

SAR Test Report

Report No.:AGC00866140801FH01

FCC ID : NZ3-WSWN683N2P

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : USB Wireless-N Adapter

BRAND NAME : ULTRA

MODEL NAME : WS-WN683N2P, U12-43870

CLIENT : Winstars Technology Limited

DATE OF ISSUE : Sep. 19,2014

STANDARD(S) : IEEE Std. 1528:2003
47CFR § 2.1093
IEEE/ANSI C95.1

REPORT VERSION : V1.0

Attestation of Global Compliance(Shenzhen) Co., Ltd.

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 19,2014	Valid	Original Report

The test plans were performed in accordance with IEEE Std. 1528:2003; 47CFR § 2.1093; IEEE/ANSI C95.1 and the following specific FCC Test Procedures:

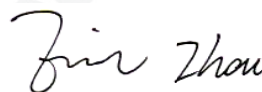
- KDB 447498 D01 General RF Exposure Guidance v05r02
- KDB 447498 D02 SAR Procedures for Dongle Xmtr v02
- KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- KDB 248227 D01 SAR meas for 802 11 a b g v01r02

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Test Report Certification

Applicant Name	:	Winstars Technology Limited
Applicant Address	:	Block 4, TaiSong Industrial Park, DaLang Street, LongHua Town, Bao'an District Shenzhen, China
Manufacturer Name	:	Winstars Technology Limited
Manufacturer Address	:	Block 4, TaiSong Industrial Park, DaLang Street, LongHua Town, Bao'an District Shenzhen, China
Product Designation	:	USB Wireless-N Adapter
Brand Name	:	ULTRA
Model Name	:	WS-WN683N2P, U12-43870
Different Description	:	All the same, except for the model name. The test model is WS-WN683N2P.
EUT Voltage	:	DC3.7V by battery
Applicable Standard	:	IEEE Std. 1528:2003 47CFR § 2.1093 IEEE/ANSI C95.1
Test Date	:	Aug. 27, 2014
Performed Location	:	Attestation of Global Compliance(Shenzhen) Co., Ltd. 2 F, Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang Street, Bao'an District, Shenzhen, China
Report Template	:	AGCRT-US-3G3/SAR (2014-04-01)

Tested By



Eric Zhou

Sep. 19, 2014

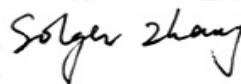
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Angela Li

Sep. 19, 2014

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Sep. 19, 2014

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1. SUMMARY OF MAXIMUM SAR VALUE

The maximum results of Specific Absorption Rate (SAR) found during testing for EUT are as follows:

Highest tested and scaled SAR Summary

Exposure Position	Test Mode	Highest Tested 1g-SAR(W/Kg)	Highest Scaled Maximum SAR(W/Kg)
Body-worn	802.11b(Antenna 1)	0.386	0.446
	802.11b(Antenna 2)	0.307	0.365
	802.11b(Antenna 1+ Antenna 2)	0.470	0.531
	802.11g Antenna 1)	0.285	0.329
	802.11g(Antenna 2)	0.272	0.323
	802.11g(Antenna 1+ Antenna 2)	0.297	0.334
	802.11n(20) (Antenna 1+ Antenna 2)	0.297	0.310
	802.11n(40) (Antenna 1+ Antenna 2)	0.286	0.356

This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/Kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1, and had been tested in accordance with measurement methods and procedures specified in IEEE 1528-2003 and the relevant KDB files like KDB 447498 D01 , KDB 865664 D01 , KDB 248227 D01....etc.

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2. GENERAL INFORMATION

2.1. EUT Description

General Information	
Product Designation	USB Wireless-N Adapter
Test Model	WS-WN683N2P
Hardware Version	WS-WN683N2P-B-V1.0
Software Version	RTLMIanU_1026.8.0211.2014_UI_1.00.0239
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
WIFI (Antenna 1)	
WIFI Specification	☐ 802.11a ☒ 802.11b ☒ 802.11g ☒ 802.11n(20) ☒ 802.11n(40)
Operation Frequency	2412~2462MHz
Avg. Burst Power	11b: 16.57dBm, 11g: 14.36dBm, 11n(20): 13.28dBm, 11n(40): 11.85dBm
Antenna Gain	Integrated Antenna with 3dBi gain(Max)
WIFI (Antenna 2)	
WIFI Specification	☐ 802.11a ☒ 802.11b ☒ 802.11g ☒ 802.11n(20) ☒ 802.11n(40)
Operation Frequency	2412~2462MHz
Avg. Burst Power	11b: 16.36dBm, 11g: 14.59dBm, 11n(20): 14.27dBm, 11n(40): 12.36dBm
Antenna Gain	Integrated Antenna with 3dBi gain(Max)
Product	Type
	☒ Production unit ☐ Identical Prototype

2.2. Test Procedure

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	WLAN test software installed on the EUT which can provide continuous RF signal

2.3. Test Environment

Ambient conditions in the laboratory:

Items	Required	Actual
Temperature (°C)	18-25	21± 2
Humidity (%RH)	30-70	55±2

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3. SAR MEASUREMENT SYSTEM

3.1. Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and occupational/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume (dv) of given mass density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dV} \right)$$

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

SAR can be obtained using either of the following equations:

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

$$SAR = c_h \left. \frac{dT}{dt} \right|_{t=0}$$

Where

SAR	is the specific absorption rate in watts per kilogram;
E	is the r.m.s. value of the electric field strength in the tissue in volts per meter;
σ	is the conductivity of the tissue in siemens per metre;
ρ	is the density of the tissue in kilograms per cubic metre;
c_h	is the heat capacity of the tissue in joules per kilogram and Kelvin;

$\left. \frac{dT}{dt} \right|_{t=0}$ is the initial time derivative of temperature in the tissue in kelvins per second

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3.2. SAR Measurement Procedure

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

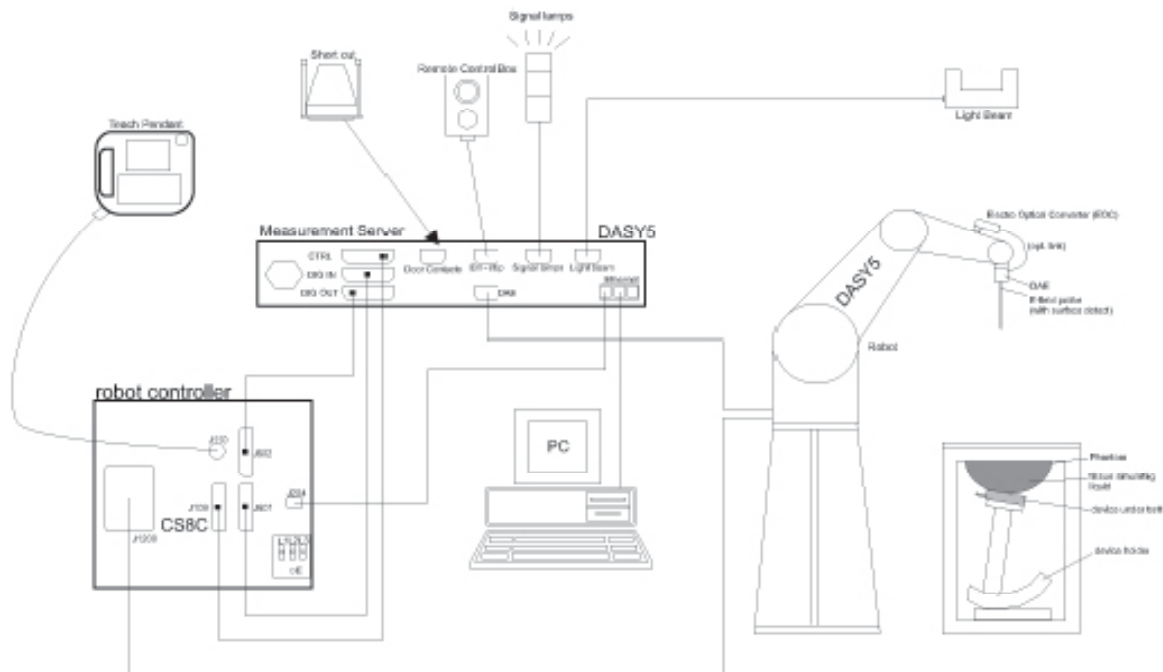
The EUT is placed against the Universal Phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at 1mm²) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at 1mm³).

When multiple peak SAR location were found during the same configuration or test mode, Zoom scan shall performed on each peak SAR location, only the peak point with maximum SAR value will be reported for the configuration or test mode.

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3.3. DASY5 System Description



DASY5 System Configurations

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

- (1) A standard high precision 6-axis robot with controller, teach pendant and software.
- (2) A data acquisition electronics (DAE) which attached to the robot arm extension. The DAE consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.
- (3) A dosimetric probe equipped with an optical surface detector system.
- (4) The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital Communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server
- (5) A Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- (6) A computer running WinXP .
- (7) DASY software.
- (8) Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- (9) Phantoms, device holders and other accessories according to the targeted measurement.

3.3.1. Applications

Predefined procedures and evaluations for automated compliance testing with all worldwide standards, e.g., IEEE 1528, IEC 62209-1, IEC 62209-2 and others.

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3.3.2. Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for applications utilize a 10mm² step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments. When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

3.3.3. Zoom Scan (Cube Scan Averaging)

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. A density of 1000 kg/m³ is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21.5mm. The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of 7x7x7 (5mmx5mmx5mm) providing a volume of 30mm in the X & Y axis, and 30mm in the Z axis.

3.3.4. Uncertainty of Inter-/Extrapolation and Averaging

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Post processor, DASY5 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEEE 1528. The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x, y, z) = A e^{-\frac{z}{2a}} \cos^2 \left(\frac{\pi}{2} \frac{\sqrt{x'^2 + y'^2}}{5a} \right)$$

$$f_2(x, y, z) = A e^{-\frac{z}{a}} \frac{a^2}{a^2 + x'^2} \left(3 - e^{-\frac{2z}{a}} \right) \cos^2 \left(\frac{\pi}{2} \frac{y'}{3a} \right)$$

$$f_3(x, y, z) = A \frac{a^2}{\frac{a^2}{4} + x'^2 + y'^2} \left(e^{-\frac{2z}{a}} + \frac{a^2}{2(a + 2z)^2} \right)$$

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3.4. DASY5 E-Field Probe

The SAR measurement is conducted with the dissymmetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dissymmetric probe has special calibration in liquid at different frequency. SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, IEC 62209, etc.) Under ISO17025. The calibration data are in Appendix D.

3.5. Isotropic E-Field Probe Specification

Model	EX3DV4	
Manufacture	SPEAG	
frequency	0.3GHz-6 GHz Linearity:±0.2dB(300 MHz-6 GHz)	
Dynamic Range	0.01W/Kg-100W/Kg Linearity:±0.2dB	
Dimensions	Overall length:337mm Tip diameter:2.5mm Typical distance from probe tip to dipole centers:1mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

3.6. Robot

The DASY system uses the high precision robots (DASY5:TX60) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from is used.

The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller



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3.7. Light Beam Unit

The light beam switch allows automatic “tooling” of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip. The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.



3.8. Device Holder

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR). Thus the device needs no repositioning when changing the angles. The DASY device holder has been made out 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.



3.9. Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chip-disk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DAYS I/O board, which is directly connected to the PC/104 bus of the CPU board. The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.



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3.10. SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom



The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

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4. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 4.2

4.1. The composition of the tissue simulating liquid

Ingredient	2450MHz
(% Weight)	Body
Water	73.2
Salt	0.04
Sugar	0.00
HEC	0.00
Preventol	0.00
DGBE	26.7
TWEEN	0.00

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4.2. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Dielectric Probe Kit and R&S Network Analyzer ZVL6 .

Tissue Stimulant Measurement for 2450MHz					
Fr. (MHz)	Ch.	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		body			
		ϵ_r 52.7 50.065-55.335	δ [s/m] 1.95 1.8525-2.0475		
2450	Low	52.06	1.92	21	Aug. 27,2014
2450	Mid	52.22	1.89	21	Aug. 27,2014
2450	High	52.17	1.92	21	Aug. 27,2014

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4.3. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 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 a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Target Frequency (MHz)	head		body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
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	1.01	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 $\rho = 1000 \text{ kg/m}^3$)

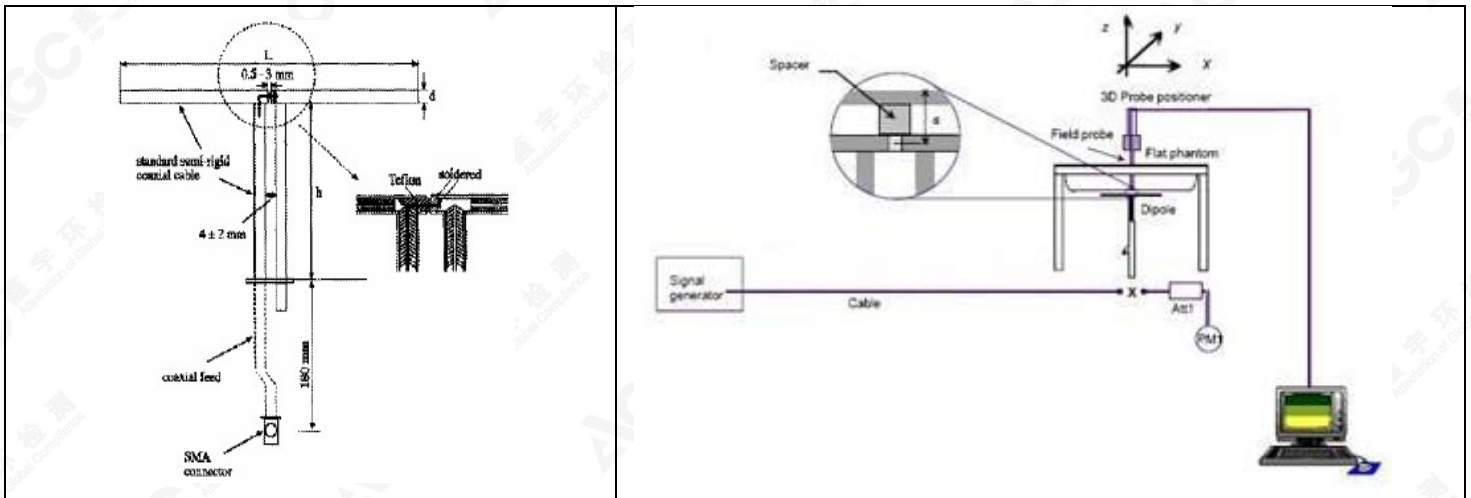
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5. SAR MEASUREMENT PROCEDURE

5.1. SAR System Validation Procedures

Each DASY5 system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY5 software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.

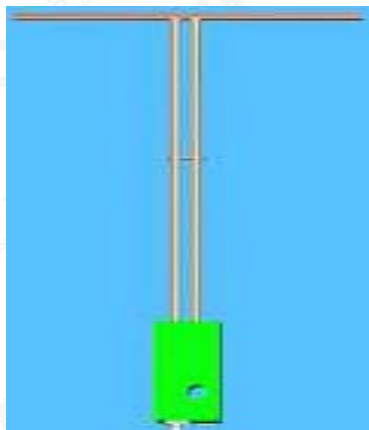
The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.



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5.2. SAR System Validation

5.2.1. Validation Dipoles



The dipoles used is based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical Specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
2450MHz	51.5	30.4	3.6

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5.2.2. Validation Result

System Performance Check at 2450MHz for Body								
Validation Kit: SN 46/11DIP 2G450-189								
Frequency [MHz]	Target Value(W/Kg)		Reference Result ($\pm 10\%$)		Tested Value(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
2450	54.19	24.96	48.771-59.609	22.464-27.456	56.9	25.5	21	Aug. 27, 2014

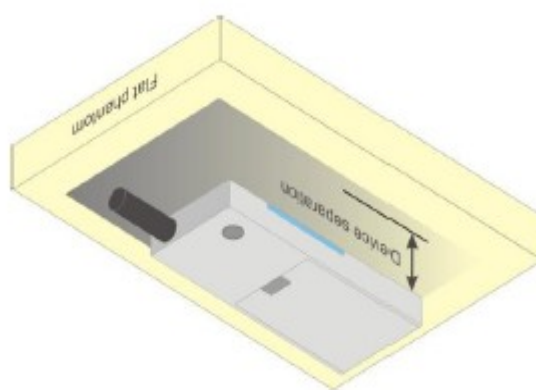
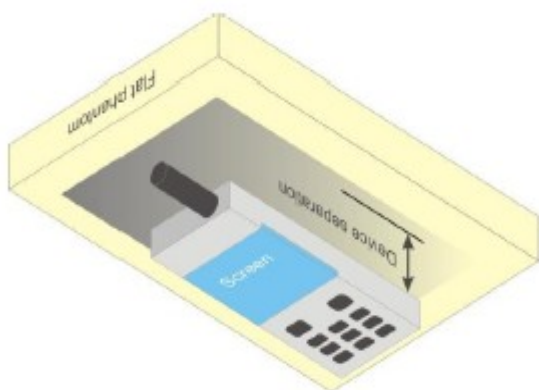
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6. EUT TEST POSITION

This EUT was tested in **Horizontal back**, **Horizontal front**, **Vertical back** and **Vertical front**.

6.1. Body Worn Position

- (1) To position the EUT parallel to the phantom surface.
- (2) To adjust the EUT parallel to the flat phantom.
- (3) To adjust the distance between the EUT surface and the flat phantom to **5mm**.



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7. SAR EXPOSURE LIMITS

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 "Uncontrolled Environments" limits. These limits apply to a location which is deemed as "Uncontrolled Environment" which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

Limits for General Population/Uncontrolled Exposure (W/kg)

Type Exposure	Uncontrolled Environment Limit
Spatial Peak SAR (1g cube tissue for brain or body)	1.60 W/kg

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8. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
Robot Controller	Stäubli-CS8	139522	N/A	N/A
TISSUE Probe	SATIMO	SN 45/11 OCPG45	11/14/2013	11/13/2015
E-Field Probe	Speag-EX3DV4	3953	10/15/2013	10/14/2014
SAM Twin Phantom	Speag-SAM	1790	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	10/10/2013	10/09/2014
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Dipole	SATIMO SID2450	SN46/11 DIP 2G450-189	11/14/2013	11/13/2015
Signal Generator	Agilent-E4438C	MY44260051	02/23/2014	02/22/2015
Power Sensor	NRP-Z23	US38261498	02/17/2014	02/16/2015
SPECTRUM ANALYZER	Agilent- E4440A	MY44303916	10/22/2013	10/21/2014
Network Analyzer	Rhode & Schwarz ZVA	SN100132	02/17/2014	02/16/2015

Note: Per KDB 865664 Dipole SAR Validation Verification, AGC Lab has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement;
4. Impedance is within 5Ω of calibrated measurement.

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9. MEASUREMENT UNCERTAINTY

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 12.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor(a)	$1/k(b)$	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) k is the coverage factor

Table 13.1 Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

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DAYS5 Measurement Uncertainty Measurement uncertainty for 30 MHz to 3GHz averaged over 1 gram / 10 gram.							
Error Description	Uncertainty value(±10%)	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	±6.0%	±6.0%
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%
Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	±2.7%	±2.7%
Probe Modulation Response	2.4	Rectangular	$\sqrt{3}$	1	1	±1.4%	±1.4%
System Detection Limits	1.0	Rectangular	$\sqrt{3}$	1	1	±0.6%	±0.6%
Boundary Effects	2.0	Rectangular	$\sqrt{3}$	1	1	±1.2%	±1.2%
Readout Electronics	0.3	Normal	$\sqrt{3}$	1	1	±0.3%	±0.3%
Response Time	0.8	Rectangular	$\sqrt{3}$	1	1	±0.5%	±0.5%
Integration Time	2.6	Rectangular	$\sqrt{3}$	1	1	±1.5%	±1.5%
RF Ambient Noise	3.0	Rectangular	$\sqrt{3}$	1	1	±1.7%	±1.7%
RF Ambient Reflection	3.0	Rectangular	$\sqrt{3}$	1	1	±1.7%	±1.7%
Probe Positioner	0.8	Rectangular	$\sqrt{3}$	1	1	±0.5%	±0.5%
Probe Positioning	6.7	Rectangular	$\sqrt{3}$	1	1	±3.9%	±3.9%
Post-processing	4.0	Rectangular	$\sqrt{3}$	1	1	±2.3%	±2.3%
Test Sample Related							
Device Positioning	3.6	Normal	1	1	1	±3.6%	±2.3%
Device Holder	2.9	Normal	1	1	1	±2.9%	±2.3%
Measurement SAR Drift	5.0	Rectangular	$\sqrt{3}$	1	1	±2.9%	±2.3%
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	±0.0%	±2.3%
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	$\sqrt{3}$	1	1	±2.3%	±2.3%
Liquid Conductivity(Meas.)	2.5	Normal	1	0.78	0.71	±2.0%	±2.0%
Liquid Conductivity(Target)	5.0	Rectangular	$\sqrt{3}$	0.64	0.43	±1.8%	±1.8%
Liquid Permittivity(Meas.)	2.5	Normal		0.26	0.26	±0.7%	±0.7%
Liquid Permittivity((Target)	5.0	Rectangular	$\sqrt{3}$	0.6	0.49	±1.7%	±1.4%
Liquid Conductivity-temperature uncertainty	1.7	Rectangular	$\sqrt{3}$	0.78	0.71	±0.8%	±0.7%
Liquid Permittivity-temperature uncertainty	0.3	Rectangular	$\sqrt{3}$	0.23	0.26	±0.0%	±0.0%
Combined Standard Uncertainty						±12.2%	±11.9%
Coverage Factor for 95%						K=2	
Expanded Uncertainty						±22.0%	±21.5%

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10. CONDUCTED POWER MEASUREMENT

Antenna 1

Mode	Data Rate (Mbps)	Channel	Frequency(MHz)	Avg. Burst Power(dBm)
802.11b	1	01	2412	16.57
		06	2437	16.37
		11	2462	15.95
802.11g	6	01	2412	14.34
		06	2437	14.36
		11	2462	13.81
802.11n(20)	6.5	01	2412	13.08
		06	2437	12.72
		11	2462	13.28
802.11n(40)	13.5	03	2422	11.85
		06	2437	11.71
		09	2452	11.70

Antenna 2

Mode	Data Rate (Mbps)	Channel	Frequency(MHz)	Avg. Burst Power(dBm)
802.11b	1	01	2412	16.35
		06	2437	16.25
		11	2462	16.36
802.11g	6	01	2412	14.58
		06	2437	14.59
		11	2462	14.50
802.11n(20)	6.5	01	2412	13.98
		06	2437	14.08
		11	2462	14.27
802.11n(40)	13.5	03	2422	11.75
		06	2437	11.89
		09	2452	12.36

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Antenna 1+ Antenna 2

Mode	Data Rate (Mbps)	Channel	Frequency(MHz)	Avg. Burst Power(dBm)
802.11b	1	01	2412	19.47
		06	2437	19.32
		11	2462	19.17
802.11g	6	01	2412	17.47
		06	2437	17.49
		11	2462	17.18
802.11n(20)	6.5	01	2412	16.56
		06	2437	16.46
		11	2462	16.81
802.11n(40)	13.5	03	2422	14.81
		06	2437	14.81
		09	2452	15.05

Note: Combine Power Calculation:

$$\text{Total Power (dBm)} = \log \left(10^{\left(\text{chain 0} \frac{\text{power 1}}{10} \right)} + 10^{\left(\text{chain 1} \frac{\text{power 2}}{10} \right)} \right) * 10$$

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11. TEST RESULTS

11.1. SAR Test Results Summary

11.1.1. Test position and configuration

Body SAR was performed with the device 5mm from the phantom

11.1.2. Operation Mode and configuration

- There are two antennas on the dongle. Firstly start with antenna 1 and test the dongle according to the procedures found in FCC KDB Publication 447498 D02, body SAR was performed with the device to phantom separation distance of 5mm. All USB orientations (A: Horizontal-Up, B: Horizontal-Down, C: Vertical-Front, and D: Vertical-Back) were evaluated with 15cm USB cable for extension. And the same test procedure for antenna 2. Simultaneous transmission can access through software. Please check the SAR test photos.
- According to KDB 447498 D01 v05r01, for each exposure position, if the highest 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
- Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
Maximum Scaling SAR = tested SAR (Max.) $\times$ [maximum turn-up power (mw)/ maximum measurement output power(mw)]

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11.1.3. Test Result

SAR MEASUREMENT									
Ambient Temperature (°C) : 21 ± 2					Relative Humidity (%): 55				
Liquid Temperature (°C) : 21 ± 2					Depth of Liquid (cm):>15				
Product: USB Wireless-N Adapter									
Test Mode:802.11b									
Position	Mode	Ch.	Fr. (MHz)	Power Drift (<±0.2)	SAR (1g) (W/kg)	Max. Turn-up Power (dBm)	Meas. output Power (dBm)	Scaled SAR (W/Kg)	Limit W/kg
Antenna 1									
Horizontal -Back	DTS	6	2437	-0.02	0.386	17.00	16.37	0.446	1.6
Horizontal -Front	DTS	6	2437	-0.08	0.286	17.00	16.37	0.331	1.6
Vertical -front	DTS	6	2437	0.19	0.347	17.00	16.37	0.401	1.6
Vertical- back	DTS	6	2437	-0.03	0.294	17.00	16.37	0.340	1.6
Tip	DTS	6	2437	-0.12	0.317	17.00	16.37	0.366	1.6
Antenna 2									
Horizontal -Back	DTS	6	2437	-0.00	0.307	17.00	16.25	0.365	1.6
Horizontal -Front	DTS	6	2437	0.04	0.216	17.00	16.25	0.257	1.6
Vertical -front	DTS	6	2437	0.04	0.241	17.00	16.25	0.286	1.6
Vertical -back	DTS	6	2437	0.12	0.271	17.00	16.25	0.322	1.6
Tip	DTS	6	2437	0.01	0.280	17.00	16.25	0.333	1.6
Antenna 1 + Antenna 2									
Horizontal -Back	DTS	6	2437	-0.01	0.470	20.00	19.47	0.531	1.6
Horizontal -Front	DTS	6	2437	-0.06	0.303	20.00	19.47	0.342	1.6
Vertical -front	DTS	6	2437	0.11	0.355	20.00	19.47	0.401	1.6
Vertical -back	DTS	6	2437	-0.00	0.347	20.00	19.47	0.392	1.6
Tip	DTS	6	2437	0.10	0.301	20.00	19.47	0.340	1.6

Note:

- According to KDB248227, SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.
- All of above "DTS" means data transmitters.
- The test separation of all above table for body part is 5mm

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SAR MEASUREMENT									
Ambient Temperature (°C) : 21 ± 2					Ambient Temperature (°C) : 21 ± 2				
Liquid Temperature (°C) : 21 ± 2					Liquid Temperature (°C) : 21 ± 2				
Product: USB Wireless-N Adapter									
Test Mode:802.11g									
Position	Mode	Ch.	Fr. (MHz)	Power Drift (<±0.2)	SAR (1g) (W/kg)	Max. Turn-up Power (dBm)	Meas. output Power (dBm)	Scaled SAR (W/Kg)	Limit W/kg
Antenna 1									
Horizontal -Back	DTS	6	2437	-0.10	0.285	17.00	16.37	0.329	1.6
Horizontal -Front	DTS	6	2437	0.00	0.196	17.00	16.37	0.227	1.6
Vertical -front	DTS	6	2437	0.10	0.270	17.00	16.37	0.312	1.6
Vertical -back	DTS	6	2437	-0.04	0.263	17.00	16.37	0.304	1.6
Tip	DTS	6	2437	-0.09	0.235	17.00	16.37	0.272	1.6
Antenna 2									
Horizontal -Back	DTS	6	2437	-0.16	0.272	17.00	16.25	0.323	1.6
Horizontal -Front	DTS	6	2437	0.08	0.187	17.00	16.25	0.222	1.6
Vertical -front	DTS	6	2437	-0.16	0.258	17.00	16.25	0.307	1.6
Vertical -back	DTS	6	2437	-0.05	0.231	17.00	16.25	0.275	1.6
Tip	DTS	6	2437	0.17	0.247	17.00	16.25	0.294	1.6
Antenna 1 + Antenna 2									
Horizontal -Back	DTS	6	2437	-0.02	0.297	18.00	17.49	0.334	1.6
Horizontal -Front	DTS	6	2437	0.02	0.270	18.00	17.49	0.304	1.6
Vertical -front	DTS	6	2437	0.01	0.262	18.00	17.49	0.295	1.6
Vertical -back	DTS	6	2437	0.13	0.222	18.00	17.49	0.250	1.6
Tip	DTS	6	2437	-0.14	0.276	18.00	17.49	0.310	1.6

Note:

- According to KDB248227, SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.
- All of above "DTS" means data transmitters.
- The test separation of all above table for body part is 5mm.

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SAR MEASUREMENT									
Ambient Temperature (°C) : 21 ± 2					Ambient Temperature (°C) : 21 ± 2				
Liquid Temperature (°C) : 21 ± 2					Liquid Temperature (°C) : 21 ± 2				
Product: USB Wireless-N Adapter									
Test Mode: 802.11n(20)									
Position	Mode	Ch.	Fr. (MHz)	Power Drift ($\leq \pm 0.2$)	SAR (1g) (W/kg)	Max. Turn-up Power (dBm)	Meas. output Power (dBm)	Scaled SAR (W/Kg)	Limit W/kg
Antenna 1 + Antenna 2									
Horizontal -Back	DTS	6	2437	0.09	0.297	17.00	16.81	0.310	1.6
Horizontal -Front	DTS	6	2437	0.02	0.262	17.00	16.81	0.274	1.6
Vertical -front	DTS	6	2437	0.07	0.269	17.00	16.81	0.281	1.6
Vertical -back	DTS	6	2437	0.10	0.199	17.00	16.81	0.208	1.6
Tip	DTS	6	2437	-0.00	0.237	17.00	16.81	0.248	1.6

Note:

- According to KDB248227, SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.
- All of above "DTS" means data transmitters.
- The test separation of all above table for body part is 5mm.

SAR MEASUREMENT									
Ambient Temperature (°C) : 21 ± 2					Ambient Temperature (°C) : 21 ± 2				
Liquid Temperature (°C) : 21 ± 2					Liquid Temperature (°C) : 21 ± 2				
Product: USB Wireless-N Adapter									
Test Mode: 802.11n(40)									
Position	Mode	Ch.	Fr. (MHz)	Power Drift ($\leq \pm 0.2$)	SAR (1g) (W/kg)	Max. Turn-up Power (dBm)	Meas. output Power (dBm)	Scaled SAR (W/Kg)	Limit W/kg
Antenna 1 + Antenna 2									
Antenna -Back	DTS	6	2437	-0.01	0.286	16.00	15.05	0.356	1.6
Antenna -Front	DTS	6	2437	0.01	0.238	16.00	15.05	0.296	1.6
Vertical -front	DTS	6	2437	0.15	0.267	16.00	15.05	0.332	1.6
Vertical- back	DTS	6	2437	-0.04	0.167	16.00	15.05	0.208	1.6
Tip	DTS	6	2437	0.05	0.266	16.00	15.05	0.331	1.6

Note:

- According to KDB248227, SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.
- All of above "DTS" means data transmitters.
- The test separation of all above table for body part is 5mm.

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APPENDIX A. SAR SYSTEM VALIDATION DATA

Test Laboratory: AGC Lab

Date: Aug. 27,2014

System Check Body 2450 MHz

DUT: Dipole 2450 MHz Type: SID 2450

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1;

Frequency: 2450 MHz; Medium parameters used: $f = 2450$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section; Input Power=10dBm

Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 2450MHz Body/Area Scan (61×81×1): Measurement grid: $dx=1.000$ mm, $dy=1.000$ mm,

Maximum value of SAR (measured)=0.895 W/Kg

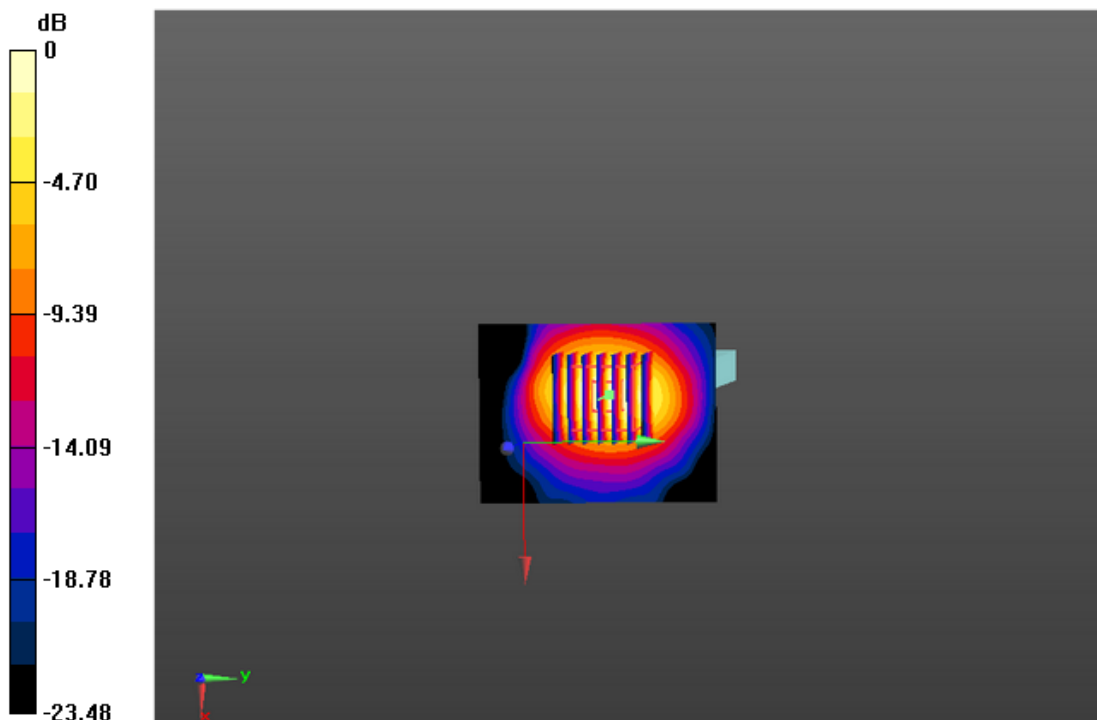
Configuration/System Check 2450MHz Body/Zoom Scan (7×7×7)/Cube 0: Measurement grid: $dx=5$ mm, $dy = 5$ mm, $dz=5$ mm,

Reference Value=18.531V/m; Power Drift=0.07 dB

Peak SAR (extrapolated) =1.25 W/kg

SAR (1g) =0.569 W/Kg; SAR (10g) =0.255 W/Kg

Maximum value of SAR (measured)=0.901 W/Kg



0 dB = 0.901 W/kg = -0.45 dBW/kg

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APPENDIX B. SAR MEASUREMENT DATA

Test Laboratory: AGC Lab
802.11b Mid-Antenna 1 - Horizontal Back(DTS)

Date: Aug. 27,2014

DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/BACK/Area Scan (151x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.453 W/kg

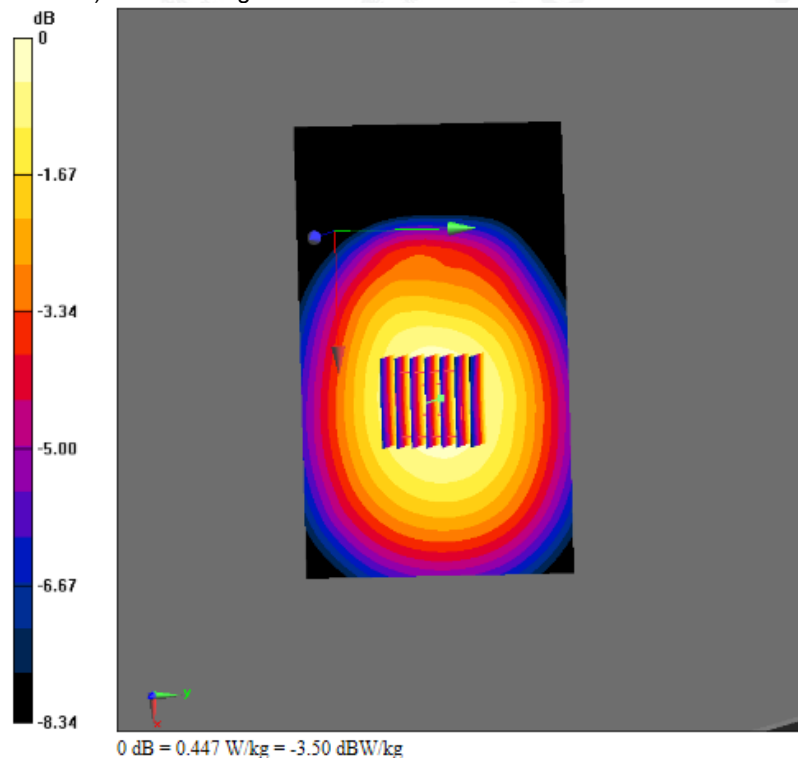
1/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.012 V/m; Power Drift = -0.02dB

Peak SAR (extrapolated) = 0.493 W/kg

SAR(1 g) = 0.386 W/kg; SAR(10 g) = 0.290 W/kg

Maximum value of SAR (measured) = 0.447 W/kg



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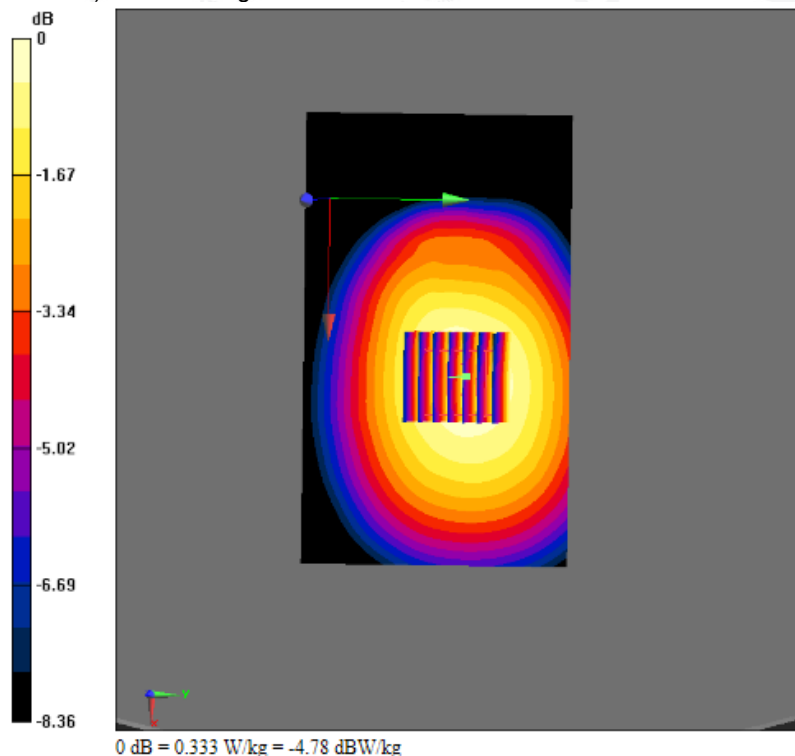
Test Laboratory: AGC Lab
802.11b Mid-Antenna 1 –Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/Front/Area Scan (151x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.327 W/kg
1/Front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 6.003 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.358 W/kg
SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.213 W/kg
Maximum value of SAR (measured) = 0.333 W/kg



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Test Laboratory: AGC Lab
802.11b Mid-Antenna 1 - Vertical Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$

Electronics: DAE4 Sn1398; Calibrated: 10/10/2013

Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;

DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/BODY/ Vertical back/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.343 W/kg

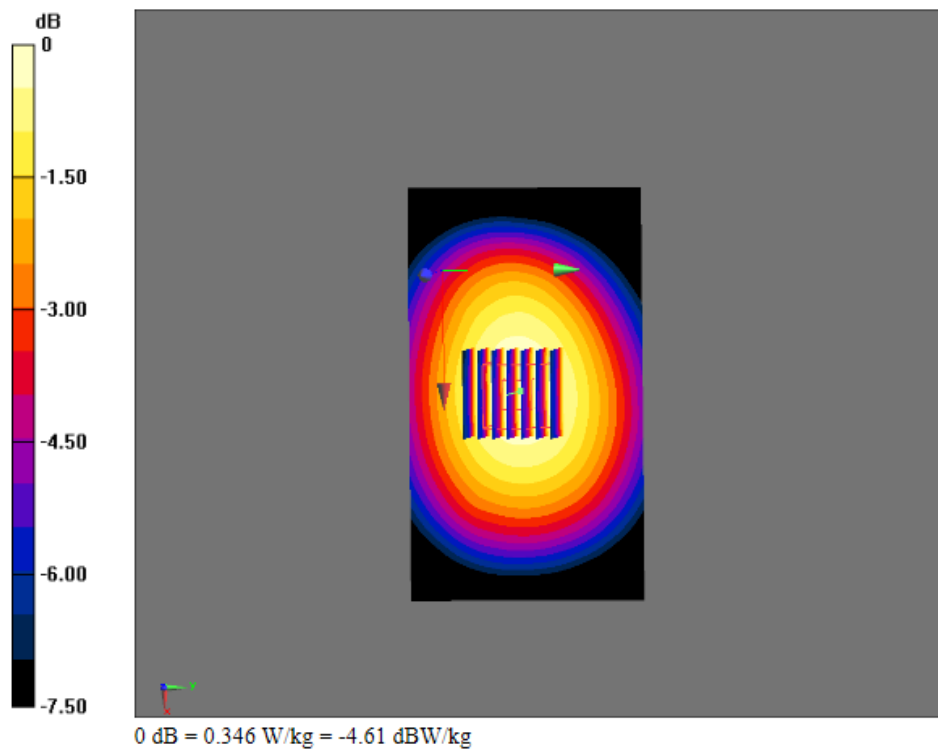
1/BODY/ Vertical back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 11.606 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.369 W/kg

SAR(1 g) = 0.294 W/kg; SAR(10 g) = 0.210 W/kg

Maximum value of SAR (measured) = 0.346 W/kg



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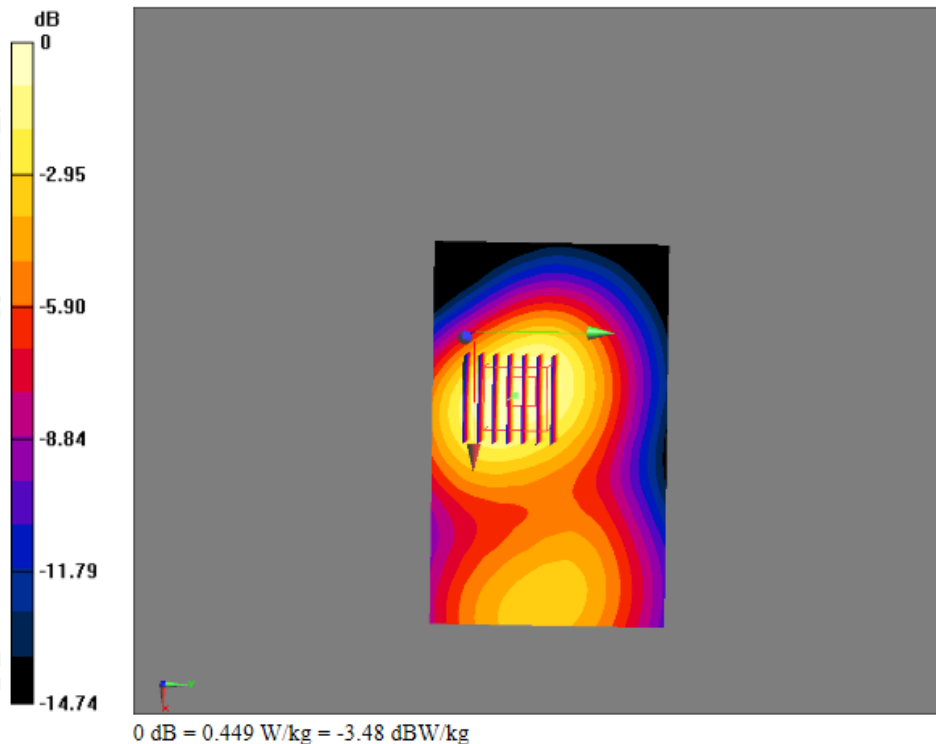
Test Laboratory: AGC Lab
802.11b Mid-Antenna 1 –Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/ Vertical front /Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.450 W/kg
1/ Vertical front /V/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 7.335 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.546 W/kg
SAR(1 g) = 0.347 W/kg; SAR(10 g) = 0.217 W/kg
Maximum value of SAR (measured) = 0.449 W/kg



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Test Laboratory: AGC Lab
802.11b Mid-Antenna 1 –Tip (DTS)

Date: Aug. 27, 2014

DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/Tip/Area Scan (101x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.357 W/kg

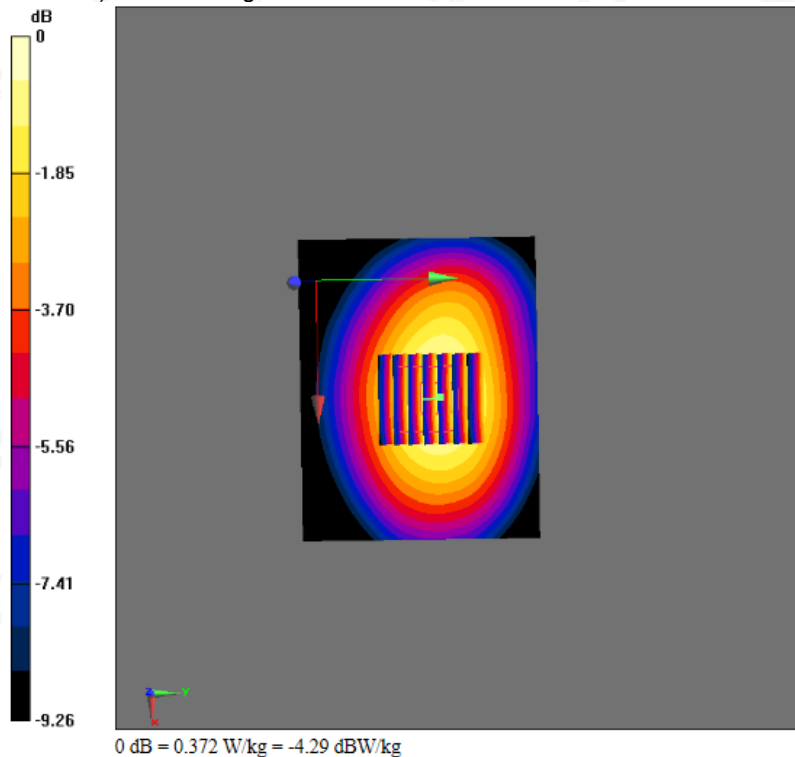
1/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.707 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.407 W/kg

SAR(1 g) = 0.317 W/kg; SAR(10 g) = 0.222 W/kg

Maximum value of SAR (measured) = 0.372 W/kg



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Test Laboratory: AGC Lab
802.11b Mid-Antenna 2 - Horizontal Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/BACK/Area Scan (151x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.362 W/kg

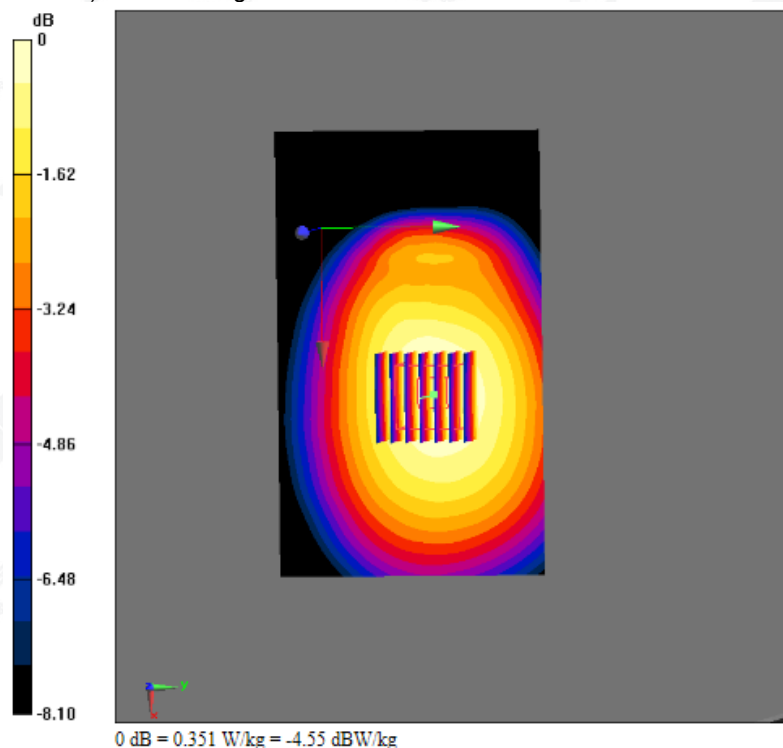
2/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.332 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.392 W/kg

