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## Revision history

Rev.	Date	By	Summary	Remark
1.0	2017/4/14	Kenhsu	New Release	
1.1	2017/8/9	Kenhsu	Correct item 2.0 Specifications Operating temperature -40°C ~ +85°C  Correct item 2.0 Specifications Power consumption	
1.2	2017/9/19	Kenhsu	Correct item 3.2 Touch line pin definition	

## 1.0 Introduction

The PenMount PM2204 control board is a high specification (Projected Capacitive Input, PCI) touch panel controller product introduced by PenMount. The PenMount PM2204 can be applied in the consumer, commercial and the industrial fields.

The PenMount PM2204 provides three types of interfaces, USB, UART and I<sup>2</sup>C and supports PCI touch panels sized from 5" to 7.9". PenMount PM2204 also supports a wide range of operating systems such as Windows and Linux.

The PenMount PM2204 is developed based on Microchip microprocessors and is paired with PenMount's in-house hardware design and firmware algorithmic mechanism. It provides high performance computing and possesses excellent anti-noise capabilities.

## 2.0 Specifications

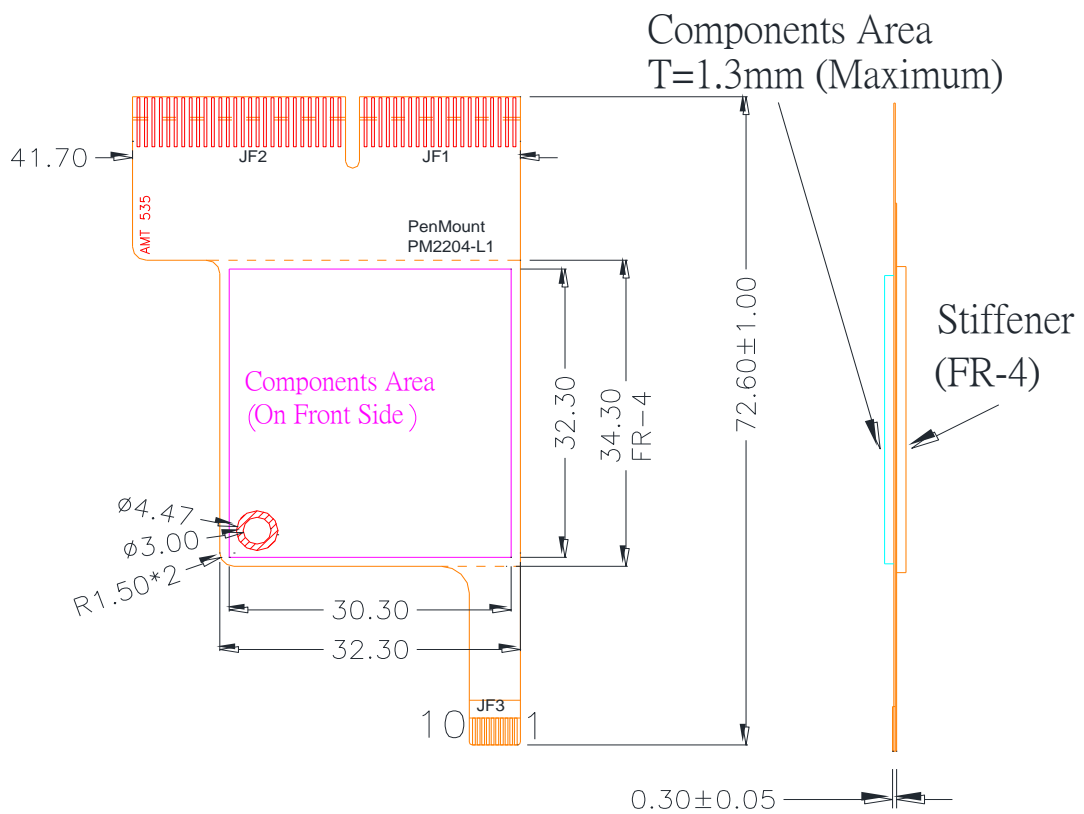
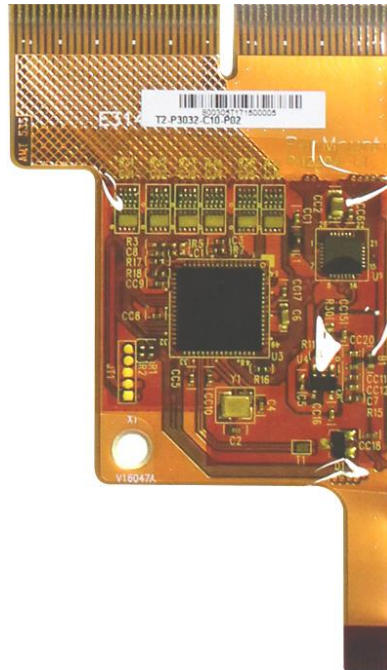
Parameter		feature
Controller part number		PenMount P2-06
Number of sensing line		24
Number of driving line		16
Supporting projected capacitive touch panel size		Projected capacitive type, from 5" to 7.9"
Interface	USB	Full-speed, 12Mbps
	UART	38400 baud rate / 8bit data / non parity / one stop bit / non-PnP
	I <sup>2</sup> C	Slave, support 100 / 400 kHz specifications
ADC resolution		10bits (Typical)
Firmware resolution		2048 x 2048 (Typical)
Response time		Average < 30ms
Sampling rate	One point	150 Hz(Typical)
	Five point	100 Hz(Typical)
Operating voltage		+5Vdc, ±5 %
Power consumption	Working mode	50mA @ 5Vdc (Typical)
	Idle mode	30mA @ 5Vdc (Typical)
	Sleep mode	3mA @ 5Vdc (Typical)
Operating temperature		-40°C ~ +85°C
Storage temperature		-40°C ~ +85°C
Relative humidity range		95% RH at 60°C. RH Non-condensing
EMS specification	RS	IEC61000-4-3 Level 3 , Criteria A, dual touch points
	CS	IEC61000-4-6 Level 3 , Criteria A, dual touch points
Watchdog Timer		Support WDT function through firmware programming

