
QUECTEL
Build a smarter world
Quectel Short-Range Module
Product Overview



Duty of confidentiality

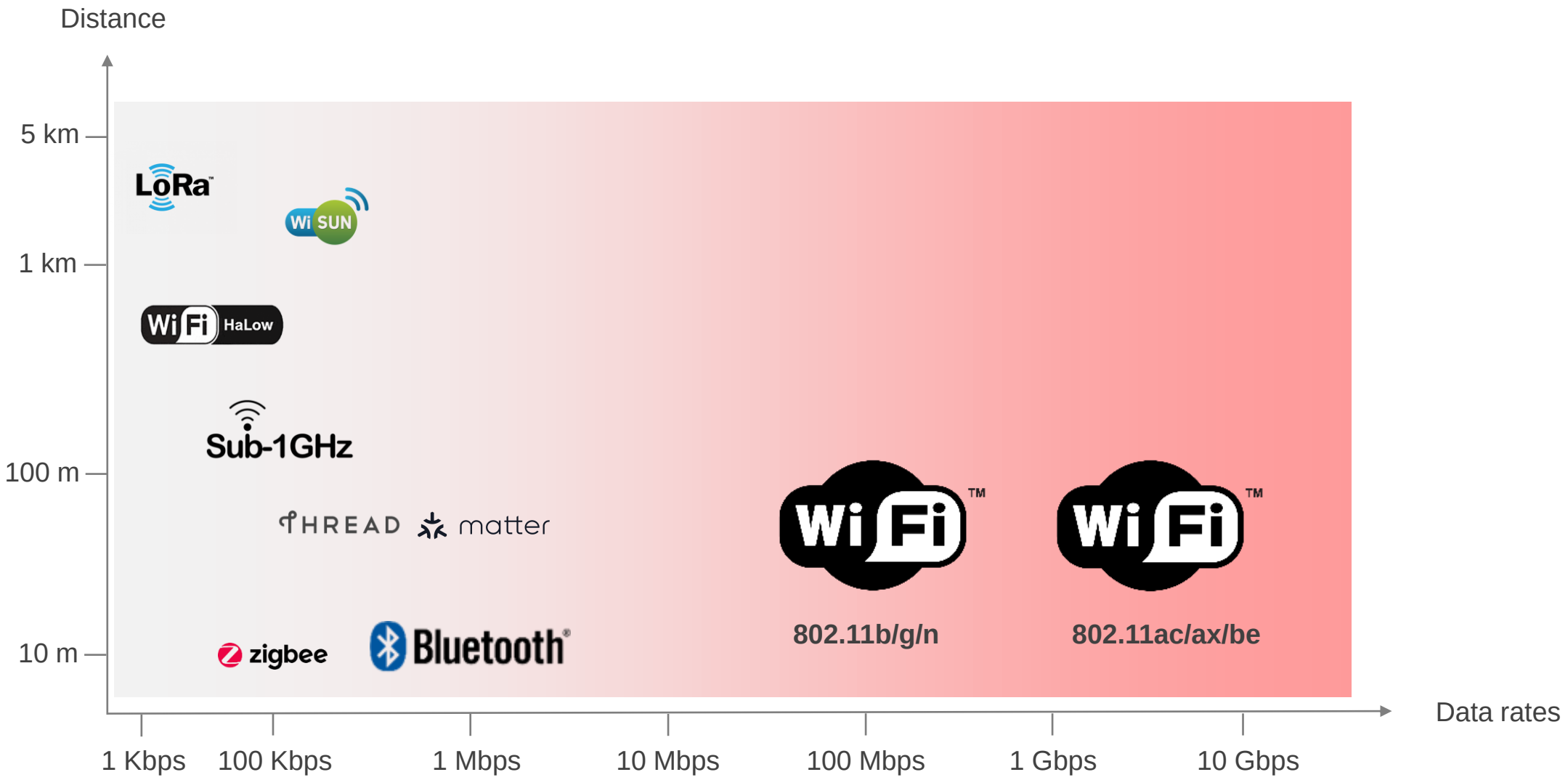
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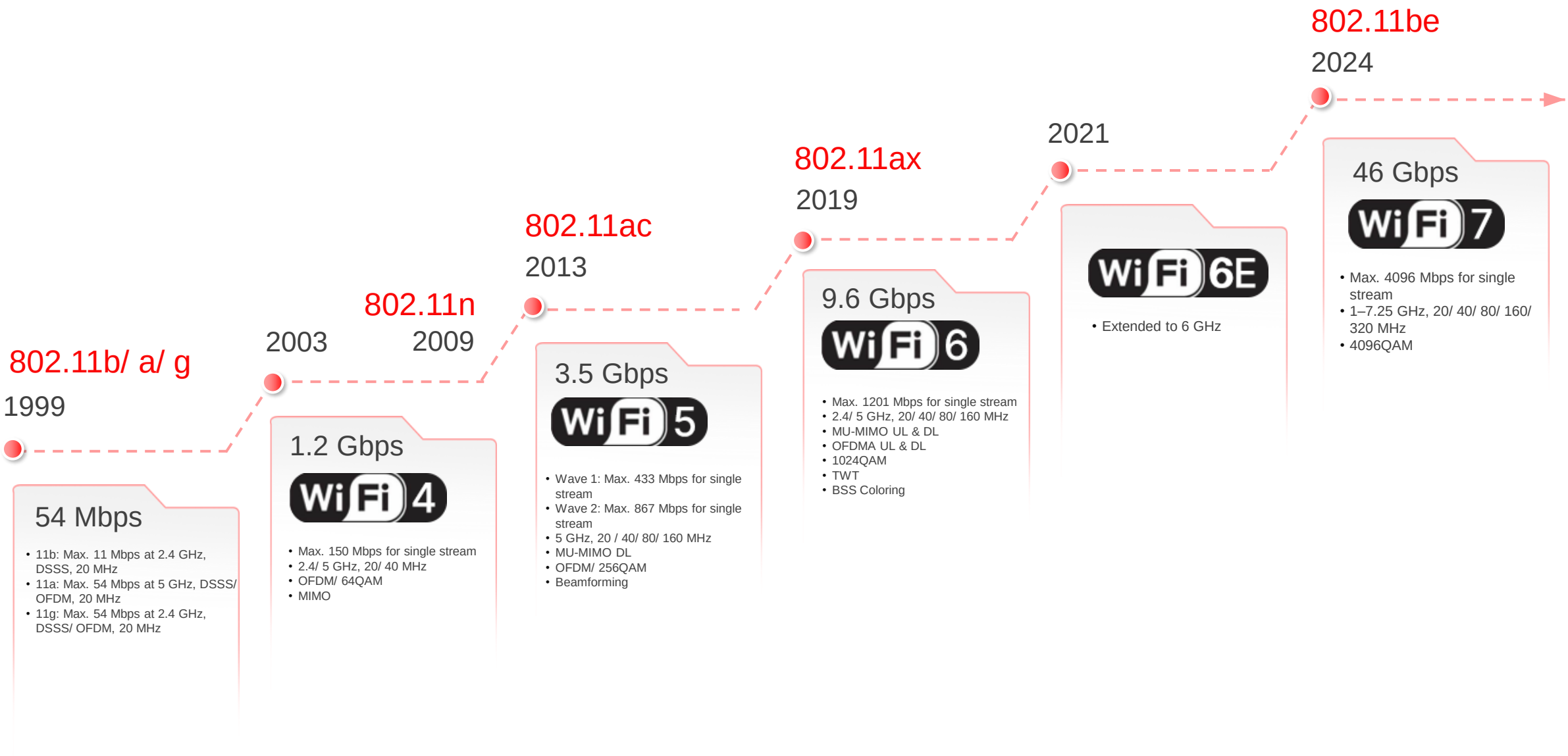
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Typical applications	82

Short-Range technologies



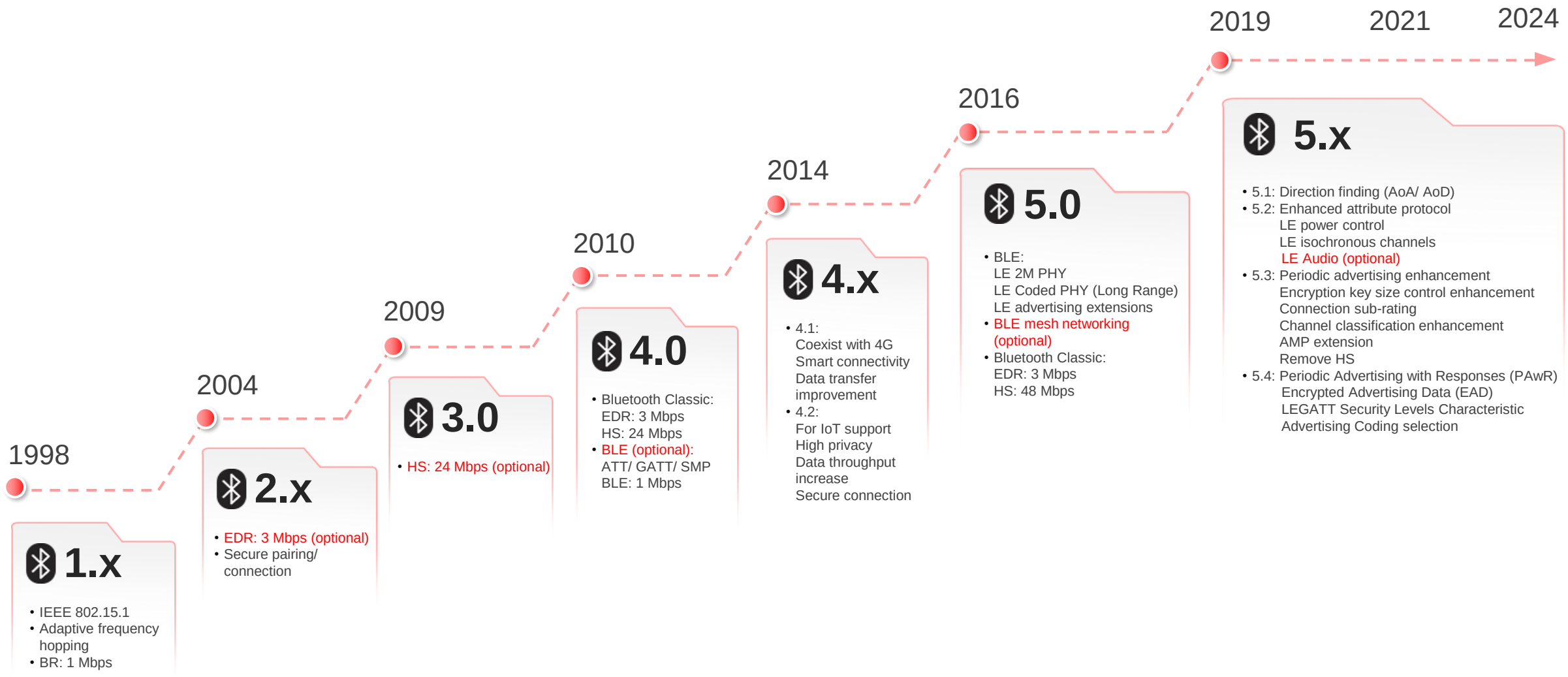
IoT: Internet of Things

Wi-Fi standard evolution



DSSS: Direct Sequence Spread Spectrum
OFDM: Orthogonal Frequency Division Multiplexing
MIMO: Multiple Input Multiple Output
OFDMA: Orthogonal Frequency Division Multiple Access
TWT: Target Wake Time
BSS: Basic Service Set

Bluetooth standard evolution



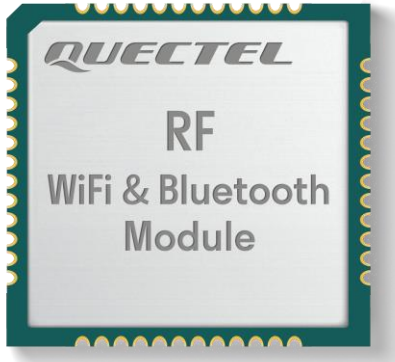
BR: Basic Rate EDR: Enhanced Data Rate HS: High Speed BLE: Bluetooth Low Energy ATT: Attribute Protocol GATT: Generic Attribute Profile SMP: Security Manager Protocol
LE: Low Energy PHY: Physical AoA: Angle of Arrival AoD: Angle of Departure AMP: Alternate MAC and PHY

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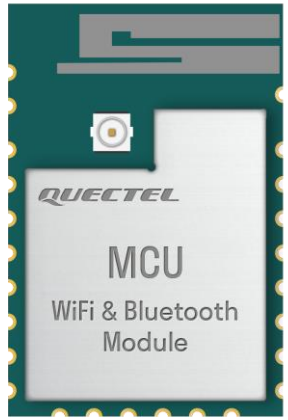
Wi-Fi & Bluetooth module classification

RF Wi-Fi & Bluetooth Module



- Connect an external processor running Linux, Android or RTOS OS
- SDIO, PCIe and USB interfaces
- Require driver porting

MCU Wi-Fi & Bluetooth Module



- Integrate MCU running RTOS
- UART and SPI interfaces
- Support TCP/IP protocol
- AT command available for external MCU

RF Wi-Fi & Bluetooth module portfolio (1)

Wi-Fi 7	**2 × 2**	 **FGE573Q** • QCC2073 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz • Bluetooth 5.3 • PCIe, PCM, UART • Temp.: -20 ℃ to +70 ℃  **FGE576Q** • QCC2076 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz, DBS • Bluetooth 5.3 • PCIe, PCM, UART • Temp.: -20 ℃ to +70 ℃  **NCM825** • WCN7851 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz, DBS • Bluetooth 5.4 • PCIe, PCM/ I2S, USB • Application: Laptop, Windows 11 • Temp.: -10 ℃ to +65 ℃  **NCM825A** • WCN7851 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz, DBS • Bluetooth 5.4 • PCIe, PCM/ SLIMBus, USB • Application: Laptop, Windows 11 • Temp.: -10 ℃ to +65 ℃  **NCM865** • WCN7851 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz, HBS • Bluetooth 5.4 • PCIe, PCM/ I2S, USB • Application: Laptop, Windows 11 • Temp.: -10 ℃ to +65 ℃  **NCM865A** • WCN7851 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz, HBS • Bluetooth 5.4 • PCIe, PCM/ SLIMBus, USB • Application: Laptop, Windows 11 • Temp.: -10 ℃ to +65 ℃  **NCM835** • WCN7851 • 802.11a/b/g/n/ac/ax/be • 2.4/ 5/ 6 GHz, DBS • Bluetooth 5.4 • PCIe, PCM/ I2S, USB • Application: Laptop, Windows 11 • Temp.: -10 ℃ to +65 ℃

Temp.: Operating temperature range HBS: High Band Simultaneous DBS: Dual Band Simultaneous FEM: Front-End Module

As the certificates of NCM8x5(A) modules belong to Qualcomm, their mandatory certification certificates can only be used for PC OEM customers directly supported by Qualcomm, and cannot be used for any PC OEM customers that are not directly supported by Qualcomm (e.g. White Brand).

RF Wi-Fi & Bluetooth module portfolio (2)

Wi-Fi 6E	**2 × 2**	 **FC65E** • QCA2065 • 802.11a/b/g/n/ac/ax • 2.4/ 5/ 6 GHz • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -30 ℃ to +75 ℃  **FC66E series** • QCA2066 • 802.11a/b/g/n/ac/ax • 2.4/ 5/ 6 GHz, DBS • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -30 ℃ to +75 ℃
Wi-Fi 6	**2 × 2**	 **FC62E** • QCA2062 • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -30 ℃ to +75 ℃  **FC64E series** • QCA2064 • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz, DBS • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -30 ℃ to +75 ℃  **FC06E** • QCA2064 • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz, DBS • 2.4/ 5 GHz FEM • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -30 ℃ to +75 ℃  **FME164Q** • QCA2064 • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz, DBS • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -30 ℃ to +75 ℃  **FCE863R** • RTL8852BE • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz • Bluetooth 5.2 • PCIe, UART, PCM • Temp.: -20 ℃ to +70 ℃/ -40 ℃ to +85 ℃ (optional)  **FCS866R** • RTL8852BS-CG • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz • Bluetooth 5.2 • SDIO, UART, PCM • Temp.: -20 ℃ to +70 ℃
	1 × 1	 **FGS060N** • IW612 • 802.11a/b/g/n/ac/ax • 802.15.4 (only RCP) • 2.4/ 5 GHz • Bluetooth 5.2 • SDIO, UART, SPI • Temp.: -40 ℃ to +85 ℃  **FGS061N** • IW611 • 802.11a/b/g/n/ac/ax • 2.4/ 5 GHz • Bluetooth 5.2 • SDIO, UART • Temp.: -40 ℃ to +85 ℃

DBS: Dual Band Simultaneous FEM: Front-End Module RCP: Radio Co-Processor

RF Wi-Fi & Bluetooth module portfolio (3)

Wi-Fi 5	**2 × 2**	 **FC80A** • CYW54591 • 802.11a/b/g/n/ac • 2.4/ 5 GHz, DBDC • Bluetooth 5.1 • SDIO, UART, PCM • Temp.: -40 ℃ to +85 ℃	 **FCS850R series** • RTL8822CS-VS-CG • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 5.0 • SDIO, UART, PCM • Temp.: -20 ℃ to +70 ℃
	1 × 1	 **FC900E** • QCA1023 • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 5.0 • SDIO, UART, PCM • Temp.: -40 ℃ to +85 ℃	 **FC905A** • CYW43455 • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 5.0 • SDIO, UART, PCM • Temp.: -30 ℃ to +85 ℃
		 **FCS950R** • RTL8821CS • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 4.2 • SDIO, UART, PCM • Temp.: -20 ℃ to +70 ℃/ -40 ℃ to +85 ℃ (optional)	 **FC20/ FC21** • QCA1023 • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 5.0 • SDIO, UART, PCM • Temp.: -40 ℃ to +85 ℃
		 **FC906A** • CYW4373 • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 5.4 • SDIO, UART, PCM • Temp.: -20 ℃ to +70 ℃	 **FCU906A** • CYW4373 • 802.11a/b/g/n/ac • 2.4/ 5 GHz • Bluetooth 5.4 • USB, PCM • Temp.: -20 ℃ to +70 ℃
Wi-Fi 4	**1 × 1**	 **FC30R** • RTL8189EM-VI-CG • 802.11b/g/n • 2.4 GHz • Wi-Fi only • SDIO • Temp.: -40 ℃ to +85 ℃	 **FC909A** • CYW43439 • 802.11b/g/n • 2.4 GHz • Bluetooth 5.2 • SDIO, UART, PCM • Temp.: -30 ℃ to +85 ℃
		 **FCS940R** • RTL8723DS • 802.11b/g/n • 2.4 GHz • Bluetooth 5.0 • SDIO, UART, PCM • Temp.: -20 ℃ to +80 ℃	 **FCS945R** • RTL8733BS • 802.11a/b/g/n • 2.4/ 5 GHz • Bluetooth 5.2 • SDIO, UART, PCM • Temp.: -20 ℃ to +70 ℃/ -40 ℃ to +85 ℃ (optional)
		 **FCU741R** • RTL8731BU-CG • 802.11a/b/g/n • 2.4/ 5 GHz • Wi-Fi only • USB • Temp.: -20 ℃ to +70 ℃	

DBDC: Dual Band Dual Concurrent

MCU Wi-Fi & Bluetooth module portfolio (1)

Wi-Fi 6

Wi-Fi + Bluetooth combo

2.4 GHz



FCM360W
- ECR6600-A
- RISC processor, 240 MHz
- 512 KB SRAM, 4/ 8 MB Flash
- PCB antenna/ 1st generation RF coaxial connector/ pin antenna
- 18 × GPIOs (UART, SPI, etc.)
- Temp.: -40 ℃ to +85 ℃/ -40 ℃ to +105 ℃ (optional)



FLM263D
- BK7235
- RISC-V processor, 320 MHz
- 512 KB SRAM, 4 MB Flash
- 1st generation RF coaxial connector/ pin antenna
- 5 × GPIOs (UART, etc.)
- Alexa Connect Kit + Matter
- Temp.: -40 ℃ to +105 ℃

2.4 GHz/ 5 GHz



FCMA62N Q3/24
- RW610
- ARM Cortex-M33 processor, 260 MHz
- 1.2 MB SRAM, 4/ 8 MB Flash
- PCB antenna/ 1st generation RF coaxial connector
- 12 × GPIOs (UART, SWD, etc.)
- Temp.: -40 ℃ to +85 ℃

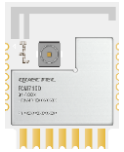
Wi-Fi 4

Wi-Fi + Bluetooth combo

2.4 GHz



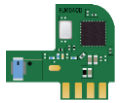
FC41D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- PCB antenna/ 4th generation RF coaxial connector/ pin antenna
- 19 × GPIOs (UART, SPI, etc.)
- Temp.: -40 ℃ to +85 ℃



FCM740D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- PCB antenna/ 1st generation RF coaxial connector
- 18 × GPIOs (UART, SPI, PWM, etc.)
- Temp.: -40 ℃ to +105 ℃



FCM100D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- PCB antenna/ 1st generation RF coaxial connector/ pin antenna
- 16 × GPIOs (UART, ADC, etc.)
- Temp.: -40 ℃ to +85 ℃/ -40 ℃ to +105 ℃ (optional)



FLM040D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- Ceramic antenna
- 5 × GPIOs (PWM)
- Typical applications: Lighting & Electrical
- Temp.: -40 ℃ to +105 ℃



FLM140D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- PCB antenna
- 6 × GPIOs (UART, PWM, etc.)
- Typical applications: Lighting & Electrical
- Temp.: -40 ℃ to +105 ℃



FLM240D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- PCB antenna
- 5 × GPIOs (PWM)
- Typical applications: Lighting & Electrical
- Temp.: -40 ℃ to +105 ℃



FLM340D
- BK7231M
- ARM968 processor, 120 MHz
- 256 KB RAM, 2/ 4 MB Flash
- Pin antenna
- 3 × GPIOs (PWM)
- Typical applications: Lighting & Electrical
- Temp.: -40 ℃ to +105 ℃

Qx/YY Estimated Engineering Sample Availability

MCU Wi-Fi & Bluetooth module portfolio (2)

Bluetooth Low Energy



HCM010S

- EFR32BG21
- BLE 5.4, BLE mesh
- ARM Cortex-M33, 80 MHz
- 64 KB RAM, 768 KB Flash
- Tx power: +10 dBm/ +20 dBm
- PCB antenna
- 20 × GPIOs (UART, SPI, etc.)
- Temp.: -40 ℃ to +105 ℃



HCM010S-E

Q3/24

- EFR32BG21
- BLE 5.4, BLE mesh
- ARM Cortex-M33, 80 MHz
- 64 KB RAM, 768 KB Flash
- Tx power: +20 dBm
- PCB antenna/ RF coaxial connector/ pin antenna
- 18 × GPIOs (UART, SPI, etc.)
- Temp.: -40 ℃ to +105 ℃



HCM511S

- EFR32BG22
- BLE 5.4, BLE mesh Low Power Node
- ARM Cortex-M33, 76.8 MHz
- 32 KB RAM, 352/ 512 KB Flash
- Tx power: +6 dBm
- PCB antenna
- 18 × GPIOs (ADC, USART, I2C, etc.)
- Temp.: -40 ℃ to +85 ℃



HCM511S-E

Q3/24

- EFR32BG22
- BLE 5.4, BLE mesh Low Power Node
- ARM Cortex-M33, 76.8 MHz
- 32 KB RAM, 352/ 512 KB Flash
- Tx power: +8 dBm
- RF coaxial connector/ pin antenna
- 18 × GPIOs (ADC, USART, I2C, etc.)
- Temp.: -40 ℃ to +85 ℃



HCM111Z

- FR8016HA
- BLE 5.3
- ARM Cortex-M3, 48 MHz
- 48 KB RAM, 512 KB Flash
- Internal audio codec
- 13 × GPIOs
- Temp.: -40 ℃ to +85 ℃

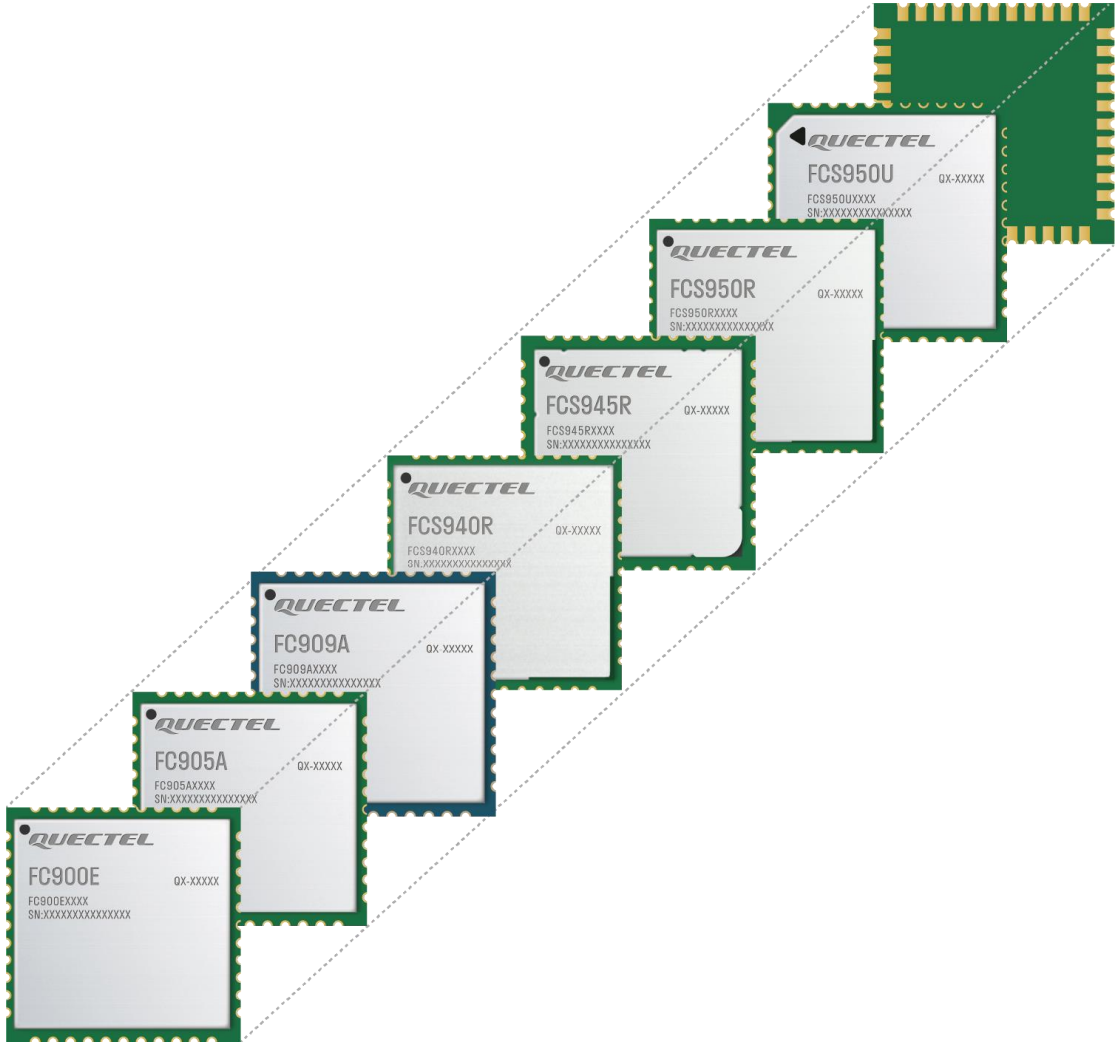
Qx/YY Estimated Engineering Sample Availability

Sub-GHz module portfolio

Wi-Fi HaLow	 **FGH100M** • MM6108 • IEEE 802.11ah compliant • 850–950 MHz • 1/ 2/ 4/ 8 MHz Bandwidth • SDIO, SPI • 1 × 1 • Temp.: -30 ℃ to +85 ℃
Sub-1 GHz CSS	 **KG100S** • EFR32BG21B • Built-in Sub-1 GHz CSS and FSK transceiver • ARM Cortex-M33 processor, 80 MHz • 1024 KB Flash, 96 KB RAM • BLE 5.1 • UART × 1, JLink × 1, SPI × 1, I2C × 1, Antenna Interface × 2, GPIOs × 2 • Amazon Sidewalk Protocol • Temp.: -40 ℃ to +85 ℃
LoRa	 **KG200Z** • STM32WLE5JCI6 • 32-bit ARM Cortex-M4 CPU, 48 MHz • 256 KB Flash, 64 KB RAM • 470–510 MHz, 862–928 MHz • GPIOs × 37, UART, SPI, I2C • Compatible LoRaWAN®, Sigfox™ (optional), W-Mbus (optional) • OTA (over-the-air) firmware update • Temp.: -40 ℃ to +85 ℃

FSK: Frequency Shift Keying GFSK: Gaussian Frequency Shift Keying CSS: Chirp Spread Spectrum

Modules compatibility

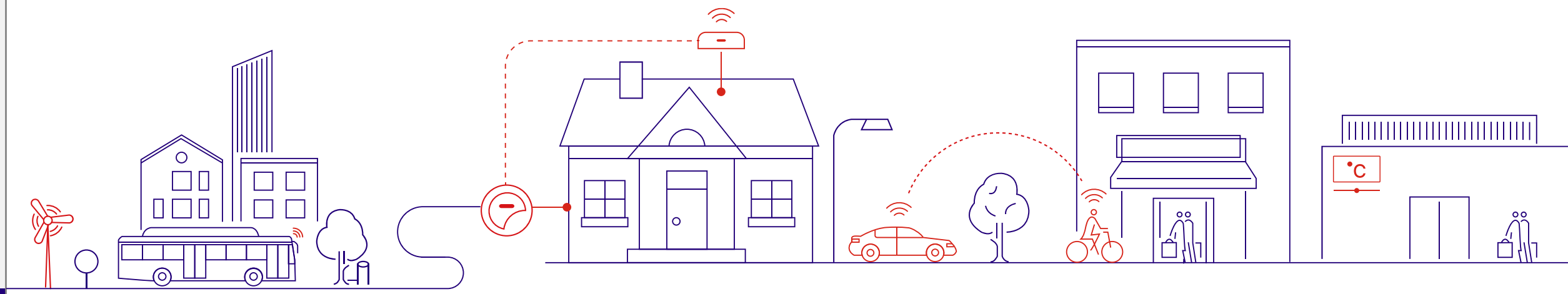


The modules with a size of 12.0 mm × 12.0 mm are compatible with each other.

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RF Wi-Fi & Bluetooth modules



FGE573Q/ FGE576Q/ NCM825(A) highlights (Wi-Fi 7)

High data rate

Ultra-low latency

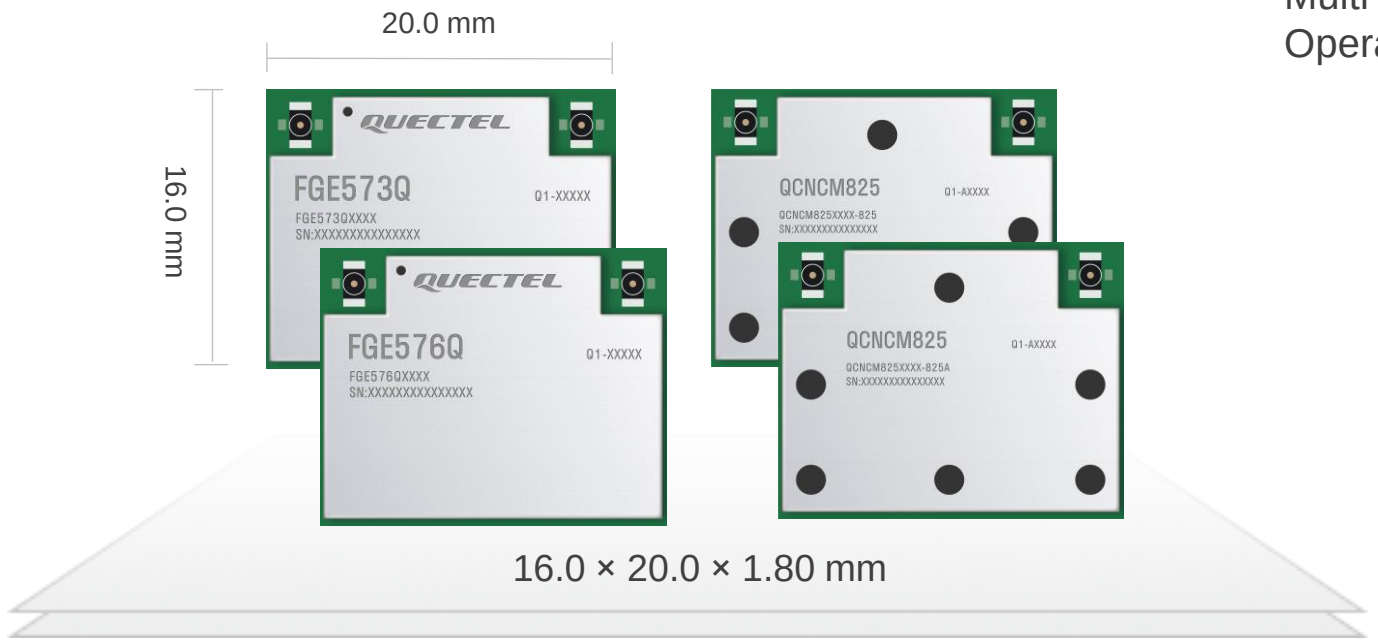
Dual Band Simultaneous (DBS)

Multi-user MIMO

160/ 320 MHz bandwidth

Multi-Link Operation (MLO)

4K-QAM



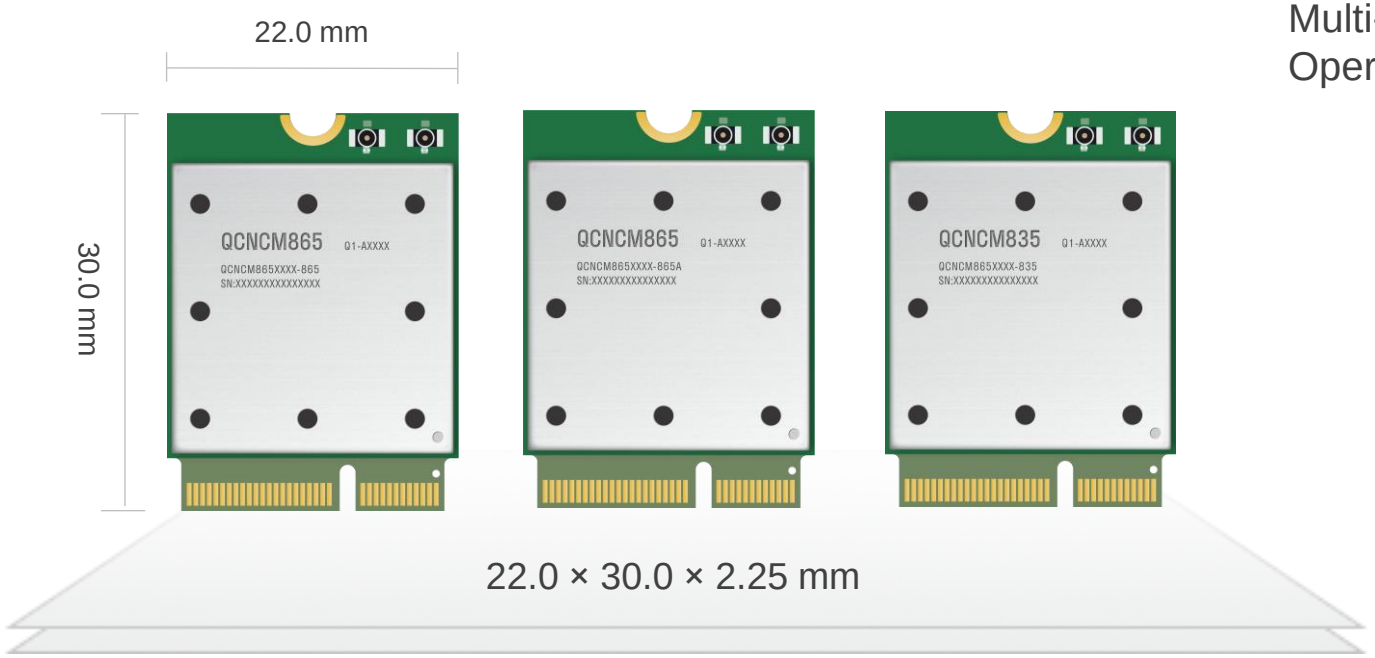
FGE576Q and NCM825(A) support DBS.
FGE573Q and FGE576Q support 160 MHz bandwidth, and NCM825(A) supports 320 MHz bandwidth.

MIMO: Multiple Input Multiple Output DBS: Dual Band Simultaneous MLO: Multi-Link Operation

NCM865(A)/ NCM835 highlights (Wi-Fi 7)

High data rate

Ultra-low latency



Multi-link Operation (MLO)

4K-QAM

- High Band Simultaneous (HBS) (only supported by NCM865/ NCM865A)
- Dual Band Simultaneous (DBS)

Multi-user MIMO

320 MHz bandwidth

MIMO: Multiple Input Multiple Output HBS: High Band Simultaneous DBS: Dual Band Simultaneous MLO: Multi-Link Operation

FGE57xQ/ NCM8x5(A) specifications (Wi-Fi 7)

Module	FGE573Q	FGE576Q	NCM825	NCM825A	NCM865	NCM865A	NCM835
Chipset	QCC2073	QCC2076	WCN7851				
Size (mm)	16.0 × 20.0 × 1.8				22.0 × 30.0 × 2.25		
WLAN protocol	802.11a/ b/ g/ n/ ac/ ax/ be						
Wi-Fi frequency band	2.4/ 5/ 6 GHz						
Wi-Fi antenna	2 × 2	2 × 2 + 2 × 2					
Wi-Fi modulation	DBPSK/ DQPSK/ CCK/ BPSK/ QPSK/ QAM						
Bluetooth protocol	Bluetooth 5.3		Bluetooth 5.4				
Bluetooth antenna	Share an antenna with Wi-Fi						
Wi-Fi operating mode	AP/ STA						
Interface	Wi-Fi: PCIe × 1 Bluetooth: PCM × 1, UART × 1		Wi-Fi: PCIe × 1 Bluetooth: PCM/ I2S × 1, USB × 1	Wi-Fi: PCIe × 1 Bluetooth: PCM/ SLIMBus × 1, UART × 1	Wi-Fi: PCIe × 1 Bluetooth: PCM/ I2S × 1, USB × 1	Wi-Fi: PCIe × 1 Bluetooth: PCM/ SLIMBus × 1, UART × 1	Wi-Fi: PCIe × 1 Bluetooth: PCM/ I2S × 1, USB × 1
DBS	-	Supported					
HBS	-				Supported		-
Encryption mode	WPA3						
Max. physical rate	2900 Mbps	3600 Mbps	5800 Mbps				
Operating temperature	-20 °C to +70 °C		-10 °C to +65 °C				
Certification	Planning	SRRC*/ CE*/ FCC*/ IC*/ RCM*	SRRC/ CE/ FCC/ IC/ Anatel/ NCC/ KC/ RCM/ TELEC				CE/ FCC/ IC/ Anatel/ NCC/ KC/ RCM/ SRRC①/ TELEC①
Project stage	ES		CS				ES

①: Under planning *: In progress

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FGE573Q/ FGE576Q timeline

2024											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

FGE573Q TBD

FGE576Q

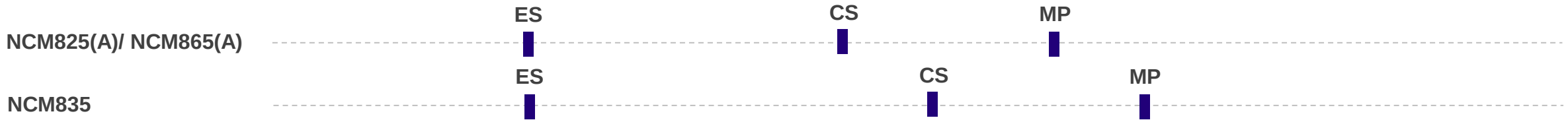
Regulatory SRRC/ CE/ FCC/ IC/ RCM



NCM825(A)/ NCM865(A)/ NCM835 timeline

2023			2024											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

NCM825(A)/ NCM865(A)

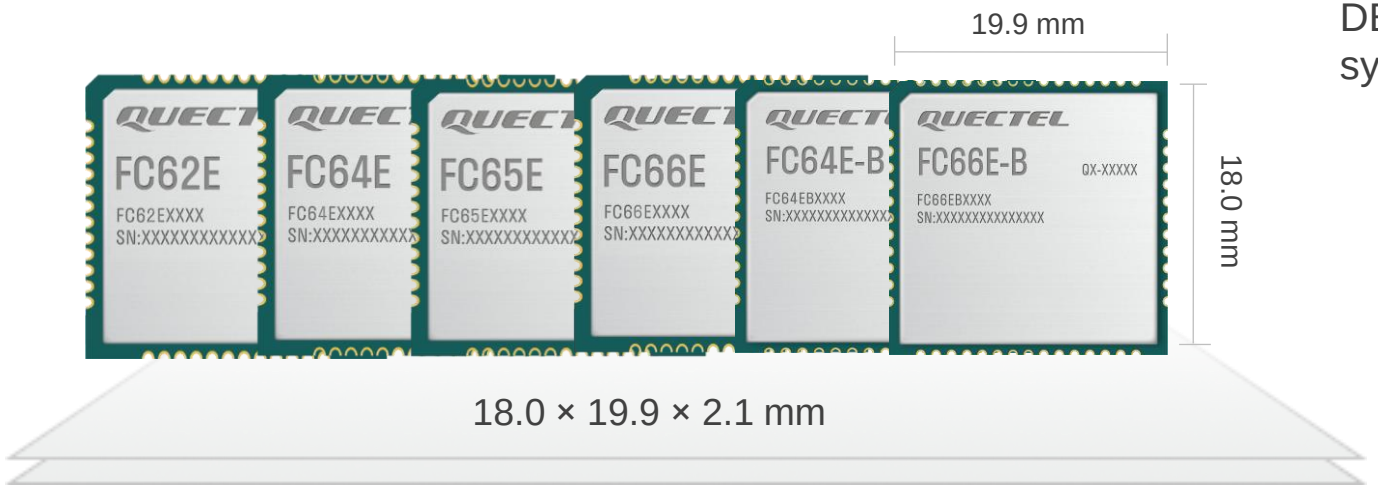
Regulatory	SRRC/ CE/ FCC/ IC/ Anatel/ NCC/ KC/ RCM/ TELEC	Completed

NCM835

Regulatory	CE/ FCC/ IC/ Anatel/ NCC/ KC/ RCM	Completed

FC6xE series highlights (Wi-Fi 6/ Wi-Fi 6E)

Wi-Fi 6/ Wi-Fi 6E module with high throughput



FC64E/ FC66E series: DBS and AP + STA synchronous operation

Adaptation to multiple third-party processors

FC65E/ FC66E series: 6 GHz band with 160 MHz channel bandwidth

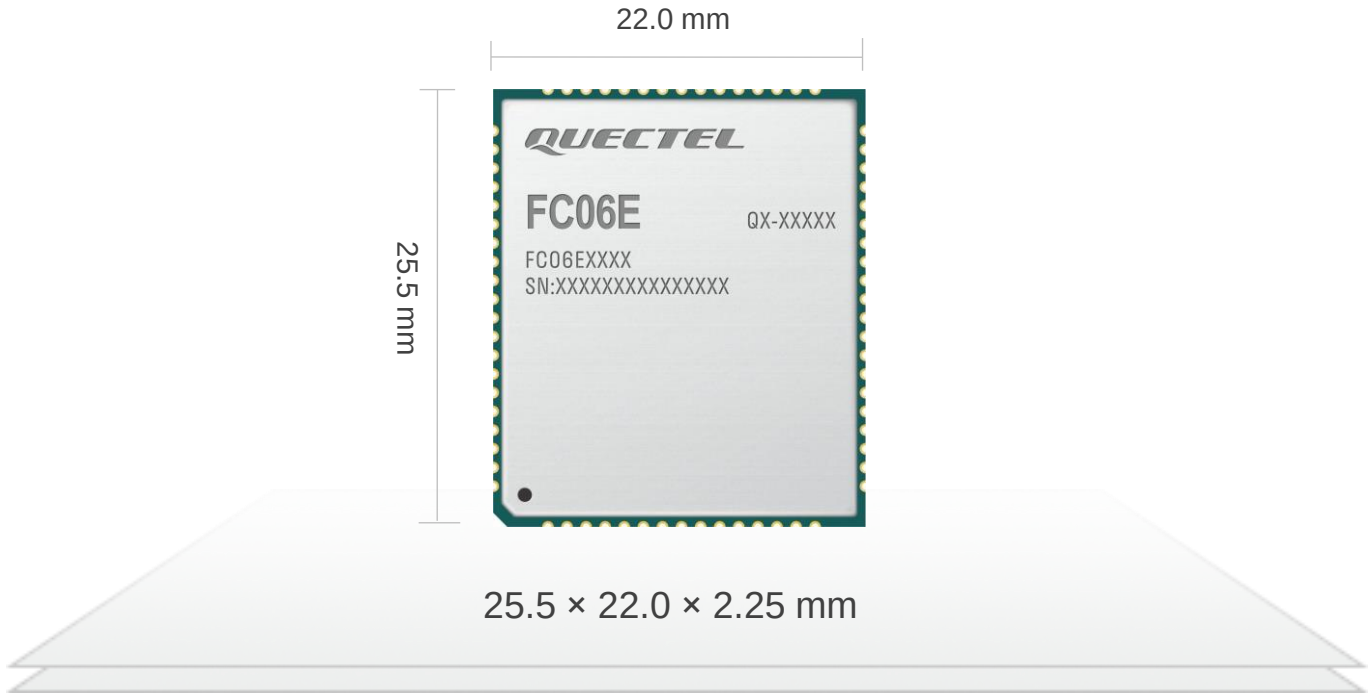
FC64E/ FC66E: excellent coexistence mechanism verified with Quectel 5G modules

DBS: Dual Band Simultaneous AP: Access Point STA: Station

Back

FC06E highlights (Wi-Fi 6)

Wi-Fi 6 module with high throughput



DBS and AP + STA synchronous operation

Built-in exclusive 2.4 GHz and 5 GHz FEMs for higher output power

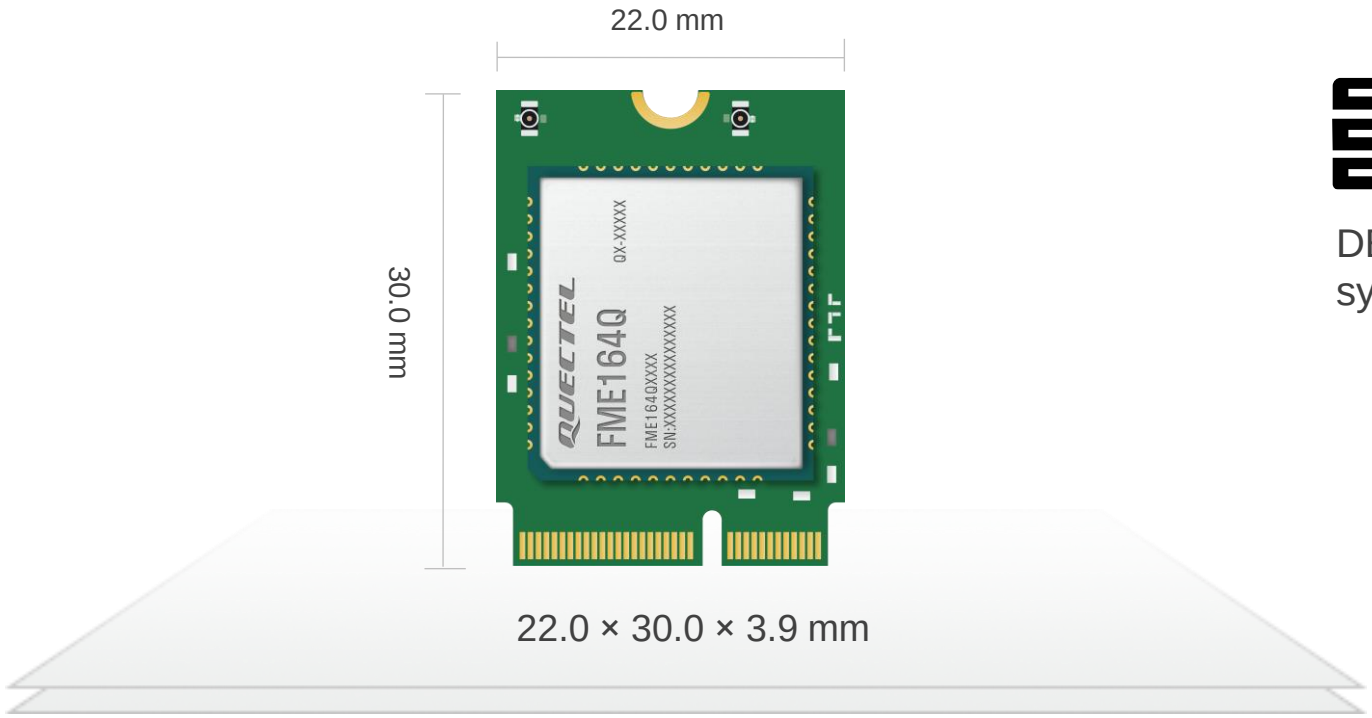
Adaptation to multiple third-party processors

Excellent coexistence mechanism verified with Quectel 5G modules

DBS: Dual Band Simultaneous AP: Access Point STA: Station FEM: Front-End Module

FME164Q highlights (Wi-Fi 6)

Wi-Fi 6 module with high throughput



DBS and AP + STA synchronous operation

Adaptation to multiple third-party processors

5 GHz band with 80 MHz channel bandwidth

Excellent coexistence mechanism verified with Quectel 5G modules

DBS: Dual Band Simultaneous AP: Access Point STA: Station

FC06E/FME164Q/FC6xE series specifications (Wi-Fi 6/ Wi-Fi 6E)

Module	FC62E	FC64E	FME164Q	FC65E	FC66E	FC64E-B	FC66E-B	FC06E ①
Chipset	QCA2062	QCA2064		QCA2065	QCA2066	QCA2064	QCA2066	QCA2064
Size (mm)	18.0 × 19.9 × 2.1		22.0 × 30.0 × 3.9	18.0 × 19.9 × 2.1		18.0 × 19.9 × 2.1		25.5 × 22.0 × 2.25
WLAN protocol	802.11a/ b/ g/ n/ ac/ ax							
Wi-Fi frequency band	2.4/ 5 GHz			2.4/ 5/ 6 GHz		2.4/ 5 GHz	2.4/ 5/ 6 GHz	2.4/ 5 GHz
Wi-Fi antenna	2 × 2	2 × 2 + 2 × 2		2 × 2	2 × 2 + 2 × 2			
Wi-Fi modulation	DBPSK, DQPSK, CCK, BPSK, QPSK, QAM							
Bluetooth protocol	Bluetooth 5.2							
BLE features	LE Audio, 2M PHY, BLE Long Range							
Bluetooth antenna	Share an antenna with Wi-Fi					Exclusive Bluetooth antenna		
Operating mode	STA/ AP/ AP + STA							
Interface	Wi-Fi: PCIe 3.0 × 1 Bluetooth: UART × 1, PCM × 1							
DBS	-	Supported		-	Supported			
Max. physical rate	1200 Mbps	1774.5 Mbps		2400 Mbps	3000 Mbps	1774.5 Mbps	3000 Mbps	1774.5 Mbps
Encryption mode	WPA3							
Operating temperature	-30 ℃ to +75 ℃							
Certification	Planning	SRRC/ CE/ FCC/ IC/ KC/ JATE / TELEC/ RCM	Planning	SRRC/ CE/ FCC/ IC/ KC/ RCM	SRRC/ CE/ FCC/ IC/ KC/ JATE / TELEC/ RCM			SRRC/ CE/ FCC/ UKCA/ IC/ KC/ RCM
Project stage	ES	MP	ES	CS	MP			

①: Built-in FEMs for long-range coverage DBS: Dual Band Simultaneous

FC65E timeline

2023											2024							
Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

Regulatory	CE/ FCC/ IC/ SRRC/ KC/ RCM	Completed

FME164Q timeline

2024											2025					
Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.

Project schedule

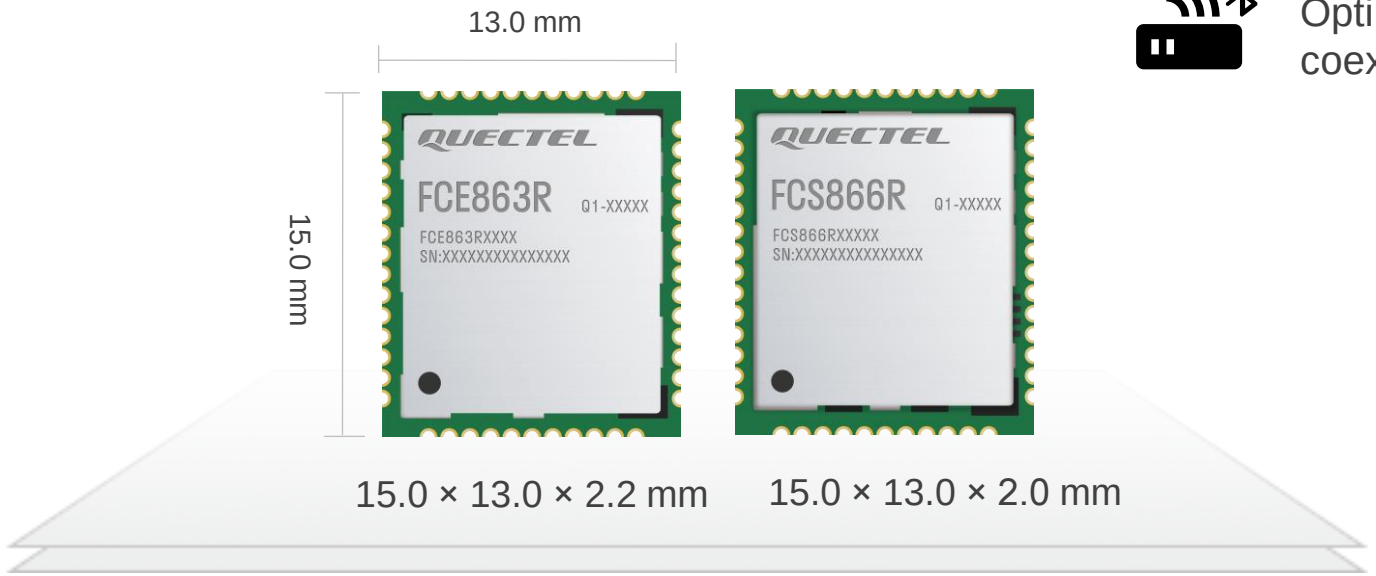


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MP: Hardware and software ready for mass production.

Certification TBD

FCE863R/ FCS866R highlights (Wi-Fi 6)

Wi-Fi 6 dual band



Optimum Wi-Fi and Bluetooth coexistence performance

Operating temperature:

- FCE863R: -20 ℃ to +70 ℃/ -40 ℃ to +85 ℃ (optional)
- FCS866R: -20 ℃ to +70 ℃

Adaptation to multiple third-party processors (IMX, ST, Renesas)

FCE863R/ FCS866R specifications (Wi-Fi 6)

Module	FCE863R	FCS866R
Chipset	RTL8852BE	RTL8852BS-CG
Size (mm)	15.0 × 13.0 × 2.2	15.0 × 13.0 × 2.0
WLAN protocol	802.11a/ b/ g/ n/ ac/ ax	
Wi-Fi frequency range	2.4/ 5 GHz	
Wi-Fi antenna	2 × 2	
Wi-Fi modulation	DBPSK/ DQPSK/ CCK/ BPSK/ QPSK/ 16QAM/ 64QAM/ 256QAM/ 1024QAM/ MU-MIMO/ OFDMA	
Bluetooth protocol	Bluetooth 5.2	
Bluetooth antenna	Share an antenna with Wi-Fi/ Exclusive Bluetooth antenna (optional)	
Operating mode	STA/ AP/ AP + STA	
Interface	Wi-Fi: PCIe 1.1× 1 Bluetooth: UART × 1, PCM × 1	Wi-Fi: SDIO 3.0 × 1 Bluetooth: UART × 1, PCM × 1
Encryption mode	WPA3	
Max. physical rate	1201 Mbps	
Operating temperature	-20 ℃ to +70 ℃/ -40 ℃ to +85 ℃ (optional)	-20 ℃ to +70 ℃
Certification	CE/ RCM/ FCC/ IC/ SRRC	CE/ RCM/ FCC/ IC/ SRRC/ KC*
Project stage	ES	CS

*: In progress AP: Access Point STA: Station RSDB: Real Simultaneous Dual Band DBDC: Dual Band Dual Concurrent

FCE863R timeline

2023					2024									
Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.

Project schedule



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CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

Regulatory	CE/ FCC/ IC/ SRRC/ RCM	Completed

FCS866R timeline

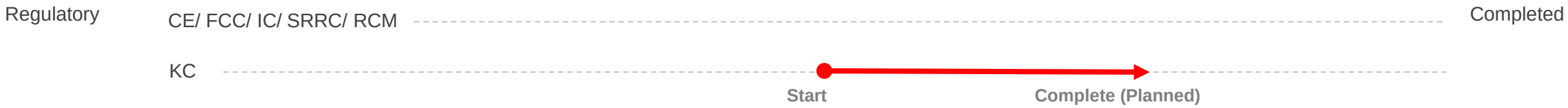
2023					2024									
Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.

Project schedule



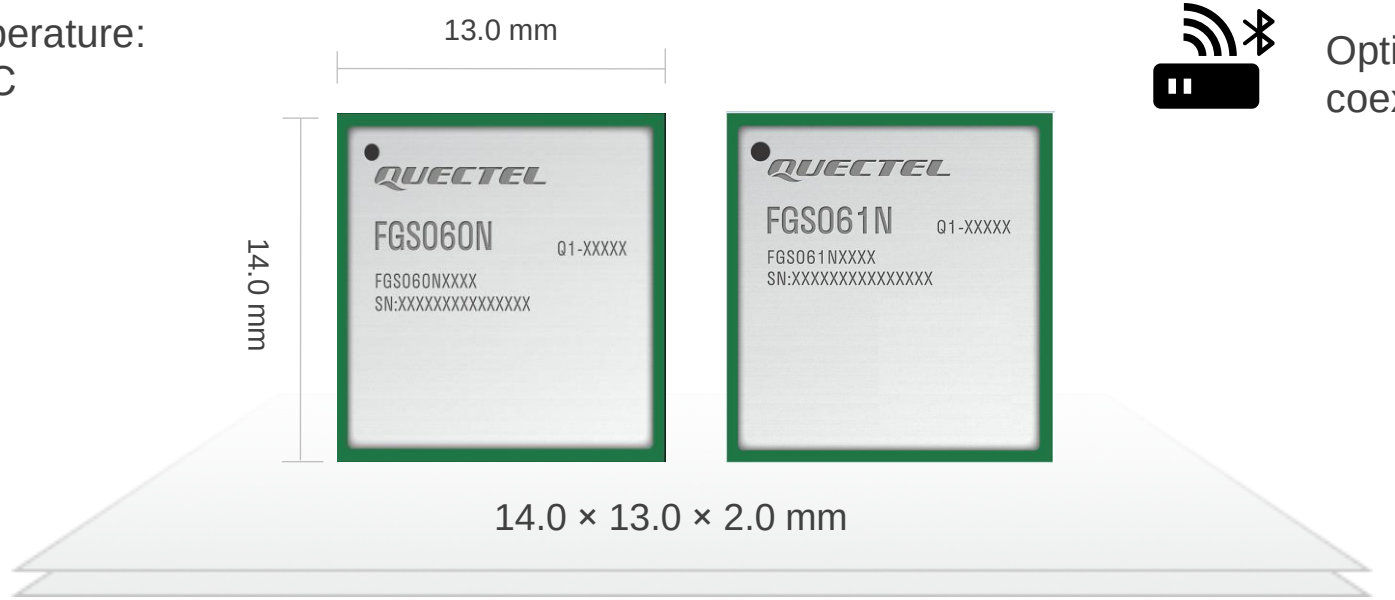
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MP: Hardware and software ready for mass production.

Certification



FGS060N/ FGS061N highlights (Wi-Fi 6)

Operating temperature:
-40 ℃ to +85 ℃



Optimum Wi-Fi and Bluetooth coexistence performance

Wi-Fi 6 dual-band

Adaptation to multiple third-party processors (IMX, Renesas)

FGS060N/ FGS061N specifications (Wi-Fi 6)

Module	FGS060N	FGS061N
Chipset	IW612	IW611
Size (mm)	14.0 × 13.0 × 2.0	
WLAN protocol	802.11a/ b/ g/ n/ ac/ ax	
Wi-Fi frequency band	2.4/ 5 GHz	
Wi-Fi antenna	1 × 1	
Wi-Fi modulation	DSSS, CCK, BPSK, QPSK, DBPSK, DQPSK, 16QAM, 64QAM, 256QAM, 1024QAM, OFDMA	
Bluetooth protocol	Bluetooth 5.2	
Thread protocol	802.15.4 (only RCP)	-
Operating mode	STA/ AP	
Interface	Wi-Fi: SDIO 3.0 × 1 Bluetooth: UART × 1 802.15.4 : SPI × 1	Wi-Fi: SDIO 3.0 × 1 Bluetooth: UART × 1
Encryption mode	WPA2, WPA3	
Max. physical rate	600 Mbps	
Operating temperature	-40 ℃ to +85 ℃	
Certification	CE/ FCC/ IC/ RCM	SRRC*/ CE*/ FCC*/ IC*/ RCM*
Project stage	ES	

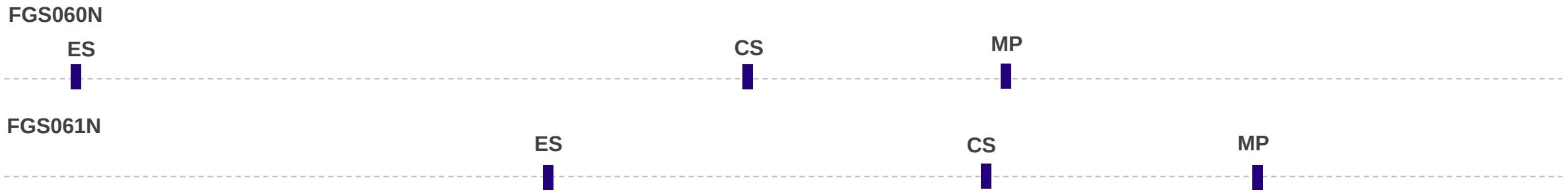
RCP: Radio Co-Processor

*: In progress

FGS060N/ FGS061N timeline

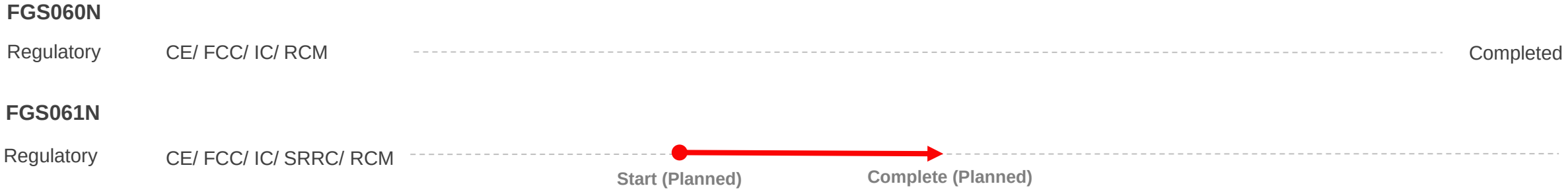
2024											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule



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MP: Hardware and software ready for mass production.

Certification



FC80A/ FCS850R series specifications (Wi-Fi 5)

Module	FC80A	FCS850R	FCS850R-B
Chipset	CYW54591	RTL8822CS-VS-CG	
Size (mm)	15.0 × 13.0 × 2.2	15.0 × 13.0 × 2.3	
WLAN protocol	802.11a/ b/ g/ n/ ac		
Wi-Fi frequency range	2.4/ 5 GHz		
Wi-Fi antenna	2 × 2		
Wi-Fi modulation	BPSK, QPSK, CCK, 16QAM, 64QAM, 256QAM		
Bluetooth protocol	Bluetooth 5.1	Bluetooth 5.0	
Bluetooth antenna	Share an antenna with Wi-Fi		Exclusive Bluetooth antenna
Operating mode	STA/ AP	STA/ AP/ AP + STA	
Interface	Wi-Fi: SDIO 3.0 × 1 Bluetooth: UART × 1, PCM × 1		
RSDB	Supported	-	
DBDC	Supported	-	
Encryption mode	WPA3		
Max. physical rate	866.7 Mbps		
Operating temperature	-40 ℃ to +85 ℃	-20 ℃ to +70 ℃	
Certification	SRRC/ CE/ FCC/ IC/ KC/ JATE/ TELEC/ RCM	CE/ FCC/ IC/ SRRC/ RCM	
Project stage	MP	MP	

Back

AP: Access Point STA: Station RSDB: Real Simultaneous Dual Band DBDC: Dual Band Dual Concurrent

FC2x/FCS950R/FCU906A/FC90xA/FC900E specifications (Wi-Fi 5)

Module	FCS950R	FC905A	FC900E	FC20/ FC21	FC906A	FCU906A
Chipset	RTL8821CS	CYW43455	QCA1023	QCA1023	CYW4373	
Size (mm)	12.0 × 12.0 × 2.35	12.0 × 12.0 × 1.55	12.0 × 12.0 × 2.05	16.6 × 13.0 × 2.05	12.0 × 12.0 × 1.55	
WLAN protocol	802.11a/ b/ g/ n/ ac					
Wi-Fi frequency band	2.4/ 5 GHz					
Wi-Fi antenna	1 × 1					
Wi-Fi modulation	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM, 256QAM	DSSS, CCK, BPSK, QPSK, DBPSK, DQPSK, 16QAM, 64QAM, 256QAM			DSSS, CCK, BPSK, QPSK, 16QAM, 64QAM, 256QAM	
Bluetooth protocol	Bluetooth 4.2	Bluetooth 5.0			Bluetooth 5.4	
Bluetooth antenna	Share an antenna with Wi-Fi					
Operating mode	STA/ AP/ AP + STA	STA/ AP	STA/ AP/ AP + STA			
Interface	Wi-Fi: SDIO 3.0 × 1 Bluetooth: UART × 1, PCM × 1					Wi-Fi: USB 2.0 × 1 Bluetooth: USB 2.0 × 1, PCM × 1
Encryption mode	WPA3					
Max. physical rate	433.3 Mbps					
Operating temperature	-20 ℃ to +70 ℃/ -40 ℃ to +85 ℃ (optional)	-30 ℃ to +85 ℃	-40 ℃ to +85 ℃		-20 ℃ to +70 ℃	
Certification	SRRC/ CE/ FCC/ IC/ RCM	SRRC/ CE/ FCC/ IC/ JATE/ TELEC	SRRC/ CE/ FCC	SRRC/ CE/ FCC/ IC/ JATE/ TELEC/ RCM	SRRC/ CE/ FCC/ IC/ RCM	SRRC*
Project stage	CS	MP	MP	MP	ES	

FC20 has a power amplifier used for improving 5 GHz output power

FCS950R timeline

2023												2024							
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

Regulatory	CE/ FCC/ IC/ SRRC/ RCM	Completed

FC906A timeline

2024											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

Regulatory	CE/ FCC/ IC/ SRRC/ RCM	Completed

FCU906A timeline

2024											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule



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CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification



FCS94xR/FCU741R/FC30R/FC909A specifications (Wi-Fi 4)

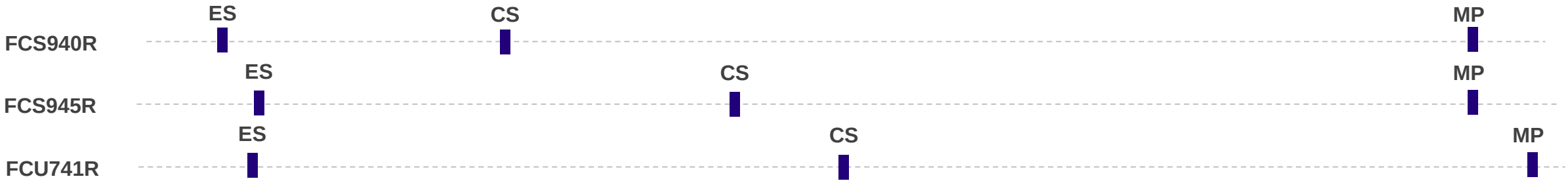
Module	FCS940R	FCS945R	FCU741R	FC30R	FC909A
Chipset	RTL8723DS-CG	RTL8733BS	RTL8731BU-CG	RTL8189EM-VI-CG	CYW43439
Size (mm)	12.0 × 12.0 × 2.0	12.0 × 12.0 × 2.15	13.0 × 12.2 × 2.25	12.0 × 12.0 × 2.1	12.0 × 12.0 × 1.95
WLAN protocol	802.11b/ g/ n	802.11a/ b/ g/ n		802.11b/ g/ n	
Wi-Fi frequency band	2.4 GHz	2.4/ 5 GHz		2.4 GHz	
Wi-Fi antenna	1 × 1				
Wi-Fi modulation	OFDM, CCK, BPSK, QPSK, 16QAM, 64QAM	CCK, BPSK, QPSK, DQPSK, 16QAM, 64QAM	DBPSK, DQPSK, BPSK, QPSK, CCK, 16QAM, 64QAM		DSSS, OFDM, DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Bluetooth protocol	Bluetooth 5.0	Bluetooth 5.2	-		Bluetooth 5.2
Bluetooth antenna	Share an antenna with Wi-Fi	Share an antenna with Wi-Fi/ Exclusive Bluetooth antenna (optional)	-		Share an antenna with Wi-Fi
Operating mode	STA/ AP/ AP + STA				STA/ AP
Interface	Wi-Fi: SDIO 2.0 × 1 Bluetooth: PCM × 1, UART × 1		Wi-Fi: USB 2.0 × 1	Wi-Fi: SDIO 3.0 × 1	Wi-Fi: SDIO 2.0 × 1 Bluetooth: PCM × 1, UART × 1
Encryption mode	WPA3				WPA3
Max. physical rate	150 Mbps				72 Mbps
Operating temperature	0 °C to +70 °C/ -20 °C to +80 °C (optional)	-20 °C to +70 °C/ -40 °C to +85 °C (optional)	-20 °C to +70 °C	-40 °C to +85 °C	-30 °C to +85 °C
Certification	CE/ FCC/ SRRC	CE/ FCC/ IC/ SRRC/ RCM/ KC*	CE/ FCC/ IC/ SRRC/ JATE/ TELEC/ RCM	CE/ FCC/ IC/ SRRC/ JATE/ TELEC/ RCM/ KC①	CE/ FCC/ IC/ SRRC
Project stage	CS	CS	CS	MP	MP

*: In progress ①: Planning

FCS940R/ FCS945R/ FCU741R timeline

2023												2024							
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

Project schedule



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MP: Hardware and software ready for mass production.

Certification

FCS940R

Regulatory	CE/ FCC/ SRRC	Completed

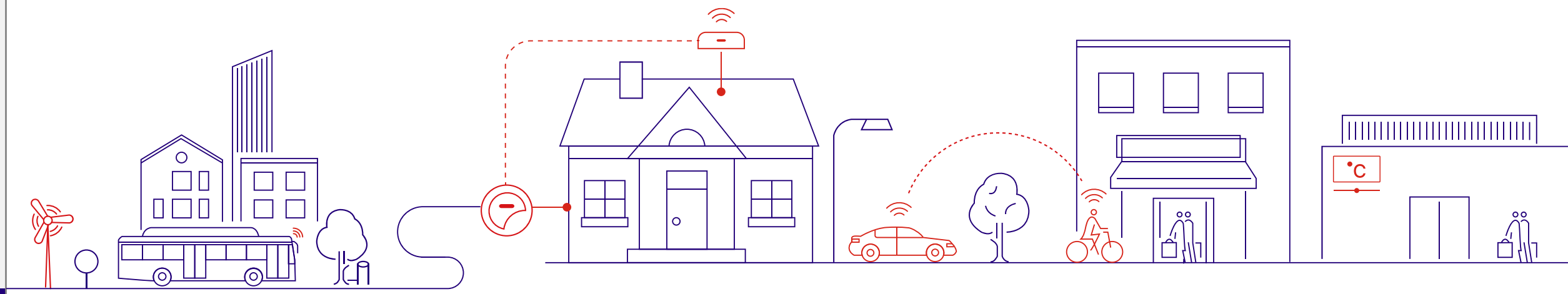
FCU741R

Regulatory	CE/ FCC/ IC/ SRRC/ JATE/ TELEC/ RCM	Completed

FCS945R

Regulatory	KC	Start → Complete (Planned)
	CE/ FCC/ IC/ SRRC/ RCM	Completed

MCU Wi-Fi & Bluetooth modules

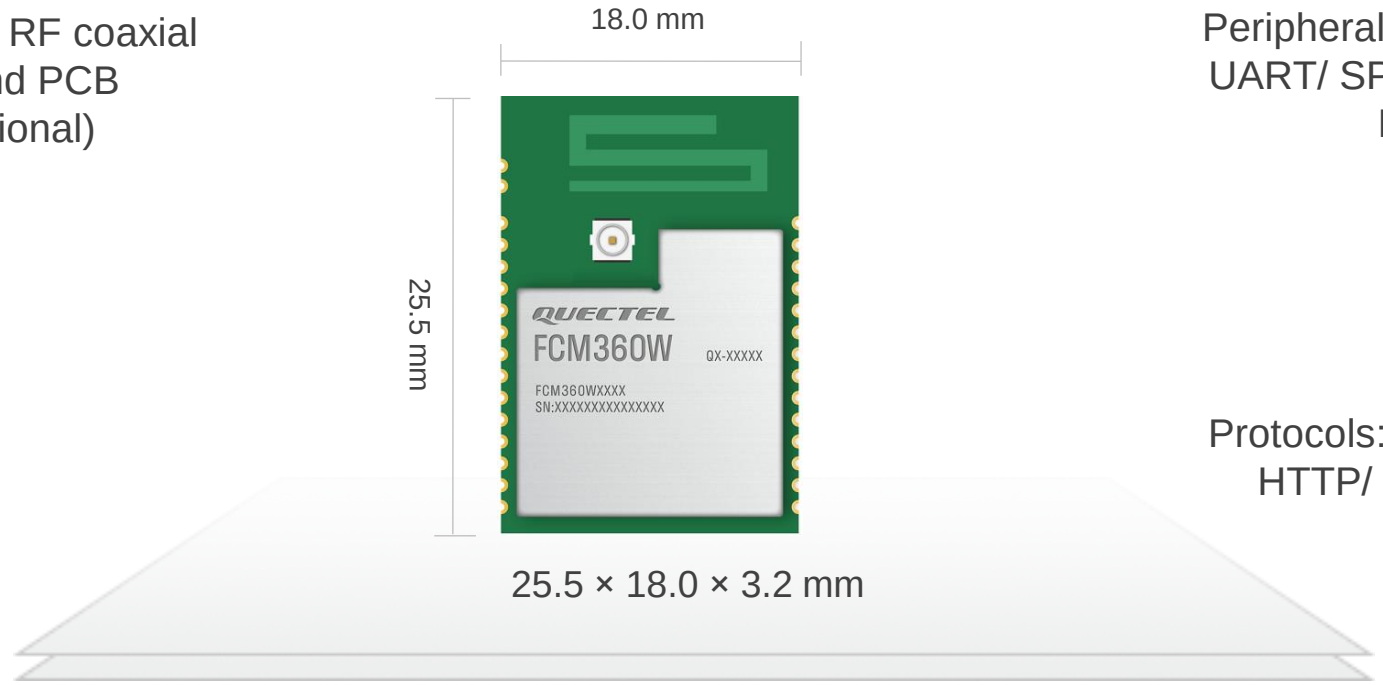


FCM360W (Wi-Fi 6)

Pin antenna, RF coaxial connector and PCB antenna (optional)

Wi-Fi 6

Industrial grade with operating temperature:
-40 ℃ to +85 ℃/
-40 ℃ to +105 ℃ (optional)



Peripheral interfaces:
UART/ SPI/ I2C/ I2S/
PWM/ ADC

Protocols: TCP/ UDP/
HTTP/ MQTT/ SSL

Cost-effective

FCM360W specifications (Wi-Fi 6)

Module	FCM360W
Chipset	ECR6600-A
Size (mm)	25.5 × 18.0 × 3.2
WLAN protocol	802.11b/ g/ n/ ax
Wi-Fi frequency band	2.4 GHz
Antenna	Pin antenna, RF coaxial connector and PCB antenna (optional)
Wi-Fi modulation	BPSK, QPSK, CCK, 16QAM, 64QAM
Bluetooth protocol	BLE 5.1
Operating mode	STA/ AP
MCU core	RISC processor (240 MHz)
ROM	48 KB
SRAM	512 KB
Flash	4 MB/ 8 MB (optional)
Interface	UART/ SPI/ I2C/ I2S/ PWM/ ADC etc.
Encryption mode	WPA-PSK/ WPA2-PSK/ WPA3-SAE/ AES-128
Operating temperature	-40 ℃ to +85 ℃/ -40 ℃ to +105 ℃ (optional)
Certification	CE/ FCC/ IC/ SRRC/ RCM
Project stage	ES

FCM360W timeline

2023										2024									
Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.

Project schedule



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CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

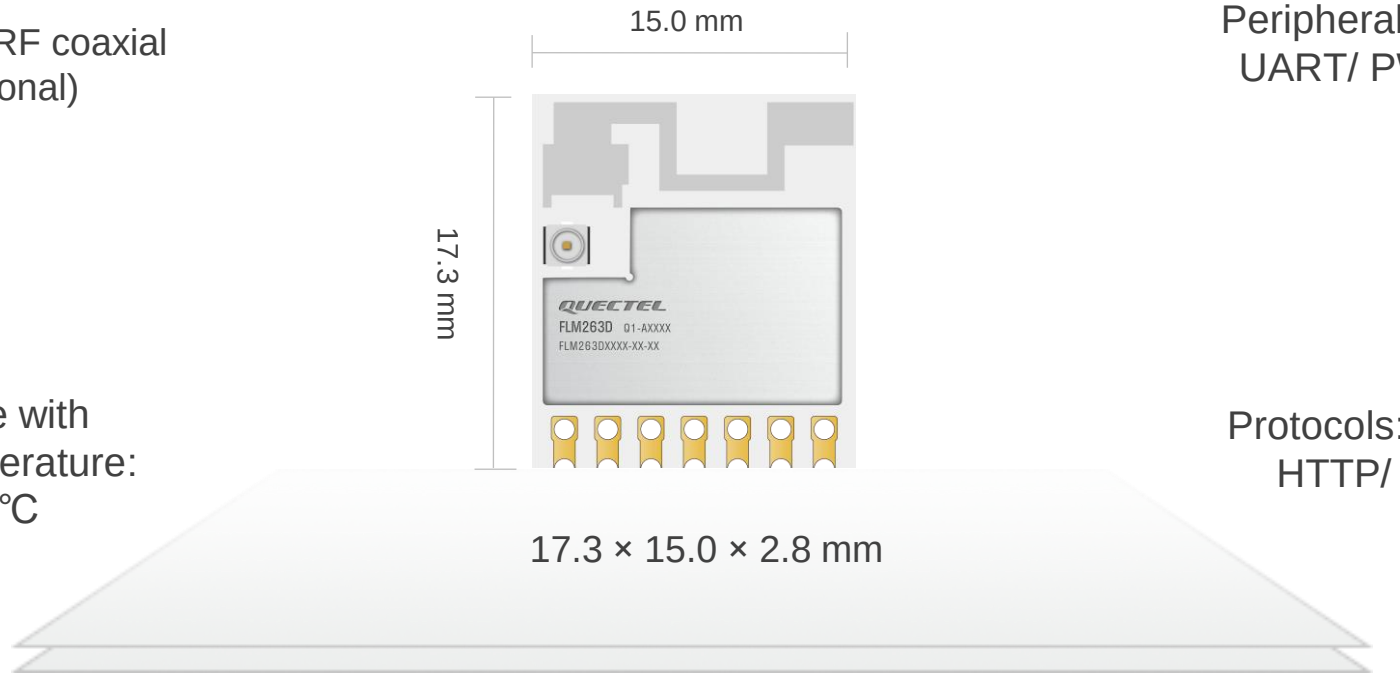
Regulatory	CE/ FCC/ IC/ SRRC/ RCM	Completed

FLM263D (Wi-Fi 6)

PCB antenna, RF coaxial connector (optional)

Industrial grade with operating temperature: -40 ℃ to +105 ℃

Support public IoT service with MQTT connection



Peripheral interfaces: UART/ PWM/ GPIO/ ADC, etc.

Protocols: TCP/ UDP/ HTTP/ MQTT/ SSL

Cost-effective

Back

FLM263D specifications (Wi-Fi 6)

Module	FLM263D
Chipset	BK7235
Size (mm)	17.3 × 15.0 × 2.8
WLAN protocol	802.11b/ g/ n/ ax
Wi-Fi frequency band	2.4 GHz
Antenna	PCB antenna, RF coaxial connector (optional)
Wi-Fi modulation	CCK/ BPSK/ QPSK/ 16QAM/ 64QAM
Bluetooth protocol	BLE 5.2
Wi-Fi operating mode	AP/ STA/ STA + AP
MCU core	RISC-V (320 MHz)
SRAM	512 KB
Flash	4 MB
Interface	UART/ ADC/ PWM/ GPIO, etc.
Encryption mode	WPA-PSK/ WPA2-PSK/ WPA3-PSK
Operating temperature range	-40 ℃ to +105 ℃
Certification	CE/ FCC/ IC/ SRRC/ RCM
Project stage	ES

FLM263D timeline

2023		2024									
Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.

Project schedule



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MP: Hardware and software ready for mass production.

Certification

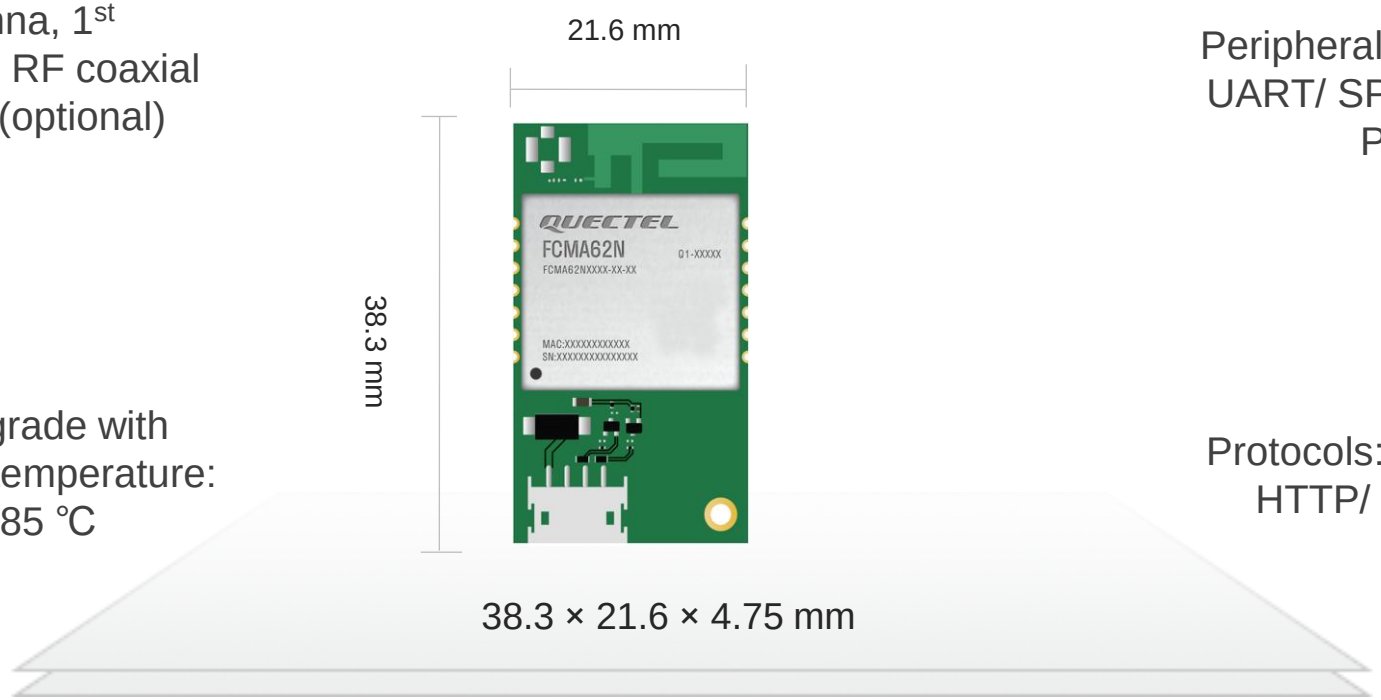
Regulatory	CE/ FCC/ IC/ SRRC/ RCM	Completed

FCMA62N (Wi-Fi 6)

PCB antenna, 1st generation RF coaxial connector (optional)

Industrial grade with operating temperature: -40 ℃ to +85 ℃

Wi-Fi 6 dual-band



Peripheral interfaces: UART/ SPI/ I2C/ I2S/ PWM/ GPIO

Protocols: TCP/ UDP/ HTTP/ MQTT/ SSL

Higher security level, dramatically reduce security risks

FCMA62N specifications (Wi-Fi 6)

Module	FCMA62N
Chipset	RW610
Size (mm)	38.3 × 21.6 × 4.75
WLAN protocol	802.11a/ b/ g/ n/ ac/ ax
Wi-Fi frequency band	2.4/ 5 GHz
Antenna	PCB antenna, RF coaxial connector (optional)
Wi-Fi modulation	DSSS, CCK, BPSK, QPSK, DBPSK, DQPSK, 16QAM, 64QAM, 256QAM
Bluetooth protocol	BLE 5.3
Wi-Fi operating mode	STA/ AP
MCU core	ARM Cortex-M33 processor (260 MHz)
SRAM	1.2 MB
Flash	8 MB/ 4 MB (optional)
Interface	UART/ SPI*/ I2C*/ I2S*/ PWM*/ GPIO
Encryption mode	WPA-PSK/ WPA2-PSK/ WPA3-SAE/ AES-128
Operating temperature range	-40 ℃ to +85 ℃
Certification	SRRC*/ CE*/ FCC*/ IC*/ RCM*/ Bluetooth*
Project stage	Pre-ES

*: Under development/ in progress

FCMA62N timeline

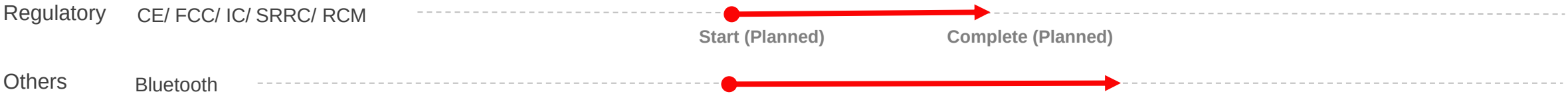
2024											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule



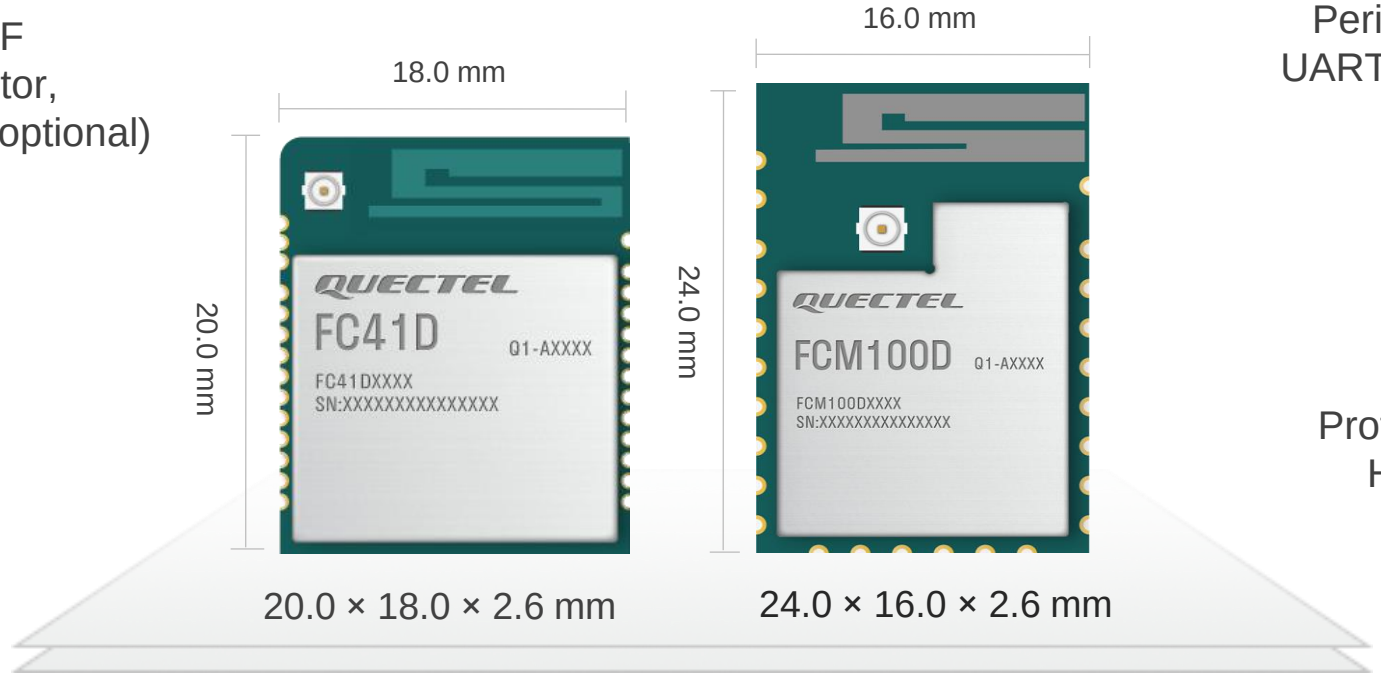
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MP: Hardware and software ready for mass production.

Certification



FC41D/ FCM100D highlights (Wi-Fi 4)

Pin antenna, RF coaxial connector, PCB antenna (optional)



Peripheral interfaces: UART/ I2C/ SPI/ PWM/ GPIO/ ADC, etc.

Protocols: TCP/ UDP/ HTTP/ MQTT/ SSL

Support public IoT service with MQTT connection

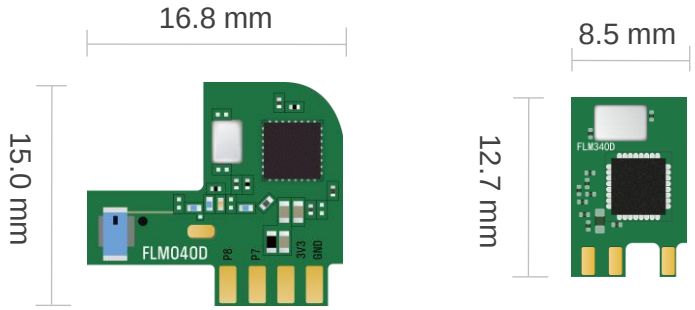
Cost-effective

FC41D/ FCM100D specifications (Wi-Fi 4)

Module	FC41D	FCM100D
Chipset	BK7231M	
Size (mm)	20.0 × 18.0 × 2.6	24.0 × 16.0 × 2.6
WLAN protocol	802.11b/ g/ n	
Wi-Fi frequency band	2.4 GHz	
Antenna	Pin antenna, RF coaxial connector, PCB antenna (optional)	
Wi-Fi modulation	BPSK, QPSK, CCK, 16QAM, 64QAM	
Bluetooth protocol	BLE 5.2	
Operating mode	STA/ AP	
MCU core	ARM968 (120 MHz)	
RAM	256 KB	
Flash	2 MB/ 4 MB (optional)	
Interface	UART, SPI, I2C, ADC, PWM, GPIO etc.	
Encryption mode	WPA-PSK/ WPA2-PSK/ WPA3-SAE	
Operating temperature	-40 ℃ to +85 ℃	-40 ℃ to +85 ℃/ -40 ℃ to +105 ℃ (optional)
Certification	CE/ FCC/ IC/ SRRC/ Anatel/ KC/ TELEC/ RCM/ Bluetooth	CE/ FCC/ IC/ Anatel/ SRRC/ RCM
Project stage	MP	

FLMx40D/ FCM740D highlights (Wi-Fi 4)

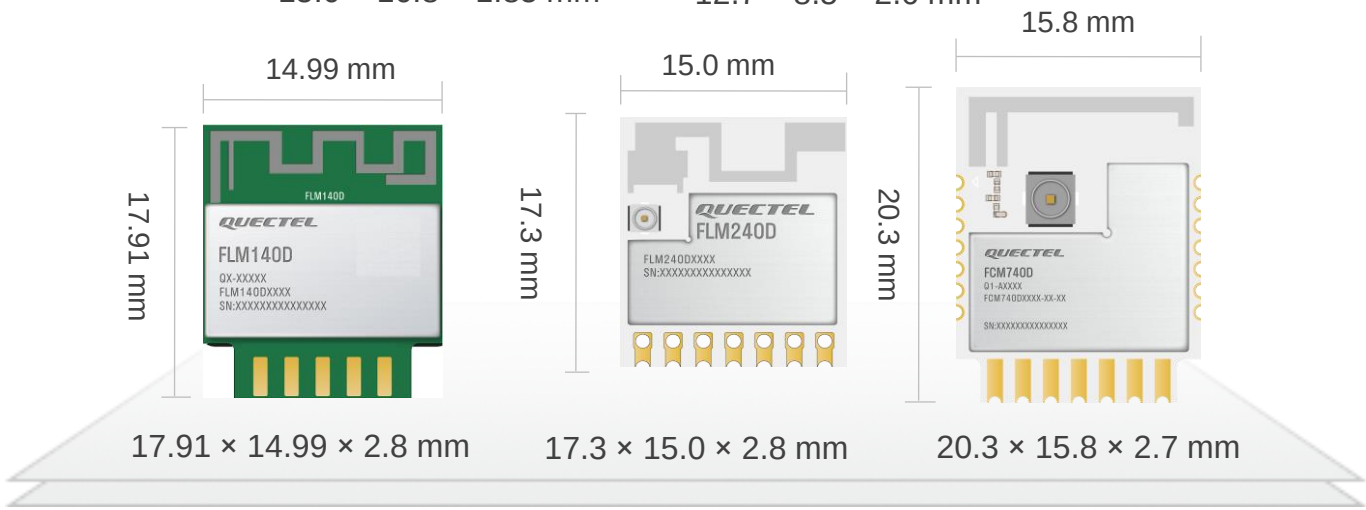
Peripheral interfaces:
UART/ PWM/ GPIO/
ADC, etc.



15.0 × 16.8 × 1.85 mm

12.7 × 8.5 × 2.6 mm

Protocols: TCP/ UDP/
HTTP/ MQTT/ SSL



17.91 × 14.99 × 2.8 mm

17.3 × 15.0 × 2.8 mm

20.3 × 15.8 × 2.7 mm

Support public IoT service
with MQTT connection

Compatible with
mainstream module
sizes

Back

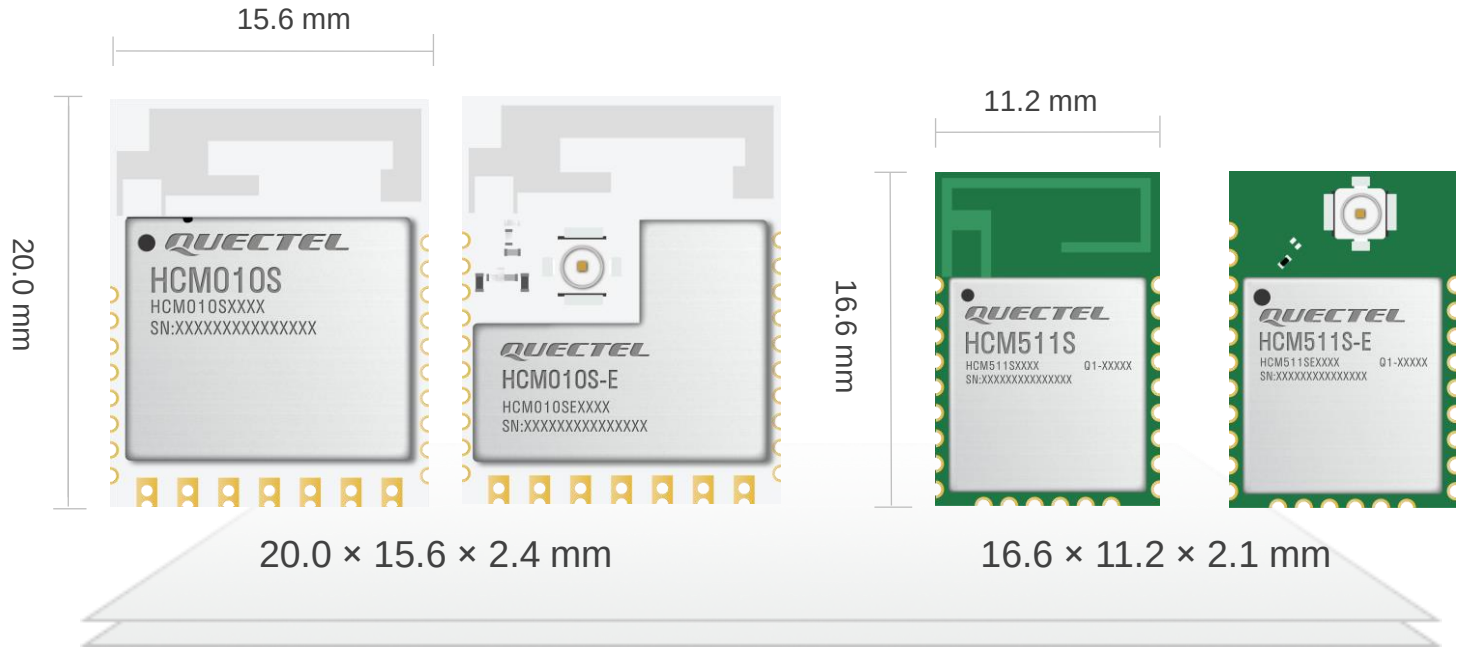
FLMx40D/ FCM740D specifications (Wi-Fi 4)

Module	FLM040D	FLM140D	FLM240D	FLM340D	FCM740D
Chipset	BK7231M				
Size (mm)	15.0 × 16.8 × 1.85	17.91 × 14.99 × 2.8	17.3 × 15.0 × 2.8	12.7 × 8.5 × 2.6	20.3 × 15.8 × 2.7
WLAN protocol	802.11b/ g/ n				
Wi-Fi frequency band	2.4 GHz				
Wi-Fi modulation	BPSK, QPSK, CCK, 16QAM, 64QAM				
Antenna	Ceramic antenna	PCB antenna		Pin antenna	PCB antenna, RF coaxial connector (optional)
Bluetooth protocol	BLE 5.2				
Operating mode	STA/ AP				
MCU core	ARM968 (120 MHz)				
RAM	256 KB				
Flash	2 MB/ 4 MB (optional)				
Interface	UART/ ADC/ PWM/ GPIO, etc.				
Encryption mode	WPA-PSK/ WPA2-PSK/ WPA3-SAE				
Operating temperature	-40 ℃ to +105 ℃	-40 ℃ to +85 ℃	-40 ℃ to +105 ℃		
Certification	SRRC/ CE/ FCC/ IC/ RCM				
Project stage	MP		CS		CS

HCM010S/ HCM511S series (BLE 5.4)

Robust and reliable communication

Multiple interfaces



HCM010S/ HCM511S: PCB antenna
HCM010S-E: pin antenna, RF coaxial connector, PCB antenna (optional)
HCM511S-E: pin antenna, RF coaxial connector (optional)

- Higher-level security
- Prevent local and remote cyber attacks

Back

HCM010S/ HCM511S Series Specifications (BLE 5.4)

Module	HCM010S	HCM010S-E	HCM511S	HCM511S-E
Chipset	EFR32BG21		EFR32BG22	
Size (mm)	20.0 × 15.6 × 2.4		16.6 × 11.2 × 2.1	
Antenna	PCB antenna	Pin antenna, RF coaxial connector, PCB antenna (optional)	PCB antenna	Pin antenna, RF coaxial connector (optional)
Bluetooth protocol	BLE 5.4, BLE mesh V1.1 & V1.0.1		BLE 5.4, BLE mesh Low Power Node	
Operating mode	Server/ Client/ Server + Client			
MCU core	ARM Cortex-M33 (80 MHz)		ARM Cortex-M33 (76.8 MHz)	
RAM	64 KB		32 KB	
Flash	768 KB		352 KB/ 512 KB (optional)	
Transmit power	+10 dBm/ +20 dBm (optional)	+20 dBm	+6 dBm	+8 dBm
Interface	UART/ SPI/ I2C/ I2S, etc.		ADC/ USART/ I2C/ I2S/ PDM/ SPI/ PWM, etc.	
Encryption mode	AES128/256, SHA-1, SHA-2 (up to 256 bits), ECC (up to 256 bits), ECDSA (up to 256 bits), ECDH, J-Pak, TRNG, secure boot		AES128/256, SHA-1, SHA-2, ECC, ECDSA, ECDH, TRNG and secure boot	
Operating temperature	-40 ℃ ~ +105 ℃		-40 ℃ ~ +85 ℃	
Certification	SRRC/ CE/ FCC/ IC/ RCM	SRRC①/ CE①/ FCC①/ IC①/ RCM①	SRRC/ CE/ FCC/ IC/ RCM/ Bluetooth	SRRC①/ CE①/ FCC①/ IC①/ RCM①/ Bluetooth①
Project stage	ES	Pre-ES	ES	Pre-ES

①: Under planning

HCM010S/ HCM511S timeline

2023							2024									
Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

HCM010S

Regulatory	SRRC/ CE/ FCC/ IC/ RCM	Completed

HCM511S

Regulatory	SRRC/ CE/ FCC/ IC/ RCM	Completed
Others	Bluetooth	Completed

HCM010S-E/ HCM511S-E timeline

2024									2025		
Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.

Project schedule

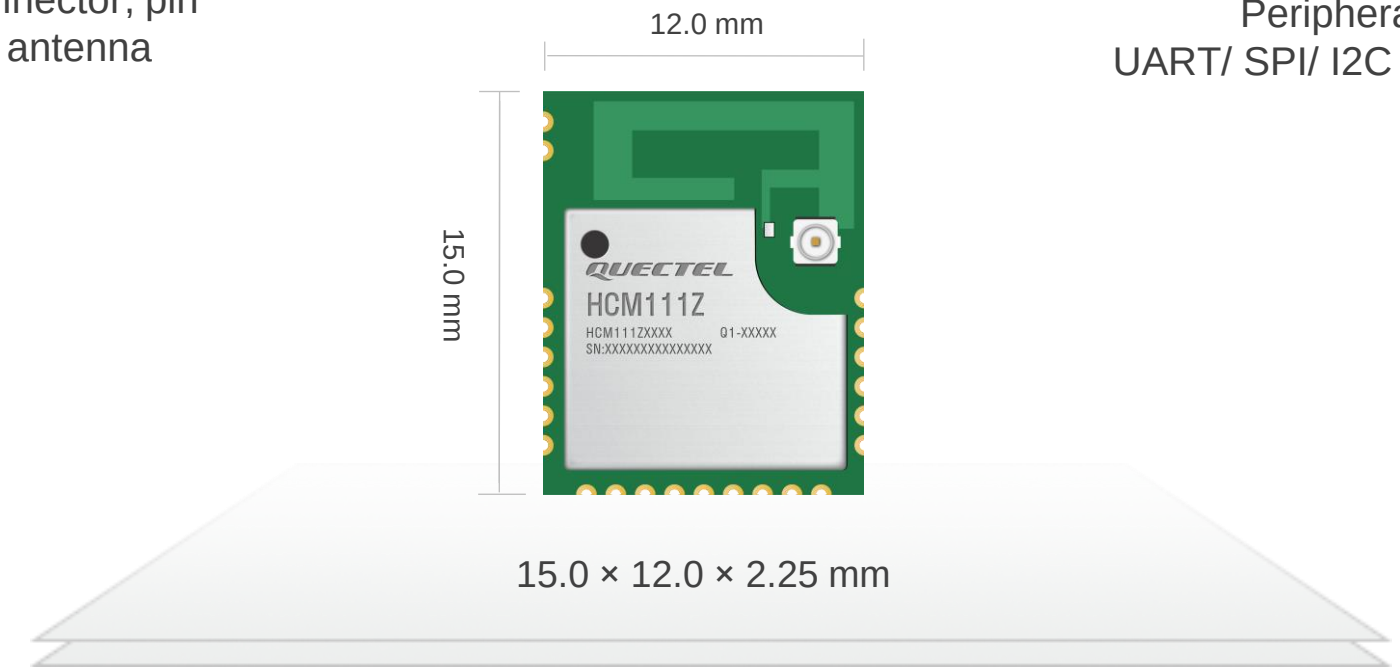


ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification TBD

HCM111Z highlights (BLE 5.3)

RF coaxial connector, pin antenna, PCB antenna (optional)



Peripheral interfaces:
UART/ SPI/ I2C /ADC/ PWM

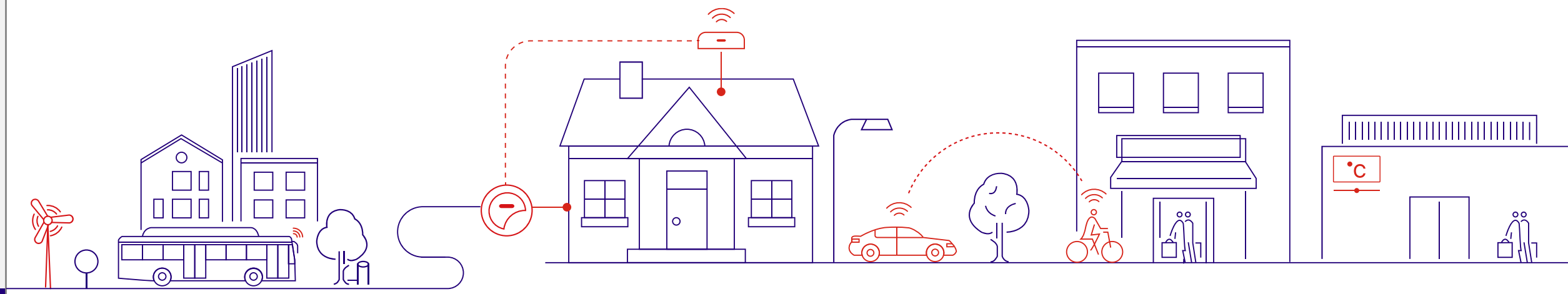
Industrial grade with operating temperature:
-40 ℃ to +85 ℃

Cost-effective

HCM111Z specifications (BLE 5.3)

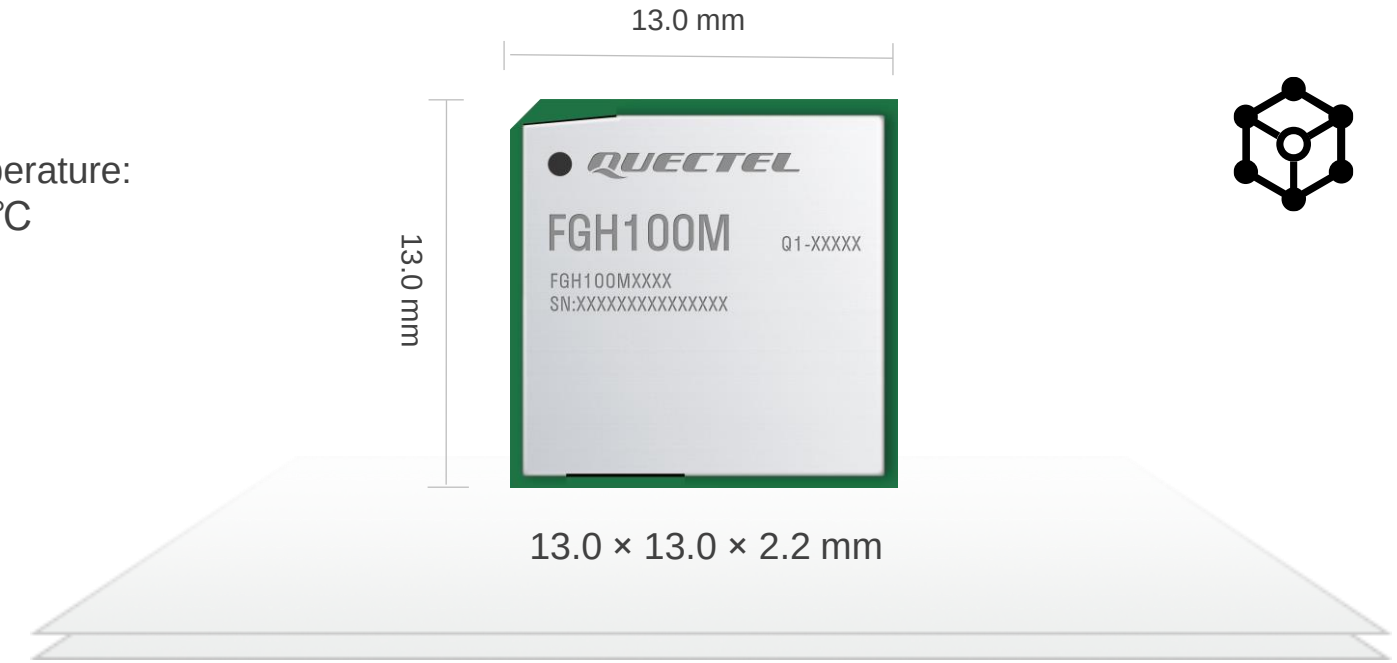
Module	HCM111Z
Chipset	FR8016HA
Size (mm)	15.0 × 12.0 × 2.25
Antenna	RF coaxial connector, pin antenna, PCB antenna (optional)
Bluetooth protocol	BLE 5.3
Operating mode	Server/ Client/ Server + Client
MCU core	ARM Cortex-M3 (48 MHz)
RAM	48 KB
Flash	512 KB
Transmit power	+10 dBm
Interface	UART/ SPI/ I2C/ ADC/ PWM, etc.
Encryption mode	TRNG, AES128 ECB
Operating temperature	-40 ℃ to +85 ℃
Certification	CE/ FCC/ IC/ SRRC/ KC/ RCM/ Bluetooth
Project stage	CS

Sub-GHz modules



FGH100M highlights (Wi-Fi HaLow)

Operating temperature:
-30 ℃ to +85 ℃



Maximum Connections: 8191

OTA Upgrade

Much lower power consumption, suitable for devices powered by batteries

Long distance: a radius of 1 km

Back

Build a smarter world

FGH100M specifications (Wi-Fi HaLow)

Module	FGH100M
Chipset	MM6108
Size (mm)	13.0 × 13.0 × 2.2
Protocol	802.11ah
Wi-Fi frequency band	Sub-1 GHz
Wi-Fi antenna	Pin antenna
Wi-Fi modulation	OFDM, BPSK, QPSK, 16QAM, 64QAM
Working mode	STA/ AP/ AP + STA
Interface	SPI, SDIO 2.0
Encryption mode	AES, SHA-256, SHA-384, SHA-512, WPA3
Operating temperature	-30 ℃ to +85 ℃
Certification	CE/ FCC/ IC/ RCM
Project stage	CS

FGH100M timeline

2023			2024										
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.

Project schedule



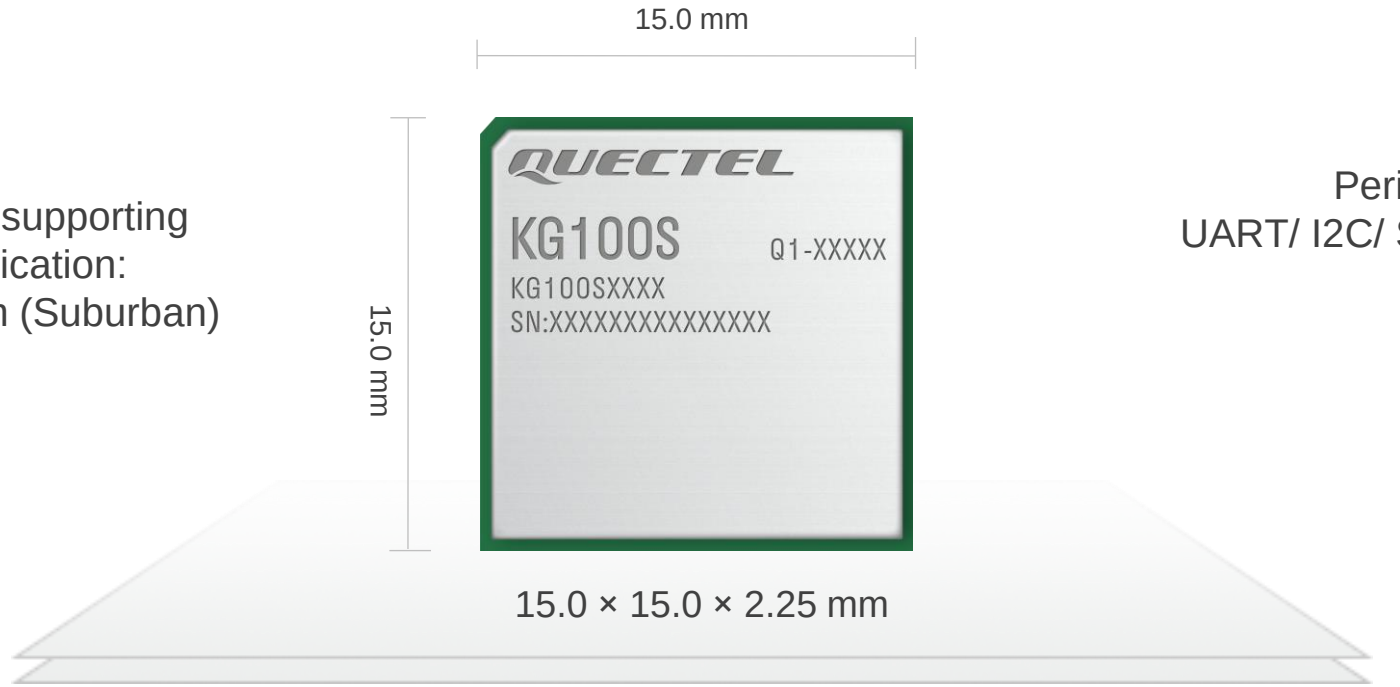
ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production.

Certification

Regulatory	CE/ FCC/ IC/ RCM	Completed

KG100S highlights (Sub-1 GHz CSS)

Sub-1 GHz FSK/ CSS supporting long distance communication:
2–5 km (Urban), 15 km (Suburban)



Peripheral interfaces:
UART/ I2C/ SPI/ GPIO/ JLINK

Industrial grade with operating temperature:
-40 ℃ to +85 ℃

Ultra low power consumption, suitable for devices powered by batteries

Full support for Amazon Sidewalk ecosystem

FSK: Frequency Shift Keying CSS: Chirp Spread Spectrum

KG100S specifications (Sub-1 GHz CSS)

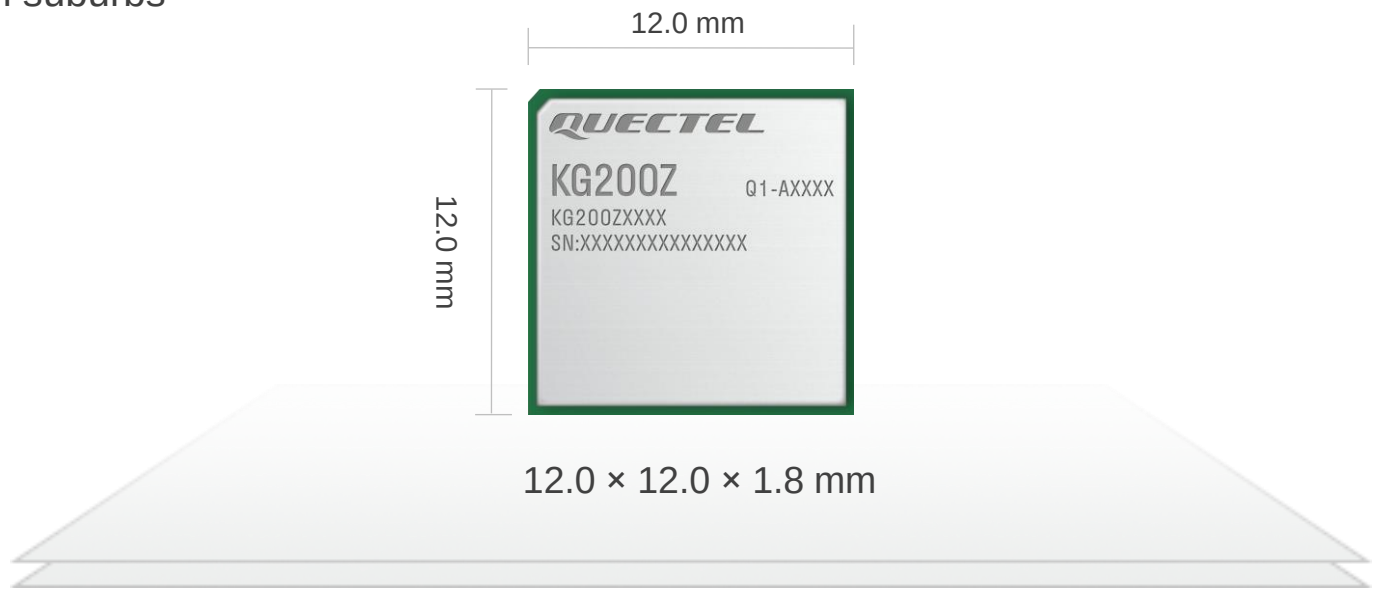
Module	KG100S
Chipset	EFR32BG21B
Size (mm)	15.0 × 15.0 × 2.25
Protocol	Amazon Sidewalk
Frequency band	Sub-1 GHz
Antenna	Pin antenna
Modulation	FSK, GFSK, Sub-1 GHz CSS
Bluetooth protocol	BLE 5.1
Operating mode	STA
RAM	96 KB
Flash	1 MB
Interfaces	UART × 1, JLINK × 1, SPI × 1, I2C × 1, Antenna Interface × 2, GPIO × 2
Operating temperature	-40 ℃ to +85 ℃
Certification	CE/ FCC/ IC/ Bluetooth
Project stage	MP

BW: Bandwidth SF: Spreading Factor FSK: Frequency Shift Keying GFSK: Gaussian Frequency Shift Keying CSS: Chirp Spread Spectrum

KG200Z (LoRa)

Sub-1 GHz FSK/ CSS, long distance communication: 2–5 km in towns and 10–15 km in suburbs

Peripheral interfaces: DMA/ USART/ SPI/ I2C/ UART



Industrial grade with operating temperature: -40 ℃ to +85 ℃

Ultra-low power consumption, suitable for battery-operated devices

Cost-effective

KG200Z specifications (LoRa)

Module	KG200Z
Chipset	STM32WLE5JCI6
Size (mm)	12.0 × 12.0 × 1.8
Protocol	LoRaWAN, Sigfox (optional), WN-Bus (optional), private protocol
Frequency band	Sub-1 GHz
Antenna	Pin antenna
Modulation	LoRa, (G)FSK, (G)MSK, BPSK
Operating mode	Terminal Node, Class A, Class B, Class C
MCU core	32-bit ARM Cortex-M4 CPU (48 MHz)
RAM	64 KB
Flash	256 KB
Interface	DMA/ ADC/ DAC/ USART/ SPI/ I2C/ LPUART, etc
Encryption mode	AES 256-bit hardware encryption, true random number generator, sector protection for read/write operations, unique device identifier (64-bit UID compliant with IEEE 802-2001 standard)
Operating temperature	-40 ℃ to +85 ℃
Certification	CE/ RCM/ FCC*/ IC*/ Anatel*
Project stage	ES

*: In progress

KG200Z timeline

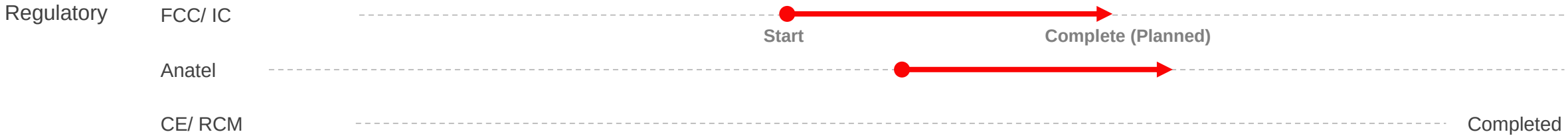
2023						2024									
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.

Project schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
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Certification



Contents

Technologies	04
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Advantages	**73**
Typical applications	82

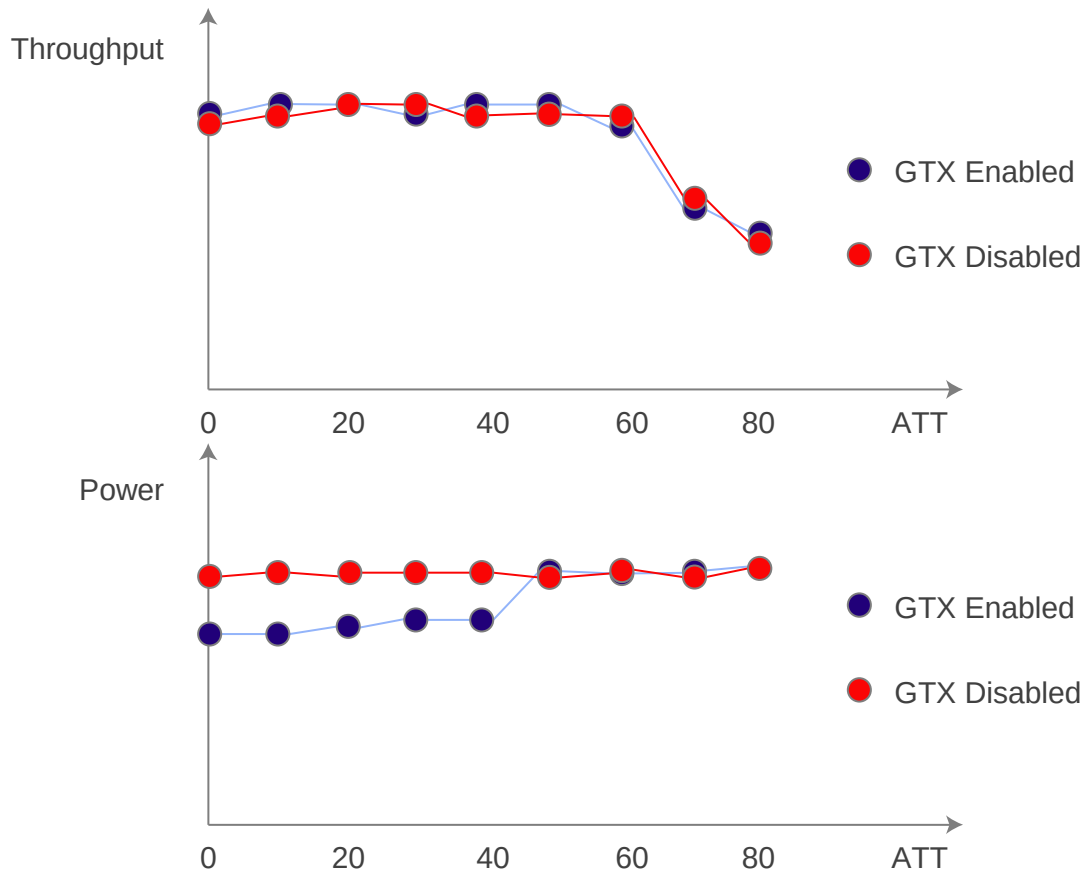
Wi-Fi module GreenTx feature

GreenTx (GTX) reduces chip power consumption by lowering the transmit power while maintaining the same throughput.

- Suitable Tx power: Closer to target power.
- Stable rate: Maintain maximum throughput, less impact to rate.
- Simplicity: Fast calculation and convergence, low CPU usage.

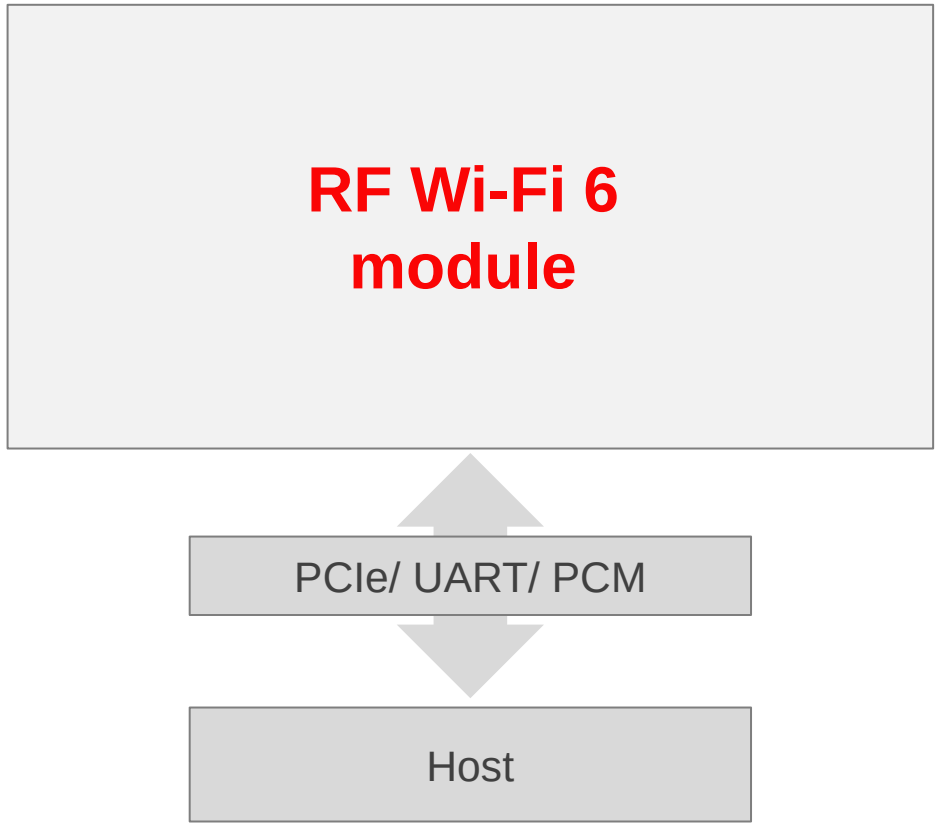
Supported modules:

Wi-Fi 5 modules: FC20, FC21
Wi-Fi 6/ 6E modules: FC62E, FC64E, FC65E, FC66E



ATT: Attenuation

RF Wi-Fi 6 module multi-function mode



Mode 1

- AP + AP + AP
- 3 SSIDs

Mode 2

- STA + AP + AP
- Provide 2 AP SSIDs and operate in STA mode concurrently



Mode 3

- STA + AP + P2P
- Operate in AP and STA modes, and P2P mode concurrently

Mode 4

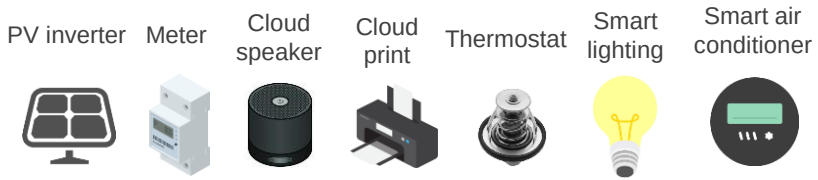
- AP + AP + P2P
- Provide 2 AP SSIDs, and operate in P2P mode concurrently

SSID: Service Set Identifier

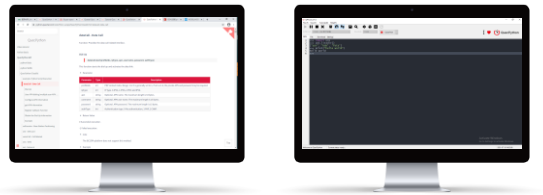
P2P: Peer to Peer

QuecPython®

- Native libraries, third-party libraries and sensors
- Demos and source code solutions
- Smooth IoT programming with online user manuals



- User-friendly
- GUI tool allows for simultaneous testing and programming



QuecPython

A new method of IoT programming

- Hardware level lock
- Software advanced encryption

- Bidirectional isolation of client code and hardware environment
- Unified API that can be used for developing applications and subsequently for running scripts freely on any module or platform
- Cost-free code and platform migration for trouble-free hardware selection



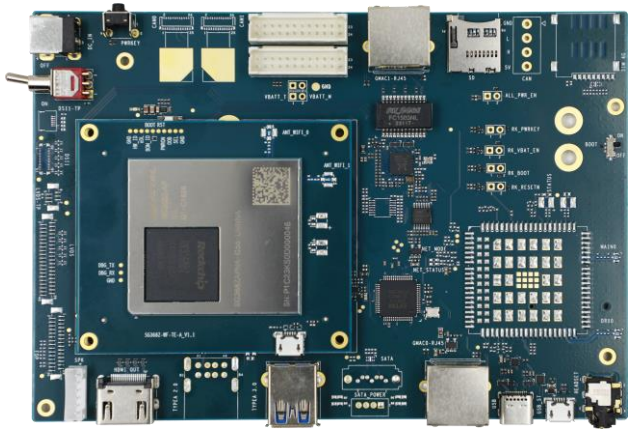
GUI: Graphical User Interface

Support package

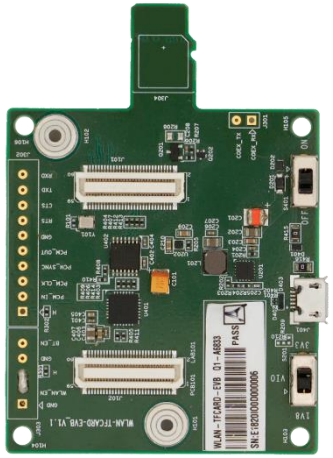
Customer host platform

- RF Wi-Fi drivers for porting to the host platform.
- MCU Wi-Fi & Bluetooth AT commands for host platform.

