Report No.:	SA190122E02
FCC ID:	PKRNVWSKR5MD8800
Test Model:	SKR5MD8800
Received Date:	Jan. 15, 2019
Test Date:	Jan. 22 to 23, 2019
Issued Date:	Mar. 06, 2019
Applicant:	Inseego Corp.
Address:	9605 Scranton Road Suite 300, San Diego, CA 92121 United States
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA190122E02	Original release.	Mar. 06, 2019

1 Certificate of Conformity

Product:	4G LTE Wireless Router
Brand:	Inseego
Test Model:	SKR5MD8800
Sample Status:	ENGINEERING SAMPLE
Applicant:	Inseego Corp.
Test Date:	Jan. 22 to 23, 2019
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

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 : , **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

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 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 32cm 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	2.4~2.4835 GHz	Dipole	R-SMA
			6.12	5.15~5.85 GHz		
WLAN_2	M.gear	C037-511343-A	4.11	2.4~2.4835 GHz	Dipole	R-SMA
			6.12	5.15~5.85 GHz		
BT_ANT	RF link	RF21S00506AX1	4.11	2,402~2,480 GHz	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		
WWAN_2_1	-	SWX-6141SAXX-508	3.56	3550 MHz to 3700 MHz	Dipole	SMA
WWAN_2_2	-	SWX-6141SAXX-508	3.56	3550 MHz to 3700 MHz	Dipole	SMA
WWAN_3_1 (Rx only)	-	RF21S00773A	3.5	5.15~5.85 GHz	Dipole	SMA
WWAN_3_2 (Rx only)	-	RF21S00773A	3.5	5.15~5.85 GHz	Dipole	SMA
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	855.093	7.12	32	0.34238	1
WLAN 5GHz (U-NII-1)	5230	570.326	9.13	32	0.36275	1
WLAN 5GHz (U-NII-3)	5795	804.638	9.13	32	0.51179	1
BT-LE	2440	3.811	4.11	32	0.00076	1

Note:
1. 2.4GHz: The directional gain = 4.11dBi + 10log(2) = 7.12dBi.
2. 5GHz: The directional gain = 6.12dBi + 10log(2) = 9.13dBi.
3. The Max. Power ≥ Max. tune up power including tolerance.

For WWAN (FCC ID: PKRNVWMD8800)

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	32	0.02955	0.5498*

Note:
1. *Limit of Power Density = F/1500
2. The Max. Power ≥ Max. tune up power including tolerance.

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz (U-NII-3) + Bluetooth + WWAN = 0.34238 / 1 + 0.51179 / 1 + 0.00076 / 1 + 0.02955 / 0.5498 = 0.90868

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

Appendix

WWAN module
MPE Evaluation for FCC ID: PKRNVWMD8800 Radio Module

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	0.03166	1	0.0445
	Band 5	826.4	846.6	24.00	251.19	1.80	0.02955	0.5509*	0.0753
LTE	Band 2	1850.7	1909.3	24.00	251.19	2.10	0.03166	1	0.0445
	Band 4	1710.7	1754.3	24.00	251.19	1.80	0.02955	1	0.0415
	Band 5	824.7	848.3	24.00	251.19	1.80	0.02955	0.5498*	0.0755
	Band 7	2502.5	2567.5	24.00	251.19	2.70	0.03635	1	0.0511
	Band 13	779.5	784.5	24.00	251.19	0.40	0.02140	0.5197*	0.0579
	Band 14	790.5	795.5	24.00	251.19	0.40	0.02140	0.527*	0.0571
	Band 66	1710.7	1779.3	24.00	251.19	1.80	0.02955	1	0.0415

Note: *Limit of Power Density = F/1500

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