Memory Module Connectors
SM3 and MM60 Series

Product Information Module

Technology to Inspire Innovation

JAE

JAE SM3 Series and MM60 Series
M.2 (NGFF) and PCI Express Mini Card Connector

Application Examples

Solid state drives and wireless card interfaces in:

- PC/tablets
- Smart meter
- TV and set top box
- Other wireless ultra portable devices

M.2 and Mini Card Overview

The SM3 Series and MM60 series are memory module connectors compatible with PCI-SIG PCI Express M.2 and mini cards. The M.2 is a new alternative for PCI Express Mini and Half Mini cards and connectors, and with an even smaller size, it is ideal for mobile devices. The SM3 Series has significant space-savings compared to previous technologies in both board space and height, but also supports higher transmission speeds and wider variety of industry standards for signaling.


M.2
(SM3 Series)
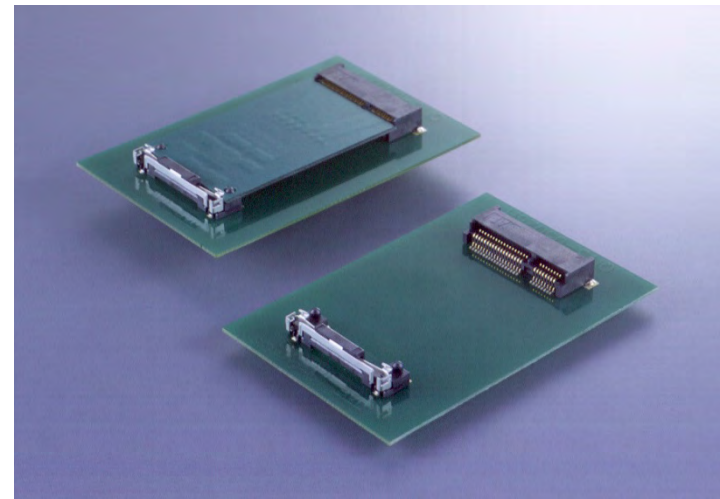
PCI Express Mini Card
(MM60 Series)

Series Features

New alternative for PCIe Mini and Half Mini cards and connectors.

- Small size card edge connector for mobile devices.

- MM60 series is compatible with the PCI Express Mini Card Electromechanical Specification

- Can be used for connecting with modules that use PCIe and USB communication

- Standard interface for solid state drives (SSD) and various wireless cards supporting Wi-Fi®, NFC, Bluetooth®, GNSS, WWAN, etc.

- Stand off nut provides a secure method to keep the card in place after assembly to the connector.

- Retention latch for the MM60 Series is available to fix module to connector
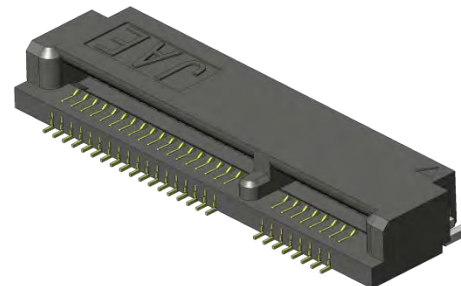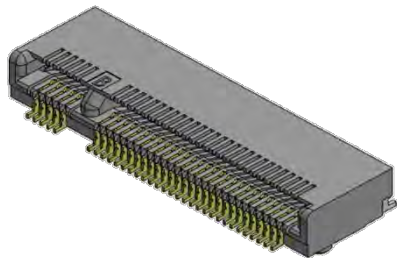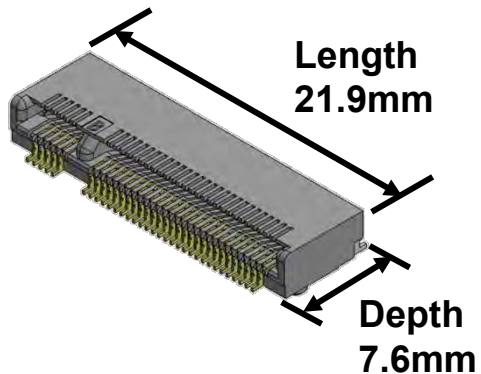
M.2 and Mini Card Comparison

M.2
(SM3 Series)

Height	1.2, 2.15, 3.1, 4.1mm
No. of Contacts	67
Pitch	0.5mm

Host Interfaces:

- PCI Express®
- USB
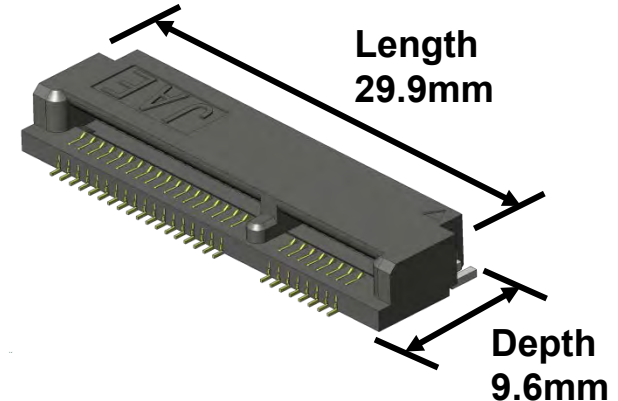- SATA
- SDIO
- SSIC

- UART
- I2C
- DisplayPort
- PCM/I2S

Length 21.9mm

Depth 7.6mm

PCI Express Mini Card
(MM60 Series)

Height	3.21, 4.0, 5.9mm
No. of Contacts	52, 76
Pitch	0.8mm

Host Interfaces:

- PCI Express
- USB

Length 29.9mm

Depth 9.6mm

General Specifications

M.2 (SM3 Series)	
No. of Contacts	67
Pitch	0.5mm
Height	1.2, 2.15, 3.1, 4.1mm
Length x Depth	21.9 x 7.6mm (top mount) 25.1 x 9.45mm (mid mount)
Applicable Card Thickness	0.8mm±0.08mm
Contact resistance	50m Ω max (initial)
Dielectric Withstanding Voltage	AC 300Vr.m.s (for 1 minute)
Operating Temperature Range	-40 to +80 ^{o}C
Rated Current	0.5A per pin
Rated Voltage	50V AC r.m.s.
Mating Durability	60 cycles
Coplanarity	0.1mm max.
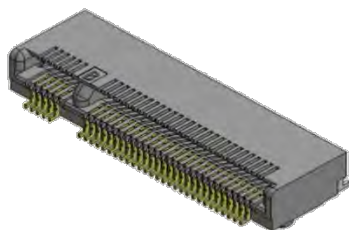
PCI Express Mini Card (MM60 Series)	
Number of Contacts	52, 76
Pitch	0.8mm
Height	3.21, 4.0, 5.9mm
Length x Depth	29.7 x 10mm (MM60-52B1-E1) 29.9 x 9.6mm (MM60-52B1-G1) 30.3 x 9.5mm (MM60-52C2-R1) 44.3 x 9.6mm (MM60-76B2-G1)
Applicable Card Thickness	1.0mm±0.1mm
Contact Resistance	60m Ω max (initial)
Dielectric Withstanding Voltage	AC 300Vr.m.s (per minute)
Operating Temperature Range	-40 to +85°C
Rated Current	0.5A per pin
Rated Voltage	50V AC r.m.s.
Mating Durability	50 cycles
Coplanarity	0.1mm max.
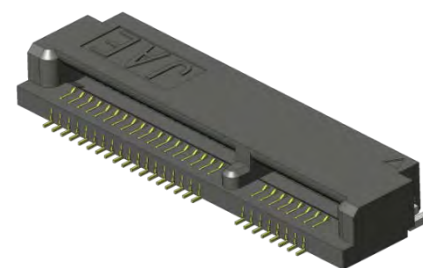
Basic Dimensions: SM3

*All units in mm

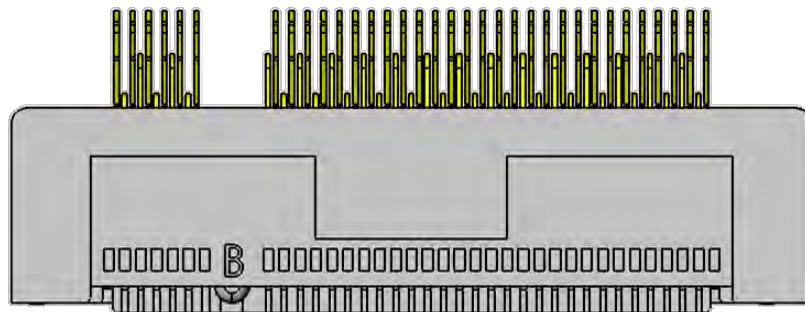| Part Number	A
SM3ZS067U215**	2.15
SM3ZS067U310**	3.1
SM3ZS067U410**	4.1

