



Bluetooth® Multimedia Modules

BTM520/521



The BTM520 and BTM521 are the most advanced low-power multimedia Bluetooth® modules available in the marketplace. Designed to meet the needs of developers requiring ultimate Bluetooth audio performance and flexibility, these modules include everything required for a fully qualified and functional Bluetooth multimedia application.

In addition to providing best-in-class radio performance, range, and power consumption, the BTM520/521 support all the functionality to run Cambridge Silicon Radio's Road Tunes and Blue Tunes development applications. They support the latest Bluetooth Version 2.1+EDR Specification, providing secure simple pairing that improves security and enhances easy use. (The BTM521 has an integrated high-performance, multilayer ceramic antenna that achieves open field ranges in excess of 300 meters.)

The modules include a 16 bit stereo codec and microphone input to support both stereo and mono applications, and may drive stereo speakers. Containing all the necessary audio filtration and biasing components, the modules only require speakers, a microphone, and push buttons to make a high-quality Bluetooth stereo product.

The BTM520/521 contain a full, integrated Bluetooth stack along with SPP, HFP 1.5, HSP, AVRCP, and A2DP profiles, all of which are Bluetooth qualified. Additional profiles could be made available for file transfer, object exchange, dial up networking, messaging, and phonebook control. Because these modules are pre-qualified, customers can list and promote their products free of charge on the Bluetooth website.

The modules include an embedded 32-bit, 64-MIPS DSP core in the BC05 that is integrated with the Bluetooth functionality, allowing the addition of significant product enhancements, such as echo cancellation, noise reduction, and audio enhancement via additional soft codecs. The availability of 16MB of flash memory in the module allows complex functionality. DSP routines can be licensed via a number of specialist partners.

To speed product development and integration, Laird Technologies has developed a comprehensive AT command interface that simplifies application development, including support for audio and headset functionality. Combined with a low-cost development kit, Laird Technologies' Bluetooth modules provide faster time to market.

Features

- Fully featured Bluetooth multimedia module
- Supports CSR Road Tunes and Blue Tunes applications
- Bluetooth v2.1+EDR
- Supports mono and stereo headset applications
- Adaptive frequency hopping to cope with interference from other wireless devices
- 32 bit Kalimba DSP for enhanced audio applications
- Support for secure simple pairing
- External or internal antenna options
- HSP, HFP, A2DP and AVRCP audio profiles
- HDP profiles (later release)
- 16 bit stereo codec and microphone input
- Integrated audio amplifiers to drive stereo speakers
- Comprehensive AT interface for simple programming
- Bluetooth End product qualified
- Compact size
- Class 1 output – 8 dBm
- Lowest power operation with high efficiency internal switch mode supply.
- Wi-Fi coexistence hardware support

Application Areas

- High quality stereo headsets
- Hands-free devices
- Wireless audio cable replacement
- MP3 and music players
- Phone accessories
- VoIP products
- Aftermarket automotive applications

global solutions: local support.

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| CATEGORIES | FEATURE | IMPLEMENTATION |
|------------------------|-------------------------|---|
| Wireless Specification | Bluetooth® | Version 2.1+EDR |
| | Frequency | 2.402 – 2.480 GHz |
| | Max Transmit Power | Class 1 - +6 dBm (at antenna connector – BTM520) 8 dBm (from integrated antenna – BTM521) |
| | Receive Sensitivity | Better than -86 dBm |
| | Data Rates | Up to 2.1 Mbps (over the air) |
| | UART Data Transfer Rate | Greater than 300 Kbps |
| Host Interface | UART | Supports DTR, DSR, DCD and RI, multiplexed with other functionality |
| Audio Interfaces | Codec | Internal 16-bit Stereo Codec Integrated Amplifiers for driving stereo speaker |
| | Microphone | Integrated low noise microphone bias |
| DSP | Integrated Kalimba DSP | 32-bit, 64 MIPS |
| Profiles | | GAP (Generic Access Profile), SDP (Service Discovery Profile), SPP (Serial Port Profile), HSP, HFP (Audio Gateway and Handset), A2DP (Source and Sink), AVRCP (Target and Controller), SCO/eSCO |
| Supply Voltage | Supply | 3.0 V to +4.2 V DC |
| | I/O | 1.7 V to +3.6 V DC |
| Power Consumption | Current Consumption | Operational - Less than 80 mA (including speaker amplifiers) Idle (sleep) < 1.5 mA |
| Coexistence | 802.11 (WLAN) | 2 wire and 3 wire hardware coexistence schemes supported |
| Connections | External Antenna | u.fl connector for external antenna – BTM520 |
| | Internal Antenna | Multilayer ceramic – BTM521 |
| Programming API | | AT Command Set (extended for audio and headset functions and Secure Simple Pairing) |
| Physical | Dimensions | 20 mm x 36 mm x 4.1 mm (SMT connector – BTM520) |
| | | 20 mm x 36 mm x 5.1 mm (integrated antenna – BTM521) |
| Environmental | Operating Temperature | -30° C to +70° C |
| | Storage Temperature | -40° C to +85° C |
| Miscellaneous | Lead Free | Lead-free and RoHS compliant |
| | Warranty | 1 Year |
| Developmental Tools | Development Kit | Development board and software tools |
| Approvals | Bluetooth | End Product Approved |
| | FCC/IC & CE | BTM520 - Full Modular Approval w/ specified antenna BTM521 - Full Modular Approval |

Ordering Information

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|------------|--|
| BTM520 | Bluetooth Multimedia Plus Module (external antenna) |
| BTM521 | Bluetooth Multimedia Plus Module (with internal antenna) |
| DVK-BTM520 | Evaluation Board with BTM520 |
| DVK-BTM521 | Development Kit (with internal antenna) |

The details contained within the document are subject to change. Download the product specification from www.lairdtech.com/wireless for the most current specification.

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