
SPECIFICATION

Digitizer Sensor Unit designed for 21.5" LCD

Model Name: 21.5 Inch EM Touch

Model No.: HC-EMR2151-W Rev:03

This product is compliant with RoHS Directive

Firmware Version : C

APPROVED	CHECKED	CHECKED	DESIGNED
Changes must go through approval process before being implemented.			

History of Version

Edi.	Revision	Date	Description	Revised by
001	A	2020/12/22	Initial	Jesse
002	B	2021/01/07	1. ADD FPC CONNECTOR Signal Assignment 2. MODIFY BARCODE LAB	ANDY
003	C	2021/02/29	MODIFY Report Rate	ANDY

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1. Scope

This specification is applicable to Electromagnetic Touch Board designed for 21.5 inch LCD Panel.

This specification applies to HC-EMR2151-W only.

1.1. Features

- 1) Without affecting the screen display
- 2) High screen resolution
- 3) High pressure levels
- 4) High position accuracy
- 5) Low power consumption
- 6) Commercial temperature range
- 7) Support battery-free cordless and pressure sensitive pens

2. Product Specifications

2.1. EM Touch Characteristics

Technology	Battery free Electro-magnetic
Effective Diagonal Size	21.5 inch
Sensor External Dimension	487.44(mm)X281.87(mm)
Active Area	476.64(mm)X268.11(mm)
Material	FR4
Resolution	0.01mm / 5080 LPI
Coordinate Accuracy	Center \pm 0.5/Edge \pm 1 (Vertical) (see Note 1,2,3)
Coordinate Jitters	1-point max (see Note 1 and 2)
Detectable Pen tilt	Up to 60° from vertical
Detectable Height	3-15mm above the Sensor Film
Position Report Rate	300 PPS (max)
Pressure Resolution	8192 levels @ full scale
EM module Thickness	0.55mm(Max)
Double Pen	NO Support (Option)
EM Board External Dimension	90.32(mm)X60.00(mm) X \leq Max 3.00(mm)
Interface	USB/I2C/UART
VID & PID	VID:0x248A, PID:0x5011

Note 1: The EM Sensor Board and Stylus at ordinary temperature.

Note 2: The pen held vertically at 0mm high from LCD.

Note 3: The pen held in the center of active area

Note: This specification is for standard module. For better performance, it needs to be customized by customer's system.

3. Appearance



4. Electrical Characteristics

4.1. Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit	Checked Terminal
Supply Voltage	V _{DD}	4.75	5.25	V	
Input Voltage of Signals	V _{IN}	5.0	5.25	V	
Operating Ambient Temperature	T _{OP}	-10	+60	°C	
Operating Ambient Humidity	H _{OP}	20	90	%(RH)	No condensing
Storage Temperature	T _{STG}	-20	+70	°C	
Storage Humidity	H _{STG}	20	95	%(RH)	No condensing

*Note 1: Do not exceed the maximum rating values under any conditions including the variations in supply voltage, input voltage, part constants, ambient temperature and so on; it may damage the single mode digitizer sensor unit.

4.2. Recommended Operating Conditions

Item	Symbol	Min	TYP	Max	Unit	Remarks
Supply voltage	V _{DD}	4.75	5.0	5.25	V	
Ambient temperature		0	25	60	°C	
Ambient humidity		40	60	80	%(RH)	

*Note : The Digitizer Sensor Unit should always be operated within these ranges.
“TYP” shows the recommended value.

4.3. Test Conditions

- Ambient Temperature : $25 \pm 5^{\circ}\text{C}$
- Ambient Humidity : $65 \pm 16\%$ (RH)
- Supply Voltage : VDD +5V

DC Electrical Characteristics

Item	Min.	Typ.	Max.	Unit.	Remark
Supply Voltage	4.75	5.0	5.25	V	
Current Consumption Pen in touch	50	130	200	mA	
Current Consumption Pen@10mm	50	130	200	mA	
Current Consumption Standby mode	50	130	200	mA	Note 1
Low Scan mode	16 (400mSec)	45	200 (130mSec)	mA	Keep standby mode 40 min will entry low scan mode

*Note 1: The control Module can be sleep when the PC going to standby mode.

