OLIMEX

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MOD-BT development board

Users Manual

All boards produced by Olimex are ROHS compliant

INTRODUCTION

MOD-BT is development board with UEXT female connector, which connected to other Olimex board with UEXT male connector can work as bluetooth serial port via RS232.

BOARD FEATURES

– BGB203 - 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.

– UEXT female connector

– on-board antenna

– three types power supply – 1.8V, 2.8V and 3.3V

– PCB: FR-4, 1.5 mm (0,062"), soldermask, silkscreen component print

– Dimensions: 35.9x18.8 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

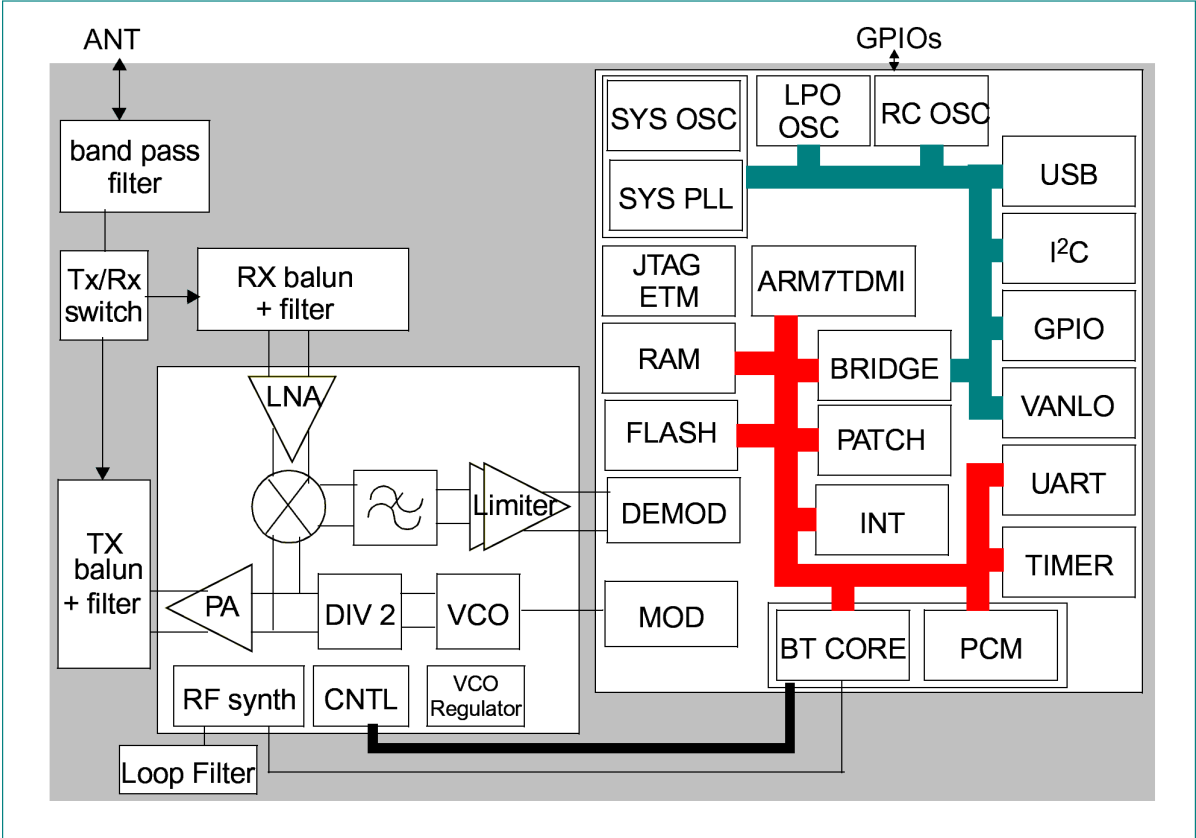**Hardware:** Some of our development boards with UEXT male connector.

Bluetooth Controller Features

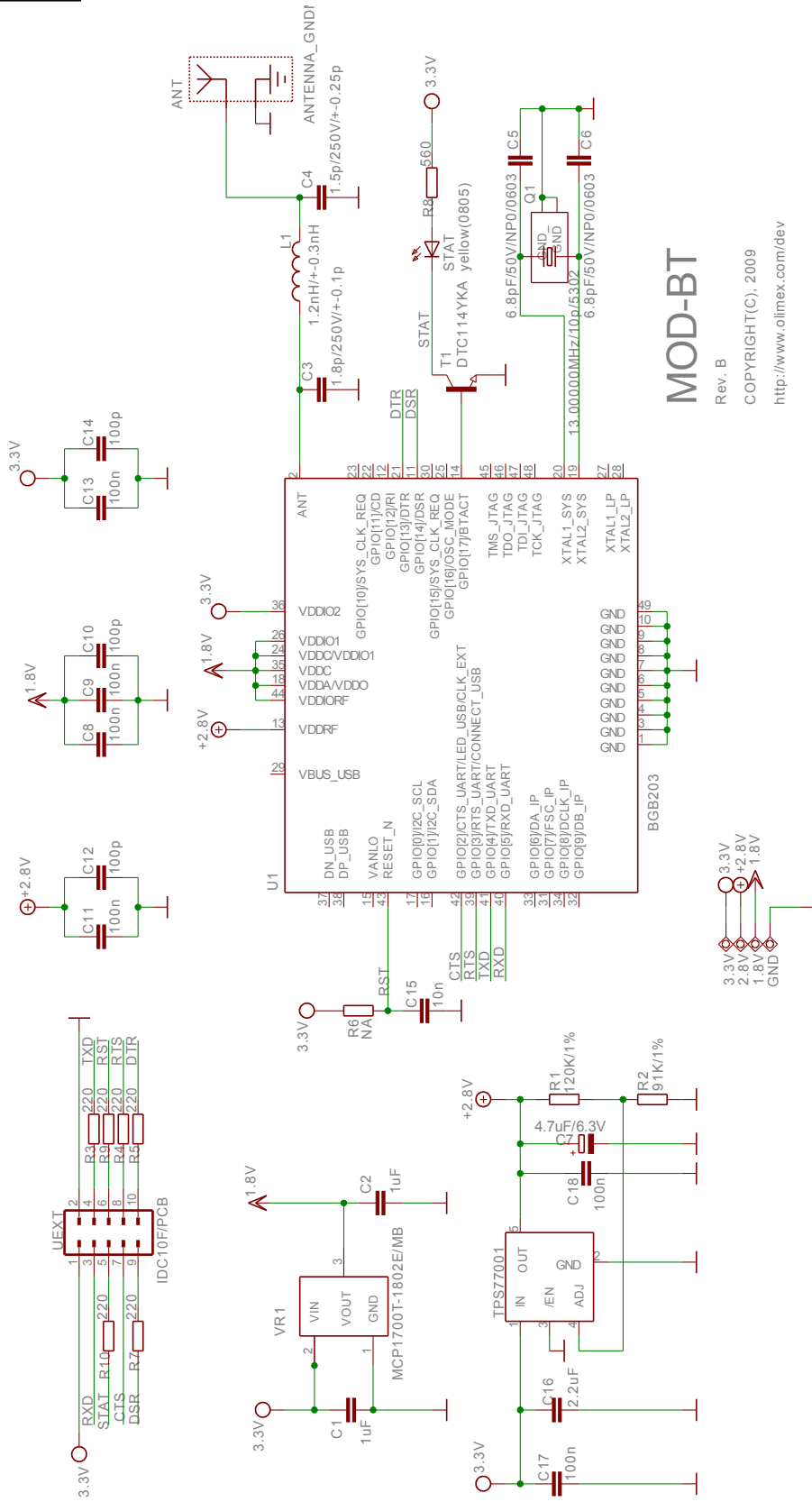**MOD-BT** board use BGB203 bluetooth system-in-a-package radio with baseband controller with these features:

