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

Product Specification

Customer: _____

ModelName: H043BWV40I3580-CT1

Date: _____

Version: _____

■ **Preliminary Specification**

☐ **Final Specification**

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

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1. Record of Revision

Version	Revise Date	Content	Editor
A0	2023-02-01	FirstRelease.	

2 General Specifications

Feature		Spec
Characteristics	LCD Size	4.3 inch
	Display Format	800 (RGB) ×480
	Interface	24-bit RGB
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec.	0.1188 x 0.1122
	Display Mode	Normally Black
	Driver IC	ST7262
	Surface Treatment	HC
	Viewing Direction	ALL
	Gray Viewing Direction	FREE
Mechanical	LCM+CTP(WxHxD)(mm)	105.50*67.20*4.57
	Active Area(mm)	95.04x53.86
	With /Without TSP	WithTSP
	Weight (g)	TBD
	LED Numbers	7LEDs

Note 1: Viewing direction is following 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	VBL-	Backlight LED Cathode
2	VBL+	Backlight LED Anode.
3	GND	System Ground
4	VCC	Power supply for logic operation
5~12	R0~R7	Data bus
13~20	G0~G7	Data bus
21~28	B0~B7	Data bus
29	GND	System Ground
30	CLK	Pixel clock signal
31	DISP	Display on/off control
32	HSYNC	Horizontal Sync signal
33	VSYNC	Vertical Sync signal
34	DEN	Data Enable
35	NC	No connect
36	GND	System Ground
37	NC/XR	TP pin XR
38	NC/YD	TP pin YD
39	NC/XL	TP pin XL
40	NC/YU	TP pin YU

4 Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power Supply Voltage	VDD	- 0.3 ~ +4.0	V
IO Supply Voltage	VDDI	- 0.3 ~ +4.0	V
Charge Pump Supply Voltage	PVDD	- 0.3 ~ +4.0	V
Enhance Charge Pump Supply Voltage	PVDD1	- 0.3 ~ +4.0	V
Logic Input Voltage Range	VIN	-0.3 ~ VDDI + 0.3	V
Logic Output Voltage Range	VOUT	-0.3 ~ VDDI + 0.3	V
Operating Temperature Range	TOPR	-20~70	℃
Storage Temperature Range	TSTG	-30~80	℃

5 Electrical Characteristics

5.1 Operating conditions:

DC Electrical Characteristics (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip)

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	VDD	3.1	3.3	3.6	V	
IO Supply Voltage	VDDI	3.1	3.3	3.6	V	
Charge Pump Supply Voltage	PVDD	3.1	3.3	3.6	V	
Enhance Charge Pump Supply Voltage	PVDD1	3.1	3.3	3.6	V	

2 DC Characteristics for Digital Circuit

DC Electrical Characteristics (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip)

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Logic-High Input Voltage	Vih	0.7VDDI	-	VDDI	V	
Logic-Low Input Voltage	Vil	DGND	-	0.3VDDI	V	
Logic-High Output Voltage	Voh	VDDI-0.4	-	VDDI	V	
Logic-Low Output Voltage	Vol	DGND	-	DGND+0.4	V	

3 DC Characteristics for Analog Circuit

DC Electrical Characteristics (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip)

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Positive High-Voltage Power	VGHS	12	15	15.5	V	No Load@ FR=60Hz
Negative High-Voltage Power	VGL	-11.5	-10	-7	V	
Output Voltage Deviation	Vod	-	±40	±50	mV	
Standby Current	Isc	-	-	50	uA	
Operation Current	Ioc	-	50	-	mA	

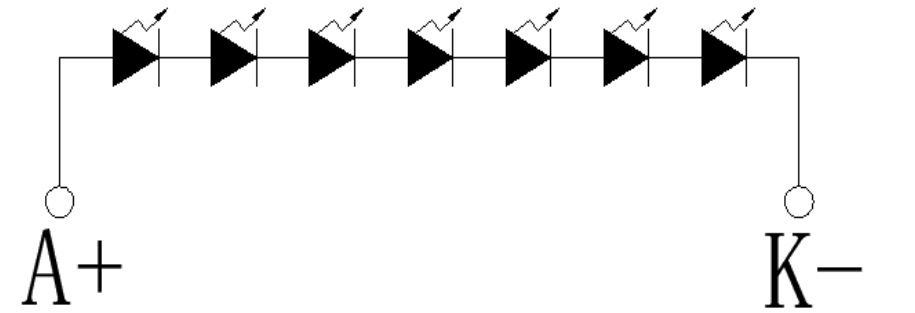
5.2 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
LED current	I_F	-	20	-	mA	
Power Consumption		-	-	-	mW	
LED Voltage	V_F	-	21	-	V	Note 1
LED Life Time	W_{BL}	25000	-	-	Hr	Note 2,3

Note1:Thereare1GroupsLED

Note 2 : Ta = 25℃

Note 3 : Brightess to be decreased to 50% of the initial value



BACKLIGHT CIRCUIT DIAGRAM:

(If=20mA, 19.6V~22.4V)

6 Interface Timing

6.1.1 Parallel 24-bit RGB Input Timing Table

Parallel 24-bit RGB Interface Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	23	25	27	MHz	
HSYNC	Period Time	Th	808	816	896	DCLK	
	Display Period	Thdisp		800		DCLK	
	Back Porch	Thbp	4	8	48	DCLK	
	Front Porch	Thfp	4	8	48	DCLK	
	Pulse Width	Thw	2	4	8	DCLK	
VSYNC	Period Time	Tv	492	496	504	HSYNC	
	Display Period	Tvdisp		480		HSYNC	
	Back Porch	Tvbp	6	8	12	HSYNC	
	Front Porch	Tvfp	6	8	12	HSYNC	
	Pulse Width	Tvw	2	4	8	HSYNC	

Note: 1. The minimum blanking time depends on the GIP timing of the panel specification

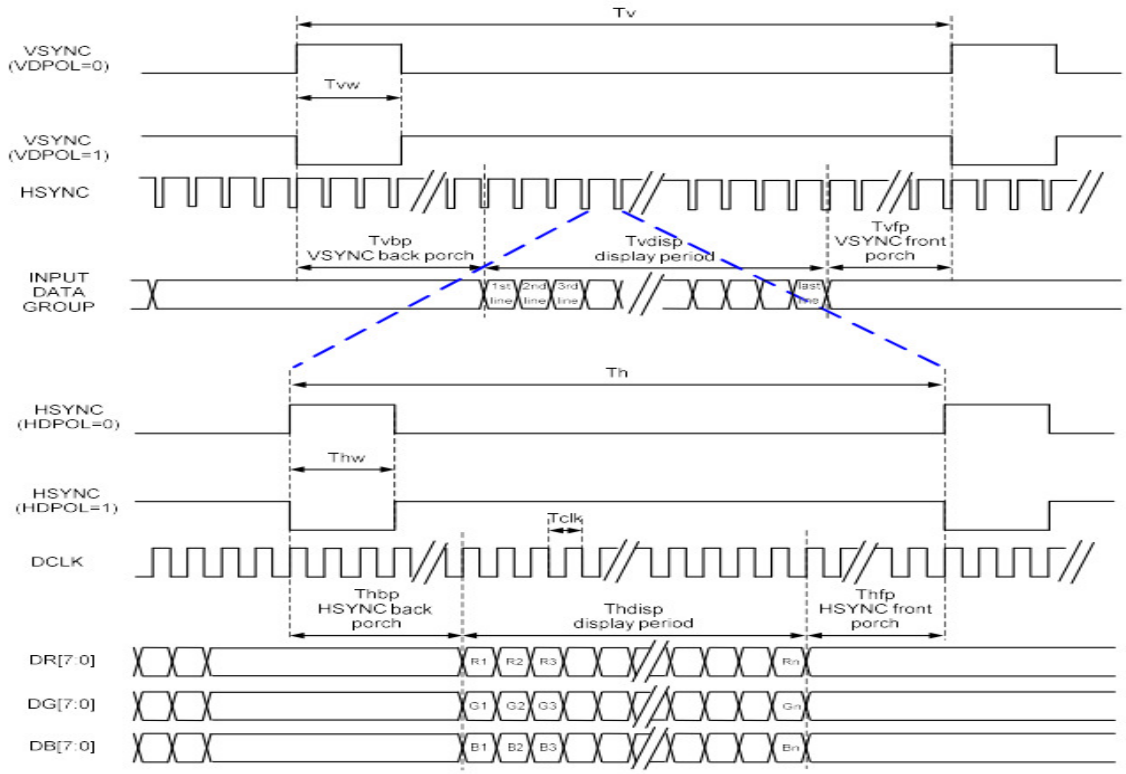
2. To ensure the compatibility of different panels, it is recommended to use the typical setting.