5. Interface Pin Description

5.1. J7 8PIN FPC Connector Signal Assignment

Pin	Name	Function
1	GND	Ground
2	GND	Ground
3	SDA	I2C Data Signal
4	SCL	I2C Clock Signal
5	INT	I2C Interrupt
6	D+	USB+ Signal
7	D-	USB- Signal
8	VCC +5V	Power Supply

Connector on wire: FPC-0.5-08P (SHENZHEN H&C TECHNOLOGY CO.,LTD.)

5.2. J8 5PIN USB Wafer Connector Signal Assignment

Pin	Name	Function
1	VCC +5V	Power Supply
2	D-	USB- Signal
3	D+	USB+ Signal
4	GND	Ground
5	GND	Ground

Connector on Board: Wafer-1.25-05P (SHENZHEN H&C TECHNOLOGY CO.,LTD.)

6. Mechanical Specifications

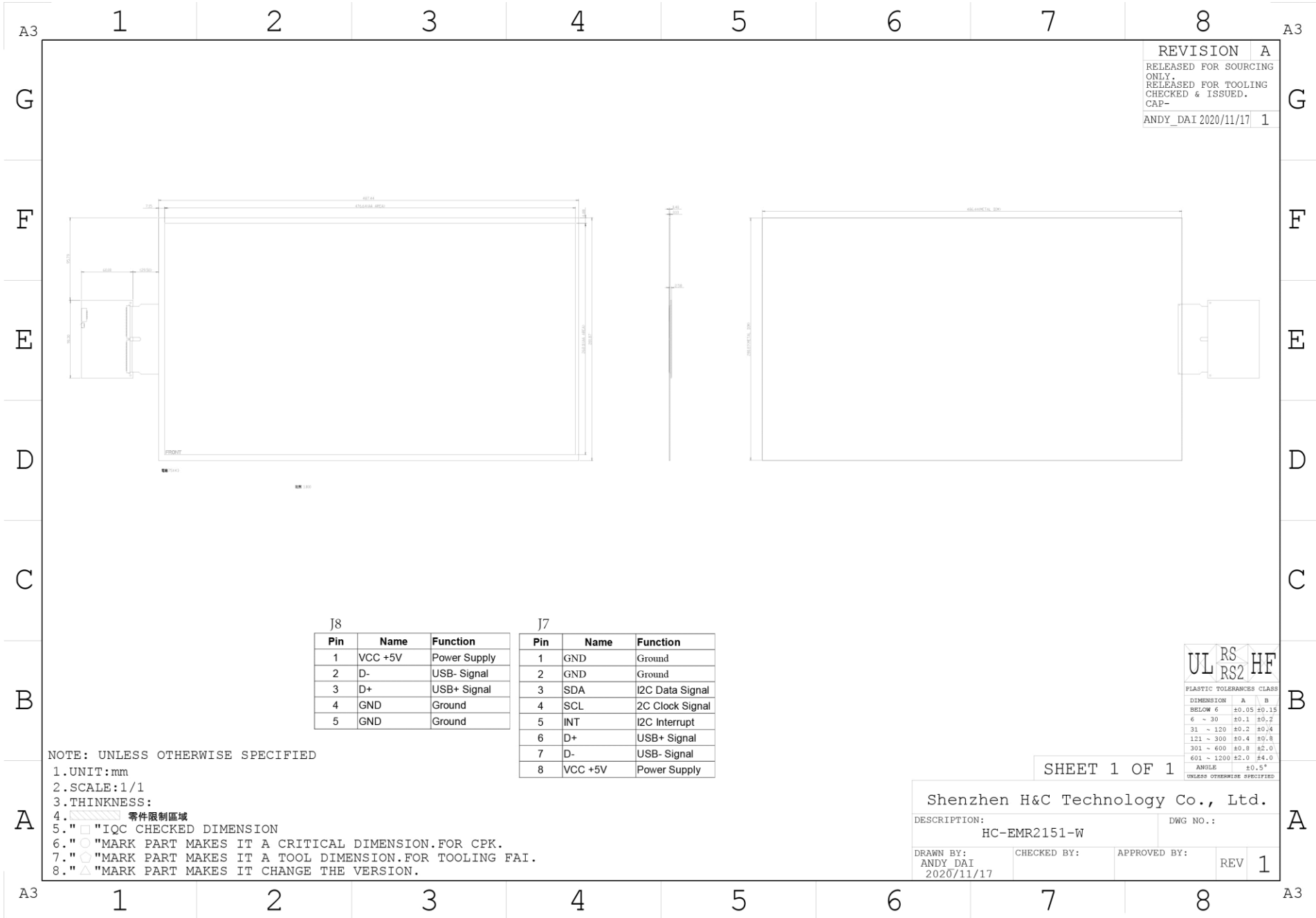
6.1. Insulation film of Shielding Plate

A insulation film is pasted onto the shielding plate to insulate from other electronic parts.

6.2. Dimensional Outline

All tolerances of DWG in this section to be 0.25mm unless otherwise specified.

6.3. EM SENSOR Drawing



REVISION	
