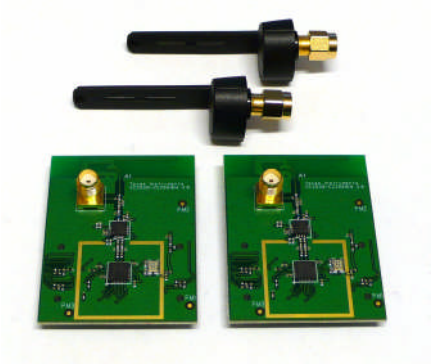
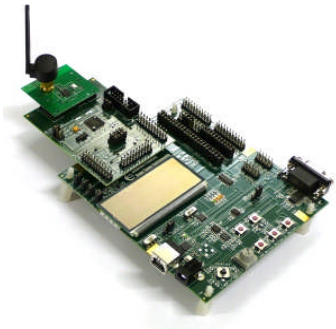
CC2520-CC2591EMK Quick Start Guide

1. Kit Contents



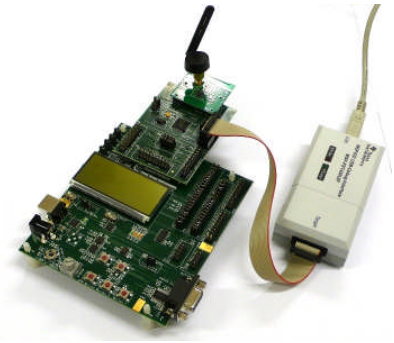
2 x CC2520-CC2591EM and antennas
Documentation

2. Plug EM into SmartRF05EB



The CC2520-CC2591EM can be plugged into the SmartRF05EB or the CCMSP-EM430F2618. Please refer to the CC2520DK User Guide for more information about these boards.

3. Download Software from web



In order to run a packet error rate (PER) test with the CC2520-CC2591, it is necessary to download updated software from the www.ti.com/cc2520dk web page. The CC2520 software examples include a hex file that can be programmed on the CCMSP-EM430F2618 board (no compilation required) with the MSP430 FET tool. Use our Flash Programmer (www.ti.com/lit/zip/swrc044) for this purpose.

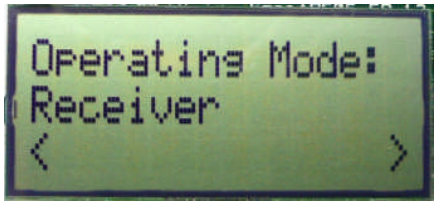
4. Packet Error Rate (PER) Test

When the board has been programmed with the PER test, the board should start up and the LCD will display the screen as shown in the picture above. The number in the parentheses is the revision of the CC2520. Press Button 1 to continue.

5. Select Channel

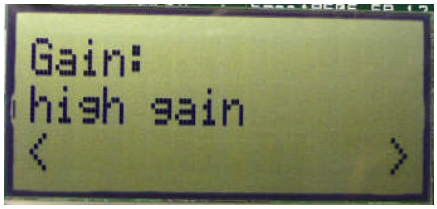
Select one of the 16 IEEE 802.15.4 channels, with channel number from 11 to 26 (2405-2480 MHz, 5 MHz channel spacing). The channel is selected by navigating the joystick to the right or left. Confirm the selection by pressing Button 1.

6. Set up the Receiver



Set one of the boards to operate as receiver. Use the joystick to select mode. Confirm the selection by pressing Button 1.

7. Select High/Low Gain

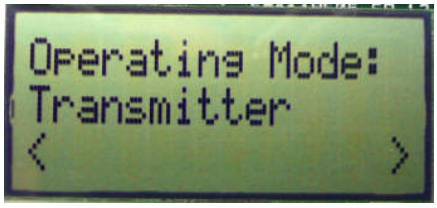


Select high gain mode or low gain mode of the LNA (low noise amplifier) on the CC2591 (see CC2591 datasheet for details). For best sensitivity, use high gain mode. Low gain mode may be used for close-in reception in order to avoid saturation of the receiver.

8. Ready to Receive

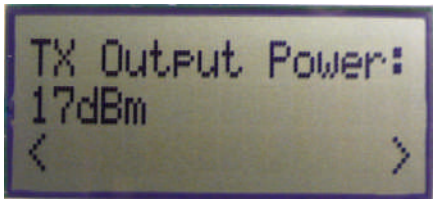
The receiver will now wait for packets from the transmitter.

9. Set up the Transmitter



Set the other board to operate as transmitter. Use the joystick to select mode. Confirm the selection by pressing Button 1.

10. Select Output Power



On the transmitter node, select the TX output power (signal strength). This adjusts the strength of the signal coming from the CC2520 to the CC2591. The displayed value is the amplified signal from the CC2591. Use the joystick to select between -1, 11, 14, 16 or 17 dBm. Confirm the selection with Button 1.

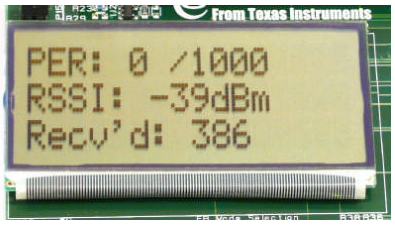
11. Select Number of Packets and Packet Rate

Select burst size (number of packets to send) by using the joystick, either 1000, 10K, 100K or 1M packets. Confirm the selection with Button 1. On the next menu step, select Packet Rate in the same way.

12. Start PER test

The PER test can now be started on the transmitter by pressing the joystick. The transmitter will display the number of packets sent, while the receiver will display the RSSI and PER values.

13. Observe PER and RSSI



The PER test receiver will display the PER value (number of lost and erroneous packets divided by the total number of packets sent, displayed as a fraction of 1000). It will also display a moving average RSSI value (received signal strength). The test can be reset by pressing Button 1.

14. SmartRF Studio

SmartRF® Studio supports the CC2520-CC2591. When the board is connected directly to the SmartRF05EB, it is possible to tick the CC2591 box in the "Range Extender" pane.

Studio will then configure some GPIO pins on the CC2520 to control the command signals of the CC2591.

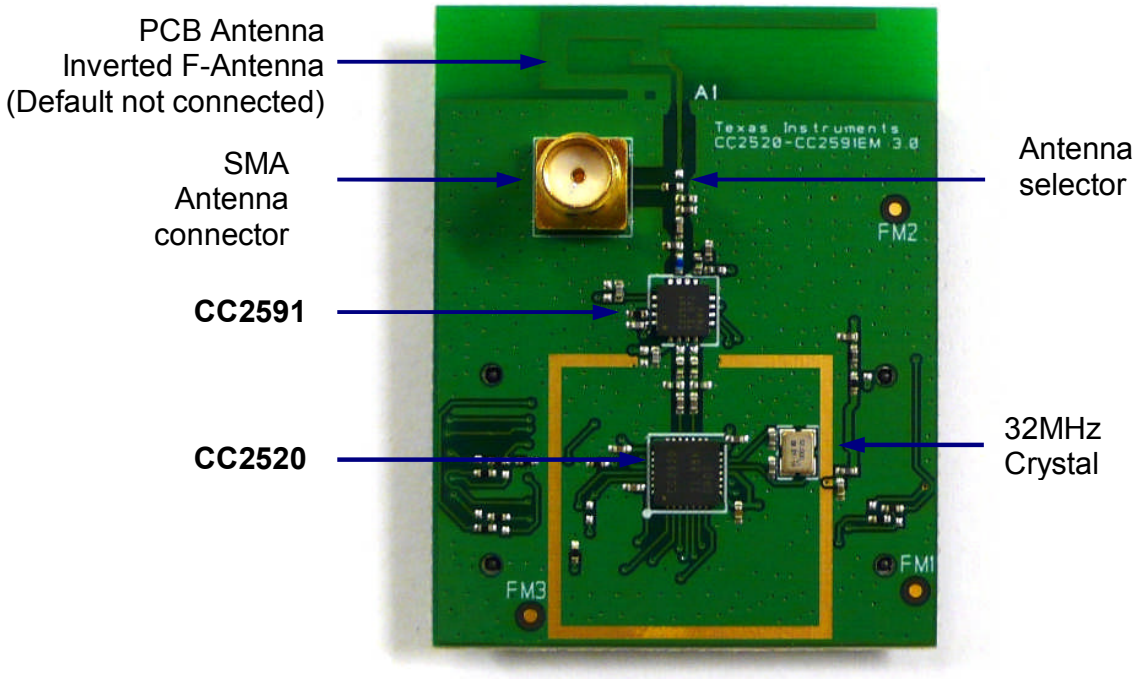
15. More Information

For more information about the CC2591, please visit the product web page on www.ti.com/cc2591.

Kit and Software
The source code for the PER tester and EM reference design can be downloaded from the CC2520-CC2591EMK web page. The latest version of SmartRF® Studio can be downloaded from www.ti.com/smartrfstudio

You can also download the latest IEEE 802.15.4 MAC or the TI ZigBee stack (Z-Stack) from the web.

We hope you will enjoy working with the CC2591 and associated Low-Power RF products from Texas Instruments.



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