TECH DESIGN

XMICR6

TECH DESIGN
VOXMICR

INNOVATIONS :
Wi-Fi 6 Modules

AIRETOS®
PCI EXPRESS®
63
CLASS

ADVANCING **SYNERGISTICALLY**

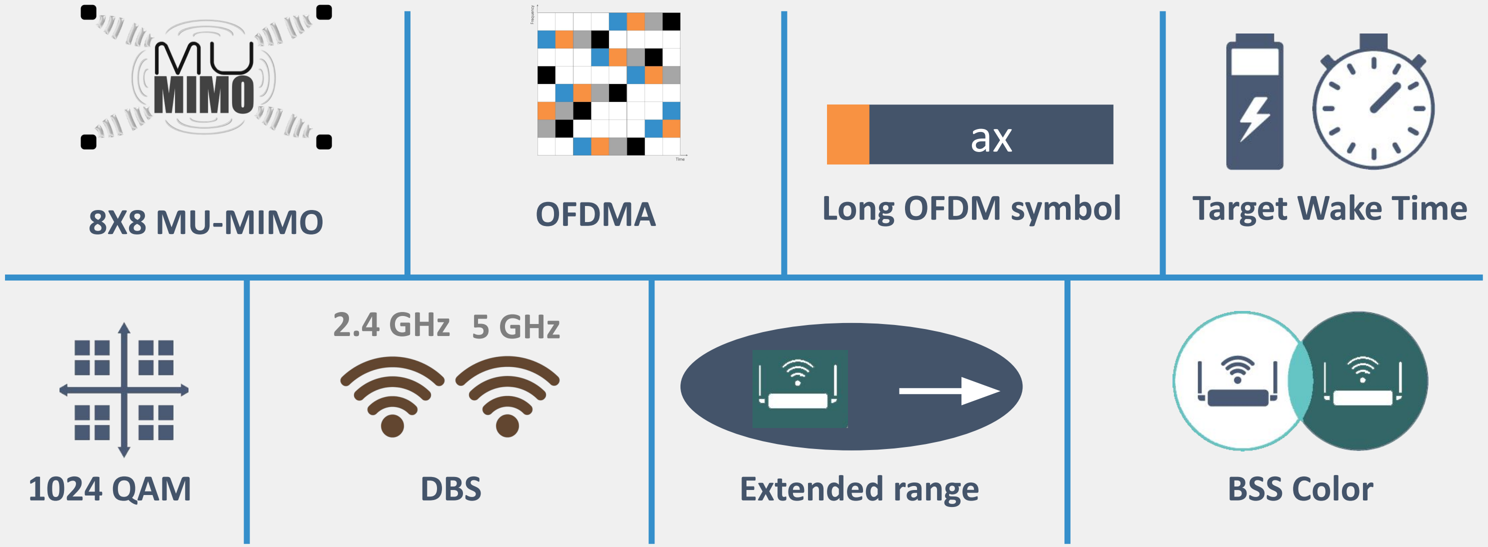
WI-FI 6, in fine coexistence with new cellular protocols, re-defines high throughput wireless data delivery.

Source: Qualcomm (amended)

RESILIENT, FASTER, **DENSER, FURTHER**

WI-FI 6 adopts cellular-like signal management to deliver an experience revolution: robust links for the entire ecosystem.

- ✔ **More HD MIMO links per AP.**
- ✔ **Up to 4x increase in capacity. ***
- ✔ **Extended coverage for outdoor use cases.**
- ✔ **Improved device battery life.**



8X8 MU-MIMO

OFDMA

Long OFDM symbol

Target Wake Time

1024 QAM

DBS

Extended range

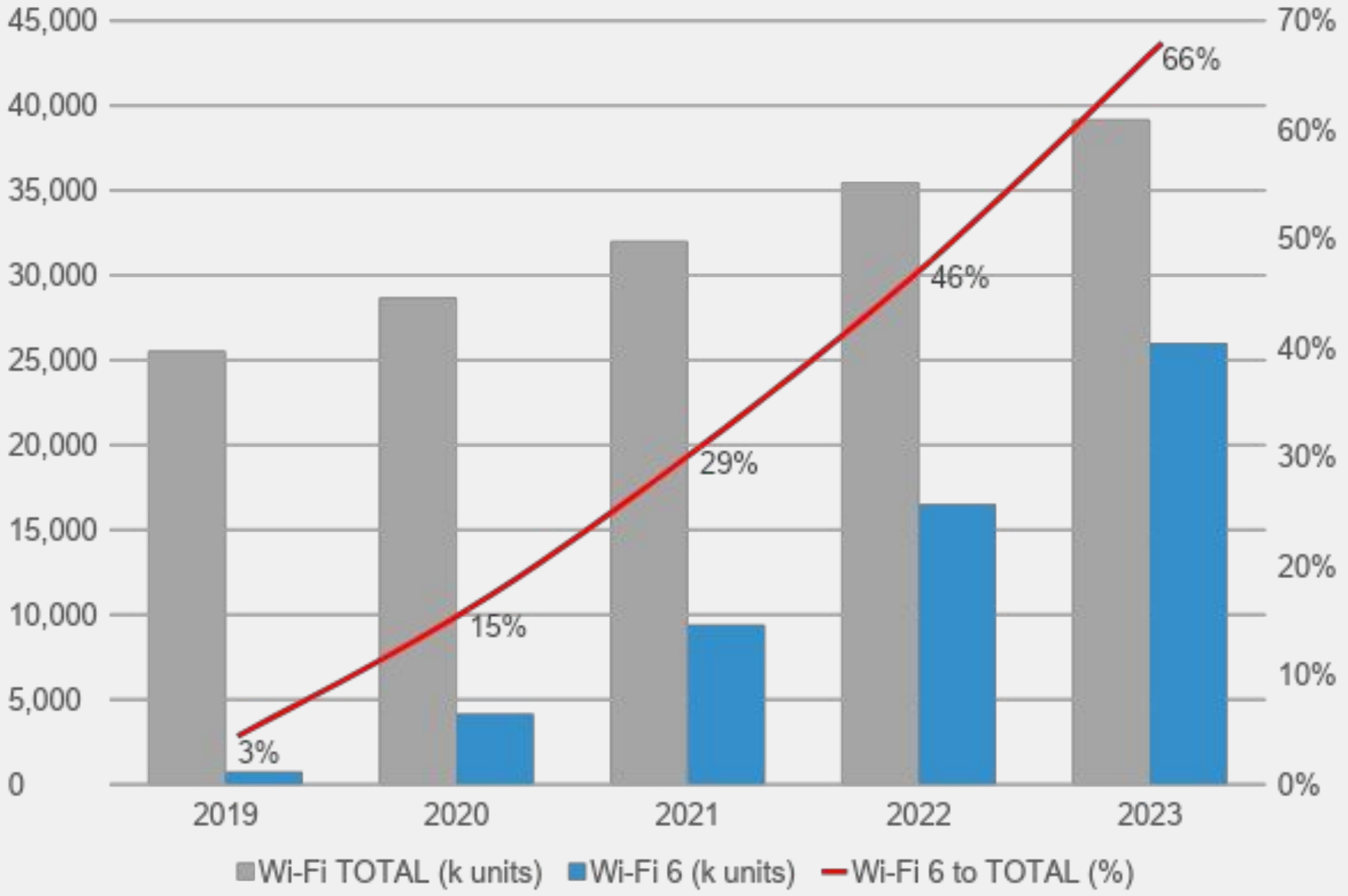
BSS Color

- ✔ **Efficiently serving multiple traffic types.**
- ✔ **Dual-Band Simultaneous with antenna sharing.**
- ✔ **Optimal performance in dense environments with many APs.**

* in median throughputs compared to 4x4 11ac Wave-2

ACCELERATED **UPTAKE**

Data demand drives WI-FI 6 WLAN Access Point unit shipments to exceed two thirds of total by 2023.



Source: GARTNER, Forecast: Enterprise Network Equipment by Market Segment, Worldwide, 2Q19

THE LEADING **CoB WI-FI 6**

Fully leveraging QUALCOMM's Wi-Fi technological leadership, VOXMICRO introduces the first complete Chip-on-Board modules.

