



# RFicient® – Efficient Wireless Communication

## Ultra-Low-Power Multi-Band Wake-up Receiver for the Internet of Things

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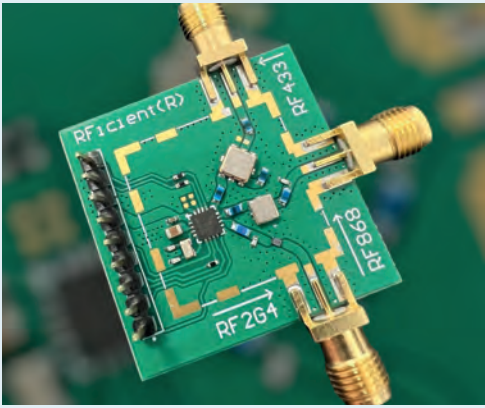
RFicient® technology delivers ultra-low-power radio reception, operating on just a few microwatts with reaction times in the millisecond range. It continuously monitors radio channels while preserving battery life, enabling wireless applications to run 24/7 for up to ten years without battery replacement – or even fully autonomously via energy harvesting. With a range of hardware platforms available for development and testing, RFicient® integrates seamlessly into real-time applications.

### Technical key facts

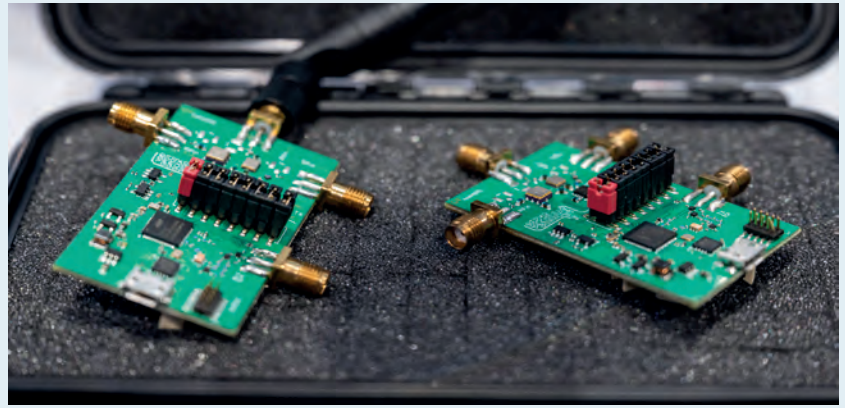
- Tri-band wake-up and data reception
- Supported frequency bands: 433 MHz, 868/915 MHz, 2.4 GHz (SRD)
- Selective wake-up with 16-bit ID via built-in address decoder
- Recognition of two separate wake-up patterns
- Operation with microcontroller in deep-sleep mode
- Ultra-low current consumption: < 3.5 µA
- Fast response time: only 32 ms at 1 kbit/s data rate
- Compact package, e. g. QFN-16

### Benefits

- Continuous monitoring of the wireless channel with minimal energy usage
- Combines extremely low power consumption with very low latency
- Very small package and footprint for easy integration into compact designs
- Adjustable receiver data rate for flexible applications
- Up to 99 % energy savings compared to conventional receivers
- Significantly extended battery lifetime



RFicient® Breakout board with SMA antenna connector, © Fraunhofer IIS



RFicient® evaluation kit consisting of two RFicient® development boards, © Fraunhofer IIS / Markus Jürgens

## Our offer: smart wake-up technology – fast on demand connectivity

Our RFicient® solutions deliver real-time data access with minimal energy use, significantly extending the battery life of wireless sensor nodes. Hardware, sample chips, low-cost breakout boards, and full-featured evaluation kits allow you to start quickly, with expert support every step of the way. For unique requirements, we provide tailored IC design services, integration support, and IP blocks – with both small- and high-volume IC availability – ensuring long-term project success.

The **evaluation kit** provides a comprehensive test environment with a preconfigured transmitter and receiver module, plus user-friendly software for easy customization of the chip settings. This allows direct evaluation of the technology's performance and testing of its suitability for specific applications without any additional development effort.

- Two RFicient® development boards including 25 samples of the RFicient® FH101RF
- Various connection cables and antennas (TX band: 433/868/2400 MHz; RX band: 433.92/868.3/24xx MHz)
- RFicient® software components
- Documentation incl. sample applications

**Breakout boards** offer a compact and inexpensive alternative for cost-conscious users and experienced developers. Featuring the RFicient® chip on a base board, these boards provide greater flexibility regarding integration, but require additional expertise and external hardware, such as microcontrollers, for operation.

- Multi-band support: 433 MHz, 868 MHz, 2.4 GHz (EU) / 433 MHz, 915 MHz, 2.4 GHz (non-EU)
- SMA antenna connector
- Standard 0.1 in (2.54 mm) header

The **RFicient® chip FH101RF** is also available as an individual component (IC) and can be integrated into existing circuit boards.

- Communication over a standard SPI interface
- Reliable data decoding with built-in error tolerance
- Tolerates co-channel interference with bit error rates up to 16 %
- Operating temperature range: -20°C to 85°C
- Compact QFN-16 package: 3 mm x 3 mm

## Applications

- Smart home and building automation
- Remote keyless operations
- Industrial condition monitoring
- Remote wireless control
- Wireless sensor networks
- Body area networks
- Ambient assisted living
- Fitness monitoring
- Asset tracking and indoor localization
- Telematics
- Vehicle monitoring

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