



IoT²BRK3V3_eSIM

BG77 LTE-M/NB2 Breakout Board

IoT²BRK3V3 is the simplest way to add a cellular connectivity and GNSS to your application. It is based on the ultra-compact LTE cat M1/cat NB2 BG77 module. This 1-inch square board comes with an on-board GNSS low-noise amplifier front-end with integrated pre and post SAW filters and a GNSS ceramic antenna. External active and passive GNSS antennas can be used via the U.FL connector. The BG77 is an ultra-compact LPWA module supporting LTE Cat M1, LTE Cat NB2 and integrated GNSS. It is fully compliant with 3GPP Rel-14 specification and provides maximum data rates of 588 kbps downlink and 1119 kbps uplink. 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.

10 yrs/500 MB 250 SMS Data Plan

included

Key

Benefits

- ✓ SWAP (Size, Weight, and Power) IoT solution
- ✓ Robust mounting and interface
- √ 3 GNSS antenna options
- ✓ On-Board eSIM
- ✓ LTE antenna U.FL connector
- ✓ USB-C interface
- ✓ Module and Network status LEDs.

Applications

- ✓ Asset Management
- ✓ Logistics
- ✓ Tracking
- ✓ Geo-Fence
- ✓ Wearables
- ✓ Smart Energy
- ✓ Medical Devices
- ✓ PPPoS/Hotspot

Key

Features

B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85* Cat NB2: LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85* Data Cat M1: Max. 588 kbps (DL)/1119 kbps (UL) Cat NB2: Max. 127 kbps (DL)/158.5 kbps (UL) Voice VolTE (Cat M1 Only) SMS Point-to-point M0 and MT SMS Cell Broadcast Text and PDU Mode Interface USB-C UART GPIO NET_STATUS Antennas GNSS GPS/GLONASS/BeiDou/Galileo/QZSS QuecLocator (Cell ID Positioning) GNSS SAW/LNA/SAW Signal gain: 17 dB Out-of-band rejection: +80 dBc, 1627 to 1660 MHz Low current consumption: 3.1 mA Firmware Upgrade Via USB-C interface Upgrade DFOTA (Delta Firmware Upgrade Over-the-Air) Power Supply 1- USB-C Receptacle 2- 2.7 V - 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V - 3.6 V Electrical Characteristics Consumption @ LTE CAT M1 (typical):	Cellular	Cat M1:
Cat NB2: LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85* Data Cat M1: Max. 588 kbps (DL)/1119 kbps (UL) Cat NB2: Max. 127 kbps (DL)/158.5 kbps (UL) Voice VolTE (Cat M1 Only) SMS Point-to-point MO and MT SMS Cell Broadcast Text and PDU Mode Interface USB-C UART GPIO NET_STATUS STATUS Antennas GNSS GPS/GLONASS/BeiDou/Galileo/QZSS QuecLocator (Cell ID Positioning) GNSS SAW/LNA/SAW Signal gain: 17 dB Out-of-band rejection: +80 dBc, 1627 to 1660 MHz Low current consumption: 3.1 mA Firmware Upgrade DFOTA (Delta Firmware Upgrade Over-the-Air) Power Supply 1- USB-C Receptacle 2- 2.7 V - 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V - 3.6 V Electrical Characteristics Consumption @ LTE CAT M1 (typical):	Technology	LTE-FDD:
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SAW/LNA/SAW Out-of-band rejection: +80 dBc, 1627 to 1660 MHz Low current consumption: 3.1 mA Firmware Upgrade DFOTA (Delta Firmware Upgrade Over-the-Air) Power Supply 1- USB-C Receptacle 2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Output Power: 21 dBm (Max.) Consumption @ LTE CAT M1 (typical):		QuecLocator (Cell ID Positioning)
Low current consumption: 3.1 mA Firmware Upgrade DFOTA (Delta Firmware Upgrade Over-the-Air) 1- USB-C Receptacle 2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Consumption @ LTE CAT M1 (typical):	GNSS	Signal gain: 17 dB
Firmware Upgrade DFOTA (Delta Firmware Upgrade Over-the-Air) Power Supply 1- USB-C Receptacle 2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Output Power: 21 dBm (Max.) Consumption @ LTE CAT M1 (typical):	SAW/LNA/SAW	
Upgrade DFOTA (Delta Firmware Upgrade Over-the-Air) 1- USB-C Receptacle 2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Output Power: 21 dBm (Max.) Consumption @ LTE CAT M1 (typical):		Low current consumption: 3.1 mA
Power Supply 1- USB-C Receptacle 2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Output Power: 21 dBm (Max.) Consumption @ LTE CAT M1 (typical):	Firmware	Via USB-C interface
2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Output Power: 21 dBm (Max.) Consumption @ LTE CAT M1 (typical):	Upgrade	DFOTA (Delta Firmware Upgrade Over-the-Air)
2- 2.7 V – 3.6 V (typ. 3.3 V) at the header I/O Voltage 2.7 V – 3.6 V Electrical Characteristics Output Power: 21 dBm (Max.) Consumption @ LTE CAT M1 (typical):	Power Supply	1- USB-C Receptacle
Electrical Output Power: 21 dBm (Max.) Characteristics Consumption @ LTE CAT M1 (typical):		2- 2.7 V – 3.6 V (typ. 3.3 V) at the header
Characteristics Consumption @ LTE CAT M1 (typical):	I/O Voltage	2.7 V – 3.6 V
Consumption @ LIE CAT MIT (typical):	Electrical	Output Power: 21 dBm (Max.)
	Characteristics	Consumption @ LTE CAT M1 (typical):
Power Saving Mode: 3.2 μA		Power Saving Mode: 3.2 μA
Idle State: TBD		·

Sleep State:
1.63 mA @ DRX = 1.28 s
0.76 mA @ e-I-DRX = 81.92 s, PTW = 20.48 s
LTE Connected Mode:
228 mA @ 21dBm, GNSS off
Consumption @ LTE CAT NB2 (typical):
Power Saving Mode: 3.2 μA
Idle State: TBD
Sleep State:
1.5 mA @ DRX = 1.28 s
0.79 mA @ e-I-DRX = 81.92 s, PTW = 20.48 s
LTE Connected Mode:
165 mA @ 21dBm, GNSS off
100 1111 @ 2100111, 01100 011
GNSS: TBD
PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M/CoAP/
IPv6*
-35 °C to +75 °C
1 inch x 1 inch (25.4 mm x 25.4 mm)
Carrier:
Vodafone* (Global)
Deutsche Telekom* (Europe)
Sprint/Verizon*/AT&T*/T-Mobile* (North America)
Telus* (Canada)
China Telecom*/China Mobile*/China Unicom* (China)
SKT* (South Korea)
NTT DOCOMO*/SoftBank*/KDDI* (Japan)
Telstra* (Australia)
Regulatory:
GCF* (Global)
CE (Europe)
FCC/PTCRB* (North America)
IC* (Canada)
SRRC*/NAL*/CCC* (China)
KC* (South Korea)
NCC* (Taiwan, China)
JATE/TELEC (Japan)
RCM (Australia/New Zealand)
NBTC* (Thailand)

^{*} Means development/on-going/plannin