A Test Lab Techno Corp.

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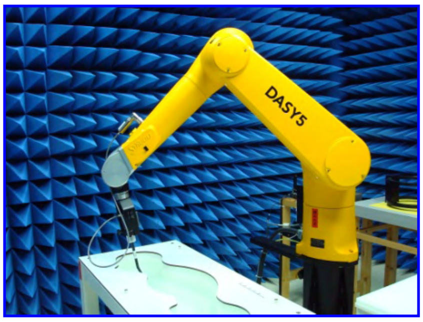
SAR EVALUATION REPORT

Test Report No.	:	1709FS18-02
Applicant	:	Reliance Communications LLC
Product Type	:	GSM/CDMA/WCDMA/LTE mobile phone
Trade Name	:	Orbic
Model Number	:	RC555L
Date of Received	:	Sep. 07, 2017
Test Period	:	Sep. 09 ~ Oct. 19, 2017
Date of Issued	:	Oct. 19, 2017
Test Environment	:	Ambient Temperature： 22 ±2 ° C Relative Humidity：40 - 70 %
Standard	:	ANSI/IEEE C95.1-1992 / IEEE Std. 1528-2013 47 CFR Part §2.1093 KDB 865664 D01 v01r04 / KDB 865664 D02 v01r02 KDB 648474 D04 v01r02 / KDB 941225 D01 v03r01 KDB 941225 D05 v02r05 / KDB 941225 D06 v02r01 KDB 248227 D01 v02r02
Test Lab Location	:	Chang-an Lab
Test Firm MRA designation number	:	TW0010



1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : (Mark Duan)

Tested By : (Sky Chou)

Contents

1. Summary of Maximum Reported SAR Value

Equipment Class	Mode	Highest Reported			
		Head SAR_{1g} (W/kg)	Body-Worn SAR_{1g} (W/kg)	Hotspot SAR_{1g} (W/kg)	Extremity SAR_{10g} (W/kg)
PCE	GSM 850	0.32	N/A	N/A	N/A
	GSM 1900	0.28	N/A	N/A	N/A
	GPRS 850	N/A	0.70	0.70	N/A
	GPRS 1900	N/A	1.06	1.06	N/A
	CDMA BC0	0.25	0.43	0.43	N/A
	CDMA BC1	0.45	0.87	0.87	N/A
	CDMA BC10	0.26	0.50	0.50	N/A
	WCDMA BandII	0.60	1.09	1.09	N/A
	WCDMA BandIV	0.23	1.17	1.17	N/A
	WCDMA BandV	0.29	0.33	0.33	N/A
	LTE Band2	0.48	1.37	1.37	2.94
	LTE Band4	0.23	1.17	1.17	N/A
	LTE Band5	0.21	0.41	0.41	N/A
	LTE Band12	0.18	0.32	0.32	N/A
	LTE Band13	0.27	0.22	0.22	N/A
	LTE Band17	0.17	0.31	0.31	N/A
	LTE Band25	0.43	1.31	1.31	N/A
	LTE Band26	0.32	0.38	0.38	N/A
	LTE Band41	0.15	0.54	0.54	N/A
DTS	2.4GHz WLAN	0.37	0.04	0.04	N/A
U-NII	5GHz WLAN U-NII-1	N/A	N/A	N/A	N/A
	5GHz WLAN U-NII-2A	0.80	0.34	0.34	N/A
	5GHz WLAN U-NII-2C	0.60	0.26	0.26	N/A
	5GHz WLAN U-NII-3	0.44	0.20	0.20	N/A
DSS	Bluetooth BR/EDR	N/A	N/A	N/A	N/A
	Bluetooth LE	N/A	N/A	N/A	N/A
Highest Simultaneous Transmission SAR		Head SAR_{1g} (W/kg)	Body-Worn SAR_{1g} (W/kg)	Hotspot SAR_{1g} (W/kg)	Extremity SAR_{1g} (W/kg)
PCE + U-NII		1.40	1.37(Bottom side)	1.37(Bottom side)	N/A
PCE + U-NII		1.40	1.29(Rear side)	1.29(Rear side)	N/A
PCE + DSS		0.77	1.37 (Bottom side)	1.37 (Bottom side)	N/A

NOTE: 1. The N/A is EUT not apply to the assessment of the exposure conditions.

2. The test procedures, as described in American National Standards, Institute ANSI/IEEE C95.1 were employed and they specify the maximum exposure limit of Head & Body is SAR_{1g} 1.6 W/kg of tissue for portable devices being used within 20cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

4. The EUT battery have be fully charged and checked periodically during the test to ascertain uniform power output.

2. *Description of Equipment under Test (EUT)*

Applicant	Reliance Communications LLC 555 Wireless Blvd, Hauppauge, New York, 11788, United States	
Manufacture	Unimaxcomm Room 602, Building-B, Shenzhen Software Park T3, Hi-Tech Park South, Nan Shan District, Shenzhen, China	
Product Type	GSM/CDMA/WCDMA/LTE mobile phone	
Trade Name	Orbic	
Model Number	RC555L	
IMEI No.	358924080001802	
FCC ID	2ABGH-RC555L	
RF Function	Operate Bands	Operate Frequency (MHz)
	GSM/GPRS/EGPRS 850	824.2 - 848.8
	GSM/GPRS/EGPRS 1900	1850.2 - 1909.8
	WCDMA Band II	1852.4 - 1907.6
	WCDMA Band V	826.4 - 846.6
	WCDMA Band IV	1712.4 - 1752.6
	CDMA /1xRTT/1xEVDO 850 (BC 0)	824.70 - 848.31
	CDMA /1xRTT/1xEVDO 1900 (BC 1)	1851.25 - 1908.75
	CDMA /1xRTT/1xEVDO Sec. 800 (BC 10)	817.25 - 822.75
	LTE Band 2 (BW 1.4, 3, 5, 10, 15, 20 MHz)	1850.7 - 1909.3
	LTE Band 4 (BW 1.4, 3, 5, 10, 15, 20 MHz)	1710.7 - 1754.3
	LTE Band 5 (BW 1.4, 3, 5, 10 MHz)	824.7 - 848.3
	LTE Band 12 (BW 1.4, 3, 5, 10 MHz)	699 - 716
	LTE Band 13 (BW 5, 10 MHz)	777 - 787
	LTE Band 17 (BW 5, 10 MHz)	704.0 - 715.9
	LTE Band 25 (BW 5, 10 MHz)	1852.5 - 1912.5
	LTE Band 26 (BW 5, 10 MHz)	816.5 - 846.5
	LTE Band 41 (BW 5, 10, 15, 20 MHz)	2498.5 – 2688.5
	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz	2412 - 2462
	IEEE 802.11a	5180 - 5825
	IEEE 802.11ac 20MHz	5180 - 5825
	IEEE 802.11ac 40MHz	5190 - 5795
	IEEE 802.11ac 80MHz	5210 - 5775
	Bluetooth BR/EDR	2402 - 2480
	Bluetooth LE	2402 - 2480
	*GPRS Multi Class: 12	
Antenna Type	LDS Antenna	
Battery Option	Standard	
	Trade Name: Orbic Model: RC555L Spec: DC 3.8V / 3000mAh	
Device Category	Portable Device	
Application Type	Certification	

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

3. *Introduction*

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **Reliance Communications LLC Trade Name：Orbic Model(s)：RC555L**. The test procedures, as described in American National Standards, Institute C95.1-1999〔1〕were employed and they specify the maximum exposure limit of 1.6mW/g as averaged over any 1 gram of tissue for portable devices being used within 20cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

3.1 SAR Definition

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

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

Figure 2. **SAR Mathematical Equation**

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

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

Where：

σ = conductivity of the tissue (S/m)

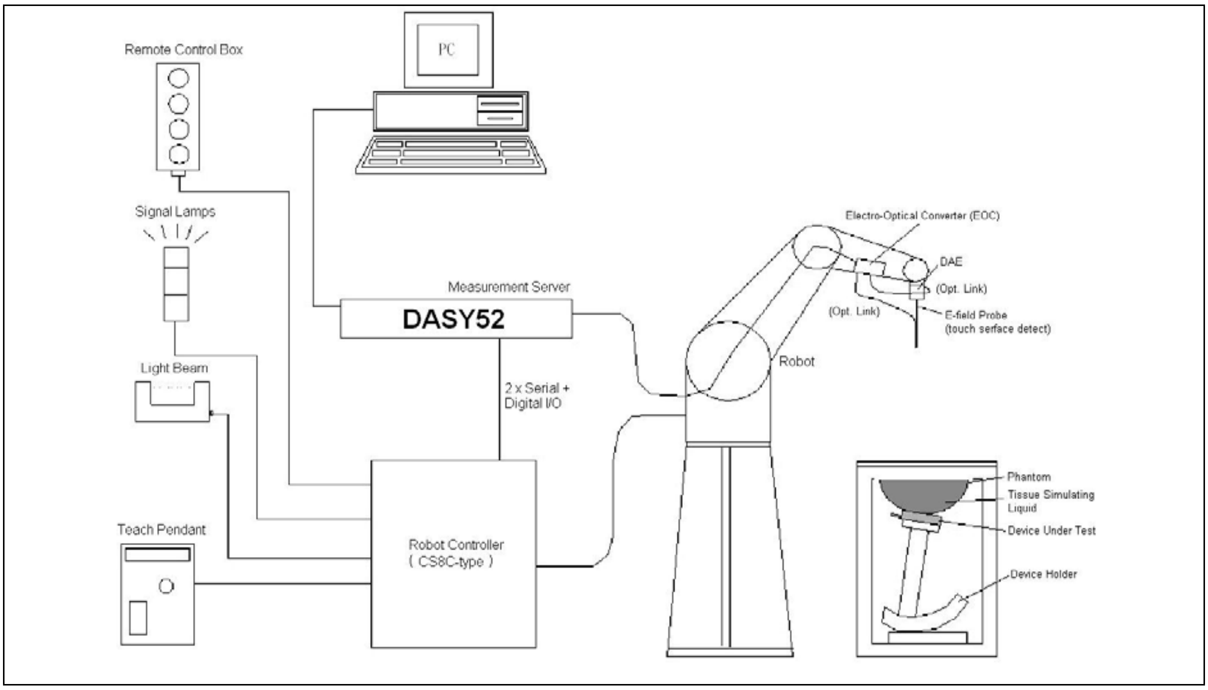
ρ = mass density of the tissue (kg/m3)

E = RMS electric field strength (V/m)

＊Note：

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

4. SAR Measurement Setup



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

1. A standard high precision 6-axis robot (Stäubli TX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
5. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
6. A computer operating Windows 2000 or Windows XP.
7. DASY52 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The SAM twin phantom enabling testing left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. Validation dipole kits allowing validating the proper functioning of the system.

4.1 DASY E-Field Probe System

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

4.1.1 E-Field Probe Specification

Construction	Symmetrical design with triangular core
	Built-in shielding against static charges
	PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to > 6 GHz
	Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	±0.3 dB in brain tissue (rotation around probe axis)
	±0.5 dB in brain tissue (rotation normal probe axis)
Dimensions	Overall length: 337 mm (Tip: 20 mm)
	Tip diameter: 2.5 mm (Body: 12 mm)
	Typical distance from probe tip to dipole centers: 1 mm

Figure 3. E-field Probe

Figure 4. Probe setup on robot

4.1.2 E-Field Probe Calibration process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

Temperature Assessment

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

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

Where：

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where：

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

4.2 Data Acquisition Electronic (DAE) System

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

4.3 Robot

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

4.4 Measurement Server

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

4.5 Device Holder

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

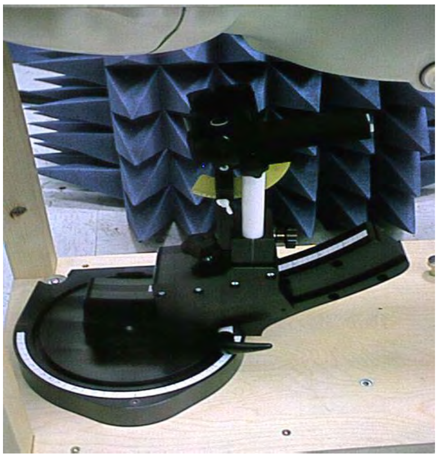


Figure 5. Device Holder

4.6 Phantom - SAM v4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	1000×500 mm (L×W)

Table 1. Specification of SAM v4.0

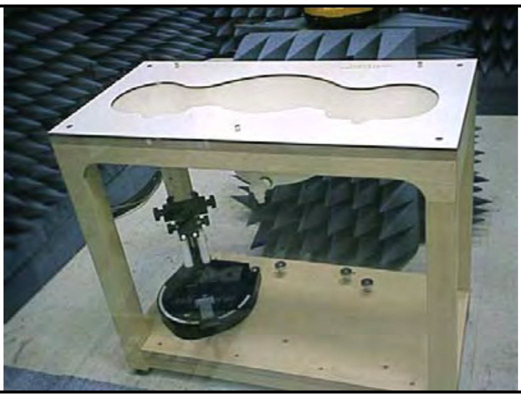


Figure 6. SAM Twin Phantom

4.7 Data Storage and Evaluation

4.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension DA4 or DA5. The post processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

4.7.2 Data Evaluation

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

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

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as：

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

With	*Vi*	= compensated signal of channel i (i = x, y, z)
	Ui	= input signal of channel i (i = x, y, z)
	cf	= crest factor of exciting field (DASY parameter)
	dcpi	= diode compression point (DASY parameter)

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

E-field probes：

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

H-field probes：

$$H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

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

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

μV/(V/m)2 for E-field Probes

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

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

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

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

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

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

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

with *SAR* = local specific absorption rate in mW/g

Etot = total field strength in V/m

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

ρ = equivalent tissue density in g/cm3

＊Note：That the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

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

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

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

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

5. Tissue Simulating Liquids

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.
The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

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

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

Target Frequency	Head		Body	
(MHz)	εr	σ (S/m)	εr	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)				

Table 2. Tissue dielectric parameters for head and body phantoms

5.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H_2O), resistivity ≥ 16 M Ω -as basis for the liquid
- Sugar: refied white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops) -to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20°C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobuthyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

5.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.
Note: The goal dielectric parameters (at 22 ℃) must be achieved within a tolerance of ±5% for εand ±5% for σ.

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

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

5.3 Liquid Depth

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

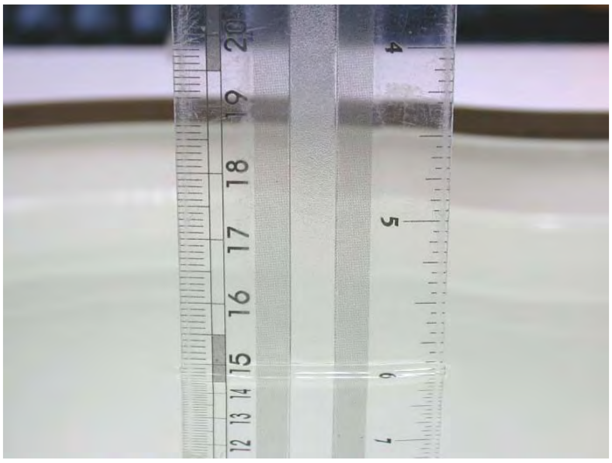


Figure 7. Head-Position	Figure 8. Body-Position

6. SAR Testing with RF Transmitters

6.1 SAR Testing with GSM/GPRS/EGPRS Transmitters

Configure the basestation to support GMSK and 8PSK call respectively, and set timeslot transmission for GMSK GSM/GPRS and 8PSK EDGE. Measure and record power outputs for both modulations, that test is applicable.

6.2 SAR Testing with WCDMA Transmitters

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

- Step 1: set a Test Mode 1 loop back with a 12.2kbps Reference Measurement Channel (RMC).
- Step 2: set and send continuously up power control commands to the device.
- Step 3: measure the power at the device antenna connector using the power meter with average detector and test SAR

6.3 SAR Testing with HSDPA Transmitters

HSDPA Date Devices setup for SAR Measurement

HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Setup for Release 5 HSDPA							
Sub-test	βc	βd	βd (SF)	βc/βd	βhs[(1,2)]	CM[(3)] (dB)	MRP[(3)] (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15(4)	15/15(4)	64	12/15(4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note

1. Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ Ahs = βhs/βc = 30/15 ⇔ βhs= 30/15 *βc
2. For theHS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude(EVM) with HS-DPCCH test in clause 5.13.1A and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with βhs = 30/15 *βc and Δ_{CQI} = 24/15 with βhs = 24/15*βc
3. CM = 1 for βc/βd =12/15, βhs/βc=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
4. For subtest 2 the βc/βd ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 11/15 and βd = 15/15.

HSPA Date Devices setup for SAR Measurement.

The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. Body exposure conditions generally apply to these devices, including handsets and data modems operating in various electronic devices. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations without HSPA. The default test configuration is to establish a radio link between the DUT and a communication test set to configure a 12.2 kbps RMC (reference measurement channel) in Test Loop Mode 1. SAR for HSPA is selectively measured with HS-DPCCH, EDPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest SAR configuration in WCDMA with 12.2 kbps RMC only. An FRC is configured according to HSDPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Subtest 5 requirements. SAR for other HSPA sub-test configurations is also confirmed selectively according to output power, exposure conditions and E-DCH UE Category. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. The UE Categories for HSDPCCH and HSPA should be clearly identified in the SAR report. The following procedures are applicable only if Maximum Power Reduction (MPR) is implemented according to Cubic Metric (CM) requirements.

When voice transmission and head exposure conditions are applicable to a WCDMA/HSPA data device, head exposure is measured according to the 'Head SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. SAR for body exposure configurations are measured according to the 'Body SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. In addition, body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurements should be used to test for head exposure.

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA should be configured according to the β values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document.

The highest body SAR measured in Antenna Extended & Retracted configurations on a channel in 12.2 kbps RMC. The possible channels are the High, Middle & Low channel. Contact the FCC Laboratory for test and approval requirements if the maximum output power measured in E-DCH Sub-test 2 - 4 is higher than Sub-test 5.

Setup for Release 6 HSPA / Release 7 HSPA+														
Sub-test	βc	βd	βd (SF)	βc/βd	βhs(1)	βec	βed	Bed (SF)	Bed (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	βed1: 47/15 βed2: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note

1. Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ Ahs = βhs/βc = 30/15 ⇔ βhs= 30/15 *βc.
2. CM = 1 for βc/βd =12/15, βhs/βc=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
3. For subtest 1 the βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.
4. For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.
5. Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
6. βed can not be set directly; it is set by Absolute Grant Value.

6.4 SAR Testing with CDMA2000 Transmitters

The following procedures were performed according to FCC "3G SAR Procedures" v03, October 2014.

Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by "3G SAR Procedures" v03, October 2014. Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the "All Up" condition.

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 6. parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 7 was applied.
5. FCHs were configured at full rate for maximum SAR with "All Up" power control bits.

Parameter	Units	Value
I_{or}	dBm/1.23MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 3. Parameters for Max. Power for RC1

Parameter	Units	Value
I_{or}	dBm/1.23MHz	-86
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 4. Parameters for Max. Power for RC3

Body SAR Measurements

SAR for body exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. SAR for multiple code channels (FCH + SCHn) is not required when the maximum average output of each RF channel is less than ¼ dB higher than that measured with FCH only. Otherwise, SAR is measured on the maximum output channel (FCH + SCHn) with FCH at full rate and SCH0 enabled at 9600 bps using the exposure configuration that results in the highest SAR for that channel with FCH only. When multiple code channels are enabled, the DUT output may shift by more than 0.5 dB and lead to higher SAR drifts and SCH dropouts. Body SAR was measured using TDSO / SO32 with power control bits in the "All Up"

Body SAR in RC1 is not required when the maximum average output of each channel is less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using the body exposure configuration that results in the highest SAR for that channel in RC3.

1xEVDO

SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev. 0 and Rev. A devices. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations. Both FTAP and FETAP are configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. AT power control should be in "All Bits Up" conditions for TAP/ETAP.

6.5 SAR Testing with LTE-FDD Transmitters

All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements.Configure the basestation to support LTE tests in respect to the 3GPP 36.521-1,and set ch , RB allocation number ,RB allocation offset , and send continuously Up power control commands to the device.

MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

6.6 SAR Testing with LTE-TDD Transmitters

All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements.Configure the basestation to support LTE tests in respect to the 3GPP 36.521-1,and set ch , TDD mode , RB allocation number ,RB allocation offset , and send continuously Up power control commands to the device.

MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

For 3GPP table 4.2.1 as below, support configurations and worst-case UpPTS information into the table.

