

## RF Exposure Report

**Report No.:** SA200225E06

**FCC ID:** NKR-LS03

**Test Model:** S40LR0-01

**Received Date:** Feb. 25, 2020

**Test Date:** Mar. 05, 2020

**Issued Date:** Apr. 15, 2020

**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

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

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

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 RF Exposure</b> .....	<b>5</b>
2.1 Limits for Maximum Permissible Exposure (MPE) .....	5
2.1 MPE Calculation Formula .....	5
2.2 Classification .....	5
2.3 Antenna Gain .....	6
2.4 Calculation Result of Maximum Conducted Power .....	7
<b>Appendix</b> .....	<b>8</b>

### Release Control Record

Issue No.	Description	Date Issued
SA200225E06	Original release.	Apr. 15, 2020

## 1 Certificate of Conformity

**Product:** Smart Home Hub

**Brand:** ADT

**Test Model:** S40LR0-01

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Wistron NeWeb Corp.

**Test Date:** Mar. 05, 2020

**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 :** Vivian Huang , **Date:** Apr. 15, 2020  
Vivian Huang / Specialist

**Approved by :** Clark Lin , **Date:** Apr. 15, 2020  
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 <sup>2</sup> )	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 <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

2 f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.1 MPE Calculation Formula

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

where

Pd = power density in mW/cm<sup>2</sup>

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

### 2.2 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**.

## 2.3 Antenna Gain

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
WiFi 2.4GHz	6.07	2.4~2.4835GHz	PCB	i-pex(MHF)
WiFi 2.4GHz	4.67	2.4~2.4835GHz	PCB	i-pex(MHF)
BLE	5.38	2.4~2.4835GHz	PCB	i-pex(MHF)
LTE_ANT1	0.87 2.38 2.25	698 ~ 716 MHz 1710 ~ 1755 MHz 1850 ~1910 MHz	Monopole	N/A
Zigbee	4.11	2.4~2.4835GHz	PCB	i-pex(MHF)
Zwawe	0.91	902 ~ 928 MHz	PIFA	N/A
ANT_DECT1	0.43	1920 ~ 1930MHz	PIFA	N/A
ANT_DECT2	0.59	1920 ~ 1930MHz	PIFA	N/A

## 2.4 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Avg. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN (2.4GHz)	2412-2462	158.511	8.41	20	0.21867	1
Bluetooth	2402-2480	6.561	5.38	20	0.00451	1
Zigbee	2405-2480	66.527	4.11	20	0.03410	1
DECT	1921.536-1928.448	81.846	0.59	20	0.01865	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: The directional gain is =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.41$  dBi

### Z-Wave Field Strength Conversion:

Evaluation Frequency (MHz)	Field Strength of Fundamental (dBuV/m) @3m	EIRP (dBm)	EIRP (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
908.4-916	93.8	-1.43	0.7194	20	0.00014312	0.6056

- Note: 1. Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) - 95.23 (dB)  
 2. Power Density Limit = F/1500

### For WWAN module < Worst Case > FCC ID: NKRIMQ5

Operation Mode	Evaluation Frequency (MHz)	Max Avg. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
LTE B12	699.7~715.3	186.21	0.87	20	0.04526	0.46647

Note: Limit of Power Density = F/1500

### 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

$$\text{WLAN 2.4GHz} + \text{Bluetooth} + \text{Zigbee} + \text{Z-Wave} + \text{LTE B12} + \text{DECT} = 0.21867 / 1 + 0.00451 / 1 + 0.03410 / 1 + 0.00014 / 0.6056 + 0.04526 / 0.46647 = 0.37319$$

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

## Appendix

WWAN module

MPE Evaluation for FCC ID: NKRIMQ5

Operation Mode	Transmitter Range (MHz)		Maximum Avg. Power		Antenna Gain (dBi)	Power Density (mW/cm <sup>2</sup> )		Ratio
	Start	Stop	(dBm)	(mW)		Vaule	Limit	
LTE Band 2	1850.7	1909.3	22.70	186.21	2.25	0.06219	1	0.06219
LTE Band 4	1710.7	1754.3	22.70	186.21	2.38	0.06408	1	0.06408
LTE Band 12	699.7	715.3	22.70	186.21	0.87	0.04526	0.46647*	<b>0.09703</b>

Note: \*Limit of Power Density = F/1500

--- END ---