
QUECTEL
Quectel
Satellite Module
Product Overview
Build a Smarter World

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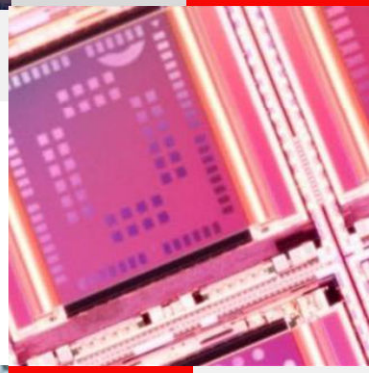
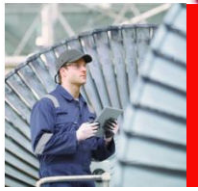


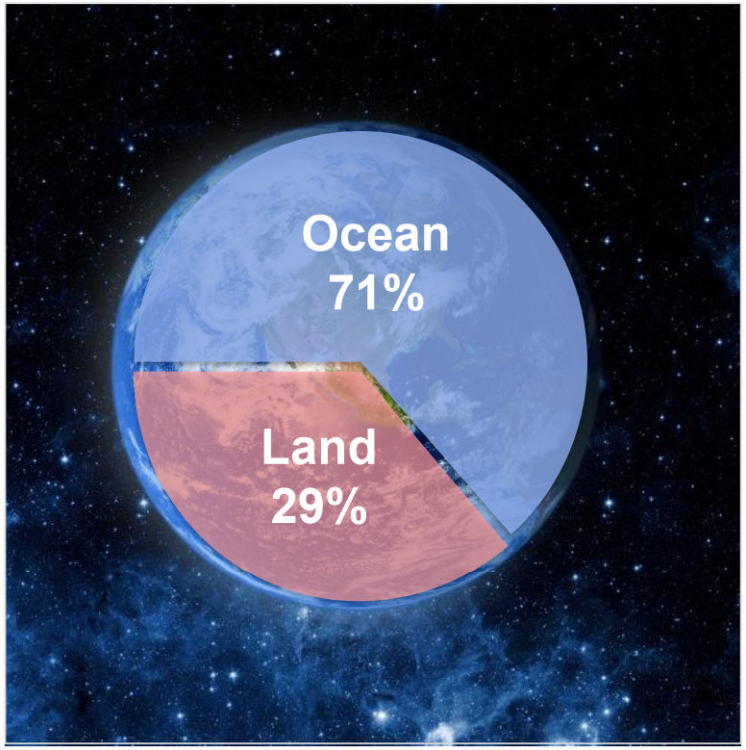


Why do we need satellite communications?

As we all know, the earth is called the “earth” ball, but in fact, the land area is only 29% while the ocean area accounts for 71%.

Mobile networks cover only 20% of the land; In contrast, the network coverage of the ocean is even lower at 5%. Overall, the terrestrial network cover less than 10% of the world!

How do you build a communication network that covers the whole world and not limited by the terrestrial environment? The solution is satellite communication.



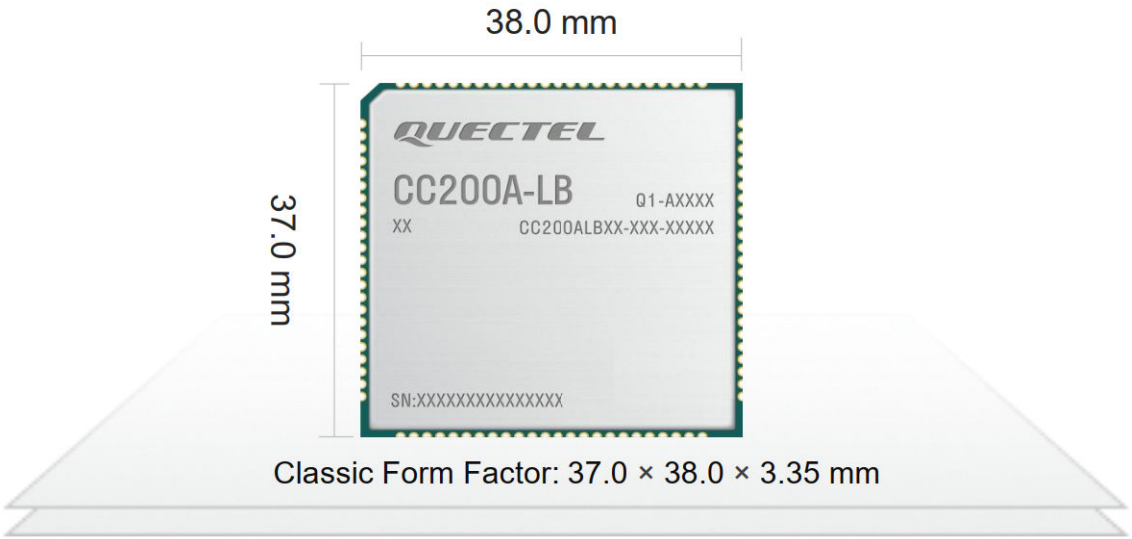
IoT Via Satellite

Why you should use satellite for M2M/ IoT applications ?

- Keeps devices connected in locations with no terrestrial infrastructure.
- Address a massive number of devices simultaneously.
- Stable and controlled QoS–suitable for scenario that does not require the low latency.
- Increased control over the network and not dependent on MVNO/ MNOs.
- Backup to terrestrial network connectivity.

CC200A-LB Key Features

Global Satellite Connectivity



Global Coverage:
Inmarsat GEO constellation

Reliable Connectivity
Two-way communication
IDP service network

Low Latency
Ultra low latency of about 20 seconds for 100-byte message

AT Commands

Multi-Constellation GNSS
GPS/ GLONASS/ Galileo/ BDS

Low Power Consumption:
Various low power mode
Scheduled receive intervals

Back

CC200A-LB Specifications

Variant		CC200A-LB
Region		Global
Satellite Service		• Inmarsat GEO; • Two-way communication; • IsatData Pro (IDP)
Satellite Band		L-band
Frequency	**L-Band**	• Tx: 1626.5–1660.5 MHz,1668–1675 MHz • Rx: 1518–1559 MHz
Max Message Size	**From-Mobile Message**	6.4 Kbytes
	To-Mobile Message	10 Kbytes
Typical Latency	**100 Bytes Message Size**	IDP: 12 s/ 20 s (Rx/Tx)
	1 Kbytes Message Size	IDP: 70 s/ 40 s (Rx/Tx)
	10 Kbytes Message Size	IDP: 5 min/ 8 min (Rx/Tx)
Communication Interface		UART
Antenna Interface		× 1 (Satellite and GNSS sharing)
GNSS		GPS L1/ GLONASS L1/ Galileo E1/ BDS B1
Certification	**Satellite**	Inmarsat Type Approval*
	Regulatory	FCC*/ IC*/ CE*/ RCM*
Project Stage		Pre-ES

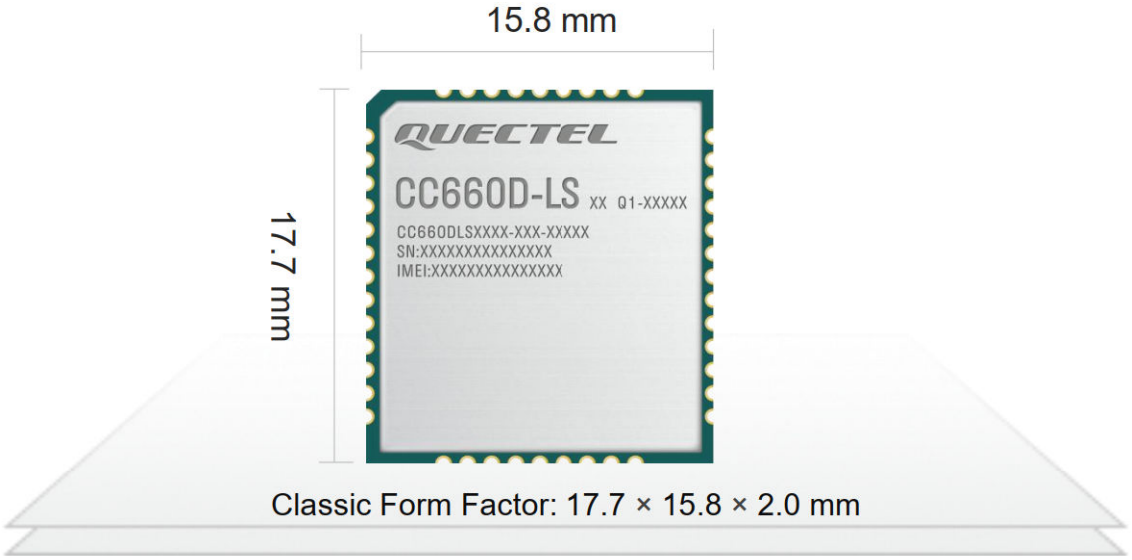
*: Under development/ in progress.

CC660D-LS Key Features

Global Satellite Connectivity

Global Coverage

Reliable Connectivity



3GPP Rel-17

Low Power Consumption

Back

CC660D-LS Specifications

Variant		CC660D-LS
Region/ Operator		Global
Satellite Service		• Skylo ① • Two-way communication
AT Command		• 3GPP TS 27.007 • 3GPP TS 27.005 • Quectel Enhanced AT Commands
IoT-NTN Band		B255*/ 256*
LTE-FDD Band		B23*
Communication Interface		UART/ DFOTA*
Antenna Interface		× 1 (Satellite)
Certification	**Satellite**	Skylo ①
	Regulatory	FCC*/ CE*
Supply Voltage Range		2.1–3.6 V, typical 3.3 V
Protocol Stack		IPv4*/ IPv6*/ UDP*/ TCP*/ Non-IP*/ CoAP*/ LwM2M*/ DTLS*/ MQTT*/ HTTP*/ DNS/ TLS*/ MQTTS*
Project Stage		Pre-ES

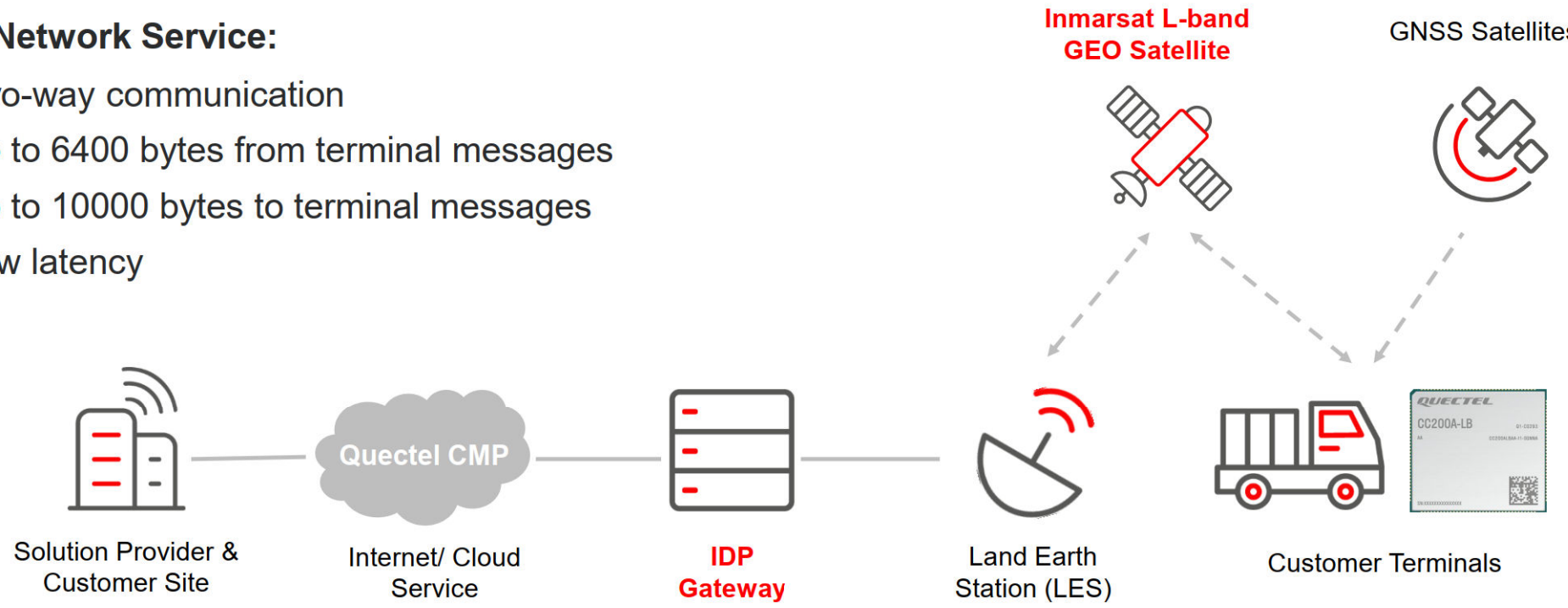
*: Under development/ in progress.
①: TBD.

