

## MPE Report

Applicant : REYAX TECHNOLOGY CO.,LTD.  
 Product Name : RFID module  
 Trade Name : REYAX  
 Model Number : RYRR20D  
 Applicable Standard : 47 CFR § 2.1091  
 Received Date : Dec. 15, 2022  
 Issue Date : Feb. 08, 2023

### Issued by

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

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### Revision History

Version	Issued Date	Revisions	Revised By
00	Feb. 02, 2023	Initial Issue	Yiyng Chiang
01	Feb. 08, 2023	Updata Information(P.1) Updata Chapter 1.1(P.4) Updata Chapter 5(P.9) Updata Chapter 6(P.9) Updata Chapter 7(P.9)	Yiyng Chiang

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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.	-

### 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	REYAX TECHNOLOGY CO.,LTD. 4F.-15, No.26, Ln. 321, Yangguang St., Neihu Dist. Taipei City Taiwan
Manufacturer	REYAX TECHNOLOGY CO.,LTD. 4F.-15, No.26, Ln. 321, Yangguang St., Neihu Dist. Taipei City Taiwan
Product Name	RFID module
Trade Name	REYAX
Model Number	RYRR20D
FCC ID	QLYRYRR20D
Frequency Range	RFID : 13.56 MHz
Supported Modulations	RFID : ASK

**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			
Frequency Range (MHz)	Model Number	Type	Max. Gain (dBi)
13.56 MHz	RYRR20D On board antenna	On board PCB antenna	-0.15

### 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

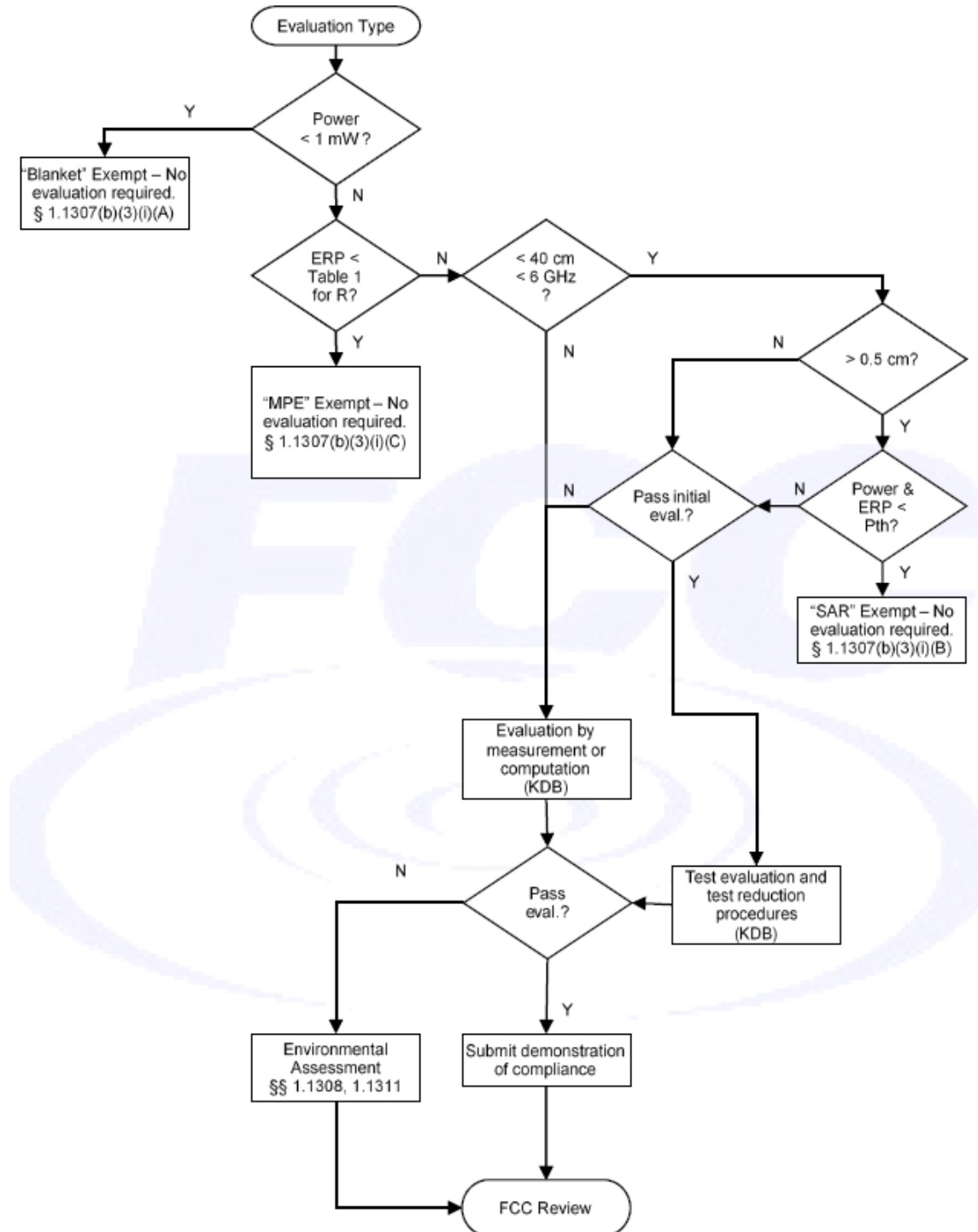
f = frequency in MHz. \* = Plane-wave equivalent power density.

## 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
RFID	13.56	20.00

## 6. Test Result

Band	Frequency (MHz)	Distance (cm) [R]	Tune-up Power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	Power with Duty cycle (mW) [P]x[G]	Power Density (mW/cm <sup>2</sup> ) [S]	Standalone Limit (mW/cm <sup>2</sup> )	Antenna
RFID	13.56 - 13.56	20.0	20.00	-0.15	0.97	1	97.00	0.02	0.98	ANT 0

Note:

1. Mobile or fixed location transmitters, minimum separation distance is 0.2 m, even if calculations indicate MPE distance is less.
2. The Numeric Gain calculated by  $10^{(\text{ant. Gain(dBi)} / 10)}$ .

## 7. Conclusion

The result shows that this device is compliance with the exposure limits in 47 CFR §1.1310.

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