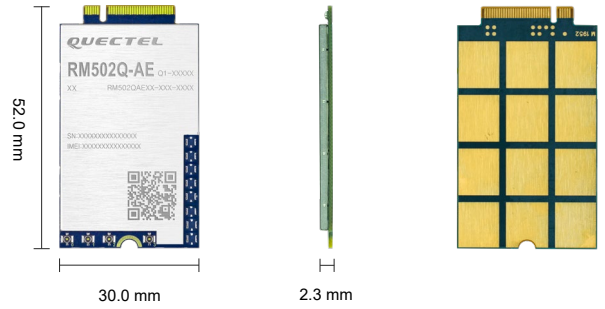


Quectel RM502Q-AE

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



Quectel RM502Q-AE is a 5G module optimized specially for IoT/eMBB applications. Adopting the 3GPP Rel-15 LTE technology, it supports both 5G NSA and SA modes. Designed in an M.2 form factor, RM502Q-AE 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-AE is an industrial-grade module for industrial and commercial applications only.

The Global version RM502Q-AE 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 the 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 and PCIe drivers for Windows 7/8/8.1/10, Linux, Android) extend the applicability of the module to a wide range of eMBB 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

Quectel RM502Q-AE

5G Sub-6		RM502Q-AE
Region/Operator	Global (Except for China)	
Dimensions (mm)	30.0 × 52.0 × 2.3	
Weight (g)	8.7	
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	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79
	5G NR SA	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79
	MIMO	DL: 4 × 4 MIMO on n1/n2/n3/n7/n25/n38/n40/n41/n48*/n66/n77/n78/n79 UL: 2 × 2 MIMO on n41
LTE Category		
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12(B17)/B13/B14/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71
	LTE-TDD	B34/B38/B39/B40/B41/B42/B43/B48
	LAA	B46 (only support 2 × 2 MIMO)
	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	Global: GCF Europe: CE North America: PTCRB America: FCC Canada: IC Japan: JATE/TELEC Australia/New Zealand: RCM	
Carrier	America: Verizon*/AT&T*/T-Mobile Australia: Telstra	
Others	RoHS/WHQL	
Data Rate (Max.) ^①		
5G SA Sub-6	DL 4.2 Gbps; UL 450 Mbps	
5G NSA Sub-6	DL 5.0 Gbps; UL 600/650 Mbps ^②	
LTE	DL 2.0 Gbps; UL 200 Mbps	
WCDMA	DL 42 Mbps; UL 5.76 Mbps	
Interfaces		
(U)SIM	x 1	
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: The presented data rates are theoretical only, and the actual value depends on network conditions.
- ^②: 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/in progress.

Quectel RM502Q-AE

5G Sub-6	RM502Q-AE
Enhanced Features	
eSIM*	○
DTMF*	●
DFOTA*	●
(U)SIM Card Detection	●
Drivers	
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
Electrical Features	
Supply Voltage Range	3.135–4.4 V, typical 3.7 V
Power Consumption	80 μ A @ Power down 4.2 mA @ Sleep 39 mA @ USB 2.0, Idle 54.5 mA @ USB 3.0, Idle

Notes:

1. *: Under development/in progress.
2. ●: Supported; ○: Optional.