SAR(1 g) = 0.307 W/kg; SAR(10 g) = 0.229 W/kg

Maximum value of SAR (measured) = 0.351 W/kg



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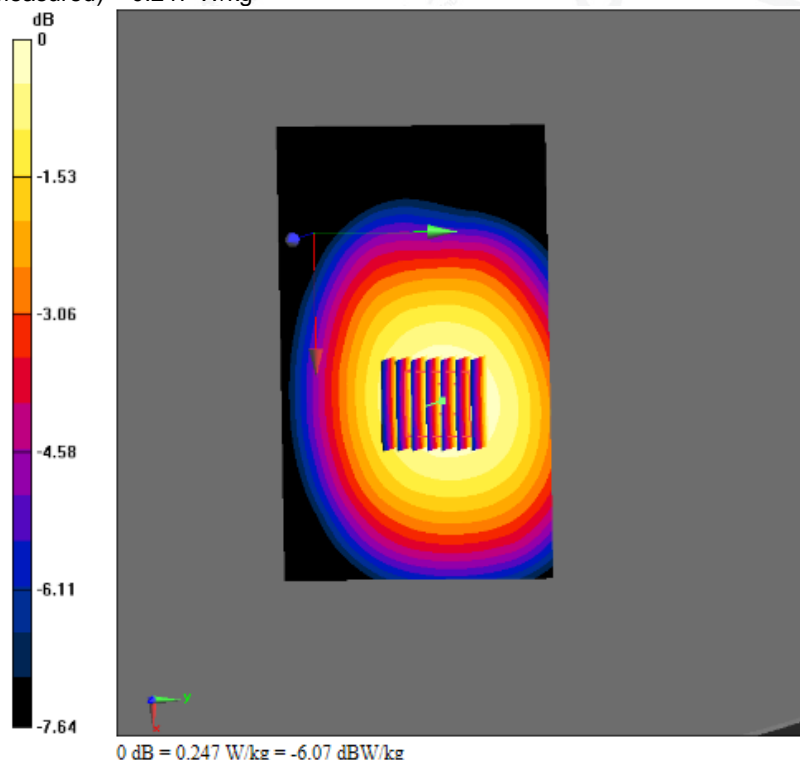
Test Laboratory: AGC Lab
802.11b Mid-Antenna 2 –Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/FRONT/Area Scan (151x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.241 W/kg
2/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 7.059 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.273 W/kg
SAR(1 g) = 0.216 W/kg; SAR(10 g) = 0.161 W/kg
Maximum value of SAR (measured) = 0.247 W/kg



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Test Laboratory: AGC Lab
802.11b Mid-Antenna 2 - Vertical Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/BODY/ Vertical back /Area Scan (171x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.321 W/kg

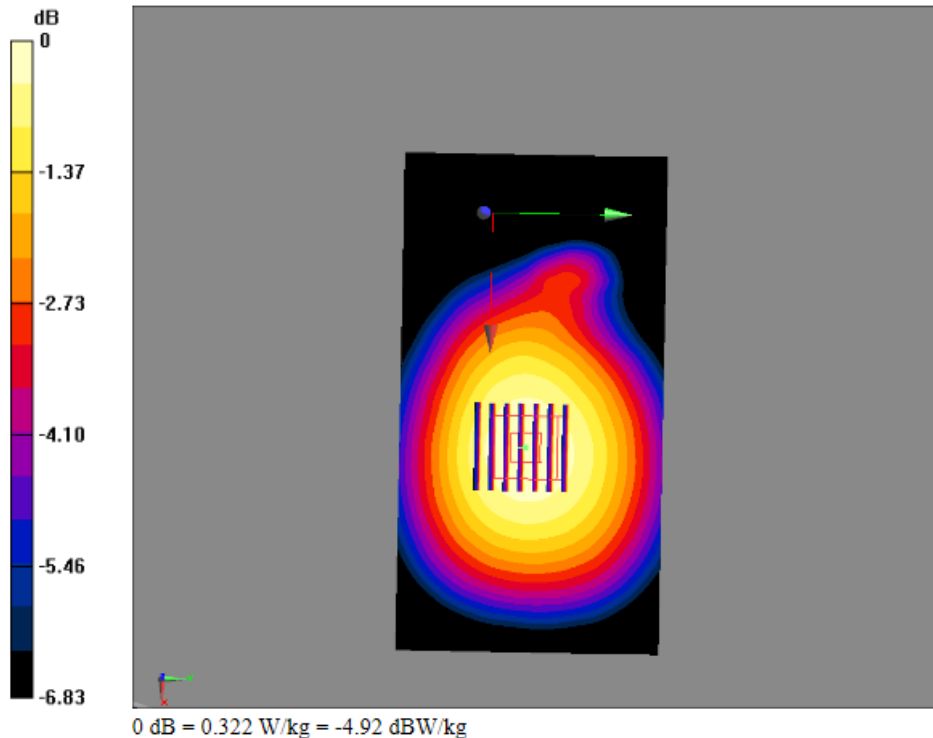
2/BODY/ Vertical back /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.640 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.348 W/kg

SAR(1 g) = 0.271 W/kg; SAR(10 g) = 0.197 W/kg

Maximum value of SAR (measured) = 0.322 W/kg



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Test Laboratory: AGC Lab
802.11b Mid-Antenna 2 –Tip(DTS)

Date: Aug. 27, 2014

DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$

Electronics: DAE4 Sn1398; Calibrated: 10/10/2013

Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;

DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/Tip/Area Scan (121x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.362 W/kg

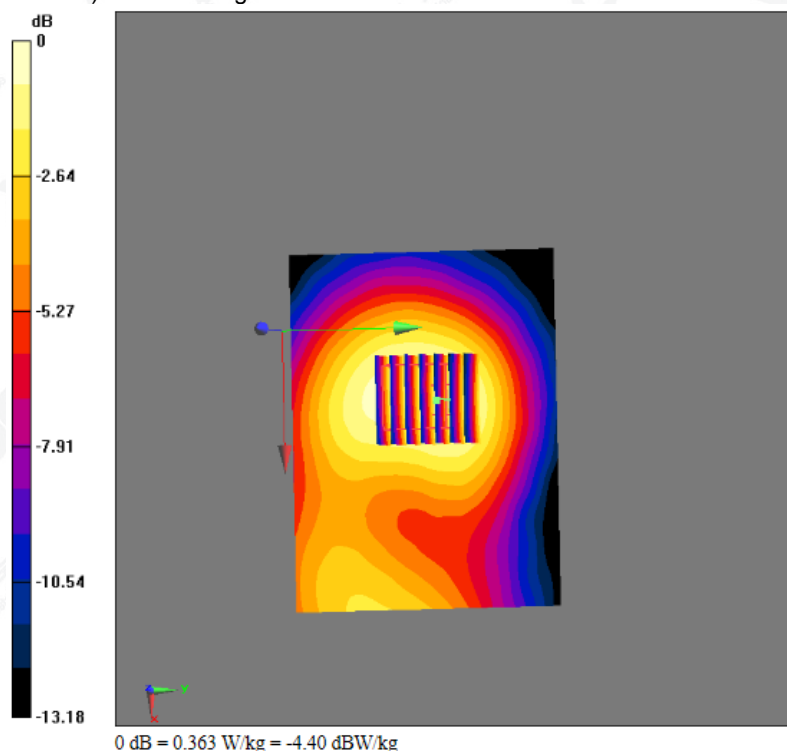
2/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 12.713 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.438 W/kg

SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.183 W/kg

Maximum value of SAR (measured) = 0.363 W/kg



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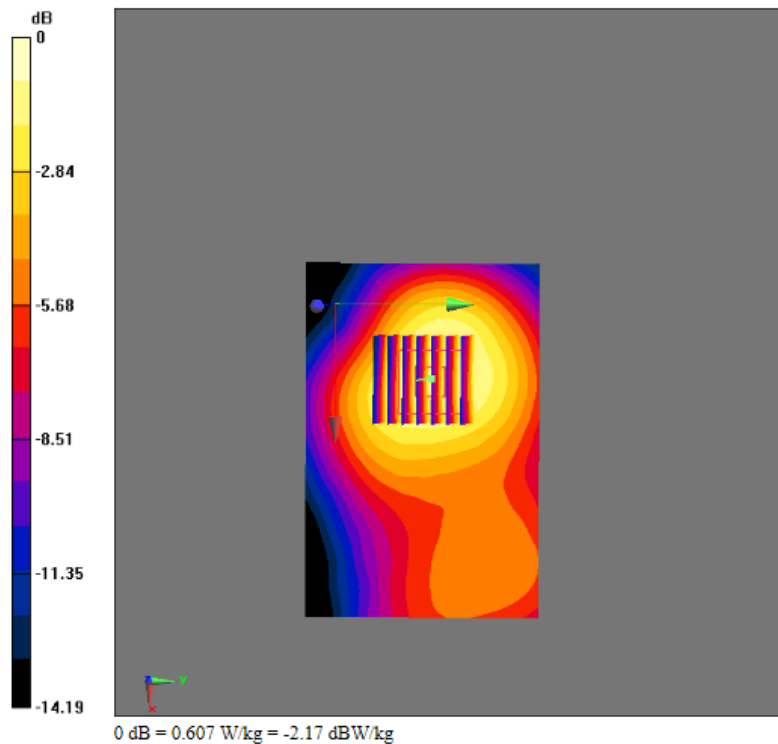
Test Laboratory: AGC Lab
802.11b Mid- Antenna 1 + Antenna 2- Horizontal Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BACK/Area Scan (121x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.610 W/kg
1+2/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 12.309 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.708 W/kg
SAR(1 g) = 0.470 W/kg; SAR(10 g) = 0.299 W/kg
Maximum value of SAR (measured) = 0.607 W/kg



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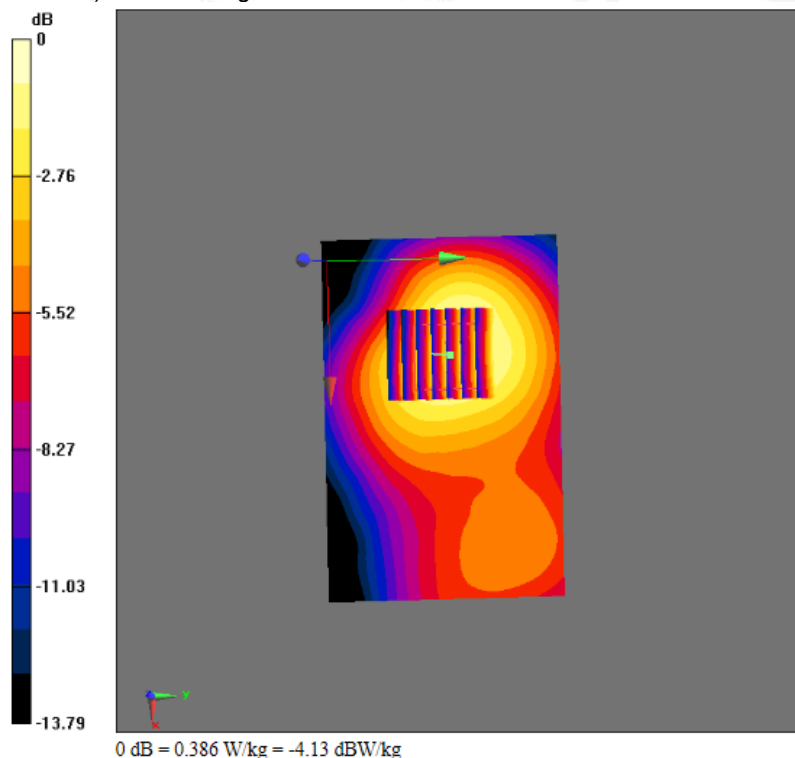
Test Laboratory: AGC Lab
802.11b Mid- Antenna 1 + Antenna 2 –Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/FRONT/Area Scan (121x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.392 W/kg
1+2/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 9.823 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.463 W/kg
SAR(1 g) = 0.303 W/kg; SAR(10 g) = 0.190 W/kg
Maximum value of SAR (measured) = 0.386 W/kg



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Test Laboratory: AGC Lab
802.11b Mid- Antenna 1 + Antenna 2- Vertical Back(DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical back /Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.406 W/kg

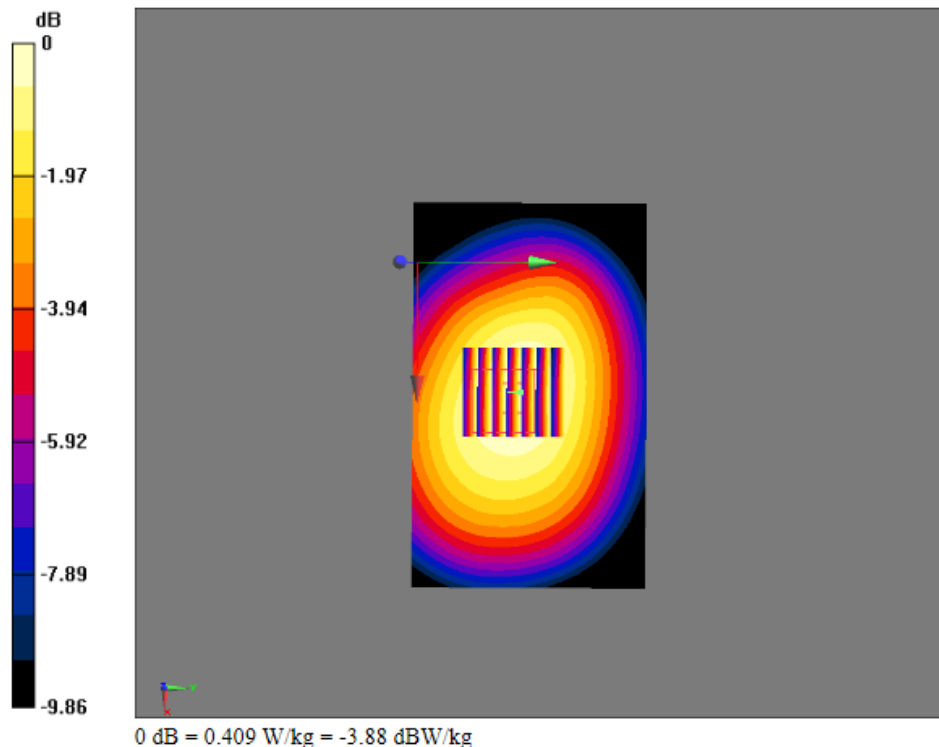
1+2/BODY/Vertical back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.476 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.455 W/kg

