

# Bluetooth 5.0

## BT-TK50 Module Datasheet

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# 1 Introduction

Yorxin Technologies introduces the pioneer of the Bluetooth

5.0 modules BT-TK50 which is a high performance, cost effective, low power and compact solution. The Bluetooth module provides a complete 2.4GHz Bluetooth system based on the America QUALCOMM chipset which is a single chip radio and baseband IC for Bluetooth 2.4GHz systems,. This module is fully qualified single-chip dual mode Bluetooth@v5.0 system.

## 2 Key Features

### Bluetooth Profiles

Bluetooth v5.0 specification support

Qualcomm® Bluetooth® Low Energy secureconnection

A2DP v1.3.1

VRCP v1.6

FP v1.7

HSP v1.2

SPP v1.2

DID v1.3

HID v1.1

PXPv1.0.1

FMP v1.0



BAS v1.0

QTIL's proximity pairing and QTIL's proximity connection

## **Music Enhancements**

SBC and AAC audio codecs

Qualcomm Shareme, which allows the sharing of audio from to another Bluetooth

A2DP sink device

Configurable Signal Detection to trigger events 1 bank of up to 10-stage Speaker

Parametric

## **EQ**

6 banks of up to 5-stage User Parametric EQ for music enhancement Qualcomm®

meloD™ Expansion audio processing: 3D stereo widening Comander to compress or expand the dynamic range of the audio

Post Mastering to improve DAC fidelity

I S input/output

## **Additional Functionality**

Support for multi-language programmable audio prompts

Multipoint support for A2DP connection to 2 A2DP sources for music playback

Talk-time extension, which automatically reduces processor functions to extend use when a low battery condition is detected

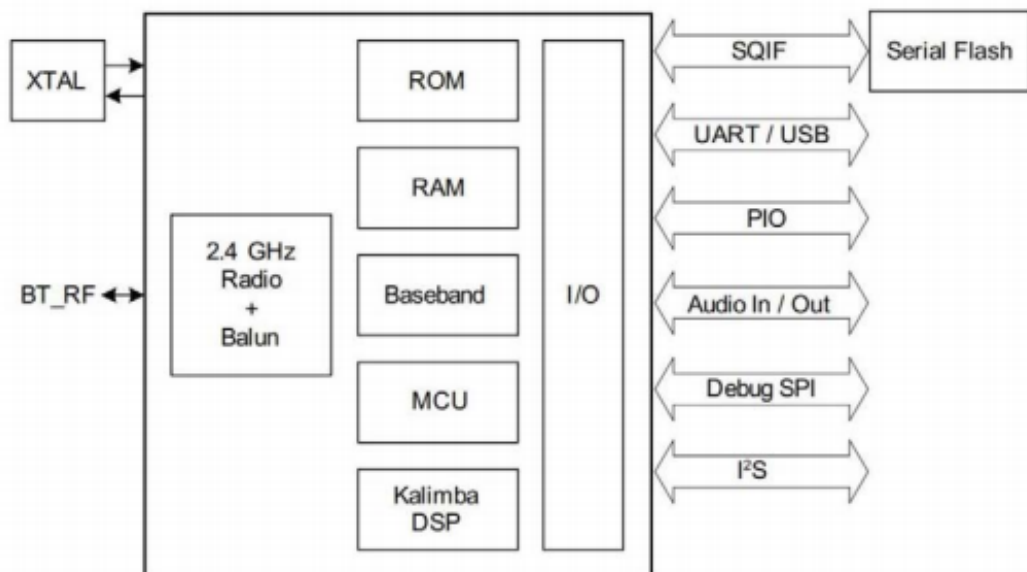
Slim module with 1.32mm x 2.50mm x 0.8mm



### 3 Applications

Stereo Headsets  
Wired Stereo headsets and headphones  
Portable Bluetooth Stereo speakers

### 4 Block Diagram



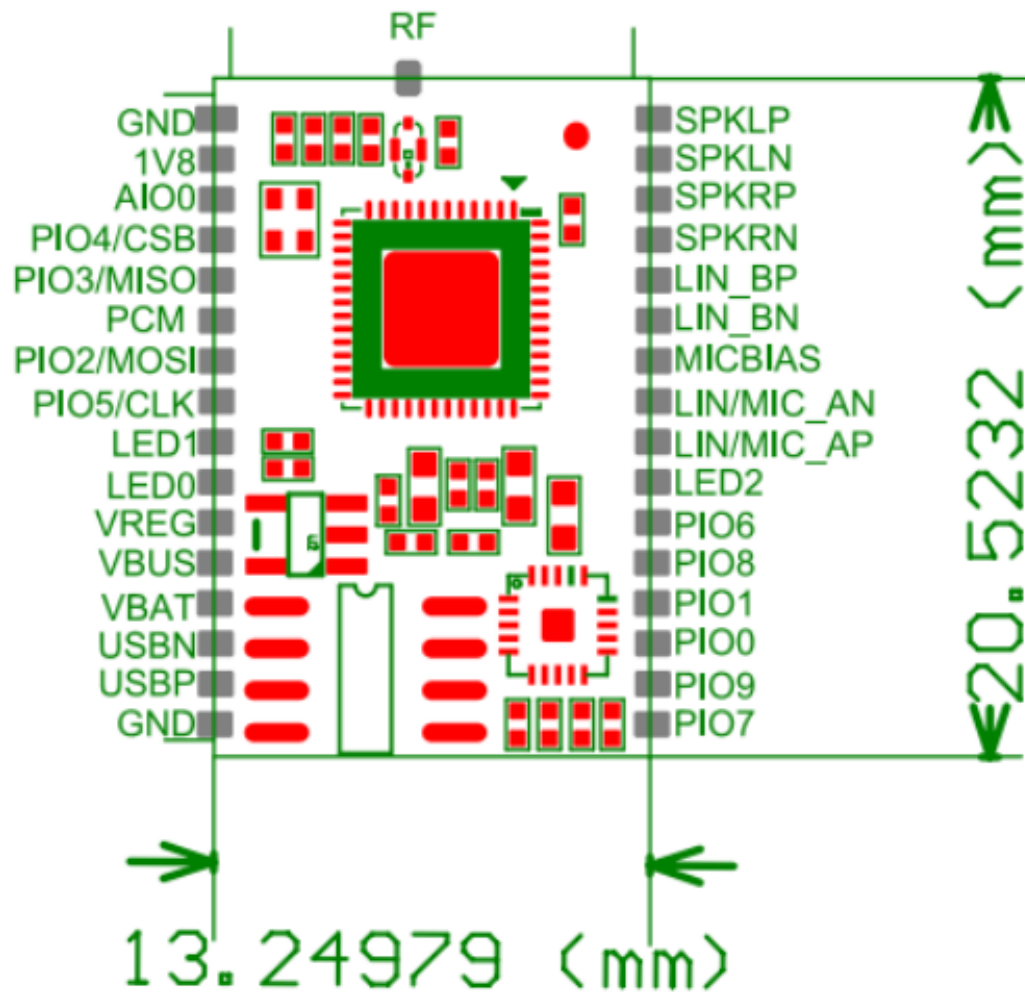
### 5 General specifications

|                               |                             |
|-------------------------------|-----------------------------|
| Model Name                    | BMD-TK50                    |
| Product Description           | Bluetooth 5.0 Class2 Module |
| Bluetooth Standard            | Bluetooth 5.0               |
| Chipset                       | QCCOOM Bluetooth Chip       |
| Dimension                     | 1.32mm x 2.50mm x 0.8mm     |
| Operating Conditions          |                             |
| Voltage                       | 2.8~4.2V                    |
| Temperature                   | -10~+70℃                    |
| Storage Temperature           | -40~+85℃                    |
| Electrical Specifications     |                             |
| Frequency Range               | 2402~2480MHz                |
| Maximum RF Transmit Power     | 9dBm                        |
| n/4 DQPSK Receive Sensitivity | -91dBm                      |
| 8DPSK Receive Sensitivity     | -81dBm                      |



## 6 Module Package Information

### 6.1 Pinout Diagram and package dimensions



Unit: MM

Recommended PCB layout footprint



## 6.2 Module Pin descriptions

| Pin# | Pin Name  | Pin Type                          | Description  |
|------|-----------|-----------------------------------|--|
| 1    | GND       | Ground                            | Ground   |
| 2    | 1V8       | Power output                      | Auxiliary regulator output (1.8V out)  |
| 3    | AIO0      | Bidirectional                     | Analog programmable input line 0   |
| 4    | PIO4/CSB  | Bidirectional with weak pull-down | Chip select for SPI, active low<br>Alternative function:<br>■ PIO_4:<br>Programmable input/output line 4   |
| 5    | PIO3/MISO | Bidirectional with weak pull-down | SPI data output<br>Alternative function:<br>■ PIO_3:<br>Programmable input/output line 3. ■ I2S1_SD_OUT: I2S1 synchronous data output  |
| 6    | PCM       | Input with weak pull-down         | SPI/PCM# select input<br>■ 0=PCM/PIO interface<br>■ 1=SPI  |
| 7    | PIO2/MOSI | Bidirectional with weak pull-down | SPI data input<br>Alternative function:<br>■ PIO_2:<br>Programmable input/output line 2. ■ I2S1_SD_IN: I2S1 synchronous data input   |
| 8    | PIO5/CLK  | Bidirectional with weak pull-down | SPI clock<br>Alternative function:<br>■ PIO_5:<br>Programmable input/output line 5. ■ I2S1_CLK: I2S1 synchronous data clock  |
| 9    | LED1      | Bidirectional                     | Open-drain output  |
| 10   | LED0      | Bidirectional                     | Open-drain output  |
| 11   | VREG      |                                   | Regulator enable and multifunction button. A high input (tolerant to VBAT voltages) enables the on-chip regulators, which can then be latched on internally and the button used as a multifunction input |
| 12   | VBUS      | Charge input                      | Charge input<br>Typically connected charger  |



|    |            |                                   |  |
|----|------------|-----------------------------------|--|
| 13 | VBAT       | CMOS Input                        | Positive supply for BT Module, or battery positive terminal  |
| 14 | USBN       | Bi-directional                    | USB data minus   |
| 15 | USBP       | Bi-directional                    | USB data plus with selectable internal 1.5kΩ pull-up resistor  |
| 16 | GND        | Ground                            | Ground   |
| 17 | PIO7       | Bidirectional with strong pull-up | Programmable input/output line 7.  |
| 18 | PIO9       | Bidirectional with strong pull-up | Programmable input/output line 9.<br>Alternative function:<br>■ UART_CTS: UART clear to send, active low   |
| 19 | PIO0       | Bidirectional with strong pull-up | Programmable input/output line 0.<br>Alternative function:<br>■ UART_RX: UART data input                   |
| 20 | PIO1       | Bidirectional with strong pull-up | Programmable input/output line 1.<br>Alternative function:<br>■ UART_TX: UART data output                  |
| 21 | PIO8       | Bidirectional with strong pull-up | Programmable input/output line 8.<br>Alternative function:<br>■ UART_RTS: UART request to send, active low |
| 22 | PIO6       | Bidirectional with strong pull-up | Programmable input/output line 6.  |
| 23 | LED2       | Bidirectional                     | Open-drain outp  |
| 24 | LIN/MIC_BN | Analogue in                       | Microphone input positive, channel A   |
| 25 | LIN/MIC_AN | Analogue in                       | Microphone input negative, channel A   |
| 26 | MICBISA    | Analogue                          | Microphone bi  |
| 27 | LIN_BN     | Analogue in                       | Line-in negative, channel B  |
| 28 | LIN_BP     | Analogue in                       | Line-in positive, channel B  |
| 29 | SPK_RN     | Analogue OUT                      | Speaker output negative, right   |
| 30 | SPK_RP     | Analogue OUT                      | Speaker output positive, right   |
| 31 | SPK_LN     | Analogue OUT                      | Speaker output negative, left  |
| 32 | SPK_LP     | Analogue OUT                      | Speaker output positive, right   |
| 33 | RF         |                                   |  |



## 7 Reference design