With the QCA6391, QUALCOMM is building on its history of delivering game-changing technologies, like MU-MIMO and 8-stream sounding. The QCA6391 is a high performance, **fully-featured Wi-Fi 6 Chip** that provides **resilient 802.11ax combo** with a rich, outperforming implementation of the new **Bluetooth 5.2** into a single die.

VOXMICRO's AIRETOS® E63 Class sets an industry benchmark by marrying state-of-the-art technologies with **extended features** and cutting-edge, **flexible design**. The E63 Class aids adoption with module variants that widely cover **form factors**, **operating grades** and **antenna designs**. All complemented by extensive regulatory and design support.

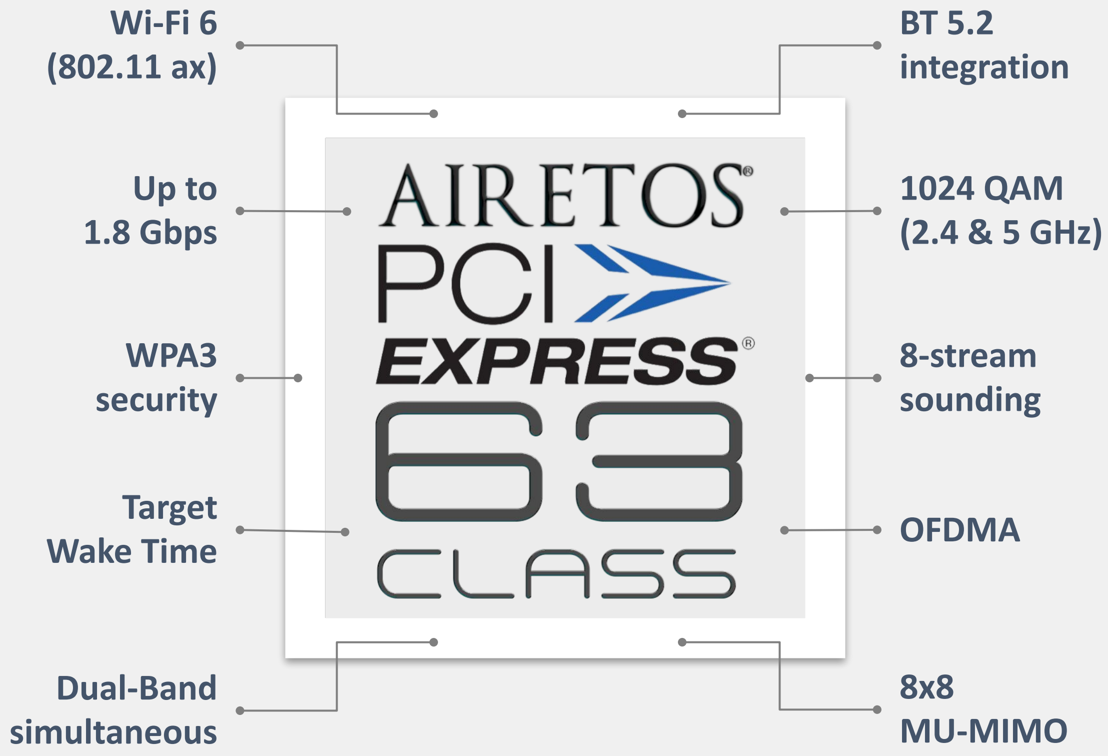
FOCUSED **RELATIONSHIP**

VOXMICRO deploys QUALCOMM's wireless ICs into flexible, supported modules by:

- **engaging early on emerging technologies**
- **directly accessing Qualcomm expertise**
- **accommodating adaptive, tailored, custom and complex designs**

Qualcomm invents breakthrough technologies that transform how the world connects, computes and communicates.

VOXMICRO is an independent licensed QUALCOMM Partner with a prime focus in Wireless Modules and Radio-Frequency Components.



