YOURITech
AN EUROTECH COMPANY

INDUSTRIAL STRENGTH...
Start Your Application From YOURITECH

Integration support
Obsolescence Management
PCAP
Embedded Systems
Human Machine Interface
Touch Solutions
Production
Custom designs
Installation
Software
Mechanical design
Quality Management
Open Frame Monitors
LCD Controller
Research & Development
Firmware
EMC tests
on-site service
In-house Manufacturing
Optical Bonding
Cover glass
System solutions
OEM Solutions
Custom Display

Erotech YOURITech AN EUROTECH COMPANY AOSHITE 奥视特 Your Reliable Display Panel and Smart Touch Embedded Solution Partner

For more information about comprehensive display panels and touch embedded solutions, welcome contact us at:

https://www.youritech.com
info@youritech.com

LCD MODULE SPECIFICATION

Customer: _____

Model Name: ET080WU05-O

Date: 2020/03/02

Version: 01

For Customer's Acceptance

Approved by	Comment

Approved By	Checked By	Prepared By
Lee	CoCo	WG

Record of Revision			
Version	Revise Date	Page	Content
00	2019/12/14	all	First issue
01	2020/03/02	13.18	BL brightness changed from 1200-1300 to 1000-1100

Contents

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	8 inch	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1200(W) RGB x 1920(H)	
4	Display mode	Normally Black, Transmissive	
5	Dot pitch	0.0897 (w)x 0.0897(H)	
6	Active area	107.64(W) x 172.22(H) mm	
7	Module size	119.41(W) ×184(H) ×4.5(D) mm	Note 1
8	View direction	ALL	O'clock
9	Surface treatment	Anti-Glare	
10	Color arrangement	RGB-stripe	
11	Interface	MIPI	
12	Lcm power consumption	4.7W	TYP
13	Drive IC	NT51021B*2	

Note 1: Refer to Mechanical Drawing.

2. Pin Assignmen

FPC Connector is used for the module electronics interface. The recommended model is FH26-31S-0.3SHW manufactured by Hirose.

Pin .No	Symbol	I/O	Function	Remark
1	NC	-	No Connection	
2	RST	I	Global reset pin, active low.	
3	VDD3.3V	P	(VDD)Power Supply For LCD	
4	VDD3.3V	p	(VDD)Power Supply For LCD	
5	GND	P	Ground	
6	DP0	I	Positive MIPI differential data inputs	
7	DN0	I	Negative MIPI differential data inputs	
8	GND	P	Ground	
9	DP1	I	Positive MIPI differential data inputs	
10	DN1	I	Negative MIPI differential data inputs	
11	GND	P	Ground	
12	CLKP	I	Positive MIPI differential clock inputs	
13	CLKN	I	Negative MIPI differential clock inputs	
14	GND	P	Ground	
15	DP2	I	Positive MIPI differential data inputs	
16	DN2	I	Negative MIPI differential data inputs	
17	GND	P	Ground	
18	DP3	I	Positive MIPI differential data inputs	
19	DN3	I	Negative MIPI differential data inputs	
20	GND	P	Ground	
21	NC	-	No Connection	
22-24	GND	P	Ground	
25	USB_DP(TP)	p	USB data bus（+）	

26	USB_DM(TP)	P	USB data bus（-）	
27	USB5V(TP)	P	USB power supply	
28	NC	-	No Connection	
29-30	GND	P	Ground	
31	NC	-	No Connection	
32	GND	P	Ground	
33-34	NC	-	No Connection	
35-38	LED-	P	Power Supply For LED Backlight Cathode Input	
39-40	LED+	P	Power Supply For LED Backlight Anode Input	

I: input; O: output; P: Power or Ground(0V).

3. Operation Specifications

3.1. Typical Operation Conditions

Test condition: GND=0V, T_A=25 °C

Note1

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	VDD	2.7	3.1	3.6	V	Note 1
	VDDIO	1.55	1.6	1.65	V	

Note 1:VDD setting should match the signals output voltage of customer's system board.

3.2. Current Consumption

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V_L	28	30	32	V	Note 1
Crrent for LED Backlight	I_L	-	150	-	mA	
LED life time	-	20,000	-	-	Hr	Note 2

Note1: V_L=30V, I_L=150mA (Backlight circuit: 10 series connection, 5 parallel connection), the ambient temperature is 25℃.

