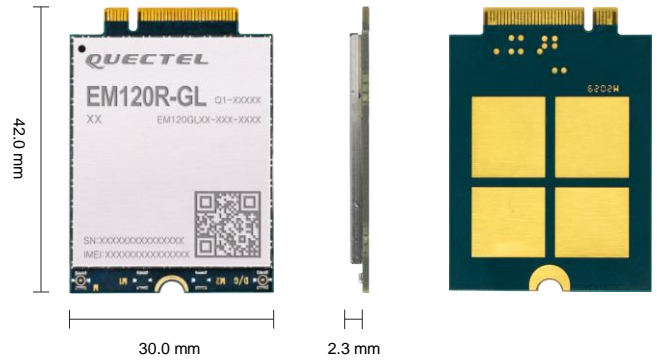


# Quectel EM120R-GL

## 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/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 supports Qualcomm® IZat™ location technology Gen9-VT (GPS, GLONASS, BeiDou/Compass and 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 (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, STB, industrial laptop, consumer laptop, industrial PDA, rugged tablet PC, and digital signage, etc.



### 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), DSSA
- ✓ 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



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	42.0 mm × 30.0 mm × 2.3 mm		
Weight	6.8 g		
Temperature Range			
Operation Temperature	-25 °C to +75 °C		
Extended Temperature	-40 °C to +85 °C		
Frequency Bands			
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 <sup>①</sup> /B30/B32 <sup>①</sup> /B66	
	LTE-TDD	B38/B39/B40/B41/B42/B43/B46 <sup>①</sup> (LAA)/B48 (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/B2/B3/B4/B5/B6/B8/B19	
GNSS	GPS/GLONASS/BeiDou(COMPASS)/Galileo		
Certifications			
Regulatory	<b>Global:</b> GCF <b>Europe:</b> CE <b>North America:</b> PTCRB <b>America:</b> FCC <b>Canada:</b> IC <b>Brazil:</b> Anatel <b>Mexico:</b> IFETEL <b>China:</b> SRRC/ NAL/ CCC <b>Taiwan, China:</b> NCC <b>South Korea:</b> KC <b>Japan:</b> JATE/ TELEC <b>Australia/New Zealand:</b> RCM <b>South Africa:</b> ICASA		
	Carrier	<b>Europe:</b> Vodafone/ British Telecom/ Swisscom <b>America:</b> Verizon/ AT&T/ T-Mobile/ Sprint <b>China:</b> China Mobile/ China Unicom <b>Japan:</b> NTT DOCOMO/ SoftBank <sup>②</sup> / KDDI <b>Australia:</b> Telstra <sup>TBD</sup>	
		Others*	WHQL
		Data Rate (Max.)	
		LTE	600 Mbps (DL); 150 Mbps (UL)
	UMTS	DC-HSDPA	42 Mbps (DL)
		DC-HSUPA	5.76Mbps (UL)
WCDMA		384 kbps (DL); 384 kbps (UL)	
Enhanced Features			
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	●		

## Notes:

- ①: For secondary component carrier only.
- ②: 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/ HTTP/ HTTPS	
Drivers	<b>MBIM Driver</b>	Windows 10
	<b>USB Serial Driver</b>	Windows 7/8/8.1/10 Linux 2.6/3.x/4.x/5.x Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x
	<b>RIL Driver</b>	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x
	<b>NDIS Driver</b>	Windows 7/8/8.1/10
	<b>ECM Driver*</b>	Linux 2.6/3.x/4.x/5.x
	<b>Gobinet Driver</b>	Linux 2.6/3.x/4.x/5.x
	<b>QMI_WWAN Driver</b>	3.x (3.4 or later)/ 4.x/5.x
	<b>PCIe MHI Driver</b>	Windows 10 Linux 3.10–5. 10
<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	
Transmitting Power	<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 (24 dBm +1/-3 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/B43/B48: 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 (24 dBm +1/-3 dB)</li> </ul>	
Power Consumption	<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)	

## Notes:

1. \*: Under development/In progress.
2. •: Supported; ○: Optional.