

# Anova Applied Electronics, Inc.

## MPE ASSESSMENT REPORT

**Report Type:**

FCC MPE assessment report

**Model:**

AN425-10

**REPORT NUMBER:**

230100950SHA-005

**ISSUE DATE:**

February 21, 2023

**DOCUMENT CONTROL NUMBER:**

TTRFFCCMPE-01\_V1 © 2018 Intertek



**Applicant:** Anova Applied Electronics, Inc.  
667 Howard Street, San Francisco, CA94105

**Manufacturer:** Anova Applied Electronics, Inc.  
667 Howard Street, San Francisco, CA94105

**Factory:** Flextronics Manufacturing (Zhuhai) Co., Ltd.  
Flextronics Zhuhai Industrial Park, Xin Qing Science & Technology  
Industrial Park, B15 Jing An Doumen, Zhuhai 519180, P.R.C

**FCC ID:** 2APBOAN425

## 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 Part2.1093 FCC Part1.1307(b)

**PREPARED BY:**

**REVIEWED BY:**



Project Engineer  
Eric Li

Reviewer  
Wakeyou Wang

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## Revision History

| Report No.       | Version | Description             | Issued Date       |
|------------------|---------|-------------------------|-------------------|
| 230100950SHA-005 | Rev. 01 | Initial issue of report | February 21, 2023 |
|                  |         |                         |                   |
|                  |         |                         |                   |

## 1 GENERAL INFORMATION

### 1.1 Description of Equipment Under Test (EUT)

|                       |  |
|-----------------------|--|
| Product name:         | Sous Vide Immersion Circulator   |
| Type/Model:           | AN425-10   |
| Description of EUT:   | EUT is a Sous Vide Immersion Circulator with BLE and WIFI functions, there is one model. We tested it and listed the worst results in this report. |
| Rating:               | 120V AC, 60Hz, 850W  |
| Category of EUT:      | Class B  |
| EUT type:             | <input checked="" type="checkbox"/> Tabletop <input type="checkbox"/> Floor standing   |
| Software Version:     | /  |
| Hardware Version:     | /  |
| Sample received date: | October 28, 2022   |
| Date of test:         | November 6, 2022~ November 17, 2022  |

### 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  |
| Type of Modulation: | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK)<br>IEEE 802.11n-HT20: OFDM (64-QAM, 16-QAM, QPSK, BPSK)<br>IEEE 802.11n-HT40: OFDM (64-QAM, 16-QAM, QPSK, BPSK) |
| Channel Number:     | 11 Channels for 802.11b, 802.11g and 802.11n(HT20)<br>7 Channels for 802.11n(HT40)  |
| Channel Separation: | 5 MHz   |
| Antenna:            | PCB Antenna, 2.24dBi  |

|                      |                              |
|----------------------|------------------------------|
| Frequency Band:      | 2402MHz to 2480MHz           |
| Support Standards:   | Bluetooth Low Energy         |
| Type of Modulation:  | GFSK                         |
| Data Rate:           | 1Mbps, 2Mbps                 |
| Channel Number:      | 40                           |
| Channel Separation:  | 2MHz                         |
| Antenna Information: | PCB Antenna, gain is 2.24dBi |

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|                      |  |
|----------------------|--|
| Frequency Range:     | 5150 ~ 5250MHz<br>5250 ~ 5350MHz<br>5470 ~ 5725MHz<br>5725 ~ 5850MHz   |
| Support Standards:   | 802.11a, 802.11n(HT20), 802.11n(HT40)  |
| Type of Modulation:  | OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)  |
| Channel Number:      | For 5150 ~ 5250MHz band: Channel 36 - 48<br>For 5250 ~ 5350MHz Band: Channel 52 - 64<br>For 5470 ~ 5725MHz Band: Channel 100 - 140<br>For 5725 ~ 5850MHz band: Channel 149 - 165 |
| Antenna Information: | PCB Antenna, gain is 2.97dBi   |

**1.3 Description of Test Facility**

|            |  |
|------------|--|
| Name:      | Intertek Testing Services Shanghai                                     |
| 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<br>Registration No. CNAS L0139                         |
|   | FCC Accredited Lab<br>Designation Number: CN0175                              |
|   | IC Registration Lab<br>CAB identifier.: CN0014                                |
|   | VCCI Registration Lab<br>Registration No.: R-14243, G-10845, C-14723, T-12252 |
|   | A2LA Accreditation Lab<br>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 $S_{eq}$ (W/m <sup>2</sup> ) |
|-----------------|------------------------|------------------------|---------------------|--|
| 0-1 Hz          | -                      | $3,2 \times 10^4$      | $4 \times 10^4$     | -  |
| 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  $\leq 1.0$**

## 2.2 Assessment Results

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

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

Where S = power density in mW/cm<sup>2</sup>

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 230100950SHA-001, 230100950SHA-002, 230100950SHA-003:

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/cm <sup>2</sup> ) | (mW/cm <sup>2</sup> ) |
| Bluetooth | 2402 -2480     | 2.71      | 2.24         | 20   | 0.0005                | 1                     |
| WIFI2.4G  | 2412-2462      | 1.90      | 2.24         | 20   | 0.0004                | 1                     |
| WIFI5G    | 5180 – 5825    | 6.23      | 2.97         | 20   | 0.0017                | 1                     |

Note: 1 mW/cm<sup>2</sup> from 1.310 Table 1

The sum of the MPE ratios for all simultaneously transmitting:

Bluetooth and 2.4G WIFI can simultaneous transmitting, so the maximum rate of MPE is,  
 $0.0005/1+0.0004/1=0.0009 < 1.0$

Bluetooth and 5G WIFI can simultaneous transmitting, so the maximum rate of MPE is,  
 $0.0005/1+0.0017/1=0.0022 < 1.0$

For the device can support simultaneous transmission, according to 447498 D01 General RF Exposure Guidance v06,

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**Appendix I**

Definition below must be outlined in the User Manual:

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.

\*\*\*\*\* END \*\*\*\*\*