

## RF Exposure Report

**Report No.:** SA200522E11A

**FCC ID:** 2AWHPR201

**Test Model:** UTR-201

**Received Date:** May 25, 2020

**Test Date:** July 01, 2020

**Issued Date:** Aug. 21, 2020

**Applicant:** Space Exploration Technologies Corp.

**Address:** 1 Rocket Rd., Hawthorne, CA 90250 USA

**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

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

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

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### Release Control Record

Issue No.	Description	Date Issued
SA200522E11A	Original release.	Aug. 21, 2020

## 1 Certificate of Conformity

**Product:** Starlink Router  
**Brand:** SPACEX  
**Test Model:** UTR-201  
**Sample Status:** ENGINEERING SAMPLE  
**Applicant:** Space Exploration Technologies Corp.  
**Test Date:** July 01, 2020  
**Standards:** FCC Part 2 (Section 2.1091)  
IEEE C95.3 -2002  
**References Test Guidance:** 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 :**  , **Date:** Aug. 21, 2020  
Claire Kuan / Specialist

**Approved by :**  , **Date:** Aug. 21, 2020  
Clark Lin / Technical 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 <sup>2</sup> )	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 <sup>2</sup> )*	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<sup>2</sup>

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

## 2.4 Antenna Gain

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	1.4	2.4~2.4835GHz	PCB	None	NA
	2.3	5.15~5.85GHz			
2	2.3	2.4~2.4835GHz	PCB	None	NA
	3.6	5.15~5.85GHz			

\* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

## 2.5 Calculation Result

The WLAN (2.4GHz) and WLAN (U-NII-1, U-NII-3) maximum power was refer to the test report (Report No.: RF200522E11, RF200522E11-1)

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN (2.4GHz)	2412~2462	990.564	4.87	23	0.45732	1
WLAN (U-NII-1)	5180~5250	781.933	5.98	23	0.46613	1
WLAN (U-NII-2A)	5260~5320	247.502	5.98	23	0.14754	1
WLAN (U-NII-2C)	5500~5720	249.572	5.98	23	0.14878	1
WLAN (U-NII-3)	5745~5825	775.408	5.98	23	0.46224	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 4.87 \text{ dBi}$
- 5GHz: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.98 \text{ dBi}$

### Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$WLAN \ 2.4GHz + WLAN \ 5GHz = 0.45732 / 1 + 0.46613 / 1 = 0.92345$

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

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