Wi-Fi 6 (802.11 ax)

Up to 1.8 Gbps

WPA3 security

Target Wake Time

Dual-Band simultaneous

BT 5.2 integration

1024 QAM (2.4 & 5 GHz)

8-stream sounding

OFDMA

8x8 MU-MIMO

Bluetooth® 5

SEPARATE BT

SIMULTANEOUS

VOXMICRO EXTENDED

VOXMICRO INDUSTRIAL

+ FORM FACTORS

Wi Fi 6 CERTIFIED

CERTIFICATIONS

E63 CLASS: **THE REVOLUTION OF THE MODULES**

01 Build with **Qualcomm**

Based on the Qualcomm QCA6391 chipset, part of the FastConnect 6800 and Networking Pro architectures, the E63 Class provides in module formats the engineering power of the world leading IC Vendor.

03 Choice of **Antenna**

Built to meet the surging connectivity demands of today's world and with choice in mind the CoB offers the option of IPEX or MHF4 antenna connectors on-board.

02 Flexible **From Factor**

The Class' Chip-On-Board (CoB) Series B, have three on board antenna connectors, two for Wi-Fi and a separate one for BT. It is offered for SMT or soldered on carriers (Series W, F and H).

04 Great **Regulatory**

Pre-certifications for all major domains, option for co-sponsoring for further countries, in-house support to assist with regulatory, antenna and design aspects. The Series R benefits of Qualcomm's world regulatory pre-certification.

THE FLEXIBILITY OF THE **AIRETOS® E63 CLASS**

SLOTTED:

SERIES R

CoB on Regular 2230 M.2 (NGFF) E-Key

EXTENDED INDUSTRIAL

2 Variants

SERIES W

CoB soldered on 3032 M.2 (NGFF) E-Key Carrier

10 Variants

SERIES F

CoB soldered on 3042 M.2 (NGFF) B-Key Carrier

10 Variants

SERIES X

CoB soldered on full-mini PCIe Carrier

10 Variants

EMBEDDED:

SERIES B

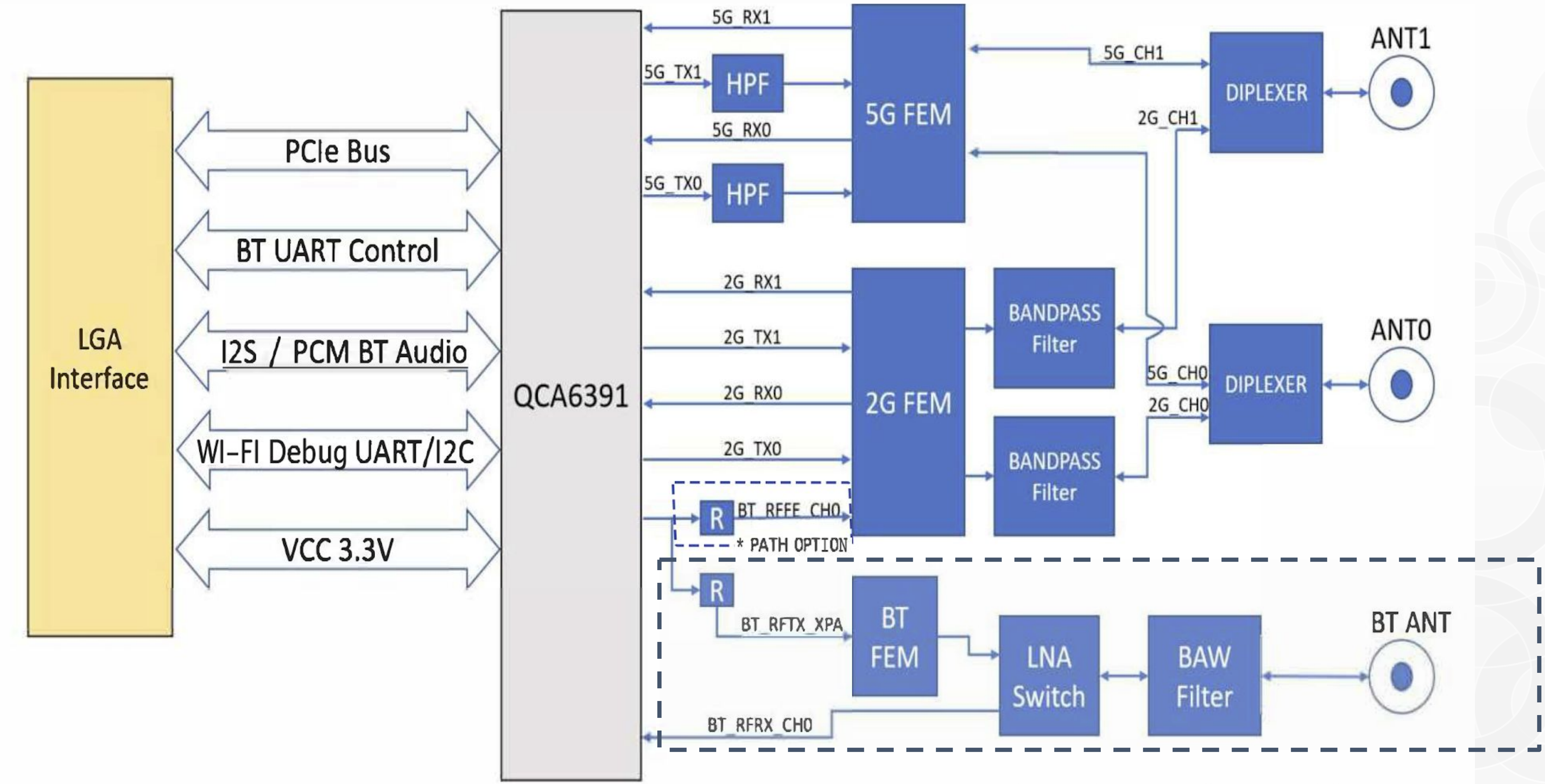
Chip-on-Board (CoB)

