

产品规格书

Product Specification

Model Name (产品名称)	TFT-LCD Module		
Part Number (产品型号)	JT167FHI30R4L01		
Item (项目)	Prepared (拟制)	Checked (审核)	Approved (批准)
Signature (签名)	赖依	林勇	
Date (日期)	2022-11-24	2022-11-24	
Note (备注)			
Customer: (客户)		Signature (签名)	
		Date (日期)	

Revision Record

Version	Issued Date	Page	Old Description	New Description
01	2022-11-24	\	Initial release	\
01	2022-12-13	\	Optimization of drawing	

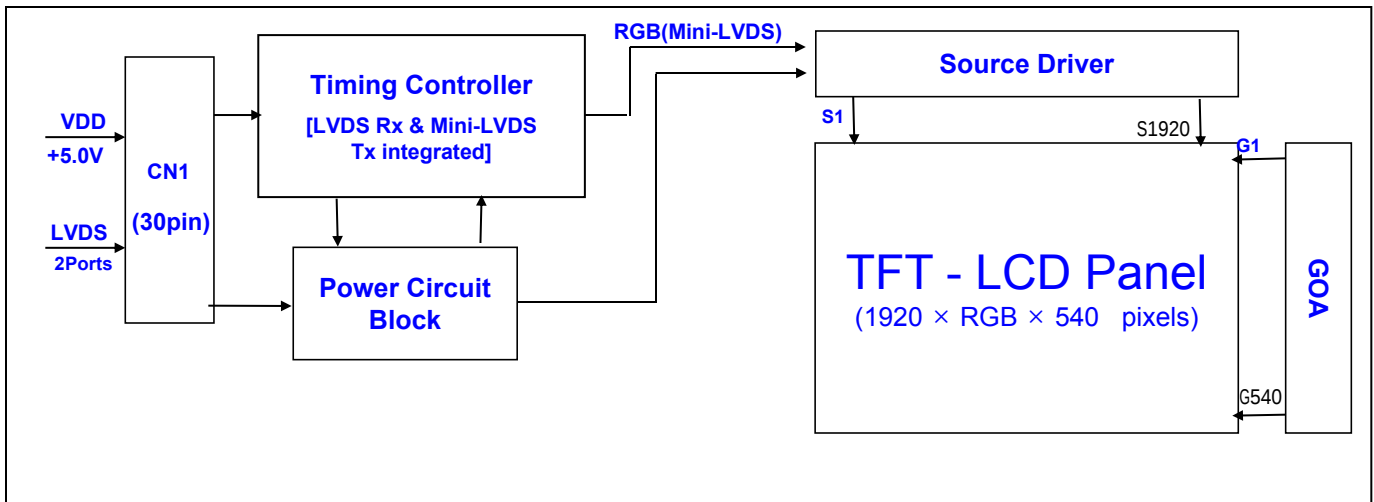
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1.0 GENERAL DESCRIPTION

1.1 Introduction

This is a color active matrix TFT LCD MDL using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This Open Cell has a 16.7 inch diagonally measured active area with FHD resolutions (1920 horizontal by 540 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors. The TFT-LCD panel is adapted for a low reflection and higher color type.



1.2 Features

- LVDS interface with 2 pixel / clock
- High-speed response
- Low color shift image quality
- 8-bit color depth, display 16.7M colors
- Wide viewing angle
- DE (Data Enable) only mode
- HADS technology is applied for high display quality
- RoHS compliant

1.3 General Specification

< Table 1. General Specifications >

Parameter	Specification	Unit	Remarks
Active area	409.8 (H) × 115 (V)	mm	
Number of pixels	1920(H) × 540 (V)	pixels	
Pixel pitch	213(H) × 213(V)	um	
Pixel arrangement	Pixels RGB Vertical stripe		
Display colors	16.7M	colors	Real 8bits
Display mode	Normally Black		
Dimensional outline	425.8(H)x131.8(V)x8(D)	mm	
Weight	0.45	kg	
Sealing Area	6/10.8/8/8	mm	U/D/L/R
Surface Treatment	Haze 25%		

