

RF Exposure Exemption

Applicant : Bionime Corporation

Product Name : BLE Module

Trade Name : BIONIME

Model Number : BM300

Applicable Standard : 47 CFR § 2.1091

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Approved By : _____

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Note:

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Revision History

Rev.	Issued Date	Revisions	Revised By
00	Jan. 17, 2023	Initial Issue	Abby Hsu

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1. General Information

1.1 Reference Applicable Standard

Standard	Description	Version
IEEE C95.1	American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York.	1992
47 CFR § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.	-
47 CFR § 1.1310	Radiofrequency radiation exposure limits.	-
KDB 447498 D04	RF exposure procedures and equipment authorization policies for mobile and portable devices	v01

1.2 Testing Location

Site Name: Site Name: Eurofins E&E Wireless Taiwan Co., Ltd.

Site Address: ☒ No. 140-1, Changan Street, Bade District, Taoyuan City 334025, Taiwan (R.O.C.)

Site Address: ☐ No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)

2. Description of Equipment under Test (EUT)

Applicant	Bionime Corporation No. 100, Sec. 2, Daqing Street, South Dist., Taichung City
Manufacturer	Bionime Corporation No. 100, Sec. 2, Daqing Street, South Dist., Taichung City
Product Name	BLE Module
Trade Name	BIONIME
Model Number	BM300
FCC ID	ADU-BM300A
Frequency Range	Bluetooth : 2402 - 2480 MHz
Supported Modulations	Bluetooth : LE

Note:

The above information of DUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Antenna Information			
Model	Type	Frequency	Max. Gain (dBi)
AT5020-B2R8HAA	Multilayer Chip Antenna	2400 MHz ~ 2500 MHz	0

3. RF Exposure Limit

For devices that operate at larger distances from persons, where there are minimal RF coupling interactions between a device and the user or nearby persons, RF exposure compliance using maximum permissible exposure (MPE) limits is applied. The limits for MPE is listed as below:

Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824 / f	2.19 / f	(180 / f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	F / 1,500	30
1,500-100,000	-	-	1.0	30
Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1,842 / f	4.89 / f	(900 / f ²)*	6
30-300	61.4	0.163	1.0	6
300-1,500	-	-	F / 300	6
1,500-100,000	-	-	5	6

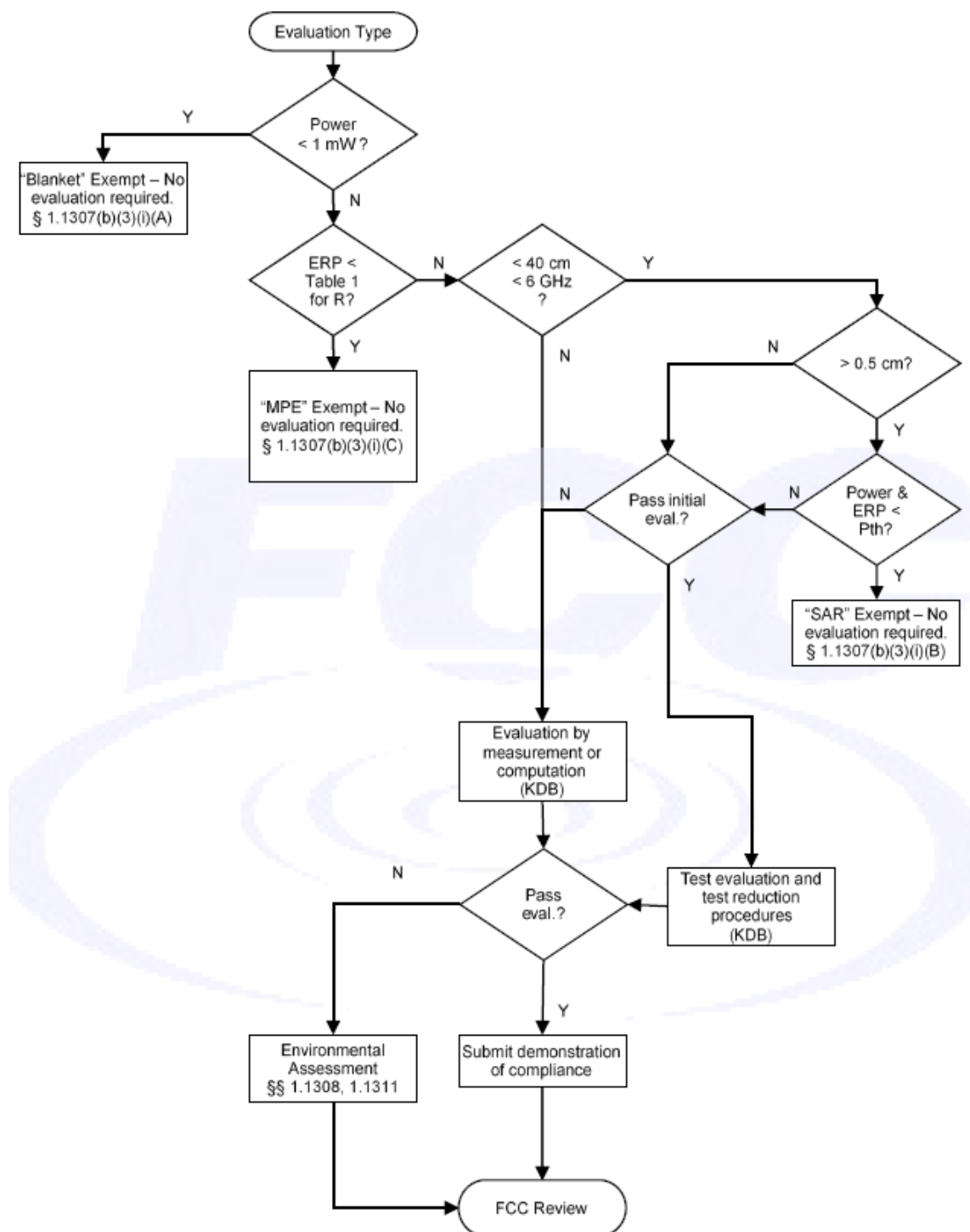
f = frequency in MHz. * = Plane-wave equivalent power density.

4. RF Exposure Assessment

4.1 Exemption Evaluation

Exemption evaluation was performed according to the appendix A and B in KDB447498 D04.

The General Sequence for Determination of Procedure demonstrated in Figure A.1 of KDB447498 D04 was applied.



4.2 Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons."

Exposure evaluation

$$S_{eip} = \frac{EIRP}{4\pi d^2} = \frac{PG}{4\pi d^2} (W / m^2)$$

Where

S: is the input power (W);

G: is the antenna gain;

d : is the distance between antennas and evaluation point (m).

5. Maximum Tune-up Power

Operate Band	Frequency (MHz)	ANT 0
Bluetooth	2402 - 2480	1.00

6. Test Result

Band	Frequency (MHz)	Distance (cm) [R]	Antenna	Tune-up Power (dBm)	Tune-up Power (mW)	ANT Gain (dBi)	ERP (W)	<§1.1307(b)(3)(i)(C)> Exemption Minimum Distance (m)	<§1.1307(b)(3)(i)(C)> Exemption Threshold ERP (W)	<§1.1307(b)(3)(i)(C)> Exemption considerations	<§1.1307(b)(3)(i)(C)> ERP / ERP _{th}
Bluetooth	2402 - 2480	20.00	ANT 0	1.00	1.26	0.00	0.001	0.020	0.008	Qualified	0.13

Note:

This device is qualified for exemption under §1.1307(b)(3)(i)(C).

7. Conclusion

The result shows that this device is qualified for MPE-Based Exemption in KDB 447498. Therefore, MPE testing is not required.

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