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Revision History

Rev.	Date	By	Summary	Remark
1.0	2017/1/20	Ken Hsu	1. New Release	
1.1	2017/3/13	Ken Hsu	1. Correct item 2.0 Sampling rate, change the unit from sps to Hz 2. Add item 2.0 Response time 3. Correct item 3.3 Interface pin definition, I2C SCL / SDA description	
1.2	2017/7/7	Ken Hsu	1. Correct item 3.2 Touch line pin definition	
1.3	2024/10/4	Ken Hsu	1. Correct item 2.0 Firmware resolution	
1.4	2024/10/9	Ken Hsu	1. Correct item 1.0, change PM1715 series supports PCAP touch panels up to 32" size 2. Correct item 3.4 Connector specifications, add component table and mechanical Drawing 3. Correct item 4.1 Divers	
1.5	2024/10/31	Ken Hsu	1. Add item 3.3 Pin's driving Voltage	

1.0 Introduction

The PenMount PM1715 series control board is a high specification (Projected Capacitive, PCAP) touch panel controller product introduced by PenMount. The PenMount PM1715 series can be applied in the consumer, commercial and industrial fields.

The PenMount PM1715 series provides two types of interfaces, USB & I²C and supports PCAP touch panels sized from 15.6" to 32". The PenMount PM1715 series also supports a wide range of operating systems such as Windows and Linux.

The PenMount PM1715 series 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 three connectors on this board: 80 Pins & 50 Pins ZIF connectors for PCAP touch screen FPC cables, one USB connector for 4-pin USB cable (optional), and one I²C connector for 7-pin I²C cable (optional).

2.0 Specifications

Parameter		feature
Controller part number		PenMount P2-08 x 2pcs
Number of sensing line		44
Number of driving line		76
Supporting touch panel		Projected capacitive type, from 15.6" to 32"
Interface	USB (PM1715U)	Full-speed, 12Mbps
	I ² C (PM1715I)	Slave, 400 kHz
ADC resolution		10bits (Typical)
Firmware resolution		4096 x 4096 (Typical)
Response time		Average < 35ms
Sampling rate	1 finger touch	150 Hz(Typical)
	5 fingers touch	100 Hz(Typical)
Operating voltage		+5Vdc, ±5 %
Power consumption	Working mode	83.5mA @ 5Vdc
	Idle mode	67.2mA @ 5Vdc
	Sleep mode	1.6mA @ 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 :

1. Firmware resolution depends on the firmware version and settings. The maximum resolution can be configured up to 16384 x 16384.
2. CS and RS performance, power consumption and sample rate will vary according to different firmware versions.

