SAR TEST REPORT

for

Harman International Industries, Inc.

Wireless Speaker

Model No.: CITATION 200

Trade Mark: harman/kardon

FCC ID: APIHKCT200

IC: 6132A-HKCT200

The MAX Report SAR(1g)	
Body SAR	0.6502W/Kg

Prepared for : Harman International Industries, Inc.
8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology Park,
Nanshan District, Shenzhen, Guangdong, China

Tel: (0755) 26639496
Fax: (0755) 26632877

Report No. : ACS-SF20016
Date of Test : Jun.06~11, 2020
Date of Report : Jun.18, 2020

TABLE OF CONTENTS

SAR TEST REPORT

Applicant	:	Harman International Industries, Inc.
Product	:	Wireless Speaker
Model No.	:	CITATION 200
FCC ID	:	APIHKCT200
IC	:	6132A-HKCT200
Trade Mark	:	harman/kardon
Test Voltage	:	DC 3.85V

Measurement Standard Used:

- FCC 47 CFR Part 2 (2.1093)
- IEEE C95.1-1999
- IEEE 1528-2013
  IEC62209-2:2010
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- RSS-102 ISSUE 5: 2015
- FCC KDB 447498 D01 v06
- FCC KDB 865664 D01/D02
- FCC KDB 248227 D01 v02r02

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. This report contains data that are not covered by the NVLAP accreditation. Also, this report shows that the EUT is technically compliant with the FCC and RSS-102 test requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jun.06~11, 2020 Report of date: Jun.18, 2020

Prepared by : Monica Liu Reviewed by : Sunny Lu

Monica Liu / Assistant 信華科技（深圳）有限公司 Sunny Lu / Deputy Manager

Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report

Approved & Authorized Signer : Signature: David Jin

David Jin / Deputy General Manager

1. GENERAL INFORMATION

1.1.Description of Equipment Under Test

Applicant	Harman International Industries, Inc.
Applicant Address	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Manufacturer	Harman International Industries, Inc.
Manufacturer Address	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Product	Wireless Speaker
Model No.	CITATION 200
FCC ID	APIHKCT200
IC	6132A-HKCT200
Trade Mark	harman/kardon
Radio	Bluetooth BDR+EDR; BLE; 2.4GHz Wi-Fi; 5GHz Wi-Fi
Sample Type	Prototype production
Date of Receipt	Jun.05, 2020
Date of Test	Jun.06~11, 2020

1.2.Feature of Equipment under Test

Product Feature & Specification	
Product	Wireless Speaker
Model No.	CITATION 200
Bluetooth	
Frequency Range	2402-2480MHz
Type of Modulation	GFSK, π/4DQPSK, 8DPSK
Data Rate	1Mbps, 2Mbps, 3Mbps
Quantity of Channels	79/40
Channel Separation	1MHz/2MHz
2.4GHz Wi-Fi	
Support Modes	802.11b/g/n20/n40
Frequency Range	2412MHz—2462MHz; 2422MHz—2452MHz
Type of Modulation	802.11b: DSSS(CCK,DQPSK,DBPSK) 802.11g/n: OFDM(64QAM, 16QAM, QPSK, BPSK)
Channel Separation	5MHz
5GHz Wi-Fi	
Support Modes	802.11a/n20/n40/ac20/ac40/ac80
Frequency Range	5150MHz—5250MHz; 5250MHz—5350MHz; 5470MHz—5725MHz; 5745MHz—5825MHz
Type of Modulation	802.11a/n: OFDM(64QAM, 16QAM, QPSK, BPSK) 802.11ac: OFDM(16QAM, 64QAM, 256QAM, QPSK, BPSK)
Channel Separation	5MHz
Type of Product	Slave device without Radar detection
Transmit Power Control	No Support

Antenna System

Bluetooth	
Type of Antenna	Dedicated FPCB antenna
Antenna Peak Gain	Antenna 1: maximum PK gain: 2.74 dBi Antenna 2: maximum PK gain: 3.17 dBi
Wi-Fi	
Type of Antenna	Antenna
Antenna number	2
Operating modes	Only SISO mode supported
Antenna Peak Gain	2.4GHz Peak Gain: Ant1: 2.74dBi; Ant2: 3.17dBi. 5GHz Peak Gain: Ant1: 3.76dBi; Ant2: 3.25dBi.

2. GENERAL DESCRIPTION

2.1.Product Description For EUT

[None]

2.2.Applied Standards

The Specific Absorption Rate (SAR) testing specification, method and procedure for this device is in accordance with the following standards:

· FCC 47 CFR Part 2 (2.1093)
· IEEE C95.1-1999
· IEEE 1528-2013
IEC62209-2:2010
· FCC OET Bulletin 65 Supplement C (Edition 01-01)
· RSS-102 ISSUE 5: 2015
· FCC KDB 447498 D01 v06
· FCC KDB 865664 D01/D02
· FCC KDB 248227 D01 v02r02

2.3.Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

2.4.Test Conditions

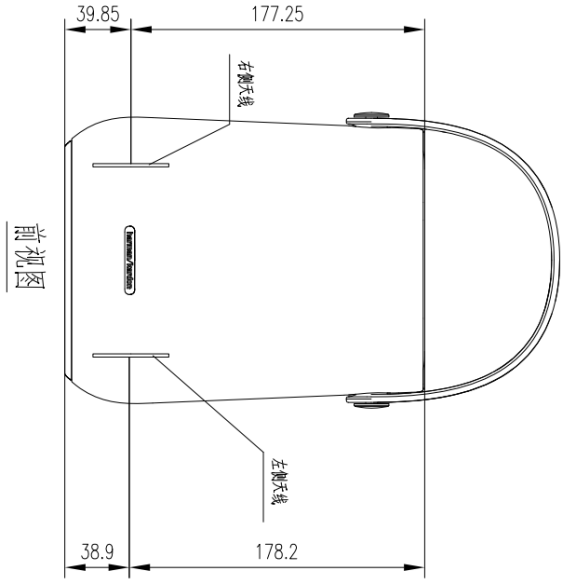
2.4.1. **Ambient Condition**

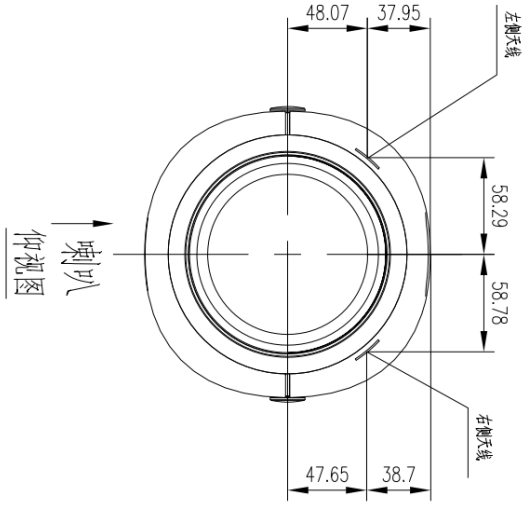
Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

2.4.2. **Test Configuration**

The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during all tests.

2.5.Exposure Positions Consideration





Sides for SAR tests Test distance: 5 mm(Body)										
Band	Body						Head Touch		Head (15°)	
	Back	Front	Top	Bottom	Left	Right	Left	Right	Left	Right
WLAN 2.4GHz	X	X	X	X	✓	✓	X	X	X	X
WLAN 5GHz	X	X	X	X	✓	✓	X	X	X	X

Note:

1. **The length of the diagonal dimension of the EUT is less than 20cm.**
2. **The side which has a distance larger than 2.5cm from antenna can be excluded from SAR measurement.**

2.6.Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] ·[√ f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

According to the KDB447498 appendix A, the SAR test exclusion threshold for 2450MHz at 5mm test separation distances is 10 mW,5.2GHz is 7 mW, 5.4GHz and 5.8GHz is 6mW

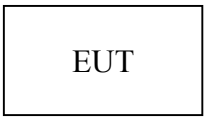
Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

2.7.EUT Configuration and operation conditions for test.



(EUT: Wireless Speaker)

2.8.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal Date	Validity Date	Cal. Agency
1.	DASY5 SAR Test System	Speag	TX60 L speag	F09/5B1H1/01	NCR	NCR	N/A
2.	Wireless Communication Test Set	Agilent	E5515C	GB443002433	2020.04.11	2021.04.11	CCIC
3.	Power Meter	Anritsu	ML2487A	6K00003262	2020.04.11	2021.04.11	CCIC
4.	Power Sensor	Anritsu	MA2491A	033005	2020.04.11	2021.04.11	CCIC
5.	Signal Generator	Rohde & Schwarz	SMB100A	181375	2020.04.11	2021.04.11	CCIC
6.	Amplifier	Milmega	ZHL-42W	C620601316	NCR	NCR	N/A
7.	Dipole Validation Kits	Speag	D2450V2	862	2017.06.06	2020.06.06	SPEAG
8.	Dipole Validation Kits	Speag	D5GHzV2	1124	2018.09.27	2021.09.27	SPEAG
9.	Attenuator	N/A	1527	001	2019.10.13	2020.10.13	CCIC
10.	Date Acquisition Electronics	Speag	DAE4	899	2020.03.18	2021.03.18	CCTL
11.	E-Field Probe	Speag	EX3DV4	3767	2020.04.01	2021.04.01	CCTL
12.	ENA Series Analyzer	Agilent	E5071B	MY42403549	2020.04.11	2021.04.11	CCIC
13.	Test Software	Schmid&Partner Englinnering AG	DASY5	52.8.7.1137	NCR	NCR	NCR
14.	Radio Communication Analyzer	ANRITSU	MT8820C	6201091003	2019.10.12	2020.10.12	CCIC
15.	Radio Communication Analyzer	R&S	CMW500	103249	2019.10.12	2020.10.12	CCIC
Note: NCR means no calibration required(calibrated with system).							

Note: Dipole antenna calibration interval is 3 year, annual check result to be follow (Refer to KDB 865664, Dipole calibration)

Dipole: 2450V2-SN862

Antenna Parameters with Body TSL

Date	2017.06.06	2018.07.01	2019.05.20
Inpedance, Transformed to Feed point	50.7Ω+4.98jΩ	50.3Ω+4.83jΩ	49.9Ω+4.77jΩ
Return Loss	-26.0dB	-25.4dB	-25.3dB

Antenna Parameters with Head TSL

Date	2017.06.06	2018.07.01	2019.05.20
Inpedance, Transformed to Feed point	48.6Ω+5.14jΩ	47.5Ω+5.04jΩ	47.1Ω+4.98jΩ
Return Loss	-25.4dB	-24.7dB	-25.1dB

Dipole: D5GHzV2-SN1124

Antenna Parameters with Body TSL at 5200MHz

Date	2019.09.29
Inpedance, Transformed to Feed point	49.2Ω-5.5jΩ
Return Loss	-26.1dB

Antenna Parameters with Body TSL at 5300MHz

Date	2019.09.30
Inpedance, Transformed to Feed point	563.5Ω-1.01jΩ
Return Loss	-24.1dB

Antenna Parameters with Body TSL at 5600MHz

Date	2019.10.01
Inpedance, Transformed to Feed point	54.2Ω+5.19jΩ
Return Loss	-26.7dB

Antenna Parameters with Body TSL at 5800MHz

Date	2019.10.02
Inpedance, Transformed to Feed point	56.2Ω+5.3jΩ
Return Loss	-23.7dB

Dipole: D5GHzV2-SN1102

Antenna Parameters with Head TSL at 5200MHz

Date	2019.10.03
Inpedance, Transformed to Feed point	50.0Ω-3.9j
Return Loss	-28.6dB

Antenna Parameters with Head TSL at 5300MHz

Date	2019.10.03
Inpedance, Transformed to Feed point	50.0Ω-2.1j
Return Loss	-25.6dB

Antenna Parameters with Head TSL at 5600MHz

Date	2019.10.04
Inpedance, Transformed to Feed point	55.2Ω+3.97jΩ
Return Loss	-24.2dB

Antenna Parameters with Head TSL at 5800MHz

Date	2019.10.07
Inpedance, Transformed to Feed point	58.0Ω-0.92jΩ
Return Loss	-23.7dB

2.9.Laboratory Environment

Temperature	Min:20℃,Max.25℃
Relative humidity	Min. = 30%, Max. = 70%
Note: Ambient noise is checked and found very low and in compliance with requirement of standards.	

2.10.Measurement Uncertainty

Test Item	Uncertainty
Uncertainty for SAR test	1g: 21.14
	10g: 20.64
Uncertainty for test site temperature and humidity	0.6℃

Source	Type	Uncertainly Value (%)	Probability Distribution	K	C1(1g)	C1(10g)	Standard uncertainty ul(%)1g	Standard uncertainty ul(%)10g	Degree of freedom Veff or Vi
Measurement system repetivity	A	0.5	N	1		1	0.5	0.5	9
Probe calibration	B	5.9	N	1	1	1	5.9	5.9	∞
Isotropy	B	4.7	R	√3	1	1	2.7	2.7	∞
Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
Probe modulation response	B	0	R	√3	1	1	0	0	∞
Detection limits	B	1.0	R	√3	1	1	0.6	0.6	∞
Boundary effect	B	1.9	R	√3	1	1	1.1	1.1	∞
Readout electronics	B	1.0	N	1	1	1	1.0	1.0	∞
Response time	B	0	R	√3	1	1	0	0	∞
Integration time	B	4.32	R	√3	1	1	2.5	2.5	∞
RF ambient conditions – noise	B	0	R	√3	1	1	0	0	∞
RF ambient conditions – reflections	B	3	R	√3	1	1	1.73	1.73	∞
Probe positioner mech. Restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
Post-processing	B	0	R	√3	1	1	0	0	∞
Test sample related									
Device holder uncertainty	A	2.94	N	1	1	1	2.94	2.94	M-1
Test sample positioning	A	4.1	N	1	1	1	4.1	4.1	M-1
Power scaling	B	5.0	R	√3	1	1	2.9	2.9	∞
Drift of output power (measured SAR drift)	B	5.0	R	√3	1	1	2.9	2.9	∞
Phantom and set-up									
Phantom uncertainty (shape and thickness tolerances)	B	4.0	R	√3	1	1	2.3	2.1	∞
Algorithm for correcting SAR for deviations in permittivity and conductivity	B	1.9	N	1	1	0,84	1,9	1,6	∞
Liquid conductivity (meas.)	A	0.55	N	1	0.78	0.71	0.24	0.21	M-1
Liquid permittivity (meas.)	A	0.19	N	1	0.23	0.26	0.09	0.06	M
Liquid permittivity – temperature uncertainty	A	5.0	R	√3	0,78	0,71	1.4	1.1	∞
Liquid conductivity – temperature uncertainty	A	5.0	R	√3	0.23	0,26	1.2	0.8	∞
Combined standard uncertainty	$u_c' = \sqrt{\sum_{i=1}^{23} c_i^2 u_i^2}$						**10.57**	**10.32**	
Expanded uncertainty (95 % conf. interval)	$u_e = 2u_c$		N		K=2		**21.14**	**20.64**	

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

3. MEASURE PROCEDURES

3.1.General description of test procedures

For the 802.11b/g SAR body tests, a communication link is set up with the test mode software for WIFI mode test. The Absolute Radiofrequency Channel Number (ARFCN) is allocated to 1,6and 11 respectively in the case of 2450 MHz. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. Testing at higher data rates is not required when the maximum average output power is less than 0.25dB higher than those measured at the lowest data rate.

