

## About us

SPARK Microsystems offers a unique & innovative PAN wireless transceiver technology that achieves **40x more energy efficiency, 60x lower latency, and 10x more data throughput** as compared to BLE. In addition, the patented SPARK UWB radio does not interfere with other narrow band radios such as WiFi, BLE, Zigbee, Z-Wave and cellular bands.

## The Problem

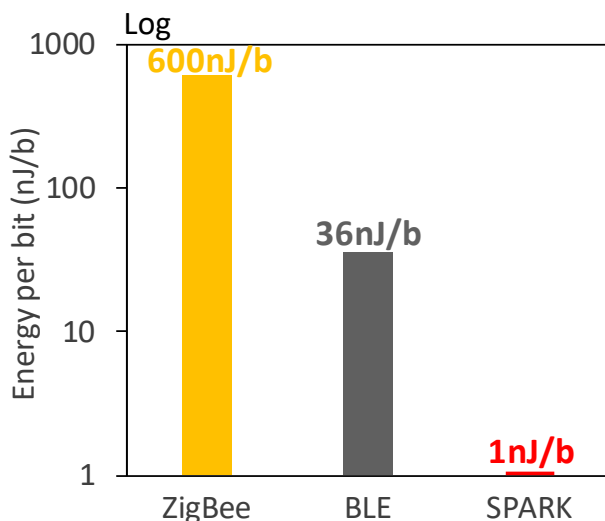
Wireless audio streaming has been an issue for wireless standards since the beginning. There are several reasons for this. The standards have generally focused on bandwidth and connectivity without much thought to the specific impact to audio capabilities.

For instance, WiFi has issues with high power, high latency, narrow band interference, and quality of service. BLE has limited bandwidth which makes uncompressed audio or HD audio impossible. BLE is also prone to latency and quality of service issues.

Other PAN wireless standards such as Zigbee and Z-wave have similar issues and can only handle a fraction of the bandwidth of BLE.

Some other custom wireless solutions solve the latency issues but still can not handle all the bandwidth demands for next generation audio.

## Energy Efficiency



## Specifications

- Ultra-low power consumption
  - ▶ 1.5 nJ/bit energy efficiency (1 mW @1 Mbps)
  - ▶ 1.8 to 3.3 V supply,
  - ▶ 55 nA Hibernate, 750 nA deep sleep (with timing)
- Scalable data rate at up to 10 Mbps payload
- Ultra-short wireless latency below 50  $\mu$ s @ 1 Kb
  - ▶ Down to 3 ms for uncompressed CD quality audio
- 3-9 GHz configurable ultra-wideband spectrum
- 10 dBm TX power
- 80 dB link budget
- 50 m range @3 Mbps; 100 m range @ 500 Kbps

## The Solution

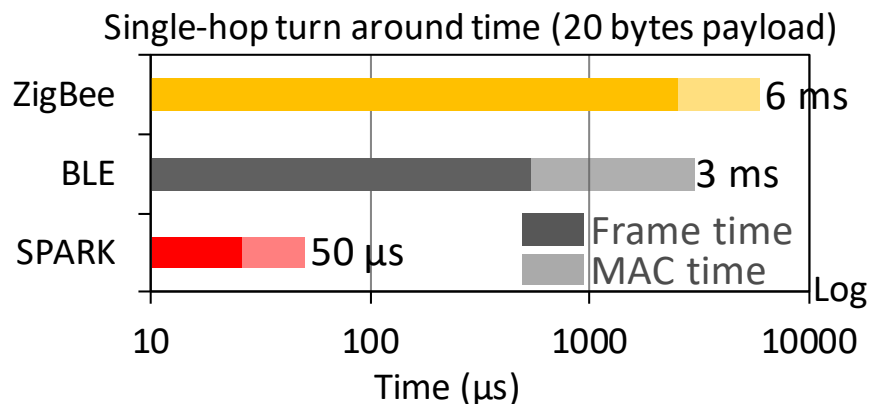
The new SPARK Radio with 10 Mbps data rate can handle HD audio, as well as uncompressed audio, and multichannel streaming.

The SPARK Radio achieves a 5 ms overall audio latency for uncompressed CD quality audio, taking advantage of ultra fast re-transmission (1000 bit packet in 50  $\mu$ s) and ensuring uninterrupted service.

In addition, the SPARK Radio uses an ultra low emission UWB spectrum from 3-10 GHz that does not interfere with any of the other narrow band standards such as BLE, Bluetooth, and WiFi. The SPARK signal is in the noise range for those standards.

Cost is also a strong consideration. The SPARK Radio is a fully integrated radio and low-cost, while enabling significant advantages in power consumption, speed, bandwidth, latency and non-interference.

## Latency



SPARK low latency and high bandwidth enabling HQ Audio to multiple destinations

In Home Theater applications SPARK positioning capability can help with optimizing placement



SPARK non-interference from other narrow band radio solutions

### **Flexibility**

- The SPARK Radio can support device-to-device, star, and mesh network configurations. These features allow for increased connectivity and reliability, as well as better coverage of large areas.
- The SPARK Radio can multiplex several users/devices in the same space (audio channels, controllers, keyboard, mouse, etc).

### **Ranging**

- In addition to communication, SPARK technology lends itself to both coarse and highly accurate location ranging based on time-of-flight.

### **Spark Audio Demo Kit (available now)**

- ARM Cortex-M4 MCU
- Expansion header for custom applications
  - (ie: sensors, controllers, keyboard, mouse)
- USB interface
- Built in audio I/O for audio streaming demo
  - Uncompressed audio
  - Range up to ~50 m
  - Short latency (5 ms)
  - Point to Point Firmware - Link quality statistics

SR1010/20 Transceiver

