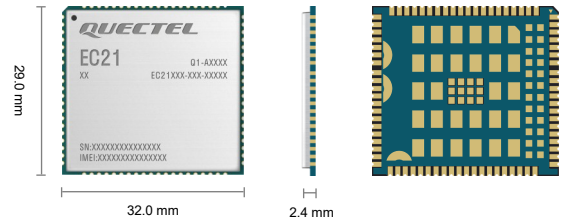


Quectel EC21 Series

IoT/M2M-optimized
LTE Cat 1 Module



Quectel EC21 is a series of LTE Cat 1 module optimized specially for M2M and IoT applications. It features cost-effective, low-power LTE connectivity, and delivers maximum data rates up to 10 Mbps downlink and 5 Mbps uplink. These make EC21 series an ideal solution for numerous IoT applications that are not reliant on high speed connectivity but still require the longevity and reliability of LTE networks.

EC21 series is compatible with Quectel UMTS/HSPA+ module and multi-mode LTE Standard EC25 series/EC20-CE/EG25-G/EG21-G modules in the compact and unified form factor. It contains 10 variants: EC21-A, EC21-V, EC21-AUT, EC21-AU, EC21-AUX, EC21-E, EC21-EU, EC21-EUX, EC21-KL and EC21-J. This makes it backward-compatible with existing EDGE and GSM/GPRS networks, ensuring that it can easily migrate from LTE to 2G or 3G network.

EC21 series supports Qualcomm® IZat™ location technology Gen8C Lite (GPS, GLONASS, BDS, Galileo and QZSS). The integrated GNSS greatly simplifies product design, and provides quicker, more accurate and more dependable positioning.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities (USB serial drivers for Windows 7/8/8.1/10/11, Linux, Android) extend the applicability of the module to a wide range of M2M and IoT applications such as smart metering, wearable devices, environmental monitoring, asset tracking, fleet management, security and alarm systems.



Key Features

- ✓ Cost-effective, lower-power LTE connectivity optimized for broad-band IoT applications
- ✓ Worldwide LTE, UMTS/HSPA(+) and GSM/GPRS/EDGE coverage
- ✓ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment
- ✓ Feature refinements: supports DFOTA and DTMF
- ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems



LTE Cat 1
Max. 10 Mbps (DL)
Max. 5 Mbps (UL)



Max. 42 Mbps (DL)
Max. 5.76 Mbps (UL)



