Anova Applied Electronics, Inc.

MPE ASSESSMENT REPORT

Report Type:
FCC MPE assessment report

Model:
AN300-10,
AN350-10

REPORT NUMBER:
240301065SHA-005

ISSUE DATE:
July 25, 2024

DOCUMENT CONTROL NUMBER:
TTRFFCCMPE-01_V1

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TEST REPORT

Report no.: 240301065SHA-005

Applicant:	Anova Applied Electronics, Inc. 180 Steuart Street #192843, San Francisco, CA 94105, U.S.A
Manufacturer:	Anova Applied Electronics, Inc. 180 Steuart Street #192843, San Francisco, CA 94105, U.S.A
Factory:	Ningbo Careline Electric Appliance Co., Ltd. No.888, WeiYi Road, Hangzhou Bay New Area, Ningbo, 315327 Zhejiang, China.
FCC ID:	2APBOAN300

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
240301065SHA-005	Rev. 01	Initial issue of report	July 25, 2024

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1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Sous Vide Immersion Circulator
Type/Model:	AN300-10, AN350-10
Description of EUT:	EUT is a Sous Vide Immersion Circulator with BLE and WIFI functions, there are two models, they are the same except declared power. We tested AN300-10 as representative and listed the worst results in this report.
Rating:	120V AC, 60Hz, AN300-10: 850W; AN350-10: 800W
Category of EUT:	Class B
EUT type:	☒ Tabletop ☐ 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) IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT40: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Channel Number:	11 Channels for 802.11b, 802.11g and 802.11n(HT20) 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

Frequency Range:	5150 ~ 5250MHz, 5250 ~ 5350MHz, 5470 ~ 5725MHz, 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 For 5250 ~ 5350MHz Band: Channel 52 - 64 For 5470 ~ 5725MHz Band: Channel 100 - 140 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 Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab 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 S_{eq} (W/m^2)
0-1 Hz	-	$3,2 \times 10^4$	4×10^4	-
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 ≤ 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^2

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 240301065SHA-001, 240301065SHA-002, 240301065SHA-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/cm2)	(mW/cm2)
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/cm2 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 **********