



About us

SPARK Microsystems offers a unique & innovative wireless transceiver that achieves **40x better energy efficiency, 60x lower latency, and 10x more data throughput** as compared to BLE. It also provides very high quality of service connectivity.

The Problem

Gamers buy wired devices to get the best performance. Many audio solutions in the market have a difficult time meeting bandwidth and latency requirements for bidirectional headsets (stereo headset and mic). The additional power requirement drives up the battery size and cost significantly.

Overall, the cost, complexity, quality, and hassle to users to adopt wireless solutions limits the potential growth over wired solutions.

SPARK Microsystems is bringing to market a unique wireless transceiver that can bridge that gap.

The Solution

The SPARK UWB Headset reference design features at the core of its connectivity an ultra-low power consumption and ultra-short latency radio: the SR1000 family of wireless transceivers.

This design provides CD quality or better uncompressed audio and multichannel streaming. The augmented bandwidth capability of its wireless chipset allows for uncompressed audio for both the stereo headset and the microphone.

SR1000 family of radios use the ultra-wideband (UWB) spectrum and does not interfere with any of the other narrow band standards such as BLE, Bluetooth, cellular, WiFi, and others.

The augmented bandwidth capability with full duplex communications provides future proofing capabilities for uncompressed HQ audio for both the stereo headset and the microphone.

Users can finally enjoy a low-latency high quality audio experience without the fear of anemic battery life or being forced to connect with a wire.

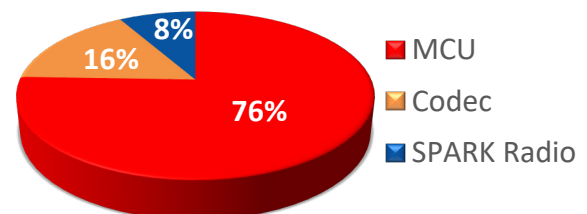
The SPARK headset reference design brings gamers the benefits of wired peripherals (short latency, superior audio quality, no battery life stress) with all the freedom of wireless connectivity.

Key Headset Features

- Down to **3 ms** audio latency with minimal uncertainty (sub ms)
- **3 times or more** longer battery life than other low latency headsets
- **Integral bitstream:**
 - No compression No down sampling No masking
- Fully bidirectional audio (headset and mic)
 - Data-rate scalable up to **96 kSps, 24-bit**, stereo
 - Microphone can scale up to **48 kSps, 24-bit**
- Dual transceivers for optimal coverage & performance

Power Consumption

- The SR1000 consumes 8% of a gaming headset's power while streaming **uncompressed** 1.54 Mbps stereo audio and 380 kbps microphone audio.
 - **Only 6.9 mW of the total power budget of 83 mW.**
 - This is while bidirectionally streaming uncompressed CD quality stereo audio and a half CD quality microphone channel.



Comparison to other Wireless Radios

Other low latency wireless solutions

- 15 ms audio latency
- Low bandwidth microphone channel
- Error masking degrading audio quality
- Limited analog bandwidth and performance for audio at high frequencies
- System power: 400 mW

Bluetooth (AptX/SBC)

- Degraded audio quality and latency
 - Only 325 – 575 kbps data rate
 - Audio compression & error masking
 - 35 – 200+ ms audio latency
- System power: 122 mW

About the SPARK Transceiver

The SR1000 family allows for up to a 10 Mbps data rate and can coexist with other wireless standards while providing high quality of service and ultra short latency. It also provides unmatched energy efficiency, allowing systems with uniquely long battery lifetimes.

The SR1000 family of transceivers operates in the license-free ultra-wideband (UWB) spectrum from 3.1 to 9.5 GHz. The SR1010, operating from 3.1 to 6 GHz, and the SR1020, operating from 6 to 9.5 GHz take advantage of the UWB spectrum uniquely to not only deliver best-in-class latency and energy efficiency, but also a high degree of coexistence with other wireless standards.

Furthermore, the SR1000 transceiver family does not interfere with other narrow band radios such as BT/BLE, WiFi, Zigbee, cellular, or BT/BLE.

It can leverage multiple GHz of bandwidth to offer high robustness and performance.

SPARK Transceiver Specifications

- Dynamically reconfigurable UWB spectrum with up to 3 GHz of bandwidth
 - SR1010: 3.1 – 5.75 GHz band
 - SR1020: 6 – 9.5 GHz band
 - Up to 10 dBm peak TX power
- Scalable data rate of up to 10 Mbps
- Ultra-short latency
 - 50 μ s airtime for 1 kb
- High quality of service
 - Capable of 3 ms audio latency for uncompressed CD quality audio streaming
- Ultra-low power consumption
 - Down to 0.25 nJ/bit TX energy efficiency and 1.15 nJ/bit RX energy efficiency
 - Sub-mW TX @ 3.1 Mbps and sub-mW RX @ 0.8 Mbps
 - Energy efficient operation down to a few kbps
 - 1.7 to 3.6 V supply
 - 55 nA hibernate, 750 nA deep sleep (with synch)
- Coexistence and non-interference with BLE/WiFi (2.4 & 5 GHz) and cellular
- 50 m range @ 5.5 Mbps; 100 m range @ 600 Kbps
- Low power & low-cost timing using a 32.768 kHz XTAL
- Industrial range: -40 to +85 °C
- Compact 4 x 4 mm 28 pin QFN package
- SPI Interface

About SPARK Microsystems

SPARK Microsystems is a fabless semiconductor company that is leading the way towards ultra-low power wireless communications for the Internet of Things revolution. With its patented technologies, SPARK Microsystems is bringing to market a high performance wireless transceiver that allows for orders of magnitude improved power consumption and latency while providing higher data rates than competing technologies. For more information, please visit www.sparkmicro.com.

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