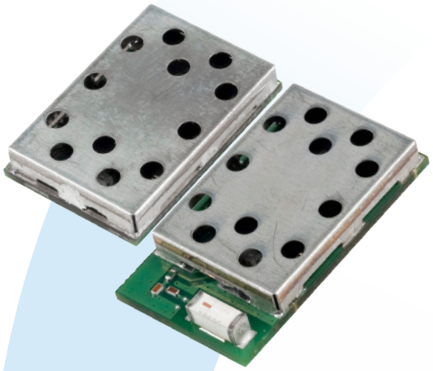
Laird TECHNOLOGIES

Innovative **Technology** for a **Connected** World

Bluetooth® Audio Modules
BTM510/511



The BTM510 and BTM511 are low-power Bluetooth® modules from Laird Technologies are designed for adding robust audio and voice capabilities. Based on the market-leading Cambridge Silicon Radio BC05 chipset, these modules provide exceptionally low power consumption with outstanding range. Supporting the latest Bluetooth Version 2.1+EDR specification, these modules provide the important advantage of secure simple pairing that improves security and enhances easy use. BTM510 and BTM511 modules now come standard with the apt-X™ audio codec for wireline qualtity stereo audio.

The compact size of the modules makes them ideal for battery-powered or headset form factor audio and voice devices. With a 16-bit stereo codec and microphone inputs to support both stereo and mono applications, these modules also contain a fully, integrated Bluetooth-qualified stack along with SPP, HFP 1.5, HSP, AVRCP, and A2DP profiles.

The BTM510/511 modules include an embedded 32-bit, 64-MIPS DSP core within the BC05. This allows designers to add significant product enhancements including features such as echo cancellation, noise reduction, and audio enhancement using additional soft codecs. The availability of the 16 MB of flash memory in the module allows complex functionality to be supported.

BTM510 and BTM511 modules are provided with CSR's apt-X codec without additional license fees. CSR's world renowned apt-X™ audio compression solutions retain the full integrity of original digital audio and are optimized for instant real-time audio streaming (http://www.csr.com/products/technology/aptx).

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 chipset
- Bluetooth v2.1+EDR
- Supports mono and stereo headset applications
- apt-X Audio Codec provided free of charge
- 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
- 16-bit stereo codec and microphone input
- AptX, AAC and SBC codecs supported
- CVC audio enhancement supported
- EIR fully supported
- Integrated audio amplifiers for driving stereo speaker
- Comprehensive AT interface for simple programming
- Bluetooth End Product qualified
- Compact size
- Class 2 output – 4 dBm
- Low power operation
- WLAN co-existence hardware support

APPLICATION AREAS

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

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CATEGORIES	FEATURE	IMPLEMENTATION
Wireless Specification	Bluetooth®	Version 2.1+EDR
	Frequency	2.402 – 2.480 GHz
	Max Transmit Power	Class 2 4 dBm (at antenna pad – BTM510) 4 dBmi (from integrated antenna – BTM511)
	Receive Sensitivity	Better than -86 dBm
	Range	30 meters
	Data Rates	Up to 3 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
	I2S / PCM	Master / Slave roles
	Microphone	Stereo microphone input
DSP	Integrated Kalimba DSP	32-bit, 64 MIPS
Additional I/O	4 x GPIO	Function Mapping e.g. button control
Profiles		SPP – Serial Port Profile HSP HFP – Audio Gateway and Handset A2DP – Source and Sink AVRCP – Target and Controller
Supply Voltage	Supply	3.0 V – 3.6 V DC
	I/O	1.7 V – 3.6 V DC
Power Consumption	Current Consumption	Operational - Less than 70 mA (including speaker amplifiers) Idle (sleep) < 1.0 mA
Coexistence / Compatibility	802.11 (WLAN)	2 wire and 3 wire schemes supported
Connections	External Antenna	Connection via SMT pad – BTM510
	Internal Antenna	Multilayer ceramic antenna – BTM511
Programming API		AT Command Set (extended for audio and headset functions)
Physical	Dimensions	14.0 mm x 20.0 mm x 3.4 mm (integrated antenna – BTM510) 14.0 mm x 25.0 mm x 3.4 mm (integrated antenna – BTM511)
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
Development Tools	Development Kit	Development board and software tools
Approvals	Bluetooth	End Product Approved
	FCC/IC & CE	BTM510 - Limited Modular Approval BTM511 - Full Modular Approval

ORDERING INFORMATION

BTM510	Bluetooth Multimedia Module (external antenna)
BTM511	Bluetooth Multimedia Module (with integrated antenna)
DVK- BTM510	Development Kit (external antenna)
DVK- BTM511	Development Kit (with integrated 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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