Quectel EC20 R2.1 Mini PCIe

IoT/M2M-optimized LTE Cat 4 Module

Quectel EC20 R2.1 Mini PCIe is an LTE category 4 module adopting standard PCI Express® MiniCard form factor (Mini PCIe). Adopting the 3GPP Release 11 LTE technology, it is optimized specially for M2M and IoT applications, and delivers 150 Mbps downlink and 50 Mbps uplink data rates.

Designed in the compact and unified form factor, EC20 R2.1 Mini PCIe is compatible with Quectel multi-mode EG25-G Mini PCIe module, which allows for flexible migration among them in design and manufacturing. Meanwhile, it is backward-compatible with existing EDGE and GSM/GPRS networks, ensuring that it can be connected even in remote areas devoid of 4G or 3G coverage.

EC20 R2.1 Mini PCIe supports multiple-input multiple-output (MIMO) technology. The use of multiple antennas at the receiver end at the same time and on the same frequency band greatly minimizes errors and optimizes the data speed. The module also combines high-speed wireless connectivity with embedded multi-constellation high-sensitivity GNSS (GPS, GLONASS, BeiDou, Galileo, and QZSS) receiver for positioning.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities (USB drivers for Windows 7/8/8.1/10, Linux, and Android) extend the applicability of the module to a wide range of M2M applications such as CPE, industrial router, industrial PDA, rugged tablet PC, video surveillance and digital signage.

Key Benefits

- LTE category 4 module optimized for M2M and 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
LTE Cat 4
Max. 150 Mbps (DL)
Max. 50 Mbps (UL)

AT
Quectel Enhanced AT Commands

Mini PCIe
Mini PCIe Package

Embedded Abundant Protocols

3G HSPA+
Max. 42 Mbps (DL)
Max. 5.76 Mbps (UL)

Multi-constellation GNSS

USB 2.0 High Speed Interface

USB Drivers

DFOTA
DFOTA

Version: 1.2 | Status: Released

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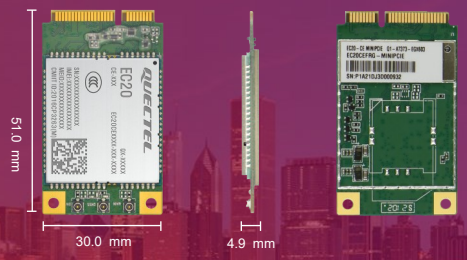

Variant for China/India

EC20-CE R2.1 Mini PCIe
LTE FDD: B1/B3/B5/B8
LTE TDD: B34/B38/B39/B40/B41
TD-SCDMA: B34/B39
WCDMA: B1/B8
CDMA: BC0
GSM: 900/1800 MHz

Data

LTE:
LTE FDD: Max. 150 Mbps (DL)/
Max. 50 Mbps (UL)
LTE TDD: Max. 130 Mbps (DL)/
Max. 30 Mbps (UL)
UMTS:
DC-HSDPA: Max. 42 Mbps (DL)
HSUPA: Max. 5.76 Mbps (UL)
WCDMA: Max. 384 kbps (DL/UL)
TD-SCDMA:
Max. 4.2 Mbps (DL)/Max. 2.2 Mbps (UL)
CDMA2000:
EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL)
1X Advanced: Max. 307.2 kbps (DL/UL)
GSM:
EDGE: Max. 296 kbps (DL)/Max. 236.8 kbps (UL)
GPRS: Max. 107 kbps (DL)/Max. 85.6 kbps (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 480 Mbps
Digital Audio through PCM (Optional)
1.8 V/3.0 V (U)SIM Card Interface
UART × 1
DTR for Sleep Mode Control
W_DISABLE# for Airplane Mode Control
LED_WWAN# for Network Status Indication
PERST# for Module Resetting
RI for Host Wake-up
WAKE# for Host Wake-up (Need a Pull-up Resistor)
Primary/Rx-diversity/GNSS Antenna Interfaces

Enhanced Features

DTMF
DFOTA: Delta firmware upgrade over the air
(U)SIM Card Detection
DL MIMO, support Rx-diversity Antenna
GNSS: GPS/GLONASS/BeiDou/Galileo/QZSS

Electrical Characteristics

Output Power:
Class 3 (23 dBm ±2 dB) for LTE FDD
Class 3 (23 dBm ±2 dB) for LTE TDD
Class 2 (24 dBm +1/-3 dB) for TD-SCDMA
Class 3 (24 dBm +1/-3 dB) for WCDMA
Class 3 (24 dBm +2/-1 dB) for EVDO/CDMA BC0
Class E2 (27 dBm ±3 dB) for EGSM900 8-PSK
Class E2 (26 dBm ±3 dB) for DCS1800 8-PSK
Class 4 (33 dBm ±2 dB) for EGSM900
Class 1 (30 dBm ±2 dB) for DCS1800
Consumption (Typical):
4.0 mA @ LTE Sleep (pF = 128)
3.7 mA @ LTE Sleep (pF = 256)
30 mA @ Idle
Sensitivity:
FDD B1: -101.6 dBm (10 MHz)
FDD B3: -101.9 dBm (10 MHz)
FDD B5: -102 dBm (10 MHz)
FDD B8: -102.1 dBm (10 MHz)
TDD B34: -101 dBm (10 MHz)
TDD B38: -101.3 dBm (10 MHz)
TDD B39: -101.2 dBm (10 MHz)
TDD B40: -101.4 dBm (10 MHz)
TDD B41: -101.4 dBm (10 MHz)
WCDMA B1: -112 dBm
WCDMA B8: -112 dBm
TD-SCDMA B34: -110 dBm
TD-SCDMA B39: -110 dBm
CDMA BC0: -108 dBm
EGSM900: -109 dBm
DCS1800: -109 dBm

Software Features

USB Serial Driver:
Windows 7/8/8.1/10,
Linux 2.6~5.12,
Android 4.x~11.x
GNSS Driver: Android 4.x~11.x
RIL Driver: Android 4.x~11.x
USB NDIS Driver: Windows 7/8/8.1/10
USB MBIM Driver:
Windows 8/8.1/10,
Linux 3.18~5.12
USB GobiNet Driver: Linux 2.6~5.12
USB QMI_WWAN Driver: Linux 3.4~5.12
USB RNDIS Driver:
Windows 7/8/8.1/10,
Linux 2.6~5.12
USB ECM Driver: Linux 2.6~5.12
PCIe MHI Driver:
Linux 3.10~5.12
Protocols:
TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS/FTPS/SMTPS/SSL/FILE

General Features

3GPP E-UTRA Release 11
Bandwidth: 1.4/3/5/10/15/20 MHz
Operation Temperature Range: -35 °C ~ +75 °C
Extended Temperature Range: - 40 °C ~ +80 °C
Dimensions: 51.0 mm x 30.0 mm x 4.9 mm
Mini PCIe Package
Approx. 10.6 g
Supply Voltage: 3.0~3.6 V, Typ. 3.3 V
3GPP TS27.007 and Enhanced AT Commands

Approvals

Regulatory:
China: SRRC/NAL/CCC
Others:
RoHS

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