3GPP Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink			EUT Support Special subframe	Worst case UpPTS
	DwPTS	UpPTS		DwPTS	UpPTS			
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		
0	6592×Ts			7680×Ts			☐	☐
1	19760×Ts			20480×Ts	2192×Ts	2560×Ts	☐	☐
2	21952×Ts	2192×Ts	2560×Ts	23040×Ts			☐	☐
3	24144×Ts			25600×Ts			■	☐
4	26336×Ts			7680×Ts			■	☐
5	6592×Ts			20480×Ts	4384×Ts	5120×Ts	☐	☐
6	19760×Ts			23040×Ts			☐	☐
7	21952×Ts	4384×Ts	5120×Ts	12800×Ts			■	■
8	24144×Ts			-	-	-	☐	☐
9	13168×Ts			-	-	-	☐	☐
							Duty cycle$_{(maximum)}$	43.33%

The EUT only supports the 40% case, which is Table 4.2.2, configuration #1 below.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number										Type of EUT
		0	1	2	3	4	5	6	7	8	9	
0	5ms	D	S	U	U	U	D	S	U	U	U	☐
1	5ms	D	S	U	U	D	D	S	U	U	D	■
2	5ms	D	S	U	D	D	D	S	U	D	D	☐
3	10ms	D	S	U	U	U	D	D	D	D	D	☐
4	10ms	D	S	U	U	D	D	D	D	D	D	☐
5	10ms	D	S	U	D	D	D	D	D	D	D	☐
6	5ms	D	S	U	U	U	D	S	U	U	D	☐

6.7 LTE Frequency range and channel bandwidth

Channel bandwidth support:

Band	BW (MHz)					
	1.4	3	5	10	15	20
LTE Band 2	V	V	V	V	V	V
LTE Band 4	V	V	V	V	V	V
LTE Band 5	V	V	V	V		
LTE Band 12	V	V	V	V		
LTE Band 13			V	V		
LTE Band 17			V	V		
LTE Band 25	V	V	V	V	V	V
LTE Band 26	V	V	V	V	V	
LTE Band 41			V	V	V	V

LTE Band	Bandwidth (MHz)	Test requency ID	N_{UL}	Frequency of Uplink (MHz)
LTE Band 2	1.4	Low Range	18607	1850.7
		Mid Range	18900	1880.0
		High Range	19193	1909.3
	3	Low Range	18615	1851.5
		Mid Range	18900	1880.0
		High Range	19185	1908.5
	5	Low Range	18625	1852.5
		Mid Range	18900	1880.0
		High Range	19175	1907.5
	10	Low Range	18650	1855.0
		Mid Range	18900	1880.0
		High Range	19150	1905.0
	15	Low Range	18675	1857.5
		Mid Range	18900	1880.0
		High Range	19125	1902.5
	20	Low Range	18700	1860.0
		Mid Range	18900	1880.0
		High Range	19100	1900.0

LTE Band	Bandwidth (MHz)	Test requency ID	N_{UL}	Frequency of Uplink (MHz)
LTE Band 4	1.4	Low Range	19957	1710.7
		Mid Range	20175	1732.5
		High Range	20393	1754.3
	3	Low Range	19965	1711.5
		Mid Range	20175	1732.5
		High Range	20385	1753.5
	5	Low Range	19975	1712.5
		Mid Range	20175	1732.5
		High Range	20375	1752.5
	10	Low Range	20000	1715.0
		Mid Range	20175	1732.5
		High Range	20350	1750.0
	15	Low Range	20025	1717.5
		Mid Range	20175	1732.5
		High Range	20325	1747.5
	20	Low Range	20050	1720.0
		Mid Range	20175	1732.5
		High Range	20300	1745.0
LTE Band 5	1.4	Low Range	20407	824.7
		Mid Range	20525	836.5
		High Range	20643	848.3
	3	Low Range	20415	825.5
		Mid Range	20525	836.5
		High Range	20635	847.5
	5	Low Range	20425	826.5
		Mid Range	20525	836.5
		High Range	20625	846.5
	10	Low Range	20450	829.0
		Mid Range	20525	836.5
		High Range	20600	844.0

LTE Band	Bandwidth (MHz)	Test requency ID	N_{UL}	Frequency of Uplink (MHz)
LTE Band 12	1.4	Low Range	23017	699.7
		Mid Range	23095	707.5
		High Range	23173	715.3
	3	Low Range	23025	700.5
		Mid Range	23095	707.5
		High Range	23165	714.5
	5	Low Range	23035	701.5
		Mid Range	23095	707.5
		High Range	23155	713.5
	10	Low Range	23060	704.0
		Mid Range	23095	707.5
		High Range	23130	711.0
LTE Band 13	5	Low Range	23205	779.5
		Mid Range	23230	782.0
		High Range	23255	784.5
	10	Low Range	23230	782.0
		Mid Range	23230	782.0
		High Range	23230	782.0
LTE Band 17	5	Low Range	23755	706.5
		Mid Range	23790	710.0
		High Range	23825	713.5
	10	Low Range	23780	709.0
		Mid Range	23790	710.0
		High Range	23800	711.0

LTE Band	Bandwidth (MHz)	Test requency ID	N_{UL}	Frequency of Uplink (MHz)
LTE Band 25	1.4	Low Range	26047	1850.7
		Mid Range	26365	1882.5
		High Range	26683	1914.3
	3	Low Range	26055	1851.5
		Mid Range	26365	1882.5
		High Range	26675	1913.5
	5	Low Range	26065	1852.5
		Mid Range	26365	1882.5
		High Range	26665	1912.5
	10	Low Range	26090	1855.0
		Mid Range	26365	1882.5
		High Range	26640	1910.0
	15	Low Range	26115	1857.5
		Mid Range	26365	1882.5
		High Range	26615	1907.5
	20	Low Range	26140	1860.0
		Mid Range	26365	1882.5
		High Range	26590	1905.0

LTE Band	Bandwidth (MHz)	Test requency ID	N_{UL}	Frequency of Uplink (MHz)
LTE Band 26	1.4	Low Range	26697	814.7
		Mid Range	26865	831.5
		High Range	27033	848.3
	3	Low Range	26705	815.5
		Mid Range	26865	831.5
		High Range	27025	847.5
	5	Low Range	26715	816.5
		Mid Range	26865	831.5
		High Range	27015	846.5
	10	Low Range	26750	820.0
		Mid Range	26865	831.5
		High Range	26990	844.0
	15	Low Range	26775	822.5
		Mid Range	26865	831.5
		High Range	26965	841.5
LTE Band 41	5	Low Range	39675	2498.5
			40148	2545.8
		Mid Range	40620	2593.0
		High Range	41093	2640.2
			41565	2687.5
	10	Low Range	39700	2501.0
			40160	2547.0
		Mid Range	40620	2593.0
		High Range	41080	2639.0
			41540	2685.0
	15	Low Range	39725	2503.5
			40173	2548.3
		Mid Range	40620	2593.0
		High Range	41068	2682.5
			41515	2682.5
	20	Low Range	39750	2506.0
			40185	2549.5
		Mid Range	40620	2593.0
		High Range	41055	2636.5
			41490	2680.0

6.7.1 Maximum power reduction (MPR)

Identify the LTE voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions etc.

The voice and data transmission:

- Data only device.

Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design:

- Maximum Power Reduction (MPR) is mandatory, i.e. built-in by design.
- A-MPR (additional MPR) must be disabled
- A-MPR was disabled during testing.

Maximum Power Reduction (MPR) for Power Class 3							
Channel bandwidth / Transmission bandwidth configuration (RB)							
Modulation	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20MHz	MPR (dB)
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

6.8 Power reduction

No power reduction issue.

6.9 Carrier Aggregation Measurement：

Note: For DL CA configurations, RX usually will not affect the TX function. The single band power is already worst-case.

Configure		CA List	PCC				SCC				Power
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)
Inter-Band		CA_2A-4A	Band 2	10M	1855	18650	Band 4	10M	2132.5	2175	22.64
			Band 4	10M	1750	20350	Band 2	10M	1960	900	22.41
		CA_2A-5A	Band 2	10M	1855	18650	Band 5	10M	881.5	2525	22.72
			Band 5	10M	844	20600	Band 2	10M	1960	900	23.43
		CA_2A-12A	Band 2	10M	1855	18650	Band 12	10M	737.5	5095	22.74
			Band 12	10M	704	23060	Band 2	10M	1960	900	23.28
		CA_2A-13A	Band 2	10M	1855	18650	Band 13	10M	751	5230	22.65
			Band 13	10M	782	23230	Band 2	10M	1960	900	23.41
		CA_4A-5A	Band 4	10M	1750	20350	Band 5	10M	881.5	2525	22.42
			Band 5	10M	844	20600	Band 4	10M	2132.5	2175	23.51
		CA_4A-12A	Band 4	10M	1750	20350	Band 12	10M	737.5	5095	22.39
			Band 12	10M	704	23060	Band 4	10M	2132.5	2175	23.37
		CA_4A-13A	Band 4	10M	1750	20350	Band 13	10M	751	5230	22.41
			Band 13	10M	782	23230	Band 4	10M	2132.5	2175	23.38
		CA_25A-26A	Band 25	10M	1910	26640	Band 26	10M	876.5	8865	22.53
			Band 26	10M	820	26750	Band 25	10M	1962.5	8365	23.74
Intra-Band	Non-Contiguous	CA_4A-4A	Band 4	10M	1750	20350	Band 4	5M	2112.5	1975	22.46
		CA_25A-25A	Band 25	10M	1910	26640	Band 25	5M	1992.5	8665	22.57

6.10 SAR Testing with 802.11 Transmitters

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

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

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.
  - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - When it is unclear, all equivalent conditions must be tested.

- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.
  - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.

- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

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

6.11 Conducted Power

Band	Modulation	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
					Time Average	Burst Average
GSM 850	GMSK	1Down1Up Duty factor 1/8	Lowest	824.2	24.41	33.44
			Middle	836.8	24.50	33.53
			Highest	848.6	24.51	33.54
GPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up Duty factor 1/8	Lowest	824.2	24.40	33.43
			Middle	836.8	24.49	33.52
			Highest	848.6	24.50	33.53
		3Down2Up Duty factor 2/8	Lowest	824.2	25.26	31.28
			Middle	836.8	25.36	31.38
			Highest	848.6	25.38	31.40
		2Down3Up Duty factor 3/8	Lowest	824.2	24.80	29.06
			Middle	836.8	24.84	29.10
			Highest	848.6	24.90	29.16
		1Down4Up Duty factor 4/8	Lowest	824.2	24.02	27.03
			Middle	836.8	24.00	27.01
			Highest	848.6	23.99	27.00
EGPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up Duty factor 1/8	Lowest	824.2	17.48	26.51
			Middle	836.8	17.44	26.47
			Highest	848.6	17.45	26.48
		3Down2Up Duty factor 2/8	Lowest	824.2	19.38	25.40
			Middle	836.8	19.39	25.41
			Highest	848.6	19.41	25.43
		2Down3Up Duty factor 3/8	Lowest	824.2	20.01	24.27
			Middle	836.8	19.98	24.24
			Highest	848.6	19.97	24.23
		1Down4Up Duty factor 4/8	Lowest	824.2	19.57	22.58
			Middle	836.8	19.53	22.54
			Highest	848.6	19.61	22.62

Note: 1. Time Average power slot duty cycle factor calculate:

1up: Average burst power+10*LOG(1/8)

2up: Average burst power+10*LOG(2/8)

3up: Average burst power+10*LOG(3/8)

4up: Average burst power+10*LOG(4/8)

Band	Modulation	Data Rate	CH	Frequency (MHz)	Average Power (dBm)	
					Time Average	Burst Average
GSM 1900	GMSK	1Down1Up Duty factor 1/8	Lowest	1850.2	21.27	30.30
			Middle	1880.0	21.25	30.28
			Highest	1909.8	21.26	30.29
GPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up Duty factor 1/8	Lowest	1850.2	21.26	30.29
			Middle	1880.0	21.24	30.27
			Highest	1909.8	21.25	30.28
		3Down2Up Duty factor 2/8	Lowest	1850.2	23.07	29.09
			Middle	1880.0	22.96	28.98
			Highest	1909.8	23.01	29.03
		2Down3Up Duty factor 3/8	Lowest	1850.2	22.99	27.25
			Middle	1880.0	22.72	26.98
			Highest	1909.8	22.80	27.06
		1Down4Up Duty factor 4/8	Lowest	1850.2	22.23	25.24
			Middle	1880.0	22.29	25.30
			Highest	1909.8	22.34	25.35
EGPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up Duty factor 1/8	Lowest	1850.2	16.71	25.74
			Middle	1880.0	16.56	25.59
			Highest	1909.8	16.55	25.58
		3Down2Up Duty factor 2/8	Lowest	1850.2	18.05	24.07
			Middle	1880.0	17.90	23.92
			Highest	1909.8	17.91	23.93
		2Down3Up Duty factor 3/8	Lowest	1850.2	18.64	22.90
			Middle	1880.0	18.47	22.73
			Highest	1909.8	18.43	22.69
		1Down4Up Duty factor 4/8	Lowest	1850.2	17.62	20.63
			Middle	1880.0	17.53	20.54
			Highest	1909.8	17.51	20.52

Note: 1. Time Average power slot duty cycle factor calculate:

1up: Average burst power+10*LOG(1/8)

2up: Average burst power+10*LOG(2/8)

3up: Average burst power+10*LOG(3/8)

4up: Average burst power+10*LOG(4/8)

UMTS Band II		Conducted Power (dBm)		
		Ch 9537 (1907.4MHz)	Ch 9400 (1880.0MHz)	Ch 9263 (1852.6MHz)
RMC	12.2kbps RMC	24.1	24.1	24.1
HSUPA	Sub Test - 1	22.2	23.1	22.9
	Sub Test - 2	21.8	21.6	21.6
	Sub Test - 3	21.5	22.1	21.6
	Sub Test - 4	22.1	22.5	22.2
	Sub Test - 5	22.8	23.1	22.8
HSDPA	Sub Test - 1	21.5	21.6	21.5
	Sub Test - 2	21.5	21.6	21.5
	Sub Test - 3	21.0	21.1	21.1
	Sub Test - 4	21.0	21.1	21.1
UMTS Band IV		Conducted Power (dBm)		
		Ch 1512 (1752.4MHz)	Ch1450 (1740.0MHz)	Ch 1313 (1712.6MHz)
RMC	12.2kbps RMC	24.2	24.0	24.0
HSUPA	Sub - Test 1	23.4	22.4	23.1
	Sub - Test 2	22.0	21.5	21.5
	Sub - Test 3	22.4	21.7	21.9
	Sub - Test 4	22.9	21.8	22.1
	Sub - Test 5	23.2	23.1	23.1
HSDPA	Sub - Test 1	21.4	21.2	21.2
	Sub - Test 2	21.4	21.3	21.3
	Sub - Test 3	20.9	20.9	20.9
	Sub - Test 4	21.0	20.8	20.8
UMTS BandV		Conducted Power (dBm)		
		Ch 4232 (846.4MHz)	Ch 4175 (835.0MHz)	Ch 4133 (826.6MHz)
RMC	12.2kbps RMC	24.1	24.3	24.3
HSUPA	Sub Test - 1	23.4	23.5	23.5
	Sub Test - 2	22.2	22.4	22.0
	Sub Test - 3	22.5	22.5	22.6
	Sub Test - 4	22.4	23.0	23.0
	Sub Test - 5	23.4	23.4	23.5
HSDPA	Sub Test - 1	21.9	22.0	21.8
	Sub Test - 2	21.9	22.0	21.9
	Sub Test - 3	21.4	21.5	21.3
	Sub Test - 4	21.5	21.5	21.2

CDMA BC0	Conducted Power (dBm)		
	Ch777 (848.31MHz)	Ch384 (836.52MHz)	Ch1013 (824.7MHz)
SO55/RC3	24.23	24.37	24.30
SO55/RC1	24.34	24.41	24.30
SO32/RC3(FCH only)	24.18	24.42	24.25
SO32/RC3(FCH+SCH_n)	24.22	24.31	24.34
1xEVDO RTAP 153.6Kbps	24.18	24.34	24.29
1xEVDO RETAP 4096Bits	24.32	24.32	24.27
CDMA BC1	Conducted Power (dBm)		
	Ch1175 (1908.75MHz)	Ch600 (1880MHz)	Ch25 (1851.25MHz)
SO55/RC3	24.30	24.12	24.25
SO55/RC1	24.35	24.22	24.31
SO32/RC3(FCH only)	24.29	24.11	24.19
SO32/RC3(FCH+SCH_n)	24.22	24.07	24.11
1xEVDO RTAP 153.6Kbps	24.28	24.16	24.22
1xEVDO RETAP 4096Bits	24.27	24.13	24.28
CDMA BC10	Conducted Power (dBm)		
	Ch684 (823.1MHz)	Ch580 (820.5MHz)	Ch476 (817.9MHz)
SO55/RC3	24.17	24.25	**24.26**
SO55/RC1	24.22	24.31	24.29
SO32/RC3(FCH only)	24.16	24.21	**24.23**
SO32/RC3(FCH+SCH_n)	24.11	24.16	24.17
1xEVDO RTAP 153.6Kbps	24.18	24.22	24.21
1xEVDO RETAP 4096Bits	24.09	24.19	24.24

LTE-FDD Band 2			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			19193	18900	18607	19185	18900	18615
1RB	High	QPSK	22.50	22.62	22.64	22.46	22.56	22.72
		16QAM	21.42	21.19	21.16	21.16	21.36	21.04
	Middle	QPSK	22.64	22.79	22.75	22.45	22.87	22.92
		16QAM	21.32	21.49	21.62	21.20	21.39	21.34
	Low	QPSK	22.58	22.70	22.64	22.44	22.68	22.72
		16QAM	21.04	21.29	21.19	20.97	20.91	21.16
50%RB	High	QPSK	22.62	22.85	22.83	21.51	21.77	21.82
		16QAM	21.33	21.53	21.56	20.54	20.83	20.88
	Middle	QPSK	22.70	22.78	22.82	21.54	21.70	21.80
		16QAM	21.75	21.57	21.52	20.69	20.82	20.83
	Low	QPSK	22.73	22.81	22.85	21.54	21.72	21.74
		16QAM	21.45	21.50	21.60	20.66	20.84	20.86
100%RB	/	QPSK	21.55	21.65	21.68	21.57	21.69	21.67
		16QAM	20.35	20.74	20.48	20.66	20.80	20.72
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			19175	18900	18625	19150	18900	18650
1RB	High	QPSK	22.40	22.33	22.46	22.54	22.62	22.50
		16QAM	20.87	20.87	20.96	21.13	21.13	21.03
	Middle	QPSK	22.37	22.74	22.75	22.50	22.65	22.60
		16QAM	21.19	21.28	21.28	21.29	21.34	21.29
	Low	QPSK	22.40	22.37	22.55	22.54	22.65	22.79
		16QAM	20.91	21.05	21.05	21.16	21.13	21.35
50%RB	High	QPSK	21.43	21.61	21.63	21.50	21.60	21.55
		16QAM	20.43	20.54	20.52	20.41	20.62	20.51
	Middle	QPSK	21.44	21.62	21.61	21.54	21.71	21.64
		16QAM	20.55	20.70	20.75	20.57	20.67	20.63
	Low	QPSK	21.35	21.50	21.52	21.51	21.56	21.72
		16QAM	20.37	20.51	20.58	20.53	20.67	20.61
100%RB	/	QPSK	21.38	21.66	21.57	21.56	21.67	21.72
		16QAM	20.47	20.63	20.67	20.41	20.64	20.63

LTE-FDD Band 2			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			19125	18900	18675	19100	18900	18700
1RB	High	QPSK	22.47	22.61	22.61	22.38	22.46	22.52
		16QAM	21.02	21.11	21.70	20.95	20.99	21.12
	Middle	QPSK	22.51	22.59	22.80	**22.70**	**22.72**	22.64
		16QAM	21.00	21.10	21.26	21.20	21.12	21.03
	Low	QPSK	22.50	22.59	22.79	22.51	22.61	**22.74**
		16QAM	21.03	21.12	21.26	21.15	21.21	21.18
50%RB	High	QPSK	22.59	22.68	22.71	21.42	21.49	21.57
		16QAM	21.38	21.50	21.52	20.47	20.54	20.60
	Middle	QPSK	22.51	22.68	22.69	21.51	**21.64**	21.59
		16QAM	21.43	21.55	21.53	20.51	20.67	20.59
	Low	QPSK	22.55	22.66	22.77	21.49	21.57	21.60
		16QAM	21.39	21.41	21.55	20.39	20.49	20.63
100%RB	/	QPSK	21.56	21.66	21.75	21.50	21.67	21.59
		16QAM	20.46	20.63	20.88	20.50	20.55	20.49

LTEFDD Band 4			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			20393	20175	19957	20385	20175	19965
1RB	High	QPSK	22.10	22.34	22.22	22.07	22.30	22.31
		16QAM	20.63	20.89	20.70	20.50	20.75	20.62
	Middle	QPSK	22.14	22.41	22.24	22.28	22.48	22.24
		16QAM	20.77	21.17	21.06	20.74	21.00	20.84
	Low	QPSK	22.17	22.12	22.17	22.23	22.30	22.30
		16QAM	20.52	20.68	20.62	20.63	20.61	20.60
50%RB	High	QPSK	22.32	22.42	22.34	21.18	21.34	21.31
		16QAM	21.11	21.20	21.09	20.22	20.58	20.43
	Middle	QPSK	22.22	22.38	22.32	21.14	21.30	21.25
		16QAM	21.23	21.36	21.28	20.29	20.43	20.25
	Low	QPSK	22.20	22.38	22.38	21.22	21.25	21.23
		16QAM	20.99	21.52	21.04	20.31	20.40	20.34
100%RB	/	QPSK	21.11	21.28	21.22	21.09	21.25	21.19
		16QAM	19.97	20.01	20.00	20.16	20.32	20.34
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			20375	20175	19975	20350	20175	20000
1RB	High	QPSK	22.18	22.30	22.12	22.41	22.39	22.20
		16QAM	20.70	20.75	20.70	20.98	20.79	20.67
	Middle	QPSK	22.43	22.36	22.38	22.48	22.39	22.38
		16QAM	20.97	21.08	20.88	21.19	20.97	20.98
	Low	QPSK	22.29	22.13	22.13	22.47	22.21	22.39
		16QAM	20.71	20.58	20.41	21.01	20.73	20.84
50%RB	High	QPSK	21.28	21.30	21.18	21.32	21.44	21.34
		16QAM	20.18	20.18	20.13	20.30	20.47	20.28
	Middle	QPSK	21.38	21.27	21.27	21.42	21.36	21.36
		16QAM	20.17	20.15	20.14	20.31	20.43	20.35
	Low	QPSK	21.26	21.25	21.18	21.38	21.34	21.28
		16QAM	20.26	20.28	20.12	20.42	20.44	20.30
100%RB	/	QPSK	21.24	21.31	21.26	21.36	21.34	21.36
		16QAM	20.20	20.29	20.15	20.35	20.24	20.38

LTE-FDD Band 4			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			20325	20175	20025	20300	20175	20050
1RB	High	QPSK	22.52	22.47	22.34	22.38	22.44	22.44
		16QAM	20.97	20.91	20.93	20.98	20.90	20.86
	Middle	QPSK	22.40	22.36	22.42	22.52	**22.73**	22.43
		16QAM	20.98	20.88	21.05	21.19	21.35	21.62
	Low	QPSK	22.57	22.28	22.52	**22.77**	22.38	**22.72**
		16QAM	20.96	20.95	21.03	21.32	21.00	20.94
50%RB	High	QPSK	22.54	22.50	22.48	21.40	21.42	21.38
		16QAM	21.30	21.49	21.36	20.50	20.42	20.38
	Middle	QPSK	22.51	22.37	22.39	21.42	21.43	21.32
		16QAM	21.34	21.30	21.33	20.55	20.48	20.34
	Low	QPSK	22.61	22.38	22.46	**21.51**	21.39	21.47
		16QAM	21.43	21.20	21.31	20.64	20.48	20.52
100%RB	/	QPSK	21.51	21.35	21.41	21.46	21.40	21.43
		16QAM	20.39	20.43	20.38	20.67	20.44	20.51

LTE-FDD Band 5			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			20643	20525	20407	20635	20525	20415
1RB	High	QPSK	23.25	23.29	23.29	23.40	23.37	23.35
		16QAM	22.08	21.80	22.05	21.91	21.68	22.20
	Middle	QPSK	23.31	23.33	23.30	23.51	23.47	23.33
		16QAM	22.49	21.68	22.18	22.20	22.02	22.35
	Low	QPSK	23.34	23.32	23.23	23.46	23.34	23.19
		16QAM	21.89	21.81	21.97	21.85	21.80	21.97
50%RB	High	QPSK	23.57	23.49	23.41	22.47	22.39	22.51
		16QAM	22.38	22.17	22.23	21.56	21.49	21.46
	Middle	QPSK	23.53	23.51	23.71	22.47	22.42	22.26
		16QAM	22.35	22.44	22.21	21.54	21.40	21.41
	Low	QPSK	23.44	23.44	23.30	22.44	22.45	22.40
		16QAM	22.36	22.29	22.23	21.38	21.45	21.44
100%RB	/	QPSK	22.46	22.39	22.37	22.54	22.44	22.40
		16QAM	21.29	21.17	21.05	21.44	21.46	21.25
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			20625	20525	20425	20600	20525	20450
1RB	High	QPSK	23.28	23.27	23.35	**23.54**	23.49	23.40
		16QAM	21.99	21.95	21.84	22.05	22.10	21.95
	Middle	QPSK	23.49	23.45	23.51	23.50	23.49	23.53
		16QAM	22.14	22.09	22.26	21.94	22.26	22.14
	Low	QPSK	23.33	23.30	23.31	23.32	23.21	23.27
		16QAM	21.77	21.76	21.79	22.02	21.92	21.89
50%RB	High	QPSK	22.47	22.42	22.39	22.50	22.46	**22.54**
		16QAM	21.36	21.17	21.29	21.46	21.33	21.48
	Middle	QPSK	22.47	22.48	22.54	22.46	22.48	22.50
		16QAM	21.33	21.25	21.39	21.50	21.42	21.50
	Low	QPSK	22.36	22.41	22.40	22.38	22.45	22.45
		16QAM	21.26	21.23	21.25	21.35	21.36	21.48
100%RB	/	QPSK	22.39	22.39	22.54	22.49	22.50	22.45
		16QAM	21.33	21.36	21.35	21.44	21.33	21.39

LTE-FDD Band 12			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			23173	23095	23017	23165	23095	23025
1RB	High	QPSK	23.30	23.43	23.43	23.32	23.36	23.37
		16QAM	22.34	22.06	22.12	21.97	22.18	21.98
	Middle	QPSK	23.53	23.46	23.55	23.53	23.53	23.41
		16QAM	22.19	22.27	22.33	22.24	22.16	22.33
	Low	QPSK	23.30	23.33	23.40	23.29	23.31	23.38
		16QAM	22.01	21.93	22.06	21.94	21.83	22.15
50%RB	High	QPSK	23.49	23.54	23.58	22.41	22.51	22.47
		16QAM	22.28	22.40	22.36	21.52	21.64	21.47
	Middle	QPSK	23.45	23.56	23.55	22.41	22.50	22.54
		16QAM	22.41	22.54	22.53	21.53	21.55	21.57
	Low	QPSK	23.47	23.52	23.56	22.32	22.39	22.55
		16QAM	22.34	22.33	22.44	21.35	21.48	21.53
100%RB	/	QPSK	22.36	22.48	22.48	22.41	22.45	22.43
		16QAM	21.27	21.36	21.37	21.49	21.47	21.48
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			23155	23095	23035	23130	23095	23060
1RB	High	QPSK	23.17	23.17	23.36	23.41	23.37	23.43
		16QAM	21.85	21.85	21.89	22.01	22.07	22.08
	Middle	QPSK	23.34	23.36	23.39	23.48	23.42	**23.49**
		16QAM	22.22	22.27	22.24	22.30	22.24	22.28
	Low	QPSK	23.18	23.26	23.32	23.22	23.21	23.27
		16QAM	21.81	21.80	21.95	21.92	21.91	21.93
50%RB	High	QPSK	22.37	22.38	22.41	22.42	22.46	22.46
		16QAM	21.29	21.40	21.23	21.49	21.37	21.51
	Middle	QPSK	22.39	22.49	22.46	22.44	22.36	**22.48**
		16QAM	21.32	21.55	21.36	21.38	21.36	21.39
	Low	QPSK	22.34	22.40	22.44	22.39	22.29	22.39
		16QAM	21.20	21.23	21.41	21.42	21.30	21.49
100%RB	/	QPSK	22.30	22.44	22.26	22.33	22.34	22.32
		16QAM	21.29	21.47	21.39	21.43	21.29	21.40

LTE-FDD Band 13			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			23255	23230	23205	23230	23230	23230
1RB	High	QPSK	23.39	23.37	23.33		23.41	
		16QAM	22.05	22.11	22.18		22.08	
	Middle	QPSK	23.60	23.51	23.69		**23.54**	
		16QAM	22.57	22.61	22.39		22.19	
	Low	QPSK	23.42	23.44	23.21		23.26	
		16QAM	21.93	22.02	21.89		21.96	
50%RB	High	QPSK	22.55	22.55	22.56		22.53	
		16QAM	21.48	21.45	21.57		21.52	
	Middle	QPSK	22.59	22.53	22.48		**22.60**	
		16QAM	21.53	21.51	21.50		21.52	
	Low	QPSK	22.47	22.55	22.44		22.55	
		16QAM	21.46	21.46	21.49		21.48	
100%RB	/	QPSK	22.54	22.57	22.52		22.58	
		16QAM	21.50	21.57	21.57		21.37	

LTE-FDD Band 17			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			23825	23790	23755	23800	23790	23780
1RB	High	QPSK	23.10	23.16	23.33	23.30	23.33	23.52
		16QAM	21.82	21.94	21.80	21.83	21.96	22.29
	Middle	QPSK	23.38	23.43	23.65	23.48	23.38	**23.55**
		16QAM	22.18	22.08	22.13	21.92	22.27	22.11
	Low	QPSK	23.26	23.34	23.37	23.40	23.29	23.31
		16QAM	21.65	21.98	22.03	22.03	21.88	21.99
50%RB	High	QPSK	22.38	22.40	22.53	22.37	22.48	**22.54**
		16QAM	21.32	21.34	21.39	21.48	21.51	21.46
	Middle	QPSK	22.43	22.43	22.41	22.49	22.47	22.51
		16QAM	21.36	21.35	21.25	21.42	21.41	21.50
	Low	QPSK	22.33	22.35	22.40	22.36	22.33	22.42
		16QAM	21.31	21.26	21.31	21.37	21.41	21.53
100%RB	/	QPSK	22.27	22.39	22.48	22.40	22.38	22.51
		16QAM	21.36	21.39	21.37	21.28	21.40	21.49

LTEFDD Band 25			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			26683	26365	26047	26675	26365	26055
1RB	High	QPSK	22.40	22.56	22.42	22.48	22.40	22.36
		16QAM	20.88	21.05	20.87	20.94	20.97	20.72
	Middle	QPSK	22.47	22.60	22.47	22.58	22.42	22.37
		16QAM	21.19	21.24	21.06	21.13	21.14	21.02
	Low	QPSK	22.40	22.37	22.36	22.44	22.36	22.35
		16QAM	20.89	20.84	20.85	20.91	20.84	20.83
50%RB	High	QPSK	22.42	22.65	22.51	21.50	21.54	21.48
		16QAM	21.26	21.29	21.24	20.58	20.62	20.55
	Middle	QPSK	22.53	22.62	22.58	21.53	21.44	21.50
		16QAM	21.36	21.39	21.30	20.64	20.58	20.51
	Low	QPSK	22.46	22.56	22.62	21.56	21.39	21.49
		16QAM	21.37	21.33	21.32	20.62	20.50	20.51
100%RB	/	QPSK	21.40	21.39	21.35	21.52	21.40	21.39
		16QAM	20.27	20.27	20.23	20.49	20.38	20.37
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			26665	26365	26065	26640	26365	26090
1RB	High	QPSK	22.38	22.42	22.23	22.62	22.46	22.33
		16QAM	20.93	20.92	20.74	21.09	20.99	20.82
	Middle	QPSK	22.44	22.61	22.25	22.60	22.47	22.43
		16QAM	21.28	21.17	20.97	21.32	21.11	21.07
	Low	QPSK	22.41	22.40	22.39	22.58	22.47	22.37
		16QAM	20.91	20.71	20.77	21.11	21.02	21.07
50%RB	High	QPSK	21.42	21.48	21.36	21.50	21.48	21.33
		16QAM	20.38	20.41	20.31	20.50	20.52	20.42
	Middle	QPSK	21.52	21.44	21.44	21.53	21.48	21.33
		16QAM	20.51	20.28	20.29	20.63	20.42	20.49
	Low	QPSK	21.51	21.39	21.44	21.55	21.38	21.41
		16QAM	20.42	20.27	20.35	20.64	20.44	20.49
100%RB	/	QPSK	21.42	21.40	21.41	21.37	21.45	21.37
		16QAM	20.48	20.46	20.43	20.51	20.41	20.44

LTE-FDD Band 25			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			26615	26365	26115	26590	26365	26140
1RB	High	QPSK	22.47	22.42	22.40	22.27	22.23	22.30
		16QAM	21.12	20.98	20.81	21.02	21.00	20.86
	Middle	QPSK	22.36	22.46	22.38	**22.47**	**22.49**	22.36
		16QAM	21.02	20.96	20.84	21.61	21.34	20.98
	Low	**QPSK**	22.28	22.39	22.64	22.28	22.34	**22.73**
		16QAM	20.85	20.98	21.08	20.93	20.97	21.10
50%RB	High	QPSK	22.39	22.46	22.38	**21.61**	21.41	21.39
		16QAM	21.35	21.28	21.34	20.54	20.40	20.52
	Middle	QPSK	22.32	22.42	22.41	21.37	21.43	21.44
		16QAM	21.18	21.27	21.21	20.54	20.50	20.63
	Low	**QPSK**	22.32	22.44	22.58	21.34	21.36	21.35
		16QAM	21.17	21.39	21.31	20.46	20.42	20.38
100%RB	/	QPSK	21.47	21.52	21.53	21.40	21.41	21.34
		16QAM	20.47	20.76	20.69	20.35	20.40	20.50

LTE-FDD Band 26			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			27033	26865	26697	27025	26865	26075
1RB	High	QPSK	23.62	23.61	23.61	23.54	23.63	22.19
		16QAM	22.24	22.39	22.33	22.27	22.21	20.70
	Middle	QPSK	23.57	23.60	23.73	23.76	23.71	22.24
		16QAM	22.45	22.48	22.57	22.44	22.42	20.90
	Low	QPSK	23.55	23.59	23.54	23.69	23.63	22.35
		16QAM	22.20	22.32	22.37	22.18	22.23	20.70
50%RB	High	QPSK	23.76	23.77	23.85	22.73	22.77	21.27
		16QAM	22.52	22.62	22.72	21.79	21.93	20.43
	Middle	QPSK	23.73	23.77	23.88	22.71	22.72	21.27
		16QAM	22.59	22.64	22.83	21.75	21.97	20.44
	Low	QPSK	23.60	23.75	23.66	22.69	22.73	21.29
		16QAM	22.59	22.63	22.61	21.81	21.88	20.43
100%RB	/	QPSK	22.66	22.76	22.78	22.64	22.69	21.30
		16QAM	21.45	21.61	21.68	21.70	21.84	20.43
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			27015	26865	26715	26690	26865	26750
1RB	High	QPSK	23.52	23.57	23.57	23.69	23.68	23.62
		16QAM	22.04	22.23	22.25	22.26	22.39	22.29
	Middle	QPSK	23.86	23.64	23.83	23.74	23.74	23.68
		16QAM	22.44	22.74	22.66	22.81	22.55	22.64
	Low	QPSK	23.63	23.48	23.51	23.63	23.57	23.82
		16QAM	22.07	22.24	22.17	22.35	22.30	22.45
50%RB	High	QPSK	22.64	22.68	22.84	22.72	22.72	22.80
		16QAM	21.58	21.65	21.77	21.63	21.73	21.80
	Middle	QPSK	22.69	22.83	22.90	22.74	22.76	22.75
		16QAM	21.69	21.73	21.89	21.80	21.85	21.87
	Low	QPSK	22.69	22.79	22.89	22.78	22.79	22.80
		16QAM	21.64	21.60	21.90	21.79	21.85	21.96
100%RB	/	QPSK	22.65	22.76	22.84	22.75	22.71	22.72
		16QAM	21.71	21.72	21.90	21.78	21.83	21.80

LTE-FDD Band 26			Actual output Power (dBm)		
			High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz		
			26965	26865	26775
1RB	High	QPSK	23.58	23.58	23.54
		16QAM	22.32	22.90	22.37
	Middle	QPSK	23.60	23.61	23.63
		16QAM	22.34	22.24	22.40
	Low	**QPSK**	23.59	23.61	**23.73**
		16QAM	22.38	22.31	22.51
50%RB	High	QPSK	23.71	**23.84**	23.67
		16QAM	22.81	22.69	22.79
	Middle	QPSK	23.65	23.63	23.64
		16QAM	22.62	22.63	22.65
	Low	**QPSK**	23.67	23.54	23.76
		16QAM	22.60	22.64	22.89
100%RB	/	QPSK	22.80	22.82	22.85
		16QAM	21.69	21.74	21.97

LTE-TDD Band 41			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			41565	40620	39675	41540	40620	39700
1RB	High	QPSK	22.96	23.03	23.16	23.13	22.97	23.13
		16QAM	21.95	21.73	21.97	22.10	21.93	22.08
	Middle	QPSK	23.20	23.06	23.38	23.30	23.23	23.44
		16QAM	22.00	21.89	21.94	22.32	22.03	22.26
	Low	QPSK	23.13	23.00	23.03	23.37	23.21	23.17
		16QAM	21.99	21.78	21.74	22.27	21.97	21.94
50%RB	High	QPSK	22.32	22.21	22.28	22.28	22.20	22.35
		16QAM	21.16	21.08	21.27	21.33	21.43	21.41
	Middle	QPSK	22.29	22.24	22.25	22.39	22.23	22.35
		16QAM	21.22	21.12	21.03	21.66	21.33	21.63
	Low	QPSK	22.38	22.29	22.21	22.33	22.23	22.17
		16QAM	21.16	21.15	21.08	21.44	21.17	21.06
100%RB	/	QPSK	22.26	22.18	22.25	22.33	22.26	22.28
		16QAM	21.15	21.16	21.17	21.40	21.24	21.24
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			41515	40620	39725	41490	40620	39750
1RB	High	QPSK	23.23	23.06	23.26	23.02	22.86	22.98
		16QAM	22.13	21.92	22.09	21.85	21.82	21.82
	Middle	QPSK	23.22	23.20	22.92	23.31	23.16	23.20
		16QAM	21.99	21.95	21.85	22.41	21.93	21.97
	Low	QPSK	23.29	23.00	22.96	**23.38**	22.79	22.82
		16QAM	22.08	22.04	21.93	22.23	21.86	21.83
50%RB	High	QPSK	23.32	23.29	23.35	22.29	22.24	22.24
		16QAM	22.41	22.41	22.42	21.38	21.26	21.19
	Middle	QPSK	23.29	23.19	23.03	**22.39**	22.23	22.30
		16QAM	22.20	22.26	22.07	21.32	21.30	21.37
	Low	QPSK	23.26	23.21	23.14	22.34	22.25	22.12
		16QAM	22.39	22.23	22.08	21.21	21.15	21.18
100%RB	/	QPSK	22.33	22.23	22.32	22.28	22.27	22.28
		16QAM	21.67	21.54	21.19	21.27	21.26	21.16

LTE-TDD Band 41			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			41093	[redacted]	40148	41080	[redacted]	40160
1RB	High	QPSK	22.76	[redacted]	23.12	23.02	[redacted]	23.08
		16QAM	21.75	[redacted]	21.93	21.99	[redacted]	22.03
	Middle	QPSK	23.00	[redacted]	23.34	23.19	[redacted]	23.39
		16QAM	21.80	[redacted]	21.90	22.21	[redacted]	22.21
	Low	QPSK	22.93	[redacted]	22.99	23.26	[redacted]	23.12
		16QAM	21.79	[redacted]	21.70	22.16	[redacted]	21.89
50%RB	High	QPSK	22.12	[redacted]	22.24	22.17	[redacted]	22.30
		16QAM	20.96	[redacted]	21.23	21.22	[redacted]	21.36
	Middle	QPSK	22.09	[redacted]	22.21	22.28	[redacted]	22.30
		16QAM	21.02	[redacted]	20.99	21.55	[redacted]	21.58
	Low	QPSK	22.18	[redacted]	22.17	22.22	[redacted]	22.12
		16QAM	20.96	[redacted]	21.04	21.33	[redacted]	21.01
100%RB	/	QPSK	22.06	[redacted]	22.21	22.22	[redacted]	22.23
		16QAM	20.95	[redacted]	21.13	21.29	[redacted]	21.19
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			41068	[redacted]	40173	41055	[redacted]	40185
1RB	High	QPSK	23.12	[redacted]	23.19	22.95	[redacted]	22.61
		16QAM	22.02	[redacted]	22.02	21.79	[redacted]	21.45
	Middle	QPSK	23.11	[redacted]	22.85	23.25	[redacted]	22.83
		16QAM	21.88	[redacted]	21.78	22.34	[redacted]	21.60
	Low	QPSK	23.18	[redacted]	22.89	23.32	[redacted]	22.45
		16QAM	21.97	[redacted]	21.86	22.17	[redacted]	21.46
50%RB	High	QPSK	23.21	[redacted]	23.28	22.23	[redacted]	21.87
		16QAM	22.30	[redacted]	22.35	21.31	[redacted]	20.82
	Middle	QPSK	23.18	[redacted]	22.96	22.32	[redacted]	21.93
		16QAM	22.09	[redacted]	22.00	21.26	[redacted]	21.00
	Low	QPSK	23.15	[redacted]	23.07	22.28	[redacted]	21.75
		16QAM	22.28	[redacted]	22.01	21.15	[redacted]	20.81
100%RB	/	QPSK	22.22	[redacted]	22.25	22.22	[redacted]	21.91
		16QAM	21.56	[redacted]	21.12	21.21	[redacted]	20.79

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11b	1 M	1	2412.0	16.21
		6	2437.0	16.51
		11	2462.0	16.39
	2 M	6	2437.0	16.06
	5.5 M	6	2437.0	15.87
	11 M	6	2437.0	15.20
IEEE 802.11g	6 M	1	2412.0	16.16
		6	2437.0	16.25
		11	2462.0	16.23
	9 M	6	2437.0	15.75
	12 M	6	2437.0	15.55
	18 M	6	2437.0	15.22
	24 M	6	2437.0	14.84
	36 M	6	2437.0	14.21
	48 M	6	2437.0	13.12
	54 M	6	2437.0	12.93
IEEE 802.11n 2.4 GHz 20MHz	6.5 M	1	2412.0	15.49
		6	2437.0	15.45
		11	2462.0	15.36
	14.4M	6	2437.0	15.18
	21.7M	6	2437.0	15.15
	28.9M	6	2437.0	15.09
	43.3M	6	2437.0	14.46
	57.8M	6	2437.0	13.77
	65M	6	2437.0	11.82
	72.2M	6	2437.0	11.65

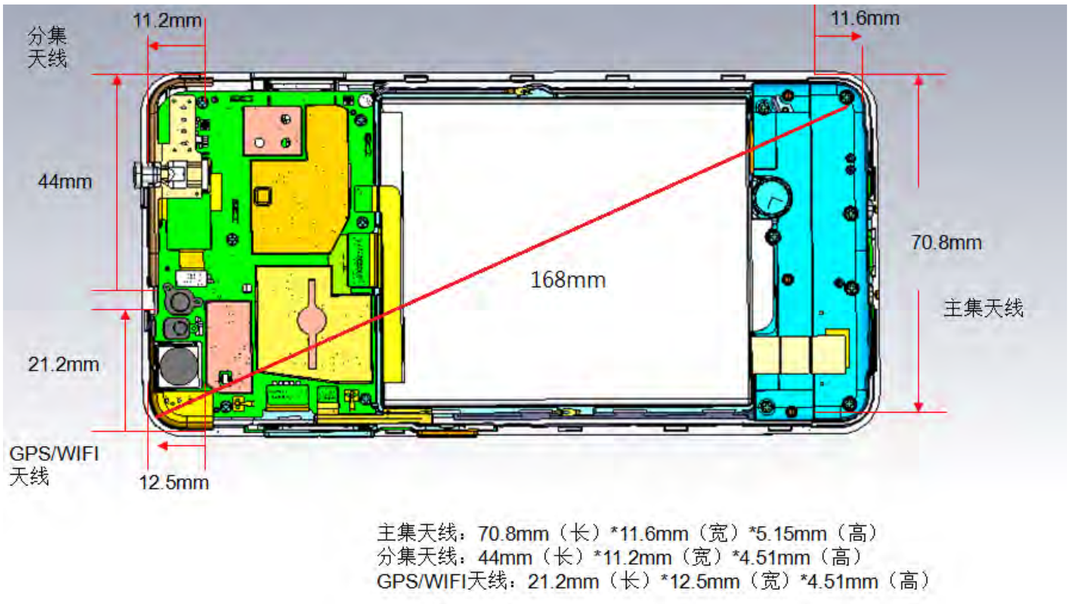
Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11a	6 M	36	5180.0	16.14
		40	5200.0	15.90
		44	5220.0	15.80
		48	5240.0	14.85
		52	5260.0	14.73
		56	5280.0	14.40
		60	5300.0	14.33
		64	5320.0	14.31
		100	5500.0	15.96
		104	5520.0	16.32
		108	5540.0	16.41
		112	5560.0	16.28
		116	5580.0	15.82
		132	5660.0	14.57
		136	5680.0	14.88
		140	5700.0	15.06
		149	5745.0	15.94
		153	5765.0	16.06
		157	5785.0	16.35
		161	5805.0	16.13
		165	5825.0	15.93
	54 M	36	5180.0	12.94
		40	5200.0	12.70
		44	5220.0	12.60
		48	5240.0	12.94
		52	5260.0	12.82
		56	5280.0	12.49
		60	5300.0	12.42
		64	5320.0	12.40
		100	5500.0	12.95
		104	5520.0	13.31
		108	5540.0	13.40
		112	5560.0	13.27
		116	5580.0	12.81
		132	5660.0	12.60
		136	5680.0	12.91
		140	5700.0	13.09
		149	5745.0	13.05
		153	5765.0	13.17
		157	5785.0	13.46
		161	5805.0	13.24
		165	5825.0	13.04

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11ac 20MHz	6.5 M	36	5180.0	14.75
		40	5200.0	14.51
		44	5220.0	14.41
		48	5240.0	14.92
		52	5260.0	14.80
		56	5280.0	14.47
		60	5300.0	14.40
		64	5320.0	14.38
		100	5500.0	15.12
		104	5520.0	15.48
		108	5540.0	15.57
		112	5560.0	15.44
		116	5580.0	14.98
		132	5660.0	14.62
		136	5680.0	14.93
		140	5700.0	15.11
		149	5745.0	15.13
		153	5765.0	15.07
		157	5785.0	15.36
		161	5805.0	15.14
		165	5825.0	14.94
	72.2 M	36	5180.0	12.05
		40	5200.0	11.81
		44	5220.0	11.71
		48	5240.0	12.05
		52	5260.0	11.93
		56	5280.0	11.60
		60	5300.0	11.53
		64	5320.0	11.79
		100	5500.0	11.84
		104	5520.0	12.20
		108	5540.0	12.29
		112	5560.0	11.85
		116	5580.0	11.39
		132	5660.0	11.18
		136	5680.0	11.49
		140	5700.0	11.67
		149	5745.0	11.63
		153	5765.0	11.79
		157	5785.0	12.08
		161	5805.0	11.86
		165	5825.0	11.66

