

## RF Exposure Exemption

Applicant : Grand Mate Co., Ltd  
 Product Name : Automatic Burner control  
 Trade Name : GRAND MATE  
 Model Number : GM9K3A-C-120VAC, GM9K3A-A-120VAC, GM9K3B-A-120VAC,  
 GM9K3C-A-120VAC, GM9K3D-A-120VAC, GM9K3B-C-120VAC,  
 GM9K3C-C-120VAC, GM9K3D-C-120VAC, GM9K3A-E-120VAC,  
 GM9K3B-E-120VAC, GM9K3C-E-120VAC, GM9K3D-E-120VAC,  
 GM9K3A-G-120VAC, GM9K3B-G-120VAC, GM9K3C-G-120VAC,  
 GM9K3D-G-120VAC, GM9K3A-I-120VAC, GM9K3B-I-120VAC,  
 GM9K3C-I-120VAC, GM9K3D-I-120VAC, GM9K3A-K-120VAC,  
 GM9K3B-K-120VAC, GM9K3C-K-120VAC, GM9K3D-K-120VAC,  
 GM9K3E, GM9K3F  
 Applicable Standard : 47 CFR § 2.1091  
 Received Date : May 17, 2022  
 Issue Date : Dec. 23, 2022

### Issued by

Approved By : \_\_\_\_\_

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Taiwan Accreditation Foundation accreditation number: 1330

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### Revision History

Rev.	Issued Date	Revisions	Revised By
00	Dec. 05, 2022	Initial Issue	Rowan Hsieh
01	Dec. 23, 2022	Update Model Number (P.1/P.5) Update chapter 2 (P.5)	Rowan Hsieh

# Contents

1.	General Information .....	4
2.	Description of Equipment under Test (EUT) .....	5
3.	RF Exposure Limit .....	6
4.	RF Exposure Assessment.....	7
5.	Maximum Tune-up Power .....	9
6.	Test Result .....	9
7.	Conclusion.....	9

## 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	Grand Mate Co., Ltd No.30, Lugong S. 2nd Rd., Lukang Township, Changhua County 50544, Taiwan
Manufacturer	Grand Mate Co., Ltd No.30, Lugong S. 2nd Rd., Lukang Township, Changhua County 50544, Taiwan
Product Name	Automatic Burner control
Trade Name	GRAND MATE
Model Number	GM9K3A-C-120VAC, GM9K3A-A-120VAC, GM9K3B-A-120VAC, GM9K3C-A-120VAC, GM9K3D-A-120VAC, GM9K3B-C-120VAC, GM9K3C-C-120VAC, GM9K3D-C-120VAC, GM9K3A-E-120VAC, GM9K3B-E-120VAC, GM9K3C-E-120VAC, GM9K3D-E-120VAC, GM9K3A-G-120VAC, GM9K3B-G-120VAC, GM9K3C-G-120VAC, GM9K3D-G-120VAC, GM9K3A-I-120VAC, GM9K3B-I-120VAC, GM9K3C-I-120VAC, GM9K3D-I-120VAC, GM9K3A-K-120VAC, GM9K3B-K-120VAC, GM9K3C-K-120VAC, GM9K3D-K-120VAC, GM9K3E, GM9K3F
Difference description of model number	This control module applied in gas burner control systems. The fire control function built in in Control Board (CB). The CB can work independent by adapter, but normally used combination of CB and PB (the powersupply by PB). The Power Board (PB) can output voltage of AC or DC to control loads.  The CB's code is 9K3X (X=A to G); PB's code is -Y (Y= A to J); Their combination code is GM9K3X-Y-ZVAC (Z= 120. They represent criterions of markets, 120=CSA )
FCC ID	UMPGM9K3
Frequency Range	Bluetooth : 2402 - 2480 MHz
Supported Modulations	Bluetooth : BR / EDR / LE
Device Category	Mobile

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)
RFANT3216120A5T	Chip Antenna	2400 ~ 2483.5 MHz	2

### 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 <sup>2</sup> )	Averaging Time E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824 / f	2.19 / f	(180 / f <sup>2</sup> )*	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 <sup>2</sup> )	Averaging Time E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1,842 / f	4.89 / f	(900 / f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1,500	-	-	F / 300	6
1,500-100,000	-	-	5	6

