PRODUCT SPECIFICATION

MODEL: S070IHLC24D

<◇>PRELIMINARY SPECIFICATION

<◆>APPROVAL SPECIFICATION

CUSTOMER
APPROVED BY
DATE:

DESIGNED	CHECKED	APPROVED

DOCUMENT REVISION HISTORY

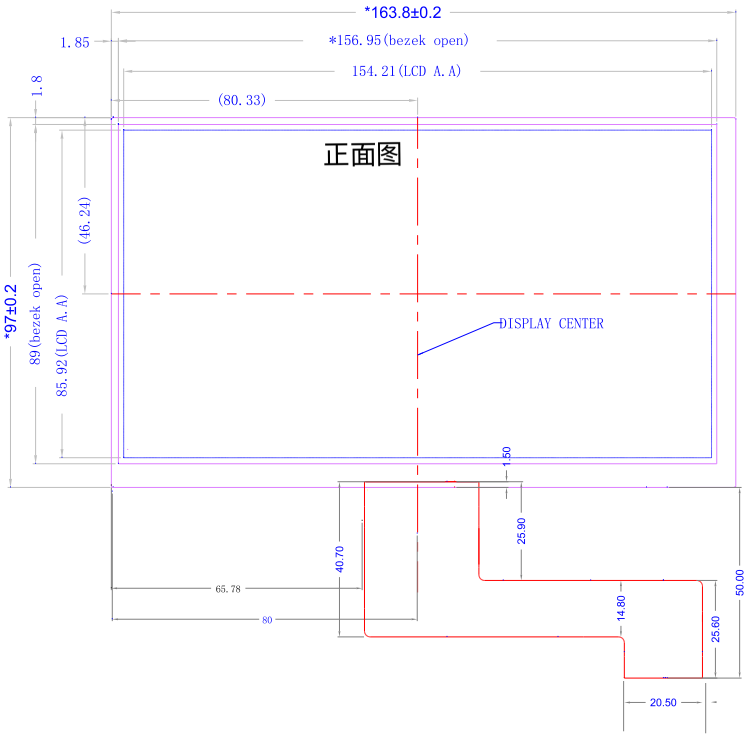
Version	DATE	DESCRIPTION	CHANGED BY
00	2018-09-28	First Issue	

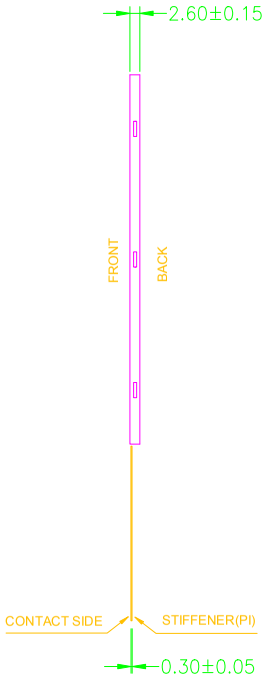
CONTENTS

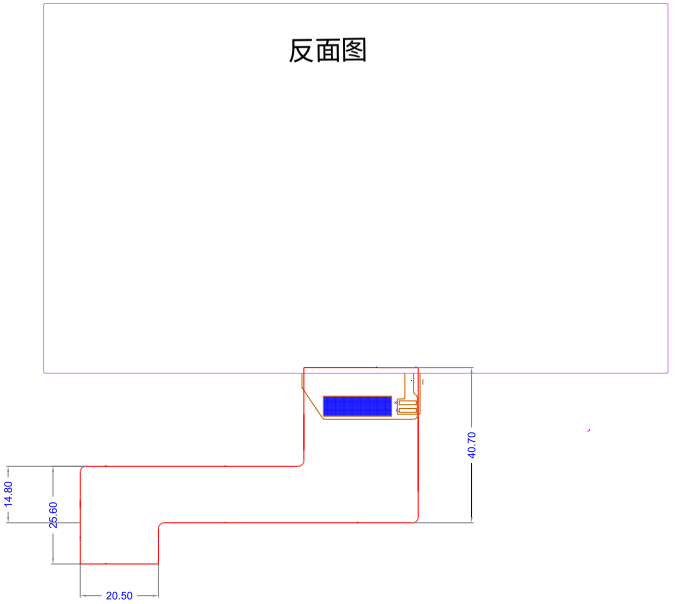
1. Features & Mechanical Specifications

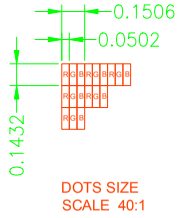
Item	Contents	Unit
	LCD	
LCD Type	TFT / Transmissive / Normally Black	--
Viewing direction	FULL VIEW	--
Backlight	White LED x 24	--
Interface	LVDS interface	--
LCM Outline Dimension	163.8(W) × 97.0(H) × 2.6(T)	mm
Glass area (W×H×T)	162.5 × 95.7 × 1.0	mm
Active area (W×H)	154.21 × 85.92	mm
Number of Dots	1024(RGB) ×600	--
Dot pitch (W×H)	0.0502 × 0.1432	mm
Pixel pitch (W×H)	0.1506 × 0.1432	mm
Operating Temperature	-20 ～ +70	℃
Storage temperature	-30 ～ +80	℃
Polarizer	Top: EWV film	--
	Bottom: EWV film	

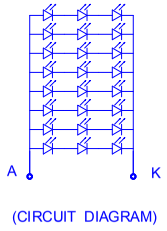
REV	DESCRIPTION:	DATE
00	First issue	2018-09-28

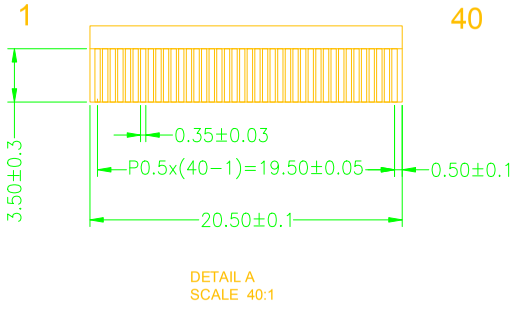












TFT SPECIFICATION:

1:DISPLAY MODE: 16.7M TFT TRAMSMISSIVE/NORMAL BLACK

2:VIEWING DIRECTION: FULL VIEW

3:OPERATING TEMP: -20°C～+70°C ≤90%RH

4:STORAGE TEMP: -30°C～+80°C ≤90%RH

5:BACKLIGHT: 24 CHIP WHITE LED, IN SERIAL, IF=160mA

6:UNSPECIFIED TOLERANCE: ±0.2

DESCRIPTION:	TFT MODULE OUTLINE		
SCALE:			
SHEET:			
GENERAL TOL: ±0.2	UNIT mm		
APPROVALS	DATE	MODEL NUMBER: S0701HLC24D	
APP:			
CHK:			
DWN:			PROJECTION

3. Pin Description

PIN No.	SYMBOL	Function
1	VCOM	Common Voltage
2，3	VDD	Digital Power
4	NC	Not connect
5	REST	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10K，C=1μF)
6	STBYB	Standby mode, normally pull high STBYB=”1”, normal operation STBYB=”0”,timing control, source driver will turn off
7	GND	Power ground
8	RXIN0-	Negative LVDS differential data inputs
9	RXIN0+	Positive LVDS differential data inputs
10	GND	Power ground
11	RXIN1-	Negative LVDS differential data inputs
12	RXIN1+	Positive LVDS differential data inputs
13	GND	Power ground
14	RXIN2-	Negative LVDS differential data inputs
15	RXIN2+	Positive LVDS differential data inputs
16	GND	Power ground
17	RXCLKIN-	Negative LVDS differential clock inputs
18	RXCLKIN+	Positive LVDS differential clock inputs
19	GND	Power ground
20	RXIN3-	Negative LVDS differential data inputs
21	RXIN3+	Positive LVDS differential data inputs
22	GND	Power ground
23，24	NC	Not connect
25	GND	Power ground
26	NC	Not connect
27	DIMO	Backlight CABC controller signal output
28	SELB	6bit/8bit mode select H : 6bit / L : 8bit
29	AVDD	Power for Analog Circuit
30	GND	Power ground
31，32	LED-	Backlight LED Cathode
33	L/R	Left or Right Display Control
34	U/D	Up or Down Display Control
35	VGL	Negative power for TFT
36，37	GND	Power ground
38	VGH	Positive power for TFT
39，40	LED+	Backlight LED Anode

4. Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Digital Supply Voltage	DVDD	-0.3 to +5.0	V
Operating Temperature range	TOP	-20 to +70	℃
Storage Temperature range	TST	-30 to +80	℃

5. Electrical Characteristics

DC Characteristics

Item	Symbol	Min.	Type.	Max.	Unit
Digital Power Supply Voltage	VDD	3.0	3.3	3.6	V
Analog Supply Voltage	AVDD	9.4	9.6	10.4	V
Gate On Voltage	VGH	17	18	19	V
Gate Off Voltage	VGL	-6.6	-6.0	-5.4	V
Common Voltage	VCOM	3.4	3.6	3.8	V

6. Backlight Characteristics

(White LED × 3 in series) × 8 in Parallel **(Ta = 25°C)**

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	VF	IF=160mA	8.0	9.1	9.8	V
Uniformity	△Bp	-	75	-	-	%
LCM Luminance	Lv	IF=160mA	250	-	-	cd/m^2

7. Electro-Optical Characteristics

(Taransmittance、contrast、RT、viewing angle results are using CPT LC+ EWV Polarizer+ CPT's BLU , reference only) (Note1，Note2)

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
Transmittance		T		3.8	4.1		%	
Contrast Ratio		CR	*1)	600	800	--	--	Note 3
Response Time		Tr+ Tf	*3)	-	25	40	ms	Note 4
NTSC				45%	50%	--		
Viewing Angle	Left	ϕ	CR≧10	80	85			Note 5
	Right	ϕ		80	85			
	Upper	θ		80	85			
	Lower	θ		80	85			
Color Filter Chromacicity with C light	White	x	θ=ϕ= 0°	0.27	0.290	0.31		Note 6
		y		0.311	0.331	0.351		
	Red	x	θ=ϕ= 0°	0.612	0.632	0.652		
		y		0.291	0.311	0.331		
	Green	x	θ=ϕ= 0°	0.277	0.297	0.317		
		y		0.516	0.536	0.556		
	Blue	x	θ=ϕ= 0°	0.12	0.140	0.16		
		y		0.134	0.154	0.174		

Note 1.Ambient condition：25℃±2℃，60±10%RH，under 10 Lunx in the darkroom。

Note 2.Measure device：BM-5A (TOPCON)，viewing cone= 1°，I_L=20mA。

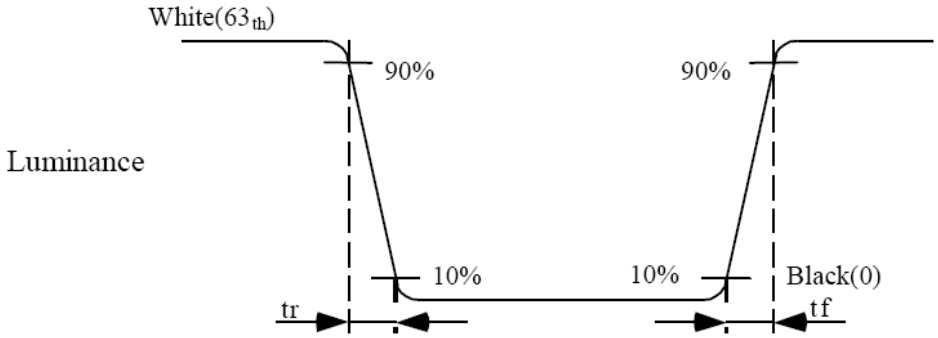


Fig. 6-1 Measuring point

Note 2: Definition of Viewing Angle(θ,ψ)

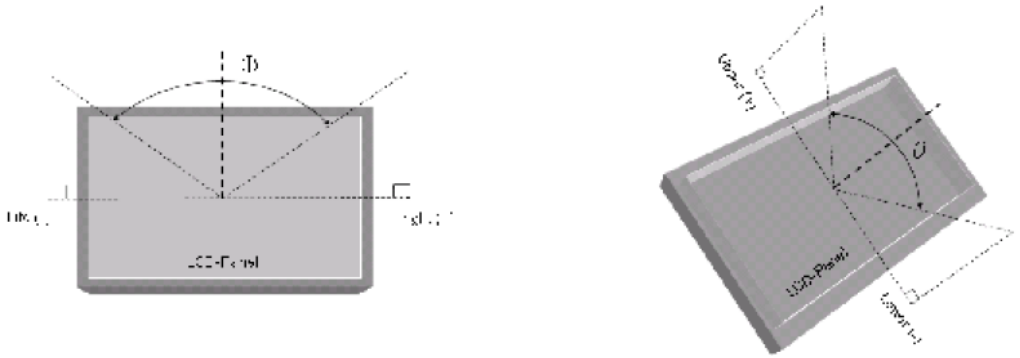


Fig.6-2 Definition of Viewing Angle

Note 3: Under C light

8. ELECTRICAL CHARACTERISTICS

LVDS mode AC electrical characteristics

Item				Symbol	Min.	Typ.	Max.	Unit
LVDS input signal sequence	CLK Frequency			tclk	45	51.2	57	MHz
LCD input signal sequence （Input LVDS Transmitter）	DENA	Horizontal	Horizontal total Time	t_H	1324	1344	1364	tCLK
			Horizontal effective Time	t_{HA}		1024		tCLK
			Horizontal Blank Time	t_{HB}	300	320	340	tCLK
		Vertical	Vertical total Time	t_V	625	635	645	t_H
			Vertical effective Time	t_{VA}		600		t_H
			Vertical Blank Time	t_{VB}	25	35	45	t_H

