

MPE Report RF Exposure Exemption

Applicant : AcSiP Technology Corporation
Product Name : Wi-Fi 6 (1x1) 802.11a/b/g/n/ac/ax + BLE5.0 Combo IoT Module
Trade Name : AcSiP
Model Number : AI7933ALD
Applicable Standard : 47 CFR § 2.1091
Received Date : Apr. 10, 2023
Issue Date : May 09, 2023

Issued by

Approved By :

(William Chung)

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Revision History

Rev.	Issued Date	Revisions	Revised By
00	May 09, 2023	Initial Issue	Rowan Hsieh

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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.	2023
47 CFR § 1.1307	Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.	2023
47 CFR § 1.1310	Radiofrequency radiation exposure limits.	2023
KDB 447498 D01	RF exposure procedures and equipment authorization policies for mobile and portable devices	v06

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	AcSiP Technology Corporation 9F, No. 242, Bo'ai St., Shulin Dist 23805 New Taipei Taiwan
Manufacturer	AcSiP Technology Corporation 9F, No. 242, Bo'ai St., Shulin Dist 23805 New Taipei Taiwan
Product Name	Wi-Fi 6 (1x1) 802.11a/b/g/n/ac/ax + BLE5.0 Combo IoT Module
Model Number	AI7933ALD
FCC ID	2ADWC-AI7933ALD
Operating Frequency Range (MHz)	WLAN 2.4G: 2412~2472 MHz WLAN 5.2G: 5150~5250 MHz WLAN 5.8G: 5725~5850 MHz Bluetooth LE: 2402 – 2480 MHz
Supported Modulations	IEEE 802.11 a/b/g/n/ac/ax: DSSS, OFDM
	Bluetooth LE 5.0: GFSK
USE Distance	20 cm

Note:

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

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

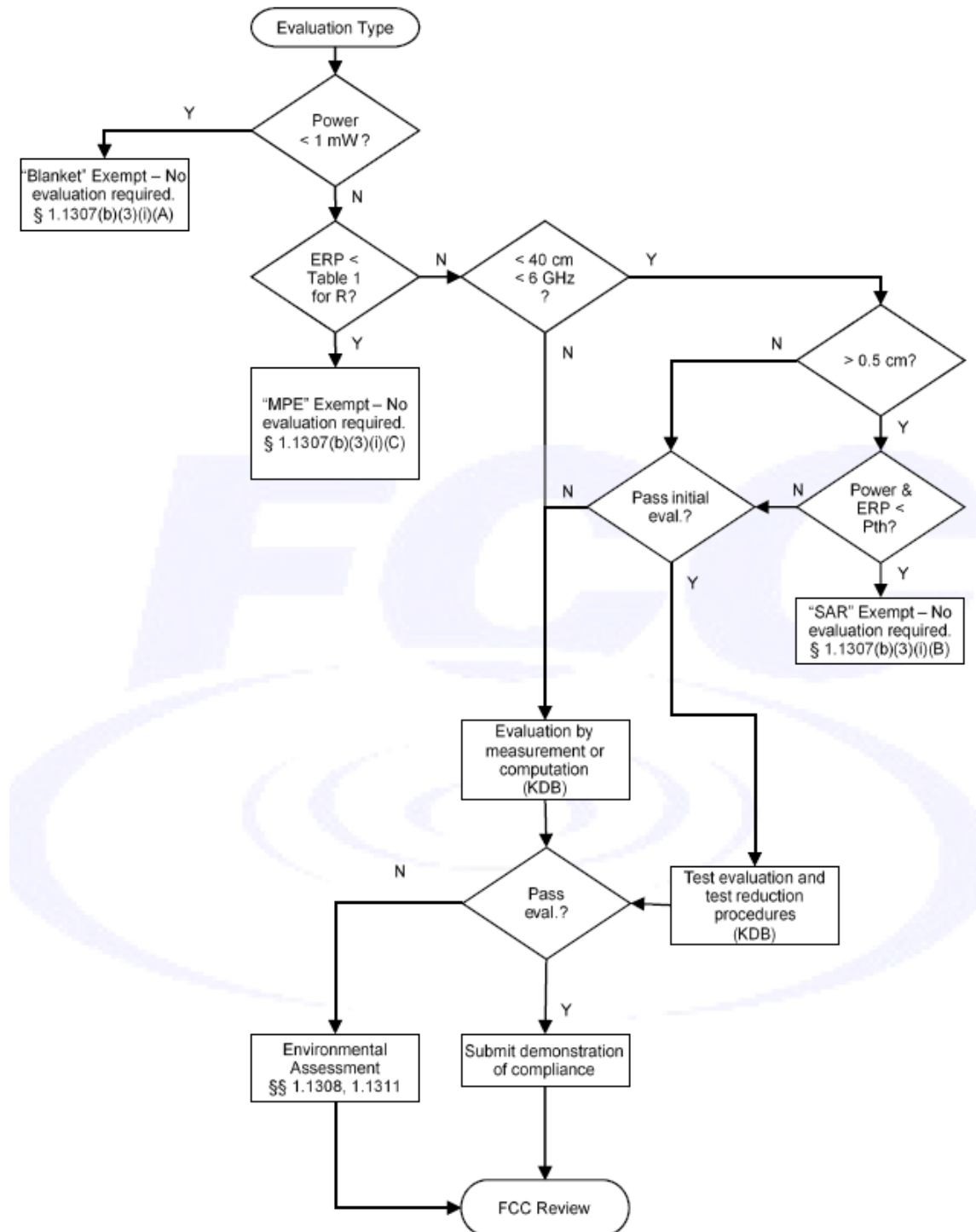
f = frequency in MHz. * = Plane-wave equivalent power density.

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

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

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

Band	Frequency (MHz)	MAX AVG Power (dBm)
2.4 GHz	2412 - 2472	23.63
5.2 GHz	5180 - 5240	17.64
5.8 GHz	5745 - 5825	19.01
Bluetooth	2402 - 2480	13.32

6. Result

Band	Frequency (MHz)	Maximum AVG Power (dBm)	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
2.4 GHz	2412 - 2462	23.63	2.80	0.268	0.020	0.768	Qualified
5.2 GHz	5150 - 5250	17.64	4.99	0.112	0.009	0.768	Qualified
5.8 GHz	5725 - 5850	19.01	4.75	0.145	0.008	0.768	Qualified
Bluetooth	2402 - 2480	13.32	2.80	0.025	0.020	0.768	Qualified

Note:

1. The Calculation are based on Max AVG power and Max Antenna gain.
2. the device is qualified for exemption under 47 CFR §1.1307(b)(3)(i)(C).

Simultaneous Transmitting :

WLAN 2.4G + WLAN 5.8G

Total Exposure Ratio: 0.54

7. Conclusion

The result shows that this device is qualified for MPE-Based Exemption in KDB447498 and compliant to exposure limits in 47 CFR §1.1310.

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