IDP Network

IDP network service is a two-way communications protocol offering near-real time message transfer.

IDP Network Service:

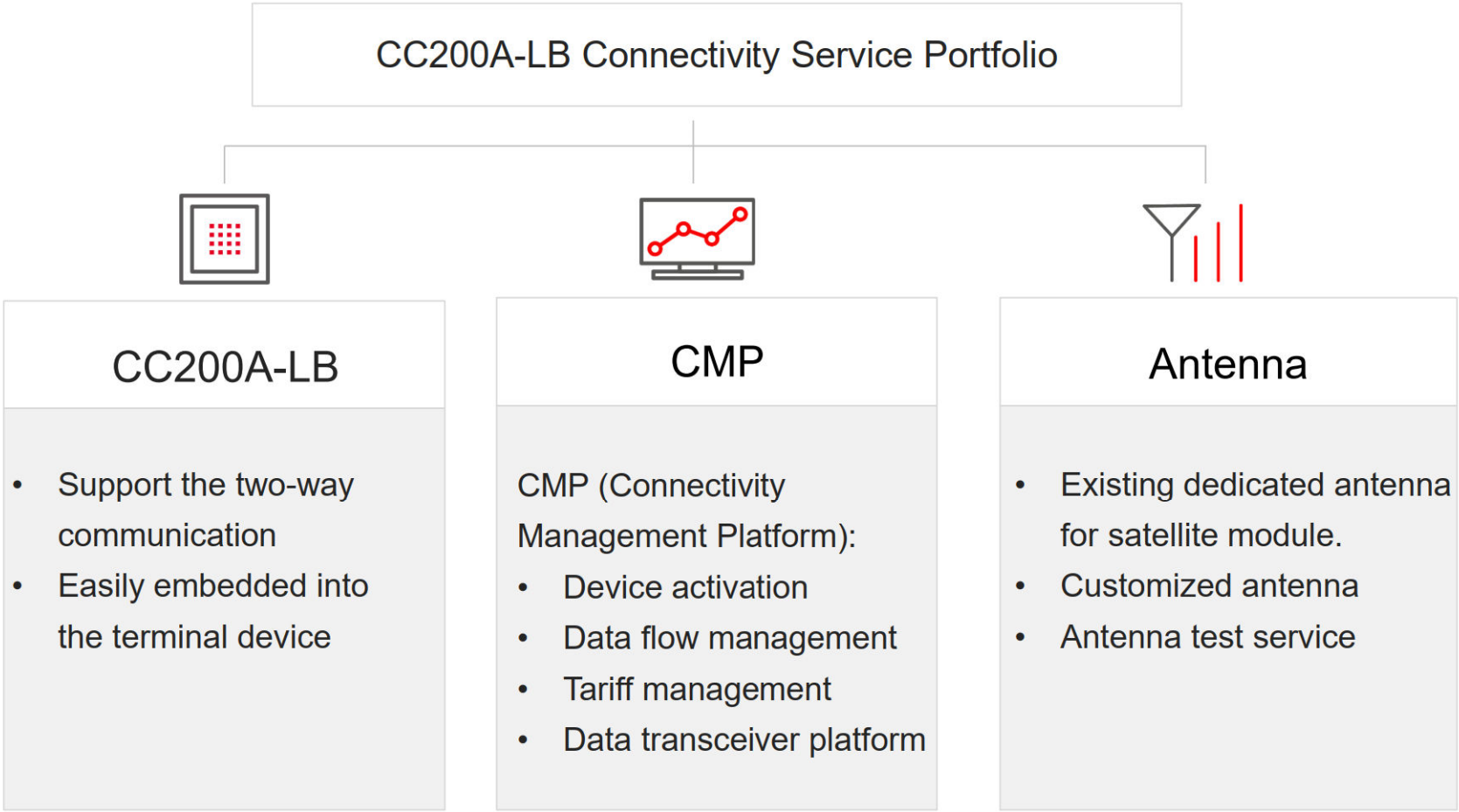
- Two-way communication
- Up to 6400 bytes from terminal messages
- Up to 10000 bytes to terminal messages
- Low latency



Note: Only CC200A-LB module supports IDP network service currently.

Satellite Product Service Portfolio

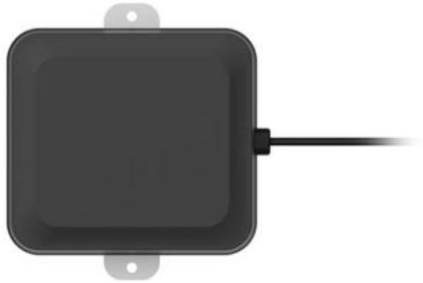
For the terminal device based on CC200A-LB module, Quectel can provide the following service portfolio.



Antenna Specifications

The following is the existing dedicated antenna for CC200A-LB module designed by Quectel, which supports satellite-band and GNSS frequency.

Quectel OC Number		YEGM023AA
Passive Electrical Specifications		
Frequency Range	**L-Band**	● Tx: 1626.5–1660.5 MHz, 1668–1675 MHz ● Rx: 1518–1559 MHz
	GNSS	GPS L1/ GLONASS L1/ Galileo E1/ BDS B1 (1559–1606 MHz)
Polarization Type		RHCP
Impedance		50 Ω
VSWR		< 2
Axial Ratio		< 3 dB
Gain		< 4 dBic
Mechanical Specifications		
Antenna Size		75 × 84 × 25 mm
Casing		ABS
Cable Type & Length		RG174 Black & 500 mm
Connector Type		SMA Male (center pin)
Working Temperature		-30 ℃ to +80 ℃
Weight		Typ.: 112 g
Color		Black
Mounting Type		Screw + Magnetic



General Antenna Development Progress

1. Consulting & Evaluation

- Feasibility & Architecture Study
- Risk Identification
- Initial Proof of Concept
- Antenna Type Selection

2. Design

- Antenna Placement
- Layout Design
- RF Specification Design
- Multi-antenna Design & Optimization
- Gerber File Review

3. Testing & Certification

- Antenna OTA Testing
- Interference Mitigation
- Pre-OTA Testing for CE/ FCC/ PTCRB

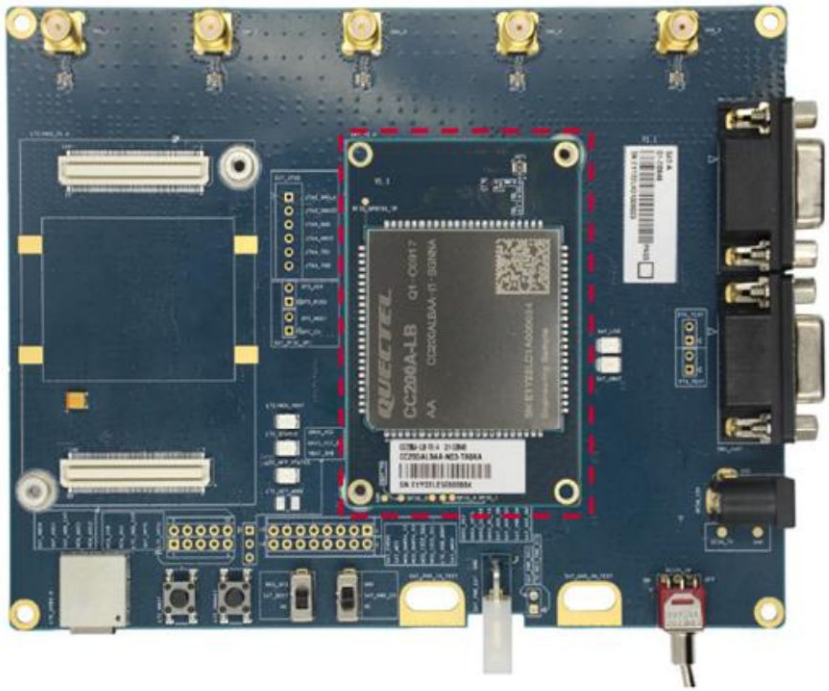
4. Manufacturing

- Antenna Sample
- Tooling & Molding
- Assembly and Production Test
- Delivery

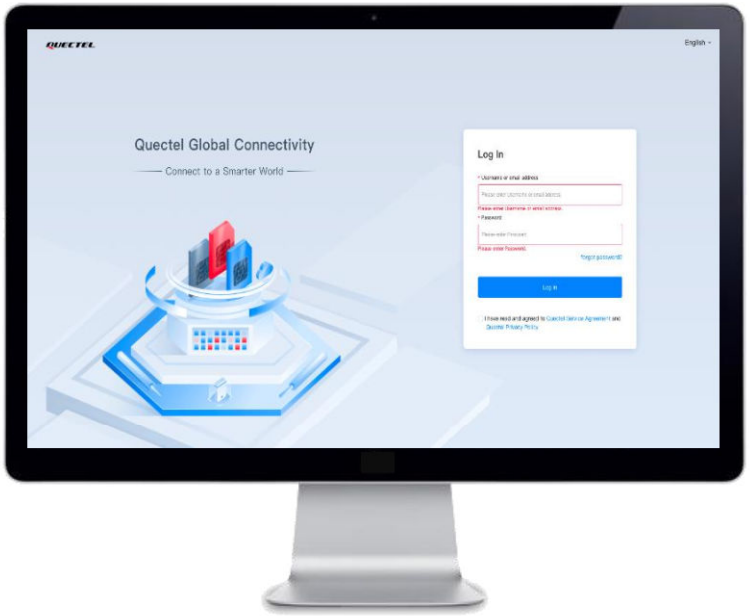
OTA: Over The Air.

Support Package

EVB Kit



Quectel Connectivity Management Platform



Typical Application

Transportation

- Vehicle Tracking
- Asset Tracking
- Chassis Tracking
- Container Tracking

Energy

- Oil & Gas Pipe Line Monitor
- Mining
- Smart Grid

Maritime

- Vessel Connection
- Maritime Buoys

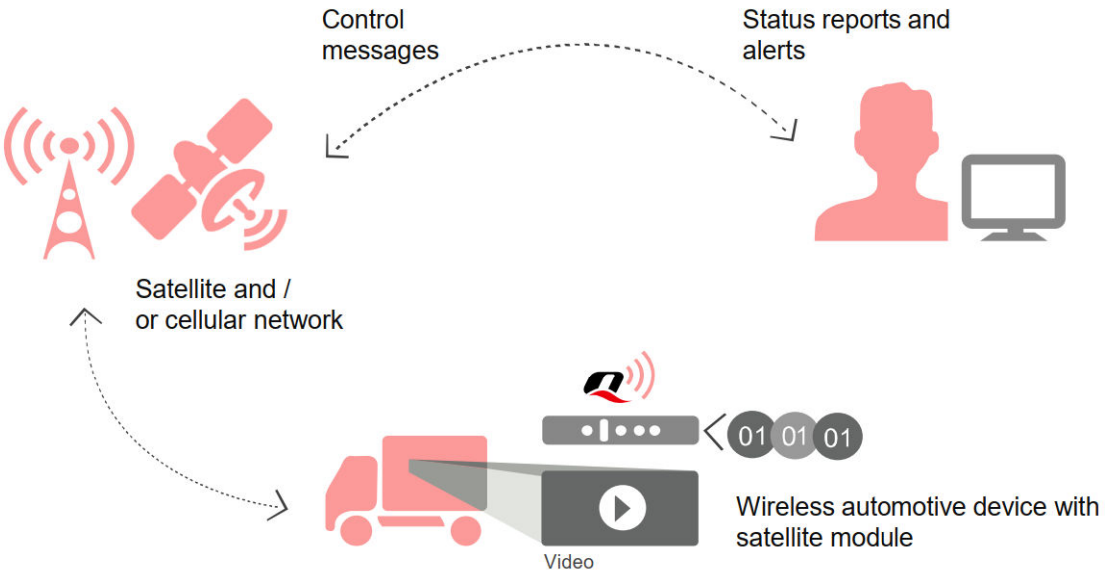
Heavy Industry

- Heavy Equipment Monitor
- Construction Fleet Management

Agriculture

- Smart Agriculture
- Environmental Monitor

Typical Application — Tracker



Service Coverage:
Global tracking (both sea and land)

Real-time tracking:
Item location and status, as well as daily vehicle use record

monitoring of operational devices and events for better asset management

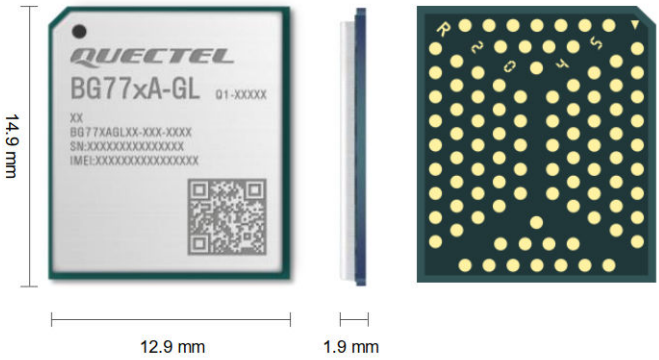
Multiple positioning:
GPS/ BDS, etc.

Electronic fence:
Notification of geofence entry or exit

Emergency SOS

Quectel BG77xA-GL

Ultra-Compact
LTE Cat M1/NB1/NB2 Module



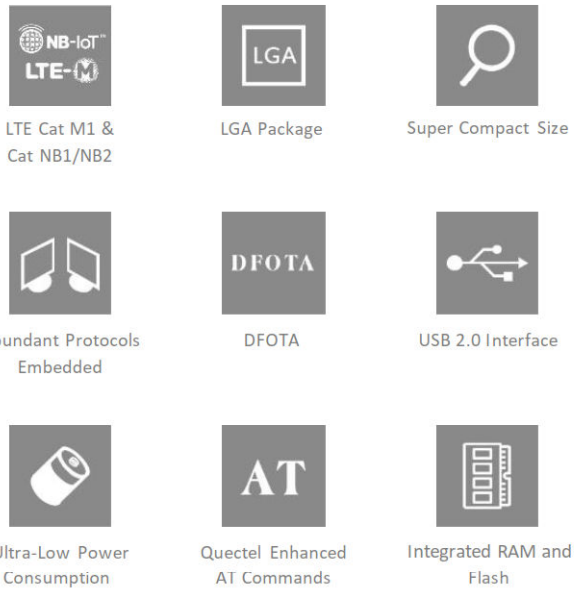
BG77xA-GL is a 5G-ready ultra-compact LPWA module compliant with 3GPP E-UTRA Release 13/14 specification. The module supports LTE Cat M1 and LTE Cat NB1/NB2 bands and integrated SIM (iSIM). Besides, it features ultra-low power consumption implemented by MIPS 5150 processor and integrated RAM and flash, which help reduce current consumption to rather low levels in various modes, including PSM, eDRX etc. It is further integrated with a GNSS engine that supports GPS and GLONASS systems and a cellular-based positioning engine that supports QuecLocator®. BG77xA-GL comes in three variants: BG770A-GL, BG772A-GL and BG773A-GL.

BG77xA-GL boasts a comprehensive hardware-based security feature - Integrated Security Elements (ISE). With an ultra-compact SMT form factor of 14.9 mm × 12.9 mm × 1.9 mm and a high integration level, the module enables integrators and developers to design applications easily leveraging its low power consumption and compact structure design. The BG77xA-GL's advanced LGA package allows for fully automated manufacturing required for large-scale applications.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities extend the applicability of the module to a wide range of M2M applications, such as wireless POS, smart metering, tracking, wearable devices, and many more.

Key Features

- Extremely compact LTE Cat M1/NB1/NB2 module with ultra-low power consumption
- Integrated RAM and flash
- Super slim profile in LGA package
- Support integrated SIM (iSIM)
- Embedded with abundant Internet service protocols
- Support QuecLocator® and DFOTA
- Support QuecOpen® to simplify the development of embedded applications
- A rich set of external interfaces (including RF control interfaces) that ensure convenient applications
- Fast time-to-market: reference designs, evaluation tools and timely technical support minimize time and efforts in design and development
- Robust mounting and interfaces



Version: 1.6 | Status: Released

Quectel BG77xA-GL

LTE Cat M1/NB1/NB2			BG770A-GL	BG772A-GL	BG773A-GL
Region/Operator			Global	Global	Global
Dimensions (mm)			14.9 × 12.9 × 1.9	14.9 × 12.9 × 1.9	14.9 × 12.9 × 1.9
Package			LGA	LGA	LGA
Temperature Range					
Operating Temperature			-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C
Extended Temperature			-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Frequency Bands					
LTE-FDD			Cat M1: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66		
			Cat NB1/NB2: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66		
Data Rate (Max.)					
LTE (kbps)	**Rel-13**	**Cat M1**	300 (DL)/375 (UL)	300 (DL)/375 (UL)	300 (DL)/375 (UL)
		Cat NB1	27.2 (DL)/62.5 (UL)	27.2 (DL)/62.5 (UL)	27.2 (DL)/62.5 (UL)
	Rel-14	**Cat M1**	588 (DL)/1119 (UL)	588 (DL)/1119 (UL)	588 (DL)/1119 (UL)
		Cat NB2	127 (DL)/158 (UL)	127 (DL)/158 (UL)	127 (DL)/158 (UL)
Certifications					
Carrier			**Europe:** Vodafone/ Deutsche Telekom **America:** Verizon/ AT&T **South Korea:** KT/ SKT/ LGU+ **Australia**: Telstra* **Japan:** NTT DOCOMO*/KDDI*	**Europe:** Deutsche Telekom **America:** AT&T/ T-Mobile* **South Korea:** KT **Australia**: Telstra*	TBD
Regulatory			**China:** SRRC/ NAL/ CCC **Global:** GCF **Europe:** CE **North America:** PTCRB **America:** FCC **Canada:** IC **South Korea:** KC **Japan:** JATE/ TELEC **Taiwan, China:** NCC **Australia/New Zealand:** RCM **South Africa**: ICASA	**Global:** GCF **Europe:** CE **North America:** PTCRB **America:** FCC **Canada:** IC **South Korea:** KC **Japan:** JATE/TELEC **Australia/New Zealand:** RCM	**Global:** GCF* **Europe:** CE* **North America:** PTCRB* **America:** FCC*
Others			RoHS	RoHS	RoHS
Interfaces					
USB 2.0			× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)
UART			× 3	Max. × 2	× 3
I2C*			-	Max. × 2	-
SPI			-	Max. × 2 (1 for master only, 1 for master/slave)	-
ADC			× 2	Max. × 2	× 2
(U)SIM			× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)
GPIO			× 7	Max. × 15	× 7
GRFC			× 2	× 2	× 2
NET_STATUS			× 1 (For network status indication)	× 1 (For network status indication)	× 1 (For network status indication)
STATUS			× 1 (For power on/off indication)	× 1 (For power on/off indication)	× 1 (For power on/off indication)
Antenna			× 2 (For the main antenna and GNSS antenna, respectively)	× 2 (For the main antenna and GNSS antenna, respectively)	× 2 (For the main antenna and GNSS antenna, respectively)
SMS					
Short Message Service			• Point-to-point MO and MT • SMS Cell Broadcast • Text and PDU Mode	• Point-to-point MO and MT • SMS Cell Broadcast • Text and PDU Mode	• Point-to-point MO and MT • SMS Cell Broadcast • Text and PDU Mode
GNSS			GPS, GLONASS	GPS, GLONASS	GPS, GLONASS
DFOTA			Delta Firmware Upgrade Over The Air	Delta Firmware Upgrade Over The Air	Delta Firmware Upgrade Over The Air
QuecLocator®			Cell ID Positioning	Cell ID Positioning	Cell ID Positioning
QuecOpen®			-	Support the second development of embedded applications, ARM Cortex M4 processor, running FreeRTOS	-

Note:
*: Under development/ in progress

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Quectel BG77xA-GL

LTE Cat M1/NB1/NB2	BG770A-GL	BG772A-GL	BG773A-GL
Software Features			
3GPP	3GPP E-UTRA Release 13/14	3GPP E-UTRA Release 13/14	3GPP E-UTRA Release 13/14
AT Commands	● 3GPP TS 27.007 ● 3GPP TS 27.005 ● Quectel Enhanced AT Commands	● 3GPP TS 27.007 ● 3GPP TS 27.005 ● Quectel Enhanced AT Commands	● 3GPP TS 27.007 ● 3GPP TS 27.005 ● Quectel Enhanced AT Commands
iSIM	-	-	Supported
Protocols	PPP/ TCP/ UDP/ SSL/ DTLS/ FTP(S)/ HTTP(S)/ NITZ/ PING/ NIDD/ MQTT/ NTP/ LwM2M/ CoAP		
Firmware Upgrade	● UART ● DFOTA ● USB	● UART ● DFOTA ● USB	● UART ● DFOTA ● USB
Electrical Features			
Output Power	Max. 23 dBm	Max. 23 dBm	Max. 23 dBm
Supply Voltage Range	**VBAT_BB:** 2.2–4.35 V, typ. 3.3 V **VBAT_RF:** 3.1–4.2 V, typ. 3.3 V	**VBAT_BB:** 2.2–4.35 V, typ. 3.3 V **VBAT_RF:** 3.1–4.2 V, typ. 3.3 V	**VBAT_BB:** 2.2–4.35 V, typ. 3.3 V **VBAT_RF:** 3.1–4.2 V, typ. 3.3 V
Power Consumption (Typical)	**Power Saving Mode:** 1.4 μA **Rock Bottom:** 45 μA **Sleep Mode:** Cat M1: 1.1 mA @ DRX = 1.28 s 0.06 mA @ eDRX = 40.96 s; PTW = 1.28 s; DRX = 1.28 s 0.05 mA @ eDRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s Cat NB1: 2.2 mA @ DRX = 1.28 s 0.16 mA @ eDRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s 0.12 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Idle Mode:** Cat M1: 16.5 mA @ DRX = 1.28 s 16.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s Cat NB1: 17.0 mA @ DRX = 1.28 s 16.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Active Mode (GNSS disabled):** Cat M1: 192.7 mA @ 23 dBm Cat NB1: 184.3 mA @ 23 dBm	**Power Saving Mode + QuecOpen @Shutdown mode:** 1.4 μA **Rock Bottom:** QuecOpen @Shutdown mode: 43 μA QuecOpen @Standby mode: 45 μA QuecOpen @Stop mode: 0.68 mA **Sleep Mode + QuecOpen @Standby mode:** Cat M1: 1.1 mA @ DRX = 1.28 s 0.06 mA @ eDRX = 40.96 s; PTW = 1.28 s; DRX = 1.28 s 0.05 mA @ eDRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s Cat NB1: 2.2 mA @ DRX = 1.28 s 0.16 mA @ eDRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s 0.12 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Idle Mode + QuecOpen @Standby mode:** Cat M1: 16.5 mA @ DRX = 1.28 s 16.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s Cat NB1: 17.0 mA @ DRX = 1.28 s 16.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Active Mode (GNSS disabled):** Cat M1: 192.7 mA @ 23 dBm Cat NB1: 184.3 mA @ 23 dBm	TBD

Note:
*: Under development / in progress.

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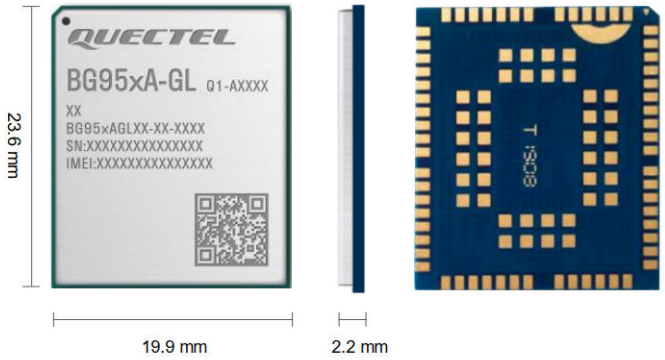
Quectel BG95xA-GL

Ultra-Compact LTE Cat M1/NB1/NB2/GPRS Module



BG95xA-GL is a 5G-ready ultra-compact LPWA module compliant with 3GPP E-UTRA Release 13/14 specification. The module supports LTE Cat M1/NB1/NB2/GPRS bands and integrated SIM (iSIM). Besides, it features ultra-low power consumption implemented by MIPS 5150 processor and integrated RAM and flash, which help reduce current consumption to rather low levels in various modes, including PSM, eDRX etc. It is further integrated with a GNSS engine that supports GPS, GLONASS, Galileo, BDS and QZSS systems and a cellular-based positioning engine that supports QuecLocator®. BG95xA-GL comes in five variants: BG950A-GL, BG951A-GL, BG952A-GL, BG953A-GL and BG955A-GL.

BG95xA-GL boasts a comprehensive hardware-based security feature - Integrated Security Elements (ISE). With an ultra-compact SMT form factor of 23.6 mm × 19.9 mm × 2.2 mm and a high integration level, the module enables integrators and developers to design applications easily leveraging its low power consumption and compact structure design. The BG95xA-GL's advanced LGA package allows for fully automated manufacturing required for large-scale applications.

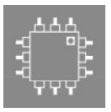
A rich set of Internet protocols, industry-standard interfaces and abundant functionalities extend the applicability of the module to a wide range of M2M applications, such as wireless POS, smart metering, tracking, wearable devices, and many more.

Key Features

- Extremely compact LTE Cat M1/NB1/NB2/GPRS module with ultra-low power consumption
- Integrated RAM and flash
- Super slim profile in LGA package
- Support integrated SIM (iSIM)
- Embedded with abundant Internet service protocols
- Support QuecLocator® and DFOTA
- Support second development of embedded applications, ARM Cortex M4 processor, running FreeRTOS
- A rich set of external interfaces (including RF control interfaces) that ensure convenient applications
- Fast time-to-market: reference designs, evaluation tools and timely technical support minimize time and efforts in design and development
- Robust mounting and interfaces

LTE Cat M1 & Cat NB1/NB2

LGA Package


iSIM


Abundant Protocols Embedded

DFOTA


USB 2.0 Interface


Ultra-Low Power Consumption

Quectel Enhanced AT Commands


Integrated RAM and Flash

Version: 1.6 | Status: Released

Quectel BG95xA-GL

	BG950A-GL	BG951A-GL	BG952A-GL	BG953A-GL	BG955A-GL
Region/Operator	Global	Global	Global	Global	Global
Dimensions (mm)	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2
Package	LGA	LGA	LGA	LGA	LGA
Weight (g)	Approx. 2.15	Approx. 2.15	Approx. 2.15	Approx. 2.15	TBD
Temperature Range					
Operating Temperature	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C
Extended Temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Frequency Bands					
LTE-FDD	Cat M1: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66	Cat M1: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66	Cat M1: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66	Cat M1: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66	Cat M1: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 27/ 28/ 66
	Cat NB1/NB2*: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66	Cat NB1/NB2*: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66	Cat NB1/NB2*: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66	Cat NB1/NB2*: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66	Cat NB1/NB2: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66
GPRS	-	-	-	-	Quad-band
Data Rate (Max.)					
LTE (kbps) Rel-13	Cat M1: 300 (DL)/375 (UL)	Cat M1: 300 (DL)/375 (UL)	Cat M1: 300 (DL)/375 (UL)	Cat M1: 300 (DL)/375 (UL)	-
	Cat NB1: 27.2 (DL)/62.5 (UL)	Cat NB1: 27.2 (DL)/62.5 (UL)	Cat NB1: 27.2 (DL)/62.5 (UL)	Cat NB1: 27.2 (DL)/62.5 (UL)	Cat NB1: 27.2 (DL)/62.5 (UL)
LTE (kbps) Rel-14	Cat M1*: 588 (DL)/1119 (UL)	Cat M1*: 588 (DL)/1119 (UL)	Cat M1*: 588 (DL)/1119 (UL)	Cat M1*: 588 (DL)/1119 (UL)	Cat M1: 588 (DL)/1119 (UL)
	Cat NB2*: 127 (DL)/158 (UL)	Cat NB2*: 127 (DL)/158 (UL)	Cat NB2*: 127 (DL)/158 (UL)	Cat NB2*: 127 (DL)/158 (UL)	Cat NB2: 127 (DL)/158 (UL)
GPRS (kbps)	-	-	-	-	85.6 (DL)/42.8 (UL)
Certifications					
Carrier	**Europe:** Vodafone/ Deutsche Telekom **America:** AT&T/ T-Mobile*/ Verizon* **South Korea:** KT/ LGU+/ KC **Australia**: Telstra* **Canada**: Rogers*/ Telus* **Japan**: KDDI*/ NTT DOCOMO*	**Europe:** Vodafone/ Deutsche Telekom **America:** AT&T/ Verizon*/ T-Mobile* **South Korea:** KT*/ LGU+ **Australia**: Telstra* **Japan**: KDDI*/ NTT DOCOMO*	**America:** AT&T **Australia**: Telstra*	TBD	TBD
Regulatory	**Global:** GCF **Europe:** CE **North America:** PTCRB **America:** FCC **Canada:** IC **South Korea:** KC **Japan:** JATE/TELEC **Australia/New Zealand:** RCM	**Global:** GCF **Europe:** CE **North America:** PTCRB **America:** FCC **Canada:** IC **South Korea:** KC **Japan:** JATE/ TELEC **Australia/New Zealand:** RCM	**Global:** GCF **Europe:** CE **North America:** PTCRB **America:** FCC **Canada:** IC **Australia/New Zealand:** RCM	**Europe**: CE* **America**: FCC* **Global**: GCF* **North America**: PTCRB*	**Europe:** CE* **America:** FCC* **Canada:** IC* **Australia/New Zealand:** RCM*
Others	RoHS	RoHS	RoHS	RoHS	RoHS
Interfaces					
USB	× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)
UART	× 3	× 3	Max. × 2	× 3	× 3
I2C*	-	-	Max. × 2	-	-
SPI	-	-	Max. × 2 (1 for master only, 1 for master/slave)	-	-
ADC	× 2	× 2	Max. × 2	× 2	× 2
(U)SIM	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)
GPIO	× 9	× 9	Max. × 15	× 9	× 9
GRFC	× 2	× 2	× 2	× 2	× 2
NET_STATUS	× 1 (For network status indication)	× 1 (For network status indication)	× 1 (For network status indication)	× 1 (For network status indication)	× 1 (For network status indication)
STATUS	× 1 (For power-on/off indication)	× 1 (For power-on/off indication)	× 1 (For power on/off indication)	× 1 (For power-on/off indication)	× 1 (For power-on/off indication)
Antenna	× 2 (For the main antenna and GNSS antenna, respectively)	× 2 (For the main antenna and GNSS antenna, respectively)	× 2 (For the main antenna and GNSS antenna, respectively)	× 2 (For the main antenna and GNSS antenna, respectively)	× 2 (For the main antenna and GNSS antenna, respectively)
SMS					
Short Message Service	Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode

Note:
*: Under development/ in progress

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Quectel BG95xA-GL

	BG950A-GL	BG951A-GL	BG952A-GL	BG953A-GL	BG955A-GL
Enhanced Features					
GNSS	GPS/GLONASS	GPS/GLONASS/Galileo/BDS/QZSS; LTE & GNSS Concurrency	GPS/GLONASS	GPS/GLONASS	GPS/GLONASS
DFOTA	●	●	●	●	●
QuecLocator®	●	●	●	●	●
QuecOpen®	-	-	●	-	-
iSIM	-	-	-	●	-
2G Fall Back	-	-	-	-	●
Software Features					
3GPP	3GPP E-UTRA Release 13/14*	3GPP E-UTRA Release 13/14*	3GPP E-UTRA Release 13/14*	3GPP E-UTRA Release 13/14*	3GPP E-UTRA Release 13/14
AT Commands	3GPP TS 27.007 3GPP TS 27.005 Quectel Enhanced AT Commands	3GPP TS 27.007 3GPP TS 27.005 Quectel Enhanced AT Commands	3GPP TS 27.007 3GPP TS 27.005 Quectel Enhanced AT Commands	3GPP TS 27.007 3GPP TS 27.005 Quectel Enhanced AT Commands	3GPP TS 27.007 3GPP TS 27.005 Quectel Enhanced AT Commands
Protocols	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ
Firmware Upgrade	UART DFOTA USB	UART DFOTA USB	UART DFOTA USB	UART DFOTA USB	UART DFOTA USB
Electrical Features					
Output Power	Max. 23 dBm	Max. 23 dBm	Max. 23 dBm	Max. 23 dBm	Max. 23 dBm
Supply Voltage Range	**VBAT_BB / VBAT_RF**: 2.2–4.35 V, typ. 3.3 V	**VBAT_BB / VBAT_RF**: 2.2–4.35 V, typ. 3.3 V	**VBAT_BB / VBAT_RF**: 2.2–4.35 V, typ. 3.3 V	**VBAT_BB / VBAT_RF**: 2.2–4.35 V, typ. 3.3 V	**VBAT_BB / VBAT_RF**: 3.3–4.3V, typ. 3.8V
Power Consumption (Typical)	**Power Saving Mode:** 1.5 µA **Rock Bottom:** 39 µA **Sleep Mode:** Cat M1: • 1.1 mA @ DRX = 1.28 s • 0.12 mA @ eDRX = 40.96 s; PTW =2.56 s; DRX = 1.28 s • 0.07 mA @ eDRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s Cat NB1: • 2.2 mA @ DRX = 1.28 s • 0.16 mA @ eDRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s • 0.19 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Idle Mode:** Cat M1: • 15.0 mA @ DRX = 1.28 s • 15.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s Cat NB1: • 16.0 mA @ DRX = 1.28 s • 15.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Active Mode (GNSS disabled):** Cat M1: 201 mA @ 23 dbm Cat NB1: 195 mA @ 23 dbm	**Power Saving Mode:** 1.5 µA **Rock Bottom:** 42 µA @ GNSS mode = 1 196 uA @ GNSS mode = 2 **Sleep Mode:** Cat M1: • 1.1 mA @ DRX = 1.28 s • 0.12 mA @ eDRX = 40.96 s; PTW =2.56 s; DRX = 1.28 s • 0.08 mA @ eDRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s Cat NB1: • 2.2 mA @ DRX = 1.28 s • 0.18 mA @ eDRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s • 0.14 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Idle Mode:** Cat M1: • 15.0 mA @ DRX = 1.28 s • 15.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s Cat NB1: • 16.0 mA @ DRX = 1.28 s • 15.0 mA @ eDRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s **Active Mode (GNSS disabled):** Cat M1: 201 mA @ 23 dbm Cat NB1: 195 mA @ 23 dbm **GNSS Stand-Alone Mode (modem disabled):** Idle: 3.62 mA Searching @ cold start: 21.51 mA Tracking @ open sky: 16.50 mA	TBD	TBD	TBD

Note:
*: Under development/ in progress
●: Supported

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