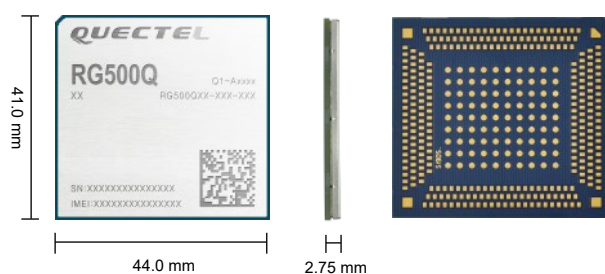




# Quectel RG500Q Series

IoT/M2M-optimized

5G Sub-6 GHz LGA Module



Quectel RG500Q is a series of 5G Sub-6 GHz LGA modules optimized specially for IoT and M2M applications. Adopting the 3GPP Rel-15 technology, it delivers maximum data rates up to 2.5 Gbps downlink and 900 Mbps uplink. It supports both 5G NSA and SA modes, Option 3x, 3a and Option 2 network architectures, which makes it backwards compatible with 4G/3G network. It is pin-to-pin compatible with Quectel LTE-A Cat 12 EG512R-EA module. It can meet customers' different application demands for high speed, large capacity, low latency, and high reliability etc.

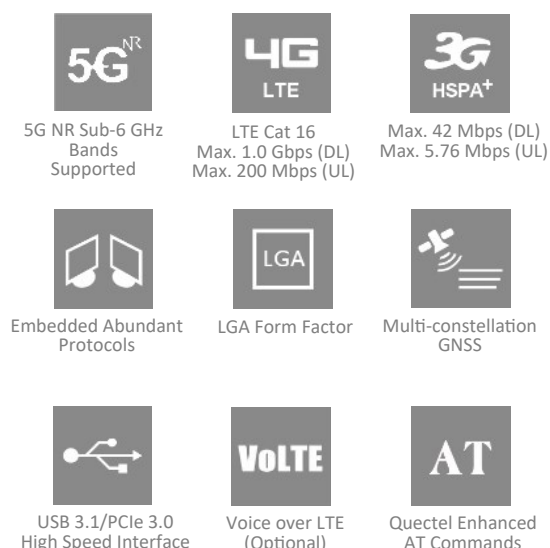
RG500Q series contains two variants: RG500Q-EA and RG500Q-NA\*. It supports Qualcomm® IZat™ location technology Gen9C Lite (GPS, GLONASS, BeiDou, Galileo and QZSS). The integrated GNSS receiver greatly simplifies product design and provides quicker, more accurate and more dependable positioning capability.

A rich set of Internet protocols, industry-standard interfaces (USB 2.0/3.0/3.1, PCIe 3.0, RGMII, PCM, UART, etc.) and abundant functionalities (USB drivers for Windows 7/8/8.1/10, Linux and Android) extend the applicability of the module to a wide range of IoT and M2M applications such as business router, home gateway, STB, industrial laptop, consumer laptop, industrial PDA, rugged tablet PC and video surveillance.



## Key Features

- ✓ Optimized for IoT and M2M applications with LGA form factor supported
- ✓ Worldwide 5G/4G/3G coverage
- ✓ 5G 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)



Version: 1.1 | Status: Released

# Quectel RG500Q Series

|                                           | RG500Q-EA                                                                                                                                                                                                                                                                            | RG500Q-NA*                                                                                                                                                                                                                                                           |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Region/Operator                           | EMEA/APAC                                                                                                                                                                                                                                                                            | North America                                                                                                                                                                                                                                                        |
| Dimensions (mm)                           | 41.0 × 44.0 × 2.75                                                                                                                                                                                                                                                                   | 41.0 × 44.0 × 2.75                                                                                                                                                                                                                                                   |
| Weight (g)                                | 11.0                                                                                                                                                                                                                                                                                 | TBD                                                                                                                                                                                                                                                                  |
| Temperature Range                         |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| Operating Temperature                     | -30 °C to +75 °C                                                                                                                                                                                                                                                                     | -30 °C to +75 °C                                                                                                                                                                                                                                                     |
| Extended Temperature                      | -40 °C to +85 °C                                                                                                                                                                                                                                                                     | -40 °C to +85 °C                                                                                                                                                                                                                                                     |
| Frequency Bands <sup>①</sup>              |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| 5G NR NSA                                 | n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79                                                                                                                                                                                                                                       | n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78                                                                                                                                                                                                                             |
| 5G NR SA                                  | n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79                                                                                                                                                                                                                                       | n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78                                                                                                                                                                                                                             |
| LTE-FDD                                   | B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32                                                                                                                                                                                                                                               | B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B29/B30/B66/B71                                                                                                                                                                                                                  |
| LTE-TDD                                   | B34/B38/39/B40/B41/B42/B43                                                                                                                                                                                                                                                           | B41/B42/B43/B48                                                                                                                                                                                                                                                      |
| LAA                                       | -                                                                                                                                                                                                                                                                                    | B46                                                                                                                                                                                                                                                                  |
| WCDMA                                     | B1/B3/B5/B6/B8/B19                                                                                                                                                                                                                                                                   | B2/B4/B5                                                                                                                                                                                                                                                             |
| MIMO                                      | DL: 4 × 4<br>UL <sup>②</sup> : 2 × 2                                                                                                                                                                                                                                                 | DL: 4 × 4<br>UL <sup>②</sup> : 2 × 2                                                                                                                                                                                                                                 |
| GNSS                                      | GPS/GLONASS/BeiDou/Galileo/QZSS (optional)                                                                                                                                                                                                                                           | GPS/GLONASS/BeiDou/Galileo/QZSS (optional)                                                                                                                                                                                                                           |
| Certifications                            |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| Carrier                                   | South Korea: LGU+<br>Australia: Telstra*<br>China: China Telecom*/China Mobile*/China Unicom*                                                                                                                                                                                        | America: Verizon*/AT&T*/T-Mobile*                                                                                                                                                                                                                                    |
| Regulatory                                | Europe: CE<br>China: SRRC/ NAL/ CCC<br>South Korea: KC<br>Australia/New Zealand: RCM                                                                                                                                                                                                 | Global: GCF*<br>North America: PTCRB*<br>America: FCC*<br>Canada: IC*                                                                                                                                                                                                |
| Others                                    | RoHS                                                                                                                                                                                                                                                                                 | RoHS                                                                                                                                                                                                                                                                 |
| Max. Data Transmission Rates <sup>③</sup> |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| 5G SA Sub-6 GHz                           | 2.1 Gbps (DL)/ 900 Mbps (UL)                                                                                                                                                                                                                                                         | 2.1 Gbps (DL)/ 450 Mbps (UL)                                                                                                                                                                                                                                         |
| 5G NSA Sub-6 GHz                          | 2.5 Gbps (DL)/ 650 Mbps (UL)                                                                                                                                                                                                                                                         | 2.5 Gbps (DL)/ 650 Mbps (UL)                                                                                                                                                                                                                                         |
| LTE                                       | 1.0 Gbps (DL)/ 200 Mbps (UL)                                                                                                                                                                                                                                                         | 1.0 Gbps (DL)/ 200 Mbps (UL)                                                                                                                                                                                                                                         |
| UMTS                                      | 42 Mbps (DL)/ 5.76 Mbps (UL)                                                                                                                                                                                                                                                         | 42 Mbps (DL)/ 5.76 Mbps (UL)                                                                                                                                                                                                                                         |
| Interfaces                                |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| (U)SIM                                    | × 2, 1.8/2.95 V                                                                                                                                                                                                                                                                      | × 2, 1.8/2.95 V                                                                                                                                                                                                                                                      |
| UART                                      | × 3                                                                                                                                                                                                                                                                                  | × 3                                                                                                                                                                                                                                                                  |
| SD Card                                   | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| USB 2.0/3.0/3.1                           | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| PCIe 3.0                                  | Gen3, Lane × 2                                                                                                                                                                                                                                                                       | Gen3, Lane × 2                                                                                                                                                                                                                                                       |
| RGMII                                     | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| PCM*                                      | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| I2S*                                      | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| I2C                                       | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| SPI                                       | × 1                                                                                                                                                                                                                                                                                  | × 1                                                                                                                                                                                                                                                                  |
| ADC                                       | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| RESET_N                                   | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| GPIOs (QuecOpen <sup>®</sup> )            | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| Wi-Fi                                     | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| Antennas                                  | Cellular: 6 + 2 (n79)<br>GNSS: × 1                                                                                                                                                                                                                                                   | Cellular: × 4<br>GNSS: × 1                                                                                                                                                                                                                                           |
| Voice                                     |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| Voice                                     | Digital Audio and VoLTE (Voice over LTE) (optional)                                                                                                                                                                                                                                  | Digital Audio and VoLTE (Voice over LTE) (optional)                                                                                                                                                                                                                  |
| Enhanced Features                         |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| DTMF*                                     | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| DFOTA*                                    | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| (U)SIM Card Detection                     | ●                                                                                                                                                                                                                                                                                    | ●                                                                                                                                                                                                                                                                    |
| Drivers                                   |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| USB Serial Driver                         | Windows 7/8/8.1/10,<br>Linux 2.6–5.8,<br>Android 4.x–10.0                                                                                                                                                                                                                            | Windows 7/8/8.1/10,<br>Linux 2.6–5.8,<br>Android 4.x–10.0                                                                                                                                                                                                            |
| PCIe MHI Driver                           | Windows 10<br>Linux 3.10–5.8                                                                                                                                                                                                                                                         | Windows 10<br>Linux 3.10–5.8                                                                                                                                                                                                                                         |
| GNSS Driver                               | Android 4.x–10.0                                                                                                                                                                                                                                                                     | Android 4.x–10.0                                                                                                                                                                                                                                                     |
| RIL Driver                                | Android 4.x–10.0                                                                                                                                                                                                                                                                     | Android 4.x–10.0                                                                                                                                                                                                                                                     |
| NDIS Driver                               | Windows 7/8/8.1/10                                                                                                                                                                                                                                                                   | Windows 7/8/8.1/10                                                                                                                                                                                                                                                   |
| MBIM Driver                               | Windows 8/8.1/10, Linux 3.18–5.8                                                                                                                                                                                                                                                     | Windows 8/8.1/10, Linux 3.18–5.8                                                                                                                                                                                                                                     |
| GobiNet Driver                            | Linux 2.6–5.8                                                                                                                                                                                                                                                                        | Linux 2.6–5.8                                                                                                                                                                                                                                                        |
| QMI_WWAN Driver                           | Linux 3.4–5.8                                                                                                                                                                                                                                                                        | Linux 3.4–5.8                                                                                                                                                                                                                                                        |
| Electrical Features                       |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                      |
| Supply Voltage Range                      | 3.3–4.3 V, typ. 3.8 V                                                                                                                                                                                                                                                                | 3.3–4.3 V, typ. 3.8 V                                                                                                                                                                                                                                                |
| Output Power                              | Class 3 (24 dBm +1/-3 dB) for WCDMA bands<br>Class 3 (23 dBm ±2 dB) for LTE bands<br>Class 3 (23 dBm ±2 dB) for 5G NR bands<br>Class 2 (26 dBm ±2 dB) for LTE B38/B40/B41/B42 bands HPUE <sup>④</sup><br>Class 2 (26 dBm +2/-3 dB) for 5G NR n41/n77/n78/n79 bands HPUE <sup>④</sup> | Class 3 (24 dBm +1/-3 dB) for WCDMA bands<br>Class 3 (23 dBm ±2 dB) for LTE bands<br>Class 3 (23 dBm ±2 dB) for 5G NR bands<br>Class 2 (26 dBm ±2 dB) for B41/B48 bands HPUE <sup>④</sup><br>Class 2 (26 dBm +2/-3 dB) for 5G NR n41/n77/n78 bands HPUE <sup>④</sup> |
| Power Consumption                         | 0.033 mA @ Power off<br>1.45mA @ Sleep, typ.<br>20.1 mA @ Idle                                                                                                                                                                                                                       | TBD @ Power off<br>TBD @ Sleep, typ.<br>TBD @ Idle                                                                                                                                                                                                                   |

## Notes:

- \* means under development.
- ① For CA bands, see document *Quectel\_RG50xQ\_Series\_CA&EN-DC\_Features*.
- ② means only supported in 5G SA mode.
- ③ means the data rates are theoretical and depend on the network condition.
- ④ HPUE only supports single carrier.

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