



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

Product Specification

Model Name	S070BWS101EP-FC106
Description	7.0" WSVGA 1024(RGB)x600 Dots
Date	2021/12/08
Version	2.0

Approved by/Date	Check by/Date	Prepared by/Date
ZHP 2021/12/08	HL 2021/12/08	ZWF 2021/12/08

Customer Approval	
Date	



Table of Contents

1. Record of Revision	3
2. General Specifications	4
3. Input/Output Terminals	5
4. Absolute Maximum Rating	6
5. Electrical Characteristics	6
6. Interface Timing	8
7. Optical Characteristics	10
8. Environmental / Reliability Tests	13
9. Mechanical Drawing	15
10. Packing	16
11. Precautions for Use of LCD modules	17



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2021/09/26	First Release	ZWF
2.0	2021/12/08	Update the PIN sequence of the CTP FPC	ZWF

2. General Specifications

	Feature	Spec
Characteristics	Size	7 inch
	Resolution	1024(horizontal)*600(Vertical)
	Interface	MIPI
	Connect type	Connector
	Display Colors	16.7M
	Technology type	a-Si
	Pixel pitch (mm)	0.150*0.143
	Pixel Configuration	R.G.B.-Stripe
	Display Mode	Normally Black
	LCD Driver IC	EK79007AD+EK73217BCGA
	CTP Driver IC	FT5446iDQQ
	Viewing Direction	Full view
Mechanical	LCM (W x H x D) (mm)	179.88*111.72*4.70
	Active Area(mm)	154.21 x85.92
	With /Without TSP	With TSP
	Weight (g)	TBD
	LED Numbers	30 LEDs

Note 1: Requirements on Environmental Protection: RoHs

Note 2: LCM weight tolerance: +/- 5%

3. Input/Output Terminals

LCD PIN-MAP

No	Symbol	Description
1	NC	No connect
2	VDD	Power supply for logic operation
3	VCCIO	Power supply for system.iovcc=1.8v
4	GND	GROUND
5	RST	Device reset signal
6	NC	No connect
7	GND	GROUND
8	MIPI_0N	MIPI Negative data signal(-)
9	MIPI_0P	MIPI Positive data signal(+)
10	GND	GROUND
11	MIPI_1N	MIPI Negative data signal(-)
12	MIPI_1P	MIPI Positive data signal(+)
13	GND	GROUND
14	MIPI_CKN	MIPI Negative data signal(-)
15	MIPI_CKP	MIPI Positive data signal(+)
16	GND	GROUND
17	MIPI_2N	MIPI Negative data signal(-)
18	MIPI_2P	MIPI Positive data signal(+)
19	GND	GROUND
20	MIPI_3N	MIPI Negative data signal(-)
21	MIPI_3P	MIPI Positive data signal(+)
22	GND	GROUND
23-24	NC	No connect
25	GND	GROUND
26	ID	ID
27	PWMO	PWM control signal for LED driver(CABC)
28	NC	No connect
29	NC	No connect
30	GND	GROUND
31~32	LED-	LED-
33~38	NC	No connect
39~40	LED+	LED anode

CTP PIN-MAP

Pin	Signal	Description
1	RST/WAKE	Reset /Wake UP
2	AVDD	Power supply
3	GND	Ground
4	INT	I2C Interrupt request to the host
5	SDA	I2C data input and output
6	SCL	I2C clock input

4. Absolute Maximum Rating

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Supply Voltage	VDD	-0.3	-	3.6	V	-
Operating Temperature	TOPR	-20	-	70	°C	-
Storage Temperature	TSTG	-30	-	80	°C	-

5. Electrical Characteristics

5.1 Driving TFT LCD Panel

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Supply Voltage	VDD	3.0	3.3	3.6	V	-
Power supply for LCD	VCCIO	1.7	1.8	2.0	V	
Current of power supply	I _{VDD}	-	140	160	mA	
Input voltage “H”level	VIH	0.7VDD	-	VDD	V	-
Input voltage “L”level	VIL	0	-	0.3VDD	V	

5.2 CTP Electrical Characteristics

FPC Design	Item	Description	Remark
COF	IC solution on TP Model	FT5446iDQQ	
	Touch Count Max	5 point	
	Display Resolution	1024*600	
	Interface Type	I2C	
	I2C Slave Address	OX70	
	Origin of Coordinate	Top left corner	

Parameter	Min	Typ	Max	Unit
Interface Signal Voltage	-	2.8	-	V
Power Voltage	VDD	3.3	-	V

5.3 LED Driving Conditions

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	220	-	mA	
Forward Voltage	V_F	8.1	-	10.2	V	
Backlight Power consumption	W_{BL}	1.78	-	2.24	W	
LED Lifetime		-	30000	-	Hrs	

Note 1: Each LED: $I_F = 22 \text{ mA}$, $V_F = 2.7 \sim 3.4 \text{ V}$.

