CC2595 EVM User's Guide

This document outlines the basic steps and functions that are required to ensure the proper operation and quick setup of the CC2595 EVM.

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1 Contents

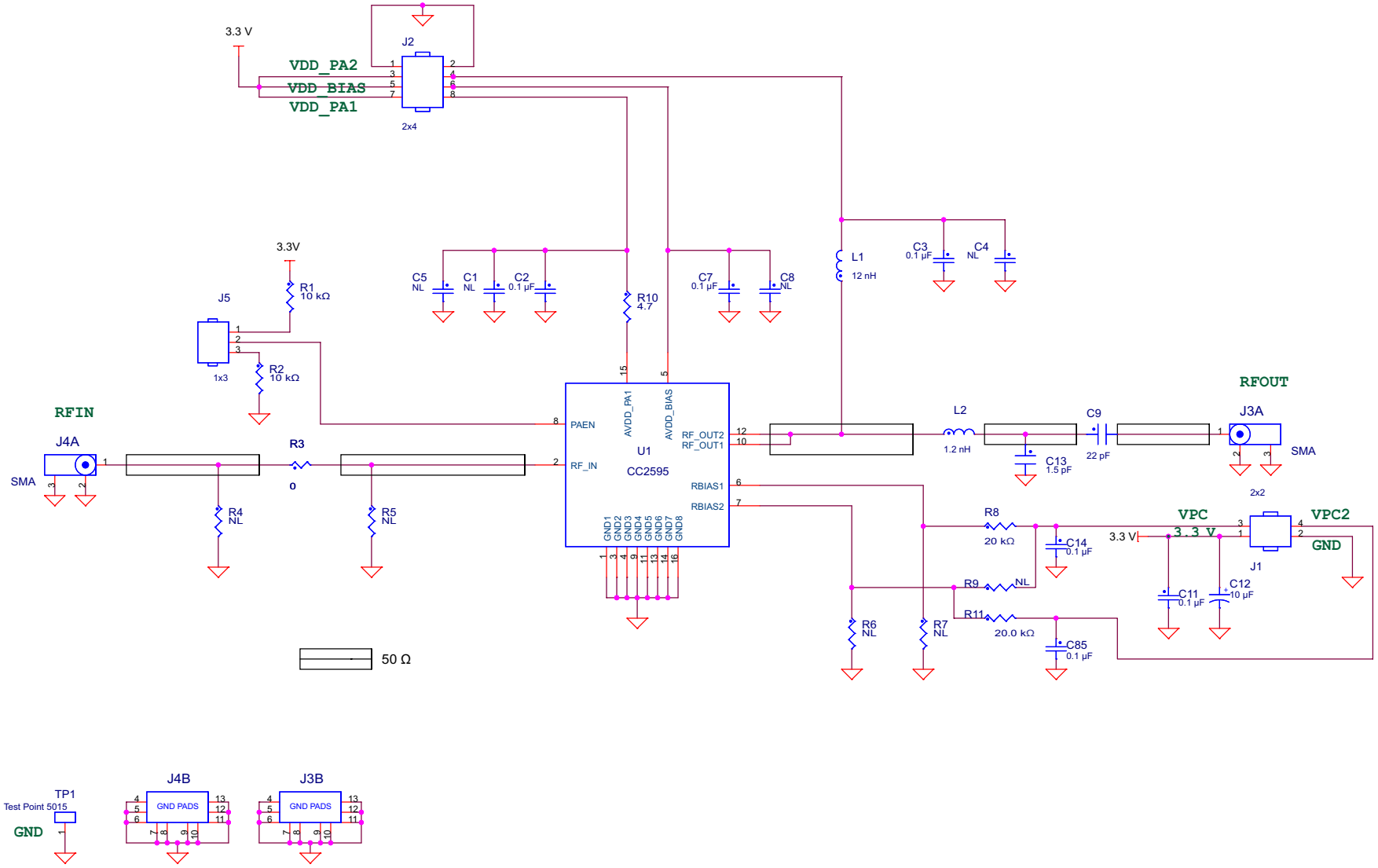
The CC2595 EVM consists of the following components:

- CC2595 EVM board

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2 EVM Overview

2.1 Schematic



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2.2 Bill of Materials

Component	Description (footprint)	Value	Manufacturer	Part Number
C2 C3 C7 C11 C14 C85	Power Supply Decoupling (0402)	0.1uF	Murata	GRM155R71C104KA88D
C9	RFOUT AC Coupling (0402)	22pF	Panasonic	ECJ-0EC1H220J
C12	Power Supply Decoupling (Tantalum)	10uF	Vishay Spraque	595D106X0016B2T
C13	RFOUT LPF Shunt to GND (0402)	1.5pF	Panasonic	ECJ-0EC1H1R5C
J1	Vcc Terminal: Pin 1= 3.3V; 2x2 Header	No Jumpers Installed	3M	929665-09-02-I
J2	Vcc Debug Terminals; 2x8 Header	Jumper (3-4,5-6,7-8)	TYCO/AMP	9-146261-0-04
J3 J4	RF Signal SMA connector		Johanson Technology	142-0701-801
J5	PAEN Terminal: 1x3 Header	Jumper (1-2)	Molex	22-28-4033
L1	DC Biasing Inductor (0402)	12nH	Toko	LL1005-FHL12NJ
L2	RFOUT LPF Series Inductor (0402)	1.2nH	Toko	LL1005-FHL1N2S
R1 R2	PAEN pull up/down resistors (0402)	10k ohm	Vishay/Dale	CRCW040210K0FKED
R3	RFIN thru (0402)	0 ohm	Panasonic	ERJ-2GE0R00X
R6, R7	Bias resistors (0402)	20k ohm	Panasonic	ERJ-2RKF2002X
R8, R11	for biasing options	DNI	Panasonic	ERJ-2RKF2002X
R10	AVDD_PA1 resistor	4.7 ohm	Yageo	RC0402FR-074R7L
TP1	GND test point		Keystone electronics	5015
U1	CC2595 PA, 3x3, 16 pin QFN		Texas Instruments	CC2595RGT

2.3 General Usage Information

Recommended power-up sequence:

1. Ensure J1 (VCC/GND terminal) has jumpers removed
2. Ensure J2 (VCC debug terminals) has three jumpers installed (pins 3 to 4, pins 5 to 6, and pins 7 to 8)
3. Ensure J5 (PAEN terminal) has one jumper installed (pins 1 to 2)
4. Connect GND to pin 2 of J1
5. Connect VCC to pin 1 of J1; set Vcc to 3.0 V
6. Connect RF input signal to J4 (RFIN), RFIN = 0 dBm at 2.4 GHz
7. Connect measurement instrument to J3 (RFOUT)

In the power-up sequence, VCC should draw approximately 30 mA of current without any RF drive. When the RFIN signal is applied, the device should output >20 dBm. To power down the device, move the J5 jumper to pins 2 to 3.

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3 EVM Layout

3.1 Description: Stack up and Material

The CC2595 EVM is a 62-mil, 4-layer board, which uses lead-free FR-4 material. The top layer routes the power, ground, and signals to and from the device. The signal impedance is targeted at 49.9 Ω.

3.2 Layers

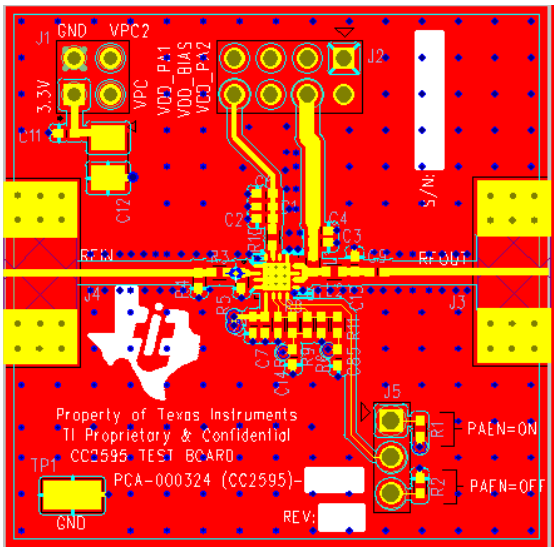


Figure 1. Layer 1 (Top)

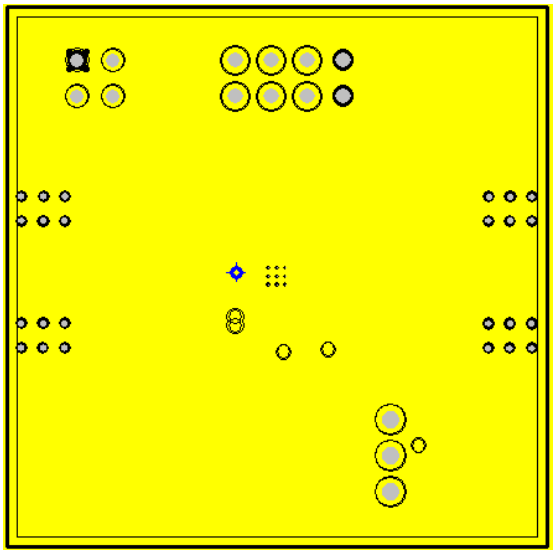


Figure 2. Layer 2 (GND)

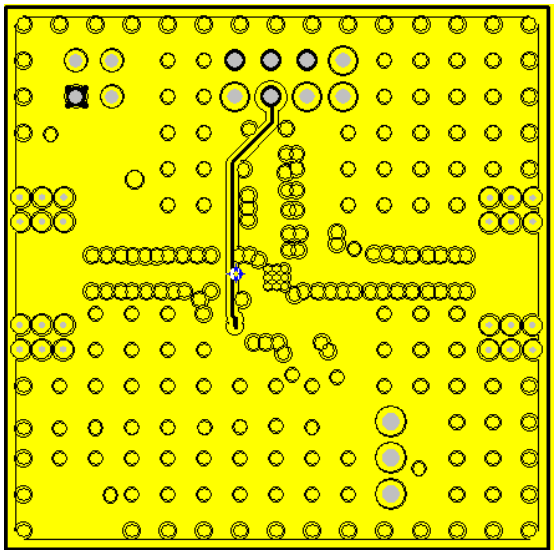


Figure 3. Layer 3 (VCC)

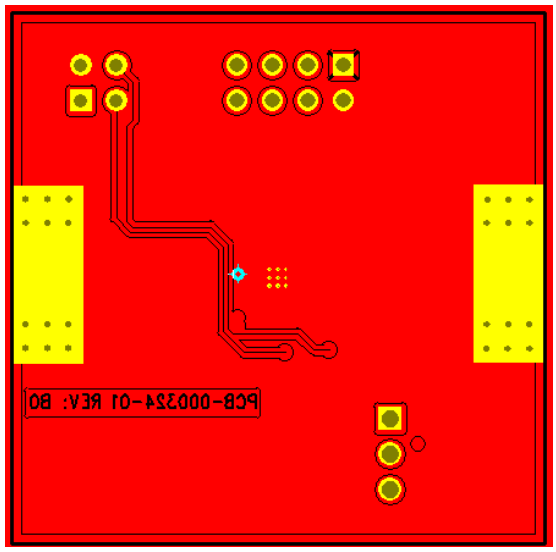


Figure 4. Layer 4 (Bottom)

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As noted in the EVM User's Guide and/or EVM itself, this EVM and/or accompanying hardware may or may not be subject to the Federal Communications Commission (FCC) and Industry Canada (IC) rules.

For EVMs **not** subject to the above rules, this evaluation board/kit/module is intended for use for ENGINEERING DEVELOPMENT, DEMONSTRATION OR EVALUATION PURPOSES ONLY and is not considered by TI to be a finished end product fit for general consumer use. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC or ICES-003 rules, which are designed to provide reasonable protection against radio frequency interference. Operation of the equipment may cause interference with radio communications, in which case the user at his own expense will be required to take whatever measures may be required to correct this interference.

General Statement for EVMs including a radio

User Power/Frequency Use Obligations: This radio is intended for development/professional use only in legally allocated frequency and power limits. Any use of radio frequencies and/or power availability of this EVM and its development application(s) must comply with local laws governing radio spectrum allocation and power limits for this evaluation module. It is the user's sole responsibility to only operate this radio in legally acceptable frequency space and within legally mandated power limitations. Any exceptions to this are strictly prohibited and unauthorized by Texas Instruments unless user has obtained appropriate experimental/development licenses from local regulatory authorities, which is responsibility of user including its acceptable authorization.

For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant

Caution

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Interference Statement for Class B EVM devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For EVMs annotated as IC – INDUSTRY CANADA Compliant

This Class A or B digital apparatus complies with Canadian ICES-003.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Concerning EVMs including radio transmitters

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concerning EVMs including detachable antennas

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet appareil numérique de la classe A ou B est conforme à la norme NMB-003 du Canada.

Les changements ou les modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actionner l'équipement.

Concernant les EVMs avec appareils radio

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

【Important Notice for Users of EVMs for RF Products in Japan】

This development kit is NOT certified as Confirming to Technical Regulations of Radio Law of Japan

If you use this product in Japan, you are required by Radio Law of Japan to follow the instructions below with respect to this product:

1. Use this product in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use this product only after you obtained the license of Test Radio Station as provided in Radio Law of Japan with respect to this product, or
3. Use of this product only after you obtained the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to this product. Also, please do not transfer this product, unless you give the same notice above to the transferee. Please note that if you could not follow the instructions above, you will be subject to penalties of Radio Law of Japan.

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Your Sole Responsibility and Risk. You acknowledge, represent and agree that:

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2. You have full and exclusive responsibility to assure the safety and compliance of your products with all such laws and other applicable regulatory requirements, and also to assure the safety of any activities to be conducted by you and/or your employees, affiliates, contractors or designees, using the EVM. Further, you are responsible to assure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard.
3. Since the EVM is not a completed product, it may not meet all applicable regulatory and safety compliance standards (such as UL, CSA, VDE, CE, RoHS and WEEE) which may normally be associated with similar items. You assume full responsibility to determine and/or assure compliance with any such standards and related certifications as may be applicable. You will employ reasonable safeguards to ensure that your use of the EVM will not result in any property damage, injury or death, even if the EVM should fail to perform as described or expected.
4. You will take care of proper disposal and recycling of the EVM’s electronic components and packing materials.

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