Testing Laboratory
1190

FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	NKR-77CORNER
Equipment	:	77Ghz Corner radar sensor
Brand Name	:	Wistron NeWeb Corporation
Model Name	:	UMD-RN03T / UMD-RN03x / UMD-RN02x (Please refer to section 1.3 for detail information.)
Applicant	:	Wistron NeWeb Corporation 20 Park Avenue II Hsinchu Science Park Taiwan 308
Manufacturer	:	Wistron NeWeb Corporation 20 Park Avenue II Hsinchu Science Park Taiwan 308
Standard	:	47 CFR Part 2.1091

The product was received on Jan. 15, 2021, and testing was started from Jan. 22, 2021 and completed on Jan. 25, 2021. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FA111513	01	Initial issue of report	Feb. 09, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Vicky Huang

1 General Description

1.1 EUT General Information

RF General Information		
Frequency Range (GHz)	**Operating Frequency (GHz)**	**Modulation Type**
76-81	76.175~76.925	FMCW

1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
						TX	RX
1	1	Wistron NeWeb Corporation	-	Patch Antenna	N/A	14.3	15.1
	2	Wistron NeWeb Corporation	-	Patch Antenna	N/A	-	15.1
	3	Wistron NeWeb Corporation	-	Patch Antenna	N/A	-	15.1
	4	Wistron NeWeb Corporation	-	Patch Antenna	N/A	-	15.1

Note1: The above information was declared by manufacturer.

Note2: The antenna has four ports (1TX, 4RX).

Only Port 1 could transmit.

Port 1, Port 2, Port 3 and Port 4 could receive simultaneously.

1.3 Table for Multiple Listing

The EUT has two different externals as the following table:

EUT	Description
1	The EUT has two different externals, but their internal circuit boards are the same
2	

Note: From the above, EUT 1 was selected for the test and its data was recorded in this report.

The model names in the following table are all refer to the identical product.

Model Name	Description
UMD-RN03T / UMD-RN03x / UMD-RN02x (where “x” can be “0-9, or “a-z”, or “A-Z”, or blank)	All the models are identical, the difference model served as marketing strategy.

Note 1: From the above models, model: UMD-RN03T was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.4 Accessories

N/A

1.5 Testing Location

Testing Location			
☐	HWA YA	ADD :	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)
		TEL :	886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD :	No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)
		TEL :	886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
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
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |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^2)	<30
30-300	27.5	0.073	0.2	<30
300-1500	-	-	f/1500	<30
1500-100,000	-	-	1.0	<30

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

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Distance (cm)	Test Freq. (GHz)	EIRP-Average (dBm)	Tune-up (dBm)	EIRP-Average (mW)	Power Density(S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
20	76.49	21.62	22.12	162.97	0.03244	1.00	PASS

———THE END———