– 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 assesment 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^{2}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
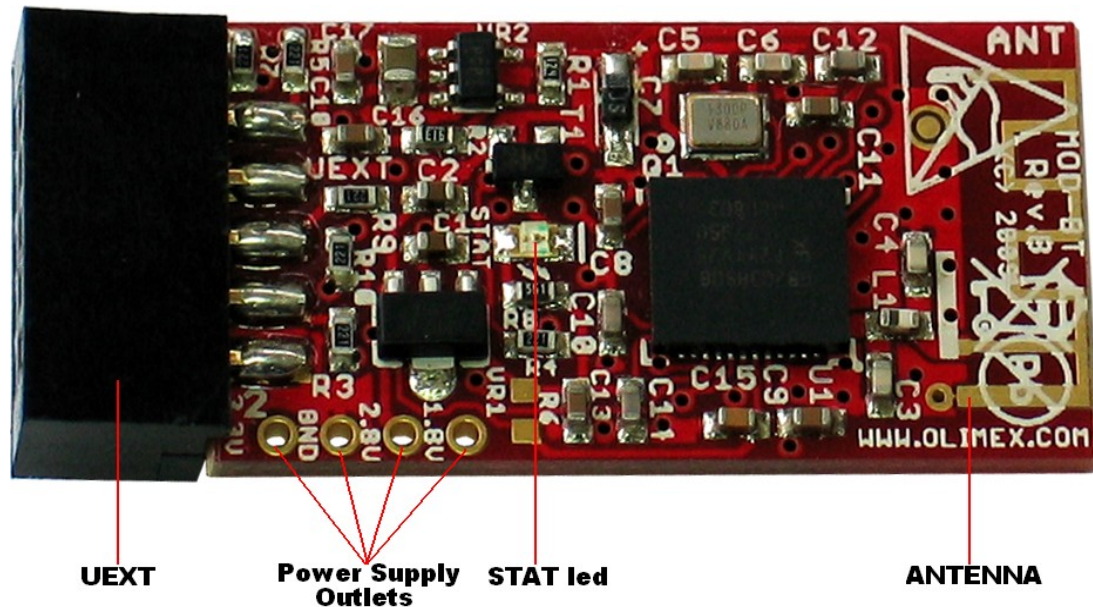   - – Peripheral pins 1.8 and 3.3V

BLOCK DIAGRAM

ANT

GPIOs

band pass filter

Tx/Rx switch

RX balun + filter

LNA

TX balun + filter

PA

DIV 2

VCO

Limiter

DEMOD

MOD

RF synth

CNTL

VCO Regulator

Loop Filter

SYS OSC

LPO OSC

RC OSC

USB

SYS PLL

I²C

JTAG ETM

ARM7TDMI

GPIO

RAM

BRIDGE

VANLO

FLASH

PATCH

UART

INT

TIMER

BT CORE

PCM

SCHEMATIC

MOD-BT

Rev. B

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http://www.olimex.com/dev

ANT

ANTENNA_GNDR

C4 1.5p/250V/+-0.25p

L1 1.2nH/+-0.3nH

C3 1.8p/250V/+-0.1p

3.3V

R8 560

STAT DTC114YKA yellow(0805)

T1 STAT

Q1 13.00000MHz/10p/5302

C5 6.8pF/50V/NP0/0603

C6 6.8pF/50V/NP0/0603

DTR
DSR

U1

ANT 2

GPIO[10]/SYS_CLK_REQ 23
GPIO[11]/CD 22
GPIO[12]/RI 12
GPIO[13]/DTR 21
GPIO[14]/DSR 11
GPIO[15]/SYS_CLK_REQ 25
GPIO[16]/OSC_MODE 14
GPIO[17]/BTACT

TMS_JTAG 45
TDO_JTAG 46
TDI_JTAG 47
TCK_JTAG 48

XTAL1_SYS 20
XTAL2_SYS 19

XTAL1_LP 27
XTAL2_LP 28

VDDIO2 36
VDDIO1 26
VDDC/VDDIO1 24
VDDC 35
VDDA/VDDO 18
VDDIORF 44
VDDRF 13

VBUS_USB 29

DN_USB 37
DP_USB 38
VANLO 15
RESET_N 43

GPIO[0]/I2C_SCL 17
GPIO[1]/I2C_SDA 16
GPIO[2]/CTS_UART/LED_USB/CLK_EXT 42
GPIO[3]/RTS_UART/CONNECT_USB 39
GPIO[4]/TXD_UART 41
GPIO[5]/RXD_UART 40

GPIO[6]/DA_IP 33
GPIO[7]/FSC_IP 31
GPIO[8]/DCLK_IP 34
GPIO[9]/DB_IP 32

GND 49
GND 10
GND 9
GND 8
GND 7
GND 6
GND 5
GND 4
GND 3
GND 1

BGB203

3.3V

1.8V 3.3V

+2.8V

C14 100p
C13 100n

C10 100p
C9 100n
C8 100n

C12 100p
C11 100n

1.8V

+2.8V

3.3V
+2.8V
1.8V

3.3V
2.8V
1.8V
GND

RST
R6 NA
C15 10n

3.3V

CTS
RTS
TXD
RXD

UEXT

TXD
RST
RTS
DTR

R3 220
R9 220
R4 220
R5 220

RXD
STAT
CTS
DSR

R10 220
R7 220

IDC10F/PCB

3.3V

1.8V

C2 1uF

VR1 MCP1700T-1802E/MB
VIN VOUT GND
3.3V
C1 1uF

+2.8V

R1 120K/1%
R2 91K/1%

C7 4.7uF/6.3V
C18 100n

TPS77001
IN OUT GND
/EN ADJ

3.3V
C16 2.2uF

3.3V
C17 100n

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BOARD LAYOUT

UEXT   Power Supply   STAT led   ANTENNA
                 Outlets

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
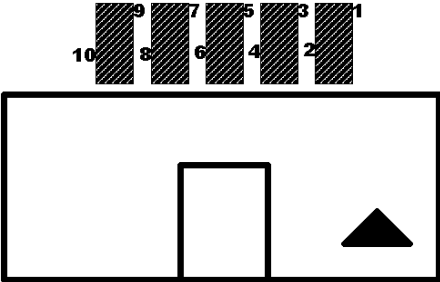
POWER SUPPLY OUTLETS

MECHANICAL DIMENSIONS

35.90 mm

0.00 mm

0.00 mm

18.80 mm

UEXT measures

9mm

20mm
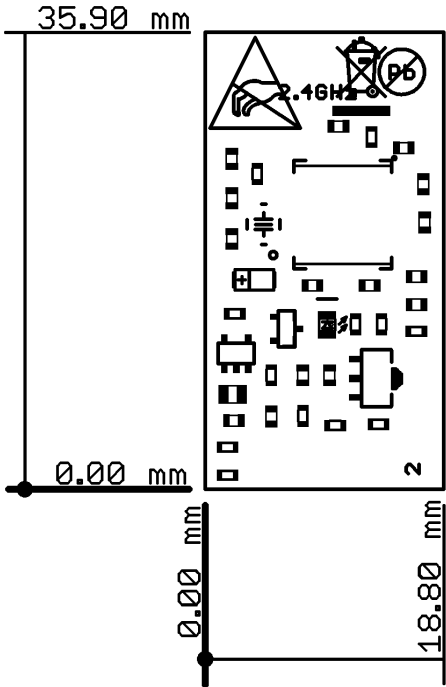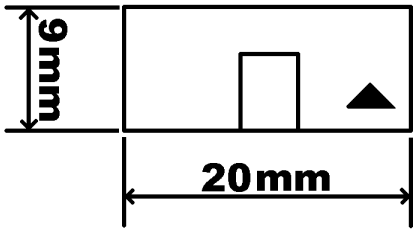
ORDER CODE

MOD-BT – completely assembled and tested

How to order?
You can order to us directly or by any of our distributors.
Check our web www.olimex.com/dev for more info.

Revision history:

REV. B   - create   September 2009

Disclaimer: