

Quectel EC21 Mini PCIe

IoT/M2M-optimized
LTE Cat 1 Module



Quectel EC21 Mini PCIe is a series of LTE category 1 module adopting standard PCI Express® Mini Card form factor (Mini PCIe). Especially optimized for M2M and IoT applications, it features cost-saving, low power LTE connectivity, and delivers M2M-optimized speeds of 10Mbps downlink and 5Mbps uplink. These make it ideal for numerous IoT applications that are not reliant on high speed connectivity but still require the longevity and reliability of LTE networks.

EC21 Mini PCIe contains 9 variants: EC21-E Mini PCIe, EC21-EU Mini PCIe, EC21-EC Mini PCIe, EC21-A Mini PCIe, EC21-V Mini PCIe, EC21-AU Mini PCIe, EC21-AUT Mini PCIe, EC21-J Mini PCIe and EC21-KL Mini PCIe. 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 Mini PCIe 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 applications such as smart metering, tracking and tracing, fleet management, wearable devices, smart home gateways, digital signs, and even drones.



Key Benefits

- ✓ Cost-effective, lower-power LTE connectivity optimized for broadband IoT applications
- ✓ Worldwide LTE, UMTS/HSPA+ and GSM/GPRS/EDGE coverage
- ✓ Standard PCI Express® MiniCard form factor (Mini PCIe) ideal for manufacturers to easily integrate wireless connectivity into their devices
- ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems
- ✓ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment



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



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



Mini PCIe Package



Embedded Abundant Protocols



eCall*



Multi-constellation GNSS



USB 2.0 High Speed Interface



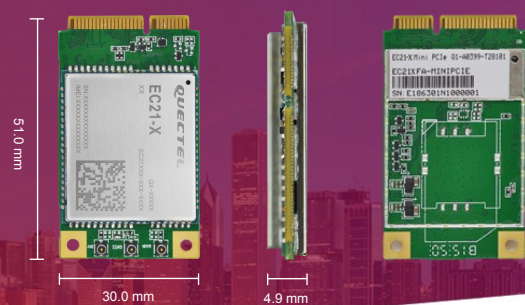
USB Drivers



Quectel Enhanced AT Commands

Quectel EC21 Mini PCIe

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Variants for EMEA/Korea/Thailand

EC21-E Mini PCIe:

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

EC21-EU Mini PCIe:

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

EC21-EC Mini PCIe:

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

Variants for North America

EC21-A Mini PCIe:

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

EC21-V Mini PCIe:

LTE FDD: B4/B13

Variants for Australia/New Zealand/Taiwan/ Brazil

EC21-AU Mini PCIe:

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

EC21-AUT Mini PCIe:

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

Variant for Japan

EC21-J Mini PCIe:

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

Variant for Korea

EC21-KL Mini PCIe:

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

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

USB 2.0 with High Speed up to 480Mbps
Digital Audio through PCM Interface (Optional)
1.8V/3.0V (U)SIM Interface
LED_WWAN# for Network Status Indication
W_DISABLE# for RF Function Control
UART x 1
PERST# for Module Resetting
Solder Pads for Main Antenna, Rx-diversity and
GNSS Antennas

Enhanced Features

eCall*
(U)SIM Card Detection
Support MIMO in DL Direction
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 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:

3.5mA @Sleep, Typ.
34mA @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*/
SSL*/FILE*

General Features

Temperature Range: -40°C ~ +80°C
Dimensions: 30.0mm × 51.0mm × 4.9mm
Mini PCIe Package
Weight: Approx. 9.8g
Supply Voltage: 3.0V~3.6V, 3.3V Typ.
3GPP E-UTRA Release 11
Bandwidth: 1.4/3/5/10/15/20MHz
3GPP TS27.007, 27.005 and Enhanced AT Com-
mands

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)

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

* Under Development