# TEST REPORT

**Product Name : Doorbell camera**
**Model Number : IPB203, DB201**
**FCC ID : 2AQ7B-IPB203**

| | | |
|---|---|---|
| Prepared for | : | SHENZHEN INTERTHINGS TECHNOLOGY CO.,LTD. |
| Address | : | L310, Jinhetian Business Center, NO. 329, 3rd Road Longhuan, Helian Community, Longhua Street, Longhua District, Shenzhen, China |
| Prepared by | : | EMTEK (DONGGUAN) CO., LTD. |
| Address | : | -1&2/F.,Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China<br><br>TEL: +86-0769-22807078<br>FAX: +86-0769-22807079 |
| Report Number | : | EDG2304230044E00103R |
| Date(s) of Tests | : | May 16, 2023 to June 06, 2023 |
| Date of issue | : | June 07, 2023 |

## Table of Contents

# 1. TEST RESULT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | SHENZHEN INTERTHINGS TECHNOLOGY CO.,LTD. |
| Address： | : | L310, Jinhetian Business Center, NO. 329, 3rd Road Longhuan, Helian Community, Longhua Street, Longhua District, Shenzhen, China |
| Manufacturer | : | SHENZHEN INTERTHINGS TECHNOLOGY CO.,LTD. |
| Address： | : | L310, Jinhetian Business Center, NO. 329, 3rd Road Longhuan, Helian Community, Longhua Street, Longhua District, Shenzhen, China |
| Factory | : | SHENZHEN INTERTHINGS TECHNOLOGY CO.,LTD. |
| Address | : | L310, Jinhetian Business Center, NO. 329, 3rd Road Longhuan, Helian Community, Longhua Street, Longhua District, Shenzhen, China |
| EUT | : | Doorbell camera |
| Model Name | : | IPB203, DB201 |
| Trademark | : | VIVITAR |

Measurement Procedure Used:

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| FCC 1.1310：§1.1307(b) | **PASS** |

The above equipment was tested by EMTEK(DONGGUAN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules FCC 1.1310：§1.1307(b).
The test results of this report relate only to the tested sample identified in this report

Date of Test : May 16, 2023 to June 06, 2023

Prepared by : Xia Yang /Editor

Reviewer : Tim Dong/ Supervisor

Approved & Authorized Signer :

Sam Lv / Manager

# Modified History

| Version | Report No. | Revision Date | Summary |
|---|---|---|---|
| | EDG2304230044E00103R | / | Original Report |
| | | | |
| | | | |

## 2. EUT Specification

| Characteristics | Description |
|---|---|
| **Product:** | Doorbell camera |
| **Model Number:** | IPB203, DB201<br>All products are the same, only the model number and color of appearance are different<br>Here we selected IPB203 for all the test |
| **Sample:** | 2# |
| **Device Type:** | 2.4G WIFI+433.92MHz Doorbell camera |
| **Data Rate:** | 802.11b<br>802.11g<br>802.11n(20MHz channel bandwidth)<br>802.11n(40MHz channel bandwidth) |
| **Modulation:** | DSSS with DBPSK/DQPSK/CCK for 802.11b;<br>OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n; |
| **Operating Frequency Range(s) :** | 2412-2462MHz for 802.11b/g/n(HT20);<br>2422-2452MHz for 802.11n(HT40);<br>433.92MHz |
| **Number of Channels:** | 11 channels for 802.11b/g/n(HT20); |
| | 7 Channels for 802.11n(HT40); |
| | 1 channel for 433.92MHz |
| **Transmit Power Max:** | Wifi 2.4G：-0.90 dBm(0.000813W)<br>433MHz：74.36 dBuV@3m |
| **Antenna Gain:** | WIFI 2.4G：1.79 dBi<br>433MHz：1.0 dBi |
| **Power supply:** | DC 5V 1A form USB, DC 3.7V form battery |
| **Evaluation applied:** | ☒ MPE Evaluation<br>☐ SAR Evaluation |

# 3. Test Requirement

RF EXPOSURE EVALUATION

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($mW/cm^2$) | Average Time |
|---|---|---|---|---|
| **(A) Limits for Occupational/Control Exposures** | | | | |
| **300-1500** | **--** | **--** | **F/300** | **6** |
| **1500-100000** | **--** | **--** | **5** | **6** |
| **(B) Limits for General Population/Uncontrol Exposures** | | | | |
| **300-1500** | **--** | **--** | **F/1500** | **6** |
| **1500-100000** | **--** | **--** | **1** | **30** |

Friis transmission formula: Pd= (Pout*G) / (4*pi*R2)

Where

Pd= Power density in $mW/cm^2$

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm

Pd the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

According to ANSI C63.10-2013
9.5 Equations to calculate EIRP
Calculate the EIRP from the radiated field strength in the far field using Equation (22):
EIRP = E + 20log (d) −104.7 (22)
where
EIRP is the equivalent isotropically radiated power, in dBm
E is the field strength of the emission at the measurement distance, in dBμV/m
d is the measurement distance, in m

## 4. Measurement Result

WIFI 2.4G
Antenna gain: 1.79 dBi

| Mode | Frequency (MHz) | Output Power (dBm) | E. I.R.P (dBm) | Target Power W/tolerance (dBm) | Max tune up power (dBm) tolerance | Max tuneup power (mW) tolerance | Power Density at R=20cm ($mW/cm^2$) | Limit (mW/cm2) |
|---|---|---|---|---|---|---|---|---|
| 802.11b | 2412 | -0.90 | 0.89 | 0±1 | 1 | 1.26 | 0.000250 | 1 |
| | 2437 | -1.89 | -0.10 | -1±1 | 0 | 1.00 | 0.000199 | 1 |
| | 2462 | -3.15 | -1.36 | -2±1 | -1 | 0.79 | 0.000158 | 1 |
| 802.11g | 2412 | -7.20 | -5.41 | -4±1 | -5 | 0.32 | 0.000063 | 1 |
| | 2437 | -8.23 | -6.44 | -7±1 | -6 | 0.25 | 0.000050 | 1 |
| | 2462 | -9.48 | -7.69 | -8±1 | -7 | 0.20 | 0.000040 | 1 |
| 802.11n (HT20) | 2412 | -7.35 | -5.56 | -6±1 | -5 | 0.32 | 0.000063 | 1 |
| | 2437 | -8.26 | -6.47 | -7±1 | -6 | 0.25 | 0.000050 | 1 |
| | 2462 | -9.53 | -7.74 | -8±1 | -7 | 0.20 | 0.000040 | 1 |
| 802.11n (HT40) | 2422 | -7.69 | -5.90 | -6±1 | -5 | 0.32 | 0.000063 | 1 |
| | 2437 | -8.28 | -6.49 | -6±1 | -5 | 0.32 | 0.000063 | 1 |
| | 2452 | -9.10 | -7.31 | -7±1 | -6 | 0.25 | 0.000050 | 1 |

433MHz
Antenna gain: 1.0 dBi

| Channel Freq. (MHz) | Max Field Strength (dBuV/m) | peak output power (dBm) | Tune up Power (dBm) | Max tune up power (dBm) | Max tune up power (mW) | Power Density at R=20cm (mW/cm2) | Limit (mW/cm2) |
|---|---|---|---|---|---|---|---|
| 433.92 | 74.36 | -19.80 | -20±1 | -19 | 0.012589 | 0.00000315 | 1 |

*** End of Report ***