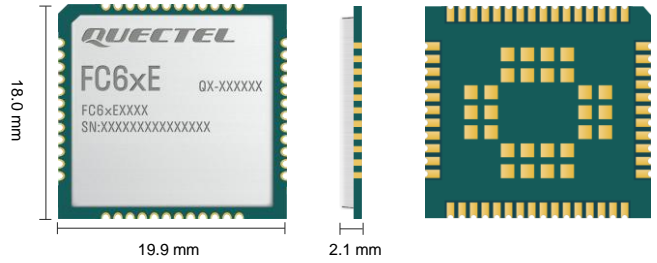


# Quectel FC6xE

## Wi-Fi 6/6E & Bluetooth 5.3 Module Compact LCC Package



FC6xE is a series of high-performance Wi-Fi 6/6E and Bluetooth 5.3 LCC package modules launched by Quectel. It can be used to establish WLAN and Bluetooth connections. FC6xE contains FC64E, FC65E and FC66E. FC6xE supports  $2 \times 2 + 2 \times 2$  MIMO, delivering a maximum data rate up to 3000 Mbps. With an ultra-compact size of 18.0 mm  $\times$  19.9 mm  $\times$  2.1 mm, FC6xE optimizes the size and cost for end-products, which fully meets the demands of size-sensitive applications.

Surface-mount technology (SMT) makes FC6xE an ideal solution for durable and rugged designs. The low profile and small size of LCC package ensure that it can be easily embedded into size-constrained applications and provide reliable connectivity with these applications. The advanced package and the laser-engraved label with better heat dissipation and indelible markings allow for large-scale automated manufacturing which has strict requirements on cost and efficiency.

Based on a reliable PCIe 3.0 interface, FC6xE achieves low-power and high-speed data transmission. Coupled with its compact size, lower power consumption, wide temperature range, higher transmit power and high reliability, the module can meet the requirements of industrial, consumer goods and automotive applications.



## Key Features

- ✓ 2.4 GHz/ 5 GHz/ 6 GHz Wi-Fi bands and Bluetooth 5.3
- ✓ Dual Band Simultaneous (DBS)
- ✓ PCIe 3.0 interface that supports higher data transmission rate and enables lower power consumption
- ✓ Fast time-to-market: simple design minimizes design-in time and development efforts
- ✓ Wide operating temperature range: -30 °C to +75 °C