Timing Chart

Horizontal Timing Sequence

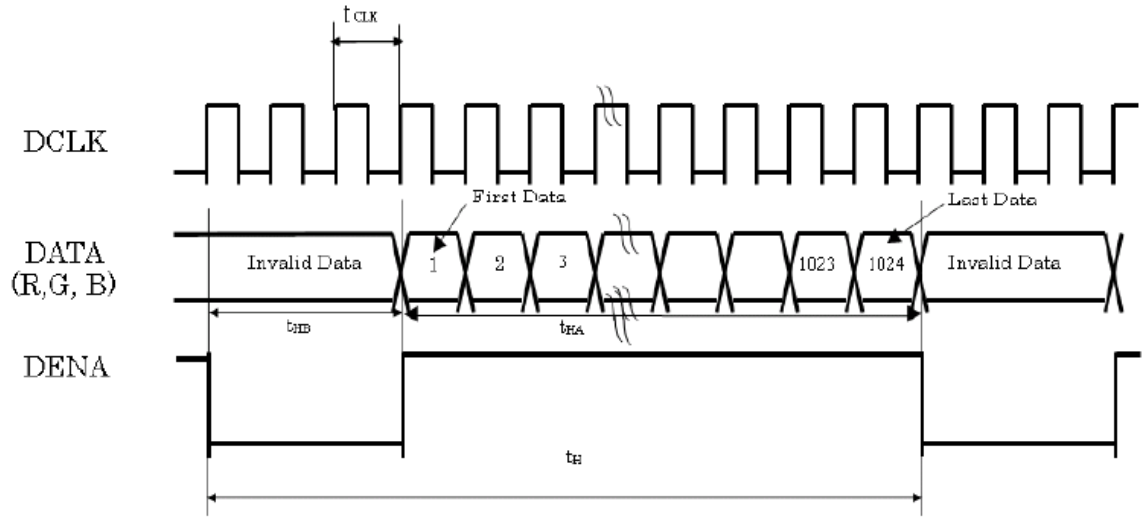
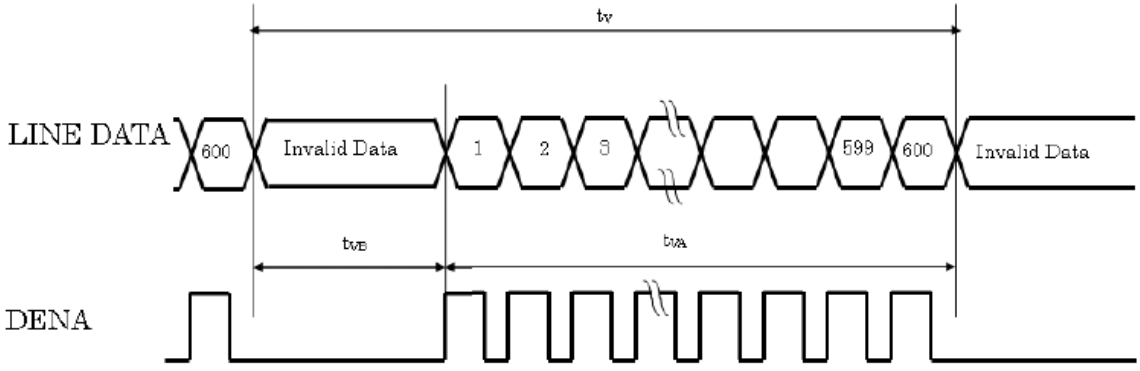


Figure 2. LVDS figure

Vertical Timing Sequence



LVDS mode data input format

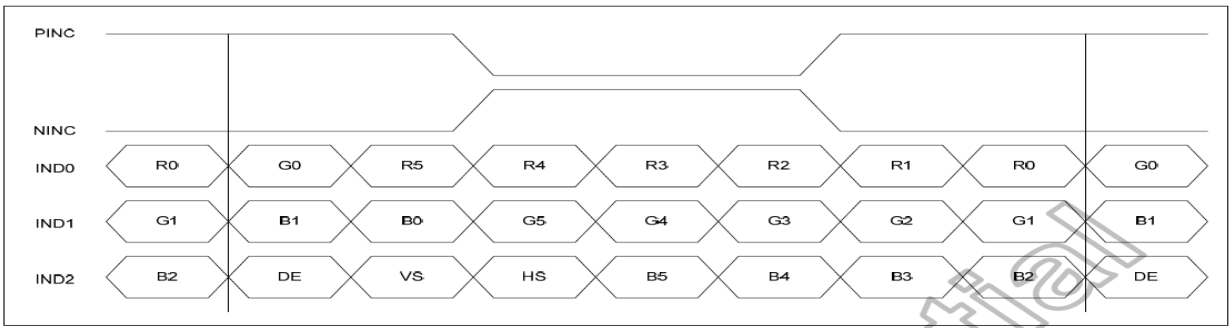


Figure 3. 6-bit LVDS input

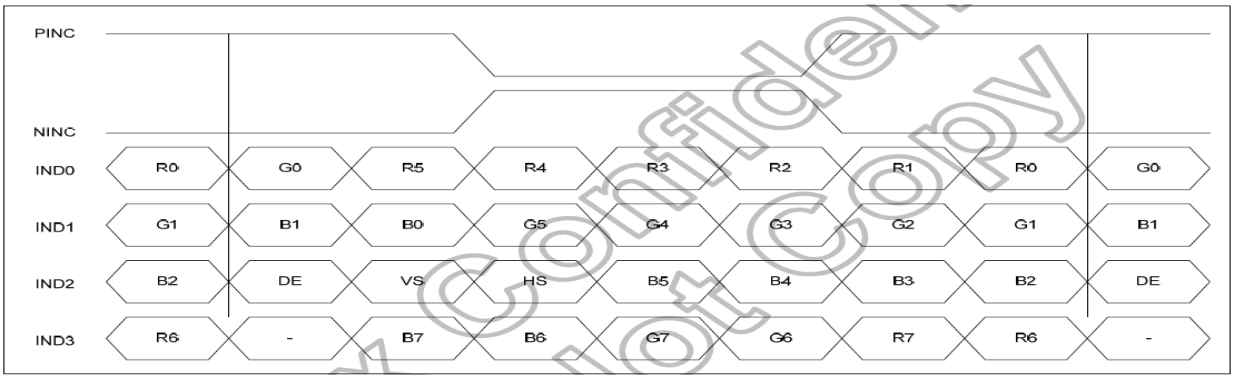


Figure 4. 8-bit LVDS input

Parallel RGB input timing table

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	Note
DCLK	Dot Clock	$1/t_{CLK}$	45	51.2	57	MHz	
	DCLK pulse duty	Tcwh	40	50	60	%	
DE	Setup Time	Tesu	5	-	-	ns	
	Hold time	Tehd	5	-	-	ns	
	Horizontal total Time	t_H	1324	1344	1364	t_{CLK}	
	Horizontal Valid	t_{HA}		1024		t_{CLK}	
	Horizontal Blank	t_{HB}	300	320	340	t_{CLK}	
	Vertical total Time	t_V	625	635	645	t_H	
	Vertical Valid	t_{VA}		600		t_H	
	Vertical Blank	t_{VB}	25	35	45	t_H	
SYNC	HSYNC Setup Time	Thst	5	-	-	ns	
	HSYNC Hold Time	Thhd	5	-	-	ns	
	VSYNC Setup Time	Tvst	5	-	-	ns	
	VSYNC Hold Time	Tvhd	5	-	-	ns	
	Horizontal total Time	th	1324	1344	1364	t_{CLK}	
	Horizontal Pulse Width	thpw		20	-	t_{CLK}	thb + thpw =160DCLK is fixed
	Horizontal Back Porch	thb		140	-	t_{CLK}	
	Horizontal Front Porch	thfp	140	160	180	t_{CLK}	
	Horizontal Valid	thd		1024		t_{CLK}	
	Vertical total Time	tv	625	635	645	th	
	Vertical Pulse Width	tvpw		3	-	th	tvpw + tvb = 23th is fixed
	Vertical Back Porch	tvb	-	20	-	th	
	Vertical Front Porch	tvfp	2	12	22	th	
	Vertical Valid	tvd		600		th	
DATA	Setup Time	Tdsu	5	-	-	ns	
	Hold Time	Tdhd	5	-	-	ns	

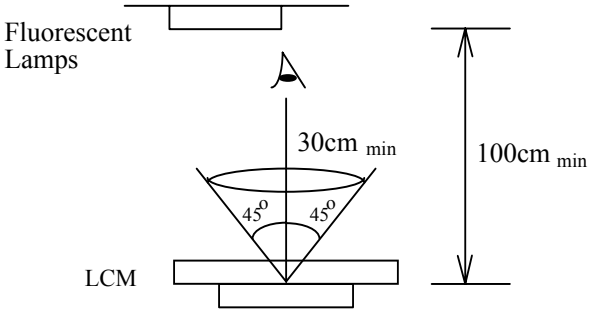
9. Quality Specifications

All The raw material are Rohs complicant.

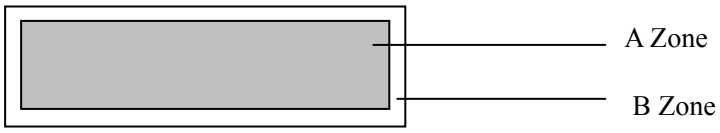
9.1. Standard of the product appearance test

Manner of appearance test: The inspection should be performed in using 20W x 2 fluorescent lamps. Distance between LCM and fluorescent lamps should be 100 cm or more. Distance between LCM and inspector eyes should be 30 cm or more.

Viewing direction for inspection is 45° from vertical against LCM.



Definition of zone:



A Zone: viewing area

B Zone: outside viewing area

9.3. Reliability of LCM

Reliability test condition:

Item	Condition	Time (hrs)	Assessment
High temp. Storage	80°C	48	No abnormalities in functions and appearance
High temp. Operating	70°C	48	
Low temp. Storage	-30°C	48	
Low temp. Operating	-20°C	48	
Humidity	60°C/ 90%RH	48	
Temp. Cycle	-30°C ← 25°C →80°C (60 min ← 5 min → 60min)	10cycles	

Recovery time should be 24 hours minimum. Moreover, functions, performance and appearance shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature (20+8°C), normal humidity (below 65% RH), and in the area not exposed to direct sun light.

9.4. Precaution for using LCD/LCM

LCD/LCM is assembled and adjusted with a high degree of precision. Do not attempt to make any alteration or modification. The followings should be noted.

General Precautions:

1. LCD panel is made of glass. Avoid excessive mechanical shock or applying strong pressure onto the surface of display area.
2. The polarizer used on the display surface is easily scratched and damaged. Extreme care should be taken when handling. To clean dust or dirt off the display surface, wipe gently with cotton, or other soft material soaked with isoproply alcohol, ethyl alcohol or trichlorotriflorothane, do not use water, ketone or aromatics and never scrub hard.
3. Do not tamper in any way with the tabs on the metal frame.
4. Do not made any modification on the PCB without consulting XINPENG.
5. When mounting a LCM, make sure that the PCB is not under any stress such as bending or twisting. Elastomer contacts are very delicate and missing pixels could result from slight dislocation of any of the elements.
6. Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels and also cause rainbow on the display.
7. Be careful not to touch or swallow liquid crystal that might leak from a damaged cell. Any liquid crystal adheres to skin or clothes, wash it off immediately with soap and water.

CMOS-LSI is used for the module circuit; therefore operators should be grounded whenever he/she comes into contact with the module.

Do not touch any of the conductive parts such as the LSI pads; the copper leads on the PCB and the interface terminals with any parts of the human body.

Do not touch the connection terminals of the display with bare hand; it will cause disconnection or defective insulation of terminals.

The modules should be kept in anti-static bags or other containers resistant to static for storage.

Only properly grounded soldering irons should be used.

If an electric screwdriver is used, it should be grounded and shielded to prevent sparks.

The normal static prevention measures should be observed for work clothes and working benches.

Since dry air is inductive to static, a relative humidity of 50-60% is recommended.

Soldering Precautions:

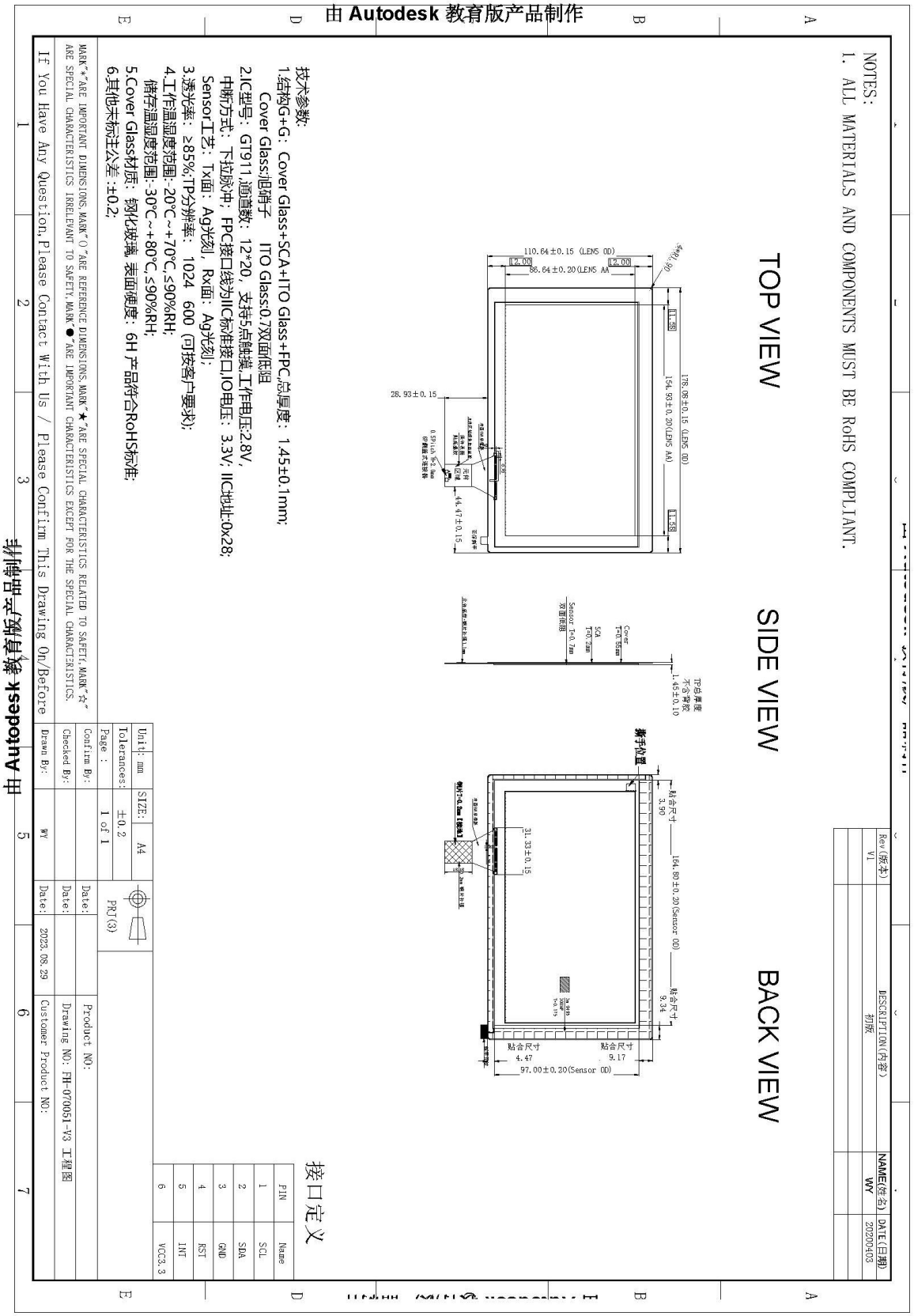
1. Soldering should be performed only on the I/O terminals.
2. Use soldering irons with proper grounding and no leakage.
3. Soldering temperature: 280°C±10°C
4. Soldering time: 3 to 4 second.
5. Use eutectic solder with resin flux filling.
6. If flux is used, the LCD surface should be protected to avoid spattering flux.
7. Flux residue should be removed.

Operation Precautions:

1. The viewing angle can be adjusted by varying the LCD driving voltage Vo.
2. Since applied DC voltage causes electro-chemical reactions, which deteriorate the display, the applied pulse waveform should be a symmetric waveform such that no DC component remains. Be sure to use the specified operating voltage.
3. Driving voltage should be kept within specified range; excess voltage will shorten display life.
4. Response time increases with decrease in temperature.
5. Display color may be affected at temperatures above its operational range.
6. Keep the temperature within the specified range usage and storage. Excessive temperature
7. and humidity could cause polarization degradation, polarizer peel-off or generate bubbles.
8. For long-term storage over 40°C is required, the relative humidity should be kept below 60%,
9. and avoid direct sunlight.

附件 **Attachment**

工程图 Engineering drawing

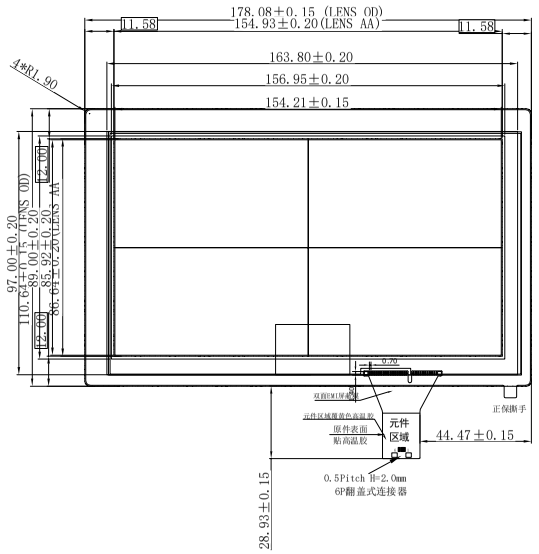


NOTES:

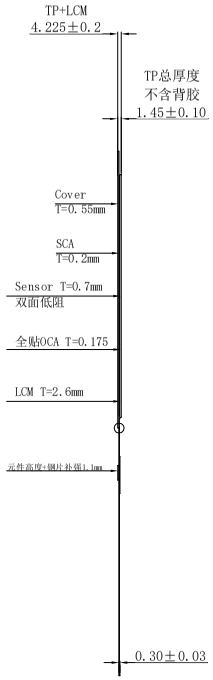
1. ALL MATERIALS AND COMPONENTS MUST BE RoHS COMPLIANT.

Rev(版本)	DESCRIPTION(内容)	NAME(姓名)	DATE(日期)
V1	初版	WY	20200403

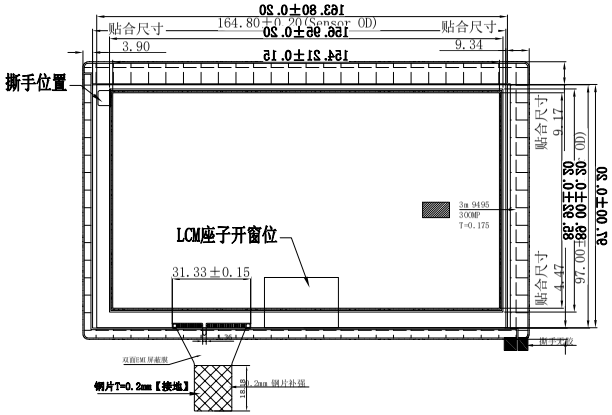
TOP VIEW



SIDE VIEW



BACK VIEW



技术参数:

1.结构G+G：Cover Glass+SCA+ITO Glass+FPC,总厚度：1.45±0.1mm;
Cover Glass:旭硝子 ITO Glass:0.7双面低阻

2.IC型号：GT911,通道数：12*20，支持5点触摸,工作电压:2.8V，
中断方式：下拉脉冲；FPC接口线为IIC标准接口,IO电压：3.3V; IIC地址:0x28;
Sensor工艺：Tx面：Ag光刻，Rx面：Ag光刻；

3.透光率：≥85%;TP分辨率： 1024 600 (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.Cover Glass材质：钢化玻璃, 表面硬度：6H 产品符合RoHS标准;

6.其他未标注公差 :±0.2;

接口定义

PIN	Name
1	SCL
2	SDA
3	GND
4	RST
5	INT
6	VCC3.3

Unit: mm	SIZE: A4	PRJ(3)			
Tolerances:	±0.2				
Page :	1 of 1				
Confirm By:		Date:		Product NO:	
Checked By:		Date:		Drawing NO: HK8.10GG.B070.5244.V1 工程图纸	
Drawn By:	WY	Date:	2020.04.03	Customer Product NO:	

MARK"*"ARE IMPORTANT DIMENSIONS,MARK"()"ARE REFERENCE DIMENSIONS,MARK"★"ARE SPECIAL CHARACTERISTICS RELATED TO SAFETY,MARK"☆" ARE SPECIAL CHARACTERISTICS IRRELEVANT TO SAFETY,MARK"●"ARE IMPORTANT CHARACTERISTICS EXCEPT FOR THE SPECIAL CHARACTERISTICS.

If You Have Any Question,Please Contact With Us / Please Confirm This Drawing On/Before