

SAR TEST REPORT

for

Square Inc.

POS Terminal

Model No.: SPD1-XX

FCC ID: 2AF3K-SPD1

The MAX Reported SAR(1g)	
Body SAR	1.563W/Kg

Prepared for : Square Inc.

1455 Market St. Suite 600 San Francisco, California United States 94103

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

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Date of Test : Sep.27~Oct.19, 2018

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TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
Test Report Verification.....	3
1. GENERAL INFORMATION.....	4
1.1. Description of Device (EUT).....	4
2. GENERAL DESCRIPTION.....	6
2.1. Product Description For EUT.....	6
2.2. Applied Standards.....	6
2.3. Device Category and SAR Limits.....	6
2.4. Test Conditions.....	6
2.5. Exposure Positions Consideration.....	7
2.6. Standalone SAR Test Exclusion Considerations.....	8
2.7. EUT Configuration and operation conditions for test.....	9
2.8. Test Equipments.....	9
2.9. Laboratory Environment.....	10
2.10. Measurement Uncertainty.....	10
3. MEASURE PROCEDURES.....	13
3.1. General description of test procedures.....	13
4. SAR MEASUREMENTS SYSTEM.....	14
4.1. SAR Measurement Set-up.....	14
4.2. ELI Phantom.....	15
4.3. Device Holder for SAM Twin Phantom.....	16
4.4. DASY5 E-field Probe System.....	17
4.5. E-field Probe Calibration.....	18
4.6. Scanning procedure.....	19
5. DATA STORAGE AND EVALUATION.....	21
5.1. Data Storage.....	21
5.2. Data Evaluation by SEMCAD.....	21
6. SYSTEM CHECK.....	23
7. TEST RESULTS.....	24
7.1. Output power.....	24
7.2. System Check for Body Tissue simulating liquid.....	27
7.3. Test Results.....	28
7.4. Dielectric Performance for Body Tissue simulating liquid.....	35

ANNEX A: SYSTEM CHECK RESULTS

ANNEX B: GRAPH RESULTS WITH BANDS OF WATCH

ANNEX C: DASY CABLIBRATION CERTIFICATE

ANNEX D: TEST SETUP PHOTOS

ANNEX E: PHOTOS OF THE EUT

SAR TEST REPORT

Applicant : Square Inc.
Product : POS Terminal
(A) Model No. : SPD1-XX
(B) Brand Name : N/A
(C) Power Supply : DC 7.2V

Measurement Standard Used:

- FCC 47 CFR Part 2 (2.1093)
- IEEE C95.1-1999
- IEEE 1528-2013
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v06
- FCC KDB 248227 D01 v02r02
- FCC KDB 616217 D04 v01r02
- FCC KDB 865664 D01/D02

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 SAR 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 : Sep.27~Oct.19, 2018 Report of date: Oct.19, 2018

Prepared by : Monica Liu / Assistant Reviewed by : Sunny Lu / Deputy Manager



Approved & Authorized Signer :

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product : POS Terminal

Model No. : SPD1-XX

Radio : IEEE802.11 a/b/g/n/ac; Bluetooth V3.0+EDR; Bluetooth V4.2; NFC

Operation Frequency : IEEE 802.11a:
5180MHz—5240MHz; 5260MHz—5320MHz
5500MHz—5700MHz; 5745MHz—5825MHz
IEEE 802.11ac VHT20:
5180MHz—5240MHz; 5260MHz—5320MHz
5500MHz—5700MHz; 5745MHz—5825MHz
IEEE 802.11ac VHT40:
5190MHz—5230MHz; 5270MHz—5310MHz
5510MHz—5670MHz; 5755MHz—5795MHz
IEEE 802.11ac VHT80: 5210MHz, 5290MHz; 5530MHz—5610MHz;
5775MHz
IEEE 802.11b: 2412MHz—2462MHz
IEEE 802.11g: 2412MHz—2462MHz
IEEE802.11nHT20: 2412MHz—2462MHz;
5180MHz—5240MHz; 5260MHz—5320MHz
5500MHz—5700MHz; 5745MHz—5825MHz
IEEE802.11nHT40:
5190MHz—5230MHz; 5270MHz—5310MHz
5510MHz—5670MHz; 5755MHz—5795MHz
Bluetooth : 2402-2480MHz
NFC: 13.56MHz

Modulation Technology : IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
IEEE 802.11a/g: OFDM(64QAM, 16QAM, QPSK, BPSK)
IEEE 802.11ac VHT20, VHT40, VHT80: OFDM(16QAM, 64QAM, 256QAM, QPSK, BPSK)
IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM,QPSK,BPSK)
Bluetooth V3.0+EDR: GFSK, $\pi/4$ DQPSK,8-DPSK
Bluetooth V4.2:GFSK
NFC: ASK

Antenna Assembly Gain	: PIFA Antenna, Bluetooth: 1.99dBi WIFI 2.4GHz: ANT 0:1.99dBi; ANT 1: 4.06dBi WIFI 5GHz: Band 1: ANT 0: 3.07dBi; ANT 1: 5.05dBi Band 2: ANT 0: 3.07dBi; ANT 1: 5.05dBi Band 3: ANT 0: 3.38dBi; ANT 1: 6.18dBi Band 4: ANT 0: 2.96dBi; ANT 1: 6.58dBi
Applicant	: Square Inc. 1455 Market St. Suite 600 San Francisco, California United States 94103
Manufacturer	: Square Inc. 1455 Market St. Suite 600 San Francisco, California United States 94103
Factory	: Fu Tai Hua Industry (ShenZhen) Co., Ltd. 5/F, Building 11, G Area, No. 2, 2 nd Donghuan Road, Longhua District, Shenzhen, Guangdong Province, P.R. China
Rechargeable Li-ion Battery	: Manufacturer: Getac Technology(Kunshan) Co., Ltd. M/N: 2ICR19/66; Output: DC 7.2V, 3135mAh(22.57Wh).
Power Adapter	: Manufacturer: Dongguan Fuqiang Electronics Co., Ltd., M/N: SWD4-01; Input: 100-240V~, 50/60Hz, 1.4A; Output: 5V dc, 3.0A; 9V dc, 3.0A; 15V dc, 3.0A; 20V dc, 3.0A; Cable: Unshielded, Detachable, 1.2m
Accessory Hub	: Manufacturer: Square, Inc., M/N: SHD3-01; Cable: Unshielded, Detachable, 1.25m
Power Cable	: Unshielded, Detachable, 1.3m
Date of Test	: Sep.27~Oct.19, 2018
Date of Receipt	: Sep.15, 2018
Sample Type	: Prototype production

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
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v06
- FCC KDB 248227 D01 v02r02
- FCC KDB 616217 D04 v01r02
- FCC KDB 865664 D01/D02

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

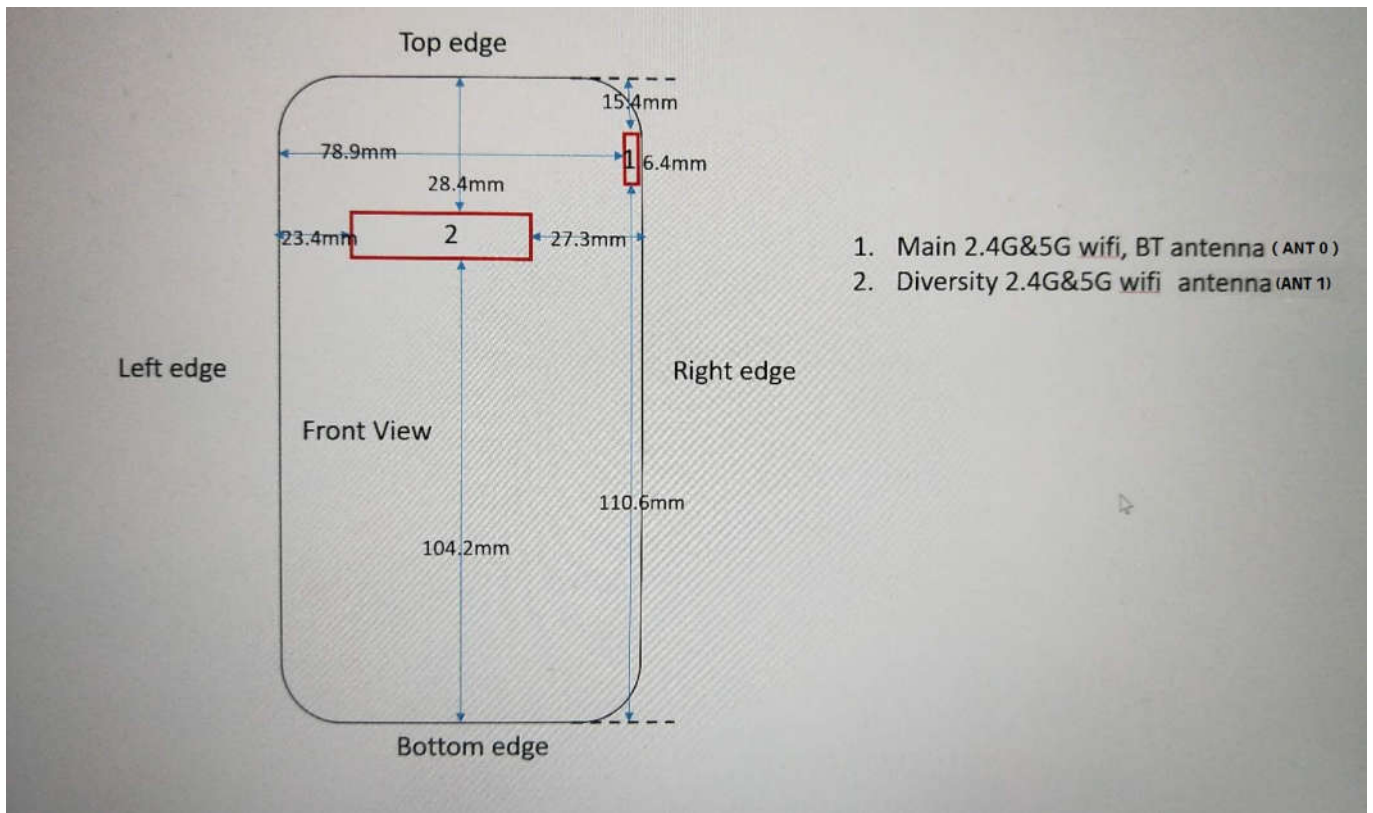
2.4.1. Ambient Condition

Ambient Temperature	20 to 24 °C
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



Antenna	Description
WIFI/Bluetooth antenna	802.11 b/g/n HT20/n HT40/ac VHT20/ ac VHT40/ac VHT80/ Bluetooth3.0+EDR, Bluetooth4.0

Note:

1. The Antenna 0 supports WLAN & BT, the WLAN and Bluetooth can not transmit simultaneously. the Antenna 1 only support WLAN.
2. The device support antenna switched diversity, the Main Antenna and Diversity Antenna can not working simultaneously.

Sides for Body SAR tests						
Test distance: 0 mm						
Band	Back	Front	Top	Bottom	Right	Left
WLAN 2.4GHz	✓	✓	✓	X	✓	✓
WLAN 5GHz	✓	✓	✓	X	✓	✓

Note:

1. The side which has a distance larger than 5cm from antenna can be excluded from SAR measurement.
2. The diagonal length of the screen is 15.7cm.

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ 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	

Standalone SAR test exclusion considerations

Band/Mode	F(MHz)	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
			dBm	mW	
2.4GHz WLAN	2450	10	12.5	17.78	NO
5.2GHz WLAN	5200	7	12.5	17.78	NO
5.5GHz WLAN	5500	6	13.0	19.95	NO
5.8GHz WLAN	5800	6	12.5	17.78	NO

Regard with Bluetooth, The 1-g SAR test exclusion threshold determined by: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR,

The max. power of channel, including tune-up tolerance is 11dBm(12.60mW), the min. test Separation distance is 5mm, the f is 2.441GHz, Calculate the 1-g SAR test exclusion threshold is 3.93 larger than 3. So the SAR test for Bluetooth can not be excluded.

2.7. EUT Configuration and operation conditions for test.



(EUT: POS Terminal)

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	2018.04.23	2019.04.23	LISAI
3.	Power Meter	Anritsu	ML2487A	6K00003262	2018.04.23	2019.04.23	LISAI
4.	Power Sensor	Anritsu	MA2491A	032516	2018.04.23	2019.04.23	LISAI
5.	Signal Generator	HP	83732B	US34490501	2018.04.23	2019.04.23	LISAI
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	1102	2017.05.25	2020.05.25	SPEAG
9.	Attenuator	Mini-Circuits	15542 VAT-10+	31349 No.1	2017.10.14	2018.10.14	LISAI
10.	Attenuator	Mini-Circuits	15542 VAT-10+	31349 No.1	2018.10.14	2019.10.14	LISAI
11.	Date Acquisition Electronics	Speag	DAE4	899	2018.02.08	2019.02.08	CCTL
12.	E-Field Probe	Speag	EX3DV4	3767	2018.03.07	2019.03.07	CCTL
13.	ENA Series Analyzer	Agilent	E5071B	MY42403549	2018.04.23	2019.04.23	LISAI
14.	Test Software	Schmid&Partner Englinnering AG	DASY5	52.8.7.1137	NCR	NCR	NCR
15.	Radio Communication Analyzer	ANRITSU	MT8820C	6201091003	2017.10.15	2018.10.15	LISAI
16.	Radio Communication Analyzer	ANRITSU	MT8820C	6201091003	2018.10.14	2019.10.14	LISAI
17.	Radio Communication Analyzer	Rohode&Schwarz	CMW500	103249	2018.01.12	2019.01.12	LISAI

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

2.9. Laboratory Environment

Temperature	Min:20°C,Max.25°C
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°C

Source	Type	Uncertainty Value (%)	Probability Distribution	K	C1(1g)	C1(10g)	Standard uncertainty y ul(%)1g	Standard uncertainty y ul(%)10g	Degree of freedom Veff or Vi
Measurement system repeitivity	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)	$u_k = 2u_c$		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 802.11a/b/g SAR body tests, a communication link is set up with the test mode software for WIFI mode test. 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 channels 1, 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.

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.

Table C.4 – Reported SAR of initial test configuration determined according to Table C.3 with frequency band test reduction taken into consideration

802.11 Modes	a	g	n (HT) [®]		ac (VHT) [®]			
Channel Bandwidth (MHz)	20	20	20	40	20	40	80	160
§15.247 (2.4 GHz)		1/6/11	1/6/11	6				
		SAR not required for OFDM; 802.11b adjusted SAR ≤ 1.2 W/kg						
U-NII-1	36/40/44/48		36/40/44/48	38/46	36/40/44/48	38/46	42	
	U-NII-2A exclusion applied							
U-NII-2A	52/56/60/64		52/56/60/64	54/62	52/56/60/64	54/62	58	
U-NII-1 + U-NII-2A	0.85							
	Ch. #							50
U-NII-2C	100/112/116/128		100/112/116/128	102/110/118/126	100/112/116/128	102/110/118/126	106/112	114
	0.95							
U-NII-3	132/149/165		132/149/165	134/142/151/159	132/149/165	134/142/151/159	138/155	
§15.247 (5.8 GHz)	132/149/165		132/149/165	134/142/151/159	132/149/165	134/142/151/159	138/155	
	1.08							

- This example assumes the device has a fixed exposure test position; therefore, initial test position SAR test reduction does not apply.
- It is also assumed that the test separation distance and measured power (illustrated in Table C.3) do not qualify for the standalone SAR test exclusion provisions in KDB Publication 447498 D01.
- SAR probe(s) are assumed to have valid calibrations at 5.25, 5.60 and 5.75 GHz.
- The illustrated SAR values are already scaled to 100% transmission duty factor and according to reported SAR procedure.
- U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.

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 issues 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.

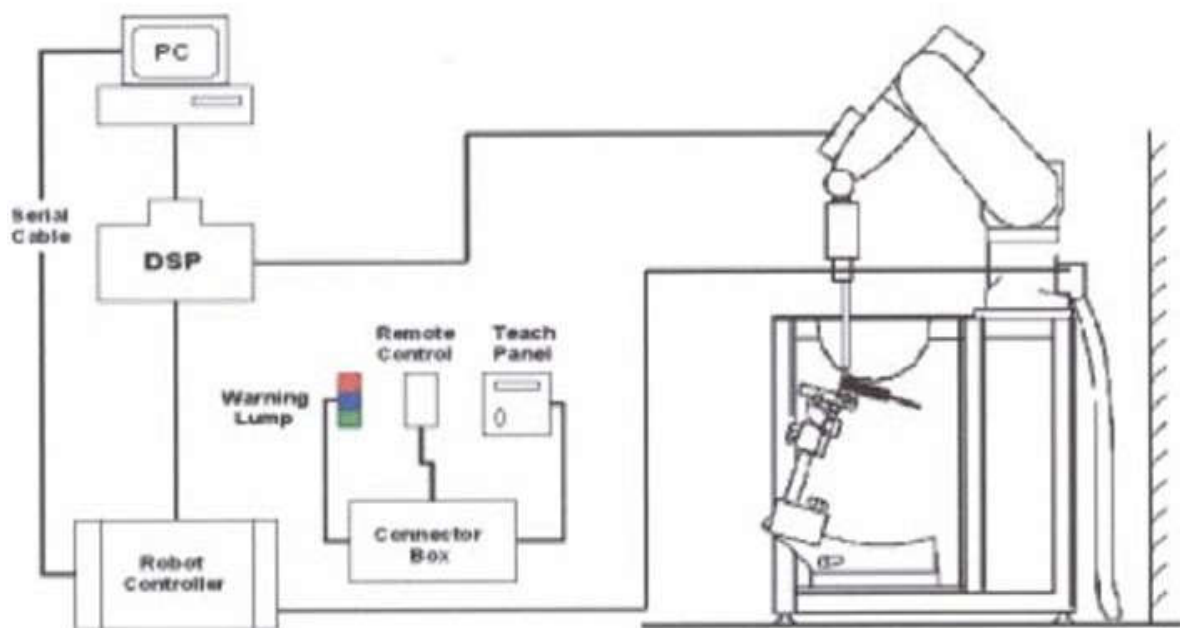


Figure 4.1 SAR Lab Test Measurement Set-up

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 $\pm 0.5\text{mm}$ would produce a SAR uncertainty of $\pm 20\%$. 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 $\epsilon_r=3$ and loss tangent $\delta = 0.02$. 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 triangular 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 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/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 $\pm 10\%$. The spherical isotropy was evaluated and found to be better than $\pm 0.25\text{dB}$. 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 below 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.

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

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

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

Where:
 σ = Simulated tissue conductivity,
 ρ = Tissue density (kg/m^3).

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. $\pm 5\%$.

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 $\pm 0.1\text{mm}$). 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 $\pm 30^\circ$.)

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 the data 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:

$$V_i = U_i + U_{i2} \cdot c f / d c p_i$$

With V_i = compensated signal of channel i ($i = x, y, z$)
 U_i = input signal of channel i ($i = x, y, z$)
 cf = crest factor of exciting field (DASY parameter)
 dcp_i = 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: $H_i = (V_i)^{1/2} \cdot (ai_0 + ai_1 f + ai_2 f^2) / f$

With V_i = compensated signal of channel i ($i = x, y, z$)
 $Norm_i$ = sensor sensitivity of channel i ($i = x, y, z$)
 $ConvF$ = sensitivity enhancement in solution
 ai_j = sensor sensitivity factors for H-field probes
 f = carrier frequency [GHz]
 E_i = electric field strength of channel i in V/m
 H_i = 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.

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

SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

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

ρ = 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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = 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 ($\pm 10\%$).

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

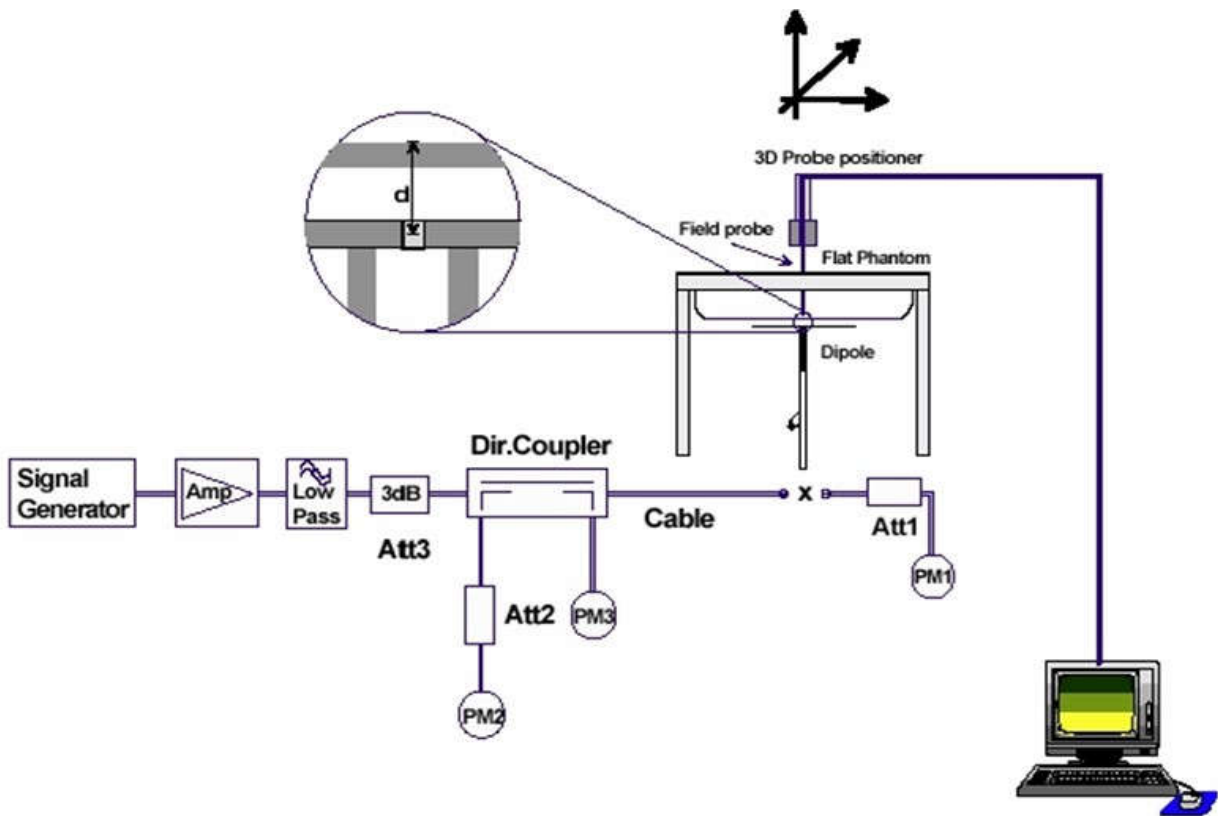


Figure 6.1: System Check Set-up

7. TEST RESULTS

7.1. Output power

(Bluetooth V3.0)

Test Mode	Frequency (MHz)	Peak output Power (dBm)
GFSK	2402	8.490
	2441	10.201
	2480	9.390
8-DPSK	2402	8.831
	2441	10.641
	2480	9.429

(Bluetooth V4.2)

Test Mode	Frequency (MHz)	Peak output Power (dBm)
GFSK	2402	-0.533
	2440	0.666
	2480	-0.492

(WIFI 2.4GHz)

Test Mode	CH	output Power (dBm)	
		ANT0	ANT1
11b	CH1	12.46	12.24
	CH6	12.50	12.49
	CH11	12.49	12.46
11g	CH1	13.01	12.65
	CH6	12.71	12.35
	CH11	12.19	11.86
11n HT20	CH1	13.06	12.82
	CH6	12.74	12.47
	CH11	12.08	11.98

Notes:

1. Use the data rate with the maximum output level for the SAR test.
2. BT and WIFI can't transmit at same time.

(WIFI 5GHz)

Test Mode	Frequency (MHz)	Maximum Conducted output power (dBm)	
		ANT0	ANT1
11a	5180	11.51	11.93
	5200	12.20	12.36
	5240	11.55	11.69
	5260	11.77	11.92
	5300	12.20	12.26
	5320	12.52	12.33
	5500	11.83	11.52
	5600	12.62	12.22
	5700	12.03	12.54
	5745	12.00	11.69
	5785	11.38	12.29
	5825	11.82	11.70
11n HT20	5180	11.55	11.78
	5200	12.15	11.74
	5240	11.61	11.16
	5260	11.81	12.20
	5300	11.40	11.54
	5320	11.36	11.86
	5500	11.91	11.67
	5600	11.61	11.41
	5700	12.00	11.59
	5745	11.90	11.69
	5785	11.47	11.22
	5825	11.79	11.28
11n HT40	5190	10.60	10.36
	5230	10.79	10.43
	5270	11.48	11.01
	5310	11.82	11.10
	5510	11.40	11.60
	5590	11.35	12.07
	5670	11.17	11.23
	5755	11.23	11.20
	5795	11.62	11.52

11ac VHT20	5180	11.40	11.84
	5200	12.06	12.32
	5240	11.50	11.66
	5260	11.78	11.82
	5300	12.19	12.10
	5320	12.40	12.31
	5500	11.90	12.28
	5600	11.57	12.16
	5700	11.98	12.39
	5745	11.87	11.45
	5785	11.33	12.20
	5825	11.68	11.53
11ac VHT40	5190	10.63	10.89
	5230	10.95	10.83
	5270	11.44	11.33
	5310	11.83	11.52
	5510	11.37	12.15
	5590	11.39	11.79
	5670	11.03	11.20
	5755	11.20	11.04
	5795	11.61	11.50
11ac VHT80	5210	11.11	11.30
	5290	11.53	11.33
	5530	11.77	11.17
	5610	11.71	11.82
	5775	11.11	11.34

Note: Use the data rate which has the maximum output power for the output power test

7.2. System Check for Body Tissue simulating liquid

Frequency	Description	SAR(W/kg) (±10 window)		Dielectric Parameters (±5% window)		Temp
		1g	10g	ϵ_r	σ (s/m)	°C
2450MHz	Recommended value	13.1 11.79 - 14.41	6.00 5.40 - 6.60	52.7 50.065 – 55.335	1.95 1.8525 – 2.0475	/
	Measurement value 2018-09-27	12.58	5.87	51.429	1.919	22.11
5250MHz	Recommended value	19.125 17.2125 - 21.0375	5.4 4.86 - 5.94	49.0 46.55 – 51.45	5.3 5.035 – 5.565	/
	Measurement value 2018-09-27	19.23	5.57	48.79	5.33	22.06
5500MHz	Recommended value	20.825 18.7425-22.9075	5.85 5.265-6.435	48.60 46.17 – 51.03	5.65 5.3675 – 5.9325	/
	Measurement value 2018-09-27	18.85	5.49	48.71	5.68	22.05
5800MHz	Recommended value	19.5 17.55 - 21.45	5.475 4.9275 - 6.0225	48.2 45.79 – 50.61	6.0 5.70 – 6.30	/
	Measurement value 2018-09-27	19.88	5.79	46.54	5.98	22.05
2450MHz	Recommended value	13.1 11.79 - 14.41	6.00 5.40 - 6.60	52.7 50.065 – 55.335	1.95 1.8525 – 2.0475	/
	Measurement value 2018-10-19	12.27	5.46	51.429	1.919	22.11
5250MHz	Recommended value	19.125 17.2125 - 21.0375	5.4 4.86 - 5.94	49.0 46.55 – 51.45	5.3 5.035 – 5.565	/
	Measurement value 2018-10-18	19.32	5.64	48.79	5.33	22.06
5500MHz	Recommended value	20.825 18.7425-22.9075	5.85 5.265-6.435	48.60 46.17 – 51.03	5.65 5.3675 – 5.9325	/
	Measurement value 2018-10-19	18.77	5.36	48.71	5.68	22.05
5800MHz	Recommended value	19.5 17.55 - 21.45	5.475 4.9275 - 6.0225	48.2 45.79 – 50.61	6.0 5.70 – 6.30	/
	Measurement value 2018-10-19	19.78	5.65	46.54	5.98	22.05

Note: Recommended Values used derive from the calibration certificate and 250 mW is used as feeding power to the calibrated dipole.

7.3. Test Results

Bluetooth V3.0:

Mode	Channel	Test Position	Output Power		Measured Results		Scaled-1		Scaled-Final		Power Drift (dBm)
			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)	
GFSK	CH0	Right	8.5	8.490	0.116	0.050	0.116	0.063	0.661	0.285	-0.14
	CH39	Right	10.5	10.201	0.136	0.059	0.146	0.063	0.828	0.359	-0.13
		Right-1			0.129	0.045	0.138	0.048	0.785	0.274	-0.15
		Back			0.00282	0.00157	0.003	0.002	0.017	0.010	0.08
		Top			0.013	0.00754	0.014	0.008	0.079	0.046	-0.02
		Left			0.00611	0.00346	0.007	0.004	0.037	0.021	0.10
		Front			0.011	0.00642	0.012	0.007	0.067	0.039	-0.05
	CH78	Right	9.5	9.390	0.124	0.053	0.127	0.054	0.723	0.309	-0.09
8-DPSK	CH0	Right	9	8.831	0.078	0.033	0.081	0.034	0.461	0.195	-0.16
	CH39	Right	11	10.641	0.129	0.055	0.140	0.060	0.796	0.339	-0.08
		Back			0.0027	0.00139	0.003	0.002	0.017	0.009	-0.20
		Top			0.014	0.00764	0.015	0.008	0.086	0.047	-0.10
		Left			0.00551	0.003	0.006	0.003	0.034	0.019	-0.12
		Front			0.012	0.00573	0.013	0.006	0.074	0.035	-0.08
	CH78	Right	9.5	9.429	0.080	0.035	0.081	0.036	0.462	0.202	-0.14
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 : 0.828W/kg for 1g SAR											

Notes: The Bluetooth V3.0 Duty Cycle is 0.176.

WIFI 2.4GHz, ANT 0:

Mode	Channel	Test Position	Output Power		Measured Results		Scaled-1		Scaled-Final		Power Drift (dBm)
			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)	
11b	CH1	Right	12.5	12.46	1.13	0.486	1.14	0.490	1.14	0.490	-0.09
		Right-1	12.5	12.46	1.13	0.482	1.14	0.486	1.14	0.486	-0.12
11b	CH6	Right	13	12.50	1.15	0.496	1.290	0.557	1.290	0.557	-0.15
		Right-1			1.12	0.482	1.257	0.541	1.257	0.541	-0.09
		Back			0.023	0.014	0.026	0.016	0.026	0.016	-0.12
		Top			0.126	0.069	0.141	0.077	0.141	0.077	-0.10
		Left			0.053	0.029	0.059	0.033	0.059	0.033	-0.10
		Front			0.132	0.078	0.148	0.088	0.148	0.088	-0.08
11b	CH11	Right	12.5	12.49	1.19	0.513	1.193	0.514	1.193	0.514	-0.06
		Right-1	12.5	12.49	1.15	0.493	1.153	0.494	1.153	0.494	-0.03
11n HT20	CH6	Right	13	12.74	1.14	0.492	1.21	0.522	1.21	0.522	0.04
		Right-1	13	12.74	1.15	0.492	1.221	0.522	1.221	0.522	-0.08
11n HT20	CH1	Right	13.5	13.06	1.13	0.380	1.250	0.421	1.250	0.421	-0.14
		Right-1			1.13	0.482	1.25	0.533	1.25	0.533	-0.13
		Back			0.022	0.013	0.024	0.014	0.024	0.014	-0.29
		Top			0.124	0.068	0.137	0.075	0.137	0.075	-0.22
		Left			0.051	0.028	0.056	0.031	0.056	0.031	-0.14
		Front			0.129	0.076	0.143	0.084	0.143	0.084	-0.06
11n HT20	CH11	Right	12.5	12.08	0.652	0.281	0.718	0.310	0.718	0.310	0.12

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 : 1.290W/kg for 1g SAR

WIFI 2.4GHz, ANT 1:

Mode	Channel	Test Position	Output Power		Measured Results		Scaled-1		Scaled-Final		Power Drift (dBm)
			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)	
11b	CH1	Back	12.5	12.24	1.13	0.504	1.20	0.535	1.20	0.535	-0.08
		Back-1	12.5	12.24	1.15	0.589	1.221	0.625	1.221	0.625	-0.04
11b	CH6	Back	12.5	12.49	1.17	0.519	1.173	0.520	1.173	0.520	-0.07
		Back-1			1.15	0.607	1.153	0.608	1.153	0.608	-0.27
		Right			0.00657	0.00435	0.007	0.40436	0.007	0.40436	-0.12
		Top			0.052	0.031	0.052	0.031	0.052	0.031	-0.10
		Left			0.017	0.009	0.017	0.009	0.017	0.009	-0.10
		Front			0.052	0.035	0.052	0.0522	0.052	0.0522	-0.08
11b	CH11	Back	12.5	12.46	1.15	0.528	1.161	0.533	1.161	0.533	-0.06
		Back-1	12.5	12.46	1.14	0.622	1.151	0.628	1.151	0.628	-0.25
11n HT20	CH6	Back	12.5	12.47	1.09	0.445	1.098	0.448	1.098	0.448	-0.20
		Back-1	12.5	12.47	1.02	0.501	1.027	0.504	1.027	0.504	-0.07
11n HT20	CH1	Right	13	12.82	0.00746	0.00442	0.008	0.005	0.008	0.005	0.51
		Back			1.12	0.459	1.167	0.478	1.167	0.478	-0.23
		Back-1			1.11	0.496	1.157	0.517	1.157	0.517	-0.08
		Top			0.061	0.035	0.064	0.036	0.064	0.036	-0.16
		Left			0.019	0.011	0.020	0.011	0.020	0.011	-0.14
		Front			0.054	0.038	0.056	0.040	0.056	0.040	-0.07
11n HT20	CH11	Back	12	11.98	0.586	0.237	0.589	0.238	0.589	0.238	-0.18

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 : 1.221kg for 1g SAR

- Notes:** 1. The WIFI 2.4GHz Duty Cycle is 100%.
 2. The Antenna 1 was located in the Back side of the device, according to explore test, Back side has the worst case SAR test result for Antenna 1.

WIFI 5GHz, ANT 0:

Mode	Channel	Test Position	Output Power		Measured Results		Scaled-1		Scaled-Final		Power Drift (dBm)
			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)	
11a	CH36	Right	12	11.51	0.900	0.293	1.007	0.328	1.007	0.328	-0.15
		Right-1	12	11.51	0.885	0.287	0.922	0.299	0.922	0.299	-0.12
	CH40	Right	12.5	12.20	0.874	0.277	0.937	0.297	0.937	0.297	-0.11
		Right-1			0.863	0.254	0.900	0.265	0.900	0.265	-0.06
		Back			0.459	0.181	0.492	0.194	0.492	0.194	-0.09
		Top			0.588	0.221	0.630	0.237	0.630	0.237	-0.01
		Left			0.119	0.044	0.128	0.047	0.128	0.047	0.11
		Front			0.546	0.203	0.585	0.218	0.585	0.218	-0.08
	CH48	Right	12	11.55	0.896	0.294	0.994	0.326	0.994	0.326	-0.17
		Right-1	12	11.55	0.874	0.279	0.911	0.291	0.911	0.291	-0.14
	CH52	Right	12	11.77	1.06	0.327	1.118	0.345	1.118	0.345	-0.12
		Right-1	12	11.77	1.03	0.315	1.074	0.328	1.074	0.328	0.13
	CH64	Right	13	12.52	1.15	0.367	1.284	0.410	1.284	0.410	-0.18
		Right-1			1.09	0.358	1.136	0.373	1.136	0.373	0.06
		Back			0.481	0.189	0.537	0.211	0.537	0.211	-0.01
		Top			0.560	0.212	0.625	0.237	0.625	0.237	-0.02
		Left			0.127	0.044	0.142	0.049	0.142	0.049	0.05
		Front			0.531	0.207	0.593	0.231	0.593	0.231	-0.10
	CH60	Right	12.5	12.20	1.16	0.372	1.243	0.399	1.243	0.399	-0.16
		Right-1	12.5	12.20	1.25	0.365	1.339	0.391	1.339	0.391	-0.12

11a	CH100	Right	12	11.83	1.36	0.436	1.414	0.453	1.414	0.453	-0.20
		Right-1	12	11.83	1.29	0.412	1.345	0.429	1.345	0.429	-0.14
	CH120	Right	13	12.62	1.41	0.452	1.539	0.493	1.539	0.493	-0.19
		Right-1			1.39	0.448	1.449	0.467	1.449	0.467	0.06
		Right-2			1.40	0.449	1.459	0.468	1.459	0.468	0.08
		Right-3			1.39	0.447	1.449	0.466	1.449	0.466	-0.07
		Back			0.707	0.248	0.772	0.271	0.772	0.271	-0.07
		Top			0.753	0.291	0.822	0.318	0.822	0.318	-0.08
		Top-1			0.752	0.287	0.784	0.299	0.784	0.299	0.02
		Left			0.159	0.056	0.174	0.061	0.174	0.061	0.02
		Front			0.703	0.235	0.767	0.256	0.767	0.256	-0.07
	CH140	Right	12.50	12.03	1.34	0.464	1.493	0.517	1.493	0.517	-0.04
		Right-1	12.50	12.03	1.26	0.428	1.404	0.477	1.404	0.477	-0.23
	CH157	Right	11.50	11.38	1.32	0.468	1.357	0.481	1.357	0.481	-0.09
		Right-1	11.50	11.38	1.29	0.457	1.345	0.476	1.345	0.476	-0.08
	CH149	Right	12.00	12.00	1.38	0.472	1.38	0.472	1.38	0.472	-0.05
		Right-1			1.28	0.463	1.334	0.483	1.334	0.483	0.09
		Back			0.591	0.238	0.591	0.238	0.591	0.238	0.01
		Top			0.437	0.164	0.437	0.164	0.437	0.164	0.20
		Left			0.237	0.077	0.237	0.077	0.237	0.077	0.06
		Front			0.436	0.162	0.436	0.162	0.436	0.162	-0.09
	CH165	Right	12.00	11.82	1.5	0.481	1.563	0.501	1.563	0.501	-0.06
		Right-1	12.00	11.82	1.45	0.452	1.511	0.471	1.511	0.471	-0.11
		Right-2	12.00	11.82	1.47	0.449	1.532	0.468	1.532	0.468	0.05
		Right-3	12.00	11.82	1.44	0.435	1.501	0.453	1.501	0.453	0.07

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 : 1.563W/kg for 1g SAR

WIFI 5GHz, ANT 1:

Mode	Channel	Test Position	Output Power		Measured Results		Scaled-1		Scaled-Final		Power Drift (dBm)
			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)	
11a	CH36	Back	12	11.93	1.09	0.314	1.108	0.319	1.108	0.319	-0.14
		Back-1	12	11.93	1.05	0.296	1.094	0.309	1.094	0.309	0.05
	CH40	Right	12.5	12.36	0.037	0.018	0.038	0.019	0.038	0.019	0.19
		Back			1.09	0.317	1.126	0.327	1.126	0.327	-0.19
		Back-1			1.03	0.297	1.074	0.310	1.074	0.310	0.04
		Top			0.10	0.039	0.103	0.040	0.103	0.040	-0.03
		Left			0.013	0.00471	0.013	0.005	0.013	0.005	0.02
		Front			0.12	0.043	0.124	0.044	0.124	0.044	-0.01
	CH48	Back	12	11.69	1.12	0.324	1.203	0.348	1.203	0.348	-0.11
		Back-1	12	11.69	1.09	0.314	1.136	0.327	1.136	0.327	0.08
	CH52	Back	12	11.92	1.18	0.344	1.223	0.350	1.202	0.350	-0.14
		Back-1	12	11.92	1.17	0.334	1.220	0.348	1.220	0.348	-0.07
	CH64	Right	12.5	12.33	0.06	0.028	0.062	0.029	0.062	0.029	-0.03
		Back			1.13	0.342	1.175	0.356	1.175	0.356	-0.10
		Back-1			1.06	0.314	1.105	0.327	1.105	0.327	0.03
		Top			0.105	0.042	0.109	0.044	0.109	0.044	0.19
		Left			0.015	0.00593	0.016	0.006	0.016	0.006	0.02
		Front			0.107	0.046	0.111	0.048	0.111	0.048	-0.06
	CH60	Back	12.50	12.26	1.12	0.344	1.184	0.364	1.184	0.364	-0.12
		Back-1	12.50	12.26	1.08	0.316	1.126	0.329	1.126	0.329	-0.02

11a	CH100	Back	12	11.52	1.22	0.406	1.363	0.453	1.363	0.453	-0.17	
		Back-1	12	11.52	1.17	0.397	1.220	0.414	1.220	0.414	-0.08	
	CH140	Right	13	12.54	0.06	0.028	0.067	0.031	0.067	0.031	-0.03	
		Back			1.17	0.421	1.301	0.468	1.301	0.468	-0.18	
		Back-1			1.09	0.367	1.136	0.383	1.136	0.383	-0.07	
		Top			0.135	0.051	0.150	0.057	0.150	0.057	0.00	
		Left			0.00867	0.00283	0.010	0.003	0.010	0.003	-0.17	
		Front			0.136	0.057	0.151	0.063	0.151	0.063	-0.07	
	CH120	Back	12.5	12.22	1.21	0.431	1.291	0.460	1.291	0.460	-0.11	
		Back-1	12.5	12.22	1.18	0.416	1.230	0.434	1.230	0.434	-0.09	
	CH149	Back	12	11.69	1.15	0.440	1.235	0.473	1.235	0.473	-0.03	
		Back-1	12	11.68	1.09	0.405	1.136	0.422	1.136	0.422	-0.01	
	CH157	Right	12.50	12.29	0.061	0.028	0.064	0.029	0.064	0.029	-0.04	
		Back			1.16	0.447	1.217	0.469	1.217	0.469	0.13	
		Back-1			1.13	0.412	1.178	0.429	1.178	0.429	0.08	
		Top			0.133	0.051	0.140	0.054	0.140	0.054	0.18	
		Left			0.017	0.00698	0.018	0.007	0.018	0.007	-0.16	
		Front			0.134	0.057	0.141	0.060	0.141	0.060	-0.10	
	CH165	Back	12	11.70	1.19	0.453	1.275	0.485	1.275	0.485	-0.14	
		Back-1	12	11.70	1.17	0.426	1.220	0.444	1.220	0.444	-0.08	
	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 : 1.363W/kg for 1g SAR											

- Notes:**
1. The power of 11n/ac is less than 1/4dB larger than 11a mode, so 11n/ac can be excluded from the SAR Test.
 2. Choose the channel which has the maximum output power for the SAR test, and if the Max scaled SAR less than 0.8W/Kg. other channel can be excluded.
 3. The WIFI 5GHz Duty Cycle is 100%.
 4. The Antenna 1 was located in the Back side of the device, according to explore test, Back side has the worst case SAR test result for Antenna 1.

7.4. Dielectric Performance for Body Tissue simulating liquid

Frequency	Description	Dielectric Parameters (±5% window)		Temp
		ϵ_r	σ (s/m)	°C
2450MHz	Recommended value	13.1 11.79 - 14.41	6.00 5.40 - 6.60	/
	Measurement value 2018-09-27	12.58	5.87	22.11
5250MHz	Recommended value	19.125 17.2125 - 21.0375	5.4 4.86 - 5.94	/
	Measurement value 2018-09-27	19.23	5.57	22.06
5500MHz	Recommended value	20.825 18.7425-22.9075	5.85 5.265-6.435	/
	Measurement value 2018-09-27	18.85	5.49	22.05
5800MHz	Recommended value	19.5 17.55 - 21.45	5.475 4.9275 - 6.0225	/
	Measurement value 2018-09-27	19.88	5.79	22.05
2450MHz	Recommended value	13.1 11.79 - 14.41	6.00 5.40 - 6.60	/
	Measurement value 2018-10-19	12.27	5.46	22.11
5250MHz	Recommended value	19.125 17.2125 - 21.0375	5.4 4.86 - 5.94	/
	Measurement value 2018-10-18	19.32	5.64	22.06
5500MHz	Recommended value	20.825 18.7425-22.9075	5.85 5.265-6.435	/
	Measurement value 2018-10-19	18.77	5.36	22.05
5800MHz	Recommended value	19.5 17.55 - 21.45	5.475 4.9275 - 6.0225	/
	Measurement value 2018-10-19	19.78	5.65	22.05



Figure 4.4: Liquid depth in the Flat Phantom

ANNEX A: SYSTEM CHECK RESULTS

Test Laboratory: Audix SAR Lab

Date: 27/09/2018

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; $\sigma = 1.919$ S/m; $\epsilon_r = 51.429$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.18, 7.18, 7.18); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- 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) = 14.00 W/kg

Configuration/CW 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

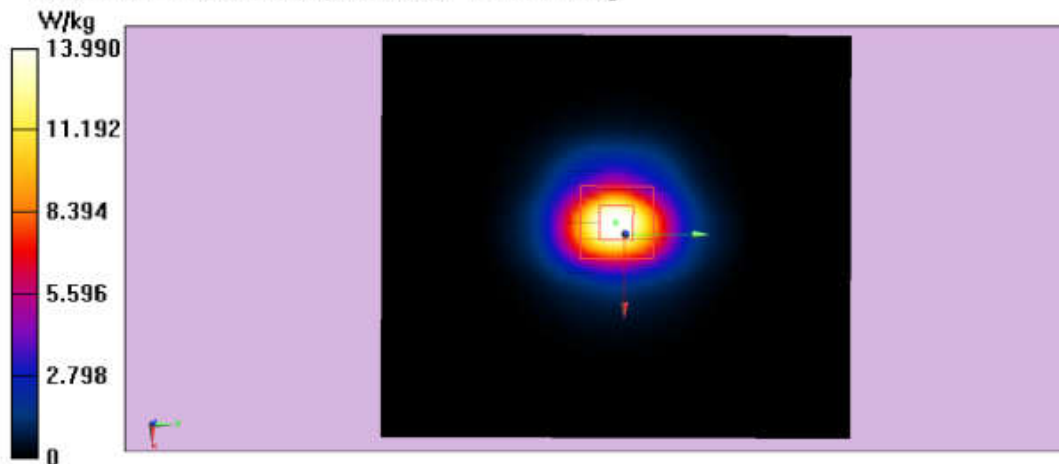
dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.11 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 27.07 W/kg

SAR(1 g) = 12.58 W/kg; SAR(10 g) = 5.87 W/kg

Maximum value of SAR (measured) = 13.990 W/kg



Test Laboratory: Audix SAR Lab
CW 5250

Date: 27/09/2018

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5250 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 5250$ MHz; $\sigma = 5.33$ S/m; $\epsilon_r = 48.79$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.44, 5.44, 5.44); Calibrated: 07/03/2018;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5250MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 27.37 W/kg

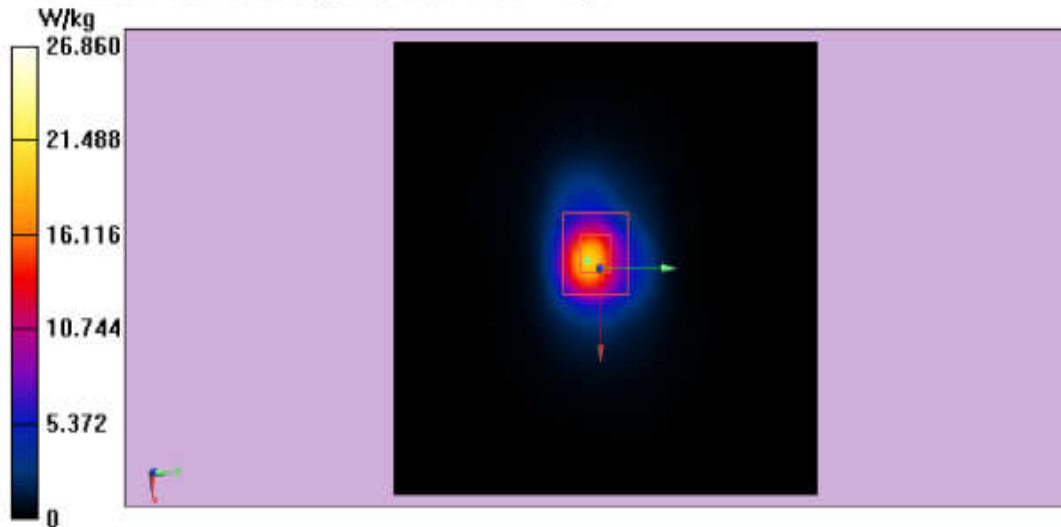
Configuration/CW 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 42.21 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 27.9 W/kg

SAR(1 g) = 19.23 W/kg; SAR(10 g) = 5.57 W/kg

Maximum value of SAR (measured) = 26.86 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CW 5500

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.68$ S/m; $\epsilon_r = 48.71$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.73, 4.73, 4.73); Calibrated: 07/03/2018;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5500MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 20.99 W/kg

Configuration/CW 5500MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

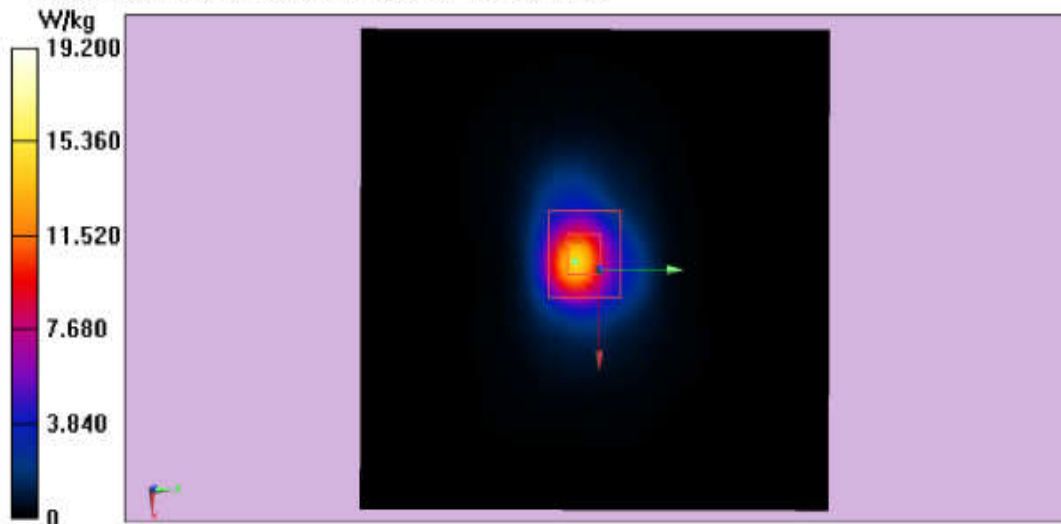
dx=5mm, dy=5mm, dz=5mm

Reference Value = 37.57 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 27.7 W/kg

SAR(1 g) = 18.85 W/kg; SAR(10 g) = 5.49 W/kg

Maximum value of SAR (measured) = 19.20 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CW 5800

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

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; $\sigma = 5.98$ S/m; $\epsilon_r = 46.54$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.65, 4.65, 4.65); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5750MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 6.96 W/kg

Configuration/CW 5750MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

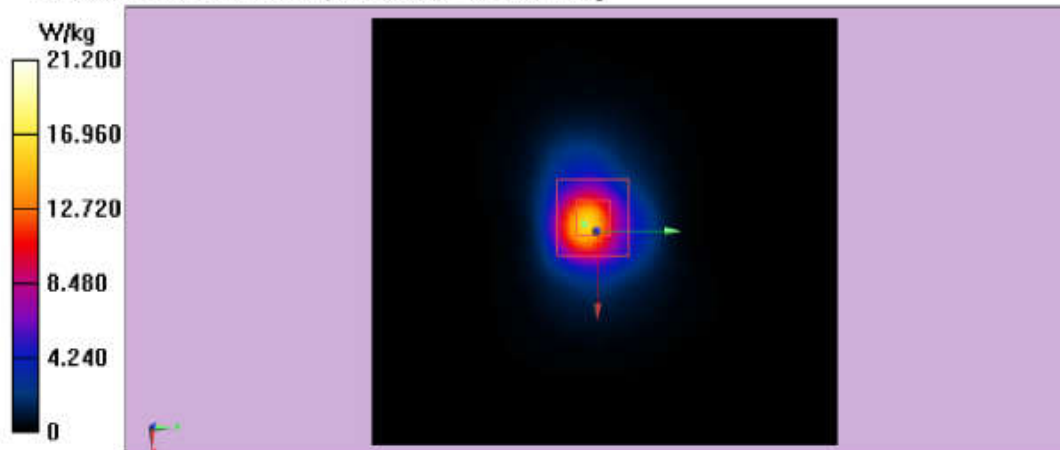
dx=5mm, dy=5mm, dz=5mm

Reference Value = 44.65 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 30.18 W/kg