LCC Package



Wi-Fi



Bluetooth*



Quectel Enhanced
AT Commands



Embedded Abundant
Protocols



Multi-constellation
GNSS



USB 2.0 High Speed
Interface



USB Drivers

Quectel EC21 Series

| LTE Cat 1 | EC21-A | EC21-V | EC21-AUT | EC21-AU | EC21-AUX |
|--|---|---|---|---|--|
| Region/Operator | North America | Verizon | Australia | Latin America/Australia/ New Zealand | Latin America/Australia/ New Zealand |
| Dimensions (mm) | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 |
| Temperature Range | | | | | |
| Operation Temperature | -35 °C to +75 °C | -35 °C to +75 °C | -35 °C to +75 °C | -35 °C to +75 °C | -35 °C to +75 °C |
| Extended Temperature | -40 °C to +85 °C | -40 °C to +85 °C | -40 °C to +85 °C | -40 °C to +85 °C | -40 °C to +85 °C |
| Frequency Bands | | | | | |
| LTE-FDD | B2/4/12 | B4/13 | B1/3/5/7/28 | B1/2 ^① /3/4/5/7/8/28 | B1/2 ^① /3/4/5/7/8/28 |
| LTE-TDD | - | - | - | B40 | B40 |
| WCDMA | B2/4/5 | - | B1/5 | B1/2/5/8 | B1/2/4/5/8 |
| GSM/EDGE | - | - | - | B2/3/5/8 | B2/3/5/8 |
| GNSS (Optional) | GPS/GLONASS/BDS/Galileo/QZSS | GPS/GLONASS/BDS/Galileo/QZSS | GPS/GLONASS/BDS/Galileo/QZSS | GPS/GLONASS/BDS/Galileo/QZSS | GPS/GLONASS/BDS/Galileo/QZSS |
| Certifications | | | | | |
| Carrier | America: AT&T/T-Mobile/U.S. Cellular Canada: Rogers/Telus | America: Verizon | Australia: Telstra | Australia: Telstra | - |
| Regulatory | North America: PTCRB America: FCC Canada: IC | Global: GCF America: FCC | Global: GCF Australia/New Zealand: RCM | America: FCC Canada: IC Brazil: Anatel Taiwan, China: NCC Japan: JATE/TELEC Australia/New Zealand: RCM | Europe: CE America: FCC Brazil: Anatel Taiwan, China: NCC Australia/New Zealand: RCM South Africa: ICASA* |
| Others | RoHS/WHQL | RoHS/WHQL | RoHS/WHQL | RoHS/WHQL | RoHS/WHQL |
| Max. Data Transmission Rates | | | | | |
| LTE-FDD (Mbps) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) |
| LTE-TDD (Mbps) | - | - | - | 8.96 (DL)/3.1 (UL) | 8.96 (DL)/3.1 (UL) |
| DC-HSPA+ (Mbps) | 42 (DL)/5.76 (UL) | - | 42 (DL)/5.76 (UL) | 42 (DL)/5.76 (UL) | 42 (DL)/5.76 (UL) |
| WCDMA (kbps) | 384 (DL)/384 (UL) | - | 384 (DL)/384 (UL) | 384 (DL)/384 (UL) | 384 (DL)/384 (UL) |
| EDGE (kbps) | - | - | - | 296 (DL)/236.8 (UL) | 296 (DL)/236.8 (UL) |
| GPRS (kbps) | - | - | - | 107 (DL)/85.6 (UL) | 107 (DL)/85.6 (UL) |
| Interfaces | | | | | |
| (U)SIM | × 1 | × 1 | × 1 | × 1 | × 1 |
| UART | × 2 | × 2 | × 2 | × 2 | × 2 |
| USB 2.0 | × 1 | × 1 | × 1 | × 1 | × 1 |
| Audio Digital (PCM) | × 1 | × 1 | × 1 | × 1 | × 1 |
| I2C | × 1 | × 1 | × 1 | × 1 | × 1 |
| SDIO (for Wi-Fi and SD Card) | × 2 | × 2 | × 2 | × 2 | × 1 |
| SGMII | × 1 | × 1 | × 1 | × 1 | × 1 |
| Bluetooth* | × 1 | × 1 | × 1 | × 1 | - |
| ADC | × 2 | × 2 | × 2 | × 2 | × 2 |
| Voice | | | | | |
| Speech Codec Modes | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB |
| Echo Arithmetic | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression |
| VoLTE (Optional) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) |
| Enhanced Features | | | | | |
| DTMF | ● | ● | ● | ● | ● |
| DFOTA | ● | ● | ● | ● | ● |
| QMI/RmNet | ● | ● | ● | ● | ● |
| Audio Playback*/ Audio Recording* | Optional | Optional | Optional | Optional | Optional |
| QuecLocator® | ● | ● | ● | ● | ● |
| QuecFile® | ● | ● | ● | ● | ● |
| (U)SIM Card Detection | ● | ● | ● | ● | ● |
| Drivers | | | | | |
| USB Serial Driver | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x |
| GNSS Driver | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x |
| RIL Driver | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x |
| USB NDIS Driver | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 |
| USB MBIM Driver | Windows 8/8.1/10/11, Linux 3.18–5.18 | Windows 8/8.1/10/11, Linux 3.18–5.18 | Windows 8/8.1/10/11, Linux 3.18–5.18 | Windows 8/8.1/10/11, Linux 3.18–5.18 | - |
| USB GobiNet Driver | Linux 2.6–5.18 | Linux 2.6–5.18 | Linux 2.6–5.18 | Linux 2.6–5.18 | Linux 2.6–5.18 |
| USB QMI_WWAN Driver | Linux 3.4–5.18 | Linux 3.4–5.18 | Linux 3.4–5.18 | Linux 3.4–5.18 | Linux 3.4–5.18 |
| Electrical Features | | | | | |
| Supply Voltage Range | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. |
| Power Consumption | 10 µA @ Power off 1.3 mA @ Sleep, Typ. 23 mA @ Idle | 10 µA @ Power off 1.1 mA @ Sleep, Typ. 22 mA @ Idle | 10 µA @ Power off 1.0 mA @ Sleep, Typ. 22 mA @ Idle | 10 µA @ Power off 1.3 mA @ Sleep, Typ. 22 mA @ Idle | 7.0 µA @ Power off 1.0 mA @ Sleep, Typ. 17 mA @ Idle |

NOTE:

- ①: LTE-FDD B2 of EC21-AU and EC21-AUX does not support Rx-diversity.
- *: Under development/In progress.
- : Supported.

Quectel EC21 Series

| LTE Cat 1 | EC21-E | EC21-EU | EC21-EUX | EC21-KL | EC21-J |
|--|--|---|--|---|---|
| Region/Operator | EMEA/Thailand/India | EMEA/Thailand | EMEA/Thailand | South Korea | Japan |
| Dimensions (mm) | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 | 29.0 × 32.0 × 2.4 |
| Temperature Range | | | | | |
| Operation Temperature | -35 °C to +75 °C | -35 °C to +75 °C | -35 °C to +75 °C | -35 °C to +75 °C | -35 °C to +75 °C |
| Extended Temperature | -40 °C to +85 °C | -40 °C to +85 °C | -40 °C to +85 °C | -40 °C to +85 °C | -40 °C to +85 °C |
| Frequency Bands | | | | | |
| LTE-FDD | B1/3/5/7/8/20 | B1/3/7/8/20/28A | B1/3/7/8/20/28A | B1/3/5/7/8 | B1/3/8/18/19/26 |
| LTE-TDD | - | - | - | - | - |
| WCDMA | B1/5/8 | B1/8 | B1/8 | - | - |
| GSM/EDGE | B3/8 | B3/8 | B3/8 | - | - |
| GNSS (Optional) | GPS/GLONASS/BDS/Galileo/QZSS | GPS/GLONASS/BDS/Galileo/QZSS | GPS/GLONASS/BDS/Galileo/QZSS | - | GPS/GLONASS/BDS/Galileo/QZSS |
| Certifications | | | | | |
| Carrier | Europe: Vodafone/Deutsche Telekom | Europe: Deutsche Telekom | - | South Korea: KT/SKT | Japan: NTT DOCOMO/KDDI |
| Regulatory | Global: GCF Europe: CE Australia/New Zealand: RCM | Global: GCF Europe: CE Taiwan, China: NCC Australia/New Zealand: RCM | Global: GCF Europe: CE Australia/New Zealand: RCM | South Korea: KC | Japan: JATE/TELEC |
| Others | RoHS/WHQL | RoHS/WHQL | RoHS/WHQL | RoHS/WHQL | RoHS/WHQL |
| Max. Data Transmission Rates | | | | | |
| LTE-FDD (Mbps) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) | 10 (DL)/5 (UL) |
| LTE-TDD (Mbps) | - | - | - | - | - |
| DC-HSPA+ (Mbps) | 42 (DL)/5.76 (UL) | 42 (DL)/5.76 (UL) | 42 (DL)/5.76 (UL) | - | - |
| WCDMA (kbps) | 384 (DL)/384 (UL) | 384 (DL)/384 (UL) | 384 (DL)/384 (UL) | - | - |
| EDGE (kbps) | 296 (DL)/236.8 (UL) | 296 (DL)/236.8 (UL) | 296 (DL)/236.8 (UL) | - | - |
| GPRS (kbps) | 107 (DL)/85.6 (UL) | 107 (DL)/85.6 (UL) | 107 (DL)/85.6 (UL) | - | - |
| Interfaces | | | | | |
| (U)SIM | × 1 | × 1 | × 1 | × 1 | × 1 |
| UART | × 2 | × 2 | × 2 | × 2 | × 2 |
| USB 2.0 | × 1 | × 1 | × 1 | × 1 | × 1 |
| Audio Digital (PCM) | × 1 | × 1 | × 1 | × 1 | × 1 |
| I2C | × 1 | × 1 | × 1 | × 1 | × 1 |
| SDIO (for Wi-Fi and SD Card) | × 2 | × 2 | × 1 | × 2 | × 2 |
| SGMII | × 1 | × 1 | × 1 | × 1 | × 1 |
| Bluetooth* | × 1 | × 1 | - | × 1 | × 1 |
| ADC | × 2 | × 2 | × 2 | × 2 | × 2 |
| Voice | | | | | |
| Speech Codec Modes | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB | HR/FR/EFR/AMR/AMR-WB |
| Echo Arithmetic | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression | Echo Cancellation/ Noise Suppression |
| VoLTE (Optional) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) | Digital Audio and VoLTE (Voice over LTE) |
| Enhanced Features | | | | | |
| DTMF | ● | ● | ● | ● | ● |
| DFOTA | ● | ● | ● | ● | ● |
| QMI/RmNet | ● | ● | ● | ● | ● |
| Audio Playback*/ Audio Recording* | Optional | Optional | Optional | Optional | Optional |
| QuecLocator® | ● | ● | ● | ● | ● |
| QuecFile® | ● | ● | ● | ● | ● |
| (U)SIM Card Detection | ● | ● | ● | ● | ● |
| Drivers | | | | | |
| USB Serial Driver | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x | Windows 7/8/8.1/10/11, Linux 2.6–5.18, Android 4.x–12.x |
| GNSS Driver | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x |
| RIL Driver | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x | Android 4.x–12.x |
| USB NDIS Driver | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 | Windows 7/8/8.1/10/11 |
| USB MBIM Driver | Windows 8/8.1/10/11, Linux 3.18–5.18 | Windows 8/8.1/10/11, Linux 3.18–5.18 | - | Windows 8/8.1/10/11, Linux 3.18–5.18 | Windows 8/8.1/10/11, Linux 3.18–5.18 |
| USB GobiNet Driver | Linux 2.6–5.18 | Linux 2.6–5.18 | Linux 2.6–5.18 | Linux 2.6–5.18 | Linux 2.6–5.18 |
| USB QMI_WWAN Driver | Linux 3.4–5.18 | Linux 3.4–5.18 | Linux 3.4–5.18 | Linux 3.4–5.18 | Linux 3.4–5.18 |
| Electrical Features | | | | | |
| Supply Voltage Range | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. | 3.3–4.3 V, 3.8 V Typ. |
| Power Consumption | 13 µA @ Power off 1.4 mA @ Sleep, Typ. 22 mA @ Idle | 13 µA @ Power off 1.8 mA @ Sleep, Typ. 18 mA @ Idle | 7.0 µA @ Power off 0.9 mA @ Sleep, Typ. 17 mA @ Idle | 10 µA @ Power off 1.1 mA @ Sleep, Typ. 25 mA @ Idle | 10 µA @ Power off 0.9 mA @ Sleep, Typ. 24 mA @ Idle |

NOTE:
1. * : Under development.
2. ● : Supported.