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Revision history

Rev.	Date	By	Summary	Remark
1.0	2015.09.16	Kenhsu	New Release	
1.1	2015/12/22	Ken Hsu	Operation temperature modified	
1.2	2016/03/11	Ken Hsu	Correct item 3.2 Interface pin definition	
1.3	2.016/05/11	Ken Hsu	Correct item 2.10 Operating temperature Add item 2.12 Operating or Storage Humidity Range Add item 2.5 Firmware Resolution	
1.4	2016/11/18	Ken Hsu	Correct item 3.3 Interface pin definition	
1.5	2016/4/25	Ken Hsu	Correct item 2.0 Sampling rate ,change the unit from sps to Hz Add item 2.0 Response time Correct item 3.3 Interface pin definition ,I2C SCL / SDA description Correct item 3.3 Interface pin definition The I2C interface detect pin amended to float	

1.0 Introduction

The PenMount PM1210 control board is a high specification (Projected Capacitive Input, PCI) touch panel controller product introduced by PenMount. The PenMount PM1210 can be applied in the consumer, commercial and industrial fields.

The PenMount PM1210 provides four types of interfaces, USB、I²C、UART and RS232 and supports PCI touch panels sized from 5" to 7.9". The PenMount PM1210 also supports a wide range of operating systems such as Windows and Linux.

The PenMount PM1210 was 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.

There are five connectors on this board: 50 Pins ZIF connectors for PCI touch screen FPC cables, one USB connector for 4-pin USB cable (optional), and one I²C/UART connector for 7-pin I²C cable (optional), and one RS232 connector for 5-pin RS232 cable (optional)

2.0 Specifications

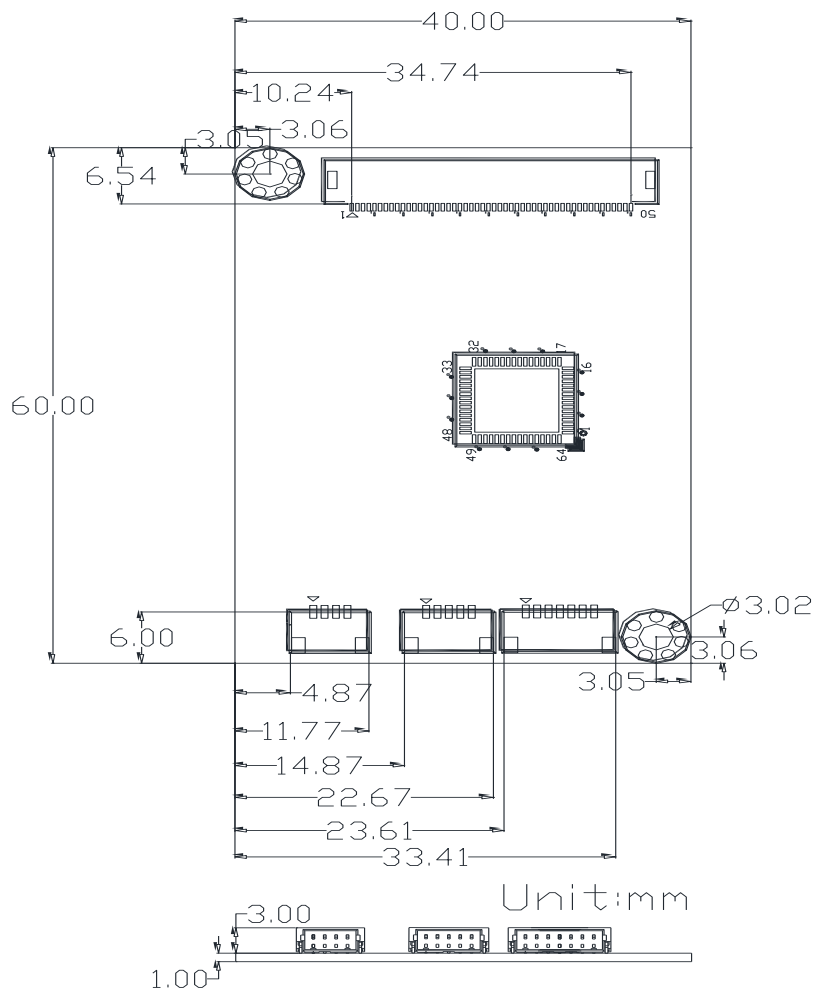
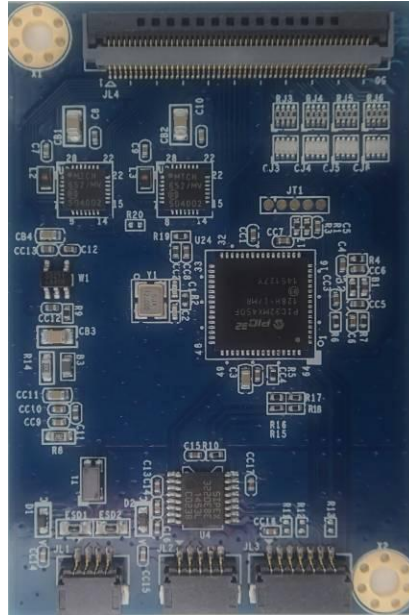
Parameter		feature
Controller part number		PenMount P2-06 x 1pcs
Number of sensing line		15
Number of driving line		24
Supporting projected capacitive touch panel size		Projected capacitive type, from 5" to 7.9"
Interface	USB	Full-speed, 12Mbps
	UART / RS-232	38400 baud rate / 8bit data / non parity / one stop bit / non-PnP
	I ² C	Slave, 400 kHz
ADC resolution		10bits (Typical)
Firmware resolution		2048 x 2048 (Typical)
Response time		Average < 30ms
Sampling rate	One finger touch	160 Hz(Typical)
	Five fingers touch	100 Hz(Typical)
Operating voltage		+5Vdc, ±5 %
Power consumption	Working mode	41.0mA @ 5Vdc
	Idle mode	23.5mA @ 5Vdc
	Sleep mode	2.9mA @ 5Vdc
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

JL4 50Pin ZIF , PH 0.5mm ; HRS FH52-50S-05SH							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	Ground	14	Cap Drive X10	27	Cap Drive X23	40	Cap Sense Y6
2	Ground	15	Cap Drive X11	28	NC	41	Cap Sense Y5
3	NC	16	Cap Drive X12	29	Ground	42	Cap Sense Y4
4	Cap Drive X0	17	Cap Drive X13	30	Ground	43	Cap Sense Y3
5	Cap Drive X1	18	Cap Drive X14	31	NC	44	Cap Sense Y2
6	Cap Drive X2	19	Cap Drive X15	32	Cap Sense Y14	45	Cap Sense Y1
7	Cap Drive X3	20	Cap Drive X16	33	Cap Sense Y13	46	Cap Sense Y0
8	Cap Drive X4	21	Cap Drive X17	34	Cap Sense Y12	47	NC
9	Cap Drive X5	22	Cap Drive X18	35	Cap Sense Y11	48	NC
10	Cap Drive X6	23	Cap Drive X19	36	Cap Sense Y10	49	NC
11	Cap Drive X7	24	Cap Drive X20	37	Cap Sense Y9	50	Ground
12	Cap Drive X8	25	Cap Drive X21	38	Cap Sense Y8		
13	Cap Drive X9	26	Cap Drive X22	39	Cap Sense Y7		

3.3 Interface pin definition

PM1210 includes USB/I2C/UART/RS232 communication interfaces, intends to maximize application flexibility and reliability, and minimizes cost through elimination of external components.

JL1 / 4PIN / ACES 50224-00401-001						
PIN NO.	USB	Description	Min	Typ	Max	Unit
1	VCC	Positive power supply		5		V
2	D-	D- pin of internal USB transceiver		3.3		V
3	D+	D+ pin of internal USB transceiver		3.3		V
4	GND	Ground		0		V

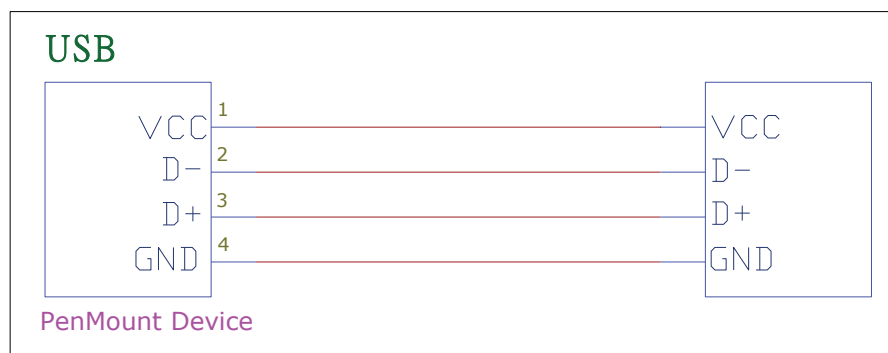


Figure1 USB interface

JL2 / 5PIN / ACES 50224-00501-001						
PIN NO.	RS232	Description	Min	Typ	Max	Unit
1	VCC	Positive power supply		5		V
2	RXD	RS232 receive	-25		+25	V
		input threshold low	0.8	1.5		
		input threshold high		1.8	2.4	
3	TXD	RS232 transmit	-13.2		+13.2	V
		output threshold low			0.4	
		output threshold high	4.4	4.9		
4	GND	Ground		0		V
5	GND	Ground		0		V

