

## MOD-BT

### Bluetooth UEXT module

### User's Manual



All boards produced by Olimex are ROHS compliant

Rev. C, July 2016

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## **INTRODUCTION**

**MOD-BT** is development board with female UEXT connector, which can be connected directly to Olimex boards that have male UEXT connector can work as bluetooth serial port via RS232.

## **BOARD FEATURES**

- BGB203HS06 – combines the Bluetooth RF part, protocol stack, Link Controller (LC), Link Manager (LM), and Host Controller Interface (HCI) firmware of the Bluetooth system specification in one SiP with embedded software. Together with an antenna and a reference clock this device forms a complete Bluetooth solution. Note that the chip comes with SPP firmware described in the stack documentation.
- UEXT female connector
- On-board antenna
- Three types of power supply – 1.8V, 2.8V and 3.3V
- PCB: FR-4, 1.5 mm (0.062"), red soldermask, white silkscreen component print
- Dimensions: (35.9 x 18.8)mm ~ (1.41 x 0.74)"

## **ELECTROSTATIC WARNING**

The MOD-BT board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

## **BOARD USE REQUIREMENTS**

**Hardware:** one of our development boards with male UEXT connector.

## **BLUETOOTH CONTROLLER HARDWARE FEATURES**

**MOD-BT** board use BGB203HS06 bluetooth system-in-a-package radio with baseband controller and SPP firmware with these features:

- General
  - Plug-and-play Bluetooth class 1 System-in-a-Package (SiP)
  - Includes all baseband and radio functionality, from HCI up to antenna, needs only external antenna and reference clock.
  - Fully compliant to Bluetooth Radio Specification version 1.2.
- Radio hardware
  - Fully integrated near-zero-IF receiver with high sensitivity (typical -88 dBm at antenna input)
  - Digital demodulator for improved reception quality
  - RSSI with high dynamic range
  - Programmable output pre-amplifier
  - Maximum output power up to +5.5 dBm typical
  - Includes high performance blocking filter for co-existence in GSM/DCS/WCDMA applications
  - Fully integrated low phase noise VCO operating in the 5 GHz frequency range
- Hardware features
  - Bluetooth burst mode controller with:
    - Ciphering, scrambling, CRC checking/generation, FEC encoding/decoding and data buffering control
    - Support for 7 slaves and three piconets, support of master-slave switch for new nodes entering the piconet, scatternet support with maximum one slave in master piconet while being slave in another piconet, support for 2 voice channels.
  - BT1.2 features:
    - Fast connection
    - EV3 (HV3+CRC)
    - AFH IP: AFH switch support as master, Channel assessment as master
  - Embedded 32-bit microprocessor consisting of
    - An ARM7TDMI-S RISC controller featuring low mW/MHz
    - Integrated Flash memory : 268 kBytes.
    - SRAM : 40 kBytes.

- Voice processing with
  - A CVSD, A-law or m-law.
  - Support of a direct link between PCM interface and BT1.2 core for the voice channels.
- Power management providing
  - Power-on reset
- Clocking
  - Low power clock crystal oscillator for low power mode, accepting 3.2KHz, 32KHz, and 32.768KHz.
  - Low-power system clock crystal oscillator with programmable on-chip capacitors for frequency adjustment with large pulling range accepting the frequency 12MHz, 13MHz, 24MHz and 26 MHz.
- Microprocessor interfaces
  - General purpose I/O-pins
  - I<sup>2</sup>C-bus interface
  - Multi port PCM interface (linear and log PCM up to 16 bit/sample supported)
  - UART with hardware handshake and IrDA support
  - USB interface (vddio2 : 3.3V).
  - System timers
  - Watch dog timer
  - JTAG for ICE and flash memory programming
  - ETM7 for real time trace.
  - Patch interface for ROM version emulation.
- Voltage range
  - Radio 2.75 V
  - Core 1.8 V
  - Peripheral pins 1.8 and 3.3V

## **FIRMWARE FEATURES**

This section provides an overview of the features provided by the SPP Module firmware. More detail on the features may be found in "BGB203\_SPP\_UserGuide.pdf".

