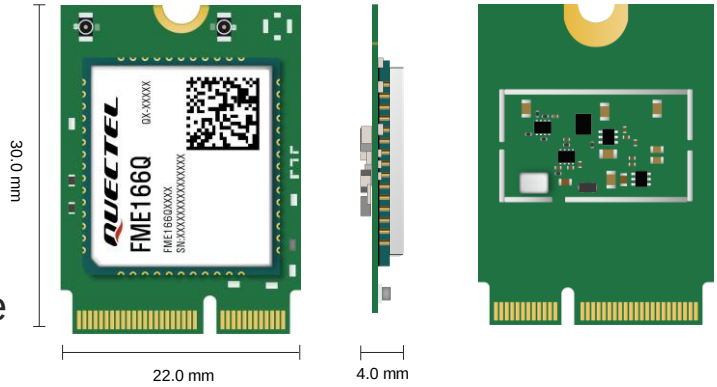
# Quectel FME166Q

2 × 2 + 2 × 2 MIMO
M.2 2230 KEY-E Package
Wi-Fi 6E & Bluetooth 5.3 Module




FME166Q is a high-performance Wi-Fi 6E and Bluetooth 5.3 module launched by Quectel, which can be used for WLAN and Bluetooth connections. With its compact size of 22.0 mm × 30.0 mm × 4.0 mm, the module fits into the M.2 2230 KEY-E package and is easy to integrate into the host device. It can also effectively lower production costs, increase production efficiency, and fulfill the demands of complicated environments.

With support for multi-link operation (MLO), FME166Q enables several links between Wi-Fi 6E devices to be transmitted and received over a single channel, with each channel supporting up to 1024 QAM. FME166Q operates simultaneously on 2.4 GHz and 5 GHz/ 6 GHz, and supports 2 × 2 + 2 × 2 MIMO and DBS (Dual Band Simultaneous), delivering a maximum physical layer data transmission rate of 3000 Mbps.

Based on a reliable PCIe 3.0 interface, FME166Q achieves low-power and high-speed data transmission. Coupled with its higher power consistency and accuracy and ultra-wide temperature range, the module can meet the requirements of industries, consumer goods and laptop 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 +65 °C

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

Bluetooth 5.3

M.2 Package

PCIe 3.0 Interface

DBS

Operating Temperature Range: -30 °C to +65 °C

Version: 1.0 | Status: Released

# Quectel FME166Q

| Wi-Fi 6E & Bluetooth 5.3 | FME166Q |
|---|---|
| **WLAN Protocol** | IEEE 802.11a/b/g/n/ac/ax |
| **Wi-Fi Frequency Band** | 2.4 GHz/ 5 GHz/ 6 GHz |
| **Wi-Fi Antenna** | 2 × 2 + 2 × 2 MIMO |
| **Wi-Fi Modulation Mode** | DBPSK/ DQPSK/ CCK/ BPSK/ QPSK/ 16QAM/ 64QAM/ 256QAM/ 1024QAM |
| **2.4 GHz Channel Bandwidth** | 20/ 40 MHz |
| **5 GHz Channel Bandwidth** | 20/ 40/ 80/ 160 MHz |
| **DBS** | Supported |
| **Encryption Mode** | WPA3 |
| **Wi-Fi Operating Mode** | AP/ STA |
| **Bluetooth Standard** | Bluetooth 5.3 |
| **BLE Feature** | LE Audio, 2M PHY, BLE Long Range |
| **Dimensions** | 22.0 mm × 30.0 mm × 4.0 mm |
| **Weight** | Approx. 3.22 g |
| **Temperature Range** | |
| **Operating Temperature** | -30 °C to +65 °C |
| **Storage Temperature** | -40 °C to +85 °C |
| **Physical Rate (Max.)** | |
| **802.11a** | 54 Mbps |
| **802.11b** | 11 Mbps |
| **802.11g** | 54 Mbps |
| **802.11n** | 600 Mbps |
| **802.11ac** | 1732 Mbps |
| **802.11ax** | 3000 Mbps |
| **Interfaces** | |
| **PCIe 3.0** | × 1 (for Wi-Fi) |
| **PCM** | × 1 (for Bluetooth) |
| **UART** | × 1 (for Bluetooth) |
| **Enablement Pins** | WLAN_EN, BT_EN |
| **Wi-Fi Antenna Interface** | × 1 (ANT_WIFI1) |
| **Wi-Fi/Bluetooth Antenna Interface** | × 1 (ANT_WIFI0/BT) |
| **Electrical Characteristics** | |
| **Power Supply Voltage** | VCC: 3.0–3.6 V, typ. 3.3 V |
| **Certifications** | |
| **Regulatory (Planning)** | **Europe:** CE<br>**America:** FCC<br>**Canada:** IC<br>**China:** SRRC<br>**South Korea:** KC<br>**Japan:** JATE/ TELEC<br>**Australia/New Zealand:** RCM |