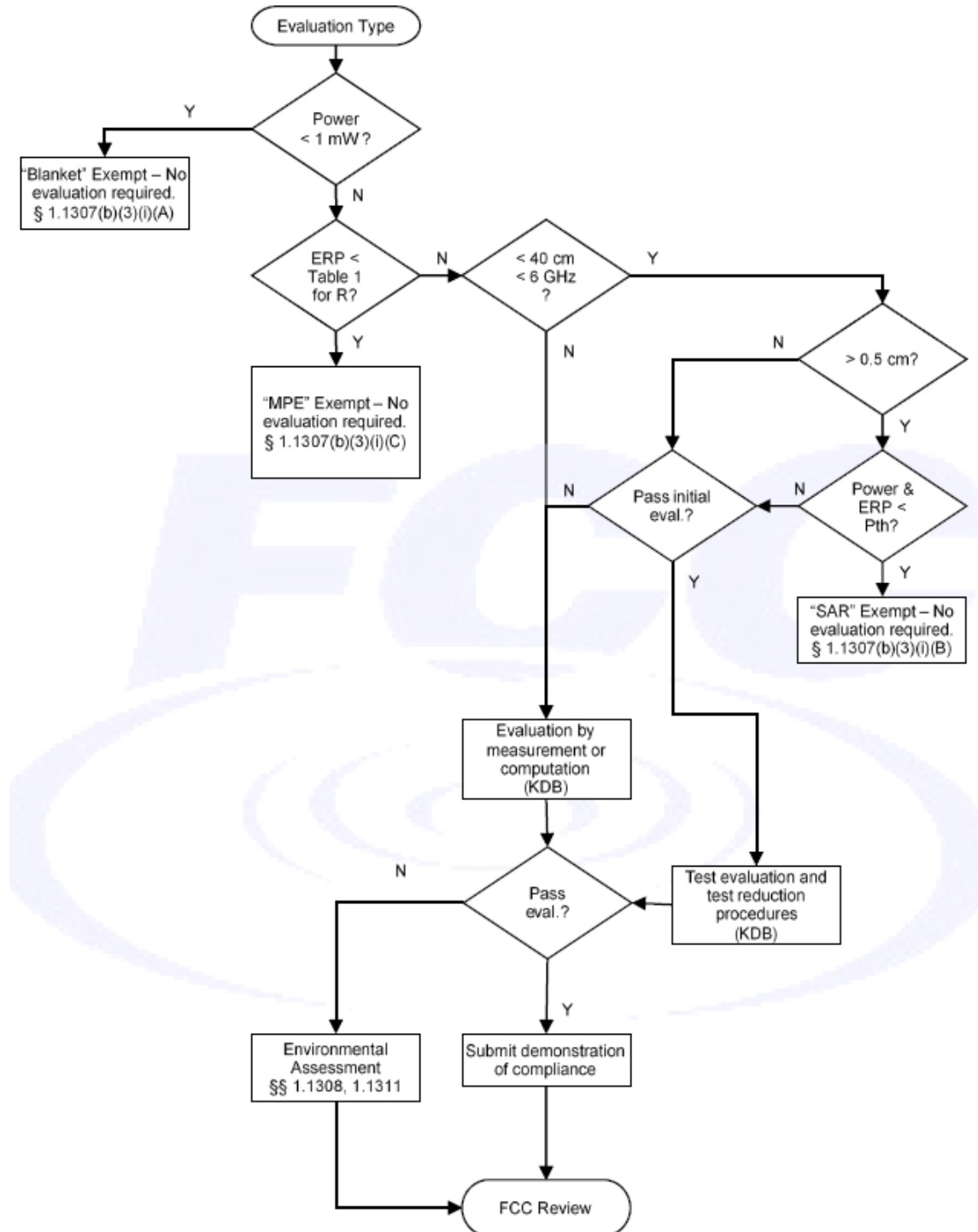
f = frequency in MHz. \* = Plane-wave equivalent power density.

## 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	-3.00

## 6. Test Result

Band	Frequency (MHz)	Distance (cm) [R]	Antenna	Tune-up Power (dBm)	Tune-up Power (mW)	ANT Gain (dBi)	ERP (W)	ERP (mW)	<§1.1307(b)(3)(i)(A)> 1 mW Exemption Threshold ERP (mW)	<§1.1307(b)(3)(i)(A)> 1 mW Exemption considerations
Bluetooth	2402 - 2480	20.00	ANT 0	-3.00	0.50	2.00	0.000	0.484	1.00	Qualified

Note:

This device is qualified for the 1 mW blanket exemption under §1.1307(b)(3)(i)(A).

## 7. Conclusion

The result shows that this device is qualified for 1 mW Test Exemption in KDB 447498. Therefore, MPE testing is not required.

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