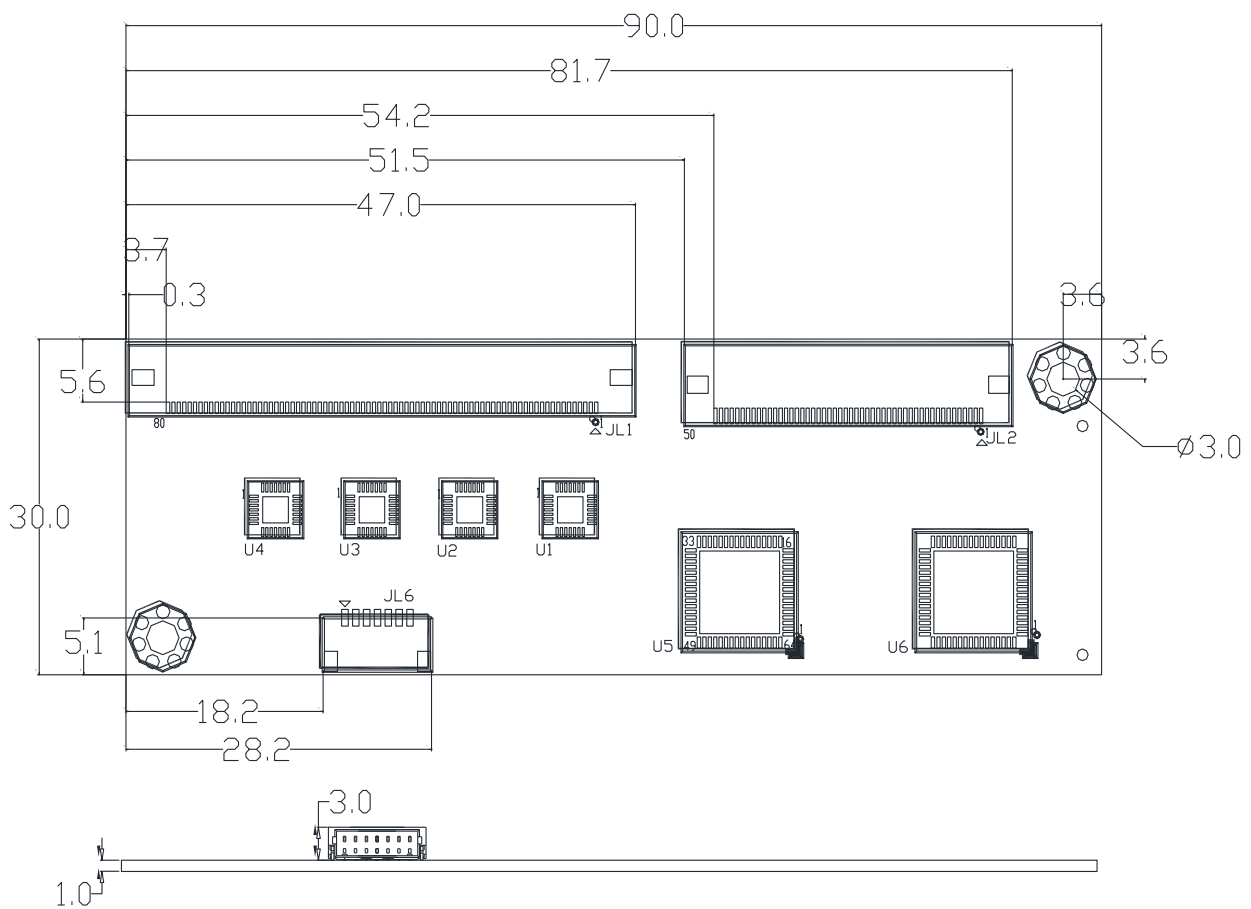
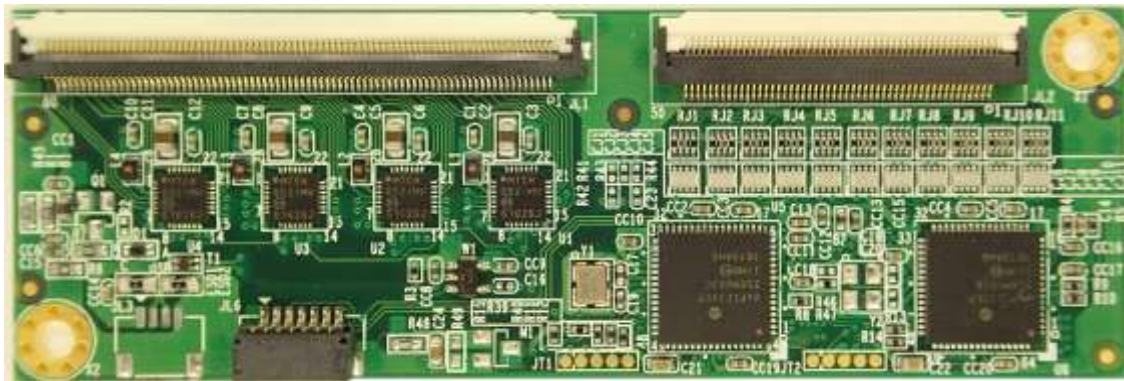


Figure 2 PM1715I

PenMount PM1715 Series PCAP Controller Board Data Sheet

3.2 Touch line pin definition

JL1 80Pin ZIF , PH 0.5mm ; ACES 50520-08001-001							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	21	Cap Drive X57	41	Cap Drive X37	61	Cap Drive X17
2	NC	22	Cap Drive X56	42	Cap Drive X36	62	Cap Drive X16
3	Cap Drive X75	23	Cap Drive X55	43	Cap Drive X35	63	Cap Drive X15
4	Cap Drive X74	24	Cap Drive X54	44	Cap Drive X34	64	Cap Drive X14
5	Cap Drive X73	25	Cap Drive X53	45	Cap Drive X33	65	Cap Drive X13
6	Cap Drive X72	26	Cap Drive X52	46	Cap Drive X32	66	Cap Drive X12
7	Cap Drive X71	27	Cap Drive X51	47	Cap Drive X31	67	Cap Drive X11
8	Cap Drive X70	28	Cap Drive X50	48	Cap Drive X30	68	Cap Drive X10
9	Cap Drive X69	29	Cap Drive X49	49	Cap Drive X29	69	Cap Drive X9
10	Cap Drive X68	30	Cap Drive X48	50	Cap Drive X28	70	Cap Drive X8
11	Cap Drive X67	31	Cap Drive X47	51	Cap Drive X27	71	Cap Drive X7
12	Cap Drive X66	32	Cap Drive X46	52	Cap Drive X26	72	Cap Drive X6
13	Cap Drive X65	33	Cap Drive X45	53	Cap Drive X25	73	Cap Drive X5
14	Cap Drive X64	34	Cap Drive X44	54	Cap Drive X24	74	Cap Drive X4
15	Cap Drive X63	35	Cap Drive X43	55	Cap Drive X23	75	Cap Drive X3
16	Cap Drive X62	36	Cap Drive X42	56	Cap Drive X22	76	Cap Drive X2
17	Cap Drive X61	37	Cap Drive X41	57	Cap Drive X21	77	Cap Drive X1
18	Cap Drive X60	38	Cap Drive X40	58	Cap Drive X20	78	Cap Drive X0
19	Cap Drive X59	39	Cap Drive X39	59	Cap Drive X19	79	GND
20	Cap Drive X58	40	Cap Drive X38	60	Cap Drive X18	80	GND

JL2 50Pin ZIF , PH 0.5mm ; ACES 51619-05001-001									
PIN	Description	PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	11	Cap Sense Y6	21	Cap Sense Y16	31	Cap Sense Y26	41	Cap Sense Y36
2	NC	12	Cap Sense Y7	22	Cap Sense Y17	32	Cap Sense Y27	42	Cap Sense Y37
3	NC	13	Cap Sense Y8	23	Cap Sense Y18	33	Cap Sense Y28	43	Cap Sense Y38
4	NC	14	Cap Sense Y9	24	Cap Sense Y19	34	Cap Sense Y29	44	Cap Sense Y39
5	Cap Sense Y0	15	Cap Sense Y10	25	Cap Sense Y20	35	Cap Sense Y30	45	Cap Sense Y40
6	Cap Sense Y1	16	Cap Sense Y11	26	Cap Sense Y21	36	Cap Sense Y31	46	Cap Sense Y41
7	Cap Sense Y2	17	Cap Sense Y12	27	Cap Sense Y22	37	Cap Sense Y32	47	Cap Sense Y42
8	Cap Sense Y3	18	Cap Sense Y13	28	Cap Sense Y23	38	Cap Sense Y33	48	Cap Sense Y43
9	Cap Sense Y4	19	Cap Sense Y14	29	Cap Sense Y24	39	Cap Sense Y34	49	NC
10	Cap Sense Y5	20	Cap Sense Y15	30	Cap Sense Y25	40	Cap Sense Y35	50	GND

3.3 Interface pin definition

PM1715 series supports 2 kinds of communication interface: PM1715U for USB interface and PM1715I for I2C interface.

