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FCC ID: PKRISGSKR3MD8800

Test Model: SKR3MD8800

Received Date: Jan. 14, 2019

Test Date: Jan. 15 to 26, 2019

Issued Date: Mar. 06, 2019

Applicant: Inseego Corp.

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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA190122E03	Original release.	Mar. 06, 2019

1 Certificate of Conformity

Product: 4G LTE Wireless Router

Brand: Inseego

Test Model: SKR3MD8800

Sample Status: ENGINEERING SAMPLE

Applicant: Inseego Corp.

Test Date: Jan. 15 to 26, 2019

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :

Phoenix Huang

Date:

Mar. 06, 2019

Phoenix Huang / Specialist

Approved by :

May Chen

Date:

Mar. 06, 2019

May Chen / Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
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

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 27cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	Brand Name	Model Name	Antenna Net Gain (dBi)	Frequency Range	Antenna Type	Connector Type
WLAN_1	RF link	RF21S00506AX1	4.11	2.4~2.4835GHz	Dipole	R-SMA
			6.12	5.15~5.85GHz		
WLAN_2	M.gear	C037-511343-A	4.11	2.4~2.4835GHz	Dipole	R-SMA
			6.12	5.15~5.85GHz		
BT_ANT	RF link	RF21S00506AX1	4.11	2,402~2,480GHz	Dipole	R-SMA
WWAN_1_1	-	SWX-614XRSXX-999	2.1	1850 MHz to 1910 MHz	Dipole	SMA
			1.8	1710 MHz to 1755 MHz		
			1.8	824 MHz to 849 MHz		
			2.7	2500 MHz to 2570 MHz		
			0.4	777 MHz to 787 MHz		
			0.4	788 MHz to 798 MHz		
			1.8	1710 MHz to 1780 MHz		
WWAN_1_2	-	SWX-614XRSXX-999	2.1	1850 MHz to 1910 MHz	Dipole	SMA
			1.8	1710 MHz to 1755 MHz		
			1.8	824 MHz to 849 MHz		
			2.7	2500 MHz to 2570 MHz		
			0.4	777 MHz to 787 MHz		
			0.4	788 MHz to 798 MHz		
			1.8	1710 MHz to 1780 MHz		
GPS_ANT	-	-	2.4	1575.4	Dipole	SMA

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz	2437	608.881	7.12	27	0.34245	1
WLAN 5GHz (UNII-1)	5200	323.377	9.13	27	0.28892	1
WLAN 5GHz (UNII-3)	5745	524.248	9.13	27	0.46838	1
BT-LE	2440	4.875	4.11	27	0.00137	1

Note:

1. 2.4GHz: The directional gain = $4.11\text{dBi} + 10\log(2) = 7.12\text{dBi}$.
2. 5GHz: The directional gain = $6.12\text{dBi} + 10\log(2) = 9.13\text{dBi}$.
3. The Max. Power $\geq$ Max. tune up power including tolerance.

For WWAN

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
824.7-848.3	251.19	1.80	27	0.04150	0.5498*

Note:

1. *Limit of Power Density = $F/1500$
2. The Max. Power $\geq$ Max. tune up power including tolerance.

Conclusion:

The formula of calculated the MPE is:

$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

$$\text{WLAN 2.4GHz} + \text{WLAN 5GHz (U-NII-3)} + \text{Bluetooth} + \text{WWAN} = 0.34245 / 1 + 0.46838 / 1 + 0.00137 / 1 + 0.04150 / 0.5498 = 0.88768$$

Therefore the maximum calculations of above situations are less than the “1” limit.

Appendix

For WWAN

Mode	Equipment Category	Transmitter Range (MHz)		Maximum		Antenna Gain (dBi)	Power Density (mW/cm ²)		Ratio
		Start	Stop	(dBm)	(W)		Vaule	Limit	
WCDMA	Band 2	1852.4	1907.6	24.00	251.19	2.10	0.04447	1	0.0317
	Band 5	826.4	846.6	24.00	251.19	1.80	0.04150	0.5509*	0.0536
LTE	Band 2	1850.7	1909.3	24.00	251.19	2.10	0.04447	1	0.0317
	Band 4	1710.7	1754.3	24.00	251.19	1.80	0.04150	1	0.0296
	Band 5	824.7	848.3	24.00	251.19	1.80	0.04150	0.5498*	0.0537
	Band 7	2502.5	2567.5	24.00	251.19	2.70	0.05106	1	0.0364
	Band 13	779.5	784.5	24.00	251.19	0.40	0.03007	0.5197*	0.0412
	Band 14	790.5	795.5	24.00	251.19	0.40	0.03007	0.527*	0.0406
	Band 66	1710.7	1779.3	24.00	251.19	1.80	0.04150	1	0.0296

Note: *Limit of Power Density = F/1500

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