

Project No: TM-2411000185P
Report No.: TMWK2411003936KS

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RF Exposure Evaluation Report

FCC 47 CFR § 2.1091

for
Wifi module iTM1811-CU

Model: iTM1811-CU

Prepared for:
Fleetmind Seon Solutions Inc.
Unit 111 – 3B Burbidge Street, Coquitlam, BC, V3K 7B2 Canada

Prepared by
Compliance Certification Services Inc.
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New Taipei City, Taiwan
Issued Date: March 12, 2025

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 12, 2025	Initial Issue	ALL	Peggy Tsai

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1 Attestation of Test Results

Applicant	Fleetmind Seon Solutions Inc. Unit 111 – 3B Burbidge Street, Coquitlam, BC, V3K 7B2 Canada
Manufacturer	Altasec Technology Corp. 12F-5, No. 75, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
Model Name	Wifi module iTM1811-CU
Applicable Standards	FCC 47 CFR § 2.1091 FCC 47 CFR § 1.1307 FCC 47 CFR § 1.1310 Published RF exposure KDB procedures
Receive EUT Date:	November 12, 2024

Compliance Certification Services Inc. , tested the above equipment in accordance with the requirements set forth in the above standards. Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty. All indications of Pass/Fail in this report are opinions expressed by Compliance Certification Services Inc, based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved & Released By:



Sky Zhou
Asst. Section Manager

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2 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1091, the following FCC Published RF exposure [KDB](#) procedures:

- 447498 D04 Interim General RF Exposure Guidance v01
- 865664 D02 RF Exposure Reporting v01r02

3 Device Under Test (DUT) Information

3.1 DUT Description

Product	Wifi module iTM1811-CU
Trade Name	Safe Fleet
Model No.	iTM1811-CU
Model Discrepancy	N/A
EUT Serial #	YR03A0QEB0T5201
Software Version	REV0.1
Hardware Version	0.5.0.9
Sample Stage	Identical prototype

3.2 Wireless Technologies

Frequency bands	<input type="checkbox"/> Bluetooth: 2402MHz-2480MHz <input checked="" type="checkbox"/> 802.11b/g/n HT20: 2412MHz ~ 2462 MHz <input checked="" type="checkbox"/> 802.11n HT40: 2422MHz ~ 2452MHz <input checked="" type="checkbox"/> 802.11a/n HT20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5720MHz / 5745MHz ~ 5825MHz <input checked="" type="checkbox"/> 802.11ac VHT20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5720MHz / 5745MHz ~ 5825MHz <input type="checkbox"/> 802.11ax HE20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5720MHz / 5745MHz ~ 5825MHz <input checked="" type="checkbox"/> 802.11n HT40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5710MHz / 5755MHz ~ 5795MHz <input checked="" type="checkbox"/> 802.11ac VHT40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5710MHz / 5755MHz ~ 5795MHz <input type="checkbox"/> 802.11ax HE40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5710MHz / 5755MHz ~ 5795MHz <input checked="" type="checkbox"/> 802.11ac VHT80: 5210MHz / 5290MHz / 5530MHz ~ 5690MHz / 5775MHz <input type="checkbox"/> 802.11ax HE80: 5210MHz / 5290MHz / 5530MHz ~ 5690MHz / 5775MHz <input type="checkbox"/> Others																									
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure <input checked="" type="checkbox"/> General Population/Uncontrolled exposure																									
Antenna Specification	<p>Type: Whipless Cellular Antenna</p> <p>WIFI 2.4G: Gain: 1 dBi</p> <p>WIFI 5G:</p> <p>Band1: Gain: 3 dBi</p> <p>Band2: Gain: 3 dBi</p> <p>Band3: Gain: 3 dBi</p> <p>Band4: Gain: 3 dBi</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">2.4GHz:</td> <td style="width: 25%;">Antenna Gain:</td> <td style="width: 25%;">1.00 dBi</td> <td style="width: 25%;">(Numeric gain: 1.26)</td> <td style="width: 25%;">Worst</td> </tr> <tr> <td>5GHz(U-NII-1):</td> <td>Antenna Gain:</td> <td>3.00 dBi</td> <td>(Numeric gain: 2.00)</td> <td>Worst</td> </tr> <tr> <td>5GHz(U-NII-2A):</td> <td>Antenna Gain:</td> <td>3.00 dBi</td> <td>(Numeric gain: 2.00)</td> <td>Worst</td> </tr> <tr> <td>5GHz(U-NII-2C):</td> <td>Antenna Gain:</td> <td>3.00 dBi</td> <td>(Numeric gain: 2.00)</td> <td>Worst</td> </tr> <tr> <td>5GHz(U-NII-3):</td> <td>Antenna Gain:</td> <td>3.00 dBi</td> <td>(Numeric gain: 2.00)</td> <td>Worst</td> </tr> </table>	2.4GHz:	Antenna Gain:	1.00 dBi	(Numeric gain: 1.26)	Worst	5GHz(U-NII-1):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst	5GHz(U-NII-2A):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst	5GHz(U-NII-2C):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst	5GHz(U-NII-3):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst
2.4GHz:	Antenna Gain:	1.00 dBi	(Numeric gain: 1.26)	Worst																						
5GHz(U-NII-1):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst																						
5GHz(U-NII-2A):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst																						
5GHz(U-NII-2C):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst																						
5GHz(U-NII-3):	Antenna Gain:	3.00 dBi	(Numeric gain: 2.00)	Worst																						

Maximum Tune up power	2.4GHz		
	IEEE 802.11b	17.00 dBm	(50.119 mW)
	IEEE 802.11g	14.00 dBm	(25.119 mW)
	IEEE 802.11n HT 20	13.00 dBm	(19.95 mW)
	IEEE 802.11n HT 40	13.00 dBm	(19.95 mW)
	5GHz (U-NII-1)		
	IEEE 802.11a	11.00 dBm	(12.589 mW)
	IEEE 802.11n HT 20	11.50 dBm	(14.125 mW)
	IEEE 802.11n HT 40	12.00 dBm	(15.85 mW)
	IEEE 802.11ac VHT 20	11.50 dBm	(14.13 mW)
	IEEE 802.11ac VHT 40	12.00 dBm	(15.85 mW)
	IEEE 802.11ac VHT 80	11.00 dBm	(12.59 mW)
5GHz (U-NII-2A)			
	IEEE 802.11a	11.00 dBm	(12.59 mW)
	IEEE 802.11n HT 20	11.50 dBm	(14.13 mW)
	IEEE 802.11n HT 40	12.00 dBm	(15.85 mW)
	IEEE 802.11ac VHT 20	11.50 dBm	(14.13 mW)
	IEEE 802.11ac VHT 40	12.00 dBm	(15.85 mW)
	IEEE 802.11ac VHT 80	11.00 dBm	(12.59 mW)
5GHz (U-NII-2C)			
	IEEE 802.11a	14.00 dBm	(25.12 mW)
	IEEE 802.11n HT 20	13.00 dBm	(19.95 mW)
	IEEE 802.11n HT 40	13.00 dBm	(19.95 mW)
	IEEE 802.11ac VHT 20	13.00 dBm	(19.95 mW)
	IEEE 802.11ac VHT 40	13.00 dBm	(19.95 mW)
	IEEE 802.11ac VHT 80	11.00 dBm	(12.59 mW)
5GHz (U-NII-3)			
	IEEE 802.11a	14.00 dBm	(25.12 mW)
	IEEE 802.11n HT 20	13.00 dBm	(19.95 mW)
	IEEE 802.11n HT 40	13.00 dBm	(19.95 mW)
	IEEE 802.11ac VHT 20	13.00 dBm	(19.95 mW)
	IEEE 802.11ac VHT 40	13.00 dBm	(19.95 mW)
	IEEE 802.11ac VHT 80	11.00 dBm	(12.59 mW)

Notes:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. The power referred the Tune up power of the test report TMWK2411003934KR and TMWK2411003935KR for RF Exposure assessment purpose.

4 Maximum Permissible Exposure

4.1 Limits for Maximum Permissible Exposure (MPE)

Table 1 - Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	* 100	6
3.0-30	1842/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
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

4.2 MPE Calculation Method

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \text{ Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

If, Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

4.3 MPE EXEMPTION

- (A) The available maximum time-averaged power is no more than 1 mW
- (B) The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

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

Where

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

and

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

d = the separation distance (cm);

- (C) Using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2 .
1.34-30	3,450 R^2/f^2 .
30-300	3.83 R^2 .
300-1,500	0.0128 R^2f .
1,500-100,000	19.2 R^2 .

Note: R is in meters, f is in MHz.

