

# Quectel RM502Q-GL

## IoT/eMBB-Optimized 5G Sub-6 GHz M.2 Module



Quectel RM502Q-GL is a 5G module optimized specially for IoT/eMBB applications. Adopting the 3GPP Release 15 LTE technology, it supports both 5G NSA and SA modes. Designed in an M.2 form factor, RM502Q-GL is compatible with Quectel LTE-A Cat 6 module EM06, Cat 12 modules EM12-G/EM120R-GL/EM121R-GL, and Cat 16 module EM160R-GL, which facilitates customers' migration from LTE-A to 5G.

RM502Q-GL is an industrial-grade module for industrial and commercial applications only.

The global version RM502Q-GL nearly covers all the mainstream carriers worldwide. The module supports Qualcomm® IZat™ location technology Gen9C Lite (GPS, GLONASS, BeiDou/Compass and Galileo). The integrated GNSS receiver 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/PCIe drivers for Windows 7/8/8.1/10, Linux, Android) 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.



## Key Features

- ✓ 5G/4G/3G multi-mode module with M.2 form factor, optimized for IoT and eMBB applications
- ✓ Worldwide 5G and LTE-A coverage
- ✓ Both NSA and SA modes supported
- ✓ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment
- ✓ Feature refinements: DFOTA and VoLTE (optional)



5G NR Sub-6 Bands Supported



DL: LTE Cat 20  
UL: LTE Cat 18



DL: max. 42 Mbps  
UL: max. 5.76 Mbps



Embedded Abundant Protocols



M.2 Form Factor



Multi-constellation GNSS



USB 3.1/PCIe 3.0 High Speed Interface



Voice over LTE (Optional)



Quectel Enhanced AT Commands

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5G Sub-6		RM502Q-GL
Region/Operator	Global (except for US/ China/ Japan)	
Dimensions (mm)	30.0 × 52.0 × 2.3	
Weight (g)	9.0	
Temperature Range		
Operation Temperature	-30 °C to +70 °C	
Extended Temperature	-40 °C to +85 °C	
Frequency Bands		
5G	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	5G NR NSA	n38/n41/n77/n78
	5G NR SA	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78
	MIMO	DL 4 × 4 MIMO on n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78 UL 2 × 2 MIMO on n41/n77/n78
LTE	LTE Category	DL Cat 20/ UL Cat 18
	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71
	LTE-TDD	B34/B38/B39/B40/B41/B42/B43/B48
	LAA	B46
	MIMO	DL 4 × 4 MIMO on B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66
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 <sup>①</sup> <b>America:</b> FCC* <b>Canada:</b> IC <sup>①</sup> <b>Australia/New Zealand:</b> RCM	
Carrier	TBD	
Others	RoHS/WHQL	
Data Rate (Max.) <sup>②</sup>		
5G SA Sub-6	DL 4.2 Gbps; UL 900 Mbps	
5G NSA Sub-6	DL 5.0 Gbps; UL 600/650 Mbps <sup>③</sup>	
LTE	DL 2.0 Gbps; UL 200 Mbps	
WCDMA	DL 42 Mbps; UL 5.76 Mbps	
Interfaces		
(U)SIM	x 2	
USB 2.0	x 1	
USB 3.0/3.1	x 1	
PCIe 3.0	x 1	
PCM*	x 1	
Antenna	x 4	
Voice		
VoLTE	Digital Audio and VoLTE (Voice over LTE) (Optional)	

## Notes:

- ①: PTCRB and IC with limited bands.
- ②: The presented data rates are theoretical only, and the actual value depends on network conditions.
- ③: 600 Mbps is the typical value; while 650 Mbps is the theoretical data rate when the UL 256QAM of both LTE and 5G NR are enabled (LTE UL 256QAM in EN-DC is disabled by default and has not been deployed by operators, and it is not fully tested).
- \*: Under development.
- TBD: To Be Determined.

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5G Sub-6	RM502Q-GL
<b>Enhanced Features</b>	
eSIM*	○
DTMF*	●
DFOTA*	●
(U)SIM Card Detection	●
<b>Drivers</b>	
USB Serial Driver	Windows 7/8/8.1/10; Linux 2.6–5.4; Android 4.x/5.x/6.x/7.x/8.x/9.x/10
GNSS Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10
NDIS Driver	Windows 7/8/8.1/10
MBIM Driver	Windows 10; Linux 3.18–5.4
GobiNet Driver	Linux 2.6–5.4
QMI_WWAN Driver	Linux 3.4–5.4
<b>Electrical Features</b>	
Supply Voltage Range	3.135–4.4 V, typical 3.7 V
Output Power	<b>5G NR:</b> Class 2 (26 dBm) for n41/n77/n78; Class 3 (23 dBm) for other Sub-6 bands. <b>LTE:</b> Class 2 (26 dBm) for B38/B40/B41/B42/B43; Class 3 (23 dBm) for other LTE bands. <b>WCDMA :</b> Class 3 (23 dBm).
Power Consumption	70 $\mu$ A @ Power down 4.06 mA @ Sleep, typ. 33 mA @ Idle

## Notes:

1. \*: Under development.
2. ●: Supported; ○: Optional.