

Quectel RM500U Series

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

Quectel RM500U series is a 5G Sub-6 GHz module specifically optimized for IoT/ eMBB/ URLLC applications. With the 3GPP Release 15/ Release 16 technology, it supports both 5G NSA and SA modes, and makes it backward compatible with the 4G/ 3G network. Designed in an M.2 form factor, RM500U series is compatible with Quectel 5G RM500Q series modules.

RM500U series is an industrial-grade module for industrial and commercial applications only.

RM500U series contains two variants: RM500U-CN and RM500U-EA. RM500U series provides a rich set of built-in network protocols, integrates industry-standard interfaces and supports multiple drivers and software functions (such as USB/ PCIe drivers for Windows, Linux and Android operating systems). It has greatly expanded its application scope in IoT/ eMBB/ URLLC, such as industrial router, home gateway, STB, 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/ eMBB/ URLLC applications
- ✓ Worldwide 5G and LTE-A coverage
- ✓ 5G NSA and SA modes supported
- ✓ Feature refinements: DFOTA, VoLTE and VoNR



5G NR Sub-6 GHz Band



Max. 600 Mbps (DL)
Max. 150 Mbps (UL)



Max. 42.2 Mbps (DL)
Max. 11 Mbps (UL)



Embedded Abundant Protocols



M.2 Form Factor



Quectel Enhanced AT Commands



USB 3.0 High Speed Interface



VoNR/ VoLTE



PCIe 2.0 Interface

Quectel RM500U Series

| 5G Sub-6 | RM500U-CN | RM500U-EA |
|--------------------------------|---|--|
| Region/Operator | EMEA, APAC | EMEA, APAC, Latin America |
| Dimensions (mm) |  |  |
| Weight (g) | 8.9 | 9.2 |
| 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 | | |
| 5G NR | 3GPP Release 15/ Release 16 ^① NSA/SA operation, Sub-6 GHz | 3GPP Release 15 NSA/ SA operation, Sub-6 GHz |
| 5G NR NSA | n41/ 78/ 79 | n1/ 3/ 7/ 28/ 38/ 40/ 41/ 77/ 78 |
| 5G NR SA | n1/ 28/ 41/ 77/ 78/ 79 | n1/ 3/ 5/7/ 8/ 20/ 28/ 38/ 40/ 41/ 66/ 71*/ 77/ 78 |
| MIMO | DL 4 × 4 MIMO: n1/ 41/ 77/ 78/ 79 UL 2 × 2 MIMO : n41/ 77/ 78/ 79 DL 2 × 2 MIMO : n28 | DL 4 × 4 MIMO: n1/ 3/ 7/ 28 / 38/ 40/ 41/ 66/ 77/ 78 UL 2 × 2 MIMO: n38/ 40/ 41/ 77/ 78 DL 2 × 2 MIMO: n5/ 8/ 20 / 71* |
| LTE Category | DL Cat 12, UL Cat 13 | DL Cat 12, UL Cat 13 |
| LTE-FDD | B1/ 2/ 3/ 5/ 7/ 8/ 20/ 28 | B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28/ 66 |
| LTE-TDD | B34/ 38/ 39/ 40/ 41 | B38/ 40/ 41 |
| DL 2 × 2 MIMO | B1/ 2/ 3/ 5/ 7/ 8/ 20/ 28/ 34/ 38/ 39/ 40/ 41 | B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66 |
| UMTS WCDMA | B1/ 2/ 5/ 8 | B1/ 2/ 5/ 8 |
| Certifications | | |
| Regulatory | China: SRRC/ NAL/ CCC Europe: CE Australia/New Zealand: RCM | Europe: CE* Australia/New Zealand: RCM* |
| Carrier | China: China Telecom/ China Mobile ^③ / China Unicom ^③ | TBD |
| Others | RoHS/ WHQL | RoHS |
| Data Rates (Max.) ^② | | |
| 5G SA Sub-6 | 2 Gbps (DL)/ 1 Gbps (UL) | 2 Gbps (DL)/ 1 Gbps (UL) |
| 5G NSA Sub-6 | 2.2 Gbps (DL)/ 575 Mbps (UL) | 2.6 Gbps (DL)/ 650 Mbps (UL) |
| LTE | 600 Mbps (DL)/ 150 Mbps (UL) | 600 Mbps (DL)/ 150 Mbps (UL) |
| UMTS | 42.2 Mbps (DL)/ 11 Mbps (UL) | 42.2 Mbps (DL)/ 11 Mbps (UL) |
| Interfaces | | |
| (U)SIM | × 2 | × 2 |
| USB 2.0 | × 1 | × 1 |
| USB 3.0 | × 1 | × 1 |
| PCIe 2.0 | × 1 | × 1 |
| SPI | × 1 | × 1 |
| UART | × 1 | × 1 |
| I2C | × 1 | × 1 |
| PCM | × 1 | × 1 |
| Antenna | × 4 | × 4 |
| Audio | | |
| Voice (optional) | Digital Audio, VoLTE and VoNR | Digital Audio, VoLTE and VoNR |

NOTE:

- ①: 3GPP Release 16 standard and 5G new features are optional.
- ②: Theoretical only. The actual values depend on network conditions.
- *: Under development/planning/in progress.
- ③: TBD.
- TBD: To Be Determined.

Quectel RM500U Series

| 5G Sub-6 | RM500U-CN | RM500U-EA |
|---------------------------------------|---|---|
| Enhanced Features | | |
| eSIM | ○ | ○ |
| DTMF | ● | ● |
| DFOTA | ● | ● |
| (U)SIM Card Detection | ● | ● |
| 5G Network Slicing | ● | ● |
| 5G LAN ^① | ● | - |
| 5G High-precision Timing ^① | ● | - |
| URLLC ^① | ● | - |
| Drivers | | |
| USB Serial Driver | Windows 7/ 8/ 8.1/ 10/ 11 Linux 2.6–5.18 Android 4.x–13.x | Windows 7/ 8/ 8.1/ 10/ 11 Linux 2.6–5.18 Android 4.x–13.x |
| RIL Driver | Android 4.x–13.x | Android 4.x–13.x |
| PCIe Driver | Linux 3.10–5.18 | Linux 3.10–5.18 |
| USB RNDIS Driver | Windows 7/ 8/ 8.1/ 10/ 11 Linux 2.6–5.18 | Windows 7/ 8/ 8.1/ 10/ 11 Linux 2.6–5.18 |
| USB ECM Driver | Linux 2.6–5.18 | Linux 2.6–5.18 |
| USB NCM Driver | Linux 2.6–5.18 | Linux 2.6–5.18 |
| Electrical Features | | |
| Supply Voltage Range | 3.3–4.4 V, typ. 3.7 V | 3.3–4.4V, typ. 3.7 V |
| Power Consumption | 90 μA @ Power off 3.7 mA @ Sleep 70 mA @ USB 3.0, idle | 99 uA @ Power off 4.8 mA @ Sleep 62.5 mA @ USB 2.0, idle 75.5 mA @ USB 3.0, idle |

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- : Supported; ○: Optional.
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- TBD: To Be Determined.