深圳市勋瑞光电科技有限公司
Xunrui photoelectric technology （shenzhen）CO,.LTD.

Product Specification

( ) Preliminary Specification

( ) Final Specification

Customer	
Model Name	H101BWS40I1K006
Description	Standard LCD Module 1024(RGB)x600 Dots 10.1" TFT LCD
Date	2023/09/05
Revision	A0

Engineering			
Check	**Date**	**Prepared**	**Date**

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1. Record of Revision

Rev	Issued Date	Description	Editor
A0	2023/09/05	FirstRelease.	gl.Liu

2 General Specifications

Feature		Spec
Characteristics	Size	10.1 inch
	Resolution	1024(horizontal)*600(Vertical)
	Interface	LVDS
	Connect type	Connector
	ColorDepth	16.7M
	Technology type	a-Si
	Pixelpitch(mm)	0.0725*0.2088
	Pixel Configuration	R.G.B.-Stripe
	Display Mode	Normally Black
	Driver IC	TBD
	Surface Treatment	HC
	ViewingDirection	FULLViewing
Mechanical	LCM(WxHxD)(mm)	235.0*143.0*5.1
	Active Area(mm)	222.72 x 125.28
	With/WithoutTSP	Without TSP
	Weight (g)	TBD
	LEDNumbers	42LEDs

Note 1: Viewing direction is follow the data which measured by optics equipment.
Note 2: Requirements on Environmental Protection: RoHS
Note 3: LCM weight tolerance: +/- 5%

3 Input/Output Terminals

No.	Symbol	Description
1	VCOM	Common Voltage
2	VDD	Power Voltage for digital circuit
3	VDD	Power Voltage for digital circuit
4	NC	No connection
5	RESET	Global reset pin
6	STBYB	Standby mode/Normal mode: Pull high/Pull Low
7	GND	Ground
8	RXIN0-	-LVDS differential data input
9	RXIN0+	+LVDS differential data input
10	GND	Ground
11	RXIN1-	-LVDS differential data input
12	RXIN1+	+LVDS differential data input
13	GND	Ground
14	RXIN2-	-LVDS differential data input
15	RXIN2+	+LVDS differential data input
16	GND	Ground
17	RXCLKIN-	-LVDS differential clock input
18	RXCLKIN+	+LVDS differential clock input
19	GND	Ground
20	RXIN3-	-LVDS differential data input
21	RXIN3+	-LVDS differential data input
22	GND	Ground
23	NC	No connection
24	NC	No connection
25	GND	Ground
26	NC	No connection
27	NC	No connection
28	SELB	6bit/8bit mode select H : 6bit / L : 8bit
29	AVDD	Power for Analog Circuit
30	GND	Ground
31	LED-	LED Cathode
32	LED-	LED Cathode

33	SHLR	Horizontal inversion
34	UPDN	Vertical inversion
35	VGL	Gate oFF Voltage
36	NC	No connection
37	NC	No connection
38	VGH	Gate ON Voltage
39	LED+	LED Anode
40	LED+	LED Anode

4 Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Digital Supply Voltage	V_{DD}	-0.3	3.96	V	
TFT Gate on Voltage	VGH	-0.3	40	V	
TFT Gate off Voltage	VGL	-20	0.3	V	
Analog power Supply Voltage	AVDD	-0.5	14.85	V	
Operating Temperature	T_{OPR}	-20	70	℃	
Storage Temperature	T_{STG}	-30	80	℃	
Humidity	R_H	-	90%	RH	

5 Electrical Characteristics

5.1 Typical Operation Conditions

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Digital Supply Voltage	DVDD	3	3.3	3.6	V	
TFTGateonVoltage	VGH	15	18	21	V	
TFTGateoffVoltage	VGL	-8	-6	-4	V	
AnalogpowerSupplyVoltage	AVDD	9.1	9.6	10.1	V	

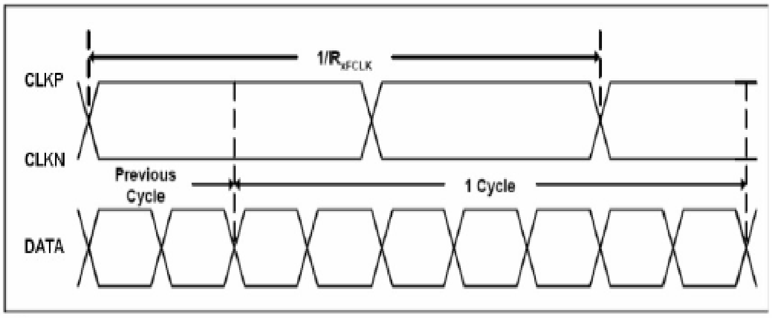
TFT Common electrode Voltage	VCOM	4.0	-	4.4	V	
Current Consumption of VDD	I_{DD}	-	40	50	mA	V_{DD}=3.3V
Current Consumption of AVDD	I_{AVDD}	-	8	15	mA	AV_{DD}=9.6V
Current Consumption of VGH Current Consumption of VGL	I_{VGH} I_{VGL}	-	0.5	15	mA	V_{GH}=18V V_{GL}=-6V

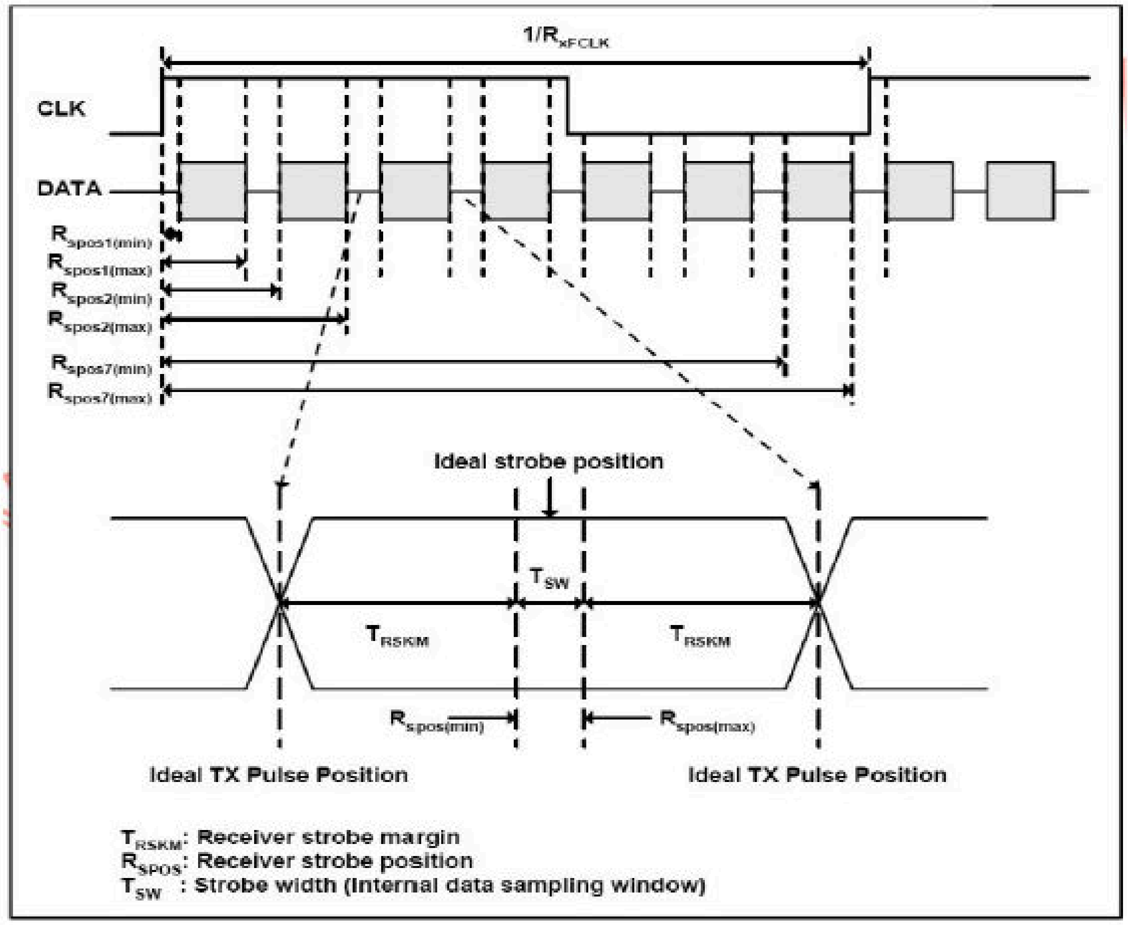
5.2Timing Characteristics

5.2.1 AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max		
Clock frequency	R_{XFCLK}	40.8	51.2	67.2	MHz	
Input data skew margin	T_{RSKM}	500	-	-	ps	
Clock high time	T_{LVCH}	-	$4/(7^{*}R_{XFCLK})$	-	ns	
Clock low time	T_{LVCL}	-	$3/(7^{*}R_{XFCLK})$	-	ns	

