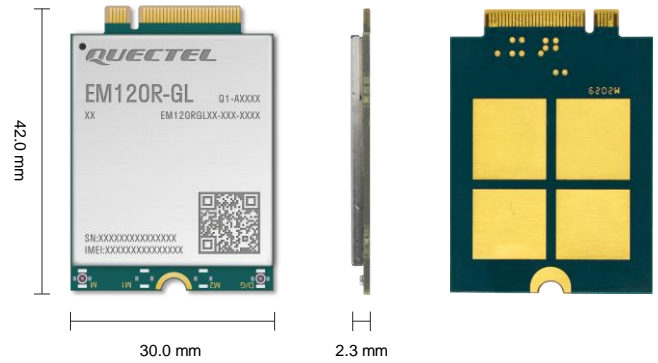




# Quectel EM120R-GL

## LTE-A Cat 12 M.2 Module



Quectel EM120R-GL is an LTE Advanced Category 12 module. Adopting the 3GPP Release 14 technology, it supports a theoretical downlink peak data rate of 600 Mbps and a theoretical uplink peak data rate of 150 Mbps. Designed in M.2 form factor, the module is compatible with Quectel LTE-A Cat 6 module EM06, Cat 12 modules EM12-G, EM160R-GL and EM121R-GL, which facilitates customers' migration between different modules.

EM120R-GL is designed for global market and nearly covers all the mainstream carriers worldwide. The module is embedded with a multi-constellation and high-sensitivity GNSS (GPS, GLONASS, BDS and Galileo) receiver for positioning. 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 (PCIe interface/ USB drivers for Windows, Linux, Android/ optional Built-in eSIM) extend the applicability of the module to a wide range of applications such as industrial router, home gateway, set-top boxes, industrial laptop, consumer laptop, industrial PDA, rugged tablet PC, video transmission and digital signage.



## Key Features

- ✓ LTE-A Cat 12 module with M.2 form factor
- ✓ Support DL 3 Carrier Aggregation and 256QAM
- ✓ Worldwide LTE-A and UMTS/HSPA+ coverage
- ✓ Support PCIe Gen2 interface for PC/ Laptop application
- ✓ Built-in eSIM (optional)
- ✓ Low power mode
- ✓ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment
- ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems



DL: LTE Cat 12  
UL: LTE Cat 13



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



M.2 Form Factor



Embedded Abundant  
Protocols



PCIe Gen2  
Interface



Multi-constellation GNSS  
(Optional)



USB 2.0/3.0 High Speed  
Interface



Quectel Enhanced  
AT Commands

# Quectel EM120R-GL

LTE Cat 12		EM120R-GL
Region/ Operator	Global	
Package	M.2 Package, Key-B	
Dimensions (mm)	42.0 × 30.0 × 2.3	
Weight (g)	6.8	
<b>Temperature Range</b>		
Operation Temperature	-25 °C to +75 °C	
Extended Temperature	-40 °C to +85 °C	
<b>Frequency Bands</b>		
LTE	LTE-FDD	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17 <sup>①</sup> / 18/ 19/ 20/ 25/ 26/ 28/ 29 <sup>②</sup> / 30/ 32 <sup>②</sup> / 66
	LTE-TDD	B38/ 39/ 40/ 41/ 42/ 43/ 46 <sup>③</sup> (LAA)/ 48 (CBRS)
	DL 2CA	Intra-band and Inter-band
	DL 3CA	Intra-band and Inter-band
	DL 256QAM	Supported
	UL 2CA	Intra-band
	UL 64QAM	Supported
UMTS	WCDMA	B1/ 2/ 3/ 4/ 5/ 6/ 8/ 19
GNSS (Optional)	GPS/ GLONASS/ BDS/ Galileo	
<b>Certifications</b>		
Regulatory	Global: GCF Europe: CE North America: PTCRB America: FCC Canada: IC Brazil: Anatel Mexico: IFETEL China: SRRC/ NAL/ CCC Taiwan, China: NCC South Korea: KC Japan: JATE/ TELEC Australia/New Zealand: RCM South Africa: ICASA	
Carrier	Europe: Vodafone/ British Telecom/ Swisscom America: Verizon/ AT&T/ T-Mobile/ Sprint China: China Mobile/ China Unicom Japan: NTT DOCOMO/ SoftBank <sup>®</sup> / KDDI/ Rakuten Australia: Telstra	
<b>Data Rate (Max.)</b>		
LTE	600 Mbps (DL); 150 Mbps (UL)	
	DC-HSDPA	42 Mbps (DL)
UMTS	HSUPA	5.76Mbps (UL)
	WCDMA	384 kbps (DL); 384 kbps (UL)
<b>Enhanced Features</b>		
MIMO: DL 2 × 2	●	
(U)SIM Card Detection & Hot Plug	●	
Built-in eSIM	○	
DSSA: Dual SIM, Single Active	●	
DFOTA: Delta Firmware Over-the-Air	●	
Embedded GNSS	○	

