

Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

SAR TEST REPORT

PRODUCT	Bluetooth & WiFi 2.4G/5G Module
BRAND	WNC
MODEL	UWM-XP9098V2
FCC ID	NKRUWM-XP9098V2
APPLICANT	Wistron NeWeb Corporation
ISSUE DATE	March 5, 2024
STANDARD(S)	FCC 47 CFR Part 2 §2.1091

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1 Summary of Test Report

1.1 Test Standard (s)

No.	Test Standard(s)	Title	Version
1	FCC 47 CFR Part 2 §2.1091	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS. Section 2.1091 Radiofrequency radiation exposure evaluation: mobile devices	N/A

1.2 Reference Documents

No.	Reference Document(s)	Title	Version
1	KDB447498	General RF Exposure Guidance	D01 v06

1.3 Data Provided by Applicant

No.	Item(s)	Data
1	Maximum output power	Antenna 1: BT:8.00 dBm Wi-Fi 5G U-NII-1:10.00 dBm Wi-Fi 5G U-NII-2A:10.00 dBm Wi-Fi 5G U-NII-2C:9.00 dBm Wi-Fi 5G U-NII-3:9.00 dBm Antenna 2: Wi-Fi 2.4G:18.00 dBm Wi-Fi 5G U-NII-1:11.00 dBm Wi-Fi 5G U-NII-2A:11.00 dBm Wi-Fi 5G U-NII-2C:10.00 dBm Wi-Fi 5G U-NII-3:10.00 dBm Antenna 1+Antenna 2: Wi-Fi 5G U-NII-1 MIMO:13.00 dBm Wi-Fi 5G U-NII-2A MIMO:13.00 dBm Wi-Fi 5G U-NII-2C MIMO:12.00 dBm Wi-Fi 5G U-NII-3 MIMO:12.00 dBm
2	Maximum antenna gain	Antenna 1: BT:2.27 dBi Wi-Fi 5G U-NII-1/2A/2C/3:2.47 dBi Antenna 2: Wi-Fi 2.4G:2.27 dBi Wi-Fi 5G U-NII-1/2A/2C/3:2.47 dBi
NOTE: The data of Maximum output power and Maximum antenna gain are provided by the customer may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

2 General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4, No. 766, Jingang Road, Pudong, Shanghai, China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364

2.2 Laboratory Environmental Requirements

Temperature	18°C~25°C
Relative Humidity	25%RH~75%RH

2.3 Project Information

Project Manager	Xu Yuting
Test Date	N/A

3 General Information of The Customer

3.1 Applicant

Company	Wistron NeWeb Corporation
Address	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C
Telephone	+886 3-666-7799

3.2 Manufacturer

Company	WNC (Kunshan) Corporation Company Limited
Address	NO.88,Central Avenue,Comprehensive Free Trade Zone,Kunshan,JIANGSU,China
Telephone	+86-25-84821688 Ext: 6190

3.3 Factory

Company	N/A
Address	N/A

4 General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product	Bluetooth & WiFi 2.4G/5G Module
Model	UWM-XP9098V2
Date of Receipt	N/A
EUT ID*	N/A
SN/IMEI	N/A
Supported Radio Technology and Bands	Wi-Fi 2.4G 802.11b/g/n/ac/ax Wi-Fi 5G 802.11a/n/ac/ax BT5.3, BR/EDR/LE
Tx Frequency	2412 MHz-2462 MHz (Wi-Fi 2.4G) 5180 MHz-5240 MHz (Wi-Fi 5G U-NII-1) 5260 MHz-5320 MHz (Wi-Fi 5G U-NII-2A) 5500 MHz-5720 MHz (Wi-Fi 5G U-NII-2C) 5745 MHz-5825 MHz (Wi-Fi 5G U-NII-3) 2402 MHz-2480 MHz (BT)
Hardware Version	G02
Software Version	N/A
NOTE1: EUT ID is the internal identification code of the laboratory. NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Description for Auxiliary Equipment (AE)

AE ID*	Description	Model	SN/Remark
N/A	N/A	N/A	N/A
NOTE: AE ID is the internal identification code of the laboratory.			

