



Qualcomm® Bluetooth Low Energy Selector Guide

Integrated single-mode and dual-mode
Bluetooth connectivity SoCs for the
Internet of Things





CSR101x SoC Product Family

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.

CSR1010 <ul style="list-style-type: none"> All-purpose general platform 12x GPIO 3x AIO 	CSR1010A05-IQQM-R <ul style="list-style-type: none"> 128KB memory QFN 32-lead package 5 x 5 x 0.6mm; 0.5mm pitch
CSR1010D <ul style="list-style-type: none"> Extended temp variant for lighting 12x GPIO 3x AIO 	CSR1010A05-DQQM-R <ul style="list-style-type: none"> 128KB memory QFN 32-lead package 5 x 5 x 0.6mm; 0.5mm pitch
CSR1011 <ul style="list-style-type: none"> High I/O count variant 32x GPIO 3x AIO 	CSR1011A05-IQQA-R <ul style="list-style-type: none"> 128KB memory QFN 56-lead package 8 x 8 x 0.9mm; 0.5mm pitch
CSR1012 <ul style="list-style-type: none"> Small form factor & Li-poly powered products 12x GPIO 3x AIO 	CSR1012A05-IQQP-R <ul style="list-style-type: none"> 128KB memory QFN 32-lead package 4 x 4 x 0.65mm; 0.4mm pitch
CSR1013 <ul style="list-style-type: none"> Ultra-thin, ultra-small form for wearables 12x GPIO 1x AIO 	CSR1013A05-IUUM-R <ul style="list-style-type: none"> 128KB memory WLCSP 34-bump package 2.43 x 2.56 x 0.35mm; 0.4mm pitch

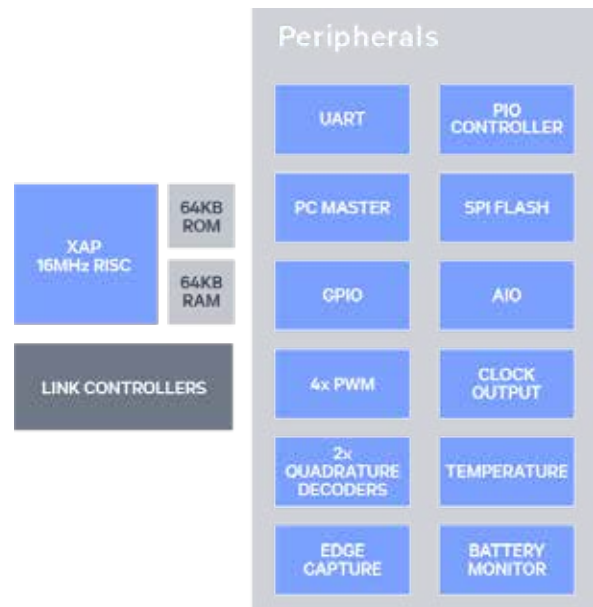
CSR101x Specifications

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	+9.5dBm max RF transmit power -93dBm receive sensitivity No external power amplifier or TX/RX switch required
Interfaces	UART, I ² C, 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)

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

CSR101x Block Diagram





CSR101x

Development Boards and Kits



DK-CSR1010-10169

CSR101x STARTER Development Kit

The CSR101x Starter Development Kit is a simplified yet comprehensive kit designed for developers and designers who need to get prototypes of their Bluetooth low energy products up and running fast, and then move quickly to production.

Applications: Supports multiple applications

Contents

- Target board
- Mini USB cable
- Setup Guide, SDK & other docs on CD-ROM
- Activation code for latest SDK



DK-CSR1010-10184

CSRmesh™ Development Kit

The CSRmesh development kit introduces a development platform for developers and product designers who want to rapidly prototype networking of Bluetooth low energy products using the CSRmesh protocol.

Applications: Lighting, Home automation, Sensor networks

Contents

- 3x Target boards
- 1x USB-SPI programmer
- 2x Connecting cables
- 3x AA alkaline batteries
- Setup guide
- Activation code for latest SDK



DK-CSR1010-10232

PROXIMITY BEACON Development Kit

This development kit provides a simplified yet comprehensive development platform for product designers who want to rapidly develop and prototype Bluetooth beacons in real world use cases.

