Chipcon Products
from Texas Instruments

CC2420

2.4 GHz ZIGBEE™/ IEEE 802.15.4 RF TRANSCEIVER

INDUSTRY LEADING SINGLE-CHIP 2.4 GHz RF TRANSCEIVER FOR IEEE 802.15.4 AND ZIGBEE™

The CC2420 is a low-cost transceiver designed specifically for low-power, low-voltage RF applications in the 2.4 GHz unlicensed ISM band and is the leading ZigBee™/IEEE 802.15.4 RF transceiver on the market. It exceeds the standard's requirements for selectivity and ensures a long communication range as well as effective, reliable communication. The CC2420 is based on Chipcon's SmartRF®03 technology in 0.18 µm CMOS.

The CC2420 meets the ZigBee™ standard's requirements for interoperability among cost-effective, standard-based network solutions supporting a low data rate, low power consumption, security and reliability.

The CC2420 provides hardware support for AES-128 based data encryption and data authentication, thus offering a very high level of security. It also supports functions such as packet handling, data buffering, burst transmissions, address recognition, clear channel assessment, link-quality indication and timing information. These functions reduce the load on the host processor and enable the CC2420 to interface with low-cost microcontrollers. The main operating parameters and transmit/receive FIFOs of the CC2420 can be accessed via an SPI interface.

The CC2420 RF transceiver is a highly integrated solution. In a typical application it will be used with a microcontroller and few external passive components.

The CC2420 is an ideal solution for home and building automation, industrial monitoring and control systems, sensor networks, consumer electronics, and intelligent toys. The CC2420 easily meets the needs most common to these applications: long battery life, reliable communication links and low system costs.

FLEXIBLE, POWERFUL DEVELOPMENT TOOLS

The CC2420 is supported by a fully featured development kit for fast and easy evaluation of the chip. Designers can quickly develop their own RF solutions based on the reference designs provided by Chipcon. The SmartRF® Studio software provides a simple interface to evaluate the performance of the CC2420, which is also supported by an IEEE 802.15.4 packet sniffer. The IEEE 802.15.4 MAC layer software is available under a license agreement.

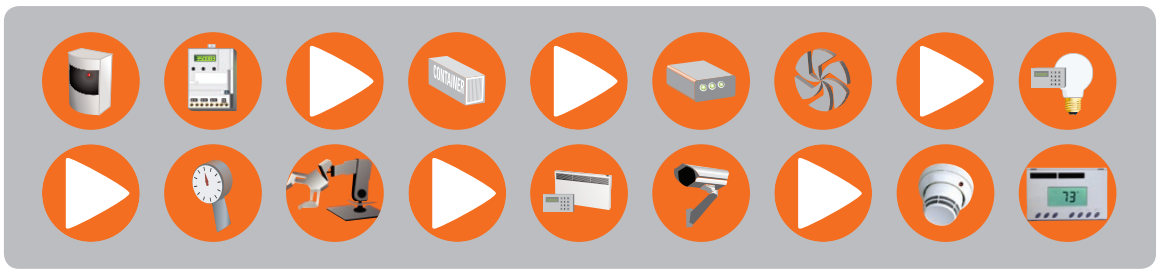
APPLICATIONS

- **Home and building automation**
- **Industrial monitoring and control**
- **Sensor networks**
- **Intelligent toys**
- **Consumer electronics**

