

Renesas Design Netherlands B.V.

TEST REPORT

SCOPE OF WORK

RF EXPOSURE EVALUATION–DA14531MOD-00F0100

REPORT NUMBER

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Intertek Report No: : 230704193GZU-002

Test standards

EN 62479:2010

Sample Description

Product : DA14531 TINY Module
Model No. : DA14531MOD-00F0100
Electrical Rating : Input: 1.8VDC - 3.3VDC
Serial No. : Not Labeled
Date Received : 04 July 2023
Date Test : 04 July 2023 to 08 July 2023
Conducted

Prepared and Checked By



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1.0 TEST RESULT SUMMARY

RF Exposure Part for Tx & Rx				
Evaluation	Evaluation Requirement	Evaluation Method	Class / Severity	Result
RF Exposure	EN 62479	EN 62479	20 mW (13 dBm)	PASS

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2.0 Results Conclusion (with Justification)

RE: Protection of the Health Evaluation Pursuant to R&TTE Directive 1999/5/EC Performed on the DA14531 TINY Module, Model: DA14531MOD-00F0100.

We tested the DA14531 TINY Module, Model: DA14531MOD-00F0100, to determine if it was in compliance with the relevant standards as marked on the Test Results Summary. We found that the unit met the requirement of EN 62479 standards when tested as received. The worst case's test data was presented in this test report.

The production units are required to conform to the initial sample as received when the units are placed on the market.

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3.0 LABORATORY MEASUREMENTS

Configuration Information

Operating Frequency	2402 MHz to 2480 MHz
Type of Modulation:	GFSK
Number of Channels	40 Channels
Channel Separation:	2 MHz
Antenna Type	Integral
Antenna gain:	-0.5 dBi
Speciality:	Bluetooth 5.1 with BLE (Bluetooth Low Energy)
Function:	Bluetooth 5.1 with BLE (Bluetooth Low Energy)
Power Supply:	DC 3.3V
Power cord:	N/A

EUT modulation and data packet during test:

The EUT has been tested on the Modulation of GFSK with 1 Mbps data rate.

Notes:

The measurements had been made in the operating mode producing the largest emission in the frequency band being investigated consistent with normal applications.

An attempt had been made to maximize the emission by varying the configuration of the EUT.

4.0 Test Specification in EN 62479

4.1 General Description of Applied Standard

EN 62479

Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

4.2 RF Exposure Evaluation

4.2.1 Low-power exclusion level

According to **EN 62479 clause 4.2**

Low-power electronic and electrical equipment is deemed to comply with the provisions of this standard if it can be demonstrated using routes B, C or D that the available antenna power and/or the average total radiated power is less than or equal to the applicable low-power exclusion level P_{max} .

Here:

$P_{max} = 20 \text{ mW}$ (13 dBm) according to ICNIRP guidelines and IEEE Std C95.1-2005 since the EUT is General public used.

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Example values of SAR-based Pmax for some cases described by ICNIRP, IEEE Std C95.1-1999 and IEEE Std C95.1-2005

Guideline / Standard	SAR limit, SARmax W/kg	Averaging mass, m g	Pmax mW	Exposure tier (a)	Region of body (a)
ICNIRP [1]	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs
	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs
IEEE Std C95.1-1999 [2]	1,6	1	1,6	Uncontrolled environment	Head, trunk, arms, legs
	4	10	40	Uncontrolled environment	Hands, wrists, feet and ankles
	8	1	8	Controlled environment	Head, trunk, arms, legs
	20	10	200	Controlled environment	Hands, wrists, feet and ankles
IEEE Std C95.1-2005 [3]	2	10	20	Action level	Body except extremities and pinnae
	4	10	40	Action level	Extremities and pinnae
	10	10	100	Controlled environment	Body except extremities and pinnae
	20	10	200	Controlled environment	Extremities and pinnae
(a) Consult the appropriate standard for more information and definitions of terms.					

Note:

Routes B The input power level to electrical or electronic components that are capable of radiating electromagnetic energy in the relevant frequency range is so low that the available antenna power and/or the average total radiated power cannot exceed the low-power exclusion level.

Routes C The available antenna power and/or the average total radiated power are limited by product standards for transmitters to levels below the low-power exclusion level.

Routes D Measurements or calculations show that the available antenna power and/or the average total radiated power are below the low-power exclusion level.

