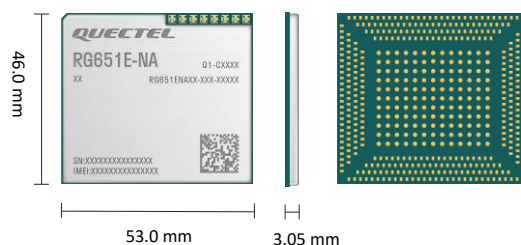


Quectel RG651E-NA

IoT/ eMBB-Optimized LGA 5G Sub-6 GHz and mmWave Module



Quectel RG651E-NA is a 5G LGA module optimized specially for IoT and eMBB applications. Adopting the 3GPP Rel-17 technology, it supports both 5G NSA and SA modes with Option 3x/ 3a/ 3 and Option 2 network architectures, and is backward compatible with the 4G/ 3G networks. The module can meet customers' different application demands for high speed, large capacity, low latency, high reliability, etc.

RG651E-NA is an industrial-grade module for industrial and commercial applications only.

RG651E-NA supports Qualcomm® IZat™ location technology Gen9C Lite (GPS, GLONASS, BDS, 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, PCM, UART, etc.) and abundant functionalities (USB drivers for Windows, Linux and Android) extend the applicability of the module to a wide range of IoT and eMBB applications such as business routers, home gateway, STB, industrial laptops, consumer laptops, industrial PDA, rugged tablet PCs and video transmission.



Key Features

- ✓ 5G/ 4G/ 3G multi-mode module with LGA package, optimized for IoT and eMBB applications
- ✓ Worldwide 5G, LTE-A and 3G coverage
- ✓ 5G NSA and SA modes
- ✓ Multi-constellation GNSS receiver (optional) available for applications requiring fast and accurate fixes in any environment
- ✓ Feature refinements: DFOTA and VoNR*/ VoLTE* (optional)



5G NR Sub-6 GHz and mmWave



LTE Cat 20 (DL)
LTE Cat 18 (UL)



Max. 42 Mbps (DL)
Max. 5.76 Mbps (UL)



Embedded Abundant Protocols



LGA Package



Multi-constellation GNSS (optional)



USB 3.1 High Speed Interface



PCIe 3.0 Interface



Quectel Enhanced AT Commands



RoHS Compliant



VoNR* /VoLTE* (optional)

Version: 1.0.0 | Status: Preliminary

Quectel RG651E-NA

RG651E-NA

Region/ Operator	North America
Dimensions (mm)	46.0 × 53.0 × 3.05
Weight (g)	TBD
Temperature Range	
Operating Temperature	-30 °C to +75 °C
Extended Temperature	-40 °C to +85 °C
Frequency Bands	
	5G NR 3GPP Rel-17 NSA/ SA operation, Sub-6 GHz and mmWave
	5G NR NSA n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 257 ^② / 258 ^② / 260 ^② / 261 ^②
5G	5G NR SA n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 257 ^② / 258 ^② / 260 ^② / 261 ^②
	DL 4 × 4 MIMO n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 257 ^② / 258 ^② / 260 ^② / 261 ^②
	8RX* (optional) n38/ 41/ 48/ 77/ 78
	LTE Category Cat 20 (DL)/ Cat 18 (UL)
	LTE-FDD B2/ 4/ 5/ 7/ 12 (17)/ 13/ 14/ 25/ 26/ 29/ 30/ 66/ 71
LTE	LTE-TDD B38/ 41/ 42/ 43/ 48
	LAA B46
	DL 4 × 4 MIMO B2/ 4/ 5/ 7/ 12 / 13/ 14/ 17/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 71
WCDMA	-
GNSS (optional)	GPS/ GLONASS/ BDS/ Galileo/ QZSS
Certifications	
Regulatory	TBD
Carrier	TBD
Others	RoHS
Data Rates (Max.) ^①	
5G SA Sub-6	7.01 Gbps (DL)/ 1.25 Gbps (UL)
5G NSA Sub-6	5.47 Gbps (DL)/ 730 Mbps (UL)
5G NSA mmWave	9.41 Gbps (DL)/ 3.66 Gbps (UL)
5G SA mmWave	8.61 Gbps (DL)/ 3.54 Gbps (UL)
5G TDD + mmWave	10.95 Gbps (DL)/ 4.79 Gbps (UL)
5G FDD + mmWave	9.54 Gbps (DL)/ 3.79 Gbps (UL)
LTE	2.0 Gbps (DL)/ 211 Mbps (UL)
WCDMA	-
Interfaces	
(U)SIM	1.8/ 3.0 V × 1; 1.8 V × 1 (eSIM external)
UART	× 3
USB 2.0/ 3.0/ 3.1	× 1
PCIe 3.0	2-Lane × 2, 1-Lane × 1
PCM*	× 2
I2C	× 2
SPI	× 2
ADC	●
RESET_N	●
GPIOs (QuecOpen®)	●
Antenna	Sub-6 GHz: × 8; GNSS: × 1; mmWave: × 8

NOTE:

- ①: The presented data rates are theoretical only, and actual values depend on network conditions.
- ②: with mmWave antenna.
- *: Under development/ Ongoing.
- : Supported.

Quectel RG651E-NA

RG651E-NA	
Audio	
Audio	Digital Audio; VoLTE*/ VoNR* (Optional)
Enhanced Features	
DTMF*	●
DFOTA	●
(U)SIM Card Detection	●
Drivers	
USB Serial Driver	Windows 7/ 8/ 8.1/ 10/ 11; Linux 2.6–6.5; Android 4.x–13.x
GNSS Driver	Android 4.x–13.x
RIL Driver	Android 4.x–13.x
USB NDIS Driver	Windows 7/ 8/ 8.1/ 10/ 11
USB MBIM Driver	Windows 8/ 8.1/ 10/ 11; Linux 3.18–6.5
USB GobiNet Driver	Linux 2.6–6.5
USB QMI_WWAN Driver	Linux 3.4–6.5
PCIe MHI Driver	Linux 3.10–6.5
Electrical Features	
Supply Voltage Range	3.3–4.4 V, typ. 3.8 V
Output Power	5G NR: - Class 1.5 (29 dBm +2/ -3 dB) for n38/ 41/ 77/ 78 - Class 2 (26 dBm +2/ -3 dB) for n2/ 5/ 7/ 25/ 38/ 41/ 66/ 71*/ 77/ 78 - Class 3 (23 dBm ±2 dB) for Other Sub-6 bands LTE: - Class 2 (26 dBm ±2 dB) for B38/ 41/ 42/ 43 - Class 3 (23 dBm ±2 dB) for Other LTE bands
Power Consumption	TBD

NOTE:

1. *: Under development/Ongoing.
2. ●: Supported.
3. TBD: To Be Determined.