EXTENDED	EXTENDED	INDUSTRIAL	INDUSTRIAL
IPEX	**MHF4**	**IPEX**	**MHF4**

10 Variants

THE POWER OF **THE CoB CORE**

The CoB+ (Chip-on-Board-on-Carrier) methodology forges choice of form-factors into Series W, F and X, maintaining all special features.



* On-Demand BT Combo on ANT0 instead of the separate chain & antenna

E63 CLASS **PRODUCT BRIEF**

	SERIES B , W , F , X	SERIES R
Chipset	Qualcomm QCA6391, offering PCIe communication bus for WLAN and UART for Bluetooth	
Wi-Fi Key Features	● Dual Band Simultaneous (DBS) with dual MAC, up to 1774.5 Mbps dynamic data transfer rate at 2x2(2.4Ghz) + 2x2(5Ghz) 11ax DBS mode. Full 802.11ax/ac/abgn MU-MIMO two antenna Wi-Fi. ● 20/40 MHz channel bandwidth for 2.4 GHz and 20/40/80 MHz channel bandwidth for 5 GHz ● Seamless antenna sharing with LTE, LTE-U and 5G ● Dynamic Frequency Selection (DFS, radar detection) ● Offloading traffic for minimal host utilization at 11ac/ax speeds ● Low power PCIe (w/L1 sub-state) interface ● Integrated close-loop power detector.	
Bluetooth Key Features	● Bluetooth 5.2+ Milan with Class I mode, ANT+ and BLE. Backward-compatible to previous standards. ● Split ACL support for A2DP true stereo. Dual eSCO and dual A2DP streams. ● Flexible interface Slimbus/PCM/I2S/I2C for BT audio. ● Virtual (soft) USB available for combined UART/PCM/I2S management.	
Operating Temperature	Up to -40^0 to +90^0 Celsius	
Operating System	Windows, Linux, macOS, Android	
Industrial Reference	Based on Qualcomm reference designs (Hastings family)	Exact Qualcomm reference design (Hastings NFA)
Antenna Configuration	Choice of higher performance U.Fl. / IPEX or smaller MHF4 Dedicated BT antenna, not-sharing with WLAN clock cycles	Smaller MHF4 connectors on board Sharing BT with WLAN and concurrent with 5G WLAN
RF Output Power	Up to 21.5dBm per chain, up to 24.5dBm combined	Up to 20dBm per chain, up to 23dBm combined
Regulatory Approvals	FCC, ISED Canada, EU RED, Japan; all with 5 antenna types	Worldwide with PIFA antenna type (ongoing)

E63 CLASS **FORM-FACTORS**

xx☐-QCA6391-xxx

SLOTTED:

	“Narrow” 1630	“Regular” 2230	“Wide” 3030	“Full” 3042	“Long” 2242
F☐ m.2 PCI [NGFF]		**R** E-Key Ref. QCNFA544	**W** E-Key	**F** B-Key	
E☐ MiniPCI Express [mPCIe]			**X** Full-Mini, Extended Break-off 30*50.95 mm		

* SMD modules soldered on carriers are shown as socketed modules with an underscore; i.e. CoB on X-carrier = X

EMBEDDED:

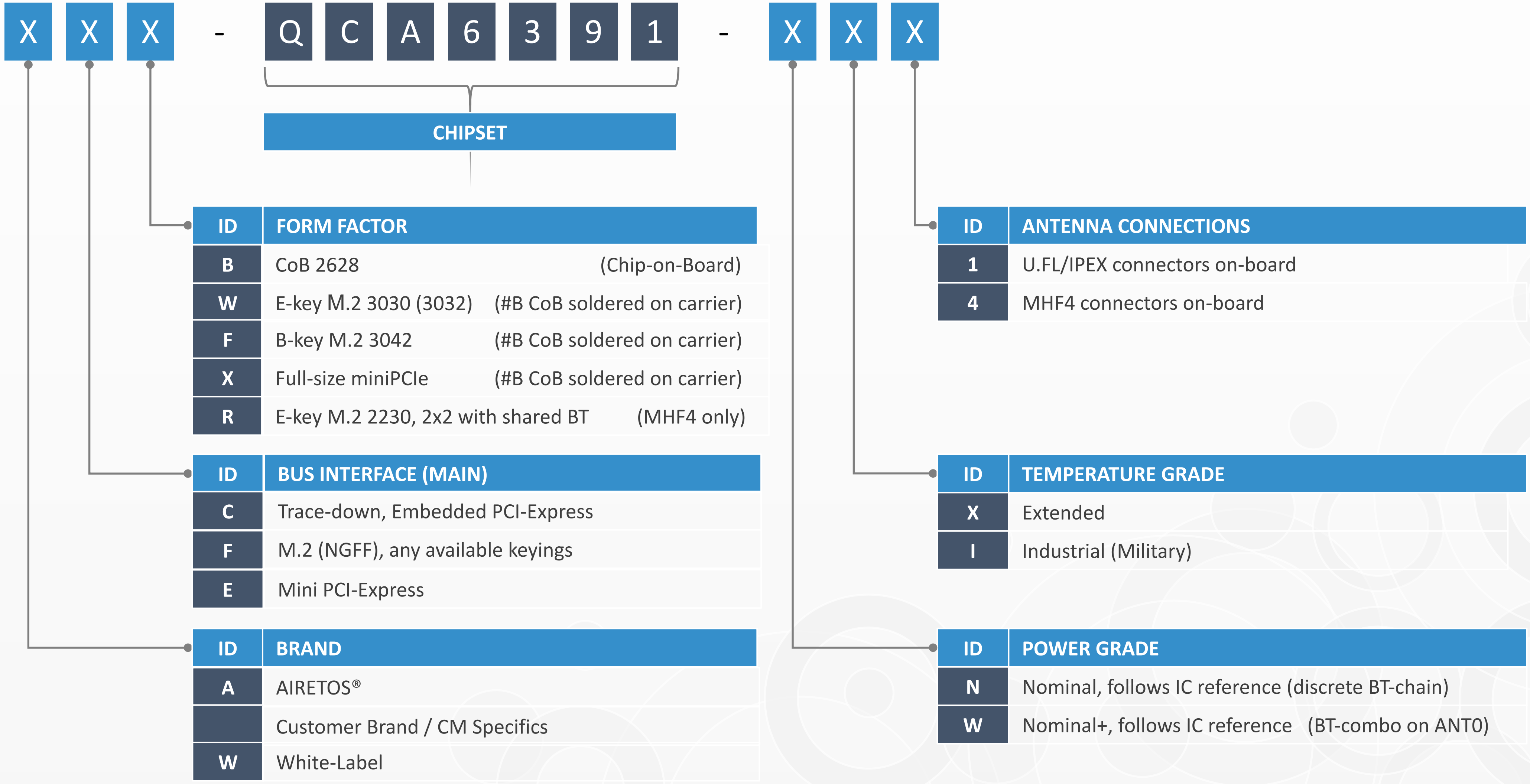
SMDs, Surface Mount Devices [CoB, SiP]
& Modules on Carrier [MoC]