## NOTE:

- ①: B17 is supported through MFBI + B12.
- ②: LTE-FDD B29/ 32 and LTE-TDD B46 support Rx only and are only for secondary component carrier.
- ③: Currently, SoftBank certification is only supported for PC applications.
- \*: Under development/In progress.
- : Supported; ○: Optional.

# Quectel EM120R-GL

LTE Cat 12		EM120R-GL
<b>SMS</b>		
Point-to-point MO and MT		●
SMS Cell Broadcast		●
Text and PDU Mode		●
3GPP/3GPP2		●
Windows OS SMS Push Feature		●
<b>Software Features</b>		
3GPP		3GPP E-UTRA Release 14
AT Command		3GPP TS27.007 Quectel Enhanced AT Commands
Protocols		QMI/ MBIM/ NITZ/ PING
<b>Drivers</b>	<b>MBIM Driver</b>	Windows 10/ 11 Linux 3.18–6.5
	<b>USB Serial Driver</b>	Windows 7/ 8/ 8.1/ 10/ 11 Linux 2.6–6.5 Android 4.x–13.x
	<b>NDIS Driver</b>	Windows 7/ 8/ 8.1/ 10/ 11
	<b>QMI_WWAN Driver</b>	Linux 3.4–6.5
	<b>PCIe MHI Driver</b>	Windows 10/ 11 Linux 3.10–6.5
<b>Interfaces</b>		
(U)SIM Interfaces (1.8/ 3.0 V)		× 2
USB 2.0/ 3.0, supporting Slave Mode		× 1
PCIe Interface		× 1
PCM*		× 1
Control and Indication Interfaces		× 7 (Airplane mode control, GNSS control*, Wake-up control, RF status indication, etc.)
Cellular/ WLAN COEX UART Interface*		× 1
Antenna Tuner Control Interfaces*		× 2
Configuration Pins		× 4
Antenna Interfaces		× 2 (Main, Rx-diversity/GNSS)
<b>Electrical Features</b>		
Supply Voltage Range		3.135–4.4 V, typ. 3.7 V
<b>Transmitting Power</b>	<b>USB Mode</b>	<ul style="list-style-type: none"> <li>LTE-FDD: Class 3 (23 dBm ±2 dB)</li> <li>LTE-TDD: <ul style="list-style-type: none"> <li>B41 HPUE: Class 2 (25.5 dBm +1/-2 dB)</li> <li>Other bands: Class 3 (23 dBm ±2 dB)</li> </ul> </li> <li>WCDMA: Class 3 (23 dBm ±2 dB)</li> </ul>
	<b>PCIe Only Mode</b>	<ul style="list-style-type: none"> <li>LTE-FDD: <ul style="list-style-type: none"> <li>B30: Class 3 (22 dBm +1/-2 dB)</li> <li>Other bands: Class 3 (24 dBm +1/-2 dB)</li> </ul> </li> <li>LTE-TDD: <ul style="list-style-type: none"> <li>B41: Class 3 (23 dBm +1/-2 dB)</li> <li>B42/ 43/ 48: Class 3 (21 dBm +1/-2 dB)</li> <li>B41 HPUE: Class 2 (25.5 dBm +1/-2 dB)</li> <li>Other bands: Class 3 (24 dBm +1/-2 dB)</li> </ul> </li> <li>WCDMA: Class 3 (23 dBm ±2 dB)</li> </ul>
<b>Power Consumption</b>	<b>USB Mode</b>	66 µA @ Power down 1.84 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.48 mA @ Idle (PF = 64, USB Active)
	<b>PCIe Only Mode</b>	66 µA @ Power down 2.35 mA @ Sleep (AT+CFUN=0, Modern standby) 15.05 mA @ Idle (PF = 64, PCIe Active)

## NOTE:

- \*: Under development/ In progress.
- : Supported; ○: Optional.