RELEASED FOR SOURCING ONLY.	A
RELEASED FOR TOOLING CHECKED & ISSUED.	
CAP-	
ANDY_DAI 2020/11/17	1

J8			J7		
Pin	Name	Function	Pin	Name	Function
1	VCC +5V	Power Supply	1	GND	Ground
2	D-	USB- Signal	2	GND	Ground
3	D+	USB+ Signal	3	SDA	I2C Data Signal
4	GND	Ground	4	SCL	2C Clock Signal
5	GND	Ground	5	INT	I2C Interrupt
			6	D+	USB+ Signal
			7	D-	USB- Signal
			8	VCC +5V	Power Supply

NOTE: UNLESS OTHERWISE SPECIFIED
 1. UNIT: mm
 2. SCALE: 1/1
 3. THINKNESS:
 4. 零件限制區域
 5. "□" IQC CHECKED DIMENSION
 6. "○" MARK PART MAKES IT A CRITICAL DIMENSION.FOR CPK.
 7. "◉" MARK PART MAKES IT A TOOL DIMENSION.FOR TOOLING FAI.
 8. "△" MARK PART MAKES IT CHANGE THE VERSION.

UL RS HF		
RS2		
PLASTIC TOLERANCES CLASS		
DIMENSION	A	B
BELOW 6	±0.05	±0.15
6 ~ 30	±0.1	±0.2
31 ~ 120	±0.2	±0.4
121 ~ 300	±0.4	±0.8
301 ~ 600	±0.8	±2.0
601 ~ 1200	±2.0	±4.0
ANGLE	±0.5°	
UNLESS OTHERWISE SPECIFIED		