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11ac 40MHz	13.5 M	38	5190.0	15.83
		46	5230.0	15.59
		54	5270.0	15.53
		62	5310.0	15.12
		102	5510.0	15.00
		110	5550.0	15.15
		134	5670.0	15.77
		151	5755.0	15.93
		159	5795.0	16.02
	150 M	38	5190.0	12.46
		46	5230.0	12.43
		54	5270.0	12.15
		62	5310.0	11.86
		102	5510.0	11.73
		110	5550.0	12.04
		134	5670.0	12.72
		151	5755.0	13.01
		159	5795.0	12.79
IEEE 802.11ac 80MHz	29.3 M	42	5210.0	15.21
		58	5290.0	14.81
		106	5530.0	14.38
		155	5775.0	13.96
	433.3 M	42	5210.0	11.39
		58	5290.0	11.51
		106	5530.0	11.80
		155	5775.0	11.38

Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)
Bluetooth BR GFSK	0	2402	DH1	5.74
			DH3	5.77
			DH5	5.81
	39	2441	DH1	5.01
			DH3	5.07
			DH5	5.11
	78	2480	DH1	5.14
			DH3	5.18
			DH5	5.27
Bluetooth EDR π /4-DQPSK	0	2402	2DH1	4.58
			2DH3	4.62
			2DH5	4.68
	39	2441	2DH1	3.61
			2DH3	3.72
			2DH5	3.79
	78	2480	2DH1	4.67
			2DH3	4.73
			2DH5	4.75
Bluetooth EDR 8DPSK	0	2402	3DH1	5.29
			3DH3	5.36
			3DH5	5.38
	39	2441	3DH1	5.46
			3DH3	5.48
			3DH5	5.51
	78	2480	3DH1	5.36
			3DH3	5.41
			3DH5	5.43
Bluetooth LE	0	2402	---	1.36
	19	2440		1.21
	39	2480		1.25

6.12 Antenna location



6.13 Stand-alone SAR Evaluate

Transmitter and antenna implementation as below:

Band	WWAN Ant	WLAN Ant	Bluetooth Ant
WWAN	V	---	---
WLAN	---	V	---
Bluetooth	---	---	V

Stand-alone transmission configurations as below:

Band	RC	RT	LC	LT	Front	Rear	Left	Right	Bottom	Top
GSM 850	V	V	V	V	V	V	V	V	V	---
GSM 1900	V	V	V	V	V	V	V	V	V	---
GPRS/EGPRS 850					V	V	V	V	V	---
GPRS/EGPRS 1900					V	V	V	V	V	---
CDMA BC0	V	V	V	V	V	V	V	V	V	---
CDMA BC1	V	V	V	V	V	V	V	V	V	---
CDMA BC10	V	V	V	V	V	V	V	V	V	---
WCDMA(RMC-12.2K)/HSDPA/HSUPA BandII	V	V	V	V	V	V	V	V	V	---
WCDMA(RMC-12.2K)/HSDPA/HSUPA BandIV	V	V	V	V	V	V	V	V	V	---
WCDMA(RMC-12.2K)/HSDPA/HSUPA BandV	V	V	V	V	V	V	V	V	V	---
LTE Band2	V	V	V	V	V	V	V	V	V	---
LTE Band4	V	V	V	V	V	V	V	V	V	---
LTE Band5	V	V	V	V	V	V	V	V	V	---
LTE Band12	V	V	V	V	V	V	V	V	V	---
LTE Band13	V	V	V	V	V	V	V	V	V	---
LTE Band17	V	V	V	V	V	V	V	V	V	---
LTE Band25	V	V	V	V	V	V	V	V	V	---
LTE Band26	V	V	V	V	V	V	V	V	V	---
LTE Band41	V	V	V	V	V	V	V	V	V	---
IEEE 802.11b	V	V	V	V	V	V	V	---	---	V
IEEE 802.11g	---	---	---	---	---	---	---	---	---	---
IEEE 802.11n 2.4GHz 20MHz	---	---	---	---	---	---	---	---	---	---
IEEE 802.11a	V	V	V	V	V	V	---	V	---	V
IEEE 802.11n 5GHz 20MHz	---	---	---	---	---	---	---	---	---	---
IEEE 802.11n 5GHz 40MHz	V	V	V	V	V	V	---	V	---	V
IEEE 802.11ac 5GHz 80MHz	---	---	---	---	---	---	---	---	---	---

Note: The "-" on behalf of Stand-alone SAR is not required (Refer to KDB 648474 D04)

Ant. Used	Band	Channel	Frequency	Tune-Power		Distance of Ant. To User (mm)					
			(GHz)	(dBm)	(mW)	Front	Rear	Left	Right	Bottom	Top
Bluetooth Ant	Bluetooth BR/EDR	0	2.402	6	4	5	5	5	5	5	5
	Bluetooth LE	0	2.402	2	2	5	5	5	5	5	5

Ant. Used	Band	Chan nel	Frequency	Tune-Power		Calculated value and evaluated result					
			(GHz)	(dBm)	(mW)	Front	Rear	Left	Right	Bottom	Top
Bluetooth Ant	Bluetooth BR/EDR	0	2.402	6	4	1.2	1.2	1.2	1.2	1.2	1.2
						EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT
	Bluetooth LE	0	2.402	2	2	0.6	0.6	0.6	0.6	0.6	0.6
						EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT

Note:

1.Calculated Value include string "mW",that is meam through compare output power with threshold, if the output power more than threshold value the SAR test should be perform. Otherwise,the SAR test could be exempt. (> 50mm).

2.Calculated Value only inculde number format, that is mean through compare output power with threshold, if the Calculated value more than 3, the SAR test should be perform. Otherwise, the SAR test could be exempt. (<50mm).

3.When an antenna qualifies for the standalone SAR test exclusion of KDB 447498 section 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to KDB 447498 section "4.3.2. Simultaneous transmission SAR test exclusion considerations b) ".

4.Power and distance are rounded to the nearest mW and mm before calculation. .

5.The result is rounded to one decimal place for comparison.

6.14 Simultaneous Transmitting Evaluate

Simultaneous transmission configurations as below:

Condition	Side	Frequency Band	
		WWAN Ant	WLAN Ant
1	RC	V	V
2	RT	V	V
3	LC	V	V
4	LT	V	V
5	Front	V	V
6	Rear	V	V
7	Left	V	V
8	Right	V	V
8	Top	V	V
9	Bottom	V	V

Condition	Side	Frequency Band	
		WWAN Ant	Bluetooth Ant
1	RC	V	V
2	RT	V	V
3	LC	V	V
4	LT	V	V
5	Front	V	V
6	Rear	V	V
7	Left	V	V
8	Right	V	V
8	Top	V	V
9	Bottom	V	V

Estimated SAR

Ant. Used	Band	Channel	Frequency	Tune-Power		Distance of Ant. To User (mm)					
			(GHz)	(dBm)	(mW)	Front	Rear	Left	Right	Bottom	Top
Bluetooth Ant	Bluetooth BR/EDR	0	2.402	6	4	0.17	0.17	0.17	0.17	0.17	0.17
	Bluetooth LE	0	2.402	2	2	0.08	0.08	0.08	0.08	0.08	0.08

6.14.1 Sum of 1-g SAR of all simultaneously transmitting

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

Sum of 1-g SAR of summary as below:

Phantom Position		Spacing (mm)	ASSY	WWAN Ant		WLAN Ant		∑ SAR1g (W/Kg)	Event
				Band	SAR1g (W/Kg)	Band	SAR1g (W/Kg)		
Head	LC	0	N/A	WCDMA Band2	0.6	IEEE 802.11n 5GHz 40MHz	0.8	1.40	<1.6
Body	Bottom	10	N/A	LTE Band2	1.37	N/A	N/A	1.37	<1.6
Body	Rear	10	N/A	LTE Band2	0.95	IEEE 802.11a	0.34	1.29	<1.6

Phantom Position		Spacing (mm)	ASSY	WWAN Ant		Bluetooth Ant		∑ SAR1g (W/Kg)	Event
				Band	SAR1g (W/Kg)	Band	SAR1g (W/Kg)		
Head	LC	0	N/A	WCDMA Band2	0.6	Bluetooth BR/EDR	*0.17	0.77	<1.6
Body	Bottom	10	N/A	LTE Band2	1.37	N/A	N/A	1.37	<1.6

Note: 1. *=Estimated SAR

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

6.14.2 SAR to peak location separation ratio (SPLSR)

When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by (SAR1 + SAR2)^1.5/Ri, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

All of sum of SAR < 1.6 W/kg, therefore SPLSR is not required.

6.15 SAR test reduction according to KDB

General:

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

KDB 447498:

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

KDB 865664:

- Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
- When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg.
- Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

KDB 941225:

For 2G

- In order to qualify for the above test reduction, the maximum burst-averaged output power for each mode (GMS/GPRS/EDGE) and the corresponding multi-slot class must be clearly identified in the SAR report for each frequency band.We perform worst case SAR with maximum time-average power on GMS/GPRS/EDGE mode.

For 3G-3GPP

- When HSDPA & (HSUPA / HSPA+ uplink with QPSK) power are not more than WCDMA 12.2K RMC 0.25dB and the SAR value of WCDMA BII/BV<1.2 W/kg ,therefore HSDPA & HSUPA / HSPA+ Stand-alone SAR is not required.

For 3G-3GPP2

- SAR for EVDO Rev. A is not required when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations.
- For 1xRTT SAR is not required when the maximum average output of each channel is less than 1/4 dB higher than that measured in EVDO Rev.0.

For 4G

- When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation, otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
- For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
- SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.
- For smaller channel bandwidth SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

For Hot-spot mode

- SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge.

KDB 248227:

- Refer 6.4 SAR Testing with 802.11 Transmitters.

7. *System Verification and Validation*

7.1 Symmetric Dipoles for System Verification

Construction	Symmetrical dipole with l/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions.
Frequency	750, 835, 1800, 1900 ,2450, 5200, 5300, 5600 and 5800 MHz
Return Loss	> 20 dB at specified verification position
Power Capability	> 100 W (f < 1GHz); > 40 W (f > 1GHz)
Options	Dipoles for other frequencies or solutions and other calibration conditions are available upon request
Dimensions	D750V3: dipole length 177 mm; overall height 300 mm D835V2: dipole length 161 mm; overall height 340 mm D1800V2: dipole length 75.2 mm; overall height 301.5 mm D1900V2: dipole length 67.7 mm; overall height 300 mm D2450V2: dipole length 51.5 mm; overall height 300 mm D5GHzV2: dipole length 20.6 mm; overall height 300 mm

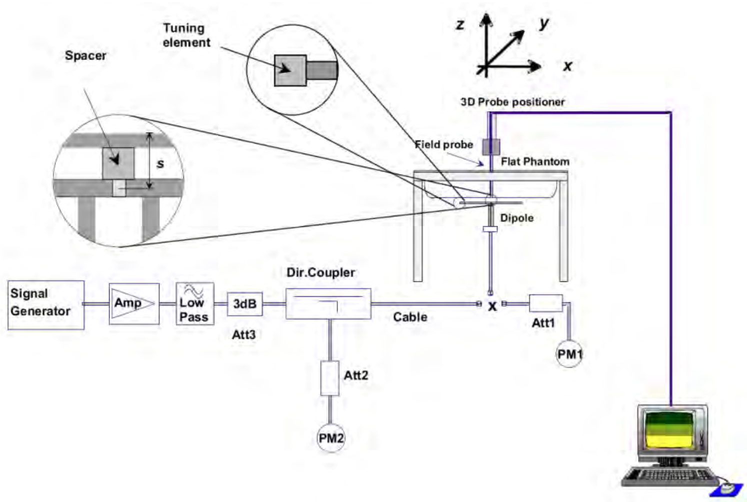


Figure 9. System Verification Setup Diagram

Figure 10. Validation Kit

7.2 Verification Summary

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ± 10%. The verification was performed at 750, 835, 1800, 1900, 2450, 2550, 5200, 5300, 5600, 5800MHz.

Mixture Type	Frequency (MHz)	Power	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	Drift (dB)	Difference percentage		Probe	Dipole	1W Target		Date
						1g	10g	Model / Serial No.	Model / Serial No.	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)	
Head	750	250 mW	2.16	1.4	-0.07	4.6%	3.1%	EX3DV4 SN3633	D750V3 SN1163	8.26	5.43	Sep. 10, 2017
		Normalize to 1 Watt	8.64	5.6								
Body	750	250 mW	2.14	1.42	-0.06	-0.2%	0.7%	EX3DV4 SN3633	D750V3 SN1163	8.58	5.64	Sep. 12, 2017
		Normalize to 1 Watt	8.56	5.68								
Head	835	250 mW	2.25	1.48	0.09	-2.4%	-1.8%	EX3DV4 SN3633	D835V2 SN4d057	9.22	6.03	Sep. 09, 2017
		Normalize to 1 Watt	9.00	5.92								
Body	835	250 mW	2.28	1.51	-0.02	-3.4%	-2.6%	EX3DV4 SN3633	D835V2 SN4d057	9.44	6.2	Sep. 13, 2017
		Normalize to 1 Watt	9.12	6.04								
Head	1800	250 mW	9.48	5.09	0.08	-2.3%	-1.2%	EX3DV4 SN3633	D1800V2 SN2d147	38.8	20.6	Sep. 10, 2017
		Normalize to 1 Watt	37.92	20.36								
Body	1800	250 mW	9.65	5.13	-0.11	-2.5%	-2.7%	EX3DV4 SN3633	D1800V2 SN2d147	39.6	21.1	Sep. 14, 2017
		Normalize to 1 Watt	38.6	20.52								
Head	1900	250 mW	10.5	5.36	-0.07	2.9%	2.1%	EX3DV4 SN3633	D1900V2 SN5d088	40.8	21	Sep. 11, 2017
		Normalize to 1 Watt	42.00	21.44								
Body	1900	250 mW	10.6	5.51	-0.02	3.2%	3.5%	EX3DV4 SN3633	D1900V2 SN5d088	41.1	21.3	Sep. 14, 2017
		Normalize to 1 Watt	42.4	22.04								
Body	1900	250 mW	10.5	5.46	0.01	4.2%	2.5%	EX3DV4 SN3633	D1900V2 SN5d088	41.1	21.3	Oct. 19, 2017
		Normalize to 1 Watt	42	21.84								
Head	2450	250 mW	12.7	5.88	-0.09	-3.2%	-2.4%	EX3DV4 SN3633	D2450V2 SN873	52.5	24.1	Sep. 22, 2017
		Normalize to 1 Watt	50.8	23.52								
Body	2450	250 mW	12.6	5.88	0.01	-3.6%	-3.6%	EX3DV4 SN3633	D2450V2 SN873	52.3	24.4	Sep. 14, 2017
		Normalize to 1 Watt	50.4	23.52								
Head	2550	250 mW	13.7	6.52	0.08	-4.2%	-0.5%	EX3DV4 SN3633	D2550V2 SN1010	57.2	26.2	Oct. 11, 2017
		Normalize to 1 Watt	54.8	26.08								

Mixture Type	Frequency (MHz)	Power	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	Drift (dB)	Difference percentage		Probe	Dipole	1W Target		Date
						1g	10g	Model / Serial No.	Model / Serial No.	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)	
Body	2550	250 mW	14.1	6.41	0.02	2.9%	2.2%	EX3DV4 SN3633	D2550V2 SN1010	54.8	25.1	Oct. 11, 2017
		Normalize to 1 Watt	56.4	25.64								
Head	5200	100 mW	7.88	2.23	0.02	2.5%	1.8%	EX3DV4 SN3633	D5200V2 SN1238	76.9	21.9	Sep. 23, 2017
		Normalize to 1 Watt	78.8	22.3								
Body	5200	100 mW	7.26	2.06	-0.03	-2.4%	-1.4%	EX3DV4 SN3633	D5200V2 SN1238	74.4	20.9	Sep. 26, 2017
		Normalize to 1 Watt	72.6	20.6								
Head	5300	100 mW	7.98	2.33	0.02	-3.9%	-1.7%	EX3DV4 SN3633	D5300V2 SN1238	83	23.7	Sep. 23, 2017
		Normalize to 1 Watt	79.8	23.3								
Body	5300	100 mW	7.45	2.12	-0.03	-2.6%	-1.4%	EX3DV4 SN3633	D5300V2 SN1238	76.5	21.5	Sep. 26, 2017
		Normalize to 1 Watt	74.5	21.2								
Head	5600	100 mW	8.15	2.43	0.02	-1.7%	3.0%	EX3DV4 SN3633	D5600V2 SN1238	82.9	23.6	Sep. 23, 2017
		Normalize to 1 Watt	81.5	24.3								
Body	5600	100 mW	8.13	2.24	-0.02	2.8%	1.4%	EX3DV4 SN3633	D5600V2 SN1238	79.1	22.1	Sep. 26, 2017
		Normalize to 1 Watt	81.3	22.4								
Head	5800	100 mW	8.09	2.28	-0.1	2.7%	2.2%	EX3DV4 SN3633	D5800V2 SN1238	78.8	22.3	Sep. 23, 2017
		Normalize to 1 Watt	80.9	22.8								
Body	5800	100 mW	7.44	2.07	0.08	-2.4%	-1.9%	EX3DV4 SN3633	D5800V2 SN1238	76.2	21.1	Sep. 26, 2017
		Normalize to 1 Watt	74.4	20.7								

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1163	Sep/19/2016	Sep/19/2018
SPEAG	835MHz System Validation Kit	D835V2	4d057	Oct/22/2015	Oct/22/2017
SPEAG	1800MHz System Validation Kit	D1800V2	2d147	Nov/03/2015	Sep/25/2018
SPEAG	1900MHz System Validation Kit	D1900V2	5d088	Nov/03/2015	Sep/25/2018
SPEAG	2450MHz System Validation Kit	D2450V2	873	Oct/30/2015	Oct/20/2017
SPEAG	2550MHz System Validation Kit	D2550V2	1010	July/24/2015	July/21/2018
SPEAG	5GHz System Validation Kit	D5GHzV2	1238	Sep/21/2016	Sep/20/2018
SPEAG	Dosimetric E-Field Probe	EX3DV4	3633	Jan/23/2017	Jan/23/2018
SPEAG	Data Acquisition Electronics	DAE4	786	Dec/08/2016	Dec/08/2017
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Phantom	SAM V4.0	TP-1150	NCR	
SPEAG	Robot	Staubli TX90XL	F07/564ZA1/A/01	NCR	
SPEAG	Software	DASY52 V52.8 (8)	N/A	NCR	
SPEAG	Software	SEMCAD X V14.6.10(7331)	N/A	NCR	
R&S	Wireless Communication Test Set	CMU200	109369	12/01/2016	12/01/2017
Anritsu	Radio Communication Analyzer	MT8820C	6201060962	12/05/2016	12/05/2017
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	
HILA	Digital Thermometer	TM-906	GF-006	08/17/2017	08/17/2018
Agilent	Power Sensor	8481H	3318A20779	06/07/2017	06/07/2018
Agilent	Power Meter	EDM Series E4418B	GB40206143	06/07/2017	06/07/2018
Agilent	Signal Generator	E8257D	MY53050382	03/01/2017	03/01/2018
Agilent	Dual Directional Coupler	778D	50334	NCR	
Woken	Dual Directional Coupler	0100AZ20200801O	11012409517	NCR	
Mini-Circuits	Power Amplifier	ZHL-42W-SMA	D111103#5	NCR	
Mini-Circuits	Power Amplifier	ZVE-8G-SMA	D042005 671800514	NCR	
Aisi	Attenuator	IEAT 3dB	N/A	NCR	

9. Measurement Uncertainty

When the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

10. Measurement Procedure

The measurement procedures are as follows:

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

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

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

10.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.
The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.
The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages

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

10.2 Area & Zoom Scan Procedures

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

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

(Our measure settings are refer KDB Publication 865664 D01v01r04)

10.3 Volume Scan Procedures

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

10.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

10.5 Power Drift Monitoring

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

11. SAR Test Results Summary

1. According KDB 447498 D01 V06 section 4.1.4, the “Reported” explanation as below:
   “When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported.”
2. If actual power less than tune-up power that Scaling SAR is required.
3. The formula of Reported SAR, that represent as below:
   Reported SAR = Original SAR * 10^[(Tune-up power - Actual power)/10]
4. If the Channel's SAR 1g is > 0.8 W/kg, low, middle and high channel are supposed to be tested.
5. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge.
6. Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge,middle and lower edge of each required test channel.
7. When the highest reported SAR for 1 RB and 50% RB allocation are > 0.8 W/kg,SAR is measured for the highest output power channel in 100%RB.
8. The procedures required for 1 RB allocation are applied to measure the SAR for QPSK with 50% RB allocation.
9. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
10. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) configurations with 12.2 kbps RMC as the primary mode.
11. SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power .
12. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions.
13. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.
14. When the reported SAR of the highest measured maximum output power channel is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS.
15. When the reported SAR of the highest measured maximum output power channel is > 0.8 W/kg, SAR is required using the next highest measured output power channel for 802.11b DSSS.
16. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for 2.4G OFDM configuration.
17. The initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band.
18. SAR for the initial test configuration is measured using the highest maximum output power channel.
19. When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.
20. If Initial test configuration SAR for 5G OFDM band is > 0.8 W/kg, SAR is required for next highest output channel in initial test configuration. The next highest output channel SAR is ≤ 1.2 W/kg, SAR is not required for subsequent next highest output channel.
21. We choose the worst-case band to test repeat SAR.
22. There is no any reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, so it is not necessary to repeated for the body-worn accessory with a headset attached to the handset.

