

Renesas Design Netherlands B.V.

TEST REPORT

SCOPE OF WORK

RF EXPOSURE EVALUATION-DA14531MOD-00F0100

REPORT NUMBER

230704199GZU-002

ISSUE DATE

04 September 2023

[REVISED DATE]

[-----]

PAGES

12

DOCUMENT CONTROL NUMBER

EN 62479:2010-b

© 2017 INTERTEK



TEST REPORT

Applicant Name & : Renesas Design Netherlands B.V.
Address : Het Zuiderkruis 53, 's-Hertogenbosch, 5215 MV, THE NETHERLANDS
Manufacturer : Same as applicant
Manufacturing Site : STARS Microelectronics (Thailand) Public Co.,Ltd.
Bang Pa-In Industrial Estate (I-EA-T Free Zone), 605-606 Moo2,
Klongjig, Bang Pa-In, Ayutthaya 13160, Thailand
Intertek Report No: : 230704199GZU-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



Dean Liu
Project Engineer

Approved By:



Strong Yao
Manager

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Room 02, & 101/E201/E301/E401/E501/E601/E701/E801 of Room 01 1-8/F., No. 7-2. Caipin Road, Science City, GETDD, Guangzhou,
Guangdong, China

TEST REPORT

CONTENT

TEST REPORT	1
CONTENT	3
1.0 TEST RESULT SUMMARY	4
2.0 RESULTS CONCLUSION (WITH JUSTIFICATION)	5
3.0 LABORATORY MEASUREMENTS	6
4.0 TEST SPECIFICATION IN EN 62479	6
4.1 GENERAL DESCRIPTION OF APPLIED STANDARD	6
4.2 RF EXPOSURE EVALUATION	6
4.2.1 <i>Low-power exclusion level</i>	6
4.2.2 <i>Test Data and Test result</i>	7
5.0 APPENDIX I – PHOTOS OF EUT	8

TEST REPORT

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

TEST REPORT

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.

TEST REPORT

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.

TEST REPORT

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

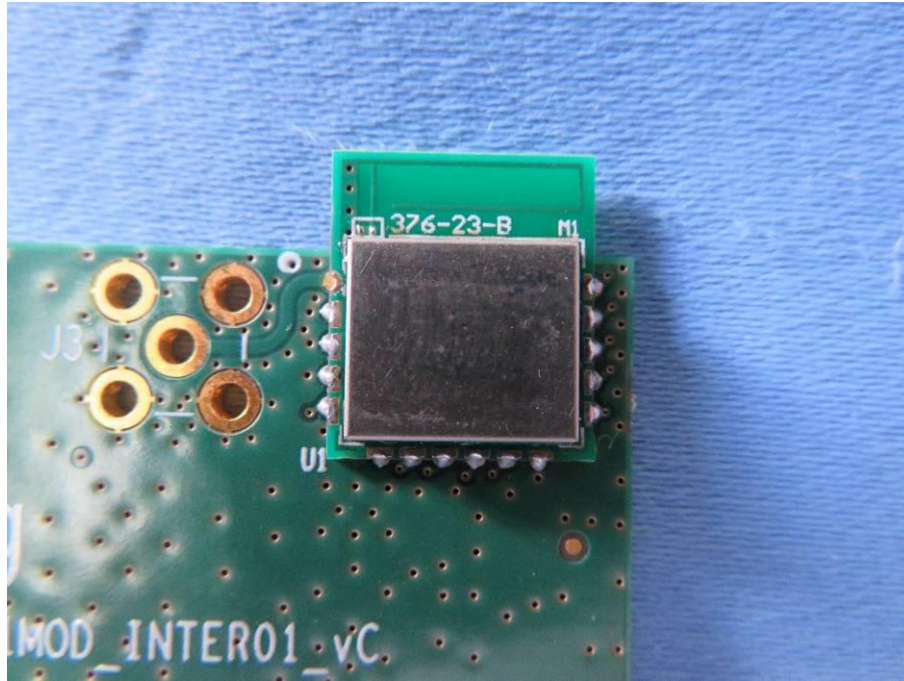
Frequency(MHz)	Measuring Bandwidth	EIRP Level (dBm)	EIRP limit(dBm)
2402	1.131109 MHz	2.1	13
2440	1.131109 MHz	2.0	13
2480	1.131109 MHz	2.1	13

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

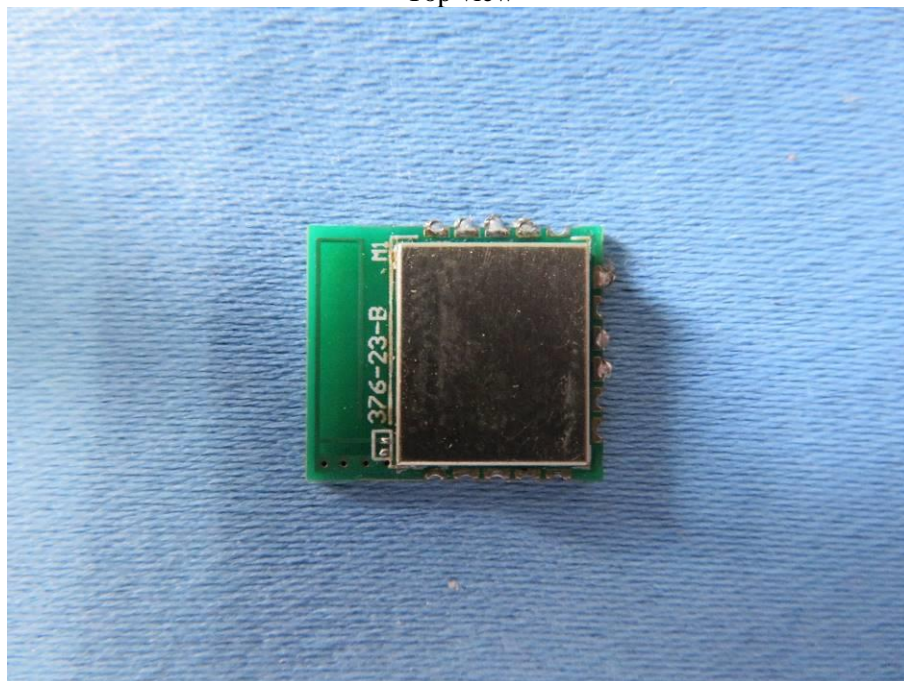
TEST REPORT

5.0 Appendix I – Photos of EUT

Overall view

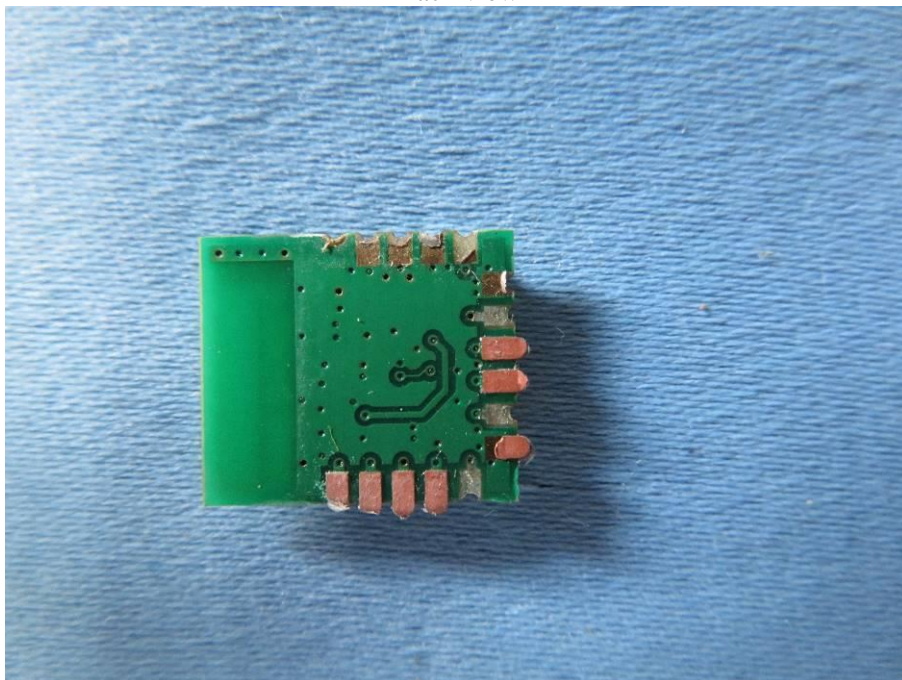


Top view