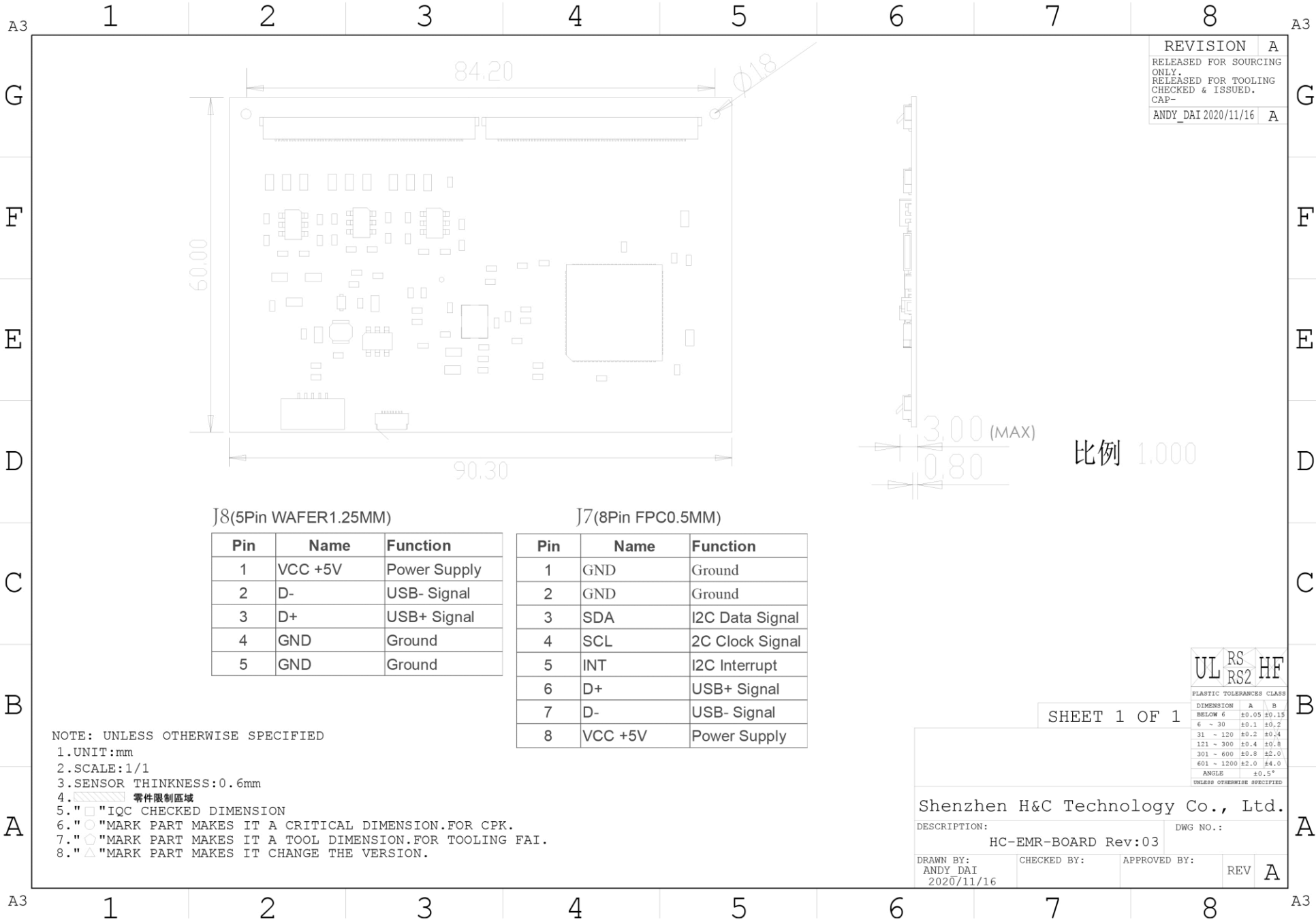
SHEET 1 OF 1

Shenzhen H&C Technology Co., Ltd.

DESCRIPTION: HC-EMR2151-W DWG NO.:

DRAWN BY: ANDY DAI 2020/11/17 CHECKED BY: APPROVED BY: REV 1

6.4. EM Control Board Drawing



REVISION	A
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RELEASED FOR TOOLING CHECKED & ISSUED.	
CAP-	
ANDY_DAI 2020/11/16	A

J8(5Pin WAFER1.25MM)

Pin	Name	Function
1	VCC +5V	Power Supply
2	D-	USB- Signal
3	D+	USB+ Signal
4	GND	Ground
5	GND	Ground

J7(8Pin FPC0.5MM)

Pin	Name	Function
1	GND	Ground
2	GND	Ground
3	SDA	I2C Data Signal
4	SCL	2C Clock Signal
5	INT	I2C Interrupt
6	D+	USB+ Signal
7	D-	USB- Signal
8	VCC +5V	Power Supply

NOTE: UNLESS OTHERWISE SPECIFIED

1. UNIT:mm
2. SCALE:1/1
3. SENSOR THINKNESS:0.6mm
4. 零件限制區域
5. "□" IQC CHECKED DIMENSION
6. "○" MARK PART MAKES IT A CRITICAL DIMENSION.FOR CPK.
7. "◊" MARK PART MAKES IT A TOOL DIMENSION.FOR TOOLING FAI.
8. "△" MARK PART MAKES IT CHANGE THE VERSION.

比例 1:1000

SHEET 1 OF 1

UL	RS	HF
RS	RS2	
PLASTIC TOLERANCES CLASS		
DIMENSION	A	B
BELOW 6	±0.05	±0.15
6 ~ 30	±0.1	±0.2
31 ~ 120	±0.2	±0.4
121 ~ 300	±0.4	±0.8
301 ~ 600	±0.8	±2.0
601 ~ 1200	±2.0	±4.0
ANGLE	±0.5°	
UNLESS OTHERWISE SPECIFIED		

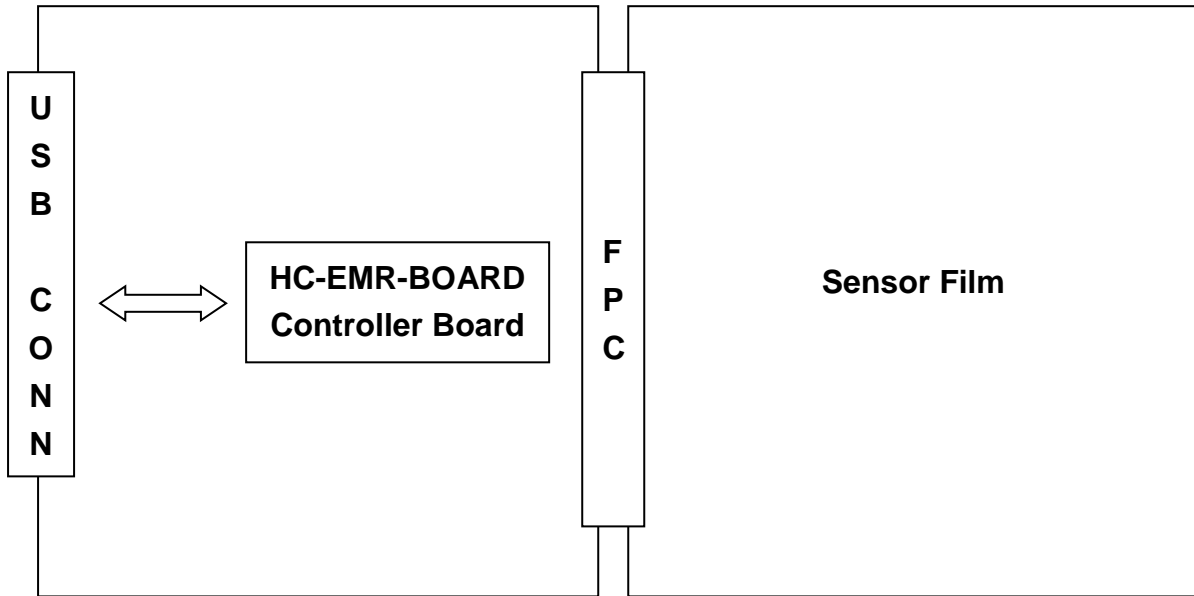
Shenzhen H&C Technology Co., Ltd.

DESCRIPTION: HC-EMR-BOARD Rev:03 DWG NO.:

DRAWN BY: ANDY DAI 2020/11/16 CHECKED BY: APPROVED BY: REV A

6.5. Electrical Specifications

Circuit Diagram



7. Quality

7.1. Coordinate Accuracy

Digitizer sensor unit only $\pm 0.5\text{mm}$ in all active area, where a pen is held vertically at 5mm high from sensor board.