11.1 Head SAR Measurement

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
GSM850	Left	Cheek	High	0.212	**0.284**	0.08	33.54	34	0.32
	Left	Tilt15°	High	0.125	0.179	0.09	33.54	34	0.20
	Right	Cheek	High	0.204	0.268	-0.09	33.54	34	0.30
	Right	Tilt15°	High	0.112	0.161	-0.12	33.54	34	0.18

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
GSM1900	Left	Cheek	Low	0.146	**0.235**	0.06	30.3	31	0.28
	Left	Tilt15°	Low	0.050	0.084	0.05	30.3	31	0.10
	Right	Cheek	Low	0.118	0.195	0.02	30.3	31	0.23
	Right	Tilt15°	Low	0.038	0.069	0.20	30.3	31	0.08

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
cdma bc0	Left	Cheek	Middle	0.162	0.211	0.09	24.37	24.8	0.23
	Left	Tilt15°	Middle	0.080	0.113	0.11	24.37	24.8	0.12
	Right	Cheek	Middle	0.170	**0.225**	0.11	24.37	24.8	0.25
	Right	Tilt15°	Middle	0.081	0.112	-0.03	24.37	24.8	0.12

Band	EUT Setup			SAR(W/kg)					
cdma bc1	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Left	Cheek	Middle	0.252	0.404	0.04	24.3	24.5	0.42
	Left	Tilt15°	Middle	0.116	0.185	0.08	24.3	24.5	0.19
	Right	Cheek	Middle	0.364	**0.431**	0.07	24.3	24.5	0.45
	Right	Tilt15°	Middle	0.104	0.165	0.05	24.3	24.5	0.17

Band	EUT Setup			SAR(W/kg)					
cdma bc10	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Left	Cheek	Middle	0.165	0.214	0.01	24.26	24.8	0.24
	Left	Tilt15°	Middle	0.083	0.117	0.09	24.26	24.8	0.13
	Right	Cheek	Middle	0.176	**0.232**	0.06	24.26	24.8	0.26
	Right	Tilt15°	Middle	0.082	0.115	0.04	24.26	24.8	0.13

Band	EUT Setup			SAR(W/kg)					
WCDMA Band 5	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Left	Cheek	Middle	0.210	**0.273**	-0.08	24.3	24.5	0.286
	Left	Tilt15°	Middle	0.121	0.174	0.06	24.3	24.5	0.182
	Right	Cheek	Middle	0.180	0.260	-0.07	24.3	24.5	0.272
	Right	Tilt15°	Middle	0.105	0.149	-0.08	24.3	24.5	0.156

Band	EUT Setup			SAR(W/kg)					
WCDMA Band 4	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Left	Cheek	High	0.112	0.173	0.05	24.2	24.3	0.18
	Left	Tilt15°	High	0.077	0.129	0.02	24.2	24.3	0.13
	Right	Cheek	High	0.145	**0.223**	0.07	24.2	24.3	0.23
	Right	Tilt15°	High	0.047	0.076	0.11	24.2	24.3	0.08

Band	EUT Setup			SAR(W/kg)					
WCDMA Band 2	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Left	Cheek	Middle	0.349	**0.568**	0.06	24.1	24.3	0.59
	Left	Tilt15°	Middle	0.133	0.220	0.05	24.1	24.3	0.23
	Right	Cheek	Middle	0.195	0.320	0.02	24.1	24.3	0.34
	Right	Tilt15°	Middle	0.112	0.194	0.03	24.1	24.3	0.20

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band2	1860.0	18700	Left Cheek,1RB	0.239	**0.378**	0.06	22.74	23.8	0.48
	1880.0	18900	Left Cheek,50%RB	0.184	0.328	0.01	21.64	22.8	0.43
	1860.0	18700	Left Tilt15°,1RB	0.147	0.242	0.01	22.74	23.8	0.31
	1880.0	18900	Left Tilt15°,50%RB	0.119	0.198	0.03	21.64	22.8	0.26
	1860.0	18700	Right Cheek,1RB	0.160	0.273	0.00	22.74	23.8	0.35
	1880.0	18900	Right Cheek,50%RB	0.128	0.219	-0.08	21.64	22.8	0.29
	1860.0	18700	Right Tilt15°,1RB	0.127	0.219	0.06	22.74	23.8	0.28
	1880.0	18900	Right Tilt15°,50%RB	0.098	0.171	-0.02	21.64	22.8	0.22

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band4	1745	20300	Left Cheek,1RB	0.075	**0.115**	-0.05	22.77	23.5	0.14
	1745	20300	Left Cheek,50%RB	0.061	0.105	0.08	21.51	22.5	0.13
	1745	20300	Left Tilt15°,1RB	0.049	0.086	0.05	22.77	23.5	0.10
	1745	20300	Left Tilt15°,50%RB	0.039	0.066	0.01	21.51	22.5	0.08
	1745	20300	Right Cheek,1RB	0.116	0.195	0.08	22.77	23.5	0.23
	1745	20300	Right Cheek,50%RB	0.093	0.160	0.09	21.51	22.5	0.20
	1745	20300	Right Tilt15°,1RB	0.035	0.058	0.05	22.77	23.5	0.07
	1745	20300	Right Tilt15°,50%RB	0.029	0.047	0.04	21.51	22.5	0.06

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band5	884	20600	Left Cheek,1RB	0.138	**0.188**	0.02	23.54	24	0.21
	884	20600	Left Cheek,50%RB	0.111	0.156	-0.03	22.54	23	0.17
	884	20600	Left Tilt15°,1RB	0.066	0.093	-0.03	23.54	24	0.10
	884	20600	Left Tilt15°,50%RB	0.063	0.090	0.07	22.54	23	0.10
	884	20600	Right Cheek,1RB	0.106	0.137	0.05	23.54	24	0.15
	884	20600	Right Cheek,50%RB	0.093	0.131	0.03	22.54	23	0.15
	884	20600	Right Tilt15°,1RB	0.055	0.078	0.01	23.54	24	0.09
	884	20600	Right Tilt15°,50%RB	0.054	0.076	-0.03	22.54	23	0.08

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band12	704	23060	Left Cheek,1RB	0.124	**0.157**	0.19	23.49	24	0.18
	704	23060	Left Cheek,50%RB	0.083	0.118	0.07	22.48	23	0.13
	704	23060	Left Tilt15°,1RB	0.039	0.056	-0.04	23.49	24	0.06
	704	23060	Left Tilt15°,50%RB	0.032	0.045	0.11	22.48	23	0.05
	704	23060	Right Cheek,1RB	0.087	0.125	-0.12	23.49	24	0.14
	704	23060	Right Cheek,50%RB	0.059	0.083	-0.15	22.48	23	0.09
	704	23060	Right Tilt15°,1RB	0.045	0.063	-0.04	23.49	24	0.07
	704	23060	Right Tilt15°,50%RB	0.032	0.045	0.06	22.48	23	0.05

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band13	782	23230	Left Cheek,1RB	0.191	**0.244**	0.05	23.54	24	0.27
	782	23230	Left Cheek,50%RB	0.125	0.179	0.14	22.6	23	0.20
	782	23230	Left Tilt15°,1RB	0.033	0.047	-0.07	23.54	24	0.05
	782	23230	Left Tilt15°,50%RB	0.025	0.036	0.04	22.6	23	0.04
	782	23230	Right Cheek,1RB	0.141	0.201	0.05	23.54	24	0.22
	782	23230	Right Cheek,50%RB	0.103	0.148	0.11	22.6	23	0.16
	782	23230	Right Tilt15°,1RB	0.063	0.090	0.15	23.54	24	0.10
	782	23230	Right Tilt15°,50%RB	0.052	0.073	-0.08	22.6	23	0.08

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band17	709	23780	Left Cheek,1RB	0.121	**0.155**	0.11	23.55	24	0.17
	709	23780	Left Cheek,50%RB	0.083	0.119	0.10	22.54	23	0.13
	709	23780	Left Tilt15°,1RB	0.042	0.059	-0.03	23.55	24	0.07
	709	23780	Left Tilt15°,50%RB	0.033	0.047	-0.06	22.54	23	0.05
	709	23780	Right Cheek,1RB	0.075	0.107	0.09	23.55	24	0.12
	709	23780	Right Cheek,50%RB	0.056	0.083	-0.06	22.54	23	0.09
	709	23780	Right Tilt15°,1RB	0.044	0.062	-0.09	23.55	24	0.07
	709	23780	Right Tilt15°,50%RB	0.032	0.045	-0.14	22.54	23	0.05

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band25	1860	26140	Left Cheek,1RB	0.222	**0.361**	0.16	22.73	23.5	0.43
	1905	26590	Left Cheek,50%RB	0.199	0.350	-0.11	21.61	22.5	0.43
	1860	26140	Left Tilt15°,1RB	0.133	0.235	0.02	22.73	23.5	0.28
	1905	26590	Left Tilt15°,50%RB	0.130	0.225	0.02	21.61	22.5	0.28
	1860	26140	Right Cheek,1RB	0.183	0.315	-0.09	22.73	23.5	0.38
	1905	26590	Right Cheek,50%RB	0.171	0.298	-0.01	21.61	22.5	0.37
	1860	26140	Right Tilt15°,1RB	0.088	0.148	-0.01	22.73	23.5	0.18
	1905	26590	Right Tilt15°,50%RB	0.085	0.144	0.14	21.61	22.5	0.18

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band26	823	26775	Left Cheek,1RB	0.218	**0.282**	0.16	23.73	24.3	0.32
	832	26865	Left Cheek,50%RB	0.165	0.248	0.06	23.84	24.3	0.28
	823	26775	Left Tilt15°,1RB	0.114	0.163	-0.11	23.73	24.3	0.19
	832	26865	Left Tilt15°,50%RB	0.086	0.124	0.07	23.84	24.3	0.14
	823	26775	Right Cheek,1RB	0.180	0.259	0.10	23.73	24.3	0.30
	832	26865	Right Cheek,50%RB	0.154	0.222	-0.05	23.84	24.3	0.25
	823	26775	Right Tilt15°,1RB	0.116	0.165	-0.11	23.73	24.3	0.19
	832	26865	Right Tilt15°,50%RB	0.104	0.149	-0.01	23.84	24.3	0.17

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Head Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band41	2680	41490	Left Cheek,1RB	0.122	**0.213**	0.02	23.38	24	0.25
	2680	41490	Left Cheek,50%RB	0.096	0.118	0.11	22.39	23	0.14
	2680	41490	Left Tilt15°,1RB	0.065	0.084	0.10	23.38	24	0.10
	2680	41490	Left Tilt15°,50%RB	0.031	0.062	0.12	22.39	23	0.07
	2680	41490	Right Cheek,1RB	0.072	0.103	0.11	23.38	24	0.12
	2680	41490	Right Cheek,50%RB	0.042	0.081	0.05	22.39	23	0.09
	2680	41490	Right Tilt15°,1RB	0.052	0.084	0.01	23.38	24	0.10
	2680	41490	Right Tilt15°,50%RB	0.031	0.067	-0.02	22.39	23	0.08

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11b	Left	Cheek	Middle	0.155	0.333	0.19	16.51	17	0.37
	Left	Tilt15°	Middle	0.124	0.249	0.12	16.51	17	0.28
	Right	Cheek	Middle	0.075	0.142	0.12	16.51	17	0.16
	Right	Tilt15°	Middle	0.063	0.121	0.01	16.51	17	0.14

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11n(40M)(5.3)	Left	Cheek	Ch54	0.177	**0.568**	-0.12	15.53	17	0.80
	Left	Tilt15°	Ch54	0.141	0.427	0.07	15.53	17	0.60
	Right	Cheek	Ch54	0.101	0.308	-0.02	15.53	17	0.43
	Right	Tilt15°	Ch54	0.100	0.305	0.02	15.53	17	0.43

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11a	Left	Cheek	Ch108	0.150	0.465	0.01	16.41	17	0.53
	Left	Tilt15°	Ch108	0.163	0.522	0.02	16.41	17	0.60
	Right	Cheek	Ch108	0.119	0.355	0.01	16.41	17	0.41
	Right	Tilt15°	Ch108	0.138	0.410	-0.01	16.41	17	0.47

Band	EUT Setup			SAR(W/kg)					
	Head Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11a	Left	Cheek	Ch157	0.104	0.323	0.01	16.35	17	0.38
	Left	Tilt15°	Ch157	0.114	0.376	-0.11	16.35	17	0.44
	Right	Cheek	Ch157	0.114	0.335	0.03	16.35	17	0.39
	Right	Tilt15°	Ch157	0.126	0.364	-0.08	16.35	17	0.42

11.2 Body SAR Measurement

The distance between EUT and Phanton is 10mm.

Band	EUT Setup			SAR(W/kg)					
GSM850	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Front	Side	High	0.276	0.390	-0.01	31.4	32.4	0.49
	Rear	Side	High	0.418	**0.554**	-0.01	31.4	32.4	0.70
	Left	Side	High	0.211	0.315	0.04	31.4	32.4	0.40
	Right	Side	High	0.306	0.452	0.09	31.4	32.4	0.57
	Bottom	Side	High	0.035	0.061	0.19	31.4	32.4	0.08

	EUT Setup			SAR(W/kg)					
GSM1900	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Front	Side	Low	0.373	0.658	-0.03	29.09	30	0.81
	Rear	Side	Low	0.309	0.545	0.03	29.09	30	0.67
	Left	Side	Low	0.107	0.186	-0.05	29.09	30	0.23
	Right	Side	Low	0.050	0.080	0.02	29.09	30	0.10
	Bottom	Side	Low	0.481	**0.861**	-0.01	29.09	30	**1.06**
	Bottom	Side	High	0.400	0.740	0.02	29.03	30	0.93
	Bottom	Side	Mid	0.415	0.764	0.00	28.98	30	0.97

Band	EUT Setup			SAR(W/kg)					
cdma bc0	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
	Front	Side	Middle	0.221	0.312	-0.03	24.42	24.8	0.34
	Rear	Side	Middle	0.266	**0.393**	-0.03	24.42	24.8	0.43
	Left	Side	Middle	0.177	0.261	-0.02	24.42	24.8	0.28
	Right	Side	Middle	0.230	0.385	0.18	24.42	24.8	0.42
	Bottom	Side	Middle	0.024	0.041	0.02	24.42	24.8	0.04

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
cdma bc1	Front	Side	High	0.363	0.566	0.03	24.29	24.5	0.59
	Rear	Side	High	0.559	0.788	-0.07	24.29	24.5	0.83
	Left	Side	High	0.279	0.457	-0.02	24.29	24.5	0.48
	Right	Side	High	0.328	0.540	0.06	24.29	24.5	0.57
	Bottom	Side	High	0.036	0.069	0.01	24.29	24.5	0.07
	Rear	Side	Middle	0.522	**0.794**	-0.08	24.11	24.5	0.87
	Rear	Side	Low	0.446	0.729	-0.04	24.19	24.5	0.78

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
cdma bc10	Front	Side	Low	0.238	0.334	0.03	24.23	24.8	0.38
	Rear	Side	Low	0.336	**0.437**	0.06	24.23	24.8	0.50
	Left	Side	Low	0.168	0.248	0.14	24.23	24.8	0.28
	Right	Side	Low	0.213	0.317	0.02	24.23	24.8	0.36
	Bottom	Side	Low	0.026	0.040	-0.04	24.23	24.8	0.05

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
WCDMA Band 5	Front	Side	Middle	0.167	0.236	-0.02	24.3	24.5	0.25
	Rear	Side	Middle	0.220	**0.312**	0.11	24.3	24.5	0.33
	Left	Side	Middle	0.132	0.196	0.03	24.3	24.5	0.21
	Right	Side	Middle	0.176	0.260	0.02	24.3	24.5	0.27
	Bottom	Side	Middle	0.018	0.029	-0.05	24.3	24.5	0.03

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
WCDMA Band 4	Front	Side	High	0.380	0.703	-0.03	24.2	24.3	0.72
	Rear	Side	High	0.413	0.735	-0.06	24.2	24.3	0.75
	Left	Side	High	0.097	0.165	-0.05	24.2	24.3	0.17
	Right	Side	High	0.071	0.116	0.02	24.2	24.3	0.12
	Bottom	Side	High	0.642	**1.140**	-0.08	24.2	24.3	1.17
	Bottom	Side	Middle	0.600	1.100	0.03	24.1	24.3	1.15
	Bottom	Side	Low	0.560	1.030	-0.05	24	24.3	1.10

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
WCDMA Band 2	Front	Side	Middle	0.434	0.727	-0.06	24.1	24.3	0.76
	Rear	Side	Middle	0.349	0.645	0.08	24.1	24.3	0.68
	Left	Side	Middle	0.128	0.220	0.03	24.1	24.3	0.23
	Right	Side	Middle	0.078	0.140	0.09	24.1	24.3	0.15
	Bottom	Side	Middle	0.496	0.936	-0.06	24.1	24.3	0.98
	Bottom	Side	High	0.495	0.940	-0.05	24.1	24.3	0.98
	Bottom	Side	Low	0.572	**1.040**	0.03	24.1	24.3	1.09

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band2	1860	18700	Front Side,1RB	0.425	0.727	0.08	22.74	23.8	0.93
	1900	19100	Front Side,1RB	0.444	0.780	-0.06	22.7	23.8	1.00
	1880	18900	Front Side,1RB	0.401	0.697	-0.02	22.72	23.8	0.89
	1880	18900	Front Side,50%RB	0.329	0.569	-0.04	21.64	22.8	0.74
	1880	18900	Front Side,100RB	0.320	0.562	-0.01	21.67	22.8	0.73
	1860	18700	Rear Side,1RB	0.434	0.743	0.05	22.74	23.8	0.95
	1880	18900	Rear Side,1RB	0.397	0.680	0.12	22.7	23.8	0.88
	1900	19100	Rear Side,1RB	0.381	0.653	0.06	22.72	23.8	0.84
	1880	18900	Rear Side,50%RB	0.287	0.517	-0.02	21.64	22.8	0.68
	1880	18900	Rear Side,100RB	0.304	0.514	-0.13	21.67	22.8	0.67
	1860	18700	Left Side,1RB	0.195	0.335	0.01	22.74	23.8	0.43
	1880	18900	Left Side,50%RB	0.160	0.275	0.05	21.64	22.8	0.36
	1860	18700	Right Side,1RB	0.090	0.156	0.06	22.74	23.8	0.20
	1880	18900	Right Side,50%RB	0.069	0.120	-0.02	21.64	22.8	0.16
	1860	18700	Bottom Side,1RB	0.594	**1.070**	-0.03	22.74	23.8	**1.37**
	1860	18700	Bottom Side,1RB_Repeat	0.587	1.050	-0.03	22.74	23.8	1.34
	1900	19100	Bottom Side,1RB	0.530	1.010	-0.12	22.7	23.8	1.30
	1880	18900	Bottom Side,1RB	0.520	0.970	-0.16	22.72	23.8	1.24
	1880	18900	Bottom Side,50%RB	0.426	0.742	-0.16	21.64	22.8	0.97
	1900	19100	Bottom Side,50%RB	0.366	0.695	0.09	21.51	22.8	0.94
	1860	18700	Bottom Side,50%RB	0.363	0.690	0.11	21.6	22.8	0.91
	1880	18900	Bottom Side,100RB	0.424	0.731	-0.13	21.67	22.8	0.95
	1900	19100	Bottom Side,100RB	0.352	0.670	-0.09	21.5	22.8	0.90
	1860	18700	Bottom Side,100RB	0.358	0.682	-0.07	21.59	22.8	0.90

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band4	1745	20300	Front Side,1RB	0.367	0.666	0.01	22.77	23.5	0.79
	1745	20300	Front Side,50%RB	0.274	0.492	0.05	21.51	22.5	0.62
	1745	20300	Rear Side,1RB	0.400	0.725	0.03	22.77	23.5	0.86
	1732.5	20175	Rear Side,1RB	0.366	0.638	-0.01	22.73	23.5	0.76
	1720	20050	Rear Side,1RB	0.346	0.599	-0.04	22.72	23.5	0.72
	1745	20300	Rear Side,50%RB	0.299	0.539	-0.04	21.51	22.5	0.68
	1745	20300	Rear Side,100RB	0.290	0.510	-0.01	21.46	22.5	0.65
	1745	20300	Left Side,1RB	0.062	0.106	0.01	22.77	23.5	0.13
	1745	20300	Left Side,50%RB	0.051	0.086	-0.02	21.51	22.5	0.11
	1745	20300	Right Side,1RB	0.064	0.103	0.01	22.77	23.5	0.12
	1745	20300	Right Side,50%RB	0.051	0.081	0.01	21.51	22.5	0.10
	1745	20300	Bottom Side,1RB	0.557	**0.988**	0.02	22.77	23.5	1.17
	1732.5	20175	Bottom Side,1RB	0.538	0.982	0.03	22.73	23.5	**1.17**
	1732.5	20175	Bottom Side,1RB_Repeat	0.534	0.978	-0.02	22.73	23.5	1.17
	1720	20050	Bottom Side,1RB	0.488	0.901	-0.10	22.72	23.5	1.08
	1745	20300	Bottom Side,50%RB	0.416	0.751	-0.14	21.51	22.5	0.94
	1732.5	20175	Bottom Side,50%RB	0.322	0.602	-0.07	21.43	22.5	0.77
	1720	20050	Bottom Side,50%RB	0.311	0.580	-0.15	21.47	22.5	0.74
	1745	20300	Bottom Side,100RB	0.398	0.737	-0.05	21.46	22.5	0.94
	1732.5	20175	Bottom Side,100RB	0.320	0.599	-0.05	21.4	22.5	0.77
	1720	20050	Bottom Side,100RB	0.316	0.589	-0.05	21.43	22.5	0.75

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band5	844	20600	Front Side,1RB	0.174	0.245	0.11	23.54	24	0.27
	829	20450	Front Side,50%RB	0.124	0.174	-0.03	22.54	23	0.19
	844	20600	Rear Side,1RB	0.278	**0.360**	-0.05	23.54	24	0.40
	829	20450	Rear Side,50%RB	0.181	0.254	-0.06	22.54	23	0.28
	844	20600	Left Side,1RB	0.156	0.231	-0.04	23.54	24	0.26
	829	20450	Left Side,50%RB	0.132	0.196	0.04	22.54	23	0.22
	844	20600	Right Side,1RB	0.163	0.240	-0.01	23.54	24	0.27
	829	20450	Right Side,50%RB	0.133	0.195	0.08	22.54	23	0.22
	844	20600	Bottom Side,1RB	0.186	0.369	-0.03	23.54	24	0.41
	829	20450	Bottom Side,50%RB	0.138	0.283	-0.05	22.54	23	0.31

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band12	704	23060	Front Side,1RB	0.168	0.236	-0.01	23.49	24	0.27
	704	23060	Front Side,50%RB	0.120	0.167	0.05	22.48	23	0.19
	704	23060	Rear Side,1RB	0.201	**0.280**	-0.01	23.49	24	0.31
	704	23060	Rear Side,50%RB	0.153	0.222	-0.04	22.48	23	0.25
	704	23060	Left Side,1RB	0.124	0.180	0.04	23.49	24	0.20
	704	23060	Left Side,50%RB	0.094	0.136	-0.01	22.48	23	0.15
	704	23060	Right Side,1RB	0.139	0.203	0.08	23.49	24	0.23
	704	23060	Right Side,50%RB	0.078	0.113	-0.03	22.48	23	0.13
	704	23060	Bottom Side,1RB	0.015	0.022	-0.09	23.49	24	0.02
	704	23060	Bottom Side,50%RB	0.011	0.016	0.06	22.48	23	0.02

