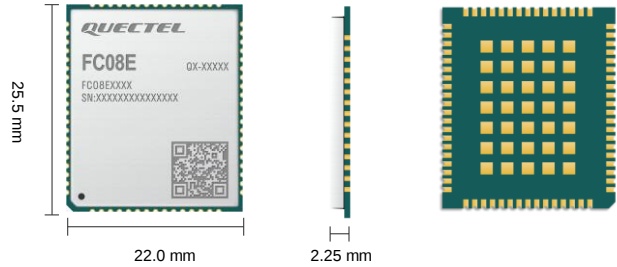


# Quectel FC08E

## Wi-Fi 6 & Bluetooth 5.2 Module Ultra-compact LCC Package



FC08E is a high-performance Wi-Fi 6 and Bluetooth 5.2 LCC package module launched by Quectel. It can be used to establish WLAN and Bluetooth connections. Supporting  $2 \times 2 + 2 \times 2$  MIMO 11ax DBS, it delivers a maximum data rate up to 3600 Mbps. With an ultra-compact size of 25.5 mm  $\times$  22.0 mm  $\times$  2.25 mm, FC08E optimizes the size and cost for end-products, which fully meets the demands of size-sensitive applications.

Surface-mount technology (SMT) makes FC08E 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, FC08E 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 and consumer goods applications.

### Key Features

- ✓ 2.4 GHz and 5 GHz Wi-Fi bands and Bluetooth 5.2
- ✓ DBS
- ✓ PCIe 3.0 interface that supports higher data transmission rate and enables lower power consumption
- ✓ Faster 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 5.2



Ultra-compact Size



PCIe 3.0



LCC Package



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

| Wi-Fi 6 & Bluetooth 5.2     |                                                                                                                                                        | FC08E |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| WLAN Protocol               | IEEE 802.11a/b/g/n/ac/ax                                                                                                                               |       |
| Wi-Fi Frequency Band        | 2.4 GHz/ 5 GHz                                                                                                                                         |       |
| Wi-Fi Antenna               | 2 × 2 + 2 × 2                                                                                                                                          |       |
| Wi-Fi Modulation Mode       | DBPSK/DQPSK/CCK/BPSK/QPSK/QAM                                                                                                                          |       |
| 2.4 GHz Channel Bandwidth   | 20 MHz/ 40 MHz                                                                                                                                         |       |
| 5 GHz Channel Bandwidth     | 20 MHz/ 40 MHz/ 80 MHz/ 160 MHz                                                                                                                        |       |
| DBS                         | Supported                                                                                                                                              |       |
| Encryption Mode             | WPA3                                                                                                                                                   |       |
| Wi-Fi Operating Mode        | AP/STA                                                                                                                                                 |       |
| Bluetooth Protocol          | Bluetooth 5.2                                                                                                                                          |       |
| Dimensions (mm)             | 25.5 mm × 22.0 mm × 2.25 mm                                                                                                                            |       |
| Weight (g)                  | Approx. 2.58 g                                                                                                                                         |       |
| Temperature Range           |                                                                                                                                                        |       |
| Operating Temperature Range | -30 °C to +75 °C                                                                                                                                       |       |
| Storage Temperature Range   | -40 °C to +85 °C                                                                                                                                       |       |
| Data Rate (Max.)            |                                                                                                                                                        |       |
| 802.11a                     | 54 Mbps                                                                                                                                                |       |
| 802.11b                     | 11 Mbps                                                                                                                                                |       |
| 802.11g                     | 54 Mbps                                                                                                                                                |       |
| 802.11n                     | 600 Mbps                                                                                                                                               |       |
| 802.11ac                    | 1800 Mbps                                                                                                                                              |       |
| 802.11ax                    | 3600 Mbps                                                                                                                                              |       |
| Interfaces                  |                                                                                                                                                        |       |
| PCIe 3.0                    | × 1                                                                                                                                                    |       |
| PCM                         | × 1                                                                                                                                                    |       |
| UART                        | × 1                                                                                                                                                    |       |
| Wi-Fi Antenna Interfaces    | × 2 (ANT_WIFI0, ANT_WIFI1)                                                                                                                             |       |
| Bluetooth Antenna Interface | × 1 (ANT_BT)                                                                                                                                           |       |
| Electrical Features         |                                                                                                                                                        |       |
| Power Supply Voltage        | VDD_CORE_VL: 0.95 V<br>VDD_CORE_VM: 1.35 V<br>VDD_CORE_VH: 1.95 V<br>VDD_RF: 1.95 V<br>VDD_FEM: 3.3 V/ 5 V                                             |       |
| I/O Power Supply Voltage    | 1.8 V                                                                                                                                                  |       |
| Power Consumption           | Max. current at non-signaling mode (DBS):<br>510 mA @ 0.95 V<br>320 mA @ 1.35 V<br>8 mA @ 1.8 V<br>200 mA @ 1.95 V<br>1300 mA @ 3.3 V<br>1350 mA @ 5 V |       |
| Certifications              |                                                                                                                                                        |       |
| Regulatory                  | China: SRRC<br>Europe: CE*                                                                                                                             |       |

NOTE:  
\*: ongoing.

