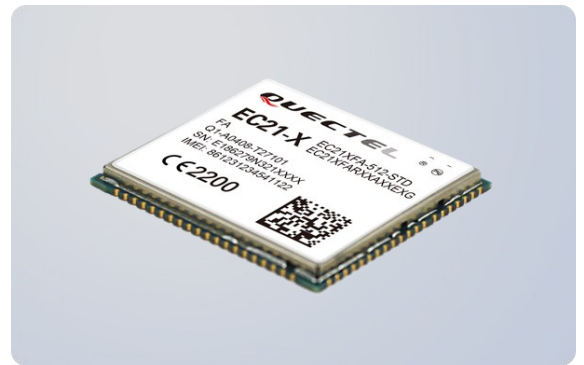


# Quectel EC21

## 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 M2M-optimized speeds of 10Mbit/s downlink and 5Mbit/s 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 module and multi-mode LTE EC20/EC25 module in the compact and unified form factor. It contains 9 variants: EC21-E, EC21-A, EC21-V, EC21-AU, EC21-AUT, EC21-AUV, EC21-J, EC21-KL and EC20-CEL. This makes it backward-compatible with existing EDGE and GSM/GPRS networks, ensuring that it can easily migrate from LTE to 2G or 3G networks.

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 drivers for Windows XP, Windows Vista, 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 broadband 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



Embedded Abundant Protocols



eCall



Multi-constellation GNSS



USB 2.0 High Speed Interface



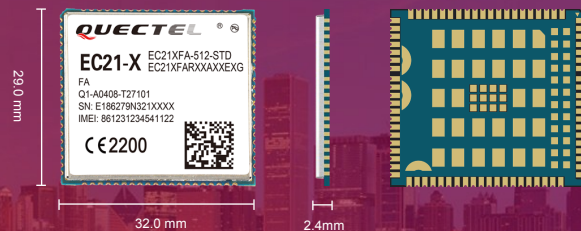
USB Drivers



Quectel Enhanced AT Commands

# Quectel EC21

## IoT/M2M-optimized LTE Cat 1 Module



### Variant for EMEA/Korea/Thailand

#### EC21-E:

LTE FDD: B1/B3/B5/B7/B8/B20  
WCDMA: B1/B5/B8  
GSM: B3/B8

### Variants for North America

#### EC21-A:

LTE FDD: B2/B4/B12  
WCDMA: B2/B4/B5

#### EC21-V:

LTE FDD: B4/B13

### Variants for Australia/New Zealand/Taiwan/ Brazil

#### EC21-AU:

LTE FDD: B1/B2<sup>①</sup>/B3/B4/B5/B7/B8/B28  
LTE TDD: B40  
WCDMA: B1/B2/B5/B8  
GSM: B2/B3/B5/B8

#### EC21-AUT:

LTE FDD: B1/B3/B5/B7/B28  
WCDMA: B1/B5

#### EC21-AUV:

LTE FDD: B1/B3/B5/B8/B28  
WCDMA: B1/B5/B8

### Variant for Japan

#### EC21-J:

LTE FDD: B1/B3/B8/B18/B19/B26

### Variant for Korea

#### EC21-KL:

LTE FDD: B1/B3/B5/B7/B8

### Variant for China

#### EC20-CEL:

LTE FDD: B1/B3/B5

### Data

#### LTE:

LTE FDD: Max 10Mbps (DL)/Max 5Mbps (UL)  
LTE TDD: Max 8.96Mbps (DL)/Max 3.1Mbps (UL)

#### UMTS:

DC-HSDPA: Max 42Mbps (DL)  
HSUPA: Max 5.76Mbps (UL)  
WCDMA: Max 384Kbps (DL)/Max 384Kbps (UL)

#### GSM:

EDGE: Max 296Kbps (DL)/Max 236.8Kbps (UL)  
GPRS: Max 107Kbps (DL)/Max 85.6Kbps (UL)

### Voice

#### Speech Codec Modes:

HR/FR/EFR/AMR/AMR-WB

#### Echo Arithmetic:

Echo Cancellation/Noise Reduction

#### Audio:

Digital Audio and VoLTE (Voice over LTE)  
(Optional)

### Interfaces

USB 2.0 with High Speed up to 480Mbps  
Digital Audio through PCM (Optional)  
1.8V/3.0V (U)SIM Interface  
UART × 2 (Main UART and Debug UART)  
NETLIGHT × 2 (NET\_STATUS and NET\_MODE)  
RESET (Active Low)  
PWRKEY (Active Low)  
Solder Pads for Primary, Rx-diversity and GNSS  
Antennas  
ADC × 2  
SDIO × 2 (for Wi-Fi and SD card)

### Enhanced Features

SDIO Interface for Wi-Fi Function (Optional)  
UART/PCM Interfaces for BT4.0 Function\*  
(Optional)  
eCall\*  
DTMF  
Audio Playback/Audio Recording  
QuecFile\*  
(U)SIM Card Detection  
Rx-diversity Antenna  
**DFOTA\***:  
Delta Firmware Upgrade Over the Air  
**GNSS**:  
GPS/GLONASS/BeiDou/Galileo/QZSS (Optional)

### Electrical Characteristics

#### Output Power:

Class 3 (23dBm±2dB) for LTE FDD  
Class 3 (23dBm±2dB) for LTE TDD  
Class 3 (24dBm+1/-3dB) for WCDMA  
Class E2 (27dBm±3dB) for EDGE 850/900MHz  
Class E2 (26dBm+3/-4dB) for EDGE  
1800/1900MHz  
Class 4 (33dBm±2dB) for GSM 850/900MHz  
Class 1 (30dBm±2dB) for GSM 1800/1900MHz

#### Consumption:

20uA @Power off  
3mA @Sleep, Typ.  
22mA @Idle

#### Sensitivity:

LTE B1: -101.5dBm (10M)  
LTE B2: -101dBm (10M)  
LTE B3: -101.5dBm (10M)  
LTE B4: -101dBm (10M)  
LTE B5: -101dBm (10M)  
LTE B7: -99.5dBm (10M)  
LTE B8: -101dBm (10M)  
LTE B12: -101dBm (10M)  
LTE B13: -100dBm (10M)  
LTE B20: -102.5dBm (10M)  
LTE B28: -102dBm (10M)  
WCDMA B1: -110dBm  
WCDMA B2: -110dBm

WCDMA B4: -110dBm  
WCDMA B5: -110.5dBm  
WCDMA B8: -110.5dBm  
GSM: -109dBm  
DCS: -109dBm

### Software Features

#### USB Serial Driver:

Windows XP, Windows Vista,  
Windows 7/8/8.1/10, Windows CE 5.0/6.0/7.0\*,  
Linux 2.6/3.x/4.1, Android 4.x/5.x/6.x/7.x

#### RIL Driver:

Android 4.x/5.x/6.x/7.x

#### NDIS Driver:

Windows 7/8/8.1/10

#### ECM Driver\*:

Linux 2.6/3.x/4.1

#### Gobinet Driver:

Linux 2.6/3.x/4.1

#### Linux qmi wwan Driver:

3.x (3.4 and later)/4.1

#### Protocols:

TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/  
CMUX\*/HTTPS\*/SMTP\*/MMS\*/FTPS\*/SMTPS\*/  
SSL\*/FILE\*

### General Features

3GPP E-UTRA Release 11  
Bandwidth: 1.4/3/5/10/15/20MHz  
Temperature Range: -40°C ~ +85°C  
Dimensions: 29.0mm × 32.0mm × 2.4mm  
LCC Package  
Approx. 4.9g  
Supply Voltage: 3.3V~4.3V, 3.8V Typ.  
3GPP TS27.007 and Enhanced AT Commands

### Approvals

RoHS Compliant  
CE/GCF/Vodafone (Europe)  
FCC/PTCRB/AT&T/Verizon (North America)  
RCM/Telstra (Australia)  
JATE/TELEC/DOCOMO\* (Japan)  
NCC (Taiwan)  
KC/SKT/KT\*/LGU+\* (Korea)  
IC/Rogers (Canada)  
Anatel (Brazil)  
CCC/SRRC/NAL (China)

①: LTE B2 of EC21-AU Does Not Support  
Rx-diversity

\* Under Development