QUECTEL

Quectel BG77xA-GL

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

QUECTEL
BG77xA-GL Q1-XXXXX
XX
BG77XAGLXX-XXX-XXXX
SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

14.9 mm

12.9 mm

1.9 mm
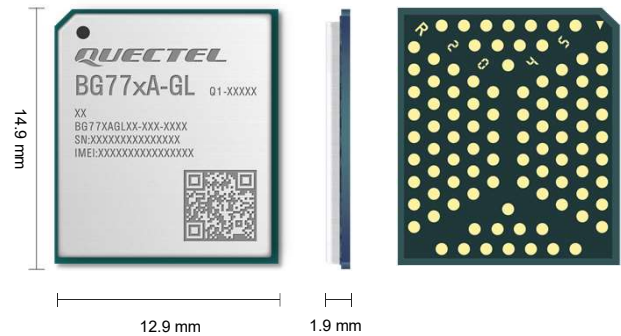
BG77xA-GL is an ultra-compact LPWA module compliant with 3GPP E-UTRA Release 13/14* specification. The module supports LTE Cat M1 and LTE Cat NB1/NB2* bands and global carrier band combinations. Besides, it features ultra-low power consumption implemented by MIPS 5150 processor and integrated RAM and 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 and GLONASS systems and a cellular-based positioning engine that supports PoLTE and QuecLocator®. BG77xA-GL comes in two variants: BG770A-GL and BG772A-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
- ✔ Embedded with abundant Internet service protocols
- ✔ Support QuecLocator®, PoLTE 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

NB-IoT LTE-M **LTE Cat M1 & Cat NB1/NB2***	LGA **LGA Package**	**Super Compact Size**
Abundant Protocols Embedded	DFOTA **DFOTA**	**USB 2.0 Interface***
Ultra-Low Power Consumption	AT **Quectel Enhanced AT Commands**	**Integrated RAM and Flash**

Version: 1.2 | Status: Released

Quectel BG77xA-GL

LTE Cat M1/NB1/NB2*	BG770A-GL	BG772A-GL
Region/Operator	Global	Global
Dimensions (mm)	14.9 × 12.9 × 1.9	14.9 × 12.9 × 1.9
Package	LGA	LGA
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:** Deutsche Telekom/ Vodafone* **America:** Verizon*/AT&T* **South Korea:** SKT*/ LGU+* **Australia**: Telstra* **Japan:** NTT DOCOMO*/KDDI*	**Europe:** Deutsche Telekom* **America:** Verizon*/AT&T* **South Korea:** SKT*/ 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 **South Africa**: ICASA	**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 2.0*	× 1 (Full speed only)	× 1 (Full speed only)
UART	× 3	Max. × 3 (1 main UART, 1 auxiliary UART, 1 debug UART)
I2C*	-	Max. × 2
SPI	-	Max. × 2 (1 for master only, 1 for master/slave)
ADC	× 2	Max. × 4
(U)SIM	× 1 (Supports 1.8 V only)	× 1 (Supports 1.8 V only)
GPIO	× 7	Max. × 27
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
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
QuecOpen®	-	Support the second development of embedded applications, ARM Cortex M4 processor, running FreeRTOS

Note:

*: Under development / in progress.

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LTE Cat M1/NB1/NB2*	BG770A-GL	BG772A-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	PPP/ TCP/ UDP/ SSL/ DTLS/ FTP(S)/ HTTP(S)/ NITZ/ PING/ NIDD/ MQTT/ NTP/ LwM2M/ CoAP	PPP/ TCP/ UDP/ SSL/ DTLS/ FTP(S)/ HTTP(S)/ NITZ/ PING/ NIDD/ MQTT/ NTP/ LwM2M/ CoAP
Firmware Upgrade	• UART • DFOTA • USB*	• UART • DFOTA • USB*
Electrical Features		
Output Power	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

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

Note:
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