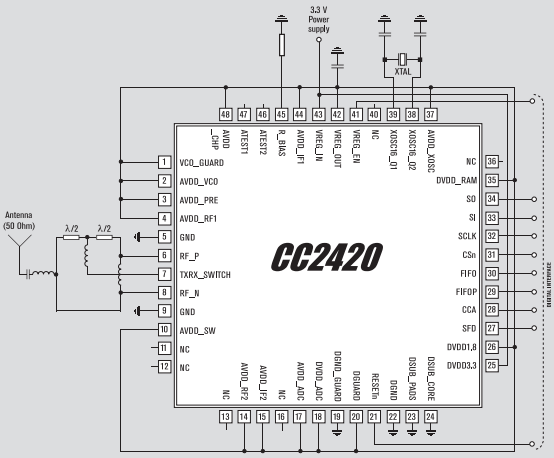
SmartRF®03 - Product line

GENERAL CHARACTERISTICS

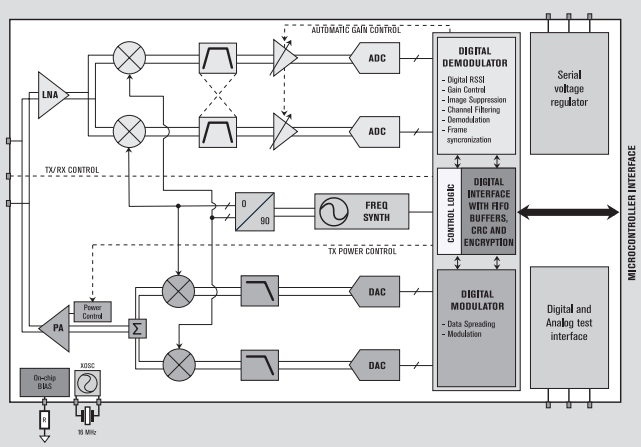
Parameter	Min	Typ	Max	Unit	Condition
OPERATING CONDITIONS:					
Frequency range	2400		2483.5	MHz	In 1 MHz steps
Data rate		250		kbps	Data rate according to IEEE 802.15.4
Operating voltage	2.1		3.6	V	
Operating temperature	-40		85	ºC	
TX mode		0		dBm	Programmable from -24 to 0 dBm
RX Mode:					
Receiver sensitivity		-95		dBm	< 1% PER
Adjacent channel rejection, +5 MHz		45		dB	Wanted signal at -82 dBm, <1 % PER
Adjacent channel rejection, -5 MHz		30		dB	Wanted signal at -82 dBm, <1 % PER
Alternate channel rejection, + 10 MHz		54		dB	Wanted signal at -82 dBm, <1 % PER
Alternate channel rejection, - 10 MHz		53		dB	Wanted signal at -82 dBm, <1 % PER
Channel rejection ≥ +/- 15 MHz		62		dB	Wanted signal at -82 dBm, <1 % PER
Power Supply:					
Current consumption, RX		18.8		mA	
Current consumption, TX, -10 dBm		11		mA	Output power in 50 Ω load
Current consumption, TX, -5 dBm		14		mA	Output power in 50 Ω load
Current consumption, TX, 0 dBm		17.4		mA	Output power in 50 Ω load
Current consumption, voltage vegulator off		0.02	1	µA	



APPLICATION CIRCUIT DIAGRAM



BLOCK DIAGRAM



FEATURES

- True single-chip 2.4 GHz IEEE 802.15.4 /ZigBee™ RF transceiver with MAC support
- Suitable for FFDs (Full Function Devices) and RFDs (Reduced Function Devices) defined by IEEE 802.15.4 and as well as end devices, routers and coordinators according to ZigBee
- DSSS modem with 2 Mchips/s and 250 kbps effective data rate
- Low current consumption (RX: 18.8 mA, TX: 17.4 mA)
- Low supply voltage with internal voltage regulator (2.1 V – 3.6 V)
- No external RF switch/filter needed
- Programmable output power
- I/Q low-IF receiver
- I/Q direct up-conversion transmitter
- Few external components
- Packet handling with 128 byte (RX) + 128 byte (TX) data buffering
- Digital RSSI/LQI support
- Hardware MAC encryption and authentication (AES-128)
- Battery monitor
- QLP-48 package (7x7 mm)
- Reference designs compliant with ETSI EN 300 440 class 2, EN 300 328, FCC CFR 47 part 15 and ARIB STD-T66
- Powerful, flexible development tools available
- Easy-to-use software for performance evaluation
- Two reference designs available: One with 0 dBm and one with +10 dBm output power

ABOUT CHIPCON

Chipcon is a leading international semiconductor company that designs, produces and markets high performance standard radio frequency integrated circuits (RF-ICs) for use in a variety of wireless applications in the 300 to 1000 MHz and 2.4 GHz frequency bands.

Chipcon targets both consumer electronics and home and building automation end markets and has a strong position within both proprietary and standards-based radio technologies.

Chipcon Group ASA is the parent company and holding company that controls the activities of its wholly owned subsidiaries Chipcon AS, Chipcon Inc. and Figure 8 Wireless Inc.

Our products are distributed worldwide and we are represented at 55 locations in 31 countries.

Texas Instruments

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