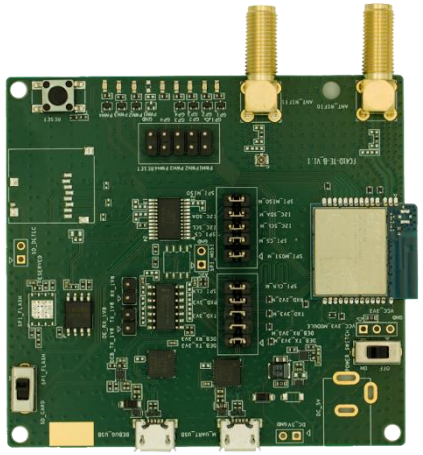
EVB kit



RF Wi-Fi & Bluetooth module EVB

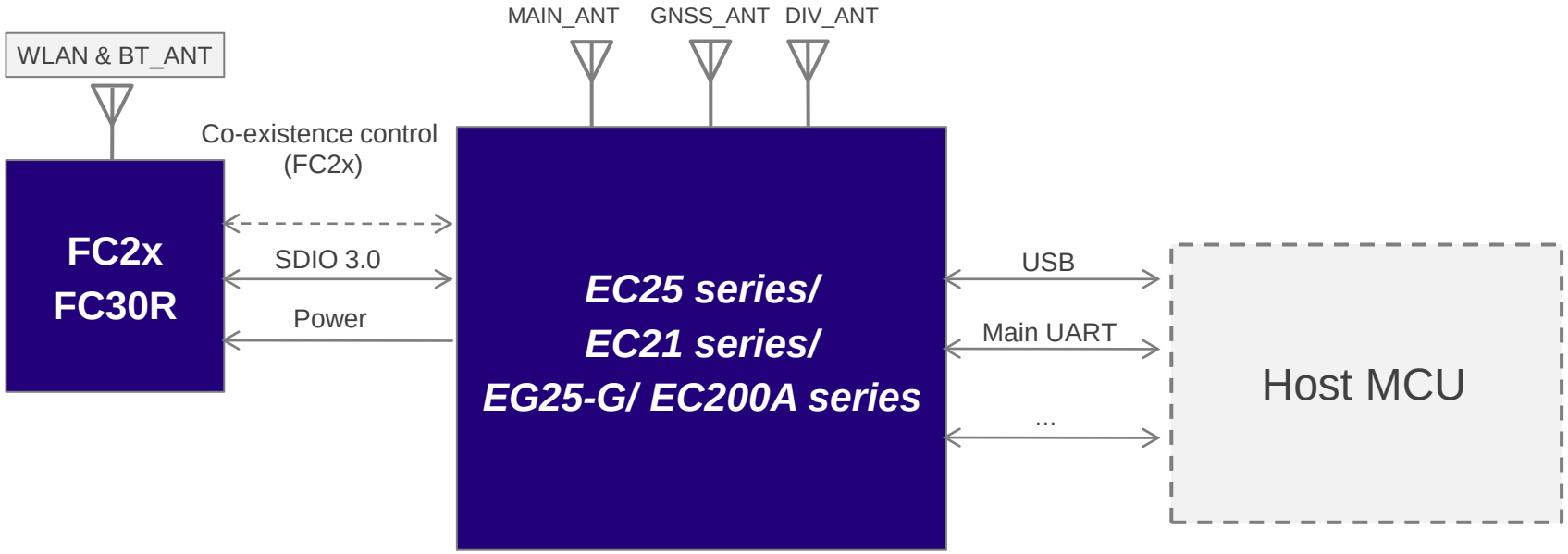


RF Wi-Fi & Bluetooth module EVB (SDIO connector)



MCU Wi-Fi & Bluetooth module EVB

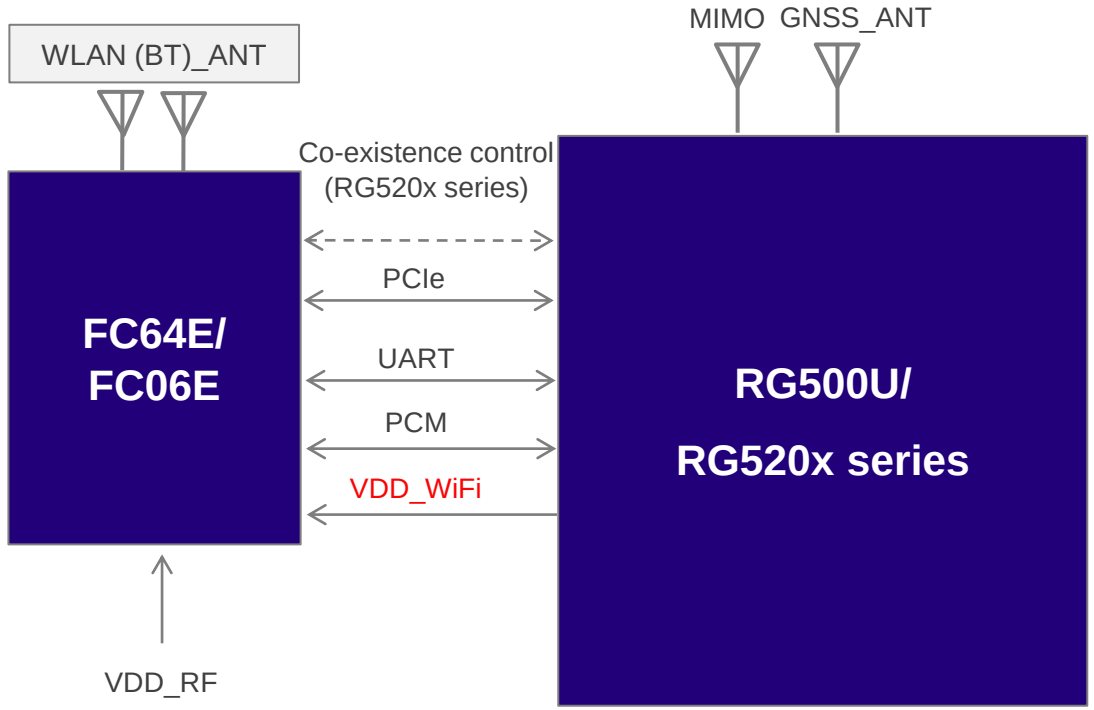
LTE + Wi-Fi 4/ 5 solution



- Total solution for Wi-Fi 4/ Wi-Fi 5 module verified with Quectel LTE module.
- Applications: Telematics, OBD, tracker, etc.
- Soft AP and STA functions.
- Excellent co-existence mechanism with optimum software and hardware designs.

EC200A series module can only be in combination with FC30R in QuecOpen® solution.
FC30R supports only hardware co-existence control. Software co-existence control is not supported.

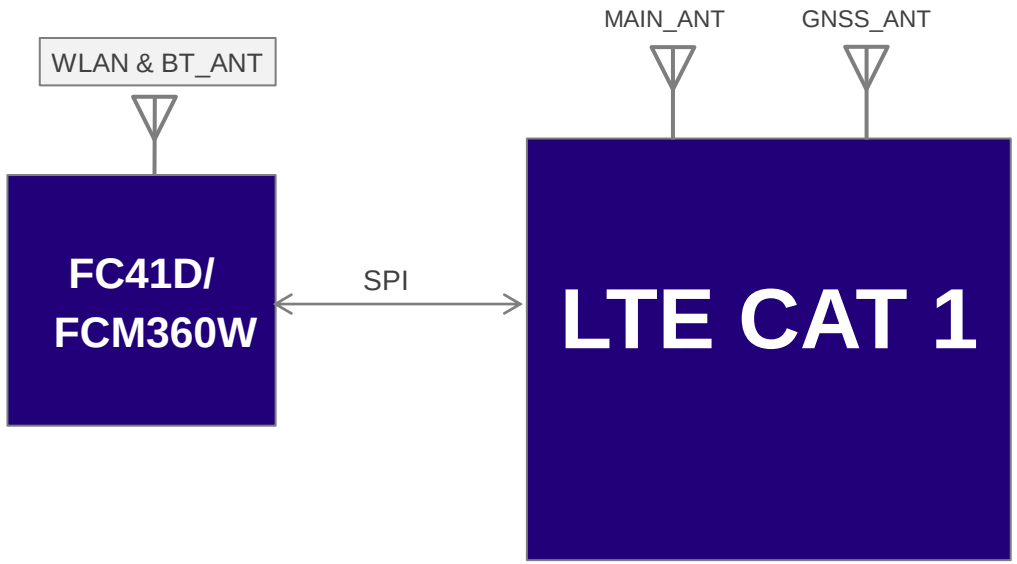
5G + Wi-Fi 6 CPE/ Mi-Fi solution



- CPE/ Mi-Fi total solution for Wi-Fi 6 module verified with Quectel 5G module.
- Best soft AP function and throughput performance.
- Excellent co-existence mechanism with optimum software and hardware designs.

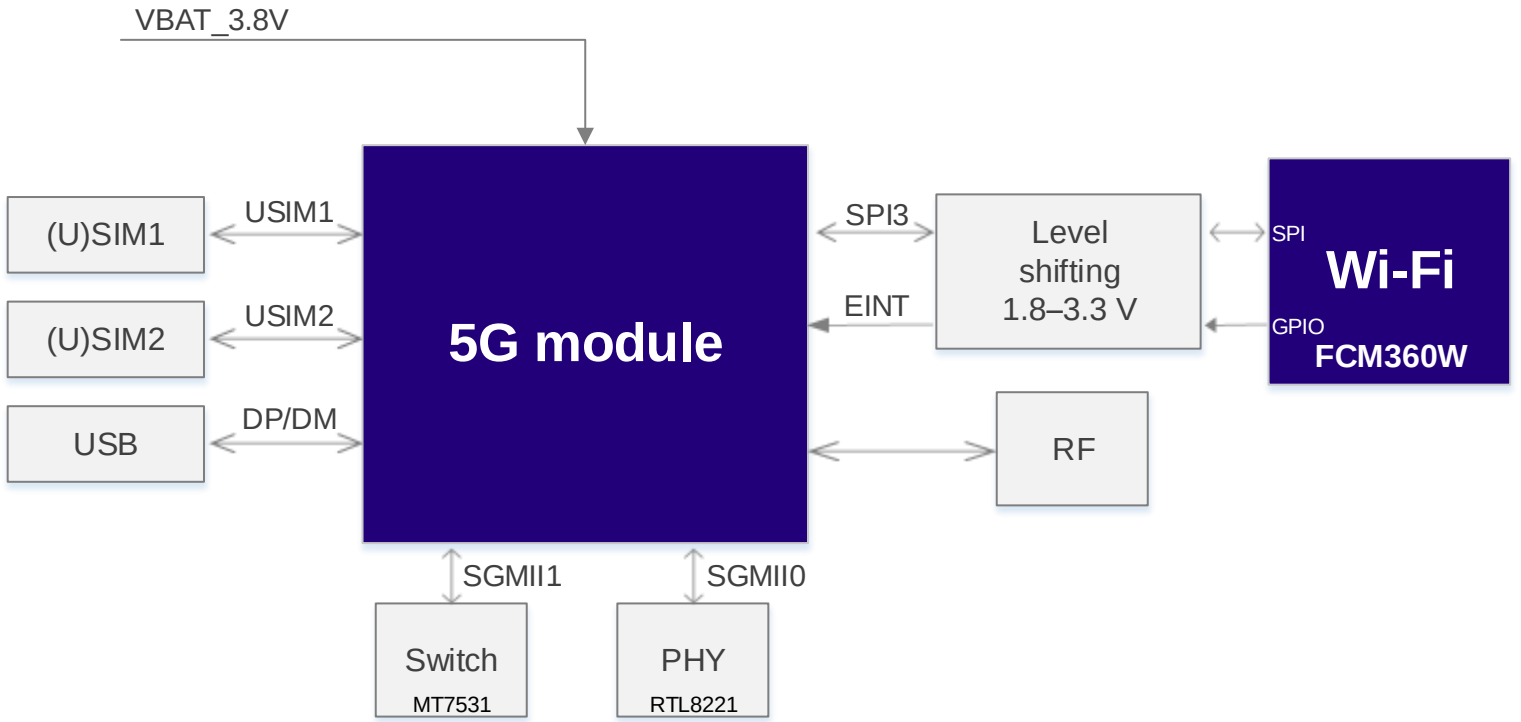
CPE: Customer Premise Equipment

LTE CAT 1 + MCU Wi-Fi solution



- Total solution for Wi-Fi 4/ Wi-Fi 6 module verified with Quectel LTE Cat 1 module.
- Applications: switch panel, smart home, charging pile, photovoltaic power generation, etc.
- Soft AP and STA functions.

5G + MCU Wi-Fi solution



- Total solution for Wi-Fi 4/ Wi-Fi 6 module verified with Quectel 5G module.
- More compatible and easy-to-use interfaces
- Optimal software and hardware design, highly cost-effective

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Matter solution

- All-in-one solution based on modules, APP, Cloud, certification, and production (lighting & electrical)

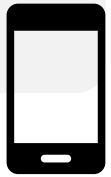
Module

- Mainstream packaging, stable and cost-effective
- Burn device certificate information during module production and authorize via the Cloud
- Embedded firmware



OEM APP

- All-in-one APP solution that lets you easily create your own bespoke app with support for numerous features and personalized settings
- Category panel



IoT service

- Matter blockchain certification scheme
- Management of equipment operation and maintenance
- APIs interface



Certification

- Matter device certification
- Certification transfer



Production line transformation

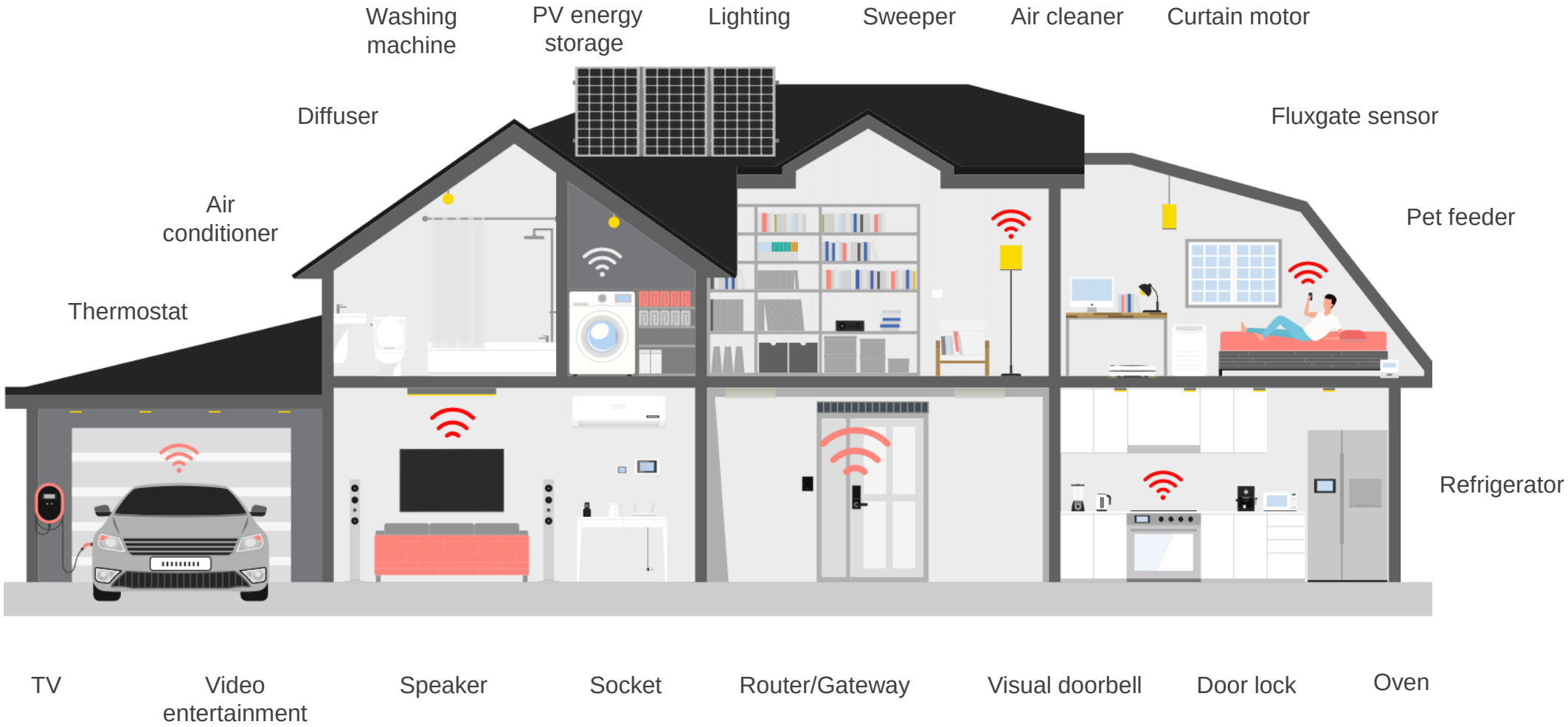
- QR code laser engraving production plan
- Functional production test
- Aging test



Supported modules:

Wi-Fi 4 modules: FLM040D/ FLM140D/ FLM240D/ FLM340D/ FCM100D/ FCM740D/ FC41D
Wi-Fi 6 module: FLM263D

Smart home


Washing machine
PV energy storage
Lighting
Sweeper
Air cleaner
Curtain motor
Diffuser
Fluxgate sensor
Air conditioner
Pet feeder
Thermostat
Charging pile
Refrigerator
TV
Video entertainment
Speaker
Socket
Router/Gateway
Visual doorbell
Door lock
Oven

Financial payment

Handheld POS

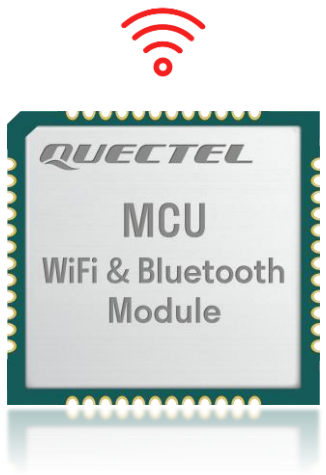


Cash register



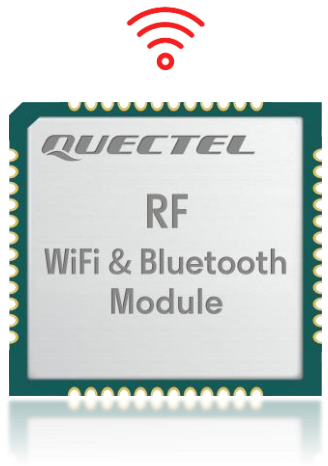
Cloud print





Cloud speaker





Outdoor applications in short-range communications

Power transmission & distribution



Outdoor lighting & video transmission



PV plant & commercial and industrial energy storage



Two-Wheeler



PV residential microinverter



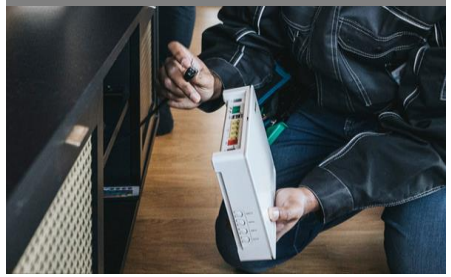
Charging pile



Lawn mower



Entertainment applications

Laptop	AR/ VR	Set-top box	Games console	Smart vehicle console
				
Advantages of Quectel modules				
• Ultra-high data rate • Ultra-low latency • Multi-link operation • HBS/ DBS	• Low latency • Low power consumption • High data rate • DBS	• Two/ Three antennas • High security • High data rate • Strong stability	• High data rate • Low latency • Good performance	• High data rate • Low power consumption • High security • Wide temperature range
NCM865 **NCM865A** **NCM835** **NCM825** **NCM825A**	**FC64E** **FC66E** **FGE573Q** **FGE576Q**	**FCS850R** **FC64E** **FC66E** **FC80A**	**FGE576Q** **FC66E**	**FC20** **FC21** **FC30R** **FCS945R** **FCS950R**

HBS: High Band Simultaneous DBS: Dual Band Simultaneous

Thank you

For more information, please visit: quectel.com, LinkedIn, Facebook and X.
Media contact: media@quectel.com

Sales support: **sales@quectel.com**
Technical support: **support@quectel.com** General: **info@quectel.com**