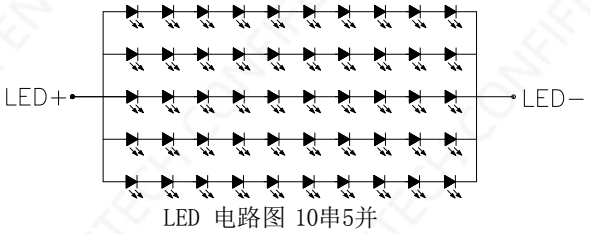
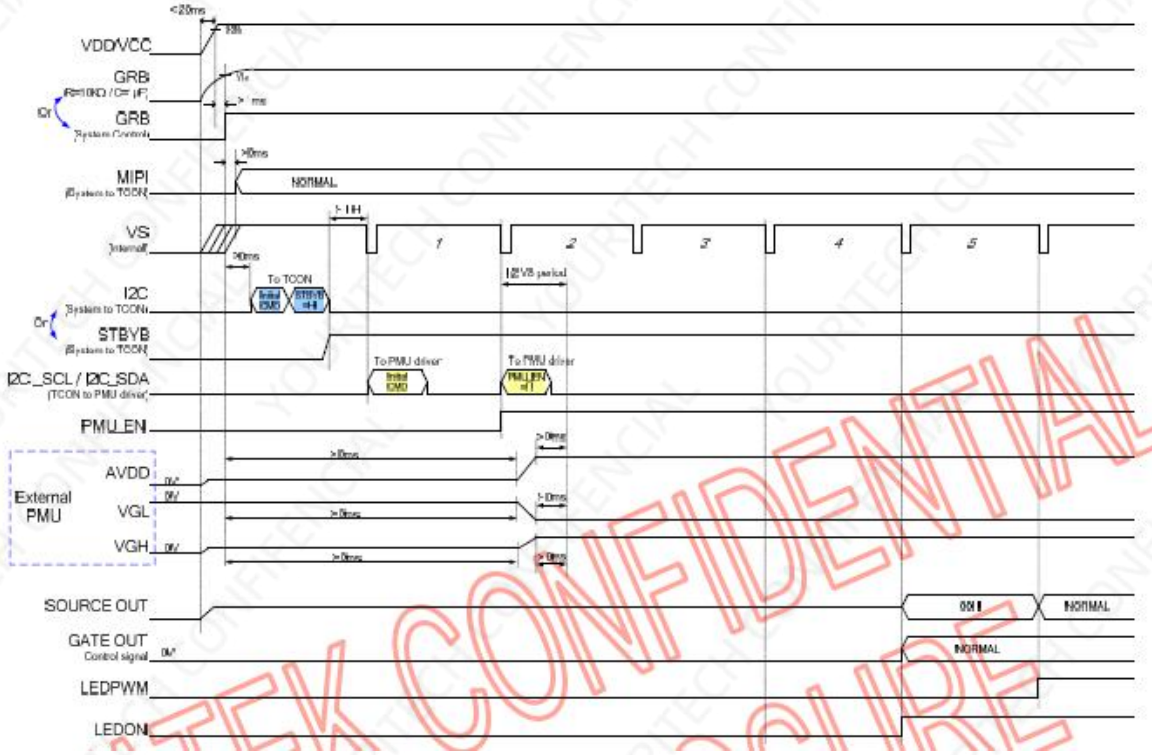


