Quectel FCS960K-NL

Wi-Fi 6 & BLE 5.4 Module
Ultra-compact LCC Package

12.0 mm

12.0 mm 1.9 mm
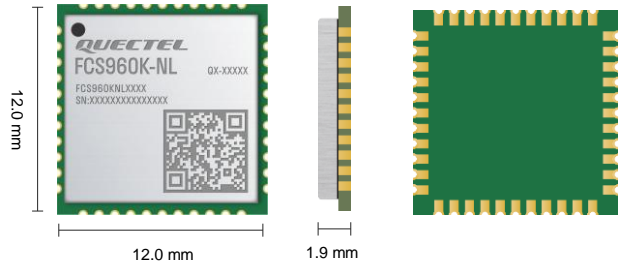
FCS960K-NL is a high-performance Wi-Fi 6 and BLE 5.4 module launched by Quectel, which can be used for WLAN and BLE connections. The module complies with IEEE 802.11a/b/g/n/ac/ax protocol and supports a bandwidth of up to 40 MHz, with a maximum transmission rate of 286.8 Mbps, and features a reliable SDIO 3.0 interface design, enabling high-speed WLAN transmission.

FCS960K-NL is in an LCC form factor with an ultra-compact size of 12.0 mm × 12.0 mm × 1.9 mm, which optimizes the size and cost for end-products and fully meets the demands of size-sensitive applications.

Surface-mount Technology (SMT) makes FCS960K-NL an ideal solution for durable and rugged designs. The low profile and small size of LCC package ensure that FCS960K-NL can be easily embedded into size-constrained applications and provide reliable connectivity with these applications. The advanced package, integrated shielding cover and the laser-engraved label with better heat dissipation and indelible markings allow for large-scale automated manufacturing that has strict requirements on cost and efficiency. Coupled with its compact size and wide operating temperature range, FCS960K-NL can meet various needs of commercial and industrial applications.

Key Features

- ✔ 2.4 GHz/5 GHz Wi-Fi bands and BLE 5.4
- ✔ Wi-Fi/Bluetooth antenna 1 × 1
- ✔ SDIO 3.0 interface that supports higher data transmission rate and enables lower power consumption
- ✔ LCC package, convenient for welding
- ✔ Faster time-to-market: simple design minimizes design-in time and development efforts
- ✔ Wide operating temperature range: -20 °C to +80 °C

IEEE 802.11 a/b/g/n/ac/ax

BLE 5.4

LCC Package

SDIO 3.0 Interface

Operating Temperature Range: -20 °C to +80 °C

Ultra-compact Size

Version: 1.2 | Status: Released

Wi-Fi 6 & BLE 5.4	FCS960K-NL
WLAN Protocol	IEEE 802.11a/b/g/n/ac/ax
Wi-Fi Frequency Band	2.4 GHz/ 5 GHz
Wi-Fi/Bluetooth Antenna	1 × 1
Wi-Fi Modulation Mode	DSSS/ CCK/ BPSK/ QPSK/ 16QAM/ 64QAM/ 256QAM/ 1024QAM
2.4 GHz Channel Bandwidth	20 MHz/ 40 MHz
5 GHz Channel Bandwidth	20 MHz/ 40 MHz
Encryption Mode	WEP/ WPA/ WPA2/ WPA3-SAE
Wi-Fi Operating Mode	AP/ STA
Bluetooth Protocol	BLE 5.4
Dimensions	12.0 mm × 12.0 mm × 1.9 mm
Weight	Approx. 0.56 g
Temperature Range	
Operating Temperature	-20 °C to +80 °C
Storage Temperature	-25 °C to +90 °C
Physical Rate (Max.)	
802.11b	11 Mbps
802.11a/g	54 Mbps
802.11n	150 Mbps
802.11ac	200 Mbps
802.11ax	286.8 Mbps
Interfaces	
SDIO 3.0	× 1 (for Wi-Fi)
USB 2.0*	× 1 (for Wi-Fi)
UART	× 1 (for Bluetooth)
Wi-Fi/Bluetooth Antenna Interface	× 1 (ANT_WIFI/BT[①])
Bluetooth Antenna Interface (Optional)	× 1 (ANT_BT)
Electrical Features	
Power Supply Voltage	VBAT: 3.0–3.6 V, typ. 3.3 V
I/O Power Supply Voltage	VDD_IO: 1.71–3.63 V, typ. 1.8 V/ 3.3 V
Power Consumption	Max. current at Tx mode: 189.75 mA @ VBAT
Certifications	
Regulatory	**Europe:** CE **America:** FCC **Canada:** IC **China:** SRRC **Australia/New Zealand:** RCM

NOTE：

1. In single antenna solution, ANT_WIFI/BT serves as Wi-Fi and Bluetooth shared antenna and ANT_BT is kept unconnected. In two-antenna solution, exclusive Bluetooth antenna (ANT_BT) is supported and ANT_WIFI/BT only serves as Wi-Fi antenna. For more details, please contact Quectel Technical Support.
2. *: Under development.

Quectel FCS960K-NL

Wi-Fi 6 & BLE 5.4		FCS960K-NL	

Wi-Fi Performance

		Transmit Power (Typ.)	Receiver Sensitivity (Typ.)
2.4 GHz	802.11b/1 Mbps	18 dBm	-97 dBm
	802.11b/11 Mbps	18 dBm	-88 dBm
	802.11g/6 Mbps	17 dBm	-91 dBm
	802.11g/54 Mbps	15 dBm	-76 dBm
	802.11n/HT20 MCS 0	17 dBm	-90 dBm
	802.11n/HT20 MCS 7	15 dBm	-73 dBm
	802.11n/HT40 MCS 0	17 dBm	-88 dBm
	802.11n/HT40 MCS 7	15 dBm	-70 dBm
	802.11ax/HE20 MCS 0	17 dBm	-93 dBm
	802.11ax/HE20 MCS 11	13 dBm	-64 dBm
	802.11ax/HE40 MCS 0	17 dBm	-88 dBm
	802.11ax/HE40 MCS 11	13 dBm	-61 dBm
5 GHz	802.11a/6 Mbps	17 dBm	-91 dBm
	802.11a/54 Mbps	15 dBm	-76 dBm
	802.11n/HT20 MCS 0	17 dBm	-91 dBm
	802.11n/HT20 MCS 7	15 dBm	-74 dBm
	802.11n/HT40 MCS 0	17 dBm	-87 dBm
	802.11n/HT40 MCS 7	15 dBm	-72 dBm
	802.11ac/VHT20 MCS 0	17 dBm	-90 dBm
	802.11ac/VHT20 MCS 8	14 dBm	-69 dBm
	802.11ac/VHT40 MCS 0	17 dBm	-88 dBm
	802.11ac/VHT40 MCS 9	13 dBm	-64 dBm
	802.11ax/HE20 MCS 0	16 dBm	-89 dBm
	802.11ax/HE20 MCS 11	12 dBm	-61 dBm
	802.11ax/HE40 MCS 0	16 dBm	-87 dBm
	802.11ax/HE40 MCS 11	12 dBm	-59 dBm

Bluetooth Performance

	Transmit Power (Typ.)	Receiver Sensitivity (Typ.)
BLE (1 Mbps)	4 dBm	-90 dBm
BLE (2 Mbps)	4 dBm	-89 dBm
BLE (S = 8) 125 kbps	4 dBm	-95 dBm
BLE (S = 2) 500 kbps	4 dBm	-95 dBm

Model	Ordering Code	Antenna	DBS	Coexistence with Cellular Module	Development Board (Only for Debugging)
FCS960K-NL	FCS960KNLAAMD	One-antenna solution: Wi-Fi and Bluetooth share one antenna	Not supported	Not supported	FCS960KNLAAM2
FCS960K-NL	FCS960KNLBAAMD	Two-antenna solution: A dedicated Wi-Fi antenna and an exclusive Bluetooth antenna	Not supported	Not supported	FCS960KNLBAAM2

QUECTEL