

EMF TEST REPORT

Test Report No. : OT-24D-RWD-015
Reception No. : 2410003560
Applicant : RANIX Inc.
Address : RANIX Bldg. 25, Eonju-ro 135-gil, Gangnam-gu, Seoul, Korea
Manufacturer : RANIX Inc.
Address : RANIX Bldg. 25, Eonju-ro 135-gil, Gangnam-gu, Seoul, Korea
Type of Equipment : Motion detection sensor module
FCC ID : 2BMJL-RMR051B
Model Name : RMR051B
Multiple Model Name : N/A
Serial number : N/A
Total page of Report : 7 pages (including this page)
Date of Incoming : November 13, 2024
Date of Issuing : December 04, 2024

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART C Section 15.249**

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.





Tested by
 Su-Min, You / Project Engineer
 ONETECH Corp.

Reviewed by
 Tae-Ho, Kim / Chief Engineer
 ONETECH Corp.

Approved by
 Jae-Ho, Lee / Chief Engineer
 ONETECH Corp.

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-24D-RWD-015	December 04, 2024	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : RANIX Inc.
 Address : RANIX Bldg. 25, Eonju-ro 135-gil, Gangnam-gu, Seoul, Korea
 Contact Person : Byung-Hyun Kim / Manager
 Telephone No. : +82-2-584-5516
 FCC ID : 2BMJL-RMR051B
 Model Name : RMR051B
 Brand Name : -
 Serial Number : N/A
 Date : December 04, 2024

DEVICE TYPE	DXX – Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	Motion detection sensor module
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC CFR47 Part 15 Subpart C Section 15.249
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. GENERAL INFORMATION

2.1 Product Description

The RANIX Inc., Model RMR051B (referred to as the EUT in this report) is an Motion detection sensor module, Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Motion detection sensor module
OPERATING FREQUENCY	5 848.5 MHz
Field Strength of Fundamental	91.85 dB μ V/m
ANTENNA TYPE	Patch Antenna
ANTENNA GAIN	3 dBi

2.2 Alternative type(s)/model(s); also covered by this test report.

-. None

3. EUT MODIFICATIONS

-. None

4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are $f/1500$ mW/cm² for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$$E = \sqrt{(30 * P * G) / d}, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric field strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (377 * 10 S)}$$

Changing to units of mW and cm, using $P \text{ (mW)} = P \text{ (W)} / 1\,000$, $d \text{ (cm)} = 0.01 * d \text{ (m)}$

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

4.2 EUT Description

Kind of EUT	Motion detection sensor module
MAX. RF OUTPUT POWER	91.85 dB μ V/m
Device Category	☐ Portable (< 20 cm separation) ☒ Mobile (> 20 cm separation) ☐ Others
Exposure Evaluation Applied	☒ MPE ☐ SAR ☐ N/A

4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. Band (MHz)	Target Power W/tolerance (dBm)	Max tune up power		Safe Distance (cm)	Power Density (mW/cm ²) @ 20 cm Separation	Limit (mW/cm ²)
		(dBm)	(mW)			
5 848.5	-3.35 ± 1.0	-2.35	0.58	0.22	0.000 116	1.00

$$E.I.R.P(dBm) = 91.85 - 95.2 = -3.35 \text{ dBm}$$

According to above table, for 5 848.5 MHz, safe distance,

$$D = 0.282 * \sqrt{0.58/1.00} = 0.22 \text{ cm.}$$

For getting power density at 20 cm separation in above table, following formula was used.

$$S = P * G / (4\pi * R^2) = 0.58 / (4 * \pi * 20^2) = 0.000 116$$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna