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SAR EVALUATION REPORT



Test Report No.	: 1811FS14
Applicant	: ASUSTeK COMPUTER INC.
Product Type	: Intel Wireless-AC 9560
Trade Name	: Intel
Model Number	: 9560D2W
Date of Received	: Oct. 25, 2018
Test Period	: Oct. 31 ~ Nov. 13, 2018
Date of Issued	: Dec. 05, 2018
Test Environment	: Ambient Temperature : $22 \pm 2^{\circ}\text{C}$ Relative Humidity : 40 - 70 %
Standard	: ANSI/IEEE C95.1-1995 / IEEE Std. 1528-2013 47 CFR Part §2.1093 KDB 865664 D01 v01r04 / KDB 865664 D02 v01r02 KDB 447498 D01 v06 / KDB 248227 D01 v02r02 KDB 616217 D04 v01r02
Test Lab Location	: Chang-an Lab
Test Firm MRA designation number	: TW0010



1. A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.
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1. Summary of Maximum Reported SAR Value

Equipment Class	Mode	Highest Reported	
		Body standalone SAR _{1g} (W/kg)	
		NB Mode	PAD Mode
DTS	WLAN 2.4 GHz ANT-MAIN	0.395	0.422
	WLAN 2.4 GHz ANT-AUX	0.979	0.945
U-NII	WLAN 5 GHz ANT-MAIN	0.766	1.071
	WLAN 5 GHz ANT-AUX	1.036	0.940
DSS	Bluetooth	0.281	0.036
Highest Simultaneous Transmission SAR		Body standalone SAR _{1g} (W/kg)	
		NB Mode	PAD Mode
Bottom of Laptop		2.083	---
Side 4		---	1.367



2. Description of Equipment under Test (EUT)

Applicant	ASUSTeK COMPUTER INC. 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan	
Manufacturer	ASUSTeK COMPUTER INC. 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan	
Product Type	Intel Wireless-AC 9560	
Trade Name	Intel	
Model Number	9560D2W	
FCC ID	MSQ9560D2	
Class II Permissive Change	(1) This is to request a Class II permissive change for FCC ID: MSQ9560D2, originally granted on 03/07/2018. The major change filed under this application is: Change #1: Additional Chassis added, ASUSTeK, model number: UX562FA, Q506F, Q526F. Models difference: All models are electrically identical, different model names are for marketing purpose. #2: Reduce the Output Power through firmware, and SAR measurement were evaluated. (Only reduce Wi-Fi Output Power, Bluetooth Output Power haven't changes). #3: Addition two antennas, the antenna type is same, the antenna gain is lower than the original application. (2) Modular has proceed 15 mm which smaller than 25 mm of bystander requirement and excluded testing.	
Host Information	Product Type: Zenbook Trade Name: ASUS Model Name: UX562FA, Q506F, Q526F (All models are electrically identical, different model names are for marketing purpose.)	
Frequency Range	Operate Modes	Operate Frequency (MHz)
	IEEE 802.11b / 802.11g / 802.11n 2.4 GHz 20 MHz	2412 - 2472
	IEEE 802.11n 2.4 GHz 40 MHz	2422 - 2462
	IEEE 802.11a U-NII Band I	5180 - 5240
	IEEE 802.11a U-NII Band II-A	5260 - 5320
	IEEE 802.11a U-NII Band II-C	5500 - 5720
	IEEE 802.11a U-NII Band III	5745 - 5825
	IEEE 802.11n 5 GHz 20 MHz U-NII Band I	5180 - 5240
	IEEE 802.11n 5 GHz 20 MHz U-NII Band II-A	5260 - 5320
	IEEE 802.11n 5 GHz 20 MHz U-NII Band II-C	5500 - 5720
	IEEE 802.11n 5 GHz 20 MHz U-NII Band III	5745 - 5825
	IEEE 802.11n 5 GHz 40 MHz U-NII Band I	5190 - 5230
	IEEE 802.11n 5 GHz 40 MHz U-NII Band II-A	5270 - 5310
	IEEE 802.11n 5 GHz 40 MHz U-NII Band II-C	5510 - 5710
	IEEE 802.11n 5 GHz 40 MHz U-NII Band III	5755 - 5795
	IEEE 802.11ac 80 MHz U-NII Band I	5210
	IEEE 802.11ac 80 MHz U-NII Band II-A	5290
	IEEE 802.11ac 80 MHz U-NII Band II-C	5530 - 5690
	IEEE 802.11ac 80 MHz U-NII Band III	5775
	IEEE 802.11ac 160 MHz UNII Band I + UNII Band II-A	5250
	Bluetooth BR/EDR	2402 - 2480
	Bluetooth LE	2402 - 2480

	Operate Modes	NB Mode				PAD Mode			
		Power (dBm)		Tune-up power (dBm)		Power (dBm)		Tune-up power (dBm)	
		MAIN	AUX	MAIN	AUX	MAIN	AUX	MAIN	AUX
Transmit Power (conducted power)	IEEE 802.11b	15.49	9.37	15.5	9.5	15.49	16.39	15.5	16.5
	IEEE 802.11g	15.46	9.35	15.5	9.5	15.46	16.28	15.5	16.5
	IEEE 802.11n 2.4 GHz 20 MHz	15.45	9.32	15.5	9.5	15.45	16.33	15.5	16.5
	IEEE 802.11n 2.4 GHz 40 MHz	15.36	9.35	15.5	9.5	15.36	15.31	15.5	16.5
	IEEE 802.11a U-NII Band I	8.88	7.92	9.0	8.0	12.58	14.55	13.0	15.0
	IEEE 802.11a U-NII Band II-A	8.80	7.92	9.0	8.0	12.60	14.57	13.0	15.0
	IEEE 802.11a U-NII Band II-C	9.95	7.04	10.0	8.0	11.88	17.46	12.0	17.5
	IEEE 802.11a U-NII Band III	9.69	6.67	10.5	8.0	13.43	16.51	13.75	17.0
	IEEE 802.11n 5 GHz 20 MHz U-NII Band I	8.82	7.84	9.0	8.0	12.72	14.56	13.0	15.0
	IEEE 802.11n 5 GHz 20 MHz U-NII Band II-A	8.80	7.86	9.0	8.0	12.67	14.60	13.0	15.0
	IEEE 802.11n 5 GHz 20 MHz U-NII Band II-C	9.95	7.04	10.0	8.0	11.83	17.44	12.0	17.5
	IEEE 802.11n 5 GHz 20 MHz U-NII Band III	9.68	6.61	10.5	8.0	13.54	16.48	13.75	17.0
	IEEE 802.11n 5 GHz 40 MHz U-NII Band I	8.79	7.84	9.0	8.0	12.65	14.47	13.0	15.0
	IEEE 802.11n 5 GHz 40 MHz U-NII Band II-A	8.76	7.83	9.0	8.0	12.64	14.43	13.0	15.0
	IEEE 802.11n 5 GHz 40 MHz U-NII Band II-C	9.93	7.04	10.0	8.0	11.83	17.46	12.0	17.5
	IEEE 802.11n 5 GHz 40 MHz U-NII Band III	9.69	6.65	10.5	8.0	13.42	16.51	13.75	17.0
	IEEE 802.11ac 80 MHz U-NII Band I	8.91	7.95	9.0	8.0	12.76	14.68	13.0	15.0
	IEEE 802.11ac 80 MHz U-NII Band II-A	8.89	7.97	9.0	8.0	12.78	14.75	13.0	15.0
	IEEE 802.11ac 80 MHz U-NII Band II-C (Channel 106)	---	---	---	---	---	15.86	---	16
	IEEE 802.11ac 80 MHz U-NII Band II-C	9.96	7.12	10.0	8.0	11.89	17.49	12.0	17.5
	IEEE 802.11ac 80 MHz U-NII Band III	9.77	6.71	10.5	8.0	13.60	16.69	13.75	17.0
	IEEE 802.11ac 160 MHz UNII Band I + UNII Band II-A	8.68	7.85	9.0	8.0	12.46	14.65	13.0	15.0
	Bluetooth BR/EDR (Channel 0)	---	9.25	---	10.0	---	9.25	---	10.0
	Bluetooth BR/EDR (Channel 39/78)	---	10.36	---	10.5	---	10.36	---	10.5
	Bluetooth LE	---	8.44	---	8.5	---	8.44	---	8.5
Device Category	Portable Device								
Application Type	Certification								

Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Antenna list:

Antenna Source	ANT	Manufacturer	Part No. (Vendor)	ASUS Part No.	Type	Max. Gain (dBi)		
						Frequency	NB	PAD
1	MAIN (Chain B)	INPAQ	WA-F-LB-02-167	14008-03240500	PIFA Antenna	2402 -2480	-2.64	-1.22
						5150 - 5250	-1.76	1.23
						5250 - 5350	-2.27	1.23
						5470 - 5725	-2.09	-1.75
						5725 - 5850	-1.73	-1.04
	AUX (Chain A)	INPAQ	WA-F-LB-01-066	04072-02950300	PIFA Antenna	2402 -2480	-3.86	-3.46
						5150 - 5250	-1.05	-3.29
						5250 - 5350	0.35	-3.52
						5470 - 5725	0.11	-5.43
						5725 - 5850	0.11	-5.43
2	MAIN (Chain B)	ACON	ANF6Y-100056	14008-03240400	PIFA Antenna	2402 -2480	-2.84	-3.51
						5150 - 5250	-3.32	-1.26
						5250 - 5350	-3.32	-1.26
						5470 - 5725	-2.23	-1.86
						5725 - 5850	-1.77	-2.24
	AUX (Chain A)	ACON	ANF6Y-100057	04072-02950200	PIFA Antenna	2402 -2480	-4.28	-3.74
						5150 - 5250	-1.07	-3.82
						5250 - 5350	-0.12	-3.82
						5470 - 5725	-0.06	-6.31
						5725 - 5850	-0.06	-5.52
Note :								
1. Antenna Source 1 (INPAQ antenna) gain is worst case. We tested and recorded it in this report.								
2. We choose worst case of Antenna Source 1 (INPAQ antenna) to test Antenna Source 2 (ACON antenna).								
3. Antenna Source 1 (INPAQ antenna) and Antenna Source 2 (ACON antenna) are the same antenna, only different in manufacturer.								

3. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of ASUSTeK COMPUTER INC. Trade Name : Intel Model(s) : 9560D2W. The test procedures, as described in American National Standards, Institute C95.1-1999 [1] were employed and they specify the maximum exposure limit of 1.6 mW/g as averaged over any 1 gram of tissue for portable devices being used within 20 cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

3.1 SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dw) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 2).

$$SAR = \frac{d}{dt} \left(\frac{dw}{dm} \right) = \frac{d}{dt} \left(\frac{dw}{\rho dv} \right)$$

Figure 2. SAR Mathematical Equation

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be related to the electrical field in the tissue by

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

Where :

σ = conductivity of the tissue (S/m)

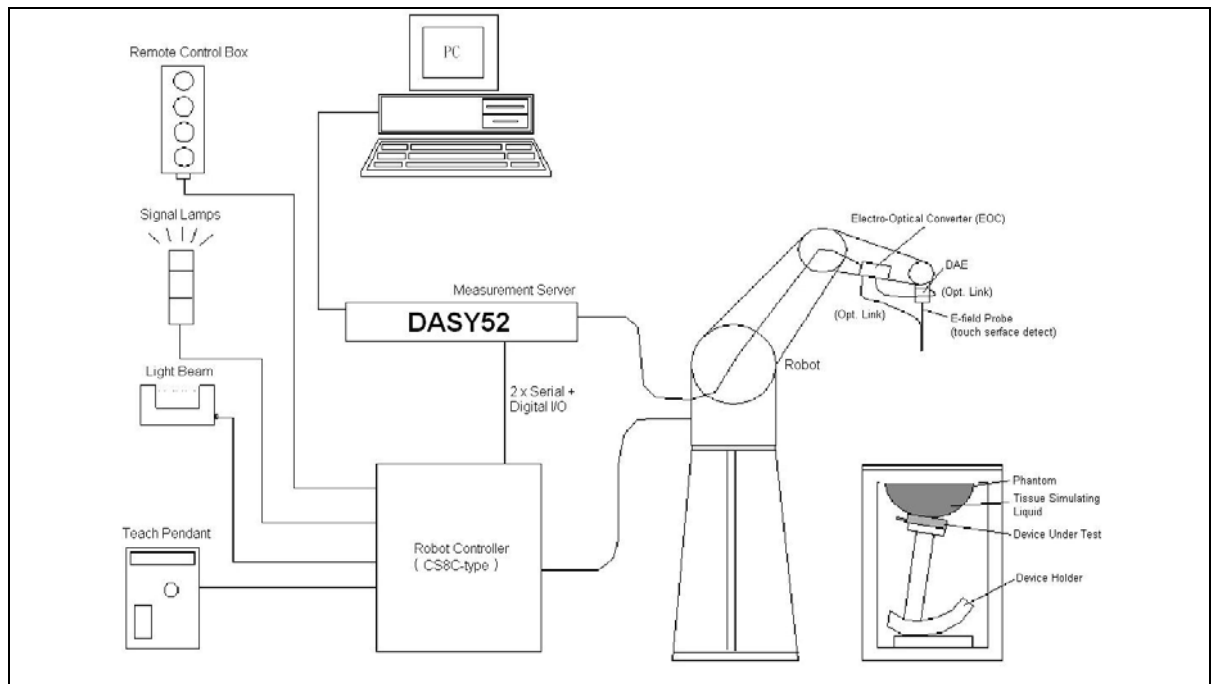
ρ = mass density of the tissue (kg/m³)

E = RMS electric field strength (V/m)

* Note :

The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane [2]

4. SAR Measurement Setup



The DASY52 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli TX family) with controller, teach pendant 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 in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronics (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. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
5. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
6. A computer operating Windows 2000 or Windows XP.
7. DASY52 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The SAM twin phantom enabling testing 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. Validation dipole kits allowing validating the proper functioning of the system.

4.1 DASY E-Field Probe System

The SAR measurements were conducted with the dosimetric probe (manufactured by SPEAG), designed in the classical triangular configuration [3] and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

4.1.1 E-Field 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 brain tissue (rotation around probe axis) ± 0.5 dB in brain tissue (rotation normal probe axis)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

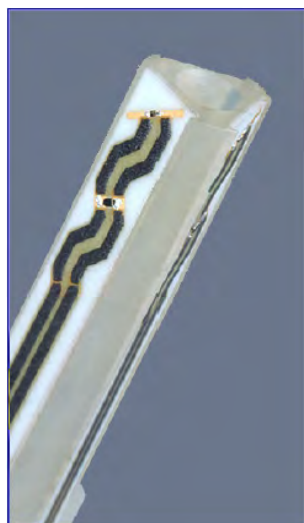


Figure 3. E-field Probe



Figure 4. Probe setup on robot



4.1.2 E-Field Probe Calibration process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm²) using an RF Signal generator, TEM cell, and RF Power Meter.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies 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 rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm².

Temperature Assessment

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

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

Where :

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (head or body),

ΔT = Temperature increase due to RF exposure.

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

Where :

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m³).



4.2 Data Acquisition Electronic (DAE) System

Model :	DAE3, DAE4
Construction :	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range :	-100 to +300 mV (16 bit resolution and two range settings: 4 mV, 400 mV)
Input Offset Voltage :	< 5 μ V (with auto zero)
Input Bias Current :	< 50 fA
Dimensions :	60 x 60 x 68 mm

4.3 Robot

Positioner :	Stäubli Unimation Corp. Robot Model: TX90XL
Repeatability :	± 0.02 mm
No. of Axis :	6

4.4 Measurement Server

Processor :	PC/104 with a 400MHz intel ULV Celeron
I/O-board :	Link to DAE4 (or DAE3) 16-bit A/D converter for surface detection system Digital I/O interface Serial link to robot Direct emergency stop output for robot

4.5 Device Holder

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ 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.

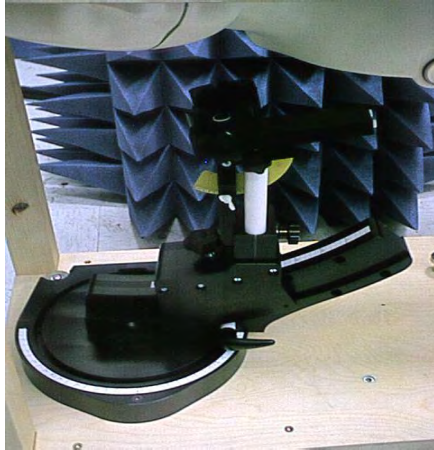


Figure 5. Device Holder

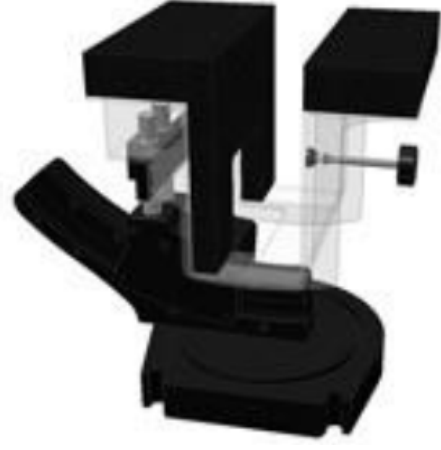


Figure 6. Device Holder for Laptops

4.6 Oval Flat Phantom - ELI 4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (Oval Flat) phantom defined in IEEE 1528-2013, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of wireless portable device usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness	2 $\pm$ 0.2 mm
Filling Volume	Approx. 30 liters
Dimensions	190×600×400 mm (H×L×W)
Table 1. Specification of ELI 4.0	

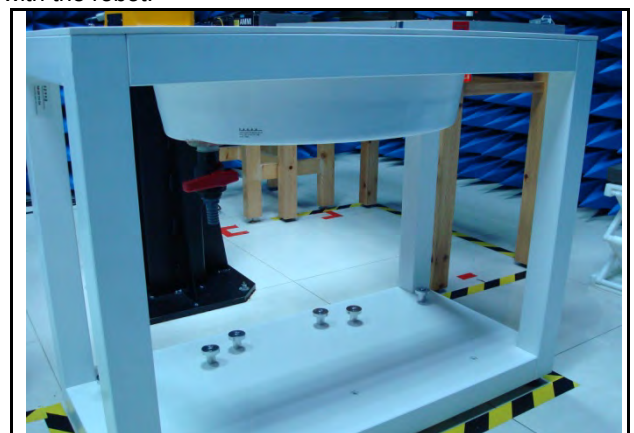


Figure 7. Oval Flat Phantom

4.7 Data Storage and Evaluation

4.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the 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 or DA5. The post processing 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 erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

4.7.2 Data Evaluation

The DASY post processing software (SEMCAD) 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 $Norm_i, ai0, ai1, ai2$
 - Conversion factor $ConvFi$
 - Diode compression point dcp_i
- Device parameters : - Frequency f
 - Crest factor cf
- Media parameters : - Conductivity σ
 - Density ρ

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 DASY 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 :

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

- 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 :

$$E\text{-field probes : } E_i = \sqrt{\frac{V_i}{\text{Norm}_i \cdot \text{ConvF}}}$$

$$H\text{-field probes : } H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}$$

with V_i = compensated signal of channel i (i = x, y, z)
 Norm_i = sensor sensitivity of channel i (i = x, y, z)
 $\mu\text{V}/(\text{V/m})^2$ for *E-field Probes*
 ConvF = sensitivity enhancement in solution
 a_{ij} = 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) :

$$E_{\text{tot}} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

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

$$\text{SAR} = E_{\text{tot}}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

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 set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

The power flow density is calculated assuming the excitation field to be a free space field.

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

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

5. Tissue Simulating Liquids

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

IEEE SCC-34/SC-2 in 1528 recommended Tissue Dielectric Parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified in 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equation and extrapolated according to the head parameter specified in 1528.

Target Frequency	Head		Body	
(MHz)	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000 \text{ kg/m}^3$)				

Table 2. Tissue dielectric parameters for head and body phantoms

5.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H₂O), resistivity $\geq 16 \text{ M } \Omega$ -as basis for the liquid
- Sugar: refined white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops)
-to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2 % in water, 20 °C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobutyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

5.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.

Note: The goal dielectric parameters (at 22 °C) must be achieved within a tolerance of $\pm 5 \%$ for ϵ and $\pm 5 \%$ for σ .

Ingredients (% by weight)	Frequency (MHz)												Frequency (GHz)	
	750		835		1750		1900		2450		2600		5 GHz	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	39.28	51.30	41.45	52.40	54.50	40.20	54.90	40.40	62.70	73.20	60.30	71.40	65.5	78.6
Salt (NaCl)	1.47	1.42	1.45	1.50	0.17	0.49	0.18	0.50	0.50	0.10	0.60	0.20	0.00	0.00
Sugar	58.15	46.18	56.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bactericide	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.2	10.7
DGBE	0.00	0.00	0.00	0.00	45.33	59.31	44.92	59.10	36.80	26.70	39.10	28.40	0.00	0.00
Diethylene Glycol Mono-hexlether	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.3	10.7
Dielectric Constant	41.88	54.60	42.54	56.10	40.10	53.60	39.90	54.00	39.80	52.50	39.80	52.50	35.1~ 36.2	47.9~ 49.3
Conductivity (S/m)	0.90	0.97	0.91	0.95	1.39	1.49	1.42	1.45	1.88	1.78	1.88	1.78	4.45~ 5.48	5.07~ 6.23

Salt: 99⁺ % Pure Sodium Chloride

Sugar: 98⁺ % Pure Sucrose

Water: De-ionized, 16 M Ω ⁺ 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

5.3 Liquid Depth

According to KDB865664 ,the depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with $\leq \pm 0.5$ cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with $\leq \pm 0.5$ cm variation for measurements > 3 GHz.



Figure 8. Body-Position



6. SAR Testing with RF Transmitters

6.1 SAR Testing with 802.11 Transmitters

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closest/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.
 - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
 - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.
 - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the initial test position, Area Scans were performed to determine the position with the Maximum Value of SAR (measured). The position that produced the highest Maximum Value of SAR is considered the worst case position; thus used as the initial test position.