PM1715U

JL3 / 4PIN / ACES 50224-00401-001 (PM1715U)						
PIN NO.	SYMBOL	Description	Min	Typ	Max	Unit
1	VCC	Positive power supply	4.75	5	5.25	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

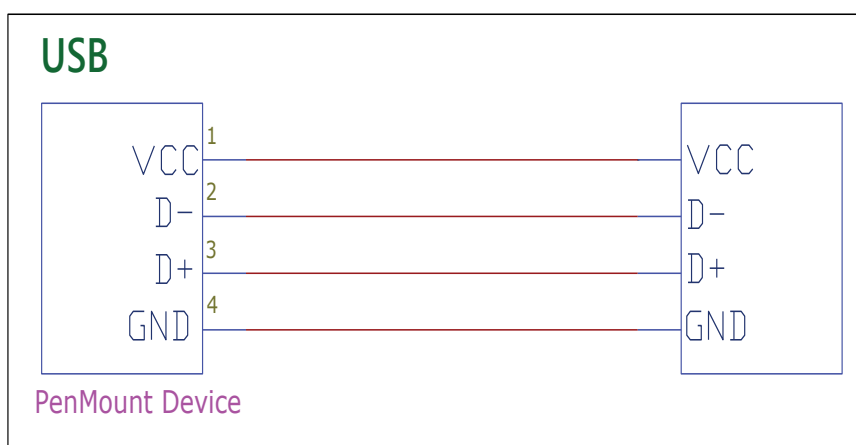


Figure 3. USB interface

PM1715I

JL6 / 7PIN ; ACES 50224-00701-001 (PM1715I)						
PIN NO.	I ² C	Description	Min	Typ	Max	Unit
1	VCC	Positive power supply	4.75	5	5.25	V
2	GND	Ground		0		V
3	SCL	Serial clock line for I2C. Open drain requires external pull-up to VCC		3.3		V
4	SDA	Serial data line for I2C. Open drain requires external pull-up to VCC		3.3		V
5	nRESET	Open-drain and active low to reset PM1715I and must be driven low for 5 μ s (typical) to be valid. Leave the pin unconnected if not used.				V
6	SW	Pull low for disable touch function, release this pin will back to enable touch function, Leave the pin unconnected if not used.		0		V
7	nINT	Processor Interrupt. This pin is active low, open drain, and should be pulled high to VCC		3.3		V

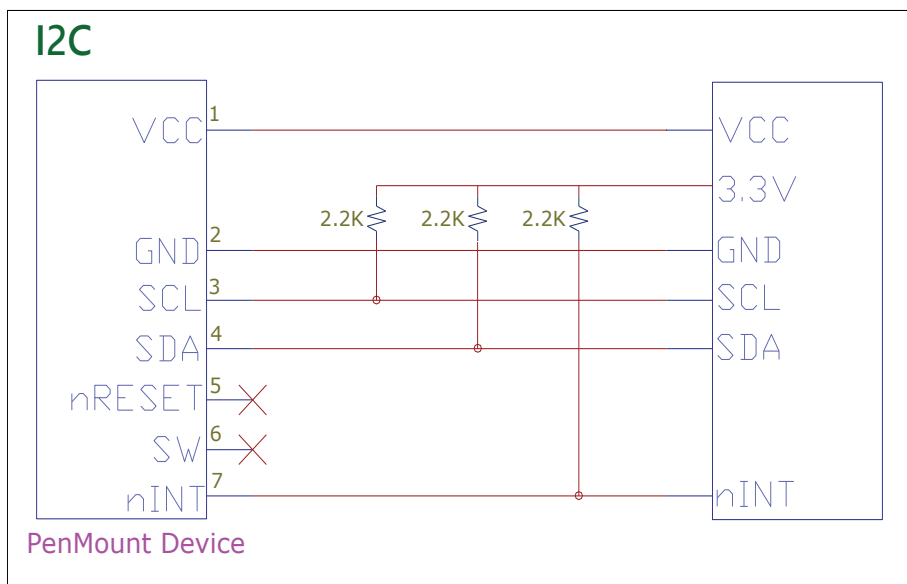
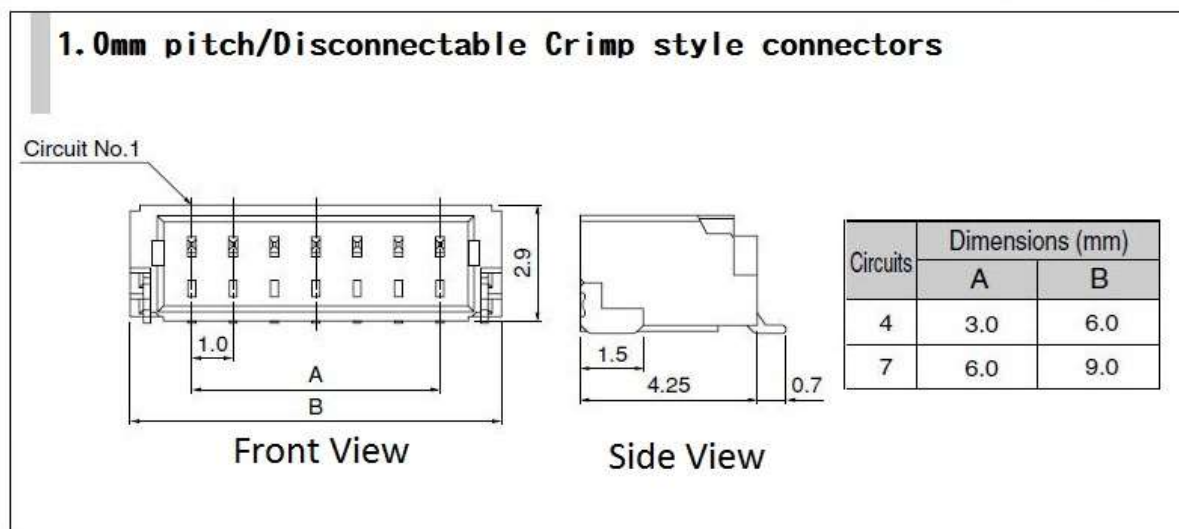


Figure 4. I2C interface

3.4 Connector specifications

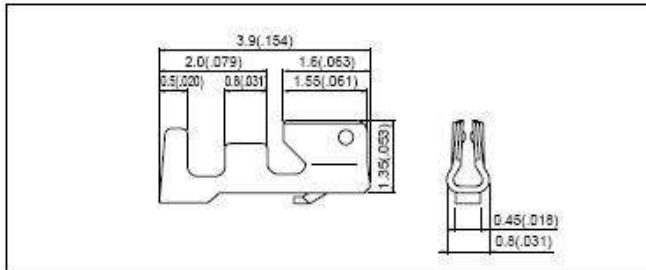
Connector name	Connector function	On-board Connector	Mating connector (JST)
JL3 (Optional)	USB	1 x 4 locking M pin header ACES p/n 50224-00401-001	JST p/n SHR-04V-S-B housing JST p/n SSH-003T-P0.2-H crimp pin
JL6 (Optional)	I2C	1 x 7 locking M pin header ACES p/n 50224-00701-001	JST p/n SHR-07V-S-B housing JST p/n SSH-003T-P0.2-H crimp pin
JL1	80 – pin ZIF touch screen	1 x 80 FFC / FPC conn ACES p/n 50520-08001-001	
JL2	50 – pin ZIF touch screen	1 x 50 FFC / FPC conn ACES p/n 51619-05001-001	

