



Chefree Technology Corp.

TFT COLOR LCD MODULE

MODEL: CH101OLHLWH-CT4-R

(Complied with RoHS)

WXGA
LVDS interface

Version: P01

Customer : _____
Approved By : _____
Date: _____

CHEFREE		
APPROVAL	CHECKER	PREPARE
Tim	Mark	Benson

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1. RECORD OF REVISION

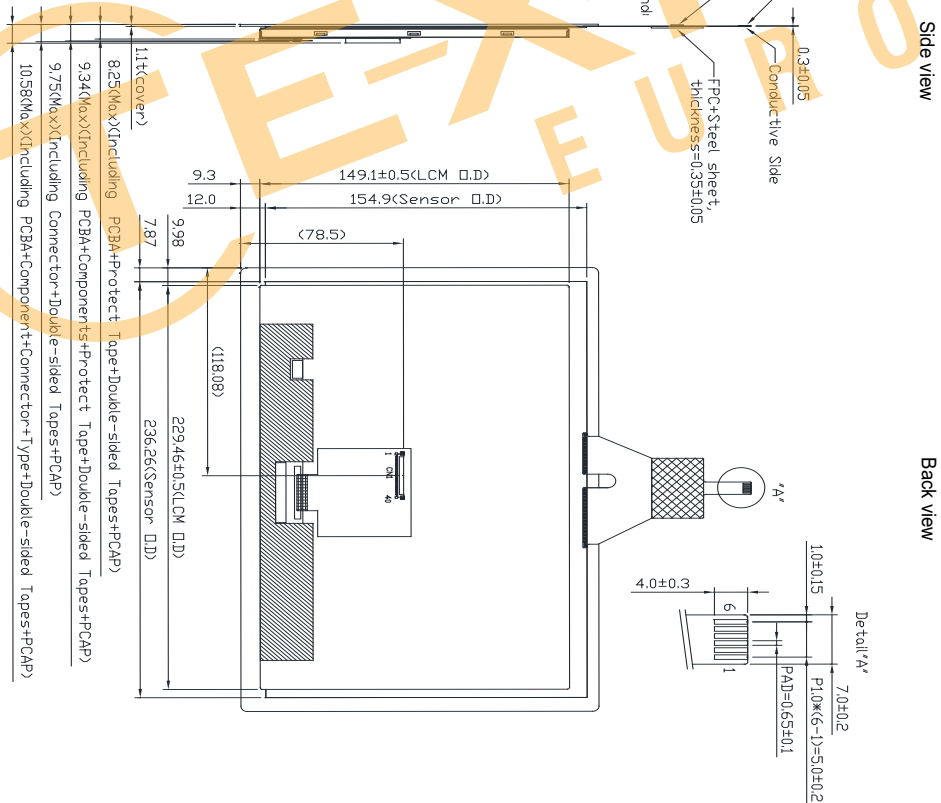
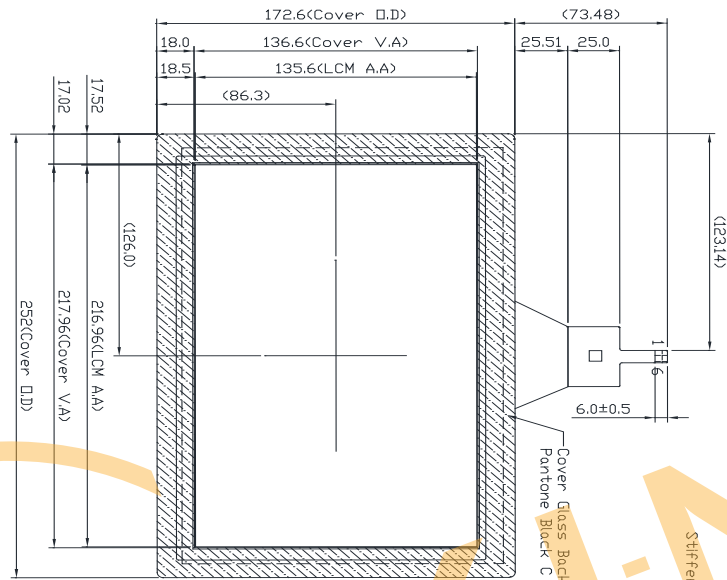
Rev	DATE	PAGE	SUMMARY																																																																																																														
P00	2020.01.20	ALL	Preliminary specification was first issued.																																																																																																														
P01	2022.07.06	8	“TBD” for the LCD and Backlight of current																																																																																																														
		9	OPTICAL CHARACTERISTICS Contrast Ratio → 800 Min. 1000 Typ. Luminance Uniformity → 75% Min.																																																																																																														
		13	AC Electrical Characteristics <table><tr><th colspan="7">AC Electrical Characteristics</th><th colspan="7">AC Electrical Characteristics</th></tr><tr><th>PARAMETER</th><th>SYMBOL</th><th>MIN.</th><th>TYP.</th><th>MAX.</th><th>UNIT</th><th>REMARK</th><th>PARAMETER</th><th>SYMBOL</th><th>MIN.</th><th>TYP.</th><th>MAX.</th><th>UNIT</th><th>REMARK</th></tr><tr><td>LVDS Differential input high Threshold voltage</td><td>RxVTH</td><td>-</td><td>-</td><td>+100</td><td>mV</td><td rowspan="3">Rxvcm=1.2V</td><td>LVDS Differential input high Threshold voltage</td><td>RxVTH</td><td>-</td><td>-</td><td>+100</td><td>mV</td><td rowspan="3">Rxvcm=1.2V</td></tr><tr><td>LVDS Differential input low Threshold voltage</td><td>RxVTL</td><td>-100</td><td>-</td><td>-</td><td>mV</td><td>LVDS Differential input low Threshold voltage</td><td>RxVTL</td><td>-100</td><td>-</td><td>-</td><td>mV</td></tr><tr><td>LVDS Differential input common mode voltage</td><td>RxVCM</td><td>0.7</td><td>-</td><td>1.6</td><td>V</td><td>LVDS Differential input common mode voltage</td><td>RxVCM</td><td>1</td><td>1.2</td><td>1.7-[VID]/2</td><td>V</td></tr><tr><td>LVDS Differential input</td><td>[VID]</td><td>200</td><td>-</td><td>600</td><td>mV</td><td></td><td>LVDS Differential input</td><td>[VID]</td><td>100</td><td>-</td><td>600</td><td>mV</td><td></td></tr></table>	AC Electrical Characteristics							AC Electrical Characteristics							PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK	PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK	LVDS Differential input high Threshold voltage	RxVTH	-	-	+100	mV	Rxvcm=1.2V	LVDS Differential input high Threshold voltage	RxVTH	-	-	+100	mV	Rxvcm=1.2V	LVDS Differential input low Threshold voltage	RxVTL	-100	-	-	mV	LVDS Differential input low Threshold voltage	RxVTL	-100	-	-	mV	LVDS Differential input common mode voltage	RxVCM	0.7	-	1.6	V	LVDS Differential input common mode voltage	RxVCM	1	1.2	1.7-[VID]/2	V	LVDS Differential input	[VID]	200	-	600	mV		LVDS Differential input	[VID]	100	-	600	mV																															
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2. MECHANICAL SPECIFICATIONS

(1)	Number of Dots	1280(R.G.B) x 800
(2)	Module Size(mm)	252(H) x 172.6(V) x 10.43 (D)
(3)	Active Area(mm)	216.96(H) x 135.6(V)
(4)	Pixel Pitch(mm)	0.1695(H) x 0.1695(V)
(5)	LCD Model	TFT, Transmissive, Normally Black
(6)	Backlight Color	White, LED
(7)	Viewing Direction	All
(8)	Electrical Interface	LVDS Interface
(9)	Color Configuration	R.G.B Stripe
(10)	Touch Panel Mode	Projected capacitive Touch
(11)	Module Weight(g)	470±5%

3. OUTLINE DIMENSIONS**Specification:**

1. Structure: Glass+Glass
2. Interface: I2C
3. Touch Controller: ILI2511
4. Operating Voltage: 12V
5. Operating Temp.: -20°C~+70°C
6. Storage Temp.: -30°C~+80°C
7. Transmittance: ≥85%
8. Hardness: ≥6H
9. Without tolerance marked: ±0.3mm.



Remark	Unit:mm	投影法:	SCALE: MTS
Made			
Checked			Part Number
Approved			CH101OLHLWH-CT4-R

4. INTERFACE PIN CONNECTION**4.1 TFT LCM PANEL PIN DEFINE**

CN1 Connector : IPEX / 20455-040E-12 or equivalent

PIN NO.	Definition	I/O	Description	Remark
1~3	VCC	P	Power Supply for Digital Circuit	
4~7	NC	-	No connection(Open)	
8	RxIN0-	I	Differential Data Input, CH0(Negative)	
9	RxIN0+	I	Differential Data Input, CH0(Positive)	
10	GND	P	Ground	
11	RxIN1-	I	Differential Data Input, CH1(Negative)	
12	RxIN1+	I	Differential Data Input, CH1(Positive)	
13	GND	P	Ground	
14	RxIN2-	I	Differential Data Input, CH2(Negative)	
15	RxIN2+	I	Differential Data Input, CH2(Positive)	
16	GND	P	Ground	
17	CLKIN-	I	Differential Clock Input(Negative)	
18	CLKIN+	I	Differential Clock Input(Positive)	
19	GND	P	Ground	
20	RxIN3-	I	Differential Data Input, CH3(Negative)	
21	RxIN3+	I	Differential Data Input, CH3(Positive)	
22	GND	P	Ground	
23,24	NC	-	No connection(Open)	
25,26	GND	P	Ground	
27	PWM	I	PWM Control Signal od LED Converter	
28	EN	I	Enable Control Signal od LED Converter	
29~33	VSS	P	LED Ground	
34,35	NC	-	No connection(Open)	
36~40	VLED	P	LED Power Supply	

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

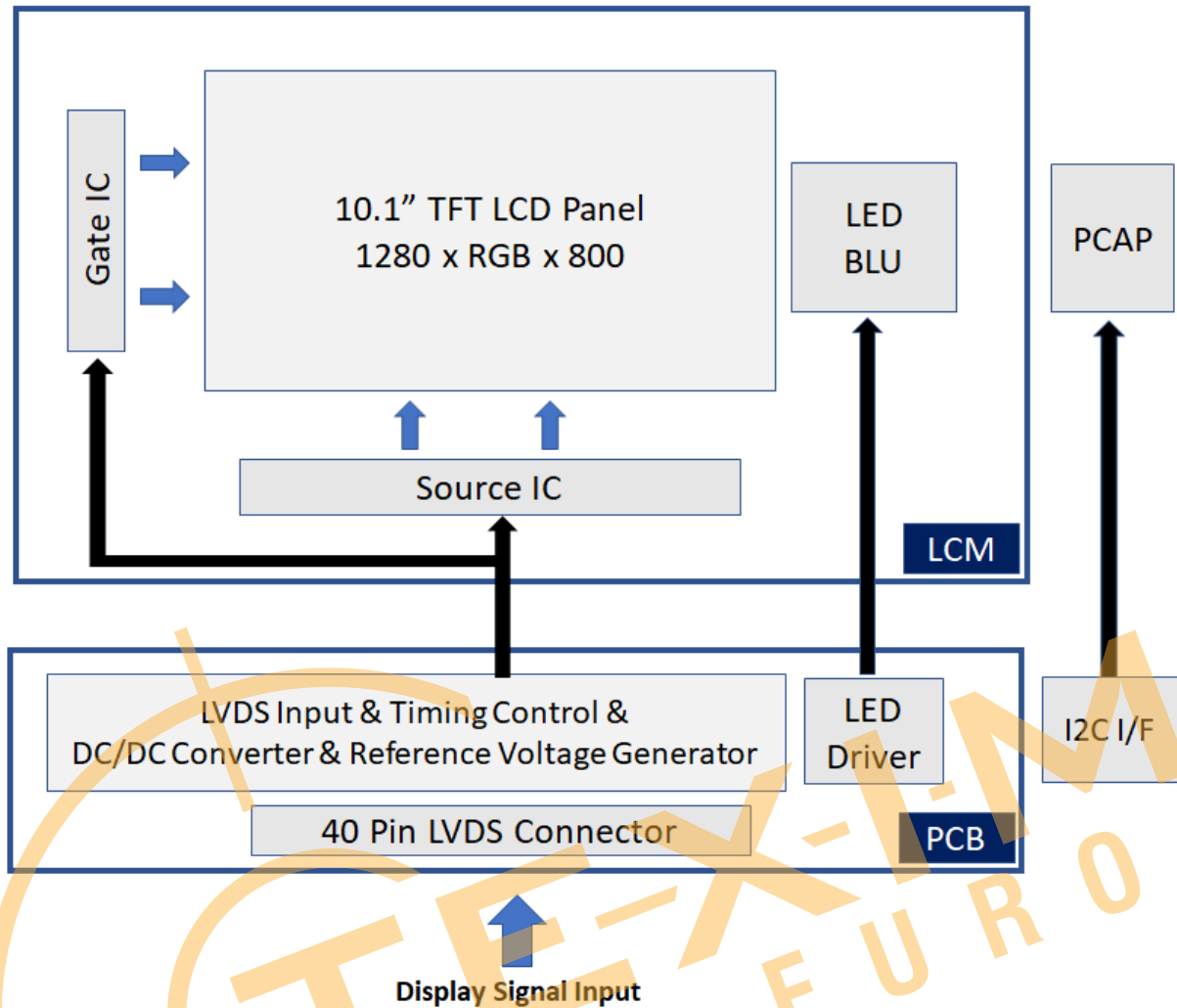
4.2 TOUCH PANEL PIN ASSIGNMENT

PITCH=1.0mm,6 PIN

Pin No.	Definition	Description
1	GND	Ground
2	REST	External reset, Low is active
3	VDD	Supply Voltage
4	INT	An interrupt signal to inform the host processor that touch data
5	SDA	I2C Serial Data Input And Output
6	SCL	I2C Serial Clock Input



5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS**6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS**

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VCC	-0.3	3.9	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.

7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	(240)	(300)	mA	Note1
Differential Input Threshold Voltage	VIH	0.8VCC	-	VCC	mV	
	VIL	0	-	0.2VCC	mV	

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

7.2 BACKLIGHT UNITS

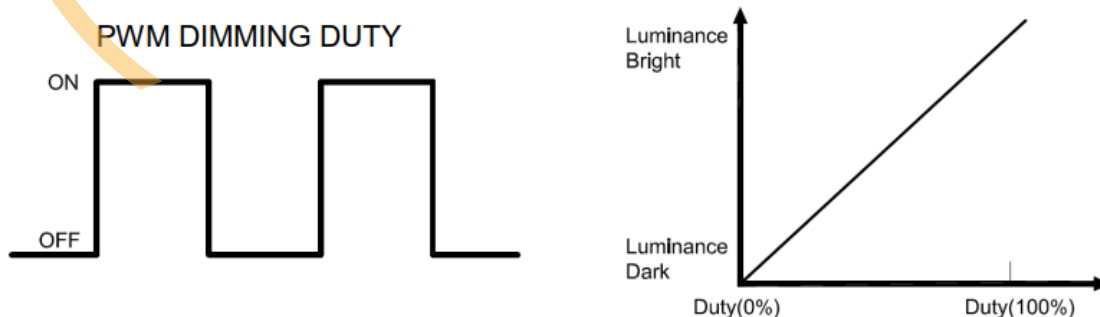
Ta=25°C

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage	VLED	5	12	13.2	V		
	ILED	-	(460)	(600)	mA		
PWM Control Level	High Level	-	3.0	3.3	3.6	V	
	Low Level	-	0	-	1.0	V	
PWM Control Duty Ratio		-	0	-	100	%	
PWM Control Frequency		f _{PWM}	100	-	2000	Hz	
LED Life Time (For Reference Only)			20,000	50,000	-	Hr	

Note 1: The LED of B/L is drive by current only, drive voltage is for reference only. drive voltage can make driving current under safety area(current between minimum and maximum). 50,000 hours is only an estimate for reference.

Note 2: The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta= 25 ±2°C and PWM = 100% (LED forward current) until the brightness becomes ≤50% of its original value.

Note 3: ADJ signal Vp-p =3.0 ~ 3.6 V, operation frequency: 100Hz ~ 2000Hz:



7.3 CTP ELECTRICAL CHARACTERISTICS

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

8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle Θx=Θy=0°	(800)	(1000)	-	-	Note 1
Response Time		TR+TF		-	25	50	ms	Note 2
Chromaticity	White	x		(0.26)	(0.31)	(0.36)	-	Note 4
		y		(0.27)	(0.32)	(0.37)	-	
Viewing Angle	Hor.	θx+	Viewing Angle Θx=Θy=0° CR≥10	75	85	-	Deg.	Note 3
		θx -		75	85	-		
	Ver.	θy+		75	85	-		
		θy -		75	85	-		
Luminance		L		(320)	(480)	-	cd/m2	
Luminance Uniformity		YU		75	80	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{63}/L_0$$

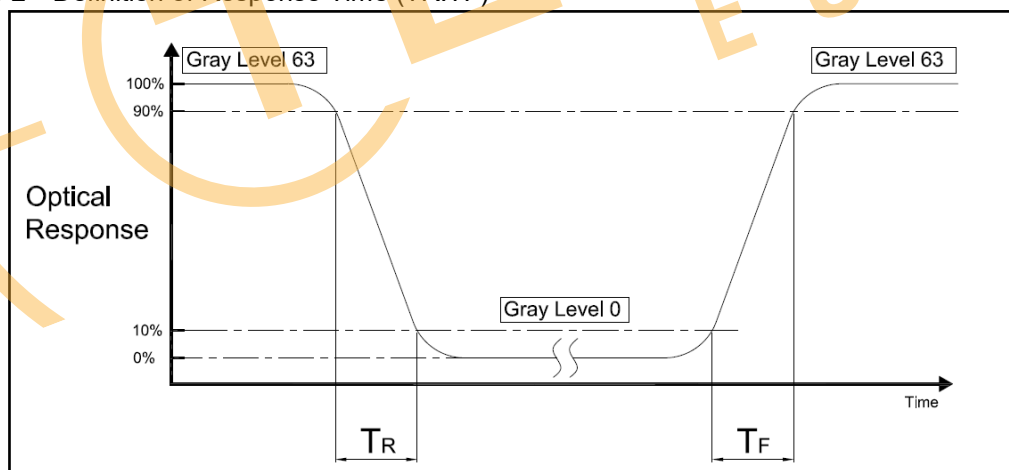
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

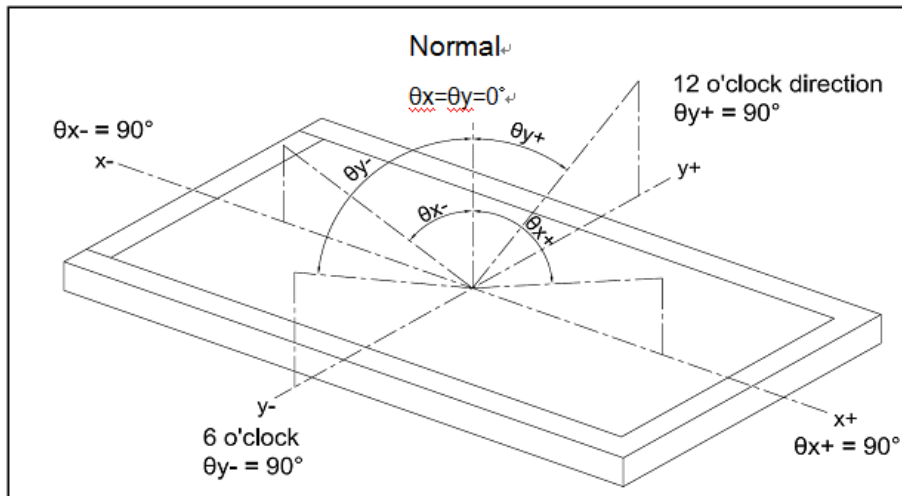
$$CR = CR(5)$$

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)



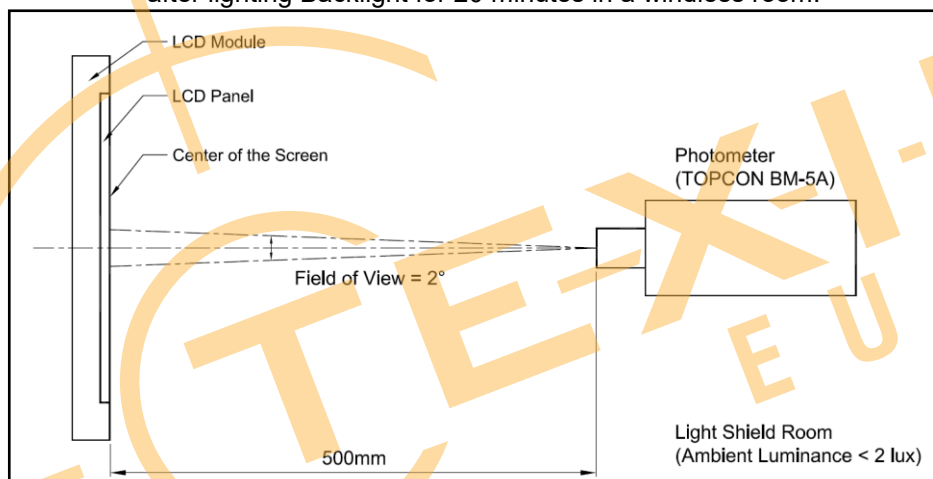
Note 3 : Definition of Viewing Angle



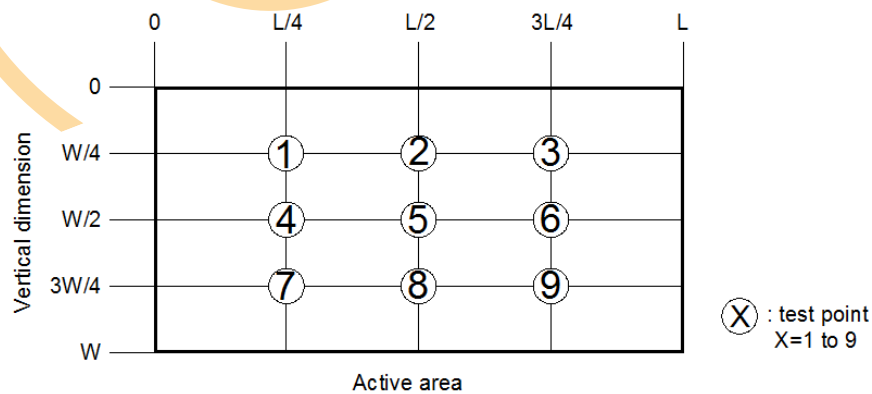
Note 4 : Measurement Set-Up :

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 :

Projected capacitive Touch Panel

Input Mode : Finger available

9.2 STRUCTURE :

Cover Glass 1.1mm, Glass Sensor 0.7mm

9.3 IC MODEL :

9.3.1 IC manufacture : ILITEK

9.3.2 IC part number : ILI2511

9.3.3 Interface : I2C

9.4 ELECTRICAL CHARACTERISTICS :

9.4.1 Operating Voltage : 5V

9.5 MECHANICAL CHARACTERISTICS :

9.5.1 Surface hardness : $\geq 6H$

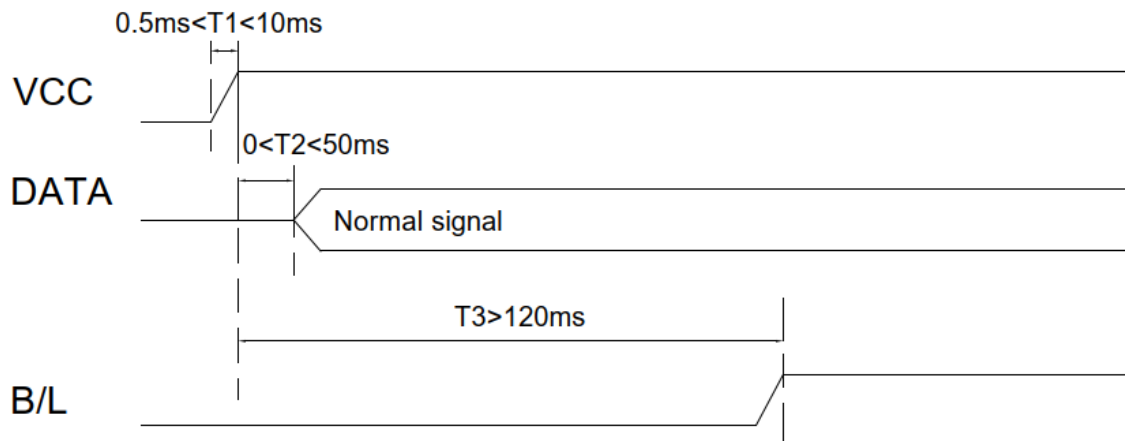
9.6 OPTICAL CHARACTERISTICS :