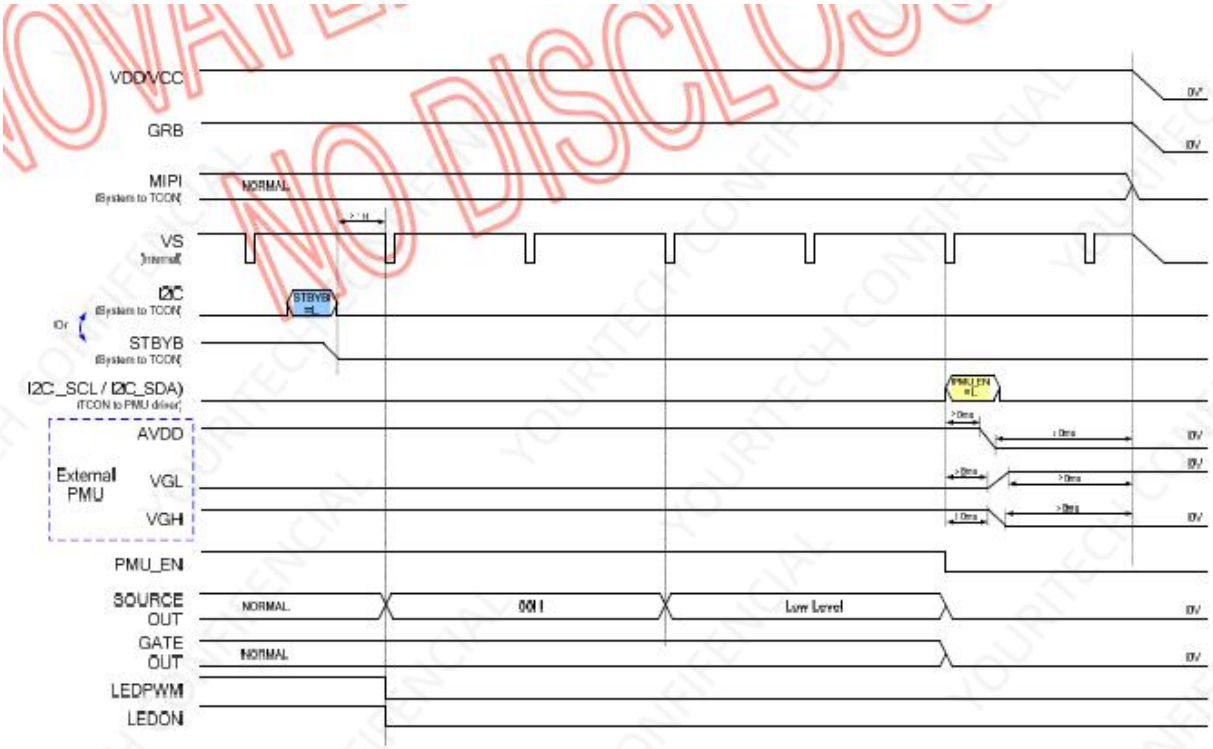
Fig. 3-1 LED test circuit diagram

Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and 1/2 rated current . The LED lifetime could be decreased if operating I_L is larger than150mA.

3.3. Timming Sequence

Power on/off timing:



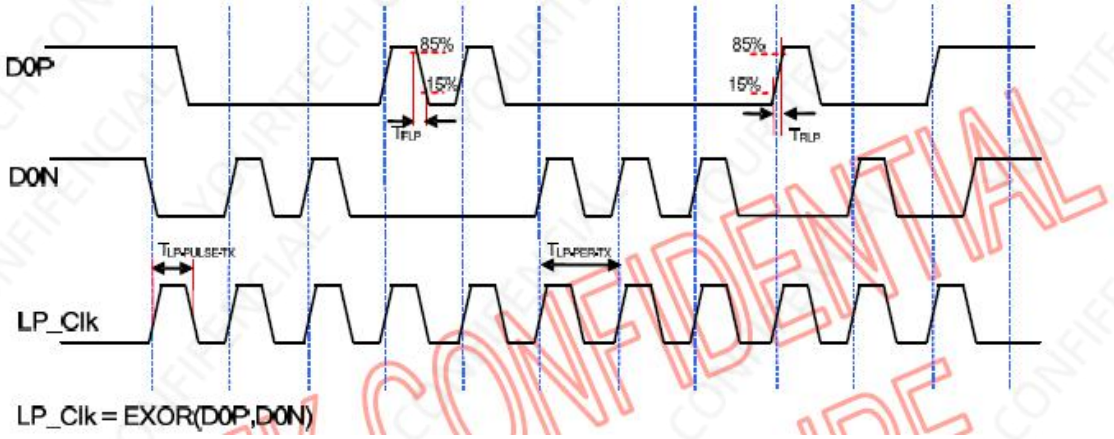


3.4. MIPI AC Characteristic:

3.4.1. LP Transmission

(VDD= 2.7V to 3.6V, AVDD= 7V to 10V, GND=AGND= 0V, TA= -20 to +85°C)

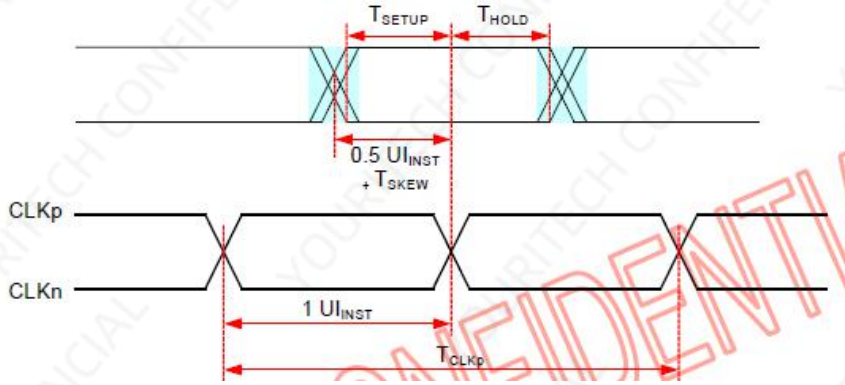
Parameter	Symbol	Min	Typ	Max	Units
15%-85% rise time and fall time	T_{RLP} / T_{FLP}	-	-	25	ns
Pulse width of the LP exclusive-OR clock	$T_{LP\text{-}PULSE\text{-}TX}$	50	-	-	ns
Period of the LP exclusive-OR clock	$T_{LP\text{-}PER\text{-}TX}$	100	-	-	ns



3.4.2. High Speed Transmission:

(VDD= 2.7V to 3.6V, AVDD= 7V to 10V, GND=AGND= 0V, TA= -20 to +85°C)

Parameter	Symbol	Min	Typ	Max	Units
UI instantaneous	UI_{INST}	1.0	-	12.5	ns
Data to Clock Setup Time	T_{SETUP}	0.3	-	-	UI_{INST}
Data to Clock Hold Time	T_{HOLD}	0.3	-	-	UI_{INST}

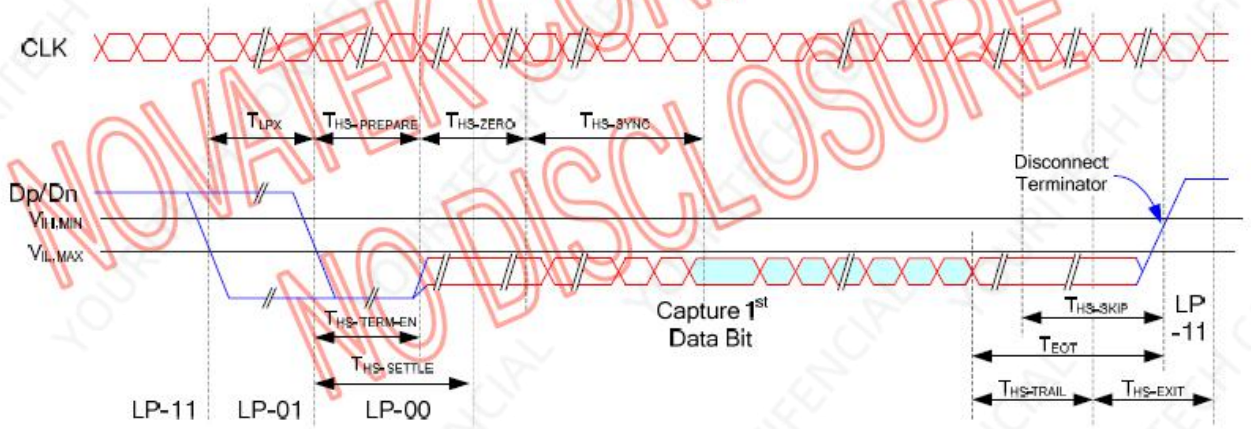


3.4.3 High-speed data transmission in bursts:

(VDD= 2.7V to 3.6V, AVDD= 7V to 10V, GND=AGND= 0V, TA= -20 to +85°C)

Parameter	Symbol	Min	Typ	Max	Units
Time to drive LP-00 to prepare for HS transmission	$T_{HS-PREPARE}$	40+4UI	-	85+6UI	ns
Time from start of tHS-TRAIL or tCLK-TRAIL period to start of LP-11 state	T_{EOT}	-	-	105+12UI	ns
Time to enable Data Lane receiver line termination measured from when Dn cross VIL,MAX	$T_{HS-TERM-EN}$	-	-	35+4UI	ns
Time to drive flipped differential state after last payload data bit of a HS transmission burst	$T_{HS-TRAIL}$	60+4UI	-	-	ns
Time-out at RX to ignore transition period of EoT	$T_{HS-SKIP}$	40	-	55+4UI	ns
Time to drive LP-11 after HS burst	$T_{HS-EXIT}$	100	-	-	ns
Length of any Low-Power state period	T_{LPX}	50	-	-	ns
Sync sequence period	$T_{HS-SYNC}$	-	8UI	-	ns
Minimum lead HS-0 drive period before the Sync sequence	$T_{HS-ZERO}$	105+6UI	-	-	ns

Note:
1. The minimum value depends on the bit rate. Implementations should ensure proper operation for all the supported bit rates.
2. UI means Unit Interval, equal to one half HS clock period on the Clock Lane.
3. T_{LPX} is an internal state machine timing reference. Externally measured values may differ slightly from the specified values due to asymmetrical rise and fall times.

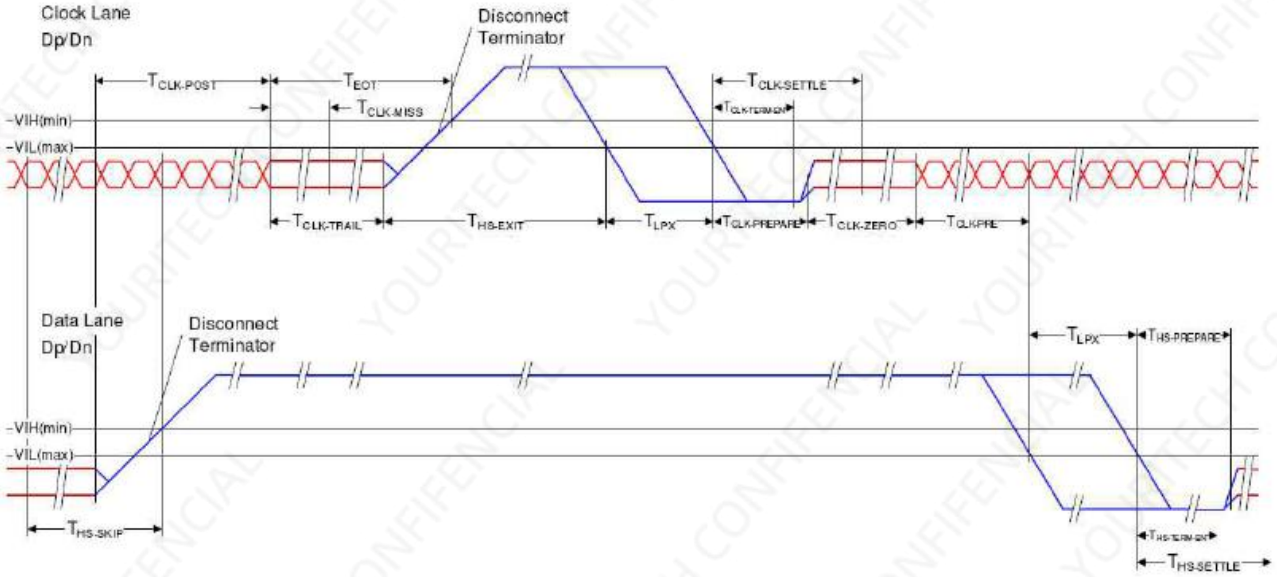


3.4.4 High-speed Clock Transmission:

(VDD= 2.7V to 3.6V, AVDD= 7V to 10V, GND=AGND= 0V, TA= -20 to +85°C)

Parameter	Symbol	Min	Typ	Max	Units
Time that the transmitter shall continue sending HS clock after the last associated Data Lane has transitioned to LP mode	$T_{CLK-POST}$	60+52UI	-	-	ns
Detection time that the clock has stopped toggling	$T_{CLK-MISS}$	-	-	60	ns
Time to drive LP-00 to prepare for HS clock transmission	$T_{CLK-PREPARE}$	38	-	95	ns
Minimum lead HS-0 drive period before starting Clock	$T_{CLK-PREPARE}$ +$T_{CLK-ZERO}$	300	-	-	ns
Time to enable Clock Lane receiver line termination measured from when Dn cross VIL,MAX	$T_{HS-TERM-EN}$	-	-	38	ns
Minimum time that the HS clock must be set prior to any associated date lane beginning the transmission from LP to HS mode	$T_{CLK-PRE}$	8	-	-	UI
Time to drive HS differential state after last payload clock bit of a HS transmission burst	$T_{CLK-TRAIL}$	60	-	-	ns

Note:
The DSI host processor shall support continuous clock on the Clock Lane for NT chip that require it, so the host processor needs to keep the HS serial clock running.



4. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	Φ=180°(9 o'clock)	80	85	-	degree	Note 1
	θ_R	Φ=0°(3 o'clock)	80	85	-		
	θ_T	Φ=90°(12 o'clock)	80	85	-		
	θ_B	Φ=270°(6 o'clock)	80	85	-		
Response time	T_{ON+} T_{OFF}	Normal θ=Φ=0°	-	27	35	msec	Note 2
Contrast ratio	CR		-	900	-	-	Note 3
Color chromaticity	W_X		0.26	0.31	0.36	-	Note 4 Note 5 Note 6
	W_Y		0.30	0.35	0.40	-	
Luminance （central point）	L		1000	1100	-	cd/m²	Note 6
Luminance uniformity	Y_U		70	75	-	%	Note 7

The test systems refer to Note 2.