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# Quectel FME166Q

| Wi-Fi 6E & Bluetooth 5.3 | | FME166Q | |
|---|---|---|---|
| **Wi-Fi Performance** | | | |
| | | **Receiver Sensitivity** | **Transmit Power** |
| **2.4 GHz** | **802.11b/11 Mbps** | -87 dBm ±2 dB | 16 dBm ±2 dB |
| | **802.11g/54 Mbps** | -73 dBm ±2 dB | 13.5 dBm ±2 dB |
| | **802.11n/HT20 MCS 7** | -72 dBm ±2 dB | 12.5 dBm ±2 dB |
| | **802.11n/HT40 MCS 7** | -70 dBm ±2 dB | 12 dBm ±2 dB |
| | **802.11ax/HE20 MCS 11** | -62 dBm ±2 dB | 10 dBm ±2 dB |
| | **802.11ax/HE40 MCS 11** | -59 dBm ±2 dB | 9.5 dBm ±2 dB |
| **5 GHz** | **802.11a/54 Mbps** | -72 dBm ±2 dB | 13 dBm ±2 dB |
| | **802.11n/HT20 MCS 7** | -72 dBm ±2 dB | 12 dBm ±2 dB |
| | **802.11n/HT40 MCS 7** | -70 dBm ±2 dB | 11.5 dBm ±2 dB |
| | **802.11ac/VHT20 MCS 8** | -69 dBm ±2 dB | 11.5 dBm ±2 dB |
| | **802.11ac/VHT40 MCS 9** | -65 dBm ±2 dB | 10.5 dBm ±2 dB |
| | **802.11ac/VHT80 MCS 9** | -61 dBm ±2 dB | 10 dBm ±2 dB |
| | **802.11ac/VHT160 MCS 9** | -59 dBm ±2 dB | 9.5 dBm ±2 dB |
| | **802.11ax/HE20 MCS 11** | -62 dBm ±2 dB | 9.5 dBm ±2 dB |
| | **802.11ax/HE40 MCS 11** | -60 dBm ±2 dB | 9.5 dBm ±2 dB |
| | **802.11ax/HE80 MCS 11** | -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 ±2.5 dB | 12 dBm ±2.5 dB |
| | **802.11ax/HE20 MCS 11** | -60 dBm ±2.5 dB | 8.5 dBm ±2.5 dB |
| | **802.11ax/HE40 MCS 11** | -58 dBm ±2.5 dB | 8.5 dBm ±2.5 dB |
| | **802.11ax/HE80 MCS 11** | -56 dBm ±2.5 dB | 7.5 dBm ±2.5 dB |
| | **802.11ax/HE160 MCS 11** | -52 dBm ±2.5 dB | 7 dBm ±2.5 dB |
| **Bluetooth Performance** | | | |
| | | **Receiver Sensitivity** | **Transmit Power** |
| **GFSK** | | -92 dBm ±2 dB | 6 dBm ±2 dB |
| **EDR (π/4-DQPSK)** | | -91 dBm ±2 dB | 2 dBm ±2 dB |
| **EDR (8-DQPSK)** | | -85 dBm ±2 dB | 2 dBm ±2 dB |
| **BLE (1 Mbps)** | | -96 dBm ±2 dB | 5 dBm ±2 dB |
| **BLE (2 Mbps)** | | -94 dBm ±2 dB | 5 dBm ±2 dB |

| Model | Ordering Code | Antenna | DBS | Coexistence with Cellular Module | Development Kit (Only for Debugging) |
|---|---|---|---|---|---|
| FME166Q | FME166QACMD | Two antennas | Supported | Supported | RK3568-WF-EVB-KIT |

**NOTE:**

1. The development board kit (RK3568-WF-EVB-KIT) is for early debugging.
2. Contact local sales or FAE for ordering.

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