

Arm Cordio-C50 radio IP

Complete Bluetooth 5 and 802.15.4 solution

- 2.4 GHz RF transceiver
- Modem, protocol processing logic
- Link layer and MAC firmware

IP implementation

- TSMC 55nm LP/ULP
- TSMC 40nm LP/ULP
- UMC 55nm ULP
- Native sub 1-volt solution

Bluetooth core specification 5

- 2400 – 2484 MHz
- GFSK modulation, FHSS
- Master and slave mode support
- Optional AES-128 encryption engine, ECC support

IEEE 802.15.4 specification

- 802.15.4-2005 version of MAC and PHY
- 2400 – 2484 MHz, O-QPSK PHY
- Optional AES-128 encryption engine

Full featured link layer firmware

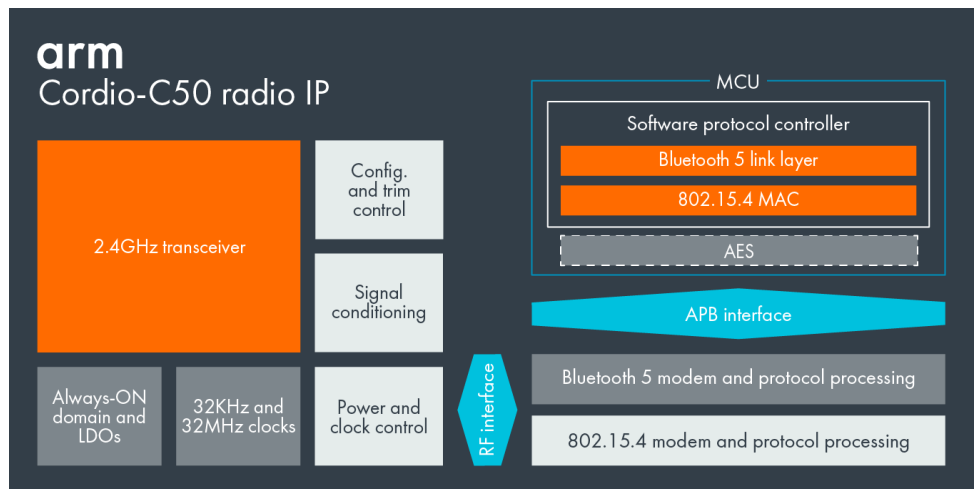
- Delivered as source code
- Optimized for energy and memory efficiency
- Supports single processor or dual-processor solutions

System clock and power

- Low power 32 MHz and 32.768 kHz XTAL oscillators with internal RC modes
- Bypass option for 32 kHz clock available

Overview

Arm® Cordio®-C50 radio IP is a complete self-contained radio sub-system supporting Bluetooth 5 and IEEE 802.15.4 protocols available at TSMC 55nm LP/ULP, TSMC 40nm LP/ULP, and UMC 55nm ULP process nodes. The solution consists of the RF 2.4GHz transceiver, modem, protocol processing logic and along with link and MAC layer firmware. The RF front end is delivered as a hard macro, the digital parts delivered as RTL, and link and MAC layer firmware as source code. The design is optimized for low-power end node IoT devices and enables designers who want a silicon proven and qualified/certified solution for reduced risk and improved time to market.



Implementation highlights

- RTL for modem and protocol processing logic
- Designed as an AMBA peripheral
- Link layer firmware available as source code
- Bluetooth qualified components
- Zigbee/Thread compliant platform through third party stacks

Low external BOM count

- 11 external components
- Single antenna pin with integrated PA, LNA and RX/TX switch
- Integrated crystal oscillator load capacitors and integrated PLL filter

Standard features

- Bluetooth 5 2Mbps support
- Coded PHY for longer range
- Bluetooth 5 advertising extensions
- LE channel selection
- MAC features to support Zigbee 3.0 and Thread

Cordio software

- Bluetooth qualified link-layer firmware up to the HCI and 802.15.4 MAC layer firmware
- Smart multiplexing to switch between the two networks
- Flexible architecture to support different memories for firmware

Design deliverables

- GDSII files for the RF front end
- RF transceiver integrated with pad ring for ease of integration and floor-planning
- RTL for modem and protocol processing logic
- Test vectors, timing and physical abstraction models
- Scripts for simulation and synthesis with Cadence tools
- Integration manual and release notes

Support deliverables

- Evaluation kit: An Arm mbed™-enabled platform with a demonstration chip containing the Cordio-C50 radio IP, sample
- Bluetooth qualified controller sub-system to ease Bluetooth listing of OEM products
- Zigbee/Thread compliant hardware platform through third party stacks
- Antenna design and PCB layout guidance
- Radio control tool, RF test guidance
- Production test & radio calibration algorithm

Arm Cordio-C50 radio IP specification

Radio standard	2.4 GHz standard-compliant Bluetooth 5 and 802.15.4 IP platform
Native voltage	950 mV (nominal)
TX power	-21 dBm up to 5 dBm
RX sensitivity	-95 dBm
Power consumption	Active RX: 6.7mW @1V Active TX: 7.2mW @1V Sleep mode: 500nW @1V
Temperature range	-40°C to 90°C

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Web: www.arm.com/Cordio



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