

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:

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Report no.: 230100950SHA-005

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)

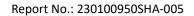
Project Engineer
Eric Li

REVIEWED BY:

REVIEWED BY:

Reviewer
Wakeyou Wang

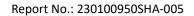
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Revision History

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





1 GENERAL INFORMATION

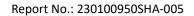
1.1 Description of Equipment Under Test (EUT)

Product name:	Sous Vide Immersion Circulator			
Type/Model:	AN425-10			
	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			
Description of EUT:	report.			
Rating:	120V AC, 60Hz, 850W			
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
	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:	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



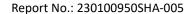


	5150 ~ 5250MHz			
	5250 ~ 5350MHz			
	5470 ~ 5725MHz			
Frequency Range:	5725 ~ 5850MHz			
Support Standards:	802.11a, 802.11n(HT20), 802.11n(HT40)			
Type of Modulation:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
	For 5150 ~ 5250MHz band: Channel 36 - 48			
	For 5250 ~ 5350MHz Band: Channel 52 - 64			
	For 5470 ~ 5725MHz Band: Channel 100 - 140			
Channel Number:	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	CNAS Accreditation Lab
recognized,	Registration No. CNAS L0139
certified, or accredited by these organizations:	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

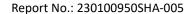
Test result: Pass

2.1 MPE Assessment Limit

Mobile device exposure for standalone operations:

Frequency range	E-field strength	H-field strength B-field		Equivalent plane wave	
	(V/m)	(A/m)	(uT)	power density	
				S _{eq} (W/m²)	
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 \leq 1.0





2.2 Assessment Results

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

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

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

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	Max	Antenna	R	S	Limits
	band	Power	Gain			
	(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

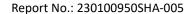
Note: 1 mW/cm2 from 1.310 Table 1

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,





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.