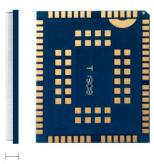# Quectel BG95xA-GL

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

23.6 mm

19.9 mm

2.2 mm

BG95xA-GL is an 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 global carrier band combinations. 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, Beidou and QZSS systems and a cellular-based positioning engine that supports PoLTE* and QuecLocator®. BG95xA-GL comes in two variants: BG950A-GL and BG951A-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* module with ultra-low power consumption
- Integrated RAM and flash
- Super slim profile in LGA package
- Embedded with abundant Internet service protocols
- Support QuecLocator®, PoLTE* and DFOTA
- 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	Super Compact Size
Abundant Protocols Embedded	DFOTA	USB 2.0 Interface*
Ultra-Low Power Consumption	Quectel Enhanced AT Commands	Integrated RAM and Flash

Version: 1.2 | Status: Released

Quectel BG95xA-GL

LTE Cat M1/NB1/NB2*	BG950A-GL	BG951A-GL
Region/Operator	Global	Global
Dimensions (mm)	23.6 mm × 19.9 mm × 2.2 mm	23.6 mm × 19.9 mm × 2.2 mm
Package	LGA	LGA
Weight (g)	Approx. 2.15	Approx. 2.15
Temperature Range		
Operating Temperature	-35 °C to +75 °C	-35 °C to +75 °C
Extended Temperature	-40 °C to +85 °C	-40 °C to +85 °C
Frequency Bands		
LTE-FDD	Cat M1: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66	
	Cat NB1/NB2*: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66	
Data Rate (Max.)		
Cat M1	588 kbps (DL)/ 1119 kbps (UL)	588 kbps (DL)/ 1119 kbps (UL)
Cat NB1	27.2 kbps (DL)/62.5 kbps (UL)	27.2 kbps (DL)/62.5 kbps (UL)
Cat NB2*	127 kbps (DL)/ 158 kbps (UL)	127 kbps (DL)/ 158 kbps (UL)
Certifications		
Carrier	**Europe:** Vodafone*/ Deutsche Telekom*/ Telefónica* **America:** Verizon*/ AT&T*/ T-Mobile* **South Korea:** LGU+* **Australia:** Telstra*	**Europe:** Vodafone*/ Deutsche Telekom*/ Telefónica* **America:** Verizon*/ AT&T*/ T-Mobile* **South Korea:** LGU+* **Australia:** Telstra*
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*
Others*	RoHS	RoHS
Interfaces		
USB*	× 1 (Full speed only)	× 1 (Full speed only)
UART	× 3	× 3
ADC	× 2	× 2
(U)SIM	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)
GPIO	× 9	× 9
GRFC*	× 2	× 2
NET_STATUS	× 1 (For network status indication)	× 1 (For network status indication)
STATUS	× 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)
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
Enhanced Features		
GNSS	GPS/GLONASS	GPS/GLONASS/Galileo/Beidou/QZSS LTE & GNSS concurrency
DFOTA	Delta Firmware Upgrade Over The Air	Delta Firmware Upgrade Over The Air
PoLTE*	Positioning over LTE	Positioning over LTE
QuecLocator®	Cell ID Positioning	Cell ID Positioning

Note:
*: Under development / in progress.

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Quectel BG95xA-GL

LTE Cat M1/NB1/NB2*	BG950A-GL	BG951A-GL
Software Features		
3GPP	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
Protocols	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*
Electrical Features		
Output Power	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

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: 201mA @ 23 dbm
	Cat NB1: 195mA @ 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: 201mA @ 23 dbm
		Cat NB1: 195mA @ 23 dbm
		
		GNSS Stand-Alone Mode (modem disabled):
		Idle: 3.62 mA
		Searching @ cold start: 21.51 mA
		Tracking @ open sky: 16.50 mA

Note:
*: Under development / in progress.

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