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Custom Display

Production Custom designs Installation

Mechanical design



MODEL NO : ET101WU01-T

MODEL VERSION: 01

SPEC VERSION : 1.0

ISSUED DATE: 2022-04-24

☐ Preliminary Specification

☒ Final Product Specification

Customer : _____

Approved by	Notes

Youri Confirmation

Prepared by	Reviewed by	Approved by
John	Johnny	Wang

1. Introduction

1.1 Scope of application

LCD specification: Dots 1920xRGBx1200

As to basic specification of the driver IC, refer to the IC (TBD) specification and data book.

All material & processing of the LCD module should be Lead Free.

1.2 TFT features:

Structure: TFT PANNEL+IC +FPC1+BL;

ALL Viewing Type LCD

1920 dot-segment and 1200 dot-common outputs;

16.7M Color can be selected by software;

White LED back light;

LVDS(two port) interface

1.3 Applications:

2. LCM General specification

ITEM	Standard value	Unit
LCD Type	Normally Black	--
Drive element	TFT active matrix	--
Number of pixels	1920*3RGB(H)X1200(V)	Dots
Pixel arrangement	RGB Vertical Stripe	--
Pixel Pitch (W*H)	0.11292(H) X 0.1269(V)	mm
Active area	216.8064(H) x135.50(4V)	mm
Viewing direction	ALL O'CLOCK	-
TFT Driver IC	TBD	
TFT interface	LVDS(two port) interface	-
Approx. Weight	TBD	g
LCM Size(W*H*T)	229.39(W) ×149.14(H) ×2.62(T)	mm
Touch structure	--	
Touch Driver IC	--	-
Touch Interface	--	

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3.Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T _{OPR}	-20	+70	°C
LCM Storage Temperature	T _{STG}	-30	+80	°C
Humidity	RH	-	90	%

4.Electrical Characteristics

4.1 TFT DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for I/O	VDDIO	--	--	--	V
Supply Voltage for(DC/DC)	VDD	3.0	3.3	3.6	V
Current Consumption	I _{DD}	-	300	360	mA
	I _{DD-SLEEP}		75	160	uA

4.2 Back-Light Unit Characeristics

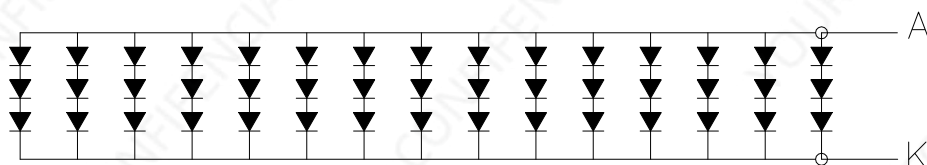
The back-light system is an edge-lighting type with 45 white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V _F	8.4	--	10.5	V	-
Forward current	I _F	--	300	-	mA	-
Luminance(With LCD)	L _v		350	--	cd/m ²	-
LED life time	N/A	----	30,000	--	Hr	Note 1

Note:

- (1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I_L=20mA/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

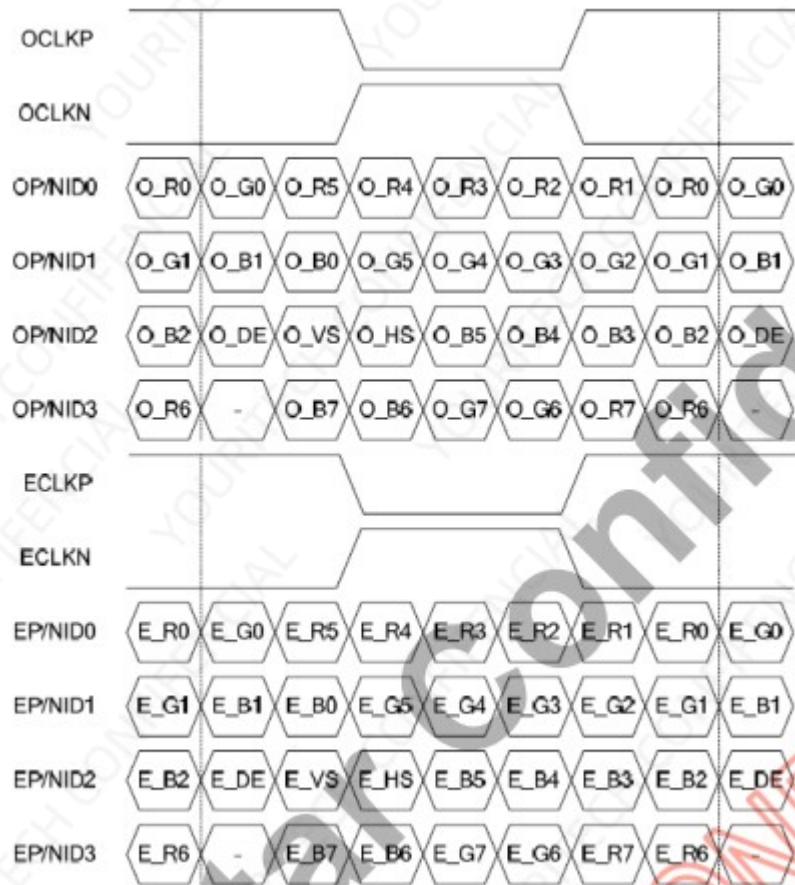
LCM Functional

Pin No.	Symbol	Description	I/O
1	VLED-	LED Cathode	P
2	VLED-	LED Cathode	P
3	VLED+	LED Anode	P
4	VLED+	LED Anode	P
5	NC	NC	-
6	GND	GROUND	P
7	ELV3P	EVEN LVDS Positive data signal (+)	I
8	ELV3N	EVEN LVDS Negative data signal (-)	I
9	GND	GROUND	P
10	ELV2P	EVEN LVDS Positive data signal (+)	I
11	ELV2N	EVEN LVDS Negative data signal (-)	I
12	GND	GROUND	P
13	ELVCLKP	EVEN LVDS Positive CLK signal (+)	I
14	ELVCLKN	EVEN LVDS Negative CLK signal (-)	I
15	GND	GROUND	P
16	ELV1P	EVEN LVDS Positive data signal (+)	I
17	ELV1N	EVEN LVDS Negative data signal (-)	I
18	GND	GROUND	P
19	ELV0P	EVEN LVDS Positive data signal (+)	I
20	ELV0N	EVEN LVDS Negative data signal (-)	I

Pin No.	Symbol	Description	I/O
21	GND	GROUND	P
22	OLV3P	Odd LVDS Positive data signal (+)	I
23	OLV3N	Odd LVDS Negative data signal (-)	I
24	GND	GROUND	P
25	OLV2P	Odd LVDS Positive data signal (+)	I
26	OLV2N	Odd LVDS Negative data signal (-)	I
27	GND	GROUND	P
28	OLVCLKP	Odd LVDS Positive CLK signal (+)	I
29	OLVCLKN	Odd LVDS Negative CLK signal (-)	I
30	GND	GROUND	P
31	OLV1P	Odd LVDS Positive data signal (+)	I
32	OLV1N	Odd LVDS Negative data signal (-)	I
33	GND	GROUND	P
34	OLV0P	Odd LVDS Positive data signal (+)	I
35	OLV0N	Odd LVDS Negative data signal (-)	I
36	GND	GROUND	P
37	I2C_SDA	Reserved for LCD manufacturer' s use , not connection	I
38	I2C_SCL		I
39	VDD_OTP		P
40	EEPEN	Not Connection	I
41	VDDIN	Power supply VDDIN=3.3V (Typ.)	P
42	VDDIN		P
43	VDDIN		P
44	VDDIN		P
45	VDDIN		P

6. Timing Characteristics

6.1 8Bit LVDS input



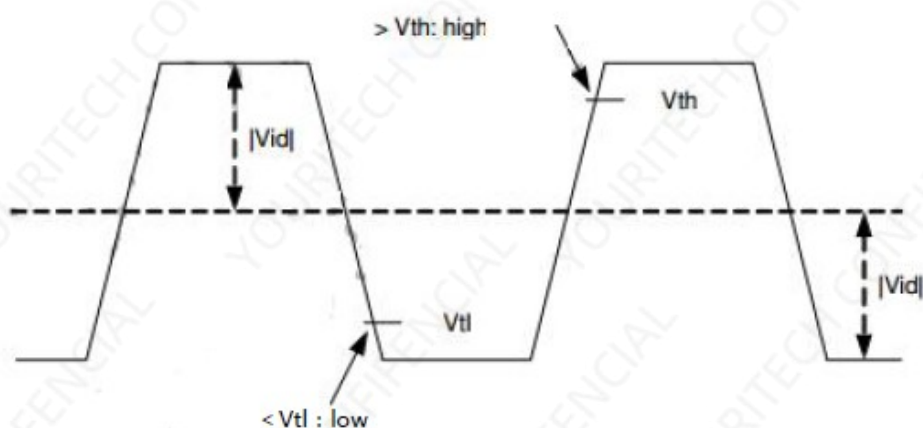
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK Frequency	Fdclk	74.5	77.56	85	MHz
Horizontal display area	Thd	960			DCLK
HSYNC period time	Th	989	1040	1248	DCLK
Horizontal Blank	THB	29	80	288	DCLK
HSYNC pulse width	Thp	2	10	255	DCLK
HSYNC back porch	thbp	3	6	255	DCLK
HSYNC Front porch	thfp	24	64	260	DCLK
Vertical display area	Tvd	1200			H
VSYNC period time	Tv	1243	1243	1560	H
Vertical Blank	TVB	43	43	360	H
VSYNC Pluse width	Tvp	4	4	20	H
VSYNC back porch	Tvbp	20	20	255	H
VSYNC front porch	Tvfp	19	19	260	H
Frequency	fV	-	60	-	Hz



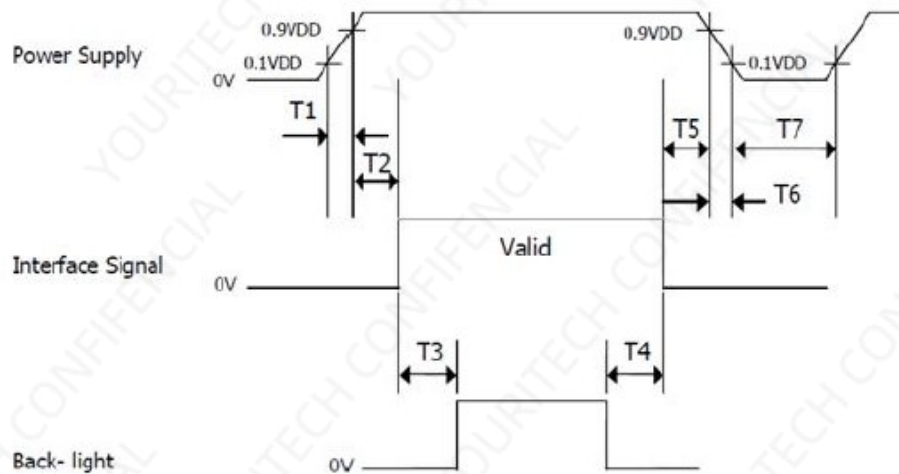
6.2 Interface Timing

Item	Symbol	Condition	MIN	TYP	MAX	Unit
Differential input high Threshold voltage	Vth	Vcm=1.2V	-	-	+0.1	V
Differential input low Threshold voltage	Vtl	-	-0.1	-	-	V
Differential input common Threshold voltage	Vcm	-	1	1.2	1.7- Vid /2	V
LVDS input voltage	Vinlv	-	0.7	-	1.7	V
Differential input voltage	Vid	-	0.35	-	0.6	V
Differential input leakage voltage	Ilvleak	-	-10	-	+10	uA

Differential:
LVCLKP(R)-LVCLKN(R)
LVD[3:0]P(R)-
LVD[3:0]N(R)

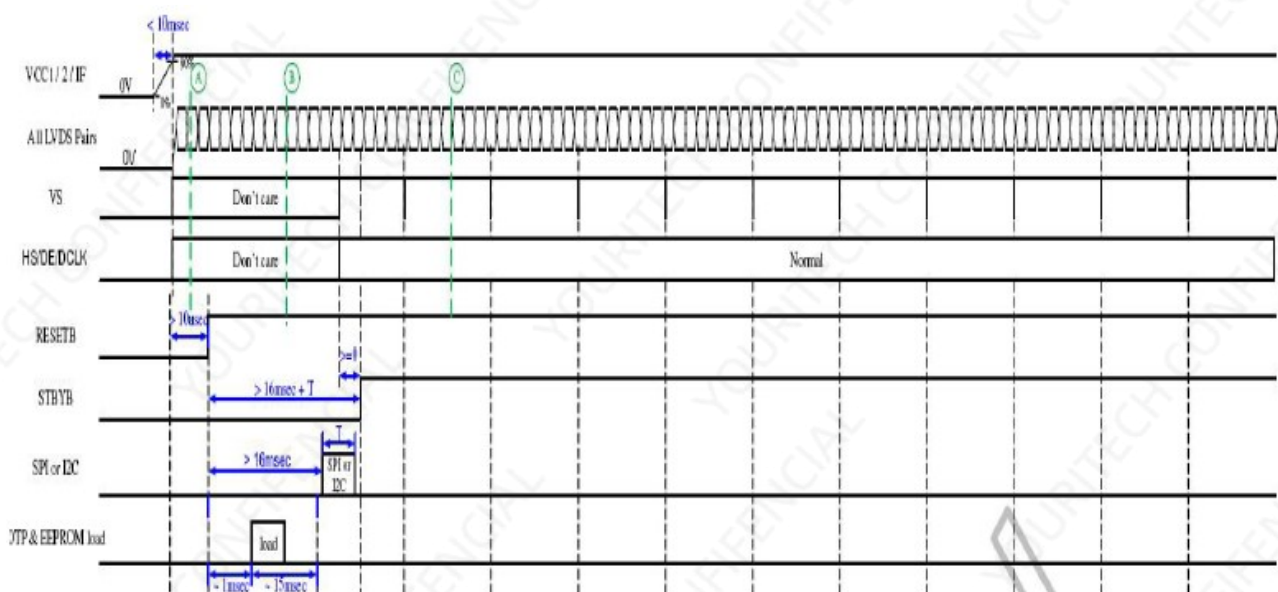


6.3 Power On/Off Sequence



< Table8. Sequence Table >

Parameter	Values			Units
	Min	Typ	Max	
T1	0	-	10	ms
T2	0	-	50	ms
T3	200	-	-	ms
T4	500	-	-	ms
T5	0	-	50	ms
T6	0	-	10	ms
T7	500	-	-	ms



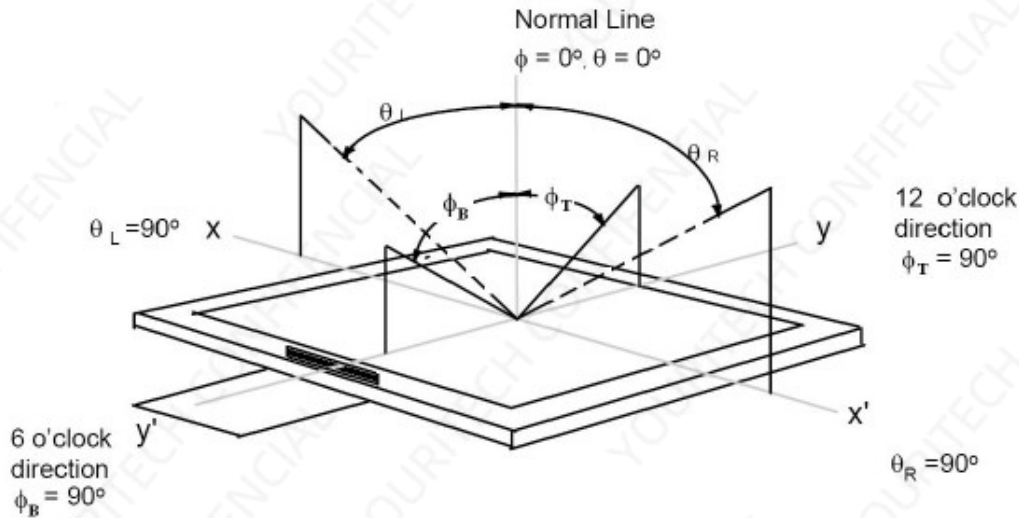
7. Optical Characteristics

7.1 Optical Specification

Item	Symbol	Condition	Min	Typ.	Max	Unit	Note
Viewing Angle	θ_L	$Cr \geq 10$	70	80	--	deg	Note 1
	θ_R		70	80	--		
	ψ_T		70	80	--		
	ψ_B		70	80	--		
Contrast Ratio	Cr	$\theta = 0^\circ$	700	900		-	Note 2
Response Time	Tr+Tf	FF=0°	--	30	35	ms	Note 3
Color Coordinate of CIE1931	Rx	$\theta = 0^\circ$	-0.03	0.644	+0.03	-	@BOE BL UNote 4
	Ry			0.344			
	Gx			0.315			
	Gy			0.632			
	Bx			0.157			
	By			0.054			
	Wx			0.285			
	Wy			0.327			
NTSC Ratio	NTSC	CIE1931	--	72	--	%	@BOE BL UNote 5
Polarization Direction of Front Polarizer	PdF	-		0		deg	Absorpti on axis Note 6
Polarization Direction of Rear Polarizer	PdR			90		deg	

Note 1: The definition of Viewing Angle

Refer to the graph below marked by θ and ϕ .



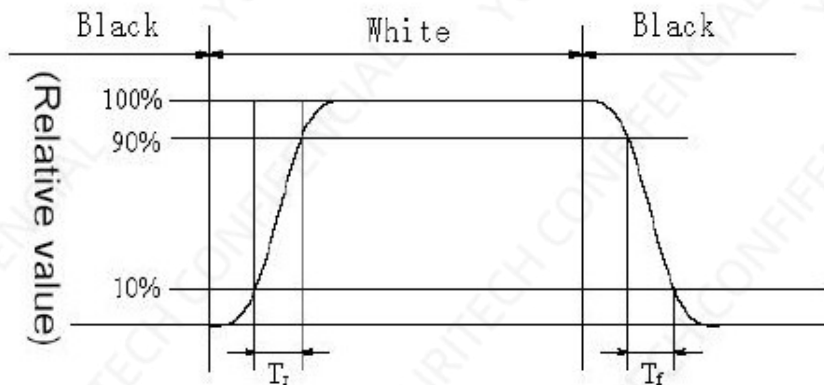
Note 2: The definition of Contrast Ratio

$$\text{Contrast Ratio (CR)} = \frac{\text{Luminance When LCD is at "White" state}}{\text{Luminance When LCD is at "Black" state}}$$

(Contrast Ratio is measured in optimum common electrode voltage)

Note 3: Definition of Response time. (Test LCD using RD80S or similar equipments):

The output sign also photo detector are measured when the input sign also are changed from "black" to "white" (Voltage falling time) and from "white" to "black" (Voltage rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figures below.



Note 4: Color Coordinates of CIE 1931

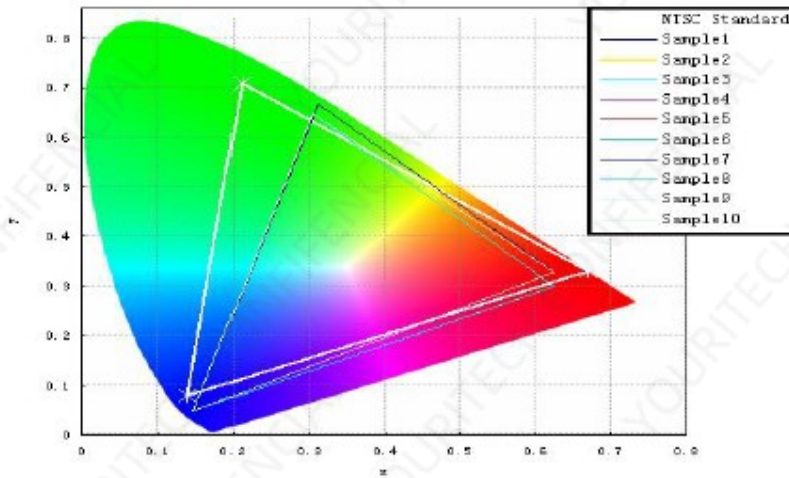
The test condition is at ILED=20mA and measured on the surface of LCD module at 25°C.

Measurement equipment: CS2000 or similar equipments

The Color Coordinate (CIE 1931) is the measurement of the center of the display shown in below figure.

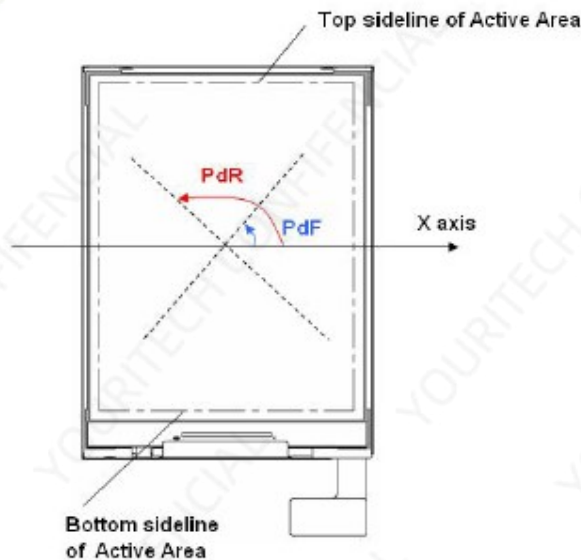
Note 5: Definition of Color of CIE Coordinate and NTSC Ratio.

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$



Note 6: Polarization Direction Definition

- Viewing direction is normal user viewing direction which is vertical to the display surface
- The polarizer which is closer to viewer is defined as Front Polarizer
- The polarizer which is on the rear side of viewer is defined as Rear Polarizer
- The X axis is defined as parallel line to top & bottom sidelines of the Active Area
- PdF which is marked in blue arrow is polarization degree of Front polarizer
- PdR which is marked in red arrow is polarization degree of Back polarizer
- The polarization degree parameter must be indicated in range of 0deg to 180deg according to above definition



7.2 Measuring Condition

- Measuring surrounding: dark room

8. Reliability Test Item

No.	Test Item	Test Condition	Notes
1	High Temp. Storage	+80°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	+70°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) ~70°C (30min), 50 cycles	

9. Packing Method----TBD

- END -