6.2 Conducted Power

NB Mode MAIN (Chain B) & AUX (Chain A)					
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Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11b	1M	1	2412.0	15.49	9.30
		6	2437.0	15.40	9.36
		11	2462.0	15.31	9.37
		12	2467.0	15.28	9.31
		13	2472.0	14.97	9.28
IEEE 802.11g	6M	1	2412.0	15.40	9.28
		6	2437.0	15.46	9.35
		11	2462.0	15.44	9.30
		12	2467.0	13.44	9.31
		13	2472.0	-6.29	-5.65
IEEE 802.11n 2.4 GHz 20 MHz	6.5M	1	2412.0	15.45	9.32
		6	2442.0	15.40	9.31
		11	2462.0	15.42	9.28
		12	2467.0	12.91	9.32
		13	2472.0	-6.55	-5.70
IEEE 802.11n 2.4 GHz 40 MHz	13.5M	3	2422.0	13.28	9.25
		6	2437.0	15.36	9.34
		9	2452.0	13.18	9.35
		10	2457.0	8.78	8.42
		11	2462.0	2.58	3.70

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11a	6M	36	5180.0	8.83	7.92
		40	5200.0	8.80	7.73
		44	5220.0	8.88	7.85
		48	5240.0	8.86	7.70
		52	5260.0	8.78	7.92
		56	5280.0	8.79	7.73
		60	5300.0	8.77	7.76
		64	5320.0	8.80	7.74
		100	5500.0	9.94	7.03
		104	5520.0	9.80	7.04
		108	5540.0	9.95	7.00
		112	5560.0	9.84	6.95
		116	5580.0	9.85	6.83
		120	5600.0	9.77	6.94
		124	5620.0	9.90	7.00
		128	5640.0	9.95	6.85
		132	5660.0	9.81	7.00
		136	5680.0	9.86	6.90
		140	5700.0	9.84	6.89
		144	5720.0	9.72	7.01
		149	5745.0	9.58	6.55
		153	5765.0	9.57	6.57
		157	5785.0	9.69	6.56
		161	5805.0	9.62	6.67
		165	5825.0	9.67	6.62

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11n 5 GHz 20 MHz	6.5M	36	5180.0	8.74	7.84
		40	5200.0	8.78	7.71
		44	5220.0	8.82	7.74
		48	5240.0	8.82	7.67
		52	5260.0	8.74	7.86
		56	5280.0	8.75	7.73
		60	5300.0	8.73	7.72
		64	5320.0	8.80	7.67
		100	5500.0	9.90	6.91
		104	5520.0	9.81	6.88
		108	5540.0	9.80	6.92
		112	5560.0	9.85	6.87
		116	5580.0	9.95	6.84
		120	5600.0	9.94	6.96
		124	5620.0	9.78	7.03
		128	5640.0	9.72	6.85
		132	5660.0	9.86	6.89
		136	5680.0	9.88	6.90
		140	5700.0	9.76	6.88
		144	5720.0	9.88	7.04
		149	5745.0	9.51	6.58
		153	5765.0	9.54	6.53
		157	5785.0	9.68	6.48
		161	5805.0	9.61	6.61
		165	5825.0	9.61	6.60

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11n 5 GHz 40 MHz	13.5M	38	5190.0	8.79	7.84
		46	5230.0	8.74	7.83
		54	5270.0	8.74	7.83
		62	5310.0	8.76	7.73
		102	5510.0	9.90	7.04
		110	5550.0	9.81	7.03
		118	5590.0	9.91	6.84
		126	5630.0	9.93	6.97
		134	5670.0	9.91	7.02
		142	5710.0	9.93	6.96
		151	5755.0	9.69	6.63
		159	5795.0	9.65	6.65
IEEE 802.11ac 80 MHz	29.3M	42	5210.0	8.91	7.95
		58	5290.0	8.89	7.97
		106	5530.0	9.89	7.07
		122	5610.0	9.88	7.04
		138	5690.0	9.96	7.12
		155	5775.0	9.77	6.71
IEEE 802.11ac 160 MHz	58.5M	50	5250.0	8.68	7.85

Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
Bluetooth BR GFSK	0	2402.0	DH1	---	9.25
			DH3	---	9.24
			DH5	---	9.24
	39	2441.0	DH1	---	10.05
			DH3	---	10.04
			DH5	---	10.04
	78	2480.0	DH1	---	10.36
			DH3	---	10.35
			DH5	---	10.35
Bluetooth EDR $\pi/4$ -DQPSK	0	2402.0	2DH1	---	8.21
			2DH3	---	8.20
			2DH5	---	8.19
	39	2441.0	2DH1	---	8.45
			2DH3	---	8.44
			2DH5	---	8.36
	78	2480.0	2DH1	---	8.50
			2DH3	---	8.49
			2DH5	---	8.49
Bluetooth EDR 8DPSK	0	2402.0	3DH1	---	8.21
			3DH3	---	8.21
			3DH5	---	8.20
	39	2441.0	3DH1	---	8.45
			3DH3	---	8.44
			3DH5	---	8.36
	78	2480.0	3DH1	---	8.50
			3DH3	---	8.49
			3DH5	---	8.49

Band	CH	Frequency (MHz)	Bandwidth	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
Bluetooth LE	0	2402.0	1M	---	8.17
	19	2440.0		---	8.35
	39	2480.0		---	8.43
	0	2402.0	2M	---	8.18
	19	2440.0		---	8.36
	39	2480.0		---	8.44

PAD Mode MAIN (Chain B) & AUX (Chain A)

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11b	1M	1	2412.0	15.49	16.31
		6	2437.0	15.40	16.33
		11	2462.0	15.31	16.39
		12	2467.0	15.28	16.28
		13	2472.0	14.97	14.88
IEEE 802.11g	6M	1	2412.0	15.40	15.33
		6	2437.0	15.46	16.25
		11	2462.0	15.44	16.28
		12	2467.0	13.44	13.40
		13	2472.0	-6.29	-5.65
IEEE 802.11n 2.4 GHz 20 MHz	6.5M	1	2412.0	15.45	15.23
		6	2442.0	15.40	16.33
		11	2462.0	15.42	14.81
		12	2467.0	12.91	13.41
		13	2472.0	-6.55	-5.70
IEEE 802.11n 2.4 GHz 40 MHz	13.5M	3	2422.0	13.28	13.36
		6	2437.0	15.36	15.31
		9	2452.0	13.18	13.06
		10	2457.0	8.78	8.28
		11	2462.0	2.58	3.70

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11a	6M	36	5180.0	12.57	14.55
		40	5200.0	12.54	14.40
		44	5220.0	12.58	14.51
		48	5240.0	12.54	14.39
		52	5260.0	12.60	14.57
		56	5280.0	12.59	14.41
		60	5300.0	12.51	14.41
		64	5320.0	12.55	14.37
		100	5500.0	11.71	17.37
		104	5520.0	11.69	17.32
		108	5540.0	11.71	17.43
		112	5560.0	11.78	17.44
		116	5580.0	11.82	17.46
		120	5600.0	11.81	17.42
		124	5620.0	11.77	17.43
		128	5640.0	11.72	17.30
		132	5660.0	11.84	17.38
		136	5680.0	11.88	17.44
		140	5700.0	11.77	17.41
		144	5720.0	11.85	17.45
		149	5745.0	13.34	16.44
		153	5765.0	13.35	16.41
		157	5785.0	13.43	16.34
		161	5805.0	13.40	16.44
		165	5825.0	13.33	16.51

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11n 5 GHz 20 MHz	6.5M	36	5180.0	12.69	14.56
		40	5200.0	12.72	14.42
		44	5220.0	12.66	14.44
		48	5240.0	12.67	14.33
		52	5260.0	12.59	14.60
		56	5280.0	12.67	14.39
		60	5300.0	12.66	14.35
		64	5320.0	12.56	14.35
		100	5500.0	11.77	17.34
		104	5520.0	11.75	17.28
		108	5540.0	11.80	17.30
		112	5560.0	11.77	17.42
		116	5580.0	11.75	17.41
		120	5600.0	11.83	17.44
		124	5620.0	11.77	17.44
		128	5640.0	11.70	17.38
		132	5660.0	11.72	17.43
		136	5680.0	11.72	17.41
		140	5700.0	11.76	17.43
		144	5720.0	11.67	17.41
		149	5745.0	13.48	16.40
		153	5765.0	13.48	16.43
		157	5785.0	13.54	16.31
		161	5805.0	13.52	16.48
		165	5825.0	13.49	16.47

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
IEEE 802.11n 5 GHz 40 MHz	13.5M	38	5190.0	12.65	14.47
		46	5230.0	12.65	14.39
		54	5270.0	12.64	14.43
		62	5310.0	12.51	14.36
		102	5510.0	11.81	17.36
		110	5550.0	11.72	17.31
		118	5590.0	11.75	17.37
		126	5630.0	11.83	17.46
		134	5670.0	11.82	17.38
		142	5710.0	11.77	17.41
		151	5755.0	13.40	16.51
		159	5795.0	13.42	16.50
IEEE 802.11ac 80 MHz	29.3M	42	5210.0	12.76	14.68
		58	5290.0	12.78	14.75
		106	5530.0	11.72	15.86
		122	5610.0	11.70	17.47
		138	5690.0	11.89	17.49
		155	5775.0	13.60	16.69
IEEE 802.11ac 160 MHz	58.5M	50	5250.0	12.46	14.65

Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
Bluetooth BR GFSK	0	2402.0	DH1	---	9.25
			DH3	---	9.24
			DH5	---	9.24
	39	2441.0	DH1	---	10.05
			DH3	---	10.04
			DH5	---	10.04
	78	2480.0	DH1	---	10.36
			DH3	---	10.35
			DH5	---	10.35
Bluetooth EDR $\pi/4$ -DQPSK	0	2402.0	2DH1	---	8.21
			2DH3	---	8.20
			2DH5	---	8.19
	39	2441.0	2DH1	---	8.45
			2DH3	---	8.44
			2DH5	---	8.36
	78	2480.0	2DH1	---	8.50
			2DH3	---	8.49
			2DH5	---	8.49
Bluetooth EDR 8DPSK	0	2402.0	3DH1	---	8.21
			3DH3	---	8.21
			3DH5	---	8.20
	39	2441.0	3DH1	---	8.45
			3DH3	---	8.44
			3DH5	---	8.36
	78	2480.0	3DH1	---	8.50
			3DH3	---	8.49
			3DH5	---	8.49

Band	CH	Frequency (MHz)	Bandwidth	Average Power (dBm)	
				MAIN (Chain B)	AUX (Chain A)
Bluetooth LE	0	2402.0	1M	---	8.17
	19	2440.0		---	8.35
	39	2480.0		---	8.43
	0	2402.0	2M	---	8.18
	19	2440.0		---	8.36
	39	2480.0		---	8.44



6.3 Antenna location

Ant	Antenna to user distance (mm)					
	Bottom of laptop	Back	Side 1	Side 2	Side 3	Side 4
WLAN ANT-MAIN	3.8	6.85	7.7	270	212.1	44.9
WLAN ANT-AUX	3.89	7.6	66.8	330.6	122	5.95
Bluetooth ANT	3.89	7.6	66.8	330.6	122	5.95

6.4 Stand-alone SAR Evaluate

Stand-alone transmission configurations as below:

Band	Bottom of laptop	Back	Side 1	Side 2	Side 3	Side 4
IEEE 802.11b	V	V	V	---	---	V
IEEE 802.11g	V	V	V	---	---	V
IEEE 802.11n 2.4 GHz 20 MHz	V	V	V	---	---	V
IEEE 802.11n 2.4 GHz 40 MHz	V	V	V	---	---	V
IEEE 802.11a	V	V	V	---	---	V
IEEE 802.11n 5 GHz 20 MHz	V	V	V	---	---	V
IEEE 802.11n 5 GHz 40 MHz	V	V	V	---	---	V
IEEE 802.11ac 80 MHz	V	V	V	---	---	V
IEEE 802.11ac 160 MHz	V	V	V	---	---	V
Bluetooth	V	V	V	---	---	V

Note: The "-" on behalf of Stand-alone SAR is not required (Refer to KDB447498 D01 v06 4.3.1 for the Standalone SAR test exclusion considerations)

NB Mode

Band	Frequency	Tune-Power		Distance of Ant. To User (mm)	Calculated value and evaluated result	
	(GHz)	(dBm)	(mW)	Bottom of laptop	Bottom of laptop	Exclusion threshold
Bluetooth	2.48	10.5	11	5	3.5 MEASURE	3
WLAN 2.4 GHz ANT-MAIN	2.462	15.5	35	5	11 MEASURE	3
WLAN 2.4 GHz ANT-AUX	2.462	9.5	9	5	2.8 EXEMPT	3
WLAN 5 GHz ANT-MAIN	5.24	9	8	5	3.7 MEASURE	3
WLAN 5 GHz ANT-AUX	5.24	8	6	5	2.7 EXEMPT	3
WLAN 5 GHz ANT-MAIN	5.3	9	8	5	3.7 MEASURE	3
WLAN 5 GHz ANT-AUX	5.32	8	6	5	2.8 EXEMPT	3
WLAN 5 GHz ANT-MAIN	5.7	10	10	5	4.8 MEASURE	3
WLAN 5 GHz ANT-AUX	5.7	8	6	5	2.9 EXEMPT	3
WLAN 5 GHz ANT-MAIN	5.825	10.5	11	5	5.3 MEASURE	3
WLAN 5 GHz ANT-AUX	5.825	8	6	5	2.9 EXEMPT	3

PAD Mode

Band	Frequency	Tune-Power		Distance of Ant. To User (mm)					Calculated value and evaluated result					
	(GHz)	(dBm)	(mW)	Back	Side1	Side2	Side3	Side4	Back	Side1	Side2	Side3	Side4	Exclusion threshold
Bluetooth	2.48	10.5	11	7.6	66.8	330.6	122	5.95	2.3 EXEMPT	263.3mW EXEMPT	2901.3mW EXEMPT	815.3mW EXEMPT	2.9 EXEMPT	3
WLAN 2.4 GHz ANT-MAIN	2.462	15.5	35	6.85	7.7	270	212.1	44.9	8 MEASURE	7.1 MEASURE	2295.6mW EXEMPT	1716.6mW EXEMPT	1.2 EXEMPT	3
WLAN 2.4 GHz ANT-AUX	2.462	16.5	45	7.6	66.8	330.6	122	5.95	9.3 MEASURE	263.6mW EXEMPT	2901.6mW EXEMPT	815.6mW EXEMPT	11.9 MEASURE	3
WLAN 5 GHz ANT-MAIN	5.24	13	20	6.85	7.7	270	212.1	44.9	6.7 MEASURE	5.9 MEASURE	2265.5mW EXEMPT	1686.5mW EXEMPT	1 EXEMPT	3
WLAN 5 GHz ANT-AUX	5.24	15	32	7.6	66.8	330.6	122	5.95	9.6 MEASURE	233.5mW EXEMPT	2871.5mW EXEMPT	785.5mW EXEMPT	12.3 MEASURE	3
WLAN 5 GHz ANT-MAIN	5.3	13	20	6.85	7.7	270	212.1	44.9	6.7 MEASURE	6 MEASURE	2265.2mW EXEMPT	1686.2mW EXEMPT	1 EXEMPT	3
WLAN 5 GHz ANT-AUX	5.32	15	32	7.6	66.8	330.6	122	5.95	9.7 MEASURE	233mW EXEMPT	2871mW EXEMPT	785mW EXEMPT	12.4 MEASURE	3
WLAN 5 GHz ANT-MAIN	5.7	12	16	6.85	7.7	270	212.1	44.9	5.6 MEASURE	5 MEASURE	2262.8mW EXEMPT	1683.8mW EXEMPT	0.9 EXEMPT	3
WLAN 5 GHz ANT-AUX	5.7	17.5	56	7.6	66.8	330.6	122	5.95	17.6 MEASURE	230.8mW EXEMPT	2868.8mW EXEMPT	782.8mW EXEMPT	22.5 MEASURE	3
WLAN 5 GHz ANT-MAIN	5.825	13.75	24	6.85	7.7	270	212.1	44.9	8.5 MEASURE	7.5 MEASURE	2262.2mW EXEMPT	1683.2mW EXEMPT	1.3 EXEMPT	3
WLAN 5 GHz ANT-AUX	5.825	17	50	7.6	66.8	330.6	122	5.95	15.9 MEASURE	230.2mW EXEMPT	2868.2mW EXEMPT	782.2mW EXEMPT	20.3 MEASURE	3



Note:

1. The tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary.
2. The test reduction for distance less than 50mm and more than 50mm. Use the max power to make sure minimum distance by evaluated for SAR testing.
3. For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following: According to KDB 447498, if the calculated threshold value are >3 then Body SAR and >7.5 then Limbs SAR testing are required.
4. For 100 MHz to 6 GHz and test separation distances > 50 mm, According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.
5. Calculated Value include string "mW", that is mean through compare output power with threshold, if the output power more than threshold value the SAR test should be perform. Otherwise, the SAR test could be exempt. (> 50 mm)
6. Calculated Value only include number format, that is mean through compare output power with threshold, if the Calculated value more than 3, the SAR test should be perform. Otherwise, the SAR test could be exempt. (<50 mm)
7. When an antenna qualifies for the standalone SAR test exclusion of KDB 447498 section 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to KDB 447498 section "4.3.2. Simultaneous transmission SAR test exclusion considerations b) "
8. We used highest frequency and power, that result should be evaluated the worst case.
9. Power and distance are rounded to the nearest mW and mm before calculation.
10. The result is rounded to one decimal place for comparison.
11. The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to KDB 447498 section 4.1 f) is applied to determine SAR test exclusion.

6.5 Simultaneous Transmitting Evaluate

Simultaneous transmission configurations as below:

Condition	Band				
	Bluetooth ANT-AUX	WLAN 2.4 GHz ANT-MAIN	WLAN 2.4 GHz ANT-AUX	WLAN 5 GHz ANT-MAIN	WLAN 5 GHz ANT-AUX
1	---	V	V	---	---
2	V	V	---	---	---
3	V	---	---	V	---
4	---	---	---	V	V
5	V	---	---	V	V

Estimated SAR

NB Mode

Band	Frequency	Tune-Power		Estimated SAR 1-g (W/kg)
	(GHz)	(dBm)	(mW)	Bottom of laptop
Bluetooth	2.48	10.5	11	---
WLAN 2.4 GHz ANT-MAIN	2.462	15.5	35	---
WLAN 2.4 GHz ANT-AUX	2.462	9.5	9	0.38
WLAN 5 GHz ANT-MAIN	5.24	9	8	---
WLAN 5 GHz ANT-AUX	5.24	8	6	0.37
WLAN 5 GHz ANT-MAIN	5.3	9	8	---
WLAN 5 GHz ANT-AUX	5.32	8	6	0.37
WLAN 5 GHz ANT-MAIN	5.7	10	10	---
WLAN 5 GHz ANT-AUX	5.7	8	6	0.38
WLAN 5 GHz ANT-MAIN	5.825	10.5	11	---
WLAN 5 GHz ANT-AUX	5.825	8	6	0.39

PAD Mode

Band	Frequency	Tune-Power		Estimated SAR 1-g (W/kg)				
	(GHz)	(dBm)	(mW)	Back	Side1	Side2	Side3	Side4
Bluetooth	2.48	10.5	11	0.3	0.4	0.4	0.4	0.39
WLAN 2.4 GHz ANT-MAIN	2.462	15.5	35	---	---	0.4	0.4	0.16
WLAN 2.4 GHz ANT-AUX	2.462	16.5	45	---	0.4	0.4	0.4	---
WLAN 5 GHz ANT-MAIN	5.24	13	20	---	---	0.4	0.4	0.14
WLAN 5 GHz ANT-AUX	5.24	15	32	---	0.4	0.4	0.4	---
WLAN 5 GHz ANT-MAIN	5.3	13	20	---	---	0.4	0.4	0.14
WLAN 5 GHz ANT-AUX	5.32	15	32	---	0.4	0.4	0.4	---
WLAN 5 GHz ANT-MAIN	5.7	12	16	---	---	0.4	0.4	0.11
WLAN 5 GHz ANT-AUX	5.7	17.5	56	---	0.4	0.4	0.4	---
WLAN 5 GHz ANT-MAIN	5.825	13.75	24	---	---	0.4	0.4	0.17
WLAN 5 GHz ANT-AUX	5.825	17	50	---	0.4	0.4	0.4	---

6.5.1 Sum of 1-g SAR of all simultaneously transmitting

When the sum of 1-g SAR of all simultaneously transmitting antennas in and operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

Sum of 1-g SAR of summary as below:

Phantom Position		Spacing (mm)	ASSY	Bluetooth ANT-AUX		2.4GHz WLAN ANT-MAIN		2.4GHz WLAN ANT-AUX		Event
				Band	SAR _{1g} (W/Kg)	Band	SAR _{1g} (W/Kg)	Band	SAR _{1g} (W/Kg)	
Flat	Bottom of laptop	0	N/A	Bluetooth	0.281	IEEE 802.11b	0.395	IEEE 802.11b	0.979	<1.6
	Back	0	N/A	Bluetooth	0.003	IEEE 802.11b	0.089	IEEE 802.11b	0.058	<1.6
	Side 1	0	N/A	Bluetooth	0.012	IEEE 802.11b	0.391	IEEE 802.11b	0.159	<1.6
	Side 2	0	N/A	Bluetooth Band	**0.4	WLAN 2.4 GHz Band	**0.4	WLAN 2.4 GHz Band	**0.4	<1.6
	Side 3	0	N/A	Bluetooth Band	**0.4	WLAN 2.4 GHz Band	**0.4	WLAN 2.4 GHz Band	**0.4	<1.6
	Side 4	0	N/A	Bluetooth	0.036	IEEE 802.11b	0.422	IEEE 802.11b	0.945	<1.6

Phantom Position		Spacing (mm)	ASSY	5GHz WLAN ANT-MAIN		5GHz WLAN ANT-AUX		Event
				Band	SAR _{1g} (W/Kg)	Band	SAR _{1g} (W/Kg)	
Flat	Bottom of laptop	0	N/A	IEEE 802.11ac 160 MHz	0.766	IEEE 802.11ac 160 MHz	1.036	<1.6
	Back	0	N/A	IEEE 802.11ac 160 MHz	0.170	IEEE 802.11ac 160 MHz	0.126	<1.6
	Side 1	0	N/A	IEEE 802.11ac 160 MHz	1.071	IEEE 802.11ac 160 MHz	0.224	<1.6
	Side 2	0	N/A	WLAN 5 GHz Band	**0.4	WLAN 5 GHz Band	**0.4	<1.6
	Side 3	0	N/A	WLAN 5 GHz Band	**0.4	WLAN 5 GHz Band	**0.4	<1.6
	Side 4	0	N/A	IEEE 802.11ac 80 MHz	0.105	IEEE 802.11ac 80 MHz	0.940	<1.6

Phantom Position		Spacing (mm)	ASSY	2.4 GHz WLAN ANT-MAIN + Bluetooth ANT AUX	2.4 GHz WLAN ANT-MAIN + 2.4 GHz WLAN ANT-AUX	5 GHz WLAN ANT-MAIN + Bluetooth ANT AUX
				$\sum$ SAR _{1g} (W/Kg)	$\sum$ SAR _{1g} (W/Kg)	$\sum$ SAR _{1g} (W/Kg)
Flat	Bottom of laptop	0	N/A	0.676	1.374	1.047
	Back	0	N/A	0.092	0.147	0.173
	Side 1	0	N/A	0.403	0.550	1.083
	Side 2	0	N/A	**0.8	**0.8	**0.8
	Side 3	0	N/A	**0.8	**0.8	**0.8
	Side 4	0	N/A	0.458	1.367	0.141

Phantom Position		Spacing (mm)	ASSY	5 GHz WLAN ANT-MAIN + 5 GHz WLAN ANT-AUX $\sum \text{SAR}_{1g} \text{ (W/Kg)}$	5 GHz WLAN ANT-MAIN + 5 GHz WLAN ANT-AUX + Bluetooth ANT AUX $\sum \text{SAR}_{1g} \text{ (W/Kg)}$
Flat	Bottom of laptop	0	N/A	1.802	2.083
	Back	0	N/A	0.296	0.299
	Side 1	0	N/A	1.295	1.307
	Side 2	0	N/A	**0.8	**0.8
	Side 3	0	N/A	**0.8	**0.8
	Side 4	0	N/A	1.045	1.081

- Note: 1. *=Estimated SAR
2. **The Estimated SAR 0.4 W/Kg , test separation distances is > 50 mm
3. When the sum of 1-g SAR of all simultaneously transmitting antennas in and operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

6.5.2 SAR to peak location separation ratio (SPLSR)

When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by $(SAR_1 + SAR_2)^{1.5}/R_i$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

5 GHz MAIN + 5 GHz AUX

Antenna	Plot.	Frequency (GHz)	SAR _{1g} (W/Kg)	Σ SAR _{1g} (W/Kg)	Antenna pair (mm)	Peak location separation ratio
5 GHz MAIN	46	5	0.766	1.802	79.28	0.03
5 GHz AUX	3	5	1.036			

Maxima and position w.r.t. Grid Reference Point associated 1g averages	
Zoom Scan (D:\Test data\2018\10\18-0788-SER_ASUS\FCC\SPLSR\46_IEEE 802.11ac 160 CH50_MCS0_Bottom of laptop_0mm_ant B_Main.da53:0/Flat)	
Max. 1 at (-107.40, -105.40, 14.34) mm	0.77 W/kg (Power Scale Factor: 1.26592)
Zoom Scan (D:\Test data\2018\10\18-0788-SER_ASUS\FCC\SPLSR\3_IEEE 802.11ac 80 CH155_MCS0_Bottom of laptop_0mm_ant A_Aux.da53:0/Flat)	
Max. 2 at (-45.40, -154.80, 13.87) mm	1.04 W/kg (Power Scale Factor: 1.46295)
Distances and Separation Ratios	
Max. 1 - Max. 2	Distance [mm]: 79.28 / Separation ratio [W/kg/mm]: 0.03

5 GHz MAIN + 5 GHz AUX + Bluetooth AUX

Antenna	Plot.	Frequency (GHz)	SAR _{1g} (W/Kg)	Σ SAR _{1g} (W/Kg)	Antenna pair (mm)	Peak location separation ratio
5 GHz MAIN	46	5	0.766	2.083	79.28	0.03
5 GHz AUX	3	5	1.036			
Bluetooth AUX	60	2.4	0.281			

5 GHz MAIN + 5GHz AUX

Maxima and position w.r.t. Grid Reference Point associated 1g averages	
Zoom Scan (D:\Test data\2018\10\18-0788-SER_ASUS\FCC\SPLSR\46_IEEE 802.11ac 160 CH50_MCS0_Bottom of laptop_0mm_ant B_Main.da53:0/Flat)	
Max. 1 at (-107.40, -105.40, 14.34) mm	0.77 W/kg (Power Scale Factor: 1.26592)
Zoom Scan (D:\Test data\2018\10\18-0788-SER_ASUS\FCC\SPLSR\3_IEEE 802.11ac 80 CH155_MCS0_Bottom of laptop_0mm_ant A_Aux.da53:0/Flat)	
Max. 2 at (-45.40, -154.80, 13.87) mm	1.04 W/kg (Power Scale Factor: 1.46295)
Distances and Separation Ratios	
Max. 1 - Max. 2	Distance [mm]: 79.28 / Separation ratio [W/kg/mm]: 0.03

5 GHz MAIN + Bluetooth AUX

Maxima and position w.r.t. Grid Reference Point associated 1g averages	
Zoom Scan (D:\Test data\2018\10\18-0788-SER_ASUS\FCC\SPLSR\46_IEEE 802.11ac 160 CH50_MCS0_Bottom of laptop_0mm_ant B_Main.da53:0/Flat)	
Max. 1 at (-107.40, -105.40, 14.34) mm	0.77 W/kg (Power Scale Factor: 1.26592)
Zoom Scan (D:\Test data\2018\10\18-0788-SER_ASUS\FCC\SPLSR\60_Bluetooth CH78_1M_Bottom of laptop_0mm_ant A_Aux.da53:0/Flat)	
Max. 2 at (-39.80, -164.00, 14.14) mm	0.28 W/kg (Power Scale Factor: 1.11435)
Distances and Separation Ratios	
Max. 1 - Max. 2	Distance [mm]: 89.46 / Separation ratio [W/kg/mm]: 0.01



6.6 SAR test reduction according to KDB

General:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC, Supplement C [June 2001], IEEE1528-2013.
- All modes of operation were investigated, and worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plots.
- Batteries are fully charged for all readings.
- When the Channel's SAR 1 g of maximum conducted power is > 0.8 mW/g, low, middle and high channel are supposed to be tested.

KDB 447498:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to IEEE1528-2013.

KDB 865664:

- Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
- When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg.
- Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
- if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

KDB 248227:

- Refer 6.1 SAR Testing with 802.11 Transmitters.

7. System Verification and Validation

7.1 Symmetric Dipoles for System Verification

Construction	Symmetrical dipole with 1/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions.
Return Loss	> 20 dB at specified verification position
Options	Dipoles for other frequencies or solutions and other calibration conditions are available upon request

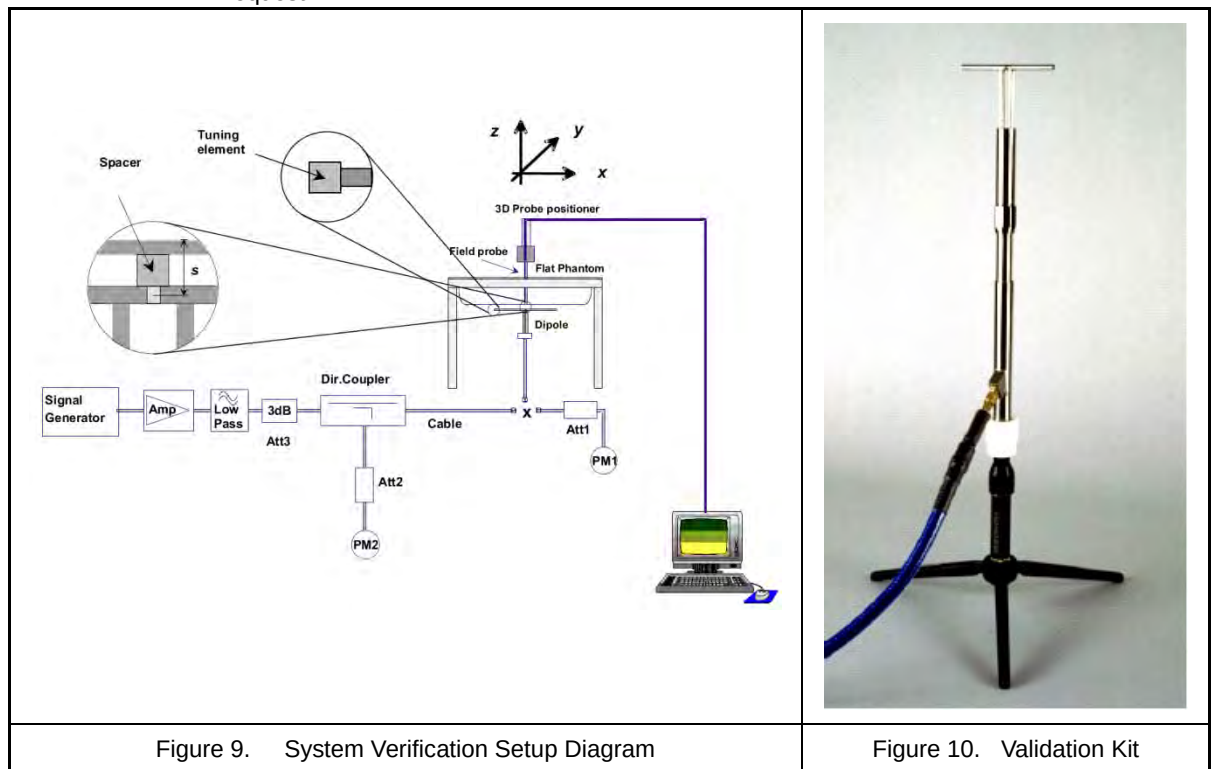


Figure 9. System Verification Setup Diagram

Figure 10. Validation Kit

7.2 Liquid Parameters

In order to comply with the target values of IEC 62209-2, we carry the same decimal place as the target value and provide it in the report. Because the gap between the values is very small, so it look same after the carry in some coefficients.

Liquid Verify								
Ambient Temperature : 22 ± 2 °C ; Relative Humidity : 40 -70 %								
Liquid Type	Frequency	Temp (°C)	Parameters	Measured Value	Target Value	Deviation (%)	Limit (%)	Measured Date
2450 (Body)	2400 MHz	22	ϵ_r	52.77	50.87	-3.60 %	±5 %	Nov. 01, 2018
			σ	1.902	1.949	2.63 %	±5 %	
	2450 MHz	22	ϵ_r	52.70	50.70	-3.80 %	±5 %	
			σ	1.950	2.004	2.56 %	±5 %	
	2500 MHz	22	ϵ_r	52.64	50.58	-3.80 %	±5 %	
			σ	2.021	2.066	2.48 %	±5 %	
5200 (Body)	5150 MHz	22	ϵ_r	49.08	48.98	-0.20 %	±5 %	Oct. 31, 2018
			σ	5.241	5.079	-3.05 %	±5 %	
	5200 MHz	22	ϵ_r	49.01	48.89	-0.20 %	±5 %	
			σ	5.299	5.154	-2.83 %	±5 %	
	5250 MHz	22	ϵ_r	48.95	48.79	-0.20 %	±5 %	
			σ	5.358	5.214	-2.80 %	±5 %	
5500 (Body)	5450 MHz	22	ϵ_r	48.68	48.34	-0.82 %	±5 %	Oct. 31, 2018
			σ	5.591	5.473	-2.15 %	±5 %	
	5500 MHz	22	ϵ_r	48.61	48.28	-0.62 %	±5 %	
			σ	5.650	5.552	-1.77 %	±5 %	
	5550 MHz	22	ϵ_r	48.54	48.16	-0.62 %	±5 %	
			σ	5.708	5.609	-1.75 %	±5 %	
5800 (Body)	5750 MHz	22	ϵ_r	48.27	47.40	-1.86 %	±5 %	Nov. 02, 2018
			σ	5.942	5.841	-1.68 %	±5 %	
	5800 MHz	22	ϵ_r	48.20	47.22	-2.08 %	±5 %	
			σ	6.000	5.956	-0.67 %	±5 %	
	5850 MHz	22	ϵ_r	48.20	47.24	-2.08 %	±5 %	
			σ	6.000	6.003	0.00 %	±5 %	
5250 (Body)	5150 MHz	22	ϵ_r	49.08	48.58	-1.02 %	±5 %	Nov. 13, 2018
			σ	5.241	5.365	2.48 %	±5 %	
	5250 MHz	22	ϵ_r	48.95	48.46	-0.82 %	±5 %	
			σ	5.358	5.425	1.31 %	±5 %	
	5350 MHz	22	ϵ_r	48.81	48.34	-1.03 %	±5 %	
			σ	5.474	5.509	0.73 %	±5 %	

Table 3. Measured Tissue dielectric parameters for body phantoms -3

7.3 Verification Summary

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. The measured SAR will be normalized to 1 W input power. The verification was performed at 2450, 5200, 5500, 5800 and 5250 MHz.

Mixture Type	Frequency (MHz)	Power	SAR _{1g} (W/Kg)	SAR _{10g} (W/Kg)	Drift (dB)	Difference percentage		Probe Model / Serial No.	Dipole Model / Serial No.	1W Target		Date
						1 g	10 g			SAR _{1g} (mW/g)	SAR _{10g} (mW/g)	
Body	2450 (Body)	250 mW	13.4	6.16	0.06	4.3 %	3.1 %	EX3DV4 SN3847	D2450V2 SN712	51.40	23.90	Nov. 01, 2018
		Normalize to 1 Watt	53.60	24.64								
Body	5200 (Body)	250 mW	7.19	1.91	0.04	-3.9 %	-8.6 %	EX3DV4 SN3847	D5200V2 SN1021	74.80	20.90	Oct. 31, 2018
		Normalize to 1 Watt	71.90	19.10								
Body	5500 (Body)	250 mW	7.62	2.11	-0.06	-6.5 %	-6.6 %	EX3DV4 SN3847	D5500V2 SN1021	81.50	22.60	Oct. 31, 2018
		Normalize to 1 Watt	76.20	21.10								
Body	5800 (Body)	250 mW	7.46	2.04	0	-4.0 %	-5.6 %	EX3DV4 SN3847	D5800V2 SN1021	77.70	21.60	Nov. 02, 2018
		Normalize to 1 Watt	74.60	20.40								
Body	5250 (Body)	250 mW	7.72	2.1	-0.02	-0.4 %	-2.3 %	EX3DV4 SN3847	D5250V2 SN1203	77.50	21.50	Nov. 13, 2018
		Normalize to 1 Watt	77.20	21.00								



7.4 Validation Summary

Per FCC KDB 865664 D02 v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters as below.

Probe Type Model / Serial No.	Prob Cal. Point (MHz)	Head / Body	Cond.	Perm.	CW Validation			Mod. Validation			Date
			ϵ_r	σ	Sensitivity	Probe	Probe	Mod. Type	Duty Factor	PAR	
						Linearity	Isotropy				
EX3DV4 SN3847	2400	Body	50.87	1.949	Pass	Pass	Pass	DSSS	N/A	Pass	Nov. 01, 2018
EX3DV4 SN3847	2402	Body	50.85	1.951	Pass	Pass	Pass	DSSS	N/A	Pass	
EX3DV4 SN3847	2412	Body	50.84	1.961	Pass	Pass	Pass	DSSS	N/A	Pass	
EX3DV4 SN3847	2441	Body	50.74	1.993	Pass	Pass	Pass	DSSS	N/A	Pass	
EX3DV4 SN3847	2450	Body	50.70	2.004	Pass	Pass	Pass	DSSS	N/A	Pass	
EX3DV4 SN3847	2462	Body	50.67	2.020	Pass	Pass	Pass	DSSS	N/A	Pass	
EX3DV4 SN3847	2480	Body	50.63	2.043	Pass	Pass	Pass	DSSS	N/A	Pass	
EX3DV4 SN3847	2500	Body	50.58	2.066	Pass	Pass	Pass	DSSS	N/A	Pass	

Probe Type Model / Serial No.	Prob Cal. Point (MHz)	Head / Body	Cond.	Perm.	CW Validation			Mod. Validation			Date
			ϵ_r	σ	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR	
EX3DV4 SN3847	5150	Body	48.98	5.079	Pass	Pass	Pass	OFDM	N/A	Pass	Oct. 31, 2018
EX3DV4 SN3847	5180	Body	48.91	5.128	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5190	Body	48.90	5.142	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5200	Body	48.89	5.154	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5210	Body	48.87	5.165	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5220	Body	48.86	5.175	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5230	Body	48.87	5.188	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5240	Body	48.81	5.199	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5250	Body	48.79	5.214	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5260	Body	48.76	5.229	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5270	Body	48.73	5.245	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5280	Body	48.72	5.26	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5290	Body	48.70	5.272	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5300	Body	48.68	5.284	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5310	Body	48.66	5.293	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5320	Body	48.64	5.303	Pass	Pass	Pass	OFDM	N/A	Pass	

Probe Type Model / Serial No.	Prob Cal. Point (MHz)	Head / Body	Cond.	Perm.	CW Validation			Mod. Validation			Date
			ϵ_r	σ	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR	
EX3DV4 SN3847	5500	Body	48.28	5.552	Pass	Pass	Pass	OFDM	N/A	Pass	Oct. 31, 2018
EX3DV4 SN3847	5510	Body	48.27	5.561	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5530	Body	48.22	5.577	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5550	Body	48.16	5.609	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5570	Body	48.08	5.639	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5580	Body	48.07	5.658	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5610	Body	48.06	5.699	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5620	Body	48.05	5.708	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5630	Body	48.03	5.717	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5660	Body	47.94	5.760	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5670	Body	47.89	5.768	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5690	Body	47.84	5.805	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5700	Body	47.83	5.822	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5710	Body	47.83	5.835	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5720	Body	47.83	5.846	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5745	Body	47.40	5.836	Pass	Pass	Pass	OFDM	N/A	Pass	Nov. 02, 2018
EX3DV4 SN3847	5750	Body	47.40	5.841	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5755	Body	47.40	5.856	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5775	Body	47.25	5.894	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5785	Body	47.22	5.920	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5795	Body	47.21	5.947	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5800	Body	47.22	5.956	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5825	Body	47.27	5.984	Pass	Pass	Pass	OFDM	N/A	Pass	

Probe Type Model / Serial No.	Prob Cal. Point (MHz)	Head / Body	Cond.	Perm.	CW Validation			Mod. Validation			Date
			ϵ_r	σ	Sensitivity	Probe	Probe	Mod. Type	Duty Factor	PAR	
						Linearity	Isotropy				
EX3DV4 SN3847	5150	Body	48.69	5.280	Pass	Pass	Pass	OFDM	N/A	Pass	Nov. 13, 2018
EX3DV4 SN3847	5180	Body	48.60	5.328	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5190	Body	48.59	5.347	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5200	Body	48.58	5.365	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5210	Body	48.56	5.381	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5220	Body	48.55	5.393	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5230	Body	48.53	5.405	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5240	Body	48.49	5.414	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5250	Body	48.46	5.425	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5260	Body	48.43	5.439	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5270	Body	48.4	5.453	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5280	Body	48.38	5.471	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5290	Body	48.36	5.49	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5300	Body	48.34	5.509	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5310	Body	48.33	5.525	Pass	Pass	Pass	OFDM	N/A	Pass	
EX3DV4 SN3847	5320	Body	48.32	5.538	Pass	Pass	Pass	OFDM	N/A	Pass	

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Cal. Date	Cal.Period
SPEAG	2450 MHz System Validation Kit	D2450V2	712	04/09/2018	1 year
SPEAG	5 GHz System Validation Kit	D5GHzV2	1021	04/30/2018	1 year
SPEAG	5 GHz System Validation Kit	D5GHzV2	1203	12/14/2017	1 year
SPEAG	Dosimetric E-Field Probe	EX3DV4	3847	04/26/2018	1 year
SPEAG	Data Acquisition Electronics	DAE4	541	03/22/2018	1 year
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Phantom	ELI V4.0	1036	NCR	
SPEAG	Robot	Staubli TX90XL	F07/564ZA1/A/01	NCR	
SPEAG	Software	DASY52 V52.10 (0)	N/A	NCR	
SPEAG	Software	SEMCAD X V14.6.10(7417)	N/A	NCR	
Agilent	ENA Series Network Analyzer	E5071B	MY42404655	04/17/2018	1 year
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	
HILA	Digital Thermometer	TM-906	GF-006	05/22/2018	1 year
Agilent	Power Sensor	8481H	3318A20779	06/12/2018	1 year
Agilent	Power Meter	EDM Series E4418B	GB40206143	06/12/2018	1 year
Agilent	Signal Generator	E8257D	MY44320425	03/08/2018	1 year
Agilent	Dual Directional Coupler	778D	50334	NCR	
Woken	Dual Directional Coupler	0100AZ20200801O	11012409517	NCR	
Mini-Circuits	Power Amplifier	EMC014225P	980292	NCR	
Mini-Circuits	Power Amplifier	EMC2830P	980293	NCR	
Aisi	Attenuator	IEAT 3dB	N/A	NCR	

Table 1. Test Equipment List



9. **Measurement Uncertainty**

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR_{1g} to be less than $\pm 21.88\%$ for 300 MHz ~ 3 GHz and 3 GHz ~ 6 GHz $\pm 25.37\%$ [8] .

According to Std. C95.3 [9], the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ± 1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ± 2 dB can be expected.

Uncertainty of a Measure SAR of EUT with DASY System

Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	c_i (1 g)	c_i (10 g)	Std. Unc. (1-g)	Std. Unc. (10-g)	v_i or V_{eff}
Measurement System									
u1	Probe Calibration ($k=1$)	$\pm 6.0 \%$	Normal	1	1	1	$\pm 6.0 \%$	$\pm 6.0 \%$	∞
u2	Axial Isotropy	$\pm 4.7 \%$	Rectangular	$\sqrt{3}$	0.7	0.7	$\pm 1.9 \%$	$\pm 1.9 \%$	∞
u3	Hemispherical Isotropy	$\pm 9.6 \%$	Rectangular	$\sqrt{3}$	0.7	0.7	$\pm 3.9 \%$	$\pm 3.9 \%$	
u4	Boundary Effect	$\pm 1.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6 \%$	$\pm 0.6 \%$	∞
u5	Linearity	$\pm 4.7 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.7 \%$	$\pm 2.7 \%$	∞
u6	System Detection Limit	$\pm 1.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6 \%$	$\pm 0.6 \%$	∞
u7	Readout Electronics	$\pm 0.3 \%$	Normal	1	1	1	$\pm 0.3 \%$	$\pm 0.3 \%$	∞
u8	Response Time	$\pm 0.8 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.5 \%$	$\pm 0.5 \%$	∞
u9	Integration Time	$\pm 1.9 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.1 \%$	$\pm 1.1 \%$	∞
u10	RF Ambient Conditions	$\pm 3.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u11	RF Ambient Reflections	$\pm 3.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u12	Probe Positioner Mechanical Tolerance	$\pm 0.4 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.2 \%$	$\pm 0.2 \%$	∞
u13	Probe Positioning with respect to Phantom Shell	$\pm 2.9 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u14	Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	$\pm 1.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6 \%$	$\pm 0.6 \%$	∞
Test sample Related									
u15	Test sample Positioning	$\pm 2.9 \%$	Normal	1	1	1	$\pm 2.9 \%$	$\pm 2.9 \%$	89
u16	Device Holder Uncertainty	$\pm 3.6 \%$	Normal	1	1	1	$\pm 3.6 \%$	$\pm 3.6 \%$	5
u17	Output Power Variation - SAR drift measurement	$\pm 5.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.9 \%$	$\pm 2.9 \%$	∞
Phantom and Tissue Parameters									
u18	Phantom Uncertainty (shape and thickness tolerances)	$\pm 4.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.3 \%$	$\pm 2.3 \%$	∞
u19	Liquid Conductivity - deviation from target values	$\pm 5.0 \%$	Rectangular	$\sqrt{3}$	0.64	0.43	$\pm 1.8 \%$	$\pm 1.2 \%$	∞
u20	Liquid Conductivity - measurement uncertainty	$\pm 2.5 \%$	Normal	1	0.64	0.43	$\pm 1.6 \%$	$\pm 1.08 \%$	69
u21	Liquid Permittivity - deviation from target values	$\pm 5.0 \%$	Rectangular	$\sqrt{3}$	0.6	0.49	$\pm 1.7 \%$	$\pm 1.4 \%$	∞
u22	Liquid Permittivity - measurement uncertainty	$\pm 2.5 \%$	Normal	1	0.6	0.49	$\pm 1.5 \%$	$\pm 1.23 \%$	69
Combined standard uncertainty			RSS				$\pm 10.94 \%$	$\pm 10.71 \%$	380
Expanded uncertainty (95 % CONFIDENCE LEVEL)			$k=2$				$\pm 21.88 \%$	$\pm 21.41 \%$	

Table 2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Uncertainty of a Measure SAR of EUT with DASY System

Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	c_i (1 g)	c_i (10 g)	Std. Unc. (1-g)	Std. Unc. (10-g)	v_i or V_{eff}
Measurement System									
u1	Probe Calibration ($k=1$)	$\pm 6.5 \%$	Normal	1	1	1	$\pm 6.5 \%$	$\pm 6.5 \%$	∞
u2	Axial Isotropy	$\pm 4.7 \%$	Rectangular	$\sqrt{3}$	0.7	0.7	$\pm 1.9 \%$	$\pm 1.9 \%$	∞
u3	Hemispherical Isotropy	$\pm 9.6 \%$	Rectangular	$\sqrt{3}$	0.7	0.7	$\pm 3.9 \%$	$\pm 3.9 \%$	
u4	Boundary Effect	$\pm 2.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.2 \%$	$\pm 1.2 \%$	∞
u5	Linearity	$\pm 4.7 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.7 \%$	$\pm 2.7 \%$	∞
u6	System Detection Limit	$\pm 1.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6 \%$	$\pm 0.6 \%$	∞
u7	Readout Electronics	$\pm 0.0 \%$	Normal	1	1	1	$\pm 0.0 \%$	$\pm 0.0 \%$	∞
u8	Response Time	$\pm 0.8 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.5 \%$	$\pm 0.5 \%$	∞
u9	Integration Time	$\pm 2.8 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.8 \%$	$\pm 2.8 \%$	∞
u10	RF Ambient Conditions	$\pm 3.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u11	RF Ambient Reflections	$\pm 3.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u12	Probe Positioner Mechanical Tolerance	$\pm 0.7 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.7 \%$	$\pm 0.7 \%$	∞
u13	Probe Positioning with respect to Phantom Shell	$\pm 9.9 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 5.7 \%$	$\pm 5.7 \%$	∞
u14	Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	$\pm 3.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
Test sample Related									
u15	Test sample Positioning	$\pm 2.9 \%$	Normal	1	1	1	$\pm 2.9 \%$	$\pm 2.9 \%$	89
u16	Device Holder Uncertainty	$\pm 3.6 \%$	Normal	1	1	1	$\pm 3.6 \%$	$\pm 3.6 \%$	5
u17	Output Power Variation - SAR drift measurement	$\pm 5.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.9 \%$	$\pm 2.9 \%$	∞
Phantom and Tissue Parameters									
u18	Phantom Uncertainty (shape and thickness tolerances)	$\pm 4.0 \%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.3 \%$	$\pm 2.3 \%$	∞
u19	Liquid Conductivity - deviation from target values	$\pm 5.0 \%$	Rectangular	$\sqrt{3}$	0.64	0.43	$\pm 1.8 \%$	$\pm 1.2 \%$	∞
u20	Liquid Conductivity - measurement uncertainty	$\pm 2.5 \%$	Normal	1	0.64	0.43	$\pm 1.6 \%$	$\pm 1.08 \%$	69
u21	Liquid Permittivity - deviation from target values	$\pm 5.0 \%$	Rectangular	$\sqrt{3}$	0.6	0.49	$\pm 1.7 \%$	$\pm 1.4 \%$	∞
u22	Liquid Permittivity - measurement uncertainty	$\pm 2.5 \%$	Normal	1	0.6	0.49	$\pm 1.5 \%$	$\pm 1.23 \%$	69
Combined standard uncertainty			RSS				$\pm 12.68 \%$	$\pm 12.48 \%$	700
Expanded uncertainty (95 % CONFIDENCE LEVEL)			$k=2$				$\pm 25.37 \%$	$\pm 24.97 \%$	

Table 3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

10. Measurement Procedure

The measurement procedures are as follows:

1. For WLAN function, engineering testing software installed on Notebook can provide continuous transmitting signal.
2. Measure output power through RF cable and power meter
3. Set scan area, grid size and other setting on the DASY software
4. Find out the largest SAR result on these testing positions of each band
5. Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

1. Power reference measurement
2. Area scan
3. Zoom scan
4. Power drift measurement

10.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1 g and 10 g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages

1. Extraction of the measured data (grid and values) from the Zoom Scan
2. Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. Generation of a high-resolution mesh within the measured volume
4. Interpolation of all measured values from the measurement grid to the high-resolution grid
5. Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. Calculation of the averaged SAR within masses of 1 g and 10 g



10.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures points and step size follow as below. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

Grid Type	Frequency		Step size (mm)			X*Y*Z (Point)	Cube size			Step size		
			X	Y	Z		X	Y	Z	X	Y	Z
uniform grid	≤ 3 GHz	≤ 2 GHz	≤ 8	≤ 8	≤ 5	5*5*7	32	32	30	8	8	5
		2 G – 3 G	≤ 5	≤ 5	≤ 5	7*7*7	30	30	30	5	5	5
	3 – 6 GHz	3 – 4 GHz	≤ 5	≤ 5	≤ 4	7*7*8	30	30	28	5	5	4
		4 – 5 GHz	≤ 4	≤ 4	≤ 3	8*8*10	28	28	27	4	4	3
		5 – 6 GHz	≤ 4	≤ 4	≤ 2	8*8*12	28	28	22	4	4	2

(Our measure settings are refer KDB Publication 865664 D01v01r04)

10.3 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1 g aggregate SAR, the DUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

10.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. 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. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

10.5 Power Drift Monitoring

All SAR testing is under the DUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of DUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5 %, the SAR will be retested.

11. SAR Test Results Summary

Note:

1. According to KDB 248227 D01 Section 5.2.1, SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:
 - a. When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
 - b. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.
2. According to KDB 248227 D01 Section 5.2.2, when SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
 - a. When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
 - b. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
3. According to KDB 248227 D01 Section 5.3.2, The initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures.
 - a. When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined by applying the following steps sequentially.
 - 1) The largest channel bandwidth configuration is selected among the multiple configurations in a frequency band with the same specified maximum output power.
 - 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
 - 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
 - 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.
 - b. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
 - 1) The channel closest to mid-band frequency is selected for SAR measurement.
 - 2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

11.1 Head SAR Measurement

Evaluated head SAR is not available.



