# RSL10

**∧VNET® SILICA**

## BRINGING THE INDUSTRY'S LOWEST POWER BLUETOOTH® LOW ENERGY TECHNOLOGY TO IoT

RSL10 is a multi-protocol Bluetooth® 5 certified System-on-Chip (SoC) designed for wearables and IoT. Offering the industry's lowest power consumption, RSL10 enables advanced wireless features without compromising battery life or overall system size.

Designed to support a voltage supply range between 1.1V and 3.3V, RSL10 is ideal for applications using 1.2V and 1.5V batteries without requiring an external DC/DC converter.

The highly-integrated SoC features a dual-core architecture and a 2.4 GHz transceiver, providing the flexibility to support Bluetooth low energy technology and 2.4 GHz proprietary or custom protocols.

## LONGER BATTERY LIFE

RSL10 provides an incredibly power-efficient operation for a wide range of applications with a superior overall profile, including some of the best numbers for peak Rx in Receive Mode (7 mW) and Deep Sleep (62.5 nW).

## MULTI-PROTOCOL SUPPORT

Providing on-chip and software flexibility for various wireless protocols, RSL10 features a 2.4GHz Radio Frequency Front End (RFFE) and a Bluetooth 5 certified baseband controller, which supports 2 Mbps data rates. The programmable ARM® Cortex®-M3 processor adds additional flexibility for supporting 2.4 GHz proprietary and custom protocol stacks. A 32-bit Dual-Harvard Digital Signal Processing (DSP) system enables signal processing intensive applications, such as wireless audio codecs.

## ULTRA-MINIATURE

RSL10 is offered in a 5.50 mm² WLCSP-the smallest package offering with embedded flash and a 6 x 6 mm QFN. For added miniaturization, RSL10 can be integrated into SiP modules, combining the radio SoC with custom ASICs.

### KEY FEATURES

**Advanced Wireless Functionality**
- Rx sensitivity: -94 dBm
- Transmitting power: -17 to +6 dB
- Supports Bluetooth low energy and 2.4 GHz proprietary or custom protocols
- Proprietary audio streaming profile
- Supports Firmware Over-The-Air (FOTA)

**Highly-Integrated SoC**
- Powerful dual-core architecture complemented by high-efficiency power management units, oscillators, flash and RAM memories, a DMA controller, and peripherals and interfaces
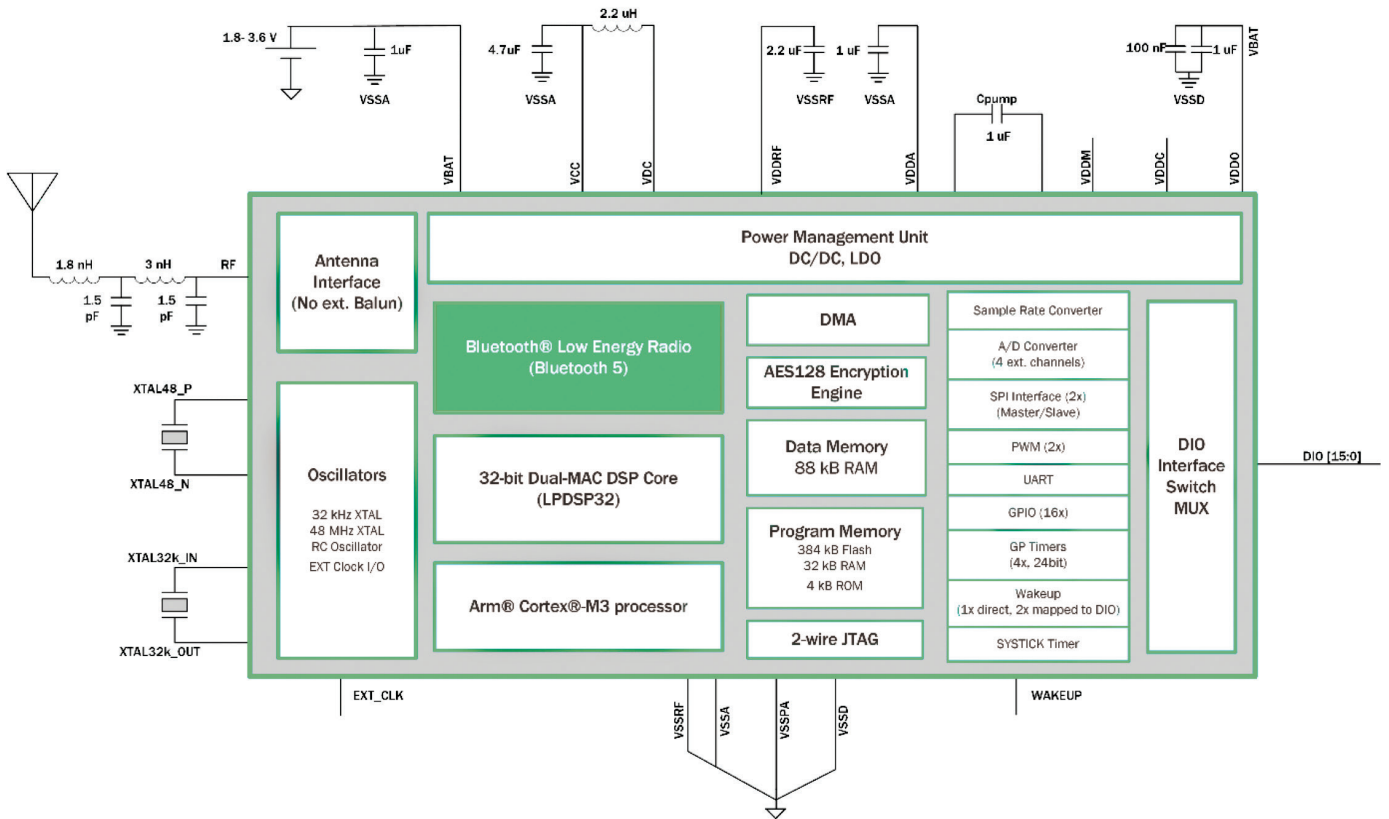
**Technical Features**
- Voltage supply range of 1.1V to 3.3V
- 384 kB of flash memory
- IP protection feature to protect flash contents
- Analog and digital sensor interfaces (GPIOs, LSADs, I2C, SPI, PCM)

**Multiple Packaging Options**
- Available in 5.50 mm² 51-pin WLCSP and a 6 x 6 mm 48-pin QFN

**ON Semiconductor®**

# RSL10

**1.8- 3.6 V** — 1uF — VSSA

**2.2 uH**

4.7uF — VSSA — VDC

2.2 uF — 1 uF — VSSRF — VSSA — VDDRF — VDDA

Cpump 1 uF — VDDM — VDDC — VDDO

100 nF — 1 uF — VSSD — VBAT

VBAT    VCC

| | |
|---|---|
| **Power Management Unit** DC/DC, LDO | |

**Antenna Interface** (No ext. Balun)

**1.8 nH    3 nH    RF**

1.5 pF    1.5 pF

**Bluetooth® Low Energy Radio** (Bluetooth 5)

**DMA**

**AES128 Encryption Engine**

**Sample Rate Converter**

**A/D Converter** (4 ext. channels)

**SPI Interface (2x)** (Master/Slave)

XTAL48_P

XTAL48_N

**Oscillators**

32 kHz XTAL
48 MHz XTAL
RC Oscillator
EXT Clock I/O

**32-bit Dual-MAC DSP Core** (LPDSP32)

**Data Memory** 88 kB RAM

**PWM (2x)**

**UART**

**GPIO (16x)**

**DIO Interface Switch MUX**

DIO [15:0]

XTAL32k_IN

XTAL32k_OUT

**Arm® Cortex®-M3 processor**

**Program Memory** 384 kB Flash 32 kB RAM 4 kB ROM

**GP Timers** (4x, 24bit)

**Wakeup** (1x direct, 2x mapped to DIO)

**2-wire JTAG**

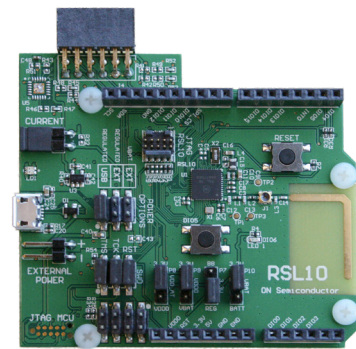**SYSTICK Timer**

EXT_CLK

VSSRF    VSSA    VSSPA    VSSD

WAKEUP

## DEVELOPMENT TOOLS

RSL10 is backed by a user-friendly, versatile toolkit for developing wireless applications, including:

- RSL10 Development Board
- Eclipse-based software with a C Development Toolkit (CDT)
- GNU tool chain for programming the ARM Cortex-M3 processor
- Bluetooth low energy protocol stacks, precompiled sample code, and technical documentation