The CSR101x product family consists of five product variants designed to develop devices that use Bluetooth low energy. The CSR101x series provides a built-in processor to run the customer application as well as the qualified Bluetooth single mode stack and radio. CSR101x chips can run directly from a 3V coin cell, and connect directly to a PCB antenna.

The CSR101x System-on-Chips (SoCs) are optimized for easy development and low cost designs with minimal external components and provide a complete Bluetooth low energy qualified solution that takes less time to make a connection and consumes approximately 20 times less power than Bluetooth basic rate. Bluetooth low energy devices based on CSR101x are able to transfer simple data sets between compact devices thereby opening up a whole new class of Bluetooth applications for the Internet of Things (IoT). Consumers expect their wireless devices to quickly and seamlessly ‘connect’ and to perform just like wired ones do – at home, in the car and on the move. And along with that universal connectivity they want minimal or no setup and full interoperability with whatever device they choose–smartphone or tablet.

Qualcomm Technologies International, Ltd. (QTL) is an industry leader in delivering high quality connectivity experiences that help differentiate devices in the Internet of Things. More than singular solutions, we develop flexible, robust product platforms combining silicon, software, and services to provide customers a complete connectivity platform for success.

Solution Highlights

Optimized for low power consumption and low cost IoT solutions

Ultra-low power connectivity and basic data transfer for applications previously limited by the power consumption, size constraints and complexity of other wireless standards.

Faster connections for more responsive, engaging devices

Make connection, send data, and receive acknowledgement in 3 milliseconds.

Full software support for easy application development

The Bluetooth low energy SDK includes example applications that are qualified and designed to significantly reduce product development time.

One-chip solution for whole new class of Bluetooth applications

Controller, host and application are integrated on one chip, perfect for transfer of simple data sets between compact devices in the IoT.
Features

- Bluetooth 4.1 low energy radio with direct single-ended 50Ω antenna connection
- 50kB of user app space
- Switch-mode power supply and linear regulators
- Up to 4.4V direct supply connection for Li-poly batteries
- Wake-up interrupt and watchdog timer
- Time-stamping hardware
- 1µA integrated key scanning hardware
- Peripheral (I²C) and debug interfaces (SPI)
- Integrated Bluetooth 4.1 qualified stack
- On-chip temperature and battery monitoring
- PWM hardware blocks for LED patterns and motor control
- Master and slave operation, including encryption
- Software development kit with C compiler and debug tools

Product Part Number
CSR1010 QFN CSR1010A05-DQQM-R
CSR1010 QFN CSR1010A05-IQQM-R
CSR1011 QFN CSR1011A05-IQQM-R
CSR1012 QFN CSR1012A05-IQQP-R
CSR1013 UT-WLCSP CSR1013A05-IUUM-R

Related Products

- CSR101x Starter Development Kit
- CSR1010/1011 Development Kits
- CSRmesh™ Development Kit
- Proximity Beacon Development Kit

To learn more visit: qualcomm.com or developer.qualcomm.com

Bluetooth Low Energy Applications

- Input Accessories
- Fitness Devices
- Heart Rate Monitor
- TV Remotes
- Auto Keyless Entry
- Smart Lighting

CSR101x Block Diagram

Chip Variants

<table>
<thead>
<tr>
<th>Chip Variant</th>
<th>GPIO</th>
<th>AIO</th>
<th>Package</th>
<th>Pinout</th>
<th>Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSR1010</td>
<td>12x</td>
<td>3x</td>
<td>All-purpose</td>
<td>QFN 32 lead 5 x 5 x 0.6mm</td>
<td>0.5mm pitch</td>
</tr>
<tr>
<td>CSR1011</td>
<td>32x</td>
<td>3x</td>
<td>High I/O count variant</td>
<td>QFN 56 lead 8 x 8 x 0.9mm</td>
<td>0.5mm pitch</td>
</tr>
<tr>
<td>CSR1012</td>
<td>12x</td>
<td>3x</td>
<td>Small package for wearables</td>
<td>QFN 32 lead 4 x 4 x 0.65mm</td>
<td>0.4mm pitch</td>
</tr>
<tr>
<td>CSR1013</td>
<td>12x</td>
<td>1x</td>
<td>Smallest and thinnest chip</td>
<td>UT-WLCSP 34 bump 2.4 x 2.6 x 0.35mm</td>
<td>0.4mm pitch</td>
</tr>
</tbody>
</table>

CSR101x Specifications

MCU

- 16MHz 16MIPS XAP application processor (RISC) with hardware link controller

Bluetooth Version

- Bluetooth v4.1 specification compliant

Memory

- 128KB Memory: 64KB RAM & 64KB ROM

Bluetooth TX/RX

- up to +9dBm max RF transmit power
- -93dBm receiver sensitivity
- No external power amplifier or TX/RX switch required

Interfaces

- UART, I²C, PIO controller
- 4x PWM modules
- 2x hardware quadrature decoders
- 12x or 32x re-assignable GPIOs plus dedicated WAKE pin
- 10-bit SAR ADC/DAC with 1x or 3x AIO
- 32kHz or 16MHz clock output

Current Consumption

- <20mA peak current
- 5µA in deep sleep
- 900nA in dormant mode

Operating Voltage

- 1.8 to 4.3V

Operating Temperature

- -40°C to +85°C
- -30°C to +105°C (CSR1010D)