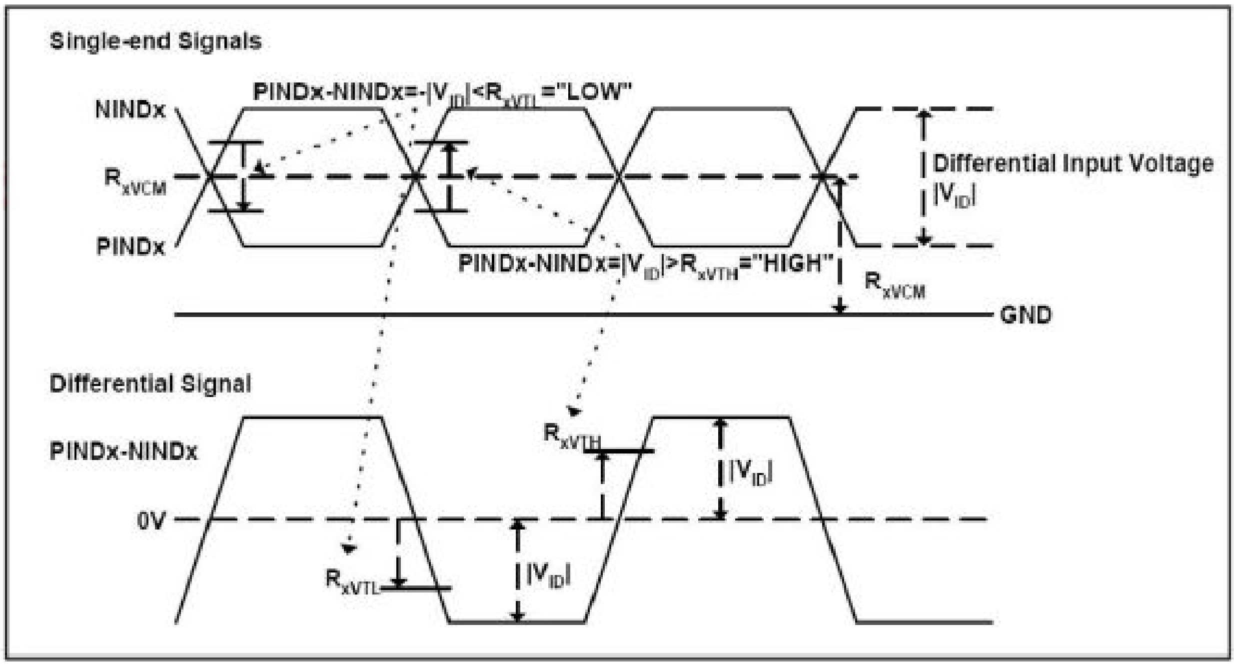
5.2.2 Input Clock and Data Timing Diagram





5.2.3 DC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max		
Differential input high threshold voltage	R_{XVTH}	-	-	+0.1	V	R_{XVCM}=1.2V
Differential input low threshold voltage	R_{XIN}	-0.1	-	-	V	
Input voltage range (single-end)	R_{XVTL}	0.0	-	2.4	V	
Differential input common mode voltage	R_{XVCM}	$\lvert V_{ID}\rvert/2$	-	$2.4-\lvert V_{ID}\rvert/2$	V	
Differential voltage	$\lvert V_{ID}\rvert$	0.2	-	0.6	V	
Differential input leakage current	RV_{XIIZ}	-10	-	+10	uA	

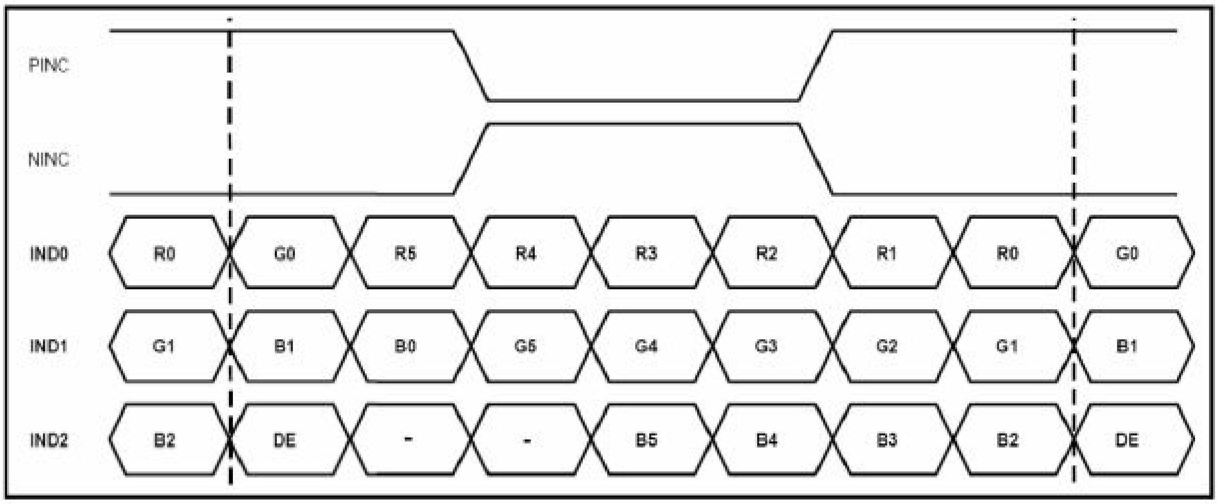


5.2.4 Timing

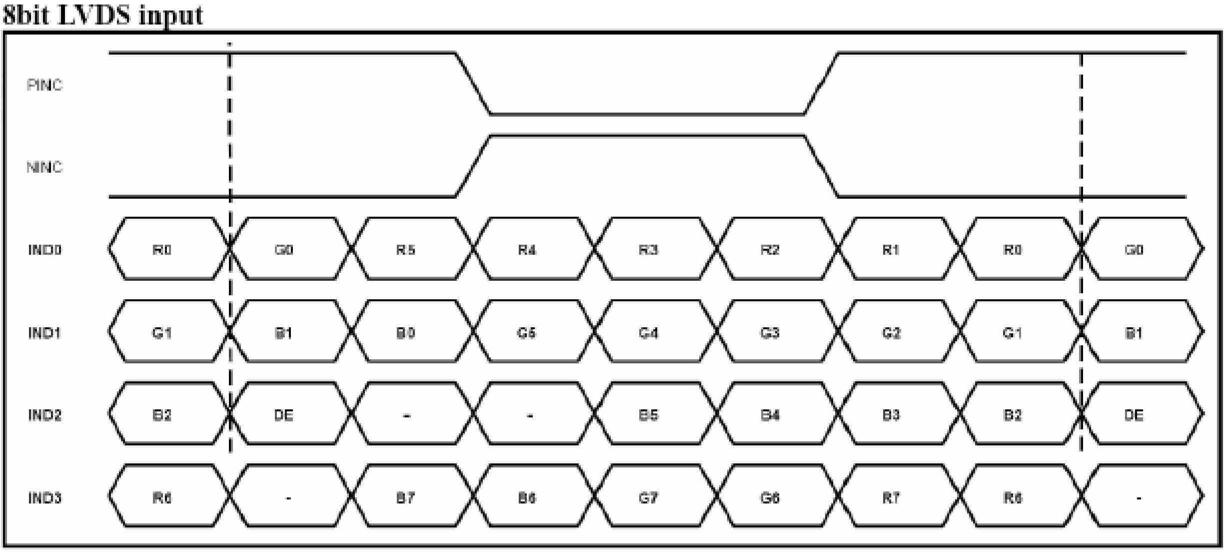
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max		
Clock frequency	fclk	40.8	51.2	67.2	MHz	Frame rate=60Hz
Horizontal display area	thd		1024		DCLK	
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb	90	320	376	DCLK	
Vertical display area	tvd		600		H	
VS period time	tv	610	635	800	H	
VS Blanking	thb	10	35	200	H	

5.2.4 Data Input Format

6bit LVDS input



8bit LVDS input



Note: Support DE timing mode only, SYNC mode not supported.

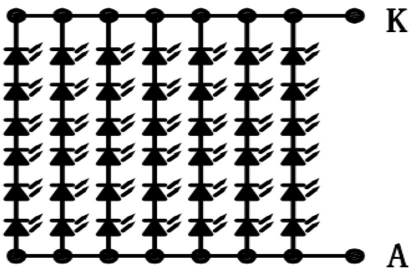
5.2.5 Reset Operation

Item	Symbol	Unit	Min.	Typ.	Max.
Reset low-level width	tRES	ms	1	-	-
Reset rise time	trRES	µs	-	-	10

5.4 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	210	-	mA	
Forward Voltage	V_F	16.2	18	19.2	V	
Backlight Power consumption	W_{BL}	-	3.78	-	W	

Note1:EachLED:IF=20mA,VF=3.0V.
Note 2: Optical performance should be evaluated at Ta=25℃ only.
Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced.Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.



LED 6串7并16.2V~19.2V 210mA

6 Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	70	80	-	Degree.	Note2
		θ_B		70	80	-		
		θ_L		70	80	-		
		θ_R		70	80	-		
Contrast Ratio		CR	Θ =0	800	1000	-		Note1, Note3
Response Time		T_{ON}	25° C	-	25	50	ms	Note1, Note4
		T_{OFF}		-				
Chromaticity	White	X_W	Backlight is on	0.269	0.289	0.360	-	Note1, Note5
		Y_W		0.303	0.323	0.343	-	
	Red	X_R		0.550	0.590	0.630	-	
		Y_R		0.300	0.340	0.380	-	
	Green	X_G		0.301	0.341	0.381	-	
		Y_G		0.554	0.594	0.634	-	
	Blue	X_B		0.117	0.157	0.197	-	
		Y_B		0.075	0.115	0.155	-	
Uniformity		U		75	80	-	%	Note1, Note6
NTSC				-	50	-	%	Note5
Luminance		L		850	1000	-	CD/M2	Note1, Note7

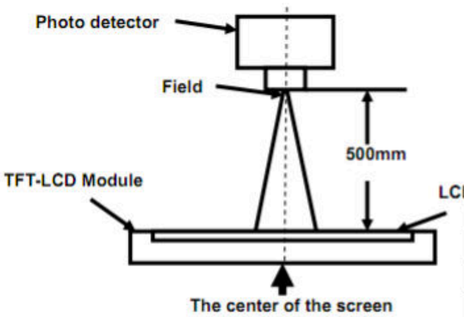
Test Conditions:

1.IF=210mA(onechannel),theambienttemperatureis25° C

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



Item	Photo detector	Field
Contrast Ratio	BM-7A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	SR-3A	2°

Note 2: Definition of viewing angle range and measurement system.
viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

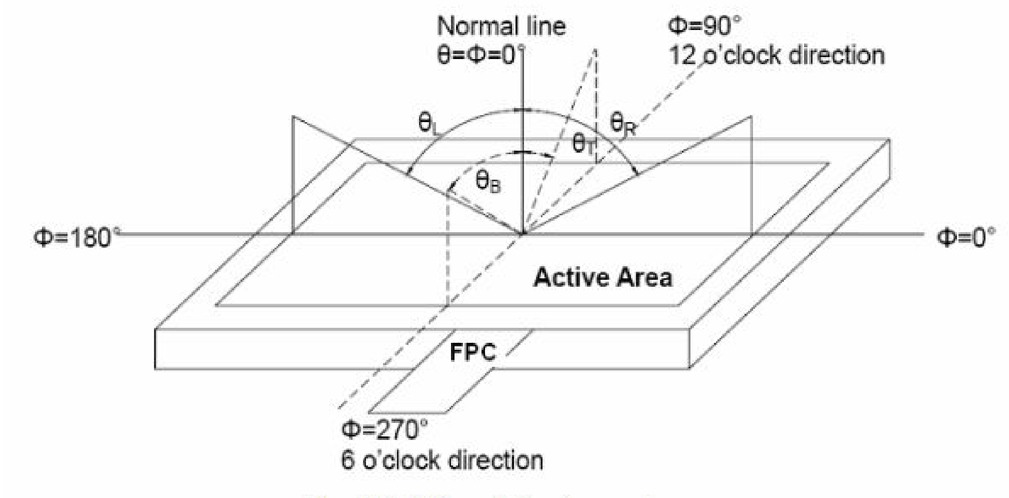


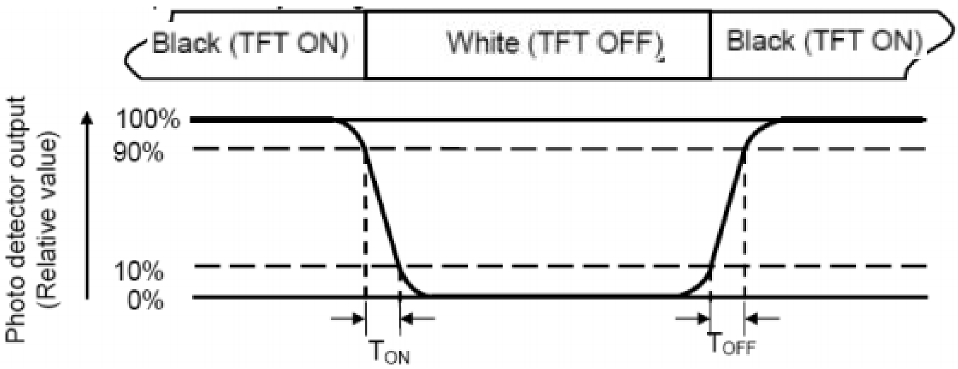
Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

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 (TON) is the time between photo detector output intensity changed from 10%to 90%.Andfalltime(TOFF) is the time between photodetector output intensity changed from 90%to10%.



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.

Luminance Uniformity(U) = Lmin/ Lmax X100%

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

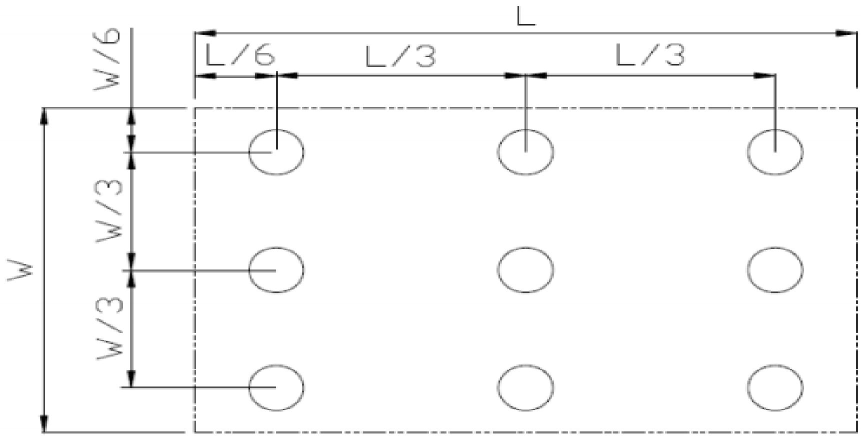


Fig. 2 Definition of uniformity

Lmax: The measured maximum luminance of all measurement position.

Lmin: The measured minimum luminance of all measurement position.

Note 7: Definition of Luminance :

Measure the luminance of white state at center point.

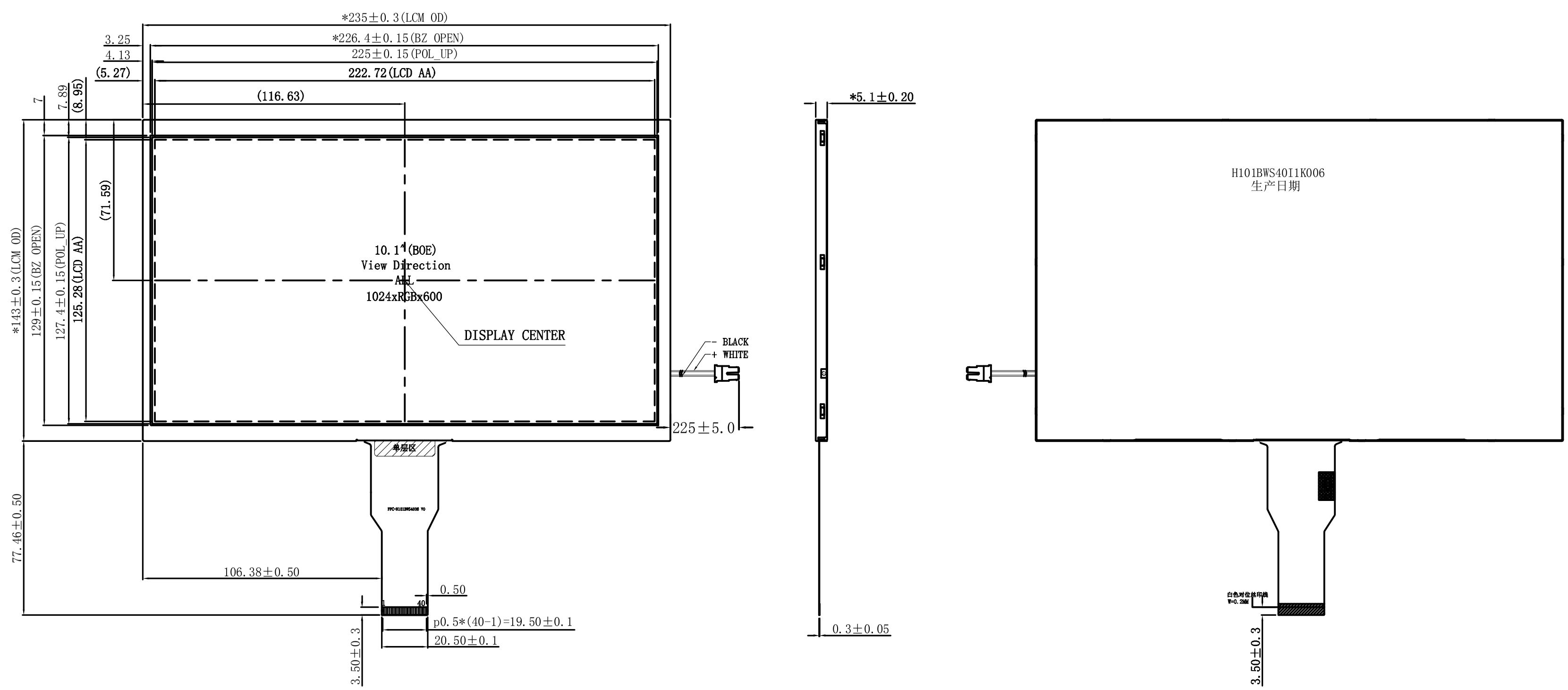
7 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Opeartion	Ts=+70 ℃,96hrs	
2	Low Temperature Opeartion	Ta=-20 ℃,96hrs	
3	High Temperature Storage	Ta=+80 ℃,96hrs	
4	Low Temperature Storage	Ta=-30 ℃,96hrs	
5	High Temperature & Humidity Storage	Ta= +60℃,90%RHmax,96hours	
6	Thermal Shock (Non-operation)	-30℃ 30min~+80 ℃ 30 min Changetime:5min,20Cycle	
7	Electro Static Discharge (Opeartion)	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15℃ ~ 35℃, 30% ~ 60%, 86Kpa ~ 106Kpa)	
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (package condition)	
9	Shock (Non-operation)	60G 6ms, ± X, ±Y, ± Z 3 times for each direction	
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	

Note: 1. T_S is the temperature of panel's surface.
2. Ta is the ambient temperature of sample.

8 Mechanical Drawing

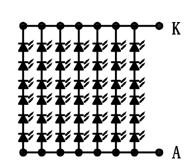
A0	2023.08.24	First issue



1	VCOM
2	VDD
3	VDD
4	NC
5	RESET
6	STBYB
7	GND
8	RXIN0-
9	RXIN0+
10	GND
11	RXIN1-
12	RXIN1+
13	GND
14	RXIN2-
15	RXIN2+
16	GND
17	RXCLKIN-
18	RXCLKIN+
19	GND
20	RXIN3-
21	RXIN3+
22	GND
23	NC
24	NC
25	GND
26	NC
27	NC
28	SELB
29	AVDD
30	GND
31	LED-
32	LED-
33	SHLR
34	UPDN
35	VGL
36	NC
37	NC
38	VGH
39	LED+
40	LED+

NOTES:

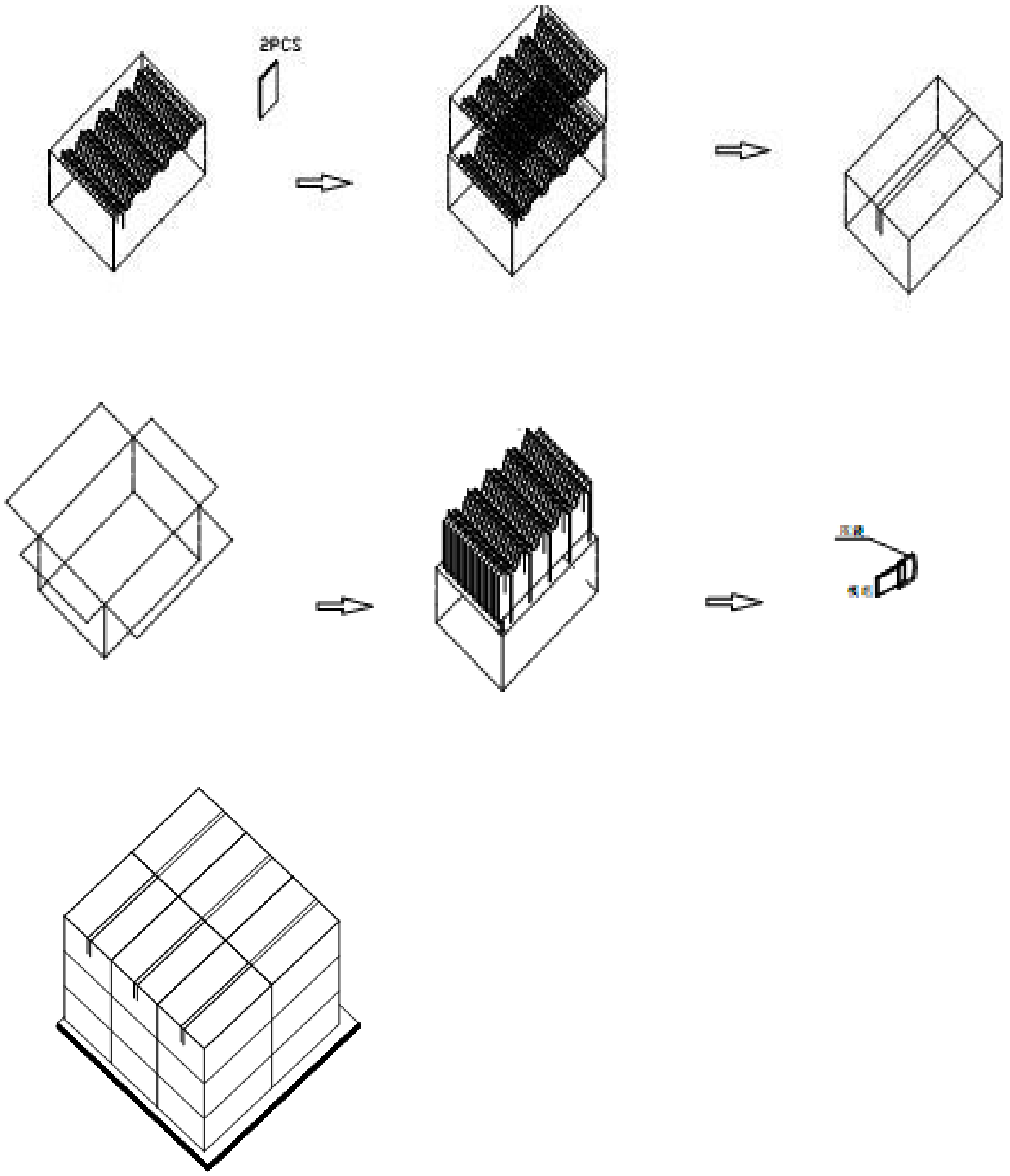
1. DISPLAY TYPE: 10.1 INCH TFT /BLACK
2. BACKLIGHT: 42 CHIP WHITE LED, IN PARALLEL
3. OPERATING TEMP: -20° C~+70° C
4. STORAGE TEMP: -30° c~+80° c
5. RESOLUTION: 1024xRGBx600
6. LCD IC: Source IC:TBD
7. Luminous instensity(CENTER):850cd/m^2(MIN),1000cd/m^2(TYP)
8. "( )"reference dimension. " * "critical dimension
9. RoHS Compliant



LED 6串7并16.2V~19.2V 210mA

INTERFACE	RGB Interface	深圳市勋瑞光电科技有限公司			
	FPC Connector	MODEL NAME TFT Display Module		PART NO. H101BWS40I1K006	
VIEWING DIRECTION	ALL	DWN		REV. A0	SHEET OF 1/1
		CHKD		TOLERANCE UNLESS SPECIFIED ±0.	
Gray Scale DIRECTION	FREE	PROJECTION 3RD ANGLE		UNIT mm	SCALE 1:1

9 Packing



10. Precautions For Use of LCD modules

10.1 Handling Precautions

10.1.1. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2. 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.

10.1.3. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5. 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

10.1.6. Do not attempt to disassemble the LCD Module.

10.1.7. If the logic circuit power is off, do not apply the input signals.

10.1.8. 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.

10.2 Storage Precautions

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

10.2.2. 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%

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

10.3 Transportation Precautions

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