Note :

CS and RS performance, Power consumption and sample rate will vary according to different firmware versions

### 3.0 Mechanical drawing

#### 3.1 Mechanical size



### 3.2 Touch line pin definition

JF1			
Pin	Description	Pin	Description
1	GND	11	Cap Drive Y6
2	Cap Drive Y15	12	Cap Drive Y5
3	Cap Drive Y14	13	Cap Drive Y4
4	Cap Drive Y13	14	Cap Drive Y3
5	Cap Drive Y12	15	Cap Drive Y2
6	Cap Drive Y11	16	Cap Drive Y1
7	Cap Drive Y10	17	Cap Drive Y0
8	Cap Drive Y9	18	GND
9	Cap Drive Y8	19	GND
10	Cap Drive Y7		

JF2			
Pin	Description	Pin	Description
1	GND	15	Cap Sense X13
2	Cap Sense X0	16	Cap Sense X14
3	Cap Sense X1	17	Cap Sense X15
4	Cap Sense X2	18	Cap Sense X16
5	Cap Sense X3	19	Cap Sense X17
6	Cap Sense X4	20	Cap Sense X18
7	Cap Sense X5	21	Cap Sense X19
8	Cap Sense X6	22	Cap Sense X20
9	Cap Sense X7	23	Cap Sense X21
10	Cap Sense X8	24	Cap Sense X22
11	Cap Sense X9	25	Cap Sense X23
12	Cap Sense X10	26	GND
13	Cap Sense X11		
14	Cap Sense X12		

### 3.3 Interface pin definition

PM2204 includes USB/I<sup>2</sup>C/UART communication interfaces, intends to maximize application flexibility and reliability, and minimizes cost through elimination of external components.

When interface setting of Firmware is auto-detection, user can select interface by Pin8 and Pin9. Please follow hardware setting as table 1 to assign interface.

