

2.4GHz IEEE 802.15.4 Radio Module

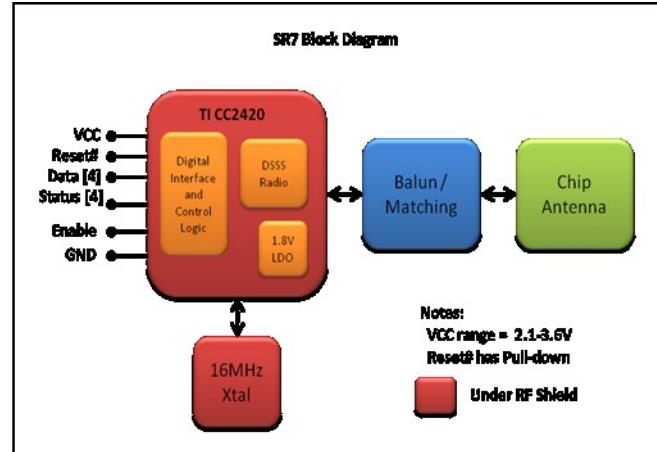


Features

- Fully tested drop-in 2.4GHz Radio Module enables rapid development of wireless solutions
- Compatible with popular network stacks and drivers
- Sustained data rate up to 250Kbps
- Integrated chip Antenna
- Half-via SMT pads for reliable hand attachment or automated assembly
- Extremely Compact size: 12mmx19mmx2mm
- RoHS compliant

Applications

- Wireless Medical Devices
- On body Data Acquisition
- Wireless Sensor Networking
- Inertial sensing
- Home automation
- Education



Certifications

- CFR Title 47 FCC Part 15 Subpart B, Class B
- ICES-003, Issue 4, Class B
- CNS-13438, Class B
- VCCI V-3/2005.04 and V-4/2003.04
- EN 55022:2006 + A1:2007, Class B (CE Mark)
- ACMA AS/NZS CISPR 22:2006, Ed. 5.2, Class B ("C" Tick Label")
- FCC 15.247, Subpart C
- Industry Canada RSS 210, Issue 7, Annex 8
- ETSI EN 300 328 V1.7.1 (2006-10)

Description and Theory of Operation

SR7 is a standalone implementation of the IEEE 802.15.4 radio solution found in Shimmer™ products. It features the popular Texas Instruments Chipcon CC2420 ZigBee-ready RF Transceiver IC and breaks out all data, signal, and control pins to module pads.

In normal operation, the SR7 is connected to a microcontroller or processor to realize a low power radio transmitter, access point, or receiver in a wireless system.

Software Applications

For details regarding programming and register-level configuration see the *Chipcon CC2420 Datasheet from Texas Instruments*. Shimmer Research supports an IP-over-802.15.4 stack on the Shimmer Live distribution. SR7 has also been validated as part of a platform running the TinyOS (TOS) CC2420 radio stack.

Network stacks and processor specific examples can be found on websites for Texas Instruments and other processor or embedded development vendors.

Photo



Figure 1 Component Side

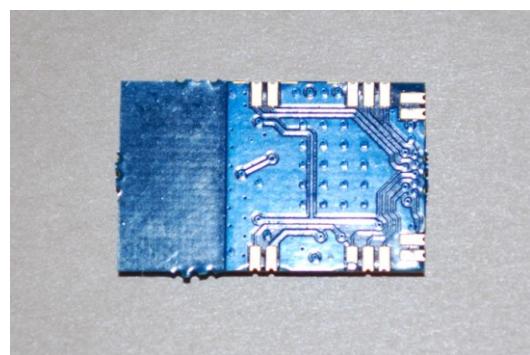


Figure 2 Solder side

Operating Characteristics

Supply Voltage	2.1-3.6V
Average Supply current	25mA (worst case)
Standby Supply Current	20-40uA
Power down Supply Current	10uA
Operating Temperature	0-35°C
Operating Humidity	<95%
RF Frequency Range	2400-2483.5 MHz
Measured Max Output Power	<.5mW

For additional specifications see the *Chipcon CC2420 Datasheet from Texas Instruments*

