Qualcomm

Qualcomm® QCC74x Tri-Radio SoC

Fully integrated, high-performance 1x1 Wi-Fi 6, Bluetooth® 5.4 technology, and IEEE 802.15.4 SoC with stacked memory options for IoT applications.

The QCC74x is a tri-radio chipset integrating 1x1 Wi-Fi 6, Bluetooth 5.4, and IEEE 802.15.4 (Thread and Zigbee-ready) powered by a 32-bit RISC-V MCU up to 325 MHz and stacked memory (pSRAM and NOR flash).

Unlike other Wi-Fi/Bluetooth 5.4/15.4 combination chipsets on the market, QCC74x is integrated with a wide array of on-chip features, including a powerful 32-bit RISC-V processor with an FPU and DSP running up to 325 MHz, 484 KB SRAM, 48 KB cache, and 128 KB ROM, as well as an optional 4/8/16 MB pSRAM and 8 MB NOR flash System-in-Package (SiP). It also includes multimedia features such as audio and video codec and interfaces, and 35x multiplexed GPIO-rich peripherals. Its all-in-one design and capabilities contribute to reduced costs and enhanced performance, making it an attractive choice for IoT edge devices requiring a single-chip solution.

QCC74x operates in hostless mode, capable of running both the protocol stack all the way to the application level as well as IoT applications without requiring an external MCU. Built on FreeRTOS, its software SDK will be open-sourced on CodeLinaro coupled with the Microsoft Visual Studio Code (VS Code) IDE market extension to facilitate rapid IoT application development. It can also be used as an IoT connectivity transceiver in hosted mode (both RCP and NCP) with an external host.

Highlights

Full radio integration

QCC74x integrates all of the following radios required for IoT connectivity: 1x1 Wi-Fi 6, Bluetooth 5.4 dual mode (BR/EDR and LE with coded PHY), and IEEE 802.15.4 (Thread and Zigbee-ready). It will support Matter over Wi-Fi, Thread, as well as Ethernet with Bluetooth LE commissioning capability.

High computing power

In addition to radio integration, QCC74x also has a powerful 32-bit RISC-V microcontroller up to 325 MHz with a DSP and FPU at its core. It also has the option to add stacked memory like pSRAM and NOR flash to boost computing capability.

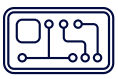
High security

QCC74x has a built-in security acceleration engine, supporting both symmetric and asymmetric algorithms. It provides security services like Secure Boot and Secure Debug, and can support public key accelerators, TRNG, and QSPI (XiP) on-the-fly AES decryption. It is also PSA Certified Level One.

Rich peripherals and multimedia support

QCC74x has 35x on-chip GPIO pins that can be multiplexed to support rich peripheral interfaces like QSPI, SDIO, SD card, SPI, UART, I2C, I2S, PWM, 12-bit ADC, 12-bit DAC, IR remote, RMII (10/100 Ethernet), CAN (ISO11898), DVP camera, and DBI display. It has built-in motion JPEG to support 720p video codec as well as MIC input with 8/12/16/22.05/24/32/44.1/48 KHz audio sampling and speaker output.

User-friendly development environment and tools



QCC74x will be provided with an open-source software SDK available on CodeLinaro, the VS Code-based IDE supported by size- and cost-optimized modules as well as associated development kits.

Materials are subject to change without notice.
87-75957-1 Rev. H

QCC74x Target Applications

Smart Appliances
Industrial IoT
IoT Hubs/Gateways
Medical Devices
Smart Home Devices

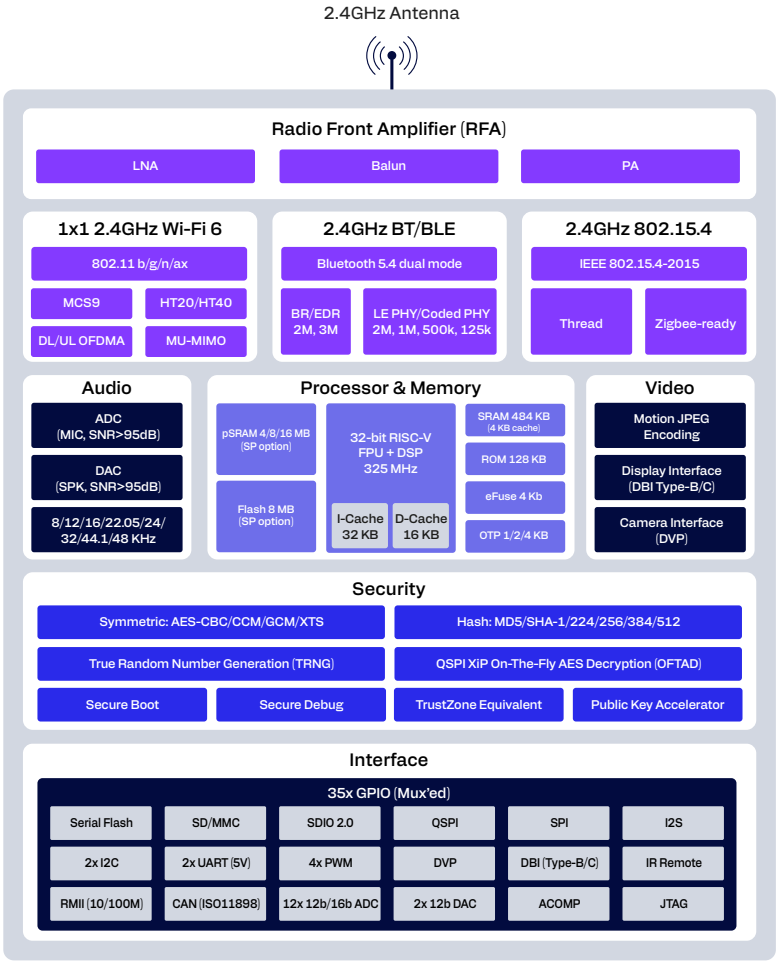
Features

- Full radio integration to address all IoT connectivity needs
- High-performance 32-bit RISC-V MCU with large memory resource and a stacked memory SiP option
- Advanced hardware-based security featuring public key accelerator, TRNG, and QSPI (XiP) on-the-fly AES decryption
- Secure Boot and Secure Debug
- Rich peripheral interfaces including Ethernet, CAN, etc.
- Direct camera interface (DVP) and display control (DBI)
- Multimedia features like motion JPEG (720p) and MIC and speaker support
- Support hostless and hosted (RCP and NCP) operation modes
- Open-source support with SDK on CodeLinaro, VS Code IDE market extension, as well as modules and associated development kits

Related Products

Qualcomm® QCC74xM is a module consisting of a combo tri-radio chipset integrating 1x1 Wi-Fi 6, Bluetooth 5.3 technology, and IEEE 802.15.4 (Thread and Zigbee-ready) powered by a 32-bit RISC-V MCU that can run up to 325 MHz and optional stacked memory (pSRAM and/or NOR flash).

Block Diagram



Ordering Information

Chipset	Product Code	Order Number	Packaging	SiP Memory	USB
QCC743	QCC743-1	QCC-743-1-MQFN40-MT-01-0	Bulk	No	N
	QCC743-4	QCC-743-4-MQFN40-MT-01-0	Bulk	4 MB Flash	N
QCC744*	QCC744-2	QCC-744-2-MQFN56-MT-01-0	Bulk	4 MB PSRAM	N
QCC748	QCC748-2	QCC-748-2-MQFN56-MT-01-0	Bulk	4 MB PSRAM	Y
	QCC748-3	QCC-748-3-MQFN56-MT-01-0	Bulk	8 MB PSRAM	Y

* Note: QCC744-2 chipset is not recommended for new designs. Use QCC748-2 chipset instead (same SW/HW and chipset footprint).

QCC74x IoT Connectivity Comparison

Stay connected with industry-leading wireless communication solutions for the Internet of Things.

Features		QCC743-1/-4	QCC744-2	QCC748-2/-3
Processor	32-bit RISC-V @ 325 MHz	Y	Y	Y
Onboard Memory	128 KB ROM, 484 KB SRAM	Y	Y	Y
SiP Memory (Optional)	4/8/16 MB pSRAM (optional)	N	4 MB	4 or 8 MB
	4/8 MB NOR Flash (optional)	0 or 4 MB	N	N
Wi-Fi Standard	1x1 2.4GHz 802.11b/g/n/ac/ax (Wi-Fi 6)	Y	Y	Y
Bluetooth Standard	Bluetooth Low Energy v5.4	Y	Y	Y
802.15.4 Standard	Thread and Zigbee-ready	Y	Y	Y
Operating Temperature	-40 to +85 °C	Y	Y	Y
Ethernet	RMII (via GPIO)	N	Y	Y
Audio Codec	1x DAC (Speaker) / 1x ADC (Mic) via GPIO	N	Y	Y
Video Codec	MJPEG Encoding	N	Y	Y
Camera Interface	DVP (via GPIO)	N	Y	Y
Display Interface	DBI (via GPIO)	N	Y	Y
GPIO	19 (5x5 QFN) or 35 (7x7 QFN)	Up to 19	Up to 35	Up to 35
SDIO	SDIO 2.0 Slave, SD Card Interface	Y	Y	Y
USB	1x	N	N	Y
UART	2x	Y	Y	Y
ISO 11898 (CAN Bus)	1x	Y	Y	Y
SPI	Master / Slave	Y	Y	Y
I2C	2x	Y	Y	Y
I2S	Master / Slave	Y	Y	Y
PWM	1x PWM (4x channels)	Y	Y	Y
QSPI	XiP QSPI (Flash)	Y	Y	Y
Timers	RTC, 2x 32-bit, 1x 16-bit	Y	Y	Y
IR Controller	Receiver	Y	Y	Y
ADC	General Purpose 12/14/16 bits	Y	Y	Y
DAC	General Purpose 12-bit	Y	Y	Y
JTAG	via GPIO	Y	Y	Y

To learn more visit: qualcomm.com

Qualcomm