

## MPE Calculation

|                       |                                                                                 |
|-----------------------|---------------------------------------------------------------------------------|
| Applicant:            | Guangzhou Puppy Robotics Co., Ltd.                                              |
| Address:              | Room 4001, No.16, Huaxia Road, Tianhe District, Guangzhou, Guangdong, P.R.China |
| Product:              | Puppy Cube                                                                      |
| Model:                | C1                                                                              |
| FCC ID:               | 2ARDX-PAIPMSVT01                                                                |
| Reference RF report # | 68.950.18.478.01, 68.950.18.480.01, 68.950.18.481.01, 68.950.18.482.01,         |

According to subpart 15.247(i) and subpart §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz)                                   | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (minutes) |
| 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                       |
| 300–1,500                                               | /                             | /                             | f/1500                              | 30                       |
| 1,500–100,000                                           | /                             | /                             | 1.0                                 | 30                       |

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

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

## 2.4GWIFI

|                                                                             |       |
|-----------------------------------------------------------------------------|-------|
| Maximum Average output power at antenna input terminal (dBm):               | 18.73 |
| Maximum peak output power at antenna input terminal (mW):                   | 74.65 |
| Prediction distance (cm):                                                   | 20    |
| Antenna Gain, typical (dBi):                                                | 2.5   |
| Maximum Antenna Gain (numeric):                                             | 1.78  |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.026 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0   |

$0.026(\text{mW}/\text{cm}^2) < 1 (\text{mW}/\text{cm}^2)$

## Bluetooth BR+EDR

|                                                                             |        |
|-----------------------------------------------------------------------------|--------|
| Maximum Average output power at antenna input terminal (dBm):               | 10.55  |
| Maximum peak output power at antenna input terminal (mW):                   | 11.35  |
| Prediction distance (cm):                                                   | 20     |
| Antenna Gain, typical (dBi):                                                | 3.6    |
| Maximum Antenna Gain (numeric):                                             | 2.29   |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.0052 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0    |

$0.0052(\text{mW}/\text{cm}^2) < 1 (\text{mW}/\text{cm}^2)$

## Bluetooth LE

|                                                                             |       |
|-----------------------------------------------------------------------------|-------|
| Maximum Average output power at antenna input terminal (dBm):               | 3.53  |
| Maximum peak output power at antenna input terminal (mW):                   | 2.25  |
| Prediction distance (cm):                                                   | 20    |
| Antenna Gain, typical (dBi):                                                | 3.6   |
| Maximum Antenna Gain (numeric):                                             | 2.29  |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.001 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0   |

$0.001(\text{mW}/\text{cm}^2) < 1 (\text{mW}/\text{cm}^2)$

## 5GWIFI

|                                                               |       |
|---------------------------------------------------------------|-------|
| Maximum Average output power at antenna input terminal (dBm): | 18.84 |
| Maximum peak output power at antenna input terminal (mW):     | 76.56 |

|                                                                             |      |
|-----------------------------------------------------------------------------|------|
| Prediction distance (cm):                                                   | 20   |
| Antenna Gain, typical (dBi):                                                | 2.9  |
| Maximum Antenna Gain (numeric):                                             | 1.95 |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.03 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0  |

$0.03(\text{mW}/\text{cm}^2) < 1 (\text{mW}/\text{cm}^2)$

Result: Compliant

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