

SPARK Radio Overview

SPARK Microsystems offers a unique & innovative short range wireless transceiver technology that achieves **35 times better energy efficiency** than BLE with 60 times lower latency.

Our technology **enables battery-less operation** of wireless devices such as tags or sensors when paired with energy harvesting technologies.

The Problem

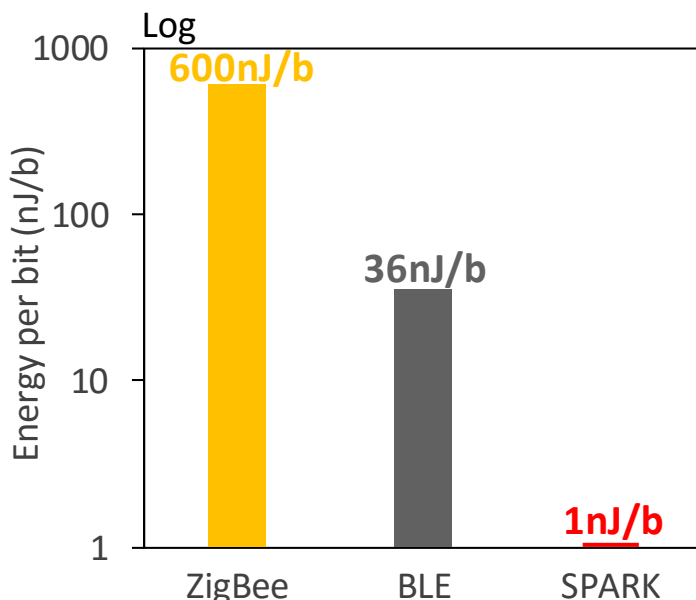
The growing number of sensors, intelligence, and features for automotive electronics and wiring harnesses are beginning to be a significant portion of vehicle cost.

Wireless solutions that could conceivably replace some of these wires are not considered reliable, generate high levels of EMI, and can fail in urban environments due to narrow band signal interference.

Standard wireless solutions are often either too slow (high latency) or have insufficient bandwidth to handle infotainment or sensor data.

Automotive companies are looking for ways to reduce wire harnesses where possible to meet their requirements for reliability, power, latency and non-interference.

Energy Efficiency



Specifications

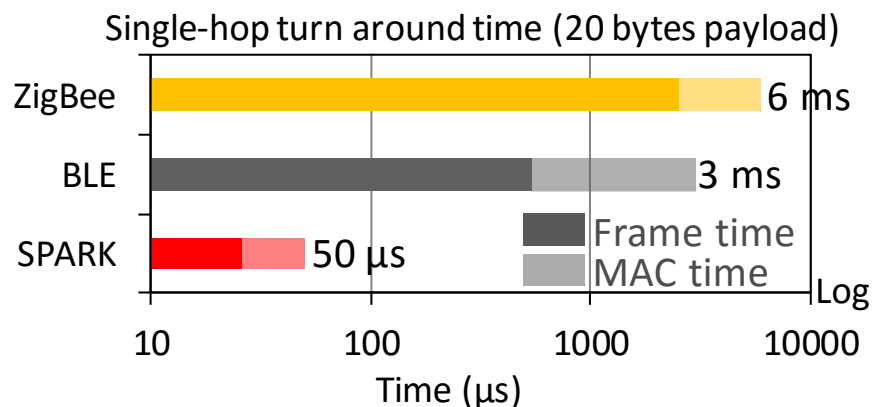
- Ultra-low power consumption
 - < 1 nJ/bit energy efficiency (<1 mW@1 Mbps)
 - 1.8 to 3.6 V supply, 700 nA sleep current
- Up to 10 Mbps data rate
- Ultra-low EMI with non-interference
- Ultra-short latency below 50 μ s
- 3-6 GHz configurable ultra-wideband spectrum
 - 11 dBm TX power, 50 meters range



The Solution

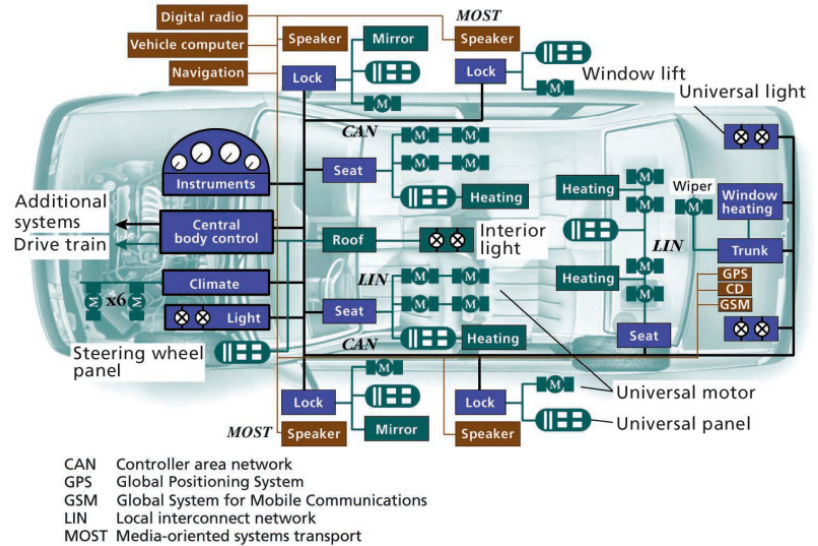
The new SPARK radio technology can communicate with ultra low energy, latency, and EMI. In addition, it does not interfere with other narrow band signals such as BLE and WIFI. It has the bandwidth to handle audio requirements or sensor data. It can be powered by a simple low cost vibrational energy harvester, solar cell or other energy harvesting device and use a capacitive cell for energy storage. This eliminates wires and batteries, and vastly simplifies the installation process for many sensors.

Latency



SPARK Radio examples

- Remote keyless entry with ranging capability for reduced cost and complexity
- Battery-less tire pressure sensors with ranging capability to detect the pressure of each individual tire
- Battery cell sensors with ranging to detect when cell is damaged within the array within 10 cm
- Wireless audio streaming with a bandwidth up to 10 Mbps to handle uncompressed audio streams for low cost high quality sound without interference



Flexibility

- SPARK can support device-to-device, star, and mesh network configurations.
- SPARK can multiplex a large number of devices in the same space.
- Ideal for battery sensors in modern electric cars.

Ranging

- In addition to communication, the SPARK technology lends itself to highly accurate location ranging based on time-of-flight.
- Using three fixed SPARK radio chips, the exact 3D location of another moving/fixed SPARK radio chip can be determined.
- Ideal for tire pressure sensors and remote keyless entry.

Target Markets

- Internet-of-Things
- Battery-less systems
- Medical and healthcare
- Health and fitness
- Industrial and automation, M2M
- Structural health monitoring
- Smartphones and tablets
- Smart agriculture
- Smart homes / buildings / cities
- Streaming data /audio / video
- Wireless peripherals
- Wearables