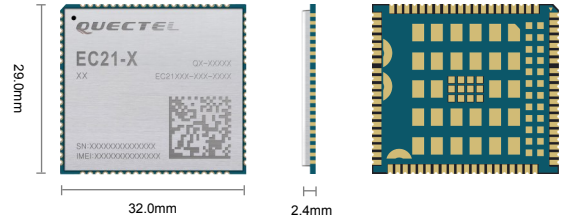




Quectel EC21 Series

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 10Mbps downlink and 5Mbps 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+ UC20/UC200T modules and multi-mode LTE Standard EC25/EC20 R2.0/EC20 R2.1/EG25-G/EG21-G modules in the compact and unified form factor. It contains 10 variants: EC21-E, EC21-EU, EC21-EUX, EC21-A, EC21-V, EC21-AUT, EC21-AU, EC21-AUX, 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/Compass, 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/eCall*) 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 Benefits

- ✓ 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, eCall* and DTMF
- ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems



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



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



LCC Package



Wi-Fi



BT*



eCall*



Embedded Abundant Protocols



Multi-constellation GNSS



USB 2.0 High Speed Interface



USB Drivers



Quectel Enhanced AT Commands

Rev.: V1.9 | Status: Released

Quectel EC21 Series

LTE Cat 1	EC21-E	EC21-EU	EC21-EUX	EC21-A	EC21-V
Region/Operator	EMEA/Thailand/India	EMEA/Thailand	EMEA/Thailand	North America	Verizon
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 ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Frequency Bands					
LTE-FDD	B1/B3/B5/B7/B8/B20	B1/B3/B7/B8/B20/B28A	B1/B3/B7/B8/B20/B28A	B2/B4/B12	B4/B13
WCDMA	B1/B5/B8	B1/B8	B1/B8	B2/B4/B5	\
GSM/EDGE	B3/B8	B3/B8	B3/B8	\	\
GNSS	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)
Certifications					
Carrier	Global: Vodafone Europe: Deutsche Telekom/ Telefonica*	Europe: Deutsche Telekom	\	North America: AT&T/T-Mobile/ U.S. Cellular Canada: Rogers/Telus	North America: Verizon
Regulatory	Global: GCF Europe: CE Russia: FAC	Global: GCF Europe: CE Taiwan (China): NCC Australia/New Zealand: RCM	Global: GCF* Europe: CE* Australia/New Zealand: RCM*	North America: FCC/PTCRB Canada: IC	Global: GCF North America: FCC
Others	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL
Data Transmission					
LTE-FDD Data Rate (Mbps)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)
DC-HSPA+ Data Rate (Mbps)	Max 42 (DL)/ 5.76 (UL)	Max 42 (DL)/ 5.76 (UL)	Max 42 (DL)/ 5.76 (UL)	Max 42 (DL)/ 5.76 (UL)	\
WCDMA Data Rate (Kbps)	Max 384 (DL)/ 384 (UL)	Max 384 (DL)/ 384 (UL)	Max 384 (DL)/ 384 (UL)	Max 384 (DL)/ 384 (UL)	\
EDGE Data Rate (Kbps)	Max 296 (DL)/ 236.8 (UL)	Max 296 (DL)/ 236.8 (UL)	Max 296 (DL)/ 236.8 (UL)	\	\
GPRS Data Rate (Kbps)	Max 107 (DL)/ 85.6 (UL)	Max 107 (DL)/ 85.6 (UL)	Max 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	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					
eCall*	●	●	●	●	●
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/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x
GNSS Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.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	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.
Power Consumption	13µA @Power off 1.4mA @Sleep, Typ. 22mA @Idle	13µA @Power off 1.8mA @Sleep, Typ. 18mA @Idle	7.0µA @Power off 0.9mA @Sleep, Typ. 17mA @Idle	10µA @Power off 1.3mA @Sleep, Typ. 23mA @Idle	10µA @Power off 1.1mA @Sleep, Typ. 22mA @Idle

Notes:
1. * means under development.
2. ● means supported.

Quectel EC21 Series

LTE Cat 1	EC21-AUT	EC21-AU	EC21-AUX	EC21-KL	EC21-J
Region/Operator	Australia	Latin America/Australia/ New Zealand	Latin America/Australia/ New Zealand	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 ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Frequency Bands					
LTE-FDD	B1/B3/B5/B7/B28	B1/B2 ^① /B3/B4/B5/B7/B8/B28	B1/B2 ^① /B3/B4/B5/B7/B8/B28	B1/B3/B5/B7/B8	B1/B3/B8/B18/B19/B26
LTE-TDD	\	B40	B40	\	\
WCDMA	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 (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	\	GPS/GLONASS/BeiDou (Compass)/ Galileo/QZSS (Optional)
Certifications					
Carrier	Australia: Telstra	Australia: Telstra	\	South Korea: KT/SKT	Japan: NTT DOCOMO/KDDI
Regulatory	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 Korea: KC	Japan: JATE/TELEC
Others	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL
Data Transmission					
LTE-FDD Data Rate (Mbps)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)	Max 10 (DL)/ 5 (UL)
LTE-TDD Data Rate (Mbps)	\	Max 8.96 (DL)/ 3.1 (UL)	Max 8.96 (DL)/ 3.1 (UL)	\	\
DC-HSPA+ Data Rate (Mbps)	Max 42 (DL)/ 5.76 (UL)	Max 42 (DL)/ 5.76 (UL)	Max 42 (DL)/ 5.76 (UL)	\	\
WCDMA Data Rate (Kbps)	Max 384 (DL)/ 384 (UL)	Max 384 (DL)/ 384 (UL)	Max 384 (DL)/ 384 (UL)	\	\
EDGE Data Rate (Kbps)	\	Max 296 (DL)/ 236.8 (UL)	Max 296 (DL)/ 236.8 (UL)	\	\
GPRS Data Rate (Kbps)	\	Max 107 (DL)/ 85.6 (UL)	Max 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	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					
eCall*	●	●	●	●	●
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/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/9.x
GNSS Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	\	Android 4.x/5.x/6.x/7.x/8.x/9.x
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.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	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.
Power Consumption	10µA @Power off 1.0mA @Sleep, Typ. 22mA @Idle	10µA @Power off 1.3mA @Sleep, Typ. 22mA @Idle	7.0µA @Power off 1.0mA @Sleep, Typ. 17mA @Idle	10µA @Power off 1.1mA @Sleep, Typ. 25mA @Idle	10µA @Power off 0.9mA @Sleep, Typ. 24mA @Idle

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