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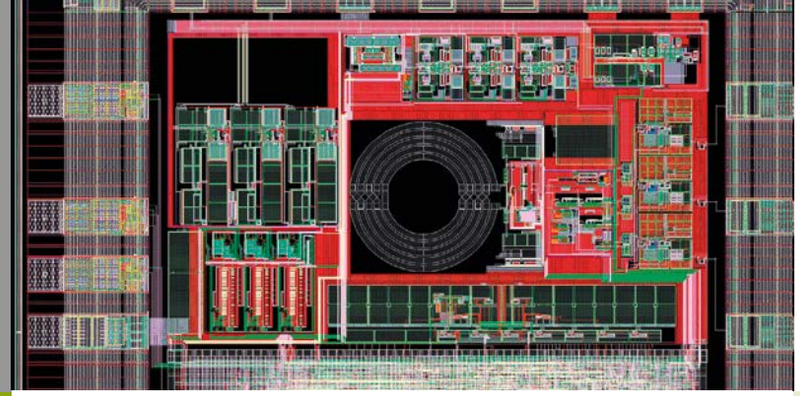
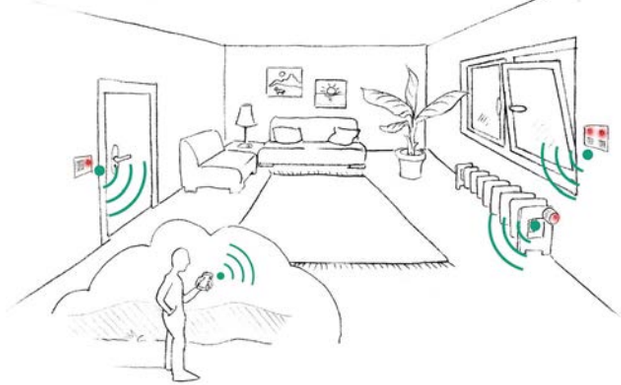
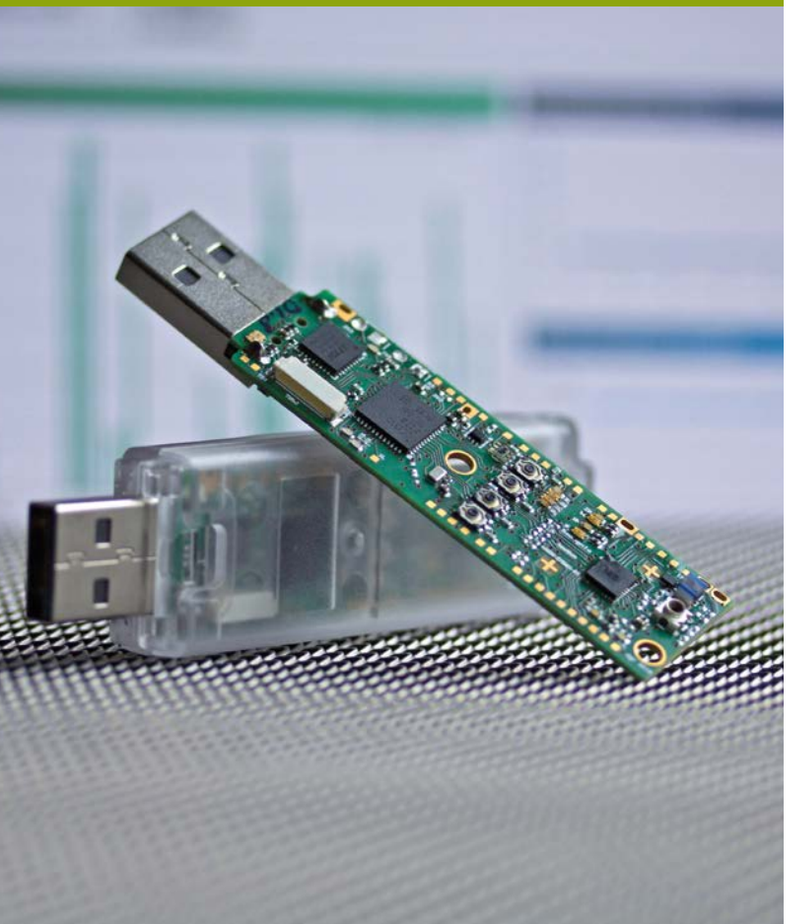




# RFICIENT® - ULTRA-LOW POWER RECEIVER TECHNOLOGY FOR THE INTERNET OF THINGS



**RFicient®Basic**

- Continuous monitoring of the wireless channel
- Tri-band WakeUp & data reception 433 MHz, 868/915 MHz, 2.4 GHz
- Supply current < 2.5 µA at 1.5 V (1kbit/s)
- Sensitivity -80 dBm
- Operation without microcontroller
- Selective wake-up with 16 Bit ID
- RSSI based indoor localization
- Silicon proven prototypes

**RFicient®Scan**

- Spectrum measurement 380 MHz – 950 MHz
- Supply current: 20 µA, 61 points
- Fast sweep < 1.8 ms, 61 points
- Integrated ULP statistics
  - Short term ~1 minute
  - Long term ~12 hours

**RFicient®Spot**

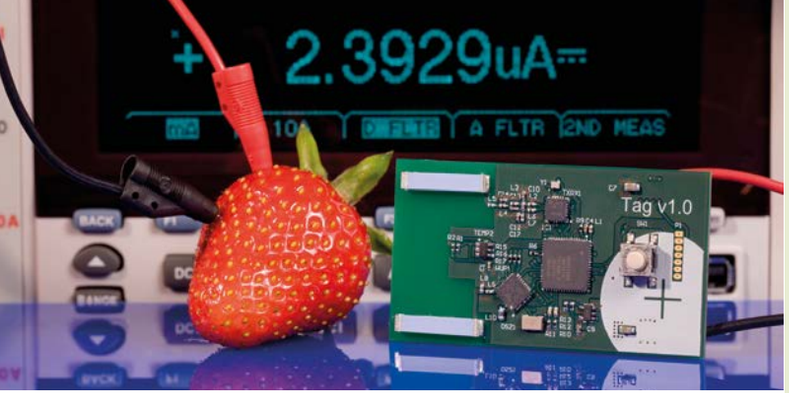
- Wireless standards recognition
  - Bluetooth®
  - Wi-Fi®
  - ZigBee®
  - WirelessHART®
- Recognition time < 1 s
- Current consumption typ. 20 µA

**RFicient® - Ultra-Low Power Receiver Technology for the Internet of Things**

The ultra-low power receiver technology RFicient® continuously monitors a radio channel while boasting a very low power consumption in the order of microwatts and reaction times in the range of milliseconds. This enables around-the-clock operation of wireless applications and increases their operating life significantly – up to ten years without battery replacement or even fully autonomous operation via energy harvesting.

**Innovative and efficient solution**

The integrated ULP receiver RFicient® was developed for ISM frequency bands and built in standard CMOS technology. Operating in the 433 MHz, 868/915 MHz and 2.4 GHz frequency bands a more robust wireless connection with higher interferer immunity can be established. Moreover, the annoying effect of frequency selective fading for single-band operation and possible loss of connection can be avoided yielding in a higher degree of accessibility of wireless sensor nodes. The current prototypes, which are based on 130-nm CMOS technology achieve a receiver sensitivity of -80 dBm. When running in the standard configuration RFicient®Basic at a data rate of 1 kbit/s, the energy consumption is reduced to a mere 2.5 µA at 1.5 V with a response time of only 32 ms.




**RFicient® for your application**

Basic functions, frequency bands and additional functionality can be modified to fit the customers' needs. Fraunhofer IIS provides the ULP receiver technology as IP block, which can be transferred to various CMOS technologies.

The RFicient®Basic technology will be available in 2019 as single chip in a QFN16 package.

**Unleashing the full potential of IoT**

IoT applications require low energy consumption and rapid response capability. As the RFicient® technology embraces these challenges as opportunities, it is the adequate solution for numerous wireless applications in the domain of IoT. It offers utility across a vast array of applications including building automation, intelligent lighting, electronic labels, remote maintenance, remote control and wireless sensor networks. In addition to our standard configuration RFicient®Basic, we develop ultra-low power solutions for localization of objects, decentralized acquisition of radio signal spectra (RFicient®Scan) as well as detection of radio signals of certain wireless standards (RFicient®Spot).

**RFicient® Applications**


SMART HOME

LOGISTICS

AUTOMOTIVE

INDUSTRY

RETAIL

**rficient.com**

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