

INDUSTRIAL STRENGTH... Start Your Application From **YOURITECH**

Integration support

Obsolescence Management

PCAP

Embedded Systems

Human Machine Interface

Touch Solutions

Software

Production Custom designs Installation

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

Mechanical design



MODEL NO : ET043WQ04-DMODEL VERSION: 01SPEC VERSION : 1.0ISSUED DATE: 2017-12-05☒ Preliminary Specification☐ Final Product Specification

Customer : _____

Approved by	Notes

Table of Contents

Record of Revision.....	3
1 General Specifications	4
2 Input/Output Terminals	5
3 Absolute Maximum Ratings	6
4 Electrical Characteristics.....	7
5 Timing Chart.....	8
6 Optical Characteristics	13
7 Environmental / Reliability Test	16
9 Packing Drawing	18
10 Precautions for Use of LCD Modules	18

Record of Revision

[illegible]

1 General Specifications

Feature		Spec
Display Spec.	Size	4.3 inch
	Resolution	480(RGB) X 272
	Technology Type	a-Si
	Pixel Configuration	RGB Vertical Stripe
	Pixel pitch(mm)	0.198 x 0.198
	Display Mode	Normally White, Transmissive
	Viewing Direction	6 o'clock
Mechanical Characteristics	MODEL (W x H x D) (mm)	105.5 x 67.07 x 3.0
	Active Area(mm)	95.04 x 53.856
	With /Without TSP	Without TSP
	Driver IC	ST7283
	Weight (g)	TBD
Electrical Characteristics	LCD Interface	RGB 24 bit parallel data
	Color Depth	16.7M

Note 1: Viewing direction for best image quality is different from TFT definition. There is a 180 degree shift.

Note 2: Requirements on Environmental Protection: Q/S0002

Note 3: LCM weight tolerance: $\pm 5\%$

2 Input/Output Terminals

2.1 LCM Interface

Pin No.	Symbol	I/O	Function	Remark
1	VLED-	P	LED Ground	
2	VLED+	P	LED Power	
3	GND	P	Ground	
4	VDD	P	Power Supply (+3.3 V)	
5	R0	I	Red Data Bit0 (LSB)	
6	R1	I	Red Data Bit1	
7	R2	I	Red Data Bit2	
8	R3	I	Red Data Bit3	
9	R4	I	Red Data Bit4	
10	R5	I	Red Data Bit5	
11	R6	I	Red Data Bit6	
12	R7	I	Red Data Bit7 (MSB)	
13	G0	I	Green Data Bit0 (LSB)	
14	G1	I	Green Data Bit1	
15	G2	I	Green Data Bit2	
16	G3	I	Green Data Bit3	
17	G4	I	Green Data Bit4	
18	G5	I	Green Data Bit5	
19	G6	I	Green Data Bit6	
20	G7	I	Green Data Bit7 (MSB)	
21	B0	I	Blue Data Bit0 (LSB)	
22	B1	I	Blue Data Bit1	
23	B2	I	Blue Data Bit2	
24	B3	I	Blue Data Bit3	
25	B4	I	Blue Data Bit4	
26	B5	I	Blue Data Bit5	
27	B6	I	Blue Data Bit6	
28	B7	I	Blue Data Bit7 (MSB)	

The information contained herein is the exclusive property of Shenzhen Youri Technology Co.,Ltd, and shall not be distributed, reproduced, or disclosed in whole or in part without prior written permission of Shenzhen Youri Technology Co.,Ltd

29	GND	P	Ground	
30	DCLK	I	Dot Data Clock	
31	DISP	I	Display On/Off	
32	Hsync	I	Horizontal Sync Input	
33	Vsync	I	Vertical Sync Input	
34	DE	I	Data Enable Control	
35	NC	-	No Connection	
36	GND	P	Ground	
37	NC	-	No Connection	
38	NC	-	No Connection	
39	NC	-	No Connection	
40	NC	-	No Connection	

3 Absolute Maximum Ratings

GND=0V

Item	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VDD	-0.3	5	V	Note1
Operating Temperature	Top	-20	70	°C	
Storage Temperature	Tst	-30	80	°C	

Table 3 Absolute Maximum Ratings

Note 1: Temperature and relative humidity range are shown in the figure below.

4 Electrical Characteristics

4.1 Driving TFT LCD Panel

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power Supply Voltage	VDD	3.0	3.3	3.6	V	
Input high level voltage	V_{IH}	$0.7V_{DDIO}$		VDDIO	V	
Input low level voltage	V_{IL}	GND		$0.3V_{DDIO}$	V	

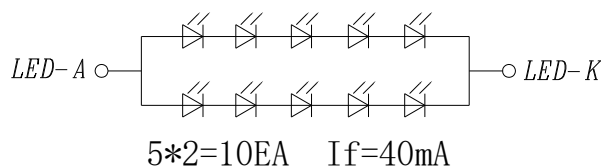
4.2 Backlight Unit

The backlight system is an edge-lighting type with 10 LED. The characteristics of the LED are shown in the following tables.

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Backlight forward voltage	V_F	-	16	-	V	10 LEDs
Backlight forward current	I_F	--	20	--	mA	
LED life time	--	20000	--	--	Hrs	

Note 1: LED life time (Hr) can be defined as the time in which it continues to operate under the condition: $T_a=25\pm3\text{ }^{\circ}\text{C}$, typical I_L value indicated in the above table and the $f_L=50\text{k Hz}$ until the brightness becomes less than 50%.

LED CIRCUIT DIAGRAM:



5 Timing Chart

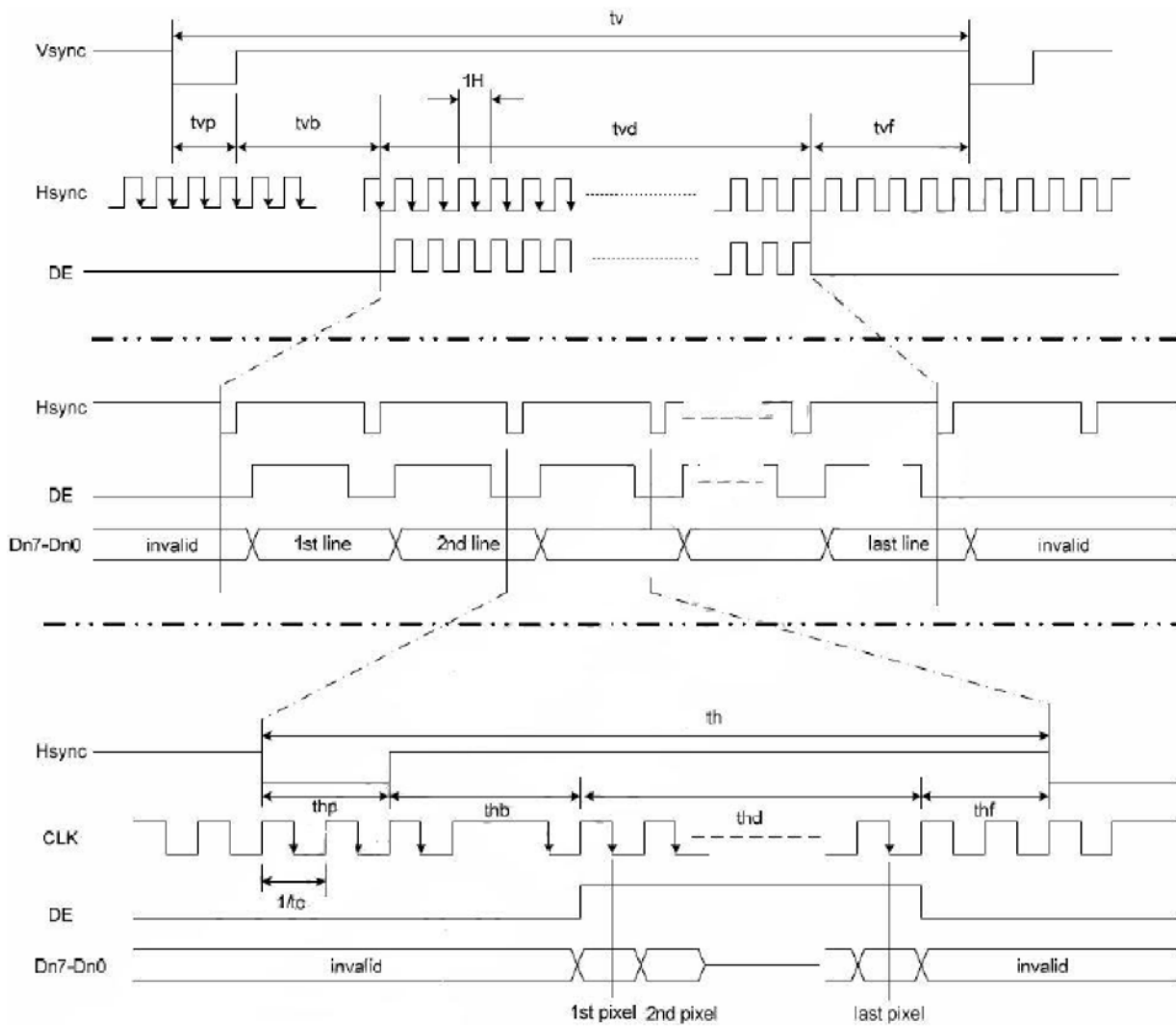
5.1 DC Timing Characteristics

Signal	Item	Symbol	Min	Typ	Max	Unit	Note
Dclk	Frequency	DCLK	-	9.0	15	MHZ	
Hsync	Period	TH	-	525	-	DCLK	(1)
	Pulse Width	Thp	2	41	-	DCLK	(2)
	Back-Porch	Thb	2	-	-	DCLK	(2)
	Display Period	Thd	-	480	-	DCLK	
	Front-Porch	Thf	2	-	-	DCLK	(2)
Vsync	Period	Tv	-	286	-	TH	
	Pulse Width	Tvp	1	10	-	TH	
	Back-Porch	Tvb	1	2	-	TH	
	Display Period	Tvd	-	27		TH	
	Front-Porch	Tvf	1		-	TH	

Note1: Thd=480 DCLK, Thf=2 DCLK, Thp= 41
525 DCLK= 480 + 2 + 41 + 2 (DCLK)

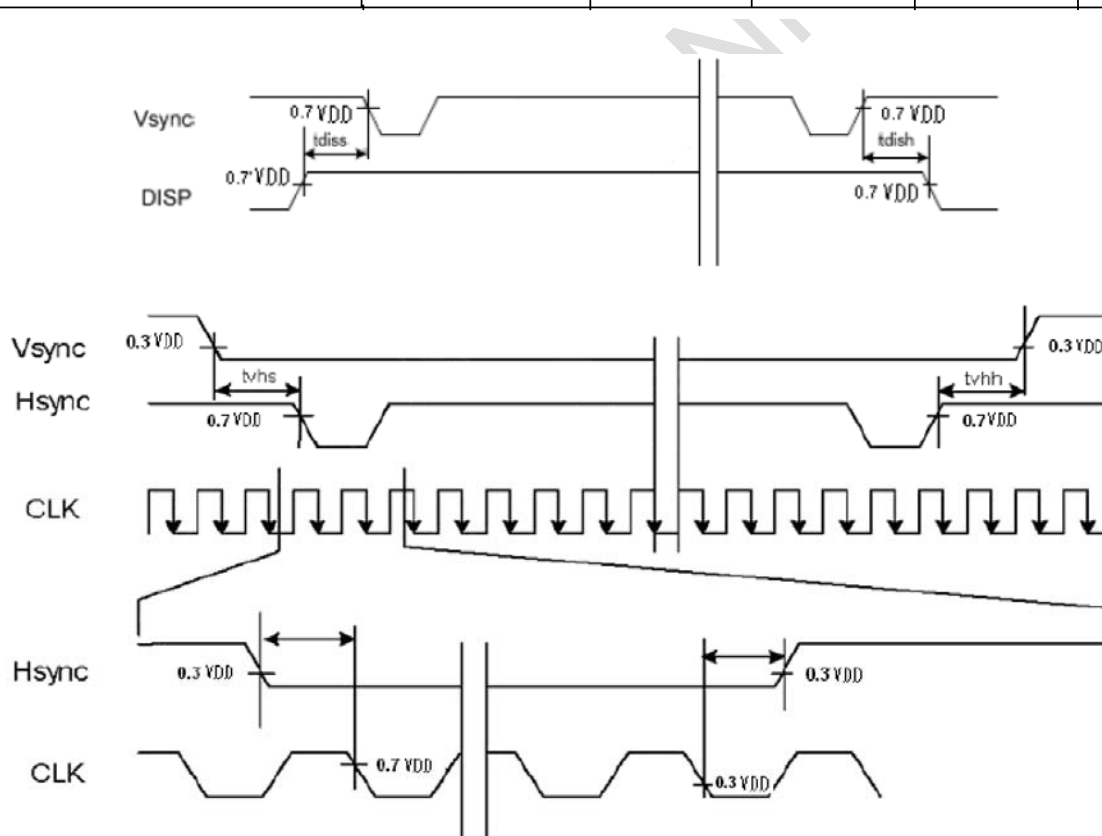
hb=2 DCLK

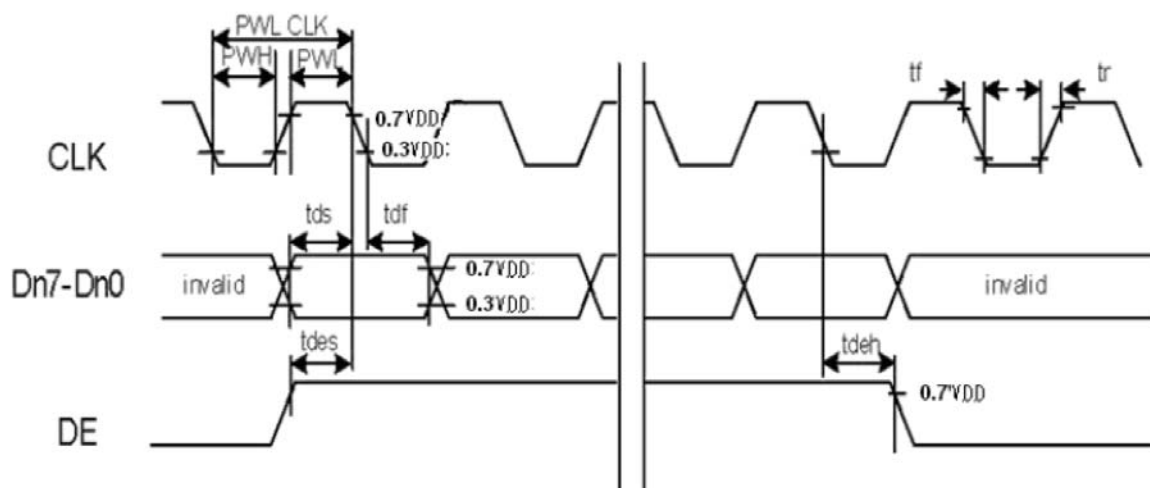
Note2: Thf+ Thp+ Thb >44



5.2 AC Timing Characteristics

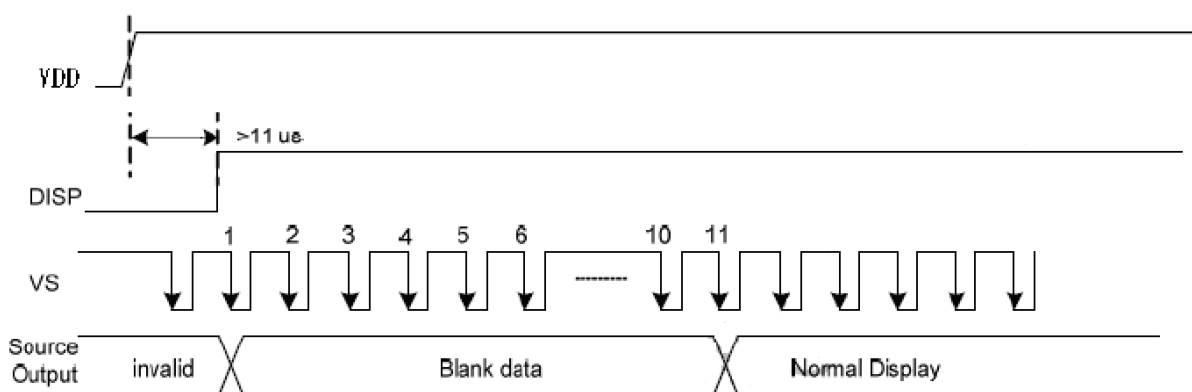
Parameter	Symbol	Spec.			Unit
		Min	Typ	Max	
DISP setup time	t_{diss}	10			ns
DISP hold time	t_{dish}	10			ns
Clock period	$PW_{CLK}^{(2)}$	66.7	-	-	ns
Clock pulse high period	$PWH^{(2)}$	26.7	-	-	ns
Clock pulse low period	$PWL^{(2)}$	26.7	-	-	ns
Hsync setup time	t_{hs}	10	-	-	n
Hsync hold time	t_{hh}	10	-	-	
Data setup time	t_{ds}	10	-		ns
Data hold time	t_{dh}	10	-		ns
DE setup time	t_{des}	10	-		ns
DE hold time	t_{deh}	10			ns
Vsync setup time	t_{vhs}	10		-	ns
Vsync hold time	t_{vhh}	10		-	ns



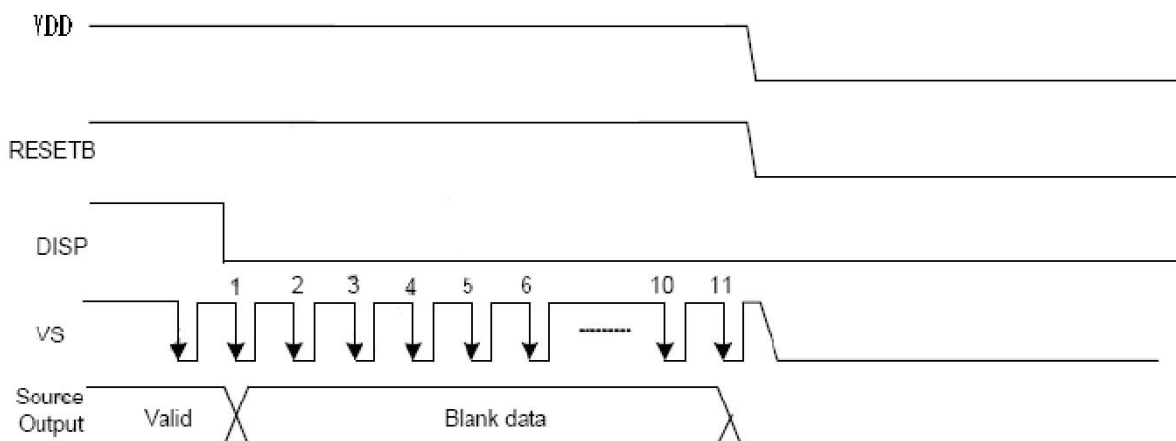


5.3 Power Sequence

The LCD panel power ON/OFF sequence is as below.



