

# **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 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 module and multi-mode LTE EC20/EC25 module in the compact and unified form factor. It contains 11 variants: EC21-E, EC21-EU, EC21-EC, EC21-A, EC21-V, EC21-AU, 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 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/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



Max 10Mbps (DL) Max 5Mbps (UL)



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



LCC Package



Embedded Abundant Protocols



eCall\*





USB 2.0 High Speed



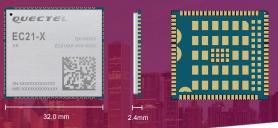


Quectel Enhanced

## **Quectel EC21**

# IoT/M2M-optimized LTE

#### Cat 1 Module



#### Variants for EMEA/Korea/Thailand

EC21-E:

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

GSM: B3/B8

LTE FDD: B1/B3/B7/B8/B20/B28A

WCDMA: B1/B8 GSM: B3/B8 EC21-EC:

LTE FDD: B1/B3/B7/B8/B20/B28A

WCDMA: B1/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/

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

CC21 I

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 Suppression

Audio:

Digital Audio and VoLTE (Voice over LTE)

(Optional)

Interfaces

UART × 2 : Main UART and Debug UART
USB x 1: USB 2.0 with High Speed up to 480Mbps

(U)SIM x 1: 1.8V/3.0V (U)SIM Interface Digital Audio through PCM Interface (Optional) NETLIGHT  $\times$  2 : NET\_STATUS and NET\_MODE

SDIO × 2 (for Wi-Fi and SD Card)

RESET (Active Low)
PWRKEY (Active Low)

Solder Pads for Primary, Rx-diversity and GNSS

Antennas

**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

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 bands Class 3 (23dBm±2dB) for LTE TDD bands Class 3 (24dBm+1/-3dB) for WCDMA bands Class E2 (27dBm±3dB) for GSM850 8-PSK Class E2 (27dBm±3dB) for EGSM900 8-PSK Class E2 (26dBm±3dB) for DCS1800 8-PSK

Class E2 (26dBm±3dB) for DCS1800 8-PSK Class E2 (26dBm±3dB) for PCS1900 8-PSK

Class 4 (33dBm±2dB) for GSM850 Class 4 (33dBm±2dB) for EGSM900

Class 1 (30dBm±2dB) for DCS1800

Class 1 (30dBm±2dB) for PCS1900

Consumption:

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

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 B18: -101.7dBm (10M) LTE B19: -101.4dBm (10M)

LTE B20: -102.5dBm (10M) LTE B26: -101.5dBm (10M)

LTE B28: -102dBm (10M) WCDMA B1: -110dBm WCDMA B2: -110dBm WCDMA B4: -110dBm WCDMA B5: -110.5dBm WCDMA B8: -110.5dBm GSM850: -109dBm

EGSM900: -109dBm DCS1800: -109dBm PCS1900: -109dBm

**Software Features** 

**USB Serial Driver:** 

Windows 7/8/8.1/10, Windows CE 5.0/6.0/7.0\*,

Linux 2.6/3.x/4.1~4.14, Android

4.x/5.x/6.x/7.x/8.x

RIL Driver:

Android 4.x/5.x/6.x/7.x/8.x

NDIS Driver:

Windows 7/8/8.1/10

ECM Driver\*:

Linux 2.6/3.x/4.1~4.14

Gobinet Driver:

Linux 2.6/3.x/4.1~4.14 Linux qmi wwan Driver:

3.x (3.4 and later)/4.1~4.14

Protocols:

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

**General Features** 

Temperature Range: -40°C ~ +85°C Dimensions: 29.0mm × 32.0mm × 2.4mm

Weight: Approx. 4.9g

LCC Package

Supply Voltage: 3.3V~4.3V, 3.8V Typ.

3GPP E-UTRA Release 11

Bandwidth: 1.4/3/5/10/15/20MHz

3GPP TS27.007, 27.005 and Enhanced AT Commands

**Approvals** 

RoHS Compliant

GCF (Global)

CE/Vodafone/Deutsche Telekom (Europe)

FCC/PTCRB/AT&T/Verizon (North America)
RCM/Telstra (Australia)
JATE/TELEC/DOCOMO (Japan)

NCC (Taiwan) KC/SKT/KT (Korea)

IC/Rogers (Canada) Anatel (Brazil) FAC (Russia) Telefonica\* (Spain)

Rx-diversity

CCC/SRRC/NAL (China)

(1): LTE B2 of EC21-AU Does Not Support

\* Under Development

