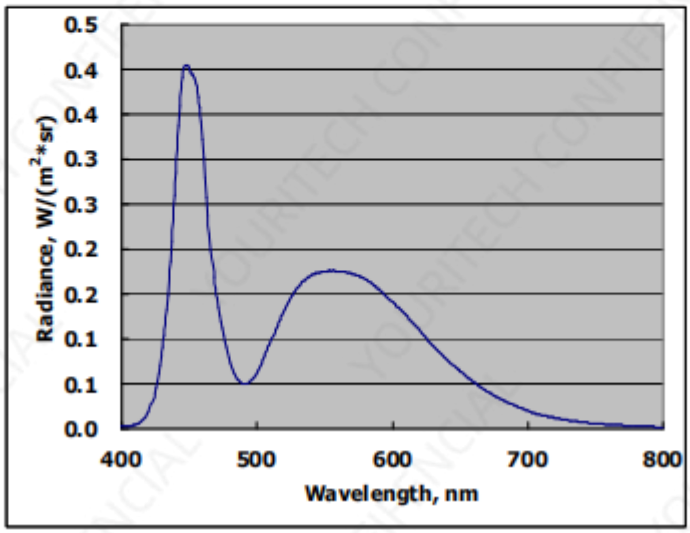
Table 13.5: Reset timing

Figure 13.6: Reset timing

7. Optical Characteristics

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance (w/o APCF)		T%	Viewing normal angle $\theta_X = \theta_Y = 0°$	3.53%	4.04%		%	All left side data are based on INX's following condition –
Contrast Ratio		CR		800	1000		--	1.LC : AAS . 2.CF : CG 70% CF.
Response Time		$T_{on} + T_{off}$			25		ms	3.Light Source : INX LED BLU. 4.Polarizer :
Viewing Angle	Hor.	θ_{X+}		80	85		deg.	CF:SRW062APN1LT4 TFT:SRW062AWL2/APFV3 5.Machine : DMS 803, (ConoScope for View Angle). 6. VLC dark ≦ 0.3 V, VLC white ≧ 4.1 V 7.Back light structure: Diffuser+BEF+BEF+ Diffuse
		θ_{X-}		80	85			
	Ver.	θ_{Y+}		80	85			
		θ_{Y-}		80	85			
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0°$				-	Under C light Simulation
		Ry					-	
	Green	Gx					-	
		Gy					-	
	Blue	Bx					-	
		By					-	
	White	Wx		0.28	0.3	0.32	-	
		Wy		0.305	0.325	0.345	-	
	Color Gamut				65		%	

*Note(1) INX LED BLU Spectrum:



*Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

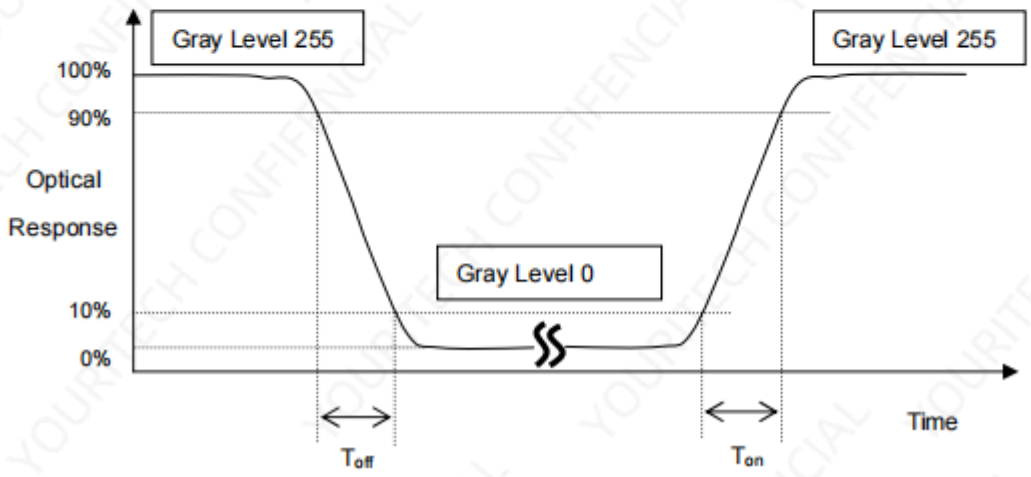
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

