CC2590
Evaluation Module Kit

Quick Start Guide

1 Introduction

Thank you for purchasing a CC2590 Evaluation Module Kit. CC2591 is a cost-effective and high performance RF Front End for low-power and low-voltage 2.4-GHz wireless applications. It increases the link budget by providing a power amplifier (PA) for increased output power, and an LNA with low noise figure for improved receiver sensitivity.

2 Using the CC2590EM

The CC2590 standalone EM can be used as a simple add-on to your existing system to improve output power and sensitivity. Use a 50 Ohm coaxial cable with SMA connectors to connect the RF signal from the radio to the CC2590EM connector P4 (top side of EM). Connect the antenna to connector P3 (bottom side of EM). See the picture below to locate the connectors.

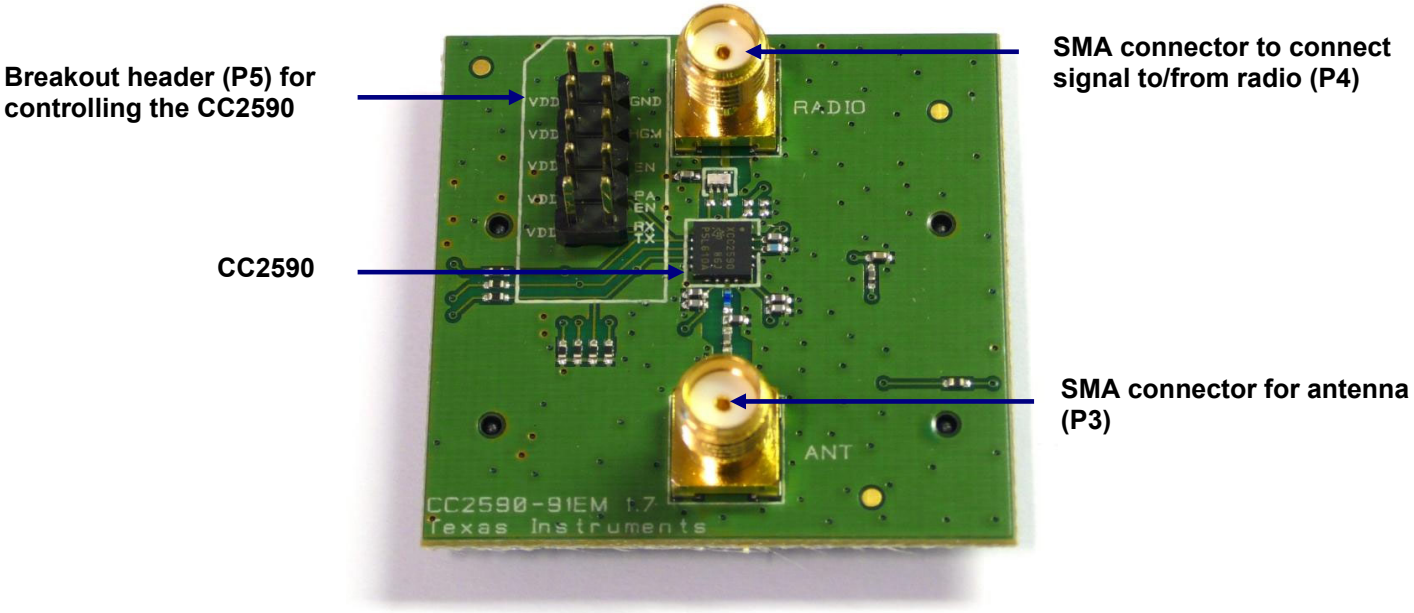


Figure 1 - CC2590EM

The picture below shows one possible set up where the output of a radio is connected to the radio input of the CC2590. Note that since there are no discrete control lines between the radio node and CC2590 in the example below, control of the LNA and PA enable signals has to be done manually by placing jumpers on header P5. Connect control signals from your microcontroller to P5 for automatic control for the device.

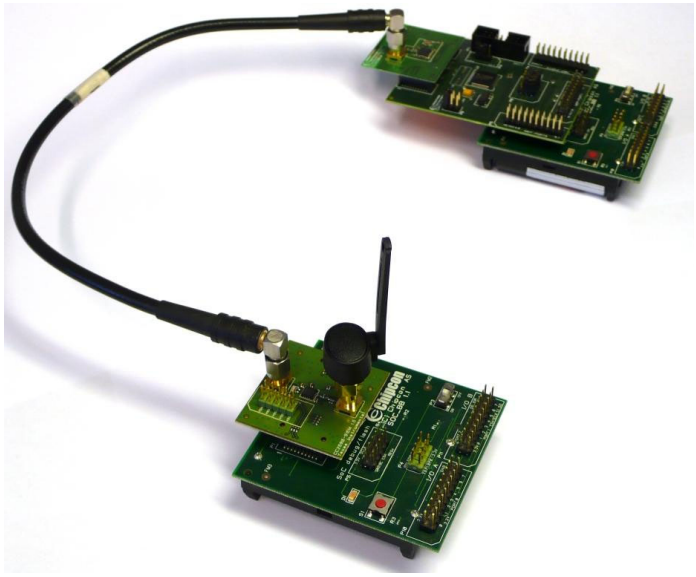
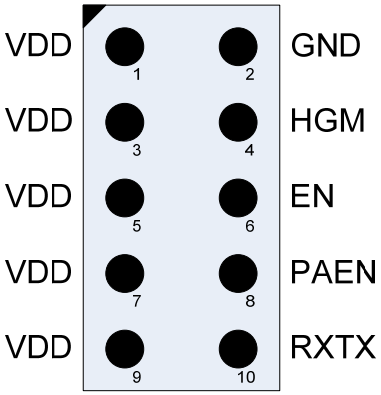


Figure 2 - Possible set up of CC2590 + radio (no control signals)

In order to test the performance of the CC2590 PA, it is possible to connect a signal generator to P4 (radio side) and a spectrum analyzer to P3 (antenna side). To test the LNA, reverse the connections.

The CC2590EM contains a 2x5 pin row header (P5). This can be used both to power and control the CC2590. Controlling the modes of the CC2590 can be done manually by using jumpers on the board, or by using an external controller to set the appropriate signal levels on the pins on P5.



Pin	Signal
1	VDD (used for power connection)
2	GND (used for power connection)
3	VDD (used for pull-up jumper)
4	HGM
5	VDD (used for pull-up jumper)
6	EN
7	VDD (used for pull-up jumper)
8	PAEN
9	VDD (used for pull-up jumper)
10	RXTX

The four control signals have pull-down resistors, giving a default value of 0. To force any of the signals to 1, connect a jumper between pins 3-4, 5-6, 7-8 or 9-10. **Do not connect a jumper between pins 1-2, as this will short-circuit the device!**

See the CC2590 datasheet for detailed description on the usage of the four control signals.

3 CC2590EM socket connectors

The sockets P1 and P2 can also be used to power and control the device, as seen in the schematic drawing. The EM can be connected to a SoC Battery Board, a SmartRF04EB or a SmartRF05EB to power the device. Note that the EM cannot be controlled directly from SmartRF Studio.

The CC2590 control signals are routed to the EM connector according to the table below

Signal	EM Connector
VDD	P2.7, P2.9
GND	P1.1, P1.19
HGM	P1.9
EN	P1.7
PAEN	P1.3
RXTX	P2.18

Note that P2.18, P1.3, P1.7 and P1.9 are sharing the UART signals on both SmartRF04EB and SmartRF05EB. On SmartRF05EB, please disconnect the jumpers in position 5-6 and 7-8 on header P1. It is also recommended to disable the UART level converter (P10 in position 1-2). On SmartRF04EB, try removing the appropriate 0-Ohm resistors if the EM does not operate as expected. Please refer to the SmartRF04EB Schematics for details.

4 Document history

Revision	Date	Description/Changes
-	2008-09-08	First revision

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		**Applications**	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Clocks and Timers	www.ti.com/clocks	Digital Control	www.ti.com/digitalcontrol
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
RFID	www.ti-rfid.com	Telephony	www.ti.com/telephony
RF/IF and ZigBee® Solutions	www.ti.com/lprf	Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated