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 优 瑞 泰 克	深圳市优瑞泰克科技有限公司 SHENZHEN YOURITECH TECHNOLOGY CO.,LTD Product Specification	ET055WU06-TT 2023-06-30 PAGE 1 OF 14
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Project No. 项目编号	ET055WU06-TT
Customer 客户名称	
Module No. 客户型号	
Product type 产品内容	Standard LCD Module TFT: 1080*RGBx1920Dots 5.46”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	

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 1080xRGBx1920.

As to basic specification of the driver IC, refer to the IC (Himax:HX8399C) 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;

IPS Type LCD

1080 dot-segment and 1920 dot-common outputs;

16.7M Color can be selected by software;

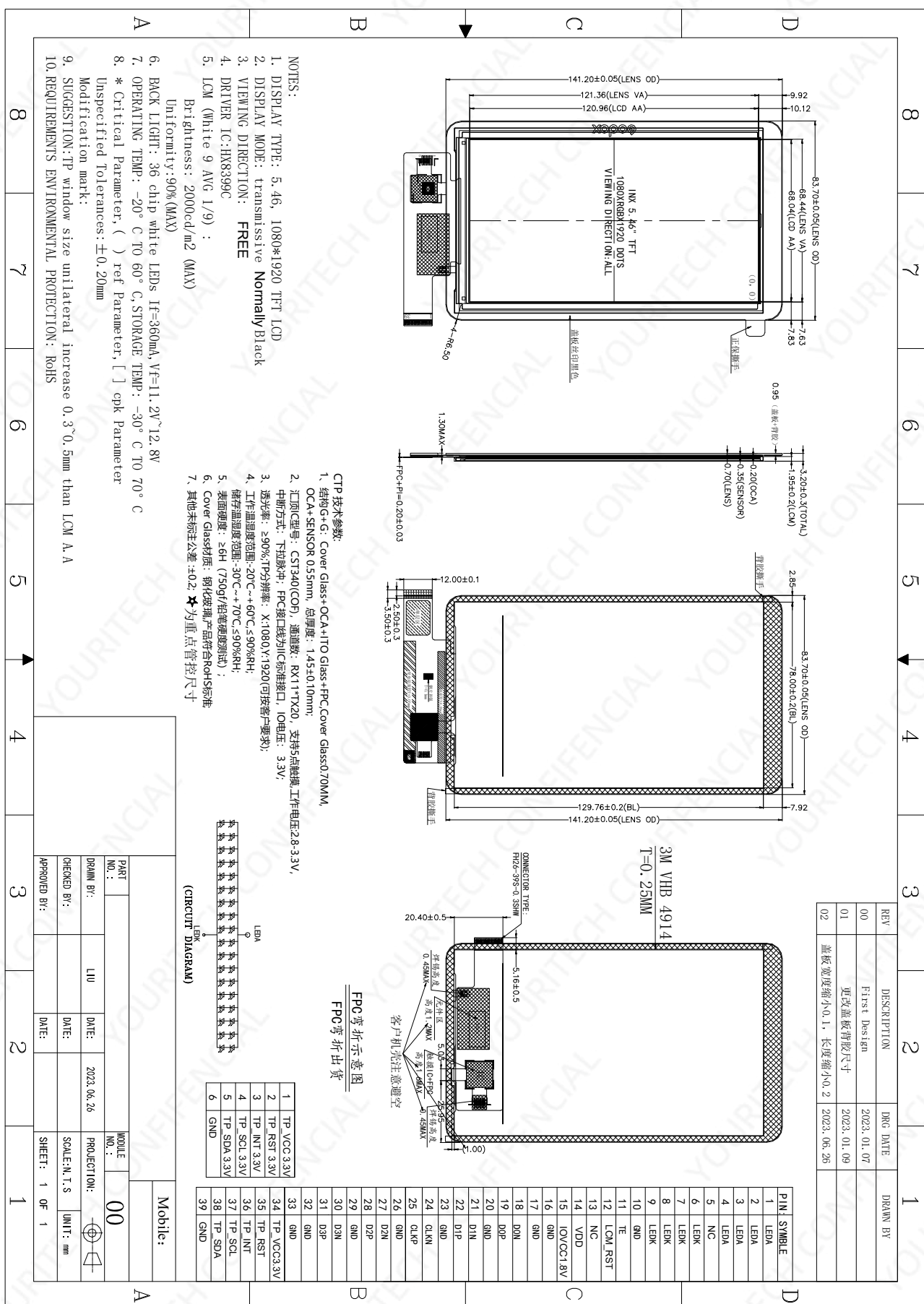
White LED back light;

4Lane MIPI interface

1.3 Applications:

2. LCM General specification

ITEM	Standard value	Unit
LCD Type	Normally black	--
Drive element	TFT active matrix	--
Number of pixels	1080*3RGB(H)X1920(V)	Dots
Pixel arrangement	RGB stripe	--
Pixel Pitch (H*V)	63 (H) x63 (V)	um
Active area(H*V)	68.04(H) x 120.96(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	HX8399C	--
TFT interface	MIPI Interface	-
Approx. Weight	TBD	g
LCM Size(W*H*T)	78.00(W) x 129.76(H) x1.95(T)	mm
LCM+CTP Size(W*H*T)	83.70(W) x 141.20(H) x3.20(T)	mm
Touch structure	G+G	--
Touch Driver IC	CST340(COF)	--
Touch Interface	I2C	--



3.Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T _{OPR}	-20	+60	°C
LCM Storage Temperature	T _{STG}	-30	+70	°C
TP Operating Temperature & Humidity (20% ~ 90%RH)	T _{OPR}	-20	+60	°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	Note
TFT OperationFrame rate	Hz	--	60	--	Hz	
Supply Voltage for I/O	VDDIO	1.65	1.8	3.3	V	
Supply Voltage for(DC/DC)	VDD	2.5	3.3	3.6	V	
TFT Gate ON Voltage	VGH	--	11	--	V	Note 2
TFT Gate OFF Voltage	VGL	--	-7	--	V	Note 2
TFT Common Voltage	Vcom	-2	TBD	0	V	Note 1

Note 1: VCOM value should be adjusted by different condition to optimize Flicker Value.

Note 2: VGH and VGL are the operating voltages of TFT gate.

4.2 Back-Light Unit Characeristics

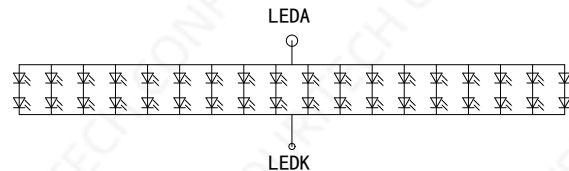
The back-light system is an edge-lighting type with 36 white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V _F	11.2	--	12.8	V	--
Forward current	I _F	--	360	--	mA	--
Luminance(With LCD+CTP)	L _v	--	2000	--	cd/m ²	--
LED life time	N/A	--	20,000	--	Hr	Note 1

Note:

- (1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at $I_L=20\text{mA/LED}$. 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	Description
1	LEDA	Power supply for backlight anode input terminal.
2	LEDA	Power supply for backlight anode input terminal.
3	LEDA	Power supply for backlight anode input terminal.
4	LEDA	Power supply for backlight anode input terminal.
5	NC	NC
6	LEDK	Power supply for backlight cathode input terminal.
7	LEDK	Power supply for backlight cathode input terminal.
8	LEDK	Power supply for backlight cathode input terminal.
9	LEDK	Power supply for backlight cathode input terminal.
10	GND	Power Ground
11	TE	Tearing effect signal is used to synchronize MCU to frame memory
12	RESET	Reset signal input terminal. Active at ‘L’ .
13	NC	NC
14	VDD	A power supply for the analog power. VDD3=2.5V to 3.6V
15	I0VCC1.8V	A power supply for the I/O circuit and logic power. I0VCC=1.65 to 3.3V
16	GND	Power Ground
17	GND	Power Ground
18	DON	MIPI-DSI Data differential signal input pins.
19	DOP	MIPI-DSI Data differential signal input pins.
20	GND	Power Ground
21	D1N	MIPI-DSI Data differential signal input pins.
22	D1P	MIPI-DSI Data differential signal input pins.
23	GND	Power Ground
24	CLKN	MIPI-DSI CLOCK differential signal input pins.
25	CLKP	MIPI-DSI CLOCK differential signal input pins.
26	GND	Power Ground
27	D2N	MIPI-DSI Data differential signal input pins.
28	D2P	MIPI-DSI Data differential signal input pins.
29	GND	Power Ground



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Product Specification

ET055WU06-TT
2023-06-30 PAGE
7 OF 14

30	D3N	MIPI-DSI Data differential signal input pins.
31	D3P	MIPI-DSI Data differential signal input pins.
32	GND	Power Ground
33	GND	Power Ground
34	TP VCC 3.3V	Touch panel Power supply 2.8~3.3V
35	TP RST3.3V	Touch panel reset
36	TP INT3.3V	Touch panel interrupt output
37	TP SCL3.3V	Touch panel I2C clock
38	TP SDA3.3V	Touch panel I2C data
39	GND	Power Ground

6. Timing Characteristics

VDD3/VDD1 input power (PCCS[2:0]=000, 001, 101)

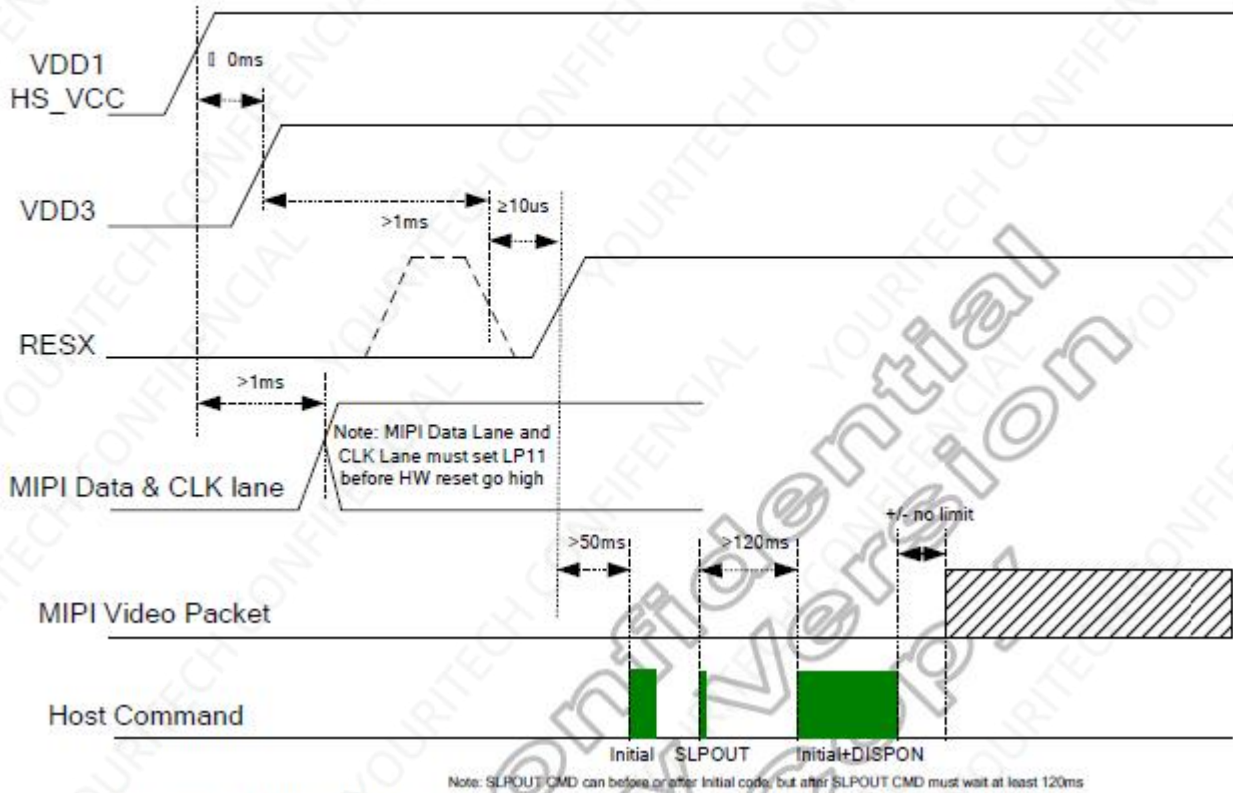


Figure 1: VDD3/VDD1 input power on sequence (PCCS[2:0]=000/001/101)

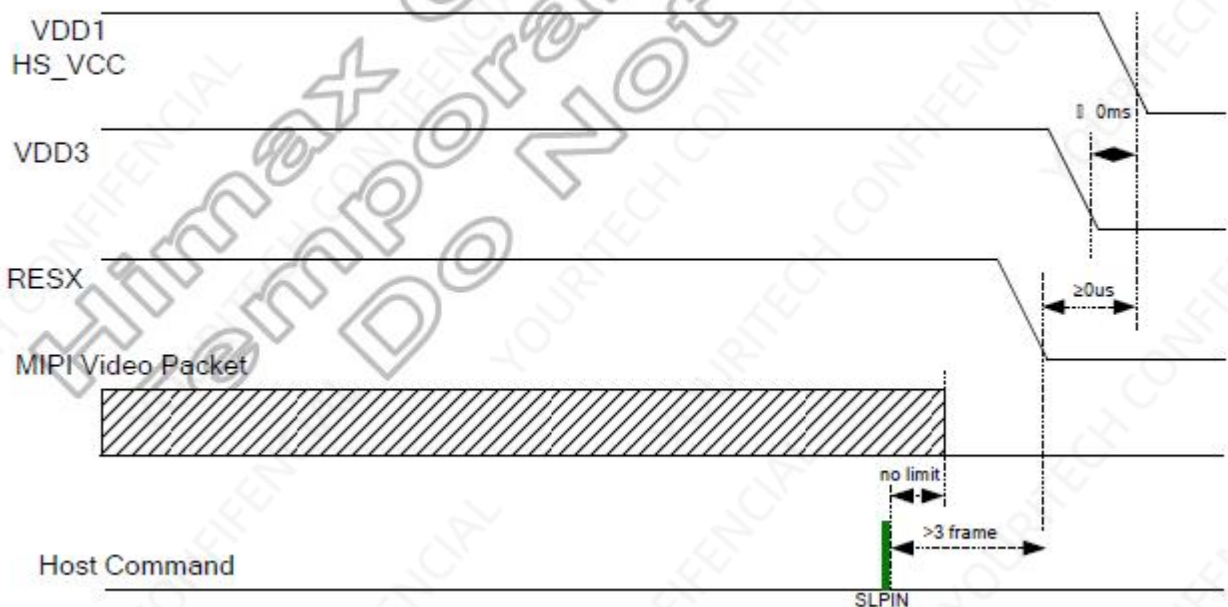


Figure 2: VDD3/VDD1 input power off sequence (PCCS[2:0]=000/001/101)

Timings for DSI video mode

Vertical Timings

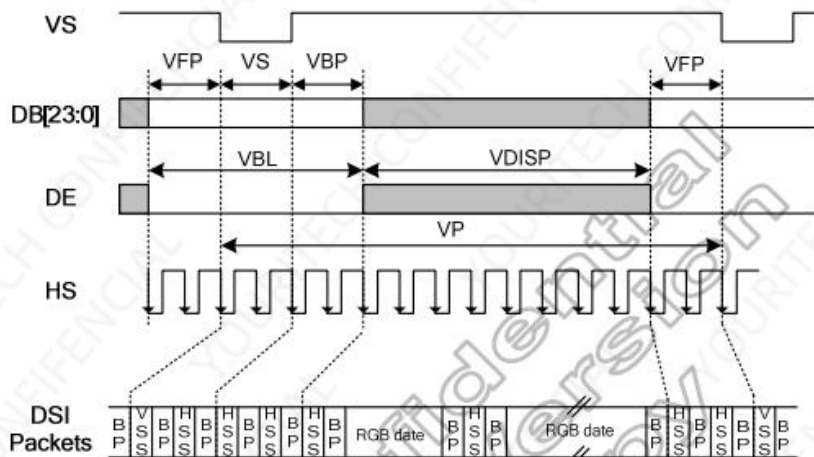


Figure 8.10: Vertical timings for DSI I/F

Vertical Resolution=528+8xNL (VSSA=0V, VDD1=1.8V, VDD3=2.8V, T_A=25 °C)

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Vertical cycle	VP	-	534+8xNL	-	-	Line
Vertical low pulse width	VS	-	2	-	Note ⁽¹⁾	Line
Vertical front porch	VFP	-	2	-	-	Line
Vertical back porch	VBP	-	2	-	Note ⁽¹⁾	Line
Vertical data start point	-	VS+VBP	4	-	Note ⁽¹⁾	Line
Vertical blanking period	VBL	VS+VBP+VFP	6	-	-	Line
Vertical active area	-	VDISP	-	528+8xNL	-	Line
Vertical Refresh rate	VRR	-	-	60	-	Hz

Note: (1) The VS and VBP pulse width are related to GSP and GCK timing. The GSP and GCK must be set at corresponding position for LCD normal display.

Table 8.14: Vertical timings for DSI I/F

Horizontal Timings

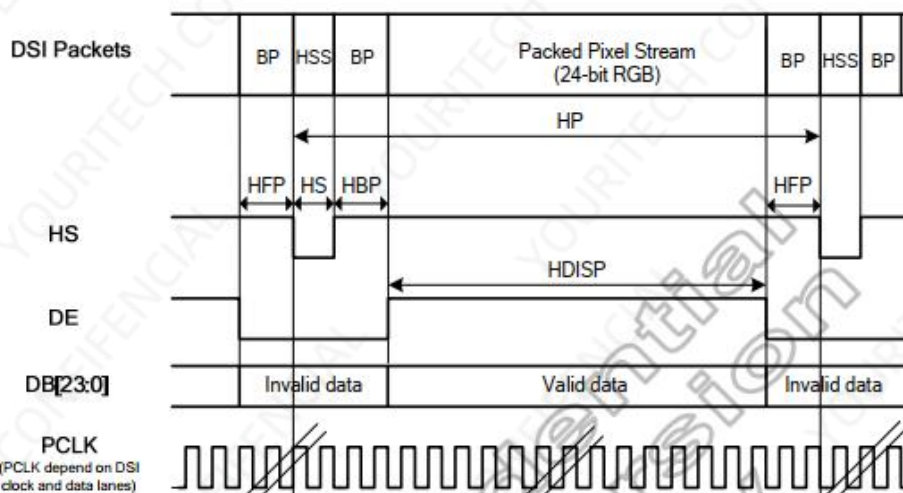


Figure 8.11: Horizontal timing for DSI video mode I/F

Horizontal Resolution=H_RES(1200/1080/1024/960/900/800/720) (VSSA=0V, VDD1=1.8V, VDD3 = HS_VCC =2.8V, T_A=25°C)

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
HS cycle	HP	-	H_RES+15	-	-	DCK
HS low pulse width	HS	-	5	-	-	DCK
Horizontal back porch	HBP	-	5	-	-	DCK
Horizontal front porch	HFP	-	5	-	-	DCK
Horizontal data start point	-	HS+HBP	10	-	-	DCK
Horizontal blanking period	HBLK	HS+HBP+HFP	15	-	-	DCK
Horizontal active area	HDISP	-	-	H_RES	-	DCK

Table 8.15: Horizontal timings for DSI video mode I/F

Reset input timing

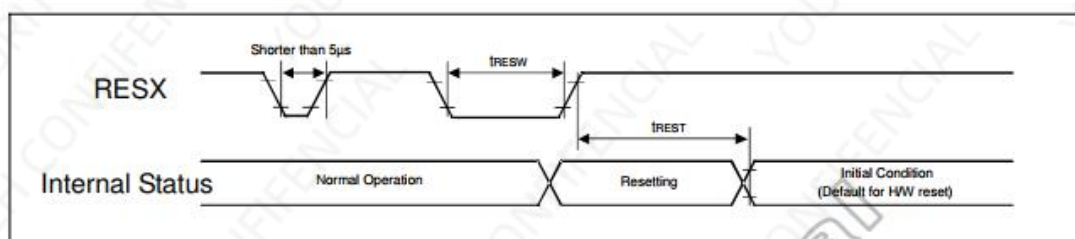


Figure 8.12: Reset input timing

Symbol	Parameter	Related pins	Spec.			Unit	Note
			Min.	Typ.	Max.		
tRESW	Reset low pulse width ⁽¹⁾	RESX	10	-	-	µs	-
tREST	Reset complete time ⁽²⁾	-	-	-	50	ms	-

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

RESX Pulse	Action
Shorter than 5µs	Reset Rejected
Longer than 10µs	Reset
Between 5µs and 10µs	Reset Start

(2) During Reset Complete Time, OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (tREST) within 5ms after a rising edge of RESX.

