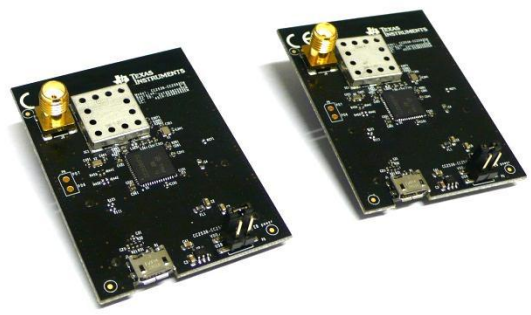
CC2538-CC2592 Evaluation Module Kit Quick Start Guide

Opening the Box and Running the Packet Error Rate Test

1. Kit Contents



2 x CC2538-CC2592 Evaluation Modules

The RF boards in this kit are FCC and IC certified and tested/comply with ETSI/R&TTE over temperature from 0 to 35°C.

FCC/IC Regulatory Compliance
FCC Part 15 Class A Compliant
IC ICES-003 Class A Compliant

2. How to use the Modules

The EMK is an add-on kit to supplement the CC2538DK with evaluation boards.

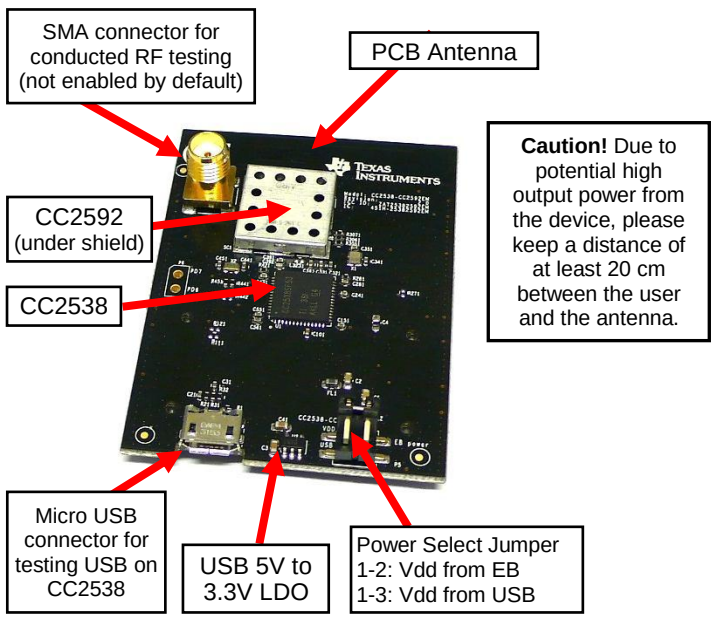
The CC2538-CC2592EM boards can be plugged into the SmartRF06 Evaluation Board from Texas Instruments. This board is included in the CC2538DK and in the SmartRF06EBK.

This board lets you run a packet error rate (PER) test, control the device from SmartRF™ Studio and it can be used as a development platform.

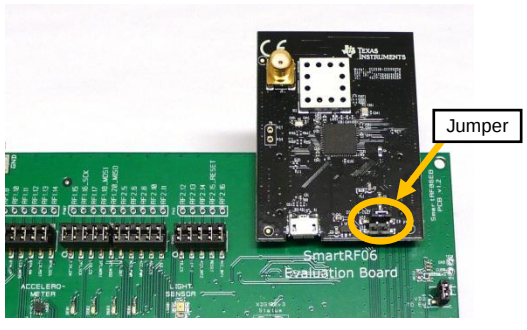
It is also possible to connect the EM to other TI development boards with the appropriate connectors

This guide will show how to use the modules together with SmartRF06EB.

3. CC2538-CC2592EM Overview



4. Plug the EM into the 06EB



Insert a CC2538-CC2592EM board into the SmartRF06EB as shown above.

Note! On the CC2538-CC2592EM, make sure you connect a jumper on the upper row on the 4-pin header.

Caution! The kit contains ESD sensitive components. Handle with care to prevent permanent damage.

5. Power Options

The CC2538-CC2592EM should be powered through the SmartRF06EB, which will supply a voltage from 2.1V to 3.6V to the daughter card. The SmartRF06EB can be powered in several different ways:

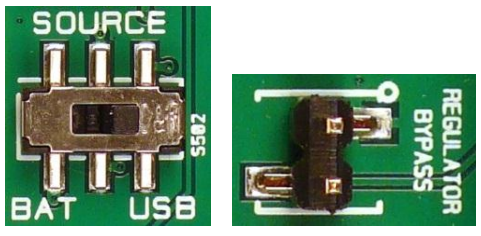
- USB (5V through USB plug)
- 2 x 1.5V AAA alkaline batteries
- External power supply (see below)

Voltage regulators on the SmartRF06EB will set the on-board voltage to 2.1V or 3.3V.

External Regulated Power Supply[1] Requirements:
Nom Voltage: 2.1 to 3.3 VDC. MAX 3.6 VDC.
Max Current: 1000 mA
Efficiency Level V

Warning! To minimize risk of injury or property damage, never use rechargeable batteries to power the board.

6. Select Power Source

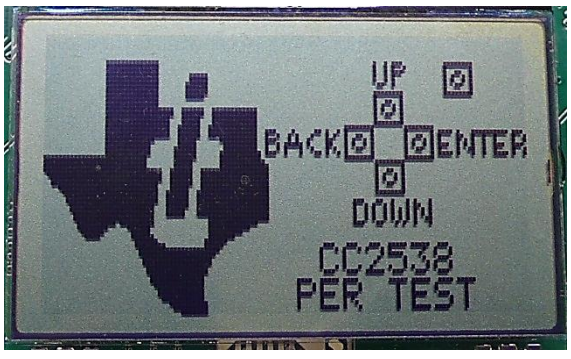


The power source is selected using the Source switch on the left hand side of the SmartRF06EB.

In “USB” position, the EM is powered over USB, running at 3.3V. In “BAT” position, the board is powered from batteries or an external source, running at 2.1V. The 2.1V regulator can be bypassed by shorting the pins on the “regulator bypass” jumper. In this case, the EM is powered directly from the external source or batteries.

Note that there should only be one active power source at any one time. Do not leave the EVM powered when unattended.

7. Welcome Screen

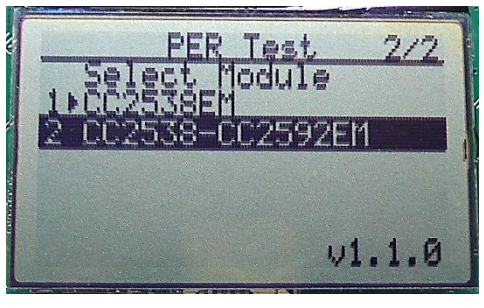


Turn on power with the Main Power switch. You should now see the Texas Instruments logo and a short description of the buttons on the LCD. Pushing any of the five buttons on the board will take you to the main menu.

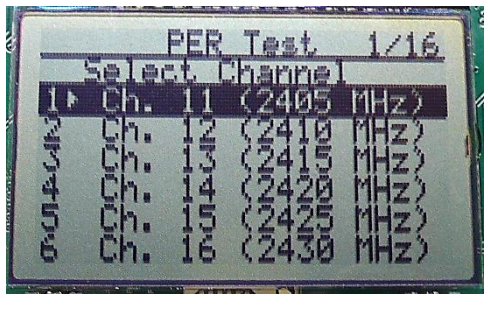
NB! If you don’t see anything on the screen make sure the board is correctly powered (see step 5 and 6 above).

8. Select Board and Channel

Start by selecting the plug-in board you have, either the CC2538EM or the combo board CC2538-CC2591EM.

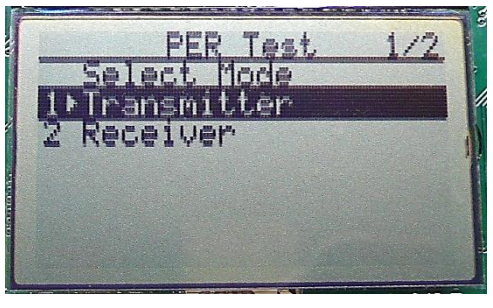


Then select which channel (frequency) to use.

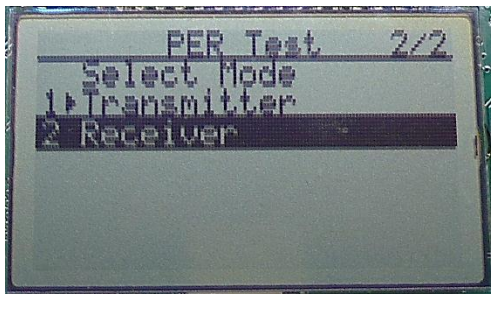


9. Select Mode

One of the boards must operate as a transmitter and the other as a receiver. Select transmitter on one board …



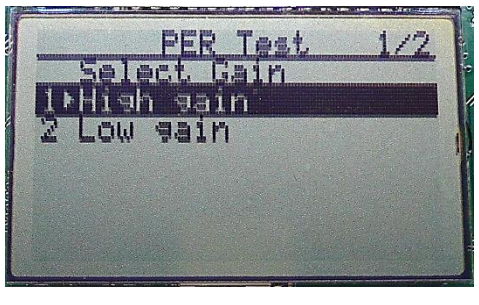
… and receiver on the other board.



[1] When using an external power supply, make sure it meets the listed requirements in addition to complying with applicable regional product regulatory and safety certification requirements such as UL, CSA, VDE, CCC, and PSE.

10. Select RX Gain Mode

On the receiver, select either high gain or low gain mode for the CC2592.

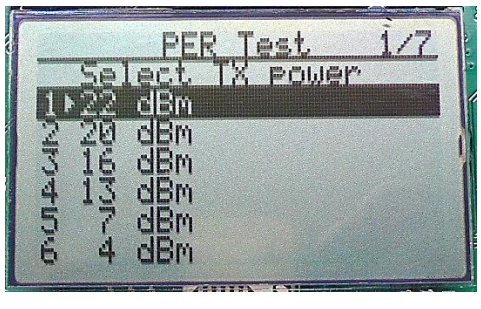


The receiver is now ready to receive packets.

Continue with the configuration of the transmitter.

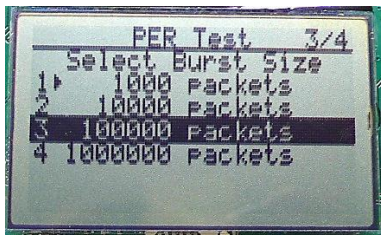
11. Select TX Power

On the transmitter, select desired output power.

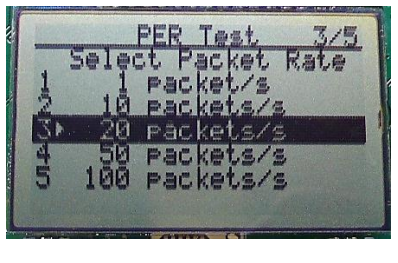


12. Select Packet Rate

Still on the transmitter, select the desired burst size, that is, the number of packets to transmit.



Then select the packet rate.

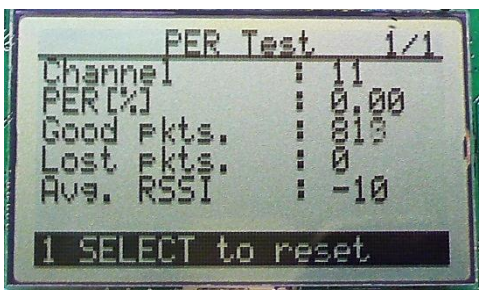


13. Start Sending Packets

The transmitter is now configured and in idle state. Sending packets is started and stopped by pressing the Select button.

14. PER Test Results

On the receiver, the statistics window will show the error rate based on the number of lost or erroneous packets divided by the total number of packets that should have been received.



15. References

Please visit www.ti.com and

http://www.ti.com/tool/cc2538-cc2592emk
http://www.ti.com/tool/cc2538dk

The reference design for the evaluation board can be found here:

http://www.ti.com/tool/cc2538-cc2592em-rd

On the kit product page, you will find additional documentation, links to updated software examples and software tools like SmartRF Studio.

You will also find a lot of information on the TI E2E forum at http://e2e.ti.com

We hope that you will enjoy working with the CC2592 and CC2538 devices.

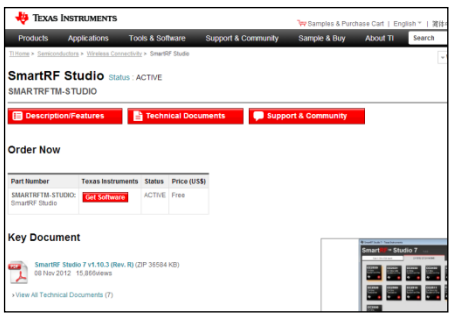
16. Troubleshooting

It you are experiencing problems with this test, please check the following:

- Nothing is shown in the display! Make sure the board is powered correctly (see steps 5 and 6 above).
- Please visit the kit web page and check for updated SW and documentation. Updated SW can be downloaded to the device using IAR Embedded Workbench for ARM or SmartRF Flash Programmer 2.

SmartRF™ Studio

1. Download and Install



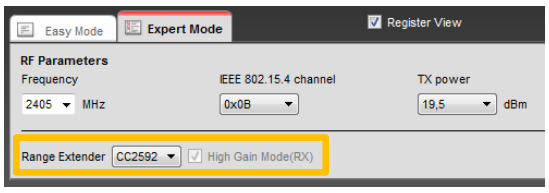
Before connecting SmartRF06EB to your PC, download and install SmartRF Studio from www.ti.com/smartrfstudio.

2. Launch SmartRF Studio

After installing the tool, connect the EB to the PC using the USB cable and start SmartRF Studio. Select the “2.4 GHz” tab and click the refresh ("Find device") button in the lower right corner. Studio will now find the connected SmartRF06EB. Double click on the detected SmartRF06EB to launch the CC2538 device control panel.

3. Test the Radio

In the device control panel for CC2538, select the range extender CC2592.



You can now configure the radio, run performance tests, export register settings and run link tests with another CC2538 on a SmartRF06EB connected to the PC.

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