

Qualcomm® CSR102x Bluetooth Low Energy Product Family

Family of SoCs with single mode Bluetooth® low energy radio, integrated microprocessor and enhanced memory for IoT applications.

The Qualcomm CSR102x product family of Bluetooth Low Energy (LE) System-on-Chips (SoCs) is specifically designed to help engineers meet the needs of today's always-on world. CSR102x provides extensive and flexible I/O capabilities designed to simplify integration into each target application, eliminating expensive interface components.

With a balance of power, features and cost that is optimal for each use case, the CSR102x series of SoCs is ideal for specific applications in the Internet of Things (IoT) including wireless remote controls, simple smart watches, home automation solutions and beacons where balancing performance, battery life and cost is critical. Customer applications can be stored on the CSR102x chip for optimal power consumption.

A comprehensive Software Development Kit (SDK) supports developers with example applications, Bluetooth low energy profiles and smartphone apps, all in source code. Additional features have been added to address target segments, including high quality voice command capabilities with ultra-low power for remote controls with always-on voice and Bluetooth mesh support for home automation manufacturers looking to create whole home systems.

Qualcomm Technologies International, Ltd. (QTI) 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.

Highlights

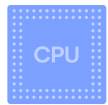
Enhanced application security features

Significant improvements on application security features including authentication and encryption. A secure Over-the-Air Update (OTAU) capability allows applications to be reliably updated in service.



Low power embedded CPU and subsystem

Highly efficient low power CPU and an independent coprocessor for isolated execution. Includes a variety of peripherals and hardware algorithm acceleration.



Easy to use development environment

The comprehensive SDK includes an extensive set of example applications that are pre-qualified and designed to significantly reduce product development time.



System cost reduction and compact design

Minimized eBOM, highly integrated with only 10 components in total - no external memory, single crystal plus passives. Multiple package options are available for low-cost board design.





Bluetooth Low Energy Applications

- Bluetooth mesh
- Input Accessories
- Health & Fitness
- Smart Watches
- Smart Remotes
- Smart Lighting



Features

- Bluetooth version 5.0 compliant stack with Bluetooth mesh support
- Direct 50Ω connection to antenna, integrated balun
- Low BoM count with single crystal operation
- 4x hardware link controllers
- Variety of integrated hardware accelerators and peripheral interfaces
- Wake-up from interrupt on any input pin in low power sleep modes
- Time-stamping hardware blocks
- Key matrix scanning block
- Integrated audio codecs & audio interfaces
- On-chip temperature and battery monitoring
- PWM hardware blocks for LED patterns and motor control
- Cryptographic accelerators and application security features
- Bluetooth low energy SDK with IDE and debugging tools

Ordering Information

Product	Part Number
CSR1020 QFN	CSR1020A06-IQGX-R
CSR1021 QFN	CSR1021A06-IQGS-R
CSR1024 LGA	CSR1024A06-ILLP-R
CSR1025 LGA	CSR1025A06-ILLQ-R

Related Products

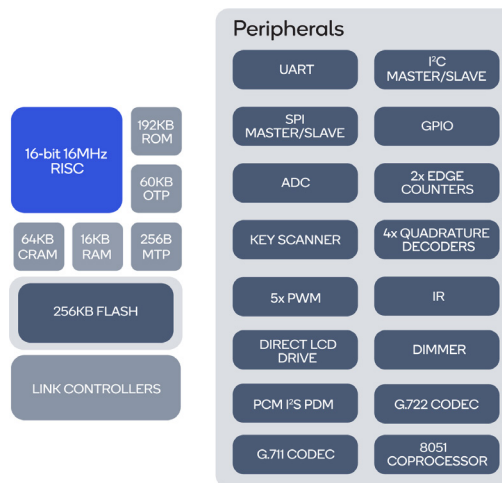
- 102x Starter Development Kit
- 102x Professional Development Kit
- 102x IoT Development Kit
- 102x Bluetooth Node Development Kit
- 102x Smart Watch Application Board
- 102x Smart Remote Application Board

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CSR102x Block Diagram



Chip Variants

CSR1020 All-purpose cost-optimized general platform	15x GPIO 1x AIO QFN 36 lead 5 x 5 x 0.65mm 0.5mm pitch Pin compatible with CSR1024
CSR1021 High I/O count cost-optimized variant	37x GPIO 2x AIO QFN 60 lead 8 x 8 x 0.65mm 0.5mm pitch Pin compatible with CSR1025
CSR1024 All-purpose upgradeable platform	15x GPIO 1x AIO LGA 36 lead 5 x 5 x 0.75mm 0.5mm pitch 256KB internal flash
CSR1025 High I/O count upgradeable platform	33x GPIO 2x AIO LGA 60 lead 8 x 8 x 0.75mm 0.5mm pitch 256KB internal flash

CSR102x Specifications

MCU	16-bit 16MHz RISC embedded CPU
Bluetooth Version	Bluetooth v5.0 compliant with Bluetooth mesh support
Memory	192KB ROM; 80KB RAM; 64KB OTP 256Kb integrated flash (CSR1024/CSR1025)
Bluetooth TX/RX	up to +4dBm max RF transmit power -92dBm receiver sensitivity No external power amplifier or TX/RX switch required
Interfaces	I ² C, UART, SPI/Q-SPI, PDM, I ² S, 15/33/37 GPIOs 4x quadrature decoders, 2x time stamping blocks 5x PWM blocks, key matrix scanner, LCD glass drive 10-bit ADC, G.722 and G.711 audio codec
Current Consumption	Total system current during active TX/RX: <5mA (at 3V, +0dBm)
Operating Voltage	0.9V to 3.6V (CSR1020/CSR1021) 1.4V to 3.6V (CSR1024/CSR1025)
Operating Temperature	-30°C to +85°C

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