JF3				
PIN NO.	SYMBOL	PIN ASSIGNMENT		
		USB	I <sup>2</sup> C	UART
1	VCC	VCC	VCC	VCC
2	D-	D-	N.C.	N.C.
3	D+	D+	N.C.	N.C.
4	GND	Ground	Ground	Ground
5	SCL / RXD	N.C.	SCL	RXD
6	SDA / TXD	N.C.	SDA	TXD
7	nRESET	N.C.	N.C.	N.C.
8	nDETECT	N.C.	Low*	Low*
9	nINT	N.C.	nINT	Low*
10	SW	N.C.	N.C.	N.C.

Table 1. Interface pin assignment

Note:

- (1) N.C. is No Connection
- (2) \* means the setting of the interface selection. Leave these pins unconnected when the interface setting of firmware is fixed

(3)

Pin Name	Type	Description	Min	Typ	Max	Unit
VCC	P	Positive power supply		5		V
GND	P	Ground		0		V
D-	I/O	D- pin of internal USB transceiver		3.3		V
D+	I/O	D+ pin of internal USB transceiver		3.3		V
SCL	I/O	Serial clock line for I <sup>2</sup> C. Open drain requires external pull-up to 3.3V		3.3		V
SDA	I/O	Serial data line for I <sup>2</sup> C. Open drain requires external pull-up to 3.3V.		3.3		V
RXD	I	UART receive		3.3		V
TXD	O	UART transmit		3.3		V
nRESET	I	Open-drain and active low to reset PM2204 and must be driven low for 5 $\mu$ s (typical) to be valid. Leave the pin unconnected if not used.				V
nDETECT	I	Pull low when selecting I <sup>2</sup> C or UART interface		0		V
nINT	O	Processor Interrupt. This pin is active low, open drain requires external pull-up to 3.3V.		3.3		V
SW	I	Pull low for disable touch function, release this pin will back to enable touch function, Leave the pin unconnected if not used.		0		V

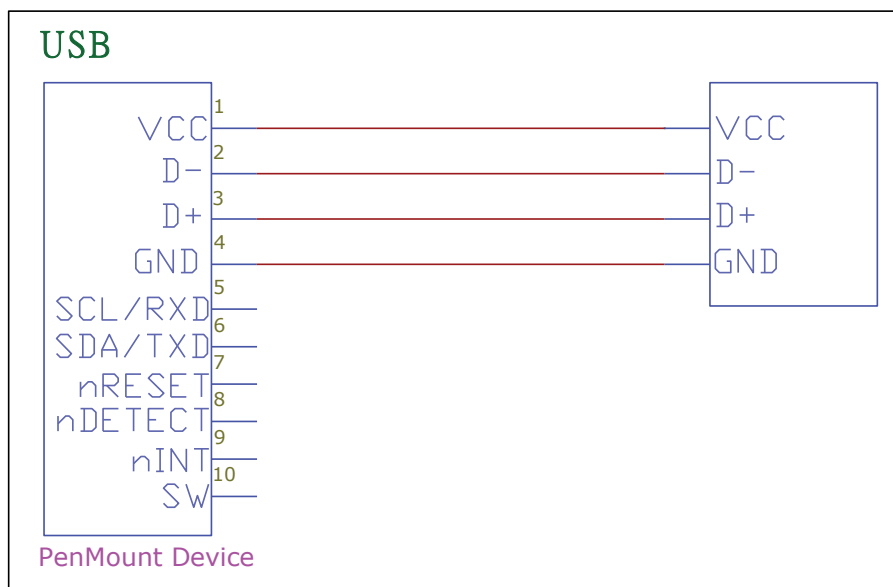


Figure 1. USB interface



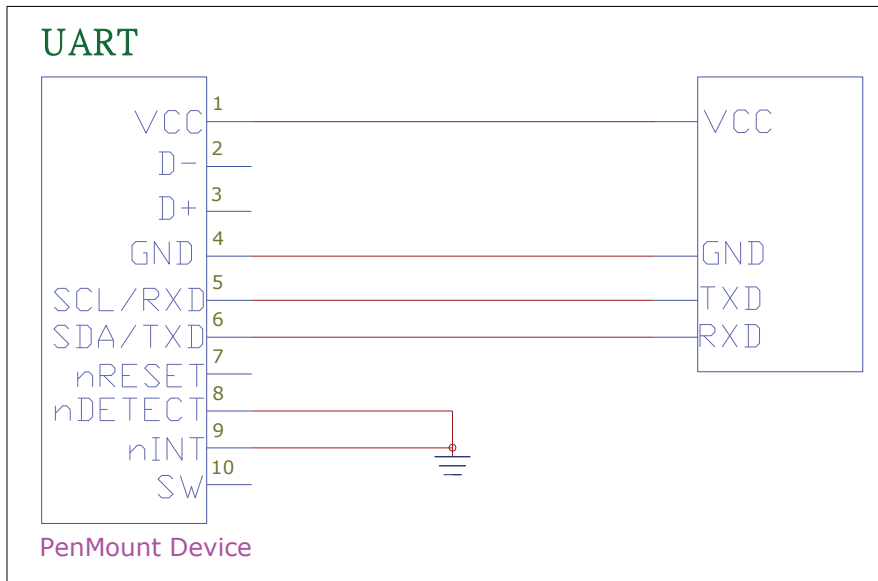


Figure 2. UART interface

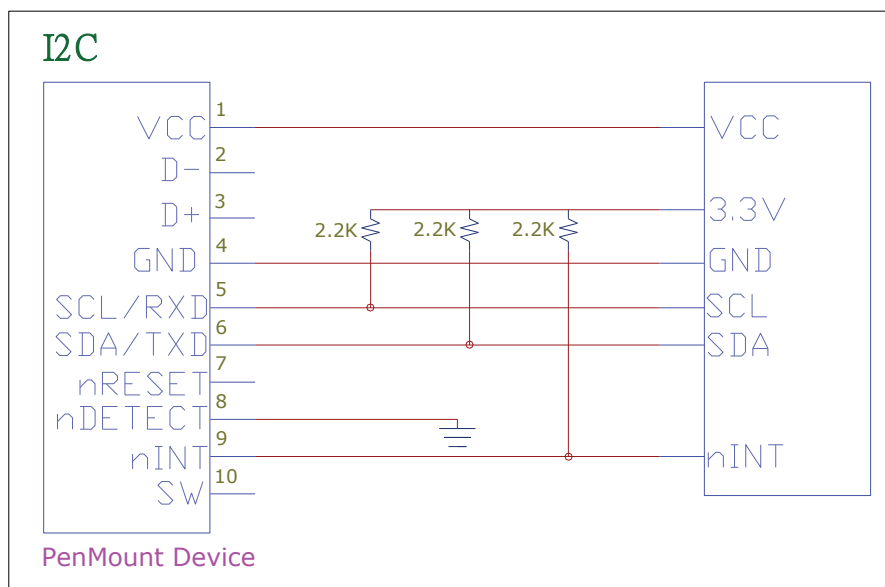


Figure 3. I<sup>2</sup>C interface

## 4.0 Drivers and Utilities

### 4.1 Drivers

For I<sup>2</sup>C:

- Windows CE : Provide binary driver for freescale iMX platform. Other platform by request.
- Linux / Android : Provide source code for integration.

For USB and UART

- Windows 2000, XP, 2003: single touch, mouse driver.
- Windows Vista: single touch, inbox driver.
- Windows 7,8,10: multi touch, Inbox driver.
- Linux: Ubuntu, Android, other Linux distributions under development.

(Provide source code for integration if any)

### 4.2 Utilities

Firmware adjustment utility allows user to fine tune the touch panel sensitivity.

Note:

All drivers and utilities are available on PenMount websites. Please contact us for further information.

## 5.0 Others

### 5.1 ROHS compliance

This control board is ROHS compliant

### 5.2 EMC protection recommendations

Please refer to PCI touch screen integration guides.

### 5.3 Noise Protection

To achieve good noise interference protection capabilities, PenMount requires paired interface cables possess comprehensive EMI shielding.