B
CoB: Chip-on-Board
2628 Based on ref. QCNFA564

*** on-request P**
SiP: System-in-Package
Ref QCNFA524

*** on-request C**
MoC: Module-on-Carrier
Two-PCB stack

E63 CLASS **MPN LEGEND**



X X X - Q C A 6 3 9 1 - X X X

CHIPSET

ID	FORM FACTOR
B	CoB 2628 (Chip-on-Board)
W	E-key M.2 3030 (3032) (#B CoB soldered on carrier)
F	B-key M.2 3042 (#B CoB soldered on carrier)
X	Full-size miniPCIe (#B CoB soldered on carrier)
R	E-key M.2 2230, 2x2 with shared BT (MHF4 only)

ID	BUS INTERFACE (MAIN)
C	Trace-down, Embedded PCI-Express
F	M.2 (NGFF), any available keyings
E	Mini PCI-Express

ID	BRAND
A	AIRETOS®
	Customer Brand / CM Specifics
W	White-Label

ID	ANTENNA CONNECTIONS
1	U.FL/IPEX connectors on-board
4	MHF4 connectors on-board

ID	TEMPERATURE GRADE
X	Extended
I	Industrial (Military)

ID	POWER GRADE
N	Nominal, follows IC reference (discrete BT-chain)
W	Nominal+, follows IC reference (BT-combo on ANT0)

PLAN IT / **BUDGET IT**

JAN
7
E63 Class introduction at CES 2020

MAR
30
(ES) Engineering Samples to Early Partners

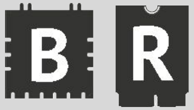
NOV
20
(CS) Commercial Sample Release

JUN
2021
(MP) Mass-Production Availability

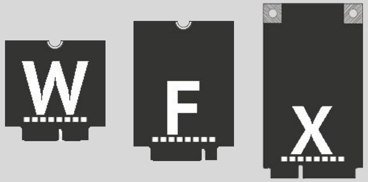
7+
YEAR
Minimum Lifespan Expected

Unit MSRP:

General Channel Release in USD.



from $\$24.^{95}$



from $\$34.^{95}$

ASK ABOUT IT / **TEST IT**

RFI with your account manager or online.

Evaluation Board Kits with reference drivers

Licensed or open drivers

Digital, mechanical and antenna support

RFQ and commercial support

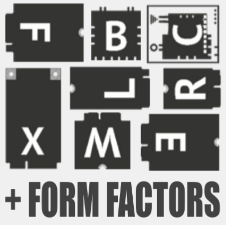
EVB Kits:

Early Access; include certified antennas.

ES	SOLD OUT
CS2	from $35.^00

CHANGE IT / BRAND IT

Customer-Open Module Making: implement new and custom features with confidence.



- ☐ Custom form factors
- ☐ Co-existence on-module
- ☐ Connectors and GPIOs
- ☐ Antenna matching
- ☐ Finish and packaging

- ☐ New antenna types
- ☐ Further countries
- ☐ Testing driver implementations
- ☐ System level approvals
- ☐ Co-listing & co-sponsoring

Other digital, mechanical, firmware, system, integration or software projects? Reach out.

Own BRAND:

OR White Label OR Custom Re-Design.

BASIC MAC, label, boxing

FULL Co-listing available

VOXMICRO