



RF Exposure Evaluation Declaration

FCC ID: 2AHXJ-ULTRASENSOR

Applicant: Mopeka Products, LLC

Product: LEVEL SENSOR

Model No.: M1015

Brand Name: MOPEKA

FCC Rule Part(s): FCC Part 2.1091

Result: Complies

Reviewed By:

Jame Yuan

Approved By:

Robin Wu



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2204RSU025-U2	Rev. 01	Initial Report	2022-05-25	Valid

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1. General Information

1.1. Applicant

Mopeka Products, LLC
1223 Industrial St, Suite A, New Braunfels, TX 78130

1.2. Manufacturer

Hangzhou Jinmai Technologies Co., Ltd.
Bld. 22, No. 189 HongCan Road, Xiaoshan Economic & Technological Development District, Hangzhou,
China

1.3. Product Information

Product Name	LEVEL SENSOR
Model No.	M1015
Brand Name	MOPEKA
Bluetooth Specification	BLE only, v4.0
Integrated Wireless Module	Product Name: IOT Module Model: nRF9160 FCC ID: 2ANPO00NRF9160
Antenna Information	Refer to Section 1.4
Power Supply	2*AA battery
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.4. Antenna Details

Mode	Antenna Type	Frequency Band (MHz)	Max Peak Gain (dBi)
Bluetooth	PCB	2402 ~ 2480	2.254
Cat-M1/NB1 Band 2	Dipole	1850 ~ 1910	2.254
Cat-M1/NB1 Band 4		1710 ~ 1755	5.349
Cat-M1/NB1 Band 5		824 ~ 849	3.652
Cat-M1/NB1 Band 12		699 ~ 716	2.712
Cat-M1/NB1 Band 13		777 ~ 787	1.023
Cat-M1 Band 14		788 ~ 798	1.023
Cat-M1/NB1 Band 17		704 ~ 716	1.023
Cat-M1/NB1 Band 25		1850 ~ 1915	1.023
Cat-M1/NB1 Band 26		814 ~ 849	5.349
Cat-M1/NB1 Band 66		1710 ~ 1780	2.712

Note: Bluetooth and LTE cannot transmit simultaneous, as declared by the manufacturer.

2. RF Exposure Evaluation

2.1. Exemption Thresholds

Per § 1.1307(b)(3)(i)(B), a single RF source is considered an RF exempt device if its available maximum time-averaged (matched conducted) power or its effective radiated power (ERP), whichever is greater, are less than or the threshold P_{th} (mW) described in the following formula.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

2.2. Test Result

Product	LEVEL SENSOR
Test Item	RF Exposure Evaluation

Mode	Frequency Band (MHz)	Max. Conducted Power (dBm)	Max. Tune-up Conducted Power (dBm)	Max. Antenna Gain (dBi)	Max. conducted power or ERP		Exclusion Threshold (mW) @ 20cm
					dBm	mW	
Bluetooth-LE	2402 ~ 2480	2.82	3.0	2.254	3.104	2.044	< 3060
Cat-M1/NB1 B2	1850 ~ 1910	23.0	24.0	5.349	27.199	524.687	< 3060
Cat-M1/NB1 B4	1710 ~ 1755	23.0	24.0	3.652	25.502	354.977	< 3060
Cat-M1/NB1 B5	824 ~ 849	23.0	24.0	2.712	24.562	285.891	< 1681
Cat-M1/NB1 B12	699 ~ 716	23.0	24.0	1.023	24.000	251.189	< 1426
Cat-M1/NB1 B13	777 ~ 787	23.0	24.0	1.023	24.000	251.189	< 1585
Cat-M1 B14	788 ~ 798	23.0	24.0	1.023	24.000	251.189	< 1608
Cat-M1/NB1 B17	704 ~ 716	23.0	24.0	1.023	24.000	251.189	< 1436
Cat-M1/NB1 B25	1850 ~ 1915	23.0	24.0	5.349	27.199	524.687	< 3060
Cat-M1/NB1 B26	814 ~ 849	23.0	24.0	2.712	24.562	285.891	< 1661
Cat-M1/NB1 B66	1710 ~ 1780	23.0	24.0	3.887	25.737	374.714	< 3060

Note: Max EIRP = Max turn-up conducted power (dBm) + Max. Antenna Gain (dBi).

Max ERP = Max EIRP - 2.15dB.

CONCLUSION:

Bluetooth and LTE can't transmit simultaneously.

Therefore, the device qualifies for RF exposure test exemption.

The End