SAR(1 g) = 0.347 W/kg; SAR(10 g) = 0.253 W/kg

Maximum value of SAR (measured) = 0.409 W/kg



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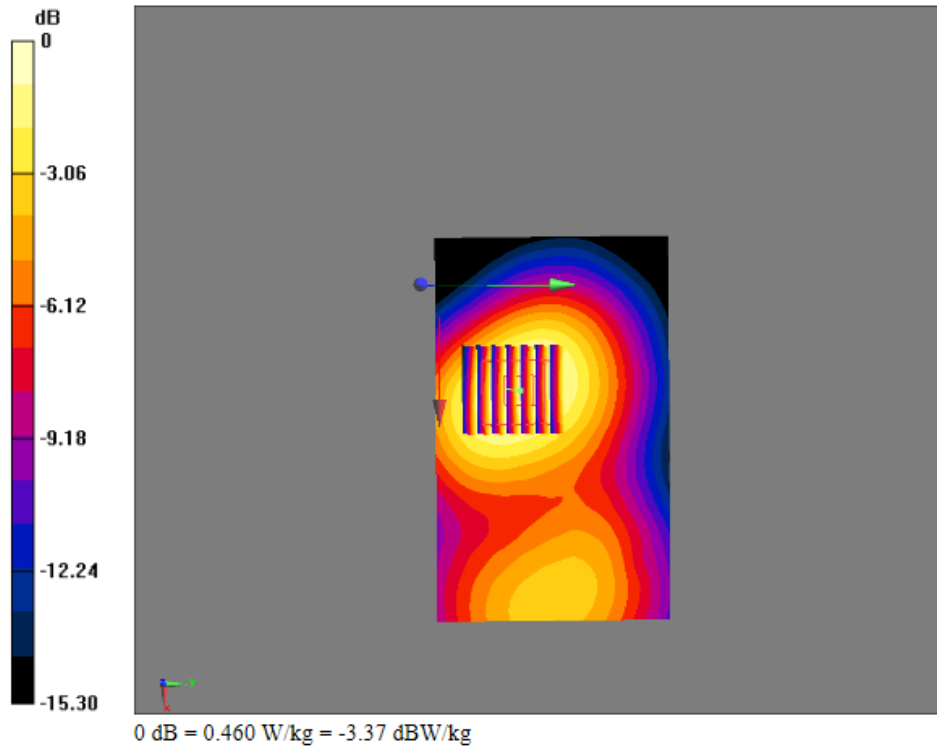
Test Laboratory: AGC Lab
802.11b Mid- Antenna 1 + Antenna 2 –Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical front /Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.462 W/kg
1+2/BODY/Vertical front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 7.346 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.555 W/kg
SAR(1 g) = 0.355 W/kg; SAR(10 g) = 0.222 W/kg
Maximum value of SAR (measured) = 0.460 W/kg



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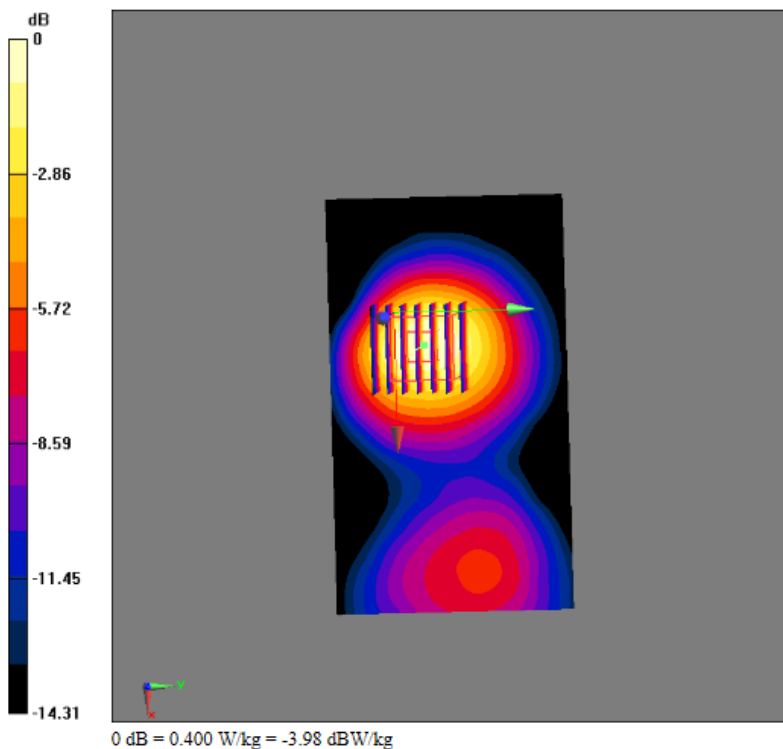
Test Laboratory: AGC Lab
802.11b Mid- Antenna 1 + Antenna 2 –Tip (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11b (0); Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 31.0
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/Tip/Area Scan (141x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.432 W/kg
1+2/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.572 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.488 W/kg
SAR(1 g) = 0.301 W/kg; SAR(10 g) = 0.175 W/kg
Maximum value of SAR (measured) = 0.400 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 1—Horizontal Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/BACK/Area Scan (121x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.318 W/kg

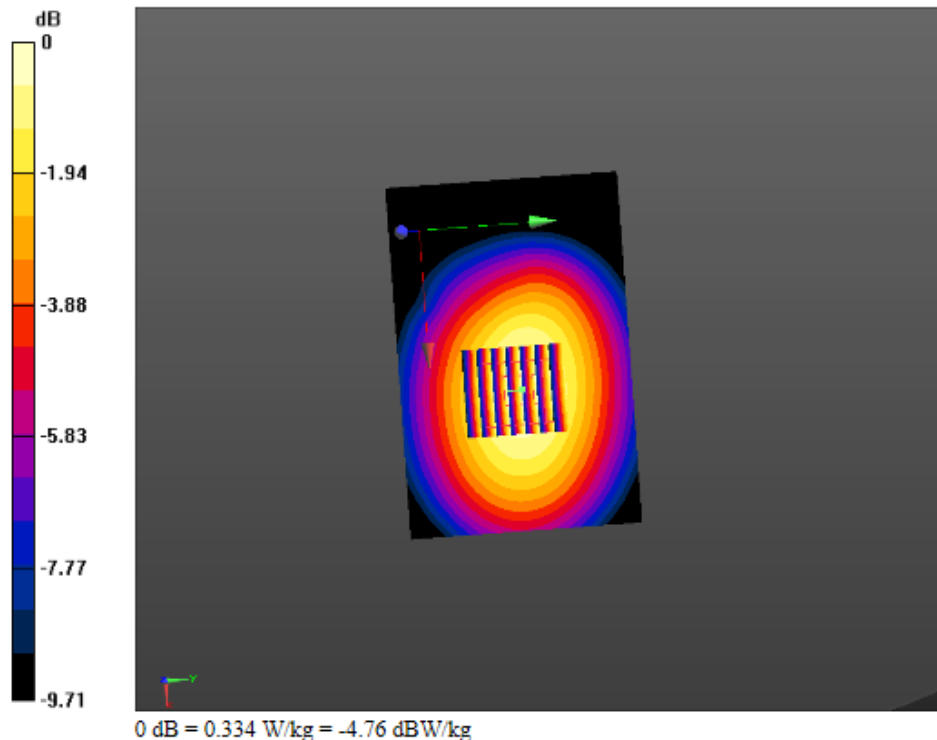
1/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.732 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.372 W/kg

SAR(1 g) = 0.285 W/kg; SAR(10 g) = 0.200 W/kg

Maximum value of SAR (measured) = 0.334 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 1 - Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/FRONT/Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.254 W/kg

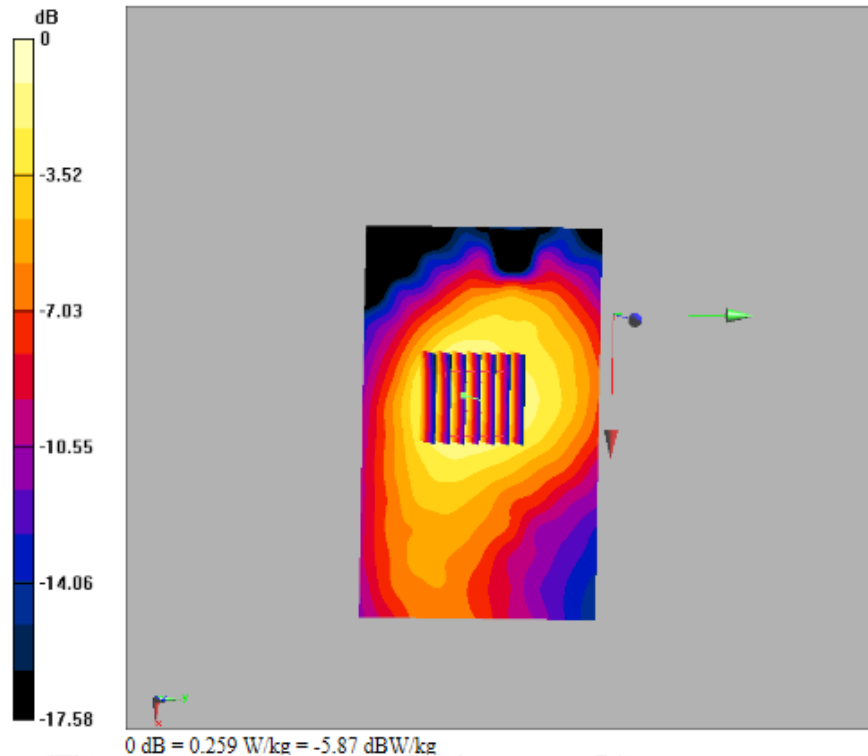
1/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.275 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.308 W/kg

SAR(1 g) = 0.196 W/kg; SAR(10 g) = 0.113 W/kg

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



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 1 –Vertical Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/BODY/ Vertical back /Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.309 W/kg

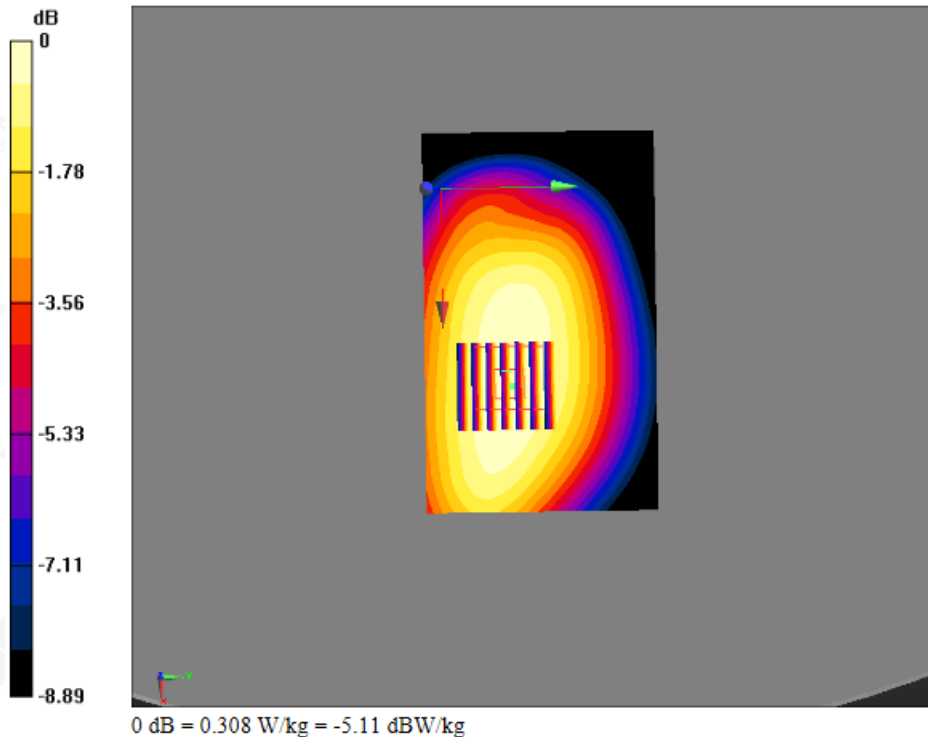
1/BODY/ Vertical back /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.604 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.342 W/kg

SAR(1 g) = 0.263 W/kg; SAR(10 g) = 0.193 W/kg

Maximum value of SAR (measured) = 0.308 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 1 - Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/BODY/ Vertical front /Area Scan (161x101x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.287 W/kg

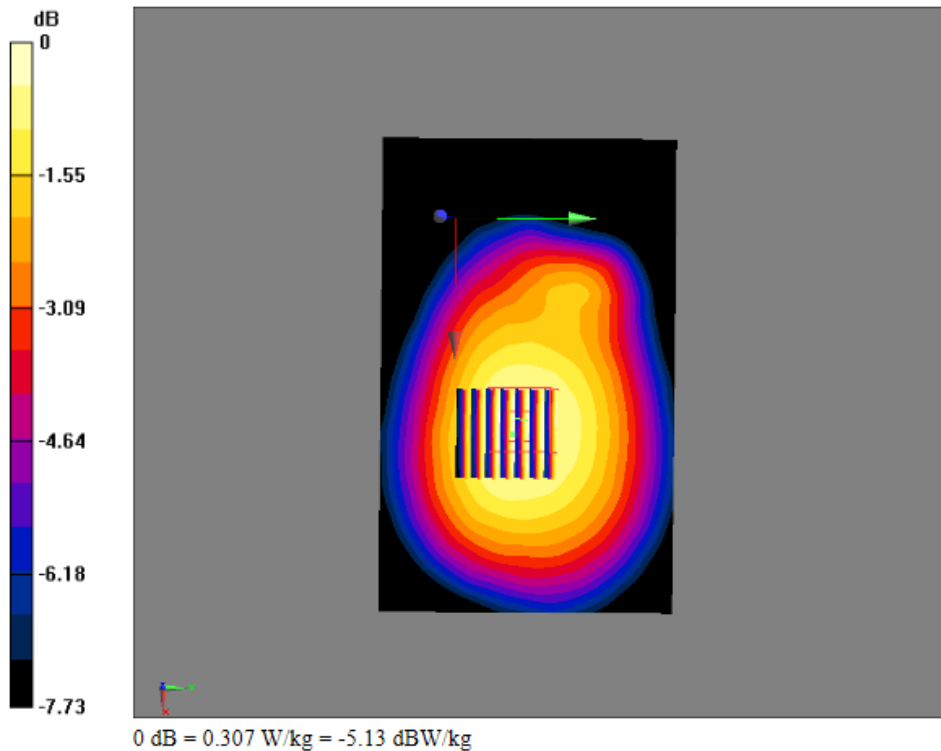
1/BODY/Vertical front /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 8.765 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.325 W/kg

SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.195 W/kg

Maximum value of SAR (measured) = 0.307 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 1 – Tip(DTS)

Date: Aug. 27, 2014

DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1/Tip/Area Scan (121x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.295 W/kg

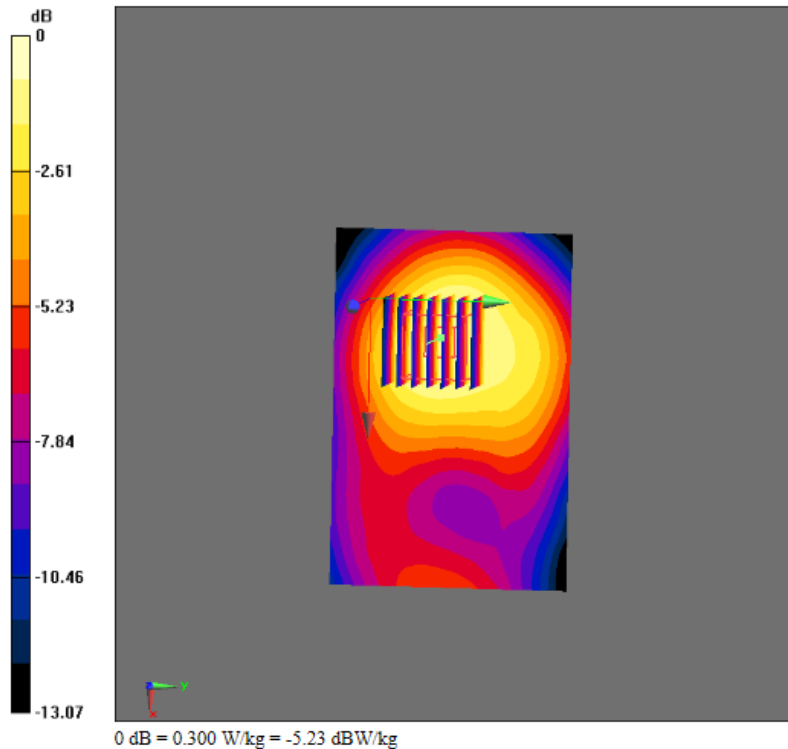
1/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.103 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.359 W/kg

SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.149 W/kg

Maximum value of SAR (measured) = 0.300 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 2 - Horizontal Back(DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/BACK/Area Scan (121x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.327 W/kg

