

No-Power Oscillating Sensor

No-power oscillating sensor technology consists of a wireless, completely passive (self-powered) analog voltage amplitude-to-RF converter for real time, harsh environment measurements. Currently, wired and battery-operated sensors are the most common sensors used in harsh or contested environments. This technology addresses the shortcomings of wired sensors with wireless, in-place measurements based on RF technology.

This technology is inherently self-powered and features an extremely long working life. It uses the RFID sensor as a frequency modulated transmitter of analog voltage amplitude. Wireless transmission is achieved through RF transmission using tuned polymer derived ceramics (PDC) as the capacitive dielectric, and wireless transmission and is the transduction mechanism for a RFID sensor. The novelty of this technology is to use the RFID sensor as a frequency modulated transmitter of analog voltage amplitude. The VCO provides the capability to efficiently use different types of analog sensors such as thermocouples, voltage, or pressure.



Features

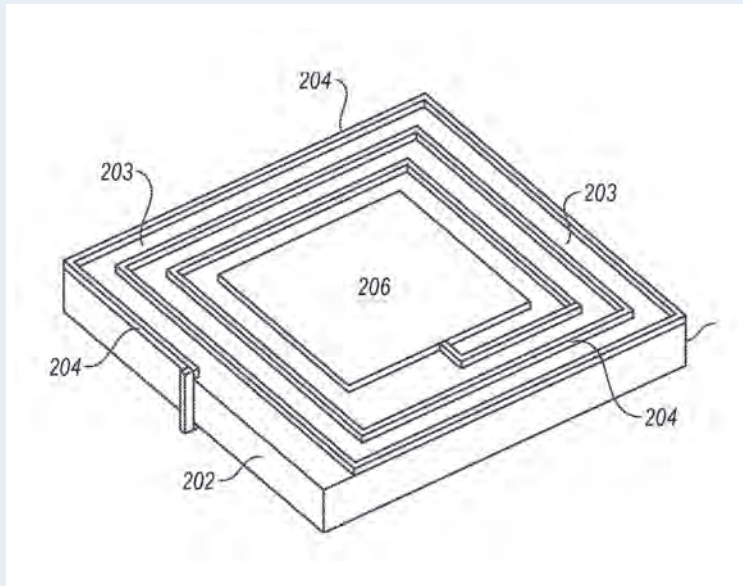
- ✓ Immune to electromagnetic interference
- ✓ No spark hazard, sensor requires no electrical power
- ✓ Easily placed or installed
- ✓ All-weather, persistent, unattended sensing
- ✓ Configurable to all environments
- ✓ Senses motion, vibration, temperature and strain
- ✓ Extremely small and light weight (low SWaP)

Applications:

- ✓ Border and perimeter security sensing
- ✓ Flight control system sensing
- ✓ In-core extreme high heat sensing
- ✓ Tagging, tracking, and locating
- ✓ Smart cities public services monitoring



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The illustration depicts a radio-frequency (RF) sensor 200. RF sensor 200 includes a substrate 202 including a surface 203. Substrate 202 may also be referred to herein a “dielectric substrate,” a “capacitive substrate,” a “capacitive dielectric,” or simply a “dielectric.” RF sensor 200 further includes an inductive coil 204 and an electrode 206 on surface 203.

PATENT: US 11,522,267 B2 - SENSING UNITS INCLUDING A RADIO-FREQUENCY SENSOR, AND RELATED SYSTEMS, DEVICES, AND METHODS.

This invention was made with government support under Contract No. DE-AC07-05-ID14517 awarded by the United States Department of Energy. The government has certain rights in the invention.

