

Chefree Technology Corp.

TFT COLOR LCD MODULE

MODEL: CF104VLGLWH-001

(Complied with RoHS)

XGA

LVDS interface (1 Port)

Version: P02

Customer : _____

Approved By : _____

Date: _____

CHEFREE		
APPROVAL	CHECKER	PREPARE
Tim	Mark	Benson

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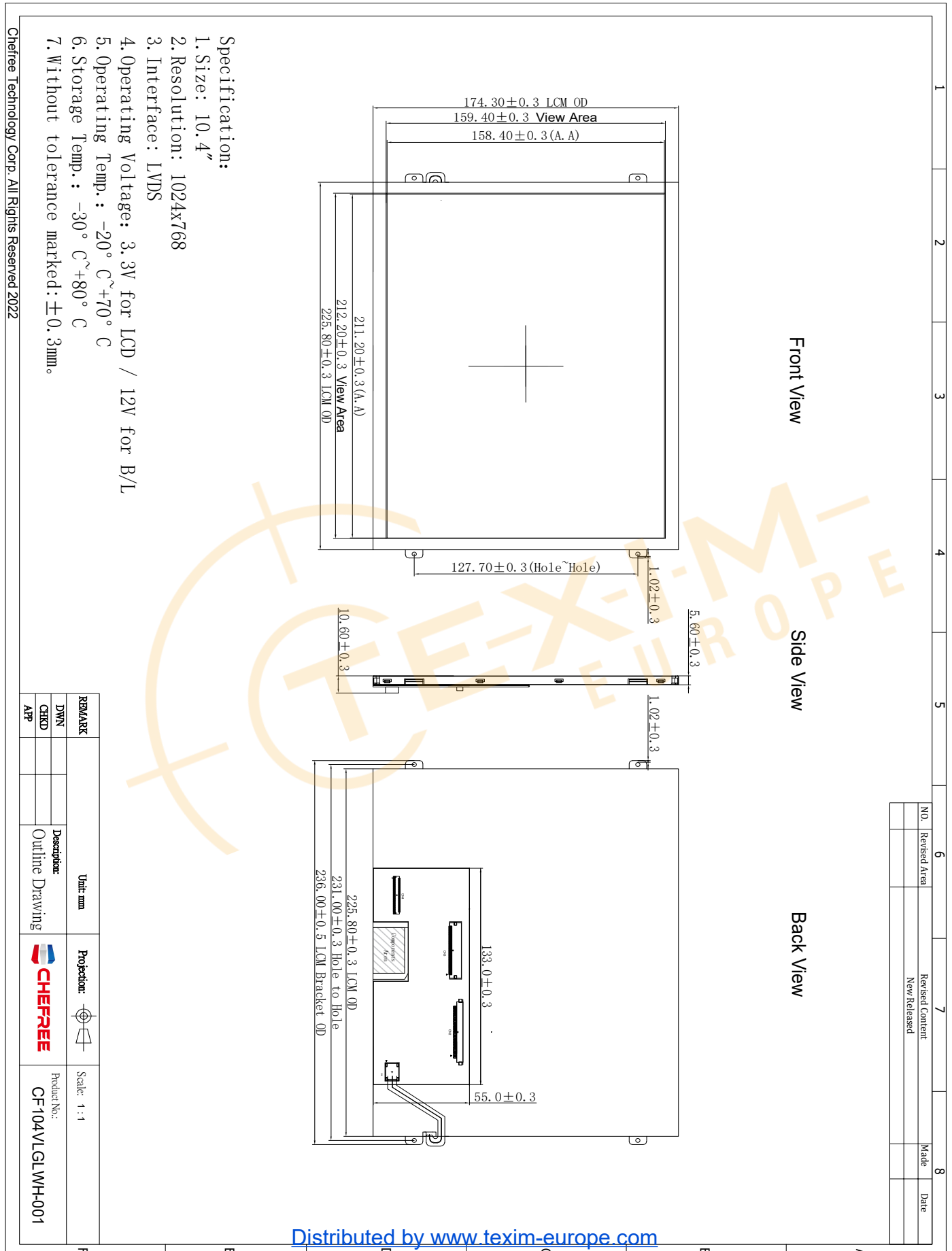
1. RECORD OF REVISION

Rev	DATE	PAGE	SUMMARY
P00	2021.01.18	ALL	Preliminary specification
P01	2022.01.11	3	Updated drawing OD: 166.85mm change to 174.3mm
P02	2202.03.22	3,4	1. Add pin define for SHRL and UPDN 2. Changed LED driver circuit

2. MECHANICAL SPECIFICATIONS

(1)	Number of Dots	1024(H) x 768(V)
(2)	Module Size(mm)	236.0(H) x 174.3(V) x (10.6) (D)
(3)	Active Area(mm)	211.2(H) x 158.4(V)
(4)	Pixel Pitch(mm)	0.20625(H) x 0.20625(V)
(5)	LCD Model	TFT, Transmissive, Normally Black Anti-glare, Hard coating
(6)	Backlight Color	White
(7)	Viewing Direction	All Direction
(8)	Electrical Interface	LVDS Interface
(9)	Color Configuration	R.G.B Vertical Stripe
(10)	Touch Panel Mode	Without Touch
(11)	Module Weight(g)	340 ± 5%

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

4.1 TFT LCM PANEL PIN DEFINE

CN2 Connector : STM MSBK2407P30 RF:HB or Equivalent

PIN NO.	Definition	I/O	Description	Remark
1	GND	P	Ground	
2	GND	P	Ground	
3	EN	I	Enable Control for Backlight	
4	PWM	I	Brightness Control for Backlight	
5	VLED	P	Power Supply for LED Backlight (12V)	
6	VLED	P	Power Supply for LED Backlight (12V)	
7	VDD	P	Power Supply for Digital Circuit (3.3V)	
8	SHLR	I	Left or right display control	Note1
9	UPDN	I	Up/Down Display Control	Note1
10	GND	P	Ground	
11	RxIN0-	I	Negative LVDS Differential Data Input	
12	RxIN0+	I	Positive LVDS Differential Data Input	
13	GND	P	Ground	
14	RxIN1-	I	Negative LVDS Differential Data Input	
15	RxIN1+	I	Positive LVDS Differential Data Input	
16	GND	P	Ground	
17	RxIN2-	I	Negative LVDS Differential Data Input	
18	RxIN2+	I	Positive LVDS Differential Data Input	
19	GND	P	Ground	
20	RxCLK-	I	Negative LVDS Differential Clock Input	
21	RxCLK+	I	Positive LVDS Differential Clock Input	
22	GND	P	Ground	
23	RxIN3-	I	Negative LVDS Differential Data Input	
24	RxIN3+	I	Positive LVDS Differential Data Input	
25	NC	-	No connection	
26	NC	-	No connection	
27	NC	-	No connection	
28	NC	-	No connection	
29	NC	-	No connection	
30	NC	-	No connection	

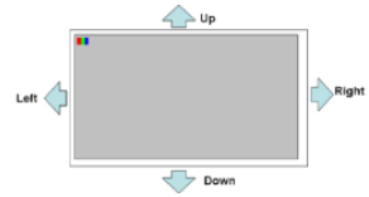
Note : 'P' stand for Power, 'I' stand for Input

Note1:

Note 1 UPDN and SHLR control function

UPDN	SHLR	Data shifting
0	1	Normally display
0	0	Inverse Left and Right
1	1	Inverse Up and Down
1	0	Inverse Left and Right Inverse Up and Down

Default setting: UPDN=0; SHLR=1;

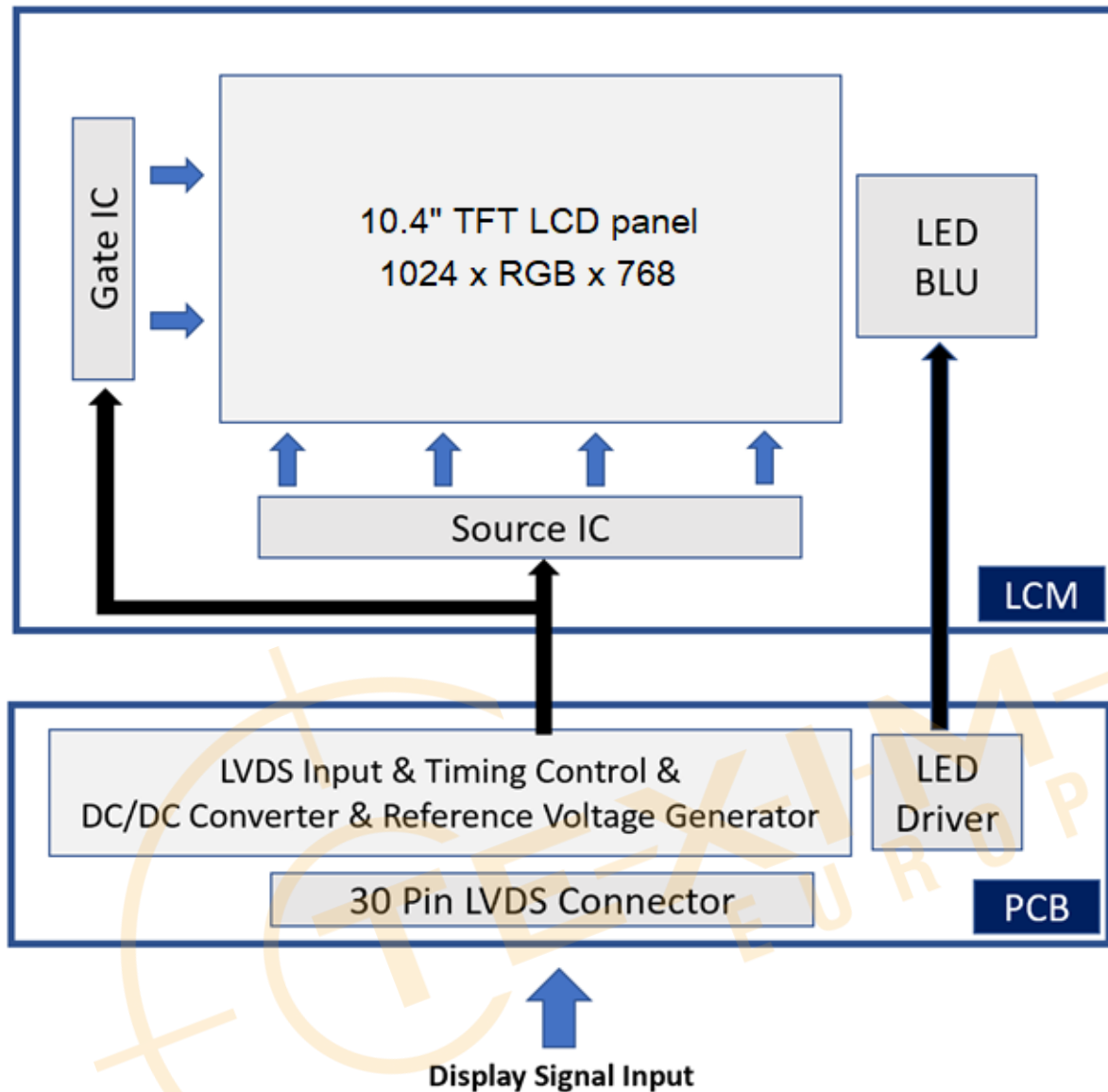


4.2 CTP Specification:

Without Touch



5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VDD	0.2	5.0	V	
Backlight Supply Voltage	VLED	-	18	V	
Power Voltage For CTP	/	/	/	V	

Note : The absolute maximum rating values of this product not allowed to be Exceeded at any times. Should be module be used with any of absolute maximum ratings exceeded. The characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(°C)	-20	70	-30	80	Note 1,2
Humidity(% RH)	10~90(Note3)		10~90(Note 3)		-

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Storage Ta=40°C & RH=90% ≤ 96Hrs

7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

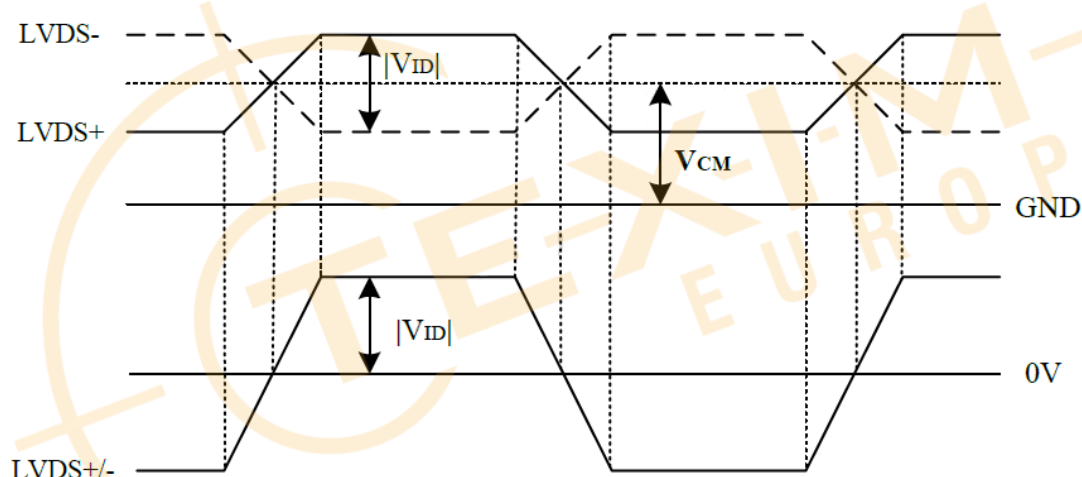
Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VDD	3.0	3.3	3.6	V	
	IDD	-	380	-	mA	Note1
Differential Input Threshold	VTH	-	-	+100	mV	Note2
	VTL	-100	-	-	mV	
Magnitude Differential Input	VID	100		600	mV	
Common Mode Voltage	VCM	0.7	1.2	1.6	V	

Note 1 : Test Condition: VDD=3.3V ; Test Pattern: Black.

Note 2 : VTH and VTL is defined in RxIN0+/- 、 RxIN1+/- 、 RxIN2+/- 、 RxIN3+/- 、 RxCLK+/- signal voltage level.

Voltage Definitions



7.2 BACKLIGHT UNITS

Ta=25°C

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage		VLED	11	12	15	V	
LED Driving Current		ILED	-	(0.7)	-	A	
LED Life Time		-	-	50,000	-	Hrs	Note1
PWM Control Level	High Level		1.5	3.3	3.6	V	
	Low Level		0	-	0.6	V _{P-P}	Note5
ADJ Frequency		-	200	-	1000	Hz	

Note 1: The LED life time define as the estimated time to 50% degradation of initial luminous.

Note 2: Operating temperature 25°C, humidity 55%RH.

Note 3: A higher LED power supply voltage will result in better power efficiency.

7.3 CTP ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For PCAP	VCC	/	/	/	V	



8. OPTICAL CHARACTERISTICS

8.1 Optical specification

Ta=25°C

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle Θx=Θy=0°	600	-	900	-	Note 1
Response Time		TR+TF		-	30	40	ms	Note 2
Chromaticity	White	x		0.273	0.313	0.353	-	Note 4
		y		0.289	0.329	0.369	-	
Viewing Angle	Hor.	θx+	Viewing Angle Θx=Θy=0° CR≥10	80	85	-	Deg.	Note 3
		θx -		80	85	-		
	Ver.	θy+		80	85	-		
		θy -		80	85	-		
Luminance		L	PWM=100%	-	1000	-	cd/m2	Center
Luminance Uniformity		YU		70	75	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63/L0

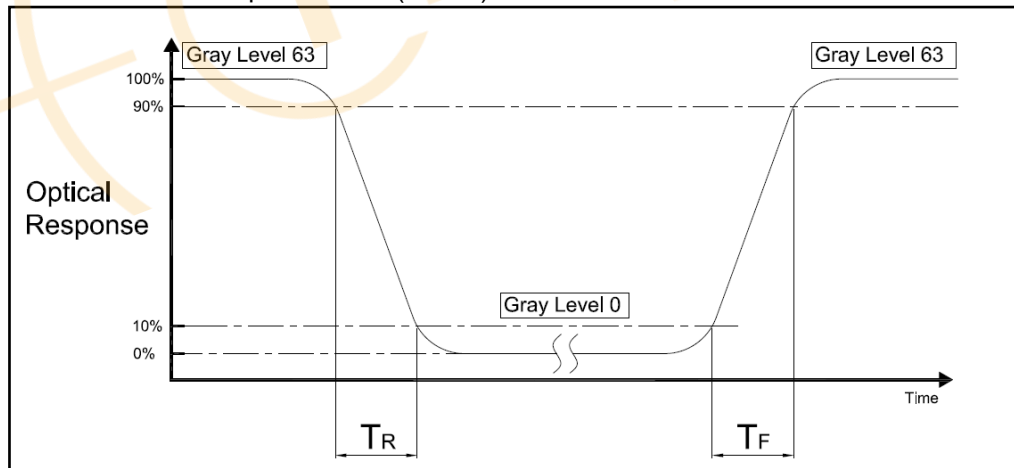
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

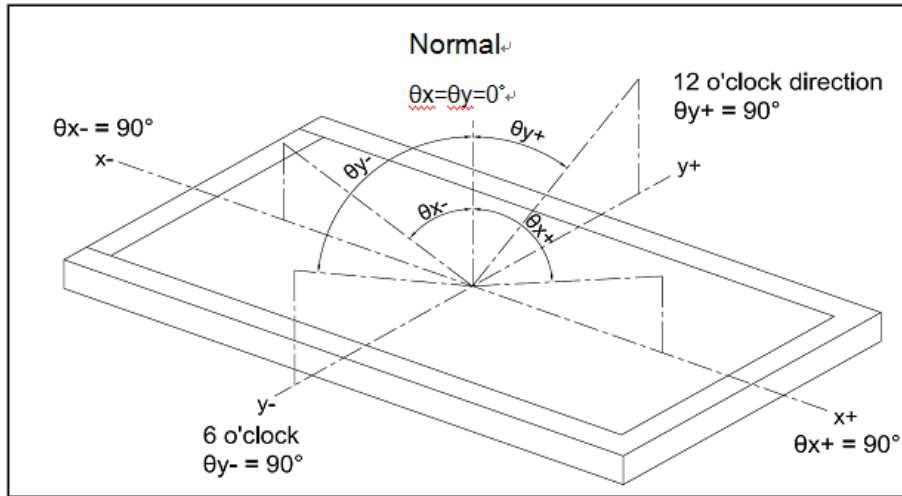
CR = CR(5)

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

Note 2 : Definition of Response Time (TR.TF)

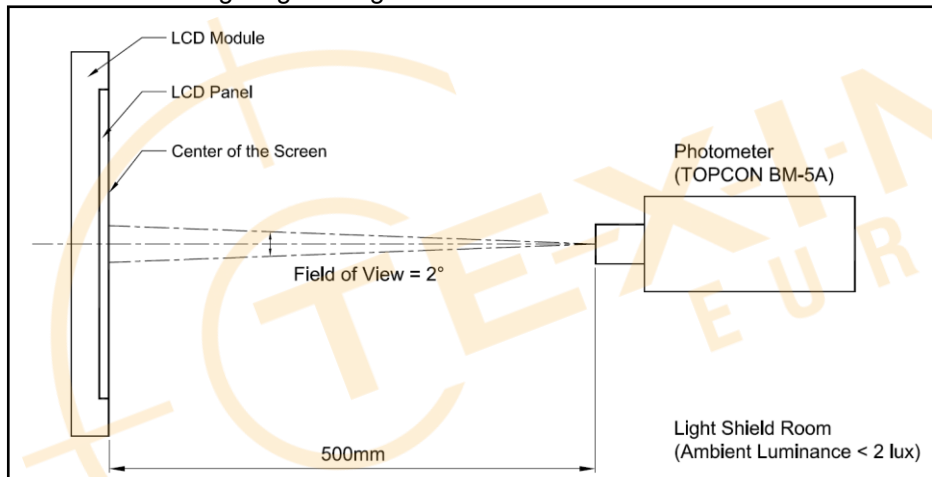


Note 3 : Definition of Viewing Angle

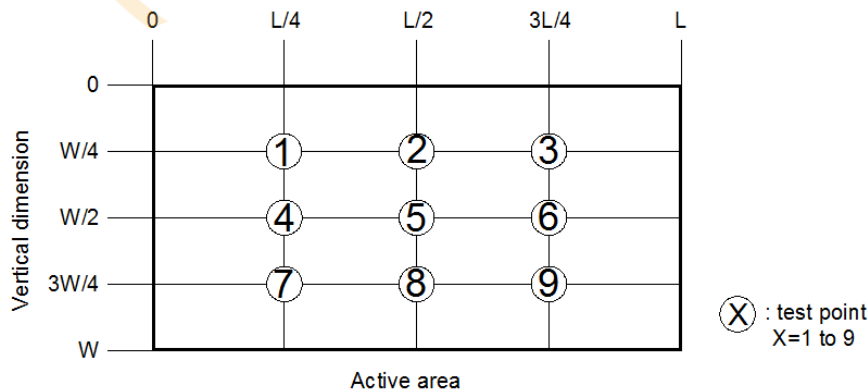


Note 4 : Measurement Set-Up :

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



Note 5 :



$$\left[1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right] \times 100\% = YU$$

9. TOUCH PANEL SPECIFICATIONS

9.1 Type :

9.2 STRUCTURE :

9.2.1 Thickness :

9.3 IC MODEL :

9.3.1 IC manufacture :

9.3.2 IC part number :

9.3.3 Interface :

9.4 ELECTRICAL CHARACTERISTICS :

9.4.1 Operating Voltage :

9.5 MECHANICAL CHARACTERISTICS :

9.5.1 Surface hardness :

9.6 OPTICAL CHARACTERISTICS :

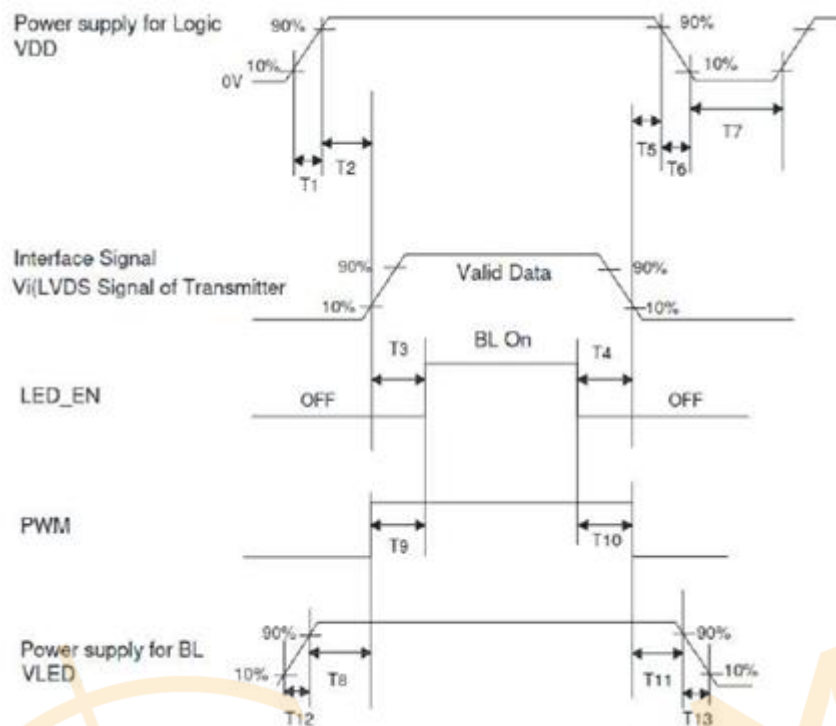
9.6.1 Transparency :

9.6.2 Haze:



10. TIMING SPECIFICATIONS

10.1 Power On/Off Sequence



Parameter	Vaule			UNIT
	MIN.	TYP.	MAX.	
T1,T6	0.5	-	10	ms
T2	50	-	-	ms
T3,T4,T9,T10	50	-	-	ms
T5	50	-	-	ms
T7	200	-	-	ms
T8	50	-	-	ms
T11	50	-	-	ms
T12,T13	0.5	-	10	ms

10.2 Interface Timing (DE mode)

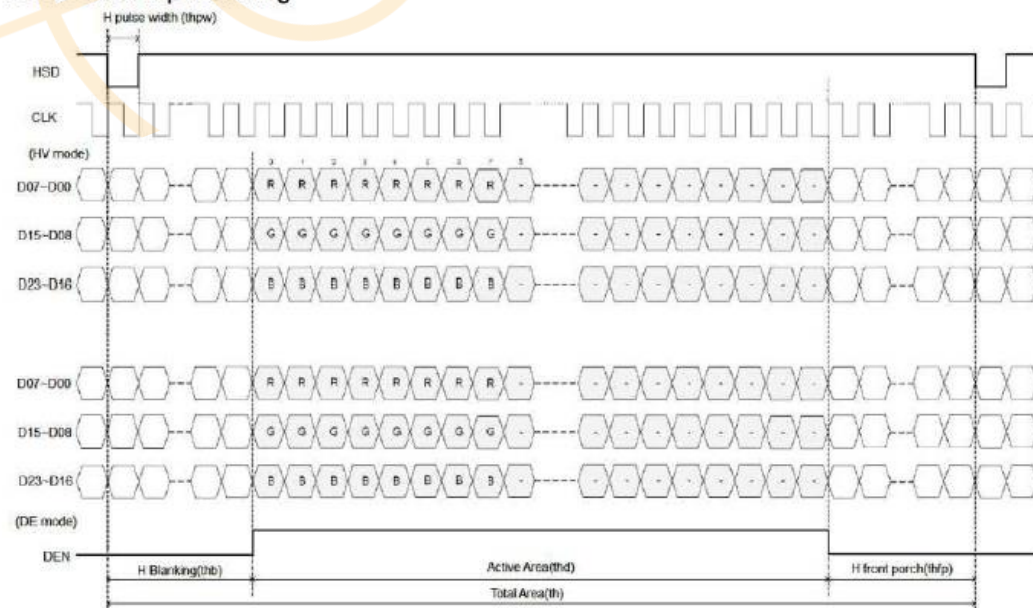
Parameter	Symbol	Vaule			UNIT
		MIN.	TYP.	MAX.	
DCLK frequency@Frame rate=60Hz	fclk	52	65	71	MHz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	768			H
VSYNC period time	tv	778	806	845	H
VSYNC blanking	tvb+tvfp	10	38	77	H

10.3 Timing Diagram of interface Signal (DE mode)

Vertical input timing

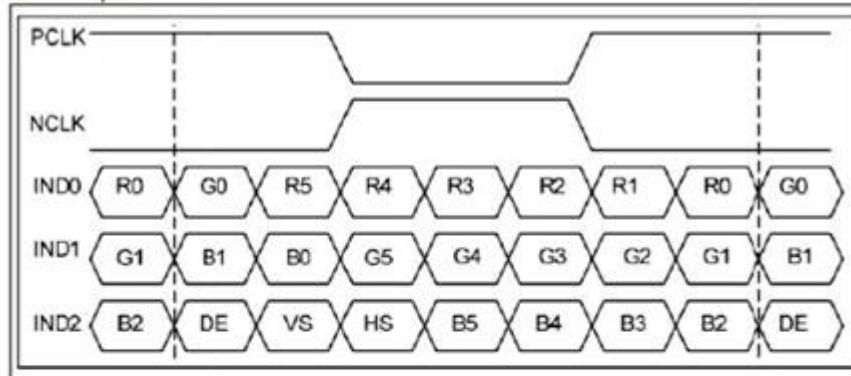


Horizontal input timing

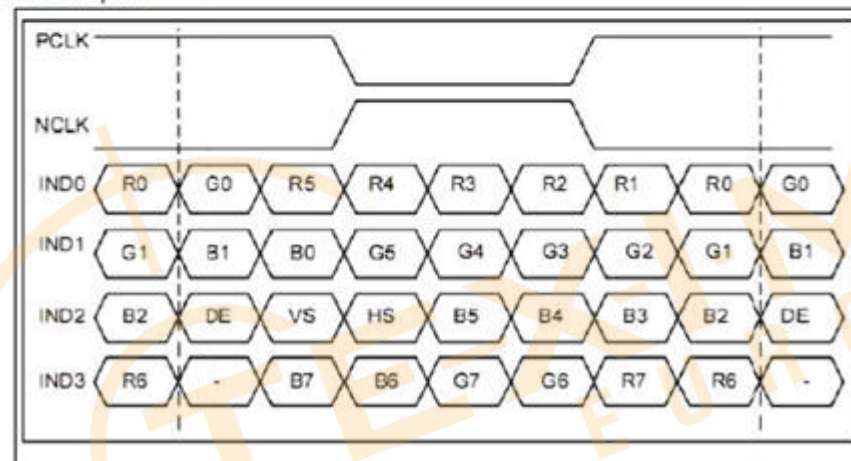


10.3 Bit LVDS Input

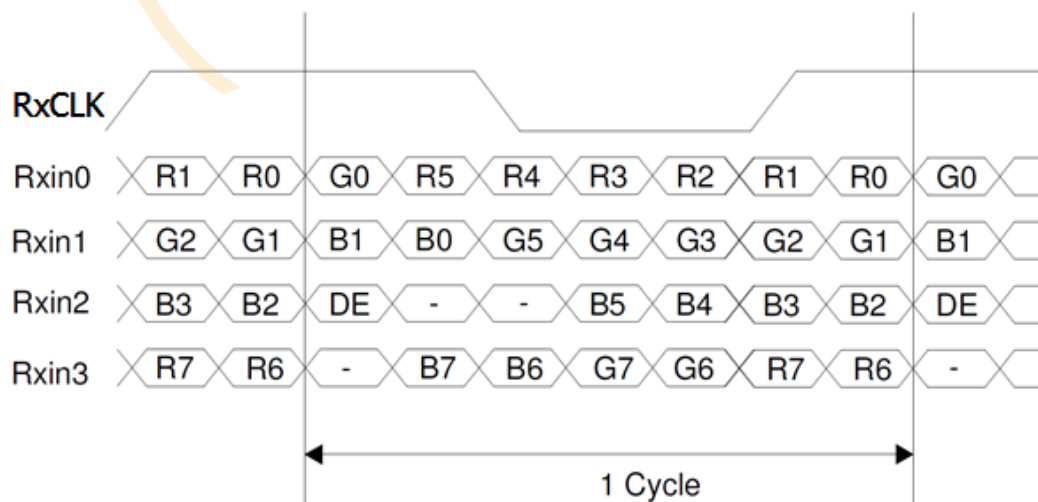
6 bits LVDS Input



8 bits LVDS Input



LVDS Data Mapping



11. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	Ta= 80°C	240Hours	Note 1,3
2	Low Temperature Storage	Ta= -30°C	240Hours	Note 1,3
3	High Temperature Humidity Storage	40°C,90%RH	240Hours	Note 1,3
4	High Temperature Operation	Ts= 70°C	240Hours	Note 2,3
5	Low Temperature Operation	Ta= -20°C	240Hours	Note 1,3
6	Temperature Cycle	-30°C~80°C (30min)~(30min)	100 cycles	Note 2,4

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 don't guarantee all of the cosmetic specification.

Note 1 : Ta is the ambient temperature of samples.

Note 2 : Ts is the temperature of panel's surface.

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

Note 4 : Star with cold temperature and end with high temperature.

12. PRECAUTIONS FOR USE

12.1 SAFETY

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

12.2 STORAGE CONDITIONS

- (1) Store the panel or module in a dark place where the temperature is $23\pm5^{\circ}\text{C}$ and the humidity is below $50\pm20\%\text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

12.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- (6) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
- (10) Wipe off water droplets or oil immediately . If you leave the droplets for a long time, staining and discoloration may occur.
- (11) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth.
In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

12.4 WARRANTY

- (1) Acceptance inspection period. The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- (2) Applicable warrant period. The period is within 12 months since the date of shipping out under normal using and storage conditions.



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