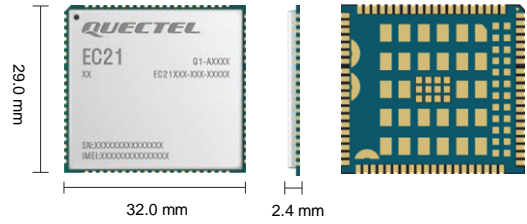


Quectel EC21 Series

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 multi-mode LTE Standard EC25 series/EC20-CE/EG25-G/EG21-G modules in the compact and unified form factor. It contains 12 variants: EC21-A, EC21-V, EC21-AUT, EC21-AU, EC21-AUX, EC21-E, EC21-EU, EC21-EUX, EC21-EC, EC21-KL, EC21-J and EC21-IN. 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 10/11, Linux and 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, smart safety 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



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



Multi-constellation GNSS
(Optional)



Embedded Abundant
Protocols



USB 2.0 High Speed
Interface



USB Drivers

Quectel EC21 Series

LTE Cat 1	EC21-A	EC21-V	EC21-AUT	EC21-AU	EC21-AUX	EC21-KL
Region/Operator	North America	Verizon	Australia	Latin America/Australia/ New Zealand	Latin America/Australia/ New Zealand	South Korea
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	29.0 × 32.0 × 2.4
Temperature Range						
Operating 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	-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	40 °C to +85 °C
Frequency Bands						
LTE-FDD	B2/4/12	B4/13	B1/3/5/7/28	B1/2 ^o /3/4/5/7/8/28	B1/2 ^o /3/4/5/7/8/28	B1/3/5/7/8
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-Mobile/ U.S. Cellular Canada: Rogers/Telus	America: Verizon	Australia: Telstra	Australia: Telstra	Australia: Telstra (Data-only)	South Korea: KT/SKT/LGU+
Regulatory/Conformance	North America: PTCRB America: FCC Canada: IC	Global: GCF America: FCC	Global: GCF Brazil: Anatel 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 Australia/New Zealand: RCM South Africa: ICASA	South Korea: KC
Others	RoHS/WHQL	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)	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	× 1
UART	× 2	× 2	× 2	× 2	× 2	× 2
USB 2.0	× 1	× 1	× 1	× 1	× 1	× 1
Audio Digital (PCM)	× 1	× 1	× 1	× 1	× 1	× 1
I2C	× 1	× 1	× 1	× 1	× 1	× 1
SDIO (for Wi-Fi and SD Card)	× 2	× 2	× 2	× 2	× 1	× 2
SGMII	× 1	× 1	× 1	× 1	× 1	× 1
Bluetooth	-	-	-	-	-	× 1
ADC	× 2	× 2	× 2	× 2	× 2	× 2
GRFC (Optional)	× 2	× 2	× 2	× 2	× 2	× 2
Voice						
Speech Codec Modes	AMR/AMR-WB	AMR/AMR-WB	AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	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	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)	Digital Audio and VoLTE (Voice over LTE)
Enhanced Features						
DTMF	●	●	●	●	●	●
DFOTA	●	●	●	●	●	●
QMI/RmNet	●	●	●	●	●	●
Audio Playback/ Audio Recording	Optional	Optional	Optional	Optional	Optional	Optional
QuecFile[®]	●	●	●	●	●	●
(U)SIM Card Detection	●	●	●	●	●	●
SMS	●	●	●	●	●	●
eSIM	-	-	-	-	Optional	-
Drivers						
USB Serial Driver	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x
GNSS Driver	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	-
RIL Driver	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x
USB MBIM Driver	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7
USB GobiNet Driver	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4
USB QMI_WWAN Driver	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7
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.	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 1.0 mA @ Sleep, Typ. 20 mA @ Idle	7.0 µA @ Power off 1.0 mA @ Sleep, Typ. 17 mA @ Idle	10 µA @ Power off 1.0 mA @ Sleep, Typ. 25 mA @ Idle

NOTE:

- ①: LTE-FDD B2 of EC21-AU and EC21-AUX does not support Rx-diversity.
- : Supported.
- The module requires an external codec to implement audio playback/audio recording functions.
- eSIM function can be supported by software, but an external eSIM chip is required.