802.11b/g operating modes are tested independently according to the service requirements in each frequency band.802.11b/g modes are tested on channels1,6,11;however,if output power reduction is necessary for channels 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels must be tested instead.

SAR is not required for 802.11g channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels. When the maximum average output channel in each frequency band is not included in the “default test channels”, the maximum channel should be tested instead of an adjacent “default test channels”, these are referred to as the “required test channels” and are illustrated in table 1.

Mode	GHz	Channel	Turbo Channel	“Default Test Channels”	
				15.247	
				802.11b	802.11g
802.11b/g	2.412	1#	1#	√	*
	2.437	6	6	√	*
	2.462	11#	11#	√	*

Table 1

Note: #= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest out put channels closet to each of these channels should be tested.
√= ” default test channels”
* = possible 802.11g channels with maximum average output 0.25dB>=the “default test channels”

Please apply the following guidance for SAR testing:

1. Please use a 0 mm (touching) test separation distance on the flat phantom during SAR testing of this device. This separation distance is based on the guidance found in FCC KDB Publication 447498 D01, Section 5.2.3 3)
2. Please utilize a body tissue simulating liquid (TSL) of the appropriate frequency during SAR testing.
3. Please use the guidance found in FCC KDB Publication 447498 D01 to determine which sides of the device need to be tested for SAR.
4. FCC KDB Publication 248227 D01 should be used for selection of the WiFi channels, data rates, etc.

4. SAR MEASUREMENTS SYSTEM

4.1.SAR Measurement Set-up

DASY5 system for performing compliance tests consists of the following items:

(1) A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

(2) A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage It issue simulating liquid. The probe is equipped with an optical surface detector system.

(3) A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

(4) A unit to operate the optical surface detector which is connected to the EOC.

(5) The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

(6) The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

(7) DASY5 software and SEMCAD data evaluation software.

(8) Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

(9) The generic twin phantom enabling the testing of left-hand and right-hand usage.

(10) The device holder for handheld mobile phones.

(11) Tissue simulating liquid mixed according to the given recipes.

(12) System validation dipoles allowing to validate the proper functioning of the system.

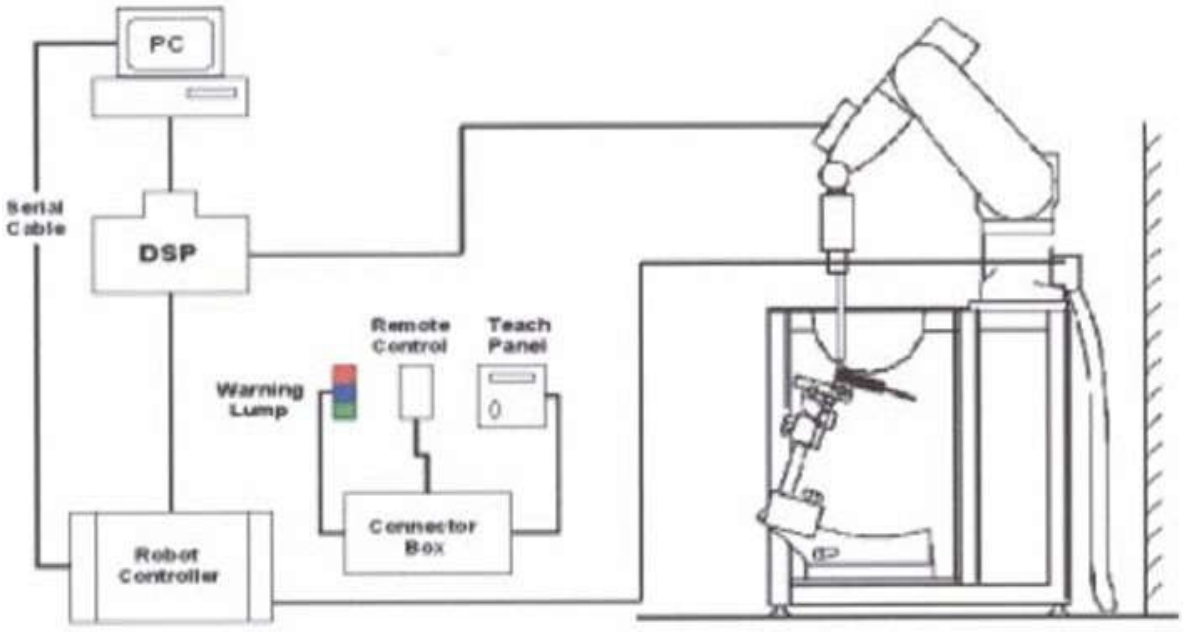
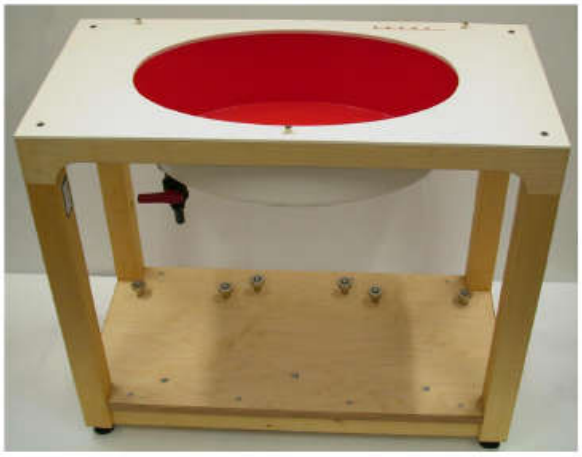


Figure 4.1 SAR Lab Test Measurement Set-up

4.2. ELI Phantom

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.



Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2.0 ± 0.2 mm (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	approx. 30 liters
Wooden Support	SPEAG standard phantom table

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

Figure 6.2 Top View of Twin Phantom

A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.

On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

The phantom can be used with the following tissue simulating liquids:

*Water-sugar based liquid
*Glycol based liquids

4.3.Device Holder for SAM Twin Phantom

The SAR in the Phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source in 5 mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ± 20%. An accurate device position is therefore crucial for accurate and repeatable measurement. The position in which the devices must be measured, are defined by the standards.

The DASY5 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (EPR).

Thus the device needs no repositioning when changing the angles.

The DASY5 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε_r=3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Figure 4.3 Device Holder

4.4.DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangul -ar configuration and optimized for dosimetric evaluation.

Figure 4.4 EX3DV4 E-field Probe

4.4.1. EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 µW/g)
Dimensions	Overall length: PRS-T2 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

4.5.E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.
Or

$$SAR = \frac{|E|^2 \sigma}{\rho}$$

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m3).

4.6.Scanning procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The ”reference“ and ”drift“ measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.The indicated drift is mainly the variation of the EUT’s output power and should vary max. ± 5 %.

The ”surface check“ measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles.

The difference between the optical surface detection and the actual surface depends on the Probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.

After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- · maximum search
- · extrapolation
- · boundary correction
- · peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

5. DATA STORAGE AND EVALUATION

5.1.Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for thedata evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.2.Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	
	- Density	

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$Vi = Ui + Ui2 \cdot c f / d c pi$$

With ***Vi*** = compensated signal of channel i (i = x, y, z)

Ui = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes: $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$

With ***Vi*** = compensated signal of channel i (i = x, y, z)

Normi = sensor sensitivity of channel i (i = x, y, z)

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

Ei = electric field strength of channel i in V/m

Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot}^2 \cdot \quad) \quad / (\quad \cdot 1000)$$ with

SAR = local specific absorption rate in mW/g

Etot = total field strength in V/m

= conductivity in [mho/m] or [Siemens/m]

= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$P_{pwe} = E_{tot}^2 / 3770$ or $P_{pwe} = H_{tot}^2 \cdot 37.7$

with ***Ppwe*** = equivalent power density of a plane wave in mW/cm2

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

6. SYSTEM CHECK

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulates, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the ANNEX A.

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.

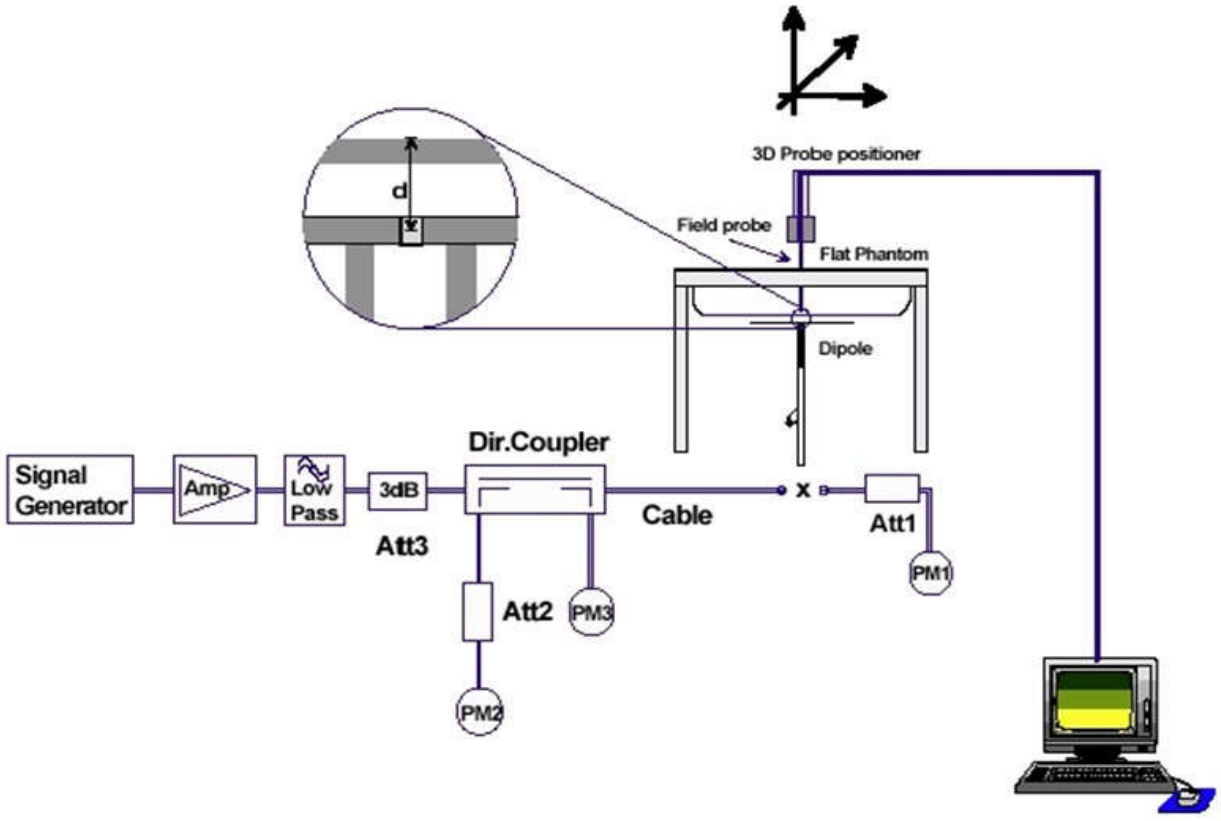


Figure 6.1: System Check Set-up

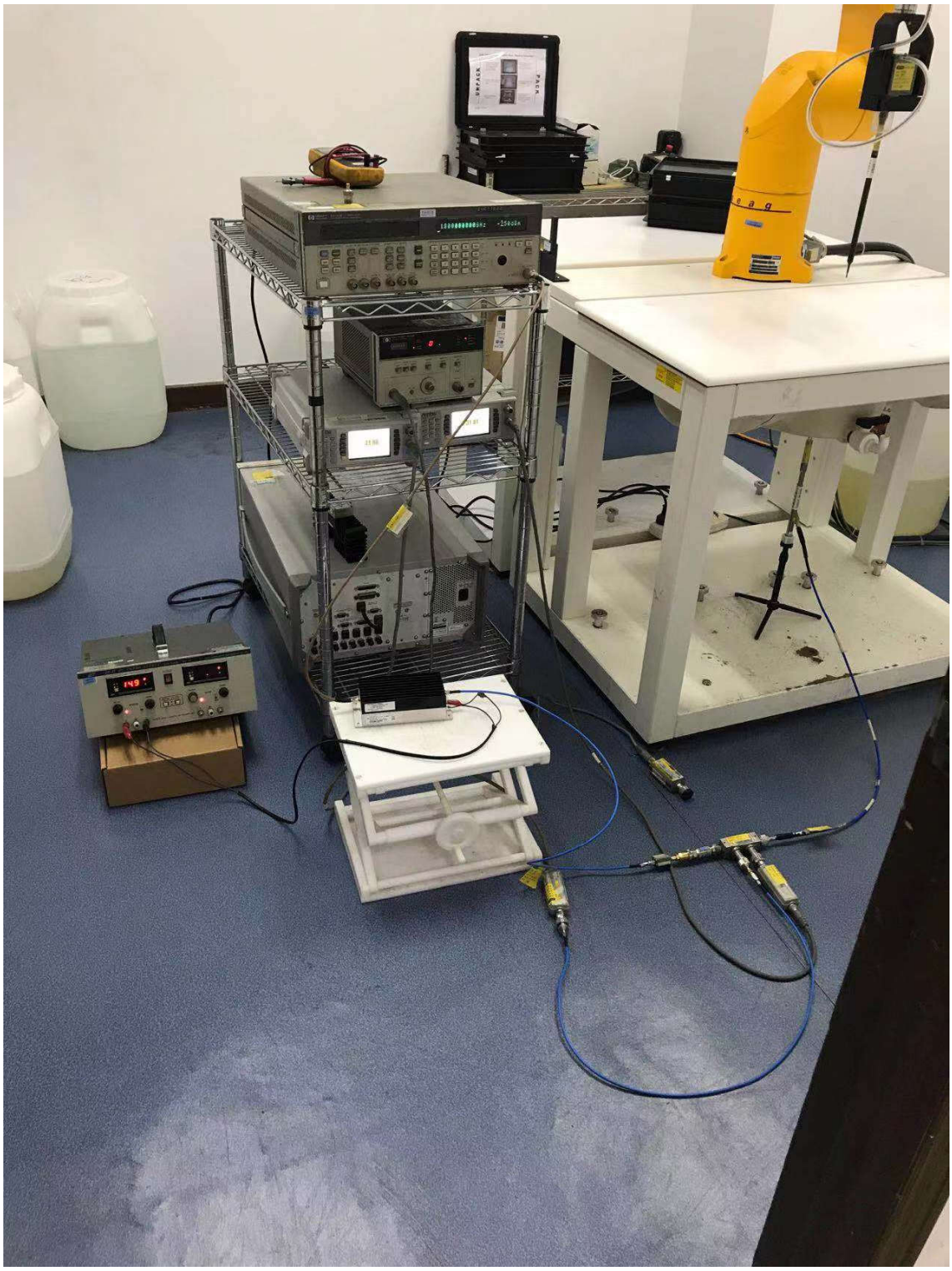


Figure 6.3: photos of system

7. TEST RESULTS

7.1.Output power

(BDR+EDR)

Mode	Antenna	Freq. (MHz)	Result (dBm)	Maximum Tune-up Power (dBm)
GFSK	ANT1	2402	6.62	7.00
	ANT2	2402	6.42	6.50
	ANT1	2441	7.11	7.50
	ANT2	2441	6.91	7.00
	ANT1	2480	7.76	8.00
	ANT2	2480	7.56	8.00
π/4-DQPSK	ANT1	2402	6.67	7.00
	ANT2	2402	6.43	6.50
	ANT1	2441	7.11	7.50
	ANT2	2441	6.88	7.00
	ANT1	2480	7.76	8.00
	ANT2	2480	7.55	8.00
8DPSK	ANT1	2402	6.59	7.00
	ANT2	2402	6.37	6.50
	ANT1	2441	7.01	7.50
	ANT2	2441	6.82	7.00
	ANT1	2480	7.70	8.00
	ANT2	2480	7.49	7.50

(BLE)

Mode	Antenna	Freq. (MHz)	Peak Output Power (dBm)	Maximum Tune-up Power (dBm)
GFSK	ANT1	2402	2.62	3.00
	ANT2		2.43	2.50
	ANT1	2440	3.14	3.50
	ANT2		2.92	3.00
	ANT1	2480	3.79	4.00
	ANT2		3.62	4.00

(WiFi 2.4GHz)

Test Mode	Frequency	PK power (dBm)		Maximum Tune-up Power (dBm)	
		Ant1	Ant2	Ant1	Ant2
11B	2412	13.10	14.61	13.50	15.00
	2437	**13.17**	14.63	13.50	15.00
	2462	13.14	**14.64**	13.50	15.00
11G	2412	12.04	13.79	12.50	14.00
	2437	11.98	13.56	12.00	14.00
	2462	12.09	13.58	12.50	14.00
11N20SISO	2412	11.65	13.33	12.00	13.50
	2437	10.79	12.27	11.00	12.50
	2462	10.72	12.26	11.00	12.50
11N40SISO	2422	11.15	12.75	11.50	13.00
	2437	9.03	10.62	9.50	11.00
	2452	9.13	10.78	9.50	11.00

Notes:

1. Use the data rate with the maximum output level for the SAR test.
2. BT and WIFI can transmit at same time.

(U-NII Band)

Test Mode	Frequency	PK power (dBm)		Maximum Tune-up Power (dBm)	
		Ant1	Ant2	Ant1	Ant2
11A	5180	13.88	14.98	14.00	15.00
	5200	13.91	14.99	14.00	15.00
	5240	**14.10**	**15.34**	14.50	15.50
	5260	14.06	15.62	14.50	16.00
	5280	14.15	15.80	14.50	16.00
	5320	**14.39**	**16.07**	14.50	16.50
	5500	**14.14**	**15.80**	14.50	16.00
	5580	13.54	15.15	14.00	15.50
	5700	11.51	13.09	12.00	13.50
	5745	12.17	13.56	12.50	14.00
	5785	12.93	14.25	13.00	14.50
	5825	**13.31**	**14.41**	13.50	14.50

Test Mode	Frequency	PK power (dBm)		Maximum Tune-up Power (dBm)	
		Ant1	Ant2	Ant1	Ant2
11N20SISO	5180	12.84	13.75	13.00	14.00
	5200	12.87	14.00	13.00	14.50
	5240	12.89	14.39	13.00	14.50
	5260	12.91	14.47	13.00	14.50
	5280	13.21	14.59	13.50	13.00
	5320	13.43	15.08	13.50	15.50
	5500	13.38	14.71	13.50	15.00
	5580	12.47	14.11	12.50	14.50
	5700	10.46	12.00	10.50	12.50
	5745	11.26	12.49	11.50	12.50
	5785	11.77	13.14	12.00	13.50
	5825	12.08	13.41	12.50	13.50
11N40SISO	5190	10.04	11.11	10.50	11.50
	5230	12.82	14.12	13.00	14.50
	5270	13.06	14.58	13.50	15.00
	5310	11.55	13.08	12.00	13.50
	5510	11.39	12.85	11.50	13.00
	5550	12.73	14.43	13.00	14.50
	5670	10.77	12.48	11.00	12.50
	5755	11.16	12.49	11.50	12.50
	5795	11.85	13.18	12.00	13.50
11AC20SISO	5180	12.78	13.85	13.00	14.00
	5200	12.78	13.90	13.00	14.00
	5240	12.99	14.30	13.00	14.50
	5260	13.04	14.61	13.50	15.00
	5280	13.08	14.76	13.50	15.00
	5320	13.31	15.05	13.50	15.50
	5500	13.27	14.68	13.50	15.00
	5580	12.59	14.09	13.00	14.50
	5700	10.53	11.98	11.00	12.00
	5745	11.09	12.46	11.50	12.50
	5785	11.83	13.10	12.00	13.50
	5825	12.12	13.36	12.50	13.50

Test Mode	Frequency	PK power (dBm)		Maximum Tune-up Power (dBm)	
		Ant1	Ant2	Ant1	Ant2
11AC40SISO	5190	10.04	11.09	10.50	11.50
	5230	12.76	14.15	13.00	14.50
	5270	12.94	14.49	13.00	14.50
	5310	11.36	13.05	11.50	13.50
	5510	11.38	12.79	11.50	13.00
	5550	12.83	14.45	13.00	14.50
	5670	10.67	12.48	11.00	12.50
	5755	11.19	12.50	11.50	13.00
	5795	11.87	13.15	12.00	13.50
11AC80SISO	5210	8.36	9.42	8.50	9.50
	5290	9.49	11.11	9.50	11.50
	5530	8.52	10.08	9.00	10.50
	5610	10.73	12.44	11.00	12.50
	5775	10.69	12.02	11.00	12.50

Notes:

3. Use the data rate with the maximum output level for the SAR test.
4. BT and WIFI can transmit at same time.

7.2.System Check for Body Tissue simulating liquid

Frequency	Description	SAR (1g±18.8% window for 2450MHz; 10g±18.7% window for 2450MHz; 1g±19.9% window for 5200 MHz / 5300MHz / 5600MHz/ 5800MHz; 10g±19.5% window for 5200 MHz / 5300MHz / 5600MHz/ 5800MHz)		Dielectric Parameters (±12.1% window for 2450MHz; ±13.3% window for 5200 MHz / 5300MHz / 5600MHz/ 5800MHz)		Temp
		1g	10g	εr	σ(s/m)	℃
2450MHz	Recommended value	51.60 41.8992 - 61.3008	23.76 19.31688 - 28.20312	39.20 34.4568 - 43.9432	1.80 1.5822 - 2.0178	/
	Measurement value **2020-06-05**	49.24	23.32	39.440	1.818	**22.03**
5200MHz	Recommended value	80.1 64.1601 - 96.0399	22.9 18.4345 - 27.3655	36.0 31.212 – 40.788	4.66 4.04022 – 5.27978	/
	Measurement value **2020-06-08**	81.3	23.40	35.53	4.51	**22.07**
5300MHz	Recommended value	80.7 64.6407 – 96.7593	23.3 18.7565 – 27.8435	35.90 31.1253 – 40.6747	4.76 4.12692 – 5.39308	/
	Measurement value **2020-06-09**	84.4	25.40	33.187	4.569	**22.02**
5600MHz	Recommended value	85.4 68.4054 – 102.3946	24.4 19.642 – 29.158	35.50 30.7785 – 40.2215	5.07 4.39569 – 5.74431	/
	Measurement value **2020-06-10**	87.1	26.10	35.00	4.82	**22.11**
5800MHz	Recommended value	79.7 63.8397 – 95.5603	22.8 18.354 – 27.246	35.3 30.6051 – 39.9949	5.27 4.56909 – 5.97091	/
	Measurement value **2020-06-11**	80.1	23.4	38.09	5.821	**22.05**

7.3.Test Results

Frequency		Dielectric Parameters (±12.1% window for 2450MHz; ±13.3% window for 5200MHz / 5300MHz / 5600MHz/ 5800MHz)			
		εr		σ(s/m)	
		Measurement value	Recommended value	Measurement value	Recommended value
2450MHz	2412 MHz	38.849 -0.90%	39.20	1.841 2.28%	1.80
	2437 MHz	38.753 -1.14%		1.873 4.06%	
	2462 MHz	38.627 -1.46%		1.908 6.00%	
5200MHz	5180 MHz	37.179 3.28%	36.0	4.225 -9.33%	4.66
	5200 MHz	35.53 -1.31%		4.51 -3.22%	
	5240 MHz	37.130 3.14%		4.235 -9.12%	
5300MHz	5260 MHz	37.037 3.17%	35.9	4.420 -7.14%	4.76
	5280 MHz	37.043 3.18%		4.467 -6.16%	
	5320 MHz	37.008 3.09%		4.510 -5.25%	
5600MHz	5500 MHz	36.818 3.71%	35.5	4.847 -4.40%	5.07
	5580 MHz	36.707 3.40%		4.729 -6.73%	
	5700 MHz	35.947 1.26%		4.932 -2.72%	
5800MHz	5745 MHz	34.933 -1.04%	35.3	5.003 -5.07%	5.27
	5785 MHz	34.861 -1.24%		5.125 -2.75%	
	5825 MHz	37.88 7.31%		5.901 11.97%	

Figure 4.4: Liquid depth in the Flat Phantom

Band	Mode	Ant / Channel	Test Position	Output Power		Measured Results		Scaled-1		Scaled-Final		Power Drift (dB)
				Max. Scaled AV Power (dBm)	Measured AV Power (dBm)	SAR1g (W/kg)	SAR10g (W/kg)	SAR1g (W/kg)	SAR10g (W/kg)	SAR1g (W/kg)	SAR10g (W/kg)	
WiFi 2.4GHz	11b	Ant2 CH1	Left	15.00	14.61	0.116	0.058	0.1269	0.0634	0.1269	0.0634	0.19
		Ant1 CH1	Right	13.50	13.10	0.151	0.074	0.1656	0.0811	0.1656	0.0811	0.10
		Ant2 CH6	Left	15.00	14.63	0.117	0.059	0.1274	0.0642	0.1274	0.0642	0.16
		Ant1 CH6	Right	13.50	13.17	0.156	0.077	0.1683	0.0831	0.1683	0.0831	0.13
		Ant2 CH11	Left	15.00	14.64	0.124	0.061	0.1347	0.0663	0.1347	0.0663	-0.20
		Ant1 CH11	Right	13.50	13.14	0.153	0.077	0.1662	0.0837	0.1662	0.0837	0.17
WiFi 5GHz	11a	Ant2 CH36	Left	15.00	14.98	0.077	0.033	0.0774	0.0332	0.0774	0.0332	0.17
		Ant1 CH36	Right	14.00	13.88	0.173	0.073	0.1778	0.0750	0.1778	0.0750	-0.15
		Ant2 CH40	Left	15.00	14.99	0.076	0.033	0.0762	0.0331	0.0762	0.0331	-0.11
		Ant1 CH40	Right	14.00	13.91	0.189	0.080	0.1930	0.0817	0.1930	0.0817	0.06
		Ant2 CH48	Left	15.50	15.34	0.079	0.034	0.0820	0.0353	0.0820	0.0353	0.16
		Ant1 CH48	Right	14.50	14.10	0.206	0.087	0.2259	0.0954	0.2259	0.0954	0.15
		Ant2 CH52	Left	16.00	15.62	0.082	0.035	0.0895	0.0382	0.0895	0.0382	0.15
		Ant1 CH52	Right	14.50	14.06	0.249	0.103	0.2755	0.1140	0.2755	0.1140	0.19
		Ant2 CH56	Left	16.00	15.80	0.084	0.037	0.0880	0.0387	0.0880	0.0387	0.18
		Ant1 CH56	Right	14.50	14.15	0.248	0.103	0.2688	0.1116	0.2688	0.1116	0.14
		Ant2 CH64	Left	16.50	16.07	0.075	0.032	0.0828	0.0353	0.0828	0.0353	0.12
		Ant1 CH64	Right	14.50	14.39	0.287	0.116	0.2944	0.1190	0.2944	0.1190	-0.13
		Ant2 CH100	Left	16.00	15.80	0.092	0.040	0.0963	0.0419	0.0963	0.0419	0.11
		Ant1 CH100	Right	14.50	14.14	0.231	0.097	0.2510	0.1054	0.2510	0.1054	-0.10
		Ant2 CH116	Left	15.50	15.15	0.096	0.039	0.1041	0.0423	0.1041	0.0423	-0.18
		Ant1 CH116	Right	14.00	13.54	0.297	0.123	0.3302	0.1367	0.3302	0.1367	0.11
		Ant2 CH140	Left	13.50	13.09	0.102	0.041	0.1121	0.0451	0.1121	0.0451	0.12
		Ant1 CH140	Right	12.00	11.51	0.244	0.103	0.2731	0.1153	0.2731	0.1153	-0.15
		Ant2 CH149	Left	14.00	13.56	0.099	0.043	0.1096	0.0476	0.1096	0.0476	0.20
		Ant1 CH149	Right	12.50	12.17	0.357	0.150	0.3852	0.1618	**0.3852**	0.1618	0.16
		Ant2 CH157	Left	14.50	14.25	0.101	0.044	0.1070	0.0466	0.1070	0.0466	-0.09
		Ant1 CH157	Right	13.00	12.93	0.238	0.097	0.2419	0.0986	0.2419	0.0986	0.01
		Ant2 CH165	Left	14.50	14.41	0.101	0.044	0.1031	0.0449	0.1031	0.0449	-0.17
		Ant1 CH165	Right	13.50	13.31	0.270	0.114	0.2821	0.1191	0.2821	0.1191	-0.16
Conclusion: PASS												
Note: Factor= Max. Scaled AV Power(W)/Measured Power(W) Scaled SAR-1= Measured SAR*Factor Scaled-Final= Scaled SAR-1*(1/Duty Cycle) The Max. Reported SAR : **0.3852W/kg for 1g SAR**												

Notes: 1. For WiFi 2.4GHz: Because the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, so the OFDM SAR for 11g/n mode can be exempted.

2. For WiFi 5GHz: The initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, 11a mode has the maximum output power compared with 11n/ac. So use 11a as the initial SAR test configuration mode.
3. The WIFI 2.4GHz Duty Cycle is 100%.
4. The WIFI 5GHz Duty Cycle is 100%.

7.4.Simultaneously SAR Evaluation

Per KDB 447498 Section 4.3.2(b), When an antenna qualifies for the standalone SAR test exclusion and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg, for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

Regard with Bluetooth, The max. power of channel, including tune-up tolerance is 8.00dBm(6.31mW), the min. test separation distance is 5mm. f=2.48GHz, so
The standalone SAR value=6.31mW/5mm*√2.48/7.5=0.265W/kg for 1g SAR.

Max Reported SAR		Sum. SAR
Bluetooth 0.265W/kg	WiFi 2.4GHz 0.1683W/kg	0.433W/kg
	WiFi 5GHz 0.3852W/kg	**0.6502W/kg**

Since the Max Sum. SAR 0.6502W/kg, which less than the FCC limit 1.6W/kg, so the SAR Evaluation for Simultaneously transmit can be exempted.

ANNEX A: System Check Results

Test Laboratory: Audix SAR Lab Date: 05/06/2020

CW 2450

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:862

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2450 MHz; σ = 1.818 S/m; ε_r = 39.440; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 2450MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 14.05 W/kg

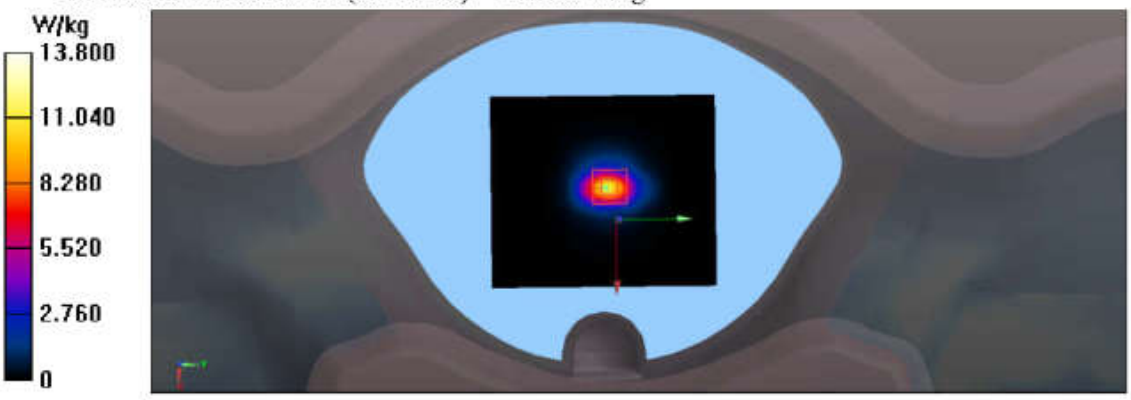
Configuration/CW 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 89.02 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 26.67 W/kg

SAR(1 g) = 12.31 W/kg; SAR(10 g) = 5.83 W/kg

Maximum value of SAR (measured) = 13.800 W/kg



Test Laboratory: Audix SAR Lab Date: 08/06/2020

CW 5200

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1124

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5200 MHz; σ = 4.51 S/m; ε_r = 35.53; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5200MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 11.63 W/kg

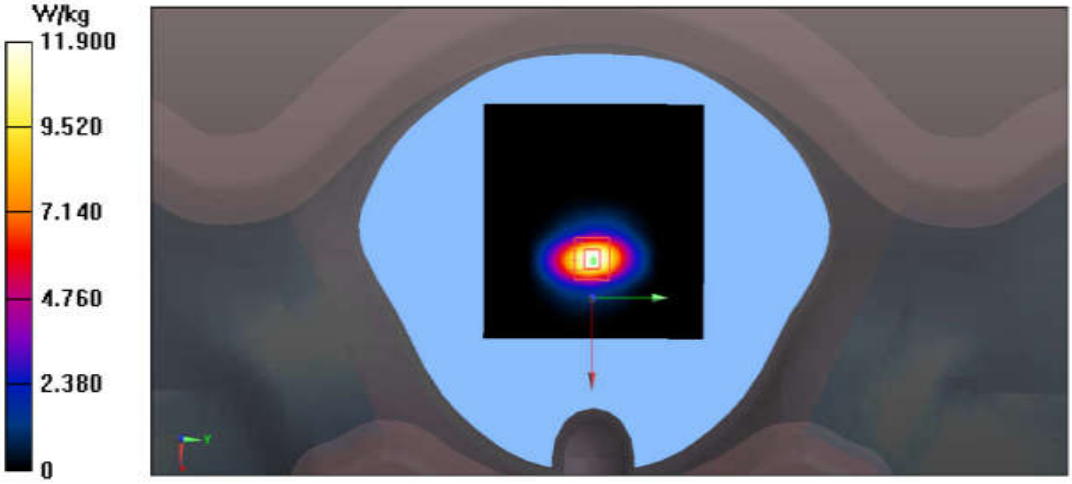
Configuration/CW 5200MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 74.47 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 28.30 W/kg

SAR(1 g) = 8.13 W/kg; SAR(10 g) = 2.34 W/kg

Maximum value of SAR (measured) = 11.897 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CW 5300

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1124

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5300 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5300 MHz; σ = 4.596 S/m; ε_r = 36.187; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5300MHz/Area Scan (61x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 11.64W/kg

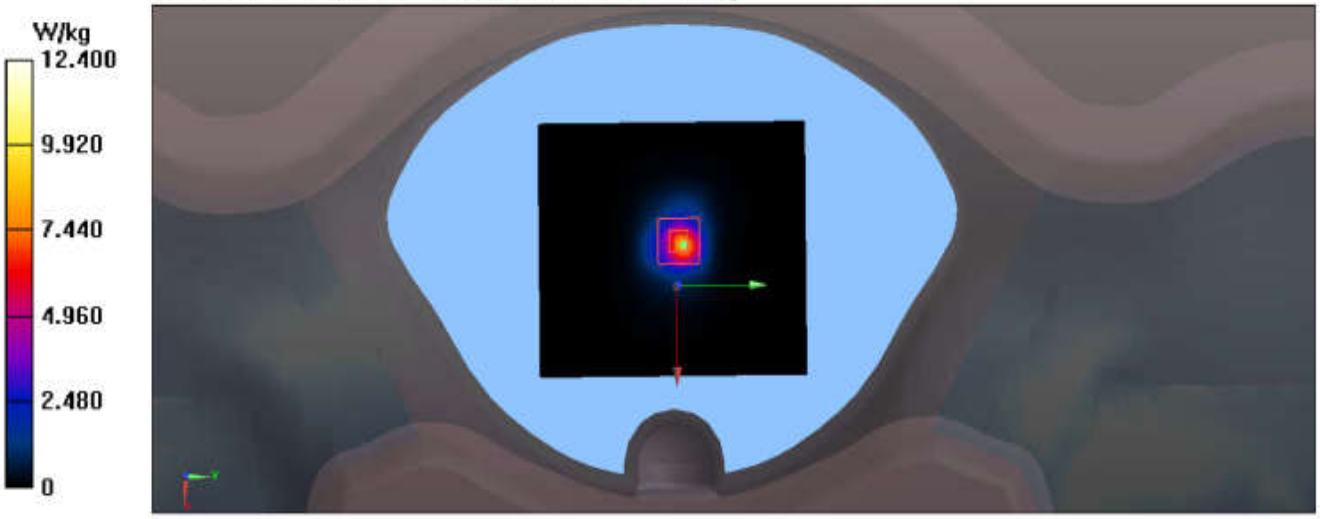
Configuration/CW 5300MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 73.14 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 18.27 W/kg

SAR(1 g) = 8.44 W/kg; SAR(10 g) = 2.54 W/kg

Maximum value of SAR (measured) = 12.371 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CW 5600

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1124

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5600 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5600 MHz; σ = 4.82 S/m; ε_r = 35; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.75, 4.75, 4.75); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5600MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 23.38 W/kg

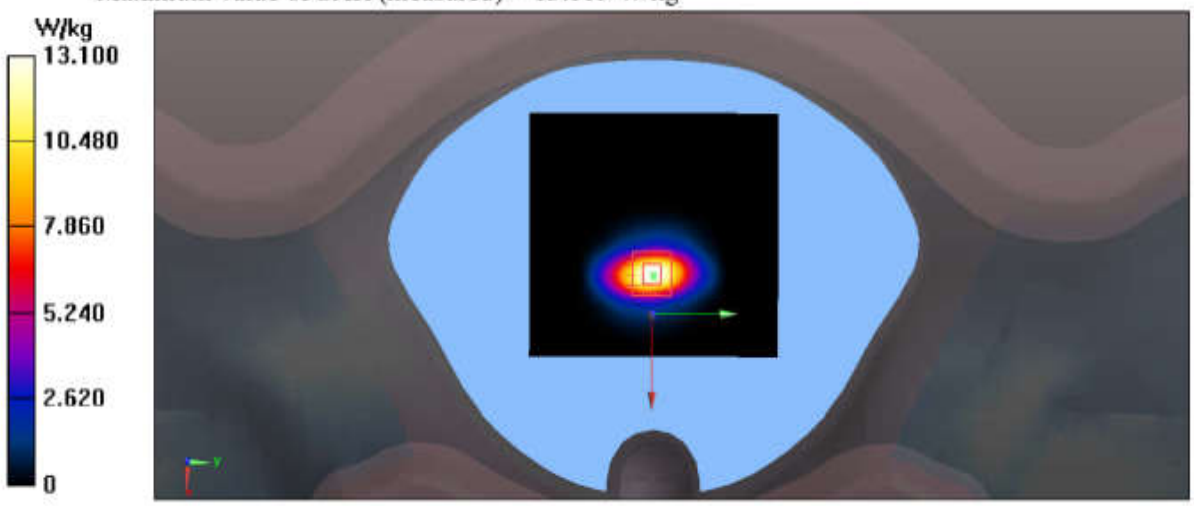
Configuration/CW 5600MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 44.29 V/m; Power Drift = 0.01dB

Peak SAR (extrapolated) = 31.47W/kg

SAR(1 g) = 8.71W/kg; SAR(10 g) =2.61 W/kg

Maximum value of SAR (measured) = 13.119 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CW 5800

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1124

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5800 MHz; σ = 5.821 S/m; ε_r = 38.09; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.70, 4.70, 4.70); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5800MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 11.67 W/kg

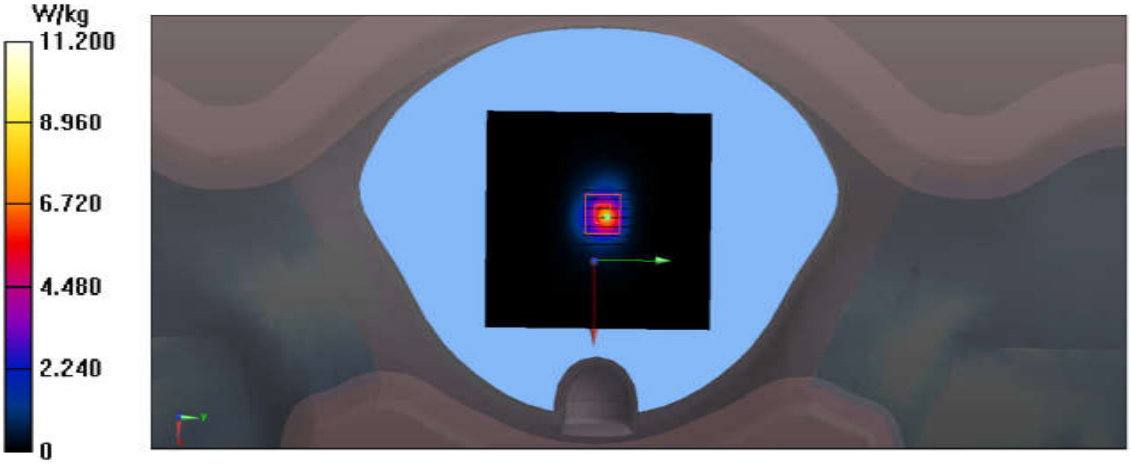
Configuration/CW 5800MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 74.65 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 15.18 W/kg

SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.34 W/kg

Maximum value of SAR (measured) = 11.19 W/kg



ANNEX B: Graph Results

WIFI 2.4GHz:

Test Laboratory: Audix SAR Lab Date: 05/06/2020

CH1(2412MHz Left)-Ant2

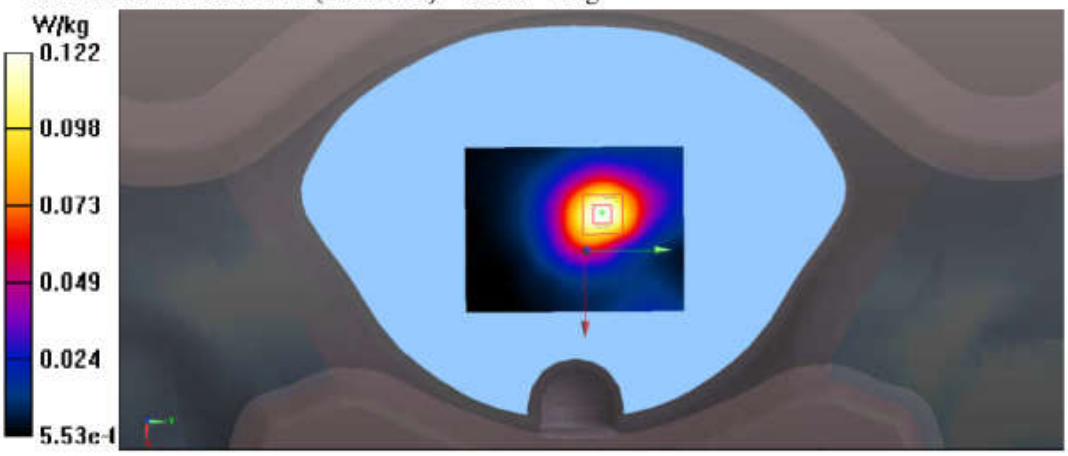
DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0);
Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.841 S/m; ε_r = 38.849; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.129 W/kg

Configuration/CH1(2412MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.750 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.255 W/kg
SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.058 W/kg
Maximum value of SAR (measured) = 0.122 W/kg



Test Laboratory: Audix SAR Lab Date: 05/06/2020

CH1(2412MHz Right)-Ant1

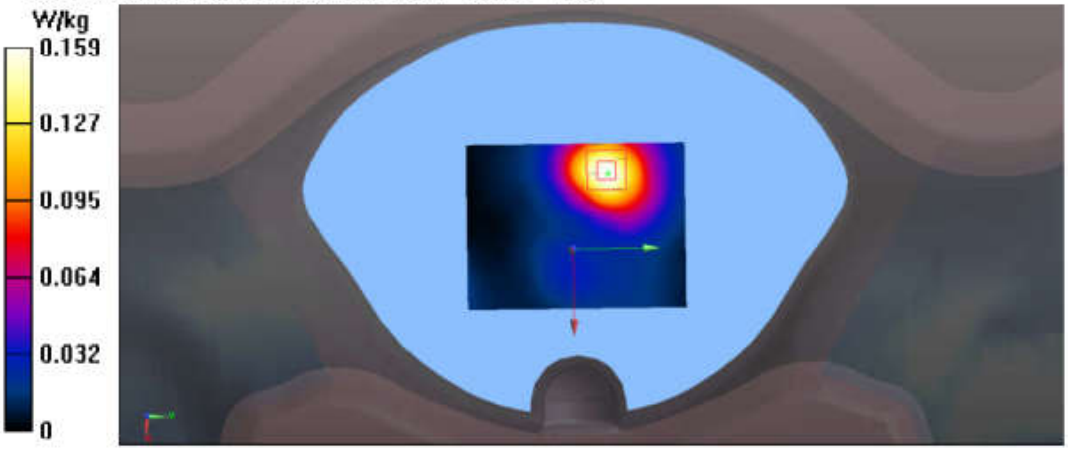
DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0);
Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.841 S/m; ε_r = 38.849; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.164 W/kg

Configuration/CH1(2412MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.069 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.367 W/kg
SAR(1 g) = 0.151 W/kg; SAR(10 g) = 0.074 W/kg
Maximum value of SAR (measured) = 0.159 W/kg



Test Laboratory: Audix SAR Lab Date: 05/06/2020

CH6(2437MHz Left)-Ant2

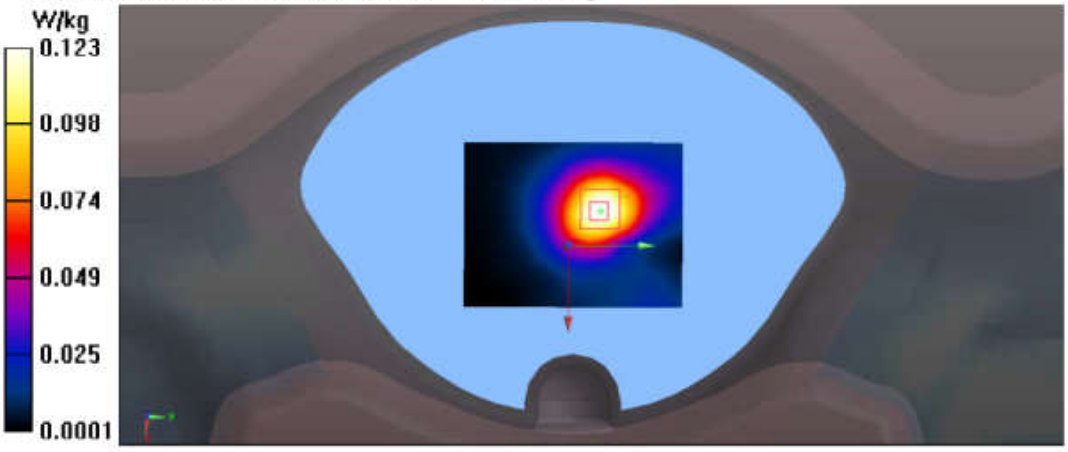
DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0);
Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency: 2437 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.873 S/m; ε_r = 38.753; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.135 W/kg

Configuration/CH6(2437MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.763 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.263 W/kg
SAR(1 g) = 0.117 W/kg; SAR(10 g) = 0.059 W/kg
Maximum value of SAR (measured) = 0.123 W/kg



Test Laboratory: Audix SAR Lab Date: 05/06/2020

CH6(2437MHz Right)-Ant1

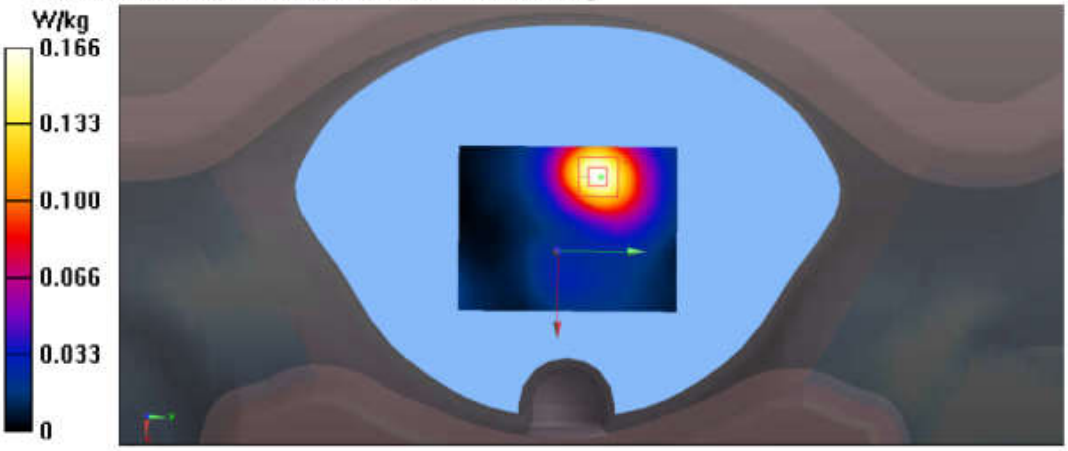
DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0);
Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency: 2437 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.873 S/m; ε_r = 38.753; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.169 W/kg

Configuration/CH6(2437MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.901 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.356 W/kg
SAR(1 g) = 0.156 W/kg; SAR(10 g) = 0.077 W/kg
Maximum value of SAR (measured) = 0.166 W/kg



Test Laboratory: Audix SAR Lab Date: 05/06/2020

CH11(2462MHz Left)-Ant2

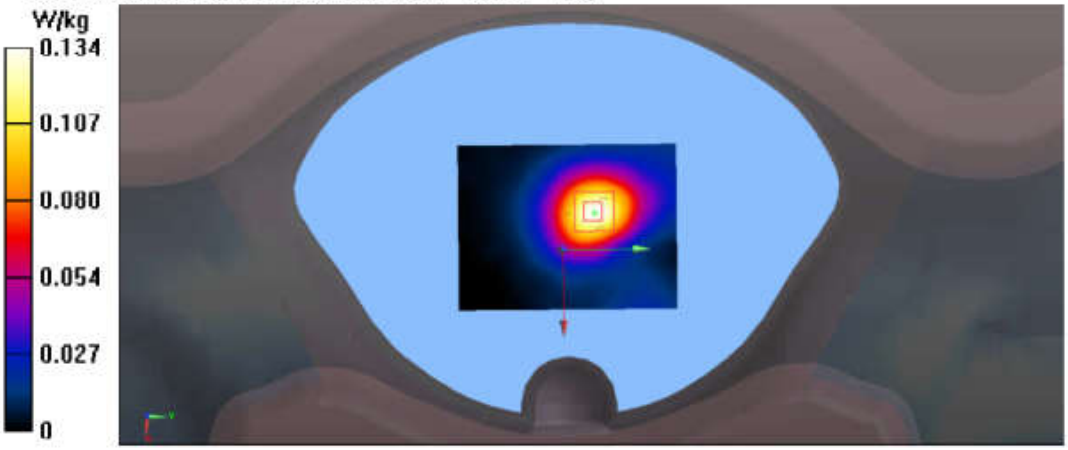
DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0);
Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency: 2462 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2472 MHz; σ = 1.908 S/m; ε_r = 38.627; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.137 W/kg

Configuration/CH11(2462MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.888 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.273 W/kg
SAR(1 g) = 0.124 W/kg; SAR(10 g) = 0.061 W/kg
Maximum value of SAR (measured) = 0.134 W/kg



Test Laboratory: Audix SAR Lab Date: 05/06/2020

CH11(2462MHz Right)-Ant1

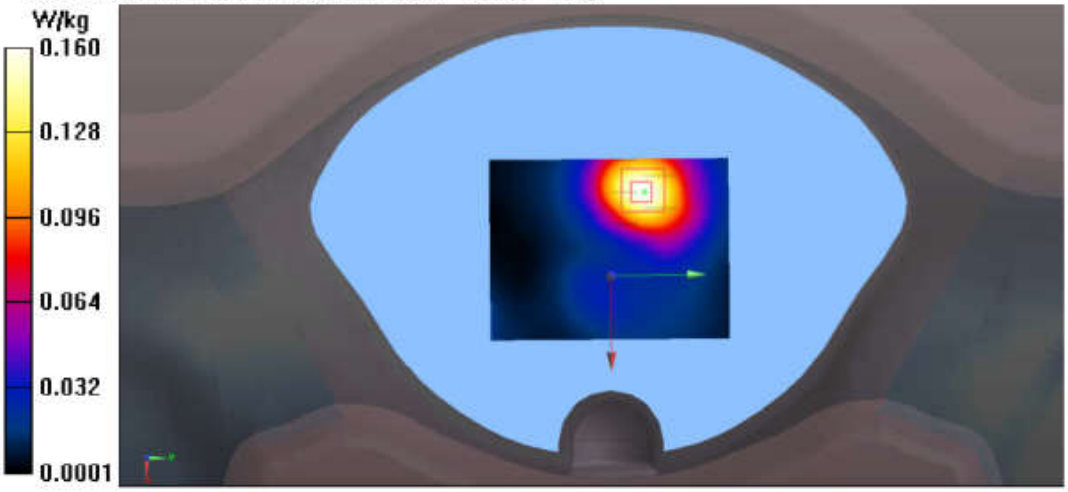
DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0);
Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency: 2462 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2462 MHz; σ = 1.908 S/m; ε_r = 38.627; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.46, 7.46, 7.46); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.164 W/kg

Configuration/CH11(2462MHz Right)/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.965 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.348 W/kg
SAR(1 g) = 0.153 W/kg; SAR(10 g) = 0.077 W/kg
Maximum value of SAR (measured) = 0.160 W/kg



WIFI 5GHz:

Test Laboratory: Audix SAR Lab Date: 08/06/2020

CH36(5180MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.2GHz (0); Communication System Band: IEEE 802.11a WiFi 5.2GHz; Frequency: 5180 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5180 MHz; σ = 4.225 S/m; ε_r = 37.179; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH36(5180MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0805 W/kg

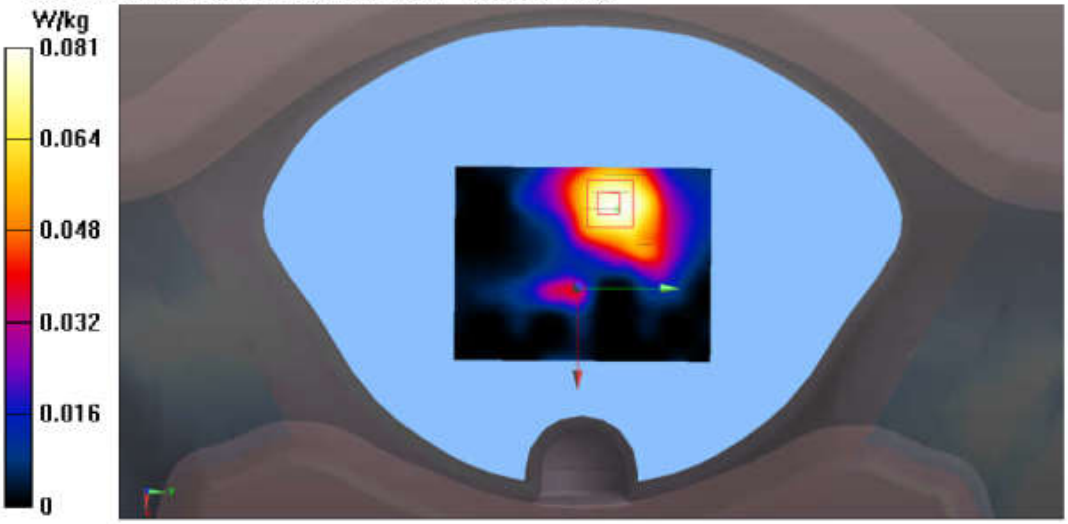
Configuration/CH36(5180MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.155 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.216 W/kg

SAR(1 g) = 0.077 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0806 W/kg



Test Laboratory: Audix SAR Lab Date: 08/06/2020

CH36(5180MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.2GHz (0); Communication System Band: IEEE 802.11a WiFi 5.2GHz; Frequency: 5200 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5180 MHz; σ = 4.225 S/m; ε_r = 37.179; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH36(5180MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.202 W/kg

Configuration/CH36(5180MHz Right)/Zoom Scan (5x5x7)/Cube 0:

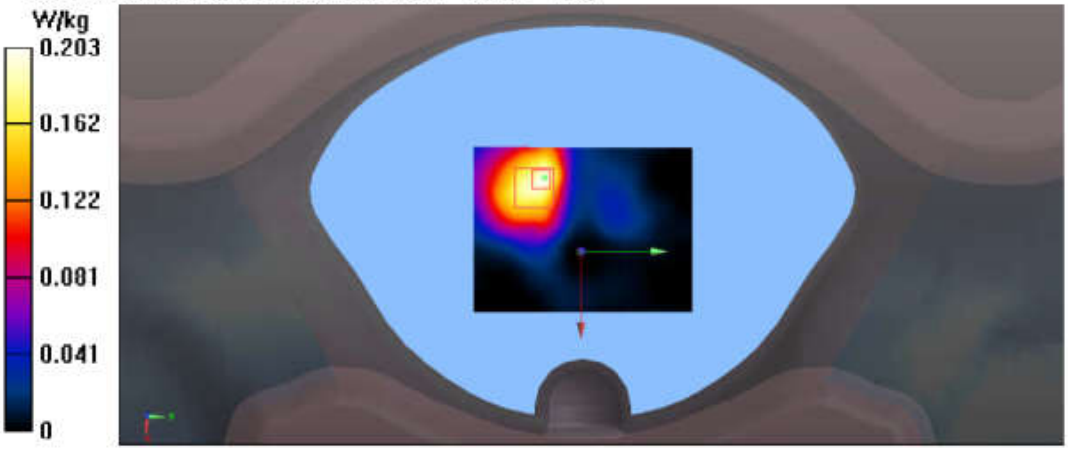
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.713 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.484 W/kg

SAR(1 g) = 0.173 W/kg; SAR(10 g) = 0.073 W/kg

Maximum value of SAR (measured) = 0.203 W/kg



Test Laboratory: Audix SAR Lab Date: 08/06/2020

CH40(5200MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.2GHz (0); Communication System Band: IEEE 802.11a WiFi 5.2GHz; Frequency: 5200 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5200 MHz; σ = 4.51 S/m; ε_r = 35.53; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH40(5200MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0841 W/kg

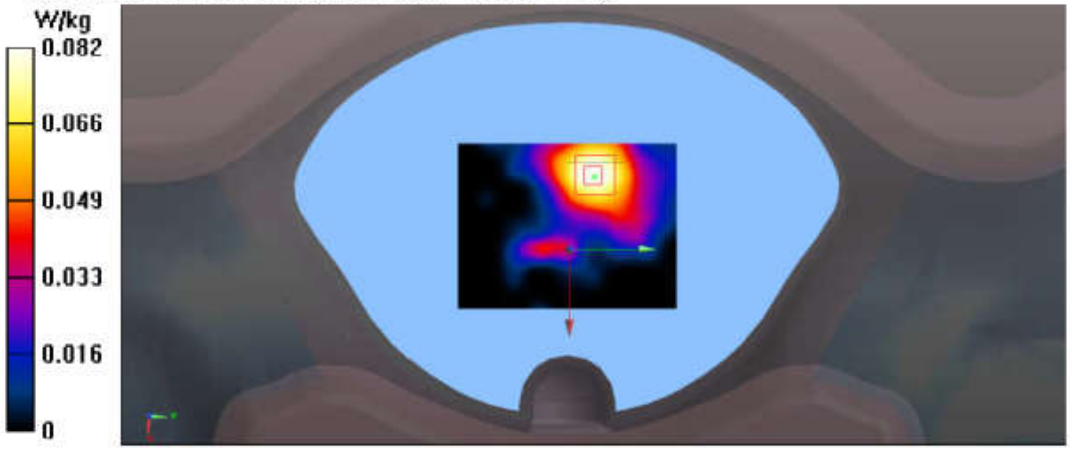
Configuration/CH40(5200MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.444 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.213 W/kg

SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0823 W/kg



Test Laboratory: Audix SAR Lab Date: 08/06/2020

CH40(5200MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.2GHz (0); Communication System Band: IEEE 802.11a WiFi 5.2GHz; Frequency: 5200 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5200 MHz; σ = 4.51 S/m; ε_r = 35.53; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH40(5200MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.206 W/kg

Configuration/CH40(5200MHz Right)/Zoom Scan (5x5x7)/Cube 0:

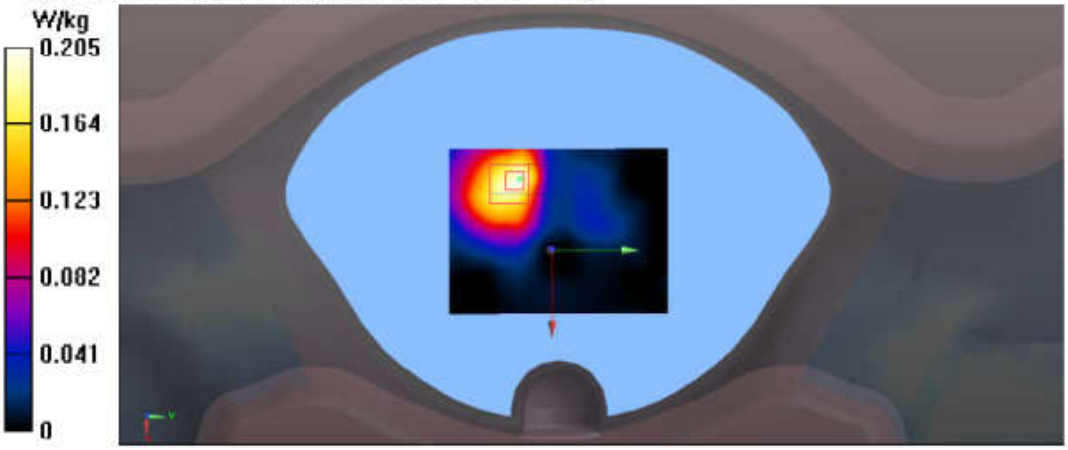
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.619 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.564 W/kg

SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.080 W/kg

Maximum value of SAR (measured) = 0.205 W/kg



Test Laboratory: Audix SAR Lab Date: 08/06/2020

CH48(5240MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.2GHz (0); Communication System Band: IEEE 802.11a WiFi 5.2GHz; Frequency: 5240 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5240 MHz; σ = 4.235 S/m; ε_r = 37.130; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH48(5240MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0861 W/kg

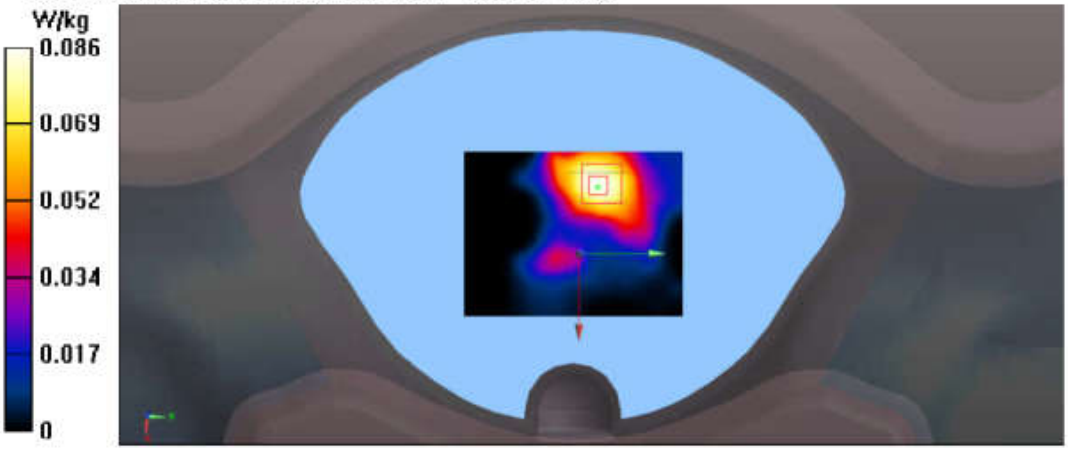
Configuration/CH48(5240MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.413 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.258 W/kg

SAR(1 g) = 0.079 W/kg; SAR(10 g) = 0.034 W/kg

Maximum value of SAR (measured) = 0.0862 W/kg



Test Laboratory: Audix SAR Lab Date: 08/06/2020

CH48(5240MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.2GHz (0); Communication System Band: IEEE 802.11a WiFi 5.2GHz; Frequency: 5240 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5240 MHz; σ = 4.235 S/m; ε_r = 37.130; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.55, 5.55, 5.55); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH48(5240MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.212 W/kg

Configuration/CH48(5240MHz Right)/Zoom Scan (5x5x7)/Cube 0:

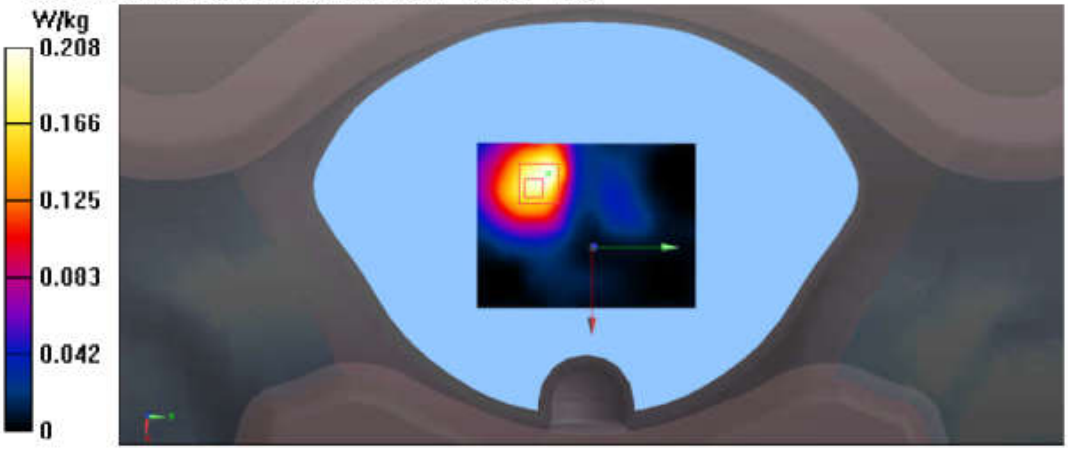
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.602 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.867 W/kg

SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.087 W/kg

Maximum value of SAR (measured) = 0.208 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CH52(5260MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.3GHz (0); Communication System Band: IEEE 802.11a WiFi 5.3GHz ; Frequency: 5260 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5260 MHz; σ = 4.420 S/m; ε_r = 37.037; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH52(5260MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0841 W/kg

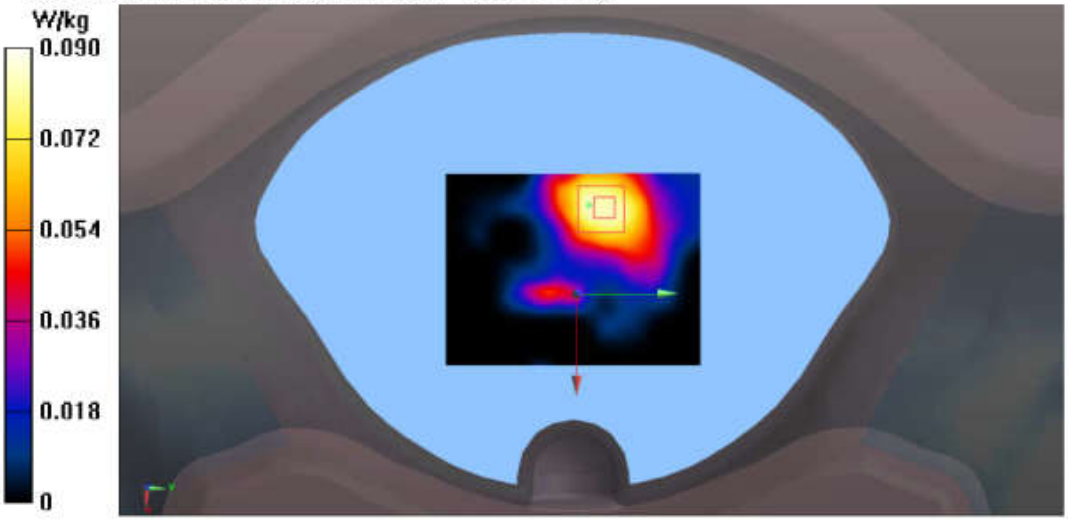
Configuration/CH52(5260MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.385 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.228 W/kg

SAR(1 g) = 0.082 W/kg; SAR(10 g) = 0.035 W/kg

Maximum value of SAR (measured) = 0.0895 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CH52(5260MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.3GHz (0); Communication System Band: IEEE 802.11a WiFi 5.3GHz ; Frequency: 5260 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5260 MHz; σ = 4.420 S/m; ε_r = 37.037; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH52(5260MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.221 W/kg

Configuration/CH52(5260MHz Right)/Zoom Scan (5x5x7)/Cube 0:

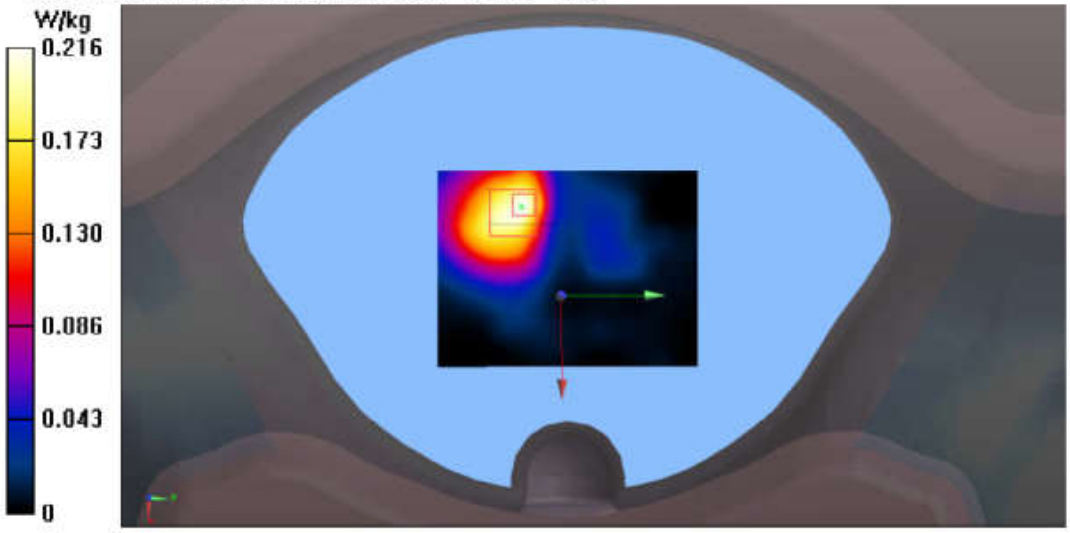
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.794 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.249 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.216 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CH56(5280MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.3GHz (0); Communication System Band: IEEE 802.11a WiFi 5.3GHz ; Frequency: 5280 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5280 MHz; σ = 4.467 S/m; ε_r = 37.043; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH56(5280MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0878 W/kg

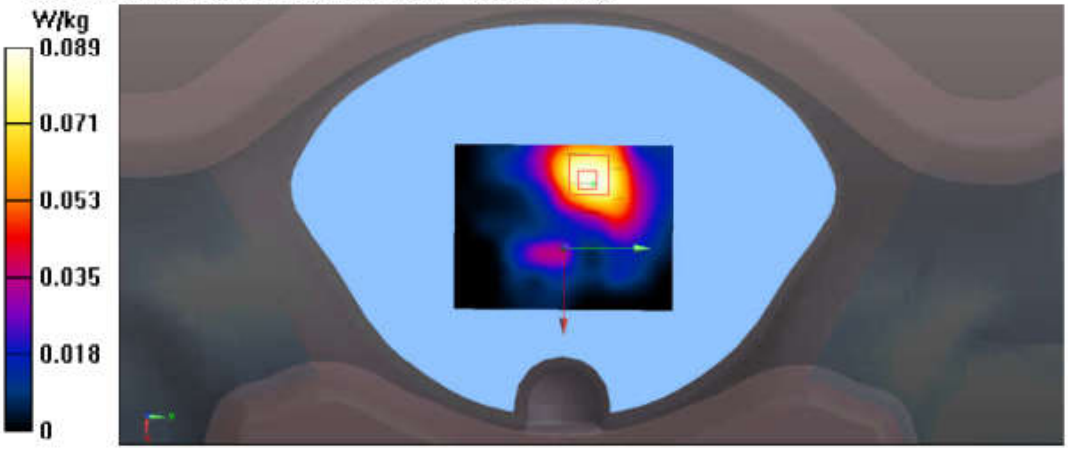
Configuration/CH56(5280MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.464 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.234 W/kg

SAR(1 g) = 0.084 W/kg; SAR(10 g) = 0.037 W/kg

Maximum value of SAR (measured) = 0.0885 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CH56(5280MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.3GHz (0); Communication System Band: IEEE 802.11a WiFi 5.3GHz ; Frequency: 5280 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5280 MHz; σ = 4.467 S/m; ε_r = 37.043; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH56(5280MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.228 W/kg

Configuration/CH56(5280MHz Right)/Zoom Scan (5x5x7)/Cube 0:

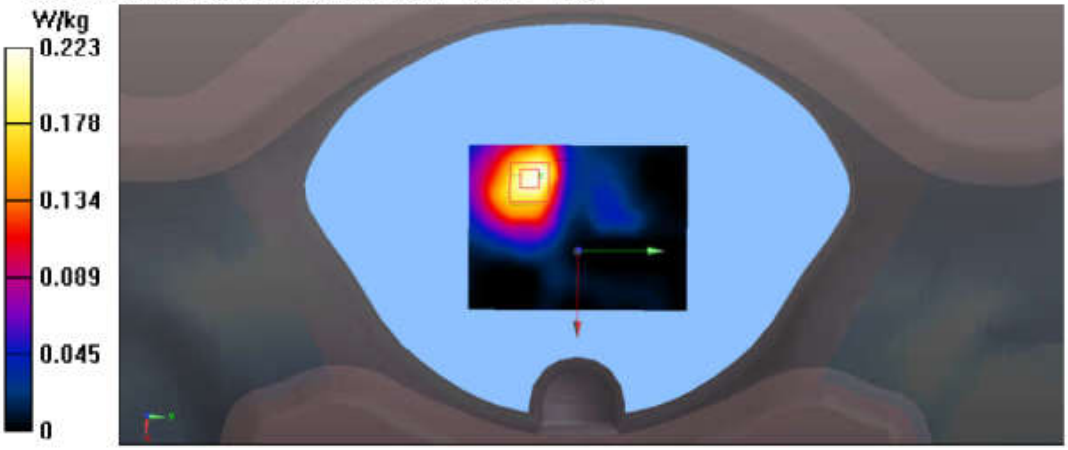
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.550 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.248 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.223 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CH64(5320MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.3GHz (0); Communication System Band: IEEE 802.11a WiFi 5.3GHz ; Frequency: 5320 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5320 MHz; σ = 4.510 S/m; ε_r = 37.008; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH64(5320MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0901 W/kg

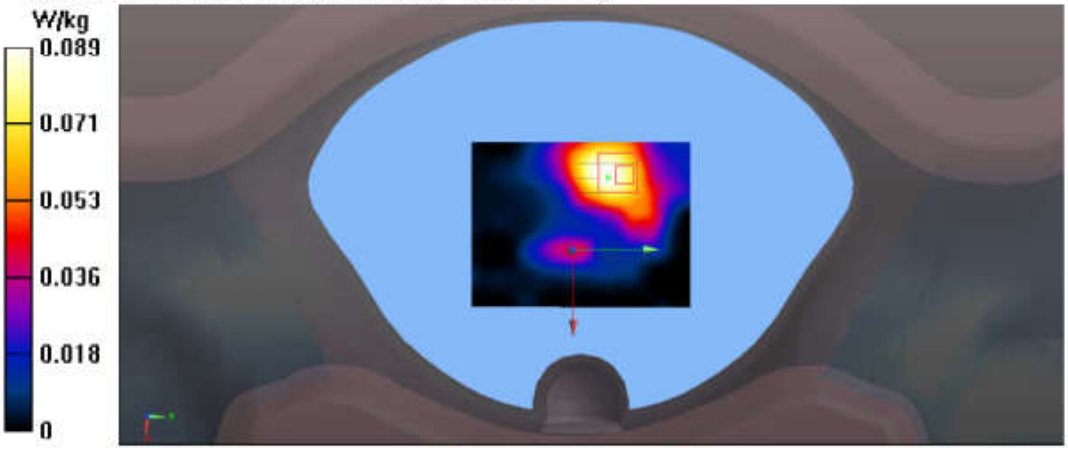
Configuration/CH64(5320MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.421 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.499 W/kg

SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.032 W/kg

Maximum value of SAR (measured) = 0.0891 W/kg



Test Laboratory: Audix SAR Lab Date: 09/06/2020

CH64(5320MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.3GHz (0); Communication System Band: IEEE 802.11a WiFi 5.3GHz ; Frequency: 5320 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5320 MHz; σ = 4.510 S/m; ε_r = 37.008; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.14, 5.14, 5.14); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH64(5320MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.236 W/kg

Configuration/CH64(5320MHz Right)/Zoom Scan (5x5x7)/Cube 0:

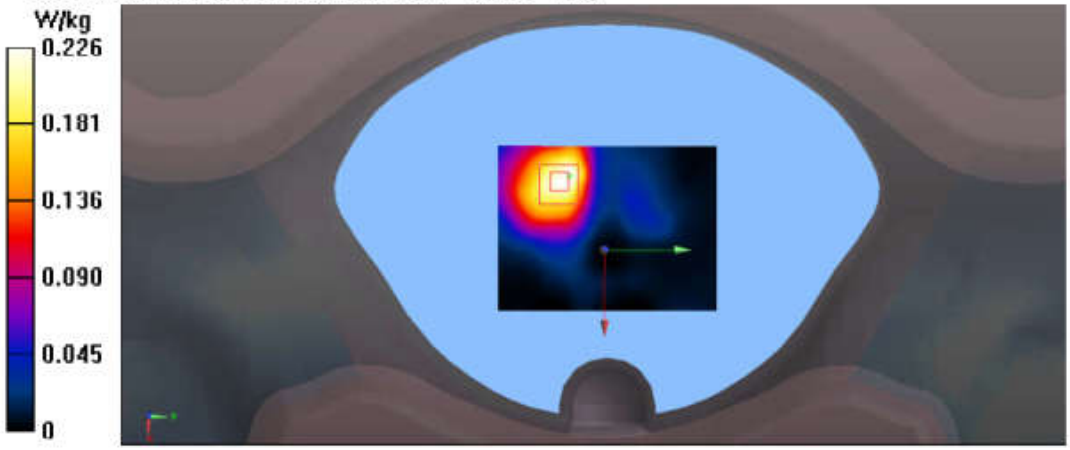
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.747 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 0.287 W/kg; SAR(10 g) = 0.116 W/kg

Maximum value of SAR (measured) = 0.226 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CH100(5500MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.5GHz (0); Communication System Band: IEEE 802.11a WiFi 5.5GHz; Frequency: 5500 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5500 MHz; σ = 4.847 S/m; ε_r = 36.818; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.82, 4.82, 4.82); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH100(5500MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0945 W/kg

Configuration/CH100(5500MHz Left)/Zoom Scan (5x5x7)/Cube 0:

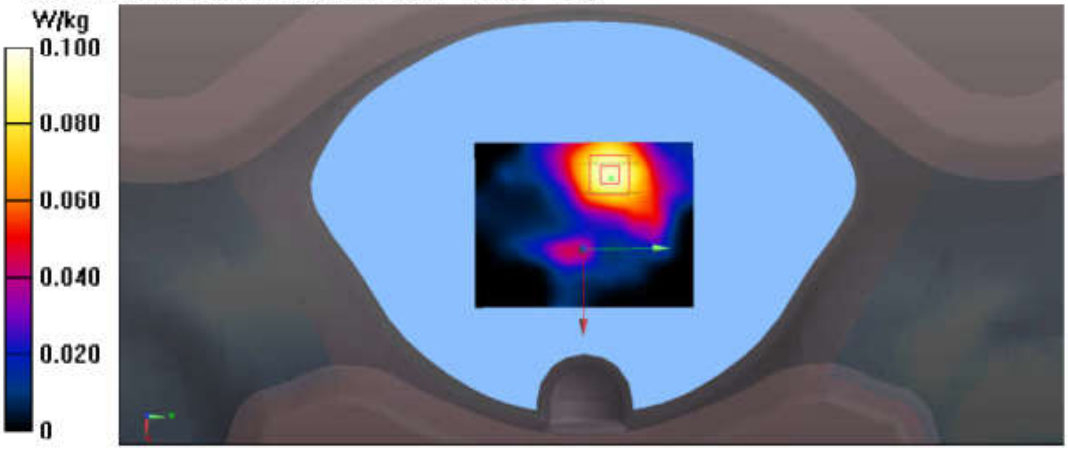
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.498 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.251 W/kg

SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.040 W/kg

Maximum value of SAR (measured) = 0.100 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CH100(5500MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.5GHz (0); Communication System Band: IEEE 802.11a WiFi 5.5GHz; Frequency: 5500 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5500 MHz; σ = 4.847 S/m; ε_r = 36.818; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.82, 4.82, 4.82); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH100(5500MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.255 W/kg

Configuration/CH100(5500MHz Right)/Zoom Scan (5x5x7)/Cube 0:

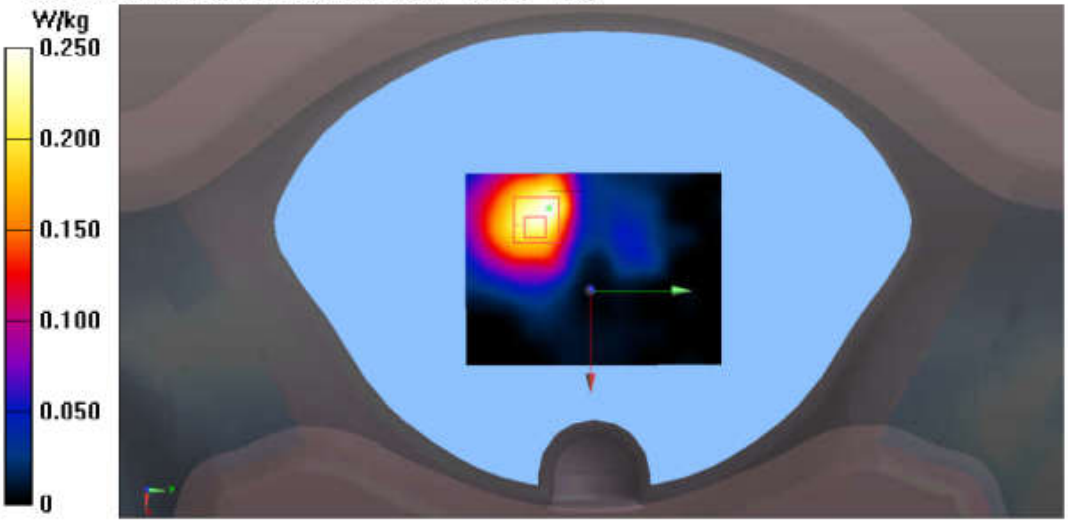
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.893 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.097 W/kg

Maximum value of SAR (measured) = 0.250 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CH116(5580MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.5GHz (0); Communication System Band: IEEE 802.11a WiFi 5.5GHz; Frequency: 5580 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5580 MHz; σ = 4.729 S/m; ε_r = 36.707; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.75, 4.75, 4.75); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH116(5580MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.103 W/kg

Configuration/CH116(5580MHz Left)/Zoom Scan (5x5x7)/Cube 0:

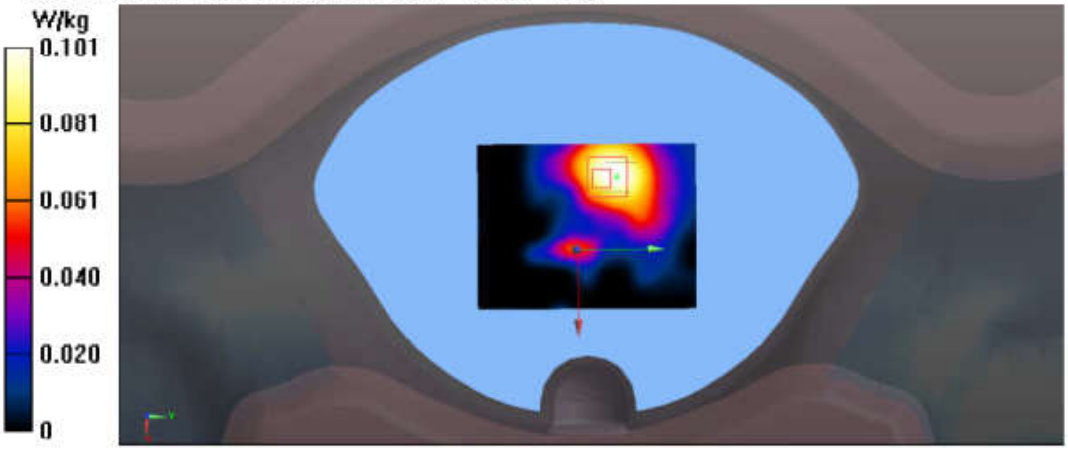
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.825 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.293 W/kg

SAR(1 g) = 0.096 W/kg; SAR(10 g) = 0.039 W/kg

Maximum value of SAR (measured) = 0.101 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CH116(5580MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.5GHz (0); Communication System Band: IEEE 802.11a WiFi 5.5GHz; Frequency: 5580 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5580 MHz; σ = 4.729 S/m; ε_r = 36.707; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.75, 4.75, 4.75); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH116(5580MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.257 W/kg

Configuration/CH116(5580MHz Right)/Zoom Scan (5x5x7)/Cube 0:

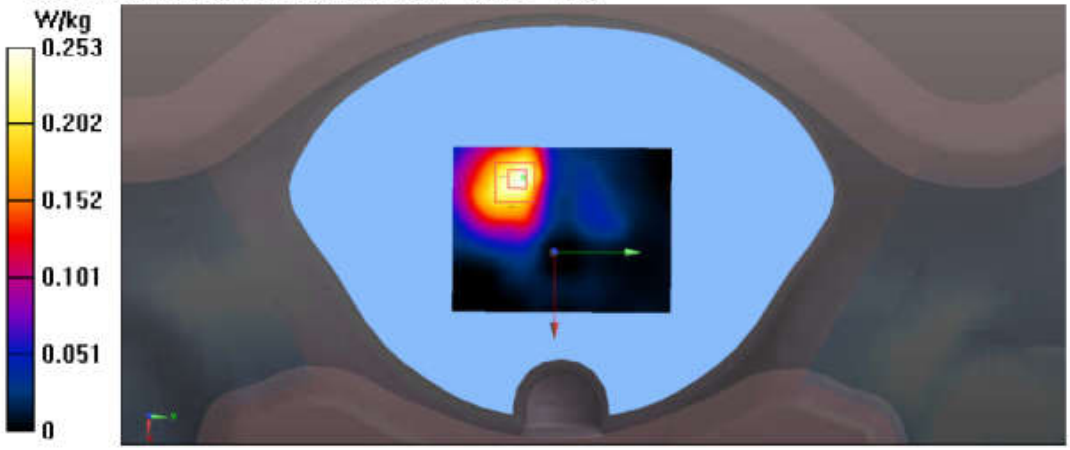
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.639 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.297 W/kg; SAR(10 g) = 0.123 W/kg

Maximum value of SAR (measured) = 0.253 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CH140(5700MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.5GHz (0); Communication System Band: IEEE 802.11a WiFi 5.5GHz; Frequency: 5700 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5700 MHz; σ = 4.932 S/m; ε_r = 35.947; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.75, 4.75, 4.75); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH140(5700MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.106 W/kg

Configuration/CH140(5700MHz Left)/Zoom Scan (5x5x7)/Cube 0:

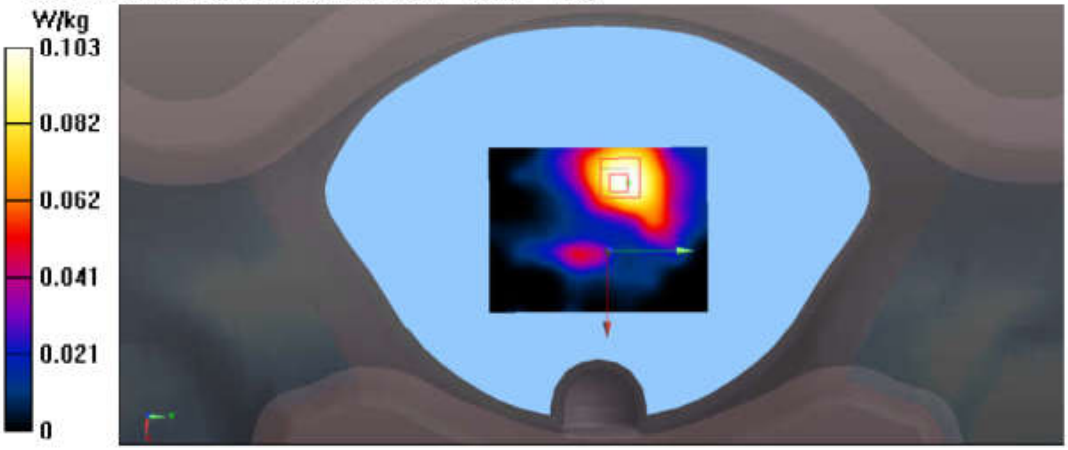
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.401 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.348 W/kg

SAR(1 g) = 0.102 W/kg; SAR(10 g) = 0.041 W/kg

Maximum value of SAR (measured) = 0.103 W/kg



Test Laboratory: Audix SAR Lab Date: 10/06/2020

CH140(5700MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.5GHz (0); Communication System Band: IEEE 802.11a WiFi 5.5GHz; Frequency: 5700 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5700 MHz; σ = 4.932 S/m; ε_r = 35.947; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.75, 4.75, 4.75); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH140(5700MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.267 W/kg

Configuration/CH140(5700MHz Right)/Zoom Scan (5x5x7)/Cube 0:

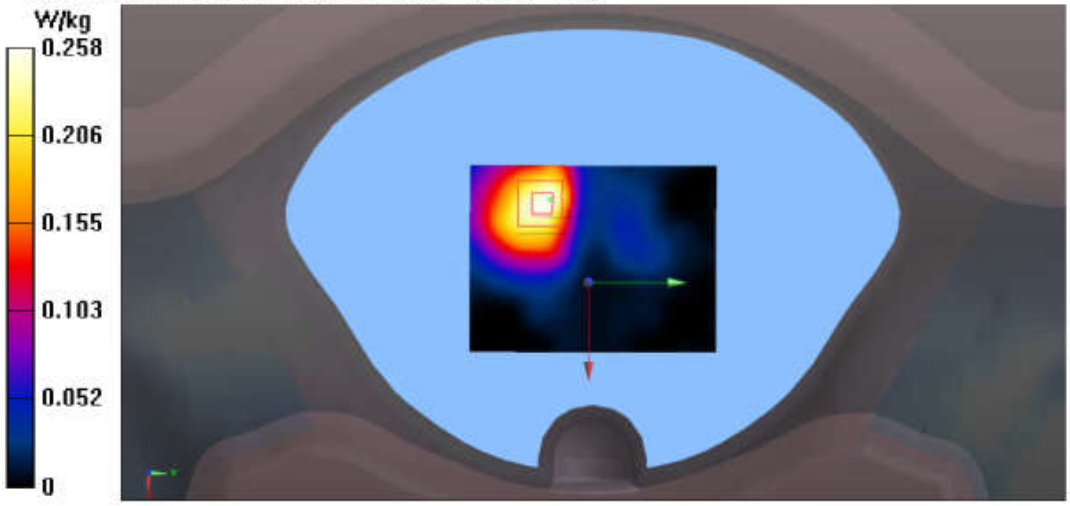
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.844 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.706 W/kg

SAR(1 g) = 0.244 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.258 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CH149(5745MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.8GHz (0); Communication System Band: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5745 MHz; σ = 5.003 S/m; ε_r = 34.933; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.7, 4.7, 4.7); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH149(5745MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.112 W/kg

Configuration/CH149(5745MHz Left)/Zoom Scan (5x5x7)/Cube 0:

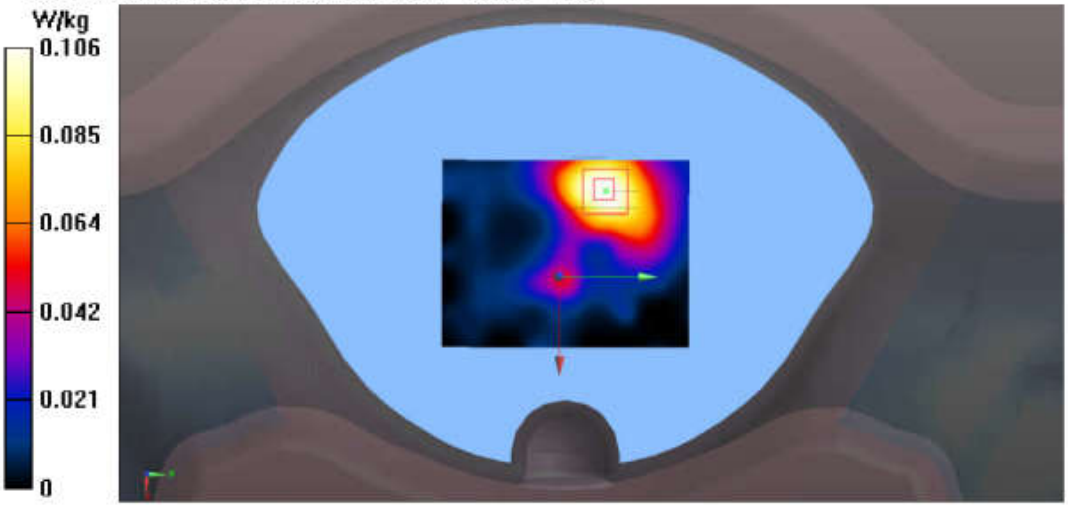
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.694 V/m; Power Drift = 0.20 dB

Peak SAR (extrapolated) = 0.266 W/kg

SAR(1 g) = 0.099 W/kg; SAR(10 g) = 0.043 W/kg

Maximum value of SAR (measured) = 0.106 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CH149(5745MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.8GHz (0); Communication System Band: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5745 MHz; σ = 5.003 S/m; ε_r = 34.933; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.7, 4.7, 4.7); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH149(5745MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.282 W/kg

Configuration/CH149(5745MHz Right)/Zoom Scan (5x5x7)/Cube 0:

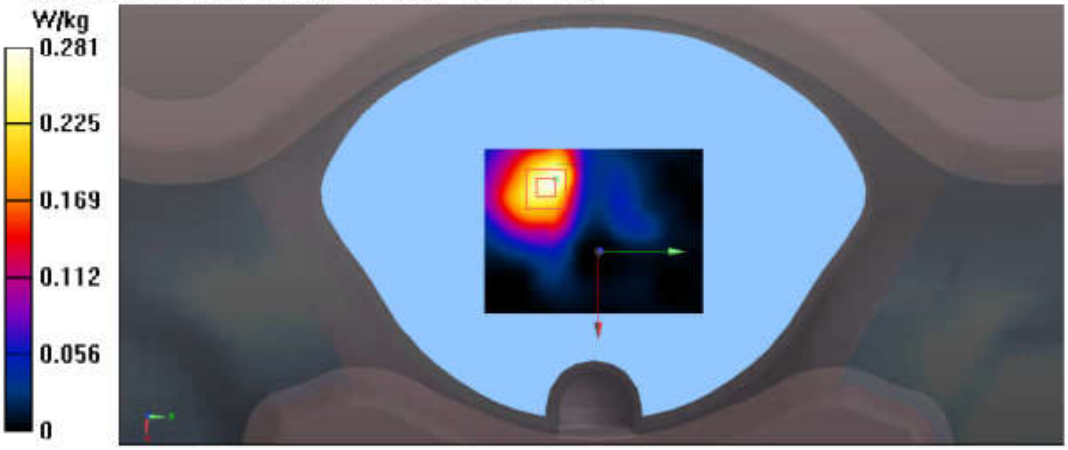
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.629 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 2.02 W/kg

SAR(1 g) = 0.357 W/kg; SAR(10 g) = 0.150 W/kg

Maximum value of SAR (measured) = 0.281 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CH157(5785MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.8GHz (0); Communication System Band: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5785 MHz; σ = 5.125 S/m; ε_r = 34.861; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.7, 4.7, 4.7); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH157(5785MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.112 W/kg

Configuration/CH157(5785MHz Left)/Zoom Scan (5x5x7)/Cube 0:

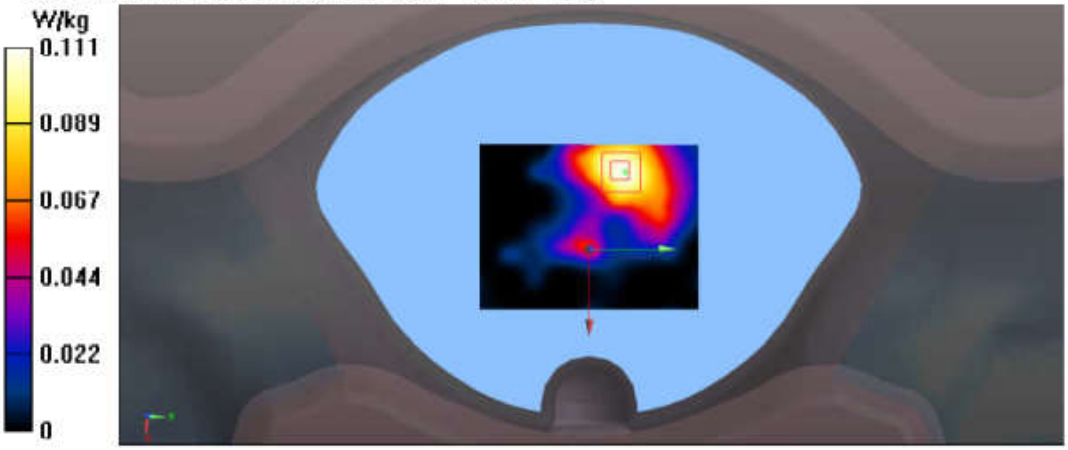
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.727 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.282 W/kg

SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.044 W/kg

Maximum value of SAR (measured) = 0.111 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CH157(5785MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.8GHz (0); Communication System Band: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5785 MHz; σ = 5.125 S/m; ε_r = 34.861; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.7, 4.7, 4.7); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH157(5785MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.283 W/kg

Configuration/CH157(5785MHz Right)/Zoom Scan (5x5x7)/Cube 0:

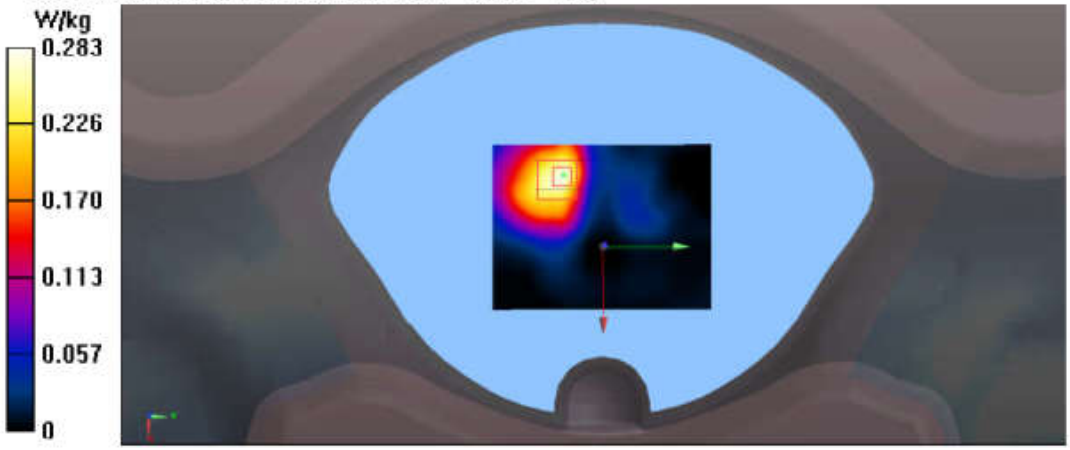
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.610 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.934 W/kg

SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.097 W/kg

Maximum value of SAR (measured) = 0.283 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CH165(5825MHz Left)-Ant2

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.8GHz (0); Communication System Band: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5825 MHz; σ = 5.901 S/m; ε_r = 37.88; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.7, 4.7, 4.7); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH165(5825MHz Left)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.116 W/kg

Configuration/CH165(5825MHz Left)/Zoom Scan (5x5x7)/Cube 0:

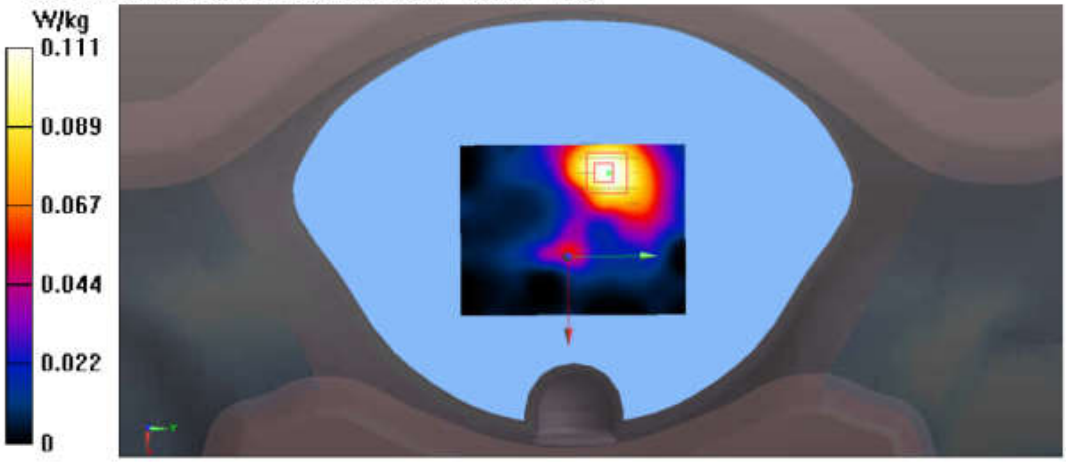
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.889 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.269 W/kg

SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.044 W/kg

Maximum value of SAR (measured) = 0.111 W/kg



Test Laboratory: Audix SAR Lab Date: 11/06/2020

CH165(5825MHz Right)-Ant1

DUT: Wireless Speaker M/N:CITATION 200

Communication System: UID 0, IEEE 802.11a WiFi 5.8GHz (0); Communication System Band: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 5825 MHz; σ = 5.901 S/m; ε_r = 37.88; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.7, 4.7, 4.7); Calibrated: 01/04/2020;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 18/03/2020
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH165(5825MHz Right)/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.288 W/kg

Configuration/CH165(5825MHz Right)/Zoom Scan (5x5x7)/Cube 0:

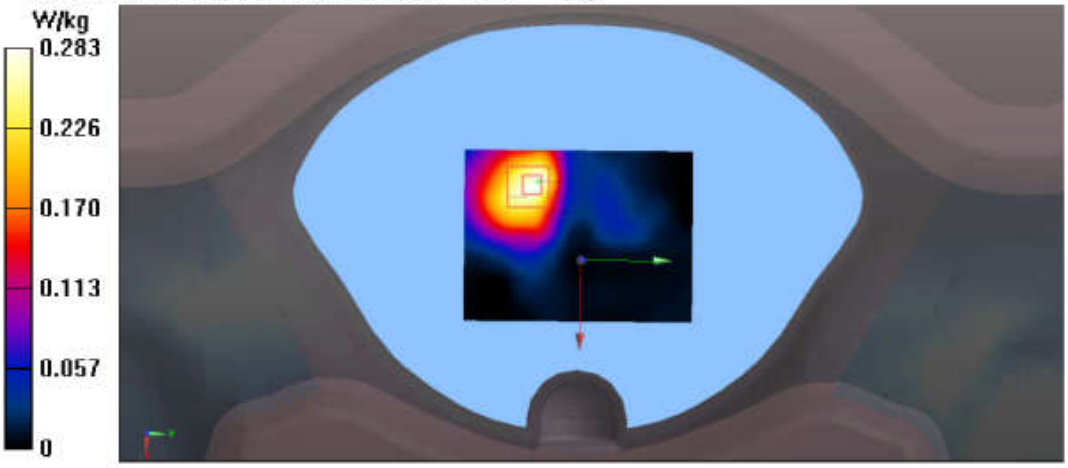
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.972 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.810 W/kg

SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.114 W/kg

Maximum value of SAR (measured) = 0.283 W/kg



ANNEX C: DASY Cablibration Certificate

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com http://www.chinattl.cn

CNAS 中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client Audix Certificate No: Z17-97065

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 862
Calibration Procedure(s)	FD-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	June 06, 2017

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Power sensor NRP-Z91	101547	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Reference Probe EX3DV4	SN 3617	23-Jan-17(SPEAG,No.EX3-3617_Jan17)	Jan-18
DAE4	SN 771	19-Jan-17(CTTL-SPEAG,No.Z17-97016)	Jan-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: June 09, 2017

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com http://www.chinattl.cn

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com http://www.chinattl.cn

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.10.0.1442
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.6 ± 6 %	1.81 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.8 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.13 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.5 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.8 ± 6 %	1.96 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**51.5 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.94 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.7 mW /g ± 18.7 % (k=2)**