2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. Open Cell Electrical Specifications >

[VSS=GND=0V]

Parameter	Symbol	Min.	Max.	Unit	Remark
Power Supply Voltage	VDD	-0.3	6.0	V	Ta = 25 °C
Logic Supply Voltage	VIN	VSS-0.3	VDD+0.3	V	
Operating Temperature	T _{OP}	0	+50	°C	Note 1
Storage Temperature	T _{SUR}	-20	+60	°C	
	T _{ST}	-20	+60	°C	
Operating Ambient Humidity	Hop	10	80	%RH	
Storage Humidity	Hst	10	80	%RH	

3.0 ELECTRICAL SPECIFICATIONS

3.1 TFT LCD Open Cell

< Table 3. Open Cell Electrical Specifications >

[Ta =25 ± 2 °C]

Parameter		Symbol	Values			Unit	Remark
			Min	Typ	Max		
Power Supply Input Voltage		VDD	4.5	5.0	5.5	Vdc	
Power Supply Ripple Voltage		VRP	-	-	200	mV	
Power Supply Current		IDD	-	400	1000	mA	Note 1
Power Consumption		PDD	-	2	5	Watt	
Rush current		IRUSH	-		3.0	A	Note 2
LVDS Interface	Differential Input High Threshold Voltage	VLVTH	+100	-	+300	mV	
	Differential Input Low Threshold Voltage	VLVTL	-300	-	-100	mV	
	Input Differential Voltage	VID	200	-	600	mV	
	Differential input common mode voltage	VCM	1.0	1.2	1.5	V	

Note 1 : The supply voltage is measured and specified at the interface connector of LCM.

The current draw and power consumption specified is for VDD=5.0V,

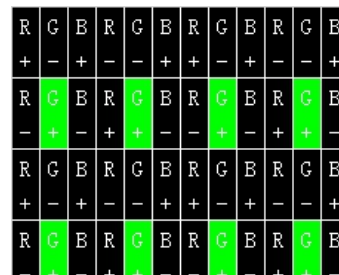
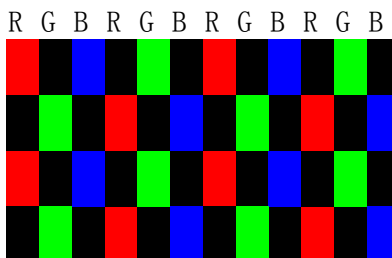
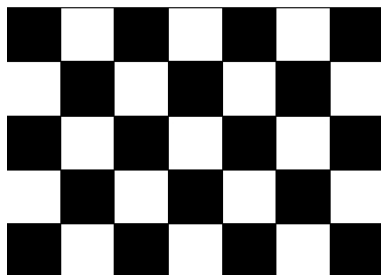
Frame rate $f_v=60\text{Hz}$ and Clock frequency = 74.25MHz.

Test Pattern of power supply current

a) Typ : Mosaic 7X5 (L0/L255)

b) Max : Skip 1 dot Pattern

c) Flicker Pattern



Note 2 : The duration of rush current is about 2ms and rising time of Power Input is 1ms(min)

3.2 Backlight Unit

Parameter		Min.	Typ.	Max.	Unit	Remarks
LED Light Bar Input Voltage Per Input Pin	V _{PIN}	-	21.9	22.5	V	Duty 100%
LED Light Bar Input Current Per Input Pin	I _{PIN}	-	300	320	mA	Note1,2,
LED Power Consumption	P _{BL}	-	6.57	7.2	W	Note 3
LED Life-Time	-	30,000	-		Hrs	Note 4

LED bar consists of 80 LED packages, 8strings*10packages

Note1: There are one light bar ,and the specified current is input LED chip 100% duty current

Note2: The sense current of each input pin is 300mA

Note3: $P_{BL} = \text{Input pins} \times V_{PIN} \times I_{PIN}$

Note4: The lifetime is determined as the time at which luminance of LED become 50% of the initial brightness or not normal lighting at I_{PIN}=290mA on condition of continuous operating at 25 ± 2 °C

4.0 INTERFACE CONNECTION

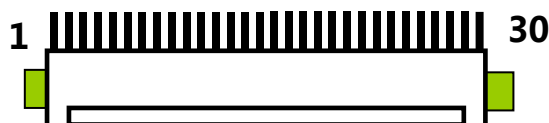
4.1 Open Cell Input Signal & Power (CN101)

- LVDS Connector : IS100-L300-C23(UJU), MSBKT2407P30HC(STM) or Equivalent.

< Table 4. Open Cell Input Connector Pin Configuration >

Pin No	Symbol	Description	Pin No	Symbol	Description
1	RX00-	Negative Transmission data of Pixel 0 (ODD)	16	RXE1+	Positive Transmission data of Pixel 1 (EVEN)
2	RX00+	Positive Transmission data of Pixel 0 (ODD)	17	GNG	Power Ground
3	RX01-	Negative Transmission data of Pixel 1 (ODD)	18	RXE2-	Negative Transmission data of Pixel 2 (EVEN)
4	RX01+	Positive Transmission data of Pixel 1 (ODD)	19	RXE2+	Positive Transmission data of Pixel 2 (EVEN)
5	RX02-	Negative Transmission data of Pixel 2 (ODD)	20	RXEC-	Negative Transmission Clock (EVEN)
6	RX02+	Positive Transmission data of Pixel 2 (ODD)	21	RXEC+	Positive Transmission Clock (EVEN)
7	GND	Power Ground	22	RXE3-	Negative Transmission data of Pixel 3 (EVEN)
8	RXOC-	Negative Transmission Clock (ODD)	23	RXE3+	Positive Transmission data of Pixel 3 (EVEN)
9	RXOC+	Positive Transmission Clock (ODD)	24	GND	Power Ground
10	RX03-	Negative Transmission data of Pixel 3 (ODD)	25	NC	No. Connection
11	RX03+	Positive Transmission data of Pixel 3 (ODD)	26	NC	No. Connection
12	RXE0-	Negative Transmission data of Pixel 0 (EVEN)	27	NC	No. Connection
13	RXE0+	Positive Transmission data of Pixel 0 (EVEN)	28	VDD	Power Supply: +5V
14	GND	Power Ground	29	VDD	
15	RXE1-	Negative Transmission data of Pixel 1 (EVEN)	30	VDD	

Note : Pin 24 should be connected with GND.

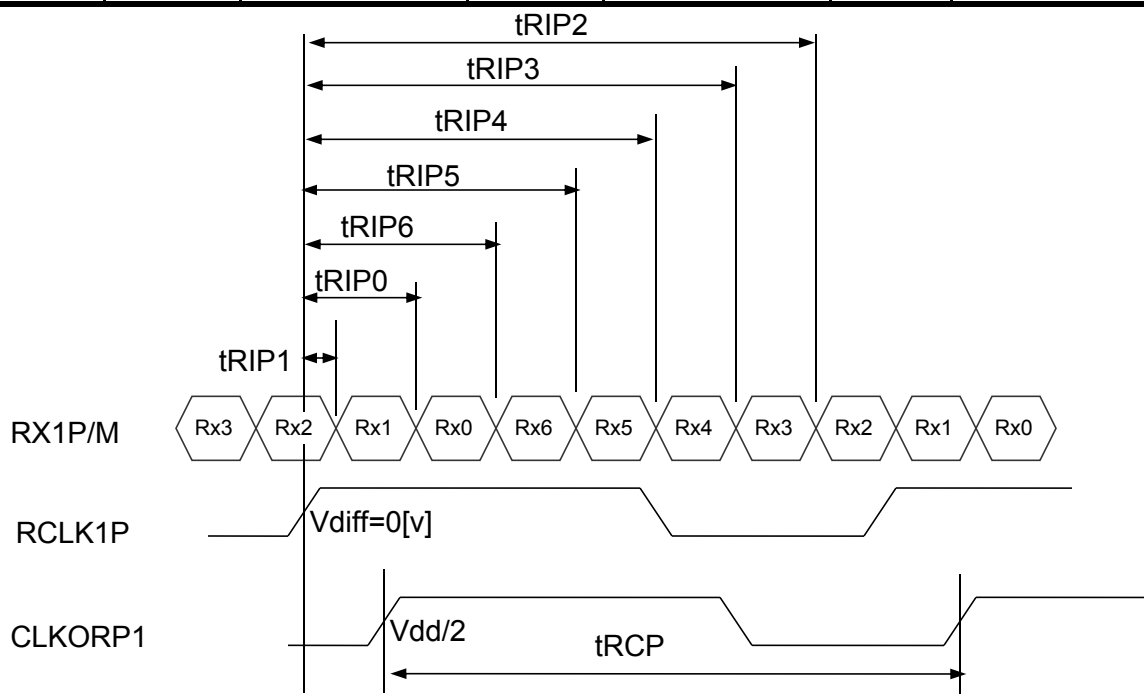


4.2 LVDS Rx Interface Timing Parameter

The specification of the LVDS Rx interface timing parameter is shown in Table 6.

<Table 6. LVDS Rx Interface Timing Specification>

Item	Symbol	Min	Typ	Max	Unit	Remark
CLKIN Period	tRCP	14.8	18.5	22.2	nsec	
Receiver Data Input Margin	tRMG	-0.35	-	0.35	nsec	fCLKIN=110MHz
		-0.40	-	0.40	nsec	fCLKIN=95MHz
		-0.45	-	0.45	nsec	fCLKIN=85MHz
		-0.60	-	0.60	nsec	fCLKIN=65MHz
Input Data 0	tRIP1	- tRMG	0.0	tRMG	Clock	
Input Data 1	tRIP0	T/7- tRMG	T/7	T/7+ tRMG	Clock	
Input Data 2	tRIP6	2 T/7- tRMG	2T/7	2T/7+ tRMG	Clock	
Input Data 3	tRIP5	3T/7- tRMG	3T/7	3T/7+ tRMG	Clock	
Input Data 4	tRIP4	4T/7- tRMG	4T/7	4T/7+ tRMG	Clock	
Input Data 5	tRIP3	5T/7- tRMG	5T/7	5T/7+ tRMG	Clock	
Input Data 6	tRIP2	6T/7- tRMG	6T/7	6T/7+ tRMG	Clock	



* Vdiff = (RXz+)-(RXz-),..., (RXCLK+)-(RXCLK-)

5.0 SIGNAL TIMING SPECIFICATION

5.1 Timing Parameters (DE only mode)

< Table 8. Timing Table >

Item		Symbols		Min	Typ	Max	Unit
Clock	Frequency	1/Tc		60	74.25	78	MHz
	High Time	Tch		-	4/7Tc	-	
	Low Time	Tcl		-	3/7Tc	-	
Frame Period		Tv		1100	1125	1149	lines
				48.5	60	63	Hz
Horizontal Active Display Term		Valid	t _{HV}	-	960	-	t _{CLK}
		Total	t _{HP}	1060	1100	1200	t _{CLK}
Vertical Active Display Term		Valid	t _{VV}	-	1080	-	t _{HP}
		Total	t _{VP}	1100	1125	1149	t _{HP}

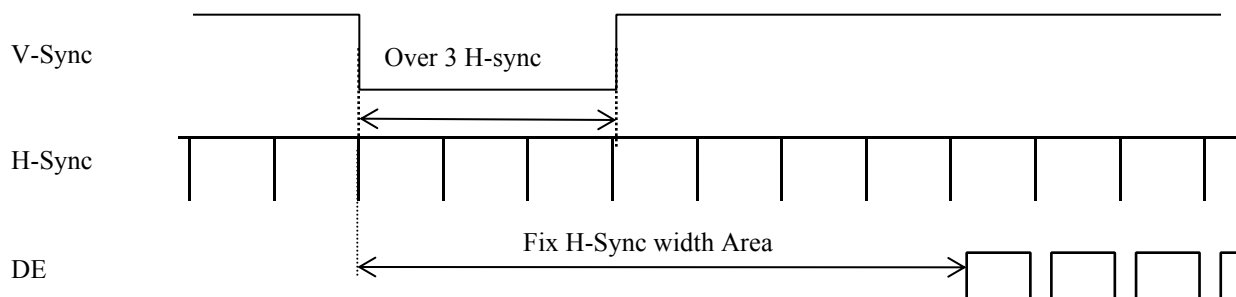
Notes: This product is DE only mode. The input of Hsync & Vsync signal does not have an effect on normal operation.

< Table 9. LVDS Input SSCG>

Symbol	Parameter	Condition	Min	Typ	Max	Unit
F	LVDS Input frequency	-	60	74.25	78	MHz
T _{LVSK}	LVDS channel to channel skew	F=100MHz V _{IC} =1.2V V _{ID} =±400mV	-380	-	+380	ps
F _{LVMOD}	Modulating frequency of input clock during SSC		60	-	85	KHz
F _{LVDEV}	Maximum deviation of input clock frequency during SSC		-3	-	+3	%
T _{CY-CY}	Cycle to Cycle jitter		-	-	100	ps

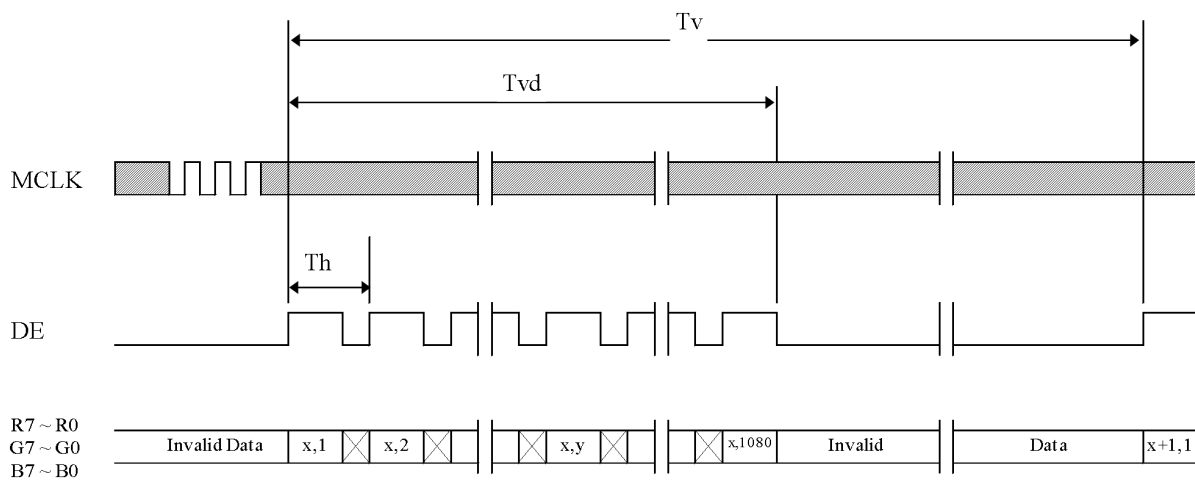
5.2 Signal Timing Waveform

5.2.1 Sync Timing Waveforms

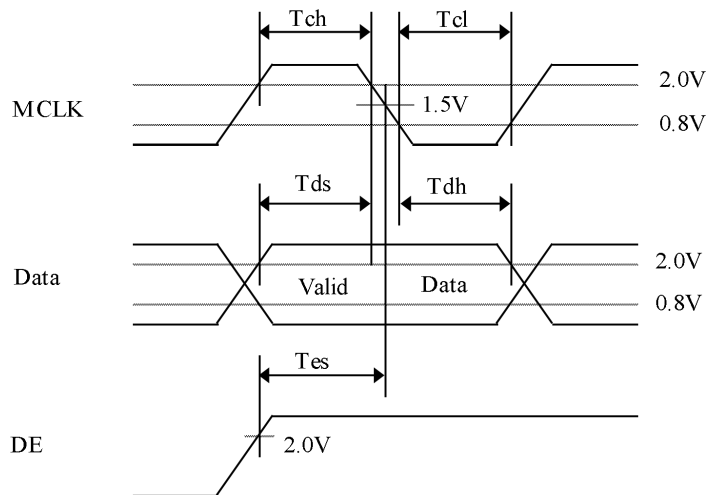
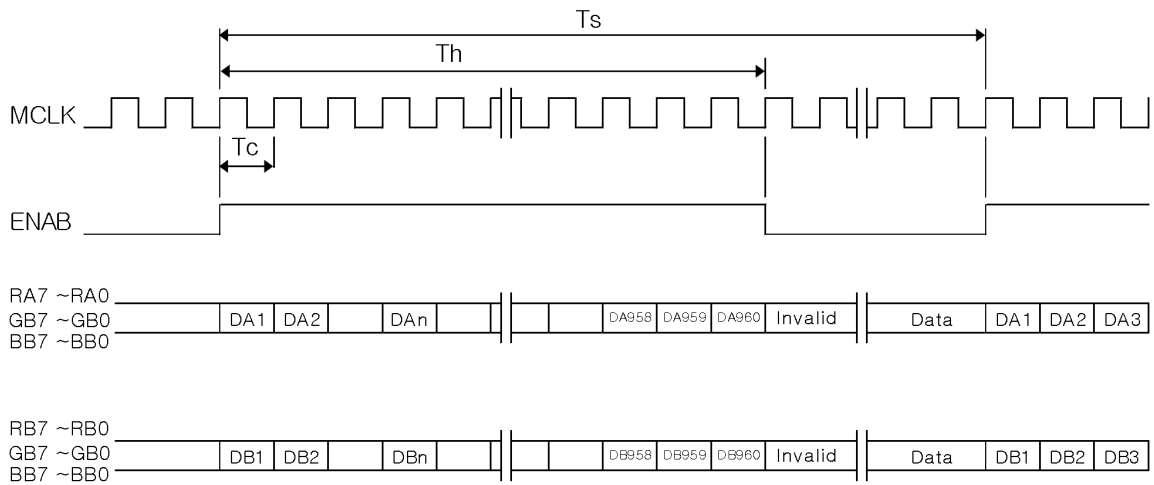


- 1) Need over 3 H-sync during V-Sync Low
- 2) Fix H-Sync width from V-Sync falling edge to first rising edge

5.2.2 Vertical Timing Waveforms

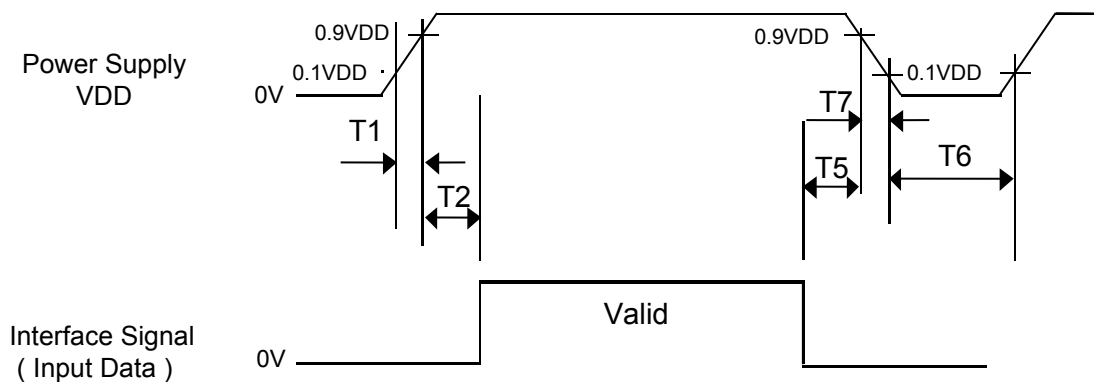


5.2.3 Horizontal Timing Waveforms



5.3 Power Sequence

To prevent a latch-up or DC operation of the Open Cell, the power on/off sequence shall be as shown in below



< Table 11. Sequence Table >

Parameter	Values			Units
	Min	Typ	Max	
T1	0.5	-	20	ms
T2	10	-	100	ms
T3	200	-	-	ms
T4	200	-	-	ms
T5	0	-	-	ms
T6	1	-	-	s

- Notes:
1. Back Light must be turn on after power for logic and interface signal are valid.
 2. Even though T1 is out of SPEC, it is still ok if the inrush current of VDD is below the limit.
 3. When $VDD < 0.9VDD$ (Typ.), Power off.
 4. T7 decreases smoothly, if there were rebounding voltage, it must smaller than 5 volts.

