Features

- Bluetooth® v4.0 specification
- 7.5dBm Bluetooth low energy maximum TX output power
- -92.5dBm Bluetooth low energy RX sensitivity
- Support for Bluetooth v4.0 specification host stack including ATT, GATT, SMP, L2CAP, GAP
- RSSI monitoring for proximity applications
- 32kHz and 16MHz crystal or system clock
- Switch-mode power supply and linear regulators
- 10-bit ADC
- 32 digital PIOs
- 3 analogue AIOs
- UART
- I²C / SPI for EEPROM / flash memory ICs and peripherals
- Debug SPI
- 3 PWM modules
- Wake-up interrupt
- 64KB RAM and 64KB ROM
- Watchdog timer
- QFN 56-lead, 8 x 8 x 0.9mm, 0.5mm pitch

General Description

The CSR1001 QFN is a product from the CSR µEnergy™ platform. CSR µEnergy is CSR’s first single-mode Bluetooth low energy solution. CSR µEnergy enables ultra low-power connectivity and basic data transfer for applications previously limited by the power consumption, size constraints and complexity of other wireless standards. The CSR µEnergy platform provides everything required to create a Bluetooth low energy product with RF, baseband, MCU, qualified Bluetooth v4.0 stack and customer application running on a single IC.

Applications

- Building an ecosystem using Bluetooth low energy

CSR is the industry leader for Bluetooth low energy. Bluetooth low energy enables the transfer of simple data sets between compact devices opening up a completely new class of Bluetooth applications such as watches, TV remote controls, medical sensors and fitness trainers.

Bluetooth low energy takes less time to make a connection than conventional Bluetooth wireless technology and consumes approximately 20 times less power than Bluetooth Basic Rate. CSR1001 QFN supports profiles for sensors, watches, HIDs and time synchronisation.

Typical Bluetooth low energy applications:

- Sports and fitness
- Healthcare
- Home entertainment
- Office and mobile accessories
- Automotive
- Commercial
- Watches
- Human interface devices
1 Device Details

**Bluetooth Radio**
- On-chip balun (50Ω impedance in TX and RX modes)
- No external trimming is required in production
- Bluetooth v4.0 specification compliant

**Bluetooth Transmitter**
- 7.5dBm RF transmit power with level control from integrated 6-bit DAC over a dynamic range >30dB
- No external power amplifier or TX/RX switch required

**Bluetooth Receiver**
- -92.5dBm sensitivity
- Integrated channel filters
- Digital demodulator for improved sensitivity and co-channel rejection
- Fast AGC for enhanced dynamic range

**Synthesiser**
- Fully integrated synthesiser requires no external VCO varactor diode, resonator or loop filter

**Baseband and Software**
- Hardware MAC for all packet types enables packet handling without the need to involve the MCU

**Physical Interfaces**
- SPI master interface
- SPI programming and debug interface
- I²C
- Digital PIOs
- Analogue AIOs

**Auxiliary Features**
- Battery monitor
- Power management features include software shutdown and hardware wake-up
- CSR1001 QFN can run in low power modes from an external 32.768kHz clock signal
- Integrated linear regulators
- Integrated switch-mode power supply
- Power-on-reset cell detects low supply voltage

**Bluetooth Stack**
CSR's protocol stack runs on the integrated MCU:
- Support for Bluetooth v4.0 specification features:
  - Master and slave operation
  - Including encryption
- Software stack in firmware includes:
  - GAP
  - L2CAP
  - Security manager
  - Attribute protocol
  - Attribute profile
  - Bluetooth low energy profile support

**Package**
- 56-lead 8 x 8 x 0.9mm, 0.5mm pitch QFN
## 2 Ordering Information

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<tr>
<th>Device</th>
<th>Package</th>
<th>Order Number</th>
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<td>QFN 56-lead (Pb free)</td>
<td>CSR1001A03-IQQA-R</td>
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<td>Tape and reel</td>
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**Note:**

The minimum order quantity is 2kpcs taped and reeled.

**Supply chain:** CSR’s manufacturing policy is to multisource volume products. For further details, contact your local sales account manager or representative.

To contact a CSR representative, email sales@csr.com or go to www.csr.com/contacts.

### 2.1 CSR1001 QFN Development Kit Ordering Information

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### Document History

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<tr>
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<td>14 MAR 11</td>
<td>Original publication of this document.</td>
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<tr>
<td>2</td>
<td>13 APR 11</td>
<td>Feature and style update.</td>
</tr>
<tr>
<td>3</td>
<td>02 JUN 11</td>
<td>Production Information added and minor editorial changes. If you have any comments about this document, email <a href="mailto:comments@csr.com">comments@csr.com</a> giving the number, title and section with your feedback.</td>
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