Applications: Industrial, Retail, Home automation

Contents

- 3x Beacon development boards
- 3x plastic beacon enclosures
- USB programmer & interface cables
- Example beacon applications
- Activation code for latest SDK



DK-ENV_SENS-10224

ENVIRONMENTAL SENSOR Board

The environmental sensor board is designed to help developers create next generation MEMS-enabled Bluetooth devices. This plug-in expansion board is designed to work with the CSR101x Starter Development Kit or the CSR1011 development board and provides Gyroscopic, Magnetic, Temperature, Pressure, Humidity and Acceleration MEMS sensors.

Applications: Home automation, Wearables

Contents

- Target board which includes the following sensors:
- Accelerometer (Analog Devices ADXL 362)
- Temperature (STMicroelectronics STTS751)
- Pressure (Saw Components T5400)
- Magnetometer (Aichi Steel AMI304E)
- Humidity (Sensirion SHT21)
- Angular rate (InvenSense ITG3050)

Qualcomm

CSR102x

CSR102x SoC Product Family

The CSR102x product family is optimized for IoT applications including wireless remote controls, smart watches, home automation solutions, and beacons. Where balancing performance, battery life, and cost is critical, the CSR102x products bring extensive and flexible I/O capabilities designed to simplify integration and eliminate expensive interface components.

CSR1020

CSR1020A06-IQXX-R

- All purpose cost-optimized general platform
- 15x GPIO
- 1x AIO
- 80KB RAM; no flash
- QFN 36-lead package
- 5 x 5 x 0.65mm; 0.5mm pitch
- Pin compatible with CSR1024

CSR1021

CSR1021A06-IQXS-R

- High I/O count cost-optimized variant
- 37x GPIO
- 2x AIO
- 80KB RAM; no flash
- QFN 60-lead package
- 8 x 8 x 0.65mm; 0.5mm pitch
- Pin compatible with CSR1025

CSR1024

CSR1024A06-ILLP-R

- All-purpose upgradeable platform
- 15x GPIO
- 1x AIO
- 80KB RAM
- 256KB internal flash
- LGA 36-lead package
- 5 x 5 x 0.75mm; 0.5mm pitch

CSR1025

CSR1025A06-ILLQ-R

- High I/O count upgradeable platform
- 33x GPIO
- 2x AIO
- 80KB RAM;
- 256KB internal flash
- LGA 60-lead package
- 8 x 8 x 0.75mm; 0.5mm pitch

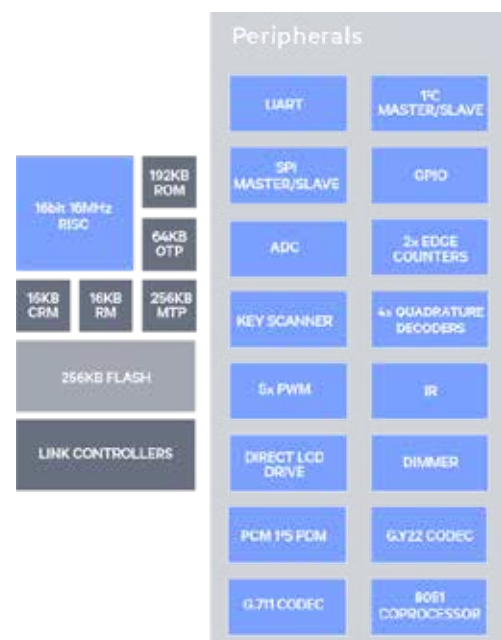
CSR102x Specifications

Bluetooth Version	Bluetooth v4.1 specification compliant
MCU	80MHz embedded RISC co-processor
DSP	40MHz, 24-bit embedded DSP
Memory	8Mb internal ROM, 56KB RAM External SQIF support up to 64Mb
Bluetooth	TX/RX 9.0dBm RF transmit power w/ level control On-chip 6-bit DAC over a dynamic range >30 dB; -90 dBm receive sensitivity; Integrated channel filters (No external power amplifier or TX/RX switch required)
Interfaces	UART, I ² C, SPI, USB 2.0, Up to 22x PIOs 22x AIOs (can be configured as digital I/O as required) SPI debug and programming interface, 7x PWM blocks: 4 dedicated to LED[3:0] 3 assignable to PIO 1x digital microphone channel (CSRB5342/5348)
Power Consumption	Standby: <0.15 mA, Operating: <1 mA
Operating Voltage	1.8V / 2.8V / 3.2V configurable LDO linear regulator
Operating Temperature	-20°C to +70°C (CSRB5341/5342) -40°C to +85°C (CSRB5348)

Features

- Bluetooth version 4.2 qualified stack with optional features
- Direct 50Ω connection to antenna
- Low BoM count with single crystal operation
- Integrated channel filters
- 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 & application security features
- Bluetooth low energy SDK with IDE and debugging tools

CSR102x Block Diagram





CSR102x

Development Boards and Kits



DK-CSR1025-10285

CSR102x STARTER Development Kit

A simplified, yet comprehensive kit designed for developers and designers who need to get prototypes of their Bluetooth low energy products up and running and into production with reduced development time.

Applications: Heart rate sensor, Security tags

Contents

- Target board
- Mini-USB cable and flexible cable
- Prototyping leads
- Setup Guide
- Activation code for latest SDK



DK-CSR1025-10280

IOT Development Kit

The IoT development kit introduces a multi-purpose development platform for prototyping a range of IoT applications and is intended for use with CSRmesh 2.1.

Applications: Lighting, Home automation, Sensor networks

Contents

- 3x IoT target boards
- Programmer board
- Mini-USB cable & flexible cable
- Setup Guide
- Activation code for latest SDK



DK-CSR1025-10284

BLUETOOTH NODE Development Kit

A small form factor design with integrated motion sensor, indication LED and button suitable for making tag applications a reality.

Applications: Beacon, Proximity tag, Footpod form factor

Contents

- Bluetooth node target board
- Setup Guide



DK-UENERGY-PB-10242

PROFESSIONAL Development Kit

A development kit based on a modular design that allows the processor to be swapped out via a pluggable module. The target board can be run from different power sources, and current can be measured from the board directly.

Applications: Auto keyless entry, Fitness & Health, Keyboards and mice, Beacons, Alert tags

Contents

- Professional target board
- Pluggable CSR1025 module
- Setup Guide
- Mini-USB cable & flexible cable
- Prototyping leads
- Activation code for latest SDK



DB-UENERGY-AB-10244

SPORT WATCH Application Board

Pluggable sport watch application board that includes NFC with payment support, GPS and multiple sensors.

Applications: Wearables

Contents

- Application plug-in board
- Setup Guide



DB-UENERGY-AB-10243

SMART REMOTE Application Board

Pluggable smart remote application board that includes a 6-axis motion sensor, IR transmitter and IR receiver.

Applications: Accessories

Contents

- Application plug-in board
- Setup Guide



Qualcomm® CSRB534x Bluetooth Stereo Series

The Qualcomm Bluetooth Stereo CSRB534x series of dual-mode SoCs (System-on-Chip) features a rich Bluetooth v4.1 compliant platform and offers a powerful, versatile and cost-effective solution, making it ideal for a variety of next generation wireless and VR (virtual reality) gaming accessories and embedded modules.

CSRB5341

- Entry level, low cost platform
- 22x Digital I/O; 22x AIO
- No Li-Ion battery charger

CSRB5341A11-IQQU-R

- 8Mb internal ROM, 56KB RAM
- External SQIF support up to 64Mb
- QFN 88-lead package
- 10 x 10 x 0.9mm; 0.4mm pitch

CSRB5342

- QFN Mid range platform with battery charging
- 22x Digital I/O; 22x AIO
- Li-Ion battery charger

CSRB5342A11-IQQU-R

- 8Mb internal ROM, 56KB RAM
- External SQIF support up to 64Mb
- QFN 88-lead package
- 10 x 10 x 0.9mm; 0.4mm pitch

CSRB5342

- BGA Mid range platform with battery charging
- 22x Digital I/O; 22x AIO
- Li-Ion battery charger

CSRB5342A11-IBVE-R

- 8Mb internal ROM, 56KB RAM
- External SQIF support up to 64Mb
- BGA 105-ball package
- 6 x 6 x 1.0mm; 0.5mm pitch

CSRB5348

- High end, Industrial temperature grade platform
- 22x Digital I/O; 22x AIO
- Li-Ion battery charger

CSRB5348A11-IBVE-R

- 8Mb internal ROM, 56KB RAM
- External SQIF support up to 64Mb
- BGA 105-ball package
- 6 x 6 x 1.0mm; 0.5mm pitch