5 General Description

5.1 Evaluation Distance

Evaluation distance 20cm as a distance between the equipment and the operator or user when it is used normally. The distance used for the assessment had be specified by the manufacturer and be onsistent with the intended usage of the equipment.

5.2 Evaluation Method

For conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

Based on the KDB447498 D01 and FCC 47 CFR Part 2 § 2.1091, the DUT is evaluated as a mobile device.

$$S = \frac{P \times G}{4\pi d^2}$$

Where

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

6 Assessment Results

6.1 Standalone Evaluation

6.1.1 Limit/Criterion

Table 6.1.1-1 Limits for Occupational / Controlled Exposure

Limits for Occupational / Controlled Exposure				
Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3 – 3.0	614	1.63	(100)*	6
3.0 – 30	1824/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1	6
300 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6
Limits for General Population / Uncontrolled Exposure				
Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3 – 1.34	614	1.63	(100)*	30
1.34 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	--	--	F/1500	30
1500 - 100000	--	--	1	30
NOTE: f = frequency in MHz; * Plane-wave equivalent power density. For the DUT, the limits for General Population / Uncontrolled Exposure are applicable.				

6.1.2 Standalone Evaluation

Table 6.1.2-1: Standalone Evaluation

Antenna	Band	Frequency (MHz)	Tune Up (dBm)	Highest Output Power (dBm)	Highest Output Power (mW)	Antenna Gain(dBi)	Numeric antenna gain	Power density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power density /Limit
Antenna 1	BT	2402	8.00	8.00	6.31	2.27	1.687	0.002	1.000	0.002
Antenna 1	Wi-Fi 5G U-NII-1	5180	10.00	10.00	10.00	2.47	1.766	0.004	1.000	0.004
Antenna 1	Wi-Fi 5G U-NII-2A	5260	10.00	10.00	10.00	2.47	1.766	0.004	1.000	0.004
Antenna 1	Wi-Fi 5G U-NII-2C	5500	9.00	9.00	7.94	2.47	1.766	0.003	1.000	0.003
Antenna 1	Wi-Fi 5G U-NII-3	5745	9.00	9.00	7.94	2.47	1.766	0.003	1.000	0.003
Antenna 2	Wi-Fi 2.4G	2412	18.00	18.00	63.10	2.27	1.687	0.021	1.000	0.021
Antenna 2	Wi-Fi 5G U-NII-1	5180	11.00	11.00	12.59	2.47	1.766	0.004	1.000	0.004
Antenna 2	Wi-Fi 5G U-NII-2A	5260	11.00	11.00	12.59	2.47	1.766	0.004	1.000	0.004
Antenna 2	Wi-Fi 5G U-NII-2C	5500	10.00	10.00	10.00	2.47	1.766	0.004	1.000	0.004
Antenna 2	Wi-Fi 5G U-NII-3	5745	10.00	10.00	10.00	2.47	1.766	0.004	1.000	0.004

6.2 Simultaneous transmission Evaluation

Table 6.2-1 Simultaneous transmission Evaluation

Antenna	1	Antenna	2	1+2
Antenna 1	Power density/Limit	Antenna 2	Power density/Limit	Σ (Power density/Limit)
BT	0.002	Wi-Fi 2.4G	0.021	0.023
		Wi-Fi 5G	0.004	0.006
Wi-Fi 5G	0.004	Wi-Fi 2.4G	0.021	0.025
		Wi-Fi 5G	0.004	0.008

Note1: Σ (Power density/Limit) : This is a summation of [(Power density for each transmitter/antenna included in the simultaneous transmission)/(corresponding MPE limit)], for Wi-Fi 2.4G/5G+BT, Wi-Fi 2.4G+Wi-Fi 5G and Wi-Fi 5G MIMO.

Note2: Considering the Antenna 1 collocation with the Antenna 2 transmitter of the Highest output power performance listed in the table above, the aggregated (Power density/Limit) is smaller than 1, and MPE collocated transmitters is compliant.

Annex A: Revised History

Version	Revised Content
V00	Initial

END OF REPORT