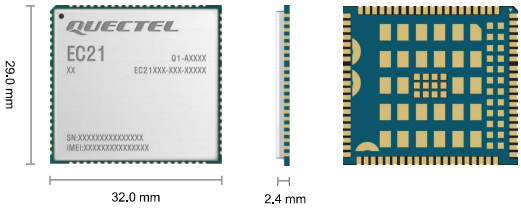
Quectel EC21 Series

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.

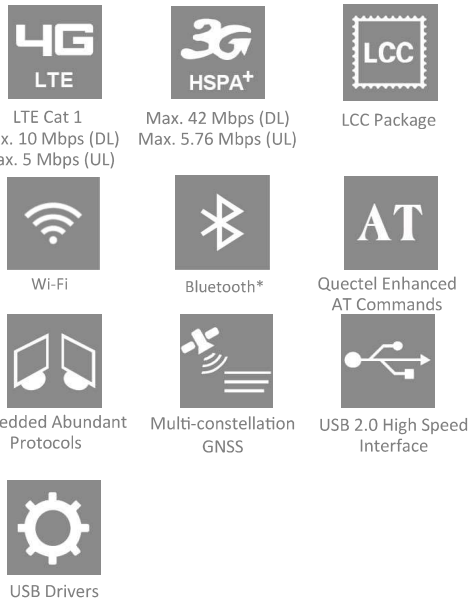
EC21 series is compatible with Quectel multi-mode LTE Standard EC25 series/EC20-CE/EG25-G/EG21-G modules in the compact and unified form factor. It contains 10 variants: EC21-A, EC21-V, EC21-AUT, EC21-AU, EC21-AUX, EC21-E, EC21-EU, EC21-EUX, EC21-KL and EC21-J. This makes it backward-compatible with 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 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, 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



Version: 2.3 | Status: Released

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	B1/2①/3/4/5/7/8/28	B1/2①/3/4/5/7/8/28
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	**Australia:** Telstra（Data-only）
Regulatory	**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
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
GRFC (Optional)	× 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
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	●	●	●	●	●
SMS	●	●	●	●	●
eSIM	-	-	-	-	Optional
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	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	11 μA @ Power off 1.0 mA @ Sleep, Typ. 20 mA @ Idle	7.0 μA @ Power off 1.0 mA @ Sleep, Typ. 17 mA @ Idle

NOTE:
1. ①: LTE-FDD B2 of EC21-AU and EC21-AUX does not support Rx-diversity.
2. *: Under development.
3. ●: Supported.
4. eSIM function can be supported by software, but an external eSIM chip is required.

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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/LGU+	**Japan:** NTT DOCOMO/KDDI
Regulatory	**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	**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
GRFC (Optional)	× 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	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
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	●	●	●	●	●
SMS	●	●	●	●	●
eSIM	Optional	Optional	Optional	-	-
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
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	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 1. 0 mA @ Sleep, Typ. 14 mA @ Idle	10 μA @ Power off 1.0 mA @ Sleep, Typ. 25 mA @ Idle	10 μA @ Power off 0.9 mA @ Sleep, Typ. 24 mA @ Idle

NOTE:
1. * : Under development.
2. ●: Supported.
3. eSIM function can be supported by software, but an external eSIM chip is required.

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