4.2.2 Test Data and Test result

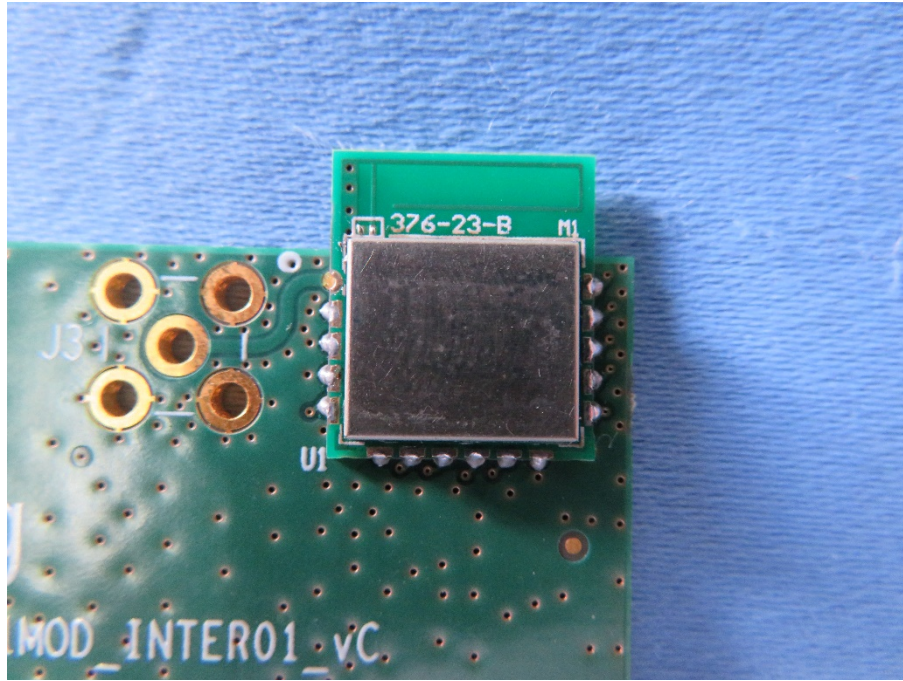
Frequency(MHz)	Measuring Bandwidth	EIRP Level (dBm)	EIRP limit(dBm)
2402	1.131109 MHz	2.1	13
2440	1.131109 MHz	2.0	13
2480	1.131109 MHz	2.1	13

Based on above test data, we do not need to conduct SAR measurement.

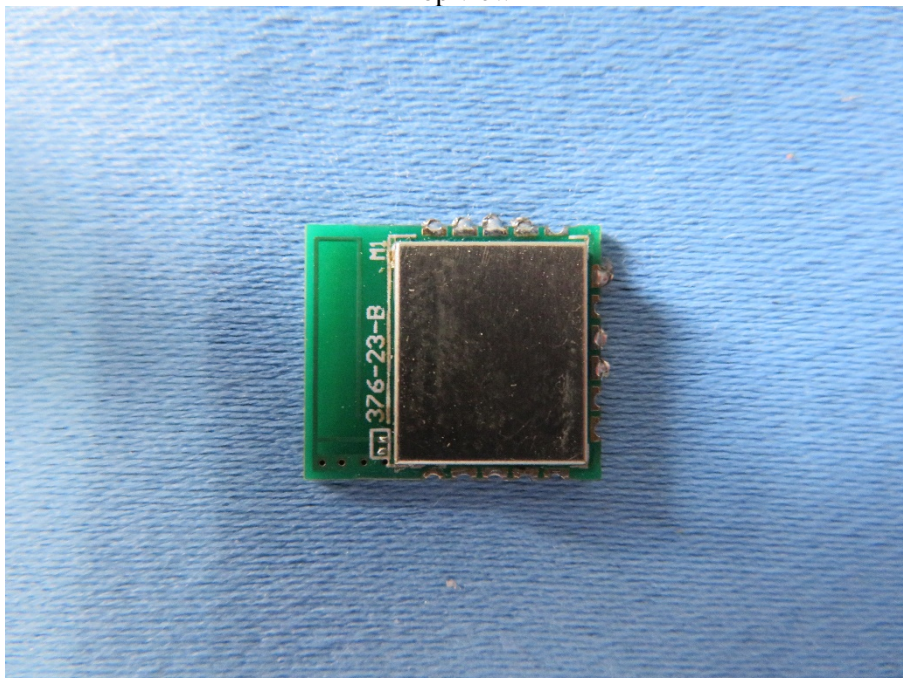
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5.0 Appendix I – Photos of EUT

Overall view

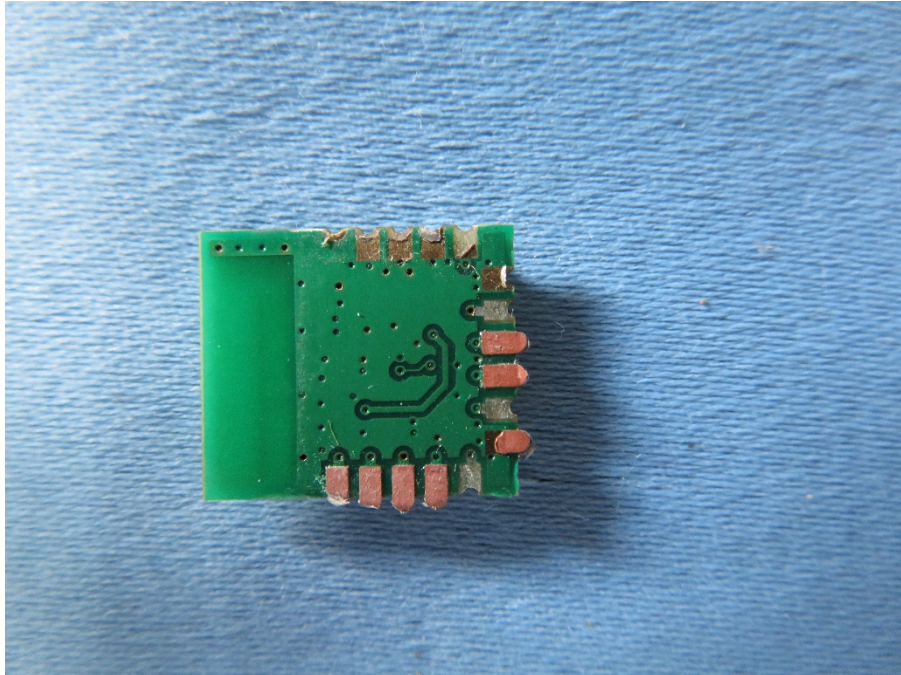


Top view

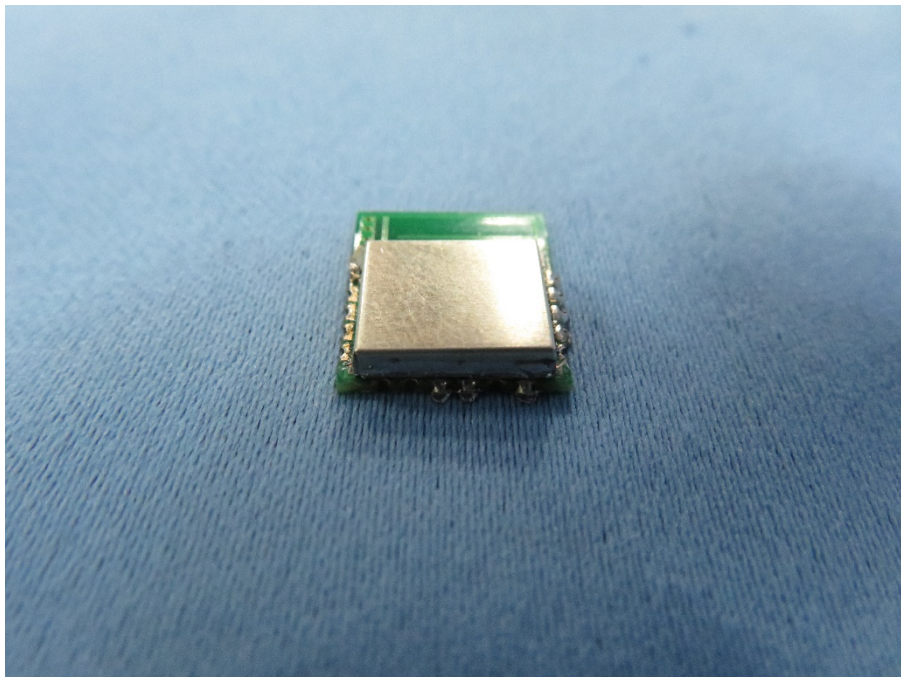


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Back view

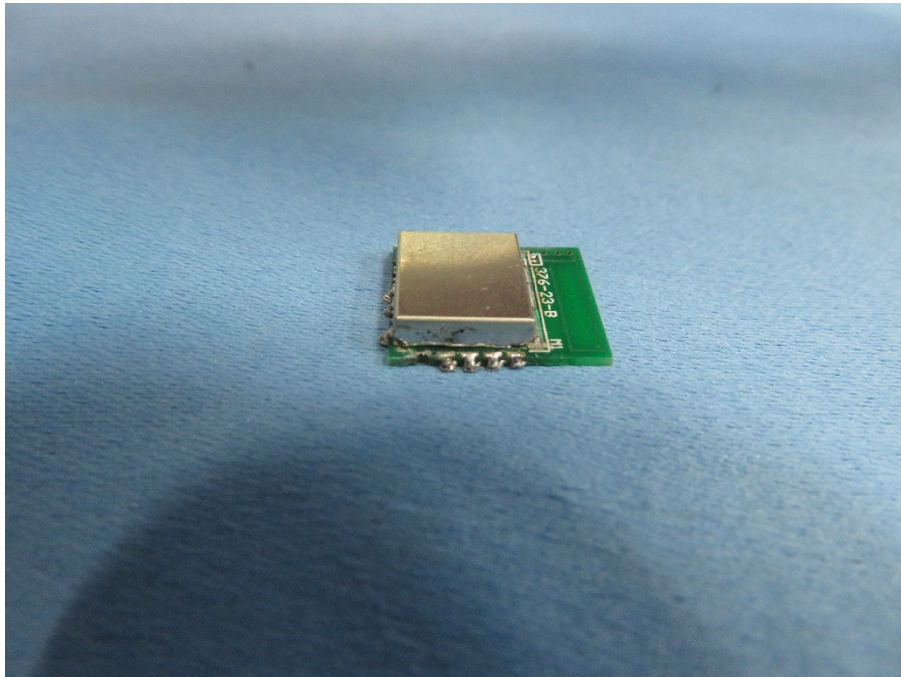


Side view

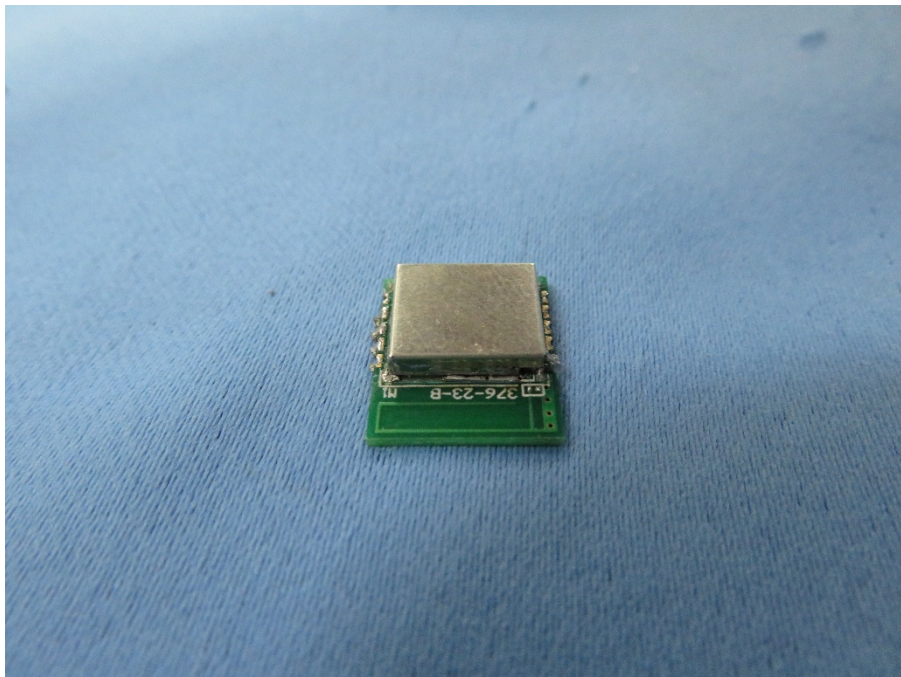


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Side view

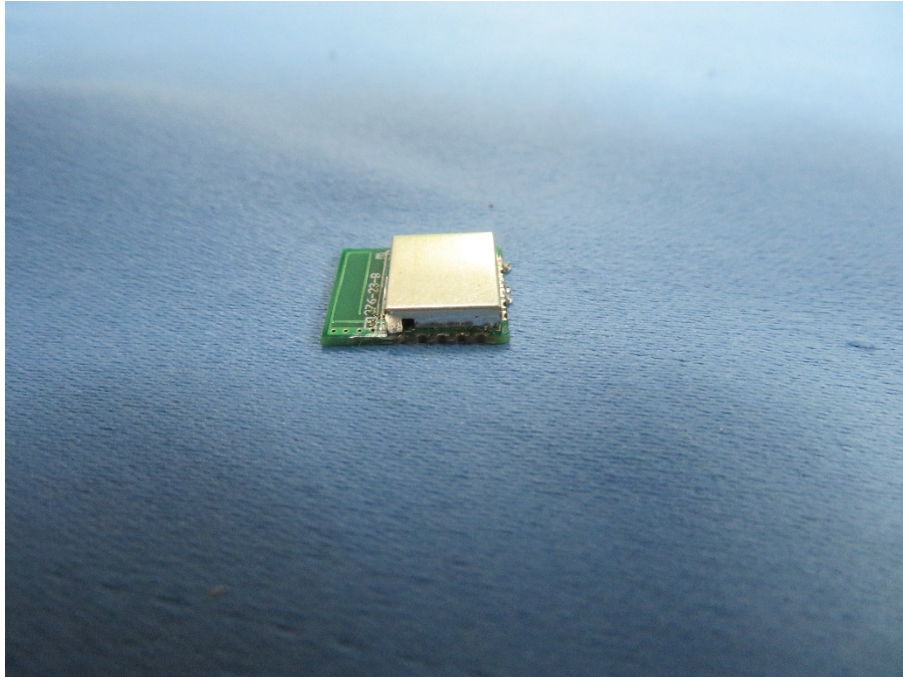


Side view

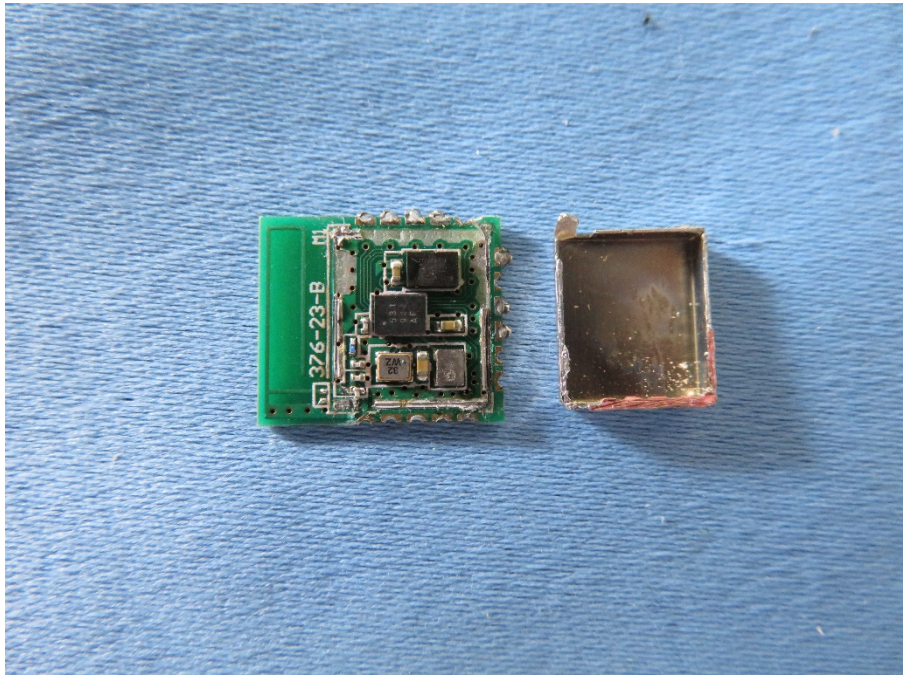


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Side view

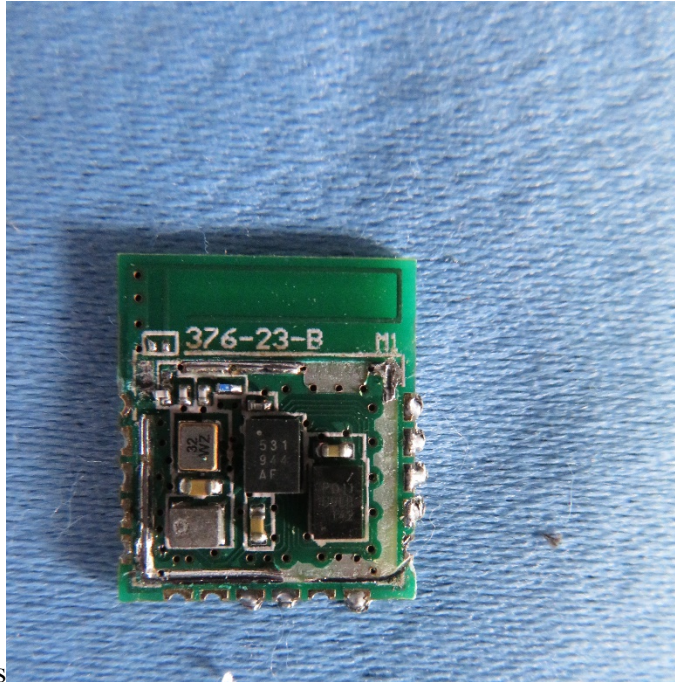


Internal view



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Internal view



*****End of the test report*****