

## RF Exposure Report (Spot Check)

**Report No.:** SA180830E03G

**FCC ID:** 2APLE18300394

**Original FCC ID:** 2APLE18300398

**Test Model:** VMB5000

**Revision:** V035

**Received Date:** June 02, 2019

**Test Date:** June 02, 2019

**Issued Date:** July 18, 2019

**Applicant:** Arlo Technologies, Inc.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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Taiwan R.O.C.

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
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**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

| Issue No.    | Description       | Date Issued   |
|--------------|-------------------|---------------|
| SA180830E03G | Original release. | July 18, 2019 |

## 1 Certificate of Conformity

**Product:** Alro Gen5 Entry Hub

**Brand:** Arlo

**Test Model:** VMB5000

**Revision:** V035

**Sample Status:** Pre Production Unit

**Applicant:** Arlo Technologies, Inc.

**Test Date:** June 02, 2019

**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 :** Wendy Wu , **Date:** July 18, 2019  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** July 18, 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 |                               |                               |                                     |                        |
| 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                     |

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<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

### 2.3 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

| Sub-GHz |                            |                  |                        |                      |              |                |                   |
|---------|----------------------------|------------------|------------------------|----------------------|--------------|----------------|-------------------|
| Ant No. | Brand                      | Model            | Antenna Gain (dBi)     | Frequency rang (MHz) | Antenna type | Connector type |                   |
| 1       | NA                         | 902P00214N0      | 1.5                    | 860~930              | PIFA         | NA             |                   |
| Z-Wave  |                            |                  |                        |                      |              |                |                   |
| Ant No. | Brand                      | Model            | Antenna Gain (dBi)     | Frequency rang (MHz) | Antenna type | Connector type |                   |
| 1       | NA                         | 902P00213N0      | 2.5                    | 860~930              | PIFA         | NA             |                   |
| Zigbee  |                            |                  |                        |                      |              |                |                   |
| Ant No. | Brand                      | Model            | Antenna Gain (dBi)     | Frequency rang (GHz) | Antenna type | Connector type |                   |
| 1       | INPAQ TECHNOLOGY CO., LTD. | ACA-5036-A2-CC-S | 3.5                    | 2.4~2.4835           | CHIP         | NA             |                   |
| WLAN    |                            |                  |                        |                      |              |                |                   |
| Ant No. | Brand                      | Model            | Antenna Net Gain (dBi) | Frequency rang (GHz) | Antenna type | Connector type | Cable Length (mm) |
| 1       | NA                         | 9 07X01052X0     | 2.5                    | 2.4~2.4835           | Dipole       | i-pex          | 75                |
|         |                            |                  | 1.8                    | 5.15~5.25            |              |                |                   |
|         |                            |                  | 2                      | 5.25~5.35            |              |                |                   |
|         |                            |                  | 2.2                    | 5.47~5.725           |              |                |                   |
|         |                            |                  | 1.6                    | 5.725~5.85           |              |                |                   |
| 2       | NA                         | 9 07X00747X19    | 2.5                    | 2.4~2.4835           | Dipole       | i-pex          | 90                |
|         |                            |                  | 2.2                    | 5.15~5.25            |              |                |                   |
|         |                            |                  | 1.2                    | 5.25~5.35            |              |                |                   |
|         |                            |                  | 3.2                    | 5.47~5.725           |              |                |                   |
|         |                            |                  | 3.5                    | 5.725~5.85           |              |                |                   |

## 2.5 Calculation Result

For 2.4GHz, 5GHz (UNII-1, U-NII-3), Zigbee, Z-Wave and Sub-GHz data was copied from the original test report (Report No.: SA180830E03)

| Operation Mode | Evaluation Frequency (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------|----------------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| WLAN 2.4GHz    | 2437                       | 508.821        | 5.51               | 20            | 0.35999                             | 1                           |
| WLAN U-NII-1   | 5200                       | 571.179        | 5.01               | 20            | 0.36016                             | 1                           |
| WLAN U-NII-2A  | 5320                       | 249.483        | 4.62               | 20            | 0.14380                             | 1                           |
| WLAN U-NII-2C  | 5550                       | 249.543        | 5.72               | 20            | 0.18530                             | 1                           |
| WLAN U-NII-3   | 5745                       | 490.624        | 5.61               | 20            | 0.35520                             | 1                           |
| Zigbee         | 2405                       | 90.991         | 3.5                | 20            | 0.04053                             | 1                           |
| Sub-GHz        | 915                        | 92.89          | 1.5                | 20            | 0.02610                             | 0.61                        |

Note:

2.4GHz: Directional gain = 2.5dBi + 10log(2) = 5.51dBi

5GHz:

For U-NII-1 band: Directional gain =  $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$  = 5.01dBi

For U-NII-2A band: Directional gain =  $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$  = 4.62dBi

For U-NII-2C band: Directional gain =  $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$  = 5.72dBi

For U-NII-3 band: Directional gain =  $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$  = 5.61dBi

### Z-Wave Field Strength Conversion:

| 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           | 93.9                                       | -1.33      | 0.7362    | 20            | 0.00015                             | 0.6056                      |

Note: 1. Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) - 95.23 (dB)

2. Power Density Limit = 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 + Zigbee + Sub-GHz + Z-Wave = 0.35999 / 1 + 0.36016 / 1 + 0.04053 / 1 + 0.02610 / 0.61 + 0.00015 / 0.6056 = 0.80371

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

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