Chipcon Products from Texas Instruments

CC1110DK Quick Start Instructions   **Revision 2.0, 2007-08-23**

RF/Packet Error Rate Test

1. Kit Contents
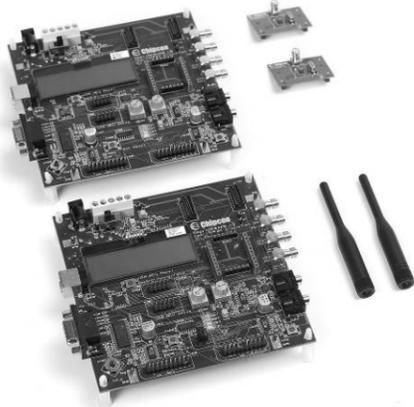
- 2 SmartRF04EB
- 2 CC1110EM
- 2 antennas
- 2 USB cables

2. EB overview

EM connectors

LCD screen

Joystick   Button S1
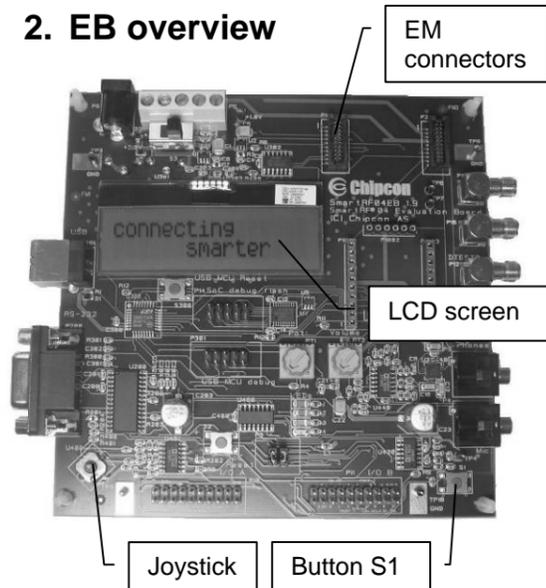
3. Plug EM into EB

Insert a CC1110EM into both SmartRF04EBs. The connectors will only fit in one position, so that the EM cannot be inserted the wrong way. Do not force the EM.

4a. Battery power


There are three different ways of applying power to the EB:

The first method involves using a battery, either a 9V or a 4xAA battery pack connected to the battery connector on the bottom side of the board

4b. DC power
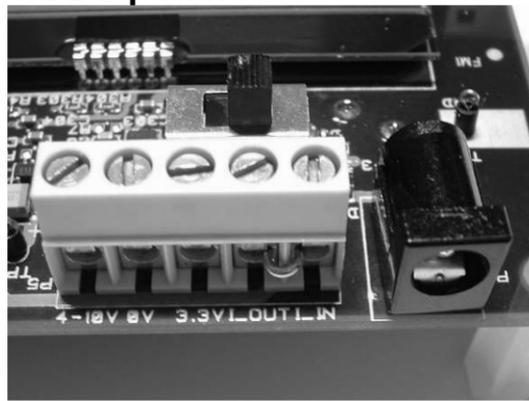
The second method applies DC power using the DC input jack (right in picture, centre is +, sleeve is ground), or by connecting a 4-10V voltage source between the 4-10V and 0V terminals of the power connector (left in picture). It is also possible to connect a 3.3V voltage source between the 3.3V and 0V terminals. The on-board voltage regulators will be bypassed in this case.

4c. USB power
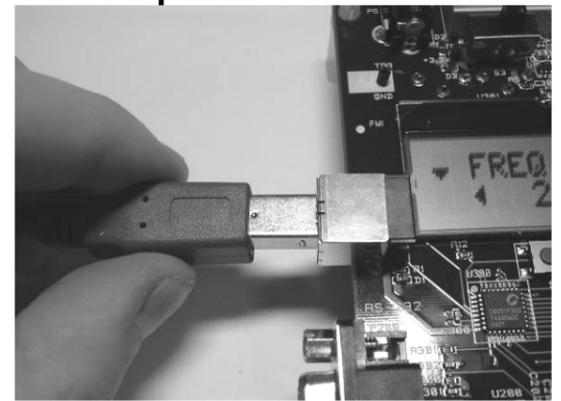
The EB can also be powered from the USB bus. Make sure that the SmartRF® Studio software is installed before connecting the EB to the PC, otherwise you may experience problems in installing it later due to driver issues.

Note that if multiple power sources are connected, the source with the highest voltage will power the EB. This means that you should disconnect any attached battery when using a lab supply or USB power, otherwise the battery will be drained.

5. Set power switch
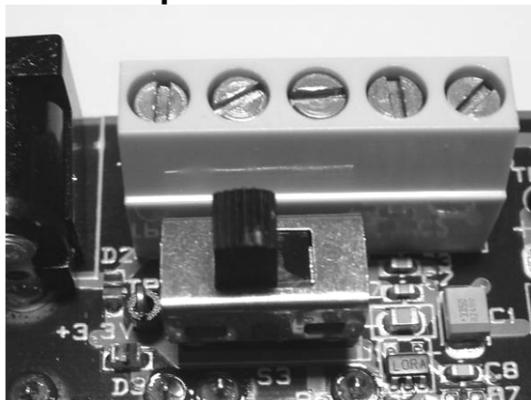
If a 3.3V source is used as described in 4b above, the switch should be set to the leftmost position. For all other cases, the switch should be set to the rightmost position. This switch can be used to turn off the EB by switching it to the opposite position of that used to turn it on.

6. Packet error rate test

When power is applied to the board, the test program will start. You should see the Chipcon logo shown above on the LCD display on both EBs. Pushing button S1 in the lower right corner of the board will show the first menu item.

7. Select Frequency

Select frequency according to the type of EM module in use (315 MHz, 433 MHz, 868 or 915 MHz). Move the joystick up or down to display the choices and push button S1 in the lower right corner of the board to select the displayed frequency.

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8. EB 1: Select Receiver
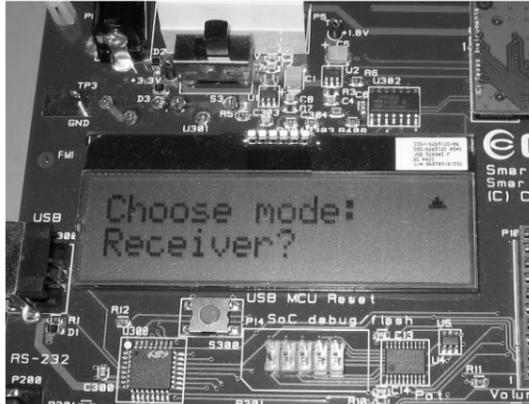

Select Receiver on the first EB by moving the joystick. Confirm by pressing button S1. The Receiving node will display "Ready to receive".

## 9. EB 2: Select Transmitter
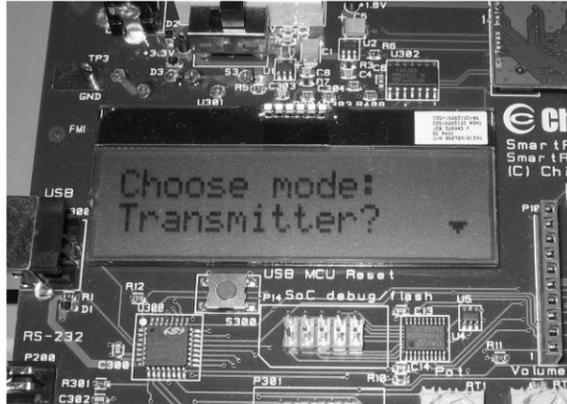
Select Transmitter on the other EB by moving the joystick. Confirm by pressing button S1.

10. EB 2: Number of packets
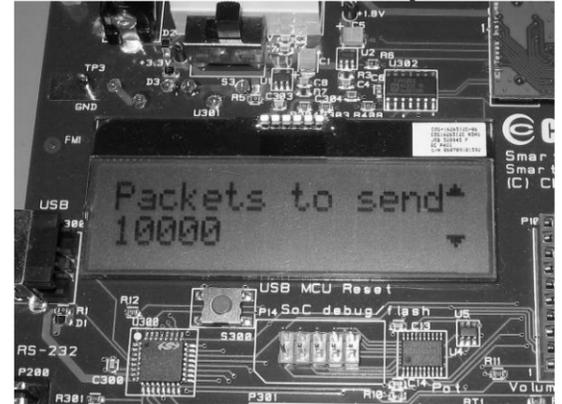
On the transmitter EB, select the number of packets to send. More packets takes longer but gives a better statistical result. Confirm by pressing button S1.

11. PER Test (Transmitter)
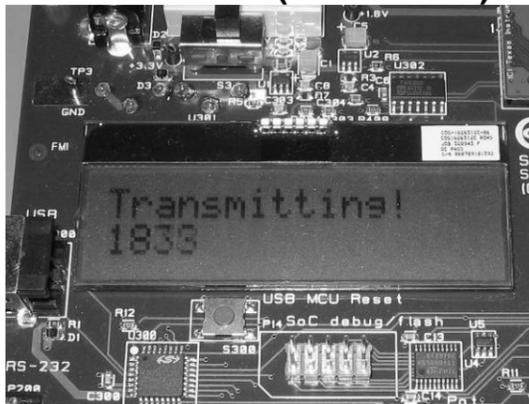
The transmitter will show "Transmitting!" and a running counter that shows the number of packets.

12. PER Test (Receiver)
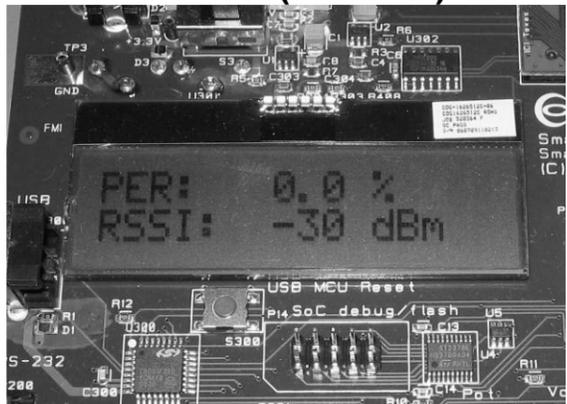
The receiver will show the total accumulated packet error rate together with the average signal strength (RSSI) of the previous 50 received packets.

13. Per Test results
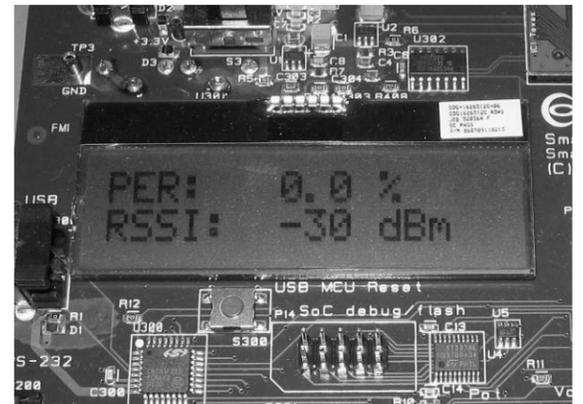
When the PER test is completed, the result will be displayed on the receiver until a new test is started. A new test can be started from the transmitter.

14. Documentation

Please visit www.ti.com to download the CC1110DK User Manual, the SmartRF®Studio software, examples, as well as relevant datasheets and application notes.

If you for some reason cannot access the TI web site and download the files, please contact your local TI representative for assistance.

15. Troubleshooting/Notice

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

- Please visit www.ti.com and enter CC1110DK in the part number search box. Check for updated SW and documentation. Updated SW can be downloaded to the device using IAR or the Flash Programmer application.
- If results are strange at short distances, try to move the transmitter and receiver further apart. The CC1110 may experience saturation when transmitting at full output power if the units are to close.
- See "DN300 -- SmartRF04EB Troubleshooting" for general troubleshooting of your EB board.

SmartRF® Studio

1. Download
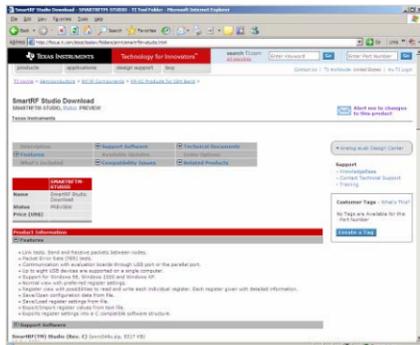
Before connecting the EB to your PC, download SmartRF® Studio from www.ti.com. To find it, type "SmartRF Studio" in the keyword search field and click Go. Install the program.

2. Plug in EB
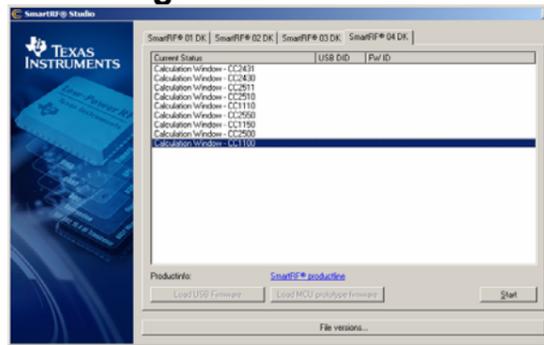
After the install program finishes, connect the EB to the PC using the USB cable. Run SmartRF® Studio. Select the SmartRF®04 tab. Select the CC1110 board, and click the Run button.

3. Configure
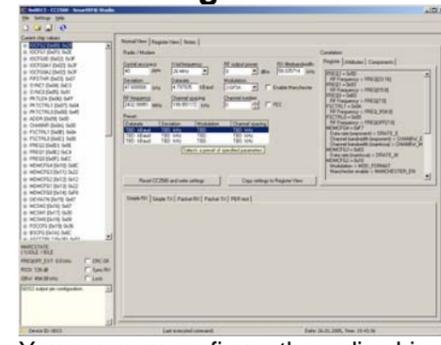
You can now configure the radio chip, run tests or communicate with another EB.

Address information

Web sites: http://www.ti.com/lpw

TI Worldwide Support: http://www-k.ext.ti.com/sc/technical-support/product-information-centers.htm

Technical Support Email: support@ti.com

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IMPORTANT NOTICE