(3) Spike Rejection also applies during a valid reset pulse as shown below:

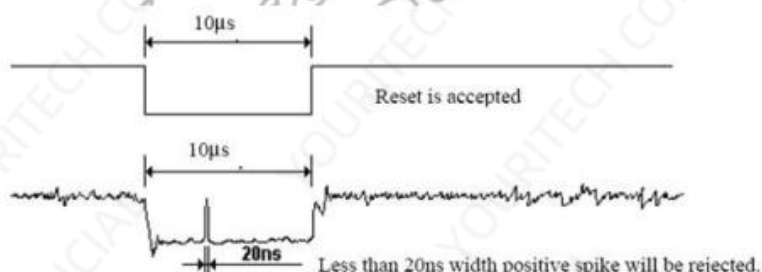


Table 8.16: Reset timing

7.Optical Characteristics

Item	Symbol	Conditions	Specifications			Unit	Note
			Min.	Typ.	Max.		
Transmittance	T%	Viewing normal angle $\theta_x = \theta_y = 0^\circ$	3.6	4.2		%	1.POL without APCF 2.Transmittance with APCF & INX Yag BLU 3.Metrology : DMS900 4.wo TOD 5.VLC dark <0.2V, VLC white=5.3V
Contrast Ratio	CR		700	1000	--	--	
Response Time	$T_{on}+T_{off}$		--	35	45	ms	
Viewing Angle	Hor.	θ_{x+}	$CR \geq 10$ at 25 °C	80	--	deg.	
		θ_{x-}		80	--		
	Ver.	θ_{y+}		80	--		
		θ_{y-}		80	--		
Color Chromaticity	Red	X_R	Viewing normal angle $\theta_x = \theta_y = 0^\circ$ at 25 °C	0.649		--	
		Y_R		0.341			
	Green	X_G		0.299			
		Y_G		0.631			
	Blue	X_B		0.151			
		Y_B		0.062			
	White	X_W		0.313			
		Y_W		0.329			
Color Gamut	CG		60	70	-	%	

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

The contrast ratio can be calculated by the following expression.

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

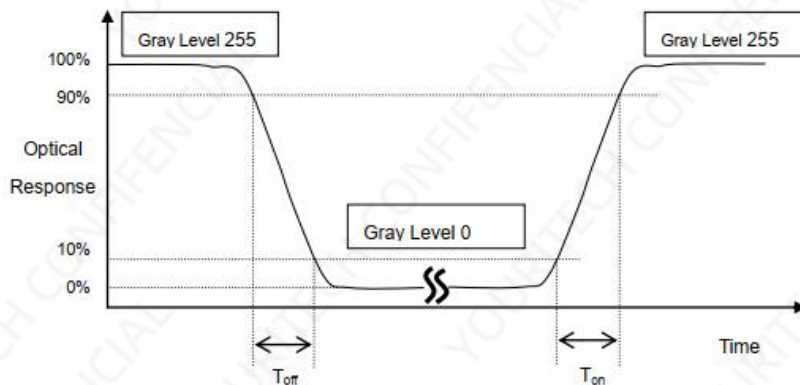
L_{255} : Luminance of gray level 255

L_0 : Luminance of gray level 0

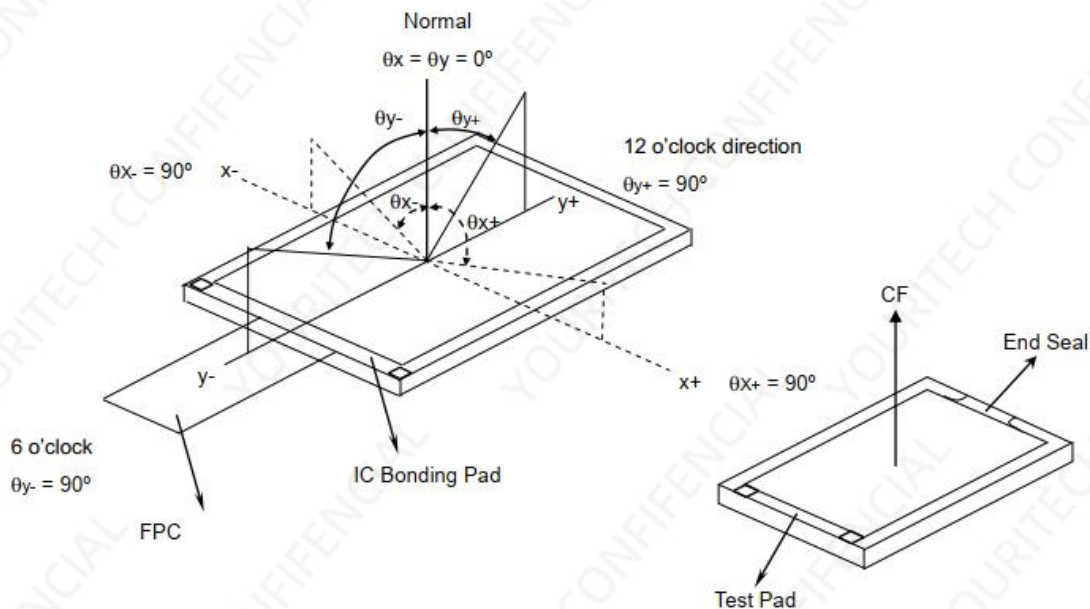
CR = CR (5)

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}):

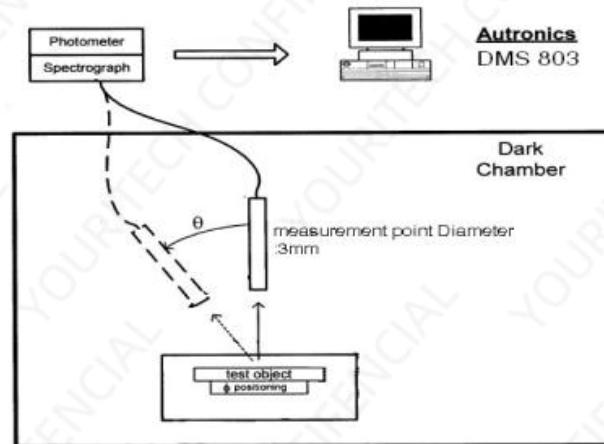


*Note(3) Definition of Viewing Angle

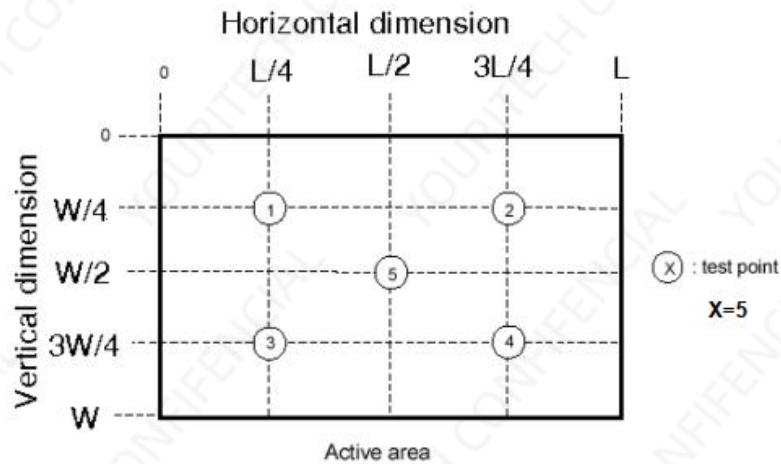


*Note (4) Measurement Set-Up:

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	+60°C / 96H	
4	Low Temp. Operating	-20°C / 96H	
5	High Temperature / Humidity storage	50°C x 90%RH / 96H	
6	Thermal and cold shock	Static state, -20°C (30min) ~60°C (30min), 10 cycles	

9. Packing Method----TBD

- END -