4.4 Multiple RF sources

In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation),

$$\sum_{i=1}^a \frac{P_i}{P_{\text{th},i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{\text{th},j}} + \sum_{k=1}^c \frac{\text{Evaluated}_k}{\text{Exposure Limit}_k} \leq 1$$

5 MPE Exemption Option B

WIFI 2.4GHz (DTS)

Mode	Frequency (MHz)	R(m)	Max Tune-up power (dBm)	G(dBi)	Max Tune-up EIRP (dBm)	Max Tune-up ERP (dBm)	Max Tune-up ERP (mW)	ERP Threshold (mW)	MPE Exemption
IEEE 802.11b	2412	0.2	17.0	1	18.00	15.85	38.459	3060	Complies
IEEE 802.11g	2412	0.2	14.0	1	15.00	12.85	19.275	3060	Complies
IEEE 802.11n HT 20	2412	0.2	13.0	1	14.00	11.85	15.311	3060	Complies
IEEE 802.11n HT 40	2422	0.2	13.0	1	14.00	11.85	15.311	3060	Complies

WIFI 5.2GHz (U-NII 1)

Mode	Frequency (MHz)	R(m)	Max Tune-up power (dBm)	G(dBi)	Max Tune-up EIRP (dBm)	Max Tune-up ERP (dBm)	Max Tune-up ERP (mW)	ERP Threshold (mW)	MPE Exemption
IEEE 802.11a	5180	0.2	11.0	3	14.00	11.85	15.311	3060	Complies
IEEE 802.11n HT 20	5180	0.2	11.5	3	14.50	12.35	17.179	3060	Complies
IEEE 802.11n HT 40	5190	0.2	12.0	3	15.00	12.85	19.275	3060	Complies
IEEE 802.11ac VHT 20	5180	0.2	11.5	3	14.50	12.35	17.179	3060	Complies
IEEE 802.11ac VHT 40	5190	0.2	12.0	3	15.00	12.85	19.275	3060	Complies
IEEE 802.11ac VHT 80	5250	0.2	11.0	3	14.00	11.85	15.311	3060	Complies

WIFI 5.3GHz (U-NII 2A)

Mode	Frequency (MHz)	R(m)	Max Tune-up power (dBm)	G(dBi)	Max Tune-up EIRP (dBm)	Max Tune-up ERP (dBm)	Max Tune-up ERP (mW)	ERP Threshold (mW)	MPE Exemption
IEEE 802.11a	5260	0.2	11.0	3	14.00	11.85	15.311	3060	Complies
IEEE 802.11n HT 20	5260	0.2	11.5	3	14.50	12.35	17.179	3060	Complies
IEEE 802.11n HT 40	5270	0.2	12.0	3	15.00	12.85	19.275	3060	Complies
IEEE 802.11ac VHT 20	5260	0.2	11.5	3	14.50	12.35	17.179	3060	Complies
IEEE 802.11ac VHT 40	5270	0.2	12.0	3	15.00	12.85	19.275	3060	Complies
IEEE 802.11ac VHT 80	5290	0.2	11.0	3	14.00	11.85	15.311	3060	Complies

WIFI 5.5GHz (U-NII 2C)

Mode	Frequency (MHz)	R(m)	Max Tune-up power (dBm)	G(dBi)	Max Tune-up EIRP (dBm)	Max Tune-up ERP (dBm)	Max Tune-up ERP (mW)	ERP Threshold (mW)	MPE Exemption
IEEE 802.11a	5500	0.2	14.0	3	17.00	14.85	30.549	3060	Complies
IEEE 802.11n HT 20	5500	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11n HT 40	5510	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11ac VHT 20	5500	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11ac VHT 40	5510	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11ac VHT 80	5530	0.2	11.0	3	14.00	11.85	15.311	3060	Complies

WIFI 5.8GHz (U-NII 3)

Mode	Frequency (MHz)	R(m)	Max Tune-up power (dBm)	G(dBi)	Max Tune-up EIRP (dBm)	Max Tune-up ERP (dBm)	Max Tune-up ERP (mW)	ERP Threshold (mW)	MPE Exemption
IEEE 802.11a	5745	0.2	14.0	3	17.00	14.85	30.549	3060	Complies
IEEE 802.11n HT 20	5745	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11n HT 40	5755	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11ac VHT 20	5745	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11ac VHT 40	5755	0.2	13.0	3	16.00	13.85	24.266	3060	Complies
IEEE 802.11ac VHT 80	5775	0.2	11.0	3	14.00	11.85	15.311	3060	Complies

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6 Facilities

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

--End of Test Report--