EMPEN 23.8” SENSOR CONTROL BOARD SPECIFICATION

Product Name: 23.8” DIGITIZER SENSOR/CONRTOL BOARD EMPEN

CUSTOMER P/N:

EMPEN P/N : 202306121001

Customer	Approved by
	empen

Revision History

Revision	Date	Description	Author /Revised by
01	2023/06/12	Initial	andy

1. Product Specifications

EM Touch Characteristics

Technology	**Battery free Electro-magnetic**
Effective Diagonal Size	13.3 inch
Sensor External Dimension	535(mm)X308(mm)
Active Area	530.38(mm)X299.6(mm)
Material	FR4
Resolution	1920X1080
Coordinate Accuracy	Center±0.5mm/Edge±1mm（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	266 PPS (max)
Pressure Resolution	8192 levels @ full scale
EM module Thickness	0.6mm(Max)
Double Pen	NO Support（Option）
EM Board External Dimension	90(mm) X 56(mm) X≤Max 3(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 4: This specification is for standard module. For better performance, it needs to be customized by customer’s system.

2. Interface Pin Description

1. J7 8PIN FPC Connector Signal Assignment

Pin	Name	Function
1	GND	Ground
2	RESET	RESET
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

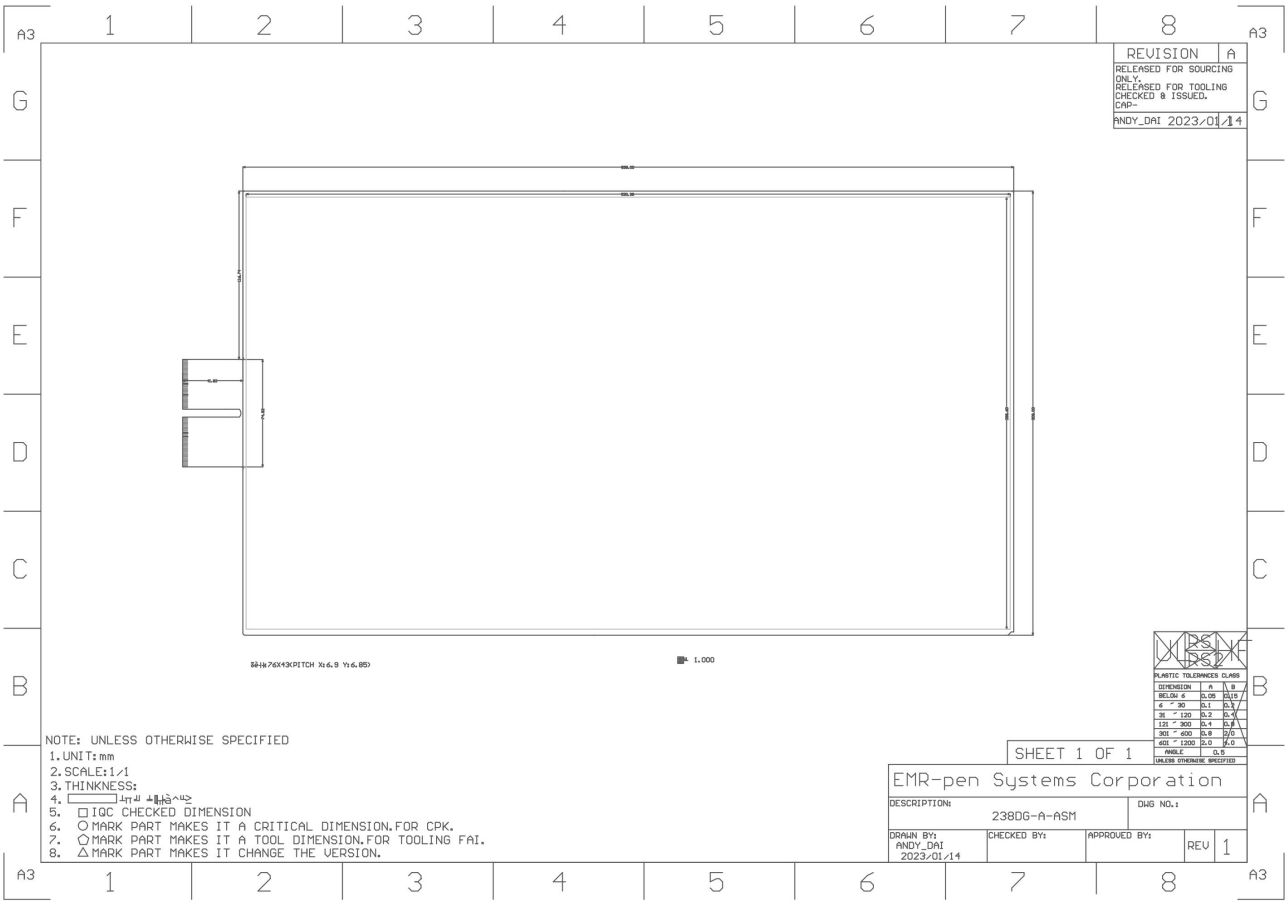
2.J8 5PIN USB Connector Signal Assignment

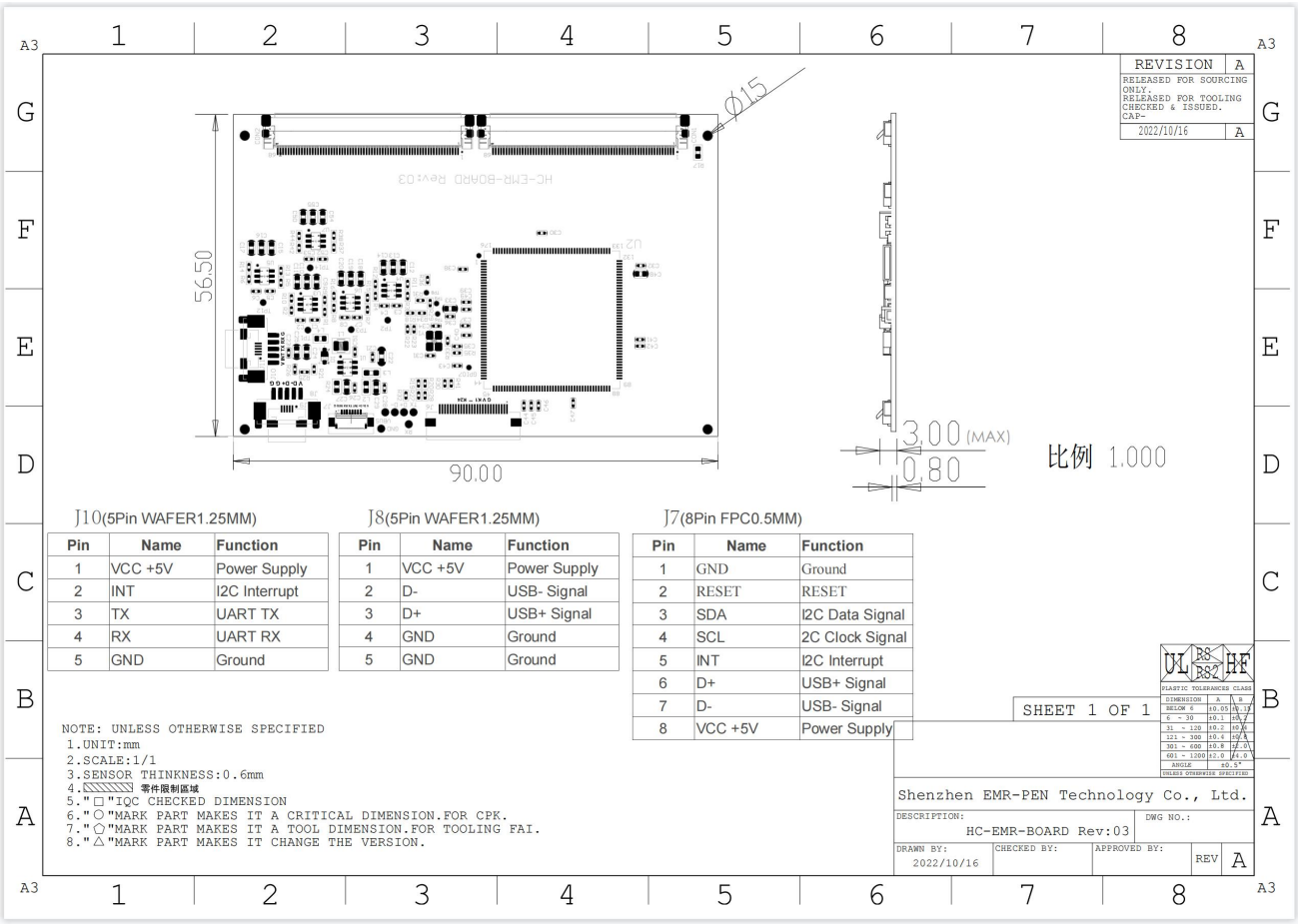
Pin	Name	Function
1	VCC +5V	Power Supply
2	D-	USB- Signal
3	D+	USB+ Signal
4	GND	Ground
5	GND	Ground

3.J11 5PIN UART Connector Signal Assignment

Pin	Name	Function
1	VCC	Power Supply
2	TX	
3	RX	
4	GND	Ground
5	GND	Ground

3.EM SENSOR/CONTROL BOARD DRAWING





J10(5Pin WAFER1.25MM)

Pin	Name	Function
1	VCC +5V	Power Supply
2	INT	I2C Interrupt
3	TX	UART TX
4	RX	UART RX
5	GND	Ground

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

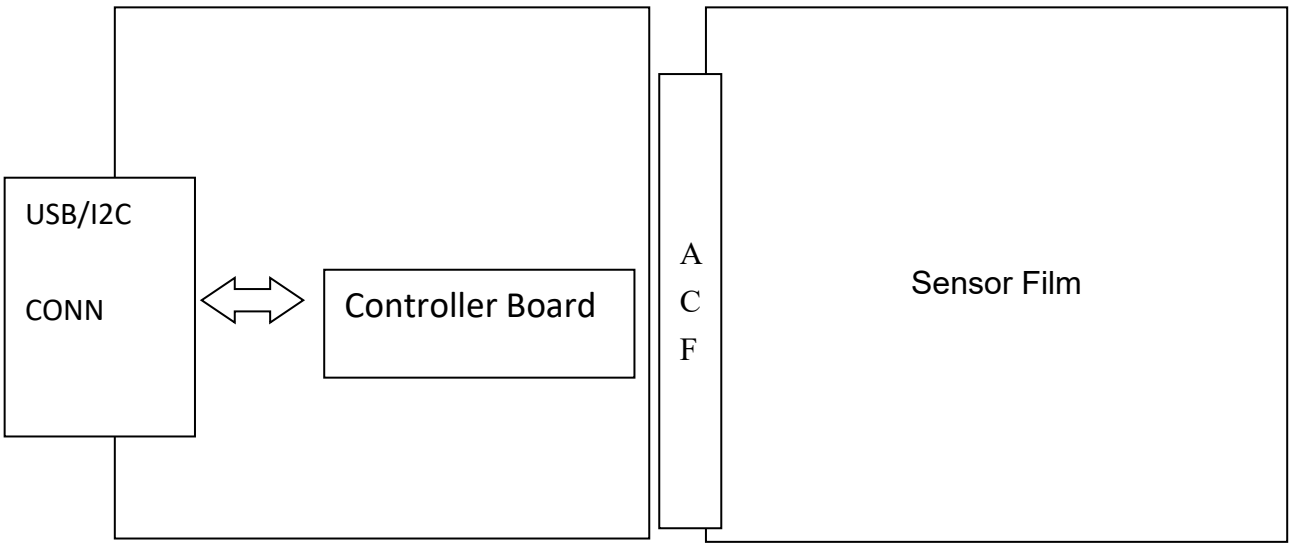
J7(8Pin FPC0.5MM)

Pin	Name	Function
1	GND	Ground
2	RESET	RESET
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.

4.Electrical Specifications

Circuit Diagram



5.Test Conditions

- Ambient Temperature : 25±5℃

- Ambient Humidity : 65±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	70	90	130	mA	
Current Consumption Pen@10mm	70	90	130	mA	
Current Consumption Standby mode	70	90	130	mA	Note 1
Low Scan mode	16 (400mSec)	45	130 (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.

6.Electrical Characteristics

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}	4.75	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.

