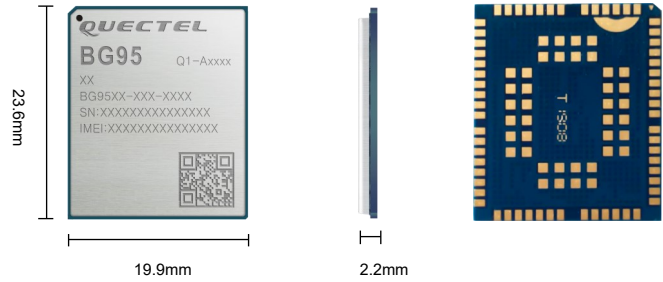


# Quectel BG95

## LTE Cat M1/ Cat NB2/ EGPRS Module












BG95 is a series of multi-mode LPWA modules supporting LTE Cat M1/Cat NB2/EGPRS and integrated GNSS. It is 3GPP Rel. 14 compliant and offers maximum data rates of 588Kbps downlink and 1119Kbps uplink under LTE Cat M1. It features ultra-low power consumption by leveraging the integrated RAM/flash as well as the ARM Cortex A7 processor supporting ThreadX, achieving up to 70% reduction in PSM leakage and 85% reduction in eDRX current consumption compared to its predecessor.

BG95 boasts a comprehensive set of hardware-based security features and enables trusted applications to run directly on the Cortex A7 TrustZone engine. Additionally, BG95 provides pin-to-pin compatibility with Quectel LTE Cat 4 modules EG91/EG95, LTE Cat M1/Cat NB1/EGPRS module BG96, NB-IoT module BC95, UMTS/HSPA modules UG95/UG96 and GSM/GPRS module M95.

With a cost-effective SMT form factor of 23.6mm × 19.9mm × 2.2mm and high integration level, BG95 enables integrators and developers to easily design their applications and take advantage from the module's low power consumption and mechanical intensity. Its advanced LGA package allows fully automated manufacturing for high-volume applications. A rich set of Internet protocols, industry-standard interfaces and abundant functions extend the applicability of the module to a wide range of M2M applications such as wireless POS, smart metering, tracking, wearable devices, etc.

### Key Benefits

- ✓ LTE Cat M1/Cat NB2/EGPRS module with ultra-low power consumption
- ✓ Easy migration from Quectel GSM/GPRS, UMTS/HSPA and LTE modules
- ✓ Super slim profile in LGA package
- ✓ Integrated RAM and flash in the baseband chipset
- ✓ Comprehensive set of hardware-based security features
- ✓ Fast time-to-market: reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- ✓ Compact SMT form factor ideal for size-constrained applications with tight space
- ✓ Robust mounting and interfaces

		
<p>LTE Cat M1 &amp; Cat NB2</p>	<p>EGPRS</p>	<p>LGA Package</p>
		
<p>Embedded Abundant Protocols</p>	<p>DFOTA</p>	<p>USB 2.0 Interface</p>
		
<p>Ultra-low Power Consumption</p>	<p>Quectel Enhanced AT Commands</p>	<p>Integrated RAM/Flash in Chipset</p>

# Quectel BG95

LPWA Module	BG95-M1	BG95-M2	BG95-M3	BG95-N1	BG95-M4*	BG95-M5*	BG95-MF (Planning)
<b>Region/Operator</b>	For the Global	For the Global	For the Global	For the Global	For the Global	For the Global	For the 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	23.6 × 19.9 × 2.2	TBD
<b>Temperature Range</b>							
<b>Operation Temperature</b>	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	TBD
<b>Extended Temperature</b>	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	TBD
<b>Frequency Bands</b>							
<b>LTE FDD</b>	<b>Cat M1 Only:</b> B1/B2/B3/B4/B5/B8/ 12/B13/B14/B18/B19/ B20/B25/B26/B27/B28/ B66/B85	<b>Cat M1:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B14/B18/B19/ B20/B25/B26/B27/B28/ B66/B85 <b>Cat NB2:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B26/B28/B66/ B71/B85	<b>Cat M1:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B14/B18/B19/ B20/B25/B26/B27/B28/ B66/B85 <b>Cat NB2:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B26/B28/B66/ B71/B85	<b>Cat NB2 Only:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B26/B28/B66/B71/ B85	<b>Cat M1:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B14/B18/B19/ B20/B25/B26/B27/B28/ B31/B66/B72/B73/B85 <b>Cat NB2:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B26/B28/B31/B66/ B72/B73/B85	<b>Cat M1:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B14/B18/B19/ B20/B25/B26/B27/B28/ B66/B85 <b>Cat NB2:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B26/B28/B66/B71/ B85	<b>Cat M1:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B14/B18/B19/ B20/B25/B26/B27/B28/ B66/B85 <b>Cat NB2:</b> B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B26/B28/B66/B71/ B85
<b>GSM/EDGE</b>	/	/	850/900/1800/1900MHz	/	/	850/900/1800/1900MHz	/
<b>GNSS (Optional)</b>	GPS/GLONASS/BeiDou/ Galileo/QZSS	GPS/GLONASS/BeiDou/ Galileo/QZSS	GPS/GLONASS/BeiDou/ Galileo/QZSS	GPS/GLONASS/BeiDou/ Galileo/QZSS	GPS/GLONASS/BeiDou/ Galileo/QZSS	GPS/GLONASS/BeiDou/ Galileo/QZSS	GPS/GLONASS/BeiDou/ Galileo/QZSS
<b>Wi-Fi (For Positioning)</b>	/	/	/	/	/	/	2.4GHz
<b>Data Transmission</b>							
<b>LTE FDD Data Rate</b>	<b>Cat M1:</b> Max. 588Kbps (DL), Max. 1119Kbps (UL)	<b>Cat M1:</b> Max. 588Kbps (DL), Max. 1119Kbps (UL) <b>Cat NB2:</b> Max. 127Kbps (DL), Max. 158.5Kbps (UL)	<b>Cat M1:</b> Max. 588Kbps (DL), Max. 1119Kbps (UL) <b>Cat NB2:</b> Max. 127Kbps (DL), Max. 158.5Kbps (UL)	<b>Cat NB2:</b> Max. 127Kbps (DL), Max. 158.5Kbps (UL)	<b>Cat M1:</b> Max. 588Kbps (DL), Max. 1119Kbps (UL) <b>Cat NB2:</b> Max. 127Kbps (DL), Max. 158.5Kbps (UL)	<b>Cat M1:</b> Max. 588Kbps (DL), Max. 1119Kbps (UL) <b>Cat NB2:</b> Max. 127Kbps (DL), Max. 158.5Kbps (UL)	<b>Cat M1:</b> Max. 588Kbps (DL), Max. 1119Kbps (UL) <b>Cat NB2:</b> Max. 127Kbps (DL), Max. 158.5Kbps (UL)
<b>EDGE Data Rate</b>	/	/	Max. 296Kbps (DL), Max. 236.8Kbps (UL)	/	/	Max. 296Kbps (DL), Max. 236.8Kbps (UL)	/
<b>GPRS Data Rate</b>	/	/	Max. 107Kbps (DL), Max. 85.6Kbps (UL)	/	/	Max. 107Kbps (DL), Max. 85.6Kbps (UL)	/
<b>Interfaces</b>							
<b>(U)SIM</b>	× 1 (1.8V only)	× 1 (1.8V only)	× 1 (1.8V only)	× 1 (1.8V only)	× 1 (1.8V only)	× 1 (1.8V only)	× 1 (1.8V only)
<b>UART</b>	× 3	× 3	× 3	× 3	× 3	× 3	TBD
<b>USB 2.0</b>	× 1	× 1	× 1	× 1	× 1	× 1	× 1
<b>PCM*</b>	× 1	× 1	× 1	× 1	× 1	× 1	× 1
<b>I2C*</b>	× 1	× 1	× 1	× 1	× 1	× 1	× 1
<b>Antenna</b>	× 2	× 2	× 2	× 2	× 2	× 2	× 3
<b>GPIO</b>	× 9	× 9	× 9	× 9	× 9	× 9	TBD
<b>GRFC*</b>	× 2	× 2	× 2	× 2	/	× 2	TBD
<b>Voice</b>							
<b>Voice*</b>	VoLTE for LTE Cat M1	VoLTE for LTE Cat M1	VoLTE for LTE Cat M1 CS Voice for GSM	/	VoLTE for LTE Cat M1	VoLTE for LTE Cat M1 CS Voice for GSM	VoLTE for LTE Cat M1
<b>SMS</b>							
<b>SMS</b>	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode	Point-to-point MO/MT SMS Cell Broadcast Text and PDU Mode
<b>Enhanced Features</b>							
<b>DFOTA</b>	*	*	●	*	*	*	*
<b>QuecOpen®</b>	*	*	●	*	*	*	*
<b>QuecLocator**</b>	Cell ID Positioning	Cell ID Positioning	Cell ID Positioning	Cell ID Positioning	Cell ID Positioning	Cell ID Positioning	Cell ID Positioning Wi-Fi Positioning
<b>Software Features</b>							
<b>Protocols</b>	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*	PPP/TCP/UDP/SSL/TLS/ FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M/ CoAP*
<b>USB Serial Driver*</b>	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x
<b>GNSS/RIL Driver*</b>	Android 4.x~9.x	Android 4.x~9.x	Android 4.x~9.x	Android 4.x~9.x	Android 4.x~9.x	Android 4.x~9.x	Android 4.x~9.x
<b>NDIS Driver*</b>	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10
<b>GobiNet Driver*</b>	Linux 2.6~5.4	Linux 2.6~5.4	Linux 2.6~5.4	Linux 2.6~5.4	Linux 2.6~5.4	Linux 2.6~5.4	Linux 2.6~5.4

