

## CC2530 RADIO MODULE

The CC 2530 RADIO MODULE is a high-performance, FCC & IC certified and ETSI compliant radio module that incorporates the Texas Instruments CC2530.

The CC2530 is a true system-on-chip (SoC) solution for IEEE 802.15.4, Zigbee and RF4CE applications. It enables robust network nodes to be built with very low total bill-of-material costs. The CC2530 combines the excellent performance of a leading RF transceiver with an industry-standard enhanced 8051 MCU, in-system programmable flash memory, 8-KB RAM, and many other powerful features. The CC2530 comes in four different flash versions: CC2530F32/64/128/256, with 32/64/128/256 KB of flash memory, respectively. The CC2530 has various operating modes, making it highly suited for systems where ultralow power consumption is required.

FCC ID: 2AZ89C2530

USER MANUAL

# Features & Applications

## General:

Minimal RF engineering experience necessary  
Minimal ZigBee® experience necessary  
Easy to program and implement, short design cycle  
No additional “Intentional Radiator” certification required (FCC CFR 47 Part 15, IC RSS-210)  
Minimal real estate required  
Easily implemented on a two layer PCB  
No additional harmonic filtering required  
100% RF-tested in production  
Common footprint for similar products in family  
No additional DC decoupling required  
Includes IEEE 802.15.4 MAC Timer  
CSMA/CA hardware support  
Accurate Digital RSSI/LQI support  
Battery monitor and temperature sensor  
AES Security co processor

## Applicatons

Consumer electronics  
Mobile phone accessories  
Sports & Fitness equipment  
HID applications  
Home and Building Automation, Lighting  
Control, Alarm and Security  
Electronic Shelf Labeling, Proximity  
Tags  
And many more...

# Electrical Characteristics

## ITEM TEST REQUIREMENT REMARKS

Excellent receiver sensitivity and robustness to interference (-95dBm average)

Wide input voltage range (2.2V – 3.6V)

100% RF tested in production

Module weight approximately 0.7 grams

Current Consumption: (TC = 25°C, VDD = 3.0V)

Active mode RX (CPU Idle): 28 mA

Active mode TX (CPU Idle): 68 mA @1dBm,

78mA @8dBm

130mA @ 15dBm

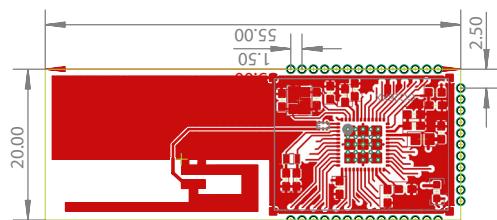
3 Low power/sleep modes from 1uA to 200 uA

## RECOMMENDED OPERATING CONDITIONS

Operating temperature -40 to +85 °C

## CAUTION:

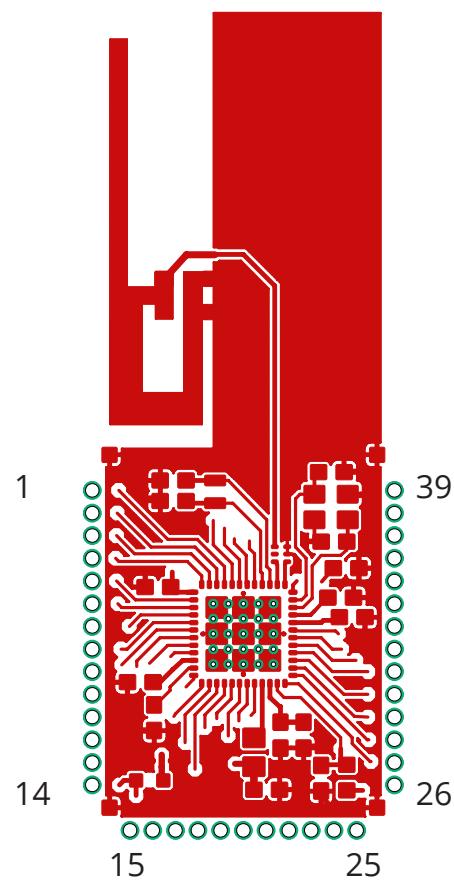
ESD sensitive device. Precautions should be used when handling the device in order to prevent permanent damage.



# Pin assignment

PIN NAME	PIN	PIN TYPE
VDD	14,15	
GND	1, 2, 3, 4, 5, 12, 13, 16, ,17, 18, 24, 25, 35, 36, 37, 38, 39	
P0_0	34	Digital I/O
P0_1	33	Digital I/O
P0_2	32	Digital I/O
P0_3	31	Digital I/O
P0_4	30	Digital I/O
P0_5	29	Digital I/O
P0_6	28	Digital I/O
P0_7	27	Digital I/O
P1_0	26	Digital I/O
P1_1	23	Digital I/O
P1_2	22	Digital I/O
P1_3	21	Digital I/O
P1_4	20	Digital I/O
P1_5	19	Digital I/O
P1_6	11	Digital I/O
P1_7	10	Digital I/O
P2_0	9	Digital I/O
P2_1	8	Digital I/O
P2_2	7	Digital I/O
RESET_N	6	Digital input

Pin counting starts top left.



# FCC regulatory compliance statement

## §15.19 Statement

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.

## §15.21 Information to user

Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### List of applicable FCC rules:

47 CFR Part 15, Subpart C 15.203  
47 CFR Part 15, Subpart C 15.205  
47 CFR Part 15, Subpart C 15.207  
47 CFR Part 15, Subpart C 15.209  
47 CFR Part 15, Subpart C 15.247  
47 CFR Part 2 2.1091

### Summarize the specific operational use conditions

This module can be used in IOT devices, the input voltage to the module is nominally 5V. Only the embedded integral antenna is allowed. Any other external antenna is prohibited.

### Limited module procedures

This module is not a limited module.

### Trace antenna designs

The antenna is not a trace antenna.

### RF exposure considerations

This Module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### Antennas

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

# FCC regulatory compliance statement

## Label and compliance information

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2AZ89C2530\_ " any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.

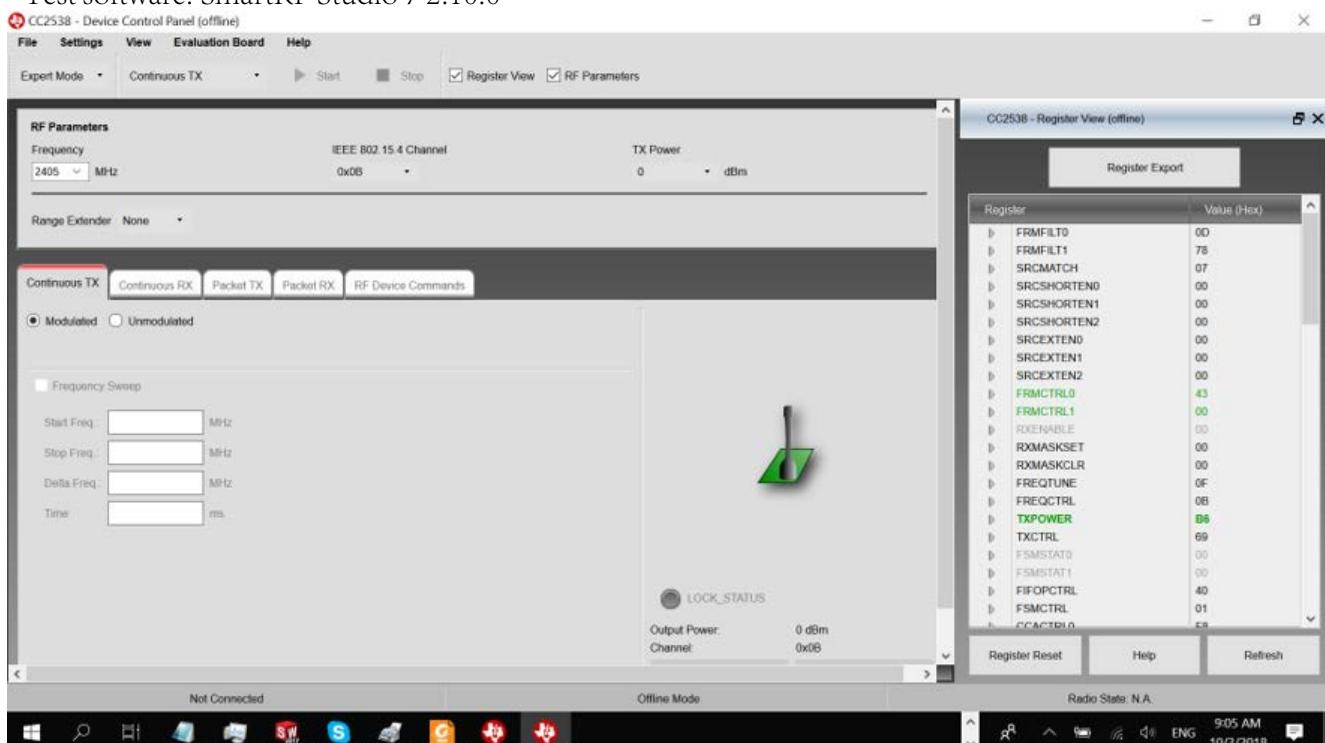
Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.

## Information on test modes and additional testing requirements

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1093 and difference antenna configurations.

Test software: SmartRF Studio 7 2.10.0



## Additional testing, Part 15 Subpart B disclaimer

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in §15.105 Information to the user or such similar statement and place it in a prominent location in the text of host product manual. Original texts as following:

# Sample Operation Description Sample Operation Description

## For Class B

Note: 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 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.

The 32MHz Hz crystal oscillator drives the base of Q1.

The modulation provided by IC FA128-32F20X-K3128. The output of has the matching network consisting of balun 2450BM14G0011 that limit the harmonic content and effect the proper coupling of the antenna to the output stage.

## Antenna, Ground and Power Source

The antenna consists of a 2.4GHz Meander line SWRU120C antenna.

Antenna gain: 1.1 to 3.3 dBi.

There is no external ground connection. The ground is only that of the printed circuit board.

Electric current is supplied by Input VCC;  
Output: 3.3 Vd.c..

## Operation Descriptions

The transmitter is a Portable Wireless Music System operating at 2400-2483.5MHz band. The transmitter is powered by 3.3 Vd.c and the transmitting frequency is crystal controlled. The operation is achieved by different combinations of form pulse modulating signal on the 2400MHz carrier frequency.

When the NTAG is positioned in the RF field, the high speed RF communication interface allows the transmission of the data and enable the wireless pairing