Application Note

CC2651R3SIPA Manual Information for the End User and OEM Installation Guide

ABSTRACT

The OEM integrator must be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual must include all required regulatory information/warning as shown in this manual.

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Trademarks

All trademarks are the property of their respective owners.

1 RF Function and Frequency Range

The CC2651R3SIPAT0MOUR is designed to operate in the 2.4GHz band.

Note

The maximum RF power transmitted in each 2.4GHz band is 9 dBm (EIRP).

2 FCC and IC Certification and Statement

This device is intended for OEM integrators under the following conditions:

- The antenna must be installed such that 20 cm is maintained between the antenna and users
- The transmitter module may not be co-located with any other transmitter or antenna
- The transmitter module may not be co-located with any other transmitter or antenna. • To comply with FCC / IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile exposure condition must not exceed:

  – 3.3 dBi in the 2.4 GHz band

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC / IC authorization is no longer considered valid and the FCC / IC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC / IC authorization.

2.1 FCC

The TI CC2651R3SIPA modules are certified for FCC as a single-modular transmitter. The module is an FCC-certified radio module that carries a modular grant.

Users are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation of the device.

CAUTION

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

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 the one the receiver is connected to.
- Consult the dealer or an experienced radio or TV technician for help.

2.2 CAN ICES-3(B) and NMB-3(B) Certification and Statement

The TI CC2651R3SIPA module is certified for IC as a single-modular transmitter. The TI CC2651R3SIPA module meets IC modular approval and labeling requirements. The IC follows the same testing and rules as the FCC regarding certified modules in authorized equipment.

This device complies with Industry Canada license-exempt RSS standards.

Operation is subject to the following two conditions:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

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:

- L'appareil ne doit pas produire de brouillage
- L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAUTION

IC RF Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

2.3 End Product Labeling

This module is designed to comply with the FCC statement, FCC ID: ZAT-2651R3SIPA. The host system using this module must display a visible label indicating the following text:

- Contains FCC ID: ZAT-2651R3SIPA

This module is designed to comply with the IC statement, IC: 451H-2651R3SIPA. The host system using this module must display a visible label indicating the following text:

- Contains IC: 451H-2651R3SIPA

2.4 Device Classifications

Since host devices vary widely with design features and configurations module integrators shall follow the guidelines below regarding device classification and simultaneous transmission, and seek guidance from their preferred regulatory test lab to determine how regulatory guidelines will impact the device compliance. Proactive management of the regulatory process will minimize unexpected schedule delays and costs due to unplanned testing activities.

The module integrator must determine the minimum distance required between their host device and the user's body. The FCC provides device classification definitions to assist in making the correct determination. Note that these classifications are guidelines only; strict adherence to a device classification may not satisfy the regulatory requirement as near-body device design details may vary widely. Your preferred test lab will be able to assist in determining the appropriate device category for your host product and if a KDB or PBA must be submitted to the FCC.

Note

The module you are using has been granted modular approval for mobile applications. Portable applications may require further RF exposure (SAR) evaluations. It is also likely that the host / module combination will need to undergo testing for FCC Part 15 regardless of the device classification. Your preferred test lab will be able to assist in determining the exact tests which are required on the host / module combination.

2.5 FCC Definitions

Portable: (§2.1093) — A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is / are within 20 centimeters of the body of the user.

Mobile: (§2.1091) (b) — A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Per §2.1091d(d)(4) In some cases (for example, modular or desktop transmitters), the potential conditions of use of a device may not allow easy classification of that device as either Mobile or Portable. In these cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength, or power density, whichever is most appropriate.

2.6 Simultaneous Transmission Evaluations

This module has not been evaluated or approved for simultaneous transmission as it is impossible to determine the exact multi-transmission scenario that a host manufacturer may choose. Any simultaneous transmission condition established through module integration into a host product must be evaluated per the requirements in KDB447498D01(8) and KDB616217D01,D03 (for laptop, notebook, netbook, and tablet applications).

These requirements include, but are not limited to:

- Transmitters and modules certified for mobile or portable exposure conditions can be incorporated in mobile host devices without further testing or certification when:
- The closest separation among all simultaneous transmitting antennas is > 20 cm.

or

- Antenna separation distance and MPE compliance requirements for ALL simultaneous transmitting antennas have been specified in the application filing of at least one of the certified transmitters within the host device. In addition, when transmitters certified for portable use are incorporated in a mobile host device, the antenna(s) must be > 5 cm from all other simultaneous transmitting antennas.
- All antennas in the final product must be at least 20 cm from users and nearby persons.

3 EU and UK Certification and Statement

3.1 RF Exposure Information (MPE)

This device has been tested and meets applicable limits for Radio Frequency (RF) exposure. To comply with the RF exposure requirements, this module must be installed in a host platform that is intended to be operated in a minimum of 20 cm separation distance to the user.

3.2 Simplified CE Declaration of Conformity Statement

Hereby, Texas Instruments declares that the radio equipment type CC2651R3SIPAT0MOUR complies with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

- CC2651R3SIPAT0MOUR: CE Delcaration of Conformity

3.3 Simplified UK Declaration of Conformity Statement

Hereby, Texas Instruments declares that the radio equipment type CC2651R3SIPAT0MOUR complies with the Radio Equipment Regulations 2017

The full text of the UK declaration of conformity is available at the following internet address:

- CC2651R3SIPAT0MOUR: UK Declaration of Conformity

3.4 Waste Electrical and Electronic Equipment (WEEE)

Waste Electrical and Electronic Equipment (WEEE)

This symbol means that according to local laws and regulations your product and/or battery shall be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. Proper recycling of your product will protect human health and the environment.

3.5 OEM and Host Manufacturer Responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the Radio Equipment Directive (RED) before it can be placed on the EU and UK markets. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the RED. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

3.6 Antenna Specifications

In all cases, assessment of the final product must be met against the Essential requirements of the Radio Equipment Directive Article 3.1(a) and (b), safety and EMC respectively, as well as any relevant Article 3.3 requirements.

The following antennas were verified in the conformity testing, and for compliance the antenna shall not be modified. A separate approval is required for all other operating configurations, including different antenna configurations.

Table 3-1. Antenna Specifications

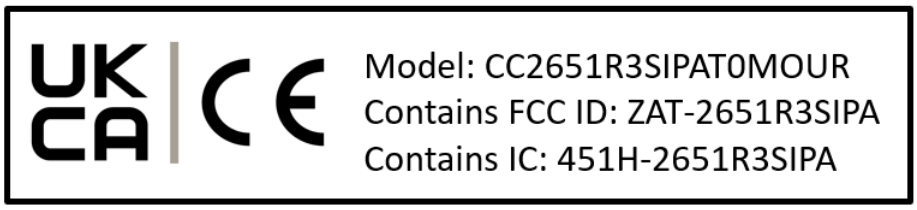
	Brand	Antenna Type	Model	2.4 GHz Gain
Antenna Information				
1	Texas Instruments	Inverted F - PCB	Custom Antenna	3.3 dBi
2		Integrated PCB	CC2651R3SIPA Integrated Antenna	1.5 dBi
3	Ethertronics	Dipole	1000423	-0.6 dBi
4	LSR	Rubber Whip / Dipole	001-0012	2 dBi
5			080-0013	2 dBi
6			080-0014	2 dBi
7		PIFA	001-0016	2.5 dBi
8			001-0021	2.5 dBi
9	Laird	PCB	CAF94504	2 dBi
10			CAF9405	2 dBi
11	Pulse	Ceramic Chip	W3006	3.2 dBi
12	ACX	Multilayer Chip	AT3216-BR2R7HAA	0.5 dBi
13			AT312-T2R4PAA	1.5 dBi
14	TDK	Multilayer Ceramic Chip Antenna	ANT016008LCD2442MA1	1.6 dBi
15			ANT016008LCD2442MA2	2.5 dBi
16	Mitsubishi Material	Chip Antenna	AM03DP-ST01	1.6 dBi
17		Antenna Unit	UB18CP-100ST01	-1.0 dBi
18	Taiyo Yuden	Chip Antenna / Helical Monopole	AF216M245001	1.5 dBi
19		Chip Antenna /Monopole Type	AH212M245001	1.3 dBi
20			AH316M245001	1.9 dBi
21	Antenna Technology	Dipole	AA2402SPU	2.0 dBi
22			AA2402RSPU	2.0 dBi
23			AA2402A-UFLLP	2.0 dBi
24			AA2402AU-UFLLP	2.0 dBi
25	Staf	Mono-pole	1019-016	2.14 dBi
26			1019-017	2.14 dBi
27			1019-018	2.14 dBi
28			1019-019	2.14 dBi
29	Map Electronics	Rubber Whip	MEIWX-2411SAXX-2400	2.0 dBi
30			MEIWX-2411RSXX-2400	2.0 dBi
31			MEIWX-282XSAXX-2400	2.0 dBi
32			MEIWX-282XRSXX-2400	2.0 dBi
33			MEIWF-HP01RS2X-2400	2.0 dBi
34	Yageo	Chip	ANT3216A063R2400A	1.69 dBi
35	Mag Layers Scientific	Chip	LTA-3216-2G4S3-A1	1 dBi
36			LTA-3216-2G4S3-A3	2 dBi
37	Advantech	Rubber Whip / Dipole	AN2450-5706RS	2.38 dBi
38			R-AN2400-5701RS	3.3 dBi

Note

If any other simultaneous transmission radio is installed in the host platform together with this module, or above restrictions cannot be kept, a separate RF exposure assessment and CE equipment certification is required.

4 End Product Labeling

In order to comply with the CC2651R3SIPA modular approval for use in Canada, Europe, Great Britain, and the United States, OEM/Host manufacturers must including the following example label on their end product and user manual:



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