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band13	782	23230	Front Side,1RB	0.143	0.199	-0.03	23.54	24	0.22
	782	23230	Front Side,50%RB	0.110	0.154	0.01	22.6	23	0.17
	782	23230	Rear Side,1RB	0.140	**0.201**	0.06	23.54	24	0.22
	782	23230	Rear Side,50%RB	0.121	0.178	0.01	22.6	23	0.20
	782	23230	Left Side,1RB	0.102	0.151	0.01	23.54	24	0.17
	782	23230	Left Side,50%RB	0.087	0.128	0.03	22.6	23	0.14
	782	23230	Right Side,1RB	0.099	0.151	0.00	23.54	24	0.17
	782	23230	Right Side,50%RB	0.057	0.084	-0.08	22.6	23	0.09
	782	23230	Bottom Side,1RB	0.012	0.019	0.07	23.54	24	0.02
	782	23230	Bottom Side,50%RB	0.010	0.017	0.01	22.6	23	0.02

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band17	709	23780	Front Side,1RB	0.174	0.243	-0.04	23.55	24	0.27
	709	23780	Front Side,50%RB	0.128	0.178	0.02	22.54	23	0.20
	709	23780	Rear Side,1RB	0.195	**0.277**	-0.03	23.55	24	0.31
	709	23780	Rear Side,50%RB	0.162	0.233	-0.03	22.54	23	0.26
	709	23780	Left Side,1RB	0.141	0.204	0.07	23.55	24	0.23
	709	23780	Left Side,50%RB	0.108	0.156	0.05	22.54	23	0.17
	709	23780	Right Side,1RB	0.154	0.223	0.03	23.55	24	0.25
	709	23780	Right Side,50%RB	0.095	0.138	0.01	22.54	23	0.15
	709	23780	Bottom Side,1RB	0.017	0.027	0.17	23.55	24	0.03
	709	23780	Bottom Side,50%RB	0.012	0.018	0.03	22.54	23	0.02

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band25	1860	26140	Front Side,1RB	0.390	0.667	0.01	22.73	23.5	0.80
	1905	26590	Front Side,50%RB	0.307	0.523	0.03	21.61	22.5	0.64
	1860	26140	Rear Side,1RB	0.435	0.739	-0.05	22.73	23.5	0.88
	1905	26590	Rear Side,1RB	0.353	0.636	-0.07	22.47	23.5	0.81
	1882.5	26365	Rear Side,1RB	0.387	0.695	-0.04	22.49	23.5	0.88
	1905	26590	Rear Side,50%RB	0.262	0.471	0.03	21.61	22.5	0.58
	1882.5	26365	Rear Side,100%RB	0.254	0.446	0.01	21.41	22.5	0.57
	1860	26140	Left Side,1RB	0.158	0.269	-0.05	22.73	23.5	0.32
	1905	26590	Left Side,50%RB	0.114	0.195	-0.04	21.61	22.5	0.24
	1860	26140	Right Side,1RB	0.133	0.234	0.03	22.73	23.5	0.28
	1905	26590	Right Side,50%RB	0.091	0.163	-0.04	21.61	22.5	0.20
	1860	26140	Bottom Side,1RB	0.595	**1.100**	-0.04	22.73	23.5	**1.31**
	1905	26590	Bottom Side,1RB	0.539	1.010	-0.01	22.47	23.5	1.28
	1882.5	26365	Bottom Side,1RB	0.528	0.988	-0.18	22.49	23.5	1.25
	1905	26590	Bottom Side,50%RB	0.335	0.629	0.03	21.61	22.5	0.77
	1882.5	26365	Bottom Side,100%RB	0.406	0.727	0.01	21.41	22.5	0.93
	1860	26140	Bottom Side,100%RB	0.364	0.683	0.08	21.4	22.5	0.88
	1905	26590	Bottom Side,100%RB	0.349	0.653	-0.08	21.34	22.5	0.85

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band26	823	26775	Front Side,1RB	0.192	0.268	0.09	23.73	24.3	0.31
	832	26865	Front Side,50%RB	0.154	0.216	0.02	23.84	24.3	0.24
	823	26775	Rear Side,1RB	0.261	**0.335**	0.01	23.73	24.3	0.38
	832	26865	Rear Side,50%RB	0.183	0.257	-0.08	23.84	24.3	0.29
	823	26775	Left Side,1RB	0.192	0.287	-0.05	23.73	24.3	0.33
	832	26865	Left Side,50%RB	0.137	0.205	-0.01	23.84	24.3	0.23
	823	26775	Right Side,1RB	0.197	0.292	0.21	23.73	24.3	0.33
	832	26865	Right Side,50%RB	0.137	0.203	-0.07	23.84	24.3	0.23
	823	26775	Bottom Side,1RB	0.022	0.035	0.03	23.73	24.3	0.04
	832	26865	Bottom Side,50%RB	0.018	0.031	0.10	23.84	24.3	0.03

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band41	2680	41490	Front Side,1RB	0.309	0.611	-0.19	23.38	24	0.70
	2593	40620	Front Side,1RB	0.294	0.573	0.04	23.16	24	0.70
	2506	39750	Front Side,1RB	0.254	0.472	0.05	23.2	24	0.57
	2636.5	41055	Front Side,1RB	0.283	0.553	0.02	23.32	24	0.65
	2549.5	40185	Front Side,1RB	0.254	0.500	-0.09	22.83	24	0.65
	2680	41490	Front Side,50%RB	0.214	0.416	-0.06	22.39	23	0.48
	2680	41490	Front Side,100%RB	0.212	0.410	0.06	22.28	23	0.48
	2680	41490	Rear Side,1RB	0.346	0.704	0.01	23.38	24	0.81
	2593	40620	Rear Side,1RB	0.340	0.703	0.18	23.16	24	0.85
	2506	39750	Rear Side,1RB	0.299	0.636	0.12	23.2	24	0.76
	2636.5	41055	Rear Side,1RB	0.346	0.712	0.02	23.32	24	0.83
	2549.5	40185	Rear Side,1RB	0.323	0.684	0.03	22.83	24	**0.90**
	2680	41490	Rear Side,50%RB	0.264	0.516	0.17	22.39	23	0.59
	2680	41490	Rear Side,100%RB	0.258	0.501	0.08	22.28	23	0.59
	2680	41490	Left Side,1RB	0.107	0.202	0.02	23.38	24	0.23
	2680	41490	Left Side,50%RB	0.085	0.162	-0.06	22.39	23	0.19
	2680	41490	Right Side,1RB	0.059	0.102	-0.01	23.38	24	0.12
	2680	41490	Right Side,50%RB	0.050	0.087	0.09	22.39	23	0.10
	2680	41490	Bottom Side,1RB	0.220	0.462	0.01	23.38	24	0.53
	2680	41490	Bottom Side,50%RB	0.172	0.340	-0.01	22.39	23	0.39

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11b	Front	Side	Middle	0.022	0.032	-0.05	16.51	17	0.04
	Rear	Side	Middle	0.025	**0.034**	-0.08	16.51	17	0.04
	Right	Side	Middle	0.016	0.031	0.10	16.51	17	0.03
	Top	Side	Middle	0.024	0.032	0.09	16.51	17	0.04

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11n(40M)(5.3)	Front	Side	Ch54	0.054	0.085	-0.04	15.53	17	0.12
	Rear	Side	Ch54	0.095	0.240	-0.13	15.53	17	0.34
	Right	Side	Ch54	0.067	0.110	0.04	15.53	17	0.15
	Top	Side	Ch54	0.062	0.097	-0.11	15.53	17	0.14

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11a(5.2)	Front	Side	Ch36	0.030	0.091	-0.12	16.14	17	0.11
	Rear	Side	Ch36	0.103	**0.278**	0.15	16.14	17	0.34
	Right	Side	Ch36	0.059	0.134	-0.03	16.14	17	0.16
	Top	Side	Ch36	0.055	0.143	-0.15	16.14	17	0.17

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11a	Front	Side	Ch108	0.070	0.167	0.12	16.41	17	0.19
	Rear	Side	Ch108	0.099	0.226	0.04	16.41	17	0.26

Band	EUT Setup			SAR(W/kg)					
	Body Position			10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
802.11a	Front	Side	Ch157	0.033	0.087	0.11	16.35	17	0.10
	Rear	Side	Ch157	0.062	0.151	0.07	16.35	17	0.18
	Right	Side	Ch157	0.039	0.118	-0.06	16.35	17	0.14
	Top	Side	Ch157	0.068	0.176	0.15	16.35	17	0.20

11.3 Extremity SAR Measurement

We choose the configuration with higher reported SAR to check extremity SAR.

The distance between EUT and Phanton is 0mm.

Band	EUT Setup			SAR(W/kg)					
	Freq	Ch	Body Position	10g Avg.	1g Avg.	PWR Drift	Power(dBm)	Tune-Up(dBm)	Report SAR
LTE Band2	1860	18700	Bottom Side,1RB	2.3	**5.05**	-0.11	22.74	23.8	**2.94**

11.4 Std. C95.1-1992 RF Exposure Limit

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

Table 5. Safety Limits for Partial Body Exposure

Notes：

***** The Spatial Peak value of the SAR averaged over any 1 gram of tissue.
(defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

****** The Spatial Average value of the SAR averaged over the whole – body.

******* The Spatial Average value of the SAR averaged over the partial – body.

******** The Spatial Peak value of the SAR averaged over any 10 grams of tissue.
(defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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

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

12. References

[1] Std. C95.1-1999, "*American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz",* New York.

[2] NCRP, National Council on Radiation Protection and Measurements, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields", NCRP report NO. 86, 1986.

[3] T. Schmid, O. Egger, and N. Kuster, "Automatic E-field scanning system for dosimetric assessments", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.

[4] K. Pokovic, T. Schmid, and N. Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.

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[11] IEEE Std 1528™-2013 - IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques

Appendix A - System Performance Check

750MHz

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 750 MHz

Medium parameters used: f = 750 MHz; σ = 0.914 S/m; ε_r = 41.142; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.39 W/kg

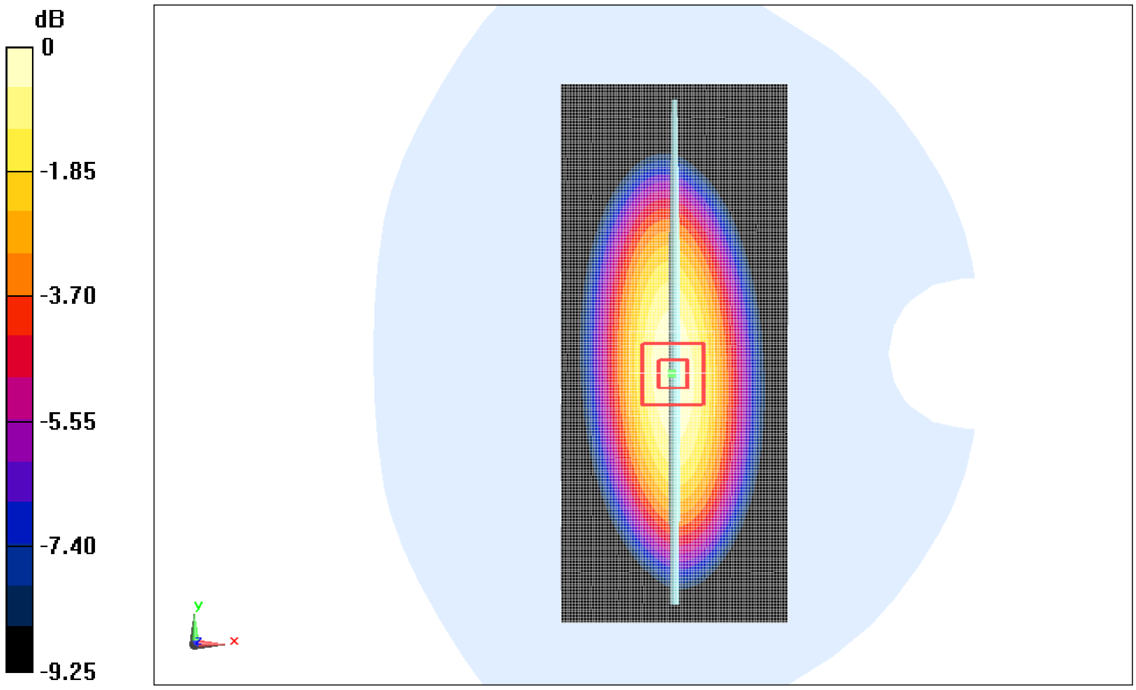
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.886 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 2.96 W/kg

SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.40W/kg

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



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

Fig.B.1 validation 750MHz 250mW

750MHz

Date: 9/12/2017

Electronics: DAE4 Sn786

Medium: Body 750 MHz

Medium parameters used: f = 750 MHz; σ = 0.942 S/m; ε_r = 53.922; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

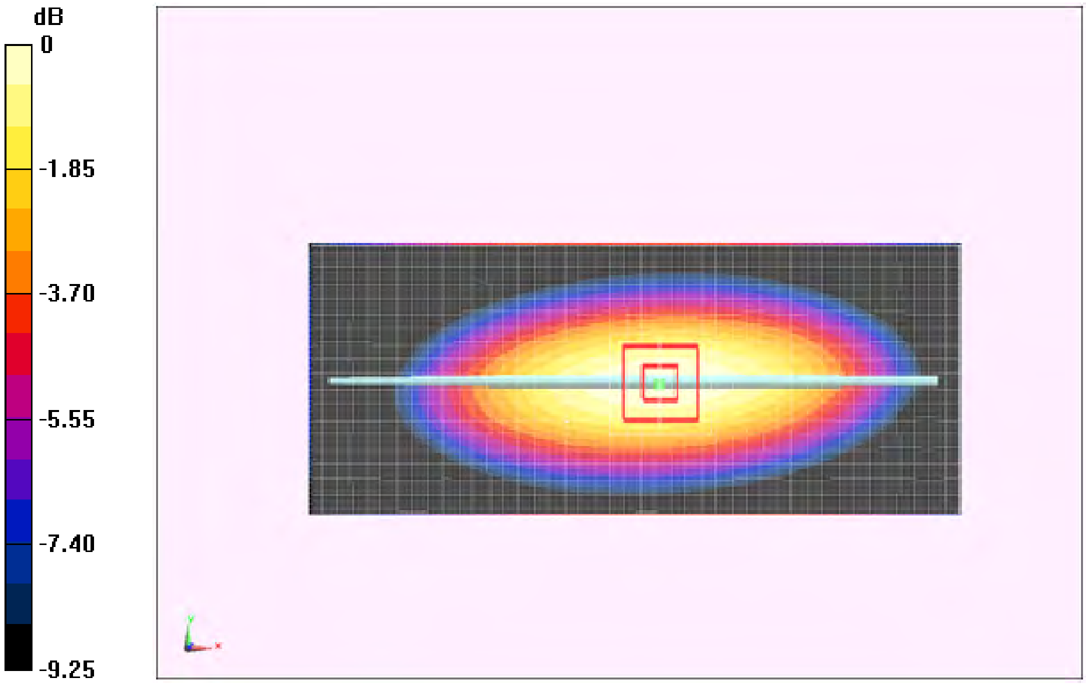
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.622 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 2.55 W/kg

SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.42 W/kg

Maximum value of SAR (measured) = 2.34 W/kg



0 dB = 2.34 W/kg = 3.69 dB W/kg

Fig.B.2 validation 750MHz 250mW

835MHz

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 835 MHz; σ = 0.885 S/m; ε_r = 40.825; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

System Validation /Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.48 W/kg

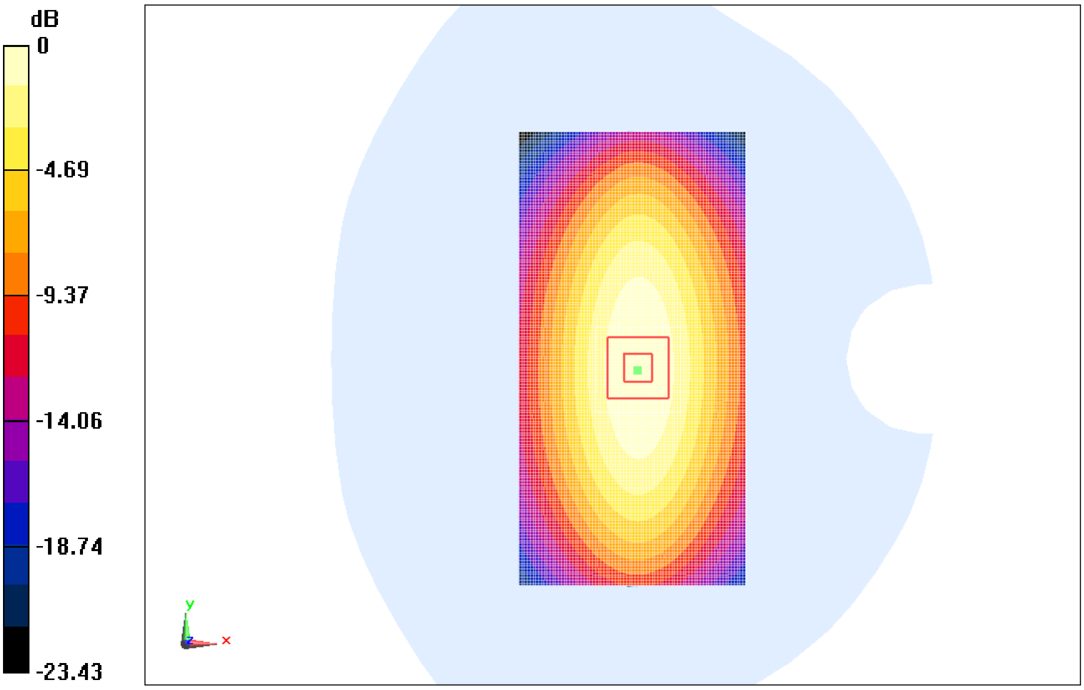
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.246 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 3.52 W/kg

SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.48 W/kg

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



0 dB = 2.38 W/kg = 3.77 dBW/kg

Fig.B.3 validation 835MHz 250mW

835MHz

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 835 MHz; σ = 0.975 S/m; ε_r = 55.676; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

System Validation /Area Scan (81x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.59 W/kg

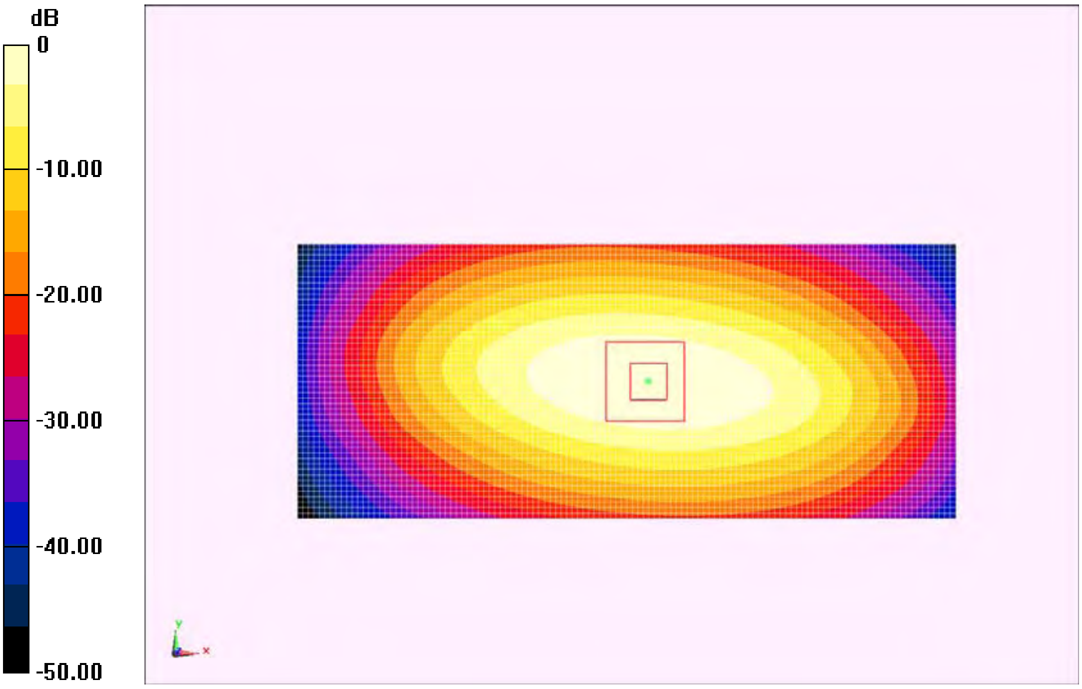
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.586 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.47 W/kg

SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.51 W/kg

Maximum value of SAR (measured) = 2.51 W/kg



0 dB = 2.51 W/kg = 4.00 dBW/kg

Fig.B.4 validation 835MHz 250mW

1800MHz

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 1800 MHz

Medium parameters used: f = 1800 MHz; σ = 1.384 S/m; ε_r = 40.994; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: CW_TMC Frequency: 1800 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.08, 8.08, 8.08); Calibrated: 1/23/2017

System Validation/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 11.9 W/kg

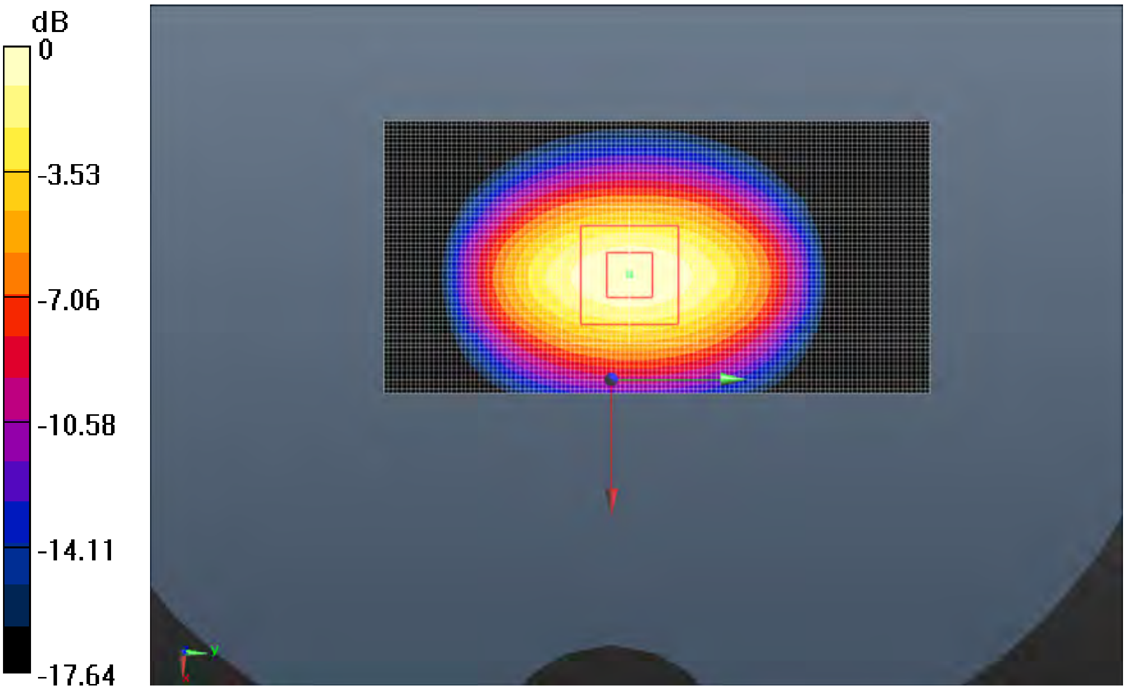
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 78.214 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 9.48 W/kg; SAR(10 g) = 5.09 W/kg

