

RF EXPOSURE EVALUATION REPORT

FCC ID : PKRISGFW2000
Equipment : 5G CPE Wireless Solution
Brand Name : Inseego
Model Name : FW2000
Applicant : Inseego Corp.
9710 Scranton Road Suite 200, San Diego, CA 92121
Manufacturer : Inseego Corp.
9710 Scranton Road Suite 200, San Diego, CA 92121
Standard : 47 CFR Part 1.1307

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part 1.1307 and it complies with applicable limit.

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Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.



Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA082512-06	Rev. 01	Initial issue of report	Mar. 30, 2022

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	5G CPE Wireless Solution
Brand Name	Inseego
Model Name	FW2000
FCC ID	PKRISGFW2000
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3550 MHz ~ 3600 MHz LTE Band 43: 3600 MHz ~ 3700 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz 5G NR n78: 3700 MHz ~ 3800 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM Bluetooth BLE

Reviewed by: Jason WangReport Producer: Carlie Tsai



2. Maximum RF average output power among production units

Antenna	Band	Maximum Power (dBm)
Antenna 0	LTE Band 5	24.00
	LTE Band 12	24.00
	LTE Band 13	24.00
	LTE Band 14	24.00
	LTE Band 17	24.00
	LTE Band 26	24.00
	LTE Band 30	21.00
	LTE Band 38	24.00
	LTE Band 71	24.00
	5G FR1 n2	23.90
	5G FR1 n5	24.00
	5G FR1 n7	24.00
	5G FR1 n12	24.00
	5G FR1 n38	24.00
	5G FR1 n41	24.00
	5G FR1 n66	20.00
	5G FR1 n71	24.00
Antenna 1	5G FR1 n5	22.00
Antenna 4	LTE Band 42	21.00
	LTE Band 43	21.00
	LTE Band 48	22.00
	5G FR1 n77	24.00
	5G FR1 n78	24.00
Antenna 8	LTE Band 2	23.90
	LTE Band 4	22.00
	LTE Band 7	24.00
	LTE Band 25	23.90
	LTE Band 41	24.00
	LTE Band 66	21.50
	5G FR1 n2	23.90
	5G FR1 n25	23.90
	5G FR1 n41	24.00
	5G FR1 n41 HPUE	25.50
	5G FR1 n66	20.00
Bluetooth		3.00

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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 Exposures				
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
300-1500			f/300	6
1500-100,000			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
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 38 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

4. Radio Frequency Radiation Exposure Evaluation

4.1. Power Density Calculation

Antenna	Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 38cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
Antenna 0	LTE Band 5	824	2.40	24.00	26.4	0.44	436.52	0.024	0.549	0.044
	LTE Band 12	699	3.30	24.00	27.3	0.54	537.03	0.030	0.466	0.064
	LTE Band 13	777	0.40	24.00	24.4	0.28	275.42	0.015	0.518	0.029
	LTE Band 14	788	0.50	24.00	24.5	0.28	281.84	0.016	0.525	0.030
	LTE Band 17	704	3.30	24.00	27.3	0.54	537.03	0.030	0.469	0.063
	LTE Band 26	814	2.40	24.00	26.4	0.44	436.52	0.024	0.543	0.044
	LTE Band 30	2305	4.20	21.00	25.2	0.33	331.13	0.018	1.000	0.018
	LTE Band 38	2570	6.00	24.00	30.0	1.00	1000.00	0.055	1.000	0.055
	LTE Band 71	663	3.10	24.00	27.1	0.51	512.86	0.028	0.442	0.064
	5G FR1 n2	1850	9.10	23.90	33.0	2.00	1995.26	0.110	1.000	0.110
	5G FR1 n5	824	2.40	24.00	26.4	0.44	436.52	0.024	0.549	0.044
	5G FR1 n7	2500	10.30	24.00	34.3	2.69	2691.53	0.148	1.000	0.148
	5G FR1 n12	699	3.30	24.00	27.3	0.54	537.03	0.030	0.466	0.064
	5G FR1 n38	2570	6.00	24.00	30.0	1.00	1000.00	0.055	1.000	0.055
	5G FR1 n41	2496	11.00	24.00	35.0	3.16	3162.28	0.174	1.000	0.174
	5G FR1 n66	1710	8.50	20.00	28.5	0.71	707.95	0.039	1.000	0.039
	5G FR1 n71	663	3.10	24.00	27.1	0.51	512.86	0.028	0.442	0.064
Antenna 1	5G FR1 n5	824	4.00	22.00	26.0	0.40	398.11	0.022	0.549	0.040
Antenna 4	LTE Band 42	3450	13.30	21.00	34.3	2.69	2691.53	0.148	1.000	0.148
	LTE Band 43	3450	12.20	21.00	33.2	2.09	2089.30	0.115	1.000	0.115
	LTE Band 48	3450	11.70	22.00	33.7	2.34	2344.23	0.129	1.000	0.129
	5G FR1 n77	3700	13.30	24.00	37.3	5.37	5370.32	0.296	1.000	0.296
	5G FR1 n78	3700	13.30	24.00	37.3	5.37	5370.32	0.296	1.000	0.296
Antenna 8	LTE Band 2	1850	9.10	23.90	33.0	2.00	1995.26	0.110	1.000	0.110
	LTE Band 4	1710	8.50	22.00	30.5	1.12	1122.02	0.062	1.000	0.062
	LTE Band 7	2500	10.30	24.00	34.3	2.69	2691.53	0.148	1.000	0.148
	LTE Band 25	1850	9.10	23.90	33.0	2.00	1995.26	0.110	1.000	0.110
	LTE Band 41	2496	10.30	24.00	34.3	2.69	2691.53	0.148	1.000	0.148
	LTE Band 66	1710	8.50	21.50	30.0	1.00	1000.00	0.055	1.000	0.055
	5G FR1 n2	1850	9.10	23.90	33.0	2.00	1995.26	0.110	1.000	0.110
	5G FR1 n25	1850	9.10	23.90	33.0	2.00	1995.26	0.110	1.000	0.110
	5G FR1 n41	2496	10.30	25.50	35.8	3.80	3801.89	0.210	1.000	0.210
	5G FR1 n66	1710	8.50	20.00	28.5	0.71	707.95	0.039	1.000	0.039
Bluetooth		2400	4.6	3.00	7.6	0.01	5.75	0.000	1.000	0.0003

**4.2. Collocated Power Density Calculation**

Antenna 0 + 8 + Bluetooth			
Maximum Bluetooth Power Density / Limit	Maximum Antenna 0 Power Density / Limit	Maximum Antenna 8 Power Density / Limit	Σ (Power Density / Limit) of Ant 0+8+Bluetooth
0.0003	0.174	0.210	0.3843

Antenna 0 + 4 + Bluetooth			
Maximum Bluetooth Power Density / Limit	Maximum Antenna 0 Power Density / Limit	Maximum Antenna 4 Power Density / Limit	Σ (Power Density / Limit) of Ant 0+4+Bluetooth
0.0003	0.174	0.296	0.4703

Antenna 0 + 1 + Bluetooth			
Maximum Bluetooth Power Density / Limit	Maximum Antenna 0 Power Density / Limit	Maximum Antenna 1 Power Density / Limit	Σ (Power Density / Limit) of Ant 0+4+Bluetooth
0.0003	0.174	0.040	0.2143

Note:

1. The MPE ratio summation regardless what the actual EN-DC list, always chose the higher value base on antenna to summed as EN-DC conservatively.
2. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for Transmit antenna 0+8 or 0+4 or 0+1 with Bluetooth.
3. Considering the WWAN collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant

Conclusion:

According to 47 CFR §1.1307, the RF exposure analysis concludes that the RF Exposure is FCC compliant.