Wi-Fi 6 & Bluetooth 5.2

FC08E

Wi-Fi Performance

|         |                        | Receiver Sensitivity (Typ.) | Transmit Power (Typ.) |                   |
|---------|------------------------|-----------------------------|-----------------------|-------------------|
|         |                        |                             | @ VDD_FEM (5 V)       | @ VDD_FEM (3.3 V) |
|         |                        |                             |                       |                   |
| 2.4 GHz | 802.11b/ 1 Mbps        | -97 dBm                     | 20 dBm                | 19 dBm            |
|         | 802.11b/ 11 Mbps       | -89 dBm                     | 20 dBm                | 19 dBm            |
|         | 802.11g/ 6 Mbps        | -93 dBm                     | 20 dBm                | 17 dBm            |
|         | 802.11g/ 54 Mbps       | -75 dBm                     | 19 dBm                | 15 dBm            |
|         | 802.11n/ HT20 MCS 0    | -93 dBm                     | 20 dBm                | 17 dBm            |
|         | 802.11n/ HT20 MCS 7    | -75 dBm                     | 18.5 dBm              | 15 dBm            |
|         | 802.11n/ HT40 MCS 7    | -73 dBm                     | 18.5 dBm              | 15 dBm            |
|         | 802.11ax/ HE20 MCS 0   | -92 dBm                     | 20 dBm                | 17 dBm            |
|         | 802.11ax/ HE20 MCS 11  | -63 dBm                     | 17.5 dBm              | 14 dBm            |
|         | 802.11ax/ HE20 MCS 13  | -56 dBm                     | 16.5 dBm              | 14 dBm            |
|         | 802.11ax/ HE40 MCS 11  | -61 dBm                     | 17.5 dBm              | 14 dBm            |
|         | 802.11ax/ HE40 MCS 13  | -55 dBm                     | 16.5 dBm              | 14 dBm            |
|         | 802.11a/ 6 Mbps        | -91 dBm                     | 20 dBm                | 18 dBm            |
|         | 802.11a/ 54 Mbps       | -74 dBm                     | 19 dBm                | 16.5 dBm          |
| 5 GHz   | 802.11n/ HT20 MCS 0    | -91 dBm                     | 20 dBm                | 18 dBm            |
|         | 802.11n/ HT20 MCS 7    | -72 dBm                     | 18.5 dBm              | 16 dBm            |
|         | 802.11n/ HT40 MCS 7    | -70 dBm                     | 18.5 dBm              | 16 dBm            |
|         | 802.11ac/ VHT20 MCS 0  | -90 dBm                     | 20 dBm                | 18 dBm            |
|         | 802.11ac/ VHT20 MCS 8  | -69 dBm                     | 17.5 dBm              | 15.5 dBm          |
|         | 802.11ac/ VHT40 MCS 9  | -65 dBm                     | 17.5 dBm              | 15.5 dBm          |
|         | 802.11ac/ VHT80 MCS 9  | -61 dBm                     | 17 dBm                | 14.5 dBm          |
|         | 802.11ac/ VHT160 MCS 9 | -60 dBm                     | 17 dBm                | 14.5 dBm          |
|         | 802.11ax/ HE20 MCS 0   | -90 dBm                     | 20 dBm                | 18 dBm            |
|         | 802.11ax/ HE20 MCS 11  | -63 dBm                     | 17 dBm                | 15 dBm            |
|         | 802.11ax/ HE20 MCS 13  | -55 dBm                     | 17 dBm                | 15 dBm            |
|         | 802.11ax/ HE40 MCS 11  | -60 dBm                     | 17 dBm                | 15 dBm            |
|         | 802.11ax/ HE40 MCS 13  | -54 dBm                     | 17 dBm                | 15 dBm            |
|         | 802.11ax/ HE80 MCS 11  | -58 dBm                     | 16.5 dBm              | 14 dBm            |
|         | 802.11ax/ HE80 MCS 13  | -52 dBm                     | 16.5 dBm              | 14 dBm            |
|         | 802.11ax/ HE160 MCS 11 | -56 dBm                     | 16 dBm                | 13.5 dBm          |
|         | 802.11ax/ HE160 MCS 13 | -49 dBm                     | 16 dBm                | 13.5 dBm          |

Bluetooth Performance

|                 | Receiver Sensitivity (Typ.) | Transmit Power (Typ.) |
|-----------------|-----------------------------|-----------------------|
| BR              | -88 dBm                     | 7.5 dBm               |
| EDR (π/4-DQPSK) | -78 dBm                     | 6.0 dBm               |
| EDR (8-DPSK)    | -76 dBm                     | 6.0 dBm               |
| BLE (1 Mbps)    | -99 dBm                     | 7.5 dBm               |
| BLE (2 Mbps)    | -97 dBm                     | 7.5 dBm               |

| Model | Ordering Code | Antenna        | DBS       | Coexistence with Cellular Module | Development Board (Only for Debugging) |
|-------|---------------|----------------|-----------|----------------------------------|----------------------------------------|
| FC08E | FC08EAAMD     | Three antennas | Supported | Supported                        | FC08EAATA                              |