Note 2: Optical performance should be evaluated at $T_a = 25^\circ \text{C}$ 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.

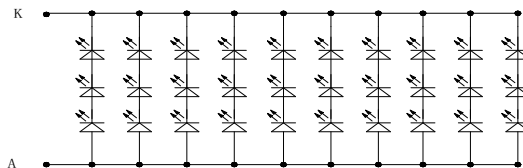


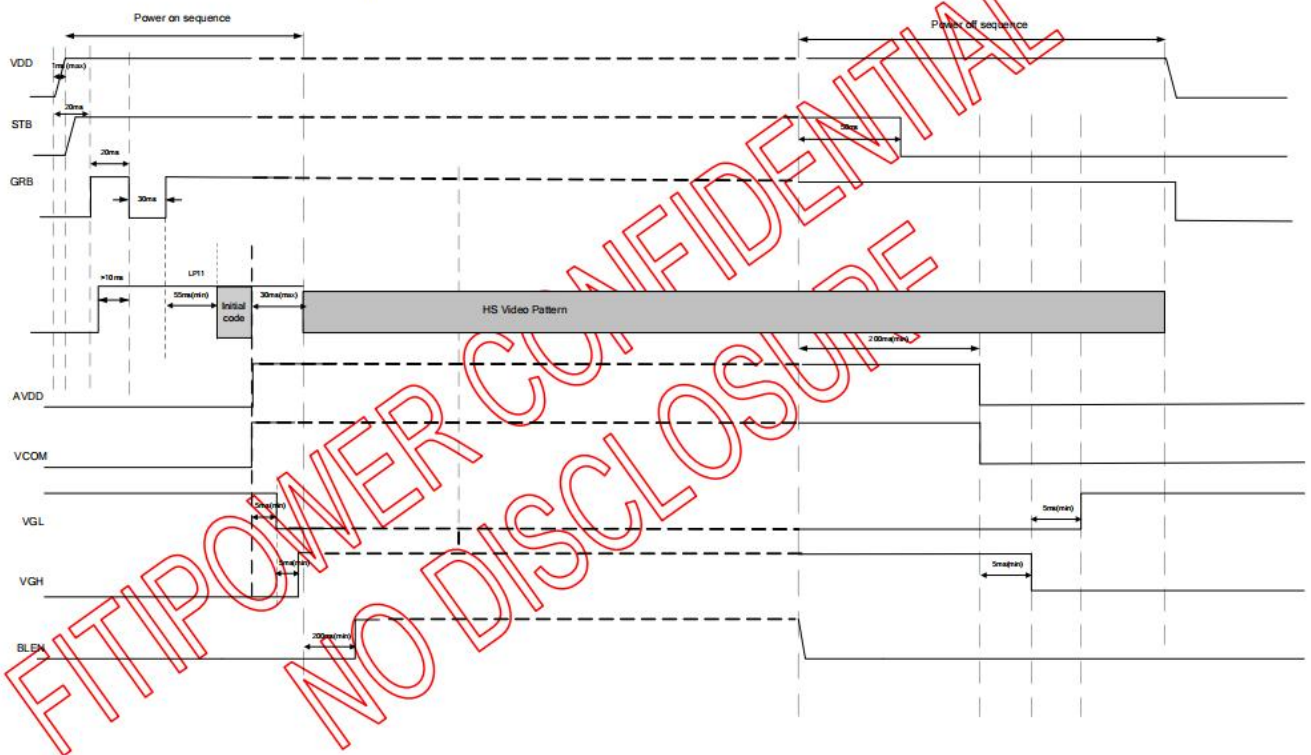
Figure: LED connection of backlight(Constant Current)

6. Interface Timing

6.1 Power sequence

In order to prevent IC from power on reset fail, the rising time (TPOR) of the digital power supply VDD should be maintained within the given specifications. Refer to “AC Characteristics” for more detail on timing.

10.1.1. Power On/Off Sequence

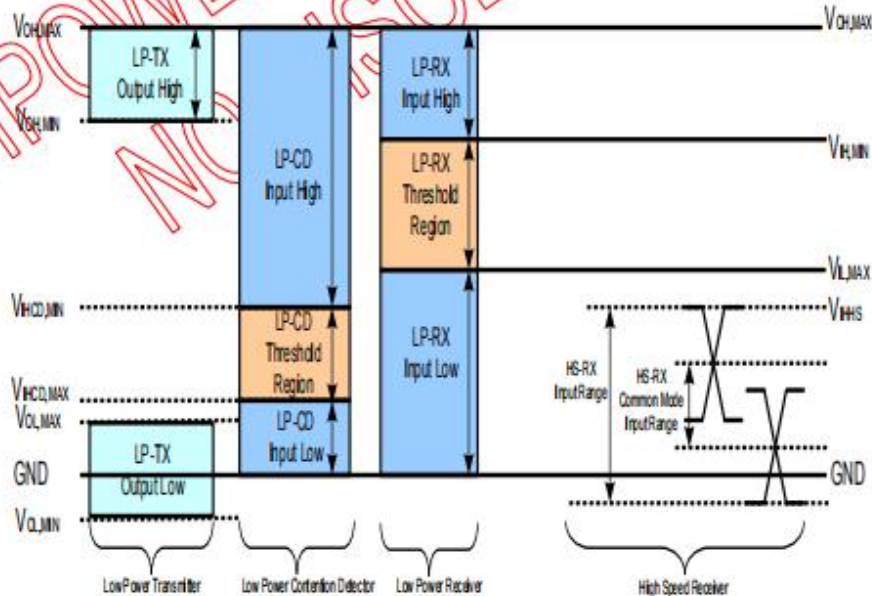


Note: CLK and Data Lanes should keep in LP11(stop state) before GRB.

6.2 Timing Characteristics

(VDD=VDD_IF=1.8V, AVDD=8 to 13.5V, GND=AGND=GND_IF=0V, TA=-20°C to 85°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
MIPI Characteristics for High Speed Receiver					
Single-ended input low voltage	VILHS	-40	-	-	mV
Single-ended input high voltage	VIHHS	-	-	460	mV
Common-mode voltage	VCDRXDC	70	-	330	mV
Differential input impedance	ZID		100		ohm
HS transmit differential voltage (VOD=VDP-VDN)	VOD	140	200	250	mV
MIPI Characteristics for Low Power Mode					
Pad signal voltage range	VI	-50	-	1350	mV
Ground shift	VGNDSH	-50	-	50	mV
Logic 0 input threshold	VIL	0	-	550	mV
Logic 1 input threshold	VIH	880	-	1350	mV
Input hysteresis	VHYST	25	-	-	mV
Output low level	VOL	-50	-	50	mV
Output high level	VOH	1.1	1.2	1.3	V
Output impedance of Low Power Transmitter	ZOLP	80	100	125	ohm
Logic 0 contention threshold	VILCD,MAX	-	-	200	mV
Logic 0 contention threshold	VIHCD,MIN	450	-	-	mV



7. Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Note
Response time		Tr+Tf	-	-	30	40	ms	FIG.1	Note4
Contrast Ratio		CR		500	800	-	-	FIG.2	Note1
Surface luminance		LV	$\theta = 0^\circ$	550	650	-	cd/m2	FIG.2	Note2
Luminance uniformity		Yu	$\theta = 0^\circ$	70	75	-	%	FIG.2	Note3
NTSC		-	$\theta = 0^\circ$	-	50	-	%	FIG.2	Note5
Viewing angle		θ_T	Center CR ≥ 10	-	85	-	deg	FIG.3	Note6
		θ_B		-	85	-	deg	FIG.3	
		θ_L		-	85	-	deg	FIG.3	
		θ_R		-	85	-	deg	FIG.3	
Chromaticity	Red	R _X	$\theta = 0^\circ$ $\phi = 0^\circ$ Ta=25°	0.549	0.599	0.649	-	FIG.2 CIE1931	Note5
		R _Y		0.288	0.338	0.388	-		
	Green	G _X		0.249	0.299	0.349	-		
		G _Y		0.500	0.550	0.600	-		
	Blue	B _X		0.089	0.139	0.189	-		
		B _Y		0.081	0.131	0.183	-		
	White	W _X		0.258	0.308	0.358	-		
		W _Y		0.286	0.336	0.386	-		

Note1. Definition of contrast ratio

Contrast ratio(Cr) is defined mathematically by the following formula. For more information see FIG.2.

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

For contrast ratio, Surface Luminance, Luminance uniformity and CIE, the testing data is base on TOPCON' s BM-5 or BM-7 photo detector or compatible.

Note2. Definition of surface luminance.

Surface luminance is the luminance with all pixels displaying white. For more information see FIG.2.

Lv = Average Surface Luminance with all white pixels(P1,P2,P3,,Pn)

Note3. Definition of luminance uniformity

The luminance uniformity in surface luminance is determined by measuring luminance at each test position 1 through n, and then dividing the maximum luminance of n points luminance by minimum luminance of n points luminance. For more information see FIG.2.

$$YU = \frac{\text{Minimum surface luminance with all white pixels (P1,P2,P3,.....,Pn)}}{\text{Maximum surface luminance with all white pixels (P1,P2,P3,.....,Pn)}}$$

Note4. 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_r) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_f) is the time between photo detector output intensity changed from 10% to 90%.

For additional information see FIG1.

Note5. Definition of color chromaticity (CIE1931)

CIE (x,y) chromaticity, The x,y value is determined by screen active area center position P5. For more information see FIG.2.

Note6. Definition of viewing angle

Viewing angle is the angle at which the contrast ratio is greater than 10. Angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG.3.

For viewing angle and response time testing, the testing data is base on Autronic-Melchers' s ConoScope or DMS series Instruments or compatible.

FIG.1. The definition of response Time

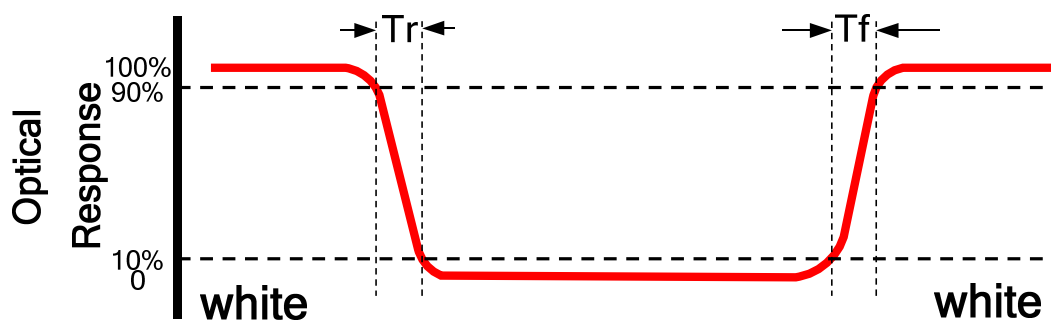


FIG.2. Measuring method for contrast ratio, surface luminance,

luminance uniformity, CIE (x,y) chromaticity

Size : $S \leq 5"$ (see Figure a) A : 5 mm B : 5 mm

H,V : Active area

Light spot size $\varnothing = 5\text{mm}$ (BM-5) or $\varnothing = 7.7\text{mm}$ (BM-7) 50cm distance or compatible distance from the LCD surface to detector lens.

test spot position : see Figure a.

measurement instrument : TOPCON's luminance meter BM-5 or BM-7 or compatible (see Figure c).

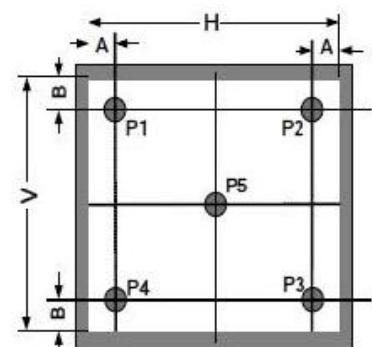


Figure a

Size : $5" < S \leq 12.3"$ (see Figure b) H,V : Active area

Light spot size $\varnothing = 5\text{mm}$ (BM-5) or $\varnothing = 7.7\text{mm}$ (BM-7) 50cm distance or compatible distance from the LCD surface to detector lens.

test spot position : see Figure b.

measurement instrument : TOPCON's luminance meter BM-5 or BM-7 or compatible (see Figure c).

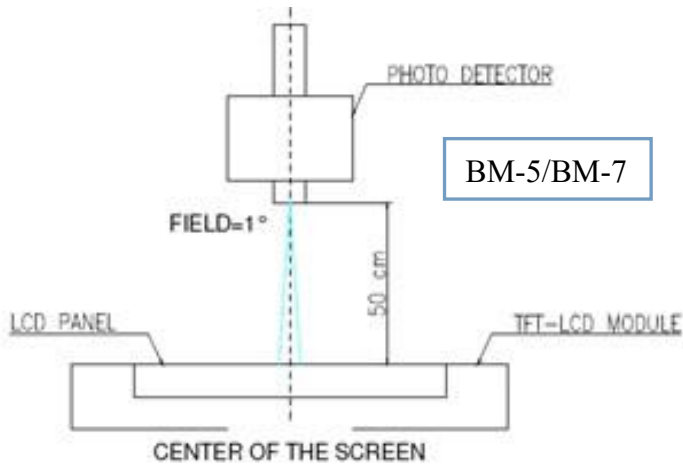


Figure c

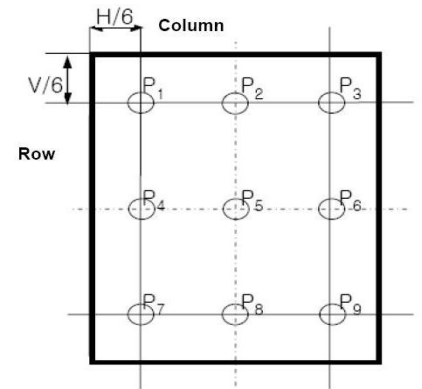
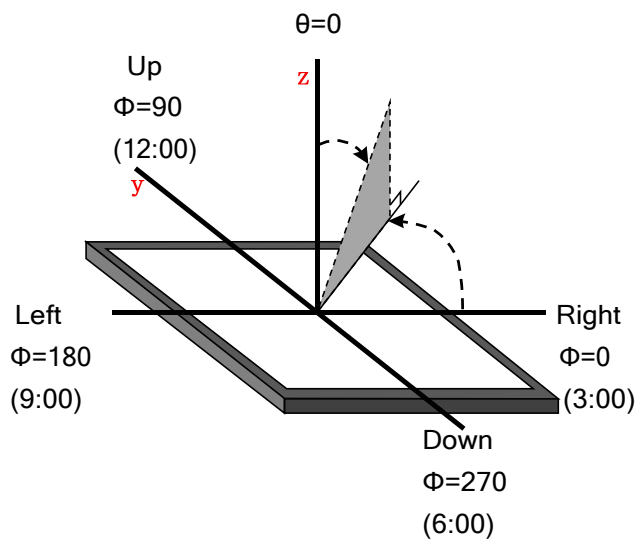


Figure b

FIG.3.The definition of viewing angle



8. Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +70°C, 96hrs	IEC60068-2-1:2007 GB2423. 2-2008
2	Low Temperature Operation	Ta= -20°C, 96hrs	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	Ta= +80°C, 96hrs	IEC60068-2-1:2007 GB2423. 2-2008
4	Low Temperature Storage	Ta= -30°C, 96hrs	IEC60068-2-1:2007 GB2423.1-2008
5	High Temperature & Humidity Operation	Ta= +60°C, 90% RH max, 96 hours	IEC60068-2-78:2001 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30°C 30 min ~ +80°C 30 min Change time: 5min, 20 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14:1984, GB2423.22-2002
7	ESD	C=150pF, R=330 Ω, 5 points/panel , Air:±8KV, 5 times Contact: ±4KV, 5 times (Environment: 15°C ~ 35°C, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2:2001 GB/T17626.2-2006
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.5mm , Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (6 hours for total)	IEC60068-2-6:1982 GB/T2423.10-1995
9	Mechanical Shock (Non-operation)	Half Sine Wave 60G ,6ms,±X,±Y,±Z 3times for each direction	IEC60068-2-27:1987 GB/T2423.5—1995
10	Package Drop Test	Height: 60 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32:1990 GB/T2423.8-1995



