

Ecovacs Home Service Robotics Co., Ltd.

MPE ASSESSMENT REPORT

Report Type:

FCC Part §2.1091 and §1.1307(b) assessment report

Model:

DEX56, DDX15

REPORT NUMBER:

2408B0748SHA-003

ISSUE DATE:

October 10, 2024

DOCUMENT CONTROL NUMBER:

TTRFFCCMPE-01 V1 © 2018 Intertek





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Report no.: 2408B0748SHA-003

Applicant: Ecovacs Home Service Robotics Co., Ltd.

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Manufacturer: Ecovacs Home Service Robotics Co., Ltd.

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FCC ID: 2A64B-DEX56

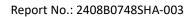
SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

KDB447498 D01 General RF Exposure Guidance v06 FCC Part2.1091, FCC Part1.1307(b)

| PREPARED BY: | KENIEMED RA: | | |
|-----------------------------|------------------------|--|--|
| Zrie. li | Jk:W | | |
| Project Engineer Eric Li | Reviewer Wakeyou Wang | | |

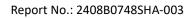
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Revision History

| Report No. | Version | Description | Issued Date | |
|------------------|---------|-------------------------|------------------|--|
| 2408B0748SHA-003 | Rev. 01 | Initial issue of report | October 10, 2024 | |
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1 GENERAL INFORMATION

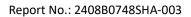
1.1 Description of Equipment Under Test (EUT)

| Product name: | Floor Cleaning Robot |
|----------------------------|--------------------------------------------------------------------------|
| Type/Model: | DEX56, DDX15 |
| Description of EUT: | The EUT is a Floor Cleaning Robot, it supports WIFI functions, there are |
| | two models, they are the same except DDX15 shut down the AI camera |
| | function through software. We tested DEX56 as representative and listed |
| | the worst results in this report. |
| Rating: | DC20V, 2A |
| EUT type: | ☐ Table top ☐ Floor standing |
| Software Version: | / |
| Hardware Version: | / |
| Sample Identification No.: | 0240804-006-002 |
| Sample received date: | 2024.8.4 |
| Date of test: | 2024.8.5~2024.8.30 |

1.2 Technical Specification

| Frequency Band: | 2400MHz ~ 2483.5MHz | | | |
|---------------------|------------------------------------------------------------------|--|--|--|
| Support Standards: | IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20, IEEE 802.11n-HT40 | | | |
| | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) | | | |
| | IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) | | | |
| | IEEE 802.11n-HT20: OFDM (64-QAM, 16-QAM, QPSK, BPSK) | | | |
| Type of Modulation: | IEEE 802.11n-HT40: OFDM (64-QAM, 16-QAM, QPSK, BPSK) | | | |
| | 11 Channels for 802.11b, 802.11g and 802.11n(HT20) | | | |
| Channel Number: | 7 Channels for 802.11n(HT40) | | | |
| Channel Separation: | 5 MHz | | | |
| Antenna: | FPC Antenna, 2.48dBi | | | |

| Frequency Band: | 2402MHz to 2480MHz |
|----------------------|------------------------------|
| Support Standards: | Bluetooth Low Energy |
| Type of Modulation: | GFSK |
| Channel Number: | 40 |
| Data Rate | 1Mbps |
| Channel Separation: | 2MHz |
| Antenna Information: | FPC Antenna, gain is 2.55dBi |

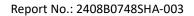




1.3 Description of Test Facility

| Name: | Intertek Testing Services (Shanghai FTZ) Co., Ltd. |
|------------|------------------------------------------------------------------------|
| Address: | Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China |
| Telephone: | 86 21 61278200 |
| Telefax: | 86 21 54262353 |

| The test facility is recognized, certified, or accredited by these organizations: | CNAS Accreditation Lab Registration No. CNAS L21189 |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| | FCC Accredited Lab Designation Number: CN0175 |
| | IC Registration Lab CAB identifier.: CN0014 |
| | VCCI Registration Lab Member No: 3598 (Registration No.: R-14243, G-10845, C-14723, T-12252) |
| | A2LA Accreditation Lab Certificate Number: 3309.02 |





2 MPE Assessment

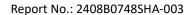
Test result: Pass

2.1 MPE Assessment Limit

Mobile device exposure for standalone operations:

| Frequency range | E-field strength (V/m) | H-field strength (A/m) | B-field (uT) | Equivalent plane wave power density Seq (W/m²) |
|-----------------|---------------------------|---------------------------|-------------------------|-------------------------------------------------|
| 0-1 Hz | - | 3,2 × 10 ⁴ | 4 × 10 ⁴ | - Seq (VV/III) |
| 1-8 Hz | 10 000 | $3.2 \times 10^4/f^2$ | $4 \times 10^4/f^2$ | - |
| 8-25 Hz | 10 000 | 4 000/f | 5 000/f | - |
| 0,025-0,8 kHz | 250/f | 4/f | 5/f | - |
| 0,8-3 kHz | 250/f | 5 | 6,25 | - |
| 3-150 kHz | 87 | 5 | 6,25 | - |
| 0,15-1 MHz | 87 | 0,73/f | 0,92/f | - |
| 1-10 MHz | 87/f ^{1/2} | 0,73/f | 0,92/f | - |
| 10-400 MHz | 28 | 0,073 | 0,092 | 2 |
| 400-2 000 MHz | 1,375 f ^{1/2} | 0,0037 f ^{1/2} | 0,0046 f ^{1/2} | f/200 |
| 2-300 GHz | 61 | 0,16 | 0,20 | 10 |

Mobile device exposure for simultaneous transmission operations: the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is \leq 1.0





TEST REPORT

2.2 Assessment Results

Power density (S) is calculated according to the formula:

 $S = PG / (4\pi R^2)$

Where $S = power density in mW/cm^2$

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

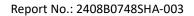
As we can see from the test report 2408B0748SHA-001, 2408B0748SHA-002:

The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

| Mode | Frequency band | Max Power | Antenna Gain | R | S | Limits |
|------|-------------------|--------------|-----------------|------|----------|----------|
| | (MHz) | dBm | dBi | (cm) | (mW/cm2) | (mW/cm2) |
| WIFI | 2412-2462 | 16.11 | 2.48 | 20 | 0.0144 | 1 |
| BLE | 2402-2480 | 3.49 | 2.55 | 20 | 0.0008 | 1 |

Note: 1 mW/cm2 from 1.310 Table 1

This device exposure for simultaneous transmission operations: the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is $0.0144/1+0.0008/1=0.0152 \le 1.0$, therefore, the MPE requirement is deemed to be satisfied without test.





Appendix I

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be

maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

Definition below must be outlined in the User Manual: