Push every boundary.™

CSR µEnergy® CSR1010 / CSR1011

Bluetooth® Smart Single Mode Solution

Product Overview

CSR is the industry leader for Bluetooth Smart, enabling Bluetooth Smart devices to transfer simple data sets between compact devices thereby opening up a whole new class of Bluetooth applications such as keyboards, mice, medical sensors, fitness training equipment, watches, TV remote controls, automotive keyless entry, advertising, indoor location, smart energy appliances and proximity tagging.

Bluetooth Smart takes less time to make a connection and consumes approximately 20 times less power than classic Bluetooth.

CSR µEnergy platform provides a built-in processor to run the customer application as well as the qualified Bluetooth 4.0 single-mode stack and radio. The platform has been optimised for easy development and low cost designs with minimal external components. Both chip variants can run directly from a 3V coin cell, and connect directly to a PCB antenna.

Product Highlights

- Bluetooth 4.0 (Single mode Bluetooth Smart)
- +7.5dBm Bluetooth LE Maximum Tx output power
- -92.5dBm Bluetooth LE Rx Sensitivity
- 128KB memory: 64KB RAM and 64KB ROM
- 50Kbytes of user App space
- Support for LE host stack incl. ATT, GATT, SMP, L2CAP, GAP
- RSSI monitoring for proximity applications

Two product variants:

- CSR1010™ - QFN 32 lead, 5 x 5 x 0.6mm package
- CSR1011™ - QFN 56 lead, 8 x 8 x 0.9mm package

CSR offers a comprehensive Software Development Kit (SDK) for application developers with C compiler and source level debug tools. Currently 11 profiles are supported and the SDK is continuously updated to support new, emerging profiles.

Applications

Human Interface Devices including:

- Keyboard
- Mouse and touchpad
- Remote control

Sports and Fitness devices including:

- Heart rate monitor
- Foot pod
- Cycle speed, power and cadence

Health devices including:

- Glucose meter

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Key Product Features

- Switch Mode Power Supply & Linear regulators
- 1 x 10-bit ADC, 1 x 10-bit ADC (shared IOs)
- 3 x Analogue IO
- 4 x PWM modules
- 1 x hardware-assisted quadrature decoder
- Programmable IO:
- CSR1010 (x12 PIOs) CSR1011 (x32 PIOs)
- 128KB Memory: 64KB RAM and 64KB ROM
- Watchdog timer
- Option for external 32KHz System Clock
- SPI for external Flash and debug
- UART
- I2C for EEPROM / external companion chips

Bluetooth Smart Features Supported

Support for v4.0 Bluetooth low energy features:

- Master or Slave mode operation
- Including Encryption
- Channel Map Updates
- Connection Updates
- Broadcast Data

Software Stack in firmware includes:

- GAP
- L2CAP
- Security Manager
- Attribute Protocol
- Attribute Profile
- I2C for EEPROM / external companion chips

Feature	Benefit	Low Power
GMSK Modulation	• More efficient transmission of data • Uses less power to get data across	✔
Advertising	• 10x to 20x lower power than BR/EDR • Uses less power to be discoverable • Uses less power to be connectable	✔
Instant Sniff Mode	• All data sent in Connection Events sub-rated • Saves even more power on slave	✔
Fast Connections	• Make connection, send data, get acknowledgement in 3 ms	✔
Attribute Protocol	• Connectionless protocol • No state required • Efficient Handle Value Indications	✔
Mode	**Description**	**Total Battery Current**
Dormant	• Chip shutdown – toggle WAKE pin to wake up	<900nA
Hibernate	• VDD_PADS = on, REFCLK = off, SLEEPCLK = on, VDD_BAT = on	<1.5µA
Deep Sleep	• VDD_PADS = on, REFCLK = off, SLEEPCLK = on, VDD_BAT = on, RAM = on, digital circuits = on, SMPS = on (low-power mode), 1ms wake-up time	<5µA
Idle	• VDD_PADS = on, REFCLK = on, SLEEPCLK = on, VDD_BAT = on, RAM = on, digital circuits = on, MCU = idle, <1µs wake-up time	~1mA
Rx / Tx Active		~18/16mA peak @ 3V

Ordering Information

Visit the website www.csr.com for a list of distributors and representatives [Contact > Sales Representatives] or request more information from a CSR representative [Contact > CSR Customer Support]. Visit the website for further information on other related products.

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