6.0 OPTICAL SPECIFICATIONS

The test of optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lx and temperature $=25 \pm 2^\circ\text{C}$) with the equipment of Luminance meter system (Goniometer system and PR730) and test unit shall be located at an approximate distance 180cm from the LCD surface at a viewing angle of θ and Φ equal to 0° . We refer to $\theta_{\Phi=0}$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta_{\Phi=90}$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta_{\Phi=180}$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta_{\Phi=270}$ ($=\theta_6$) as the 6 o'clock direction ("bottom"). While scanning θ and/or Φ , the center of the measuring spot on the Display surface shall stay fixed. The measurement shall be executed after 30 minutes warm-up period. VDD shall be 12.0V at $25 \pm 2^\circ\text{C}$. Optimum viewing angle direction is 6 o'clock.

< Table 12. Optical Table >

[VDD = 12.0V, Frame rate = 60Hz, Ta $=25 \pm 2^\circ\text{C}$]

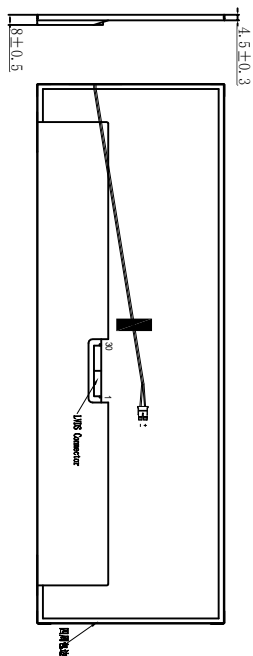
Parameter		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Θ_3	CR > 10	80	89	-	Deg.	Note 1
		Θ_9		80	89	-	Deg.	
	Vertical	Θ_{12}		80	89	-	Deg.	
		Θ_6		80	89	-	Deg.	
Brightness		Lv	$\Theta = 0$ (Center) Normal Viewing Angle	360	400	-	nit	
Contrast ratio		CR		700:1	1000:1	-		Note 2
White luminance uniformity		ΔY		75	80	-	%	Note 3
Reproduction of color	White	W_x		TYP. - 0.03	0.2888	TYP. + 0.03		Note 4
		W_y			0.3165			
	Red	R_x			0.6488			
		R_y			0.3165			
	Green	G_x			0.3243			
		G_y			0.6179			
	Blue	B_x			0.1443			
		B_y			0.0556			
Color Gamut				68	72	-	%	
Cell Transmittance				TBD	TBD			
Response Time	G to G	T_g		-	14	20	ms	Note 5

7. Mechanical Characteristics

The contents provide general mechanical characteristics. In addition the figures in the next page are detailed mechanical drawing of the LCD.

Outline Dimension	Horizontal	425.8mm
	Vertical	131.8mm
	Depth	8mm
Active Display Area	Horizontal	409.8mm
	Vertical	115mm
Weight	0.45 kg (Typ.)	

Notes : Please refer to a mechanic drawing in terms of tolerance at the next page.

[illegible]

No.	PIN Name
1	RX00-
2	RX00+
3	RX01-
4	RX01+
5	RX02-
6	RX02+
7	GND
8	RX0C-
9	RX0C+
10	RX03-
11	RX03+
12	RX06-
13	RX06+
14	GND
15	RX1E1-
16	RX1E1+
17	GND
18	RX2E2-
19	RX2E2+
20	RX2E3-
21	RX2E3+
22	RX3E3-
23	RX3E3+
24	GND
25	GND
26	NC
27	NC
28	VDD
29	VDD
30	VDD

图纸编号

序号	标记	更改内容	日期	签名
1	△	图纸更新及优化结构	2022-12-10	

8. Packing

TBD

9. DEFINITION OF LABELS