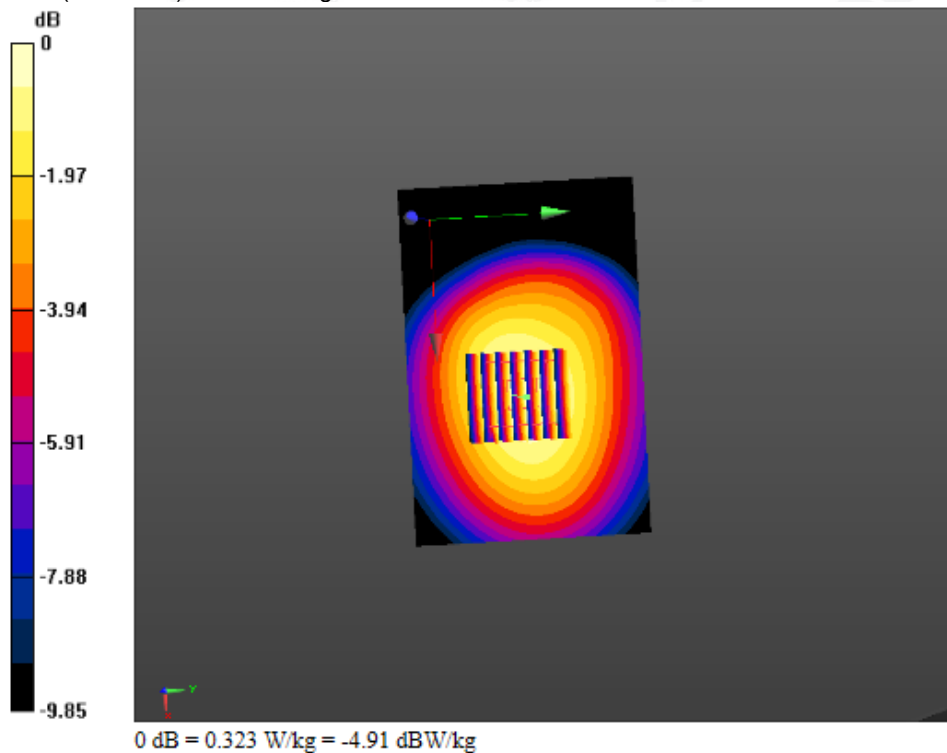
2/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.142 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.368 W/kg

SAR(1 g) = 0.272 W/kg; SAR(10 g) = 0.194 W/kg

Maximum value of SAR (measured) = 0.323 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 2 - Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/FRONT/Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.267 W/kg

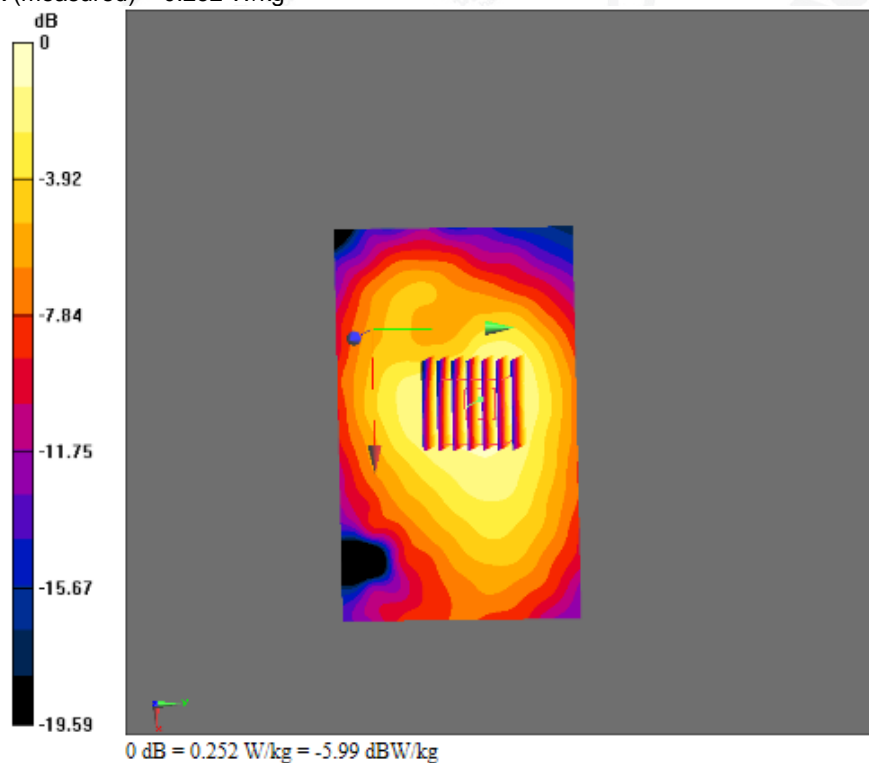
2/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.610 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.309 W/kg

SAR(1 g) = 0.187 W/kg; SAR(10 g) = 0.112 W/kg

Maximum value of SAR (measured) = 0.252 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 2 - Vertical Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/BODY/Vertical back /Area Scan (171x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.271 W/kg

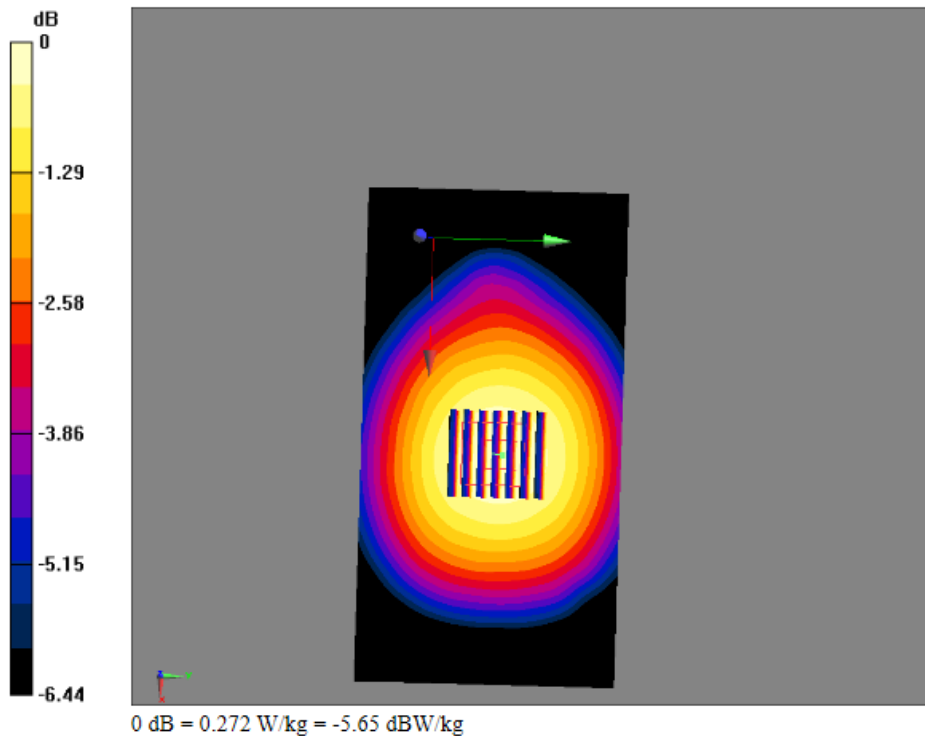
2/BODY/Vertical back /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 8.522 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.288 W/kg

SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.168 W/kg

Maximum value of SAR (measured) = 0.272 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 2 - Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/BODY/ Vertical front/Area Scan (171x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.341 W/kg

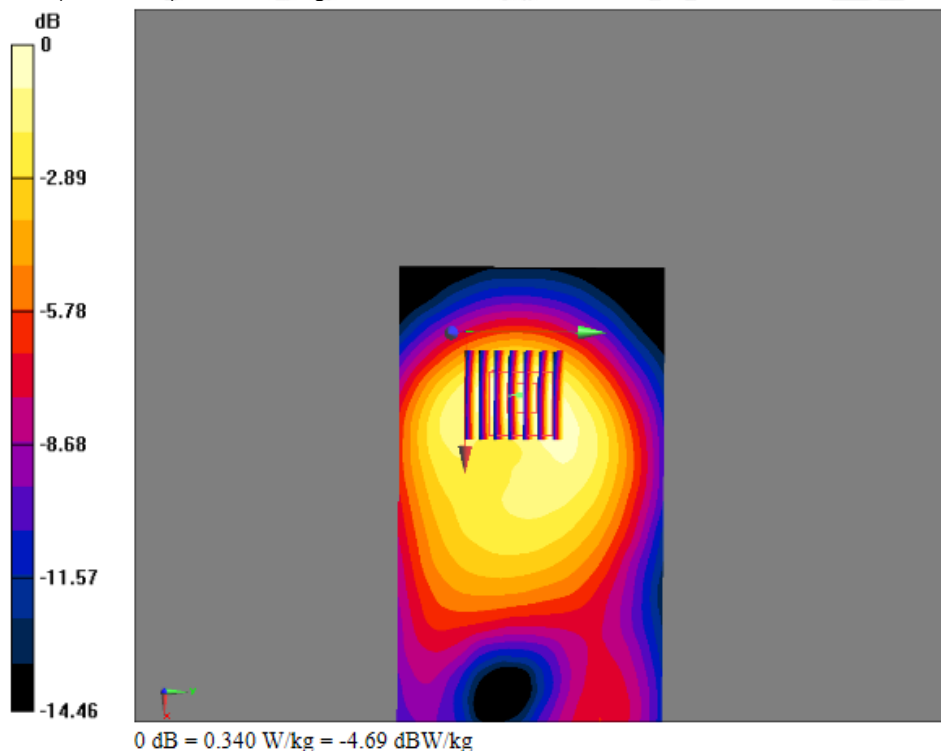
2/BODY/ Vertical front /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.905 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.407 W/kg

SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.156 W/kg

Maximum value of SAR (measured) = 0.340 W/kg



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Test Laboratory: AGC Lab
802.11g Mid-Antenna 2 - Tip (DTS)

Date: Aug. 27, 2014

DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2/Tip/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.331 W/kg

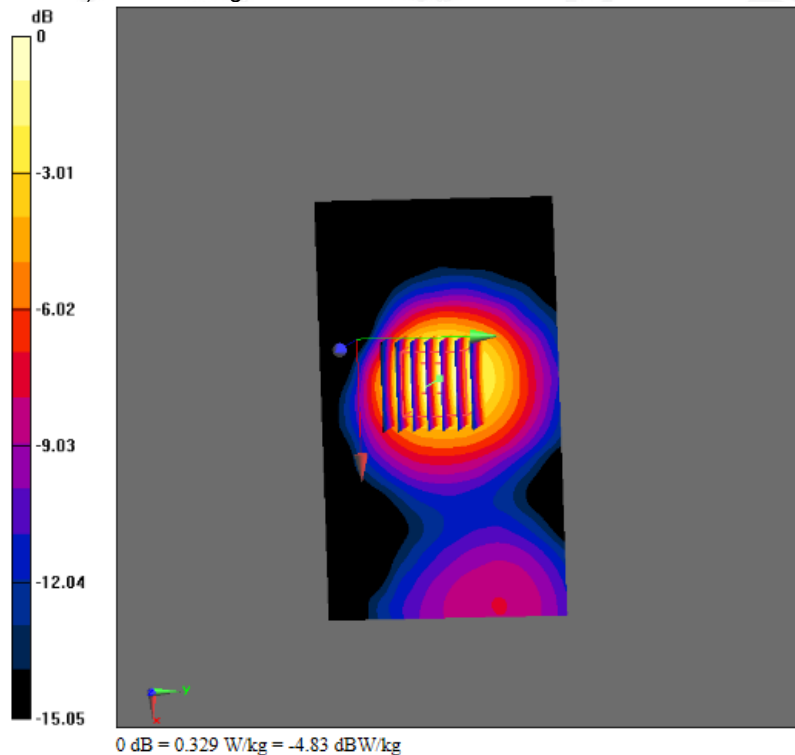
2/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.183 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.398 W/kg

SAR(1 g) = 0.247 W/kg; SAR(10 g) = 0.143 W/kg

Maximum value of SAR (measured) = 0.329 W/kg



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Test Laboratory: AGC Lab
802.11g Mid- Antenna 1 + Antenna 2 - Horizontal Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BACK/Area Scan (151x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.402 W/kg

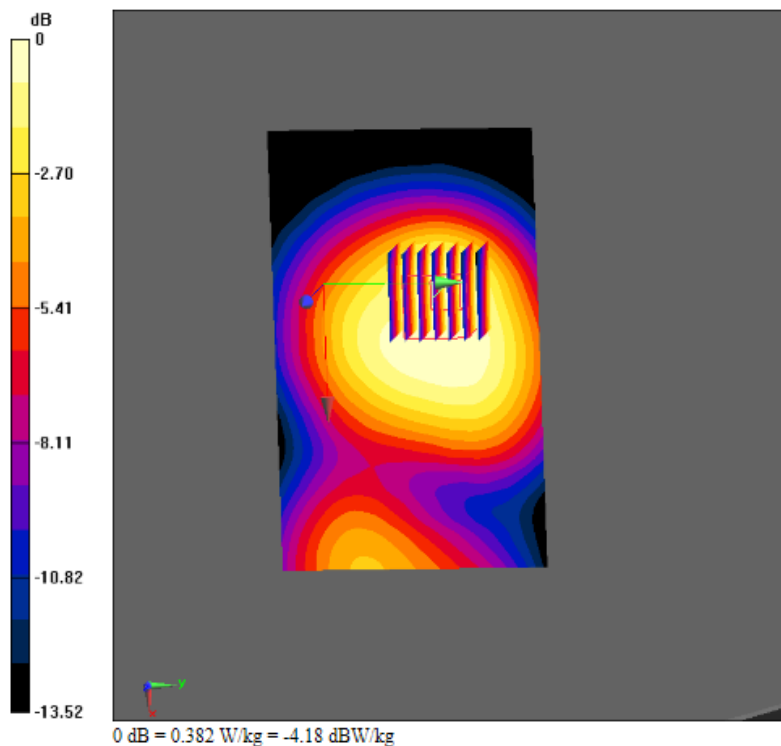
1+2/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.210 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.467 W/kg

SAR(1 g) = 0.297 W/kg; SAR(10 g) = 0.193 W/kg

Maximum value of SAR (measured) = 0.382 W/kg



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Test Laboratory: AGC Lab
802.11g Mid- Antenna 1 + Antenna 2 - Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/FRONT/Area Scan (151x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.330 W/kg

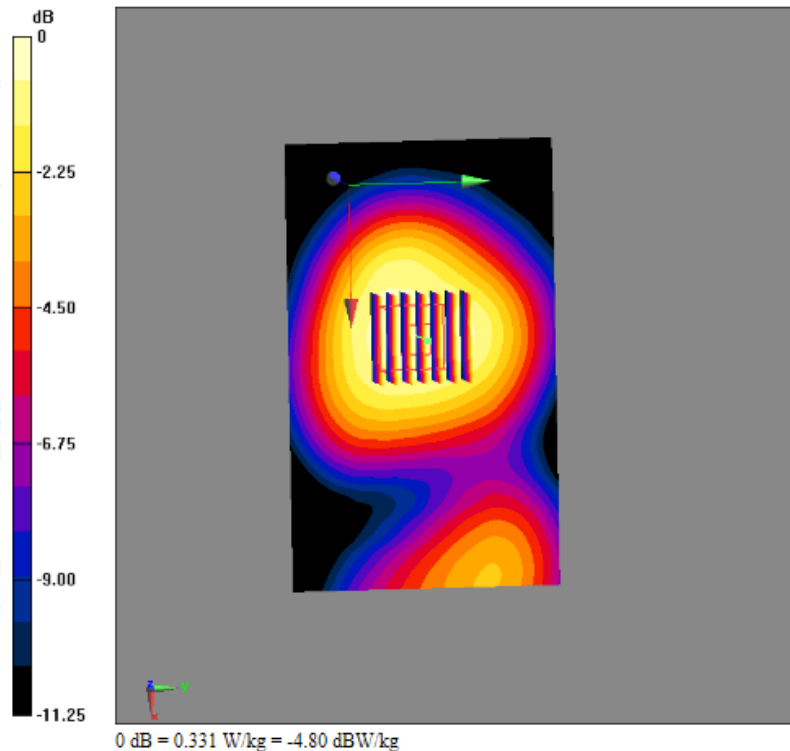
1+2/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 8.416 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.380 W/kg

SAR(1 g) = 0.270W/kg; SAR(10 g) = 0.179 W/kg

Maximum value of SAR (measured) = 0.331 W/kg



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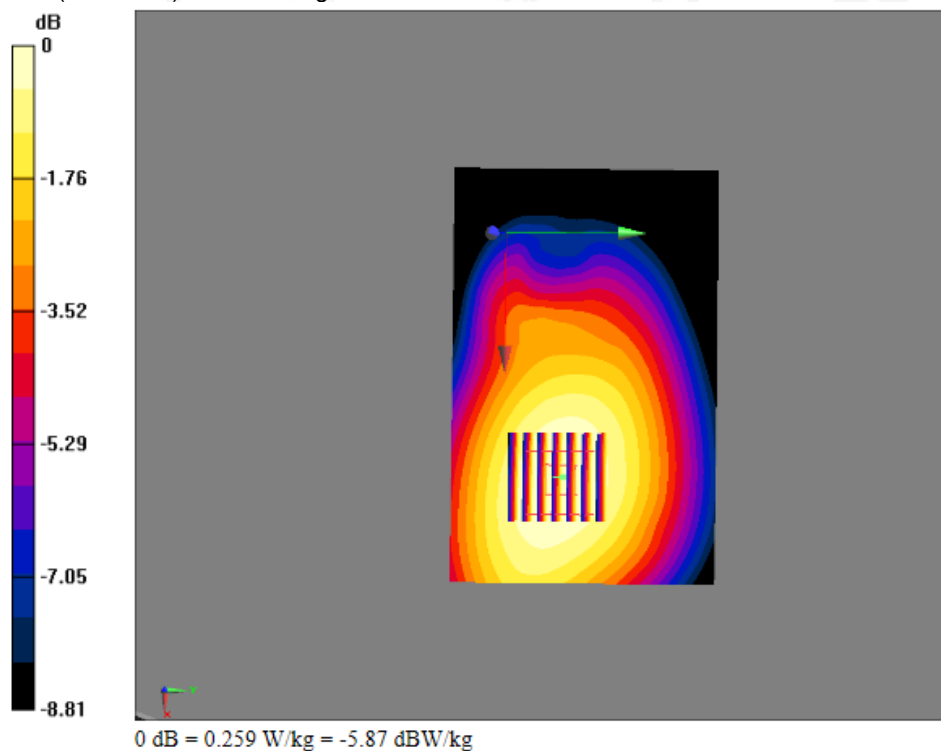
Test Laboratory: AGC Lab
802.11g Mid- Antenna 1 + Antenna 2 - Vertical Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical back /Area Scan (141x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.262 W/kg
1+2/BODY/Vertical back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 6.553 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.288 W/kg
SAR(1 g) = 0.222 W/kg; SAR(10 g) = 0.163 W/kg
Maximum value of SAR (measured) = 0.259 W/kg



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Test Laboratory: AGC Lab
802.11g Mid- Antenna 1 + Antenna 2 - Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical front /Area Scan (131x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.340 W/kg

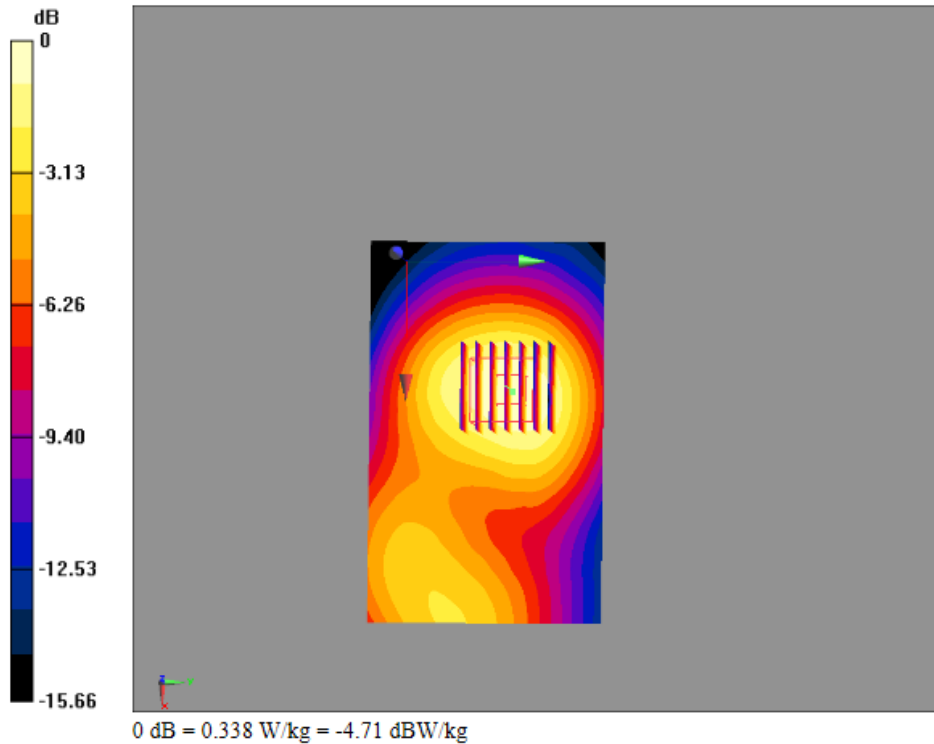
1+2/BODY/Vertical front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.609 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.404 W/kg

SAR(1 g) = 0.262 W/kg; SAR(10 g) = 0.166 W/kg

Maximum value of SAR (measured) = 0.338 W/kg



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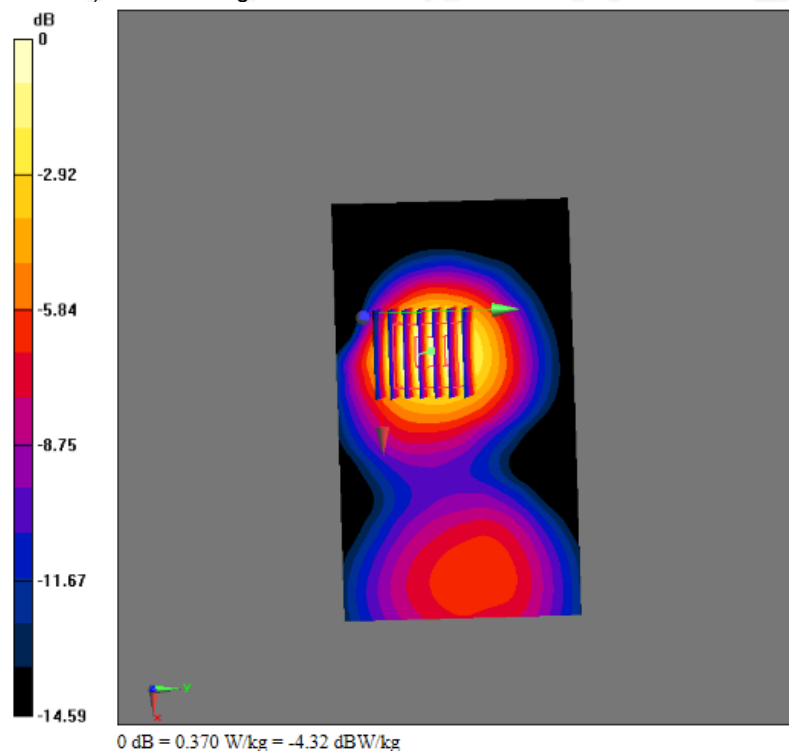
Test Laboratory: AGC Lab
802.11g Mid- Antenna 1 + Antenna 2 - Tip (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/Tip/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.370 W/kg
1+2/Tip /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 8.070 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.450 W/kg
SAR(1 g) = 0.276 W/kg; SAR(10 g) = 0.161 W/kg
Maximum value of SAR (measured) = 0.370 W/kg



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Test Laboratory: AGC Lab
802.11n (20) Mid- Antenna 1 + Antenna 2 –Horizontal Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BACK/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.400 W/kg

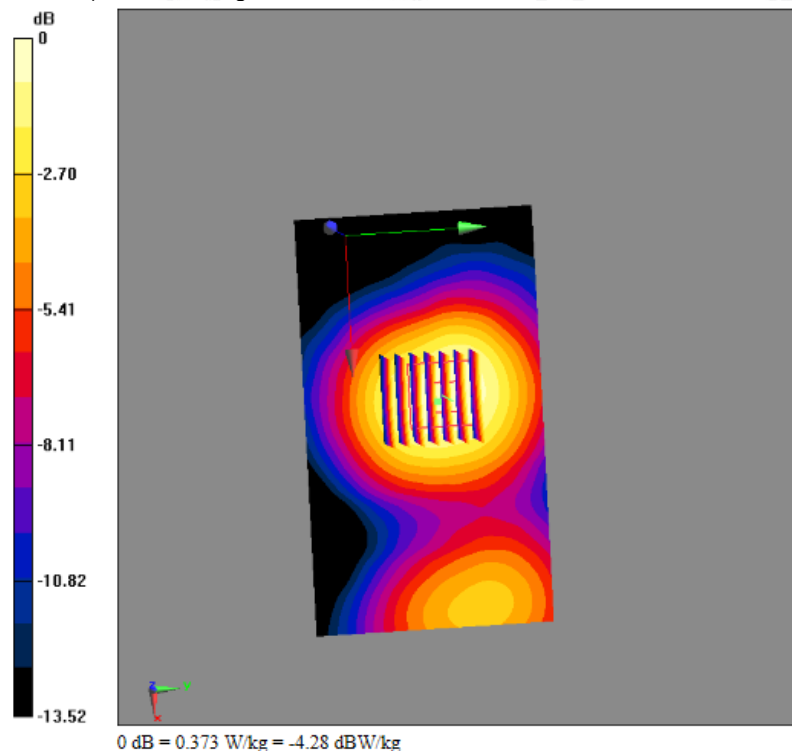
1+2/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.219 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.440 W/kg

SAR(1 g) = 0.297 W/kg; SAR(10 g) = 0.190 W/kg

Maximum value of SAR (measured) = 0.373 W/kg



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Test Laboratory: AGC Lab
802.11n (20) Mid- Antenna 1 + Antenna 2 - Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/FRONT/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.340 W/kg

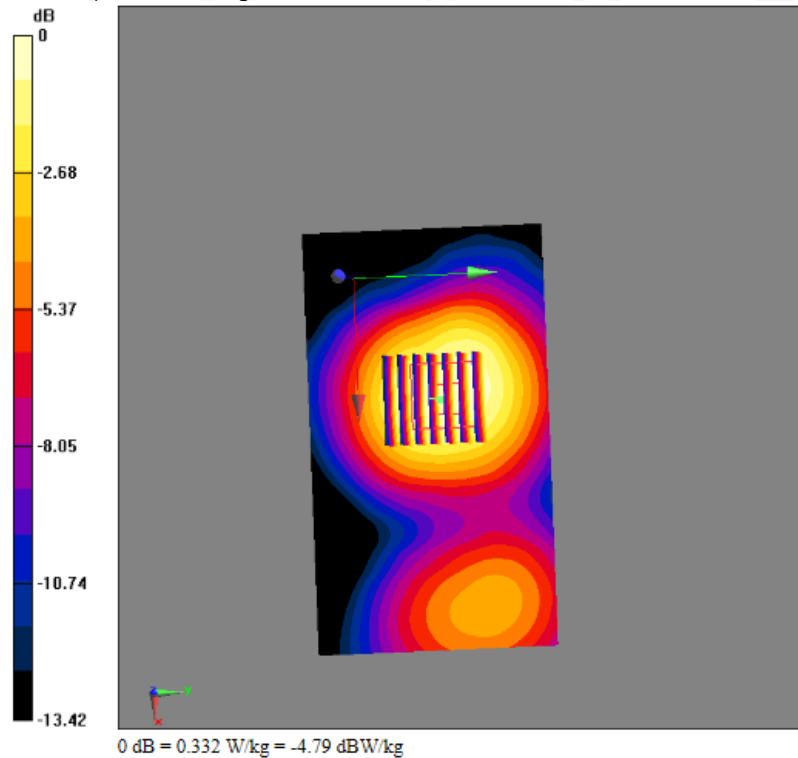
1+2/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.371 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.410 W/kg

SAR(1 g) = 0.262 W/kg; SAR(10 g) = 0.169 W/kg

Maximum value of SAR (measured) = 0.332 W/kg



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Test Laboratory: AGC Lab
802.11n (20) Mid- Antenna 1 + Antenna 2 –Vertical Back (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical back /Area Scan (171x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.235 W/kg

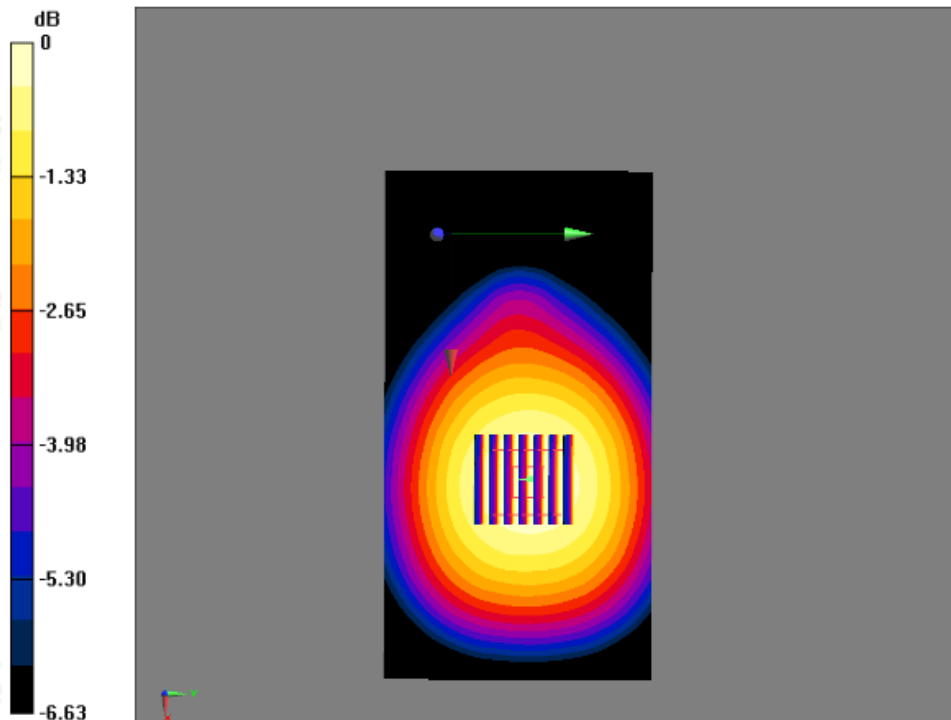
1+2/BODY/Vertical back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.641 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.255 W/kg

SAR(1 g) = 0.199 W/kg; SAR(10 g) = 0.146 W/kg

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



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Test Laboratory: AGC Lab
802.11n (20) Mid- Antenna 1 + Antenna 2 - Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

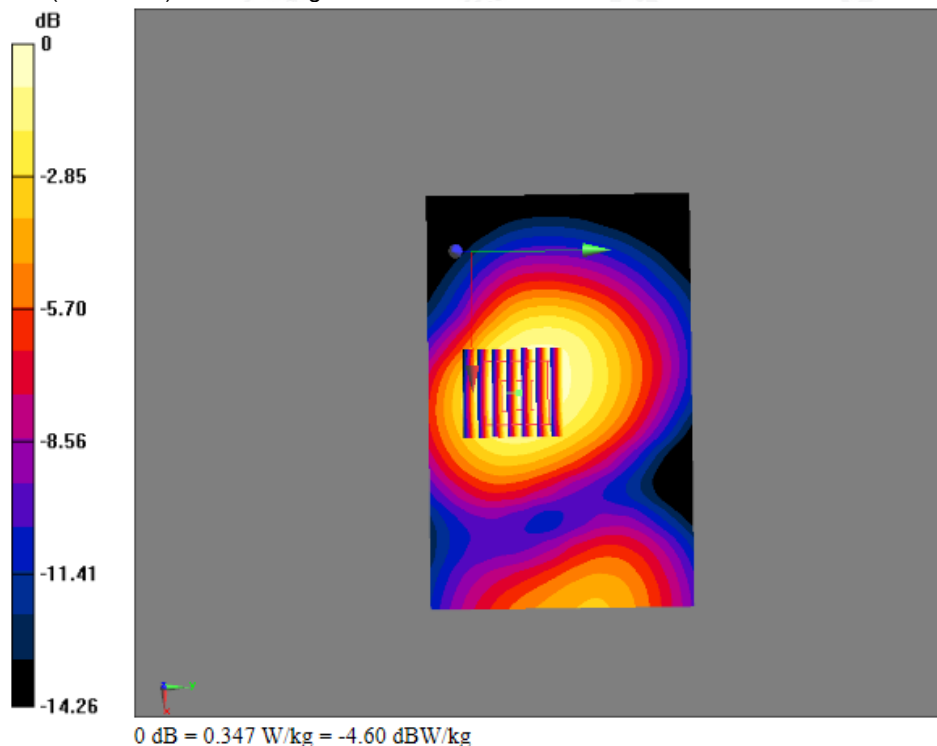
Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical front /Area Scan (141x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.346 W/kg

