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

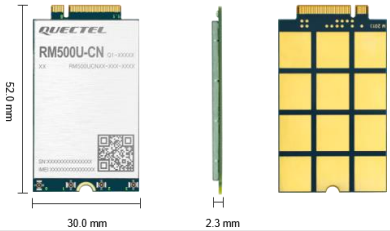
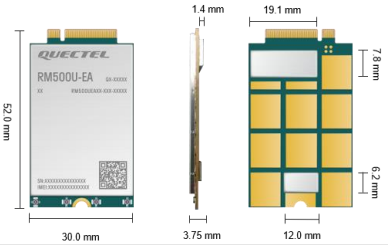
USB 3.0 High Speed Interface

VoNR/ VoLTE

PCIe 2.0 Interface

Version: 1.2 | Status: Released

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	5G NR	3GPP Release 15/ Release 16① 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	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 Mobile③/ China Unicom③	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. ①: 3GPP Release 16 standard and 5G new features are optional.
2. ②: Theoretical only. The actual values depend on network conditions.
3. *: Under development/planning/in progress.
4. ③ : TBD.
5. TBD: To Be Determined.

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5G Sub-6	RM500U-CN	RM500U-EA
Enhanced Features		
eSIM	○	○
DTMF	●	●
DFOTA	●	●
(U)SIM Card Detection	●	●
5G Network Slicing	●	●
5G LAN①	●	-
5G High-precision Timing①	●	-
URLLC①	●	-
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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