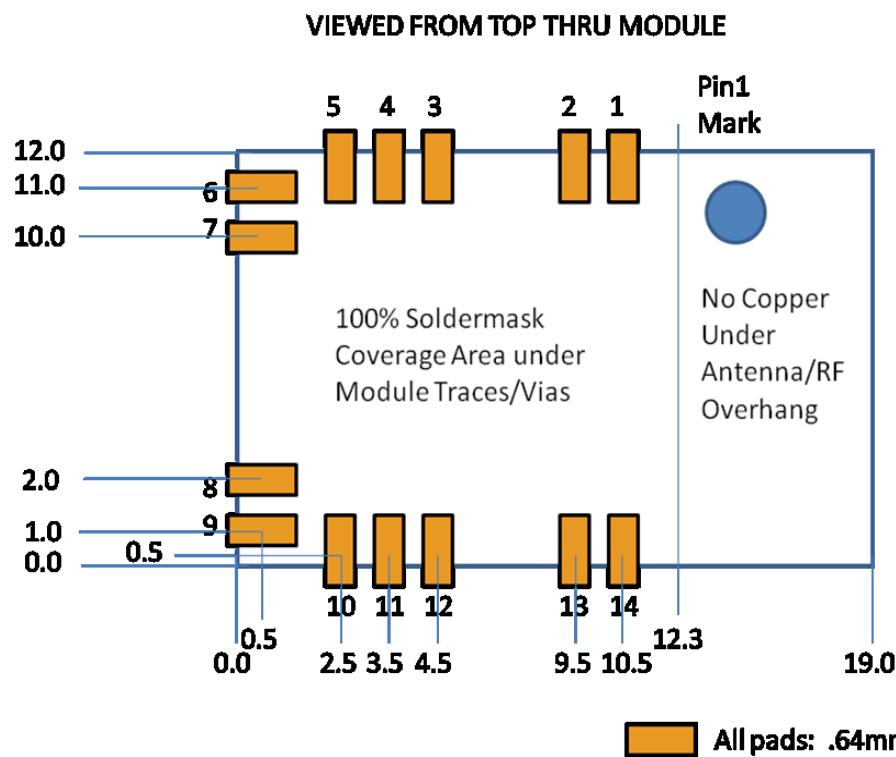
To avoid device damage do not exceed supply voltage +.3V on any pin

Both VCC supply pins (pins 7 and 13) must be connected to the same supply

Connections

Pin	Name	Type	Description
1	FIFO	Output	Active when FIFO contains data. Connect to interrupt pin
2	FIFOP	Output	Active when FIFO contents exceed threshold. Connect to interrupt pin
3	RESET#	Input PD	Drive Low (0V) to reset the module. This contains a 412k weak pull-down
4	CCA	Output	Clear Channel Assessment. Connect to interrupt pin
5	SFD	Output	Start of Frame Delimiter. Connect to Timer Capture or interrupt pin
6	GND	PWR	
7	VCC	PWR	Module Supply Voltage Must be connected to same voltage as pin 13
8	SOMI	Output	Slave Out Master In. SPI bus connection
9	GND	PWR	
10	SIMO	Input	Slave In Master Out. SPI bus connection
11	SCLK	Input	SPI bus clock
12	CS	Input	SPI bus device chip select
13	VCC	PWR	Module Supply Voltage Must be connected to same voltage as pin7
14	ENABLE	Input	Drive high (VCC) to enable radio voltage regulator (exit power-down)

SMT Footprint



Agency Compliance

Any device using this module must comply with Federal Communications Commission (FCC) requirements for FCC ID marking and include the product manual statement below. Changes and Modifications not expressly approved by Realtime Technologies Ltd. can void your authority to operate this equipment FCC Rules. Co-location with additional radios or RF sources may void your authority to operate this equipment under FCC Rules and/or require additional end-device testing.

FCC ID marking

If the FCC-ID etched on the device is not visible, the exterior of the device must include the following text:

Contains FCC ID: X2W-SR7-1

The FCC ID marking label is to remain affixed at all times to comply with FCC requirements for Modular approval. The product manual should comply with FCC requirement s including publication of the FCC Part 15 Class B Manual Statement for RADIO AND TELEVISION INTERFERENCE:

FCC Part 15 Class B Manual Statement

The following statement should be conspicuously located in bold letters in the instruction manual:

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes and Modifications not expressly approved by Realtime Technologies Ltd, can void your authority to operate this equipment under FCC Rules.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

ICES-003 Label

This Class (*) digital apparatus complies with Canadian ICES-003
Cet appareil numérique de la classe (*) est conforme à la norme
NMB-003 du Canada

(*) Insert either "A" or "B" but not both as appropriate for the equipment requirements

Legal Notices and Disclaimers

Disclaimers

REALTIME TECHNOLOGIES LTD. MAKE NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. REALTIME TECHNOLOGIES LTD. ASSUME NO RESPONSIBILITY FOR ANY ERRORS THAT MAY APPEAR IN THIS DOCUMENT. REALTIME TECHNOLOGIES LTD. MAKES NO COMMITMENT TO UPDATE NOR TO KEEP CURRENT THE INFORMATION CONTAINED IN THIS DOCUMENT.

THIS SPECIFICATION IS COPYRIGHTED BY AND SHALL REMAIN THE PROPERTY OF REALTIME TECHNOLOGIES LTD. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED HEREIN.

REALTIME TECHNOLOGIES LTD. DISCLAIM ALL LIABILITY, INCLUDING LIABILITY FOR INFRINGEMENT OF ANY PROPRIETARY RIGHTS, RELATING TO USE OF THE MATERIALS AND IMPLEMENTATION OF INFORMATION IN THIS SPECIFICATION. REALTIME TECHNOLOGIES LTD. DO NOT WARRANT OR REPRESENT THAT SUCH USE OR IMPLEMENTATIONS WILL NOT INFRINGE SUCH RIGHTS.

REALTIME TECHNOLOGIES LTD. RETAINS THE RIGHT TO MAKE CHANGES TO THESE SPECIFICATIONS AT ANY TIME, WITHOUT NOTICE.

The SHIMMER logo is a registered trademark of Realtime Technologies Ltd.



Other brands, marks and names mentioned herein may be the property of their respective owners and used in accordance with published guidelines.

© REALTIME TECHNOLOGIES LTD. 2010, All Rights Reserved