

Quectel 5G modules for New Radio (NR) Sub-6GHz



2021

We develop solutions to enable your future products

Quectel 5G modules for New Radio (NR) Sub-6GHz

5G Modules Overview



Sub-6GHz

Sub-6GHz + mmWave

RG500Q Series



- LGA Form Factor
- Variants:
 - EA Commercial Sample 1
 - NA Engineering Sample

RM500Q Series



- M.2 Form Factor
- Variant:
 - GL Engineering Sample
 - NA Planning

RG510Q-XX



- LGA Form Factor
- Variant:
 - XX Planning

RM510Q-GL



- M.2 Form Factor
- Variant:
 - GL Engineering Sample

RG502Q-EA



- LGA Form Factor
- Variant:
 - EA Engineering Sample

RM502Q-GL



- M.2 Form Factor
- Variant:
 - GL Engineering Sample

RM500

VS

RM502

Data Transmission*	
5G SA Sub-6 Data Rate (Mbps)	DL 2.1 Gbps; UL 900 Mbps
5G NSA Sub-6 Data Rate (Mbps)	DL 2.5 Gbps; UL 650 Mbps
LTE Data Rate (Mbps)	DL 1.0 Gbps; UL 200 Mbps
WCDMA Data Rate (Mbps)	DL 42 Mbps; UL 5.76 Mbps

Data Transmission*	
5G SA Sub-6 Data Rate	DL 4.1 Gbps; UL 900 Mbps
5G NSA Sub-6 Data Rate	DL 5.0 Gbps; UL 650 Mbps
LTE Data Rate	DL 2.0 Gbps; UL 200 Mbps
WCDMA Data Rate	DL 42 Mbps; UL 5.76 Mbps

Quectel 5G modules for New Radio (NR) Sub-6GHz

RG50xQ Series Specifications (1)

■ UMTS/LTE/5G Multi-Mode Module



44.0 mm × 41.0 mm × 2.75 mm
5G Sub-6 GHz LGA Module

Variant		RG500Q-EA	RG502Q-EA
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79
	SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n77/n78/n79	n1/n3/n7/n38/n40/n41/n77/n78/n79
	UL 2 × 2 MIMO	n41/n77/n78/n79	n41/n77/n78/n79
LTE	LTE Category	Cat 16	Cat 20
	LTE Bands	B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32/B34/B38/B39/B40/B41/B42/B43	B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32/B34/B38/B39/B40/B41/B42/B43
	DL 4 × 4 MIMO	B1/B3/B7/B32/B34/B38/B39/B40/B41/B42/B43	B1/B3/B7/B32/B34/B38/B39/B40/B41/B42/B43
UMTS	WCDMA Bands	B1/B3/B5/B6/B8/B19	B1/B3/B5/B6/B8/B19
Embedded GNSS		Supported	Supported
PCIe 3.0 Interface		Supported	Supported
USB 3.1 Interface		Supported	Supported
RGMII Interface		Supported	Supported
Region		EMEA/ APAC	EMEA/ APAC
Certification		Carrier: LGU+/ Telstra*/ China Telecom*/ China Mobile*/ China Unicom Regulatory: CE/ SRRC/ NAL/ CCC/ KC/ RCM	Carrier: TBD Regulatory: CE/ RCM

Quectel 5G modules for New Radio (NR) Sub-6GHz

RG50xQ Series Specifications (2)

■ UMTS/LTE/5G Multi-Mode Module



44.0 mm × 41.0 mm × 2.75 mm
5G Sub-6 GHz LGA Module

Variant		RG500Q-EU (Preliminary)	RG501Q-EU (Preliminary)
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78
	SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n77/n78	n1/n3/n7/n38/n40/n41/n77/n78
	UL 2 × 2 MIMO	n41	n41
LTE	LTE Category	Cat 16	Cat 20
	LTE Bands	B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42	B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42
	DL 4 × 4 MIMO	B1/B3/B7/B38/B40/B41/B42	B1/B3/B7/B38/B40/B41/B42
UMTS	WCDMA Bands	B1/B5/B8	B1/B5/B8
Embedded GNSS		Supported	Supported
PCIe 3.0 Interface		Supported	Supported
USB 3.1 Interface		Supported	Supported
RGMII Interface		Supported	Supported
Region		EMEA/ Oceania/ Brazil	EMEA/ Oceania/ Brazil
Certification		Carrier: TBD Regulatory: CE*/ RCM*	Carrier: TBD Regulatory: CE*/ RCM*

Quectel 5G modules for New Radio (NR) Sub-6GHz

RG50xQ Series Specifications (3)

■ UMTS/LTE/5G Multi-Mode Module



44.0 mm × 41.0 mm × 2.75 mm
5G Sub-6 GHz LGA Module

Variant		RG500Q-NA (Preliminary)
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA Bands	n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78
	SA Bands	n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78
	DL 4 × 4 MIMO	n2/n7/n25/n41/n48/n66/n77/n78
	UL 2 × 2 MIMO	n41
LTE	LTE Category	Cat 16
	LTE Bands	B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B29/ B30/B41/B42/B43/B46/B48/B66/B71
	DL 4 × 4 MIMO	B2/B4/B25/B30/B41/B42/B43/B46/B48/B66
UMTS	WCDMA Bands	B2/B4/B5
Embedded GNSS		Supported
PCIe 3.0 Interface		Supported
USB 3.1 Interface		Supported
RGMI Interface		Supported
Region		North America
Certification		Carrier: Verizon*/ AT&T*/ T-Mobile* Regulatory: GCF*/ PTCRB*/ FCC*/ IC*

Notes: 1. “*”: Under development / In progress.
2. TBD: To Be Determined.

Quectel 5G modules for New Radio (NR) Sub-6GHz

RM500Q Series/RM505Q-AE Specifications

■ UMTS/LTE/5G Multi-Mode Module



Variant		RM500Q-GL	RM500Q-AE (Preliminary)	RM505Q-AE (Preliminary)
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz		3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA Bands	n41/n77/n78/n79	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79
	SA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79
	UL 2 × 2 MIMO	n41/n77/n78/n79	n41	n41
LTE	LTE Category	DL Cat 16/ UL Cat 18		DL Cat 16/ UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B8/B19		B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported	Supported	Supported (Independent GNSS Antenna Port, Active)
PCIe 3.0 Interface		Supported	Supported	Supported
USB 3.1 Interface		Supported	Supported	Supported
eSIM		Supported / Built-in eSIM (optional)	Supported / Built-in eSIM (optional)	Supported / Built-in eSIM (optional)
Region		Global (except for US)		Global
Certification		Carrier: China Telecom*/ China Mobile*/ China Unicom/ KT*/ SKT*/ LGU+* Regulatory: GCF™/ CE/ SRRC/ NAL/ CCC/ KC/ RCM	Carrier: AT&T*/ T-Mobile*/ Verizon*/ NTT DOCOMO*/ Telstra* Regulatory: GCF*/ PTCRB*/ CE/ RCM/ IC*/ FCC*/ JATE*/ TELEC*	Carrier: AT&T*/ T-Mobile*/ Verizon*/ Telstra* Regulatory: GCF*/ PTCRB*/ CE*/ RCM*/ IC*/ FCC*

Notes: 1. “*”: Under development / In progress.
2. TBD: To Be Determined.

Quectel 5G modules for New Radio (NR) Sub-6GHz

RM502Q Series Specification

■ UMTS/LTE/5G Multi-Mode Module



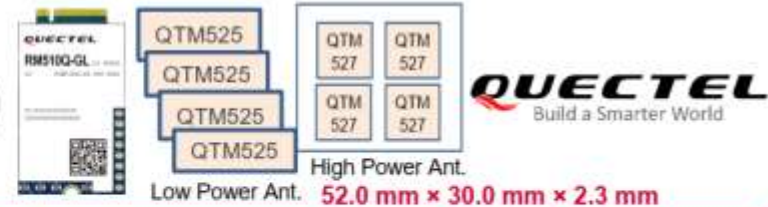
QUECTEL
Build a Smarter World

52.0 mm × 30.0 mm × 2.3 mm
5G Sub-6 GHz M.2 Module

Variant	RM502Q-GL	RM502Q-AE	
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA Bands	n38/n41/n77/n78	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79
	SA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78	n1/n2/n3/n7/n25/n28/n38/n40/n41/n48/n66/77/n78/n79
	UL 2 × 2 MIMO	n41/n77/n78	n41
LTE	LTE Category	DL Cat 20/ UL Cat 18	DL Cat 20/ UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/39/B40/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B6/B8/B19	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS	Supported	Supported	
PCIe 3.0 Interface	Supported	Supported	
USB 3.1 Interface	Supported	Supported	
eSIM	Supported / Built-in eSIM (optional)	Supported / Built-in eSIM (optional)	
Region	Global (except for US/ China/ Japan)	Global	
Certification	Carrier: TBD Regulatory: GCF ^{TBD} / PTCRB ^① / CE/ RCM/ IC ^② / FCC ^{TBD}	Carrier: AT&T*/ T-Mobile*/ Verizon*/ Telstra* Regulatory: GCF*/ PTCRB*/ CE/ RCM/ IC/ FCC	

RM510Q-GL Specifications (Preliminary)

■ 5G Sub-6 GHz + mmWave Module



Variant	RM510Q-GL	
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz, mmWave
	Sub6 NSA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79
	Sub6 SA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79
	mmWave Bands	n257/n258/n260/n261
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79
	UL 2 × 2 MIMO	n41/n257/n258/n260/n261
LTE	LTE Category	DL Cat 20 / UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
PCIe 3.0 Interface		Supported
USB 3.1 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		Carrier: Verizon*/AT&T*/T-Mobile*/ Telstra* Regulatory: GCF*/ CE*/ PTCRB*/ FCC*/ IC*/ RCM*