11.2 Body SAR Measurement

INPAQ Antenna													
Measurement Results													
Index	Band	Mode	Frequency		Data Rate	Test Position	Spacing (mm)	SAR _{1g} (W/Kg)	Burst Avg Power	Max tune-up	Duty Cycle %	Reported SAR _{1g}	Note
			Ch.	MHz									
#13	WLAN 2.4 GHz	802.11b	1	2412.0	1Mbps	Bottom of laptop (NB mode)	0	0.39	15.49	15.5	98.95	0.395	ANT-MAIN
#43	WLAN 2.4 GHz	802.11b	1	2412.0	1Mbps	Back (PAD mode)	0	0.088	15.49	15.5	98.95	0.089	ANT-MAIN
#15	WLAN 2.4 GHz	802.11b	1	2412.0	1Mbps	Side 1 (PAD mode)	0	0.386	15.49	15.5	98.95	0.391	ANT-MAIN
#21	WLAN 2.4 GHz	802.11b	1	2412.0	1Mbps	Side 4 (PAD mode)	0	0.416	15.49	15.5	98.95	0.422	ANT-MAIN
#14	WLAN 2.4 GHz	802.11b	11	2462.0	1Mbps	Bottom of laptop (NB mode)	0	0.923	9.37	9.5	98.95	0.962	ANT-AUX
#17	WLAN 2.4 GHz	802.11b	1	2412.0	1Mbps	Bottom of laptop (NB mode)	0	0.916	9.30	9.5	98.95	0.970	ANT-AUX
#18	WLAN 2.4 GHz	802.11b	6	2437.0	1Mbps	Bottom of laptop (NB mode)	0	0.938	9.36	9.5	98.95	0.979	ANT-AUX
#44	WLAN 2.4 GHz	802.11b	11	2462.0	1Mbps	Back (PAD mode)	0	0.056	16.39	16.5	98.95	0.058	ANT-AUX
#22	WLAN 2.4 GHz	802.11b	11	2462.0	1Mbps	Side 1 (PAD mode)	0	0.153	16.39	16.5	98.95	0.159	ANT-AUX
#16	WLAN 2.4 GHz	802.11b	11	2462.0	1Mbps	Side 4 (PAD mode)	0	0.911	16.39	16.5	98.95	0.945	ANT-AUX
#19	WLAN 2.4 GHz	802.11b	1	2412.0	1Mbps	Side 4 (PAD mode)	0	0.855	16.31	16.5	98.95	0.903	ANT-AUX
#20	WLAN 2.4 GHz	802.11b	6	2437.0	1Mbps	Side 4 (PAD mode)	0	0.899	16.33	16.5	98.95	0.945	ANT-AUX
#60	Bluetooth	---	78	2480.0	1Mbps	Bottom of laptop (NB mode)	0	0.252	10.36	10.5	77.20	0.281	ANT-AUX
#61	Bluetooth	---	78	2480.0	1Mbps	Back (PAD mode)	0	0.00299	10.36	10.5	77.20	0.003	ANT-AUX
#62	Bluetooth	---	78	2480.0	1Mbps	Side 1 (PAD mode)	0	0.011	10.36	10.5	77.20	0.012	ANT-AUX
#63	Bluetooth	---	78	2480.0	1Mbps	Side 4 (PAD mode)	0	0.032	10.36	10.5	77.20	0.036	ANT-AUX

Measurement Results													
Index	Band	Mode	Frequency		Data Rate	Test Position	Spacing (mm)	SAR _{1g} (W/Kg)	Burst Avg Power	Max tune-up	Duty Cycle %	Reported SAR _{1g}	Note
			Ch.	MHz									
#6	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Bottom of laptop (NB mode)	0	0.512	8.89	9	91.97	0.571	ANT-MAIN
#27	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Back (PAD mode)	0	0.118	12.78	13	91.97	0.135	ANT-MAIN
#7	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Side 1 (PAD mode)	0	0.689	12.78	13	91.97	0.788	ANT-MAIN
#23	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Side 4 (PAD mode)	0	0.055	12.78	13	91.97	0.063	ANT-MAIN
#1	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Bottom of laptop (NB mode)	0	0.847	7.97	8	91.97	0.927	ANT-AUX
#28	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Back (PAD mode)	0	0.102	14.75	15	91.97	0.117	ANT-AUX
#25	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Side 1 (PAD mode)	0	0.091	14.75	15	91.97	0.105	ANT-AUX
#12	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Side 4 (PAD mode)	0	0.723	14.75	15	91.97	0.832	ANT-AUX
#46	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Bottom of laptop (NB mode)	0	0.605	8.68	9	85.00	0.766	ANT-MAIN
#47	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Back (PAD mode)	0	0.128	12.46	13	85.00	0.170	ANT-MAIN
#48	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Side 1 (PAD mode)	0	0.804	12.46	13	85.00	1.071	ANT-MAIN
#49	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Side 4 (PAD mode)	0	0.05	12.46	13	85.00	0.067	ANT-MAIN
#50	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Bottom of laptop (NB mode)	0	0.846	7.91	8	85.00	1.016	ANT-AUX
#51	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Back (PAD mode)	0	0.078	14.65	15	85.00	0.099	ANT-AUX
#52	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Side 1 (PAD mode)	0	0.093	14.65	15	85.00	0.119	ANT-AUX
#53	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Side 4 (PAD mode)	0	0.717	14.65	15	85.00	0.914	ANT-AUX
#5	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Bottom of laptop (NB mode)	0	0.594	9.96	10	91.97	0.652	ANT-MAIN
#29	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Back (PAD mode)	0	0.092	11.89	12	91.97	0.103	ANT-MAIN
#8	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Side 1 (PAD mode)	0	0.558	11.89	12	91.97	0.622	ANT-MAIN
#30	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Side 4 (PAD mode)	0	0.038	11.89	12	91.97	0.042	ANT-MAIN
#2	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Bottom of laptop (NB mode)	0	0.748	7.12	8	91.97	0.996	ANT-AUX

Measurement Results													
Index	Band	Mode	Frequency		Data Rate	Test Position	Spacing (mm)	SAR _{1g} (W/Kg)	Burst Avg Power	Max tune-up	Duty Cycle %	Reported SAR _{1g}	Note
			Ch.	MHz									
#31	WLAN 5 GHz	802.11ac 80 MHz	106	5530.0	MCS0	Bottom of laptop (NB mode)	0	0.622	7.07	8	91.97	0.838	ANT-AUX
#32	WLAN 5 GHz	802.11ac 80 MHz	122	5610.0	MCS0	Bottom of laptop (NB mode)	0	0.66	7.04	8	91.97	0.895	ANT-AUX
#33	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Back (PAD mode)	0	0.116	17.49	17.5	91.97	0.126	ANT-AUX
#11	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Side 1 (PAD mode)	0	0.206	17.49	17.5	91.97	0.224	ANT-AUX
#34	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Side 4 (PAD mode)	0	0.863	17.49	17.5	91.97	0.940	ANT-AUX
#35	WLAN 5 GHz	802.11ac 80 MHz	106	5530.0	MCS0	Side 4 (PAD mode)	0	0.64	15.86	16	91.97	0.718	ANT-AUX
#36	WLAN 5 GHz	802.11ac 80 MHz	122	5610.0	MCS0	Side 4 (PAD mode)	0	0.783	17.47	17.5	91.97	0.857	ANT-AUX
#4	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Bottom of laptop (NB mode)	0	0.516	9.77	10.5	91.97	0.664	ANT-MAIN
#39	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Back (PAD mode)	0	0.103	13.60	13.75	91.97	0.116	ANT-MAIN
#9	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Side 1 (PAD mode)	0	0.594	13.60	13.75	91.97	0.668	ANT-MAIN
#40	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Side 4 (PAD mode)	0	0.093	13.60	13.75	91.97	0.105	ANT-MAIN
#3	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Bottom of laptop (NB mode)	0	0.708	6.71	8	91.97	1.036	ANT-AUX
#41	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Back (PAD mode)	0	0.05	16.69	17	91.97	0.058	ANT-AUX
#10	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Side 1 (PAD mode)	0	0.169	16.69	17	91.97	0.197	ANT-AUX
#42	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Side 4 (PAD mode)	0	0.694	16.69	17	91.97	0.810	ANT-AUX

ACON Antenna													
Measurement Results													
Index	Band	Mode	Frequency		Data Rate	Test Position	Spacing (mm)	SAR _{1g} (W/Kg)	Burst Avg Power	Max tune-up	Duty Cycle %	Reported SAR _{1g}	Note
			Ch.	MHz									
#67	WLAN 5 GHz	802.11ac 160 MHz	50	5250.0	MCS0	Side 1 (PAD mode)	0	0.581	12.46	13	85.00	0.774	ANT-MAIN
#66	WLAN 5 GHz	802.11ac 80 MHz	155	5775.0	MCS0	Bottom of laptop (NB mode)	0	0.536	6.71	8	91.97	0.784	ANT-AUX



11.3 Hot-spot mode SAR Measurement

Hot-spot mode SAR is not available.

11.4 Extremity (wrist or ankle) SAR Measurement

Evaluated extremity SAR is not available.

11.5 SAR Variability Measurement

Measurement Results										
Index	Band	Mode	Frequency		Data Rate	Test Position	Spacing (mm)	Note	Original SAR _{1g} (W/Kg)	First SAR _{1g} (W/Kg)
			Ch.	MHz						
#48	WLAN 2.4 GHz	802.11b	6	2437.0	1Mbps	Bottom of laptop (NB mode)	0	original #18_once	0.938	0.892
#35	WLAN 5 GHz	802.11ac 80 MHz	58	5290.0	MCS0	Bottom of laptop (NB mode)	0	original #1_once	0.847	0.827
#37	WLAN 5 GHz	802.11ac 80 MHz	138	5690.0	MCS0	Side 4 (PAD mode)	0	original #34_once	0.863	0.807

Detailed evaluations please refer KDB 865664 on "SAR test reduction according to KDB" section.

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

- 1.The original highest measured Reported SAR 1 g is ≥ 0.80 W/kg, repeat that measurement once.
- 2.Perform a second repeated measurement the ratio of largest to smallest SAR for the original and first repeated measurements is < 1.2 , the original or repeated measurement is ≥ 1.45 W/kg (~ 10 % from the 1-g SAR limit).

11.6 Std. C95.1-1992 RF Exposure Limit

Human Exposure	Population Uncontrolled Exposure (W/kg) or (mW/g)	Occupational Controlled Exposure (W/kg) or (mW/g)
Spatial Peak SAR* (head)	1.60	8.00
Spatial Peak SAR** (Whole Body)	0.08	0.40
Spatial Peak SAR*** (Partial-Body)	1.60	8.00
Spatial Peak SAR**** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 4. Safety Limits for Partial Body Exposure

Notes :

- * The Spatial Peak value of the SAR averaged over any 1 gram of tissue.
(defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- ** The Spatial Average value of the SAR averaged over the whole – body.
- *** The Spatial Average value of the SAR averaged over the partial – body.
- **** The Spatial Peak value of the SAR averaged over any 10 grams of tissue.
(defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Population / Uncontrolled Environments : are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational / Controlled Environments : are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

12. References

- [1] Std. C95.1-1999, "American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz", New York.
- [2] NCRP, National Council on Radiation Protection and Measurements, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields", NCRP report NO. 86, 1986.
- [3] T. Schmid, O. Egger, and N. Kuster, "Automatic E-field scanning system for dosimetric assessments", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.
- [4] K. Pokovi^c, T. Schmid, and N. Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.
- [5] K. Pokovi^c, T. Schmid, and N. Kuster, "E-field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.
- [6] N. Kuster, and Q. Balzano, "Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz", IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.
- [7] Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988 , pp. 139-148.
- [8] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.
- [9] Std. C95.3-1991, "IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave, New York: IEEE, Aug. 1992.
- [10] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10KHz-300GHz, Jan. 1995.
- [11] IEEE Std 1528™-2013 - IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques

Appendix A - System Performance Check

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 03:47:44

System Performance Check at 2450MHz_20181101_Body

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.004$ S/m; $\epsilon_r = 50.705$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 2450MHz/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 23.6 W/kg

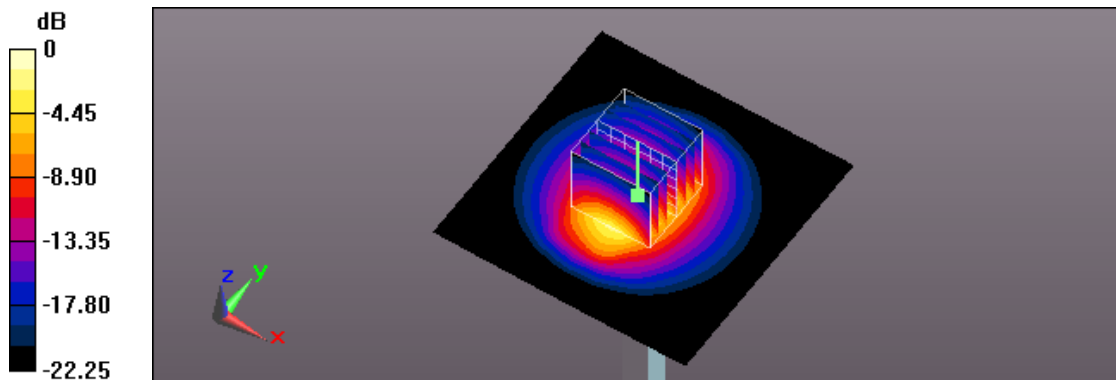
System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 107.3 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 29.1 W/kg

SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.16 W/kg

Maximum value of SAR (measured) = 23.0 W/kg



0 dB = 23.0 W/kg = 13.62 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 03:45:36

System Performance Check at 5200MHz_20181031_Body

DUT: Dipole 5GHzV2; Type: D5GHz; Serial: 1021

Communication System: UID 0, CW (0); Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.154 \text{ S/m}$; $\epsilon_r = 48.885$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 5200MHz/Area Scan (91x91x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 16.3 W/kg

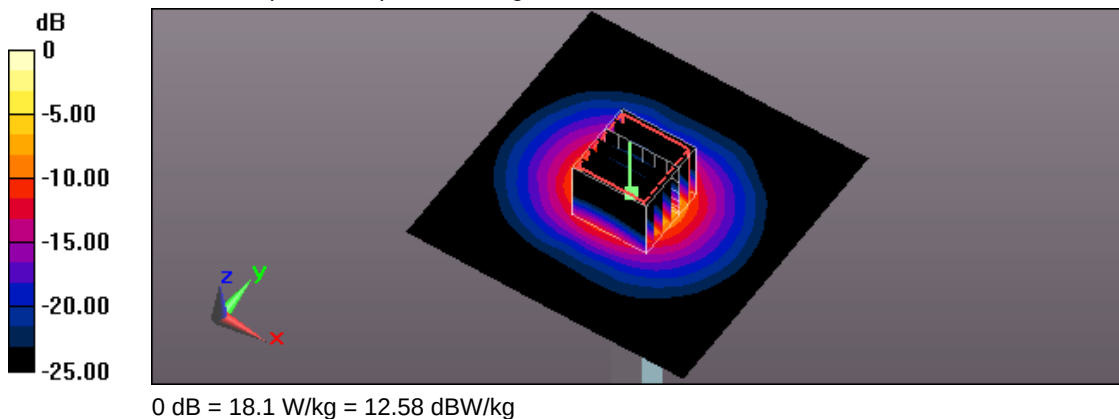
System Performance Check at 5200MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 66.96 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 30.2 W/kg

SAR(1 g) = 7.19 W/kg; SAR(10 g) = 1.94 W/kg

Maximum value of SAR (measured) = 18.1 W/kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 02:11:38

System Performance Check at 5250MHz_20181113_Body

DUT: Dipole 5GHzV2; Type: D5GHz; Serial: 1023

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.425 \text{ S/m}$; $\epsilon_r = 48.458$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 5250MHz/Area Scan (91x91x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 18.4 W/kg

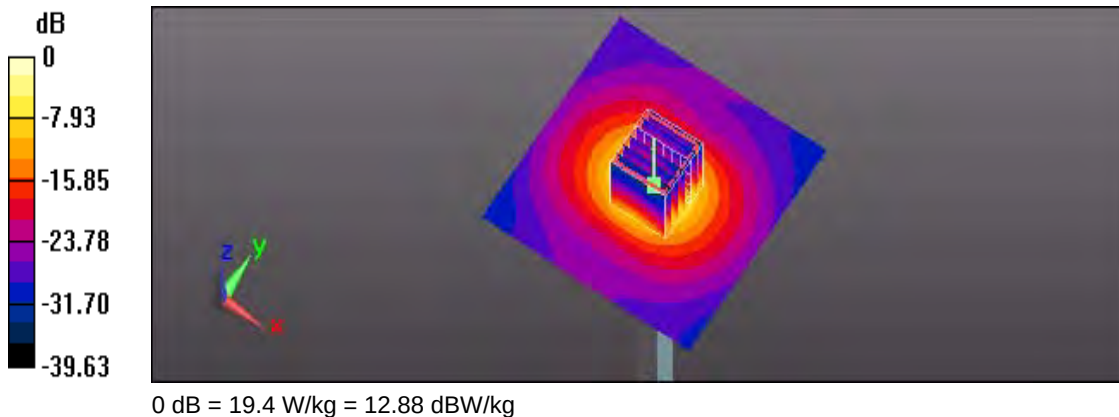
System Performance Check at 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 69.49 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.1 W/kg

Maximum value of SAR (measured) = 19.4 W/kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 05:02:31

System Performance Check at 5500MHz_20181031_Body

DUT: Dipole 5GHzV2; Type: D5GHz; Serial: 1021

Communication System: UID 0, CW (0); Frequency: 5500 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.552$ S/m; $\epsilon_r = 48.279$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.28, 4.28, 4.28); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 5500MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.9 W/kg

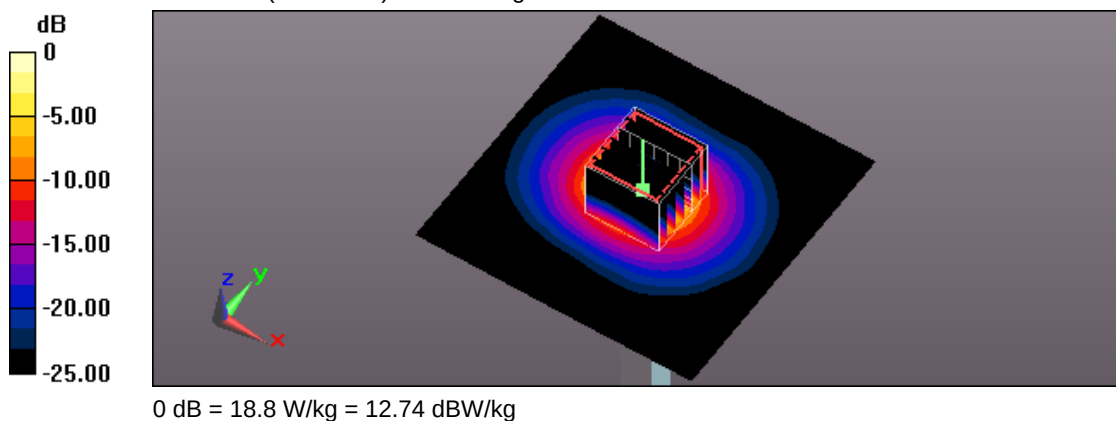
System Performance Check at 5500MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.11 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 34.6 W/kg

SAR(1 g) = 7.62 W/kg; SAR(10 g) = 2.11 W/kg

Maximum value of SAR (measured) = 18.8 W/kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 PM 05:53:42

System Performance Check at 5800MHz_20181102_Body

DUT: Dipole 5GHzV2; Type: D5GHz; Serial: 1021

Communication System: UID 0, CW (0); Frequency: 5800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.956 \text{ S/m}$; $\epsilon_r = 47.221$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 5800MHz/Area Scan (91x91x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 19.2 W/kg

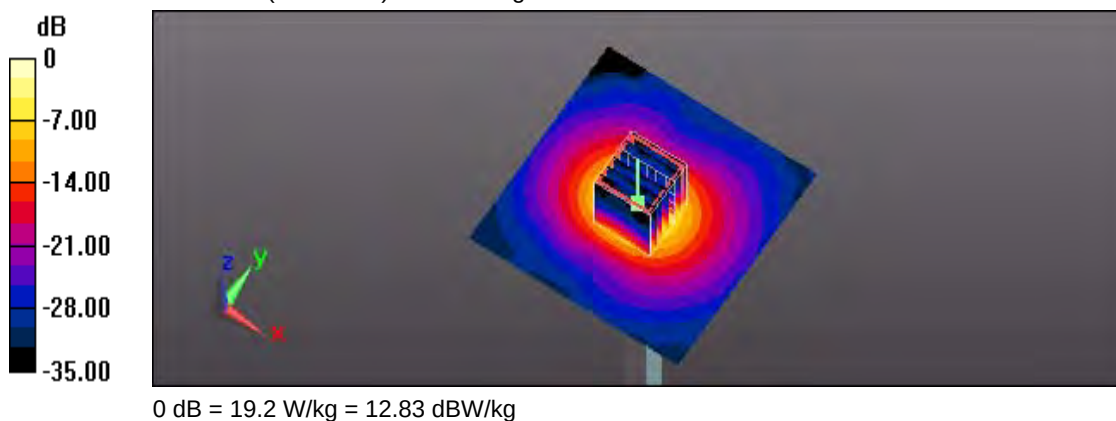
System Performance Check at 5800MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 66.30 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 38.6 W/kg

SAR(1 g) = 7.46 W/kg; SAR(10 g) = 2.04 W/kg

Maximum value of SAR (measured) = 19.2 W/kg



Appendix B - SAR Measurement Data

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 04:59:34

13_IEEE 802.11b CH1_1M_Bottom of laptop_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2412 MHz; Duty Cycle: 1:1.01065

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.961$ S/m; $\epsilon_r = 50.837$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (81x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.787 W/kg

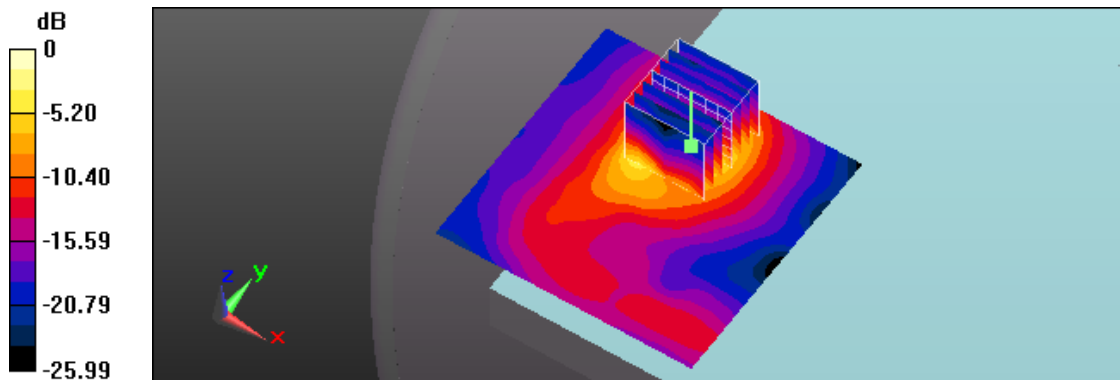
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 15.79 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.390 W/kg; SAR(10 g) = 0.148 W/kg

Maximum value of SAR (measured) = 0.784 W/kg



0 dB = 0.784 W/kg = -1.06 dBW/kg

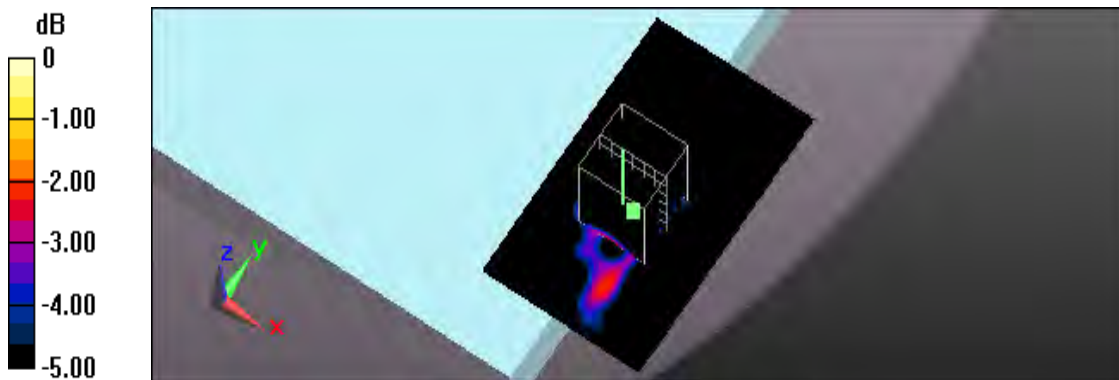
Test Laboratory: A Test Lab Techno Corp.
 Date/Time: 2018/11/2 PM 00:14:31
 43_IEEE 802.11b CH1_1M_Back_0mm_ant B_Main
DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2412 MHz; Duty Cycle: 1:1.01065
 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.961 \text{ S/m}$; $\epsilon_r = 50.837$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
 DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (61x101x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.135 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
 Reference Value = 8.680 V/m; Power Drift = 0.11 dB
 Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.088 W/kg; SAR(10 g) = 0.044 W/kg
 Maximum value of SAR (measured) = 0.146 W/kg



0 dB = 0.146 W/kg = -8.36 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 06:26:57

15_IEEE 802.11b CH1_1M_Side 1_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2412 MHz; Duty Cycle: 1:1.011

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.961$ S/m; $\epsilon_r = 50.837$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.604 W/kg

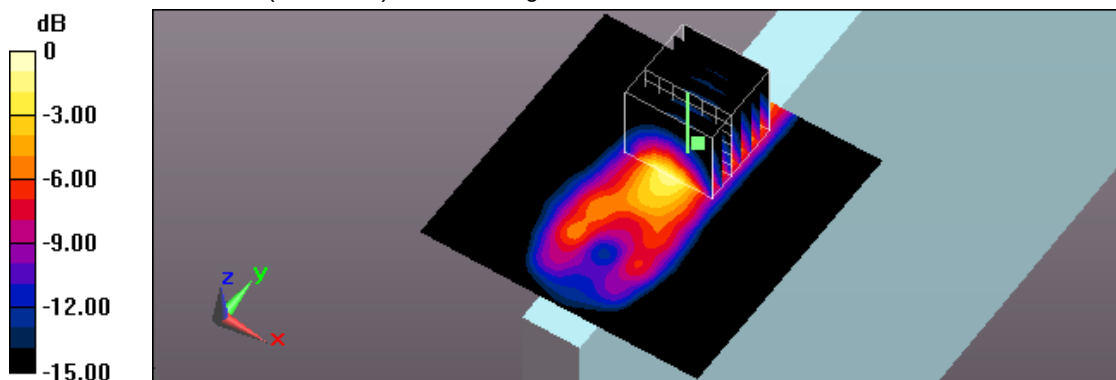
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.02 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.823 W/kg