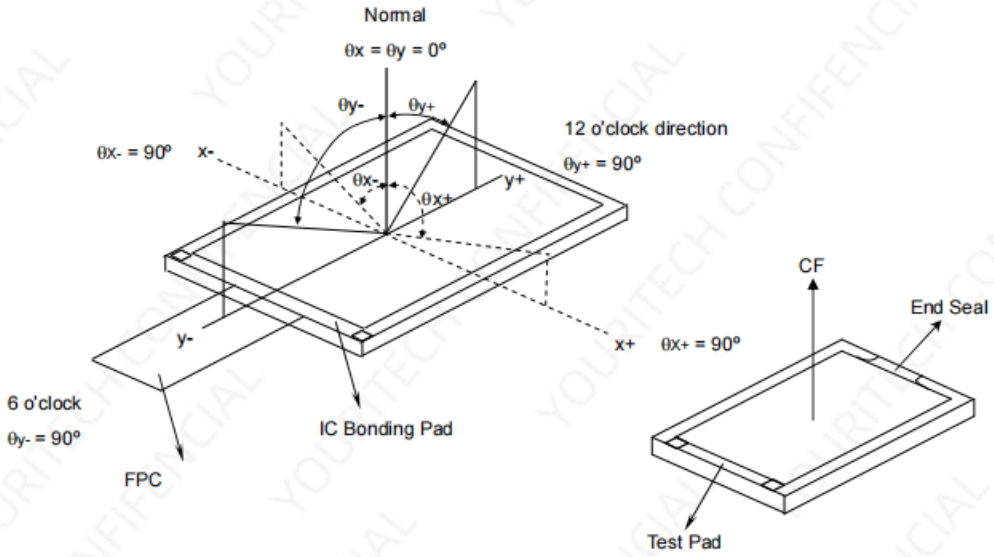
CR = CR (5)

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

*Note (3) Definition of Response Time (T_{on}, T_{off}):

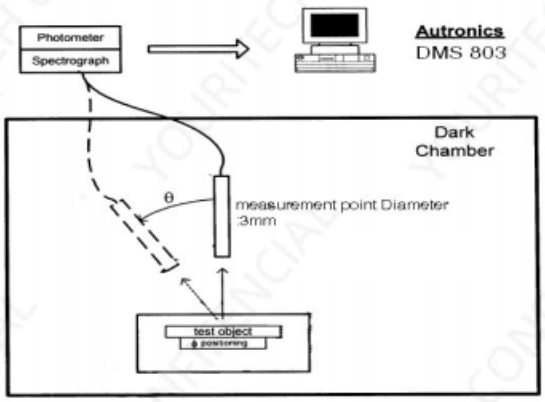


*Note(4) Definition of Viewing Angle

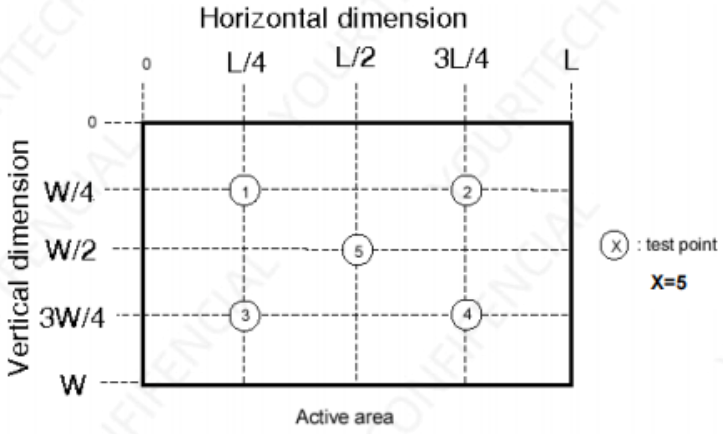


*Note (5) Measurement Set-Up:

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 (6)



8. Reliability Test Item

No.	Test Item	Test Condition	Notes
1	High Temp. Storage	+70°C / 96H	1. Functional test isOK. Missing Segment,short, unclear segment non-display,display abnormally and liquid crystal leakare un-allowed. 2. No low temperature bubbles,end seal loose andfall, frame rainbow.
2	Low Temp. Storage	-20°C / 96H	
3	High Tempe. Operating	+60°C / 96H	
4	Low Tempe. Operating	-10°C / 96H	
5	High Temperature /Humidity storage	50°C x 90%RH /96H	
6	Thermal and cold shock	Static state， -20℃（30min） ~60℃（30min），10 cycles	

9. Packing Method----TBD

- END -