RENESAS DA14535MOD SmartBond TINY Bluetooth LE Module User Manual

Contents

RENESAS DA14535MOD SmartBond TINY Bluetooth LE Module

Product Information

Specifications:

- **Model:** DA14535MOD
- **Standards Conformance:**
  - Europe (CE/RED)
  - UK (UKCA)
  - US (FCC)
  - Canada (IC)
  - Japan (MIC)
  - South Korea (KCC)
  - Taiwan (NCC)
  - Brazil (Anatel)
  - South Africa (ICASA)
  - China (SRRC)
  - Thailand (NBTC)
  - India (WPC)
  - Australia/ New Zealand (ACMA)
- **Revision:** 1.5-DRAFT
- **Date:** 28-Sept-2023

Key Features:

- Confidential
- **Target:** Beacons, Remote Controls, Proximity tags, Low Power Sensors, Commissioning/Provisioning, RF

pipe, Toys, Industrial applications, Data acquisition, Wellness, Infotainment, IoT, Robotics, Gaming

Applications:

- Beacons
- Remote Controls
- Proximity tags
- Low Power Sensors
- Commissioning/Provisioning
- RF pipe
- Toys
- Industrial applications
- Data acquisition
- Wellness
- Infotainment
- IoT
- Robotics
- Gaming

Product Usage Instructions

1. **References**
   The references section provides additional information and resources related to the product. Please refer to this section for further guidance.
2. **Block Diagram**
   The block diagram illustrates the internal components and connections of the DA14535MOD. Use this diagram to understand the overall structure of the product.
3. **Pinout**
   The pinout diagram displays the pin assignments and functions of the DA14535MOD. Refer to this diagram when connecting external devices or components to the product.
4. **Packaging Information**
   This section provides details about the packaging of the product, including information about tape and reel packaging, as well as labeling instructions. Follow these guidelines when handling and storing the product.
5. **Application Information**
   The application information section contains valuable instructions and guidelines for using the product in various applications. Refer to this section for specific usage instructions and recommendations.
6. **Soldering**
   This section outlines the soldering requirements and recommendations for the DA14535MOD. Follow these guidelines when soldering or reworking the product to ensure proper functionality and reliability.
7. **Ordering Information**
   The ordering information section provides details on how to place orders for the DA14535MOD, including part numbers and quantities. Use this information when ordering or requesting additional units of the product.

FAQ:

Q: What are the standards of conformance of the DA14535MOD?
The DA14535MOD conforms to the following standards:

- Europe (CE/RED)
- UK (UKCA)
- US (FCC)
- Canada (IC)
- Japan (MIC)
- South Korea (KCC)
- Taiwan (NCC)
- Brazil (Anatel)
- South Africa (ICASA)
- China (SRRC)
- Thailand (NBTC)
- India (WPC)
- Australia/ New Zealand (ACMA)

Q: What are the key features of the DA14535MOD?
The key features of the DA14535MOD include:

- Confidential
- Support for beacons, remote controls, proximity tags, low-power sensors, commissioning/provisioning, RF pipe, toys, industrial applications, data acquisition, wellness, infotainment, IoT, robotics, and gaming.

Key Features

Standards Conformance

- Europe (CE/RED)
- UK (UKCA)
- US (FCC)
- Canada (IC)
- Japan (MIC)
- South Korea (KCC)
- Taiwan (NCC)
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- India (WPC)
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Applications

- Beacons

- Remote Controls
- Proximity tags
- Low Power Sensors
- Commissioning/Provisioning
- RF pipe
- Toys
- Industrial applications
- Data acquisition
- Wellness
- Infotainment
- IoT
- Robotics
- Gaming

References

- DA14535, Datasheet.
- DA14585/DA14531 SW Platform Reference Manual

Pinout

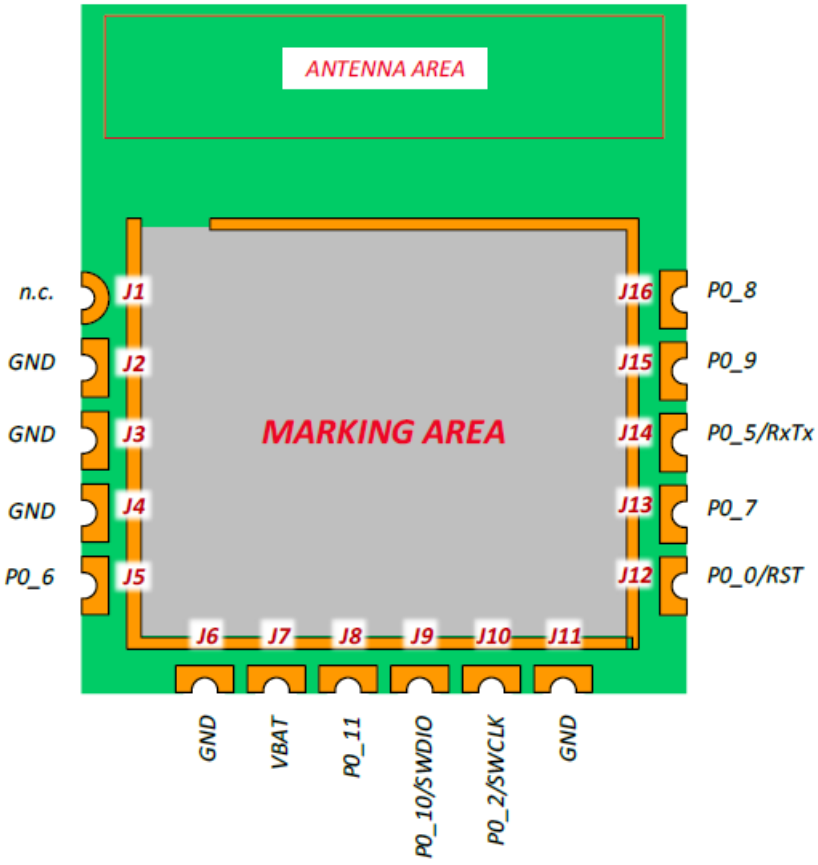


Figure 2: Pinout Diagram Top View

Note that J1 has no internal connection. J1 should be connected to ground.

Table 1: Pin Description

Pin #	Pin Name	Type	Reset State	Description
J1	n.c			Not internally connected. Recommended t o be connected to ground externally
J2	GND	GND		Ground
J3	GND	GND		Ground
J4	GND	GND		Ground
J5	P0_6	DIO (Type A) Note 1	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power down
J6	GND	GND		Ground
J7	VBAT	PWR		POWER. Battery connection. IO supply
J8	P0_11	DIO	I-PD	INPUT/OUTPUT with selectable pull-

		(Type A)		up/down resistors. Pull-down enabled durin g and after reset. General purpose I/O port bit or alternate function nodes. Contains a state retention mechanism during power d own
J9	P0_10	DIO (Type A)	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power down
	SWDIO			INPUT/OUTPUT. SWI Data input/output. Bi directional data and control communication (by default)
J10	P0_2	DIO (Type B)	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power-down
	SWCLK			INPUT SWI clock signal (by default)
J11	GND	GND		Ground
J12	P0_0	DIO (Type B) Note 2	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power-down
	RST			RST active high hardware reset (default)
J13	P0_7	DIO (Type A)	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power down
J14	P0_5	DIO (Type B)	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power down
J15	P0_9	DIO (Type A)	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power down
J16	P0_8	DIO (Type A)	I-PD	INPUT/OUTPUT with selectable pull- up/do wn resistors. Pull-down enabled during and after reset. General purpose I/O port bit or alternate function nodes. Contains a state r etention mechanism during power down

Note 1
There are two types of pads, namely Type A and Type B. Type A is a normal IO pad with a Schmitt trigger on input

while Type B has an extra RC Filter with a cutoff frequency of 100 kHz.

Note 2
This pin is also used for communication to the internal SPI FLASH.

- I-PD is Input-Pulled Down
- I-PU is Input-Pulled Up
- DIO is Digital Input-Output
- PWR is power
- GND is Ground

Characteristics

- All MIN/MAX specification limits are guaranteed by design, production testing, and/or statistical characterization. Typical values are based on characterization results at default measurement conditions and are informative only.
- Default measurement conditions (unless otherwise specified): VBAT= 3.0 V, TA = 25 oC. All radio measurements are done with standard RF measurement equipment.

Absolute Maximum Ratings
Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, so functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification are not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

Table 2: Absolute Maximum Ratings

Parameter	Description	Conditions	Min	Max	Unit
VBAT_LIM	Limiting battery supply voltage		-0.2	3.6	V

Recommended Operating Conditions

Table 3: Recommended Operating Conditions

Parameter	Description	Conditions	Min	Typ	Max	Unit
VBAT	Battery supply voltage enabling FLASH programming		1.65		3.6	V
VBAT_NOM	Nominal battery supply voltage			3		V
VPIN	Voltage on a pin		-0.2		3.6	V
TA	Ambient operating temperature		-40	25	85	°C

Device Characteristics

Table 4: DC Characteristics

Parameter	Description	Conditions	Min	Typ	Max	Unit
IBAT_ACTIVE	Battery supply current with CPU running CoreMark from RAM at 16 MHz			tbd		mA
IBAT_BLE_ADV_ 100ms	Average battery supply current with system in Advertising state (3 channels) every 100 ms and extended sleep with all RAM retained. TX output power at 3 dBm. FLASH is off.			tbd		µA
IBAT_BLE_CON	Average battery supply current with system in a			tbd		µA
N_30ms	connection state with 30ms connection interval and extended sleep with all RAM retained. TX output power at 3 dBm. FLASH is off.					
IBAT_FLASH	Battery supply current with CPU fetching code from serial FLASH. RF is off.			tbd		mA

IBAT_HIBERN	Battery supply current with system shut down (Hibernation or shipping mode). FLASH is off.			tbd		µA
IBAT_IDLE	Battery supply current with CPU in Wait for Interrupt Mode. FLASH is off.			tbd		mA
IBAT_SLP_32KB	Battery supply current with system in extended sleep mode and 32 kB RAM retained			tbd		µA
IBAT_SLP_64KB	Battery supply current with system in extended sleep mode and all RAM retained			tbd		µA
IBAT_RF_RX	Battery supply current	Continuous RX; FLASH in sleep mode; DCDC converter is on;		tbd		mA
IBAT_RF_TX_+3 dBm	Battery supply current	Continuous TX; FLASH in sleep mode; DCDC converter is on; Output power at 3 dBm;		tbd		mA
IBAT_RF_TX_0dBm	Battery supply current	Continuous TX;FLASH in sleep mode; DCDC converter is on; Output power at 0 dBm;		tbd		mA
IBAT_RF_TX_-3dBm	Battery supply current	Continuous TX;FLASH in sleep mode; DCDC converter is on; Output power at -3 dBm;		tbd		mA
IBAT_RF_TX_-7dBm	Battery supply current	Continuous TX;FLASH in sleep mode; DCDC converter is on; Output power at -7 dBm		tbd		mA

IBAT_RF_TX_- 19dBm	Battery supply current	Continuous TX;FLASH in sleep mode; DCDC converter is on; Output power at -19.5 dBm		tbd		mA

Table 5: XTAL32M – Recommended Operating Conditions

Parameter	Description	Conditions	Min	Typ	Max	Unit
fXTAL(32M)	Crystal oscillator frequency			32		MHz
ΔfXTAL(32M)	Crystal frequency tolerance	After optional trimming; including aging and temperature drift Note 1	-20		20	ppm

Note 1 Using the internal varicaps a wide range of crystals can be trimmed to the required tolerance.

Table 6: Digital I/O – Recommended Operating Conditions

Parameter	Description	Conditions	Min	Typ	Max	Unit
VIH	HIGH level input voltage	VDD=0.9V	0.7*VDD			V
VIL	LOW level input voltage	VDD=0.9V			0.3*VDD	V

Table 7: Digital I/O – DC Characteristics

Parameter	Description	Conditions	Min	Typ	Max	Unit
IIH	HIGH level input current	VI=VBAT_HIGH=3.0V	-10		10	µA
IIL	LOW level input current	VI=VSS=0V	-10		10	µA
IIH_PD	HIGH level input current	VI=VBAT_HIGH=3.0V	60		180	µA
IIL_PU	LOW level input current	VI=VSS=0V, VBAT_HIGH=3.0V	-180		-60	µA
VOH	HIGH level output voltage	IO=3.5mA, VBAT_HIGH=1.7V	0.8*VB AT_HI GH			V
VOL	LOW level output voltage	IO=3.5mA, VBAT_HIGH=1.7V			0.2*VBAT_HIGH	V
VOH_LOWDRV	HIGH level output voltage	IO=0.3mA, VBAT_HIGH=1.7V	0.8*VB AT_HI GH			V
VOL_LOWDRV	LOW level output voltage	IO=0.3mA, VBAT_HIGH=1.7V			0.2*VBAT_HIGH	V

Table 8: Radio – AC Characteristics

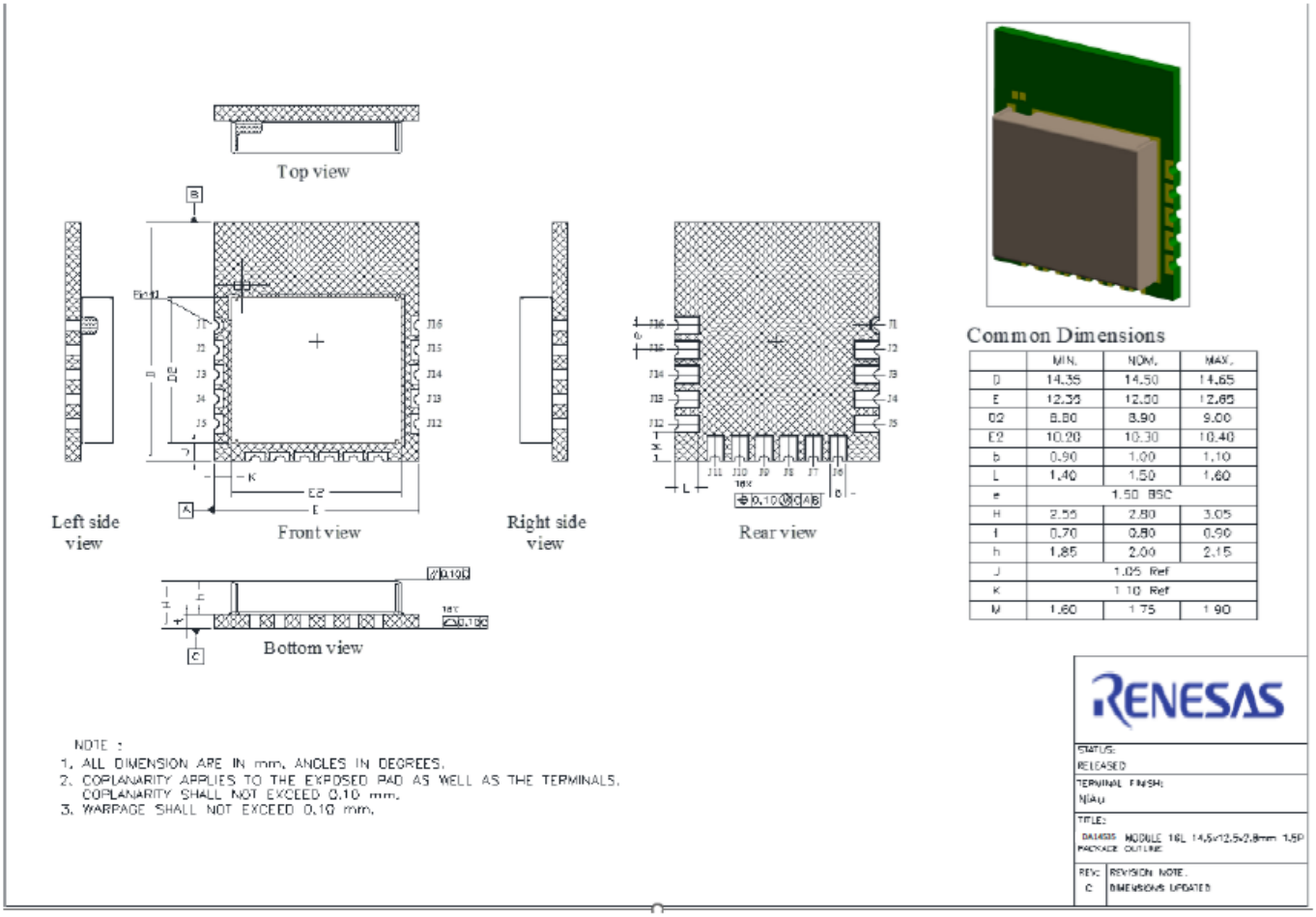
Parameter	Description	Conditions	Min	Typ	Max	Unit
PSENS_CLEAN	sensitivity level	Dirty Transmitter disabled;		tbd		dBm
		DC-DC converter disabled; PER = 30.8 %; Note 1				
PSENS_EPKT	sensitivity level	Extended packet size (255 octets)		tbd		dBm

Note 1 Measured according to Bluetooth® Low Energy Test Specification RF-PHY.TS/4.0.1, section 6.4.1.

Mechanical Specifications

Dimensions

The module’s dimensions are shown in Figure 3.



	MIN.	NOM.	MAX.
D	14.35	14.50	14.65
E	12.35	12.50	12.65
D2	8.80	8.90	9.00
E2	10.20	10.30	10.40
b	0.90	1.00	1.10
L	1.40	1.50	1.60
e	1.50 BSC		
H	2.55	2.80	3.05
f	0.70	0.80	0.90
h	1.85	2.00	2.15
J	1.05 Ref		
K	1.10 Ref		
M	1.60	1.75	1.90

Figure 3: Mechanical Drawing

PCB Footprint

The footprint for the PCB is shown in Figure 4.

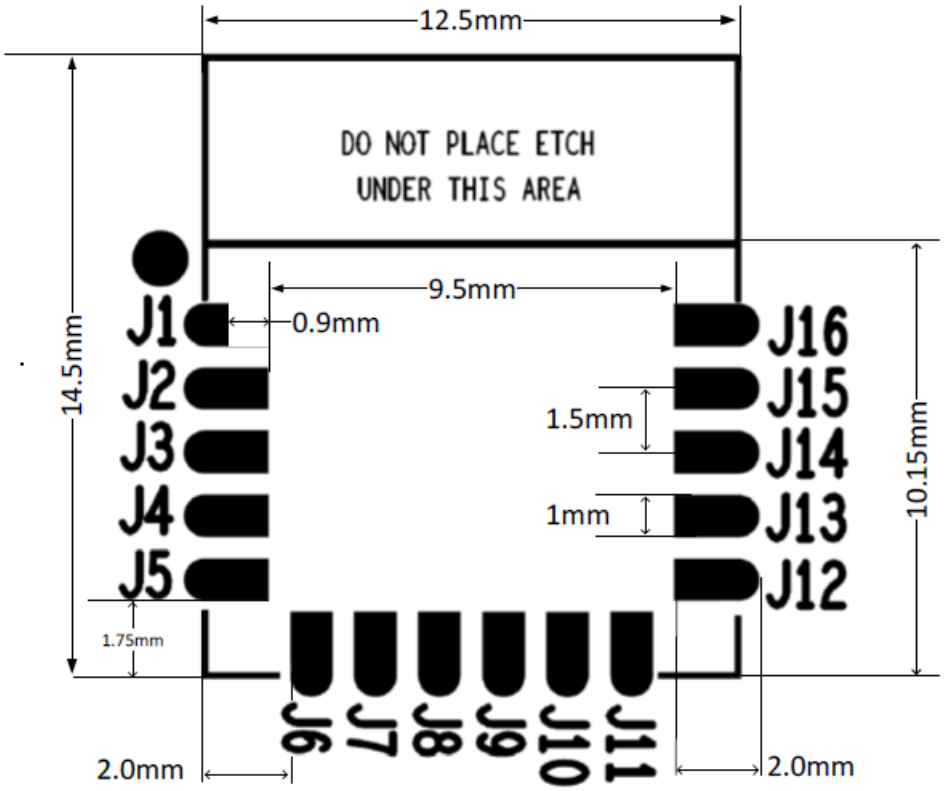


Figure 4: Module Footprint Top View

Marking

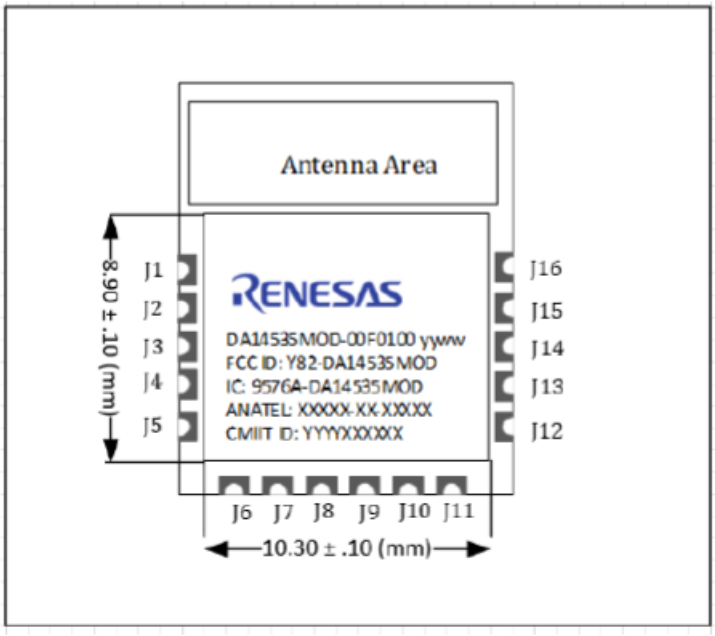


Figure 5: Module Shield Marking

Packaging Information

Tape and Reel

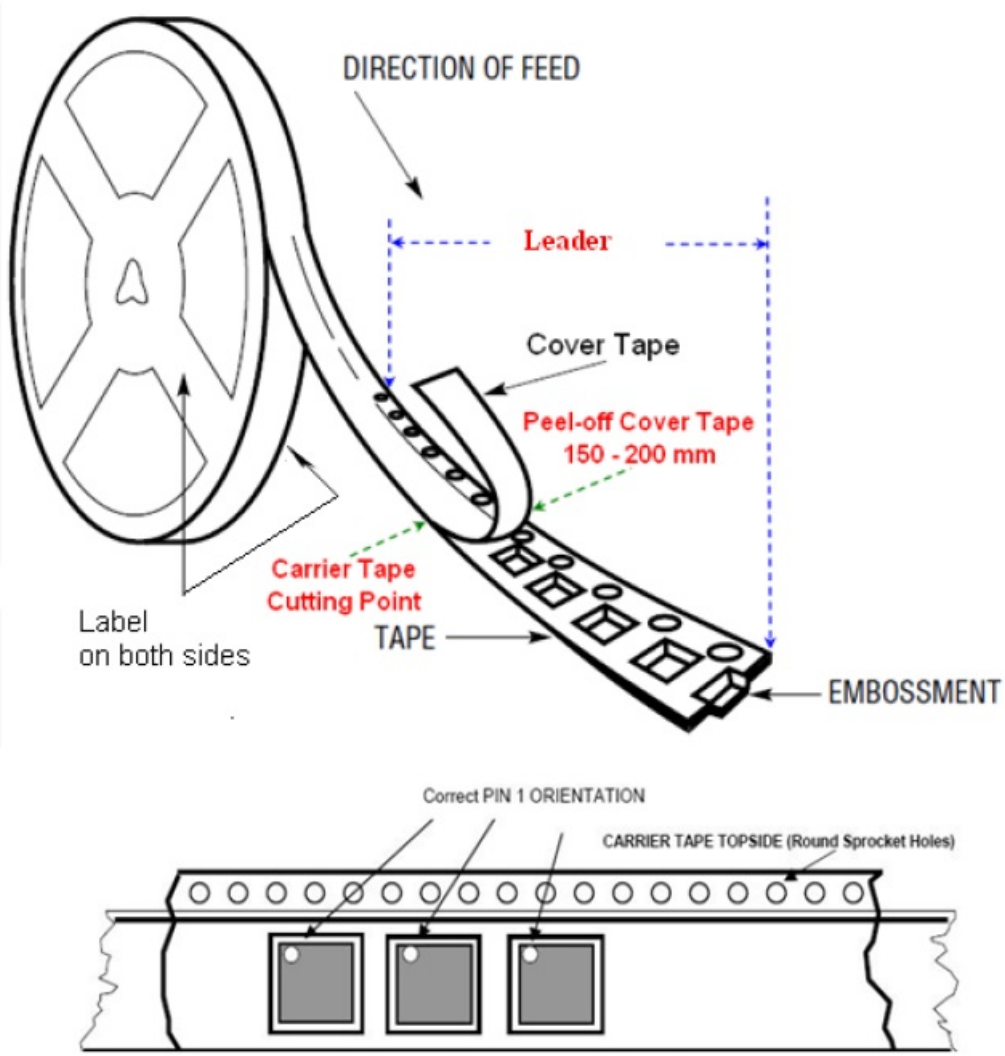


Figure 6: Tape and Reel

The actual reel specifications are presented in the following table:

Table 9: Reel Specifications

Diameter	13 inch
Reel tape width	24 mm
Tape material	Antistatic
Qty/Reel	100/1000 pcs
Leader	400 mm + 10%
Trailer	160 mm + 10%

Labeling

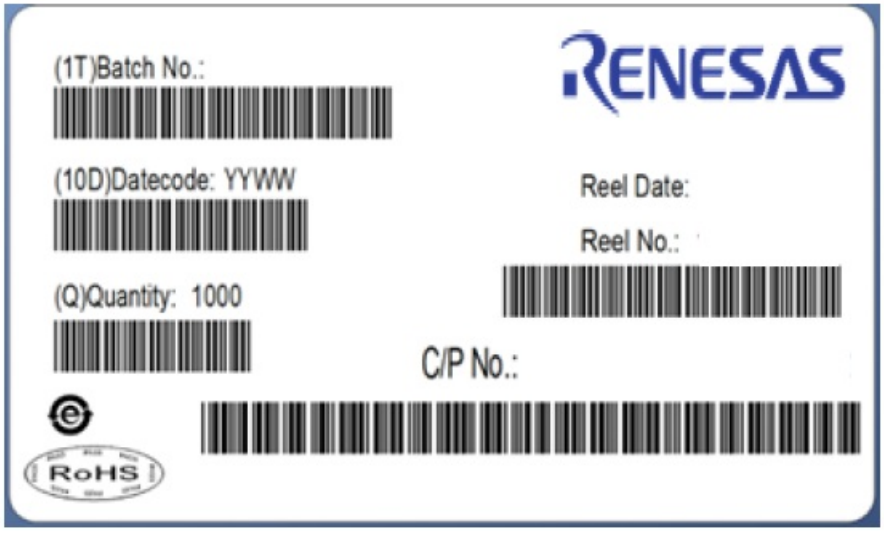


Figure 7: Reel Labeling

The directives label shows information regarding directives conformity as in Figure 8.

Figure 8: Reel Directives Conformity Label

Application Information

There are some special considerations for the use of the TINYTM module, namely:

- The RST signal is shared with the MOSI input of the NOR flash. For this reason, RST must not be driven to GND. When the internal Flash is in use, the reset functionality is not available
- The SPI Bus of DA14535 is used for the communication of the SoC with the NOR Flash at boot time. Three of the four signals are not driven to external module pins. For this reason, a sensor that utilizes the SPI bus must be assigned (by software) to the module pins to communicate with after the boot is completed and when NOR Flash is no longer in use. An example is given in Figure 12.

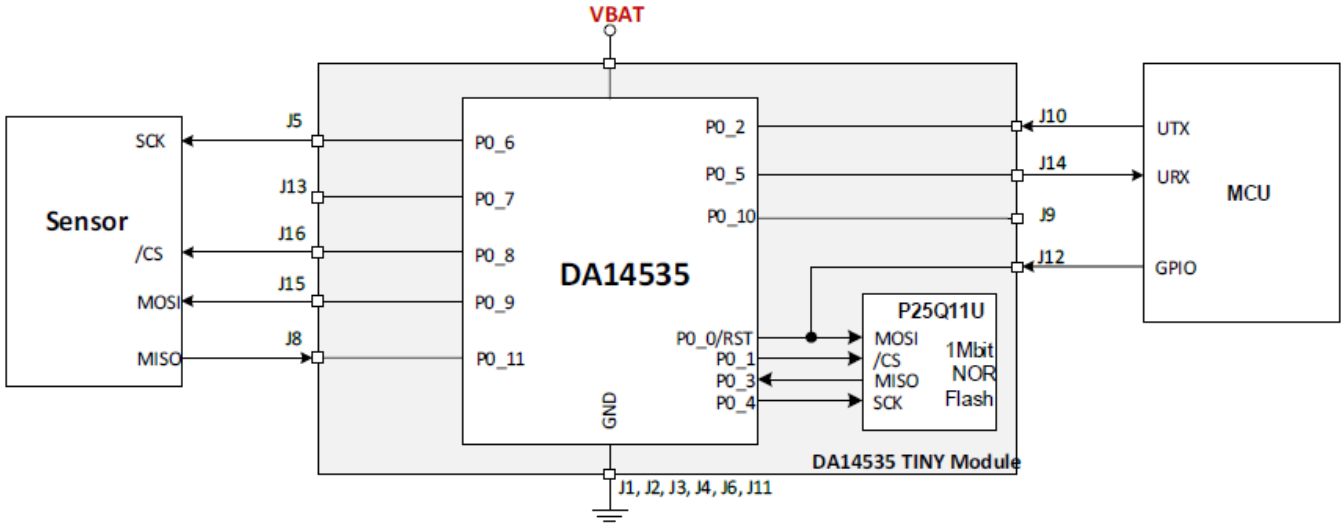


Figure 9: Example of Connecting a Sensor to the SPI Bus and an MCU to RST and UART

Note that the P0_0/RST pin (J12) should not be driven while the TINYTM module boots from its internal SPI FLASH.

Design Guidelines

- The DA14535 SmartBond TINY™ Module comes with an integrated PCB trace antenna. The antenna area is 12×4 mm. The antenna's Voltage Standing Wave Ratio (VSWR) and efficiency depend on the installation location.
- The radiation performance of the PCB trace antenna depends on the host PCB layout. The maximum antenna gain is -0.5 dBi when installed on a 50×50 mm reference board, as shown in Figure 21. The radiation pattern is omnidirectional.
- The RF front end is optimized to achieve the maximum possible efficiency for various installation positions of the module on a host PCB. To obtain a similar performance, follow the guidelines described in the following sections.

Installation Location

- For optimum performance, install the module at the edge of a host PCB with the antenna edge facing out. The module can be located on either of the outer corners or the middle of the host PCB with equivalent performance.
- The antenna should have 4 mm free space in all directions. Copper or laminate in the proximity of the PCB trace antenna will affect the efficiency of the antenna. Laminate or copper under the antenna should be avoided as it severely affects the performance of the antenna. The antenna keep-out area can be seen in Figure 11.
- Metals close to the antenna will degrade the antenna's performance. The amount of degradation depends on the host system's characteristics.
- Table 10 summarizes the antenna efficiency at different installation locations on a host PCB as shown in Figure 10.

Table 10: Antenna Efficiency vs TINYTM Module Positions

Position # 1 (Left)			Position # 2 (Middle)		Position # 3 (Right)	
Freq	Antenna efficiency		Antenna efficiency		Antenna efficiency	
[MHz]	[%]	[dB]	[%]	[dB]	[%]	[dB]
2405	52	-2,8	40	-4,0	40	-4,0
2440	46	-3,4	34	-4,7	41	-3,9
2480	50	-3,0	40	-4,0	52	-2,8

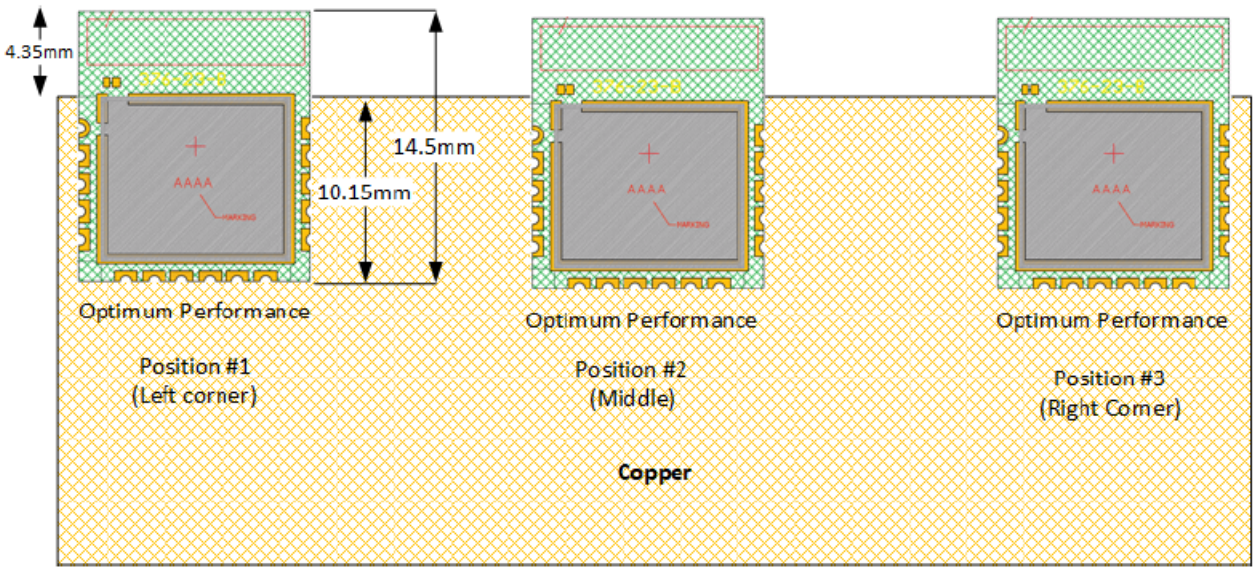


Figure 10: Installation Locations for Optimum Antenna Performance

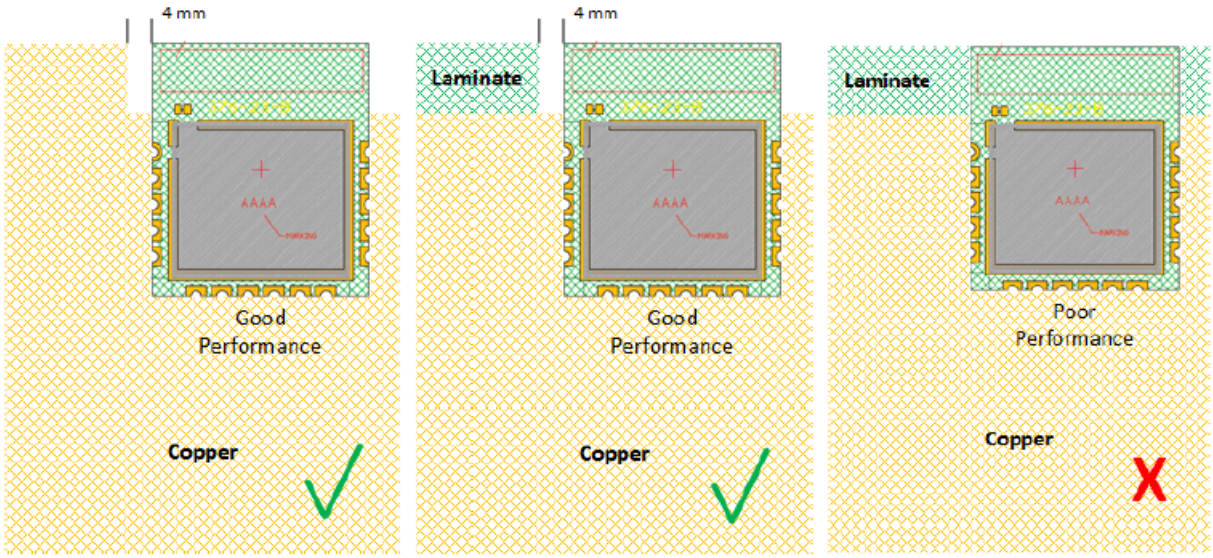


Figure 11: Antenna Performance in Proximity of Copper (Left), Laminate (Middle), and Laminate under Antenna (Right)

The actual TINYTM module evaluation board layout that has been used to conduct measurements is shown in Figure 12.

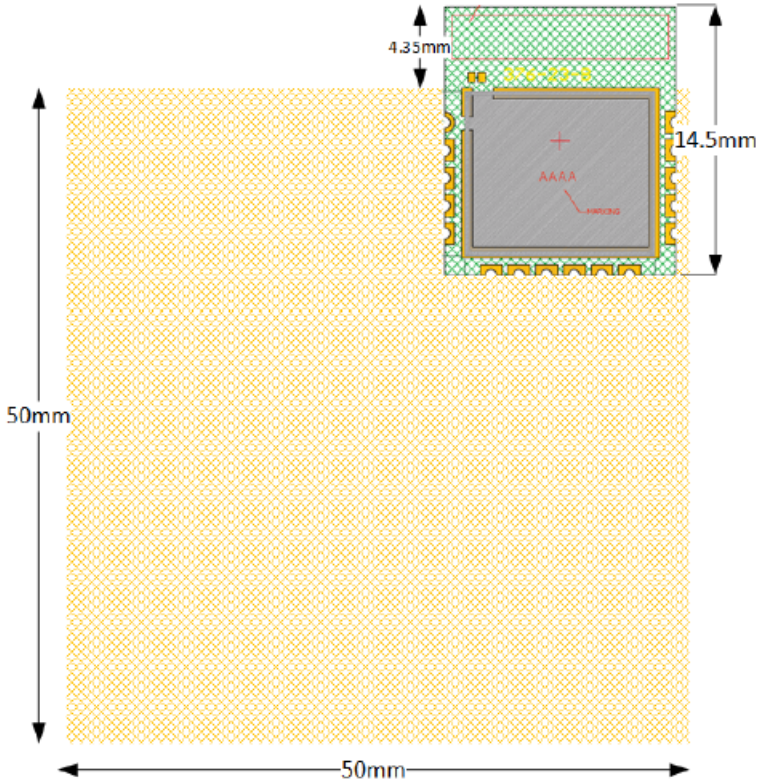


Figure 12: DA14535 TINY™ Module Evaluation Board

Antenna Graphs

The antenna VSWR measurements for the three installation positions are shown in the following figures.

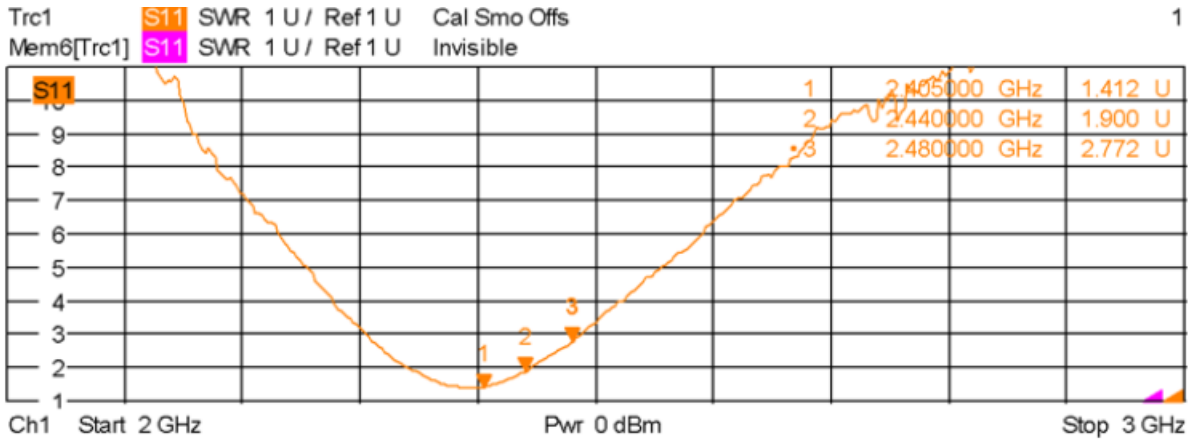


Figure 13: VSWR Installed in the Upper Left Corner (Position #1) of Evaluation Board

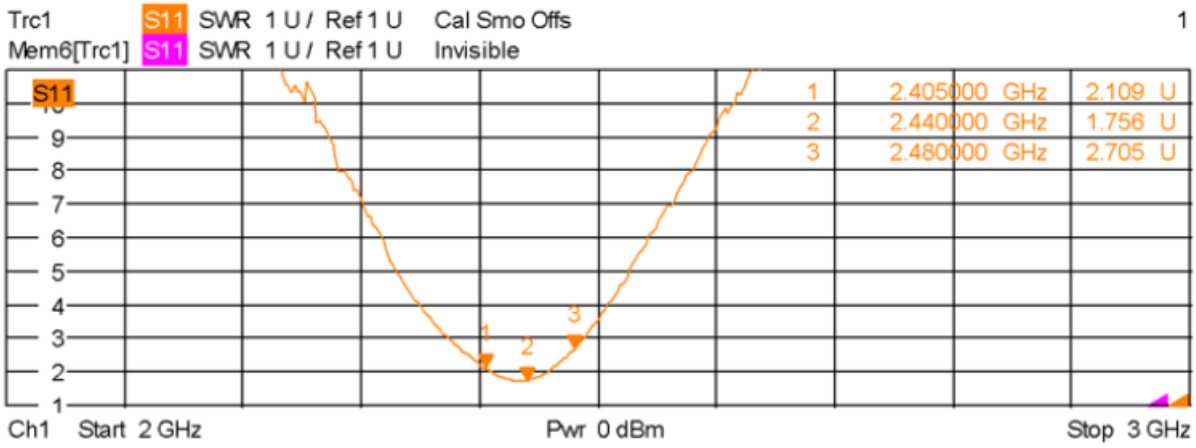


Figure 14: VSWR with Module Installed in Center (Position #2) of the Evaluation Board

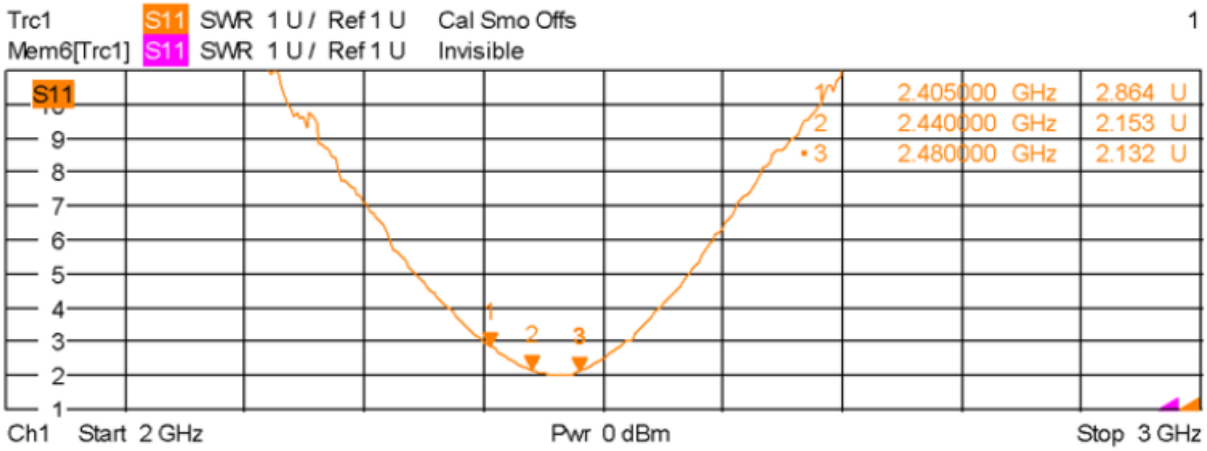


Figure 15: VSWR with Module Installed in the Upper Right Corner (Position #3) of the Evaluation Board

Radiation Pattern

The antenna radiation pattern measurements are carried out in an anechoic chamber. Radiation patterns are presented for three measurement planes: XY-, XZ-, and YZ- planes with horizontal and vertical polarization of the receiving antenna.

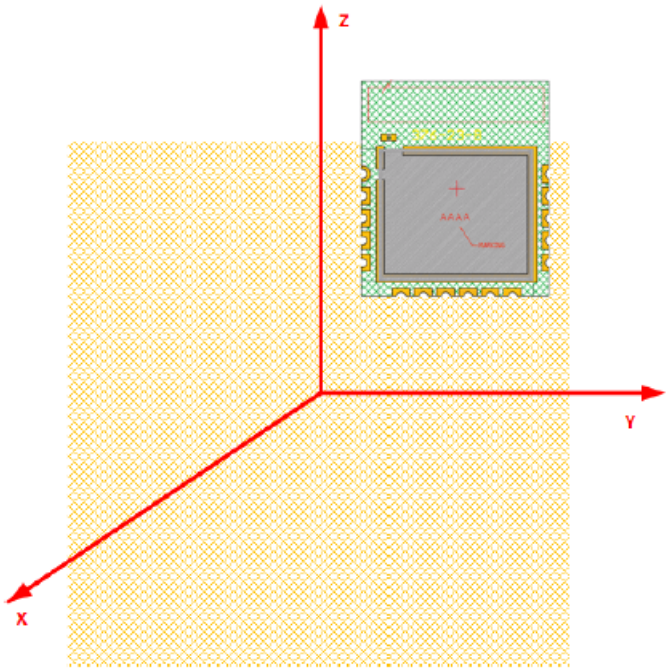
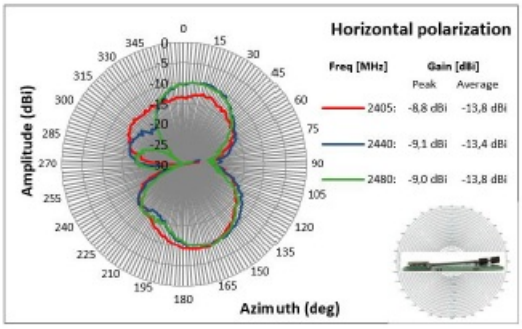
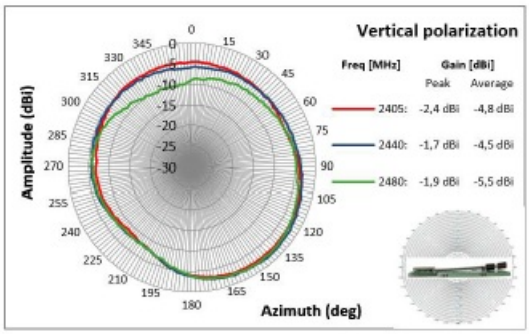
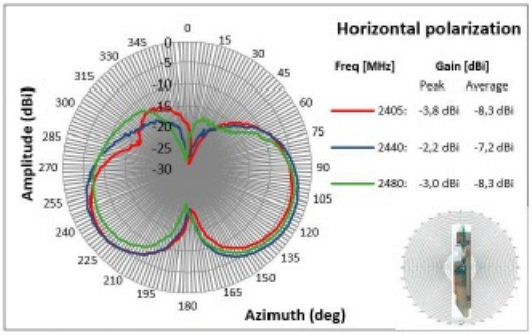
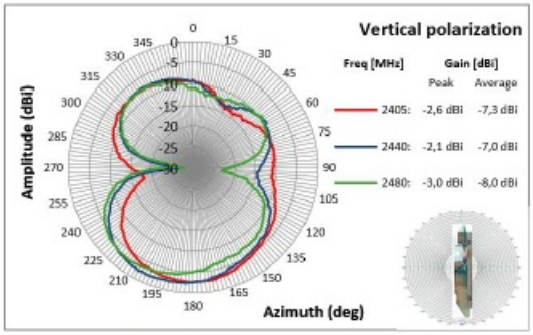
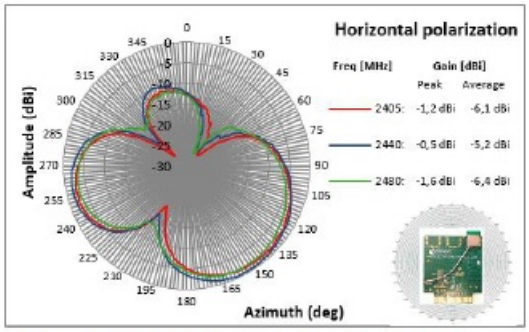
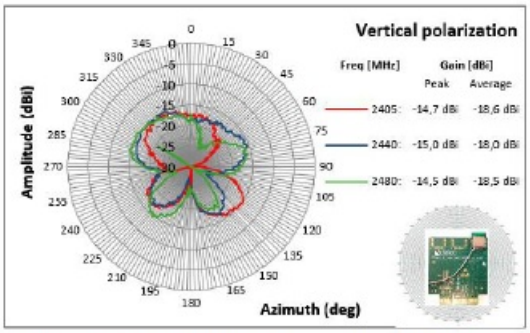


Figure 16: Measurement Plane Definition

Measurements are carried out for the module installed in the upper right corner of the reference board with no laminate below the antenna trace.

Radiation Pattern for Antenna Trace	
Horizontal polarization	**Vertical polarization**
 **Figure 17: Radiation Pattern for XY-Plane, Horizontal Polarization**	 **Figure 18: Radiation Pattern for XY-Plane, Vertical Polarization**
 **Figure 19: Radiation Pattern for XZ-Plane, Horizontal Polarization**	 **Figure 20: Radiation Pattern for XZ-Plane, Vertical Polarization**
 **Figure 21: Radiation Pattern for YZ-Plane, Horizontal Polarization**	 **Figure 22: Radiation Pattern for YZ-Plane, Vertical Polarization**

Soldering

- The successful reflow soldering of the DA14535 TINYTM Module on a PCB depends on several parameters such as the thickness of the stencil, the pads solder paste aperture, the solder paste characteristics, the reflow soldering profile, size of the PCB, and so on.
- The volume of solder paste applied to the board is mainly determined by the aperture size and stencil thickness. An initial solder paste aperture for the pads is provided on the solder paste layer of the PCB footprint. This aperture is modified by the assembly process experts according to stencil thickness, solder paste, and available assembly equipment.
- The solder profile depends on the solder paste type used. For example, the soldering profile of a lead-free solder paste, Sn3Ag0.5Cu with no clean Flux (ROL0) and Solder Powder Type 4, is presented below.

- No clean flux is recommended because washing must not be applied after assembly to avoid moisture being trapped under the shield.

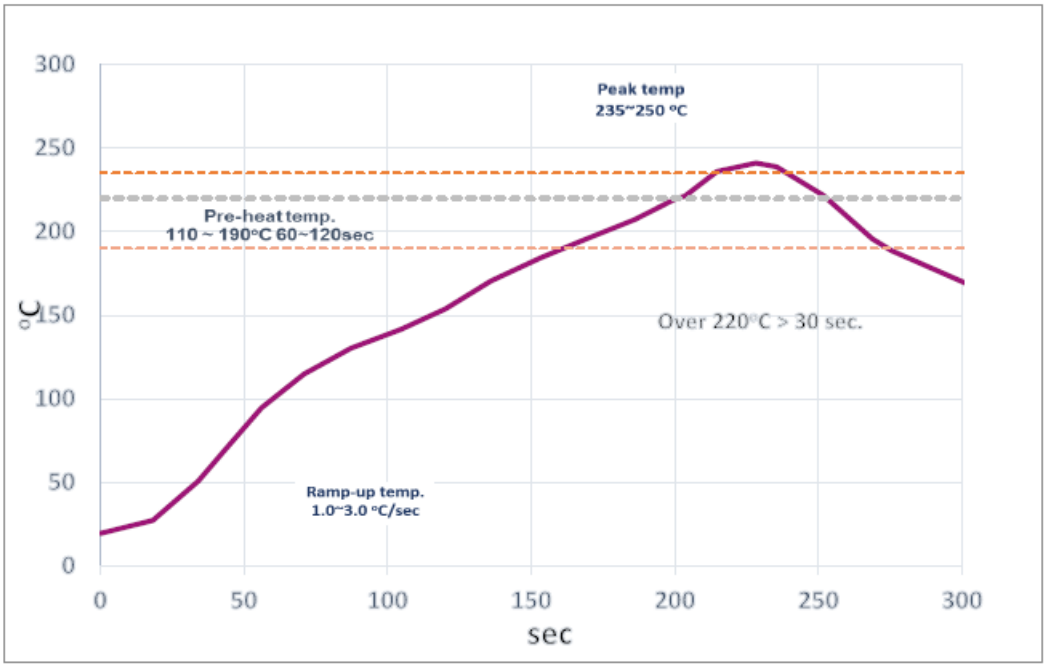


Figure 23: Recommended Reflow Profile for Lead Free Solder

Table 11: Reflow Profile Specification

Statistic Name	Low Limit	High Limit	Units
Slope1 (Target=2.0) Between 30.0 and 70.0	1	3	Degrees/Second
Slope2 (Target=2.0) Between 70.0 and 150.0	1	3	Degrees/Second
Slope3 (Target=-2.8) Between 220.0 and 150.0	-5	-0.5	Degrees/Second
Preheat time 110-190°C	60	120	Seconds
Time above reflow @220°C	30	65	Seconds
Peak temperature	235	250	Degrees Celsius
Total time above @235°C	10	30	Second

Solderability reflow check of five cycles was performed, applying the procedures mentioned in the JESD-A113E standard. The MSL is an indicator for the maximum allowable time period (floor lifetime) in which a moisture-sensitive plastic device, once removed from the dry bag, can be exposed to an environment with a maximum temperature of 30 °C and a maximum relative humidity of 60 % RH before the solder reflow process.

- DA14535 TINY Module is qualified for MSL 3.

Table 12: MSL Level vs Floor Lifetime

MSL Level	Floor Lifetime
MSL 4	72 hours
MSL 3	168 hours
MSL 2A	4 weeks
MSL 2	1 year
MSL 1	Unlimited at 30 °C/85 %RH

Ordering Information

The ordering number consists of the part number followed by a suffix that indicates the packing method. For details and availability, consult your Renesas local sales representative.

Table 13: Ordering Information (Samples)

Part Number	Size (mm)	Shipment Form	Pack Quantity	MOQ
DA14535MOD-00F0100C	12.5 x 14.5 x 2.8	Reel	100	3

Table 14: Ordering Information (Production)

Part Number	Size (mm)	Shipment Form	Pack Quantity	MOQ
DA14535MOD-00F01002	12.5 x 14.5 x 2.8	Reel	1000	1

Regulatory Information

This section outlines the regulatory information for the DA14535 SmartBond TINYTM Module. The module is certified for the global market. This facilitates the market entry of the end product. Note that the end product would need to apply for the end product certification, however, the module certification listed below will facilitate that procedure.

When the user sends the end product to those markets, the end product may need to follow additional requirements according to the specific market regulation. For example, some markets have additional testing and/or certification like Korea EMC, South Africa SABS EMC and some have the requirement to put on the end product label a modular approval ID or mark that consists of an approved Bluetooth® Low Energy modular ID on host label directly, like Japan, Taiwan, Brazil.

A list of the Conformance Standards that the DA14535 SmartBond TINYTM Module meets is shown in Table 15.

Table 15: Standards Conformance

Area	Item	Service	Standard	Certificate ID
Global	Safety for module	CB	IEC 62368-1:2018	CERTIFICATION IN PROGRESS Note 1
Europe	Wireless	RED	EN 300 328 v2.2.2 EN 62479:2010	CERTIFICATION IN PROGRESS
	Safety for module	CE	EN IEC 62368-1: 2020+A11: 2020	
	EMC	RED	EN 301 489-1 v2.2.3 EN 301 489-17 v3.2.4	
UK	Wireless	UKCA-RED	EN 300 328 v2.2.2 EN 62479:2010	CERTIFICATION IN PROGRESS
	Safety for module	UKCA-LVD	BS EN IEC 62368-1: 2020+A11: 2020	
	EMC	UKCA-RED	EN 301 489-1 V2.2.3 EN 301 489-17 V3.2.4	
US/CA	Wireless	FCC ID	47 CFR PART 15 Subpart C: 2021 section 15.247	Y82-DA14535MOD
		IC ID	RSS-247 Issue 2: February 2017 RSS-Gen Issue 5: April 2018+A1: March 2019+A2: February 2021	9576A-DA14535MOD
Japan	Wireless	MIC	JRL	012-230026
Taiwan	Wireless	NCC	LP0002	CERTIFICATION IN PROGRESS

South Korea	Wireless	MSIP	■■■■■■ KS X 3123 “■■ ■■ ■■■ ■■ ■ ■ ■■” KN 301 489	R-R-8DL-DA14535MOD
South Africa	Wireless	ICASA	Based on RED	CERTIFICATION IN PROGRESS
Brazil	Wireless	Anatel	ATO No.14448/2017 Resolution No.680	CERTIFICATION IN PROGRESS
China	Wireless	SRRC	2002 353	CERTIFICATION IN PROGRESS
Thailand	Wireless	NBTC	NBTC TS 1035-2562	CERTIFICATION IN PROGRESS
India	Wireless	WPC	Based on RED	CERTIFICATION IN PROGRESS
Australia/ New Zealand	Wireless	ACMA	Based on RED	CERTIFICATION IN PROGRESS

Note 1
Include national differences of the US/Canada/Japan/China/Korea/Europe/Australia/South Africa/Taiwan/Brazil/Thailand.

CE (Radio Equipment Directive 2014/53/EU (RED)) – (Europe)
The DA14535 SmartBond TINYTM Module is a Radio Equipment Directive (RED) assessed radio that is CE marked. The module has been manufactured and tested with the intention of being a subassembly to a final product. The module has been tested to RED 2014/53/EU Essential Requirements for Health, Safety, and Radio. The applicable standards are:

- **Radio:** EN 300 328 V2.2.2 (2019-07)
- **Health:** (SAR) EN 62479:2010
- **Safety:** EN 62368-1
- **EMC:** EN 301 489-1 v2.2.3, EN 301 489-17 v3.2.4

End product will need to perform the radio EMC tests according to EN 301 489. The conducted tests can be inherited from the module test report. It is recommended to repeat the EN 300 328 radiated testing with the end product assembly.

FCC – (U.S.A.)
Model no. DA14535MOD-00F0100

FCC ID: Y82-DA14535MOD

List of Applicable FCC Rules
The module complies with FCC Part 15.247.

Summarize the Specific Operational Use Conditions
The module has been certified for Portable applications. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Limited Module Procedures

- Not applicable.

Trace Antenna Designs

- Not applicable.

RF Exposure Considerations
This equipment complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

Antennas

Type	Gain	Impedance	Application
PCB Antenna	-0.5 dBi	50Ω	Fixed

The antenna is permanently attached, can't be replaced.

Label and Compliance Information

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

Note 2 This device must accept any interference received, including interference that may cause undesired operation.

Note
The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or c hanges to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

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

Note
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to par t 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference i n a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not in stalled 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 o ff 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.

The system integrator must place an exterior label on the outside of the final product housing the DA14535MOD-00F0100 Module. Below are the contents that must be included on this label.

OEM Labeling Requirements:

Notice
The OEM must make sure that FCC labeling requirements are met. This includes a clearly visible exterior label on the outside of the final product housing that displays the contents shown in below:

- **Model:** DA14535MOD-00F0100
- **Contains FCC ID:** Y82-DA14535MOD

Information on test modes and additional testing requirements:
When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements. In setting up the configurations, if the pairing and call box options for testing does not work, then the host product manufacturer should coordinate with the module manufacturer for access to test mode software.

Additional testing, Part 15 Subpart B disclaimer:
The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) list on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuity.

IC (Canada)

- **Model no.** DA14535MOD-00F0100
- **IC ID:** 9576A-DA14535MOD

The DA14535 SmartBond TINYTM Module is certified for the IC as a single-modular transmitter. The 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.

The module has been tested according to the following standards:

- **Radio:** RSS-247 Issue 2: February 2017, RSS-Gen Issue 5: April 2018+A1: March 2019+A2: February 2021
- **Health:** RSS-102 Issue 5:2015

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

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

RF Exposure Statement
This device complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM Responsibilities to comply with IC Regulations
OEM integrator is responsible for testing their end product for any additional compliance requirements needed for the module installation like IC ES003 (EMC). This can be combined with the FCC Part 15B test.

End product labeling
The DA14535 SmartBond TINYTM Module is labeled with its own IC ID: 9576A-DA14535MOD. If the IC ID is not visible when the module is installed inside another device, then the host product must be labelled to display the ISED certification number for the module, preceded by the word "contains" or similar wording expressing the same meaning, as follows: Contains IC: 9576A-DA14535MOD."

UKCA (UK)

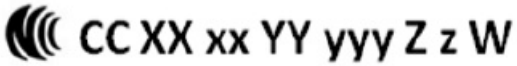
UKCA ID: CERTIFICATION PENDING
The module has been tested and found to comply with the standards harmonized with the regulations listed below according to UKCA-Radio Equipment Regulations 2017-CHAPTER 1 6(1)(a) Health, 6(1)(b) & 6(2).

The applicable standards are:

- **Radio:** EN 300 328 V2.2.2 (2019-07)
- **Health:** (SAR) EN 62479:2010
- **Safety:** EN 62368-1:2018, BS EN IEC 62368-1: 2020+A11: 2020
- **EMC:** EN 301 489-1 v2.2.3, EN 301 489-17 v3.2.4

End-product will need to perform the radio EMC tests according to EN 301 489. The conducted tests can be inherited from the module test report. It is recommended to repeat the EN 300 328 radiated testing with the end product assembly.

NCC (Taiwan)
NCC ID: CERTIFICATION PENDING



The DA14535 SmartBond TINYTM Module has received compliance approval in accordance with the Telecommunications Act. The module has been tested according to the following standard:

- **Radio:** Low Power Radio Frequency Devices Technical Regulations (LP0002)

End product may need to follow additional requirements according to the regulation EMC.

End product labeling
The NCC ID can be applied directly to the end product's label.

MSIP (South Korea)

- **Model no.** DA14535MOD-00F0100
- **MSIP ID:** R-R-8DL-DA14535MOD

DA14535 SmartBond TINYTM Module has received certification of conformity in accordance with Radio Waves Act. The module has been tested according to the following standard:

- **Radio:** Ministry of Science and ICT Notice No. 2019-105

For the end product wireless test, you can refer to Renesas' own certification report so that the lab knows the module itself has passed although it still needs to be tested.

- **Additionally, EMC for wireless (KN301489).**

End product labeling
The MSIP ID can be applied directly to the end product's label. The ID should be clearly visible on the final end product. The integrator of the module should refer to the labeling requirements for Korea available on the Korea Communications Commission (KCC) website.

ICASA (South Africa)
South Africa certification is based on RED(CE) approval.

Approval is granted to print labels for the products as described below:

1. For use as Label on the product size: 80 mm (W) X 40 mm (H). To be printed on the product.
2. For use as Label on the package size: 80 mm (W) X 40 mm (H). To be printed on the package.

End product may need to follow additional requirements according to the regulation EMC.

ANATEL (Brazil)

- **Model no.** DA14535MOD-00F0100
- **ANATEL ID:** CERTIFICATION PENDING

The module has been tested and found to be compliant according to the following Category II standards:

- ATO (Act) No 14448/2017

End product may need to follow additional requirements according to the regulation EMC.
“Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
Translation of the text:
“This equipment is not entitled to protection against harmful interference and must not cause interference in duly authorized systems.”

SRRC (China)

Model no. DA14535MOD-00F0100

- **CMIIT ID:** CERTIFICATION PENDING

The module has been tested and found to be compliant according to the following standards:

End product may need to follow additional requirements according to the regulation EMC.

MIC (Japan)

- **Model no.** DA14535MOD-00F0100
- **MIC ID:** 012-230026

The DA14535 SmartBond TINYTM Module has received type certification as required to conform to the technical standards regulated by the Ministry of Internal Affairs and Communications (MIC) of Japan pursuant to the Radio Act of Japan.

The module has been tested according to the following standard:

- **Radio:** JRL “Article 49-20 and the relevant articles of the Ordinance Regulating Radio” Equipment End product may need to follow additional requirements according to the regulation EMC.

End product labeling
The MIC ID can be applied directly to the end product’s label. The end product may bear the GITEKI mark and certification number so that is clear that the end product contains a certified radio module. The following note may be shown next to, below, or above the GITEKI mark and certification number in order to indicate the presence of a certified radio module:

SmartBond TINY Bluetooth® LE Module
Translation of the text:
“This equipment contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Radio Law.”

NBTC (Thailand)

- **Model no.** DA14535MOD-00F0100
- **NBTC SDoC ID:** CERTIFICATION PENDING

1. The DA14535 SmartBond TINYTM Module is compliant with NBTC requirements in Thailand.
2. End product may need to follow additional requirements according to the regulation EMC.

End product labeling
End products will have their own ID and labeling requirements.

WPC (India)

- **Model no.** DA14535MOD-00F0100
- **Registration No:** CERTIFICATION PENDING
    - India certification is based on RED(CE) approval/reports. There are no marking/labeling requirements.
    - End product may need to follow additional requirements according to the regulation EMC.

Australia/ New Zealand

- **Model no.** DA14535MOD-00F0100
- **Registration No:** CERTIFICATION PENDING

Revision History

Revision	Date	Description
1.0	22-Jun-2023	First release.
1.1	09-Aug-2023	Updated Key Features with maximum output power.
1.2	09-Sept-2023	Updated with regulatory information
1.3	22-Sept-2023	Updated regulatory information
1.4	26-Sept-2023	Updated regulatory information
1.5	28-Sept-2023	Updated marking with FCC, IC ID

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