SAR(1 g) = 19.88 W/kg; SAR(10 g) = 5.79 W/kg

Maximum value of SAR (measured) = 21.19 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

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; $\sigma = 1.919$ S/m; $\epsilon_r = 51.429$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.18, 7.18, 7.18); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- 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) = 14.21 W/kg

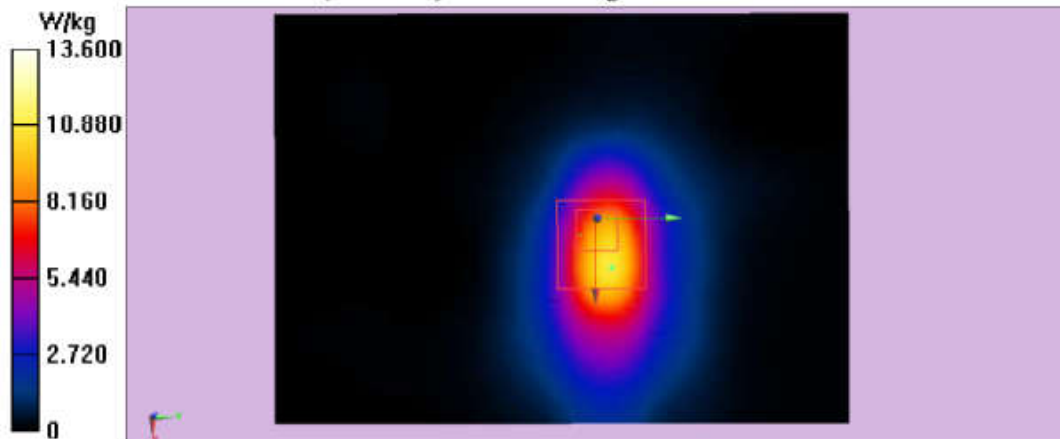
Configuration/CW 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 85.36 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 25.79 W/kg

SAR(1 g) = 12.27 W/kg; SAR(10 g) = 5.46 W/kg

Maximum value of SAR (measured) = 13.601 W/kg



Test Laboratory: Audix SAR Lab

Date: 18/10/2018

CW 5250

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5250 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 5250$ MHz; $\sigma = 5.33$ S/m; $\epsilon_r = 48.79$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(5.44, 5.44, 5.44); Calibrated: 07/03/2018;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5250MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 27.43 W/kg

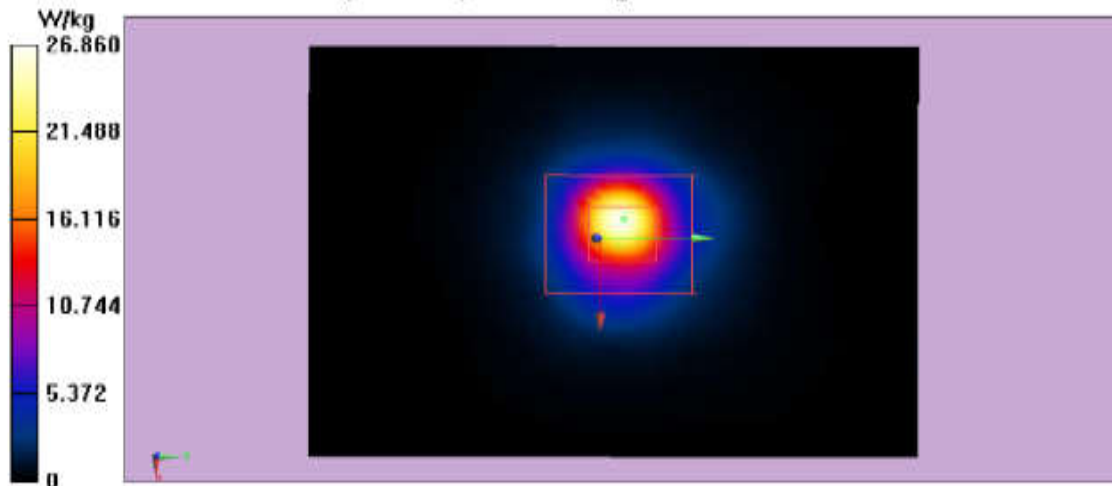
Configuration/CW 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 42.26 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 27.81 W/kg

SAR(1 g) = 19.32 W/kg; SAR(10 g) = 5.64 W/kg

Maximum value of SAR (measured) = 26.858W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

CW 5500

DUT: Dipole D5GHz V2; Type: D5GHz V2; Serial: D5GHz V2 - SN:1102

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.68$ S/m; $\epsilon_r = 48.71$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.73, 4.73, 4.73); Calibrated: 07/03/2018;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5500MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 20.59 W/kg

Configuration/CW 5500MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

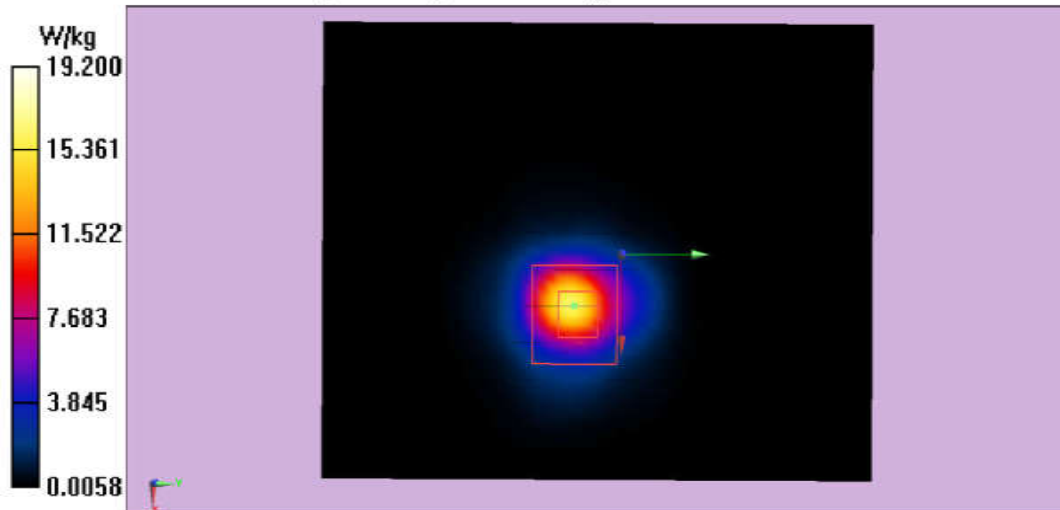
dx=5mm, dy=5mm, dz=5mm

Reference Value = 37.21 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 27.8 W/kg

SAR(1 g) = 18.77 W/kg; SAR(10 g) = 5.36 W/kg

Maximum value of SAR (measured) = 19.20 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

CW 5800

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

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; $\sigma = 5.98$ S/m; $\epsilon_r = 46.54$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(4.65, 4.65, 4.65); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: SAM1; Type: SAM; Serial: TP-1543
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CW 5750MHz/Area Scan (61x71x1): Interpolated grid: dx=2.000 mm, dy=2.000 mm

Maximum value of SAR (interpolated) = 6.57 W/kg

Configuration/CW 5750MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

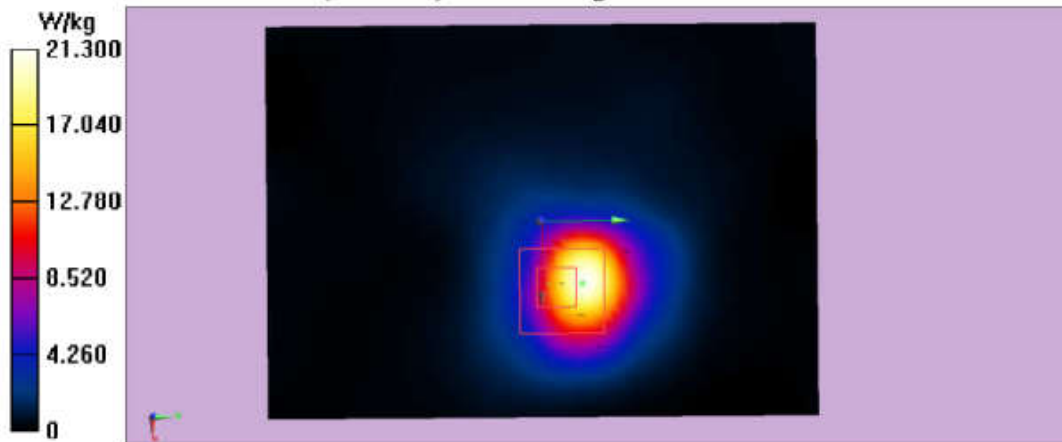
dx=5mm, dy=5mm, dz=5mm

Reference Value = 44.43 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 30.22 W/kg

SAR(1 g) = 19.78 W/kg; SAR(10 g) = 5.65 W/kg

Maximum value of SAR (measured) = 21.34 W/kg



ANNEX B: GRAPH RESULTS WITH BANDS OF WATCH

Bluetooth V3.0:

GFSK

Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH0(2402MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2402 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 2402$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.913$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH0(2402MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.126 W/kg

Configuration/CH0(2402MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

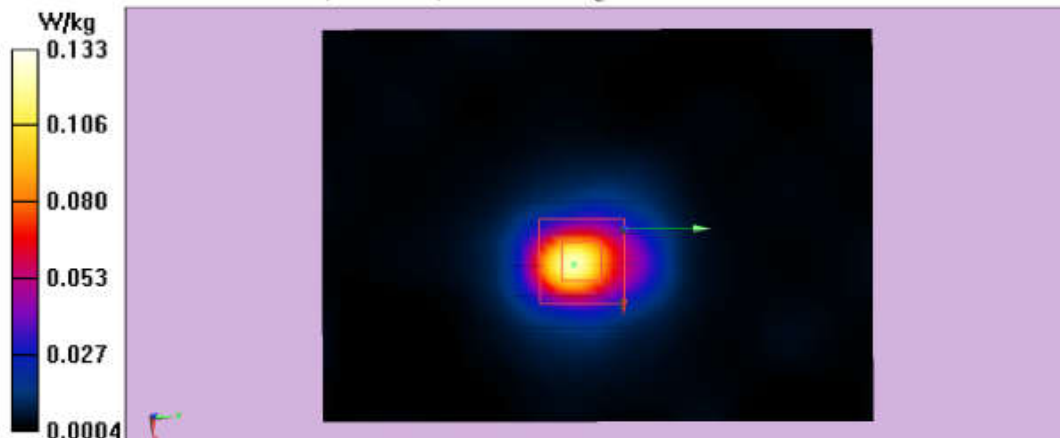
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.594 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.249 W/kg

SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.050 W/kg

Maximum value of SAR (measured) = 0.133 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Back)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.00464 W/kg

Configuration/CH39(2441MHz Back)/Zoom Scan (5x5x7)/Cube 0:

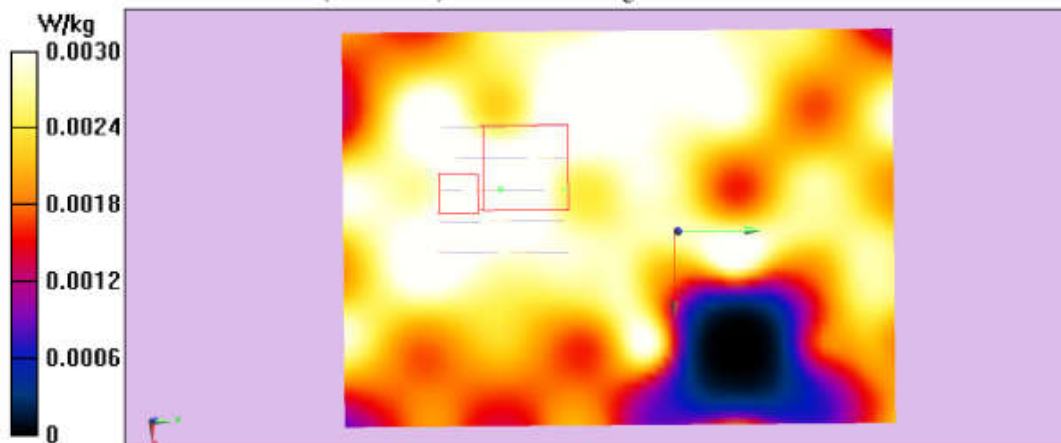
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 0.7530 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.0120 W/kg

SAR(1 g) = 0.00282 W/kg; SAR(10 g) = 0.00157 W/kg

Maximum value of SAR (measured) = 0.00306 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Left)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Left)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0103 W/kg

Configuration/CH39(2441MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement

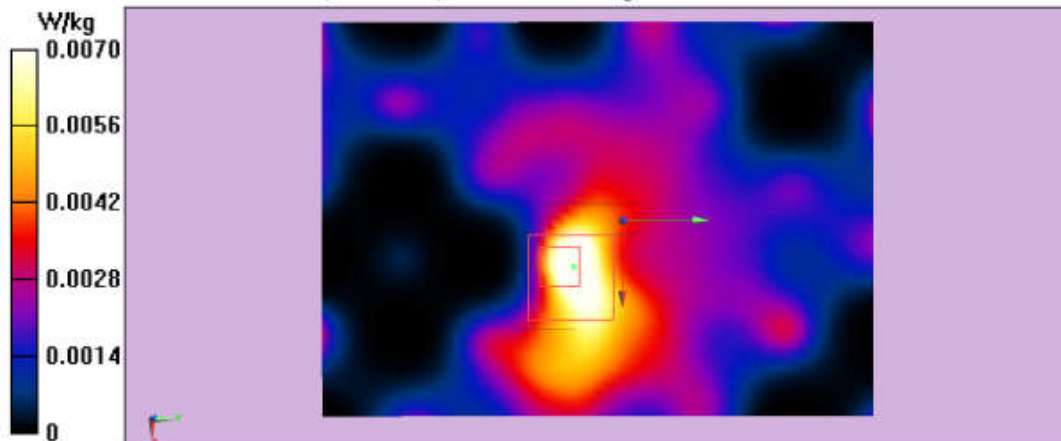
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 1.317 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.0110 W/kg

SAR(1 g) = 0.00611 W/kg; SAR(10 g) = 0.00346 W/kg

Maximum value of SAR (measured) = 0.00705 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.143 W/kg

Configuration/CH39(2441MHz Right)/Zoom Scan (5x5x7)/Cube 0:

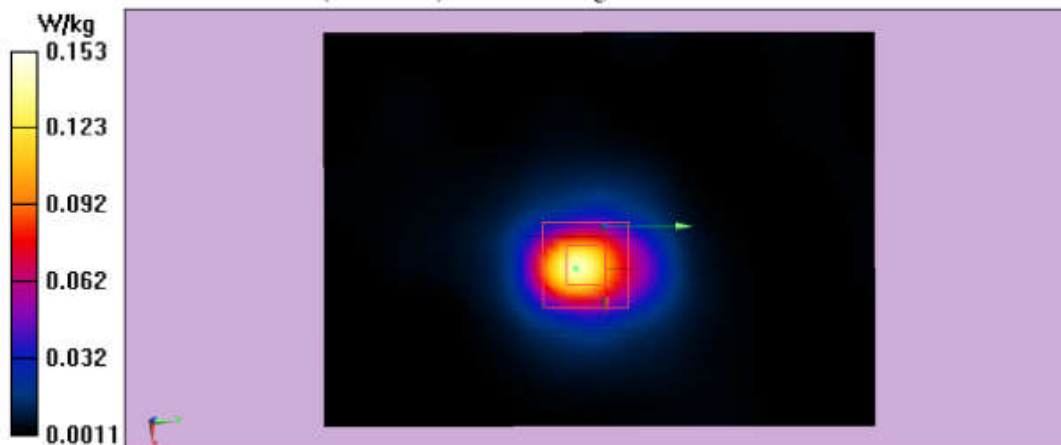
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.117 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.297 W/kg

SAR(1 g) = 0.136 W/kg; SAR(10 g) = 0.059 W/kg

Maximum value of SAR (measured) = 0.153 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Top)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Top)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0150 W/kg

Configuration/CH39(2441MHz Top)/Zoom Scan (5x5x7)/Cube 0: Measurement

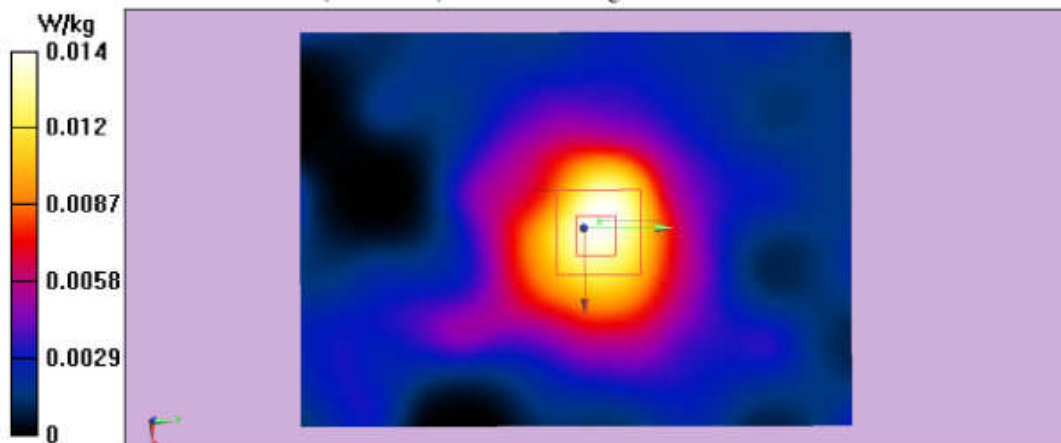
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 2.737 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.0230 W/kg

SAR(1 g) = 0.013 W/kg; SAR(10 g) = 0.00754 W/kg

Maximum value of SAR (measured) = 0.0145 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH78(2480MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2480 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 2480$ MHz; $\sigma = 1.927$ S/m; $\epsilon_r = 53.579$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH78(2480MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.133 W/kg

Configuration/CH78(2480MHz Right)/Zoom Scan (5x5x7)/Cube 0:

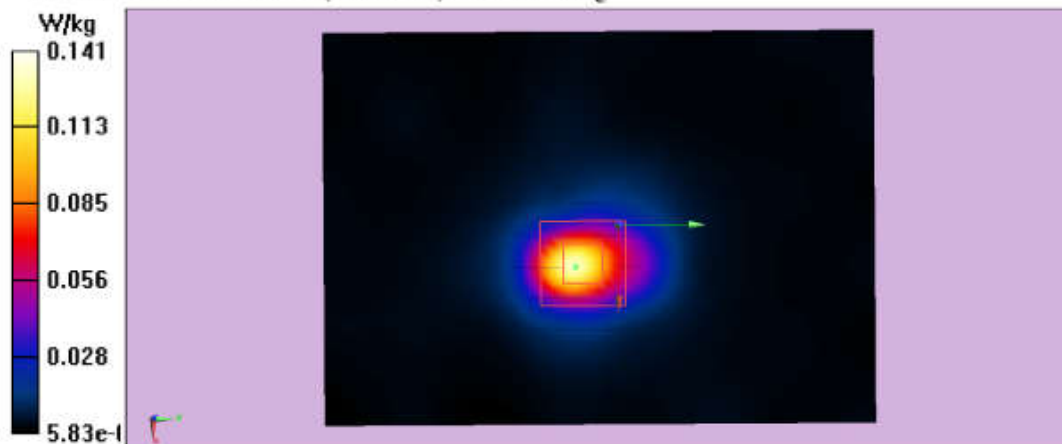
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.685 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.263 W/kg

SAR(1 g) = 0.124 W/kg; SAR(10 g) = 0.053 W/kg

Maximum value of SAR (measured) = 0.141 W/kg



8-DPSK:

Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH0(2402MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2402 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 2402$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.913$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH0(2402MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0827 W/kg

Configuration/CH0(2402MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

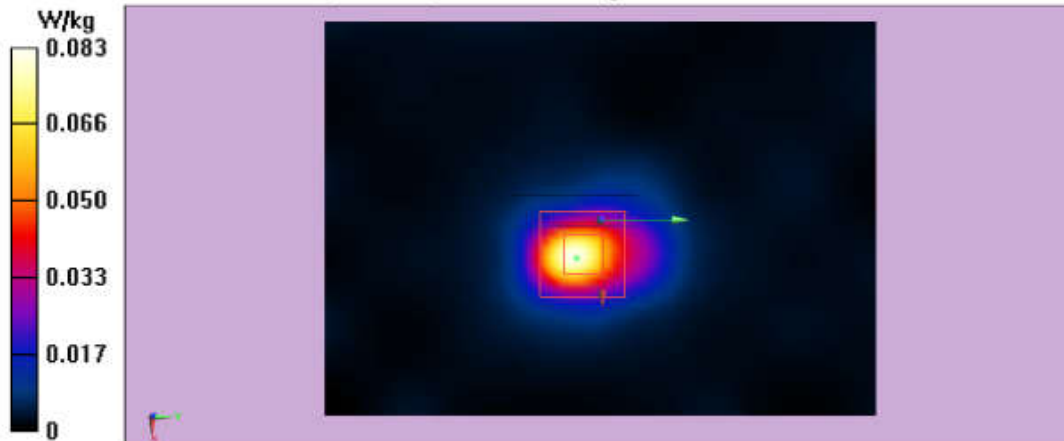
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.511 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.167 W/kg

SAR(1 g) = 0.078 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0876 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Back)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.00493 W/kg

Configuration/CH39(2441MHz Back)/Zoom Scan (5x5x7)/Cube 0:

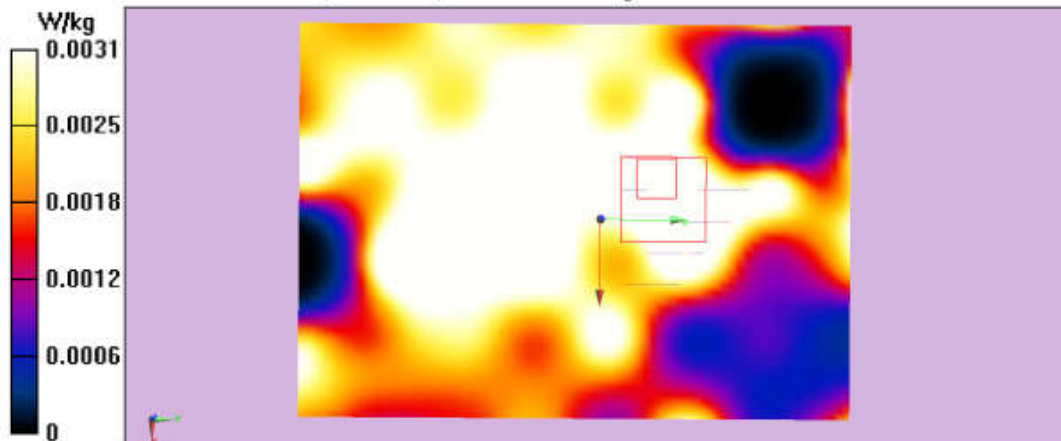
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 1.037 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 0.00717 W/kg

SAR(1 g) = 0.0027 W/kg; SAR(10 g) = 0.00139 W/kg

Maximum value of SAR (measured) = 0.00313 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Left)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Left)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.00838 W/kg

Configuration/CH39(2441MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement

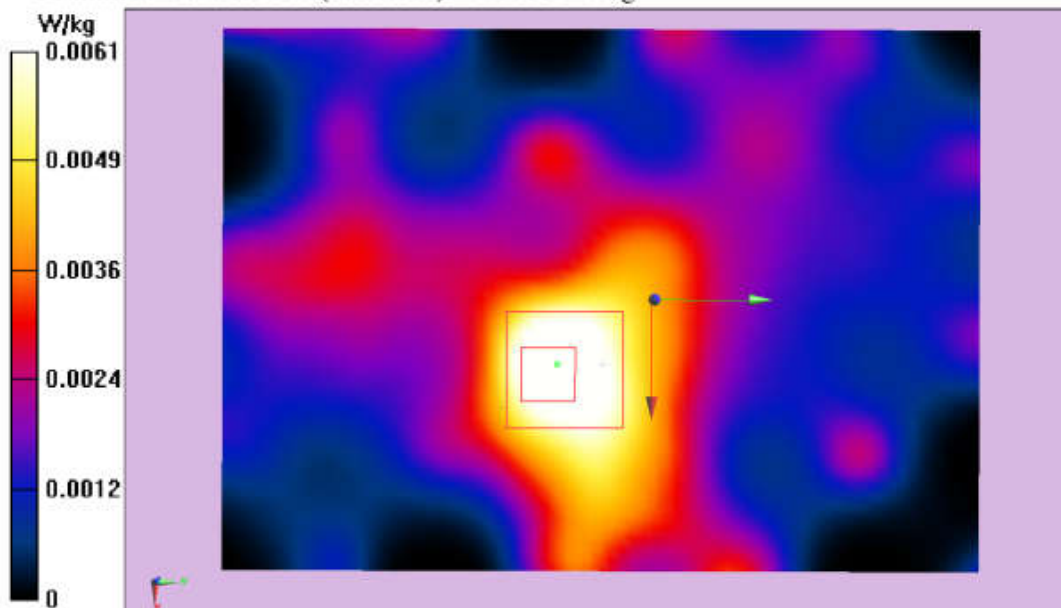
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 1.494 V/m; Power Drift = -0.12dB

Peak SAR (extrapolated) = 0.0130 W/kg

SAR(1 g) = 0.00551 W/kg; SAR(10 g) = 0.003 W/kg

Maximum value of SAR (measured) = 0.00613 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.137 W/kg

Configuration/CH39(2441MHz Right)/Zoom Scan (5x5x7)/Cube 0:

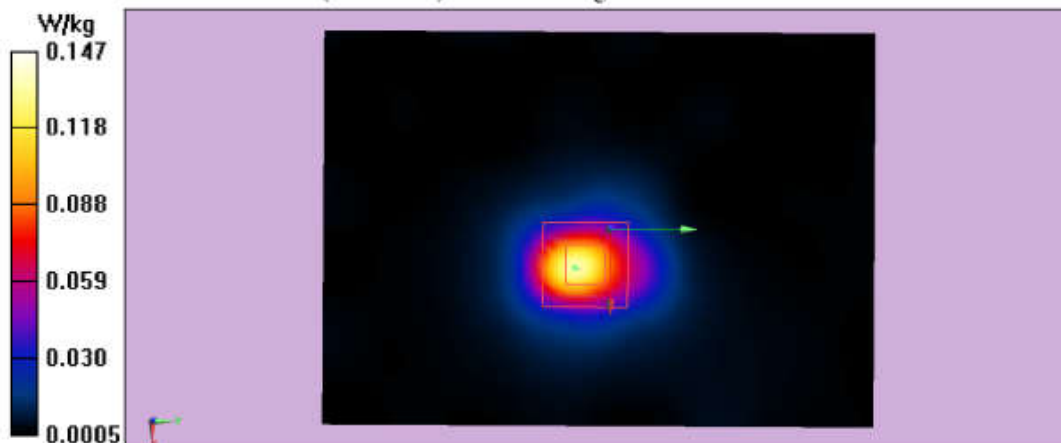
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.068 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.274 W/kg

SAR(1 g) = 0.129 W/kg; SAR(10 g) = 0.055 W/kg

Maximum value of SAR (measured) = 0.147 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH39(2441MHz Top)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH39(2441MHz Top)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0164 W/kg

Configuration/CH39(2441MHz Top)/Zoom Scan (5x5x7)/Cube 0: Measurement

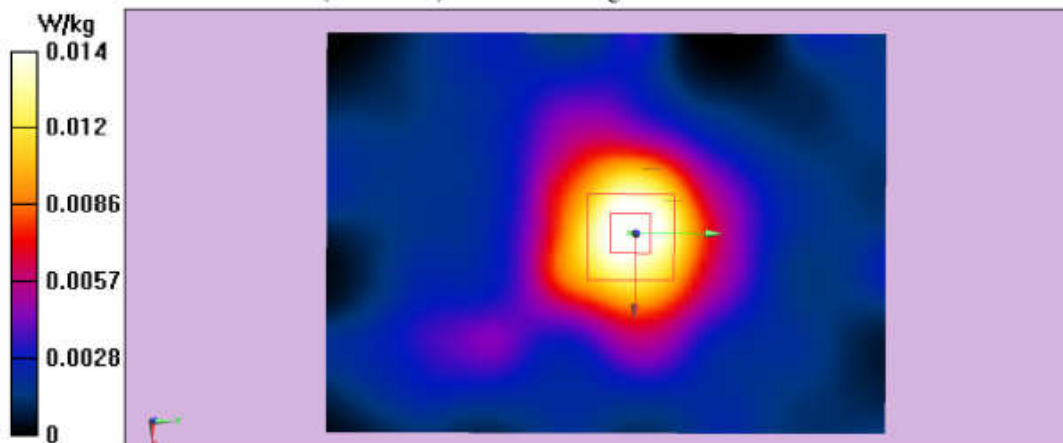
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 2.740 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.0280 W/kg

SAR(1 g) = 0.014 W/kg; SAR(10 g) = 0.00764 W/kg

Maximum value of SAR (measured) = 0.0144 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

CH78(2480MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, Blue Tooth (0); Communication System Band: Mid;

Frequency: 2441 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 53.734$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH78(2480MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

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

Configuration/CH78(2480MHz Right)/Zoom Scan (5x5x7)/Cube 0:

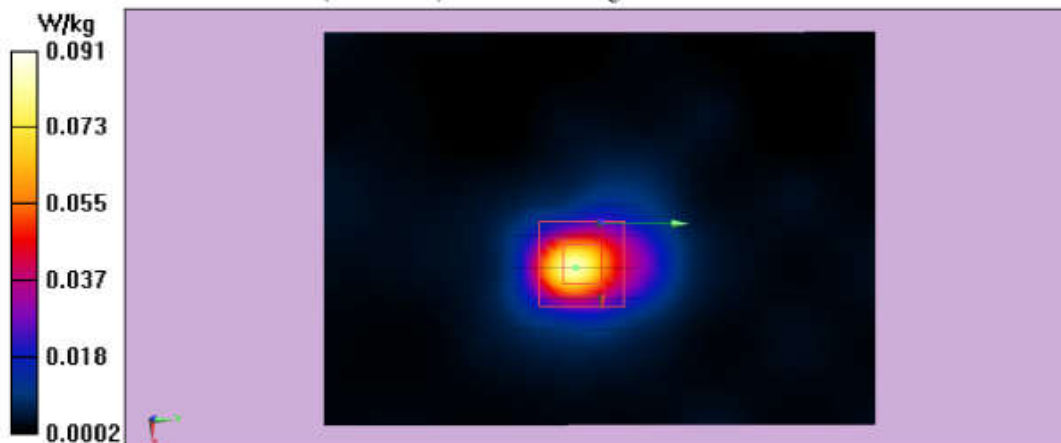
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.572 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.175 W/kg

SAR(1 g) = 0.080 W/kg; SAR(10 g) = 0.035 W/kg

Maximum value of SAR (measured) = 0.0915 W/kg



WIFI 2.4GHz:

ANT 0

Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11b CH1(2412MHz Right)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.911$ S/m; $\epsilon_r = 53.849$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.21 W/kg

Configuration/CH1(2412MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

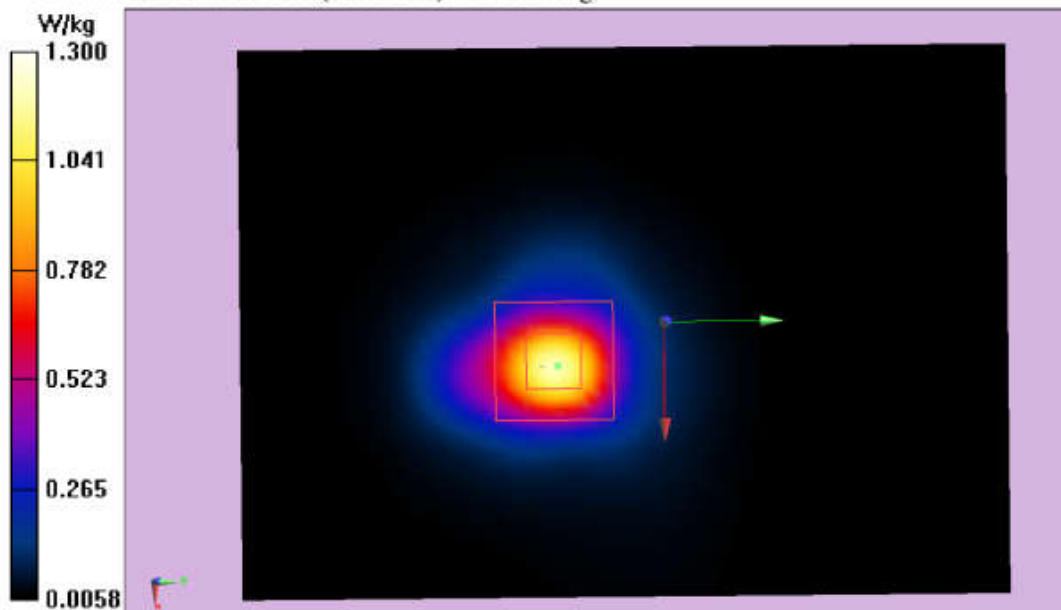
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.15 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.41 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.486 W/kg

Maximum value of SAR (measured) = 1.30 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11b CH6(2437MHz Right)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.913$ S/m; $\epsilon_r = 53.753$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.21 W/kg