SAR(1 g) = 0.386 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.618 W/kg



0 dB = 0.618 W/kg = -2.09 dBW/kg

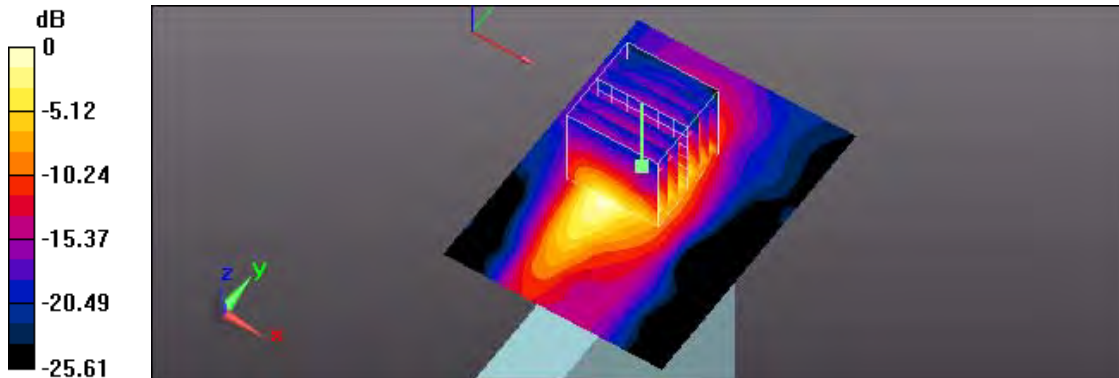
Test Laboratory: A Test Lab Techno Corp.
 Date/Time: 2018/11/2 AM 09:04:52
 21_ IEEE 802.11b CH1_1M_Side 4_0mm_ant B_Main
DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2412 MHz; Duty Cycle: 1:1.01065
 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.961 \text{ S/m}$; $\epsilon_r = 50.837$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
 DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (61x81x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$
 Maximum value of SAR (interpolated) = 1.04 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
 Reference Value = 17.09 V/m; Power Drift = -0.71 dB
 Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.416 W/kg; SAR(10 g) = 0.185 W/kg
 Maximum value of SAR (measured) = 0.791 W/kg



0 dB = 0.791 W/kg = -1.02 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 08:32:48

14_IEEE 802.11b CH11_1M_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1.01065

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.02 \text{ S/m}$; $\epsilon_r = 50.67$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.942 W/kg

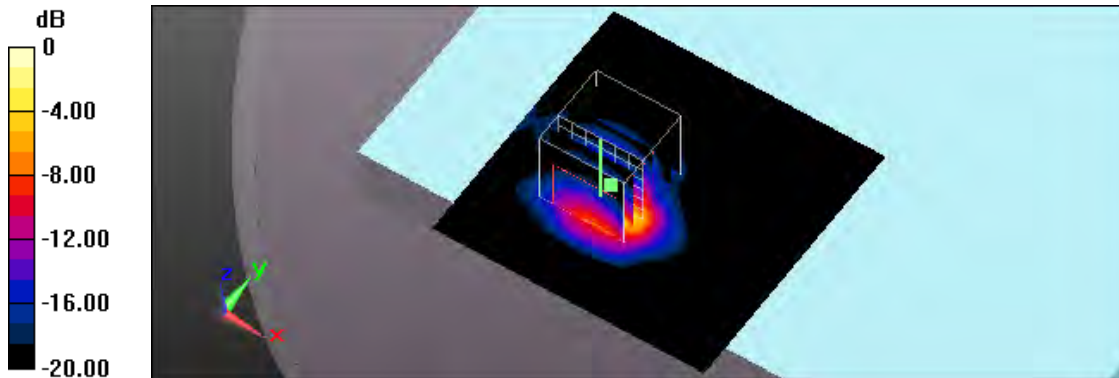
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.41 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 2.55 W/kg

SAR(1 g) = 0.923 W/kg; SAR(10 g) = 0.325 W/kg

Maximum value of SAR (measured) = 1.74 W/kg



0 dB = 1.74 W/kg = 2.41 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 00:41:48

17_ IEEE 802.11b CH1_1M_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2412 MHz; Duty Cycle: 1:1.01065

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.961$ S/m; $\epsilon_r = 50.837$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

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

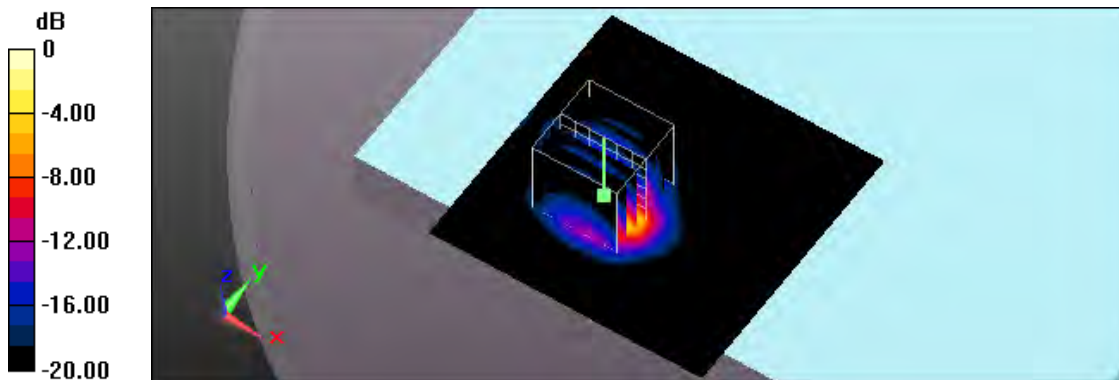
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.79 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 2.34 W/kg

SAR(1 g) = 0.916 W/kg; SAR(10 g) = 0.321 W/kg

Maximum value of SAR (measured) = 1.69 W/kg



0 dB = 1.69 W/kg = 2.28 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 01:06:23

18_IEEE 802.11b CH6_1M_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1.01065

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.988$ S/m; $\epsilon_r = 50.75$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.63 W/kg

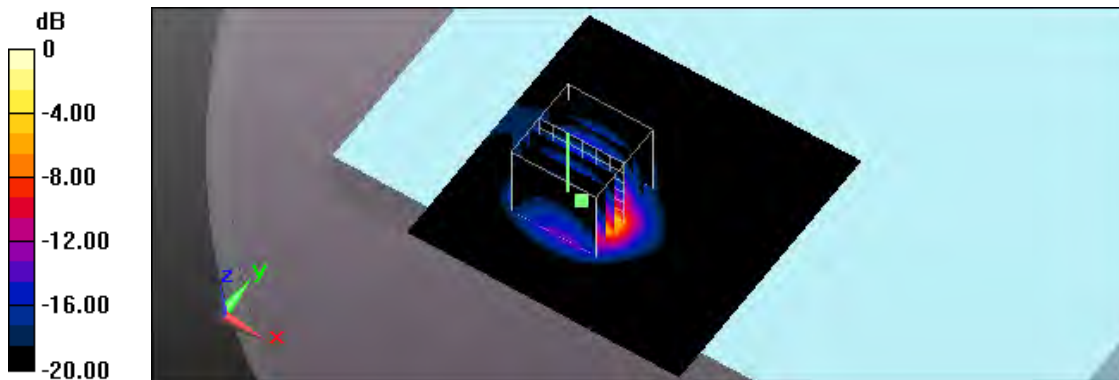
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 16.68 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 2.51 W/kg

SAR(1 g) = 0.938 W/kg; SAR(10 g) = 0.331 W/kg

Maximum value of SAR (measured) = 1.68 W/kg



0 dB = 1.68 W/kg = 2.25 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 10:32:07

45_ IEEE 802.11b CH6_1M_Bottom of laptop_0mm_ant A_Aux_original 18

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1.01065

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.988$ S/m; $\epsilon_r = 50.75$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4 mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.99 W/kg

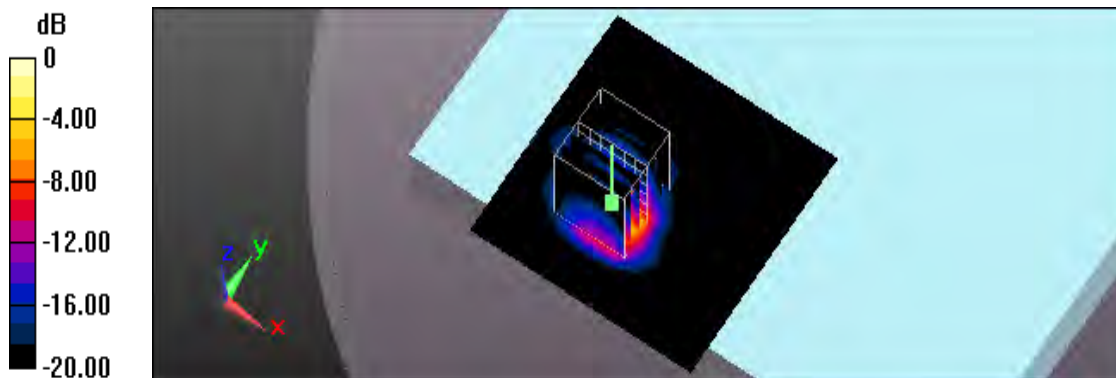
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.76 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 2.28 W/kg

SAR(1 g) = 0.892 W/kg; SAR(10 g) = 0.311 W/kg

Maximum value of SAR (measured) = 1.72 W/kg



0 dB = 1.72 W/kg = 2.36 dBW/kg

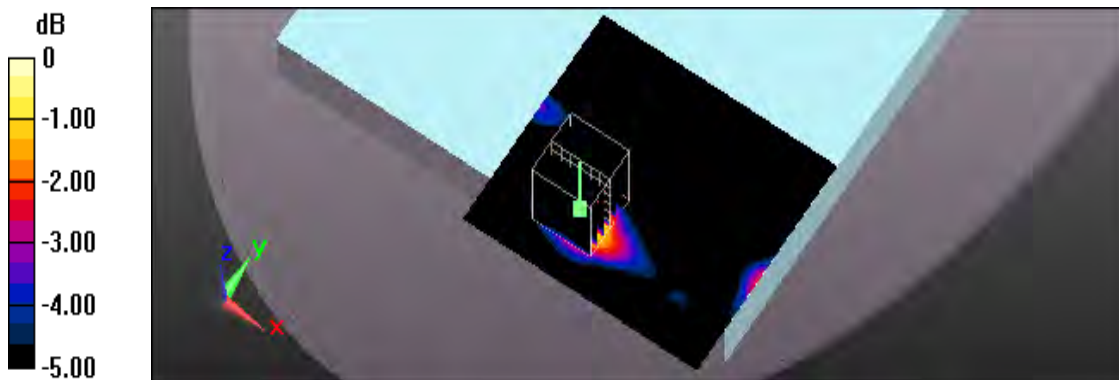
Test Laboratory: A Test Lab Techno Corp.
 Date/Time: 2018/11/2 AM 11:27:40
 44_ IEEE 802.11b CH11_1M_Back_0mm_ant A_Aux
DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1.01065
 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.02 \text{ S/m}$; $\epsilon_r = 50.67$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
 DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x91x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.0952 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
 Reference Value = 6.820 V/m; Power Drift = -0.02 dB
 Peak SAR (extrapolated) = 0.119 W/kg
SAR(1 g) = 0.056 W/kg; SAR(10 g) = 0.028 W/kg
 Maximum value of SAR (measured) = 0.0922 W/kg



0 dB = 0.0922 W/kg = -10.35 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 09:37:24

22_IEEE 802.11b CH11_1M_Side 1_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1.011

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.02 \text{ S/m}$; $\epsilon_r = 50.67$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x91x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.348 W/kg

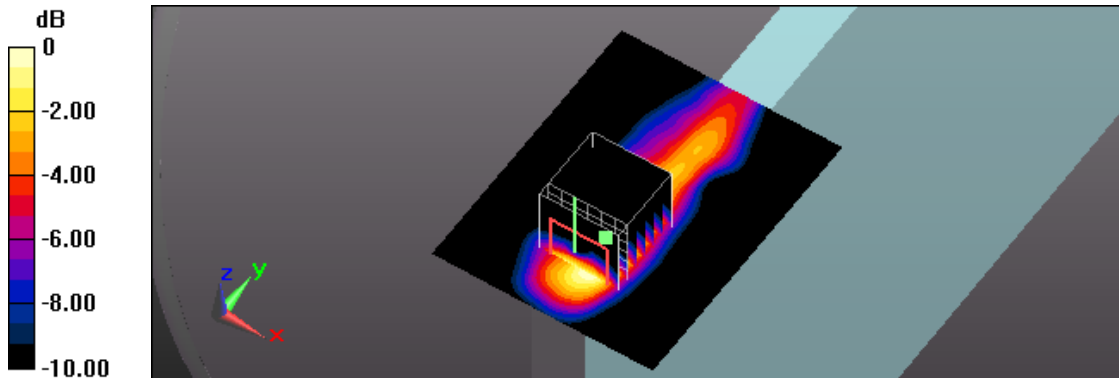
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.447 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.360 W/kg

SAR(1 g) = 0.153 W/kg; SAR(10 g) = 0.081 W/kg

Maximum value of SAR (measured) = 0.259 W/kg



0 dB = 0.259 W/kg = -5.87 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 06:54:55

16_IEEE 802.11b CH11_1M_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1.011

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.02 \text{ S/m}$; $\epsilon_r = 50.67$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 1.68 W/kg

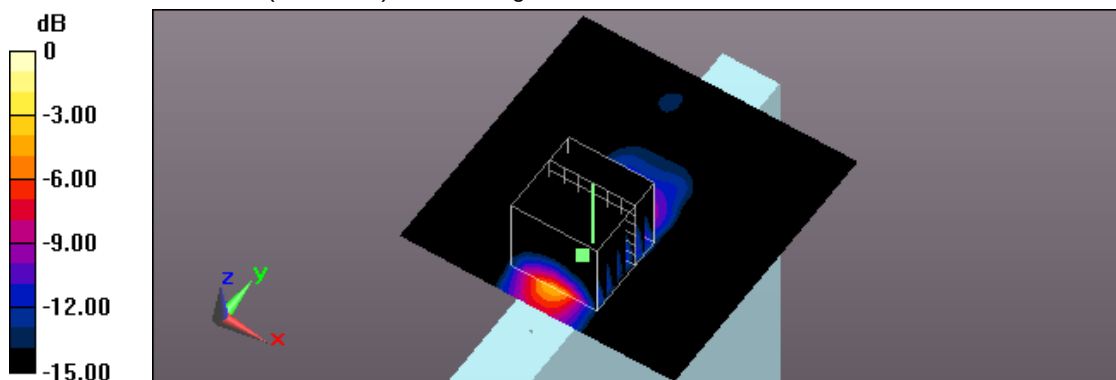
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.52 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 2.45 W/kg

SAR(1 g) = 0.911 W/kg; SAR(10 g) = 0.328 W/kg

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



0 dB = 1.70 W/kg = 2.30 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 01:35:57

19_IEEE 802.11b CH1_1M_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2412 MHz; Duty Cycle: 1:1.011

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.961$ S/m; $\epsilon_r = 50.837$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 1.57 W/kg

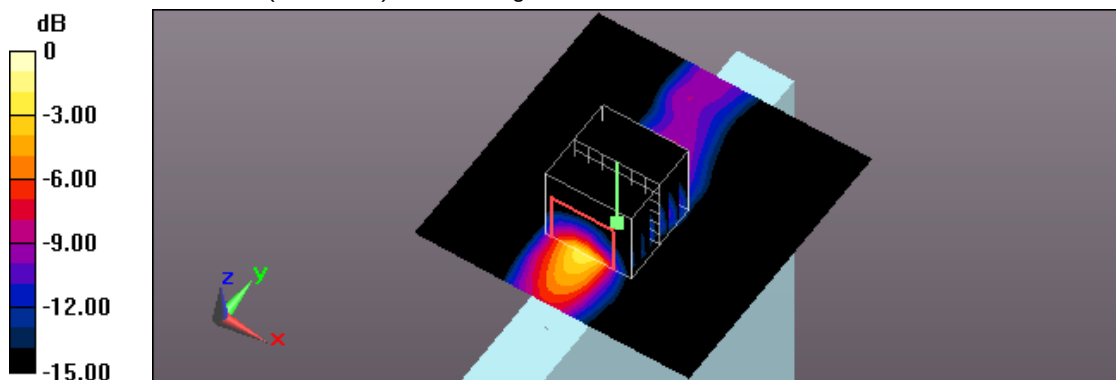
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 28.98 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 2.32 W/kg

SAR(1 g) = 0.855 W/kg; SAR(10 g) = 0.310 W/kg

Maximum value of SAR (measured) = 1.58 W/kg



0 dB = 1.58 W/kg = 1.99 dBW/kg

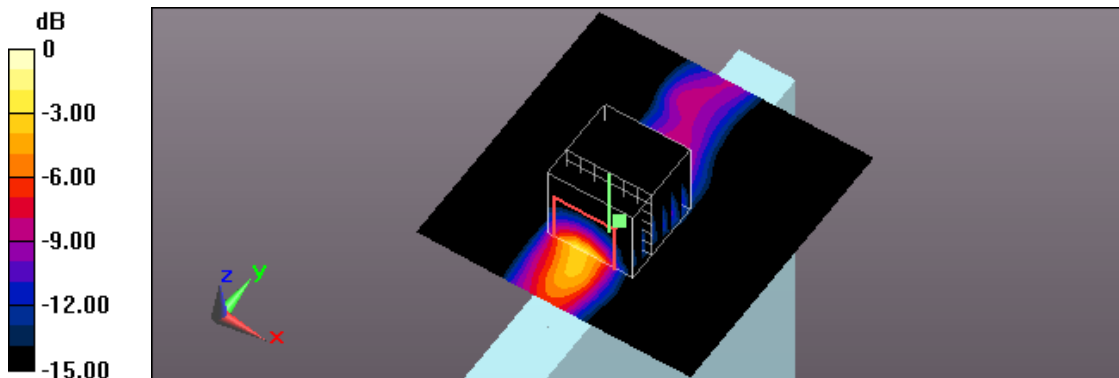
Test Laboratory: A Test Lab Techno Corp.
 Date/Time: 2018/11/2 AM 02:25:12
 20_IEEE 802.11b CH6_1M_Side 4_0mm_ant A_Aux
DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1.011
 Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.988$ S/m; $\epsilon_r = 50.75$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
 DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm
 Maximum value of SAR (interpolated) = 1.57 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
 Reference Value = 30.84 V/m; Power Drift = -0.16 dB
 Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 0.899 W/kg; SAR(10 g) = 0.327 W/kg
 Maximum value of SAR (measured) = 1.61 W/kg



0 dB = 1.61 W/kg = 2.07 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 03:28:08

60_Bluetooth CH78_1M_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2480$ MHz; $\sigma = 2.043$ S/m; $\epsilon_r = 50.627$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.508 W/kg

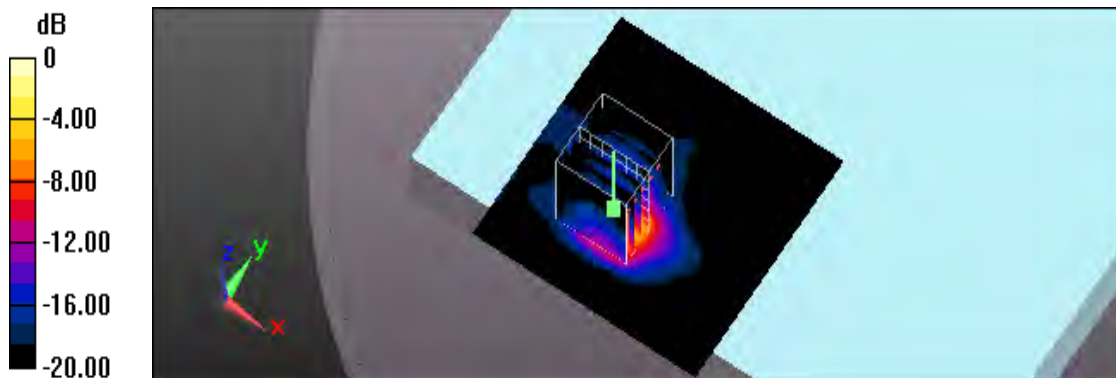
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.143 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.655 W/kg

SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.088 W/kg

Maximum value of SAR (measured) = 0.498 W/kg



0 dB = 0.498 W/kg = -3.03 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 AM 04:14:55

61_Bluetooth CH78_1M_Back_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2480 \text{ MHz}$; $\sigma = 2.043 \text{ S/m}$; $\epsilon_r = 50.627$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x91x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.0183 W/kg

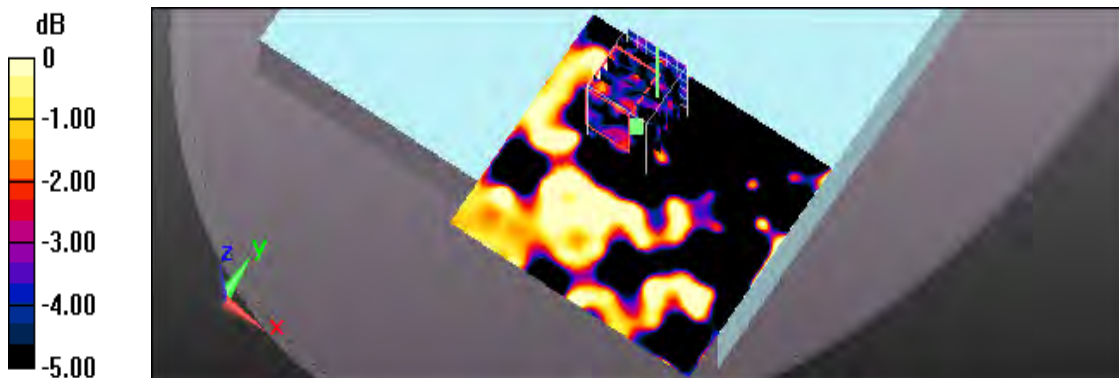
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 1.402 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.00996 W/kg

SAR(1 g) = 0.00299 W/kg; SAR(10 g) = 0.00243 W/kg

Maximum value of SAR (measured) = 0.00549 W/kg



0 dB = 0.00549 W/kg = -22.60 dBW/kg

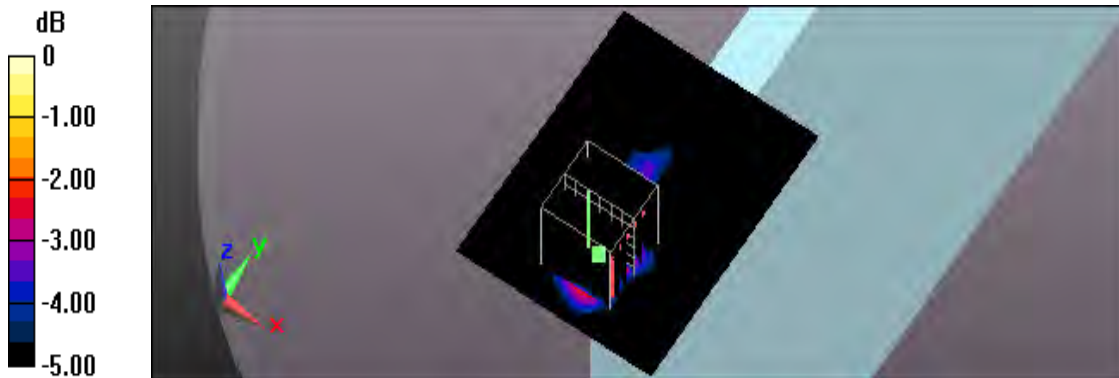
Test Laboratory: A Test Lab Techno Corp.
 Date/Time: 2018/11/2 AM 04:48:37
 62_Bluetooth CH78_1M_Side 1_0mm_ant A_Aux
DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2480 \text{ MHz}$; $\sigma = 2.043 \text{ S/m}$; $\epsilon_r = 50.627$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
 DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x91x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.0227 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
 Reference Value = 2.907 V/m; Power Drift = -0.15 dB
 Peak SAR (extrapolated) = 0.0290 W/kg
SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.0065 W/kg
 Maximum value of SAR (measured) = 0.0198 W/kg



0 dB = 0.0198 W/kg = -17.03 dBW/kg

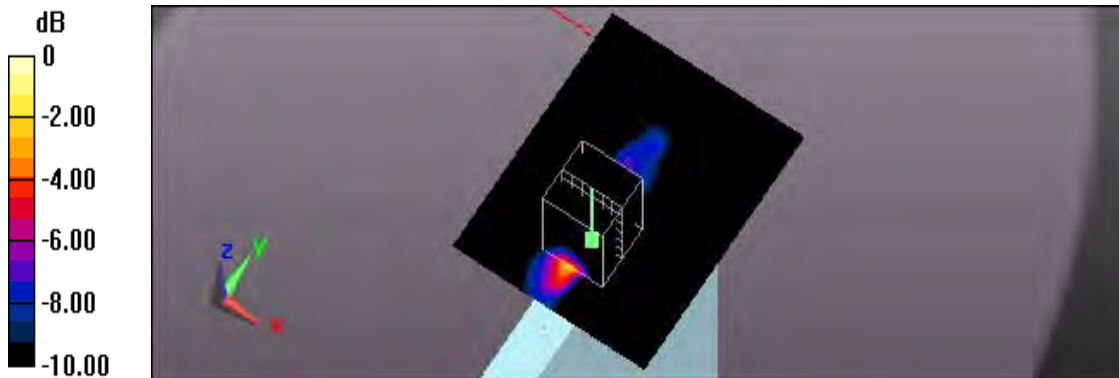
Test Laboratory: A Test Lab Techno Corp.
 Date/Time: 2018/11/2 AM 05:33:31
 63_Bluetooth CH78_1M_Side 4_0mm_ant A_Aux
DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2480 \text{ MHz}$; $\sigma = 2.043 \text{ S/m}$; $\epsilon_r = 50.627$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
 DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x101x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.0598 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
 Reference Value = 4.770 V/m; Power Drift = -0.16 dB
 Peak SAR (extrapolated) = 0.0890 W/kg
SAR(1 g) = 0.032 W/kg; SAR(10 g) = 0.012 W/kg
 Maximum value of SAR (measured) = 0.0616 W/kg



0 dB = 0.0616 W/kg = -12.10 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 10:00:13

6_ IEEE 802.11ac 80 CH58_MCS0_Bottom of laptop_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

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

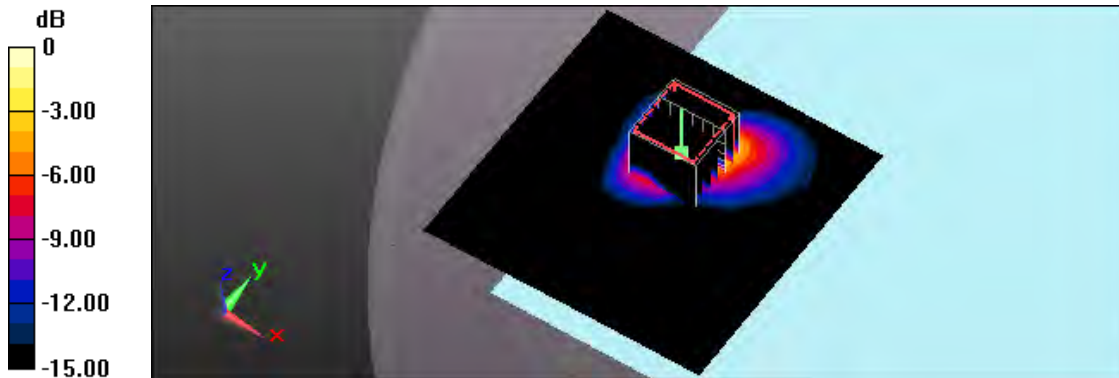
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 15.19 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 0.512 W/kg; SAR(10 g) = 0.164 W/kg

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



0 dB = 1.25 W/kg = 0.97 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 10:15:59

27_IEEE 802.11ac 80 CH58_MCS0_Back_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.264 W/kg

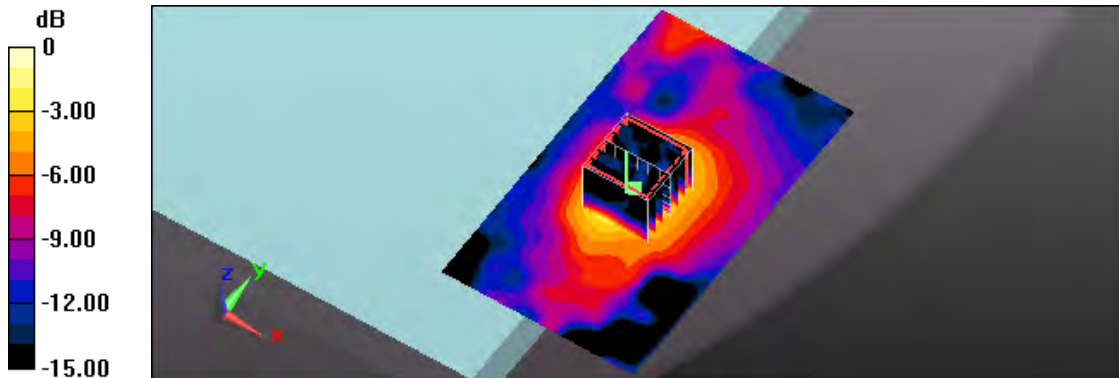
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 7.783 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.452 W/kg

SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.048 W/kg

Maximum value of SAR (measured) = 0.265 W/kg



0 dB = 0.265 W/kg = -5.77 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 00:41:42

7_ IEEE 802.11ac 80 CH58_MCS0_Side 1_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 2.16 W/kg

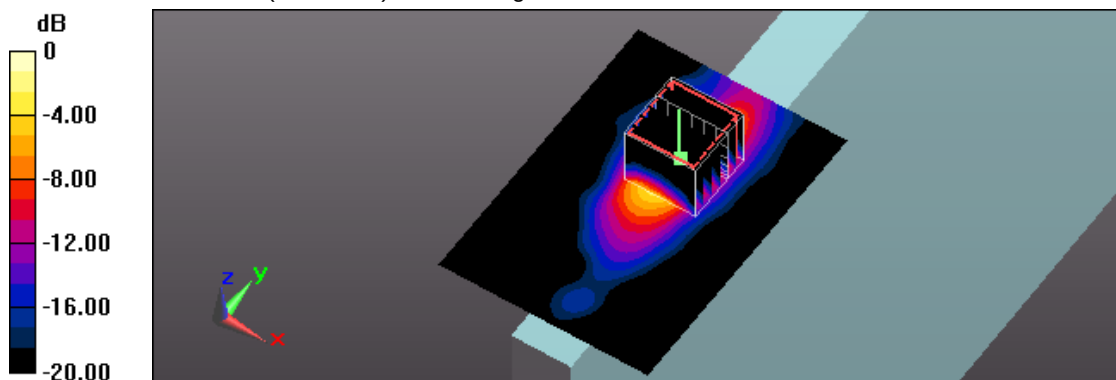
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 18.29 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.00 W/kg

SAR(1 g) = 0.689 W/kg; SAR(10 g) = 0.209 W/kg

Maximum value of SAR (measured) = 1.63 W/kg



0 dB = 1.63 W/kg = 2.12 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 00:17:06

23_IEEE 802.11ac 80 CH58_MCS0_Side 4_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.134 W/kg

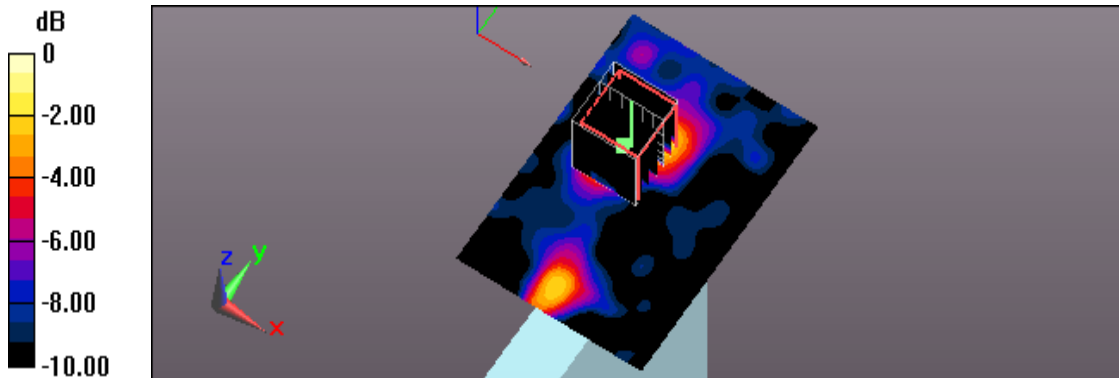
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 1.572 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.243 W/kg

SAR(1 g) = 0.055 W/kg; SAR(10 g) = 0.018 W/kg

Maximum value of SAR (measured) = 0.145 W/kg



0 dB = 0.145 W/kg = -8.39 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 07:59:37

1_ IEEE 802.11ac 80 CH58_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.97 W/kg

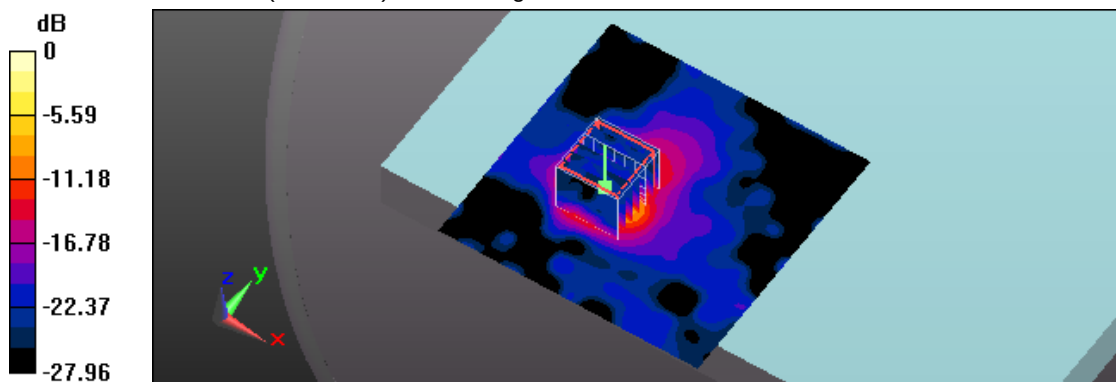
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 14.59 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 3.55 W/kg

SAR(1 g) = 0.847 W/kg; SAR(10 g) = 0.205 W/kg

Maximum value of SAR (measured) = 2.22 W/kg



0 dB = 2.22 W/kg = 3.46 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 04:04:16

38_ IEEE 802.11ac 80 CH58_MCS0_Bottom of laptop_0mm_ant A_Aux_original 1

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.78 W/kg

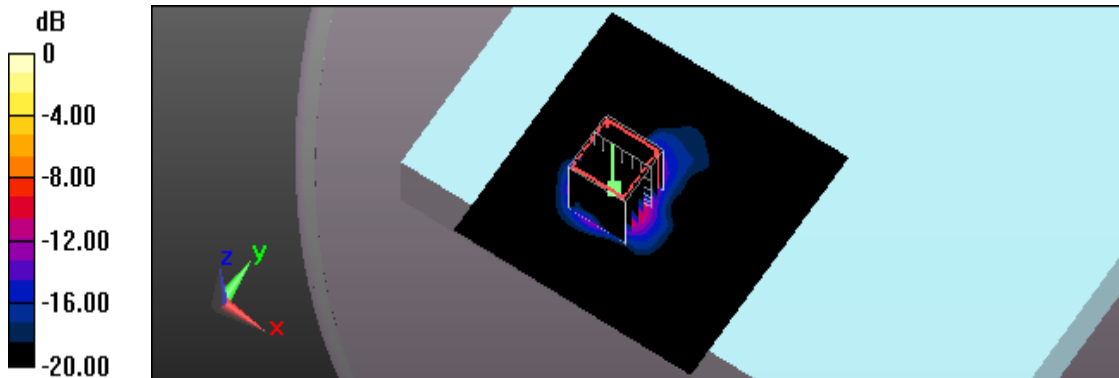
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 16.35 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 0.827 W/kg; SAR(10 g) = 0.197 W/kg

Maximum value of SAR (measured) = 2.13 W/kg



0 dB = 2.13 W/kg = 3.28 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 11:20:32

28_IEEE 802.11ac 80 CH58_MCS0_Back_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290 \text{ MHz}$; $\sigma = 5.272 \text{ S/m}$; $\epsilon_r = 48.702$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (121x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

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

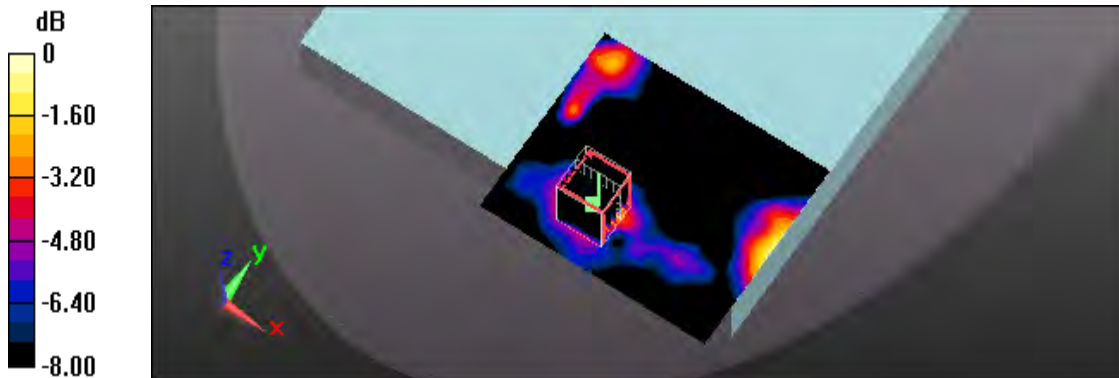
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 7.133 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.337 W/kg

SAR(1 g) = 0.102 W/kg; SAR(10 g) = 0.046 W/kg

Maximum value of SAR (measured) = 0.220 W/kg



0 dB = 0.220 W/kg = -6.58 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 03:11:27

25_IEEE 802.11ac 80 CH58_MCS0_Side 1_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290$ MHz; $\sigma = 5.272$ S/m; $\epsilon_r = 48.702$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.199 W/kg

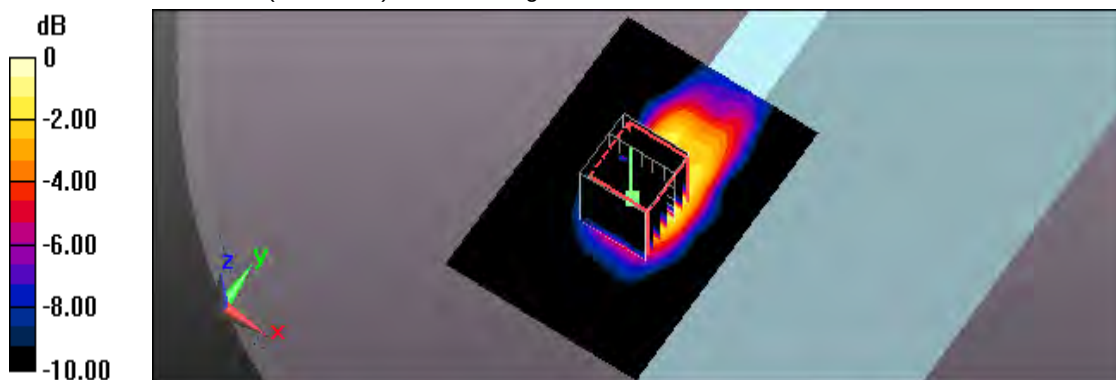
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 5.472 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.329 W/kg

SAR(1 g) = 0.091 W/kg; SAR(10 g) = 0.032 W/kg

Maximum value of SAR (measured) = 0.210 W/kg



0 dB = 0.210 W/kg = -6.78 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 09:35:00

12_IEEE 802.11ac 80 CH58_MCS0_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5290 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5290$ MHz; $\sigma = 5.272$ S/m; $\epsilon_r = 48.702$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.64, 4.64, 4.64); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.10 W/kg

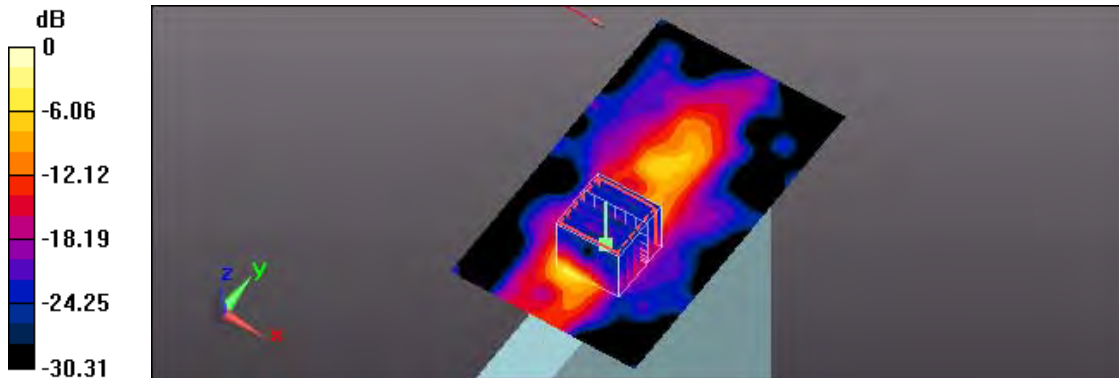
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 21.13 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 3.57 W/kg

SAR(1 g) = 0.723 W/kg; SAR(10 g) = 0.189 W/kg

Maximum value of SAR (measured) = 1.83 W/kg



0 dB = 1.83 W/kg = 2.62 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 08:28:26

46_ IEEE 802.11ac 160 CH50_MCS0_Bottom of laptop_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 48.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.61 W/kg

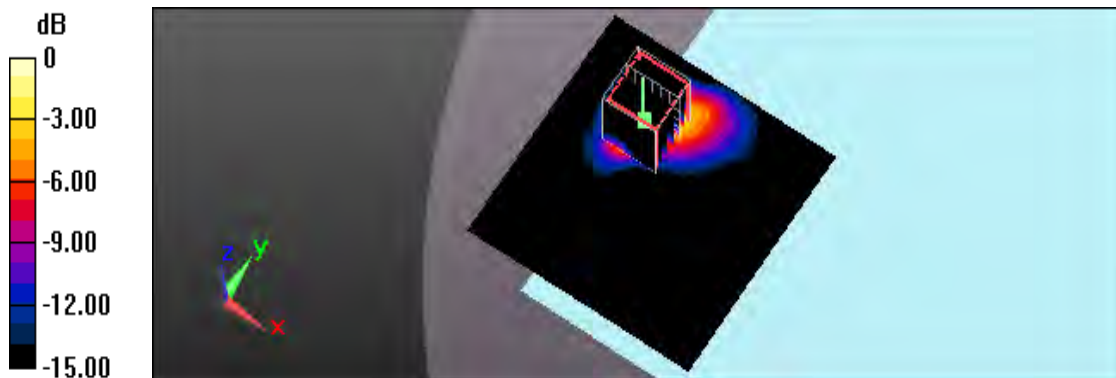
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0.9700 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 2.47 W/kg

SAR(1 g) = 0.605 W/kg; SAR(10 g) = 0.192 W/kg

Maximum value of SAR (measured) = 1.48 W/kg



0 dB = 1.48 W/kg = 1.70 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 10:55:19

47_ IEEE 802.11ac 160 CH50_MCS0_Back_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 48.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.290 W/kg

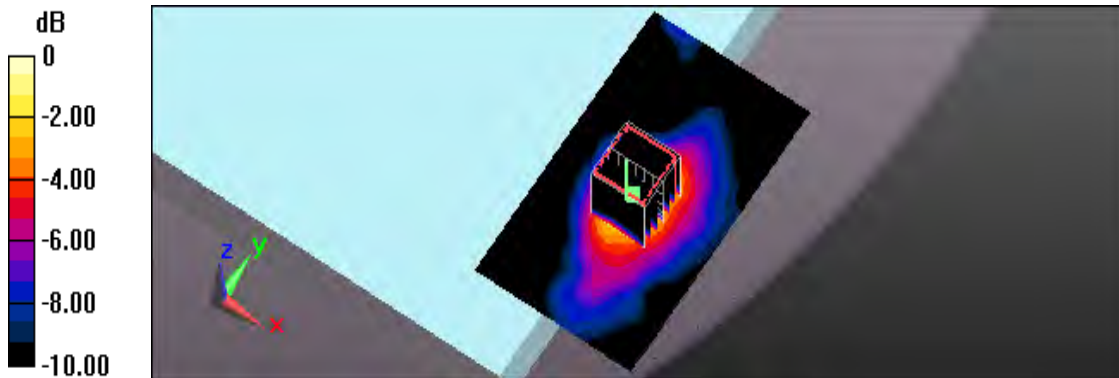
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0.3270 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.486 W/kg

SAR(1 g) = 0.128 W/kg; SAR(10 g) = 0.051 W/kg

Maximum value of SAR (measured) = 0.286 W/kg



0 dB = 0.286 W/kg = -5.44 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 09:44:56

48_IEEE 802.11ac 160 CH50_MCS0_Side 1_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 48.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.18 W/kg

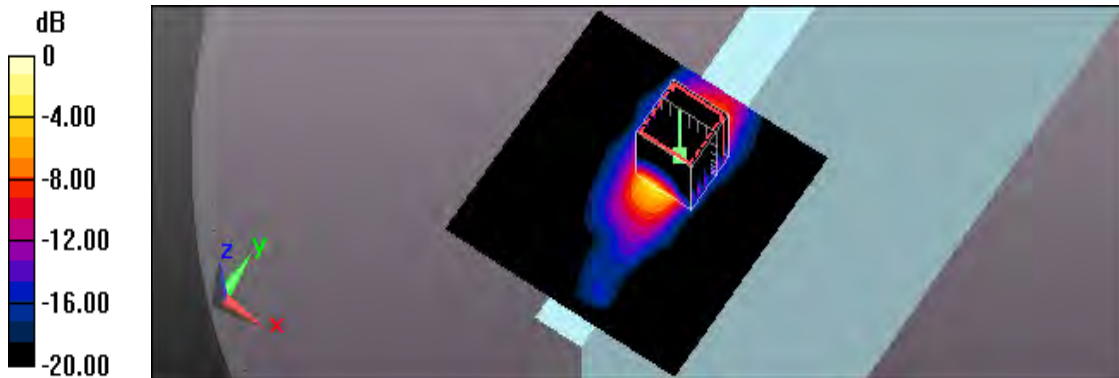
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0.9150 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 3.10 W/kg

SAR(1 g) = 0.804 W/kg; SAR(10 g) = 0.238 W/kg

Maximum value of SAR (measured) = 1.94 W/kg



0 dB = 1.94 W/kg = 2.88 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 09:20:19

49_IEEE 802.11ac 160 CH50_MCS0_Side 4_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 48.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

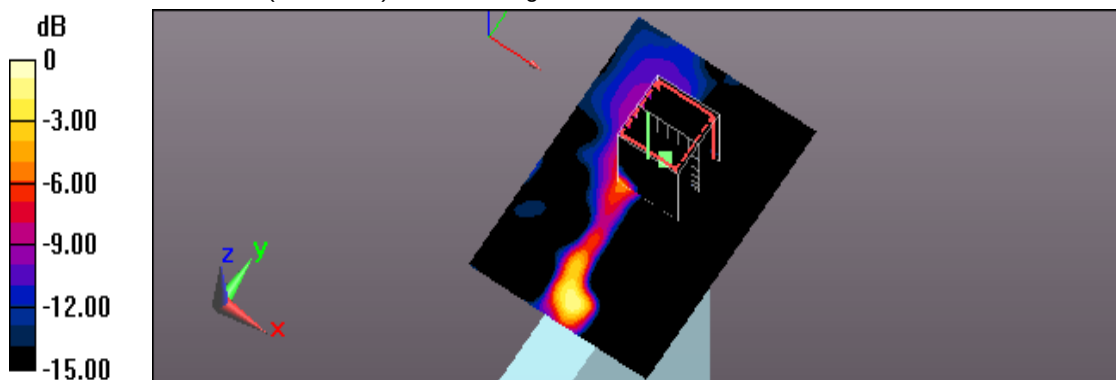
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 1.471 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.249 W/kg

SAR(1 g) = 0.050 W/kg; SAR(10 g) = 0.012 W/kg

Maximum value of SAR (measured) = 0.156 W/kg



0 dB = 0.156 W/kg = -8.07 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 08:03:53

50_IEEE 802.11ac 160 CH50_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 48.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.92 W/kg

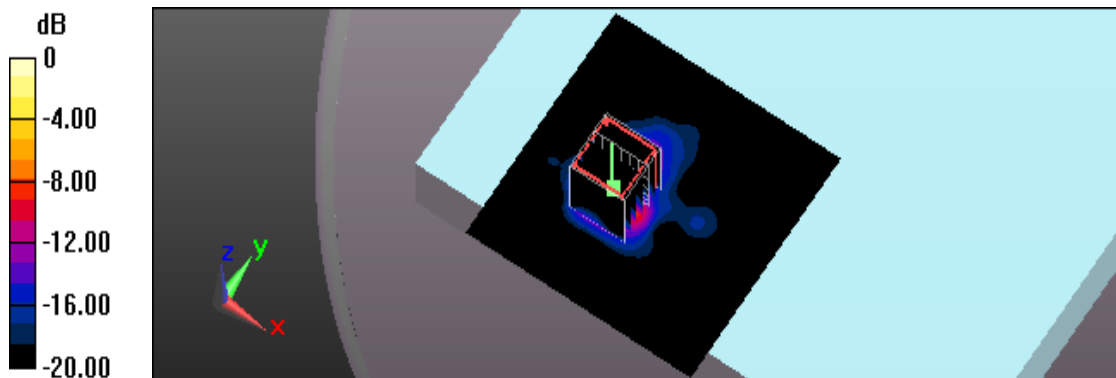
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0.4690 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 0.846 W/kg; SAR(10 g) = 0.207 W/kg

Maximum value of SAR (measured) = 2.18 W/kg



0 dB = 2.18 W/kg = 3.38 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 10:31:01

51_ IEEE 802.11ac 160 CH50_MCS0_Back_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.425 \text{ S/m}$; $\epsilon_r = 48.458$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (121x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.222 W/kg

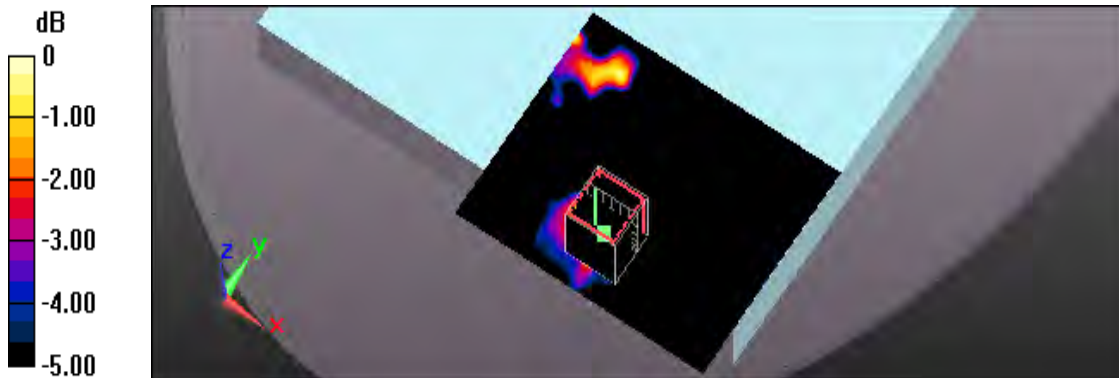
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 0.4630 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.278 W/kg

SAR(1 g) = 0.078 W/kg; SAR(10 g) = 0.032 W/kg

Maximum value of SAR (measured) = 0.173 W/kg



0 dB = 0.173 W/kg = -7.62 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 10:09:19

52_ IEEE 802.11ac 160 CH50_MCS0_Side 1_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.425 \text{ S/m}$; $\epsilon_r = 48.458$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.245 W/kg

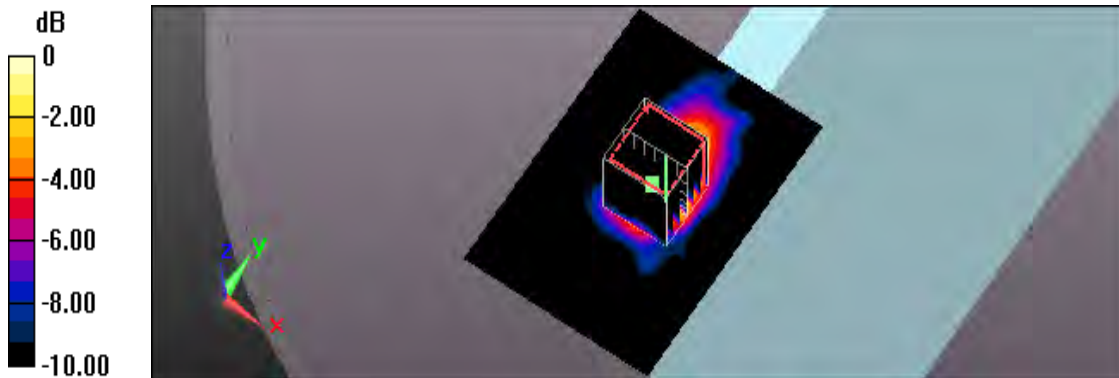
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 1.453 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.396 W/kg

SAR(1 g) = 0.093 W/kg; SAR(10 g) = 0.038 W/kg

Maximum value of SAR (measured) = 0.200 W/kg



0 dB = 0.200 W/kg = -6.99 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 08:57:18

53_ IEEE 802.11ac 160 CH50_MCS0_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.425 \text{ S/m}$; $\epsilon_r = 48.458$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.88 W/kg

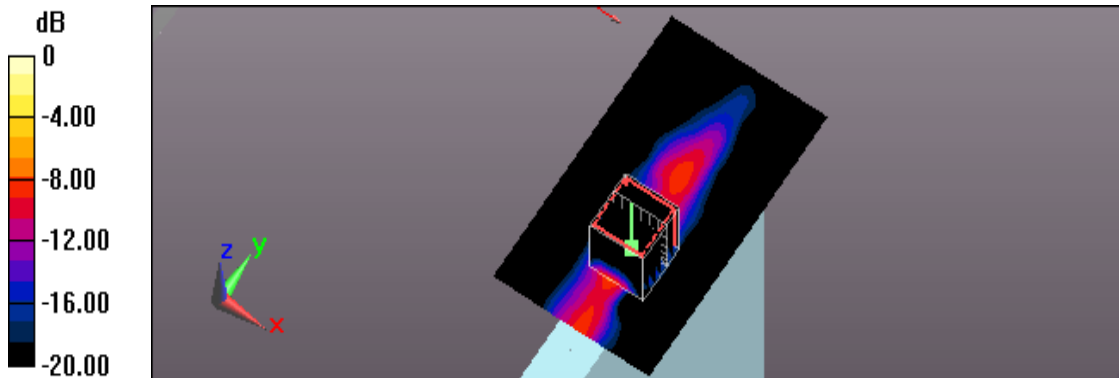
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 6.630 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 3.72 W/kg

SAR(1 g) = 0.717 W/kg; SAR(10 g) = 0.170 W/kg

Maximum value of SAR (measured) = 1.92 W/kg



0 dB = 1.92 W/kg = 2.83 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 09:32:54

5_ IEEE 802.11ac 80 CH138_MCS0_Bottom of laptop_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690 \text{ MHz}$; $\sigma = 5.805 \text{ S/m}$; $\epsilon_r = 47.842$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.57 W/kg

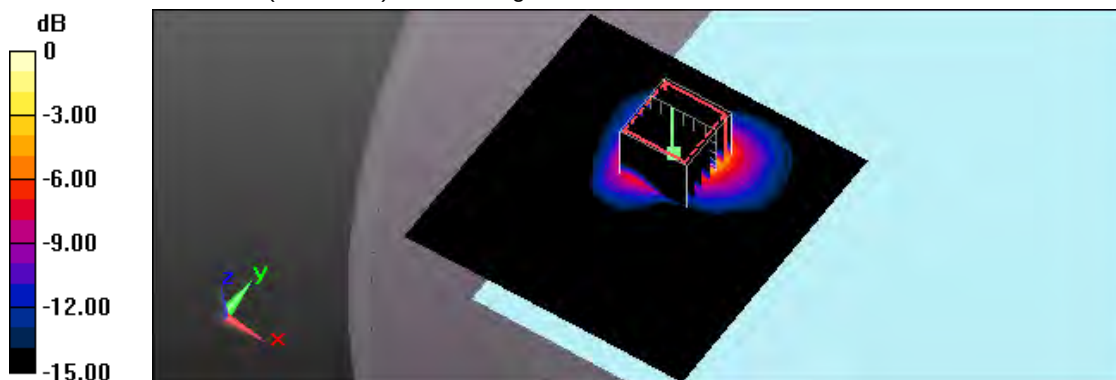
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 12.88 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 3.09 W/kg

SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.179 W/kg

Maximum value of SAR (measured) = 1.63 W/kg



0 dB = 1.63 W/kg = 2.12 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 10:39:53

29_IEEE 802.11ac 80 CH138_MCS0_Back_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

20181031/Flat/Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.207 W/kg

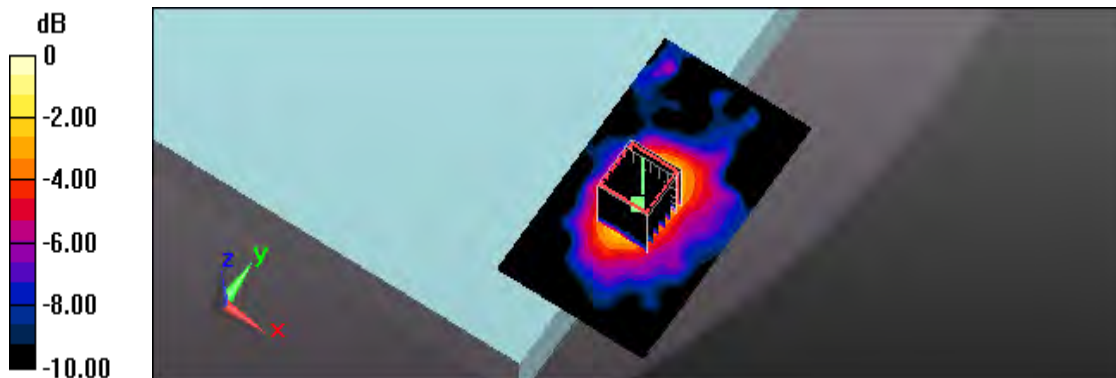
20181031/Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 6.622 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.790 W/kg

SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.038 W/kg

Maximum value of SAR (measured) = 0.211 W/kg



0 dB = 0.211 W/kg = -6.76 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 PM 00:11:30

8_ IEEE 802.11ac 80 CH138_MCS0_Side 1_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690 \text{ MHz}$; $\sigma = 5.805 \text{ S/m}$; $\epsilon_r = 47.842$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.76 W/kg

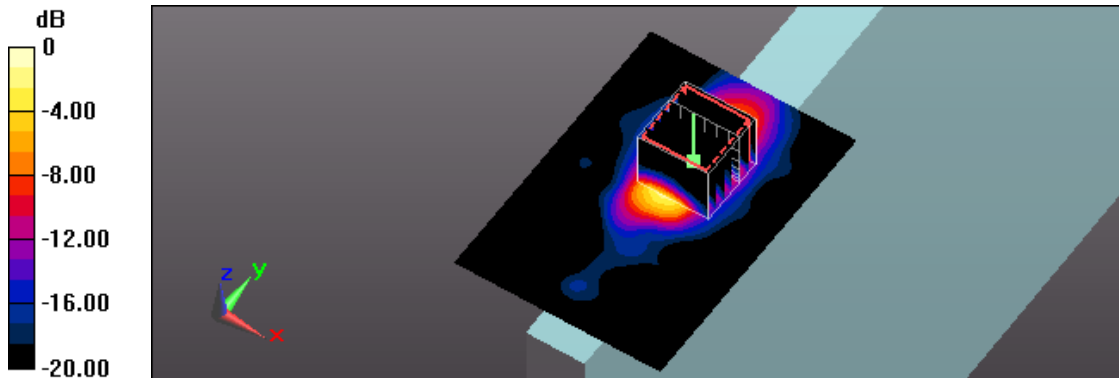
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 16.11 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.28 W/kg

SAR(1 g) = 0.558 W/kg; SAR(10 g) = 0.168 W/kg

Maximum value of SAR (measured) = 1.36 W/kg



0 dB = 1.36 W/kg = 1.34 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 00:44:09

30_IEEE 802.11ac 80 CH138_MCS0_Side 4_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.123 W/kg

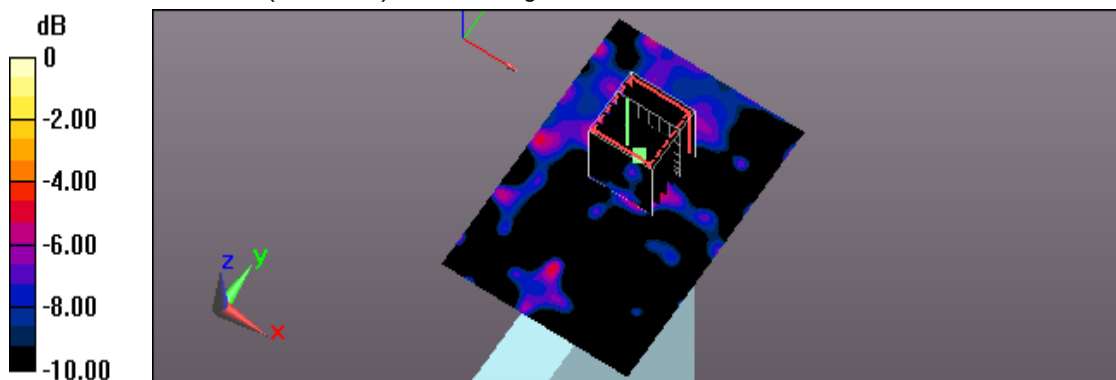
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

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

Peak SAR (extrapolated) = 0.180 W/kg

SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.011 W/kg

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



0 dB = 0.112 W/kg = -9.51 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 08:06:56

2_ IEEE 802.11ac 80 CH138_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.01 W/kg

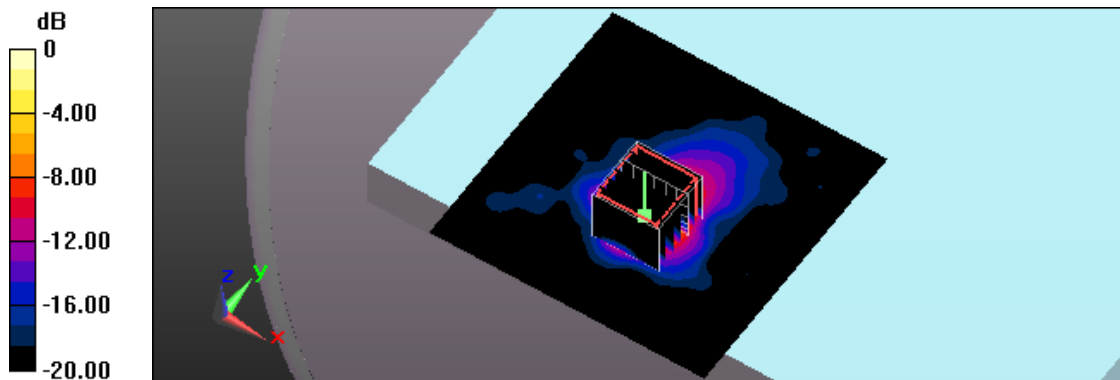
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 8.741 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 3.71 W/kg

SAR(1 g) = 0.748 W/kg; SAR(10 g) = 0.178 W/kg

Maximum value of SAR (measured) = 2.03 W/kg



0 dB = 2.03 W/kg = 3.07 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 06:47:02

31_ IEEE 802.11ac 80 CH106_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5530 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5530 \text{ MHz}$; $\sigma = 5.577 \text{ S/m}$; $\epsilon_r = 48.216$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.28, 4.28, 4.28); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.36 W/kg

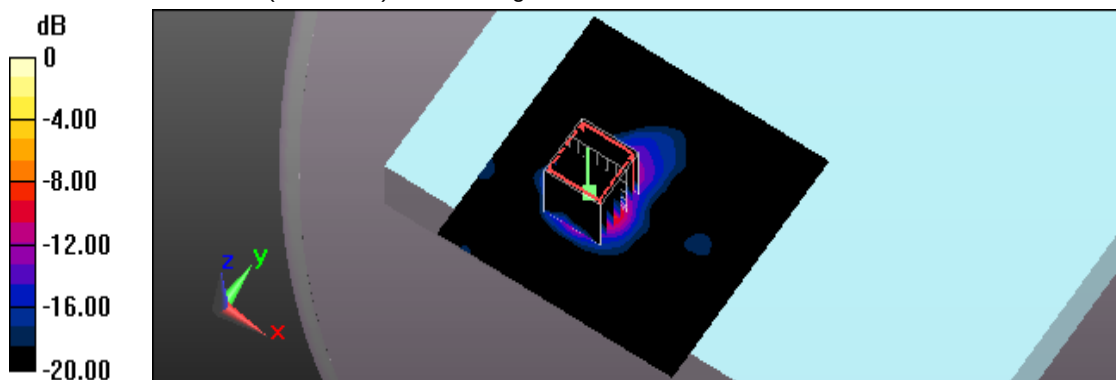
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 14.63 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 3.47 W/kg

SAR(1 g) = 0.622 W/kg; SAR(10 g) = 0.147 W/kg

Maximum value of SAR (measured) = 1.69 W/kg



0 dB = 1.69 W/kg = 2.28 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 07:16:03

32_IEEE 802.11ac 80 CH122_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5610 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5610$ MHz; $\sigma = 5.699$ S/m; $\epsilon_r = 48.055$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.44 W/kg

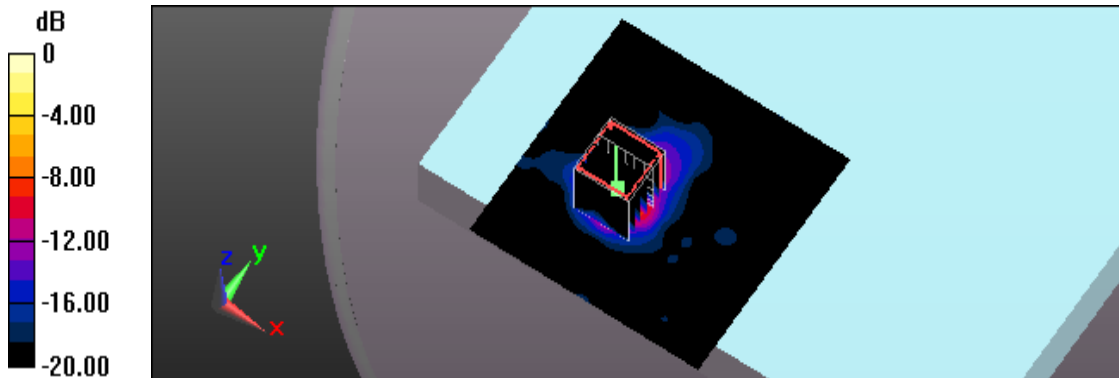
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 12.35 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 3.19 W/kg

SAR(1 g) = 0.660 W/kg; SAR(10 g) = 0.156 W/kg

Maximum value of SAR (measured) = 1.85 W/kg



0 dB = 1.85 W/kg = 2.67 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/10/31 PM 11:20:32

33_IEEE 802.11ac 80 CH138_MCS0_Back_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (121x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.264 W/kg

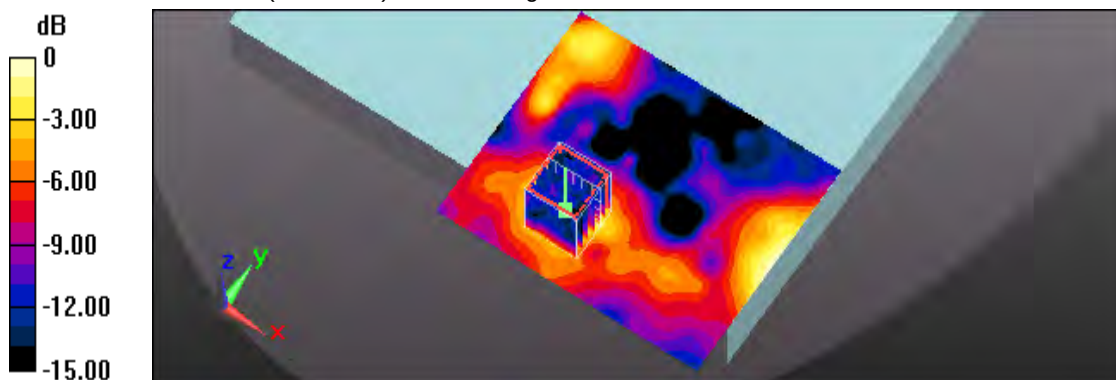
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 7.445 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.866 W/kg

SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.049 W/kg

Maximum value of SAR (measured) = 0.260 W/kg



0 dB = 0.260 W/kg = -5.85 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 11:43:05

11_ IEEE 802.11ac 80 CH138_MCS0_Side 1_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.618 W/kg

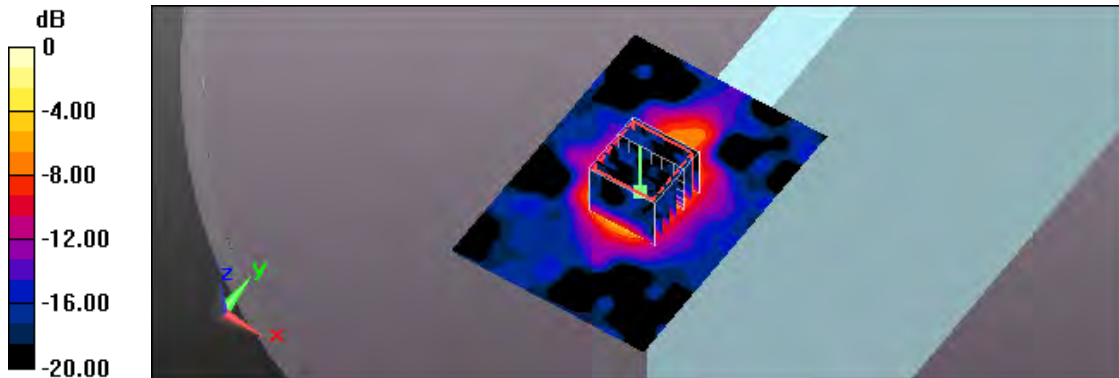
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 8.443 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.881 W/kg

SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.066 W/kg

Maximum value of SAR (measured) = 0.474 W/kg



0 dB = 0.474 W/kg = -3.24 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 01:11:33

34_IEEE 802.11ac 80 CH138_MCS0_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.42 W/kg

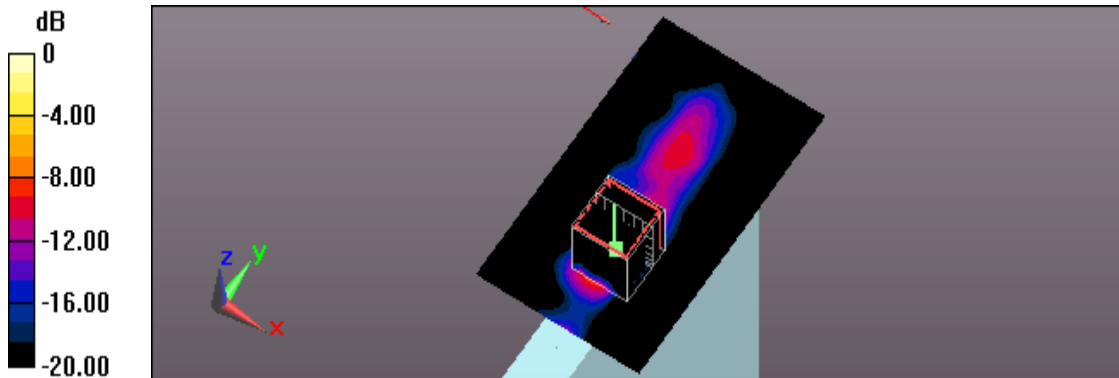
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 22.62 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 9.58 W/kg

SAR(1 g) = 0.863 W/kg; SAR(10 g) = 0.182 W/kg

Maximum value of SAR (measured) = 2.44 W/kg



0 dB = 2.44 W/kg = 3.87 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 02:36:12

37_IEEE 802.11ac 80 CH138_MCS0_Side 4_0mm_ant A_Aux_original 34

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5690 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5690$ MHz; $\sigma = 5.805$ S/m; $\epsilon_r = 47.842$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.38 W/kg

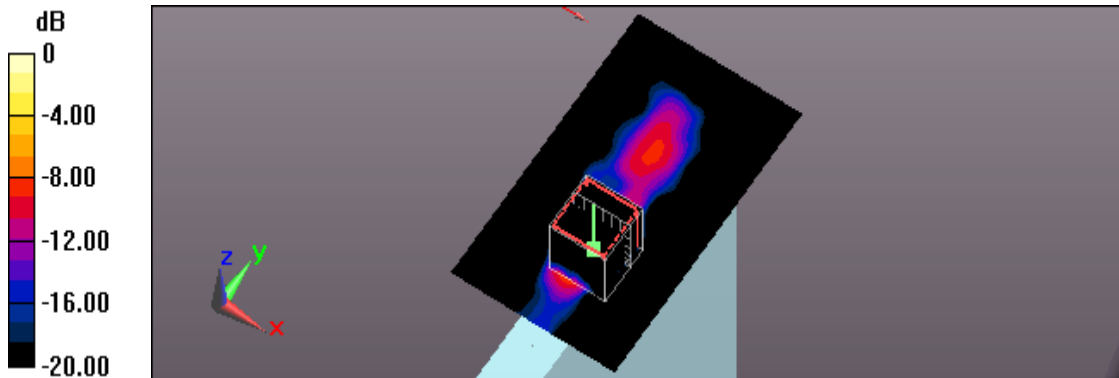
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 16.28 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 7.53 W/kg

SAR(1 g) = 0.807 W/kg; SAR(10 g) = 0.175 W/kg

Maximum value of SAR (measured) = 2.33 W/kg



0 dB = 2.33 W/kg = 3.67 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 01:41:41

35_ IEEE 802.11ac 80 CH106_MCS0_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5530 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5530 \text{ MHz}$; $\sigma = 5.577 \text{ S/m}$; $\epsilon_r = 48.216$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.28, 4.28, 4.28); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

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

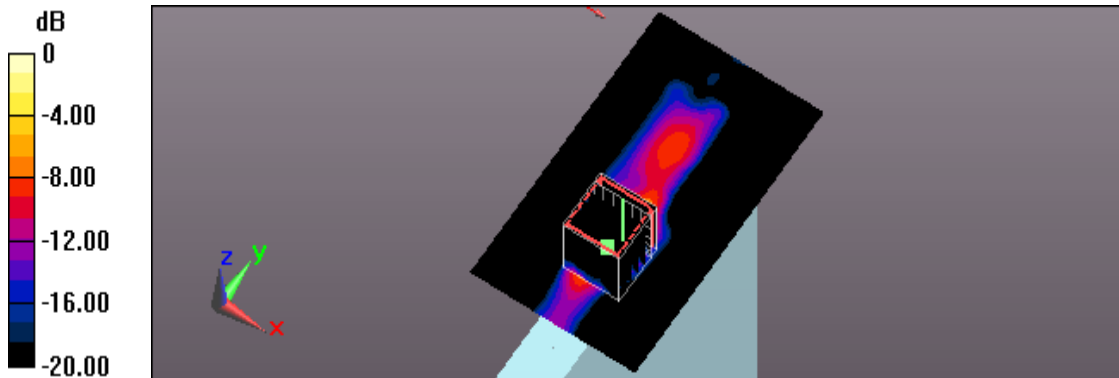
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 19.69 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 3.55 W/kg

SAR(1 g) = 0.640 W/kg; SAR(10 g) = 0.129 W/kg

Maximum value of SAR (measured) = 1.69 W/kg



0 dB = 1.69 W/kg = 2.28 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/1 AM 02:00:15

36_IEEE 802.11ac 80 CH122_MCS0_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5610 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5610 \text{ MHz}$; $\sigma = 5.699 \text{ S/m}$; $\epsilon_r = 48.055$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.11, 4.11, 4.11); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 2.05 W/kg

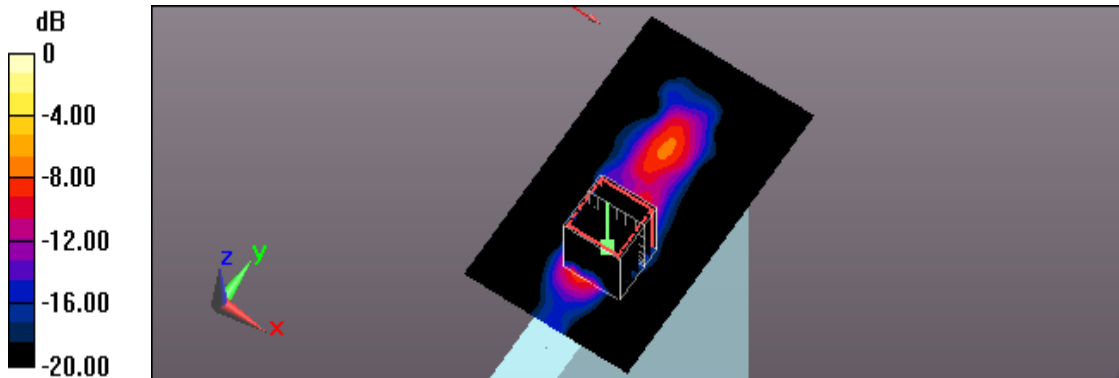
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 19.25 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 4.09 W/kg

SAR(1 g) = 0.783 W/kg; SAR(10 g) = 0.175 W/kg

Maximum value of SAR (measured) = 2.23 W/kg



0 dB = 2.23 W/kg = 3.48 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 PM 09:05:04

4_ IEEE 802.11ac 80 CH155_MCS0_Bottom of laptop_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

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

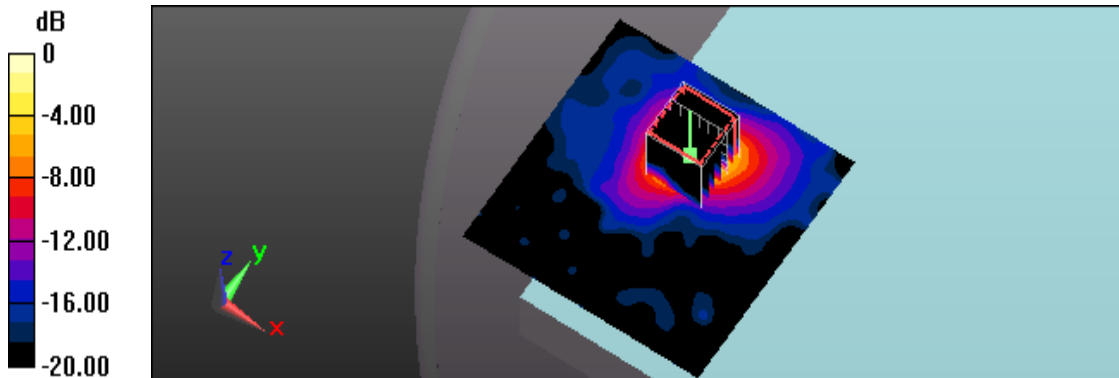
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 11.60 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.14 W/kg

SAR(1 g) = 0.516 W/kg; SAR(10 g) = 0.151 W/kg

Maximum value of SAR (measured) = 1.49 W/kg



0 dB = 1.49 W/kg = 1.73 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/3 AM 00:32:34

39_IEEE 802.11ac 80 CH155_MCS0_Back_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.264 W/kg

Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 5.947 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.494 W/kg

SAR(1 g) = 0.103 W/kg; SAR(10 g) = 0.041 W/kg

Maximum value of SAR (measured) = 0.243 W/kg



0 dB = 0.243 W/kg = -6.14 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 PM 10:36:05

9_ IEEE 802.11ac 80 CH155_MCS0_Side 1_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (81x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.51 W/kg

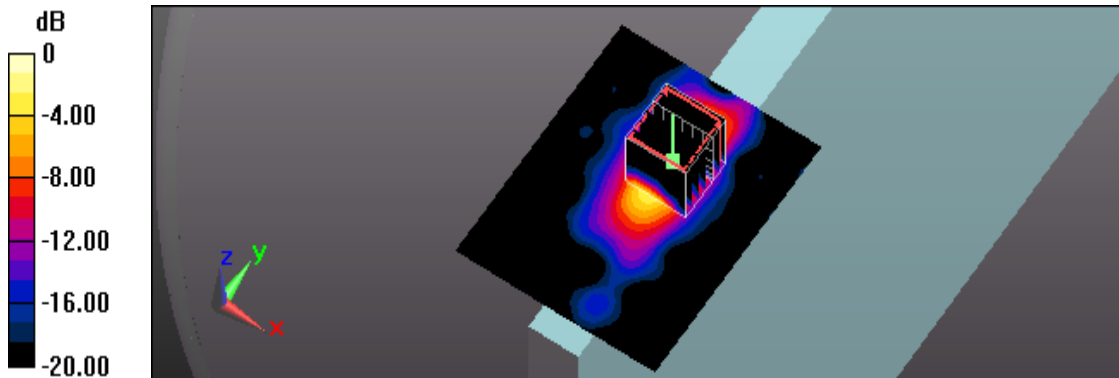
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 16.76 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.87 W/kg

SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.176 W/kg

Maximum value of SAR (measured) = 1.46 W/kg



0 dB = 1.46 W/kg = 1.64 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/3 PM 01:54:05

40_IEEE 802.11ac 80 CH155_MCS0_Side 4_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.225 W/kg

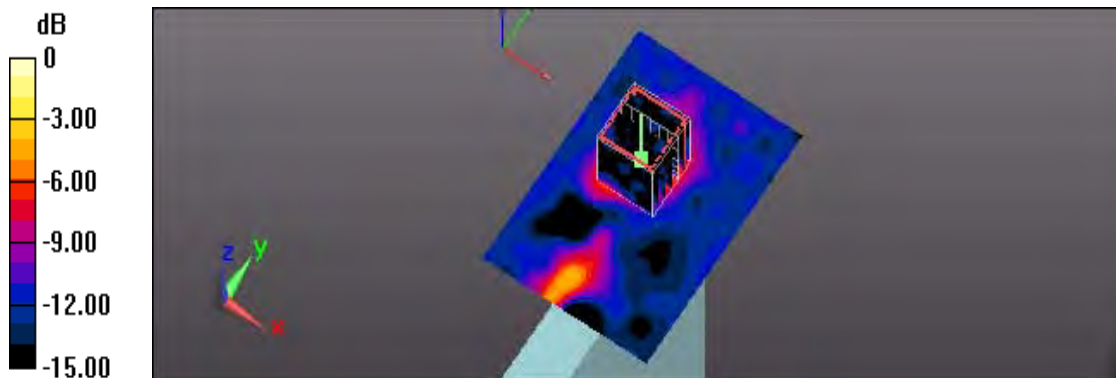
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 4.106 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.487 W/kg

SAR(1 g) = 0.093 W/kg; SAR(10 g) = 0.032 W/kg

Maximum value of SAR (measured) = 0.225 W/kg



0 dB = 0.225 W/kg = -6.48 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/3 AM 08:17:51

3_ IEEE 802.11ac 80 CH155_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

20181031/Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

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

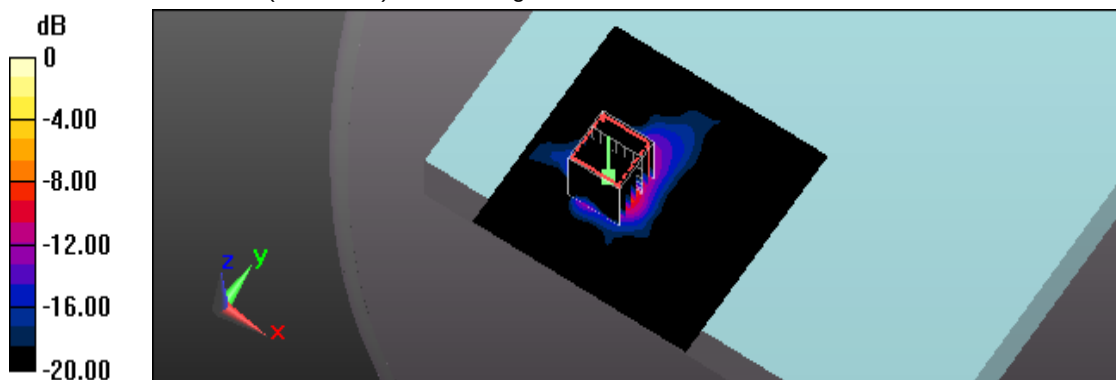
20181031/Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 13.08 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 3.65 W/kg

SAR(1 g) = 0.708 W/kg; SAR(10 g) = 0.168 W/kg

Maximum value of SAR (measured) = 1.93 W/kg



0 dB = 1.93 W/kg = 2.86 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/3 AM 00:06:20

41_ IEEE 802.11ac 80 CH155_MCS0_Back_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (121x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.159 W/kg

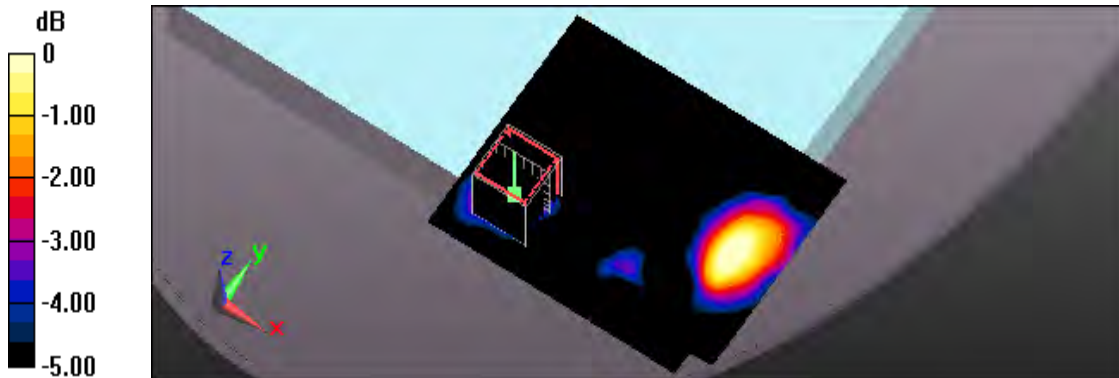
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 5.481 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.740 W/kg

SAR(1 g) = 0.050 W/kg; SAR(10 g) = 0.017 W/kg

Maximum value of SAR (measured) = 0.146 W/kg



0 dB = 0.146 W/kg = -8.36 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/2 PM 11:00:09

10_IEEE 802.11ac 80 CH155_MCS0_Side 1_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.534 W/kg

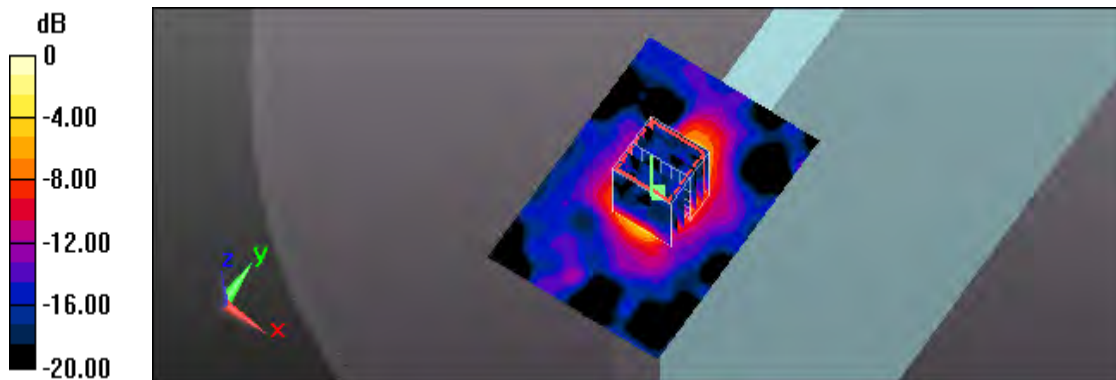
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 9.613 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.818 W/kg

SAR(1 g) = 0.169 W/kg; SAR(10 g) = 0.058 W/kg

Maximum value of SAR (measured) = 0.391 W/kg



0 dB = 0.391 W/kg = -4.08 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/3 PM 01:21:24

42_ IEEE 802.11ac 80 CH155_MCS0_Side 4_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.087

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 1.80 W/kg

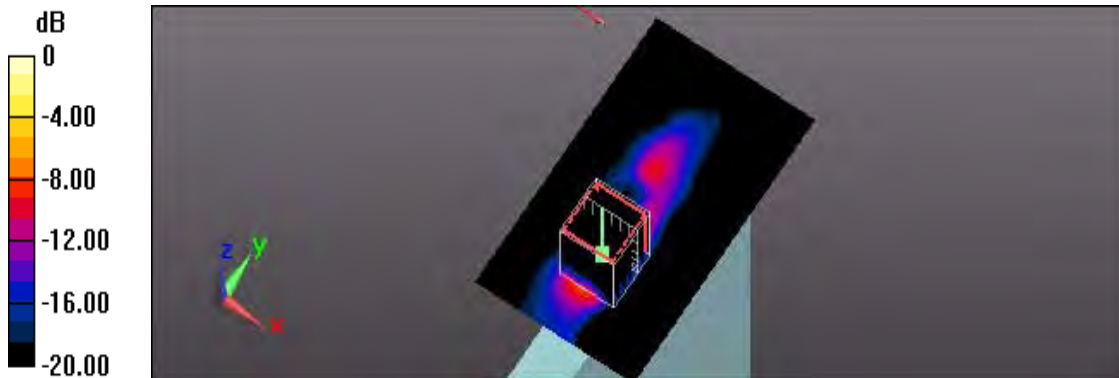
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 18.60 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 4.26 W/kg

SAR(1 g) = 0.694 W/kg; SAR(10 g) = 0.150 W/kg

Maximum value of SAR (measured) = 1.95 W/kg



0 dB = 1.95 W/kg = 2.90 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/13 PM 11:39:01

67_ IEEE 802.11ac 160 CH50_MCS0_Side 1_0mm_ant B_Main

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 160; Frequency: 5250 MHz; Duty Cycle: 1:1.17571

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 48.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.84, 4.84, 4.84); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.53 W/kg

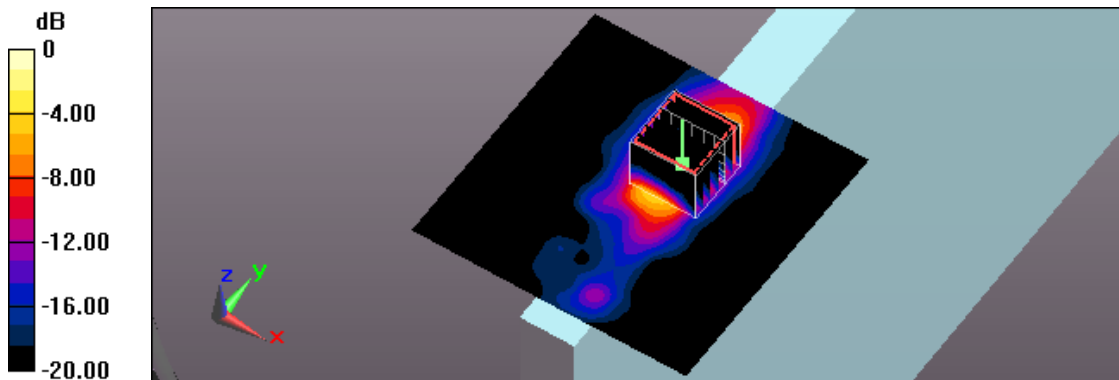
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 1.175 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 2.36 W/kg

SAR(1 g) = 0.581 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 1.35 W/kg



0 dB = 1.35 W/kg = 1.30 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 2018/11/3 PM 03:12:41

66_ IEEE 802.11ac 80 CH155_MCS0_Bottom of laptop_0mm_ant A_Aux

DUT: 9560D2W; Type: Intel Wireless-AC 9560

Communication System: UID 0, IEEE 802.11ac 80; Frequency: 5775 MHz; Duty Cycle: 1:1.08743

Medium parameters used: $f = 5775 \text{ MHz}$; $\sigma = 5.894 \text{ S/m}$; $\epsilon_r = 47.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(4.29, 4.29, 4.29); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1036
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Flat/Area Scan (101x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.590 W/kg

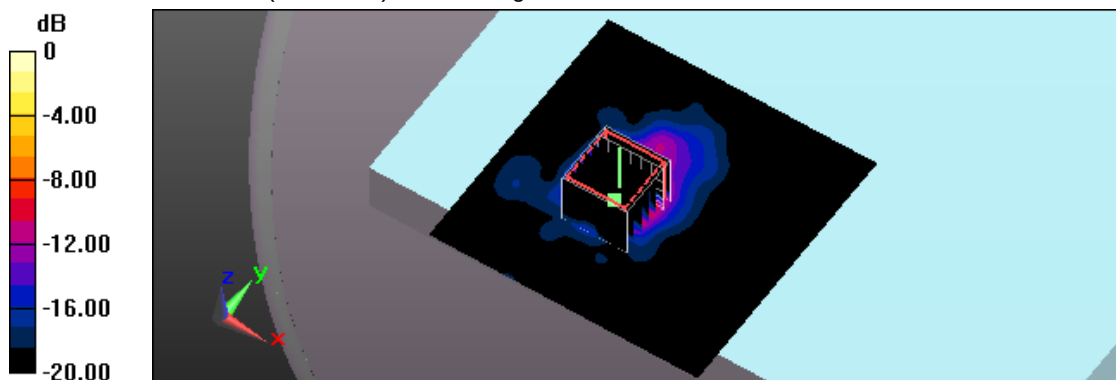
Flat/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 12.35 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 7.12 W/kg

SAR(1 g) = 0.536 W/kg; SAR(10 g) = 0.122 W/kg

Maximum value of SAR (measured) = 1.37 W/kg



0 dB = 1.37 W/kg = 1.37 dBW/kg



Appendix C - Calibration

All of the instruments Calibration information are listed below.

- Dipole _ D2450V2
- Dipole _ D5GHzV2
- Probe _ EX3DV4
- DAE _ DAE4



ST-60Z-18-12)

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Client

ATL

Certificate No: Z18-60066

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 712

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: April 9, 2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Power sensor NRV-Z5	100542	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Reference Probe EX3DV4	SN 7464	12-Sep-17(SPEAG,No.EX3-7464_Sep17)	Sep-18
DAE4	SN 1525	02-Oct-17(SPEAG,No.DAE4-1525_Oct17)	Oct-18
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
NetworkAnalyzer E5071C	MY46110673	24-Jan-18 (CTTL, No.J18X00561)	Jan-19

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

Issued: April 12, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z18-60066

Page 1 of 8



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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM _{x,y,z}
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.3 $\pm$ 6 %	1.85 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.6 mW / g $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.14 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.5 mW / g $\pm$ 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.2 $\pm$ 6 %	1.99 mho/m $\pm$ 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	51.4 mW / g $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.99 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	23.9 mW / g $\pm$ 18.7 % (k=2)



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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$52.9\Omega + 3.91j\Omega$
Return Loss	- 26.6dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$48.9\Omega + 5.92j\Omega$
Return Loss	- 24.3dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.020 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

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DASY5 Validation Report for Head TSL

Date: 04.08.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 712

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.853$ S/m; $\epsilon_r = 40.34$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(7.89, 7.89, 7.89); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

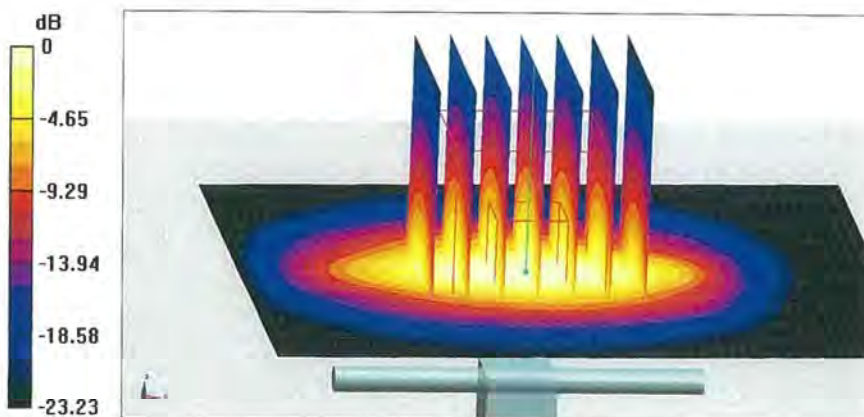
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.0 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 28.9W/kg

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.14 W/kg

Maximum value of SAR (measured) = 23.1 W/kg



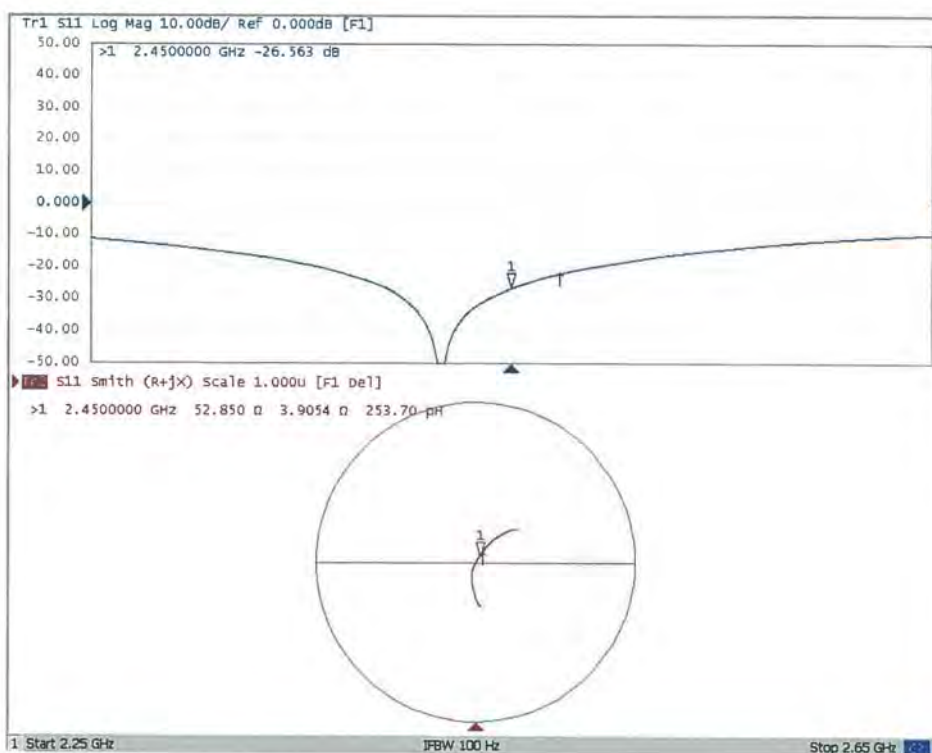
0 dB = 23.1 W/kg = 13.64 dBW/kg



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Impedance Measurement Plot for Head TSL





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DASY5 Validation Report for Body TSL

Date: 04.09.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 712

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.991$ S/m; $\epsilon_r = 54.17$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.09, 8.09, 8.09); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

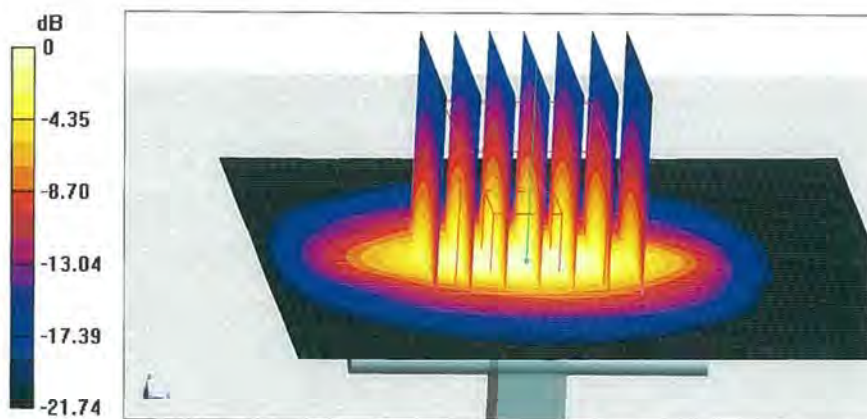
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.9 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 26.5 W/kg

SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.99 W/kg

Maximum value of SAR (measured) = 21.6 W/kg



0 dB = 21.6 W/kg = 13.34 dBW/kg



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Impedance Measurement Plot for Body TSL

