

## RF Exposure Report

**Report No.:** SA190401E07

**FCC ID:** NKR-LVSK-ODU

**Test Model:** LVSKODU

**Received Date:** Apr. 01, 2019

**Test Date:** May 21, 2019

**Issued Date:** June 12, 2019

**Applicant:** Wistron NeWeb Corp.

**Address:** 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

**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 R.O.C.

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

Issue No.	Description	Date Issued
SA190401E07	Original release.	June 12, 2019

## 1 Certificate of Conformity

**Product:** LVSKODU

**Brand:** WNC

**Test Model:** LVSKODU

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Wistron NeWeb Corp.

**Test Date:** Apr. 01 to 26, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

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.

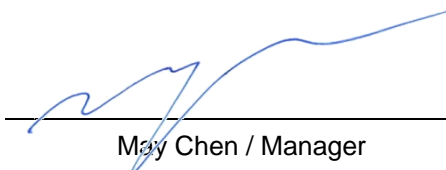
**Prepared by :**



**Date:** June 12, 2019

Claire Kuan / Specialist

**Approved by :**



**Date:** June 12, 2019

May Chen / 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 <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

### 2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

LTE					
Ant. No.	Ant. Net Gain (dBi)	Freq. range (MHz)	Ant. Type	Connector Type	Cable Length (mm)
1.ODU-LH1 (Ant. 0)	3.86	746~894	IFA	NA	NA
		1710~2200			
2.ODU-LH2 (Ant. 2)	4.55	746~894	IFA	NA	NA
		1710~2200			
3.ODU-H1 (Ant. 3)	3.58	1710~2200	IFA	i-pex (MHF)	62
4.ODU-H2 (Ant. 4)	2.27	1710~2200	IFA	i-pex (MHF)	66
Bluetooth					
Ant. No.	Ant. Net Gain (dBi)	Freq. range (GHz)	Ant. Type	Connector Type	
5.ODU-BT (Ant. 1)	2.69	2.4~2.4835	IFA	NA	
5G NR					
Ant. No.	Freq. range (MHz)		Ant. Type	Connector Type	
5G NR Antenna	27500~28350 37000~40000		Smart patch array Antenna	NA	

## 2.5 Calculation Result

### WWAN 1Tx:

Operation Mode	Evaluation Frequency (MHz)	Max.Conducted Power		Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
		(mW)	(dBm)				
LTE B2	1850.7	354.813	25.50	3.86	20	0.17168	1
LTE B4	1710.7	354.813	25.50	3.86	20	0.17168	1
LTE B5	824.7	354.813	25.50	3.86	20	0.17168	0.5498
LTE B13	779.5	354.813	25.50	3.86	20	0.17168	0.5197
LTE B66	1710.7	354.813	25.50	3.86	20	0.17168	1
LTE CA_ ANT0 off / ANT2 uplink for Band 2	1850.7	251.189	24.00	4.55	20	0.14247	1
LTE CA_ ANT0 off / ANT2 uplink for Band 4	1712.5	251.189	24.00	4.55	20	0.14247	1
LTE CA_ ANT0 off / ANT2 uplink for Band 66	1712.5	354.813	25.50	4.55	20	0.20125	1

Note:

1. Limit of Power Density = F/1500 (For frequency below 1500MHz)
2. This power include tune-up tolerance range that specified in LVSKODU Tune Up power table.

### WWAN CA 2Tx <Worst case>:

Operation Mode	Evaluation Frequency (MHz)	Max.Conducted Power		Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
		(mW)	(dBm)				
LTE CA_13A ANT0 / 66A_ANT2	779.5	354.813	25.50	3.86	20	0.17168	0.5197
	1712.5	354.813	25.50	4.55	20	0.20125	1

### 5G NR:

Operation Mode	Evaluation Frequency (MHz)	Max.EIRP		Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
		(mW)	(dBm)			
5G NR n261	27500	354.813	25.50	20	0.07059	1
5G NR n260	37000	223.872	23.50	20	0.04454	1

Note:

1. This power include tune-up tolerance range that specified in LVSKODU Tune Up power table.

### BT-LE:

Operation Mode	Evaluation Frequency (MHz)	Max.Conducted Power		Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
		(mW)	(dBm)				
BT-LE (1M)	2402	10	10	2.69	20	0.00370	1

Note:

1. This power include tune-up tolerance range that specified in LVSKODU Tune Up power table.

**Conclusion:**

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

$BT\text{-}LE + 5G\ NR\ n261 + WWAN\ (CA\_B13A\_ANT\ 0) + WWAN\ (CA\_B66A\_ANT\ 2) = 0.0037 / 1 + 0.07059 / 1 + 0.17168 / 0.5197 + 0.20125 / 1 = 0.60588$

$BT\text{-}LE + 5G\ NR\ n260 + WWAN\ (CA\_B13A\_ANT\ 0) + WWAN\ (CA\_B66A\_ANT\ 2) = 0.0037 / 1 + 0.04454 / 1 + 0.17168 / 0.5197 + 0.20125 / 1 = 0.57983$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

**--- END ---**