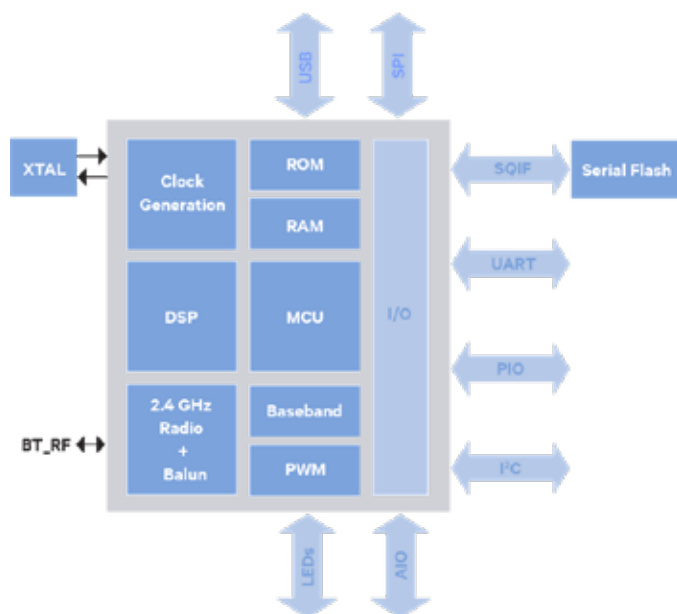
CSRB534x Specifications

Bluetooth Version	Bluetooth v4.1 specification compliant
MCU	80MHz embedded RISC co-processor
DSP	40MHz, 24-bit embedded DSP
Memory	8Mb internal ROM, 56KB RAM External SQIF support up to 64Mb
Bluetooth TX/RX	9.0dBm RF transmit power with level control from on-chip 6-bit DAC over a dynamic range >30 dB; -90 dBm receive sensitivity Integrated channel filters No external power amplifier or TX/RX switch required
Interfaces	UART, I ² C, SPI, USB 2.0, Up to 22x PIOs 22x AIOs (can be configured as digital I/O as required) SPI debug and programming interface, 7x PWM blocks: 4 dedicated to LED[3:0] 3 assignable to PIO 1x digital microphone channel (CSRB5342/5348)
Power Consumption	Standby: <0.15 mA, Operating: <1 mA
Operating Voltage	1.8V / 2.8V / 3.2V configurable LDO linear regulator
Operating Temperature	-20°C to +70°C (CSRB5341/5342) -40°C to +85°C (CSRB5348)

Features

- Integrated application processor with internal ROM, a power management subsystem and LED drivers in a SoC IC
- Programmable DSP for exclusive use of customer applications
- 22 programmable digital I/O & 22 analog I/O
- Optional serial flash interface
- On-chip balun (50Ω impedance in TX and RX modes)
- Integrated 1.35V switch-mode regulator
- All internally required regulators integrated on chip
- Integrated Li-Ion battery charger with instant-on (CSRB5342/48 only) or dry-cell battery technology (CSRB5341)
- Dedicated SDK includes xIDE & market leading Bluetooth stack
- OTA/USB updates for future proofing products
- 7 hardware PWM controllers, 4 on dedicated LED pads
- Keyscan hardware
- Requires minimum external components

CSRB534x Block Diagram





CSRB534x

Development Boards and Kits



DK-CSRB5341-10229

CSRB5341 Development Kit

Compliant platform for development of next-gen wireless gaming controllers and more. Designed to provide for low latency control and ultra-low power operation with enhanced connection topologies for improved smart device and accessory support.

Applications: Wireless gaming controllers, TV remote controls, VR accessories, toys and modules

Contents

- CSRB534x development board
- CSRB5341 QFN example board
- Micro and mini USB leads
- Setup Guide



DK-CSRB5342-10230

CSRB5342 Development Kit

Compliant platform for development of next-gen wireless gaming controllers and more. Designed to provide for low latency control and ultra-low power operation with enhanced connection topologies for improved smart device and accessory support.

Applications: Wireless gaming controllers, TV remote controls, VR accessories, toys and modules

Contents

- CSRB534x development board
- CSRB5342 BGA example board
- Micro and mini USB leads
- 560mAh Li-ion battery
- Setup Guide



DK-CSRB5348-10203

CSRB5348 Development Kit

Compliant platform for development of next-gen embedded systems and modules with industrial grade temperature requirements. Designed to provide for low latency control and ultra-low power operation with enhanced connection topologies for improved smart device and accessory support.

Applications: Embedded modules. Industrial and home automation, EPOS, data loggers, barcode readers, metering devices and systems with large interface requirements.

Contents

- CSRB534x development board
- CSRB5348 BGA example board
- Micro and mini USB leads
- 560mAh Li-ion battery
- Setup Guide

Where to Buy



AITgroup.com



Arrow.com



Atlantikelektronik.de



Silica.avnet.com



Btc.macnica.co.jp



CEACSZ.com.cn



Codico.com



Digikey.com



Excelpoint.com



Fortune-co.com



Futureelectronics.com



Maxtek-icrep.com.tw



Kanematsu.co.jp



Nexty-ele.com



Oscokorea.com



Uniquet.co.kr



Wpgholdings.com/wpig



Kr.wpgholdings.com

To learn more visit:
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or qualcomm.com

Qualcomm Technologies International, Ltd. works with some of the world's leading module manufacturers to create pre-certified solutions that reduce time to market and meet technical qualifications and quality requirements. The third party module suppliers listed below*, will be able to help you with all pricing, detailed features and purchasing inquiries.

Find additional information at developer.qualcomm.com/hardware/csr101x-product-family/module-suppliers

Module Suppliers	Region	Qualcomm Device	Part Numbers	Sales Contact/Where to Buy
apmComm	Taiwan	CSR1010	APM1010	sales@apmcomm.com
AsiaRF	Taiwan	CSR1010	BTM001; Tracker001	paul@asiarf.com
Atech OEM Inc.	Taiwan	CSR1010	BL-4011	www.atechoem.com
BARUN	South Korea	CSR1010	BM-LDS605	sales_module@bec.co.kr
Blue Creation	United Kingdom	CSR1010	BC118	sales@bluecreation.com
BluePacket	Taiwan	CSR1010	BPM1010; BPS1010-TAG; RS1001	sales@bluepacket.net
CC&C Technologies	Taiwan	CSR1010	BM-1010	market@ccandc.com.tw
CEL	United States	CSR1010	B1010SP0-1x	sales@cel.com
DeviceDesign	South Korea	CSR1010	DDLCW-NMS1x	ylchoi@dd-device.com
EGIGA Technologies	Taiwan	CSR1010	eGM-A20	jasen@egigatek.com.tw
Ehong	China	CSR1010	EH-MC10	sales@ehlink.com.cn
EnzyTek	Taiwan	CSR1010	BTA-C1010-2; BTM-C1010-2	sales@enzytek.com
F1 Media	South Korea	CSR1010	FILC10	sales@f1-media.com
Flairmicro	China	CSR1010	FLC-BTM101	www.flairmicro.com
GooWi	China	CSR1010	GWLE1010A	thomas.wei@goowi-tech.com
HANA Micron	South Korea	CSR1010	HBL2X1N	sales@hanamicron.co.kr
iTON	China	CSR1010	CB1010-8P	mark@sziton.com
JL Tech Corporation	South Korea	CSR1010	BT40	sdkim365@gmail.com
Kaynes Technology	India	CSR1010	KT1010	nadeem.maniyar@kaynestechology.net
LITEON	Taiwan	CSR1010	MB0100C	ralf.Liu@liteon.com
Microchip	United States	CSR1010	RN4020	www.microchipdirect.com
MtM Technology	Taiwan	CSR1010	M903L	sales@mtmtech.com.tw
Novacomm Technologies	China	CSR1010	NVC-MDCS71	sales@novacomm.cn
nFore	Taiwan	CSR1010	NF1010E	sales@nforetek.com
Partron	South Korea	CSR1010	BTMC1010	park.jihong@partron.co.kr
Rayson	Taiwan	CSR1010	BTM800; BTM840	sales@rayson.com
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Avi-on	United States	CSR1012	AVI-ON-1012	dana@avi-on.com
F1 Media	South Korea	CSR1012	FILC12, FILC12S	sales@f1-media.com
Isung	South Korea	CSR1012	BMC1012	smith@isung.com
LM Technologies	United Kingdom	CSR1012	LM930; LM931	http://lm-technologies.com/where-to-buy/
Mitsumi	Japan	CSR1012	WML-C75	www.mitsumi.co.jp
Rayson	Taiwan	CSR1012	BTM800	sales@rayson.com
Scientech Materials	Taiwan	CSR1012	MRB111	michael.wang@scientech-m.com
Sysgration	Taiwan	CSR1012	CSR1012 BLE Module	alanchang@sysgration.com
Trusted Link	China	CSR1012	BLE012	mason.song@trlinktek.com
Coordwise	Taiwan	CSRB5248	OBD II Plus	mint@coordwise.com
EnzyTek	Taiwan	CSRB5348	BTD-C5348	aneli.jow@enzytek.com
LM Technologies	United Kingdom	CSRB534X	LM961	http://lm-technologies.com/where-to-buy/
Flairmicro	China	CSR1024	FLC-BTM201	Jie Zheng
GooWi	China	CSR1024	GWLE1024A	thomas.wei@goowi-tech.com
Sunitec	China	CSR1024	BLM124	sales@sunitec-cn.com

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