A

7.6

21.9
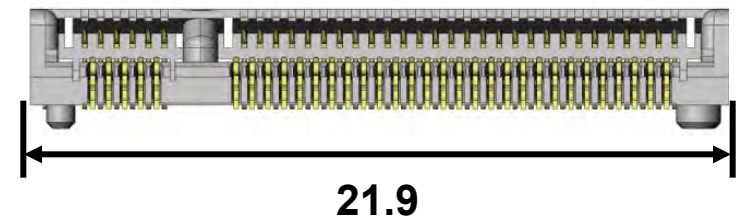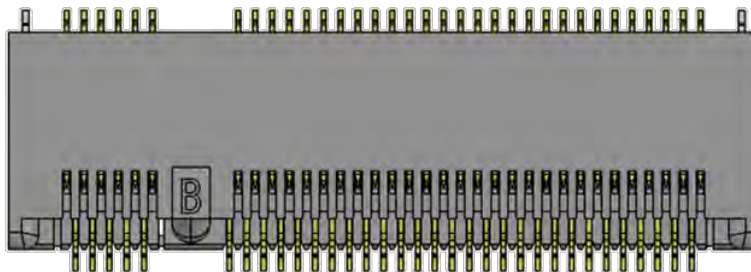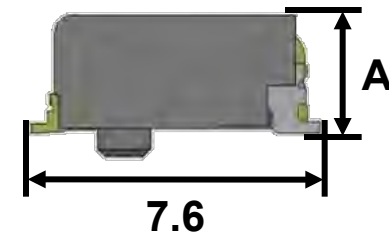
Basic Dimensions: SM3

*All units in mm

SM3ZS067B120***

2.8

9.45

1.2

25.1
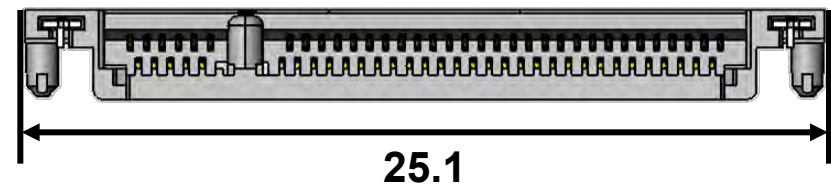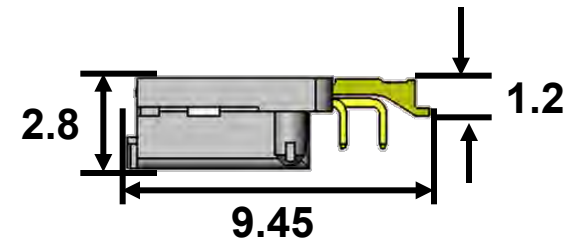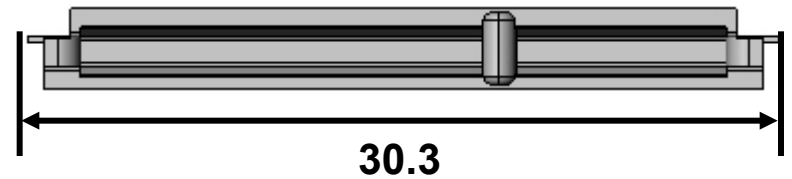
Basic Dimensions: MM60

*All units in mm

MM60-52C2-R1

1.05

(0.035)

3.21

9.5

30.3
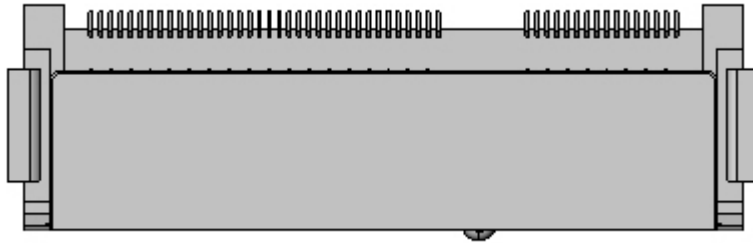
Basic Dimensions: MM60

*All units in mm

MM60-52B1-G1

4

9.6

29.9
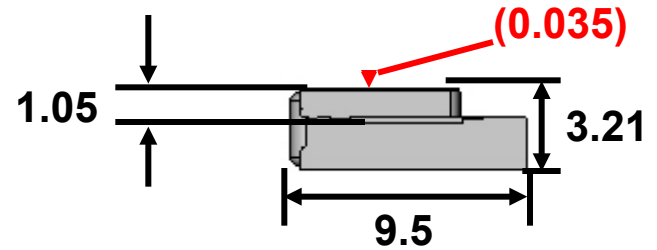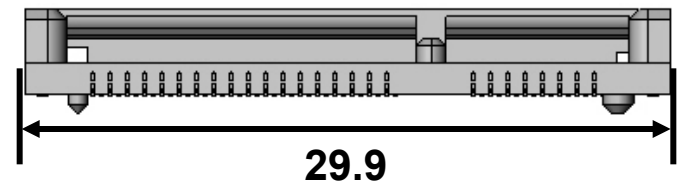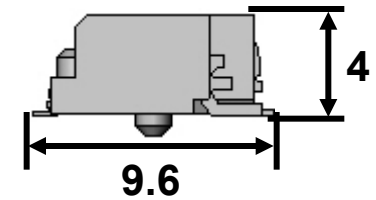
Basic Dimensions: MM60

*All units in mm

MM60-76B2-G1

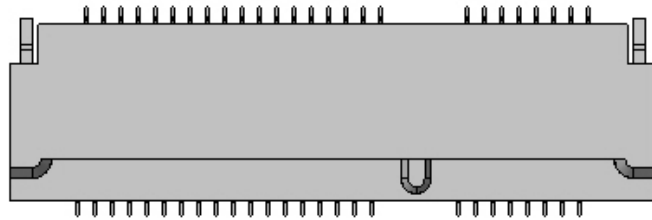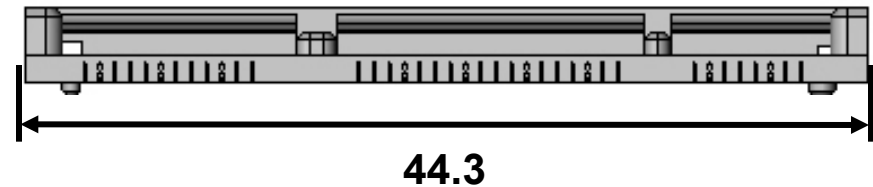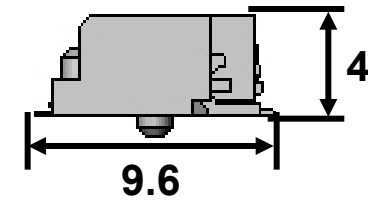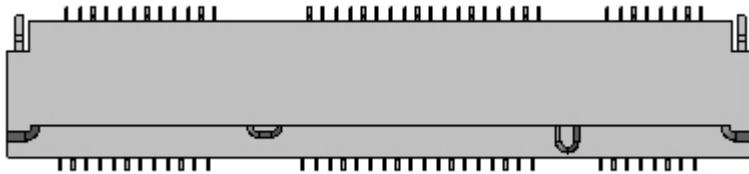4

9.6

44.3
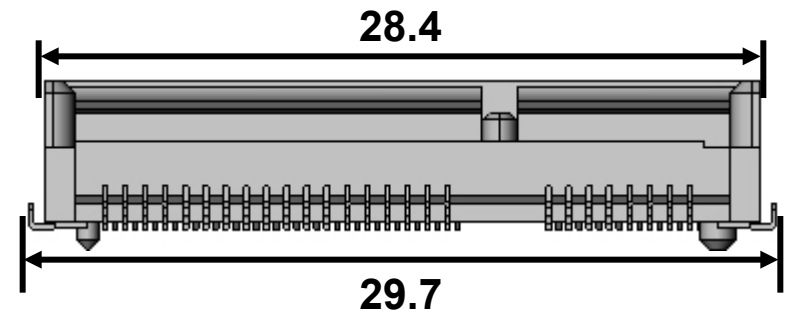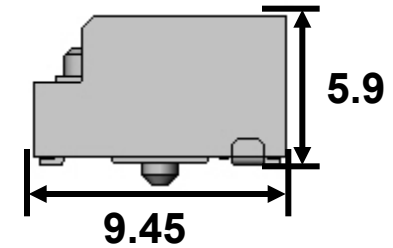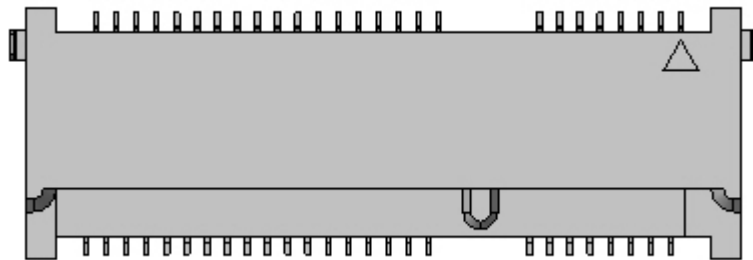
Basic Dimensions: MM60

*All units in mm

MM60-52B1-E1

5.9

9.45

28.4

29.7

Materials and Finishes

M.2
(SM3 Series)

Component	Material / Finish
Hold Down	Copper alloy/ Tin Plating Over Ni
Top Contacts	Contact area: Copper alloy / Au plating over Ni Terminal area: Copper alloy / Au flash plating over Ni
Bottom Contacts	Contact area: Copper alloy / Au plating over Ni Terminal area: Copper alloy / Au flash plating over Ni
Insulator	Heat-resistant resin (Black, Halogen-free)

Insulator

Hold Down

Top Contacts

Bottom Contacts
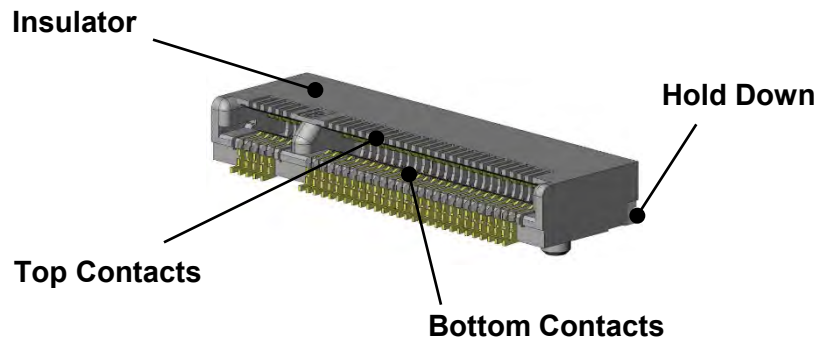
PCI Express Mini Card
(MM60 Series)

Component	Material / Finish
Contact	Copper alloy / Contact area: Au plating over Ni Terminal area: Au flash over Ni
Insulator	Heat resistant material (UL94V-0)
Hold Down	Copper alloy / Sn plating

Connector

Insulator

Hold Down
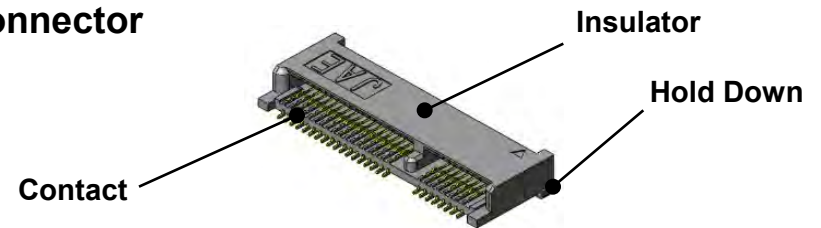
Contact

Component	Material / Finish
Contact	Stainless steel / Sn plating
Insulator	Heat resistant material (UL94V-0)

Automatic Latch

Contact

Insulator

Ordering Information: SM3 Series

| SM3 | Z | S | 067 | * | *** | * | * | * | R**** |

Series

Force Type
Z: Low Insertion

S: Standard Mounting Type

No. of Contacts

Mounting Type
U: On-board Mounting Type
B: Sunk-into-the-board Type

Product Height
120: 1.20mm
215: 2.15mm
310: 3.10mm
410: 4.10mm

Contact Area Finish
A: Au 0.13μm min.
B: Au 0.25μm min.

Polarizing Key: A / B / E / M

Modification Code

Reel Size
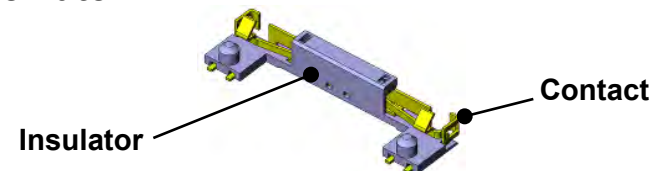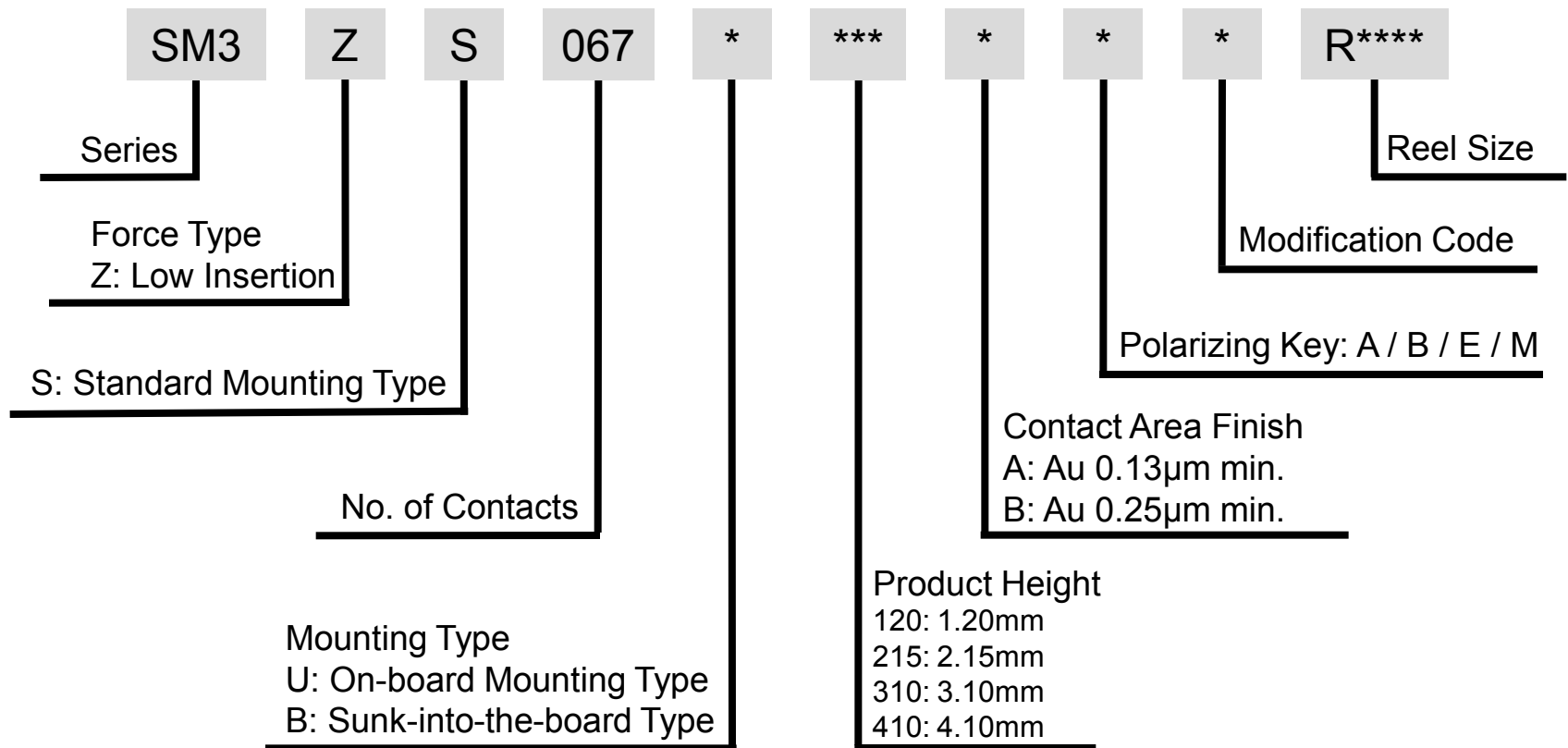
Ordering Information: SM3 Series

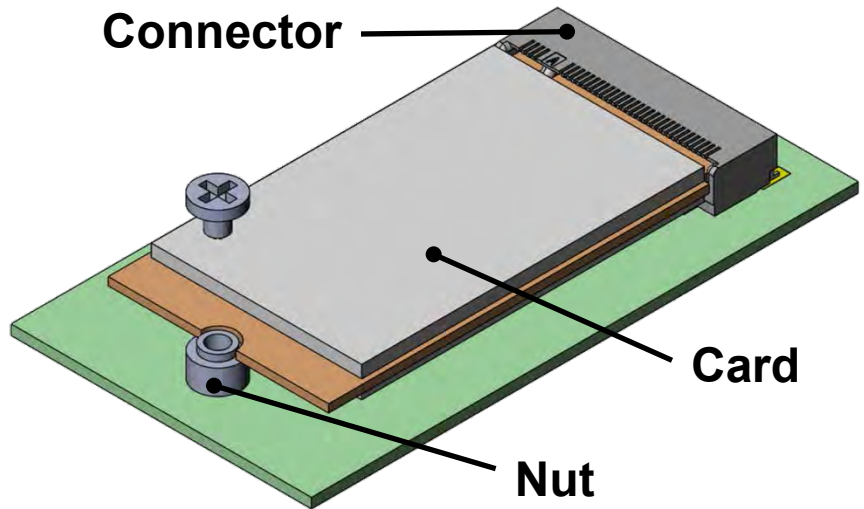| Part Number		SM3ZS067 U215** (R1500)	SM3ZS067 U410** (R1000)	SM3ZS067 U310** (R1500)	SM3ZS067 B120**2 (R1500)	SM3ZS067 B120**1 (R1500)
Mounting type		On board			Mid mount	
Key Options		A/B/E/M	A/B/E/M	A/B/E/M	B/E/M	
Contact Area Au plating thickness	0.1μm	A/B/E/M	A/B/E/M	A/B/E/M	B/E/M	
	0.25μm	B/E	B	A		
Board Fixing Method		SMT				Through-hole
Specification		JACS-10937	JACS-10941	JACS-10941	JACS-11000	
Drawing No. Individual Product		SJ113567	SJ113505	SJ113503	SJ114364	SJ114362

Stand-off Nut Accessory: SM3 Series

M2x0.4 tapped thru hole

Ø4.5

Ø3

0.65

L1

Ø2.5

0.7

Connector

Card

Nut
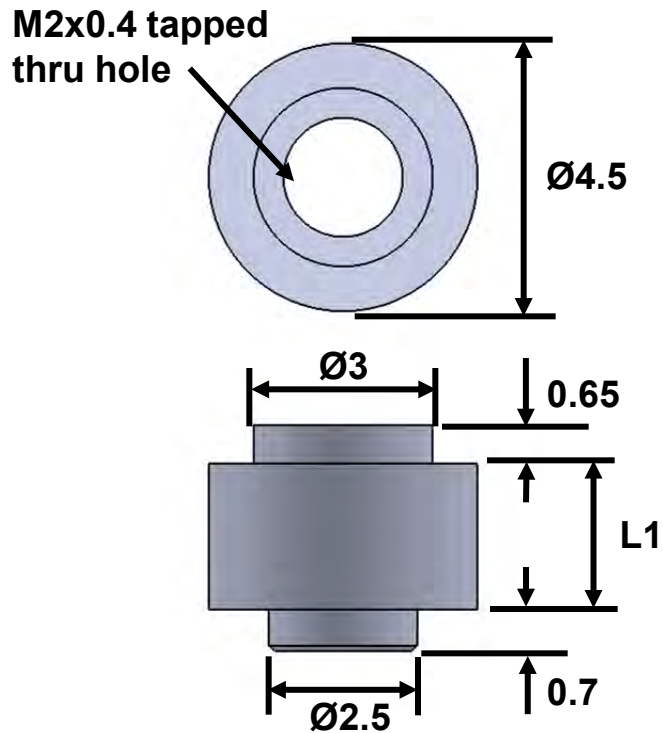
	Nut Part Number	Stand-off Height L1	Compatible Connectors
	SM3ZS067U310-NUT1-R1800	1.45	SM3ZS067U310**
	SM3ZS067U410-NUT1-R1200	2.45	SM3ZS067U410**

Ordering Information: MM60 Series

Connector

MM60 - 52 B 1 - E 1

- Series (MM60)
- No. of Contacts (52)
- Socket Type (B)
- Key Type (1)
- Height, Modification Code (E)
- Contact Finish (1)
  1: Au plating (0.1um)

Latch

MM60 - EZ H059 - B 5

- Series (MM60)
- Latch Type (EZ)
- Applicable Connector Height (H059)
- With boss (B)
- Sn plating (5)
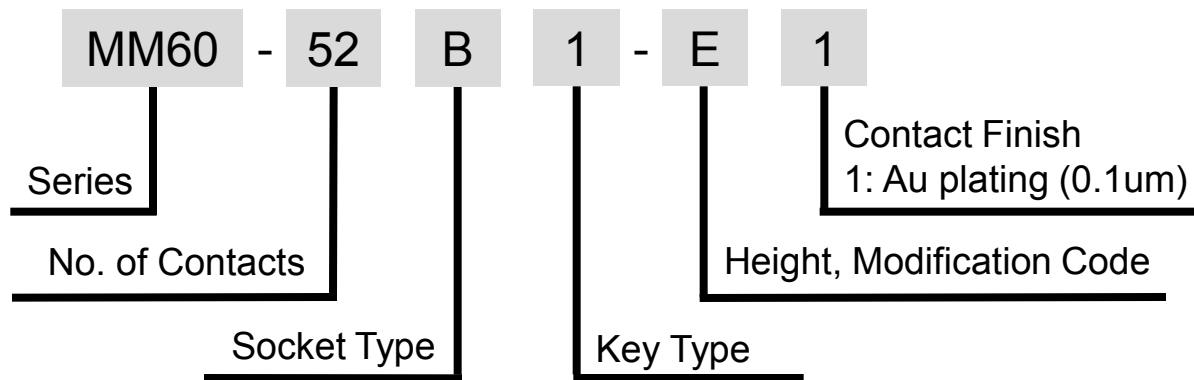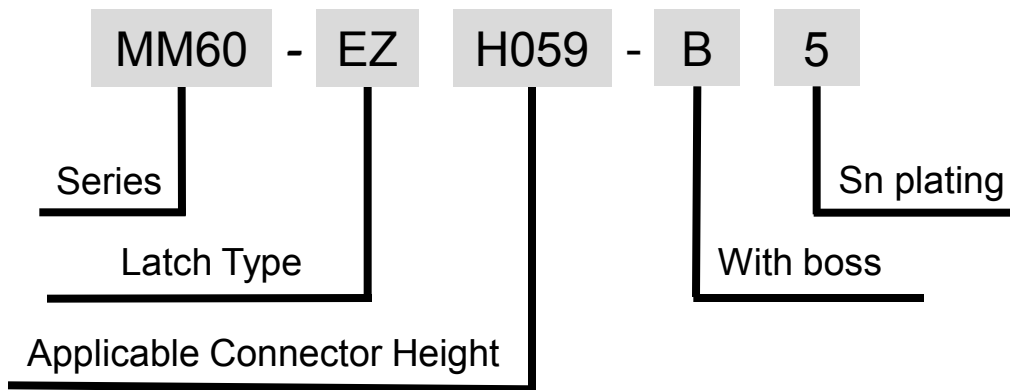
Connector	Drawing No.	Height	Latch	Drawing No.	Nut	Drawing No.
MM60-52C2-R1	SJ111356	3.21mm	-	-	-	-
MM60-52B1-G1	SJ110608	4.0mm	MM60-EZH039-B5	SJ105217	NT1	SJ109548
MM60-76B2-G1	SJ110638					
MM60-52B1-E1	SJ105219	5.9mm	MM60-EZH059-B5	SJ105221	NT4	SJ110869

Summary

- Small size card edge connector for mobile devices.

- Compatible with the PCI Express Mini Card Electromechanical Specification

- Can be used for connecting with modules that use PCIe and USB communication

- Standard interface for solid state drives (SSD) and various wireless cards supporting Wi-Fi®, NFC, Bluetooth®, GNSS, WWAN, etc.

- Stand off nut for provides a secure method to keep the card in place after assembly to the connector.

- Retention latch for the MM60 Series is available to fix module to connector

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