### **Command Interface**

- Subset of V.25
- Extensions following the GSM command convention
- Configurable via command interface
- Configurable escape sequence

### **Physical Interface**

- Universal Asynchronous Receive Transmit (UART)
- Configurable UART
  - Baud rate
  - Word length
  - Parity
  - Stop bits
  - RTS/CTS flow control
  - DTR/DSR flow control
- RS-232 signal support
  - Support for CD, RI, DTR/DSR (including pass-through)
  - Support for DCE or DTE device
- Active connection output

### **Bluetooth Features**

- Supports Bluetooth 1.2 features of BGB203
  - Fast connection
  - Adaptive Frequency Hopping (AFH)
- Entirely embedded Bluetooth protocol stack
  - Link Controller (LC)
  - Link Manager (LM)
  - Logical Link and Adaptation Protocol (L2CAP)
  - Service Discovery Protocol (SDP)
  - RFCOMM Protocol (RFCOMM)
  - Serial Port Profile (SPP)
  - Generic Access Profile (GAP)

## **Bluetooth Functionality**

- Inquiry
- Service Discovery with filter
- Remote Name discovery
- Link Key management
- Pairing (active and passive)
- Serial Port Profile server
- Configurable service name
- Configurable access control
- Serial Port Profile client
- Configurable RFCOMM port
- Configurable connection attempts
- Configurable local device discoverability
- Configurable local device name
- Configurable local class of device
- Configurable link supervision timeout
- Configurable PIN codes
- Configurable Security and/or Encryption
- Configurable sniff low power mode
- Master/slave role switch supported

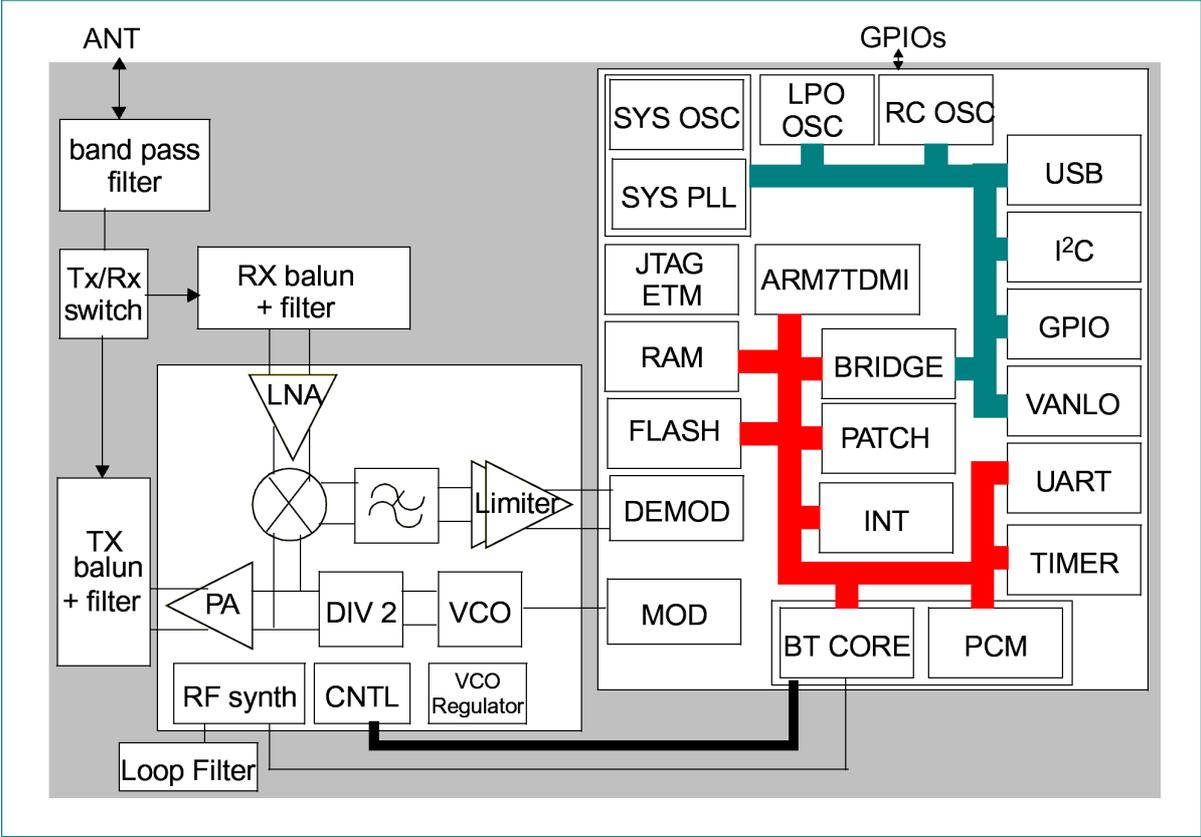
## **Test Modes**

- Bluetooth test mode
- FCC/Bluetooth transmission test modes
- Calibration mode (RXTUN)

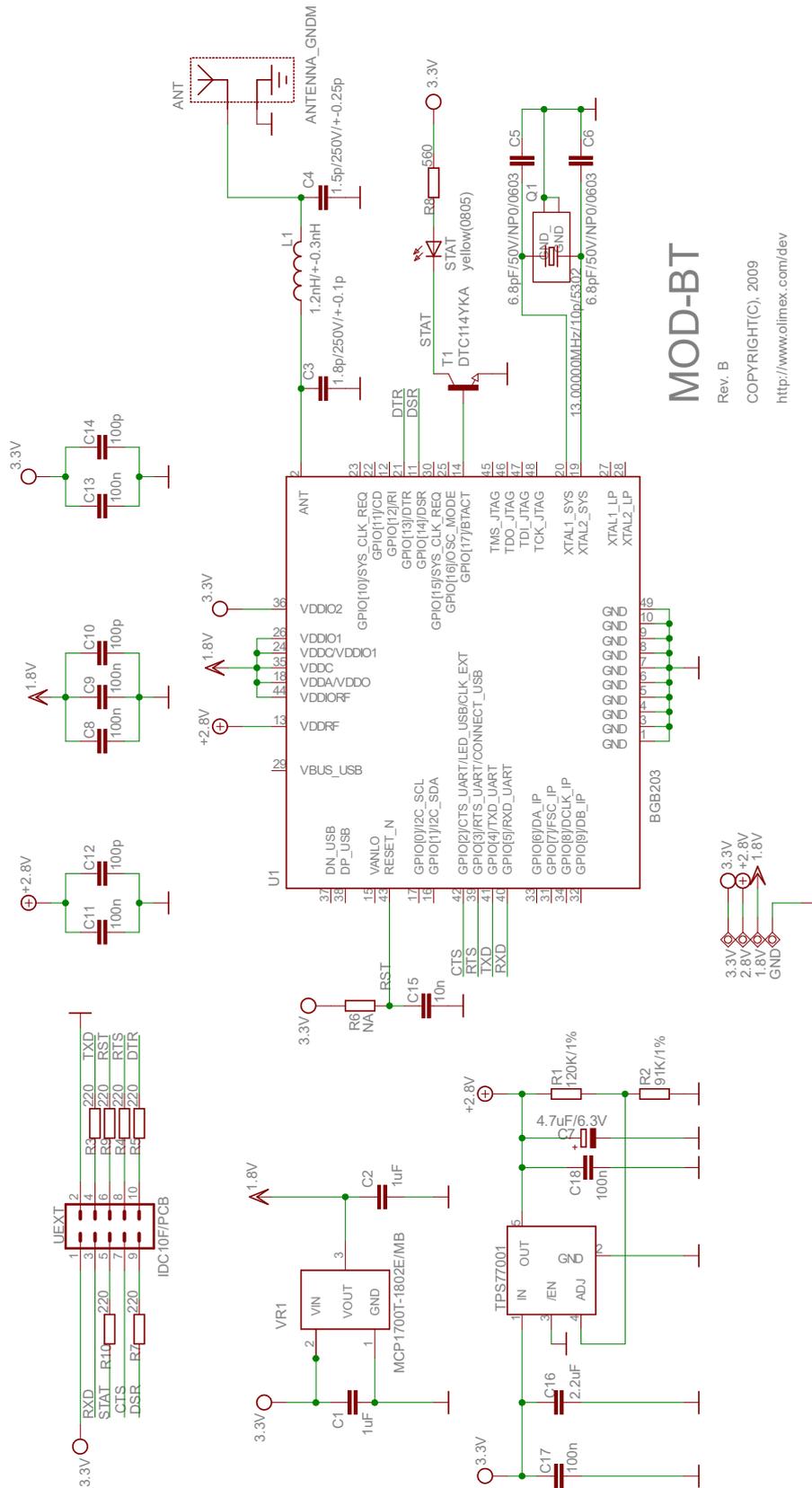
## **Miscellaneous Features**

- Configuration storable to Flash
- Automatic re-connect mode
- Low power sleep mode

