Quectel RM50xQ Series

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

Quectel RM50xQ are a series of 5G modules optimized specially for IoT/eMBB applications. Adopting the 3GPP Release 15 technology, it supports both 5G NSA and SA modes. Designed in an M.2 form factor, RM50xQ series modules are 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.

RM50xQ series are industrial-grade modules for industrial and commercial applications only.

The globally applicable RM50xQ series nearly covers all the mainstream carriers worldwide. The module supports Qualcomm® IZat™ location technology Gen9C Lite (GPS, GLONASS, BDS 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 transmission 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)
### Quectel RM50xQ Series

**Region/Operator**

- Global (Except for China)
- Global (Except for China)
- Global (Except for China)
- Global (except for United States)
- China

### Dimensions (mm)

<table>
<thead>
<tr>
<th>Region/Operator</th>
<th>RM500Q-AE</th>
<th>RM502Q-AE</th>
<th>RM505Q-AE</th>
<th>RM500Q-GL</th>
<th>RM500Q-CN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10.5×20×2.7</td>
<td>10.5×20×2.7</td>
<td>10.5×20×2.7</td>
<td>10.5×20×2.7</td>
</tr>
</tbody>
</table>

### Weight (g)

- 8.7
- 8.7
- 8.7
- 8.7
- 8.9

### Supply Voltage Range

- 3.15 – 4.4 V, typical 3.7 V
- 3.15 – 4.4 V, typical 3.7 V
- 3.15 – 4.4 V, typical 3.7 V
- 3.15 – 4.4 V, typical 3.7 V
- 3.15 – 4.4 V, typical 3.7 V

### Power Consumption

- 8μA @ Power down
- 8μA @ Power down
- 8μA @ Power down
- 70μA @ Power down
- 78μA @ Power down

### Temperature Range

- Operation Temperature: -30°C to +75°C
- Extended Temperature: -40°C to +85°C

### Frequency Bands

#### 5G NR

- NSA
  - B1/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 19/ 20/ 25/ 38/ 39/ 40/ 41/ 42/ 43/ 66/ 71
- SA
  - B1/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 19/ 20/ 25/ 38/ 39/ 40/ 41/ 42/ 43/ 66/ 71

#### LTE

- LTE-FOO
  - B1/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 19/ 20/ 25/ 38/ 39/ 40/ 41/ 42/ 43/ 66/ 71
- LTE-TDD
  - B3/ 4/ 38/ 39/ 40/ 41/ 42/ 43/ 48
- LAA
  - B46 (only support 2 × 2 MIMO)

#### UMTS

- WCDMA
  - B2/ 3/ 5/ 6/ 7/ 8/ 19

#### GNSS (Optional)

- B3/ 4/ 38/ 39/ 40/ 41/ 42/ 43/ 48

### Certifications

- Carriers
  - Deutsche Telekom / AT&T / T-Mobile / Telecom Italia / Verison
  - Deutsche Telekom / AT&T / T-Mobile / Telstra / China Mobile / China Unicom
  - Deutsche Telekom / China Telecom / China Mobile / China Unicom

- Regulatory
  - GCF / CE / PTB / FCC / IC / NCC / JATEL / TeLC / RCM
  - GCF / CE / TSB / FCC / IC / JATEL / Tele / RCM
  - GCF / CE / SRRC / NAF / FCC / IC / RCM
  - SRRC / NA / CCC

### Others

- Rhône/WHQI
- Rhône/WHQI
- Rhône/WHQI

### Data Rate (Max.)

<table>
<thead>
<tr>
<th>5G Sub-6</th>
<th>5G NSA Sub-6</th>
<th>LTE</th>
<th>WCDMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>5G 1.2 Gbps / 450 Mbps</td>
<td>5G 2.5 Gbps / 600 Mbps</td>
<td>5G 1.0 Gbps / 1.2 Gbps</td>
<td>4G 0.5 Mbps / 5 Mbps</td>
</tr>
</tbody>
</table>

### Interface

- (U)SIM
  - x 1
  - x 1
  - x 1
  - x 1

- USB 2.0
  - x 1
  - x 1

- USB 3.0/3.1
  - x 1
  - x 1

- PCIe 3.0
  - x 1
  - x 1

- PCM
  - x 1

### Antenna

- Cellular: x 3
- Cellular + GNSS L1: x 1

### Voice

- Digital Audio & VoLTE
  - 0
  - 0

### Enhanced Features

- eSIM
  - 0
  - 0

- DTMF*
  - 0

- DFOTA
  - 0

- (U)SIM Card Detection
  - 0

### 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 550 Mbps is the theoretical data rate on 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).
3. 525 Mbps is the typical value; while 550 Mbps is the theoretical data rate on 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).
4. 6.0 Gbps is the typical value; while 650 Mbps is the theoretical data rate on 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).
5. Under development/ in progress.
6. TBD: To Be Determined.