Quectel 5G modules for New Radio (NR) Sub-6GHz

5G Key Technology: Much More Spectrum



mmWave
100-800MHz Bandwidth

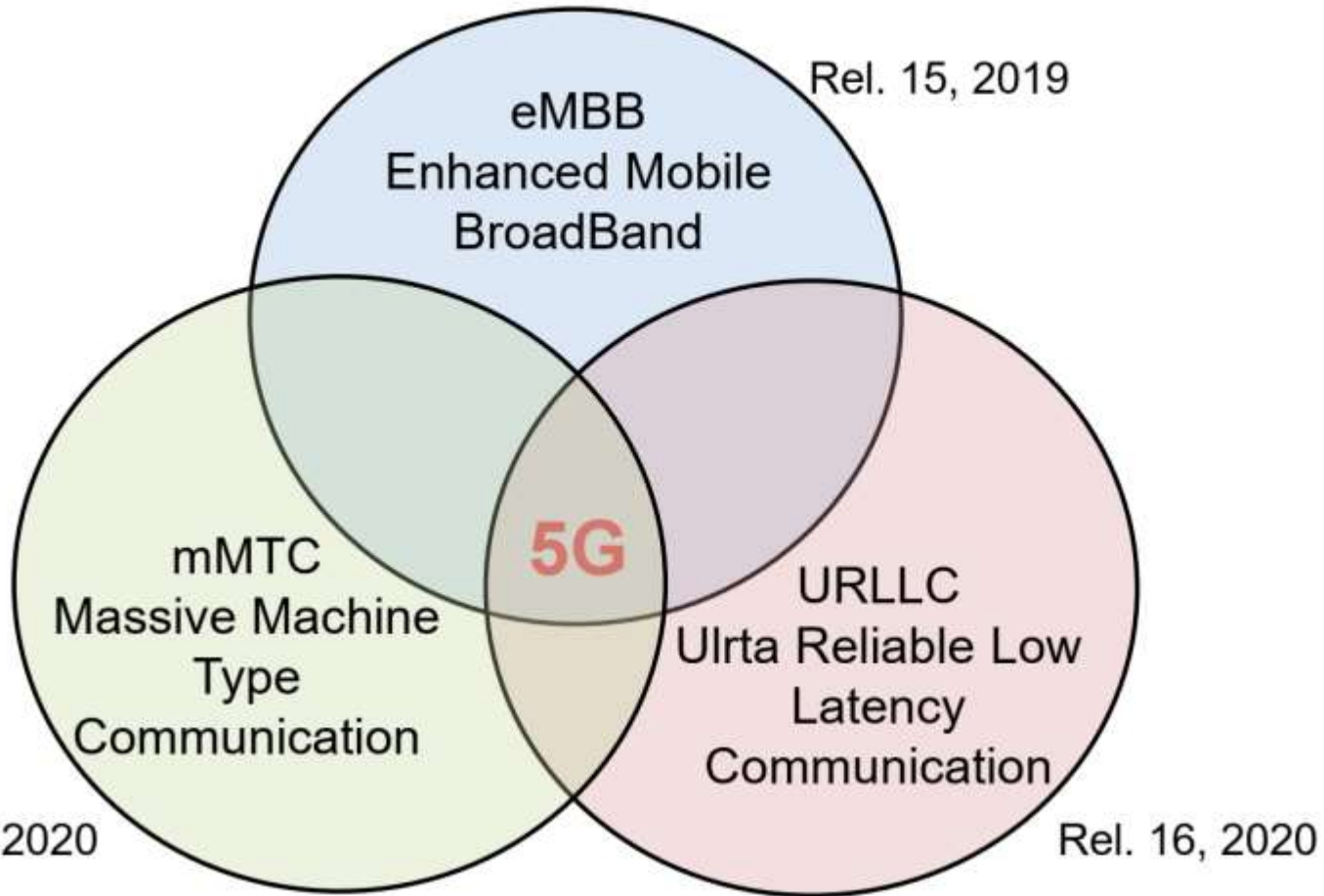
Sub-6GHz
100-200MHz Bandwidth

Sub 2.6GHz
20-100MHz Bandwidth



Quectel 5G modules for New Radio (NR) Sub-6GHz

5G – More than two letters




Quectel 5G modules for New Radio (NR) Sub-6GHz

Global spectrum for industrial IoT / private Networks



USA


- 3.5 GHz CBRS band, exclusive and shared licenses, deployments in 2H 2019
- 37-37.6 GHz shared spectrum/local licenses, under evaluation

Netherland


- 3.5 GHz for local industrial use; 3.7-3.8 GHz (in consultations); 2.3-2.4 GHz (licensed shared access online booking system)
- 3.5 GHz for local industrial use; however users may need to move to 3.7-3.8 GHz, if allocated; 2.3 GHz approved for PMSE

Germany


- 3.7 - 3.8 GHz
- Local licenses. Assignment complete; available 2H 2019

France


- 2.6 GHz
- Regulator database and approval. 20 MHz approved for Professional Mobile Radio

U.K.


- 3.8-4.2 GHz
- Local licenses (50 meters square); regulator database; decision formalized; applications invited from end 2019

Australia


- 24.25-27.5 GHz
- Under evaluation

Sweden


- 3.7-3.8 GHz
- In consultations

Hong Kong


- 24.25-28.35 (400 MHz)
- Local licenses; regulator approval. Approved; available 3Q 2019

Finland


- Sub-licensing of 3.4-3.8 GHz
- Local permission via operator lease; assignment complete

Japan


- Phase 1: 2,575-2,595 MHz (as NSA anchor) and 28.2-28.3 GHz; Local licenses, legislation planned in December 2019.
- Phase 2: 4.6-4.8 GHz & 28.3-29.1 GHz; local license, possible regulator database. Consultation planned Aug. 2019, legislation planned 3Q 2020