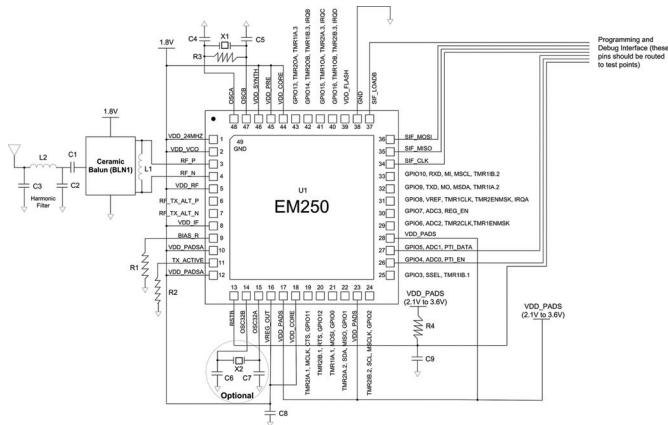


EM250

802.15.4 and ZigBee Compliant System-on-Chip

Radio
2.4GHz

Fact Sheet



Overview

The EM250 from Ember provides a true ZigBee System-on-Chip that combines a 2.4GHz IEEE 802.15.4 compliant radio transceiver with a powerful, efficient industry proven 16-bit microprocessor with comprehensive hardware supported network-level debugging features to simplify development.

Designed specifically for use with EmberZNet PRO, Ember's ZigBee compliant embedded mesh networking software which supports the ZigBee PRO feature set, the EM250 is optimized for designs requiring long battery life, low external component count, and a reliable, proven, industry-standard networking solution.

ZigBee System-on-Chip

The EM250's integrated microprocessor includes FLASH and RAM to accommodate many user applications built around the EmberZNet Pro networking library, and eases integration and debugging by providing hardware-supported guaranteed timing, protected application memory space, and a unique, non-intrusive, network level debugging capability.

The EM250's built-in 802.15.4 RF section provides the highest level of integration, requiring only minimal external components. It provides exceptional immunity to other 2.4GHz interferers such as Wi-Fi, and excellent receiver sensitivity for long range. For applications requiring even longer range, an easy method of connecting an external PA and/or LNA is provided.

Power

Applications requiring years of battery life take advantage of the EM250's low operating and sleep currents and the integrated EmberZNet PRO networking library to easily incorporate short activity cycles.

The EM250's integrated voltage regulator supports a wide range of operating voltages that allows hardware to be optimized for use with lithium-ion or alkaline batteries, without additional circuitry.

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Extended Features

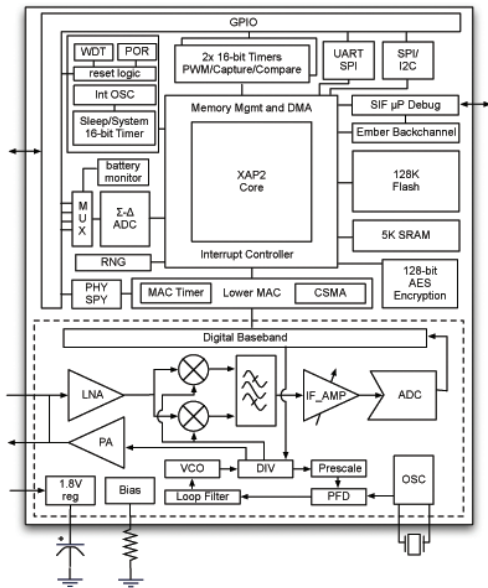
- Best in class RF Performance
- Flexible Antenna Interface allows easy antenna connection with or without external PA
- Excellent noise immunity to 802.11 b/g. Exceeds 802.15.4 adjacent/alternate channel rejection specification for improved co-existence
- Digital RSSI/802.15.4 Link Quality Indication
- InSight Port - Hardware supported network level debugging
- Functions such as CSMA backoff, automatic ack generation and reception, and CRC calculation
- Power efficient 16-bit RISC core with embedded Flash and RAM
- Hardware Encryption Engine (AES 128) with true Random Number Generator
- Integrated sleep oscillator allows a single crystal design reducing cost and power consumption
- Capable of being ZigBee co-ordinator, Full-Functional Device (FFD), and Reduced Functional Device (RFD)

EM250 802.15.4 and ZigBee Compliant System-on-Chip

Development

The EM250 is supported by InSight Desktop, a comprehensive integrated development environment (IDE) and C-language compiler tool-chain. Ember InSight Desktop is designed for writing, compiling, loading, and debugging software onto multiple nodes in a networked environment: in addition to supporting instruction level and register level debugging capabilities, the EM250 IDE supports a special hardware-based network level debugging capability that helps quickly identify complicated bugs that can't be caught by examining a single node.

The EM250 is tightly integrated with the EmberZNet PRO, a complete ZigBee protocol software package containing all the elements required for robust and reliable mesh networking applications on Ember's silicon platforms.



General Characteristics

Deep Sleep Current (with sleep timer running)	1 uA max
RX Current (CPU@12MHz + RF)	36 mA – Normal Mode 38 mA – Boost Mode
TX Current (CPU@12MHz + RF, +5dBm)	36 mA – Normal Mode 42 mA – Boost Mode
Crystal Frequency	24 MHz
Operating Temperature Range	-40 – +85 C
Voltage (internal reg)	2.1 – 3.6 V
Package	7 mm x 7 mm, 48 pin QFN

RF Characteristics

Data Rate	250 kbps
Frequency	2400 – 2500 16 – 5 MHz Channels
RX Sensitivity	-99 dBm – Normal Mode -100 dBm – Boost Mode
Adj Channel Rejection (15.4)	>35 dB
Alt Channel Rejection (15.4)	>40 dB
802.11g Rejection (+12 / -13 MHz)	>35 dB
TX Power	-32 dBm – + 3 dBm – Normal Mode -32 dBm – + 5 dBm – Boost Mode

About Ember

Ember Corporation (www.ember.com) develops wireless mesh networking technology — chips, software and tools — for Smart Energy, connected homes, and many other monitoring and control applications enabling greener living and work environments. The Boston-based company is a promoter of the ZigBee Alliance with an IC design center in Cambridge, England, an office in Hong Kong and sales channels and distributors worldwide.

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EM250-0511
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