



RF Exposure Evaluation Declaration

FCC ID: 2BF3W-7161
Applicant: Wireless (US) Inc
Product: SkyNet IAB Node
Model No.: SkyNet SR7161, SkyNet SC7161
Brand Name: SkyNet
FCC Rule Part(s): FCC Part 2.1091
Result: Complies
Evaluation Date: 2024-08-21

Reviewed By:


Vincent Yu

Approved By:


Robin Wu



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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Revision History

Report No.	Version	Description	Issue Date	Note
2407RSU001-U6	V01	Initial Report	2024-08-27	Invalid
2407RSU001-U6	V02	Update Product Model	2024-08-27	Invalid
2407RSU001-U6	V03	Modify the Frequency Range of Wi-Fi 6E	2024-09-22	Valid

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1. General Information

1.1. Applicant

Wireless (US) Inc

10 CORPORATE PARK STE 330 IRVINE, CA 92606, USA

1.2. Manufacturer

Wireless (US) Inc

10 CORPORATE PARK STE 330 IRVINE, CA 92606, USA

1.3. Testing Facility

<input checked="" type="checkbox"/>	Test Site – MRT Suzhou Laboratory				
	Laboratory Location (Suzhou - Wuzhong)				
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China				
	Laboratory Location (Suzhou - SIP)				
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China				
	Laboratory Location (Suzhou - Wujiang)				
	Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People's Republic of China				
	Laboratory Accreditations				
A2LA: 3628.01		CNAS: L10551			
FCC: CN1166		ISED: CN0001			
VCCI:	<input type="checkbox"/> R-20025	<input type="checkbox"/> G-20034	<input type="checkbox"/> C-20020	<input type="checkbox"/> T-20020	
	<input type="checkbox"/> R-20141	<input type="checkbox"/> G-20134	<input type="checkbox"/> C-20103	<input type="checkbox"/> T-20104	
<input type="checkbox"/>	Test Site – MRT Shenzhen Laboratory				
	Laboratory Location (Shenzhen)				
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China				
	Laboratory Accreditations				
	A2LA: 3628.02		CNAS: L10551		
FCC: CN1284		ISED: CN0105			
<input type="checkbox"/>	Test Site – MRT Taiwan Laboratory				
	Laboratory Location (Taiwan)				
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)				
	Laboratory Accreditations				
TAF: 3261					
FCC: 291082, TW3261		ISED: TW3261			

1.4. Product Information

Product	SkyNet IAB Node
Model No.	SkyNet SR7161, SkyNet SC7161
Antenna Information	Refer to Section 1.5
Working Voltage	By PoE
Operating Temp.	-40 ~ 55°C
Operating Environment	Outdoor Use
Accessory	
PoE Injector	Model: UPI3301-PSC Input: AC 100-240V, 50/60Hz Output: 54V, DC
Remark:	
1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	
2. SR7161 with built-in omnidirectional antenna, SkyNet SC7161 with built-in directional antenna and 2.4G Wi-Fi is disabled by SW based on SkyNet SR7161 hardware. The circuit parts of SkyNet SR7161 and SkyNet SC7161 are the same.	

1.5. Antenna Details

Antenna Type	Frequency Range (MHz)	Antenna Gain (dBi)				Directional Gain (dBi)		30°elevation Gain (dBi)
		Ant 0	Ant 1	Ant 2	Ant 3	For Power	For PSD	
Model No.: SkyNet SR7161								
Built-in omni antenna	2412 ~ 2462	7.53	6.85	7.26	6.50	7.53	13.55	--
	5150 ~ 5850	6.97	7.65	7.80	8.12	8.12	14.14	7.65
	5925 ~ 6425	8.01	9.30	7.79	9.86	9.86	15.88	9.62
	6525 ~ 6875	6.51	8.81	6.78	8.71	8.81	14.83	8.70
Model No.: SkyNet SC7161								
Built-in directional antenna	5150 ~ 5850	8.58	10.19	10.12	10.32	10.32	16.34	3.92
	5925 ~ 6425	12.53	11.50	11.91	11.55	12.53	18.55	1.23
	6525 ~ 6875	12.24	11.25	12.72	11.29	12.72	18.74	-0.63
Note 1: The antenna gain and directional gain refer to manufacturer’s antenna specification.								
Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode for 802.11a/b/g/n/ac/ax/be.								
Note 3: Software automatically backs power down based on CDD power for beamforming operation.								
Note 4: The transmit power of SkyNet SC7161 will be adjusted according to the difference in antenna gain between the two models.								

1.6. Device Classification

According to the user manual, this device is classified as a Mobile Device. So, the RF exposure evaluation requirements of § 2.1091 for mobile device exposure conditions subject to MPE limits.

1.7. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 2.1091 & KDB 447498 D04 Interim General RF Exposure Guidance v01

2. RF Exposure Evaluation

2.1. Limits

According to FCC §1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

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)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500	--	--	f/300	<6
1,500-100,000	--	--	5	<6
(B) Limits for General Population/ Uncontrolled Exposures				
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
300-1,500	--	--	f/1500	<30
1,500-100,000	--	--	1.0	<30

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

2.2. MPE Exemptions

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph §1.1307(b)(2) of this section): A single RF source is exempt if:

(Option A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph §1.1307(b)(3)(ii)(A) of this section.

Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(ii)(A);

(Option B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P is given by:

$$P_{th}(mW) = \{ERP_{20cm} (d / 20cm)^x \quad d \leq 20cm$$

$$P_{th}(mW) = \{ERP_{20cm} \quad 20cm < d \leq 40cm$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20cm}(mW) = \{2040f \quad 0.3GHz \leq f < 1.5GHz$$

$$ERP_{20cm}(mW) = \{3060 \quad 1.5GHz \leq f \leq 6GHz$$

(Option C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to §1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1920R ²
1.34-30	3450R ² /f ²
30-300	3.83R ²
300-1,500	0.0128R ² f
1,500-100,000	19.2R ²

For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph §1.1307(b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(B) of this section for P_{th} , including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph §1.1307(b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i .

ERP_j = the ERP of fixed, mobile, or portable RF source j .

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j , at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph §1.1307(b)(3)(i)(C) of this section.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k , as applicable from §1.1310 of this chapter.

2.3. Calculated Result

Product	SkyNet IAB Node
Test Item	RF Exposure Evaluation

Test Mode	Frequency Band (MHz)	Tune-up Conducted Power (dBm)	Antenna Gain (dBi)	Tune-up ERP (dBm)	Tune-up ERP (mW)
Wi-Fi (DTS)	2412 ~ 2462	28.15	7.53	33.53	2254.24
Wi-Fi (NII)	5150 ~ 5250	13.30	8.12	19.27	84.53
	5250 ~ 5350	19.94	8.12	25.91	389.94
	5470 ~ 5725	21.07	8.12	27.04	505.82
	5725 ~ 5850	27.81	8.12	33.78	2387.81
Wi-Fi (6SD-L)	5955 ~ 6415	11.28	9.86	18.99	79.25
Wi-Fi (6SD-H)	6595 ~ 6855	12.20	8.81	18.86	76.91

Notes:

1. The Tune-up Power was declared by manufacturer.
2. Tune-up ERP = Tune up Conducted Power + Antenna Gain - 2.15.

For single RF source, Option C

Test Mode	Frequency Band (MHz)	$\lambda / 2 \pi$ (m)	R (m)	Tune-up ERP (mW)	Thresholds ERP (mW)
Wi-Fi (DTS)	2412 ~ 2462	0.019	0.55	2280.34	5808
Wi-Fi (NII)	5725 ~ 5850	0.009	0.55	2387.81	5808
Wi-Fi (6SD-L)	5955 ~ 6415	0.007	0.55	79.25	5808
Wi-Fi (6SD-H)	6595 ~ 6855	0.007	0.55	76.91	5808

Notes:

1. R is from user manual.
2. The EUT supports Wi-Fi (DTS) + Wi-Fi (NII) + Wi-Fi (6SD-L) + Wi-Fi (6SD-H) simultaneous transmissions, therefore, the worst-case total exposure ratios = $2280.34/5808 + 2387.34/5808 + 79.25/5808 + 76.91/5808 = 0.83 < 1$.

CONCLUSION:

The device qualifies for RF exposure test exemption at 55cm distance.

The End