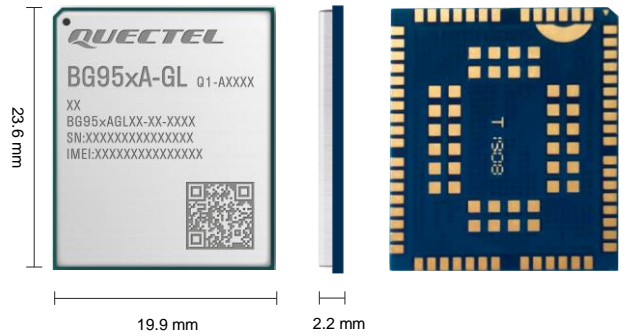


# Quectel BG95xA-GL

## 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<sup>®</sup>. 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

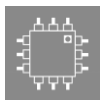
- ✓ Extremely compact LTE Cat M1/ NB1/ NB2/ GPRS module with ultra-low power consumption
- ✓ Super slim profile in LGA package
- ✓ Support integrated SIM (iSIM)
- ✓ Embedded with abundant Internet service protocols
- ✓ Support QuecLocator<sup>®</sup> and DFOTA
- ✓ Support second development of embedded 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



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

# Quectel BG95xA-GL

	BG950A-GL	BG951A-GL	BG952A-GL	BG953A-GL	BG955A-GL
<b>Region/ Operator</b>	Global	Global	Global	Global	Global
<b>Dimensions (mm)</b>	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
<b>Package</b>	LGA	LGA	LGA	LGA	LGA
<b>Weight (g)</b>	Approx. 2.15	Approx. 2.15	Approx. 2.15	Approx. 2.15	Approx. 2.15
<b>Temperature Range</b>					
<b>Operating Temperature</b>	-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
<b>Extended Temperature</b>	-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
<b>Frequency Bands</b>					
	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
<b>LTE-FDD</b>					
	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 NB2: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66	Cat NB2: B1/ 2/ 3/ 4/ 5/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 28/ 66
<b>GPRS</b>	-	-	-	-	GSM 850/ EGSM 900/ DCS 1800/ PCS 1900
<b>Data Rate (Max.)</b>					
<b>LTE (kbps)</b>	<b>Rel-13</b>	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)
	<b>Rel-14</b>	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)
<b>GPRS (kbps)</b>	-	-	-	-	85.6 (DL)/ 42.8 (UL)
<b>Certifications</b>					
<b>Carrier</b>	<b>Europe:</b> Vodafone/ Deutsche Telekom <b>America:</b> AT&T/ T-Mobile <sup>①</sup> / Verizon* <b>South Korea:</b> KT/ LGU+ / KC <b>Australia:</b> Telstra* <b>Canada:</b> Rogers <sup>①</sup> / Telus <sup>①</sup> <b>Japan:</b> KDDI* / NTT DOCOMO*	<b>Europe:</b> Vodafone/ Deutsche Telekom <b>America:</b> AT&T/ Verizon* / T-Mobile <sup>①</sup> <b>South Korea:</b> KT/ LGU+ <b>Australia:</b> Telstra* <b>Japan:</b> KDDI* / NTT DOCOMO*	<b>America:</b> AT&T <b>Australia:</b> Telstra*	TBD	TBD
<b>Regulatory</b>	<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>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>Global:</b> GCF <b>Europe:</b> CE <b>North America:</b> PTCRB <b>America:</b> FCC <b>Canada:</b> IC <b>Japan:</b> JATE/ TELEC <b>Australia/New Zealand:</b> RCM	<b>Global:</b> GCF* <b>Europe:</b> CE <b>North America:</b> PTCRB* <b>America:</b> FCC <b>Canada:</b> IC <b>Japan:</b> JATE/ TELEC <b>Australia/New Zealand:</b> RCM	<b>Europe:</b> CE <b>America:</b> FCC <b>Canada:</b> IC <b>Australia/New Zealand:</b> RCM
<b>Others</b>	RoHS	RoHS	RoHS	RoHS	RoHS
<b>Interfaces</b>					
<b>USB</b>	× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)	× 1 (Full speed only)
<b>UART</b>	× 3	× 3	Max. × 2	× 3	× 3
<b>I2C*</b>	-	-	Max. × 2	-	-
<b>SPI</b>	-	-	Max. × 2 (1 for master only, 1 for master/ slave)	-	-
<b>ADC</b>	× 2	× 2	Max. × 2	× 2	× 2
<b>(U)SIM</b>	× 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)
<b>GPIO</b>	× 9	× 9	Max. × 15	× 9	× 9
<b>GRFC</b>	× 2	× 2	× 2	× 2	× 2
<b>NET_STATUS</b>	× 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)
<b>STATUS</b>	× 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)
<b>Antenna</b>	× 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)
<b>SMS</b>					
<b>Short Message Service</b>	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:

1. \*: Under development/ in planning/ in progress.

2. ①: TBD (To Be Determined).

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# Quectel BG95xA-GL

	BG950A-GL	BG951A-GL	BG952A-GL	BG953A-GL	BG955A-GL
<b>Enhanced Features</b>					
<b>GNSS</b>	GPS/ GLONASS	GPS/ GLONASS/ Galileo/ BDS/ QZSS LTE & GNSS Concurrency	GPS/ GLONASS	GPS/ GLONASS	GPS/ GLONASS
<b>DFOTA</b>	●	●	●	●	●
<b>QuecLocator®</b>	●	●	●	●	●
<b>QuecOpen®</b>	-	-	●	-	-
<b>iSIM</b>	-	-	-	●	-
<b>2G Fall Back</b>	-	-	-	-	●
<b>Software Features</b>					
<b>3GPP</b>	3GPP E-UTRA Release 13/ 14*	3GPP E-UTRA Release 13/ 14*	3GPP E-UTRA Release 13/ 14*	3GPP E-UTRA Release 14	3GPP E-UTRA Release 14
<b>AT Commands</b>	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
<b>Protocols</b>	TCP/ PPP/ UDP/ SSL/ MQTT(S)/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT(S)/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT(S)/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT(S)/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ	TCP/ PPP/ UDP/ SSL/ MQTT(S)/ FTP(S) / HTTP(S) / LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ
<b>Firmware Upgrade</b>	UART/ DFOTA/ USB*	UART/ DFOTA/ USB*	UART/ DFOTA/ USB*	UART/ DFOTA/ USB*	UART/ DFOTA/ USB*
<b>Electrical Features</b>					
<b>Output Power (Max.)</b>	23 dBm	23 dBm	23 dBm	23 dBm	23 dBm
<b>Supply Voltage Range</b>	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
<b>Power Consumption (Typical)</b>	<p><b>Power Saving Mode:</b> 1.5 μA</p> <p><b>Rock Bottom:</b> 39 μA</p> <p><b>Sleep Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>1.1 mA @ DRX = 1.28 s</li> <li>0.12 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.07 mA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>2.2 mA @ DRX = 1.28 s</li> <li>0.19 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.16 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Idle Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>15.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>16.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Active Mode (GNSS disabled):</b> Cat M1: 201 mA @ 23 dbm Cat NB1: 195 mA @ 23 dbm</p>	<p><b>Power Saving Mode:</b> 1.5 μA</p> <p><b>Rock Bottom:</b> 42 μA @ GNSS mode = 1 196 uA @ GNSS mode = 2</p> <p><b>Sleep Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>1.1 mA @ DRX = 1.28 s</li> <li>0.12 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.08 mA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>2.2 mA @ DRX = 1.28 s</li> <li>0.19 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.16 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Idle Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>15.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>16.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Active Mode (GNSS disabled):</b> Cat M1: 201 mA @ 23 dbm Cat NB1: 195 mA @ 23 dbm</p> <p><b>GNSS Stand-Alone Mode (modem disabled):</b> Idle: 3.62 mA Searching @ cold start: 21.51 mA Tracking @ open sky: 16.50 mA</p>	<p><b>Power Saving Mode:</b> 1.5 μA</p> <p><b>Rock Bottom:</b> 39 μA</p> <p><b>Sleep Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>1.1 mA @ DRX = 1.28 s</li> <li>0.12 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.07 mA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>2.2 mA @ DRX = 1.28 s</li> <li>0.19 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.16 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Idle Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>15.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>16.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Active Mode (GNSS disabled):</b> Cat M1: 201 mA @ 23 dbm Cat NB1: 195 mA @ 23 dbm</p>	<p><b>Power Saving Mode:</b> 1.5 μA</p> <p><b>Rock Bottom:</b> 39 μA</p> <p><b>Sleep Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>1.2 mA @ DRX = 1.28 s</li> <li>0.12 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.07 mA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s</li> </ul>                     Cat NB2:  <ul style="list-style-type: none"> <li>3.5 mA @ DRX = 1.28 s</li> <li>0.19 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.16 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Idle Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>15.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>16.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Active Mode (GNSS disabled):</b> Cat M1: 201 mA @ 23 dbm Cat NB2: 195 mA @ 23 dbm</p>	<p><b>Power Saving Mode:</b> 1.5 μA</p> <p><b>Rock Bottom:</b> 42 μA</p> <p><b>Sleep Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>1.2 mA @ DRX = 1.28 s</li> <li>0.12 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.07 mA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s</li> </ul>                     Cat NB2:  <ul style="list-style-type: none"> <li>3.5 mA @ DRX = 1.28 s</li> <li>0.19 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s</li> <li>0.16 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Idle Mode:</b> Cat M1:  <ul style="list-style-type: none"> <li>15.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul>                     Cat NB1:  <ul style="list-style-type: none"> <li>16.0 mA @ DRX = 1.28 s</li> <li>15.0 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s</li> </ul> </p> <p><b>Active Mode (GNSS disabled):</b> Cat M1: 201 mA @ 23 dbm Cat NB2: 195 mA @ 23 dbm</p>
				Note: 1. *: Under development/planning/ in progress. 2. ●: Supported.	