



REPORT No.: SZ24100188S01

RF EXPOSURE EVALUATION REPORT

APPLICANT : Rhino Mobility LLC
PRODUCT NAME : Module
MODEL NAME : M3501
BRAND NAME : RHINO
FCC ID : 2AUOUM3501
STANDARD(S) : FCC 47CFR Part 2(2.1091)
RECEIPT DATE : 2024-10-28
TEST DATE : 2024-12-19 to 2024-12-20
ISSUE DATE : 2025-01-10

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DIRECTORY

1. Technical Information	3
1.1 Applicant and Manufacturer Information	3
1.2 Equipment under Test (EUT) Description	3
1.3 Applied Reference Documents	6
2. Device Category and RF Exposure Limit	7
3. RF Output Power	8
4. RF Exposure Assessment	10
Annex A General Information	12

Change History		
Version	Date	Reason for Change
1.0	2025-01-10	First edition



1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Rhino Mobility LLC
Applicant Address:	8 The Green, Suite A, Dover, Delaware,19901, USA
Manufacturer:	Rhino Mobility LLC
Manufacturer Address:	8 The Green, Suite A, Dover, Delaware,19901, USA

1.2 Equipment under Test (EUT) Description

Product Name:	Module
Hardware Version:	SM3501_V1.0
Software Version:	M3501(001)_20250109
Frequency Bands:	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 Band12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 41: 2496 MHz ~ 2690 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 n14:788 MHz ~ 798 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n26: 814 MHz ~ 849 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n30: 2305 MHz ~ 2315 MHz 5G NR n41: 2496 MHz ~ 2690 MHz



	5G NR n48: 3550 MHz ~ 3700 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n71: 663 MHz ~ 698 MHz 5G NR n77: 3300 MHz ~ 4200 MHz 5G NR n78: 3300 MHz ~ 3800 MHz	
Modulation Mode:	LTE: QPSK,16QAM,64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, PI/2 BPSK QPSK, 16QAM, 64QAM, 256QAM	
Antenna Type:	LTE ANT: PIFA Antenna 5G NR ANT: PIFA Antenna	
Antenna Gain:	Frequency Bands	Antenna Gain (dBi)
	LTE Band 2	1.14
	LTE Band 4	-0.24
	LTE Band 5	1.71
	LTE Band 7	-0.18
	LTE Band 12	1.88
	LTE Band 13	1.69
	LTE Band 14	1.65
	LTE Band 25	1.14
	LTE Band 26	1.71
	LTE Band 30	-1.66
	LTE Band 41	0.06
	LTE Band 48	-0.42
	LTE Band 66	-0.24
	LTE Band 71	-1.26
	5G NR n2	1.14
	5G NR n5	1.71
	5G NR n7	-0.18
	5G NR n12	1.88
	5G NR n14	1.65
	5G NR n25	1.14
	5G NR n26	1.71
	5G NR n30	-1.66
	5G NR n41	0.06
	5G NR n48	-0.42
	5G NR n66	-0.24
	5G NR n71	-1.26
	5G NR n77	1.01



REPORT No.: SZ24100188S01

	5G NR n78	1.01
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Note:

When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% Confidence intervals.



1.3 Applied Reference Documents

Leading reference documents for testing:

Identity	Document Title	Method Determination /Remark
FCC 47 CFR Part 2(2.1091)	Radio Frequency Radiation Exposure Assessment: mobile devices	No deviation
KDB 447498 D01v06	General RF Exposure Guidance	No deviation
Note 1: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.		



2. RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

General Population/Uncontrolled Exposure:

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

Table 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)	Averaging time (minutes)
(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

f = frequency in MHz* = Plane-wave equivalent power density



3. RF Output Power

➤ **WWAN Maximum Average Power**

Wireless Mode	Frequency (MHz)	Max Tune-up Limit (dBm)
LTE Band 2	1880	24.00
LTE Band 4	1732.5	24.00
LTE Band 5	836.5	24.00
LTE Band 7	2535	24.00
LTE Band 12	707.5	24.00
LTE Band 13	782	24.00
LTE Band 14	793	24.00
LTE Band 25	1882.5	24.00
LTE Band 26	831.5	24.00
LTE Band 30	2310	24.00
LTE Band 41	2593	24.00
LTE Band 48	3625	24.00
LTE Band 66	1745	24.00
LTE Band 71	683	24.00
5G NR n2	1880	24.50
5G NR n5	836.5	24.00
5G NR n7	2535	24.00
5G NR n12	707.5	24.00
5G NR n14	793	24.00
5G NR n25	1882.5	24.50
5G NR n26 (814-824MHz)	819	24.00
5G NR n26 (824-849MHz)	836.5	24.00
5G NR n30	2310	24.00
5G NR n41	2592.99	23.50
5G NR n48	3624.99	23.50
5G NR n66	1745	24.00
5G NR n71	680.5	24.00
5G NR n77 (3450-3550MHz)	3500.01	24.00



5G NR n77 (3700-3980MHz)	3840	24.00
5G NR n78 (3450-3550MHz)	3500.01	24.00
5G NR n78 (3700-3980MHz)	3750	24.00

Note :

According to KDB 447498 Section 4.3, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

4. RF Exposure Assessment

➤ Standalone Transmission Assessment:

Bands	Frequency (MHz)	Tune-up Power (dBm)	Maximum Antenna Gain (dBi)	EIRP (mW)	PD (mW/cm ²)	Limit Value (mW/cm ²)
LTE Band 2	1880	24.00	1.14	326.59	0.065	1.0
LTE Band 4	1732.5	24.00	-0.24	237.68	0.047	1.0
LTE Band 5	836.5	24.00	1.71	372.39	0.074	0.558
LTE Band 7	2535	24.00	-0.18	240.99	0.048	1.0
LTE Band 12	707.5	24.00	1.88	387.26	0.077	0.472
LTE Band 13	782	24.00	1.69	370.68	0.074	0.521
LTE Band 14	793	24.00	1.65	367.28	0.073	0.529
LTE Band 25	1882.5	24.00	1.14	326.59	0.065	1.0
LTE Band 26	831.5	24.00	1.71	372.39	0.074	0.554
LTE Band 30	2310	24.00	-1.66	171.40	0.034	1.0
LTE Band 41	2593	24.00	0.06	254.68	0.051	1.0
LTE Band 48	3625	24.00	-0.42	228.03	0.045	1.0
LTE Band 66	1745	24.00	-0.24	237.68	0.047	1.0
LTE Band 71	683	24.00	-1.26	187.93	0.037	0.455
5G NR n2	1880	24.50	1.14	366.44	0.073	1.253
5G NR n5	836.5	24.00	1.71	372.39	0.074	0.558
5G NR n7	2535	24.00	-0.18	240.99	0.048	1.0
5G NR n12	707.5	24.00	1.88	387.26	0.077	0.472
5G NR n14	793	24.00	1.65	367.28	0.073	0.529
5G NR n25	1882.5	24.50	1.14	366.44	0.073	1.0
5G NR n26 (814-824MHz)	819	24.00	1.71	372.39	0.074	0.546
5G NR n26 (824-849MHz)	836.5	24.00	1.71	372.39	0.074	0.558
5G NR n30	2310	24.00	-1.66	171.40	0.034	1.0
5G NR n41	2592.99	23.50	0.06	226.99	0.045	1.0
5G NR n48	3624.99	23.50	-0.42	203.24	0.040	1.0
5G NR n66	1745	24.00	-0.24	237.68	0.047	1.0
5G NR n71	680.5	24.00	-1.26	187.93	0.037	0.454
5G NR n77 (3450-3550MHz)	3500.01	24.00	1.01	316.96	0.063	1.0
5G NR n77 (3700-3980MHz)	3840	24.00	1.01	316.96	0.063	1.0



5G NR n78 (3450-3550MHz)	3500.01	24.00	1.01	316.96	0.063	1.0
5G NR n78 (3700-3980MHz)	3750	24.00	1.01	316.96	0.063	1.0

Note:

1. According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

2. MPE calculate method

$$\text{Power Density} = \text{EIRP}/4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (20cm)

➤ **Simultaneous Transmission Assessment**

This device contains transmitters that don't operate simultaneously, therefore simultaneous transmission analysis is not required.

➤ **Conclusion:**

According to FCC 47 CFR Part 2 (2.1091), this device complies with human exposure basic restrictions.



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
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2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

The FCC designation number is CN1192, the test firm registration number is 226174.

_____ END OF REPORT _____