# RF Exposure Report

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|---|---|
| **Report No.:** | SA190819E05 |
| **FCC ID:** | NKRM18QF |
| **Test Model:** | M18QF, M18QA |
| **Series Model:** | M14QF, M14QA |
| **Received Date:** | Aug. 19, 2019 |
| **Test Date:** | Sep. 18, 2019 |
| **Issued Date:** | Oct. 19, 2019 |
| **Applicant:** | Wistron NeWeb Corporation |
| **Address:** | 20 Park Ave. 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 |
|---|---|---|
| SA190819E05 | Original release. | Oct. 19, 2019 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | M2M DATA MODULE |
| **Brand:** | Wistron NeWeb Corporation |
| **Test Model:** | M18QF, M18QA |
| **Series Model:** | M14QF, M14QA |
| **Sample Status:** | ENGINEERING SAMPLE |
| **Applicant:** | Wistron NeWeb Corporation |
| **Test Date:** | Sep. 18, 2019 |
| **Standards:** | FCC Part 2 (Section 2.1091)<br>KDB 447498 D01 General RF Exposure Guidance v06<br>IEEE C95.3 -2002 |

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 / Specialist , **Date:** Oct. 19, 2019

**Approved by :** May Chen / Manager , **Date:** Oct. 19, 2019

## 2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

| 2 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

2.1 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

| For GPS | | | | | | |
|---|---|---|---|---|---|---|
| Antenna No. | Brand | Model | Antenna Net Gain (dBi) | Frequency Range (MHz) | Antenna Type | Connector Type |
| GPS | Master | 98619ZSAX029 | 2.24 | 1559~1606 | Dipole | SMA |

| For WWAN | | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna No. | RF Chain No. | Brand | Model | Antenna Net Gain (dBi) | Frequency Range (MHz) | Antenna Type | Connector Type |
| 1 | Main | Wieson | GY115 | Please refer to below table | Please refer to below table | Dipole | SMA |
| 2 | Aux | Wieson | GY115 | Please refer to below table | Please refer to below table | Dipole | SMA |

| Antenna gain list | | | |
|---|---|---|---|
| Band | Freq. Range (MHz) | Gain (dBi) | |
| | | Ant 1 (Main) | Ant 2 (Aux) |
| WCDMA II (B2) | 1850~1910 | 1.56 | 1.56 |
| WCDMA V (B5) | 824~849 | 3.2 | 3.2 |
| LTE Band (2) | 1850~1910 | 1.56 | 1.56 |
| LTE Band (4) | 1710~1755 | 1.62 | 1.62 |
| LTE Band (5) | 824~849 | 3.2 | 3.2 |
| LTE Band (12) | 698~716 | 1.49 | 1.49 |
| LTE Band (13) | 777~787 | 1.66 | 1.66 |
| LTE Band (14) | 788~798 | 1.60 | 1.60 |

2.4 Calculation Result

| Operation Mode | Evaluation Frequency (MHz) | Max.Conducted Power | | Antenna Gain (dBi) | Distance (cm) | Power Density ($mW/cm^2$) | Limit ($mW/cm^2$) |
|---|---|---|---|---|---|---|---|
| | | (mW) | (dBm) | | | | |
| WCDMA B2 | 1852.4 | 283.792 | 24.53 | 1.56 | 20 | 0.08086 | 1 |
| WCDMA B5 | 826.4 | 335.738 | 25.26 | 3.20 | 20 | 0.13955 | 0.55093 |
| LTE B2 | 1908.5 | 198.153 | 22.97 | 1.56 | 20 | 0.05646 | 1 |
| LTE B4 | 1720 | 200.447 | 23.02 | 1.62 | 20 | 0.05791 | 1 |
| LTE B5 | 836.5 | 266.073 | 24.25 | 3.20 | 20 | 0.11059 | 0.55767 |
| LTE B12 | 704 | 281.19 | 24.49 | 1.49 | 20 | 0.07884 | 0.46933 |
| LTE B13 | 779.5 | 283.792 | 24.53 | 1.66 | 20 | 0.08274 | 0.51967 |
| LTE B14 | 795.5 | 275.423 | 24.40 | 1.60 | 20 | 0.07920 | 0.53033 |

Note: Limit of Power Density = f/1500 (For frequency below 1500MHz)

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