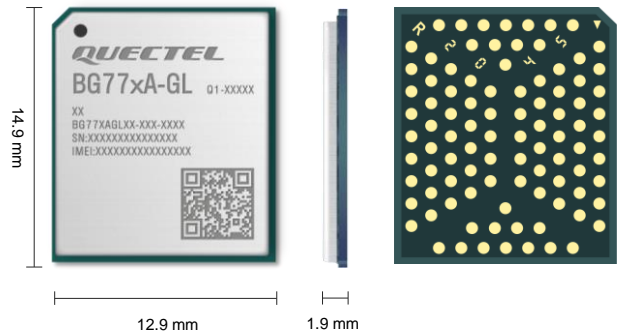




# Quectel BG77xA-GL

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



BG77xA-GL is an ultra-compact LPWA module compliant with the 3GPP E-UTRA Release 13/14\* specification and has an integrated GNSS and cellular-based positioning engine that supports GPS and GLONASS systems. The module supports LTE Cat M1 and LTE Cat NB1/NB2\* bands and global carrier band combinations. Besides, it features the MIPS 5150 processor and integrated RAM and flash, which help reduce current consumption to rather low levels in various standby/hibernation modes, including PSM and eDRX. BG77xA-GL comes in two variants: BG770A-GL and BG772A-GL.

BG77xA-GL has 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 VoLTE\* (Cat M1 only), QuecLocator®, PoLTE and DFOTA
- ✓ Support QuecOpen® to simplify the development of embedded applications
- ✓ A rich set of external, multi-band 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

# 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 NB2*	127 kbps (DL)/ 158 kbps (UL)	127 kbps (DL)/ 158 kbps (UL)
Certifications		
Carrier	<b>Europe:</b> Vodafone*/Deutsche Telekom <b>America:</b> Verizon*/AT&T* <b>South Korea:</b> SKT* <b>Japan:</b> NTT DOCOMO*/KDDI*	<b>Europe:</b> Vodafone*/Deutsche Telekom* <b>America:</b> Verizon*/AT&T* <b>South Korea:</b> SKT* <b>Japan:</b> NTT DOCOMO*/KDDI*
Regulatory	<b>Global:</b> GCF <b>Europe:</b> CE <b>North America:</b> PTCRB <b>America:</b> FCC <b>Canada:</b> IC <b>South Korea:</b> KC <b>Japan:</b> JATE/TELEC <b>Australia/New Zealand:</b> RCM <b>South Africa:</b> ICASA	<b>Global:</b> GCF* <b>Europe:</b> CE * <b>North America:</b> PTCRB* <b>America:</b> FCC * <b>Canada:</b> IC* <b>South Korea:</b> KC* <b>Japan:</b> JATE/TELEC* <b>Australia/New Zealand:</b> RCM*
Others*	RoHS	RoHS
Interfaces		
USB 2.0*	× 1 (Full speed only)	× 1 (Full speed only)
UART	× 3	Max. × 3 (2 for QuecOpen® application, 1 for debug)
PCM*	× 1 (For VoLTE only)	× 1 (For VoLTE only)
I2C*	× 1 (For VoLTE only)	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)
Voice		
VoLTE*	Voice over LTE (For Cat M1 only)	Voice over LTE (For Cat M1 only)
SMS		
Short Message Service	<ul style="list-style-type: none"> <li>● Point-to-point MO and MT</li> <li>● SMS Cell Broadcast</li> <li>● Text and PDU Mode</li> </ul>	<ul style="list-style-type: none"> <li>● Point-to-point MO and MT</li> <li>● SMS Cell Broadcast</li> <li>● Text and PDU Mode</li> </ul>
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®	-	Simplify the development of embedded applications

Notes:

\*: Under development / in progress.

-: Not supported.

# Quectel BG77xA-GL

LTE Cat M1/NB1/NB2*	BG770A-GL	BG772A-GL
<b>Software Features</b>		
<b>3GPP</b>	3GPP E-UTRA Release 13/14*	3GPP E-UTRA Release 13/14*
<b>AT Commands</b>	<ul style="list-style-type: none"> <li>● 3GPP TS 27.007</li> <li>● 3GPP TS 27.005</li> <li>● Quectel Enhanced AT Commands</li> </ul>	<ul style="list-style-type: none"> <li>● 3GPP TS 27.007</li> <li>● 3GPP TS 27.005</li> <li>● Quectel Enhanced AT Commands</li> </ul>
<b>Protocols</b>	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
<b>Firmware Upgrade</b>	<ul style="list-style-type: none"> <li>● UART</li> <li>● DFOTA</li> <li>● USB*</li> </ul>	<ul style="list-style-type: none"> <li>● UART</li> <li>● DFOTA</li> <li>● USB*</li> </ul>
<b>Electrical Features</b>		
<b>Output Power</b>	Max. 23 dBm	Max. 23 dBm
<b>Supply Voltage Range</b>	<b>VBAT_BB:</b> 2.2–4.35 V, Typ. 3.3 V <b>VBAT_RF:</b> 3.1–4.2 V, Typ. 3.3 V <b>Power Saving Mode:</b> 1.4 $\mu$ A  <b>Sleep Mode (modem disabled):</b> 45 $\mu$ A  <b>Sleep Mode (ECL0):</b> Cat M: 1.1 mA @ DRX = 1.28 s 0.06 mA @ eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s 0.05 mA @ eDRX Cycle = 81.92 s; PTW = 1.28 s; DRX = 1.28 s  NB-IoT: 2.2 mA @ DRX = 1.28 s 0.16 mA @ eDRX Cycle = 40.96 s; PTW = 2.56 s; DRX = 1.28 s 0.12 mA @ eDRX Cycle = 81.92 s; PTW = 2.56 s; DRX = 1.28 s  <b>Idle Mode (ECL0):</b> Cat M: 16.5 mA @ DRX = 1.28 s 16.0 mA @ eDRX Cycle = 81.92 s; PTW = 2.56 s; DRX = 1.28 s  <b>Power Consumption (Typical)</b>  NB-IoT: 17.0 mA @ DRX = 1.28 s 16.0 mA @ eDRX Cycle = 81.92 s; PTW = 2.56 s; DRX = 1.28 s  <b>Active Mode (GNSS disabled):</b> Cat M: 189 mA @ 23 dBm, B1/2/3/4/5/18/19/20/25/26/27/66 201 mA @ 23 dBm, B8/B13 225 mA @ 23 dBm, B12/B28  NB-IoT (max power mode 3.75 kHz): 322 mA @ 23 dBm, B1/B2/B3/B4/B25/B66 359 mA @ 23 dBm, B5/B8/B13/B18/B19/B20 225 mA @ 23 dBm, B12/B17/B28  NB-IoT (max power mode 15 kHz): 169 mA @ 23 dBm, B1/B2/B3/B4/B25/B66 191 mA @ 23 dBm, B5/B8/B13/B18/B19/B20 225 mA @ 23 dBm, B12/B17/B28	<b>VBAT_BB:</b> 2.2–4.35 V, Typ. 3.3 V <b>VBAT_RF:</b> 3.1–4.2 V, Typ. 3.3 V

Note:

\*: Under development / in progress.