



M.2 Connector (NGFF) Introduction

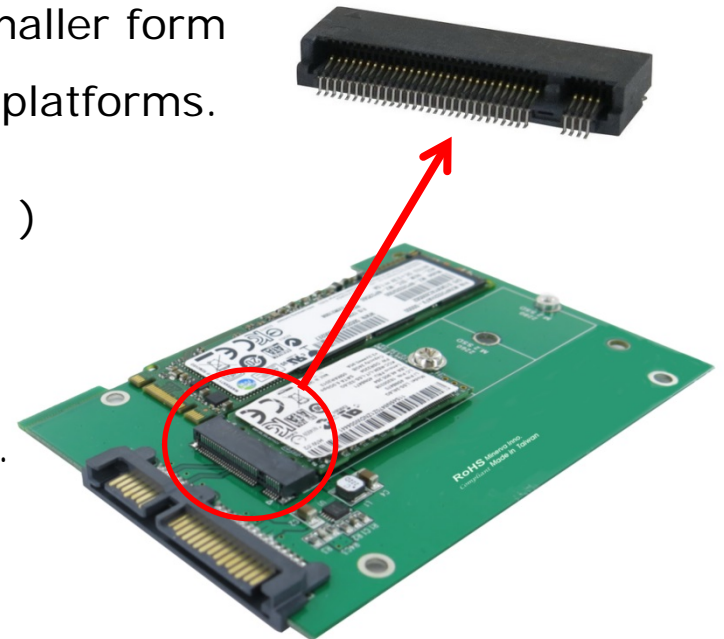


M.2 Overview

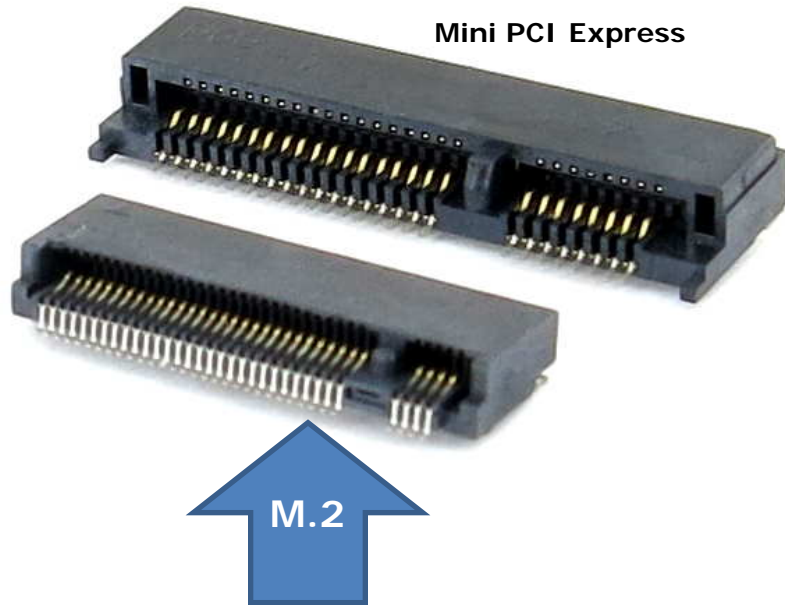
NGFF (The **N**ew **G**eneration **F**orm **F**actor) is now formally renamed as “**M.2**”

As a new type of connector, it supports multiple modules including SSD and WiFi. The new smaller form factor is suitable for applications in new thin platforms.

- Pitch : 0.5mm (Mini PCI Express is 0.8mm)
- Positions : 67 Pin
- Various Heights : H 3.2mm
- Support : PCIe Gen3 、 USB 3.0 、 SATA 3.0...
- Support multiple Module Card



M.2 v.s Mini PCI Express



- M.2 (NGFF) supports wireless and SSD ,and it is regarded as the Next Generation Form Factor after Mini PCI Express (mSATA) .
- The specifications of M.2 are co-led by Intel, SATA and PCIe.
- Compared to Mini PCI Express, M.2 saves 25% in heights and more sufficiently saves 55% in the space of PCB layout.

- Designed for both single and double-sided modules.
- Only 1 set of screw needed so the cost is reduced.



M.2 Applications



Specification Check

The Points of spec needed to check with customers

- 2 heights

Dim. A : The height is 3.2 mm.

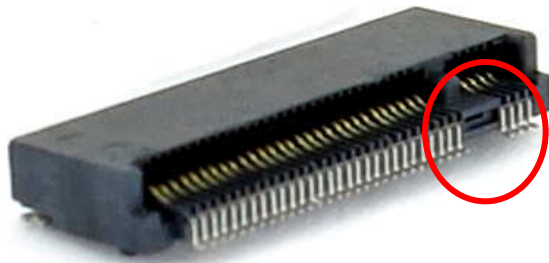
Dim. C : For double-sided modules, this height is also important to keep in mind.



- The positions of the key

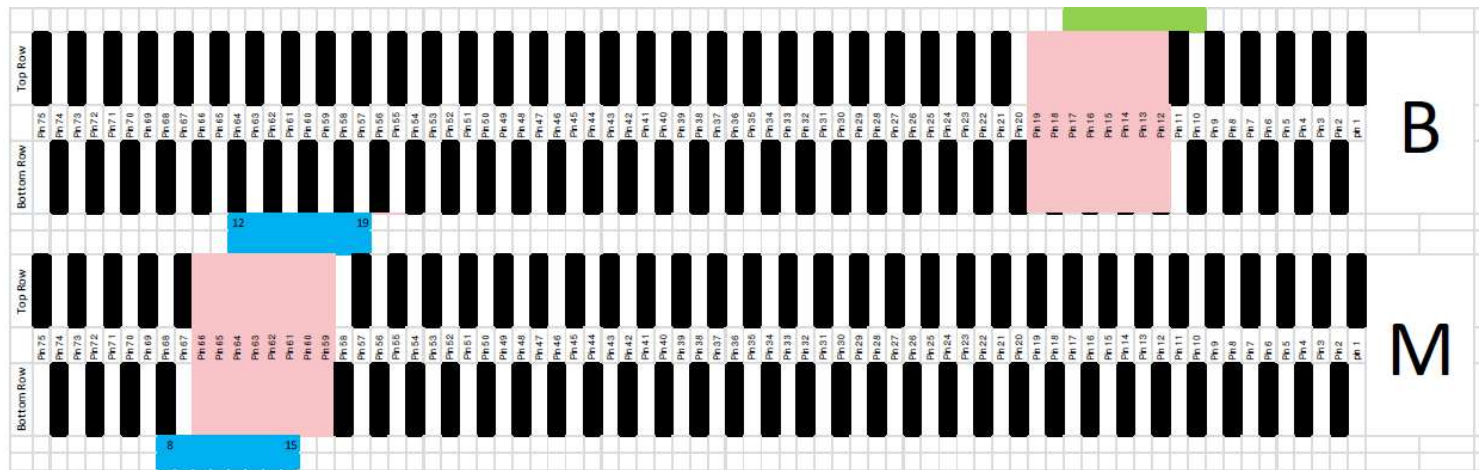
Different keys of M.2 are for different Module Cards, and the main keys are A, B, E and M.

Specification Check



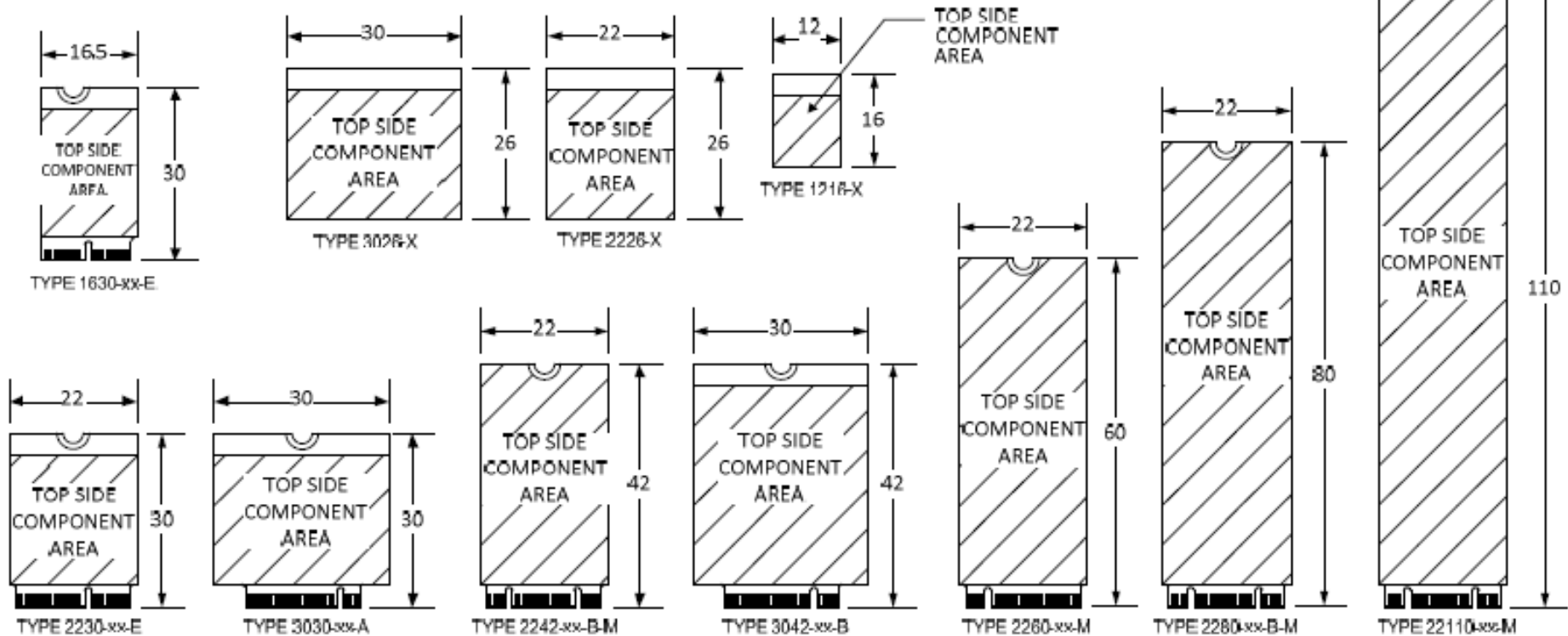
- “B Key” and “M key” are ATTEND’s main product of M.2 series.

M.2 Keying Diagram



Module Card Overview

- M.2 supports multiple modules like SSD, Wifi, Bluetooth, GPS, NFC, WWAN, others
- For each specific application, there's a specific Module Key like A, B, E, M, A+E and B+M.



Module Card Overview



Key	Module Card Type	Applications
A	1630,2230,3030	Wireless devices
B	3042,2230,2242,2260,2280,22110	WWAN+GNSS, or SSD
E	1630,2230,3030	Wireless devices
M	2242,2260,2280,22110	SSD devices

Type XX XX-XX-X-X*



Width (mm)
12
16
22
30

Length (mm)
16
26
30
38
42
60
80
110

	Component Max Ht (mm)	
	T Max**	B Max**
S1	1.2	0 [†]
S2	1.35	0 [†]
S3	1.5	0 [†]
D1	1.2	1.35
D2	1.35	1.35
D3	1.5	1.35
D4	1.5	0.7
D5	1.5	1.5

Key ID	Pin	Interface
A	8-15	PCIe x2 / USB / I2C / DP x4
B	12-19	PCIe x2 / SATA / USB / PCM / IUM / SSIC / UART-I2C
C	16-23	Reserved for Future Use
D	20-27	Reserved for Future Use
E	24-31	PCIe / USB / I2C-ME / SDIO / UART / PCM
F	28-35	Future Memory Interface (FMI)
G	39-46	Generic (Not used for M.2)*
H	43-50	Reserved for Future Use
J	47-54	Reserved for Future Use
K	51-58	Reserved for Future Use
L	55-62	Reserved for Future Use
M	59-66	PCIe x4 / SATA



- THANK YOU -

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