# BLOCK DIAGRAM



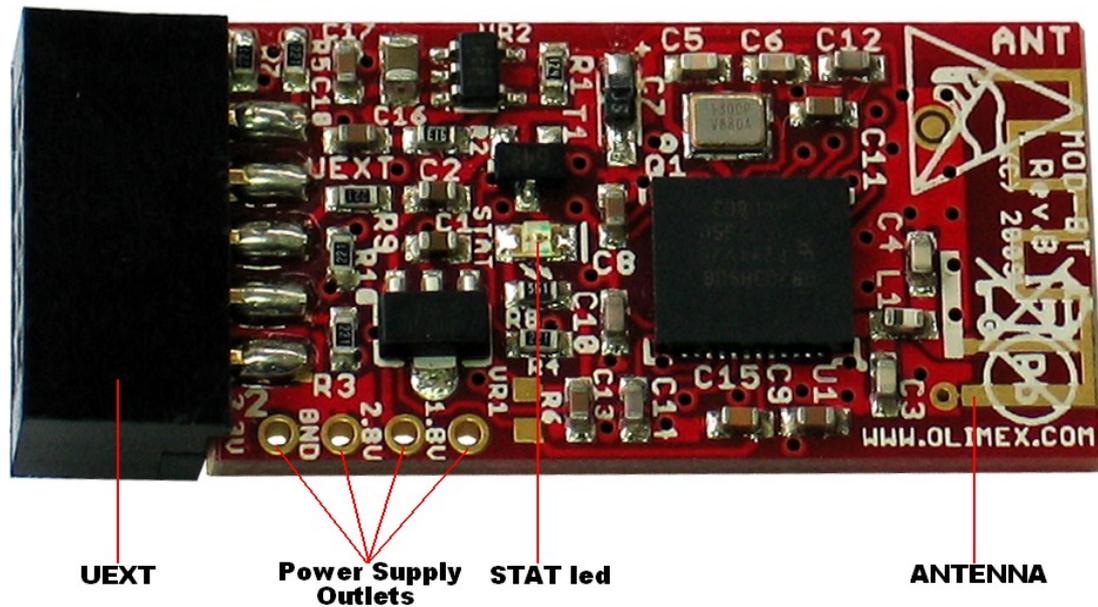
# SCHEMATIC



**MOD-BT**

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## BOARD LAYOUT



## POWER SUPPLY CIRCUIT

MOD-BT is typically power supplied by UEXT pin 1 and pin 2 with 3.3V.

There are two more power supplies – 2.8V for Radio and 1.8V for the core.

## RESET CIRCUIT

MOD-BT reset circuit includes pin 6 of UEXT connector, pin 43 (RESET\_N) of U1 and C15 (10nF).

## CLOCK CIRCUIT

Quartz crystal 13 MHz is connected to BGB203 pin 20 (XTAL1\_SYS) and pin 19 (XTAL2\_SYS).

## JUMPER DESCRIPTION

There are no jumpers on this board.

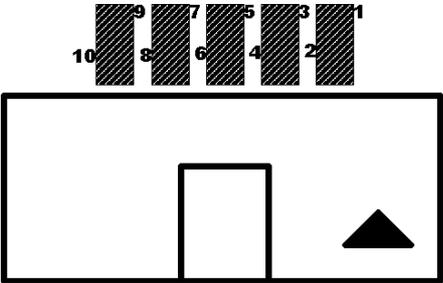
## INPUT/OUTPUT

Status led (yellow) with name STAT – this led shows that +3.3V is applied to the board.

**CONNECTOR DESCRIPTIONS**

**UEXT**

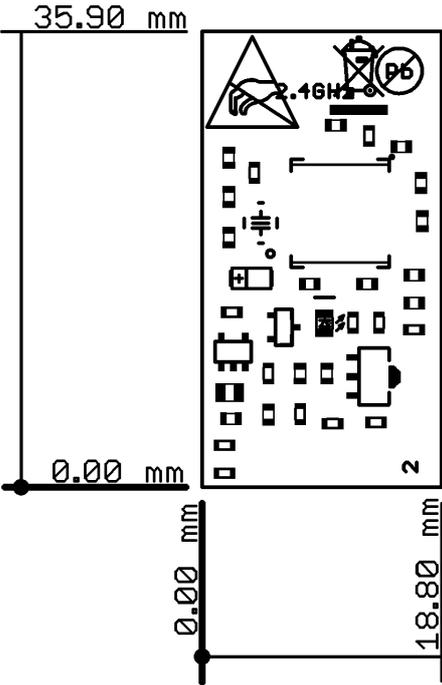
Pin #	Signal Name
1	3.3V
2	GND
3	RXD
4	TXD
5	STAT
6	RST
7	CTS
8	RTS
9	DSR
10	DTR



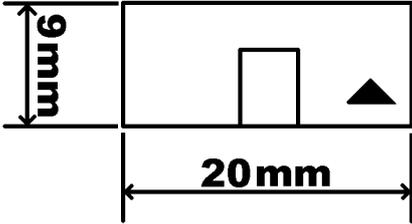
**POWER SUPPLY OUTLETS**



MECHANICAL DIMENSIONS



TEXT DIMENSIONS



## **ORDER CODE**

MOD-BT – completely assembled and tested

How to order?

You can purchase directly from our online shop or from any of our distributors.

Check our web <https://www.olimex.com/> for more info.

### **Revision history:**

REV. B – initial release – September 2009

REV.C – added more info about the exact chip used – July 2016

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