3. It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

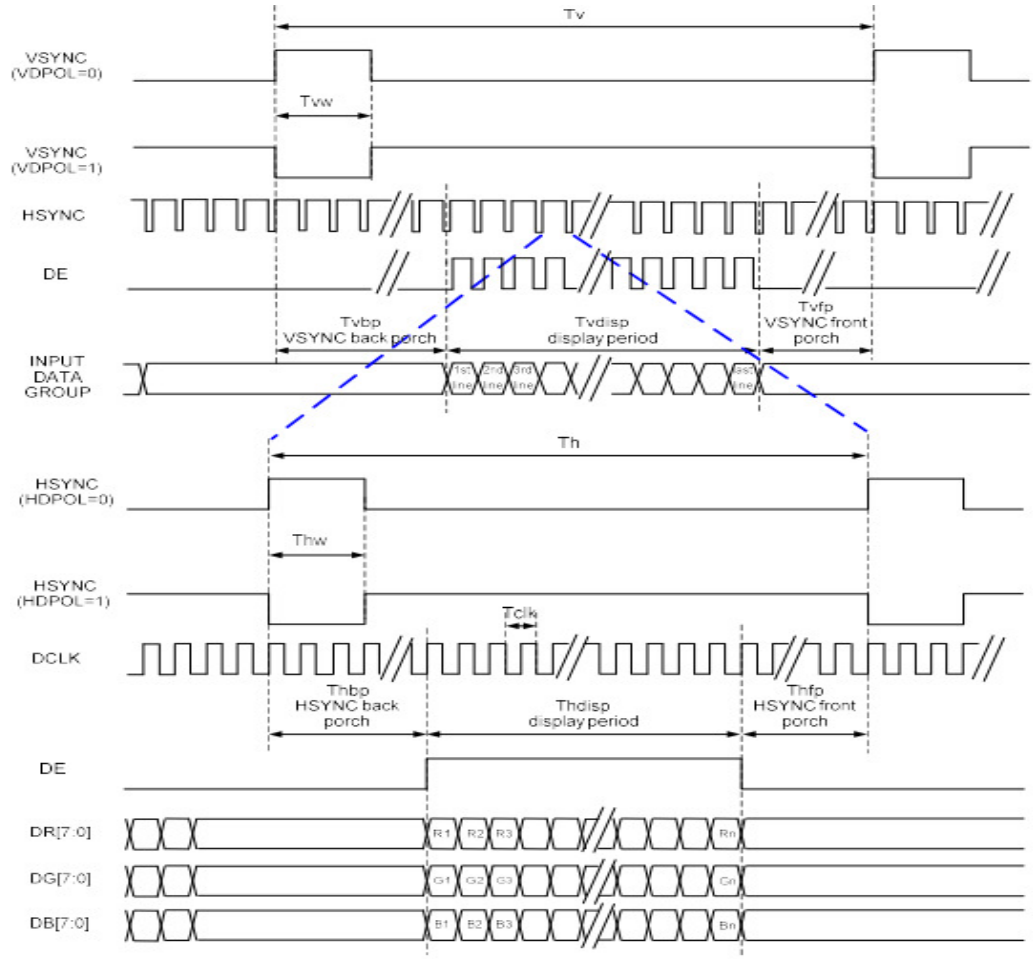
RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

