



RF EXPOSURE EVALUATION REPORT

APPLICANT : Nanjing Juplink Intelligent Technologies Co., Ltd..
PRODUCT NAME : Dual-band Gigabit Router
MODEL NAME : RX4-1800
BRAND NAME : JupLink
FCC ID : 2AT9Z-RX4-1800
STANDARD(S) : 47 CFR§2.1091; KDB 447498 D01v06
RECEIPT DATE : 2020-01-03
TEST DATE : 2020-02-18 to 2020-02-21
ISSUE DATE : 2020-06-02

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Change History		
Issue	Date	Reason for change
1.0	2020-06-02	First edition



1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

Applicant:	Nanjing Juplink Intelligent Technologies Co., Ltd.
Applicant Address:	No. 757, Dixiu Road, Binjiang Economic Development Zone, Jiangning District, Nanjing China
Manufacturer:	Sichuan Tianyi Comheart Telecom Co., Ltd.
Manufacturer Address:	No. 198, Section 1, Xueshan Avenue, Dayi County, Chengdu, Sichuan, China

1.2. Equipment Under Test (EUT) Description

Product Name:	Dual-band Gigabit Router
Hardware Version:	V1.0.0
Software Version:	V1.0.1
Modulation Mode:	802.11b/g/n 802.11ac(HT20), 802.11ac(HT40),802.11ac(HT80) 802.11a,802.11n(HT20), 802.11n(HT40) 802.11ax(HEW20), 802.11ax(HEW40),802.11ax(HEW80)
Operating Frequency Range:	802.11b/g/n-20MHz: 2.412GHz - 2.462GHz 802.11n-40MHz: 2.422GHz - 2.452GHz 5.180 GHz- 5.240 GHz;5.725GHz- 5.850GHz
Modulation Type:	DSSS, OFDM
Antenna type:	Dipole Antenna
Antenna Gain:	Ant 5 dBi

1.3. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1091	Radiofrequency Radiation Exposure Evaluation: mobile devices
2	KDB 447498 D01v06	General RF Exposure Guidance



2. Device category and 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 Exposure Evaluation

Standalone transmission MPE evaluation

Mode		Frequency	Maximum conducted output power		Power density(S)	Limit for MPE
			(MHz)	(dBm)		
802.11b	ANT0	2412	17.72	118.032	0.023	1.0
802.11b	ANT1	2412	17.50	112.202	0.022	1.0
802.11n20	ANT0+ANT1	2462	20.52	225.113	0.045	1.0
802.11ac	ANT0	5230	14.12	51.523	0.010	1.0
802.11ac	ANT1	5230	15.44	69.823	0.014	1.0
802.11ac	ANT0+ANT1	5230	18.22	66.374	0.013	1.0
802.11ax	ANT0	5240	18.38	68.865	0.014	1.0
802.11ax	ANT1	5745	19.16	82.414	0.016	1.0
802.11ax	ANT0+ANT1	5755	21.66	146.555	0.029	1.0

Calculation method:

$$S = P \cdot G / 4\pi R^2$$

Where:

S = power density(in appropriate units, e.g., mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = antenna gain

R = Separation distance (20cm)

This device supports simultaneous transmission of 2.4G Wi-Fi and 5G Wi-Fi.

According to KDB447498 D01 General RF Exposure Guidance v06, simultaneous transmission is evaluated:

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0 .

For simultaneously transmit system, the calculated power density should comply with:

$$\text{The sum of MPE ratios} = \sum_i \frac{S_i}{S_{\text{Limit},i}} \leq 1$$

The worst case is as below:

$$\text{Max MPE ratios of 2.4G Wi-Fi} + \text{Max MPE ratios of 5G Wi-Fi} = 0.045 + 0.029 = 0.074 \leq 1.$$



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Kehu-Morlab Test Laboratory
Department:	Kehu-Morlab Test Laboratory
Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian), P. R. China
Responsible Test Lab Manager:	Mr. Di Dehai
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2. Identification of the Responsible Testing Location

Name:	Kehu-Morlab Test Laboratory
Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian), P. R. China

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