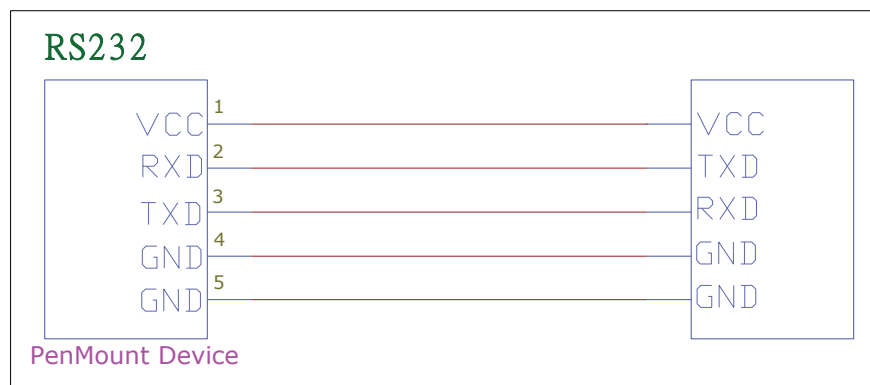


Figure2 RS232 interface

JL3 / 7PIN ; ACES 50224-00701-001			
PIN NO.	SYMBOL	PIN ASSIGNMENT	
		I ² C	UART
1	VCC	VCC	VCC
2	GND	Ground	Ground
3	SCL / RXD	SCL	RXD
4	SDA / TXD	SDA	TXD
5	nRESET	N.C.	N.C.
6	nDetect	N.C.	Low
7	nINT	nINT	N.C.

PIN NO.	Type	Description	Min	Typ	Max	Unit
VCC	P	Positive power supply		5		V
GND	P	Ground		0		V
SCL	I/O	Serial clock line for I2C. Open drain requires external pull-up to 3.3V.		3.3		V
SDA	I/O	Serial data line for I2C. 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 PM1210 and must be driven low for 5 μ s (typical) to be valid. Leave the pin unconnected if not used.				V
nDETECT	I	Pull low when selecting UART interface float when selecting I2C interface		0		V
nINT	O	Processor Interrupt. This pin is active low, open drain requires external pull-up to 3.3V.		3.3		V

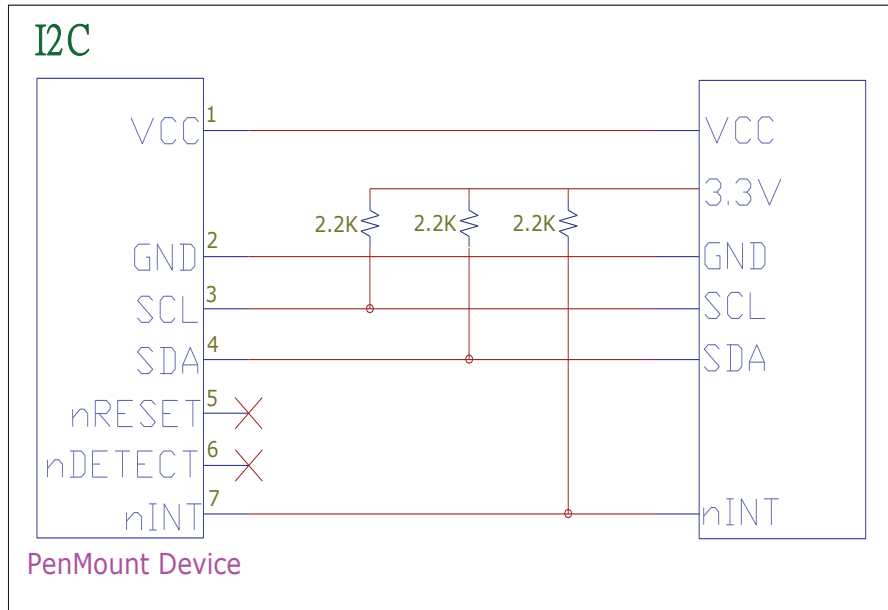


Figure3 I2C interface

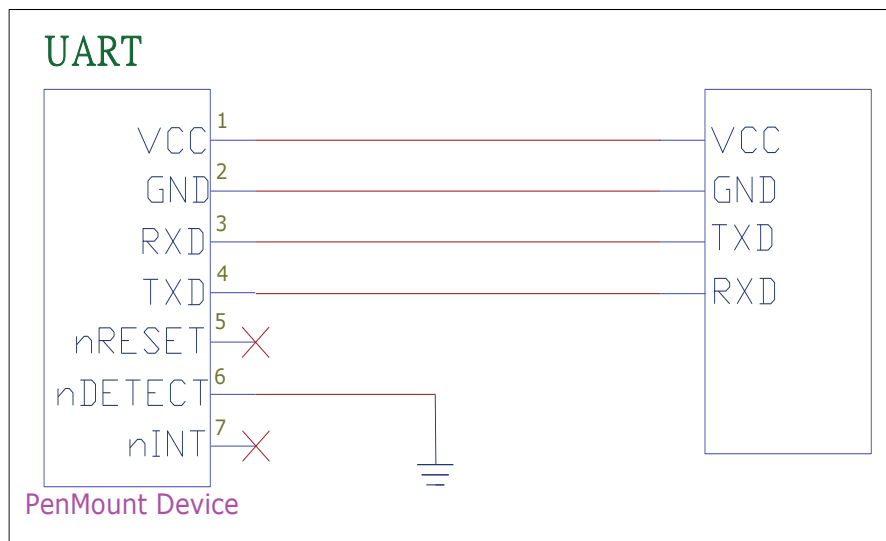
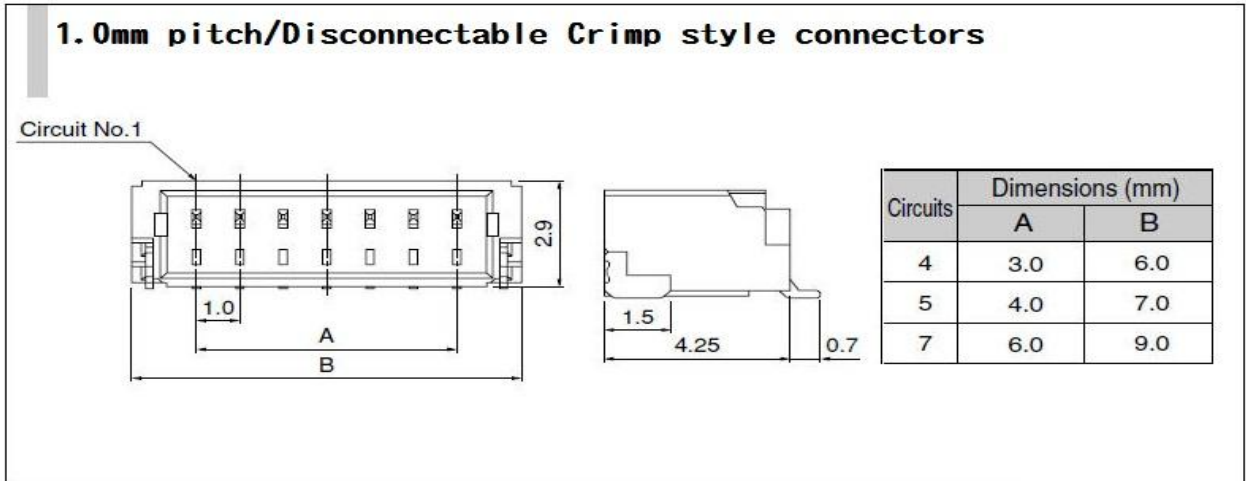


Figure4 UART interface

3.4 Connector specifications



4.0 Drivers and utilities

4.1 Drivers

For I²C:

- Windows CE : Binary driver for freescale iMX platform. Other platform by request.
- Linux / Android : Source code for integration.

For USB

- Windows 2000, XP, 2003: single touch, mouse driver.
- Windows Vista: single touch, inbox driver.
- Windows 7,8,10: five touch, Inbox driver.
- Linux: Ubuntu, Android, other versions of Linux support, please refer PenMount website

For UART / RS-232

- Windows 2000, XP, 2003: single touch, mouse driver.
- Windows Vista: single touch, digitizer driver.
- Windows 7,8,10: 5 touches support, digitizer driver.
- Linux: inbox driver after kernel 3.2, provide source code for kernel 2.6

(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.

The cable should have a woven or spirally copper shield with 360 ° shield coverage

The shield must be terminated to the receptacle and be connected to ground plane carefully.

Below is an example for 4-pin USB cable diagram. For other implementation, please follow the same design rules.