1. Recommended Operating Conditions

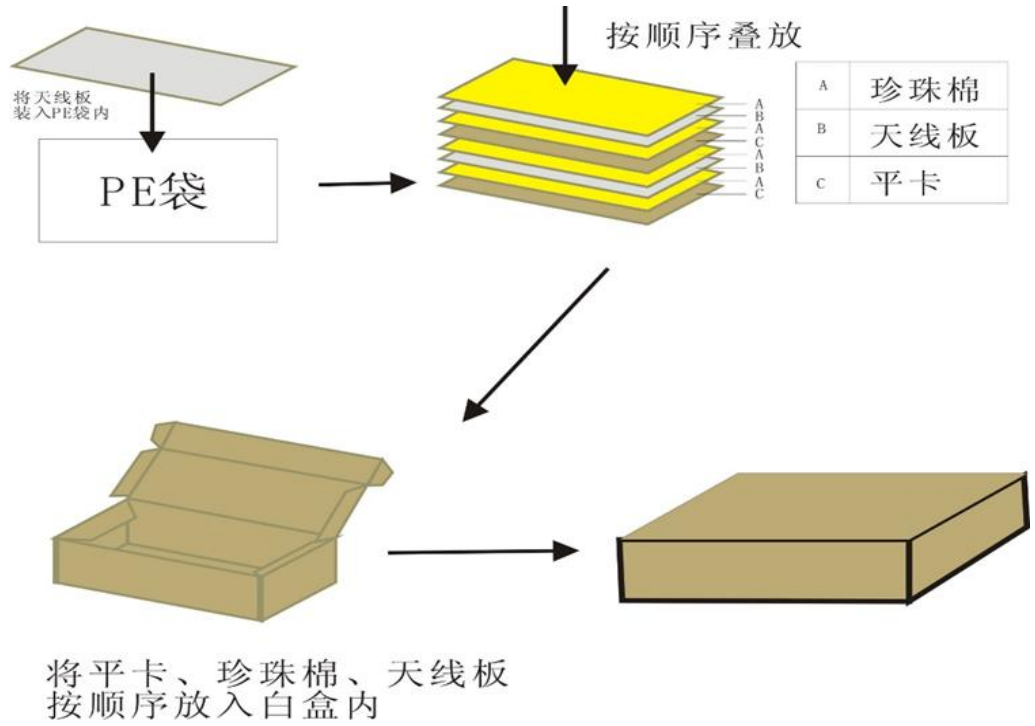
Item	Symbol	Min	TYP	Max	Unit	Remarks
Supply voltage	V_{DD}	4.75	5.0	5.25	V	
Ambient temperature		0	25	60	℃	
Ambient humidity		40	60	80	%(RH)	

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

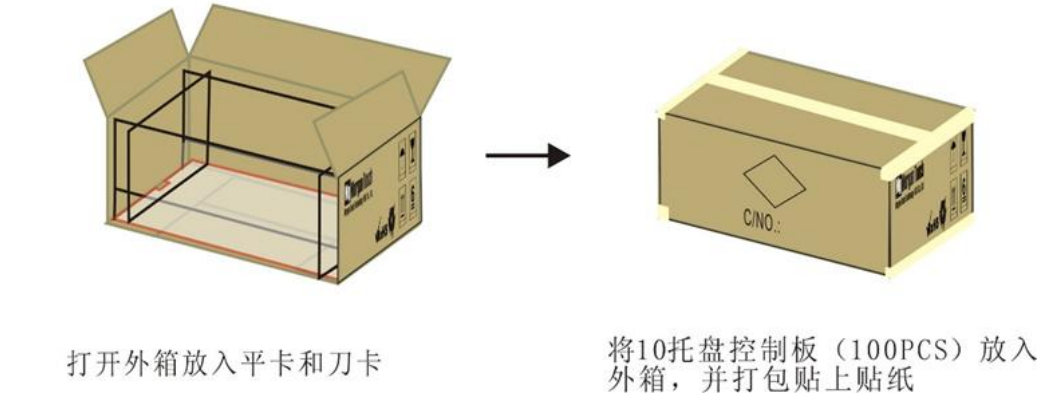
7.Reliability Test

Item	SPEC	Testing method	Criteria	Number of test samples
High Temperature /High Humidity Storage Test	30℃/95%~61℃/95%, 12 hours for 30℃ /95%, 12 hours for 61℃/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 any cosmetic damage 5. T/S cannot allow the abnormal status like peel off, bubble .	2
High Temperature Test (Operating)	61℃ 96h	MIL-STD-810G-501.5 Procedure II Operation		2
High Temperature Test (Non-Operating)	33℃~71℃ ,10days 12 hours for 31℃, 12 hours for 71℃ one cycle is 24 hours, test time is 10days	MIL-STD-810G-501.5 Procedure I		2
Low Temperature Test (Operating)	-21℃ 96h	MIL-STD-810G-502.5 Procedure II		2
Low Temperature Test (Non-Operating)	-40℃ 96h	MIL-STD-810G-502.5 Procedure I		2
Temperature Shock Test	-41℃~71℃ duration 1h, 10cycle ,total:10h	MIL-STD-810G-503.5 Procedure-I-C Multi-cycle shock.		2

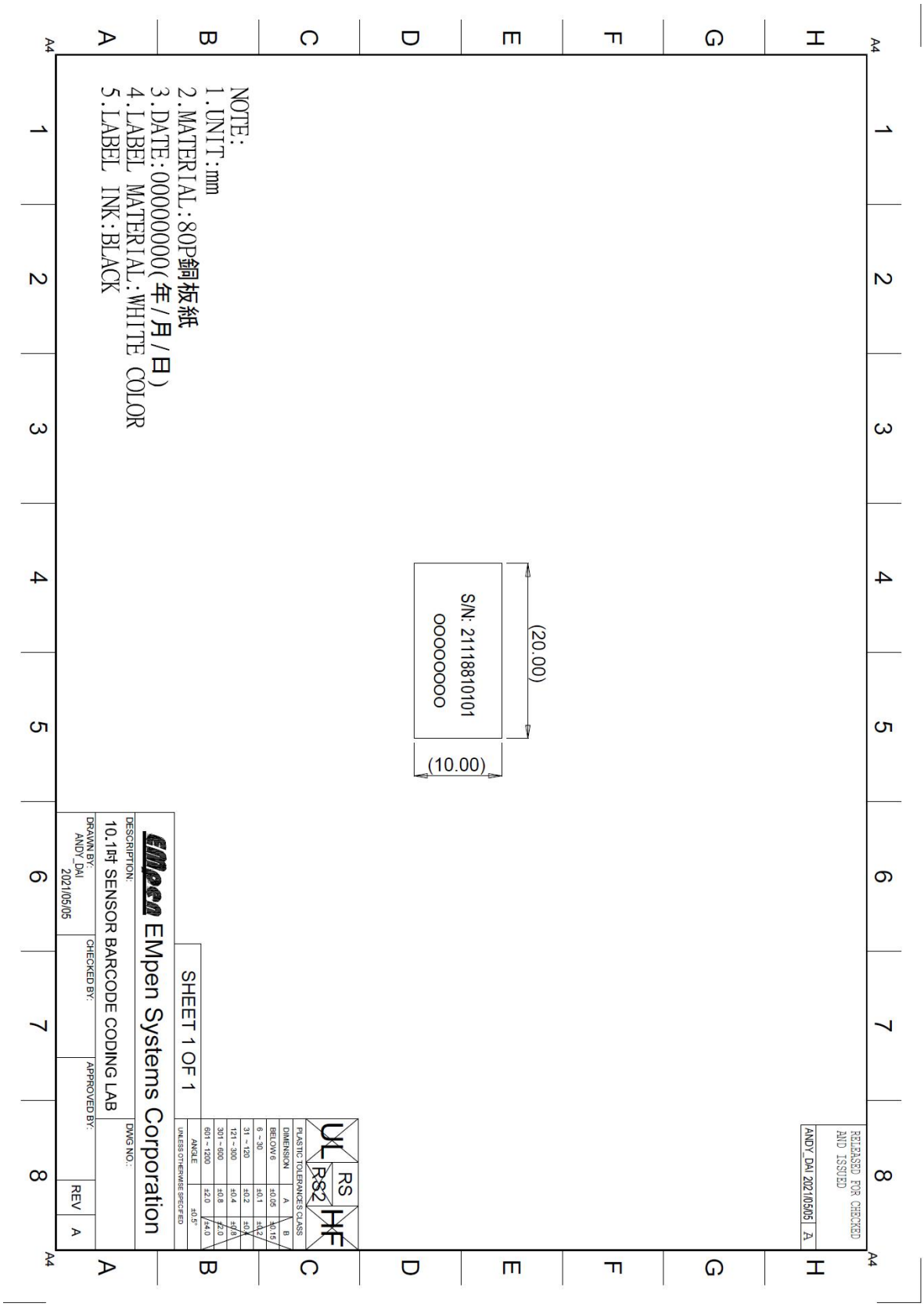
8.Packing


将天线板
装入PE袋内
PE袋
按顺序叠放
A 珍珠棉
B 天线板
C 平卡
将平卡、珍珠棉、天线板
按顺序放入白盒内


将控制板装入PE袋放入吸塑托盘内
10PCS/托盘
将托盘重叠放好
(10PCS 托盘)


C/NO.:
打开外箱放入平卡和刀卡
将10托盘控制板（100PCS）放入
外箱，并打包贴上贴纸

9.Body Label Drawing



10.Carton Label Drawing