9.6.1 Transparency : $\geq 85\%$

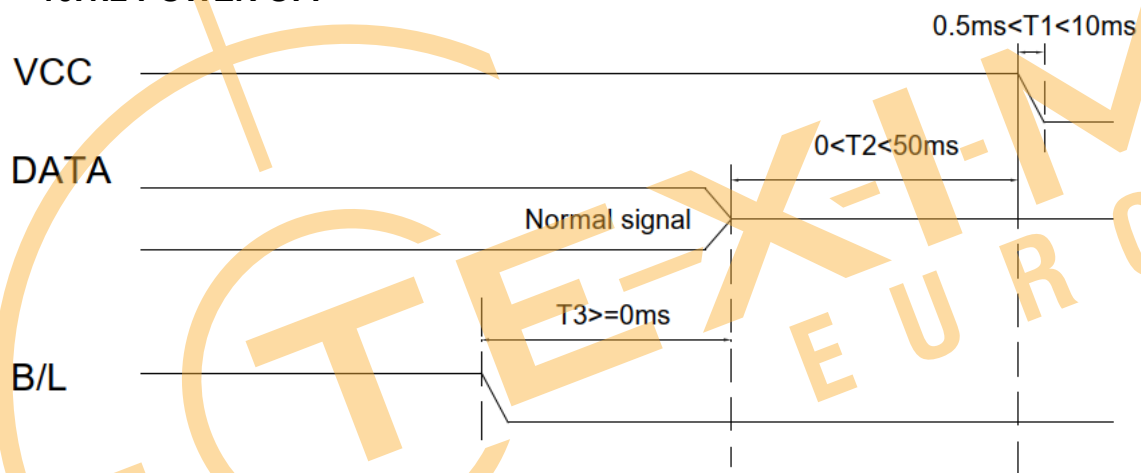
9.6.2 Haze: TBD

10. TIMING SPECIFICATIONS

10.1.1 POWER ON



10.1.2 POWER OFF

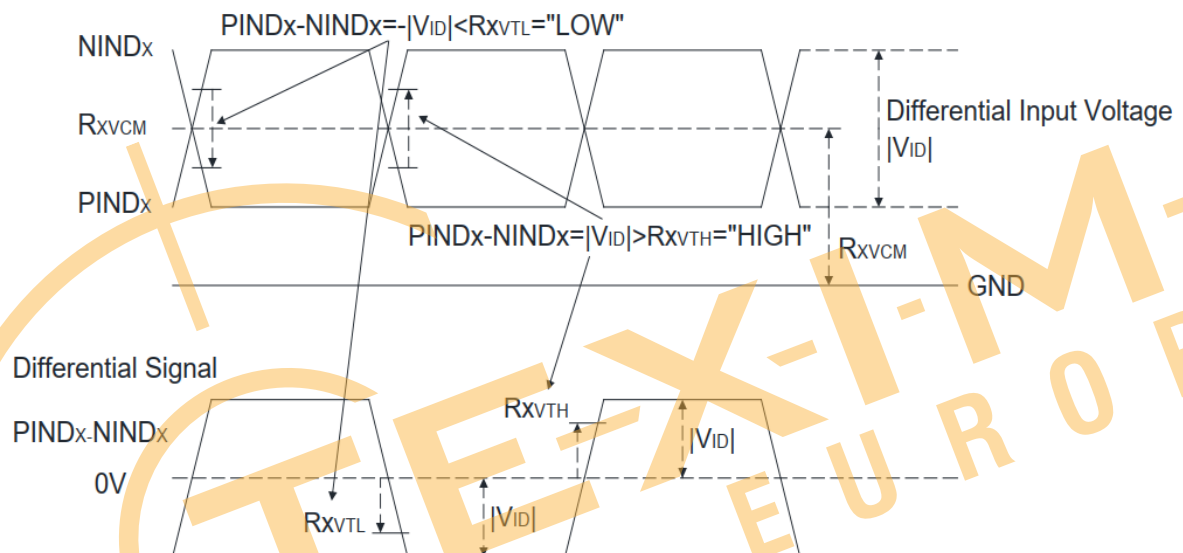


10.2 RESET TIMING CHARACTERISTICS

AC Electrical Characteristics

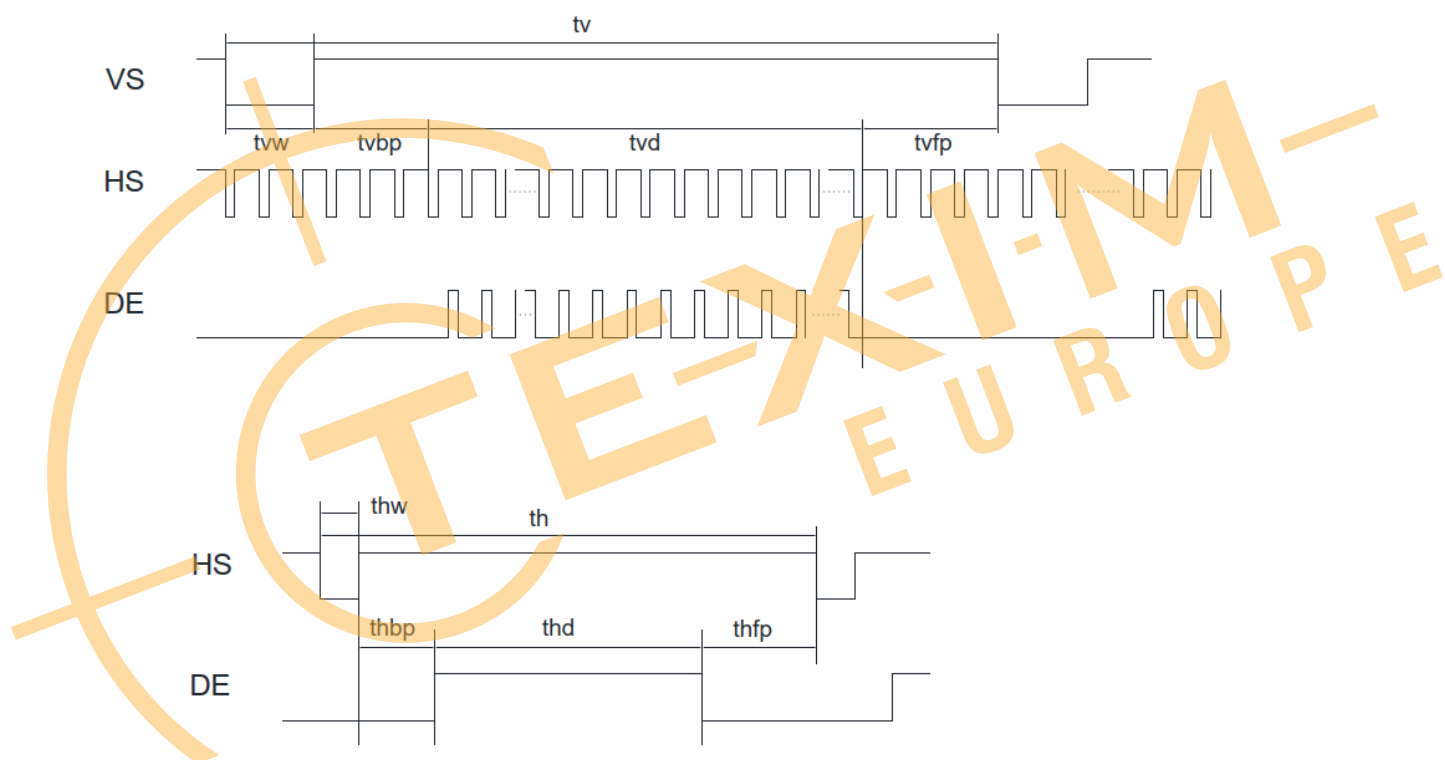
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LVDS Differential input high Threshold voltage	RxVTH	-	-	+100	mV	Rxvcm=1.2V
LVDS Differential input low Threshold voltage	RxVTL	-100	-	-	mV	
LVDS Differential input common mode voltage	RxVCM	1	1.2	1.7- VID /2	V	
LVDS Differential input	VID	100	-	600	mV	

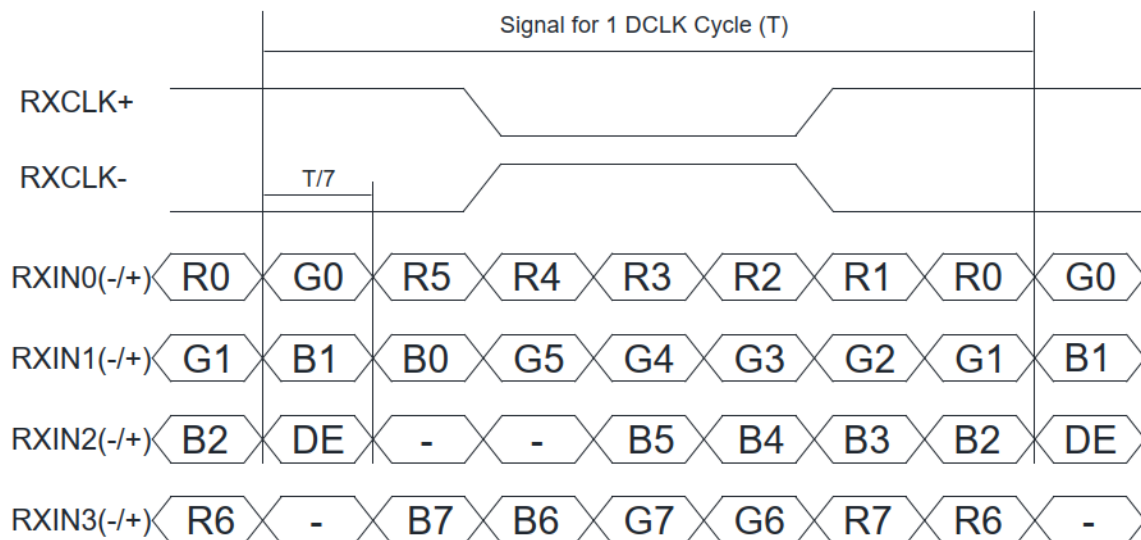
Single-end signals



10.3 Timing

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Clock Frequency	1/Tc	63.4	64.5	85	MHz	
Horizontal display area	thd	1280			Tc	
HS period time	th	1309	1322	1664	Tc	
HS Width+Back Porch+Front Porch	thw+thbp+thfp	39	54	255	Tc	
Vertical display area	tvd	800			tH	
VS period time	tv	807	813	1040	tH	
VS Width+Back Porch+Front Porch	tvw+tvbp+tvfp	8	16	260	tH	



10.3 Data Input format

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	1H/cycle 100CYCLE	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.

Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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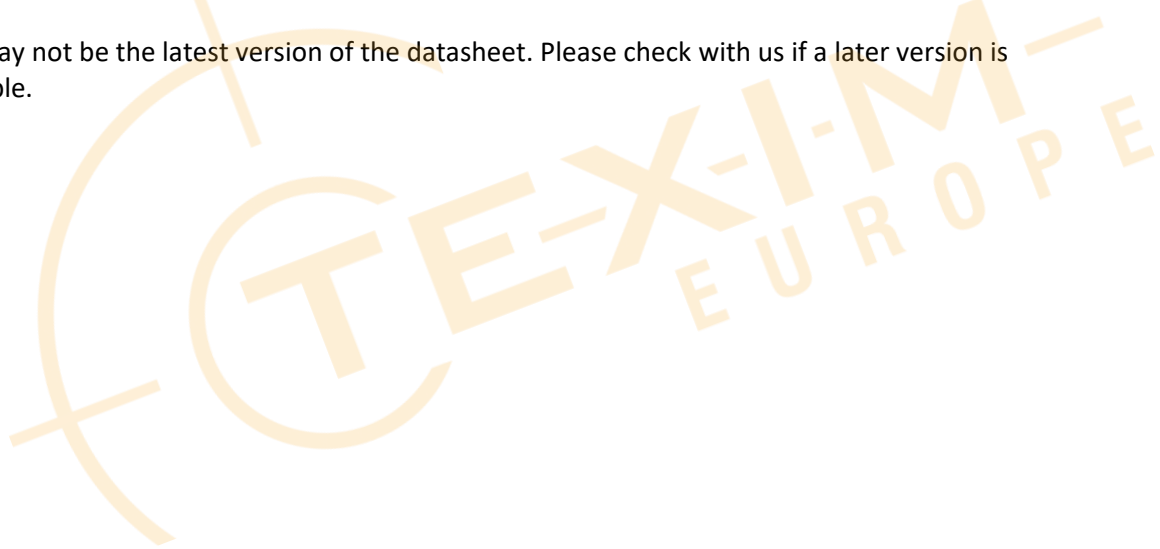
It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.





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