JL3 、 JL6 On-board Connector Specification



JL3、JL6 Mating Connector (JST) Specification

Contact

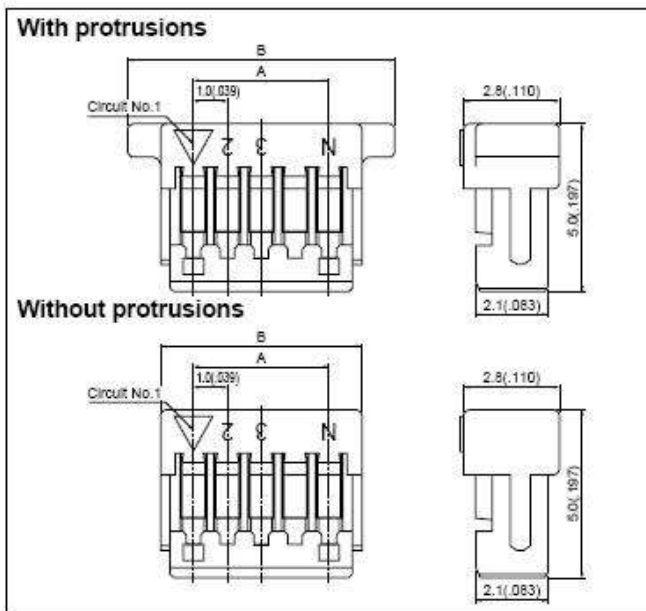


Model No.	Applicable wire			Q'ty / reel
	mm ²	AWG#	Insulation O.D. mm(in.)	
SSH-003T-P0.2-H	0.032 to 0.08	32 to 28	0.4 to 0.8(0.16 to .031)	23,000

Material and Finish
Phosphor bronze, tin-plated

Note: Contact JST for gold-plated contacts.

Housing



Circuits	Model No.		Dimensions mm(in.)			Q'ty / box
	With protrusions	Without protrusions	A	B		
2	SHR-02V-S-B	SHR-02V-S	1.0(.039)	5.0(.197)	3.0(.118)	2,000
3	SHR-03V-S-B	SHR-03V-S	2.0(.079)	6.0(.236)	4.0(.157)	2,000
4	SHR-04V-S-B	SHR-04V-S	3.0(.118)	7.0(.278)	5.0(.197)	2,000
5	SHR-05V-S-B	SHR-05V-S	4.0(.157)	8.0(.315)	6.0(.236)	2,000
6	SHR-06V-S-B	SHR-06V-S	5.0(.197)	9.0(.354)	7.0(.278)	2,000
7	SHR-07V-S-B	SHR-07V-S	6.0(.236)	10.0(.394)	8.0(.315)	2,000
8	SHR-08V-S-B	SHR-08V-S	7.0(.276)	11.0(.433)	9.0(.354)	2,000
9	SHR-09V-S-B	SHR-09V-S	8.0(.315)	12.0(.472)	10.0(.394)	2,000
10	SHR-10V-S-B	SHR-10V-S	9.0(.354)	13.0(.512)	11.0(.433)	2,000
11	SHR-11V-S-B	SHR-11V-S	10.0(.394)	14.0(.551)	12.0(.472)	2,000
12	SHR-12V-S-B	SHR-12V-S	11.0(.433)	15.0(.591)	13.0(.512)	2,000
13	SHR-13V-S-B	SHR-13V-S	12.0(.472)	16.0(.630)	14.0(.551)	2,000
14	SHR-14V-S-B	SHR-14V-S	13.0(.512)	17.0(.669)	15.0(.591)	2,000
15	SHR-15V-S-B	SHR-15V-S	14.0(.551)	18.0(.709)	16.0(.630)	2,000
20	SHR-20V-S-B	-	19.0(.748)	23.0(.906)	21.0(.827)	2,000

Material
PBT, UL94V-0, natural (white)

Note: SHR-20V-S-B is not CSA approved.

4.0 Drivers and Utilities

4.1 Drivers

For I²C

- Windows / Linux / Android :
HID over I2C protocol: Inbox driver support.
PenMount I2C protocol: Provide source code for integration.

For USB

- Windows XP: PenMount or inbox driver support.
- Windows Vista: Inbox single-touch driver support.
- Windows 7, 8, 10, 11: Inbox multi-touch driver support.
- Linux / Android: PenMount or inbox driver support.

Note:

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

4.2 Utilities

Firmware adjustment utility allows user to fine tune the touch panel performance, including set parameters, adjust sensitivity and noise handling, update firmware, etc.

5.0 Others

5.1 ROHS compliance

This control board is ROHS compliant

5.2 EMC protection recommendations

Please refer to AMT Projected Capacitive Touch Panel Integration Guide.

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.