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



Bluetooth 5.3



Ultra-compact Size



PCIe 3.0  
Interface



DBS



Operating  
Temperature Range:  
-30 °C to +75 °C



LCC Package

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Wi-Fi & Bluetooth 5.3	FC64E	FC65E	FC66E
<b>WLAN Protocol</b>	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax
<b>Wi-Fi Frequency Band</b>	2.4 GHz/ 5 GHz	2.4 GHz/ 5 GHz/ 6 GHz	2.4 GHz/ 5 GHz/ 6 GHz
<b>Wi-Fi Antenna</b>	2 × 2 + 2 × 2 MIMO	2 × 2 MIMO	2 × 2 + 2 × 2 MIMO
<b>Wi-Fi Modulation Mode</b>	CCK/ BPSK/ QPSK/ 16QAM/ 64QAM/ 256QAM/ 1024QAM	CCK/ BPSK/ QPSK/ 16QAM/ 64QAM/ 256QAM/ 1024QAM	CCK/ BPSK/ QPSK/ 16QAM/ 64QAM/ 256QAM/ 1024QAM
<b>2.4 GHz Channel Bandwidth</b>	20/ 40 MHz	20/ 40 MHz	20/ 40 MHz
<b>5 GHz Channel Bandwidth</b>	20/ 40/ 80 MHz	20/ 40/ 80/ 160 MHz	20/ 40/ 80/ 160 MHz
<b>6 GHz Channel Bandwidth</b>	-	20/ 40/ 80/ 160 MHz	20/ 40/ 80/ 160 MHz
<b>DBS</b>	Supported	-	Supported
<b>Encryption Mode</b>	WPA3	WPA3	WPA3
<b>Wi-Fi Operating Mode</b>	AP/ STA	AP/ STA	AP/ STA
<b>Bluetooth Standard</b>	Bluetooth 5.3	Bluetooth 5.3	Bluetooth 5.3
<b>BLE Feature</b>	LE Audio, 2M PHY, BLE Long Range	LE Audio, 2M PHY, BLE Long Range	LE Audio, 2M PHY, BLE Long Range
<b>Dimensions</b>	18.0 mm × 19.9 mm × 2.1 mm	18.0 mm × 19.9 mm × 2.1 mm	18.0 mm × 19.9 mm × 2.1 mm
<b>Weight</b>	Approx. 1.6 g	Approx. 1.6 g	Approx. 1.6 g
<b>Temperature Range</b>			
<b>Operating Temperature</b>	-30 °C to +75 °C	-30 °C to +75 °C	-30 °C to +75 °C
<b>Storage Temperature</b>	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
<b>Physical Rate (Max.)</b>			
<b>802.11a</b>	54 Mbps	54 Mbps	54 Mbps
<b>802.11b</b>	11 Mbps	11 Mbps	11 Mbps
<b>802.11g</b>	54 Mbps	54 Mbps	54 Mbps
<b>802.11n</b>	600 Mbps	300 Mbps	600 Mbps
<b>802.11ac</b>	866 Mbps	1732 Mbps	1732 Mbps
<b>802.11ax</b>	1774.5 Mbps	2400 Mbps	3000 Mbps
<b>Interfaces</b>			
<b>PCIe</b>	× 1 (for Wi-Fi)	× 1 (for Wi-Fi)	× 1 (for Wi-Fi)
<b>PCM</b>	× 1 (for Bluetooth)	× 1 (for Bluetooth)	× 1 (for Bluetooth)
<b>UART</b>	× 1 (for Bluetooth)	× 1 (for Bluetooth)	× 1 (for Bluetooth)
<b>Special Pins</b>	WLAN_EN, BT_EN	WLAN_EN, BT_EN	WLAN_EN, BT_EN
<b>Wi-Fi Antenna Interface</b>	× 1	× 1	× 1
<b>Wi-Fi/Bluetooth Antenna Interface</b>	× 1	× 1	× 1
<b>Electrical Characteristics</b>			
<b>Power Supply Voltage</b>	VDD_CORE_VL: 0.95 V VDD_CORE_VM: 1.35 V VDD_CORE_VH: 1.95 V VDD_RF: 2.2 V	VDD_CORE_VL: 1.0 V VDD_CORE_VM: 1.8 V VDD_CORE_VH: 2.0 V VDD_RF: 2.0 V	VDD_CORE_VL: 1.0 V VDD_CORE_VM: 1.8 V VDD_CORE_VH: 2.0 V VDD_RF: 2.0 V
<b>I/O Power Supply Voltage</b>	1.8 V	1.8 V	1.8 V
<b>Certifications</b>			
<b>Regulatory</b>	<b>Europe:</b> CE <b>America:</b> FCC <b>Canada:</b> IC <b>China:</b> SRRC <b>South Korea:</b> KC <b>Japan:</b> JATE/TELEC <b>Australia/New Zealand:</b> RCM	<b>Europe:</b> CE <b>America:</b> FCC <b>Canada:</b> IC <b>China:</b> SRRC <b>South Korea:</b> KC <b>Australia/New Zealand:</b> RCM	<b>Europe:</b> CE <b>America:</b> FCC <b>Canada:</b> IC <b>China:</b> SRRC <b>South Korea:</b> KC <b>Japan:</b> JATE/TELEC <b>Australia/New Zealand:</b> RCM

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Wi-Fi & Bluetooth 5.3		FC64E		FC65E/FC66E	
<b>Wi-Fi Performance</b>					
		Receiver Sensitivity	Transmit Power	Receiver Sensitivity	Transmit Power
2.4 GHz	802.11b/11 Mbps	-87 dBm ±2 dB	17 dBm ±2 dB	-89 dBm ±2 dB	17 dBm ±2 dB
	802.11g/54 Mbps	-74 dBm ±2 dB	14.5 dBm ±2 dB	-75 dBm ±2 dB	14.5 dBm ±2 dB
	802.11n/HT20 MCS 7	-72 dBm ±2 dB	13.5 dBm ±2 dB	-75 dBm ±2 dB	13.5 dBm ±2 dB
	802.11n/HT40 MCS 7	-67 dBm ±2 dB	13 dBm ±2 dB	-72 dBm ±2 dB	13 dBm ±2 dB
	802.11ax/HE20 MCS 11	-62 dBm ±2 dB	11 dBm ±2 dB	-63 dBm ±2 dB	11 dBm ±2 dB
	802.11ax/HE40 MCS 11	-59 dBm ±2 dB	10 dBm ±2 dB	-61 dBm ±2 dB	10 dBm ±2 dB
5 GHz	802.11a/54 Mbps	-72 dBm ±2 dB	13 dBm ±2 dB	-73 dBm ±2 dB	13 dBm ±2 dB
	802.11n/HT20 MCS 7	-70 dBm ±2 dB	12 dBm ±2 dB	-73 dBm ±2 dB	12 dBm ±2 dB
	802.11n/HT40 MCS 7	-68 dBm ±2 dB	11.5 dBm ±2 dB	-71 dBm ±2 dB	11.5 dBm ±2 dB
	802.11ac/VHT20 MCS 8	-66 dBm ±2 dB	11.5 dBm ±2 dB	-68 dBm ±2 dB	11.5 dBm ±2 dB
	802.11ac/VHT40 MCS 9	-63 dBm ±2 dB	10.5 dBm ±2 dB	-65 dBm ±2 dB	10.5 dBm ±2 dB
	802.11ac/VHT80 MCS 9	-57 dBm ±2 dB	10 dBm ±2 dB	-62 dBm ±2 dB	10 dBm ±2 dB
	802.11ax/HE20 MCS 11	-60 dBm ±2 dB	9.5 dBm ±2 dB	-62 dBm ±2 dB	9.5 dBm ±2 dB
	802.11ax/HE40 MCS 11	-58 dBm ±2 dB	9.5 dBm ±2 dB	-60 dBm ±2 dB	9.5 dBm ±2 dB
	802.11ax/HE80 MCS 11	-55 dBm ±2 dB	8.5 dBm ±2 dB	-57 dBm ±2 dB	8.5 dBm ±2 dB
	802.11ax/HE160 MCS 11	-	-	-53 dBm ±2 dB	8 dBm ±2 dB
6 GHz	802.11a/54 Mbps	-	-	-72 dBm ±2 dB	12 dBm ±2 dB
	802.11ax/HE20 MCS 11	-	-	-60 dBm ±2 dB	8.5 dBm ±2 dB
	802.11ax/HE40 MCS 11	-	-	-58 dBm ±2 dB	8.5 dBm ±2 dB
	802.11ax/HE80 MCS 11	-	-	-56 dBm ±2 dB	7.5 dBm ±2 dB
	802.11ax/HE160 MCS 11	-	-	-52 dBm ±2 dB	7 dBm ±2 dB
<b>Bluetooth Performance</b>					
		Receiver Sensitivity	Transmit Power	Receiver Sensitivity	Transmit Power
<b>GFSK</b>		-92 dBm ±2 dB	7 dBm ±2 dB	-92 dBm ±2 dB	7 dBm ±2 dB
<b>EDR (π/4-DQPSK)</b>		-90 dBm ±2 dB	4 dBm ±2 dB	-90 dBm ±2 dB	4 dBm ±2 dB
<b>EDR (8-DQPSK)</b>		-85 dBm ±2 dB	4 dBm ±2 dB	-85 dBm ±2 dB	4 dBm ±2 dB
<b>BLE (1 Mbps)</b>		-95 dBm ±2 dB	7 dBm ±2 dB	-95 dBm ±2 dB	7 dBm ±2 dB
<b>BLE (2 Mbps)</b>		-93 dBm ±2 dB	7 dBm ±2 dB	-93 dBm ±2 dB	7 dBm ±2 dB

Model	Ordering Code	Antenna	DBS	Coexistence with Cellular Module	Development Board (Only for Debugging)
FC66E	FC66EAAMD	Two antennas	Supported	-	FC66EAAM2
FC66E	FC66EABMD	Two antennas	Supported	Supported	FC66EABM2
FC65E	FC65EAAMD	Two antennas	-	-	FC65EAAM2
FC64E	FC64EAAMD	Two antennas	Supported	-	FC64EAAM2
FC64E	FC64EABMD	Two antennas	Supported	Supported	FC64EABM2

- NOTE:**
- The development board is in M.2 form factor, which can be used to connect to the host that supports standard M.2 interface and can also work with Quectel EVB kit (RK3568-WF-EVB-KIT) for early debugging.
  - Contact local sales or FAE for ordering.