Power On Sequence



Power Off Sequence

6 Optical Characteristics

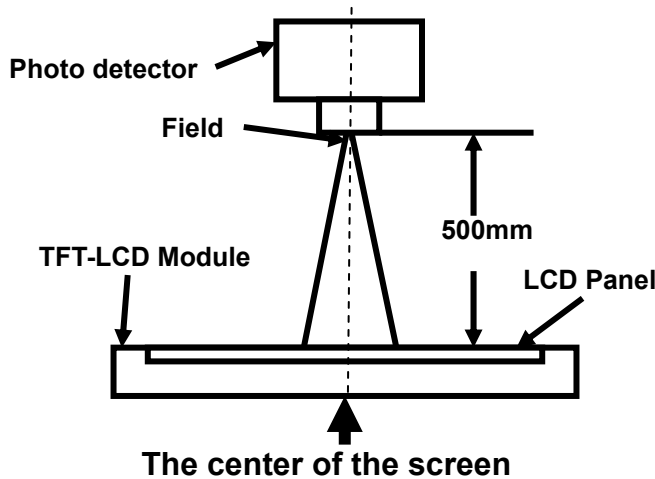
Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	-	60	-	Degree	Note2,3
		θB		-	70	-		
		θL		-	70	-		
		θR		-	70	-		
Contrast Ratio		CR	θ=0°	-	600	-		Note 3
Response Time		T _{ON}	25℃	-	35	-	ms	Note 4
		T _{OFF}						
Chromaticity	White	x	Backlight is on	0.26	0.31	0.36		Note 1,5
		y		0.28	0.33	0.38		
	Red	x						Note 1,5
		y						
	Green	x						Note 1,5
		y						
	Blue	x						Note 1,5
		y						
Uniformity		U		75	80	--	%	Note 6
Luminance		L		250	300	-	cd/m ²	Note 7

Test Conditions:

1. $I_F = 20$ mA, and the ambient temperature is 25℃.
2. The test systems refer to Note 1 and Note 2.

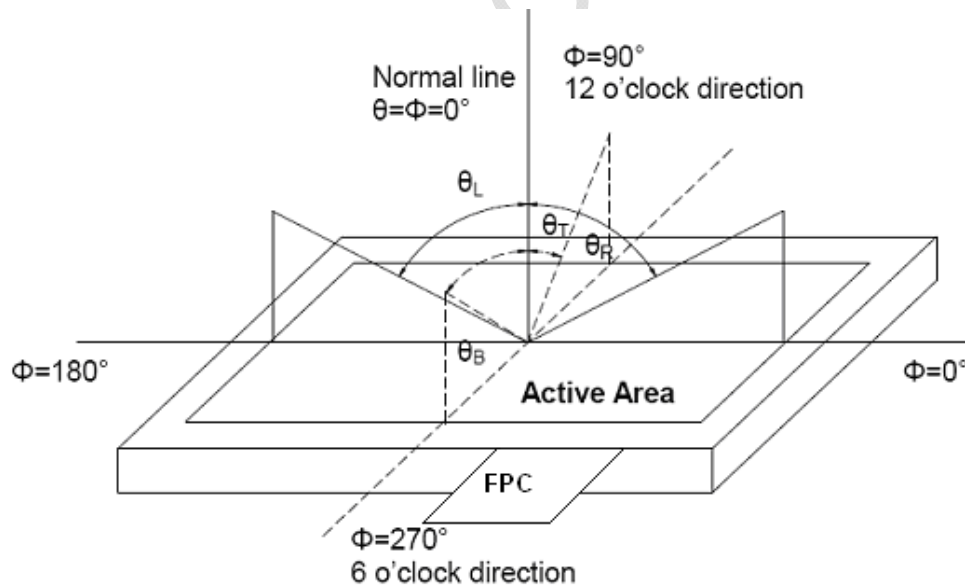
Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD.



Note 3: Definition of contrast ratio

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

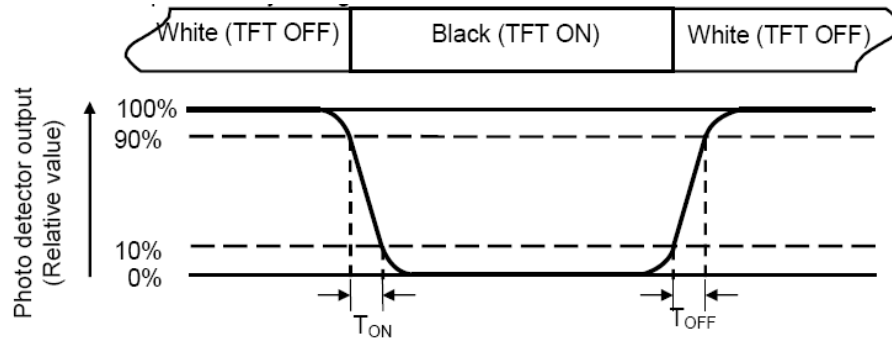
"White state ": The state is that the LCD should drive by V_{white} .

"Black state": The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

Note 4: 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%.



Note 5: Definition of color chromaticity (CIE1931)

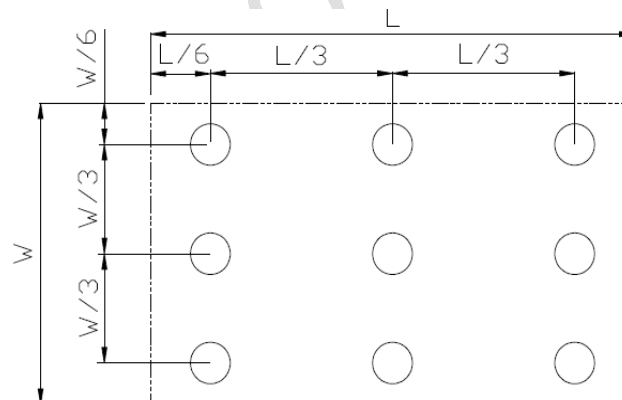
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = L_{\min} / L_{\max}$$

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



$L_{\max}$: The measured Maximum luminance of all measurement position.

$L_{\min}$: The measured Minimum luminance of all measurement position.

Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

7 Environmental / Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	80℃, 120Hours	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	-30℃, 120Hours	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	70℃, 120Hours	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	-20℃, 120Hours	IEC60068-2-1:2007 GB2423.1-2008
5	Storage at High Temperature and Humidity	40℃, 90%RH, 120Hours	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-20℃ ↔ 70℃, ON/OFF, 20CYC	Start with cold temperature, End with high temperature, IEC60068-2-14:1984,G B2423.22-2002
7	ESD	Voltage:±8KV R:330 ohm,C:150pF Air discharge,10 times	IEC61000-4-2:2001 GB/T17626.2-2006
8	Vibration Test	10 => 55 =>10 => 55 => 10 Hz, within 1 minute;Amplitude:1.5mm. 15 minutes for each Direction (X,Y,Z)	IEC60068-2-6:1982 GB/T2423.10—1995
10	Package Drop Test	Packed, 66CM free fall 6 sides, 1 corner, 3edges	IEC60068-2-32:1990 GB/T2423.8—1995

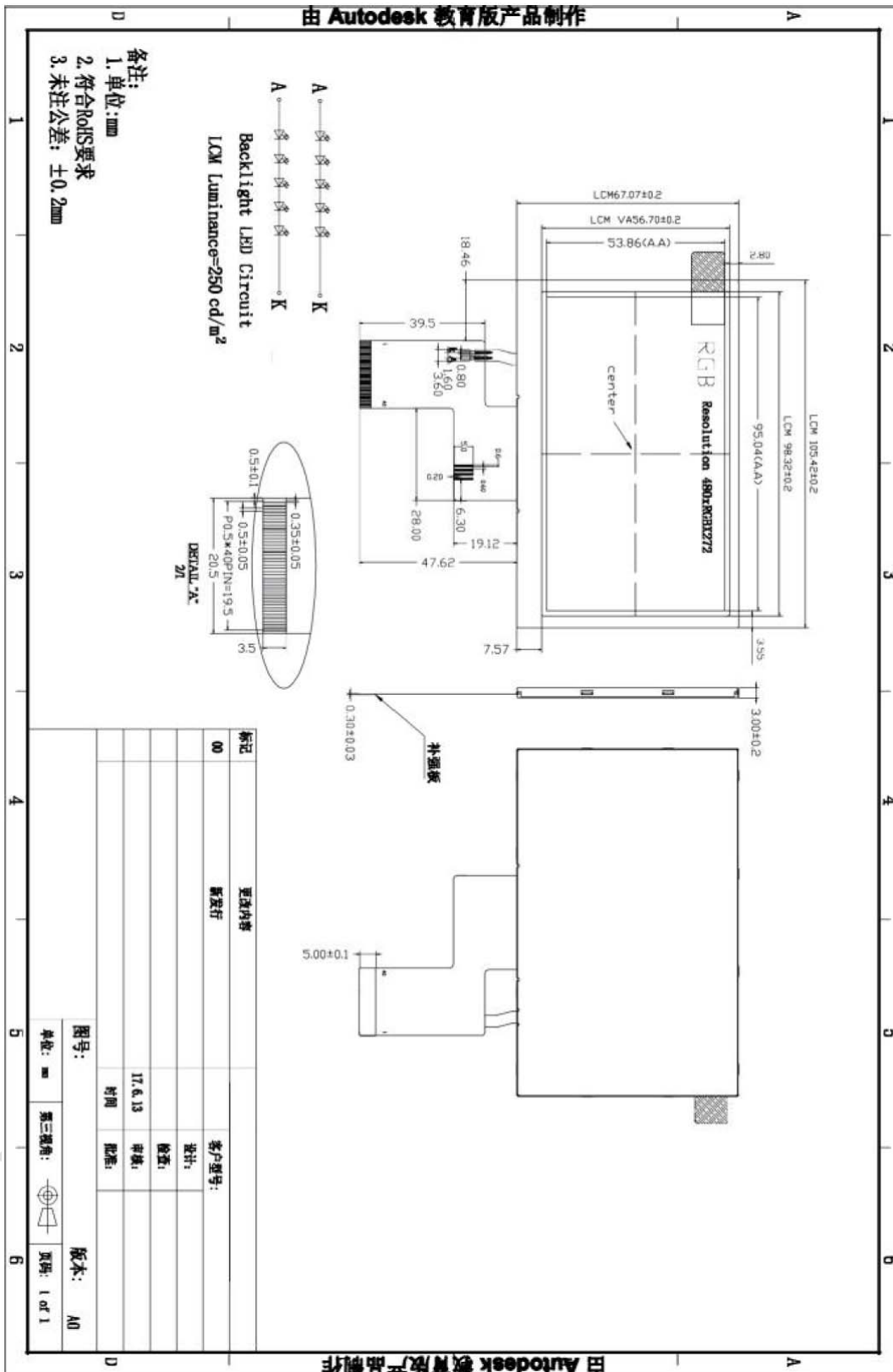
Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of sample.

Note3: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Note 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.

8. Outline Dimension



9 Packing Drawing

TBD

10 Precautions for Use of LCD Modules

a) Handling Precautions

- i. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- ii. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- iii. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- iv. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- v. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
 - Ketone
 - Aromatic solvents
- vi. Do not attempt to disassemble the LCD Module.
 - vii. If the logic circuit power is off, do not apply the input signals.
 - viii. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1 Be sure to ground the body when handling the LCD Modules.

10.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

b) Storage precautions

The information contained herein is the exclusive property of Shenzhen Youri Technology Co.,Ltd, and shall not be distributed, reproduced, or disclosed in whole or in part without prior written permission of Shenzhen Youri Technology Co.,Ltd

- i. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

ii. The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ~ 40℃ Relatively humidity: ≤80%

- iii. The LCD modules should be stored in the room without acid, alkali and harmful gas.

c) Transportation Precautions

- i. The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.