

Quectel EM12-G

IoT/M2M-optimized LTE-A Cat 12 M.2 Module



Quectel EM12-G is LTE Advanced category 12 module optimized specially for M2M and IoT applications. Adopting the 3GPP Rel. 12 LTE technology, it delivers M2M-optimized speeds of 600Mbit/s downlink and 150Mbit/s uplink peak data rates. Designed in the M.2 form factor, EM12 is compatible with Quectel Cat6 module EM06 and future Cat 16 module EM16 , which will facilitate customers to migrate between different categories.

EM12-G which are designed for global and nearly cover all the main stream carriers worldwide.

EM12-G supports Qualcomm® IZat™ location technology Gen9HT Lite (GPS, GLONASS, BeiDou, Galileo). The integrated GNSS greatly simplifies product design, and provides quicker, more accurate and more dependable positioning capability.

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



Key Benefits

- ✓ LTE-A Cat 12 module with M.2 form factor, optimized for eMBB and IoT applications
- ✓ Support DL 3x carrier aggregation and 256QAM
- ✓ Worldwide LTE-A and UMTS/HSPA+ coverage
- ✓ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment
- ✓ Feature refinements: supports DFOTA and VoLTE
- ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems



LTE Cat 12
Max 600Mbps (DL)
Max 150Mbps (UL)



Max 42Mbps (DL)
Max 11.2Mbps (UL)



M.2 Form Factor



Embedded Abundant Protocols



Voice over LTE



Multi-constellation GNSS



USB 2.0/3.0 High Speed Interface



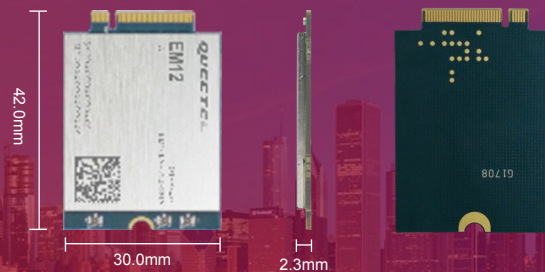
USB Drivers



Quectel Enhanced AT Commands

Quectel EM12-G

IoT/M2M-optimized LTE-A Cat 12 M.2 Module



For Global

EM12-G

LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/
B14/B17/B18/B19/B20/B21/B25/B26/B28/B29/
B30/B32/B66;
LTE-TDD: B38/39/B40/B41

DL 2×CA:

B1+3/5/18/19/20/26;
B2+2/4/5/12/13/17/29/30/66;
B3+3/5/7/8/19/20/28;
B4+4(CA_4C only)/5/12/13/17/29/30;
B5+7/25/30/66;
B7+7/20/28;
B12+25;B12+30;
B13+66;
B19+21;
B20+B32;
B25+25,B25+26,B25+41;
B29+30;
B38+38(CA_38C only);
B39+39(CA_39C only);
B39+39; B39+41
B40+40(CA_40C only);
B41+41;
B66+66 (CA_66C only);12,29,30;
B2+B14;B14+B30;B14+B66;
(Note: B29, B32 is only for secondary component
carrier)

DL 3×CA:

DL inter-band 3CA:
B1+3+5/7/8/19/20/28
B1+7+20,
B2+4+5,B2+4+13, B2+5+30, B2+12+30,
B2+29+30, B3+7+20, B3+7+28, B3+7+8,
B4+5+30, B4+12+30, B4+29+30,
B5+66+2, B13+66+2,
B66+12+30,B66+29+30,B66+5+30;
B2+B14+B66;
DL 2 intra-band plus inter-band 3CA:
B2+2+5, B2+2+13,
B3+3+7, B3+7+7, B3+3+20, B3+3+28, B3+3+1,
B4+4+5, B4+4+13,
B7+7+28,
B5+66+66, B13+66+66, B66+66+2,
B39+B39+B41; B39+B41+B41;
B14+B66+B66
DL 3 intra-band 3CA:

B40+40+40, B41+41+41, B66+66+66

DL 256QAM

UL Intra-band Continuous 2×CA:
B3+3;B41+41;

UL 64QAM

WCDMA Band:

B1/B2/B3/B4/B5/B8/B9/B19

Data

LTE:

LTE-FDD: Max 600Mbps (DL), Max 150Mbps (UL)
LTE-TDD: Max 408Mbps (DL), Max 90Mbps (UL)

UMTS:

DC-HSDPA: Max 42Mbps (DL)
HSUPA: Max 11.2Mbps (UL)
WCDMA: Max 384Kbps (DL), Max 384Kbps (UL)

SMS

Point-to-point MO and MT
SMS Cell Broadcast
Text and PDU Mode

Interfaces

USB 2.0/3.0, Supports Slave Mode
Digital Audio Through PCM Interface
I2C × 1
(U)SIM Interface × 2: 1. 8V/3.0V
ANTCTL × 4
W_DISABLE1#: Control Airplane Mode
RESET#: Reset the Module
WAKE_ON_WAN#: Wake up the Host
WWAN_LED#: Indicate Network Status
PCIe Interface*
Main, Diversity and GNSS Antenna Interfaces

Enhanced Features

MIMO: 2 × 2, 4 × 2, DL
eCall: Emergency Service*
Digital Audio and VoLTE (Voice over LTE)
(Optional)
(U)SIM Card Detection
DTMF: Dual-tone Multi-frequency*
DFOTA: Delta Firmware over the Air
GNSS: GPS/GLONASS/BeiDou/Galileo

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

Consumption:

56uA @Power off
3.7mA @Sleep, Typ.
10.3mA @Idle

Software Features

MBIM Driver: Windows 10
USB Serial Driver: Windows 7/8/8.1/10, Linux
2.6/3.x/4.1-4.14, Android 4.x/5.x/6.x/7.x
RIL Driver: Android 4.x/5.x/6.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
QMI_WWAN Driver: Linux 3.x (3.4 or later)/4.1-
4.14
Protocols:
PPP/QMI/NTP*/TCP*/UDP*/FTP*/HTTP*/PING*/
HTTPS*/SMTP*/MMS*/FTPS*/SMTPS*/SSL*

General Features

3GPP E-UTRA Release 12
Bandwidth: 1.4/3/5/10/15/20MHz
Supply Voltage: 3.135V~4.4V, 3.7V Typ.
Temperature Range:
Operating temperature Range:
-30°C ~ +70°C
-10°C ~ +65°C (Only for UL CA ACLR test)

Extended Temperature Range: -40°C ~ +85°C
Dimensions: 42.0mm × 30.0mm × 2.3mm
M.2 Package
Approx. TBD
3GPP TS27.007 and Quectel Enhanced AT
Commands

Approvals

CE/FCC/CCC/IC/RCM/Microsoft WHQL
GCF/PTCRB/JATE/TELEC
Telstra*/ATT*/Verizon*/Telefonica*

*under development