Wireless Connectivity

MCR20AVHM 2.4 GHz Wireless Transceiver

Design with 802.15.4 solutions for Kinetis MCUs

Overview

The MCR20AVHM expands the Freescale portfolio of wireless connectivity products by delivering a new generation of 2.4 GHz transceiver for the IEEE® 802.15.4 standard. The MCR20AVHM provides a link budget of 110 dB that ensures the longest range of communication. At the same time, the MCR20AVHM is able to receive and transmit at significantly lower peak currents than other competitive devices. This enables mesh networks to run on the same battery for a much longer period. The Dual PAN support allows the system to simultaneously participate in two ZigBee® networks, eliminating the need for multiple radios. Software protocol stacks, tools and IDE are compatible with Kinetis MCUs, and now fully integrated in the Kinetis software development kit (SDK).

MCR20AVHM Block Diagram
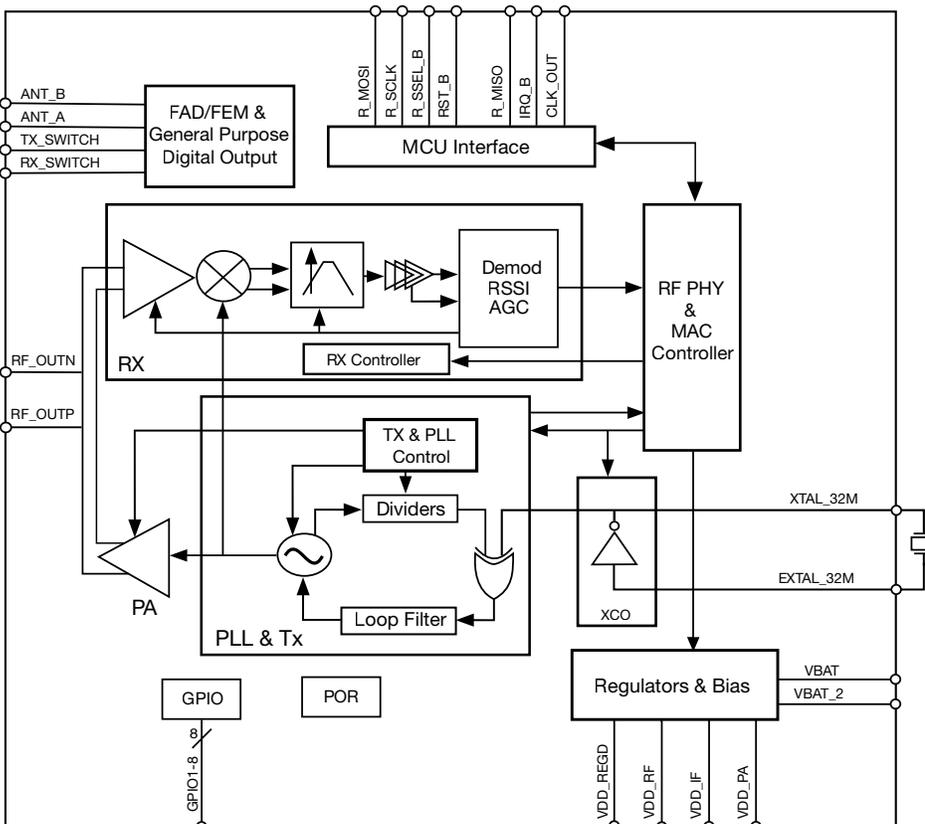
Target Applications

- Home Automation
  - Access control
  - Curtain/window blind control
  - Intruder alarms
  - Lighting control
  - Remote control
  - Smart thermostats
  - Water heater control
- Building Automation
  - Asset tracking
  - Building control and monitoring
  - Building HVAC control
  - Fire/security
  - Retail pricing management
  - Security and access control
  - Smart grid and smart metering
  - Usage data collection
- Healthcare
  - Asset tracking
  - Fitness monitoring
  - Home healthcare
  - Institutional care
  - Medication asset
  - Monitoring/billing
  - Patient monitoring
- Smart energy
  - Home energy gateways
  - In-home displays
  - Load control
  - Metering
  - PEV charge monitoring
  - Smart thermostat
  - Solar panel monitoring

Enablement

- Freedom development board platform

- 802.15.4 PHY/MAC support

- Full integration with Kinetis software development kit (SDK)

- Software stacks available for both FRDM-K64F and FRDM-KL46Z

Features and Benefits

Features	Benefits
• -102 dBm sensitivity • +8 dBm maximum output power	• 110 dB link budget improves range and lowers cost by reducing the need for external power amplifiers
• TX 18 mA @ 0 dBm • RX 19.5 mA max	• Significantly reduces power consumption and extends battery life • Low Power Preamble Search (LPPS) receiver mode
• Dual PAN support	• System can simultaneously participate in two ZigBee networks, eliminating the need for multiple radios
• Differential RF RX/TX Port • Fast Antenna Diversity	• Single 50 ohm antenna uses single balun to reduce component count and cost • Freescale fast antenna diversity allows the hardware to automatically select between two antennas for improved reliability in high-interference environments
• Packet processor	• Radio handles many 802.15.4 functions in hardware to reduce the software stack size and reduce power consumption by off-loading functions from the CPU
• 128-bit random number generator	• Meets the FIPS 140 security requirements for cryptographic modules
• 1.8–3.6 V operating range	• Provides wide voltage range to maximize usable voltage for battery operation
• Small 5x5 footprint	• Smaller size and low component count reduces cost
• –40 ˚C to +105 ˚C operational temperature range	• Ideal for applications that need extended temperature range
• Compatible with Freescale Kinetis MCU family	• Software protocol stacks, tools and IDE are compatible with the Kinetis MCUs, and integrated in the Kinetis software development kit (SDK)

Development Tools

Kit Number	Description
FRDM-CR20A	Freescale Freedom development board platform, MCR20A for Kinetis devices, 2.4 GHz 802.15.4 wireless transceiver

Orderable Part Number

Device	Sensitivity (dBm)	Current TX	RX	Feature	Package
MCR20AVHM	-102	18	19.5	Low power, high-performance 2.4 GHz IEEE 802.15.4 compliant transceiver	5x5 pin LGA 32

For more information about the MCR20A 2.4 GHz wireless transceiver and documentation, please visit freescale.com/MCR20A

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