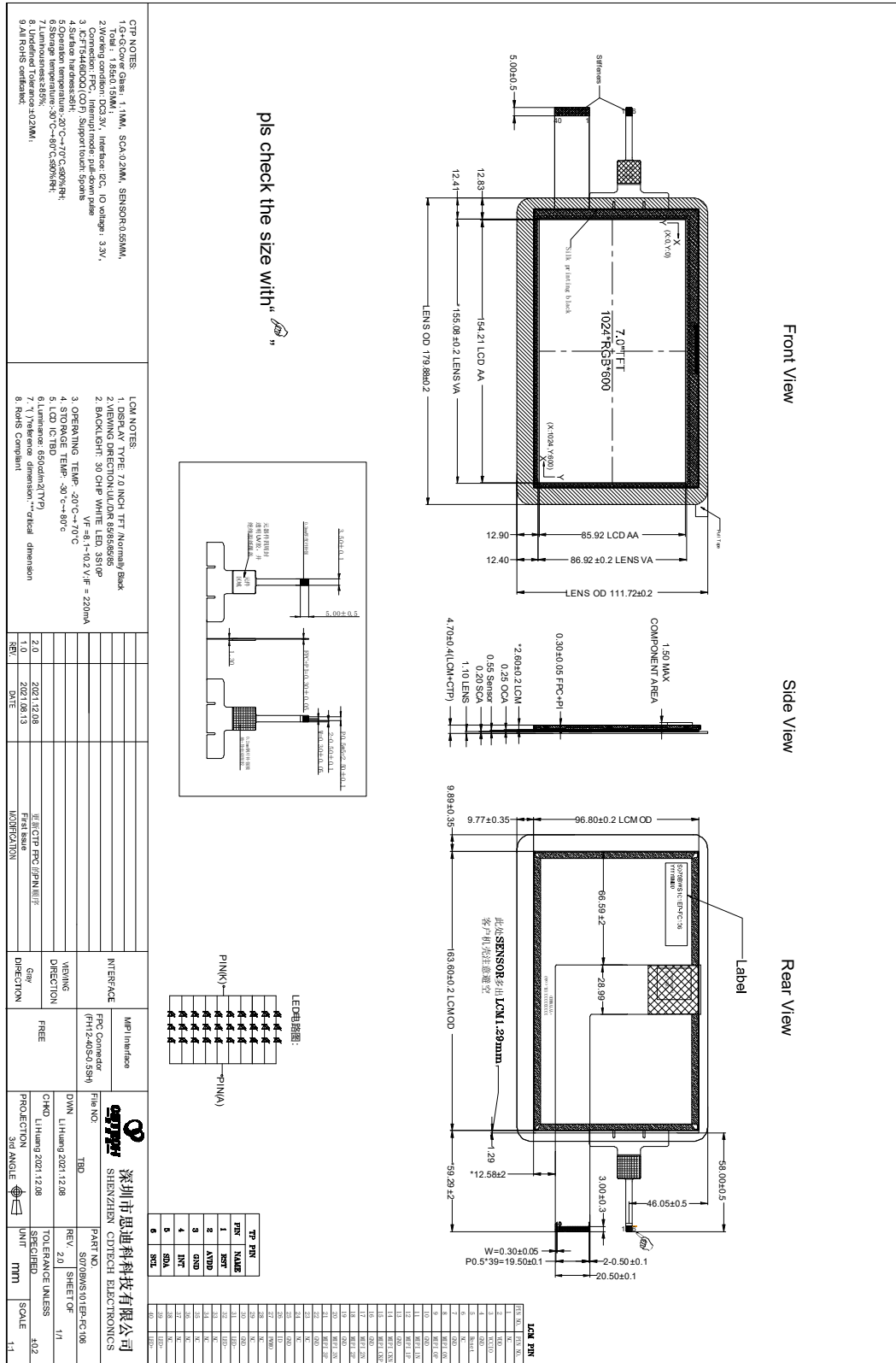
深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

