

# CC2530EM Datasheet V1.30

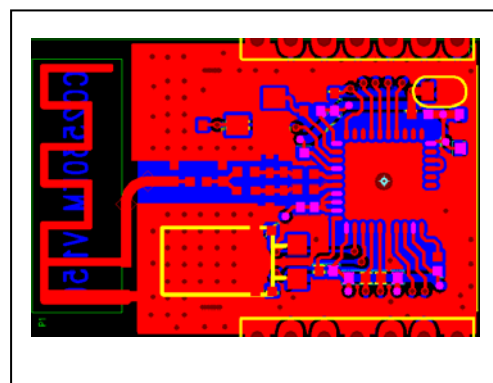
## • General Description

The CC2530EM RF Module is a low-power, highly integrated 2.4-GHz transceiver that suitable for systems targeting compliance with worldwide radio-frequency. It's a true system-on-chip solution for 2.4-GHz IEEE802.15.4, ZigBee and RF4CE applications.

## • Key Features

### Radio

- 2.4-GHz IEEE802.15.4 compliant RF transceiver
- Excellent receiver sensitivity and robustness to Interference, receiver sensitivity reach to -97dBm
- Programmable output power up to 4.5dBm
- Suitable for systems targeting compliance with worldwide radio-frequency
- Accurate digital RSSI/LQI support
- data rate: 250kBank
- modulation: O-QPSK



### 8051 MCU

- Powerful five-channel DMA
- 128KB in-system programmable flash, customization 32-,64-,256KB
- 8KB RAM with retention in all power modes
- CSMA/CA hardware support
- AES security coprocessor
- Battery monitor and temperature sensor
- 12-Bit ADC with eight channels and configurable resolution
- Two powerful USARTs with support for several serial protocols
- IEEE 802.15.4 MAC timer, general-purpose timers (One 16-Bit, Two 8-Bit)
- 32-kHz sleep timer with capture
- Watchdog timer
- 21 general-purpose I/O pins (19x 4 mA, 2x20 mA)
- Hardware debug support

## • Low Power

- Active-Mode RX (CPU Idle): 24 mA
- Active Mode TX at 1 dBm (CPU Idle): 29 mA
- Power Mode 1 (4 ms Wake-Up): 0.2 mA
- Power Mode 2 (Sleep Timer Running): 1 mA
- Power Mode 3 (External Interrupts): 0.4 mA
- Wide Supply-Voltage Range (2 V–3.6 V)

## • Applications

- 2.4-GHz IEEE 802.15.4 systems
- RF4CE remote control systems (64-KB flash and higher)
- ZigBee systems (256-KB flash)
- Home/Building automation
- Lighting systems
- Industrial control and monitoring
- Low-Power wireless sensor networks
- Consumer electronics
- Health care
- Industrial control

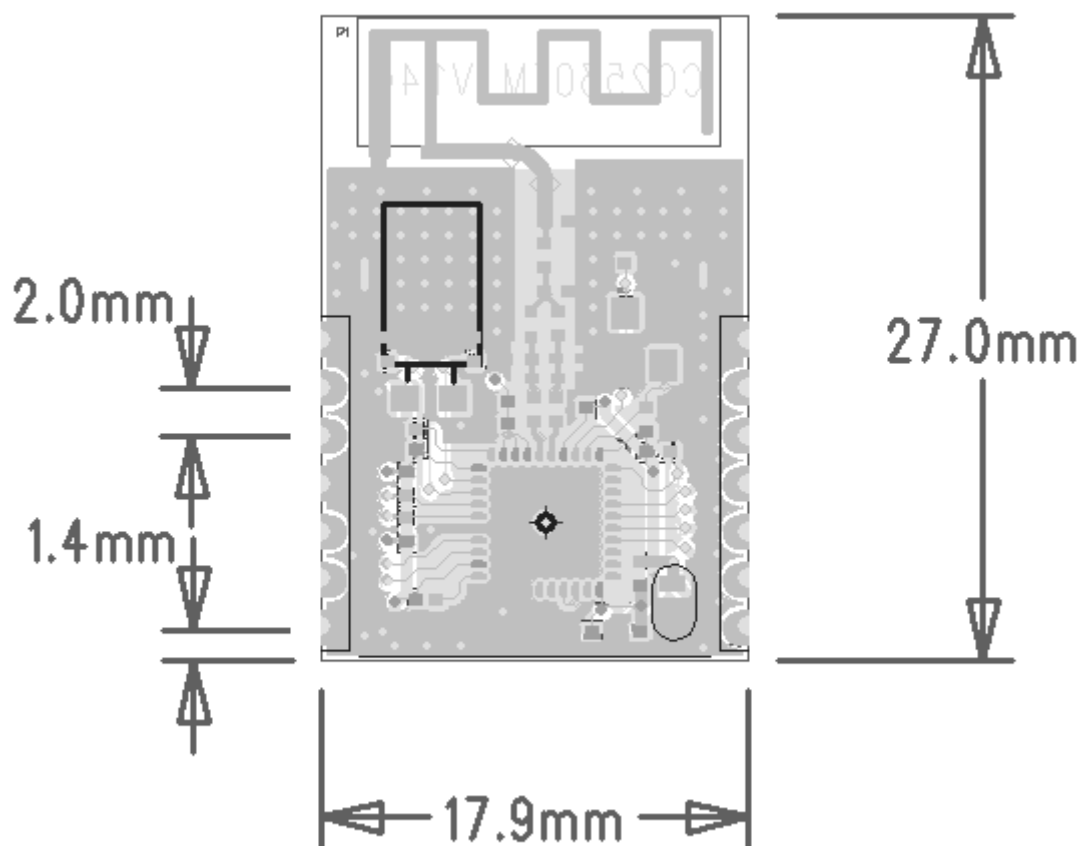
## • Electrical Characteristics

T<sub>a</sub> = 25°C, VCC = 3.0V

Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacture.

TEST ITEM	TEST CRITERIA & REQUIREMENT	REMARKS
Voltage supply	2.0–3.6V	DC
Center frequency	2394–2507MHz	Programmable
Frequency error	±40ppm	
Modulation	O-QPSK	
Output power	≤4.5dBm	Programmable
Receiving sensitivity	-97dBm	
Receiving current	24mA	
Transmitting current	29mA	Po=1dBm
Sleep consumption	0.4mA	Power Mode 1
Data rate	250kBand	typical
Transmit distance	200m	At open area
Antenna	50ohm	
Store temperature	-40–125°C	
Operating temperature	-40–125 °C	
Package size	26.0*36.0mm	

## Package Description

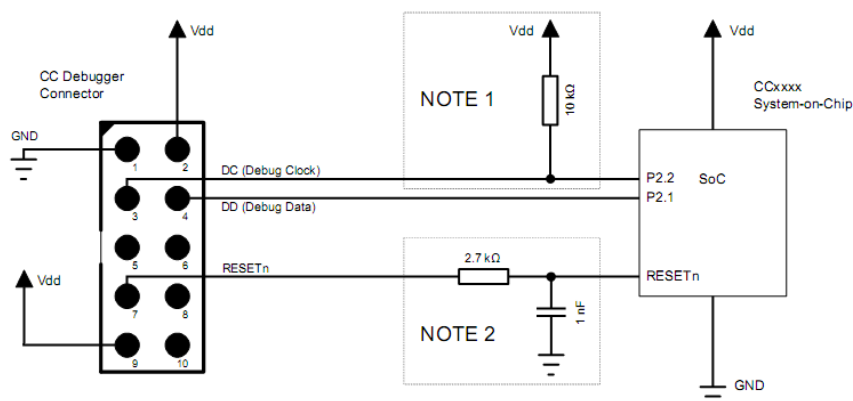


The table below shows the pin-out from the CC2530 to the two connectors on the backside of the evaluation module.

Pin	Name	Description	Pin	Name	Description
7	GND	Connect to GND	14	GND	Connect to GND
6	DC	Debug Clock,P2.2	13	RESETN	Soc reset pin,
5	DD	Debug Data,P2.1	12	UART0_RX	UART0 RXDATA,P0.2
4	GND	Connect to GND	11	UART0_TX	UART0 TXDATA,P0.3
3	UART1_RX	UART1 RXDATA,P1.7	10	UART0_CT	UART0 CTS,P0.4
2	UART1_TX	UART1 TXDATA,P1.6	9	UART0_RT	UART0 RTS,P0.5
1	GND	Connect to GND	8	VCC_3.3V	power-supply *

\* 2-V–3.6-V digital power-supply connection

## • Debugger and programmer connect



See the CC Debugger Quick Start Guide.

## • Development Tools

- TI CC2530 Development Kit
- TI CC2530 ZigBee Development Kit
- TI CC2530 Remo TI™ Development Kit for RF4CE
- TI SmartRF™ Software
- TI Packet Sniffer
- IAR Embedded Workbench™ Available

## • Tools & Software Download

- Z-Stack:

<http://focus.ti.com.cn/cn/docs/toolsw/folders/print/z-stack.html>

- SmartRF Flash Programmer:

<http://focus.ti.com.cn/cn/docs/toolsw/folders/print/flash-programmer.html>

- SmartRF Protocol Packet Sniffer:

<http://focus.ti.com.cn/cn/docs/toolsw/folders/print/packet-sniffer.html>

- SmartRF Studio:

<http://focus.ti.com.cn/cn/docs/toolsw/folders/print/smartrftm-studio.html>

- CC2530-Software Examples

<http://focus.ti.com.cn/cn/lit/sw/swrc135b/swrc135b.zip>