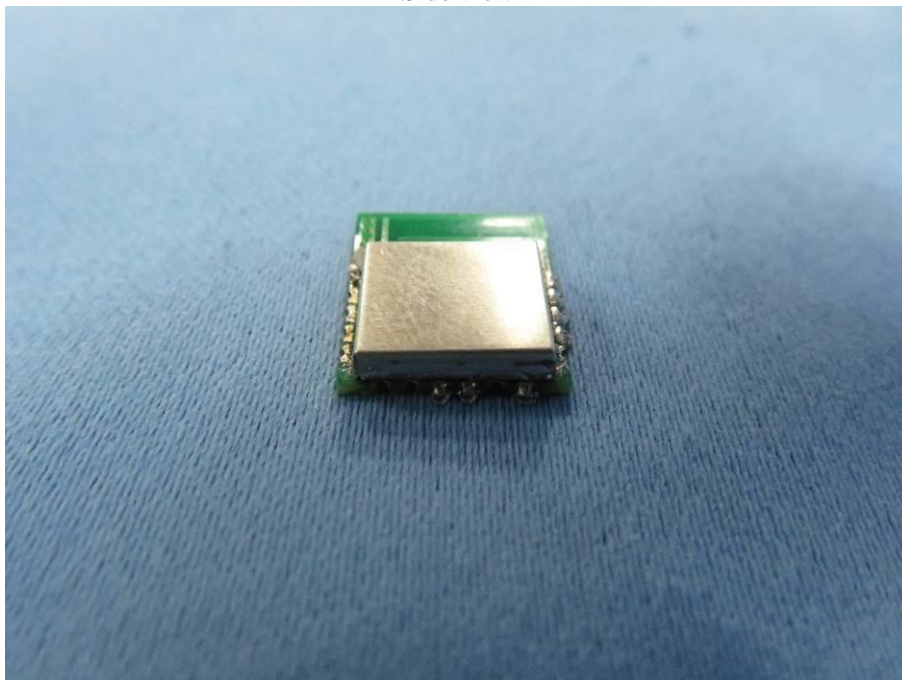


TEST REPORT

Back view

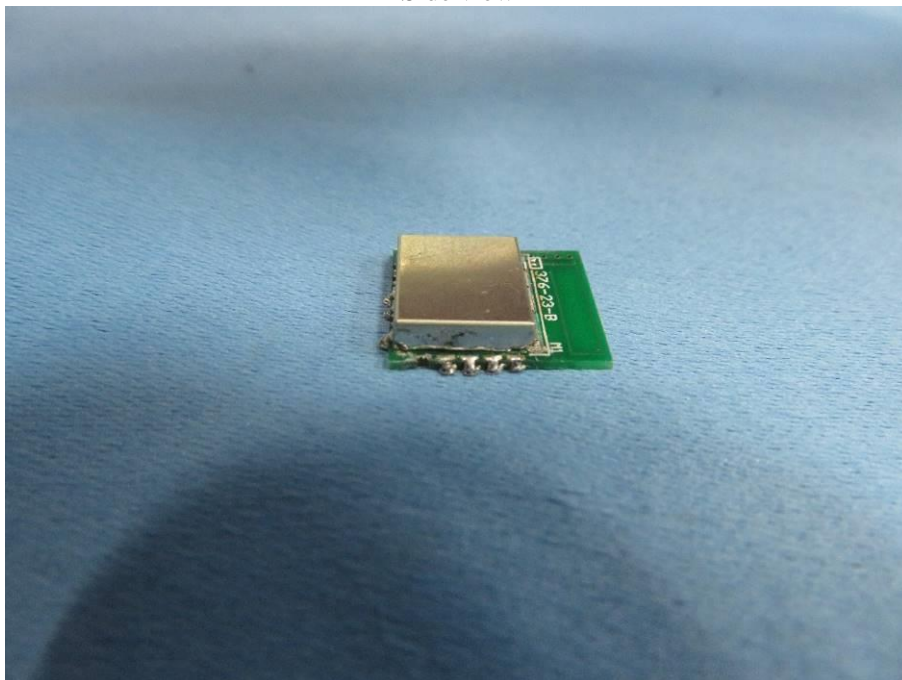


Side view



TEST REPORT

Side view

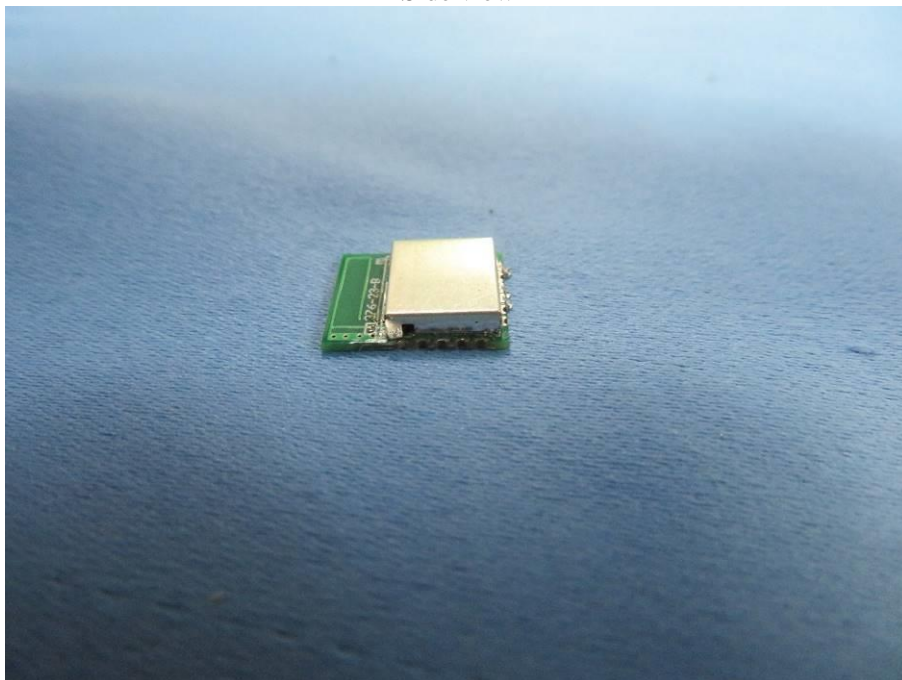


Side view

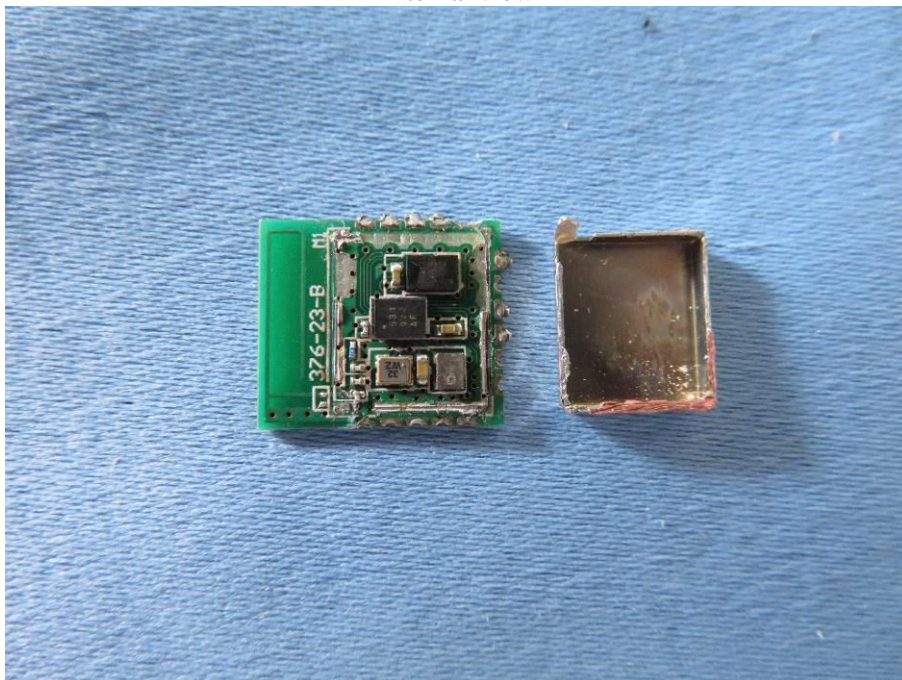


TEST REPORT

Side view

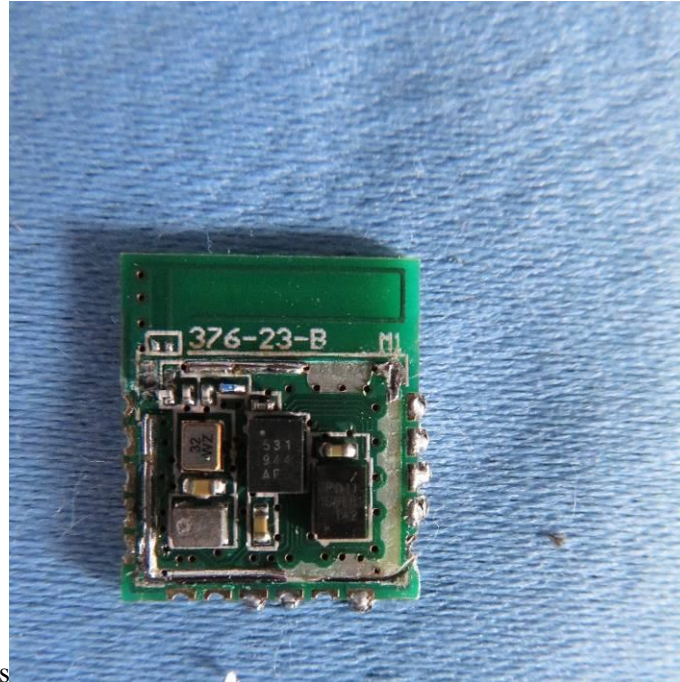


Internal view



TEST REPORT

Internal view



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