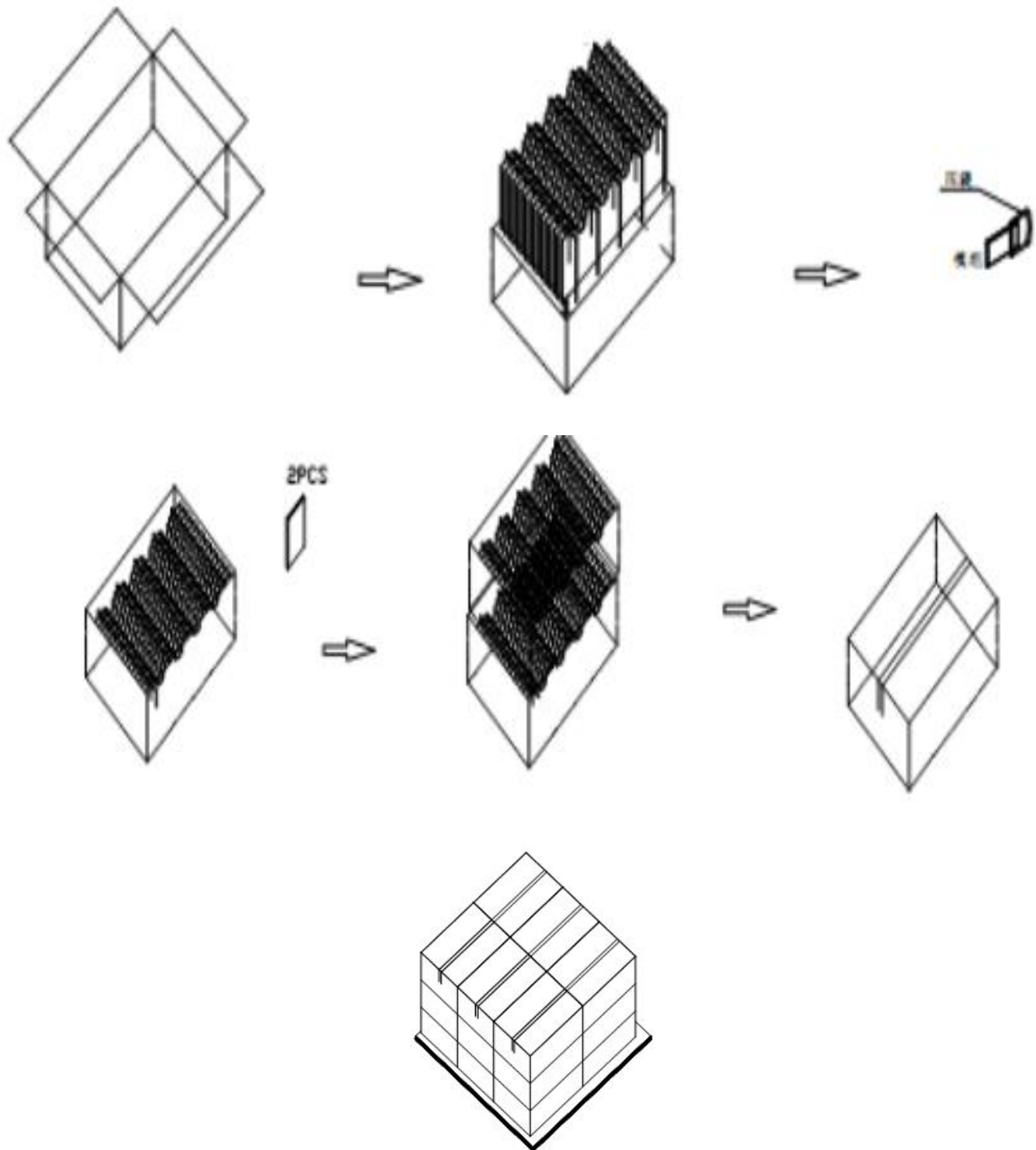
Notes:

1. The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample will not be accepted if appear these defects:
 - 1).Air bubble in the LCD;
 - 2).Seal leak
 - 3).Non-display
 - 4).missing segments
 - 5).Glass crack
 - 6).CR reduction >40%
 - 7).IDD increase >100%
 - 8).Brightness reduction >50%
 - 9).Color coordinate tolerance >0.05
2. ≤ 7.0 inch: The size of sample is 5pcs;
 > 7.0 inch: The size of sample is 2pcs;
3. One test sample must complete each test item;
4. In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.
5. In the test of High Temperature Operation and High Temperature & Humidity Operation ,the operation temperature is the surface temperature of module.

9. Mechanical Drawing



10. Packing



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

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.



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

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.