Note: "Input" means these signals are driven by host side

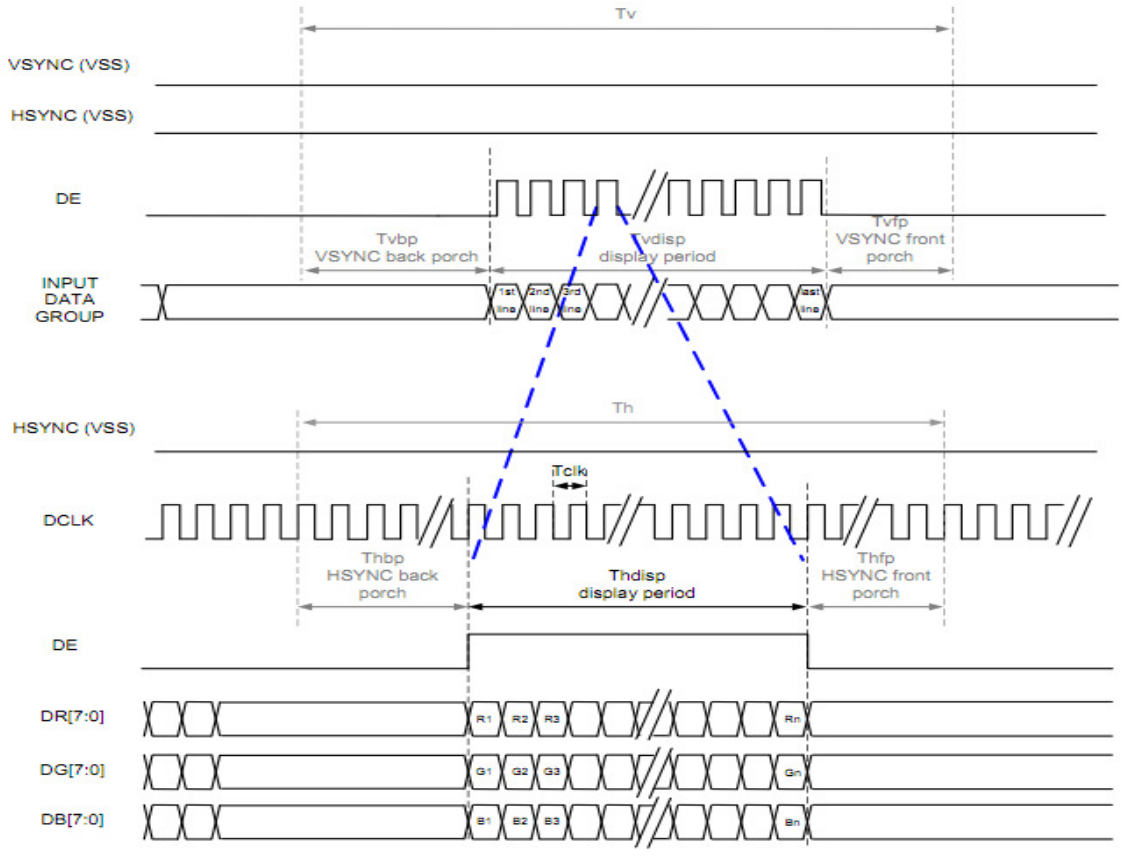
6.1.2 SYNC Mode Timing Diagram



6.1.3 SYNC-DE Mode Timing Diagram

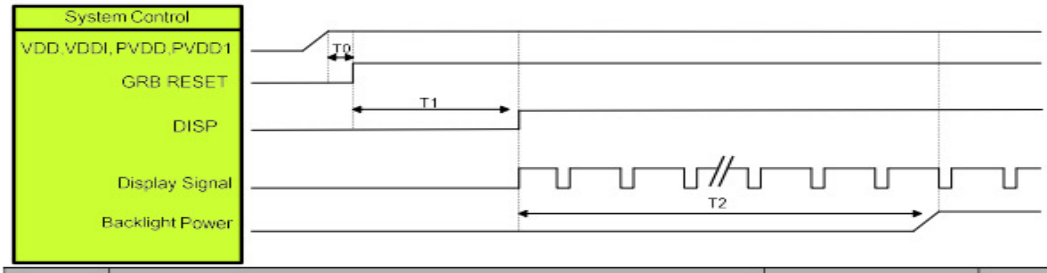


6.2 DE Mode Timing Diagram



6.3 Power ON/OFF Sequence

6.3.1 Power ON Sequence



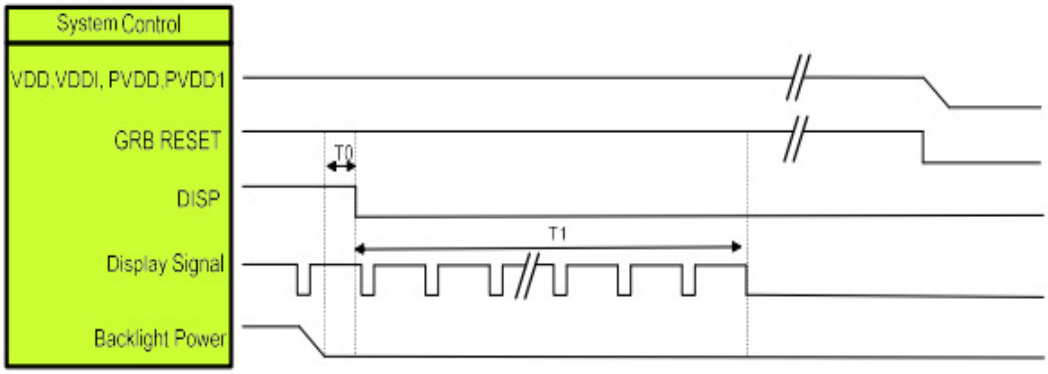
Symbol	Description	Min. Time	Unit
T0	System power stability to GRB RESET signal	0	ms
T1	GRB RESET= “High” to DISP=”High”	10	ms
T2	Display Signal output to Backlight Power on	250	ms

Note :

1. When DISP pull “H” or “L”, IC will execute the internal power on or power off procedures .Please be careful about the timing of DISP and do not interrupt it during power on or power off procedure, otherwise unexpected errors will occur.

2. RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

6.3.2 Power OFF Sequence



Symbol	Description	Min. Time	Unit
T0	Backlight Power off to DISP="Low"	5	ms
T1	DISP="Low" to IC internal voltage discharge complete	100	ms

Note :

