



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 simple secure pairing that improves security and enhances easy use. BTM510 and BTM511 modules now come standard with the apt-X™ audio codec for wireline quality 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, SPP 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
- Industrial temperature range
- 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
- Speaker docks
- 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	
<b>Wireless Specification</b>	Bluetooth®	Version 2.1+EDR	
	Frequency	2.402 – 2.480 GHz	
	Max Transmit Power	Class 2 4 dBm (at antenna pad – BTM510) 4 dBm (from integrated antenna – BTM511)	
	Receive Sensitivity	Better than -86 dBm	
	Range	Circa 30 meters	
	Data Rates	Up to 3 Mbps (over the air)	
	UART Data Transfer Rate	Greater than 300 Kbps	
<b>Host Interface</b>	UART	Supports DTR, DSR, DCD and RI, multiplexed with other functionality.	
<b>Audio Interfaces</b>	Codec	Internal 16 bit Stereo Codec Integrated Amplifiers for driving Stereo Speaker	
	I2S / PCM	Master / Slave roles	
	Microphone	Stereo microphone input	
<b>DSP</b>	Integrated Kalimba DSP	32-bit, 64 MIPS	
<b>Additional I/O</b>	4 x GPIO	Function Mapping e.g. button control	
<b>Profiles</b>		SPP – Serial Port Profile HSP HFP – Audio Gateway and Handset A2DP – Source and Sink AVRCP – Target and Controller	
	<b>Supply Voltage</b>	Supply	3.0 V – 3.6 V DC
		I/O	1.7 V – 3.6 V DC
	<b>Power Consumption</b>	Current Consumption	Operational - Less than 70 mA (including speaker amplifiers) Idle (sleep) < 1.0 mA
<b>Coexistence / Compatibility</b>	802.11 (WLAN)	2 wire and 3 wire schemes supported	
<b>Connections</b>	External Antenna	Connection via SMT pad – BTM510	
	Internal Antenna	Multilayer ceramic antenna – BTM511	
<b>Programming API</b>		AT Command Set (extended for audio and headset functions)	
<b>Physical</b>	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)	
<b>Environmental</b>	Operating Temperature	-40°C to +85°C	
	Storage Temperature	-40°C to +85°C	
<b>Miscellaneous</b>	Lead free	Lead-free and RoHS compliant	
	Warranty	1 Year	
<b>Development Tools</b>	Development Kit	Development board and free software tools	
<b>Approvals</b>	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](http://www.lairdtech.com/wireless) for the most current specification.

LWS-DS-BTM510-511 0513

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