**Notes:**  
1. \* means under development/on-going.  
2. ● means supported.

# Quectel BG95

LPWA Module	BG95-M1	BG95-M2	BG95-M3	BG95-N1	BG95-M4*	BG95-M5*	BG95-MF (Planning)
<b>Certifications</b>							
<b>Carrier</b>	North America: Verizon*/AT&T*/Sprint*	North America: Verizon*/AT&T*/ T-Mobile*/Sprint* South Korea: SKT* Japan: NTT DOCOMO*/ SoftBank*/KDDI* Australia: Telstra*	Global: Vodafone* Europe: Deutsche Telekom* North America: AT&T/ Verizon/ T-Mobile*/Sprint* China: China Telecom*/China Mobile*/China Unicom* South Korea: SKT* Japan: NTT DOCOMO*/ SoftBank*/KDDI* Australia: Telstra*	North America: Verizon*/AT&T*/ T-Mobile*/Sprint*	Planning	Planning	Planning
<b>Regulatory</b>	Global: GCF* Europe: CE* North America: FCC*/PTCRB* Canada: IC* Australia: RCM*	Global: GCF* Europe: CE* North America: FCC*/PTCRB* Canada: IC* South Korea: KC* Taiwan: NCC* Japan: JATE*/TELECOM* Australia: RCM* Thailand: NBTC*	Global: GCF Europe: CE North America: FCC/PTCRB Canada: IC Brazil: Anatel* China: SRRRC*/NAL*/CCC* South Korea: KC* Taiwan: NCC* Japan: JATE*/TELECOM* Australia: RCM Thailand: NBTC* Singapore: IMDA*	Global: GCF* Europe: CE* North America: FCC*/PTCRB* Canada: IC* Australia: RCM*	Planning	Planning	Planning
<b>Others</b>	RoHS	RoHS	RoHS/PEN/ATEX*	RoHS	Planning	Planning	Planning
<b>Electrical Features</b>							
<b>Supply Voltage Range</b> ①	2.6V~4.8V, 3.3V Typ.	2.6V~4.8V, 3.3V Typ.	3.3V~4.3V, 3.8V Typ.	2.6V~4.8V, 3.3V Typ.	3.8V Typ.	3.3V~4.3V, 3.8V Typ.	TBD
<b>Max Output Power</b>	Power Class 5 21dBm @ LTE Bands	Power Class 5 21dBm @ LTE Bands	Power Class 5 21dBm @ LTE Bands	Power Class 5 21dBm @ LTE Bands	Power Class 5 21dBm @ LTE Bands	Power Class 3 23dBm @ LTE Bands	Power Class5 21dBm @ LTE Bands
<b>Power Consumption</b>	LTE Cat M1 (Typical): PSM: 3.8µA Sleep Mode: 1.5mA @ DRX=1.28s 0.8mA @ e-I-DRX=81.92s Active Mode (GNSS off): 227mA @ 21dBm	LTE Cat M1 (Typical): PSM: 3.8µA Sleep Mode: 1.5mA @ DRX=1.28s 0.8mA @ e-I-DRX=81.92s Active Mode (GNSS off): 227mA @ 21dBm  LTE Cat NB1 (Typical): PSM: 3.8µA Sleep Mode: 1.49mA @ DRX=1.28s 0.71mA @ e-IDRX=81.92s Active Mode (GNSS off): 185mA @ 21dBm	LTE Cat M1 (Typical): PSM: 3.9µA Sleep Mode: 1.65mA @ DRX=1.28s 0.85mA @ e-IDRX=81.92s Active Mode (GNSS off): 202mA @ 21dBm  LTE Cat NB1 (Typical): PSM: 3.9µA Sleep Mode: 1.56mA @ DRX=1.28s 0.81mA @ e-IDRX=81.92s Active Mode (GNSS off): 167mA @ 21dBm	TBD	TBD	TBD	TBD

**Notes:**

- \* means under planning/on-going.
- ① please refer to the hardware design manual for more specific requirements on the power supply voltage.