1. When DISP pull “H” or “L”, IC will execute the internal power on or power off procedures. Please be careful about the timing of DISP and do not interrupt it during power on or power off procedure, otherwise unexpected errors will occur.

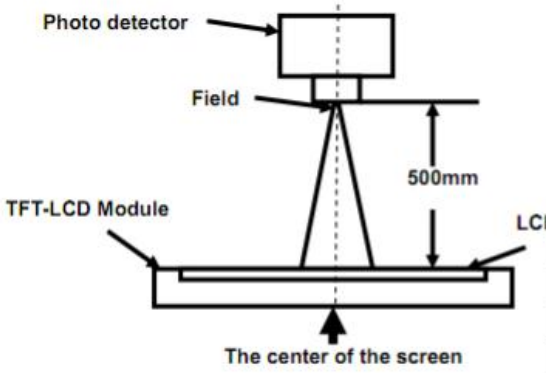
2. RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

7 Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	-	80	-	Degree.	Note2
		θ_B		-	80	-		
		θ_L		-	80	-		
		θ_R		-	80	-		
Contrast Ratio		CR	Θ =0	-	1200	-	-	Note1, Note3
Response Time		T_{ON}	25° C	-	30	45	ms	Note1, Note4
		T_{OFF}		-	30	45		
Chromaticity	White	X_W	Backlight is on	0.282	0.312	0.342	-	Note1, Note5
		Y_W		0.319	0.349	0.379	-	
	Red	~~X_R~~		0.609	0.639	0.669	-	
		Y_R		0.314	0.344	0.374	-	
	Green	~~X_G~~		0.264	0.294	0.324	-	
		Y_G		0.557	0.587	0.617	-	
	Blue	~~X_B~~		0.102	0.132	0.162	-	
		Y_B		0.106	0.136	0.166	-	
Uniformity		U		80	85		%	Note1, Note6
NTSC					50		%	Note5
Luminance		L			290			Note1, Note7

Test Conditions:
1.IF=20mA(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 be ground when measuring the center area of the panel.



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).

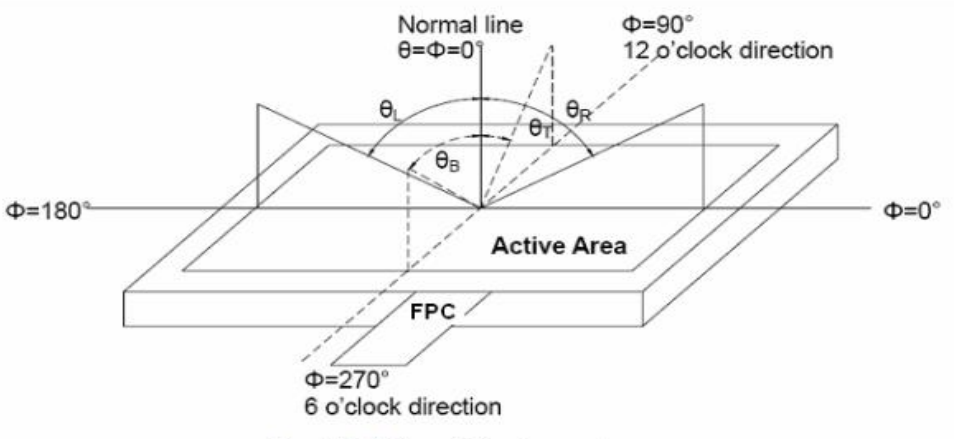


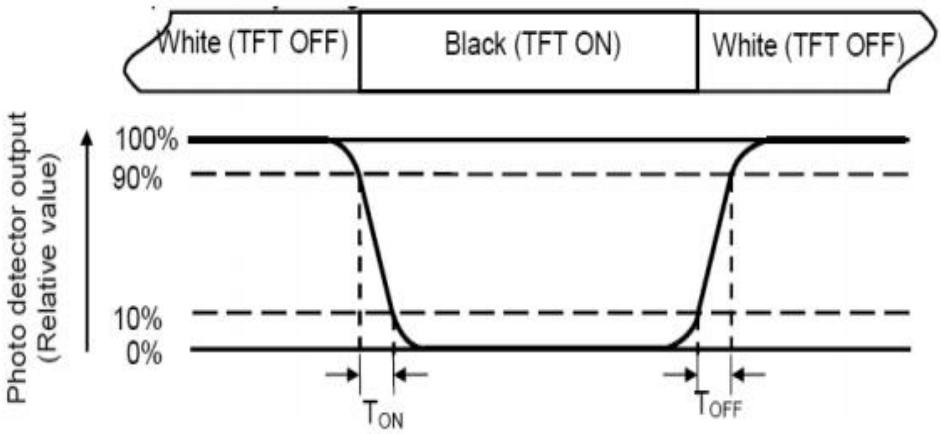
Fig. 1 Definition of viewing angle

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 90% to 10%. And fall time (TOFF) 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

Luminance Uniformity (U) = Lmin/ Lmax X100%

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

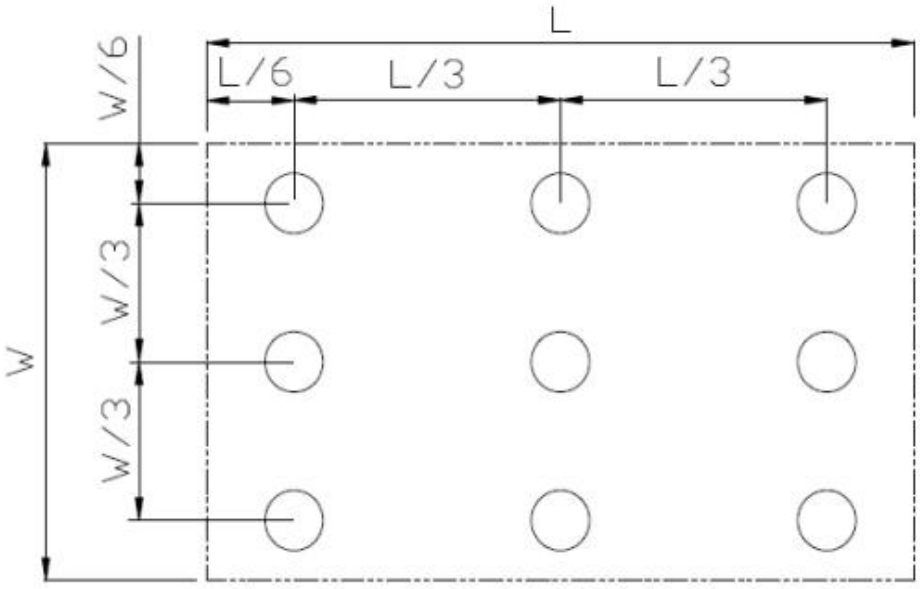


Fig. 2 Definition of uniformity

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.

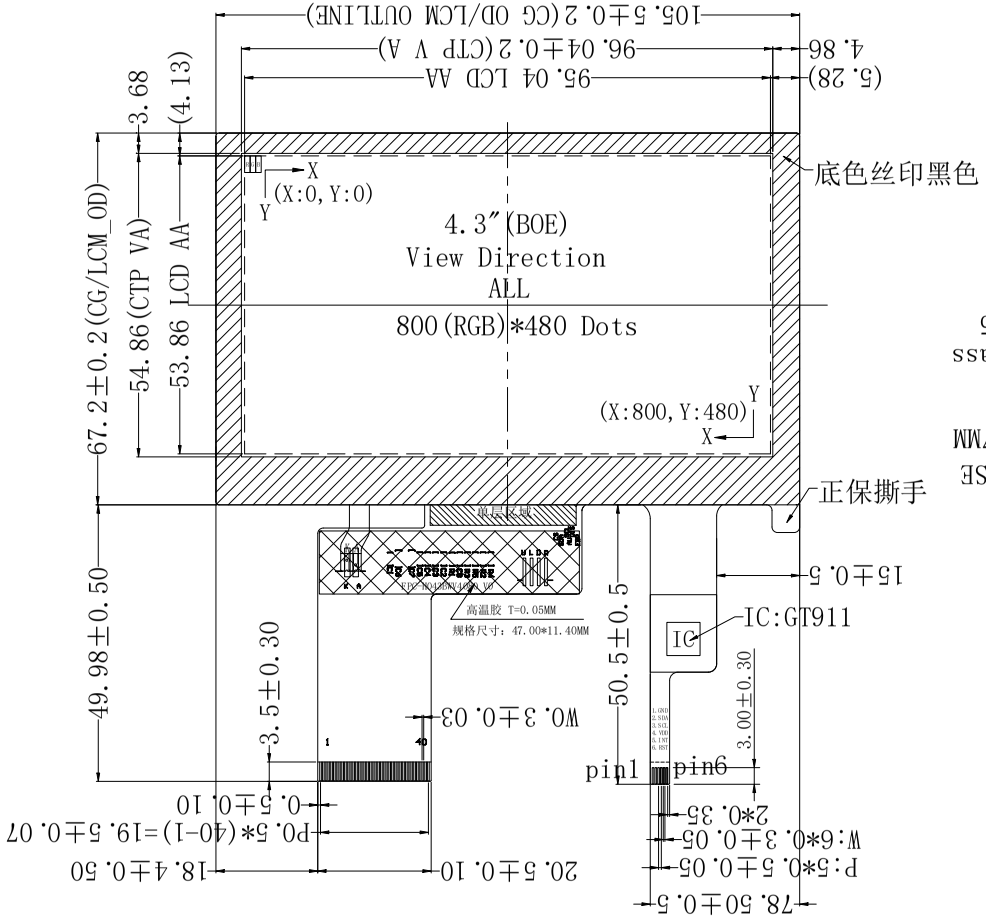
8 Environmental / Reliability Tests

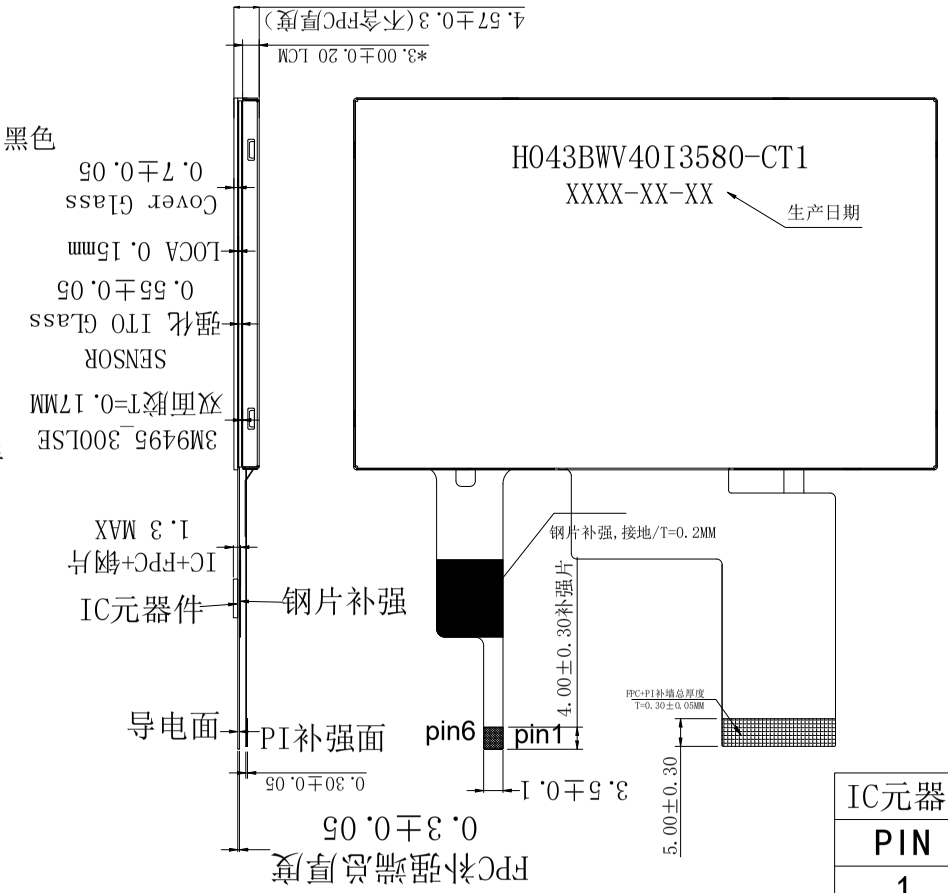
No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts=+70 ℃,96hrs	
2	Low Temperature Operation	Ta=-20 ℃,96hrs	
3	High Temperature Storage	Ta=+80 ℃,96hrs	
4	Low Temperature Storage	Ta= -30℃,96hrs	
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 160 hours	
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Changetime:5min,20Cycle	
7	Electro Static Discharge (Operation)	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: 60 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.

9 Mechanical Drawing

REV.	DATE	MODIFICATION
A0	2023/02/01	First issue



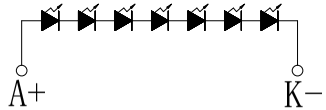


PIN	SYMBLE
1	LEDK
2	LEDA
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

IC元器件:GT911

PIN	定义
1	GND
2	SDA
3	SCL
4	VDD
5	INT
6	RST

电路图:



BACKLIGHT CIRCUIT DIAGRAM:

(If=20mA, 19.6V~22.4V)

NOTES:

1. DISPLAY TYPE:4.3 INCH TFT /TRANSMISSIVE
2. BACKLIGHT: 7 CHIP WHITE LED, IN PARALLEL
3. OPERATING TEMP: -20° C~+70° C
4. STORAGE TEMP: -30° c~+80° c
5. RESOLUTION: 800xRGBx480
6. Luminous instensity(9 AVG):Module:240cd/m2(MIN.), 290cd/m2(TYP.)
7. Uniformity:80%(Min)
8. LCD IC: ST7262E43-G4
9. "( )"reference dimension. "*"critical dimension
10. RoHS Compliant

CTP:技术参数:

1.结构G+G：Cover Glass+LOCA+ITO GLASS+FPC,Cover Glass:0.7mm，LOCA:0.15mm,ITO GLASS:0.55mm,总厚度：1.4±0.15mm;
2.IC型号：GT911(COF),5点触摸,通道数：15*9;工作电压:3.3V,
中断方式：下拉脉冲；FPC接口线为IIC标准接口,IO电压：2.8V；IIC地址：0X70;
3.透光率：≥83%;TP分辨率：X:800,Y:480(可按客户要求);
4.工作温湿度范围:-20℃~+70℃,≤90%RH;
储存温湿度范围:-30℃~+80℃，≤90%RH;
5.表面硬度：≥6H（铅笔硬度测试）;
6.Cover Glass材质：钢化玻璃(旭硝子);产品符合RoHS标准;
7.未标注公差 :±0.2;

INTERFACE	RGB Interface	深圳市灿瑞光电科技有限公司 Xunrui photoelectric technology (shenzhen) CO.,LTD.	
	FPC Connector	MODEL NAME TFT Display Module	PART NO. H043BWV40I3580-CT1
VIEWING DIRECTION	ALL	DWN	REV. A0 / SHEET OF 1/1
Gray Scale DIRECTION	FREE	CHKD	TOLERANCE UNLESS SPECIFIED ±0.3
		PROJECTION 3RD ANGLE	UNIT mm / SCALE 1:1

1 0.Packing

Packing Method

TBD

11. Precautions for Use of LCD modules

11.1 Handling Precautions

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

11.1.2. 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.

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

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

11.1.5. 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 ； Ketene ； Aromatic solvents

11.1.6. Do not attempt to disassemble the LCD Module.

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

11.1.8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

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

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

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

11.1.8.4. 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.

11.2 Storage Precautions

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

11.2.2. 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%

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

11.3 Transportation Precautions

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