

# RF Exposure Evaluation Report

**Product** : Artificial Intelligence Terminal Computer  
**Trade mark** : N/A  
**Model/Type reference** : PP23TQB  
**Serial Number** : N/A  
**Report Number** : EED32M00052605  
**FCC ID** : 2AWMI-PP23TQB  
**Date of Issue** : Jul.14, 2020  
**Test Standards** : 47 CFR  
47 CFR Part 2.1091  
KDB447498D01v06  
**Test result** : PASS

Prepared for:

**Beijing Puppy Robotics Co., Ltd.**  
**Room 103, building 1, Yard 33,**  
**Yanqi Road, Huairou District, Beijing, China**

Prepared by:

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Date:

Jul.14, 2020

Check No.:3915652268



## 2 Version

| Version No. | Date         | Description |
|-------------|--------------|-------------|
| 00          | Jul.14, 2020 | Original    |
|             |              |             |
|             |              |             |

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## 4 General Information

### 4.1 Client Information

|                          |   |
|--------------------------|---|
| Applicant:               | Beijing Puppy Robotics Co., Ltd.  |
| Address of Applicant:    | Room 103, building 1, Yard 33, Yanqi Road, Huairou District, Beijing, China |
| Manufacturer:            | Beijing Puppy Robotics Co., Ltd.  |
| Address of Manufacturer: | Room 103, building 1, Yard 33, Yanqi Road, Huairou District, Beijing, China |
| Factory:                 | Zhang zhou Wanlida Technology Co., Ltd.                                     |
| Address of Factory:      | Wanlida Industrial Zone, Jingcheng Town, Nanjing, Zhangzhou, Fujian, China  |

### 4.2 General Description of EUT

|                                 |  |
|---------------------------------|--|
| Product Name:                   | Artificial Intelligence Terminal Computer  |
| Model No.(EUT):                 | PP23TQB  |
| Trade Mark:                     | N/A  |
| EUT Supports Radios application | BT5.0 Dual mode 2402MHz to 2480MHz<br>2.4GHz Wi-Fi:802.11b/g/n(HT20)(HT40): 2412MHz ~2462 MHz;<br>5GHz Wi-Fi: U-NII-1: 5.15-5.25GHz; U-NII-2A: 5.25-5.35GHz;<br>U-NII-2C: 5.470-5.725GHz; U-NII-3: 5.725-5.850GHz; |

### 4.3 Product Specification subjective to this standard

|                       |  |
|-----------------------|--|
| Frequency Range:      | BT: 2402MHz to 2480MHz<br>2.4GHz Wi-F: 2412MHz ~2462 MHz<br>5GHz Wi-Fi: 5.15-5.25GHz; 5.25-5.35GHz; 5.470-5.725GHz;<br>5.725-5.850GHz  |
| Modulation Type:      | BT: GFSK ,π/4DQPSK,8DPSK<br>WiFi : DSSS,OFDM   |
| Number of Channels:   | BT: 79; 40<br>2.4G WIFI: IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels<br>IEEE 802.11n HT40: 7 Channels<br>5G WIFI: IEEE 802.11a/n/ac(HT20): 5180MHz ~5240 MHz / 4 channel<br>IEEE 802.11a/n/ac(HT20): 5260MHz ~5320 MHz / 4 channel<br>IEEE 802.11a/n/ac(HT20): 5500MHz ~5700 MHz / 11 channel<br>IEEE802.11a/n/ac(HT20): 5745MHz ~5825 MHz / 5 channel<br>IEEE802.11n/ac(HT40) 5190MHz ~5230 MHz/ 2 channel<br>IEEE802.11n/ac(HT40) 5270MHz ~5310 MHz / 2 channel<br>IEEE802.11n/ac(HT40) 5510MHz ~5670 MH/ 5 channel<br>IEEE802.11n/ac(HT40) 5755MHz ~5795 MHz / 2 channel<br>IEEE802.11ac(HT80) 5210 / 1 channel<br>IEEE802.11ac(HT80) 5290 / 1 channel<br>IEEE802.11ac(HT80) 5530 ~ 5690 / 2 channel<br>IEEE802.11ac(HT80) 5775 /1 channel |
| Test Power Grade:     | Reference report EED32M00052601,EED32M00052602,<br>EED32M00052603,EED32M00052604   |
| Test Software of EUT: | 2.4G/5G Wi-Fi/BT:QRCT  |

|   |                                |   |                               |
|---|--------------------------------|---|-------------------------------|
| Antenna Type:   | FPC antenna                    |   |                               |
| Antenna Specification   | Bluetooth :                    | Antenna Gain :  | 3.50 dBi (Numeric gain: 2.24) |
|   | 2.4GHz                         | Antenna Gain :  | 3.50 dBi (Numeric gain: 2.24) |
|   | 5GHz                           | Antenna Gain :  | 4.10 dBi (Numeric gain: 2.57) |
| Maximum tune up power   | Bluetooth:                     | 9.00 dBm  | (7.943 mW)                    |
|   | 2.4G WIFI                      |   |                               |
|   | SISO                           |   |                               |
|   | IEEE 802.11b Mode:             | 19.00 dBm   | (79.433 mW)                   |
|   | IEEE 802.11g Mode:             | 18.00 dBm   | (63.096 mW)                   |
|   | IEEE 802.11n HT 20 Mode:       | 17.00 dBm   | (50.119 mW)                   |
|   | IEEE 802.11n HT 40 Mode:       | 16.00 dBm   | (39.811 mW)                   |
|   | MIMO                           |   |                               |
|   | IEEE 802.11n HT 20 Mode:       | 17.00 dBm   | (50.119 mW)                   |
|   | IEEE 802.11n HT 40 Mode:       | 16.00 dBm   | (39.811 mW)                   |
|   | 5G WIFI                        |   |                               |
|   | SISO                           |   |                               |
|   | IEEE 802.11a Mode:             | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11n HT 20 Mode:       | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11n HT 40 Mode:       | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11ac VHT 20 Mode:     | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11ac VHT 40 Mode:     | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11ac VHT 80 Mode:     | 10.00 dBm   | (10.000 mW)                   |
|   | MIMO                           |   |                               |
|   | IEEE 802.11n HT 20 Mode:       | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11n HT 40 Mode:       | 14.00 dBm   | (25.119 mW)                   |
|   | IEEE 802.11ac VHT 20 Mode:     | 14.00 dBm   | (25.119 mW)                   |
| IEEE 802.11ac VHT 40 Mode:  | 14.00 dBm                      | (25.119 mW)   |                               |
| IEEE 802.11ac VHT 80 Mode:  | 10.00 dBm                      | (10.000 mW)   |                               |
| Power Supply:   | AC Adapter                     | MODEL:AP065G-19300<br>INPUT:100-240V~50/60Hz 1.5A Max<br>OUTPUT:19V---3A                      |                               |
|   | Battery                        | Model:BT-J003 3LPC5/60/102<br>Rated Capacity:5000mAh<br>Power Rating:11.55V---5000mAh 57.75Wh |                               |
| Sample Received Date:   | Mar. 19, 2020                  |   |                               |
| Sample tested Date:   | Mar. 19, 2020 to Jun. 23, 2020 |   |                               |
| The tested sample(s) and the sample information are provided by the client. |                                |   |                               |

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#### **4.4 Test Location**

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

#### **4.5 Deviation from Standards**

None.

#### **4.6 Abnormalities from Standard Conditions**

None.

#### **4.7 Other Information Requested by the Customer**

None.

## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

Given  $E = \frac{\sqrt{30 \times P \times G}}{d}$  &  $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm<sup>2</sup>

## 5.2 Maximum Permissible Exposure

Substituting the MPE safe distance using  $d = 20$  cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where  $P$  = Power in mW

$G$  = Numeric antenna gain

$S$  = Power density in mW / cm<sup>2</sup>

### Bluetooth:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 19  | 2440      | 7.943  | 2.24        | 20     | 0.0035                                | 1                           |

### 2.4G WIFI

#### SISO

#### IEEE 802.11b mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 6   | 2437      | 79.433 | 2.24        | 20     | 0.0354                                | 1                           |

#### IEEE 802.11g mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 1   | 2412      | 63.096 | 2.24        | 20     | 0.0281                                | 1                           |

#### IEEE 802.11n HT20 mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 11  | 2462      | 50.119 | 2.24        | 20     | 0.0223                                | 1                           |

#### IEEE 802.11n HT40 mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 6   | 2437      | 39.811 | 2.24        | 20     | 0.0177                                | 1                           |

### MIMO

#### IEEE 802.11n HT20 mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 1   | 2412      | 50.119 | 2.24        | 20     | 0.0223                                | 1                           |

#### IEEE 802.11n HT40 mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 3   | 2422      | 39.811 | 2.24        | 20     | 0.0177                                | 1                           |



**5G WIFI  
SISO**
**IEEE 802.11a mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 116 | 5580      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11 HT20 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 149 | 5745      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11 HT40 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 62  | 5310      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11ac VHT20 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 140 | 5700      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11ac VHT40 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 62  | 5310      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11ac VHT80 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 155 | 5775      | 10.00  | 2.57        | 20     | 0.0051                                | 1                           |

**MIMO**
**IEEE 802.11 HT20 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 64  | 5320      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11 HT40 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 110 | 5550      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11ac VHT20 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 64  | 5320      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

**IEEE 802.11ac VHT40 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 159 | 5795      | 25.119 | 2.57        | 20     | 0.0128                                | 1                           |

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**IEEE 802.11ac VHT80 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 42  | 5210      | 10.00  | 2.57        | 20     | 0.0051                                | 1                           |

## PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32M00052601 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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