Quectel EC21 Series

LTE Cat 1	EC21-E	EC21-EU	EC21-EUX	EC21-EC	EC21-J	EC21-IN
Region/Operator	EMEA/Thailand/India	EMEA/Thailand	EMEA/Thailand	EMEA/Thailand/India	Japan	India
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	29.0 × 32.0 × 2.4
Temperature Range						
Operating 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	-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	-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	B1/3/7/8/20/28A	B1/3/8/18/19/26	B1/3/5/8
LTE-TDD	-	-	-	-	-	B40/41
WCDMA	B1/5/8	B1/8	B1/8	B1/8	-	-
GSM/EDGE	B3/8	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	GPS/GLONASS/BDS/Galileo/QZSS
Certifications						
Carrier	Europe: Vodafone/ Deutsche Telekom	Europe: Deutsche Telekom	-	Europe: Deutsche Telekom	Japan: NTT DOCOMO/KDDI	-
Regulatory/Conformance	Global: GCF Europe: CE The UK: UKCA Australia/New Zealand: RCM	Global: GCF Europe: CE The UK: UKCA Taiwan, China: NCC Australia/New Zealand: RCM	Global: GCF Europe: CE The UK: UKCA South Korea: KC Australia/New Zealand: RCM	Global: GCF Europe: CE The UK: UKCA Australia/New Zealand: RCM	Japan: JATE/TELEC	-
Others	RoHS/WHQL	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)	10 (DL)/5 (UL)
LTE-TDD (Mbps)	-	-	-	-	-	8.96 (DL)/3.1 (UL)
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)	384 (DL)/384 (UL)	-	-
EDGE (kbps)	296 (DL)/236.8 (UL)	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)	107 (DL)/85.6 (UL)	-	-
Interfaces						
(U)SIM	× 1	× 1	× 1	× 1	× 1	× 1
UART	× 2	× 2	× 2	× 2	× 2	× 2
USB 2.0	× 1	× 1	× 1	× 1	× 1	× 1
Audio Digital (PCM)	× 1	× 1	× 1	× 1	× 1	× 1
I2C	× 1	× 1	× 1	× 1	× 1	× 1
SDIO (for Wi-Fi and SD Card)	× 2	× 2	× 1	-	× 2	× 2
SGMII	× 1	× 1	× 1	-	× 1	× 1
Bluetooth (Optional)	× 1	× 1	-	-	-	× 1
ADC	× 2	× 2	× 2	× 2	× 2	× 2
GRFC (Optional)	× 2	× 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	AMR/AMR-WB	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	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)	Digital Audio and VoLTE (Voice over LTE)
Enhanced Features						
DTMF	●	●	●	●	●	●
DFOTA	●	●	●	●	●	●
QMI/RmNet	●	●	●	●	●	●
Audio Playback/ Audio Recording	Optional	Optional	Optional	Optional	Optional	Optional
QuecFile®	●	●	●	●	●	●
(U)SIM Card Detection	●	●	●	●	●	●
SMS	●	●	●	●	●	●
eSIM	Optional	Optional	Optional	Optional	-	Optional
Drivers						
USB Serial Driver	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11, Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11 Linux 2.6-6.7 Android 4.x-14.x	Windows 10/11, Linux 2.6-6.7 Android 4.x-14.x
GNSS Driver	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	-	Android 4.x-16.x	Android 4.x-16.x
RIL Driver	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x	Android 4.x-16.x
USB MBIM Driver	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7	Windows 10/11 Linux 3.18-6.7
USB GobiNet Driver	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4	Linux 2.6-3.4
USB QMI_WWAN Driver	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7
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.	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 1.0 mA @ Sleep, Typ. 14 mA @ Idle	7.6 µA @ Power off 1.0 mA @ Sleep, Typ. 17 mA @ Idle	10 µA @ Power off 0.9 mA @ Sleep, Typ. 24 mA @ Idle	8.81 µA @ Power off 0.98 mA @ Sleep, Typ. 19.08 mA @ Idle

NOTE:

- : Supported.
- The module requires an external codec to implement audio playback/audio recording functions.
- eSIM function can be supported by software, but an external eSIM chip is required.