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**Bluetooth® Stereo Audio Module**

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**Introduction**

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The BTM923 stereo audio module is a Bluetooth v5.0 (BDR/EDR) audio module for designers to add wireless audio and voice applications to their products. This Bluetooth SIG-certified module provides a complete wireless solution with Bluetooth stack, integrated antenna, and worldwide radio certifications in a compact surface mount package.

This stereo module contains a built-in Li-Ion charger and a digital audio interface. It supports HSP, HFP, SPP, A2DP, and AVRCP profiles. Both AAC and SBC Codecs are supported for A2DP.

**Note:** The customers must connect their own external analog Codec/DSP/amplifier and MCU for audio output.

**Figure 1. BTM923 Module**

**Features**

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- Qualified for Bluetooth v5.0 Specification
  - HFP v1.6, HSP v1.1, A2DP v1.2, AVRCP v1.5, SPP v1.0, PBAP v1.0
  - Bluetooth Classic, Basic Rate/Enhanced Data Rate (BDR/EDR)
- On-Board Embedded Bluetooth Stack
- Easy to Configure with Windows Graphical User Interface (GUI) or Direct by Microcontroller Unit (MCU)
- Compact Surface Mount Module:
  - 29 x 15 x 2.5 mm
  - Castellated surface mount pads

- Integrated 3V and 1.8V Configurable Switching Regulator and LDO
- Built-in Lithium-ion Battery Charger (up to 350 mA)
- Built-in ADC for Battery Monitor and Voltage Sense
- Audio-In/Out
  - BTM923 supports digital audio I2S format
- Transparent Universal Asynchronous Receiver/Transmitter (UART) Mode for Seamless Serial Data Over UART Interface
- Integrated Crystal Oscillator and Matching Circuitry
- Secure AES128 Encryption

## RF/Analog

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- Frequency Spectrum: 2.402 GHz to 2.480 GHz
- Receive Sensitivity: -91 dB ( $\pi/4$  DQPSK)
- Transmitter Output Power: +4 dBm (maximum) for Class 2

## Audio processor

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- Support 64 Kbps A-Law,  $\mu$ -Law PCM format/Continuous Variable Slope Delta Modulation (CVSD) for SCO Channel Operation
- Noise Reduction (NR) and Acoustic Echo Cancellation (ACE)
- Sub-Band Coding (SBC) and Optional Advanced Audio Coding (AAC) Decoding
- Packet Loss Concealment (PLC)
- Four Languages (Chinese/ English/ Spanish/ French) Voice Prompts Support (20 events for each language) using the IS20XXS\_UI tool
- Serial Copy Management System (SCMS-T) Content Protection

## Audio Codec

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- 20-Bit Digital-to-Analog Converter (DAC) and 16-bit Analog-to-Digital Converter (ADC) Codec
- 98 dB Signal-to-Noise ratio (SNR) DAC Playback

## Peripherals

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- One Line-in Port for External Audio Input
- Two LED Drivers
- One UART Interface
- Multiple I/O Pins for Control and Status
- High-Speed HCI-UART Interface (supports up to 921,600 bps)

## Antenna

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- PCB Antenna

## Compliance

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- Bluetooth Special Interest Group (SIG) Certified:
  - BTM923 QDID: 121137

- BTM923 modules have been granted modular approval from various countries. For additional details, refer to [9. Certification Notices](#).
- RoHS Compliant

## Operating Conditions

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- Operating Voltage: 3.0V to 4.2V
- Temperature Range: -20°C to 70°C

## Applications

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- Bluetooth Sound Bar
- Bluetooth Stereo Speaker Phone

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## 8. Ordering Information

The following table provides the ordering information of the BTM923 module.

**Table 8-1. Module Ordering Information**

<b>Module</b>	<b>Microchip IC</b>	<b>Description</b>	<b>Shield</b>	<b>Regulatory Certification</b>	<b>Part No.</b>
BTM923	IS2023S-203	Bluetooth 5.0 BDR/EDR, Class 2 Surface Mount module with integrated antenna and shield.	Yes	FCC, IC, CE, MIC, KCC, NCC, SRRC, ANATEL, IFT, CNC	BM23SPKS1NB9