μ🌀 MURADG

IoT²BRK3V3_eSIM

BG77 LTE-M/NB2 Breakout Board

1" (25.4 mm)
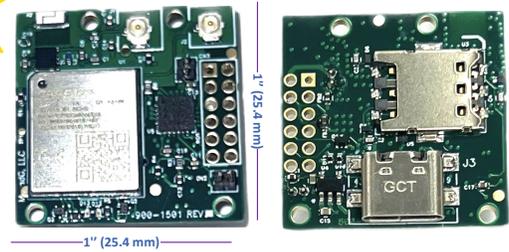
IoT²BRK3V3 is the simplest way to add cellular connectivity and GNSS to your application. It is based on the ultra-compact LTE cat M1/cat NB2 BG77 module. This 1-inch square board comes with an on-board GNSS low-noise amplifier front-end with integrated pre and post SAW filters and a GNSS ceramic antenna. 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.

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

Block Diagram
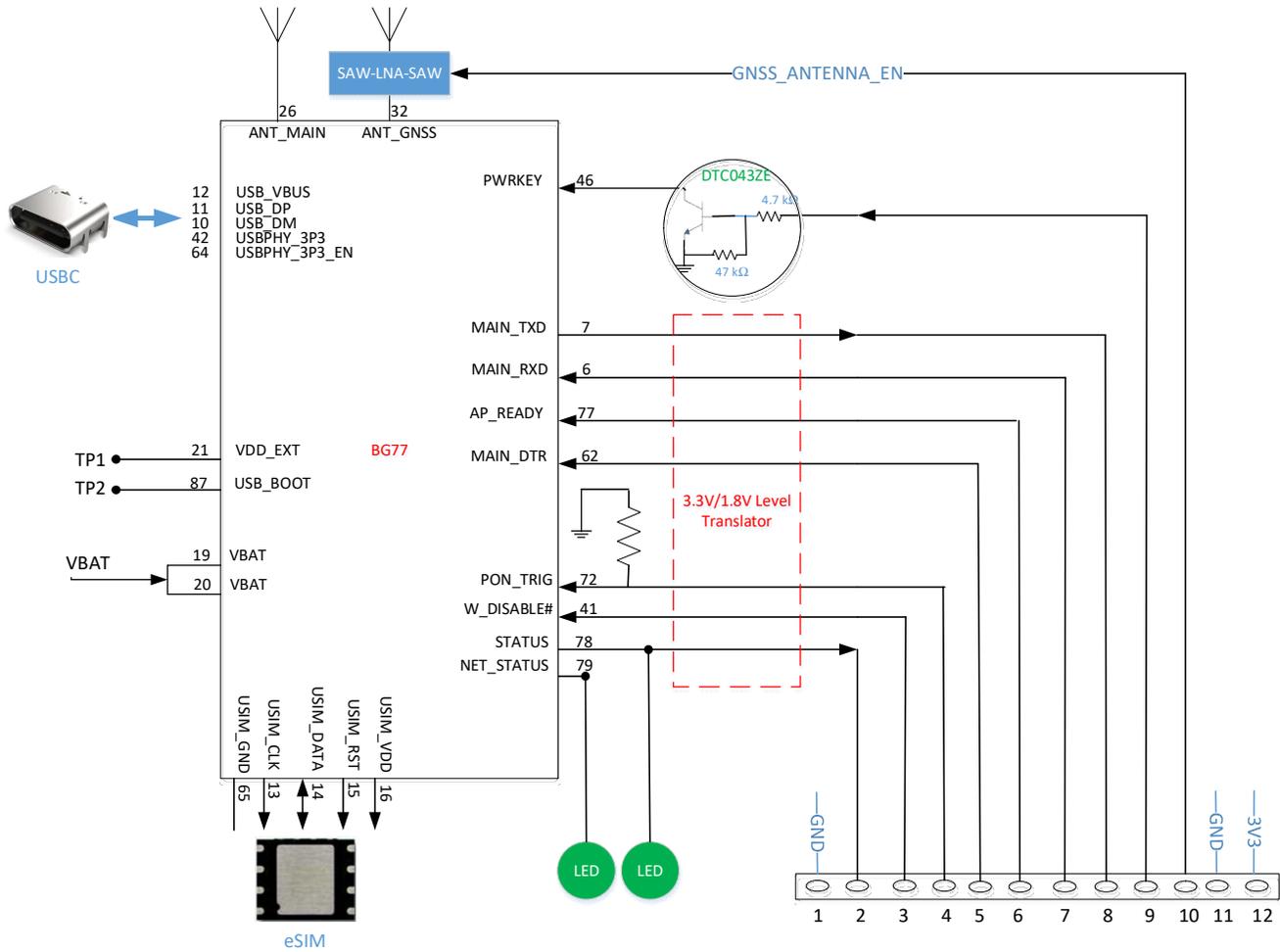
HD1 Pin Description

Pin Number	Direction	Name	Description
1	-	GND	Ground
2	Output	STATUS_HDR	BG77 Module operation status indication
3	Input	W_DISABLE_HDR	Airplane mode control
4	Input	PON_TRIG_HDR	Wake up the module from PSM
5	Input	MAIN_DTR_HDR	Main UART data terminal ready
6	Input	AP_READY_HDR	Application Ready
7	Input	MAIN_RXD_HDR	Main UART receive
8	Output	MAIN_TXD_HDR	Main UART transmit
9	Input	PWRKEY_HDR	Turn on/off the BG77 module
10	Input	GPS_LNA_HDR	Enable/Disable GNSS LNA

11	Power Input/Output	3V3	Power Supply
12	-	GND	Ground

LED
Description

LED Number	Name	Description
D12	NET STATUS	Flicker slowly (200 ms High/1800 ms Low): Network searching Flicker slowly (1800 ms High/200 ms Low): Idle Flicker quickly (125 ms High/125 ms Low): Data transfer is ongoing Always high: Voice calling
D13	STATUS	High: BG77 is ON Low: BG77 is OFF

Power

Interface: The board can be powered by providing a 3.3 V at the J? pin or through a USB-C.

Power Supply	Jumper Position	Description
3.3 V	JMR1 installed JMR2 uninstalled	Connect a 3.3 V and Ground to HDR pins 11 and 12 respectively.
USB-C	JMR1 uninstalled JMR2 installed	

Jumper
Settings

JMB1	JMB2	Function
Installed	Uninstalled	USB-C is the input power
Uninstalled	Installed	3.3 V is an input powered
Installed	Installed	3.3 V is an output Power
Uninstalled	Uninstalled	System off

GNSS
Antenna

LTE

Antenna

TP1

Description: TP1 is connected to the BG77 USB_BOOT input pin. This pin is used Force the module into emergency download mode.

Resources

1- **BG77 AT Commands Manual**

https://www.quectel.com/download/quectel_bg95bg77bg600l_series_at_commands_manual_v2-0

2- **BG77 GNSS Application Note**

https://www.quectel.com/download/quectel_bg95bg77bg600l_series_gnss_application_note_v1-2