

# RF Exposure Evaluation declaration

Product Name : Miku Life Monitor  
Trade Name : miku  
Model No. : M0100  
FCC ID. : 2AQM3M0100

Applicant : Miku, Inc.

Address : 10 Woodbridge Center Drive Suite 650 Woodbridge, NJ 07095

Date of Receipt : Aug. 02, 2018  
Date of Declaration : Sep. 21, 2018  
Report No. : 1880035R-RFUSP02V00  
Report Version : V0.1-Draft



The declaration results relate only to the samples calculated.

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## 1. RF Exposure Evaluation

### 1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### 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) |
|-----------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures            |                               |                               |                                     |                        |
| 300-1500                                                  | --                            | --                            | F/300                               | 6                      |
| 1500-100,000                                              | --                            | --                            | 5                                   | 6                      |
| (B) Limits for General Population/ Uncontrolled Exposures |                               |                               |                                     |                        |
| 300-1500                                                  | --                            | --                            | F/1500                              | 6                      |
| 1500-100,000                                              | --                            | --                            | 1                                   | 30                     |

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### 1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

### 1.3. Test Result of RF Exposure Evaluation

|                |                        |
|----------------|------------------------|
| Product        | Miku Life Monitor      |
| Test Mode      | Transmit               |
| Test Condition | RF Exposure Evaluation |

#### Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.85 dBi or 2.43 dBi in linear scale.

#### Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11b (ANT 0) |                         |                              |                                                  |
|----------------------|-------------------------|------------------------------|--------------------------------------------------|
| WLAN Function        |                         |                              |                                                  |
| Channel              | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) |
| 1                    | 2412                    | 142.889                      | 0.069                                            |
| 6                    | 2437                    | 178.649                      | 0.086                                            |
| 11                   | 2462                    | 275.423                      | 0.133                                            |

| IEEE 802.11g (ANT 0) |                         |                              |                                                  |
|----------------------|-------------------------|------------------------------|--------------------------------------------------|
| WLAN Function        |                         |                              |                                                  |
| Channel              | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) |
| 1                    | 2412                    | 437.522                      | 0.212                                            |
| 6                    | 2437                    | 449.780                      | 0.217                                            |
| 11                   | 2462                    | 420.727                      | 0.203                                            |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.

The results are evaluated using the maximum power.

|                |                        |
|----------------|------------------------|
| Product        | Miku Life Monitor      |
| Test Mode      | Transmit               |
| Test Condition | RF Exposure Evaluation |

### Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.85 dBi or 2.43 dBi in linear scale.

### Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11n (20MHz) (ANT 0+1) |                         |                              |                                                  |
|--------------------------------|-------------------------|------------------------------|--------------------------------------------------|
| WLAN Function                  |                         |                              |                                                  |
| Channel                        | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) |
| 1                              | 2412                    | 104.568                      | 0.051                                            |
| 6                              | 2437                    | 254.976                      | 0.123                                            |
| 11                             | 2462                    | 251.652                      | 0.122                                            |

| IEEE 802.11n (40MHz) (ANT 0+1) |                         |                              |                                                  |
|--------------------------------|-------------------------|------------------------------|--------------------------------------------------|
| WLAN Function                  |                         |                              |                                                  |
| Channel                        | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) |
| 3                              | 2422                    | 235.885                      | 0.114                                            |
| 6                              | 2437                    | 231.526                      | 0.112                                            |
| 9                              | 2452                    | 237.739                      | 0.115                                            |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.

The results are evaluated using the maximum power.

|                |                        |
|----------------|------------------------|
| Product        | Miku Life Monitor      |
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| Power Density (2.4G)<br>(mW/cm <sup>2</sup> ) | Power Density (UWB)<br>(mW/cm <sup>2</sup> ) | Total Power Density<br>(2.4GHz + UWB)<br>(mW/cm <sup>2</sup> ) | Limit<br>(mW/cm <sup>2</sup> ) |
|-----------------------------------------------|----------------------------------------------|----------------------------------------------------------------|--------------------------------|
| 0.217                                         | 0.001                                        | 0.218                                                          | 1                              |

Note: The power of certified UWB module (FCC ID: 2AD9QX4M02) is according to 1772022R-RF-US-P06V02 from DEKRA report.

The Power Density in UWB is 0.001 mW/cm<sup>2</sup>.