RF Exposure Report

Report No.:	SABCKS-WTW-P21010640
FCC ID:	NKR-WLD92
Test Model:	WLD92
Received Date:	Jan. 19, 2021
Test Date:	Feb. 05 to 22, 2021
Issued Date:	Apr. 06, 2021
Applicant:	Wistron NeWeb Corporation
Address:	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SABCKS-WTW-P21010640	Original release.	Apr. 06, 2021

1 Certificate of Conformity

Product:	LTE Indoor Router
Brand:	Wistron NeWeb Corporation
Test Model:	WLD92
Sample Status:	Engineering sample
Applicant:	Wistron NeWeb Corporation
Test Date:	Feb. 05 to 22, 2021
Standards:	FCC Part 2 (Section 2.1091) IEEE C95.3 -2002
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Phoenix Huang , **Date:** Apr. 06, 2021

Phoenix Huang / Specialist

Approved by : , **Date:** Apr. 06, 2021

Clark Lin / Technical Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
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

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range	Antenna Type	Connector Type
1 (LTE)	Chain0	2.3	1850~1910 MHz	PIFA	None
		1.9	1710~1755 MHz		
		1.8	824~849 MHz		
		0.4	698~716 MHz		
		1.9	1710~1780 MHz		
2 (LTE)	Chain1 (RX only)	-	-	PIFA	None
3 (WLAN)	Chain0	2.1	2.4~2.4835 GHz	PIFA	None
		3.7	5.15~5.85 GHz		
4 (WLAN)	Chain1	2.9	2.4~2.4835 GHz	PIFA	None
		4.7	5.15~5.85 GHz		

Note: The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5 Calculation Result

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN (2.4GHz)	2412-2462	378.501	5.52	20	0.26841	1
WLAN (U-NII-1)	5180-5240	135.38	7.22	20	0.142	1
WLAN (U-NII-3)	5745-5825	117.093	7.22	20	0.12282	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2 / 2$] = 5.52 dBi
3. 5GHz: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2 / 2$] = 7.22 dBi

MPE Evaluation

Operation Mode	Evaluation Frequency (MHz)	The Worst Case		Max. EIRP Power		Power Density (mW/cm^2)		Ratio
		Mode	Freq. (MHz)	mW	dBm	Value	Limit	
LTE (Band 2)	1850-1910	10MHz	1905	384.592	25.85	0.07651	1	0.07651
LTE (Band 4)	1710-1755	20MHz	1720	329.61	25.18	0.06557	1	0.06557
LTE (Band 5)	824-849	1.4MHz	848.3	299.916	24.77	0.05967	0.54933*	0.10862
LTE (Band 12)	699-716	1.4MHz	699.7	239.883	23.80	0.04772	0.466*	0.10240
LTE (Band 66)	1710-1780	20MHz	1720	329.61	25.18	0.06557	1	0.06557

Note: *Limit of Power Density = F/1500

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN (2.4GHz) + WLAN (5GHz) + WWAN = 0.26841 / 1 + 0.142 / 1 + 0.05967 / 0.54933 = 0.51903

Therefore the maximum calculations of above situations are less than the "1" limit.

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