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

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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 : , **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^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

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^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

2.2 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)
Zwave	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^2)	Limit (mW/cm^2)
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:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 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^2)	Limit (mW/cm^2)
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^2)	Limit (mW/cm^2)
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 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + Bluetooth + Zigbee + Z-Wave + LTE B12 + 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	Power Density (mW/cm^2)		Ratio
	Start	Stop	(dBm)	(mW)	(dBi)	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*	**0.09703**

Note: *Limit of Power Density = F/1500

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