7.2. Coordinate Jitters

Digitizer sensor unit only 1-point max

8. Reliability Test

Item	SPEC	Testing method	Criteria	Number of test samples
High Temperature /High Humidity Storage Test	30°C/95%~61°C /95%, 12 hours for 30°C /95%, 12 hours for 61°C/95%, one cycle is 24 hours , test time is 10days	MIL-STD-810G-507.5 Humidity Procedure – II Aggravated	1. All functions must be normally 2. No oxidation on screws. 3. No visual abnormal. 4. There shall not be	2
High Temperature Test (Operating)	61°C 96h	MIL-STD-810G-501.5 Procedure II Operation	any cosmetic damage 5. T/S cannot allow	2
High Temperature Test (Non-Operating)	33°C~71°C ,10days 12 hours for 31°C , 12 hours for 71°C one cycle is 24 hours, test time is 10days	MIL-STD-810G-501.5 Procedure I	the abnormal status like peel off, bubble .	2
Low Temperature Test (Operating)	-21°C 96h	MIL-STD-810G-502.5 Procedure II		2
Low Temperature Test (Non-Operating)	-40°C 96h	MIL-STD-810G-502.5 Procedure I		2
Temperature Shock Test	-41°C~71°C duration 1h, 10cycle ,total:10h	MIL-STD-810G-503.5 Procedure-I-C Multi-cycle shock.		2

9. RoHS

9.1. RoHS Profession

View of the EU countries have legislation against the use has been associated toxic substances, to comply with this global trend and related needs of our customers, H&C to raise the following statement:

H&C with the manufacturer's identity, in the manufacture and sale of products involved in the process of RoHS information is based on the raw material suppliers based on the information, suppliers of materials information is correct or not has nothing to do with the H&C.

10. Code regulations

10.1. Body Label Drawing

HC-EMR2151-W Rev:03 Bar code style and size : 20*10mm

Coding Rules :

HC-EMR2151-W Rev:03 XX2151EMR210700001 MADE IN CHINA
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Bit 1-2	XX Express :	Customer Name
Bit 3-6	2151 Express :	Model serial number
Bit 7-9	EMR Express :	Antenna board module
Bit 10-11	21 Express :	Year
Bit 12-13	07 Express :	Month
Bit 14-18	00001 Express :	Production serial number

HC-EMR-BOARD Rev:01 Bar code style and size : 20*10mm

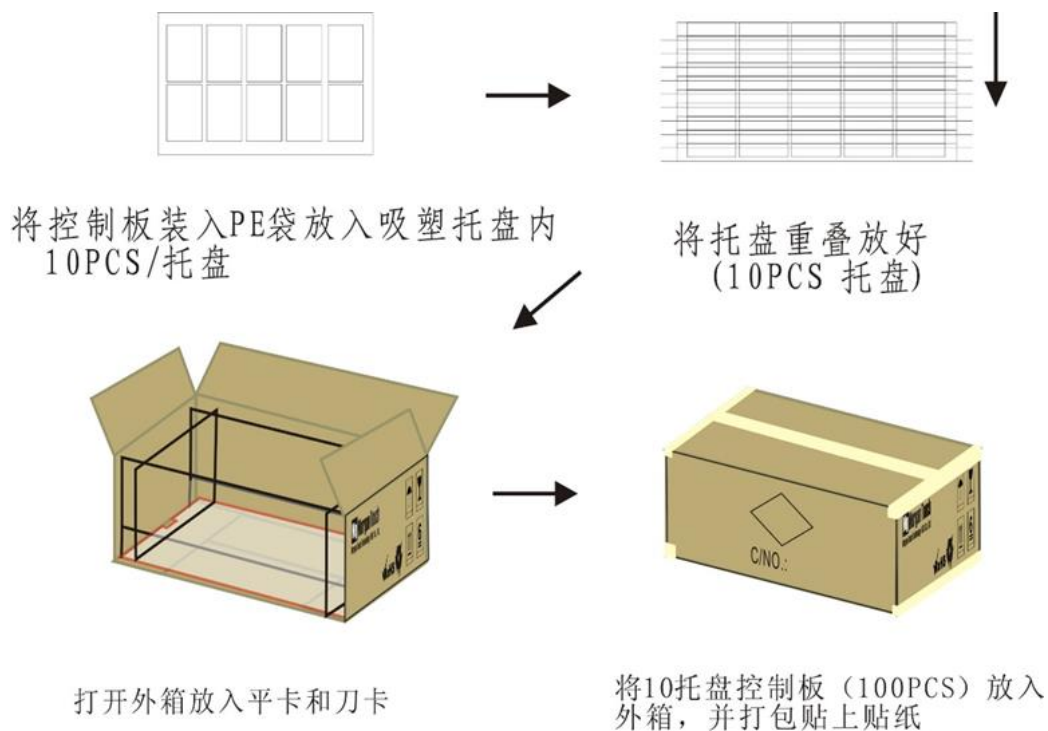
Coding Rules :

HC-EMR-BOARD Rev:03 XX2151EMB210700001 MADE IN CHINA
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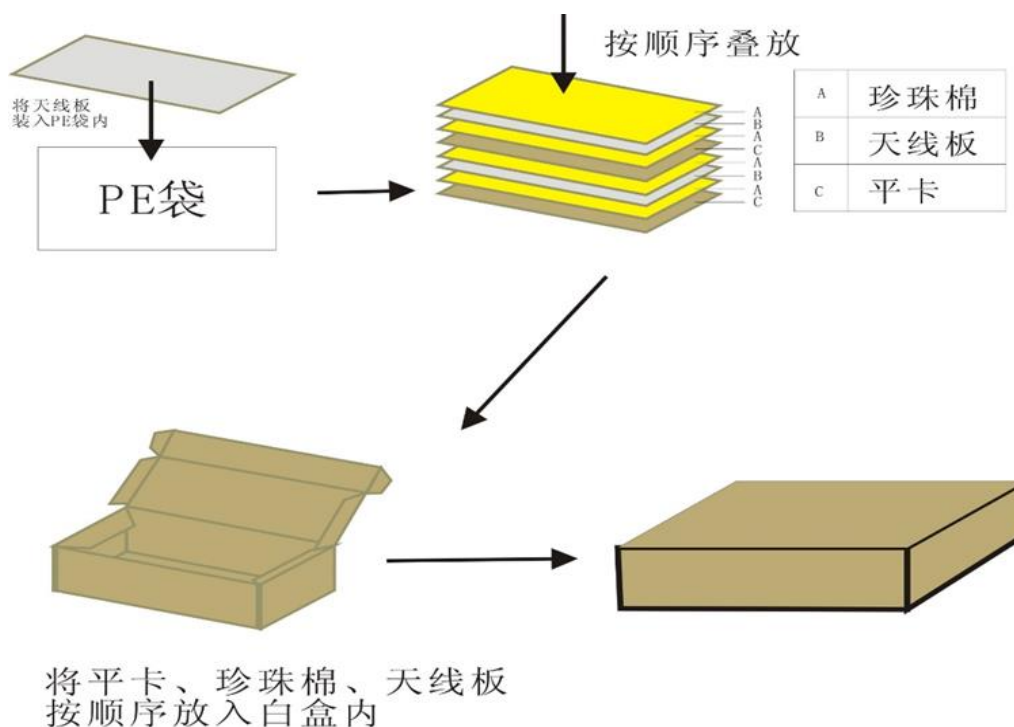
Bit 1-2	XX Express :	Customer Name
Bit 3-6	2151 Express :	Model serial number
Bit 7-9	EMB Express :	EM control board module
Bit 10-11	21 Express :	Year
Bit 12-13	07 Express :	Month
Bit 14-18	00001 Express :	Production serial number

11. Packing

HC-EMR-BOARD Rev:03



HC-EMR2151-W Rev:03



12. Carton Label Drawing

Bar code style and size : 100*80mm

物料标识卡 Identification Card	
客户名称:	XX 公司
产品名称:	Digitizer Sensor Unit designed for 21.5 inch
产品型号:	HC-EMR2151-W Rev:03/ HC-EMR-BOARD Rev:03
客户料号:	XXXXXXX
订单总数:	1000 pcs
交货数量:	1000 pcs
本箱数量:	100 pcs
箱 号:	第 1 箱, 总 10 箱
供方名称:	
生产单号:	SZ210728002
图纸版本:	Rev:03
检验员:	QC01
备 注:	
RoHS/CE/FCC	
MADE IN CHINA	