Note 1: Definition of viewing angle range

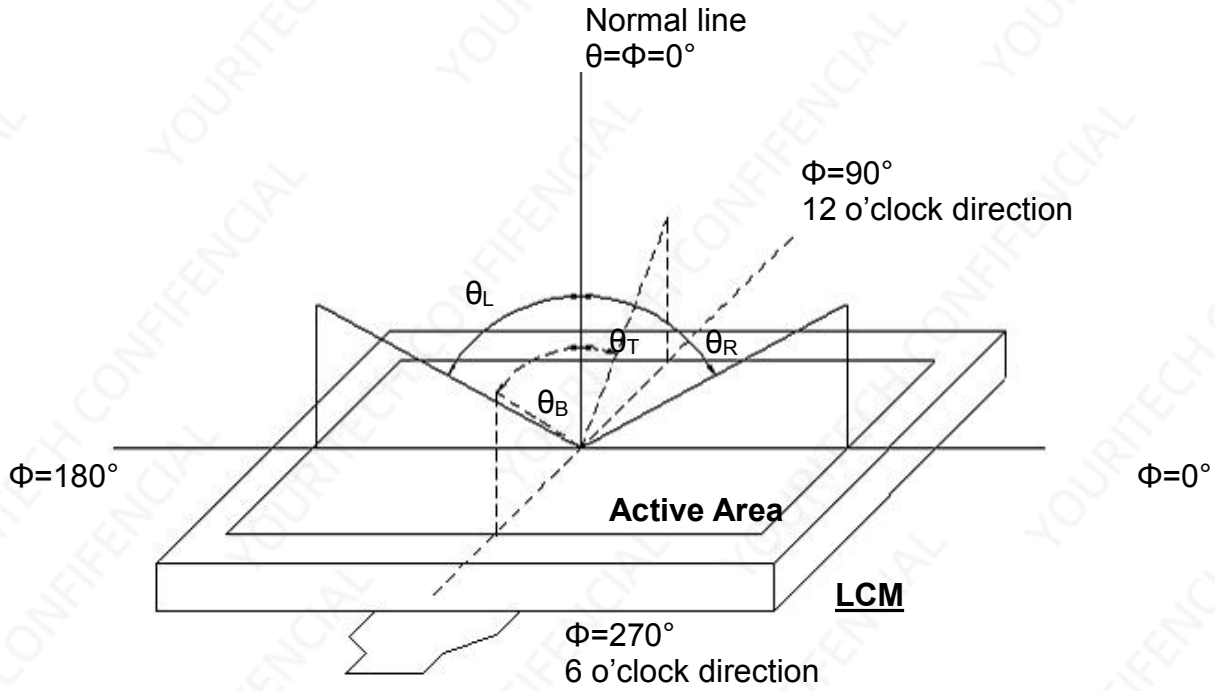


Fig. 4-2 Definition of viewing angle

Note 2: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.

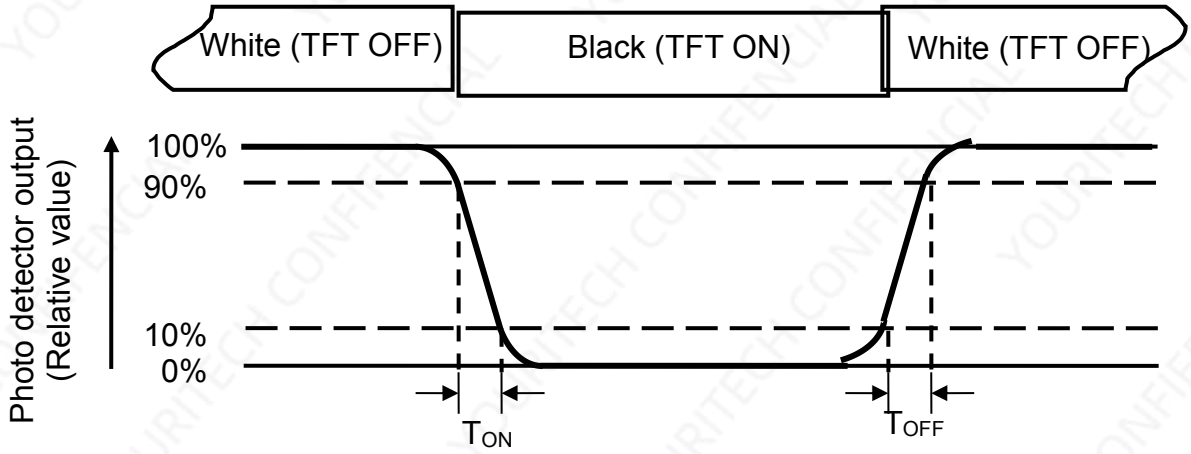


Fig. 4- 3 Definition of response time

Note 3: Definition of contrast ratio

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

Note 4: Definition of optical measurement system.
The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm, Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/ Field of view: 1° /Height: 500mm.) or CA-210.

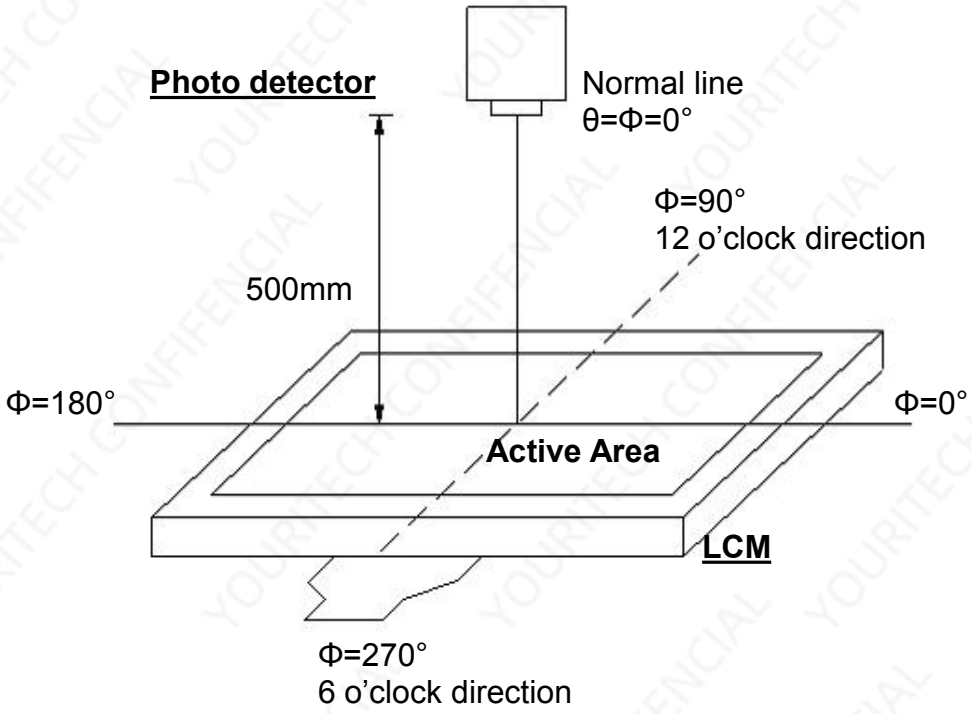


Fig. 4-3 Optical measurement system setup

Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is I_L=150mA .