1+2/BODY/Vertical front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 5.252 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.415 W/kg
SAR(1 g) = 0.269 W/kg; SAR(10 g) = 0.170 W/kg
Maximum value of SAR (measured) = 0.347 W/kg



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Test Laboratory: AGC Lab
802.11n (20) Mid- Antenna 1 + Antenna 2 - Tip (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/Tip/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.322 W/kg

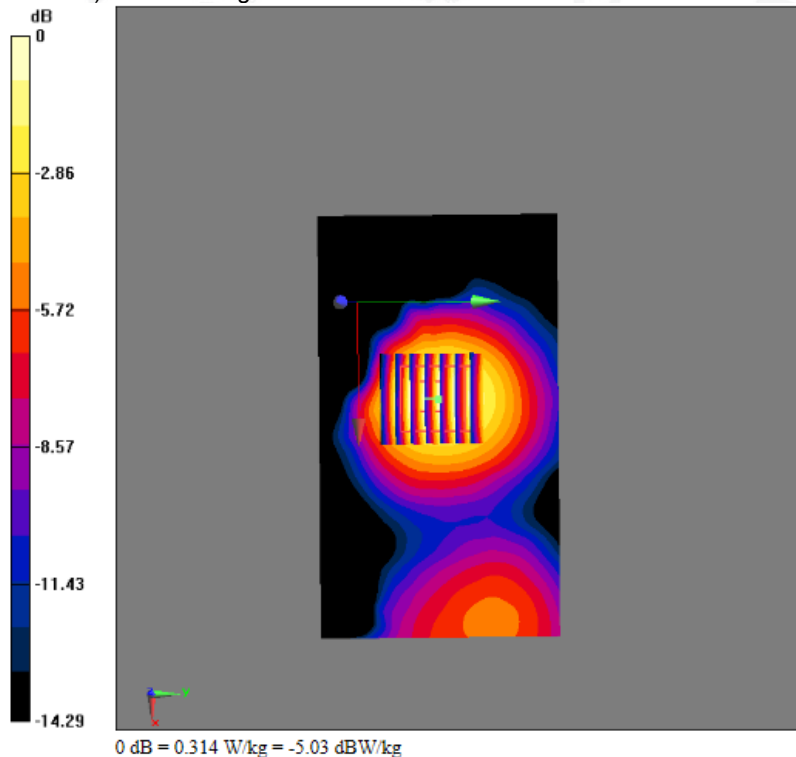
1+2/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.075 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.383 W/kg

SAR(1 g) = 0.237 W/kg; SAR(10 g) = 0.140 W/kg

Maximum value of SAR (measured) = 0.314 W/kg



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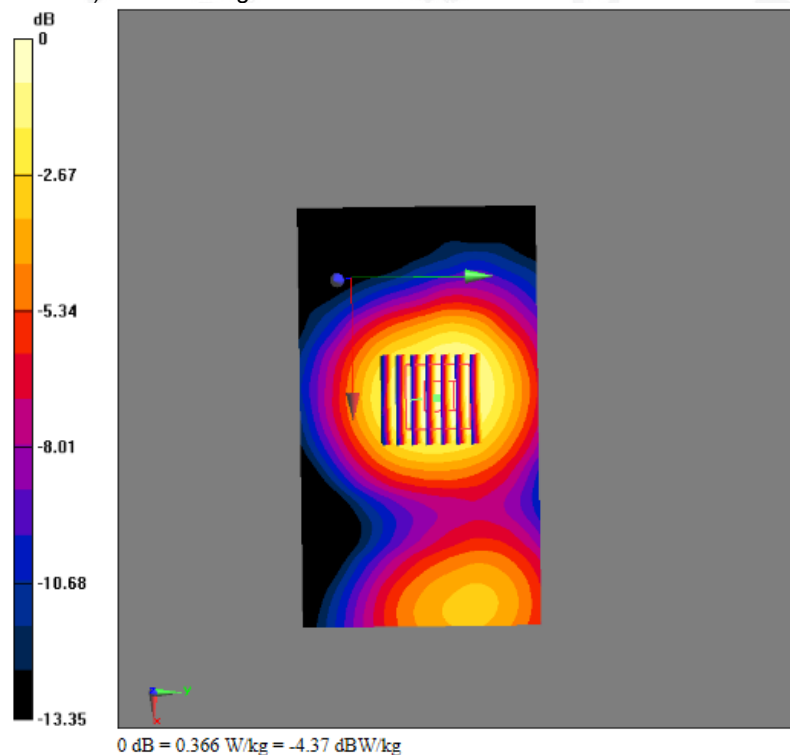
Test Laboratory: AGC Lab
802.11n (40) Mid- Antenna 1 + Antenna 2 - Horizontal Back(DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:
Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BACK/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.372W/kg
1+2/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 4.220 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.438W/kg
SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.185 W/kg
Maximum value of SAR (measured) = 0.366 W/kg



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Test Laboratory: AGC Lab
802.11n (40)- Antenna 1 + Antenna 2 - Horizontal Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/FRONT/Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
Maximum value of SAR (interpolated) = 0.290 W/kg

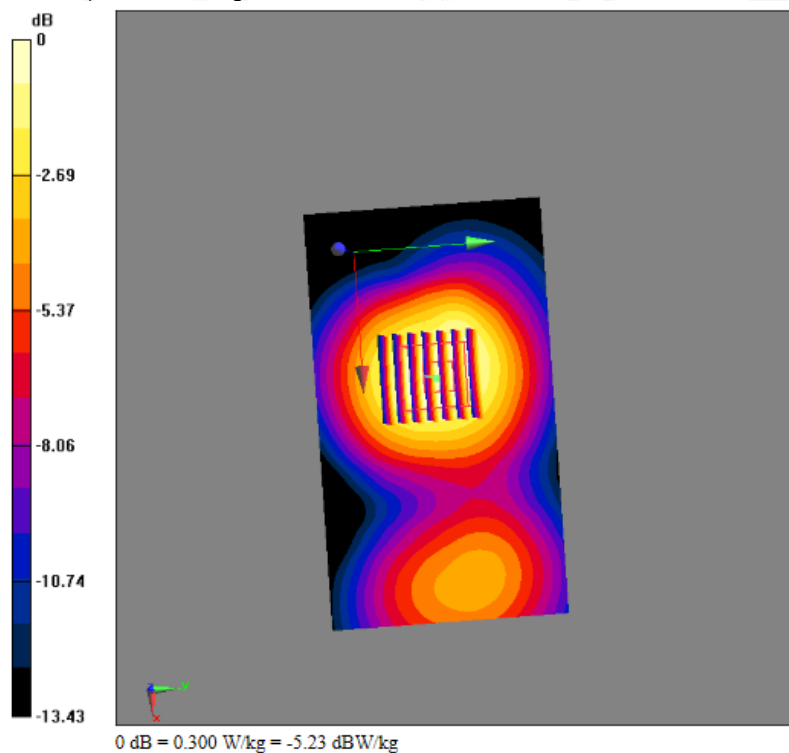
1+2/FRONT/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.810 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.362 W/kg

SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.156 W/kg

Maximum value of SAR (measured) = 0.300 W/kg



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Test Laboratory: AGC Lab
802.11n (40) Mid- Antenna 1 + Antenna 2 - Vertical Back(DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical back /Area Scan (141x91x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.193 W/kg

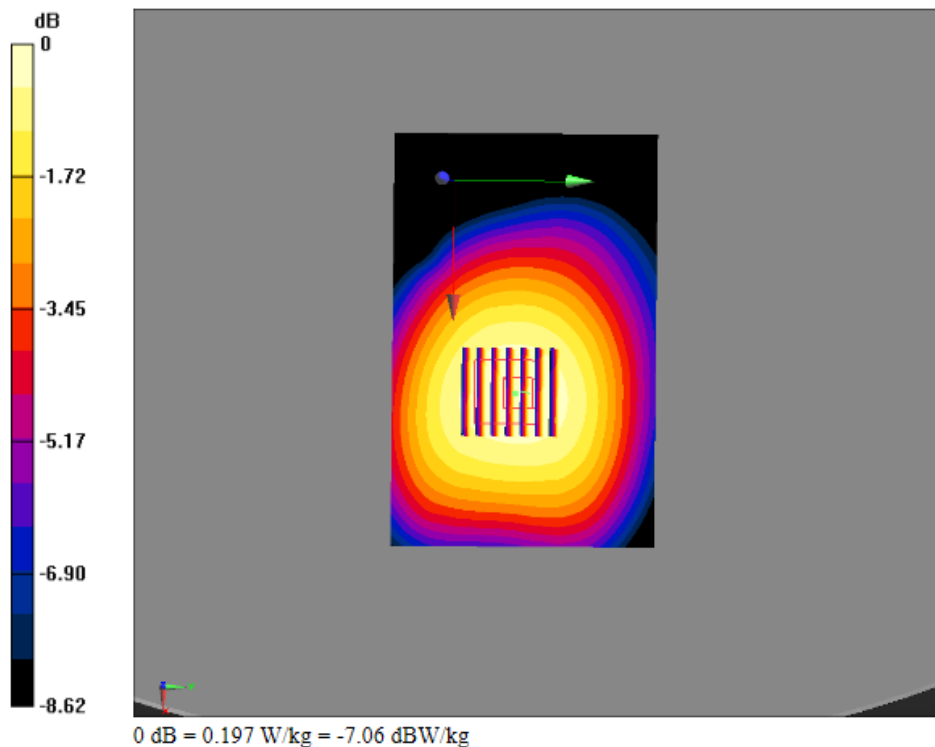
1+2/BODY/Vertical back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.726 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.216 W/kg

SAR(1 g) = 0.167 W/kg; SAR(10 g) = 0.124 W/kg

Maximum value of SAR (measured) = 0.197 W/kg



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Test Laboratory: AGC Lab
802.11n (40)- Antenna 1 + Antenna 2 - Vertical Front (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27,2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/BODY/ Vertical front /Area Scan (221x101x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.338 W/kg

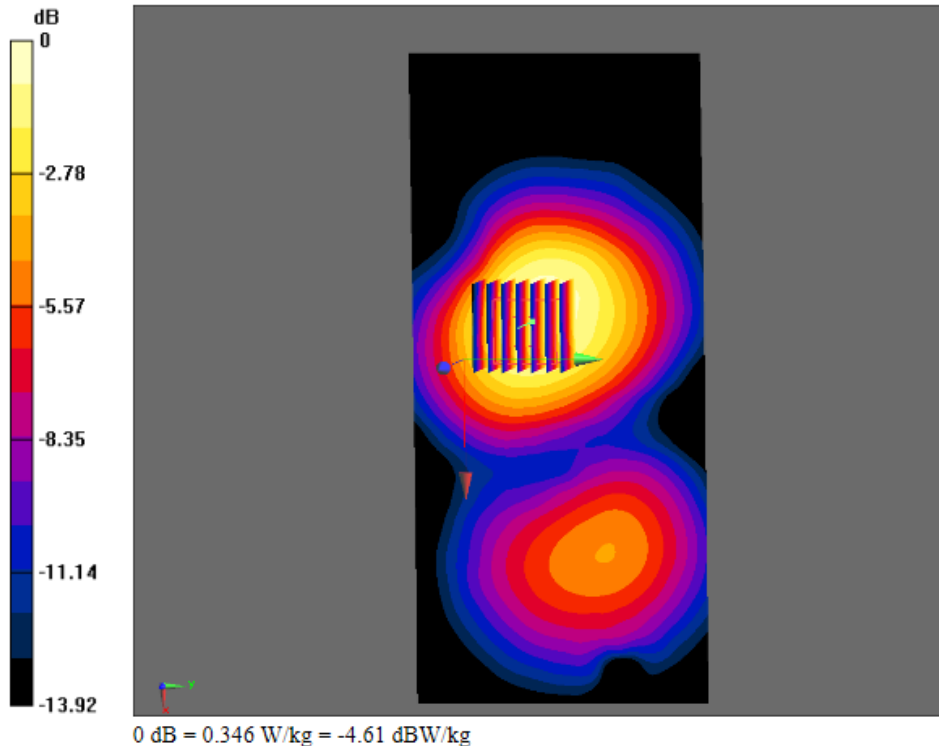
1+2/BODY/Vertical front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 14.997 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.425 W/kg

SAR(1 g) = 0.267 W/kg; SAR(10 g) = 0.167 W/kg

Maximum value of SAR (measured) = 0.346 W/kg



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Test Laboratory: AGC Lab
802.11n (40)- Antenna 1 + Antenna 2 - Tip (DTS)
DUT: USB Wireless-N Adapter; Type: WS-WN683N2P

Date: Aug. 27, 2014

Communication System: UID 0, WIFI 802.11g (0); Communication System Band: 802.11g; Duty Cycle: 1:1;
Frequency: 2437 MHz; Medium parameters used: $f = 2437$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.22$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21, Liquid temperature (°C): 21

DASY Configuration:

Probe: EX3DV4 - SN3953; ConvF(7.35,7.35,7.35); Calibrated: 10/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 1.0, 31.0$
Electronics: DAE4 Sn1398; Calibrated: 10/10/2013
Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1+2/Tip /Area Scan (141x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.359 W/kg

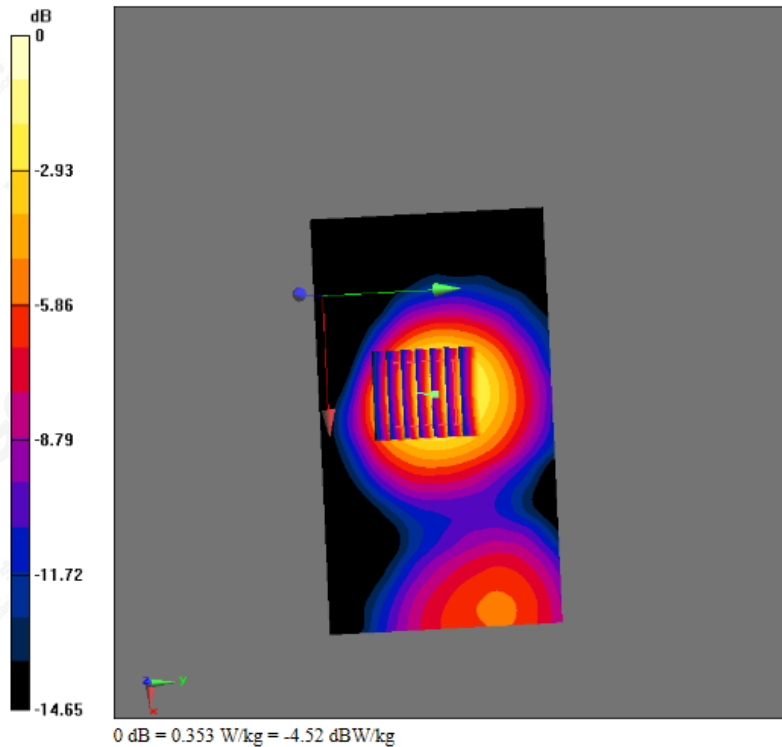
1+2/Tip/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.987 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.425 W/kg

SAR(1 g) = 0.266 W/kg; SAR(10 g) = 0.157 W/kg

Maximum value of SAR (measured) = 0.353 W/kg



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