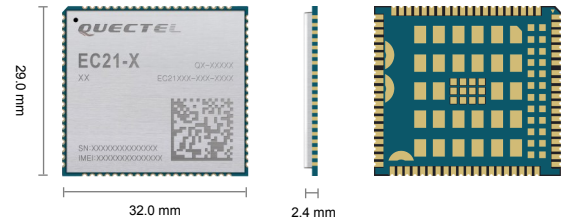




Quectel EC21 Series

IoT/M2M-optimized

LTE Cat 1 Module



Quectel EC21 is a series of LTE category 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 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 is compatible with Quectel UMTS/HSPA+ UC200T series modules and multi-mode LTE Standard EC25 series/EC20 R2.1/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 supports Qualcomm® IZat™ location technology Gen8C Lite (GPS, GLONASS, BeiDou, 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, 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, and so on.



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



BT*



Quectel Enhanced
AT Commands



Embedded Abundant
Protocols



Multi-constellation
GNSS



USB 2.0 High Speed
Interface



USB Drivers

Version: 2.0 | 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)	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	32.0 × 29.0 × 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/B4/B12	B4/B13	B1/B3/B5/B7/B28	B1/B2 ^① /B3/B4/B5/B7/B8/B28	B1/B2 ^① /B3/B4/B5/B7/B8/B28
LTE-TDD	-	-	-	B40	B40
WCDMA	B2/B4/B5	-	B1/B5	B1/B2/B5/B8	B1/B2/B4/B5/B8
GSM/EDGE	-	-	-	B2/B3/B5/B8	B2/B3/B5/B8
GNSS	GPS/GLONASS/BeiDou/Galileo/ QZSS (Optional)	GPS/GLONASS/BeiDou/Galileo/ QZSS (Optional)	GPS/GLONASS/BeiDou/Galileo/ QZSS (Optional)	GPS/GLONASS/BeiDou/Galileo/ QZSS (Optional)	GPS/GLONASS/BeiDou/Galileo/ QZSS (Optional)
Certifications					
Carrier	North America: AT&T/ T-Mobile/U.S. Cellular Canada: Rogers/Telus	North America: Verizon	Australia: Telstra	Australia: Telstra	-
Regulatory	North America: FCC/PTCRB Canada: IC	Global: GCF North America: FCC	Global: GCF Australia/New Zealand: RCM	North America: FCC Canada: IC Brazil: Anatel Taiwan (China): NCC Japan: JATE/TELEC Australia/New Zealand: RCM	Europe: CE North 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	x 1	x 1	x 1	x 1	x 1
UART	x 2	x 2	x 2	x 2	x 2
USB 2.0	x 1	x 1	x 1	x 1	x 1
Audio Digital (PCM)	x 1	x 1	x 1	x 1	x 1
I2C	x 1	x 1	x 1	x 1	x 1
SDIO (For Wi-Fi and SD Card)	x 2	x 2	x 2	x 2	x 1
SGMII	x 1	x 1	x 1	x 1	x 1
Bluetooth*	x 1	x 1	x 1	x 1	-
ADC	x 2	x 2	x 2	x 2	x 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	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)
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, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x
GNSS Driver	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x
RIL Driver	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	-
GobiNet Driver	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
QMI_WWAN Driver	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4
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

Notes:
1. * means under development.
2. ● means supported.
3. - means unsupported.

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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)	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	32.0 × 29.0 × 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/B3/B5/B7/B8/B20	B1/B3/B7/B8/B20/B28A	B1/B3/B7/B8/B20/B28A	B1/B3/B5/B7/B8	B1/B3/B8/B18/B19/B26
LTE-TDD	-	-	-	-	-
WCDMA	B1/B5/B8	B1/B8	B1/B8	-	-
GSM/EDGE	B3/B8	B3/B8	B3/B8	-	-
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou/Galileo/QZSS (Optional)	-	GPS/GLONASS/BeiDou/Galileo/QZSS (Optional)
Certifications					
Carrier	Global: Vodafone Europe: Deutsche Telekom/ Telefónica*	Europe: Deutsche Telekom	-	South Korea: KT/SKT	Japan: NTT DOCOMO/KDDI
Regulatory	Global: GCF Europe: CE Australia/New Zealand: RCM Russia: FAC	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	x 1	x 1	x 1	x 1	x 1
UART	x 2	x 2	x 2	x 2	x 2
USB 2.0	x 1	x 1	x 1	x 1	x 1
Audio Digital (PCM)	x 1	x 1	x 1	x 1	x 1
I2C	x 1	x 1	x 1	x 1	x 1
SDIO (For Wi-Fi and SD Card)	x 2	x 2	x 1	x 2	x 2
SGMII	x 1	x 1	x 1	x 1	x 1
Bluetooth*	x 1	x 1	-	x 1	x 1
ADC	x 2	x 2	x 2	x 2	x 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	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)
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, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x
GNSS Driver	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x
RIL Driver	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	-	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4
GobiNet Driver	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
QMI_WWAN Driver	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4
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

Notes:

- ① LTE-FDD B2 of EC21-AU and EC21-AUX does not support Rx-diversity.
- * means under development.
- means supported.
- means unsupported.