RF Exposure Report

Report No.: MFBCKS-WTW-P22040223A

FCC ID: UXX-S5A235A

Test Model: S5A235A

Received Date: Apr. 08, 2022

Test Date: Apr. 20 ~ Jul. 23, 2022

Issued Date: Dec. 02, 2022

Applicant: Cradlepoint, Inc.

Address: 1111 West Jefferson Street ,Boise ,Idaho, United States 83702

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan

FCC Registration / Designation Number: 788550 / TW0003

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
MFBCKS-WTW-P22040223A	Original release	Dec. 02, 2022

1 Certificate of Conformity

Product:	Ruggedized LTE Router
Brand:	Cradlepoint, Inc.
Test Model:	S5A235A
Sample Status:	Engineering sample
Applicant:	Cradlepoint, Inc.
Test Date:	Apr. 20 ~ Jul. 23, 2022
FCC Rule Part:	FCC Part 2 (Section 2.1091)
Standards:	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 RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** _____Dec. 02, 2022_____

Polly Chien / Specialist

Approved by : _____ , **Date:** _____Dec. 02, 2022_____

Jeremy Lin / Project Engineer

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				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

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 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max AV Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN					
CDD Mode					
2412~2462	23.19	5.51	20	0.147	1
5180~5240	21.74	5.81	20	0.113	1
5260~5320	20.78	5.77	20	0.090	1
5500~5720	20.98	5.71	20	0.093	1
5745~5825	22.18	6.00	20	0.131	1
Beamforming Mode					
2412~2462	22.89	8.52	20	0.275	1
5180~5240	20.74	8.82	20	0.180	1
5260~5320	20.72	8.78	20	0.177	1
5500~5720	20.67	8.72	20	0.173	1
5745~5825	20.76	9.01	20	0.189	1
BT LE					
2402~2480	17.85	2.16	20	0.020	1

WWAN (EUT contains certified WWAN module (FCC ID: N7NEM74B)

Band	Max Time-Avg Cond Power (dBm)	Antenna Gain (dBi)	EIRP Power (dBm)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 2/ LTE B2	24	2.69	26.69	20	0.093	1.00
WCDMA Band 4/ LTE B4	24	2.69	26.69	20	0.093	1.00
WCDMA Band 5/ LTE B5	24.3	2	26.30	20	0.085	0.55
LTE B7	23.8	2.69	26.49	20	0.089	1.00
LTE B12	24	1.5	25.50	20	0.071	0.46
LTE B13	24	1.5	25.50	20	0.071	0.52
LTE B14	24	1.5	25.50	20	0.071	0.53
LTE B25	24	2.69	26.69	20	0.093	1.00
LTE B26	24	2	26.00	20	0.079	0.54
LTE B41	23.8	2.69	26.49	20	0.089	1.00
LTE B42	23.8	4.13	27.93	20	0.124	1.00
LTE B43	23.8	4.13	27.93	20	0.124	1.00
LTE B48	23.8	4.13	27.93	20	0.124	1.00
LTE B66	24	2.69	26.69	20	0.093	1.00
LTE B71	24	1.42	25.42	20	0.069	0.44

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2. EIRP = Cond Power + Antenna Gain

3. The above Max Power is Tune-up Power which client declared.

4. Directional antenna:
   2412~2462MHz: Directional gain = 5.51dBi + 10log(2)=8.52dBi
   5180~5240MHz: Directional gain = 5.81dBi + 10log(2)=8.82dBi
   5260~5320MHz: Directional gain = 5.77dBi + 10log(2)=8.78dBi
   5500~5720MHz: Directional gain = 5.71dBi + 10log(2)=8.72dBi
   5745~5825MHz: Directional gain = 6.00dBi + 10log(2)=9.01dBi

5. Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

WLAN + BT LE + WWAN = 0.275 / 1 + 0.020 / 1 + 0.069/ 0.44 = 0.452

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

---END---