Configuration/CH6(2437MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

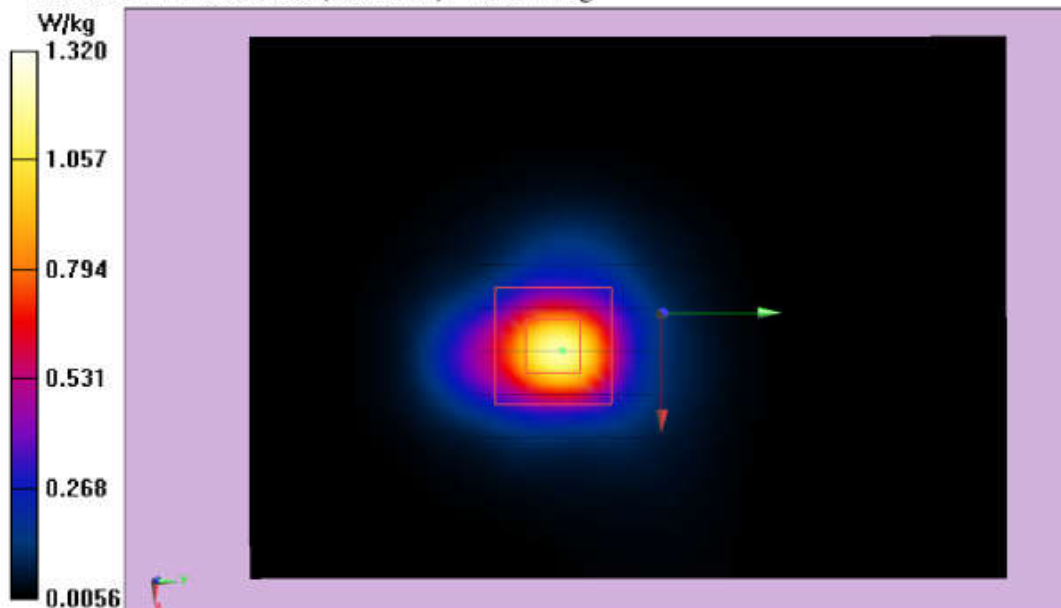
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.12 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 2.47 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.496 W/kg

Maximum value of SAR (measured) = 1.32 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11b CH11(2462MHz Right)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.899$ S/m; $\epsilon_r = 53.666$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.29 W/kg

Configuration/CH11(2462MHz Right)/Zoom Scan (5x5x7)/Cube 0:

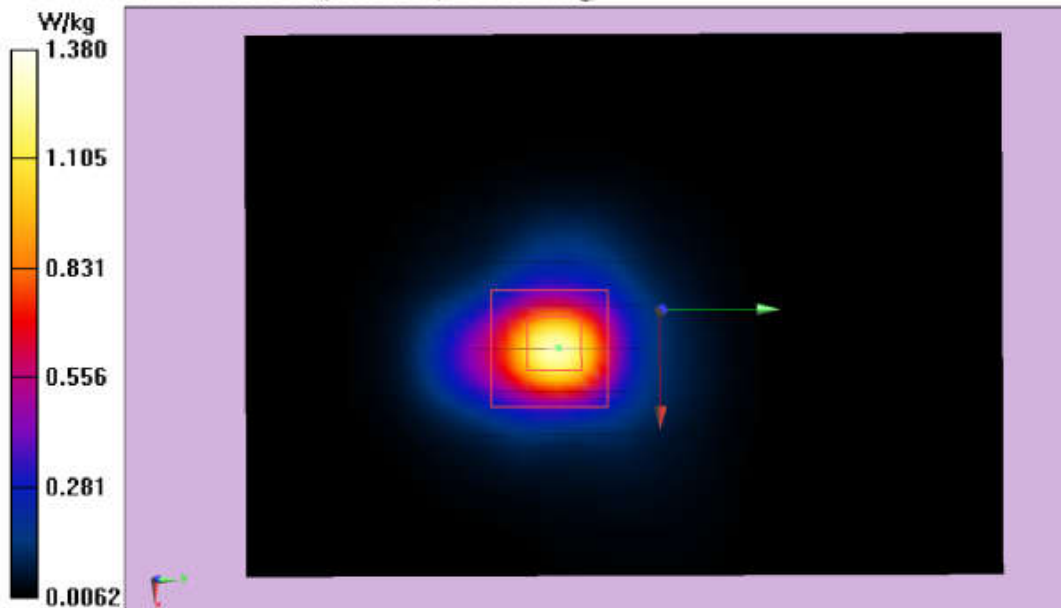
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.30 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 2.55 W/kg

SAR(1 g) = 1.19 W/kg; SAR(10 g) = 0.513 W/kg

Maximum value of SAR (measured) = 1.38 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Back)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0); Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2412MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0233 W/kg

Configuration/CH1(2412MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

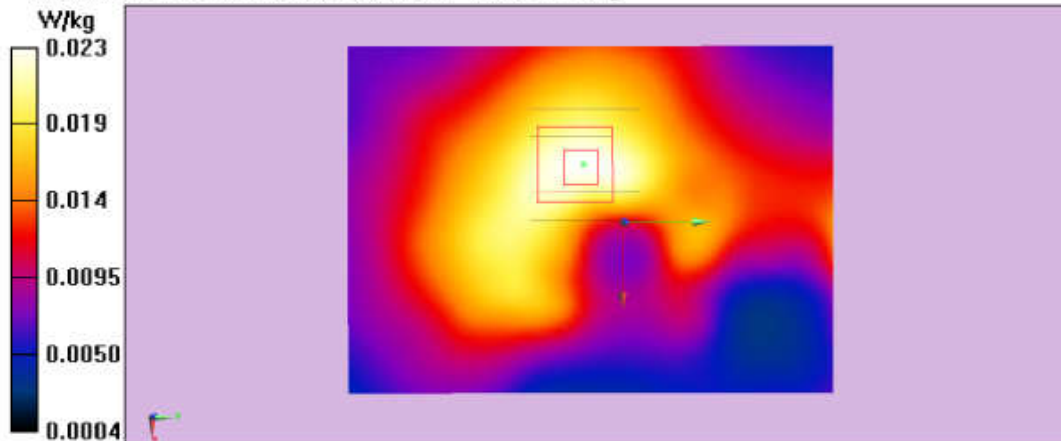
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 2.681 V/m; Power Drift = -0.29 dB

Peak SAR (extrapolated) = 0.0360 W/kg

SAR(1 g) = 0.022 W/kg; SAR(10 g) = 0.013 W/kg

Maximum value of SAR (measured) = 0.0231 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Left)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0); Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2412 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Left)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0517 W/kg

Configuration/CH1(2412MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement

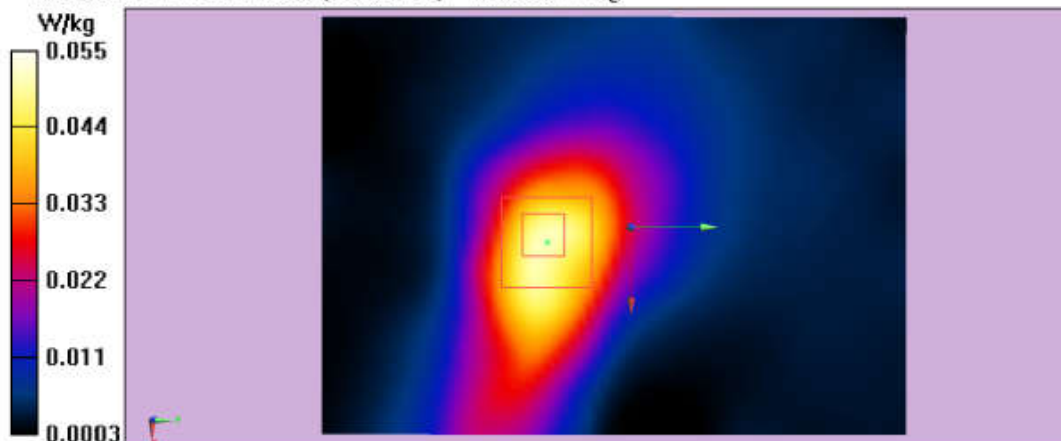
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 3.627 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.0880 W/kg

SAR(1 g) = 0.051 W/kg; SAR(10 g) = 0.028 W/kg

Maximum value of SAR (measured) = 0.0553 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0); Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2412 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.892 W/kg

Configuration/CH1(2412MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

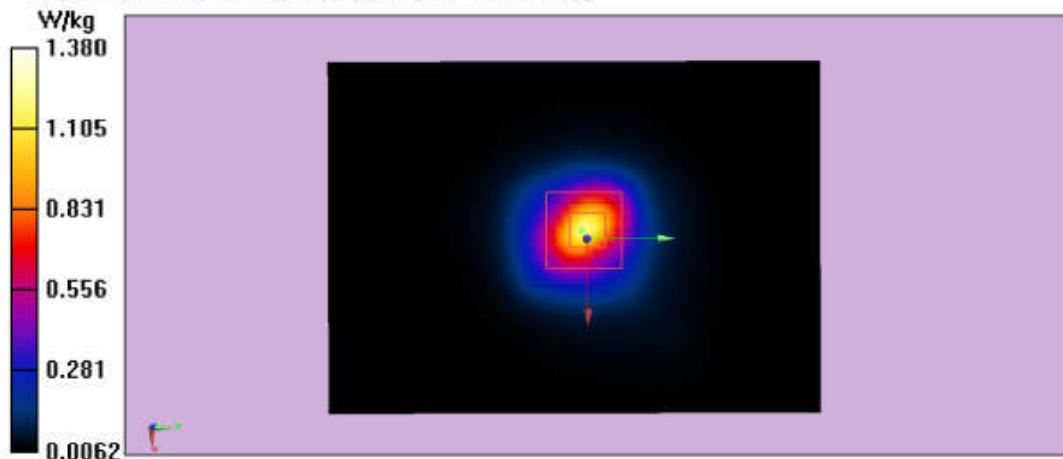
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 22.74 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.380 W/kg

Maximum value of SAR (measured) = 1.38 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Top)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0); Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2412 MHz; Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Top)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.136 W/kg

Configuration/CH1(2412MHz Top)/Zoom Scan (5x5x7)/Cube 0: Measurement

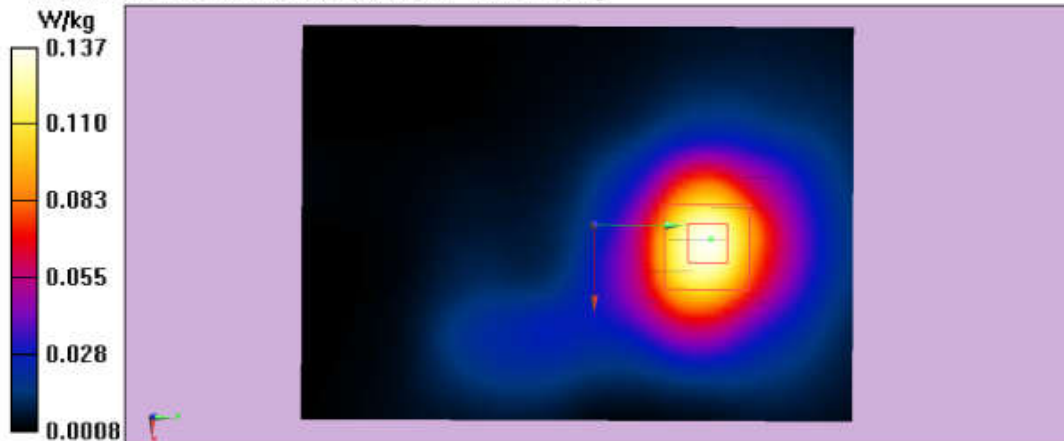
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 3.427 V/m; Power Drift = -0.22 dB

Peak SAR (extrapolated) = 0.213 W/kg

SAR(1 g) = 0.124 W/kg; SAR(10 g) = 0.068 W/kg

Maximum value of SAR (measured) = 0.137 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH6(2437MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps)
(0); Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency:
2437 MHz;Communication System PAR: 0 dB

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.909$ S/m; $\epsilon_r = 53.232$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.09 W/kg

Configuration/CH6(2437MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

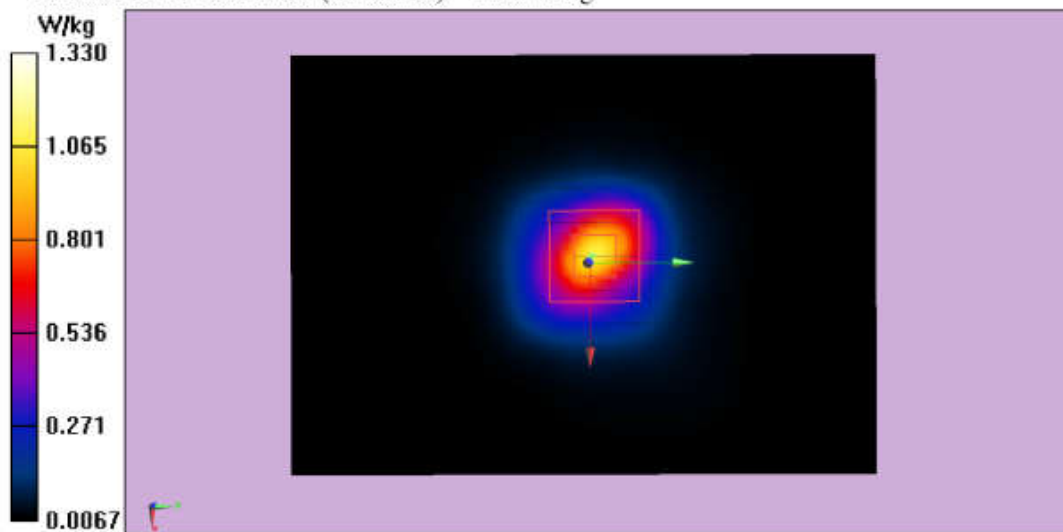
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 26.31 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 2.43 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.492 W/kg

Maximum value of SAR (measured) = 1.33 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH11(2462MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps)
(0); Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency:
2462 MHz;Communication System PAR: 0 dB

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.981$ S/m; $\epsilon_r = 54.144$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.614 W/kg

Configuration/CH11(2462MHz Right)/Zoom Scan (5x5x7)/Cube 0:

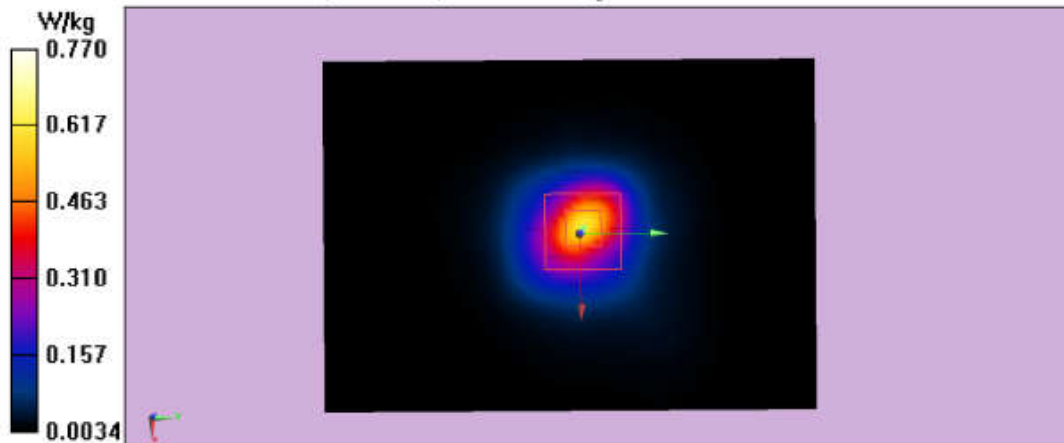
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 19.60 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.652 W/kg; SAR(10 g) = 0.281 W/kg

Maximum value of SAR (measured) = 0.770 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11b CH1(2412MHz Right)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.911$ S/m; $\epsilon_r = 53.849$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.21 W/kg

Configuration/CH1(2412MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

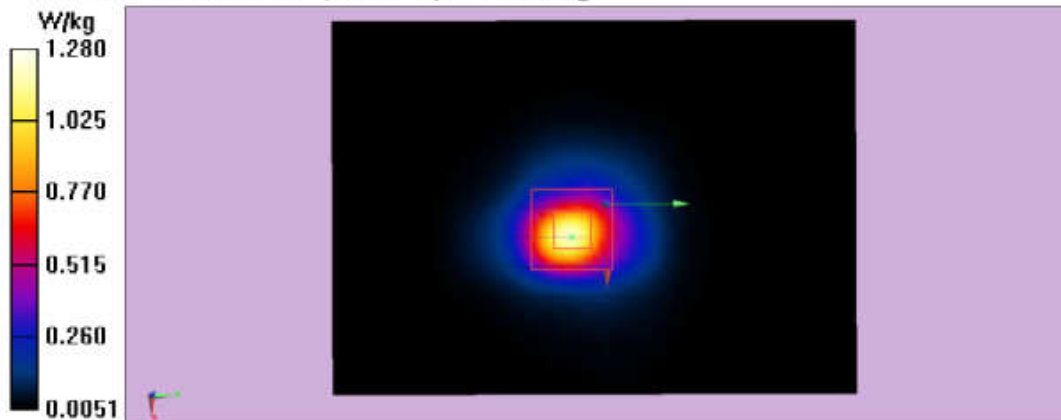
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.17 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 2.45 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.482 W/kg

Maximum value of SAR (measured) = 1.28 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11b CH6(2437MHz Right)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.913$ S/m; $\epsilon_r = 53.753$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.25 W/kg

Configuration/CH6(2437MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

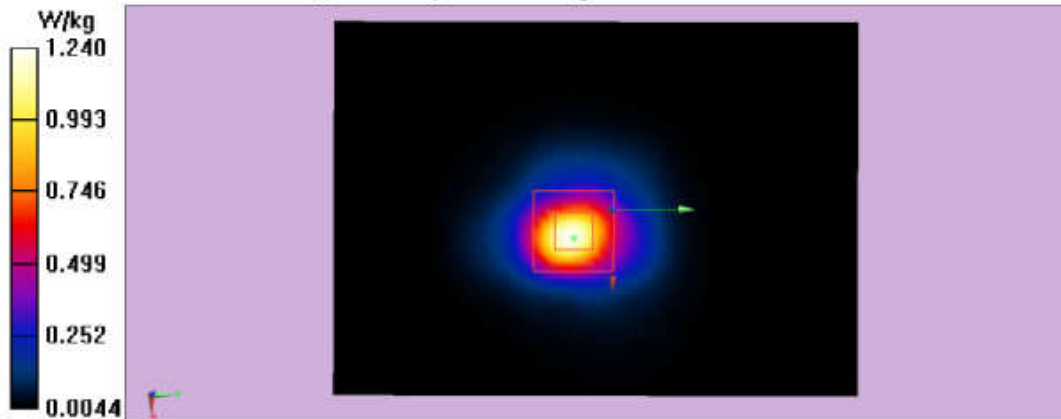
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.58 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.41 W/kg

SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.482 W/kg

Maximum value of SAR (measured) = 1.24 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11b CH11(2462MHz Right)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.919$ S/m; $\epsilon_r = 53.666$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.24 W/kg

Configuration/CH11(2462MHz Right)/Zoom Scan (5x5x7)/Cube 0:

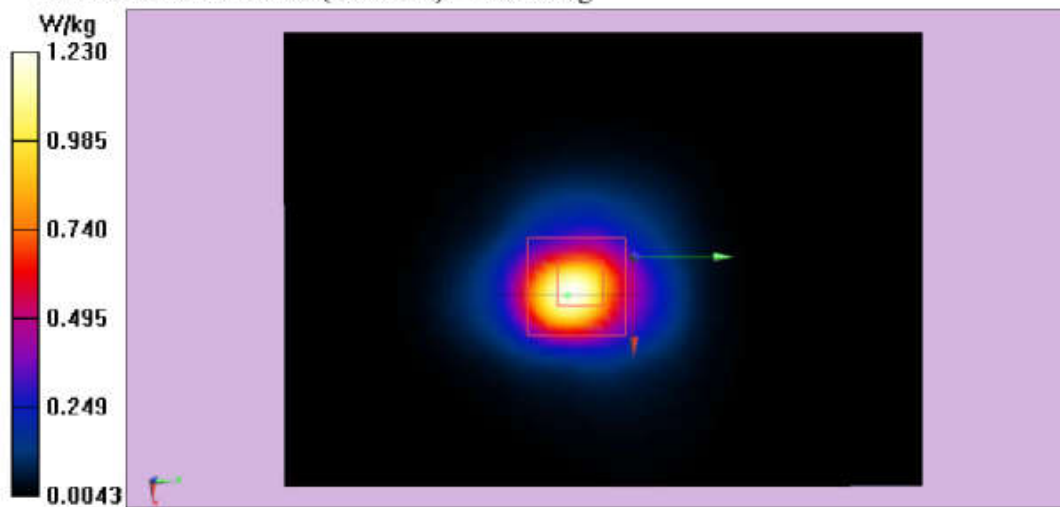
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.60 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.47 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.493 W/kg

Maximum value of SAR (measured) = 1.23 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11n20 CH1(2412MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0);

Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2412

MHz;Communication System PAR: 0 dB

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.911$ S/m; $\epsilon_r = 53.849$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.14 W/kg

Configuration/CH1(2412MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

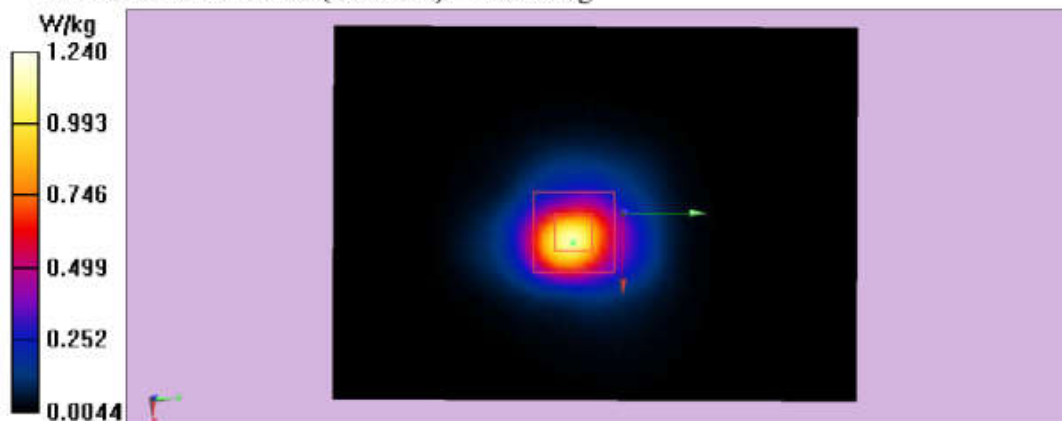
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.39 V/m; Power Drift = -0.23 dB

Peak SAR (extrapolated) = 2.44 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.482 W/kg

Maximum value of SAR (measured) = 1.24 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11n20 CH6(2437MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0);

Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2437

MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.913$ S/m; $\epsilon_r = 53.753$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.21 W/kg

Configuration/CH6(2437MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

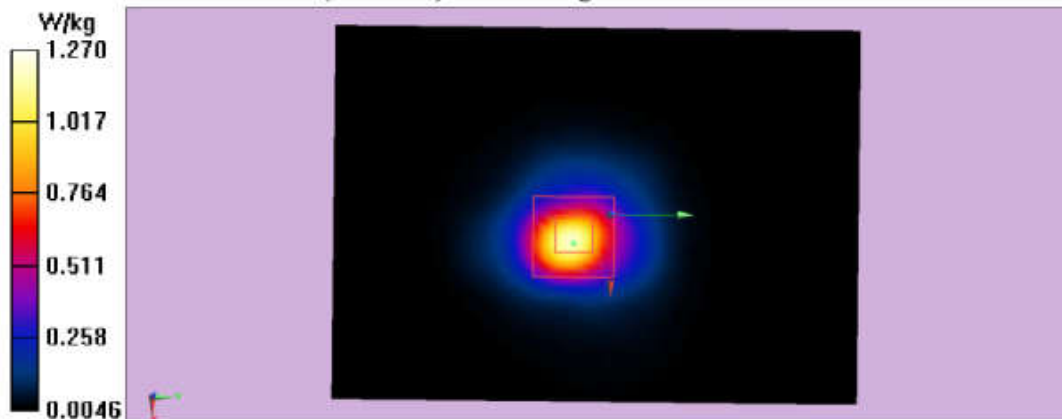
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.52 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 2.49 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.492 W/kg

Maximum value of SAR (measured) = 1.27 W/kg



ANT 1:

Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11b CH1(2412MHz Back)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.911$ S/m; $\epsilon_r = 53.849$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.27 W/kg

Configuration/CH1(2412MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

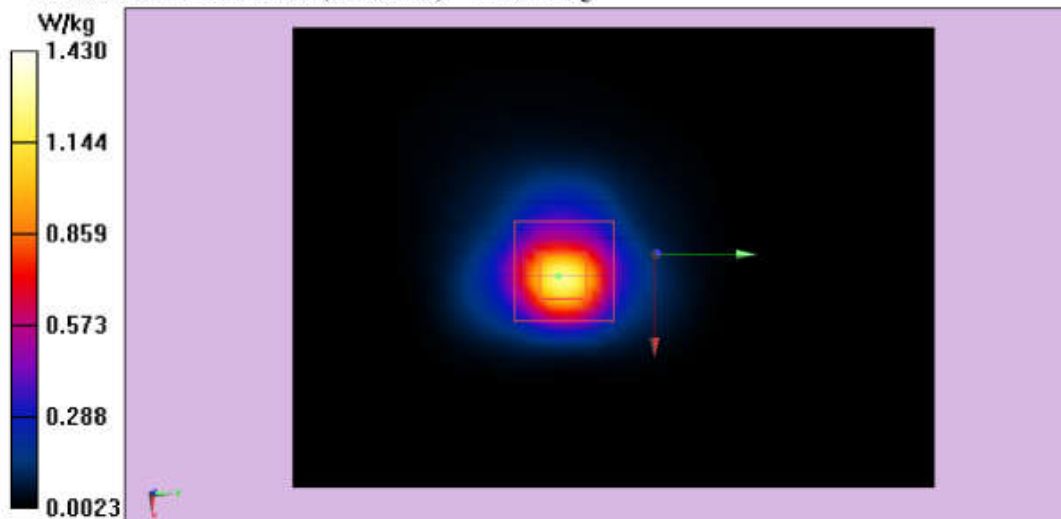
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 14.18 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 2.84 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.504 W/kg

Maximum value of SAR (measured) = 1.43 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11b CH6(2437MHz Back)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.913$ S/m; $\epsilon_r = 53.753$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.29 W/kg

Configuration/CH6(2437MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

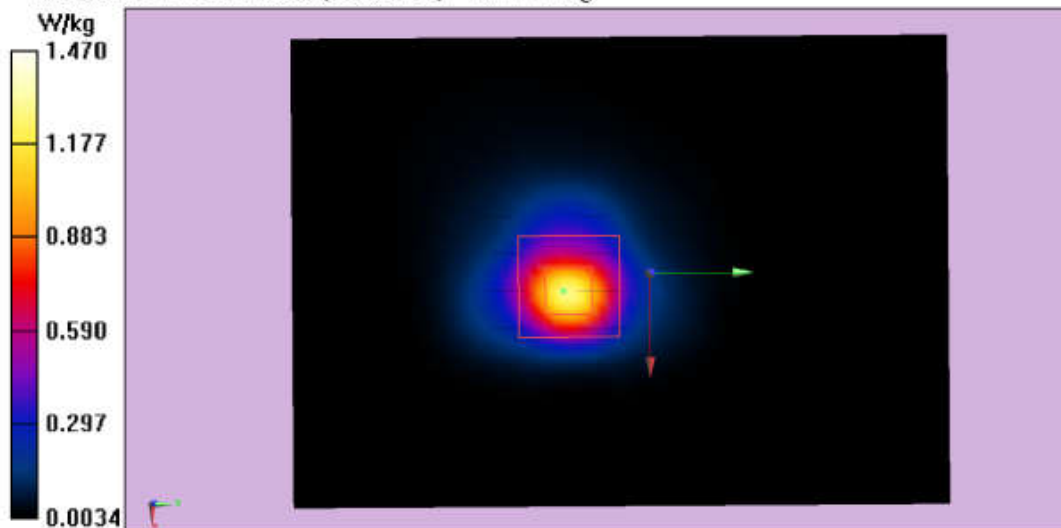
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 13.72 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 2.93 W/kg

SAR(1 g) = 1.17 W/kg; SAR(10 g) = 0.519 W/kg

Maximum value of SAR (measured) = 1.47 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11b CH11(2462MHz Back)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.919$ S/m; $\epsilon_r = 53.666$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.22 W/kg

Configuration/CH11(2462MHz Back)/Zoom Scan (5x5x7)/Cube 0:

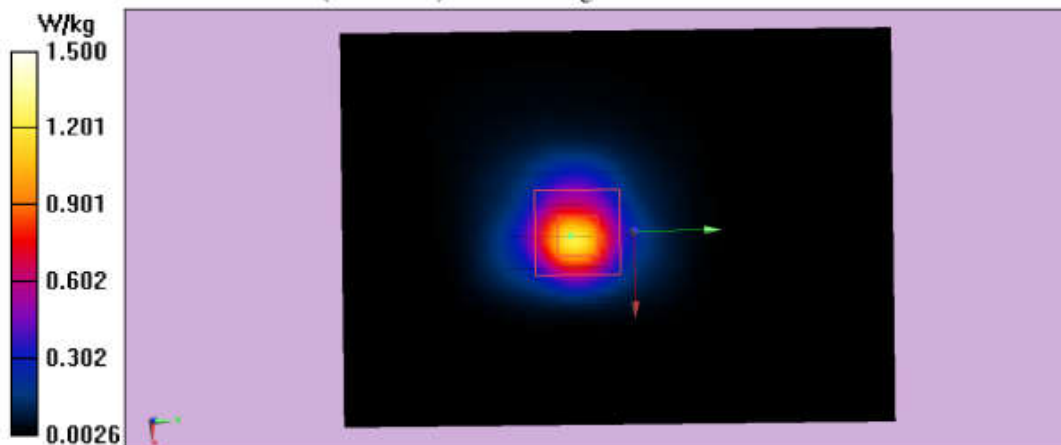
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 14.68 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 2.99 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.528 W/kg

Maximum value of SAR (measured) = 1.50 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Back)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 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 (interpolated): $f = 2412\text{MHz}$; $\sigma = 1.936\text{ S/m}$; $\epsilon_r = 53.415$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200\text{ mm}$, $dy=1.200\text{ mm}$

Maximum value of SAR (interpolated) = 0.744 W/kg

Configuration/CH1(2412MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

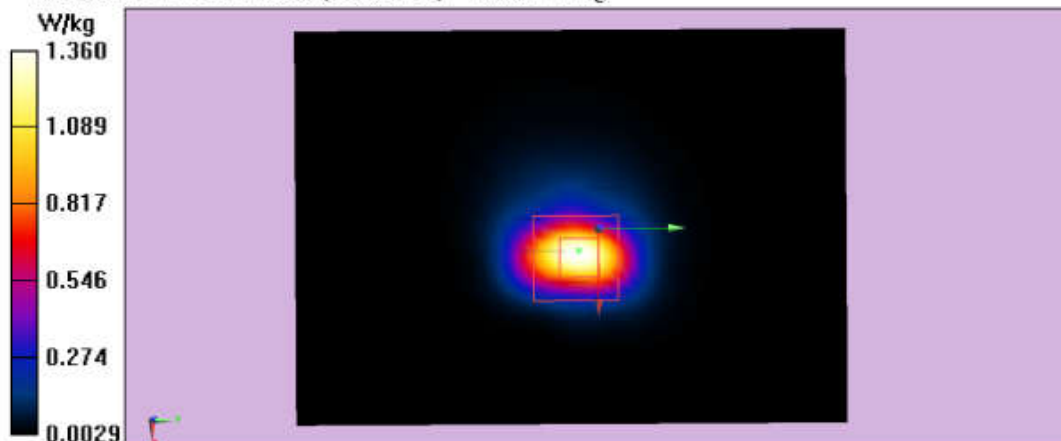
grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.48 V/m; Power Drift = -0.23 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.459 W/kg

Maximum value of SAR (measured) = 1.361 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Left)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 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 (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Left)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0232 W/kg

Configuration/CH1(2412MHz Left)/Zoom Scan (5x5x7)/Cube 0: Measurement

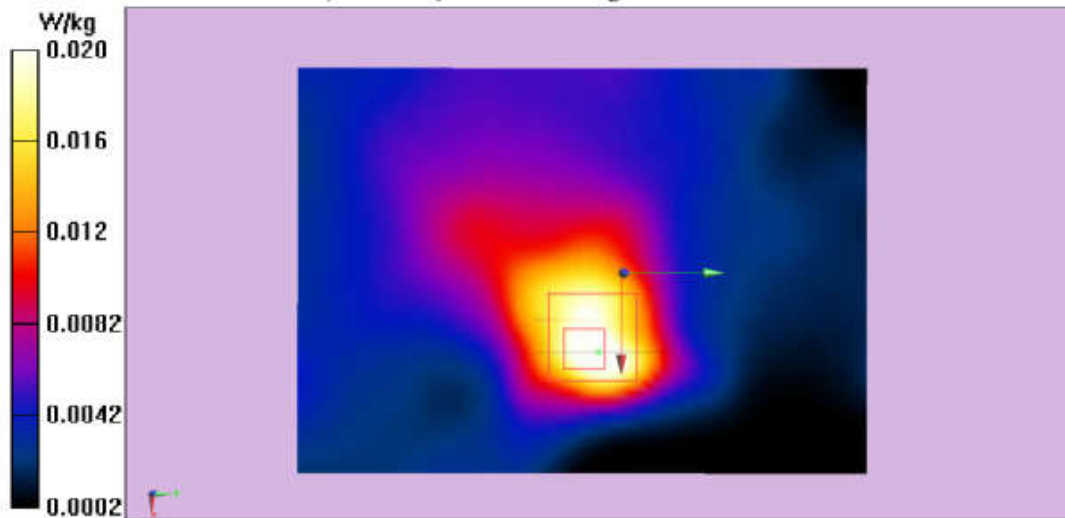
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 2.597 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.0340 W/kg

SAR(1 g) = 0.019 W/kg; SAR(10 g) = 0.011 W/kg

Maximum value of SAR (measured) = 0.0203 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Right)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 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 (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(242MHz Right)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0100 W/kg

Configuration/CH1(2412MHz Right)/Zoom Scan (5x5x7)/Cube 0: Measurement

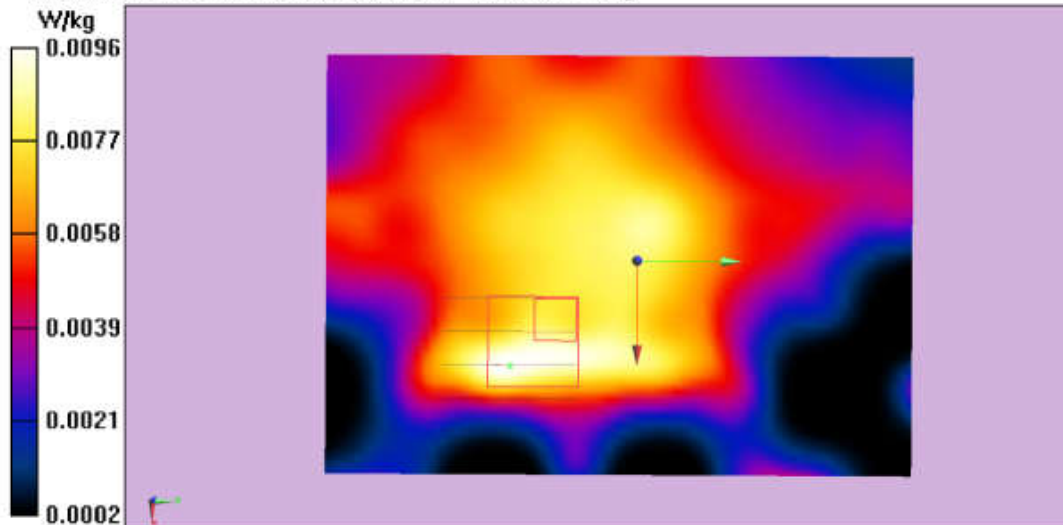
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 1.941 V/m; Power Drift = 0.51 dB

Peak SAR (extrapolated) = 0.0130 W/kg

SAR(1 g) = 0.00746 W/kg; SAR(10 g) = 0.00442 W/kg

Maximum value of SAR (measured) = 0.00962 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH1(2412MHz Top)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (DSSS, 1 Mbps) (0);

Communication System Band: ISM 2.4GHz Band (2400.0-2483.5MHz); Frequency:

2412MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 53.415$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Top)/Area Scan (51x71x1): Interpolated grid:

dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0739 W/kg

Configuration/CH1(2412MHz Top)/Zoom Scan (5x5x7)/Cube 0: Measurement

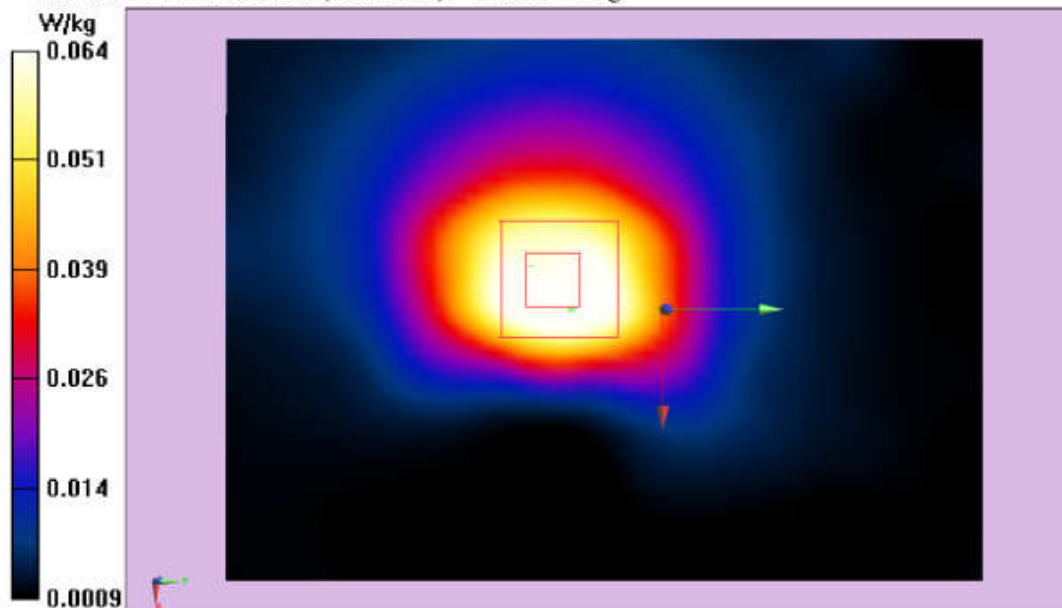
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.256 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.104 W/kg

SAR(1 g) = 0.061 W/kg; SAR(10 g) = 0.035 W/kg

Maximum value of SAR (measured) = 0.0639 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH6(2437MHz Back)**DUT: POS Terminal M/N:SPD1-01**

Communication System: UID 0, IEEE 802.11nHT20 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: $f = 2437\text{MHz}$; $\sigma = 1.909\text{ S/m}$; $\epsilon_r = 53.232$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Back)/Area Scan (51x71x1): Interpolated grid:

dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.28 W/kg

Configuration/CH6(2437MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

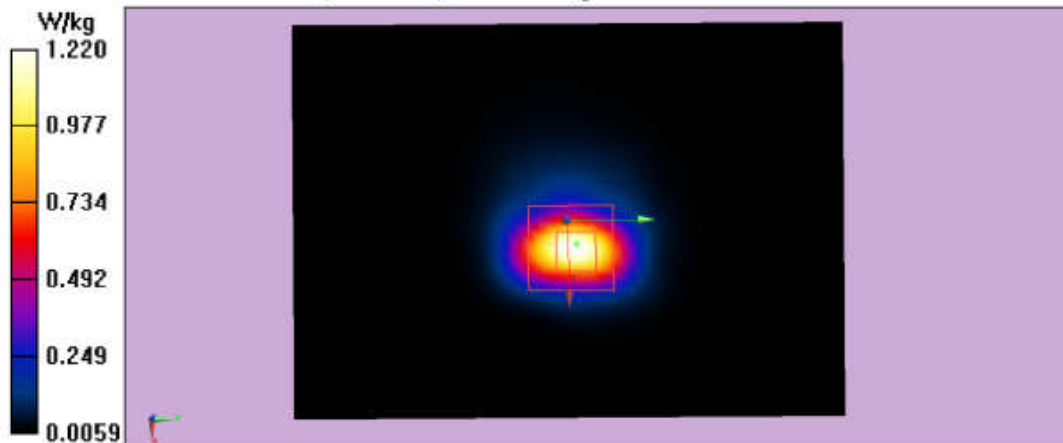
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.02 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 2.45 W/kg

SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.445 W/kg

Maximum value of SAR (measured) = 1.22 W/kg



Test Laboratory: Audix SAR Lab

Date: 27/09/2018

11n HT20 CH11(2462MHz Back)**DUT: POS Terminal M/N:SPD1-01**

Communication System: UID 0, IEEE 802.11nHT20 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, $\sigma = 1.981$ S/m; $\epsilon_r = 54.144$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Back)/Area Scan (51x71x1): Interpolated grid:

dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.681 W/kg

Configuration/CH11(2462MHz Back)/Zoom Scan (5x5x7)/Cube 0:

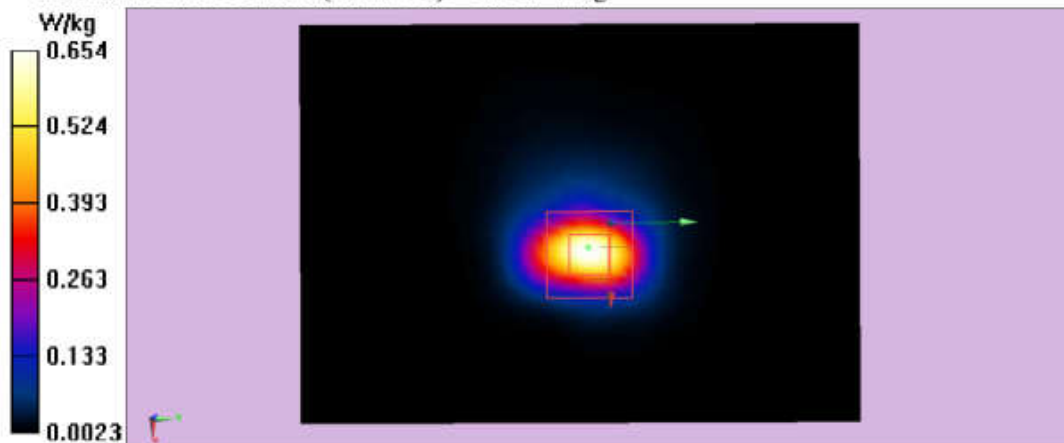
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.75 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.586 W/kg; SAR(10 g) = 0.237 W/kg

Maximum value of SAR (measured) = 0.654 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11b CH1(2412MHz Back)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.911$ S/m; $\epsilon_r = 53.849$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.38 W/kg

Configuration/CH1(2412MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

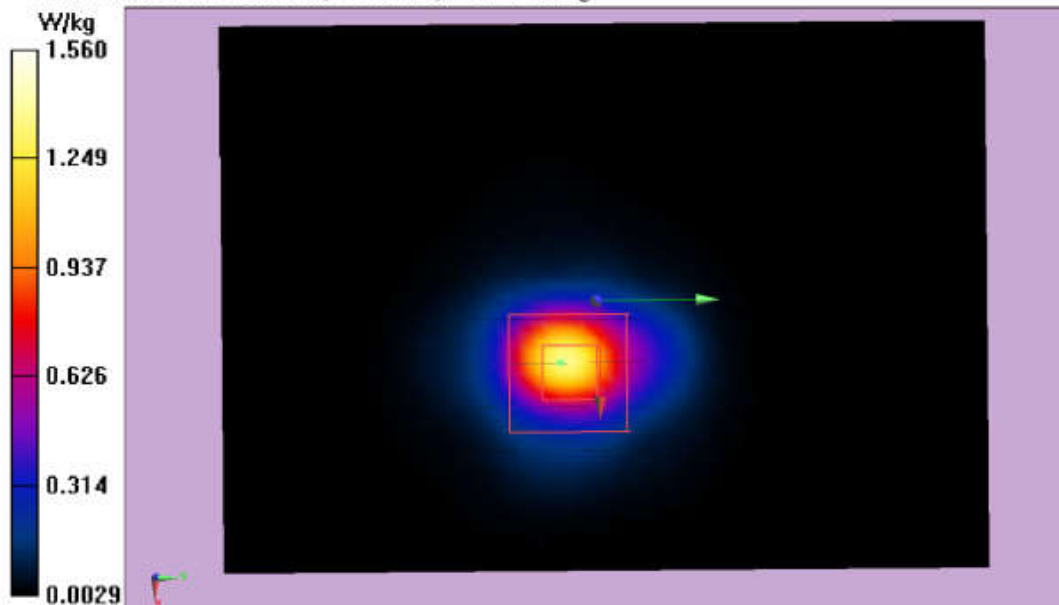
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.725 V/m; Power Drift = -0.04dB

Peak SAR (extrapolated) = 3.27 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.589 W/kg

Maximum value of SAR (measured) = 1.56 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11b CH6(2437MHz Back)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.913$ S/m; $\epsilon_r = 53.753$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Back)/Area Scan (51x71x1): Interpolated grid;

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.41 W/kg

Configuration/CH6(2437MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

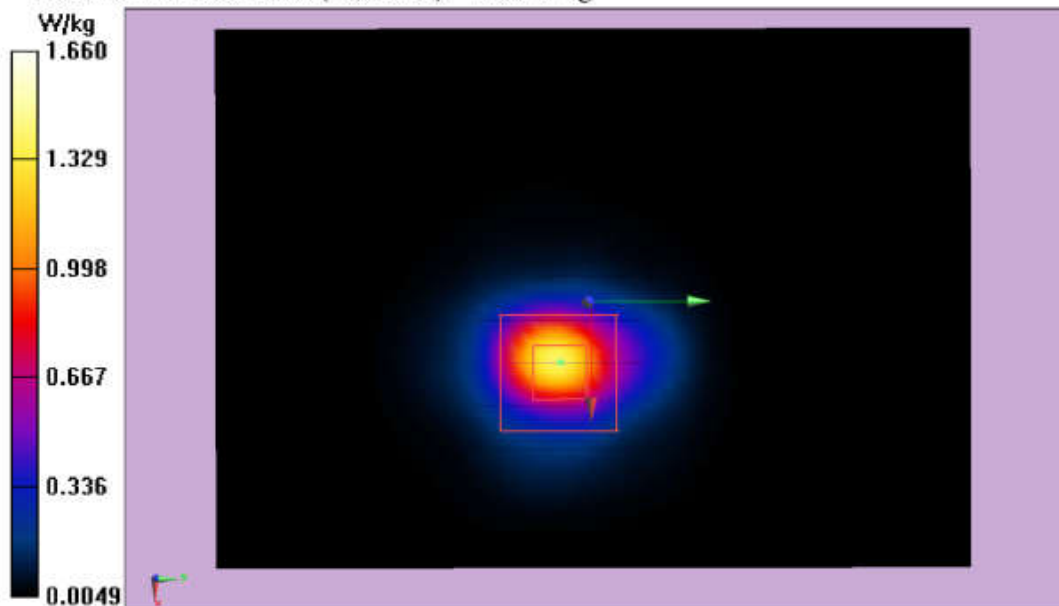
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.480 V/m; Power Drift = -0.27 dB

Peak SAR (extrapolated) = 3.37 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.607 W/kg

Maximum value of SAR (measured) = 1.66 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11b CH11(2462MHz Back)

DUT: POS Terminal M/N:SPD1-01

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; $\sigma = 1.919$ S/m; $\epsilon_r = 53.666$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH11(2462MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.45 W/kg

Configuration/CH11(2462MHz Back)/Zoom Scan (5x5x7)/Cube 0:

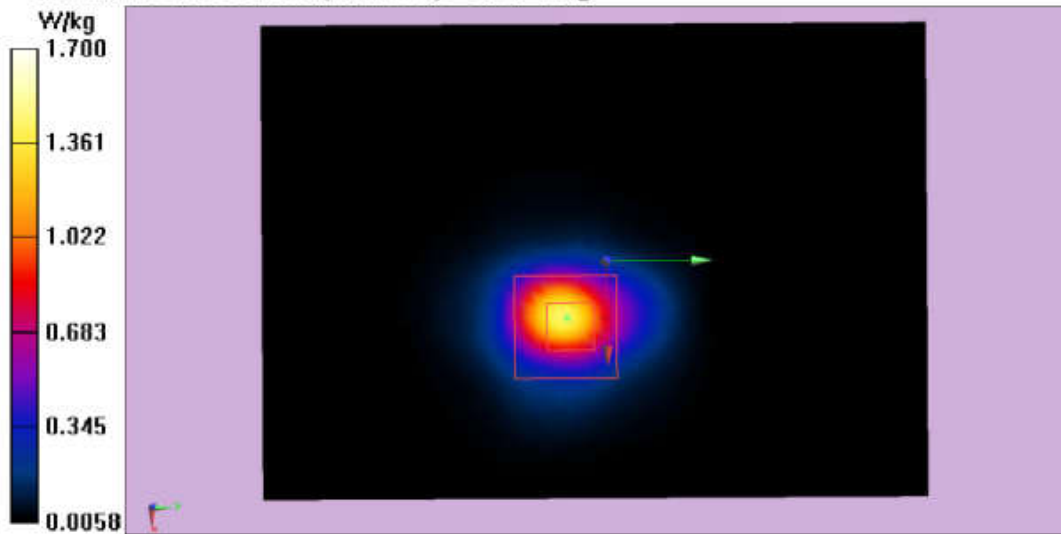
Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.574 V/m; Power Drift = -0.25 dB

Peak SAR (extrapolated) = 3.47 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.622 W/kg

Maximum value of SAR (measured) = 1.70 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11n20 CH1(2412MHz Back)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0);

Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2412

MHz;Communication System PAR: 0 dB

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.911$ S/m; $\epsilon_r = 53.849$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH1(2412MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.33 W/kg

Configuration/CH1(2412MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

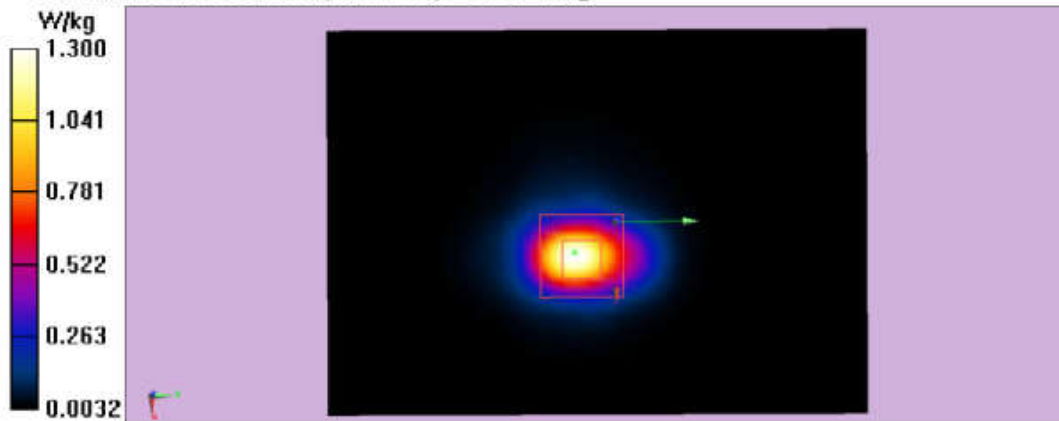
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 14.39 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 2.74 W/kg

SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.496 W/kg

Maximum value of SAR (measured) = 1.30 W/kg



Test Laboratory: Audix SAR Lab

Date: 19/10/2018

11n20 CH6(2437MHz Back)

DUT: POS Terminal M/N:SPD1-01

Communication System: UID 0, IEEE 802.11nHT20 WiFi 2.4 GHz (OFDM, 6.5 Mbps) (0);

Communication System Band: ISM 2.4GHz Band(2400-2483.5MHz); Frequency: 2437

MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.913$ S/m; $\epsilon_r = 53.753$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3767; ConvF(7.47, 7.47, 7.47); Calibrated: 07/03/2018;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 08/02/2018
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/CH6(2437MHz Back)/Area Scan (51x71x1): Interpolated grid:

$dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.39 W/kg

Configuration/CH6(2437MHz Back)/Zoom Scan (5x5x7)/Cube 0: Measurement

grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 14.45 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 2.75 W/kg

SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.501 W/kg

Maximum value of SAR (measured) = 1.33 W/kg