Note 7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas(Refer to Fig. 4-4).

Every measuring point is placed at the center of each measuring area.

$$Luminance\ \ Uniformity\ (Yu) = \frac{B_{min}}{B_{max}}$$

L-------Active area length W----- Active area width

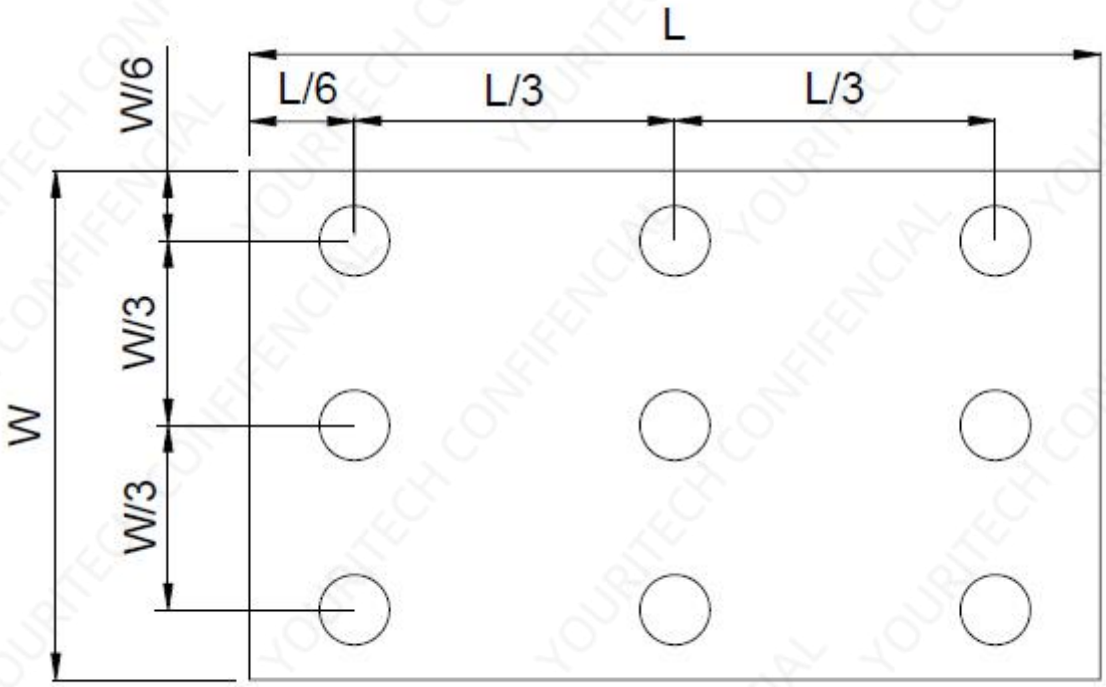


Fig. 4-4 Definition of measuring points

B_{MAX}: The measured maximum luminance of all measurement position.

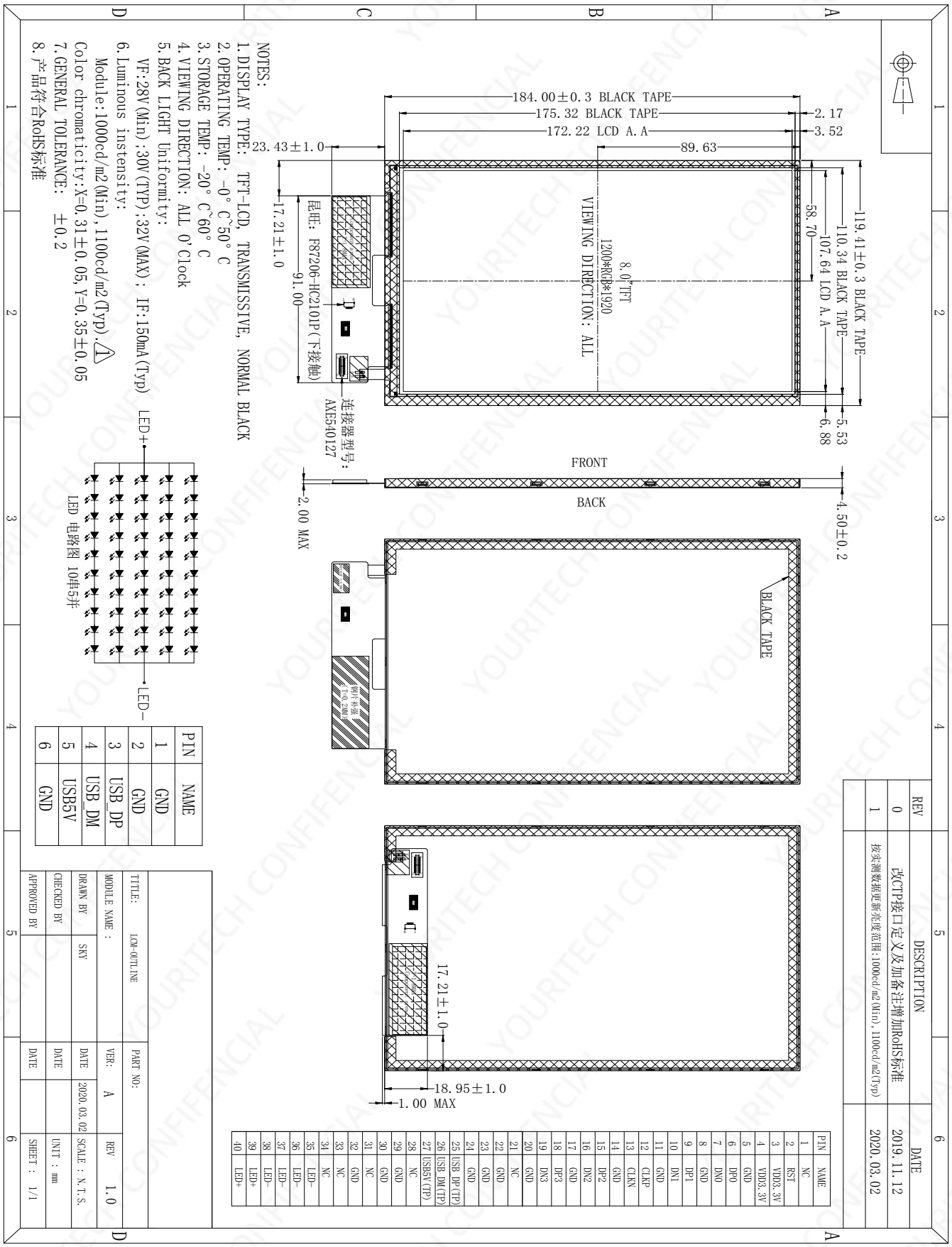
B_{MIN}: The measured minimum luminance of all measurement position.

5. Reliability Test Items

Item	Test Conditions	Criterion
High Temperature Storage	Ta = 60℃ 240hrs	A,B,C,D,E
Low Temperature Storage	Ta = -20℃ 240hrs	A,B,C,D,E
High Temperature Operation	Ts = 50℃ 240hrs	A,B,C,D,E
Low Temperature Operation	Ta =-0℃ 240hrs	A,B,C,D,E
Operate at High Temperature and Humidity	+40℃, 90%RH 240hrs	A,B,C,D,E
Thermal Shock(non operation)	-20℃/30 min ~ +60℃/30 min for a total 100 cycles, Start with cold temperature and end with high temperature.	A,B,C,D,E
Vibration Test	Sweep:10Hz~55Hz~10Hz 2G 2 hours for each direction of X. Y. Z. (6 hours for total)	A,B,C,D,E
Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	A,B,C,D,E
Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 surfaces	A,B,C,D,E
Electro Static Discharge	Contact=+/-4KV, Air=+/-8KV,(R=330R,C=150pF), 1 sec,9point,10times/point;	A,B,C,D,E

※Criterion:
A.LCM each function is OK,.
B.LCM appearance inspection without abnormalities (Including scratch, damage, corrosion and serious deformation)
C.LCM brightness above the Min. value of Spec.
D. Luminance uniformity above the Min. value of Spec.
E. Color chromaticity within tolerance range

6. Mechanical Drawing



PIN	NAME
1	GND
2	GND
3	USB_DP
4	USB_DM
5	USB5V
6	GND

PIN	NAME
1	NC
2	RST
3	VDD3.3V
4	VDD3.3V
5	GND
6	DP0
7	DN0
8	GND
9	DP1
10	DN1
11	GND
12	CLKP
13	CLKN
14	GND
15	DP2
16	DN2
17	GND
18	DP3
19	DN3
20	GND
21	NC
22	GND
23	GND
24	GND
25	USB_DP(TP)
26	USB_DM(TP)
27	USB5V(TP)
28	NC
29	GND
30	GND
31	NC
32	GND
33	NC
34	NC
35	LED-
36	LED-
37	LED-
38	LED-
39	LED+
40	LED+

REV	DESCRIPTION	DATE
0	改CTP接口定义及加备注增加RoHS标准	2019.11.12
1	按实测数据更新亮度范围:1000cd/m2(Min),1100cd/m2(Typ)	2020.03.02

TITLE:	LCM-OUTLINE	PART NO:	
MODULE NAME :		VER: A	REV 1.0
DRAWN BY	SKY	DATE	2020.03.02
CHECKED BY		DATE	SCALE : N.T.S.
APPROVED BY		DATE	UNIT : mm
			SHEET : 1/1

7. Package Drawing

TBD

8. General Precautions

8.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

8.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

8.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

8.4. Storage

1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

8.5. Cleaning

1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.