Maximum value of SAR (measured) = 11.4 W/kg



0 dB = 11.4 W/kg = 10.57 dBW/kg

Fig.B.5 validation 1800MHz 250mW

1800MHz

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1800 MHz

Medium parameters used: f = 1800 MHz; σ = 1.502 S/m; ε_r = 53.22; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: CW_TMC Frequency: 1800 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.9, 7.9, 7.9); Calibrated: 1/23/2017

System Validation/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.5 W/kg

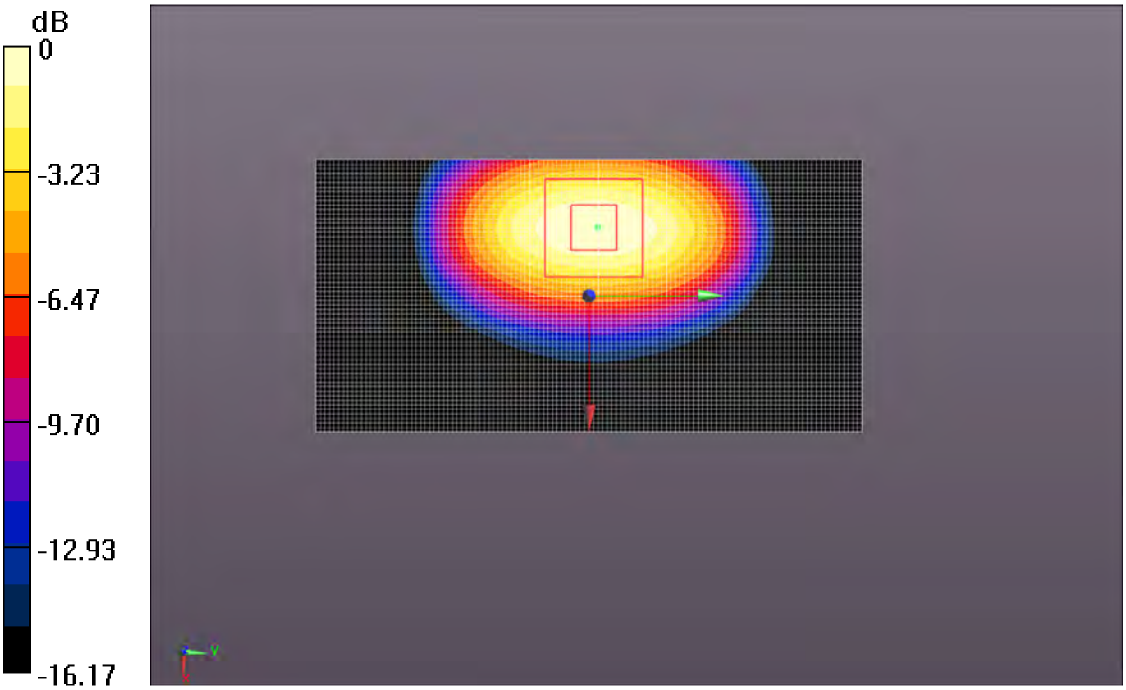
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 77.854 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 17.4 W/kg

SAR(1 g) = 9.65 W/kg; SAR(10 g) = 5.13 W/kg

Maximum value of SAR (measured) = 11.8 W/kg



0 dB = 11.8 W/kg = 10.72 dBW/kg

Fig.B.6 validation 1800MHz 250mW

1900MHz

Date: 9/11/2017

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.419 S/m; ε_r = 40.662; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.00, 8.00, 8.00); Calibrated: 1/23/2017

System Validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.7 W/kg

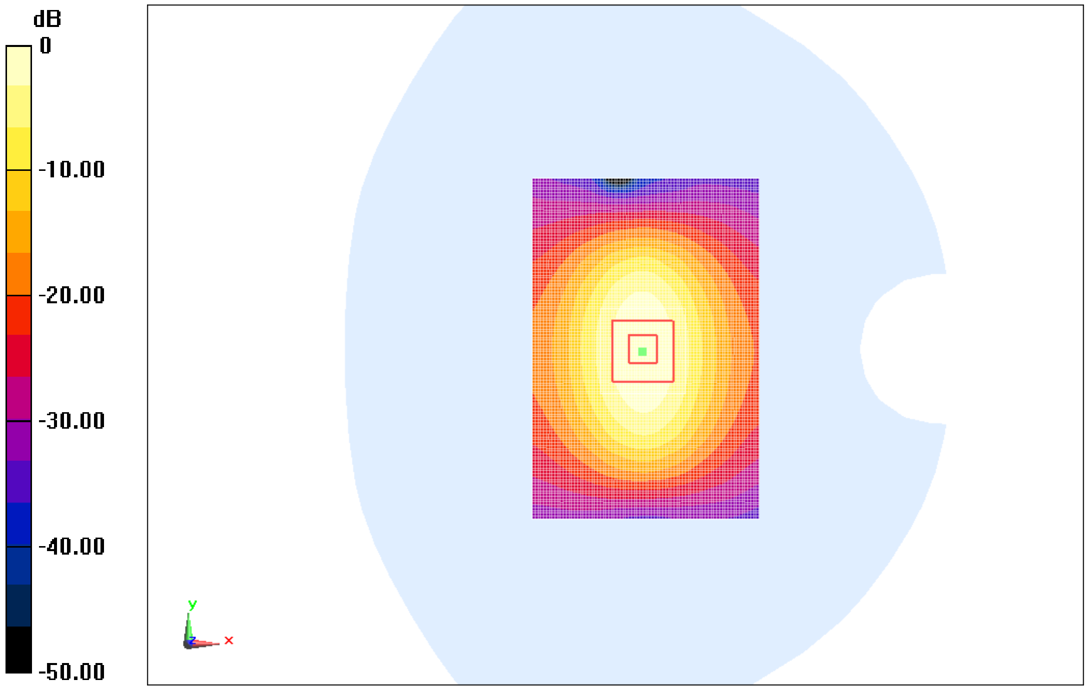
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.684 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 18.8 W/kg

SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.36 W/kg

Maximum value of SAR (measured) = 11.9 W/kg



0 dB = 11.9 W/kg = 10.76 dBW/kg

Fig.B.7 validation 1900MHz 250mW

1900MHz

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.548 S/m; ε_r = 52.95; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

System validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.8 W/kg

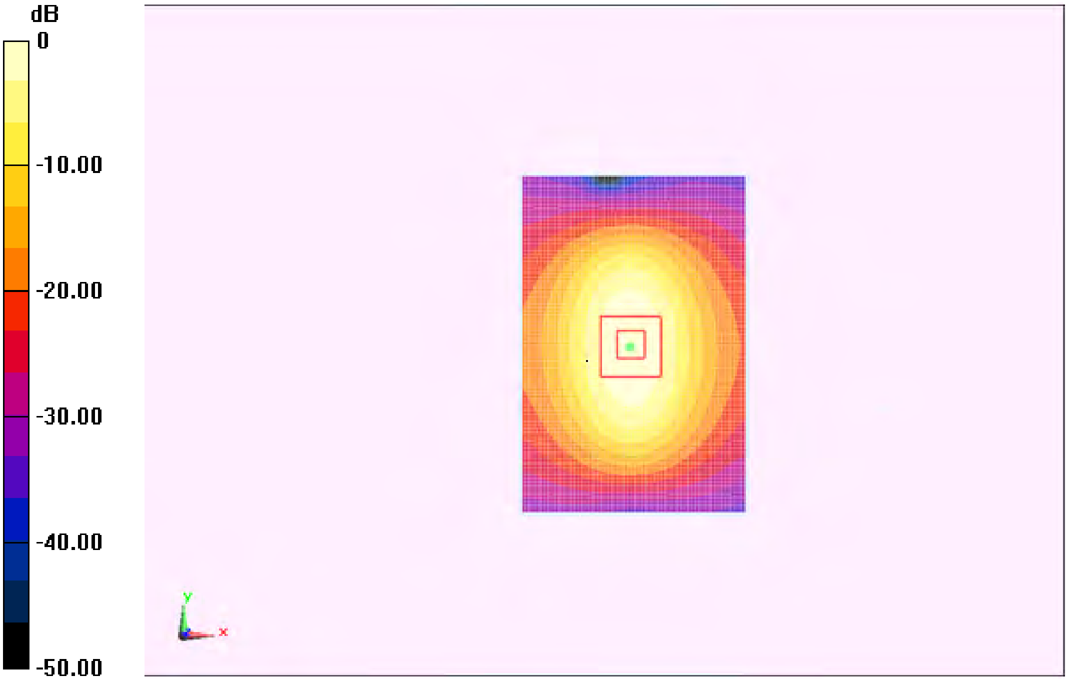
System validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 62.745 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 19.6 W/kg

SAR(1 g) = 10.6 W/kg; SAR(10 g) = 5.51 W/kg

Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.90 dBW/kg

Fig.B.8 validation 1900MHz 250Mw

1900MHz

Date: 10/19/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.529 S/m; ε_r = 52.61; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

System validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.1 W/kg

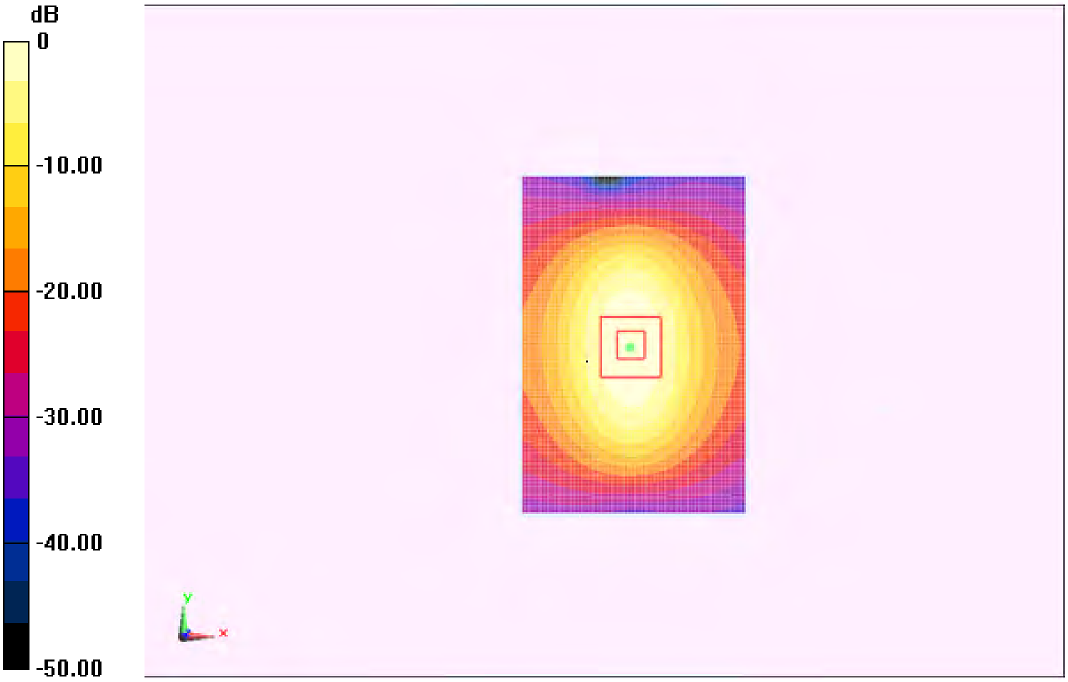
System validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.067 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 18.9 W/kg

SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.46 W/kg

Maximum value of SAR (measured) = 11.9 W/kg



0 dB = 11.9 W/kg = 10.60 dBW/kg

2450MHz

Date: 9/22/2017

Electronics: DAE4 Sn786

Medium: 2450Head

Medium parameters used: f = 2450 MHz; σ = 1.853 S/m; ε_r = 37.874; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.4, 7.4, 7.4); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 16.7 W/kg

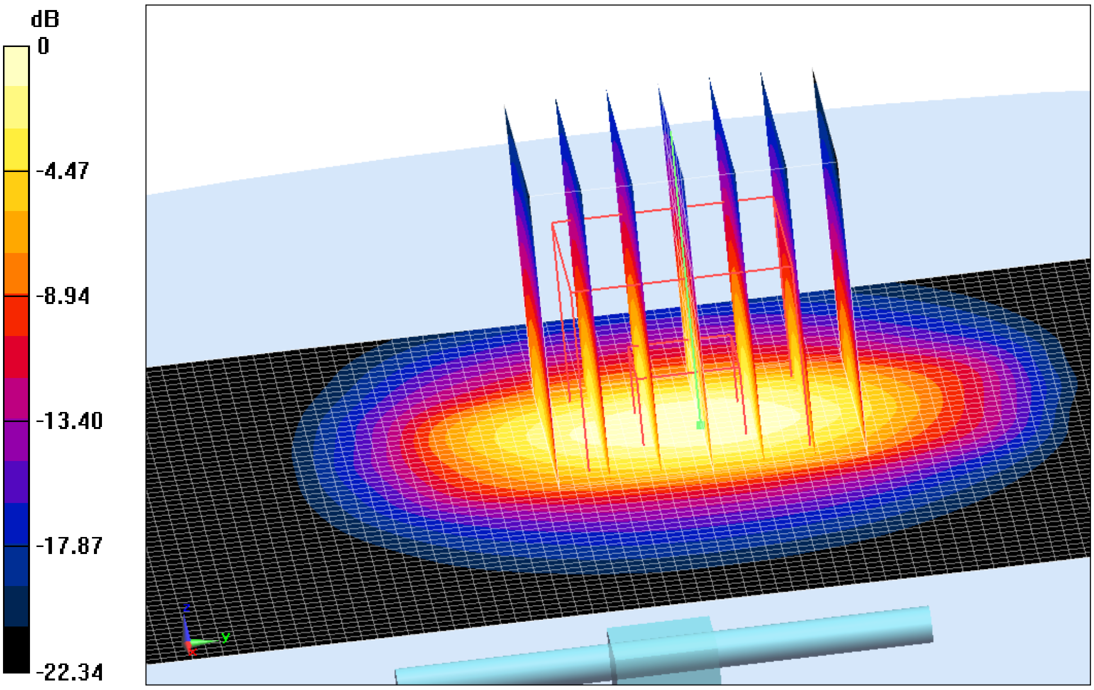
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 85.664 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 26.23 W/kg

SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.88 W/kg

Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg = 11.93 dBW/kg

Fig.B.9 validation 2450MHz 250mW

2450MHz

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: 2450Body MHz

Medium parameters used: f = 2450 MHz; σ = 1.914 S/m; ε_r = 52.654; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.37, 7.37, 7.37); Calibrated: 1/23/2017

System Validation/Area Scan (81x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 14.0 W/kg

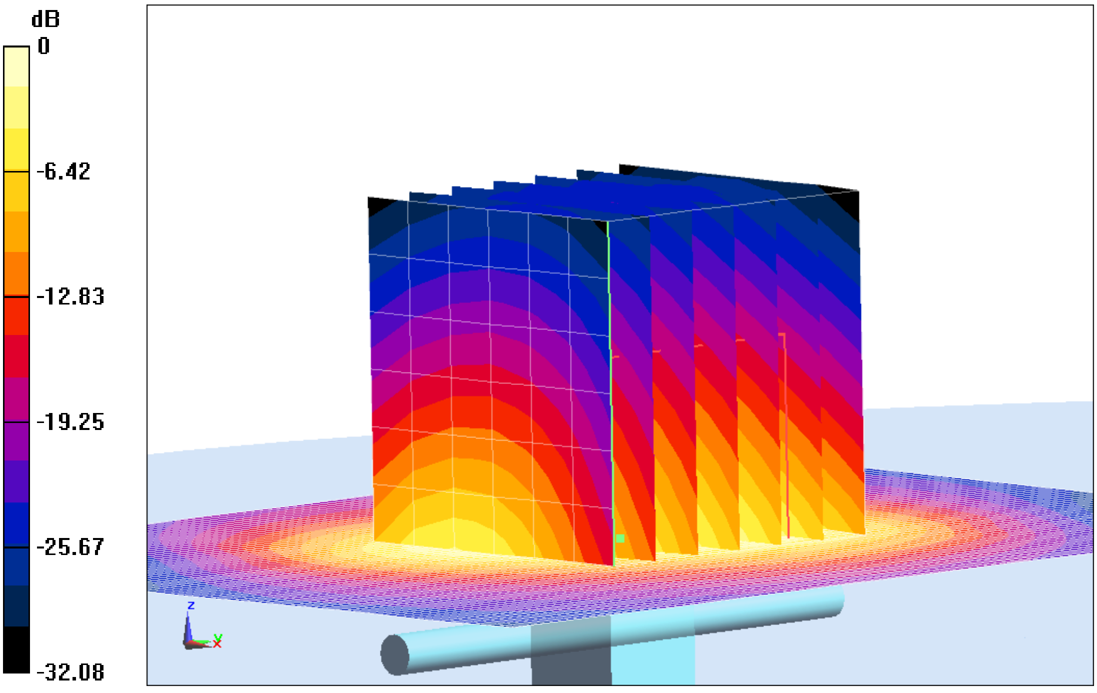
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.556 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 26.27 W/kg

SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.88 W/kg

Maximum value of SAR (measured) = 14.6 W/kg



0 dB = 14.6 W/kg = 11.64 dB W/kg

Fig.B.10 validation 2450MHz 250Mw

2550MHz

Date: 10/11/2017

Electronics: DAE4 Sn786

Medium: Head 2600 MHz

Medium parameters used: f = 2550 MHz; σ = 1.921 S/m; ε_r = 38.591; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: CW_TMC Frequency: 2550 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.27, 7.27, 7.27); Calibrated: 1/23/2017

System Validation/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.6 W/kg

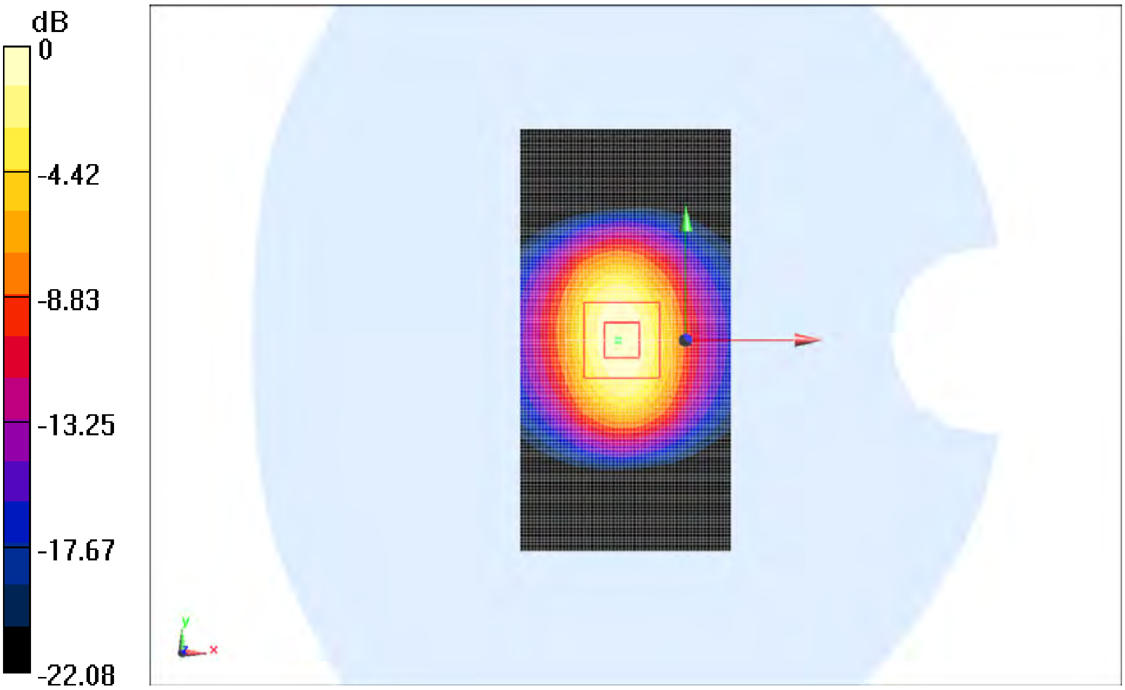
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 86.241 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 29.6 W/kg

SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.52 W/kg

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



0 dB = 16.3 W/kg = 12.15 dBW/kg

2550MHz

Date: 10/11/2017

Electronics: DAE4 Sn786

Medium: Body 2600 MHz

Medium parameters used: f = 2550 MHz; σ = 2.035 S/m; ε_r = 51.621; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: CW Frequency: 2550 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.24, 7.24, 7.24); Calibrated: 1/23/2017

System Validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 21.9 W/kg

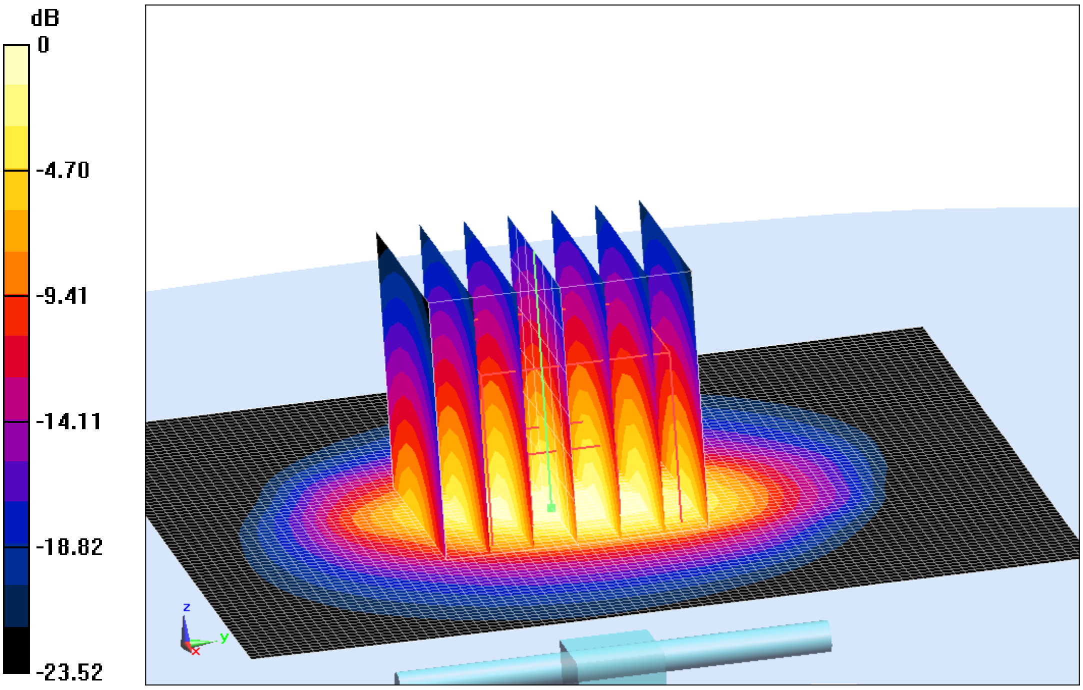
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.221 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 30.7 W/kg

SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.41 W/kg

Maximum value of SAR (measured) = 23.2 W/kg



0 dB = 23.2 W/kg = 13.25 dB W/kg

5200MHz

Date: 9/23/2017

Electronics: DAE4 Sn786

Medium: Head 5000

Medium parameters used: f = 5200 MHz; σ = 4.586 S/m; ε_r = 36.266; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C   Liquid Temperature: 21.5^{o}C

Communication System: CW Frequency: 5200 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(5.32, 5.32, 5.32); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 10.3 W/kg

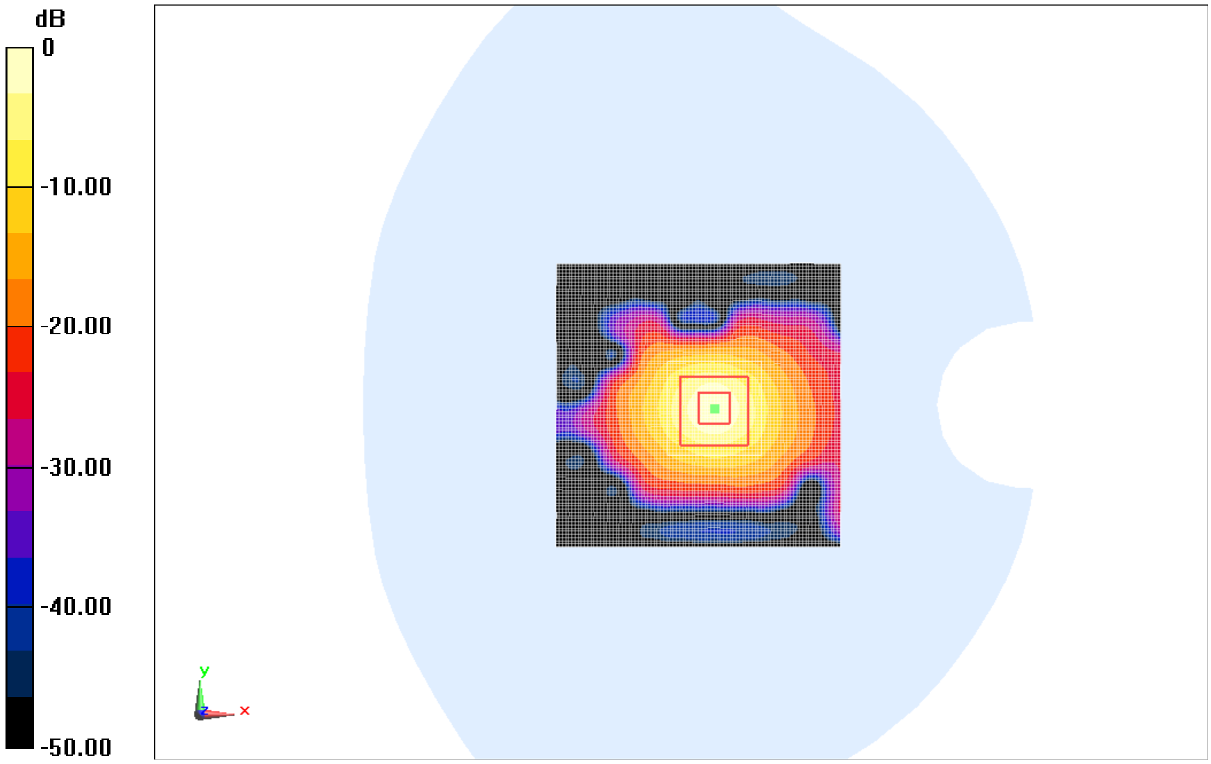
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 65.524 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 22.6 W/kg

SAR(1 g) = 7.88 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 15.6 W/kg



0 dB =15.6W/kg = 11.93 dB W/kg

Fig.B.9 validation 5200MHz 100mW

5200MHz

Date: 9/26/2017

Electronics: DAE4 Sn786

Medium: Body 5000

Medium parameters used: f = 5200 MHz; σ = 4.784 S/m; ε_r = 47.96; ρ = 1000 kg/m^3

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: CW Frequency: 5200 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.82, 4.82, 4.82); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.7 W/kg

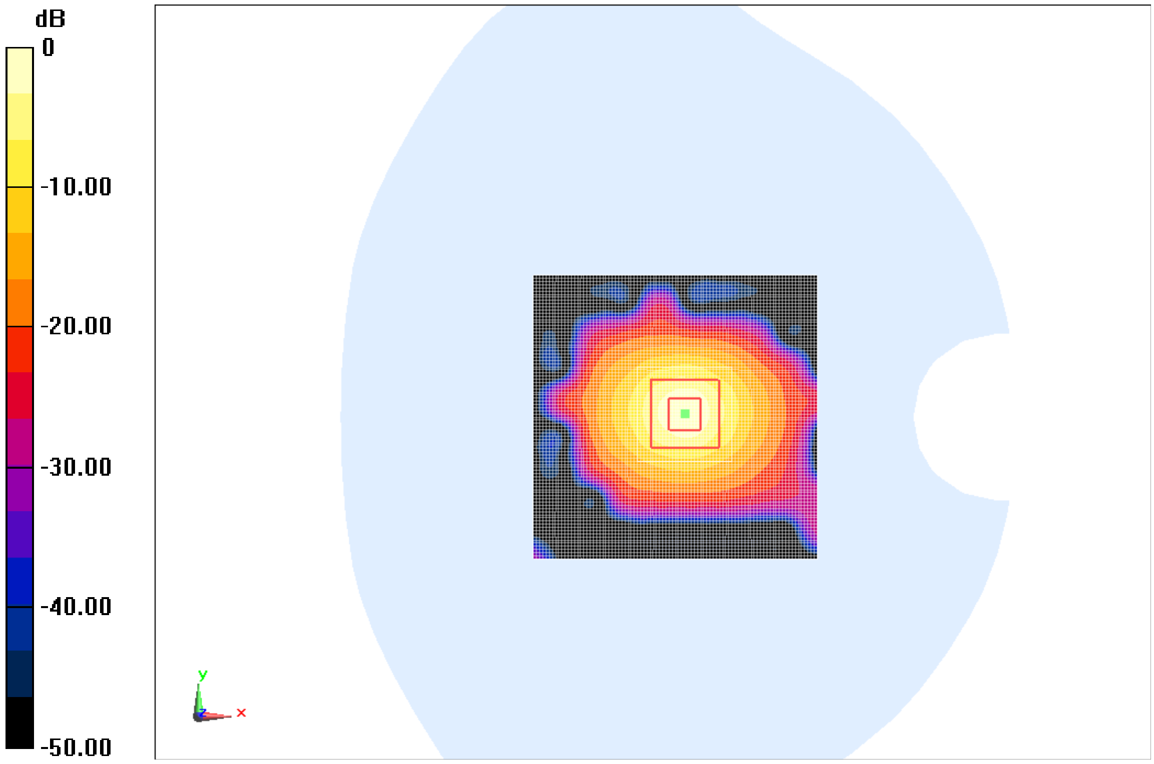
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.441 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 20.2 W/kg

SAR(1 g) = 7.26 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 10.6 W/kg



0 dB = 10.6W/kg = 10.25 dB W/kg

Fig.B.10 validation 5200MHz 100mW

5300MHz

Date: 9/23/2017

Electronics: DAE4 Sn786

Medium: Head 5000 MHz

Medium parameters used: f = 5300 MHz; σ = 4.762 S/m; ε_r = 36.68; ρ = 1000 kg/m^3

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: CW Frequency: 5300 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.32, 4.32, 4.32); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 10.3 W/kg

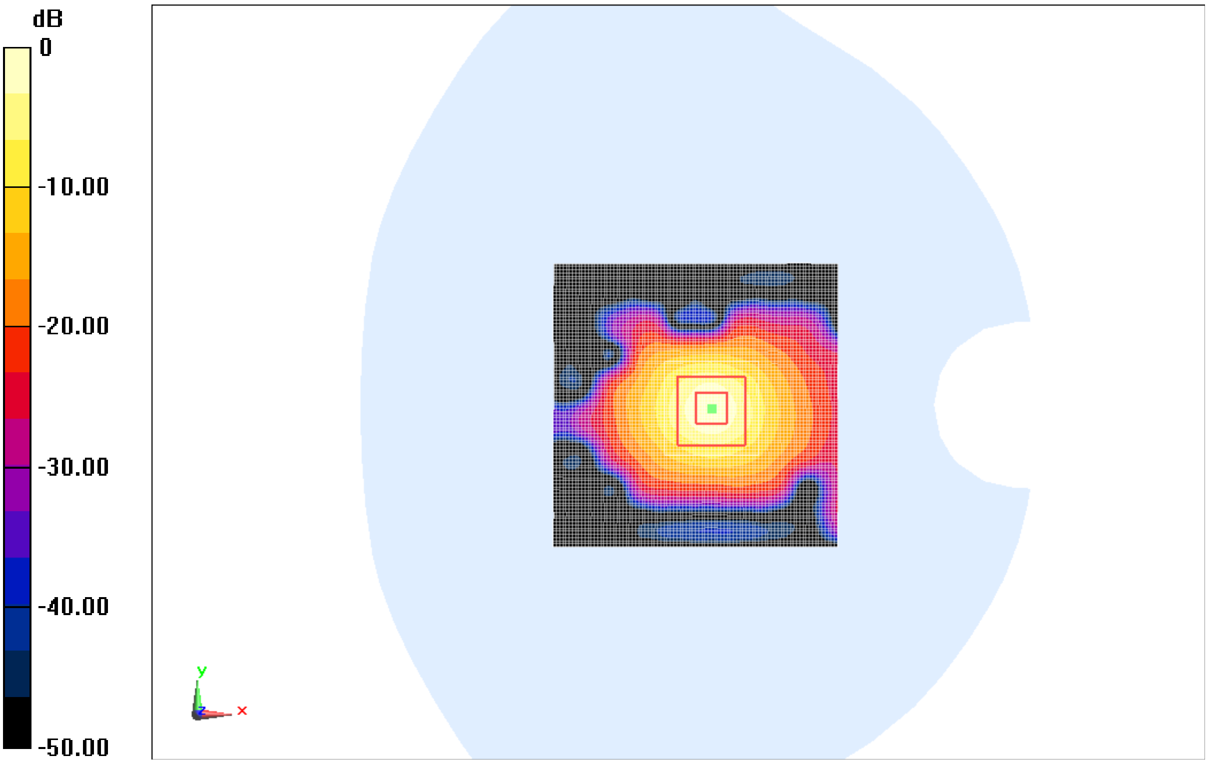
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 62.354 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 34.6 W/kg

SAR(1 g) = 7.98 W/kg; SAR(10 g) = 2.33 W/kg

Maximum value of SAR (measured) = 9.85 W/kg



0 dB =9.83W/kg = 9.93 dB W/kg

Fig.B.9 validation 5300MHz 100mW

5300MHz

Date: 9/26/2017

Electronics: DAE4 Sn786

Medium: Body 5000 MHz

Medium parameters used: f = 5300 MHz; σ = 5.315 S/m; ε_r = 50.27; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: CW Frequency: 5300 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.82, 4.82, 4.82); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.7 W/kg

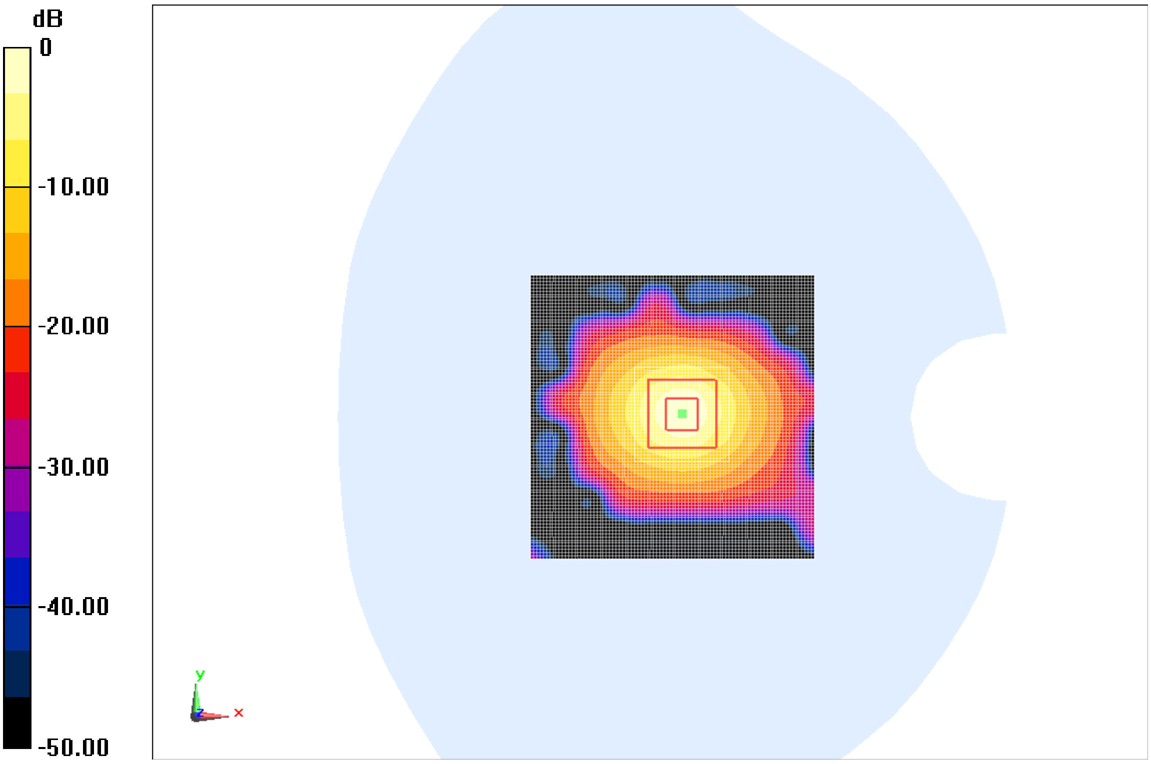
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 63.241 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 33.4 W/kg

SAR(1 g) = 7.45 W/kg; SAR(10 g) = 2.12 W/kg

Maximum value of SAR (measured) = 9.28 W/kg



0 dB = 9.28W/kg = 9.65 dB W/kg

Fig.B.10 validation 5300MHz 100mW

5600MHz

Date: 9/23/2017

Electronics: DAE4 Sn786

Medium: Head 5000 MHz

Medium parameters used: f = 5600 MHz; σ = 5.117 S/m; ε_r = 35.98; ρ = 1000 kg/m^3

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.71, 4.71, 4.71); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 10.3 W/kg

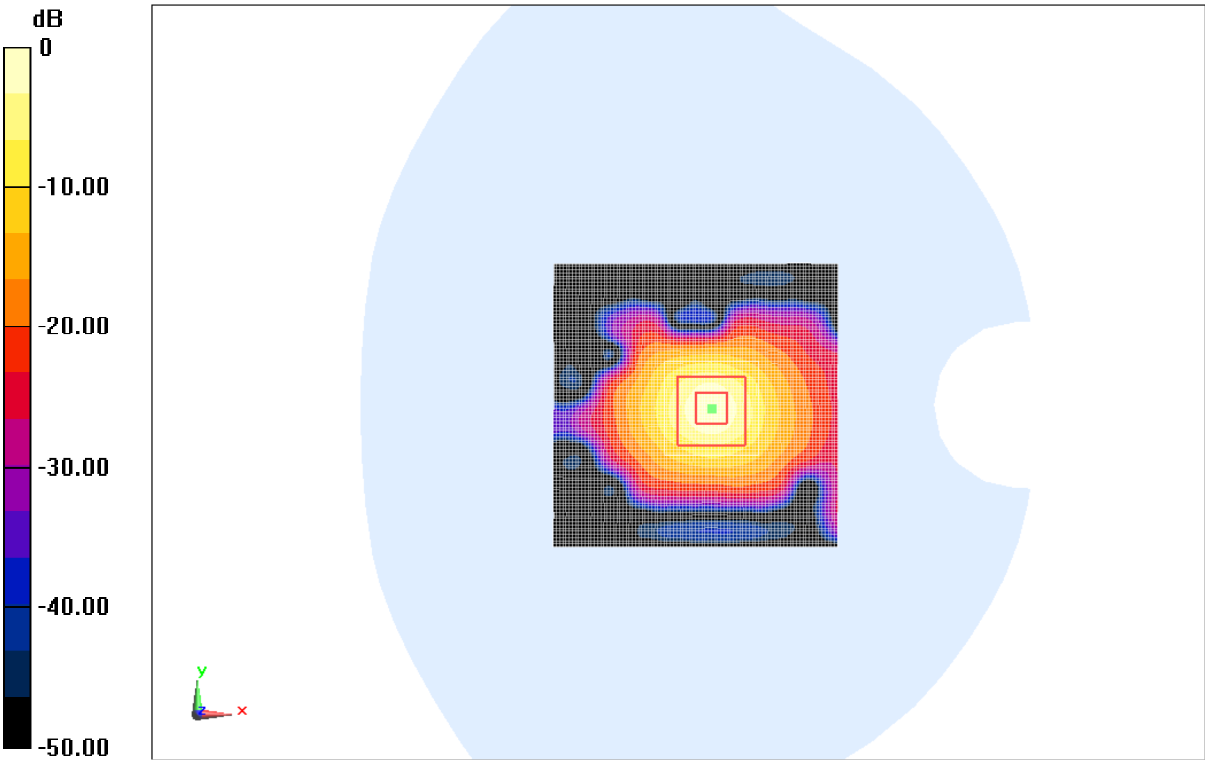
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 62.112 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 35.2 W/kg

SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.43 W/kg

Maximum value of SAR (measured) = 10.2 W/kg



0 dB =10.2W/kg = 10.3 dB W/kg

Fig.B.9 validation 5600MHz 100mW

5600MHz

Date: 9/26/2017

Electronics: DAE4 Sn786

Medium: Body 5000 MHz

Medium parameters used: f = 5600 MHz; σ = 5.731 S/m; ε_r = 49.57; ρ = 1000 kg/m^3

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.16, 4.16, 4.16); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.7 W/kg

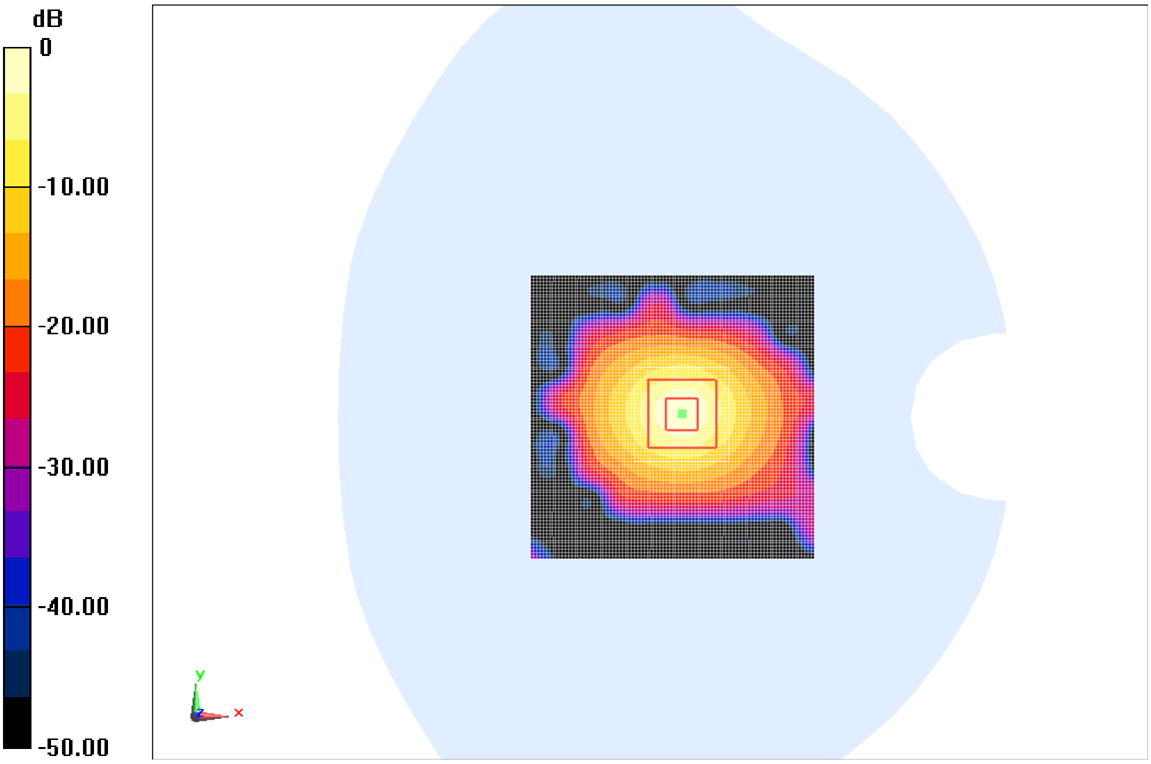
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 63.182 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 34.2 W/kg

SAR(1 g) = 8.13 W/kg; SAR(10 g) = 2.24 W/kg

Maximum value of SAR (measured) = 9.92 W/kg



0 dB = 9.92W/kg = 9.97 dB W/kg

Fig.B.10 validation 5600MHz 100mW

5800MHz

Date: 9/23/2017

Electronics: DAE4 Sn786

Medium: Head 5800 MHz

Medium parameters used: f = 5800 MHz; σ = 5.192 S/m; ε_r = 34.522; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C   Liquid Temperature: 21.5^{o}C

Communication System: CW Frequency: 5800 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.67, 4.67, 4.67); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 20.5 W/kg

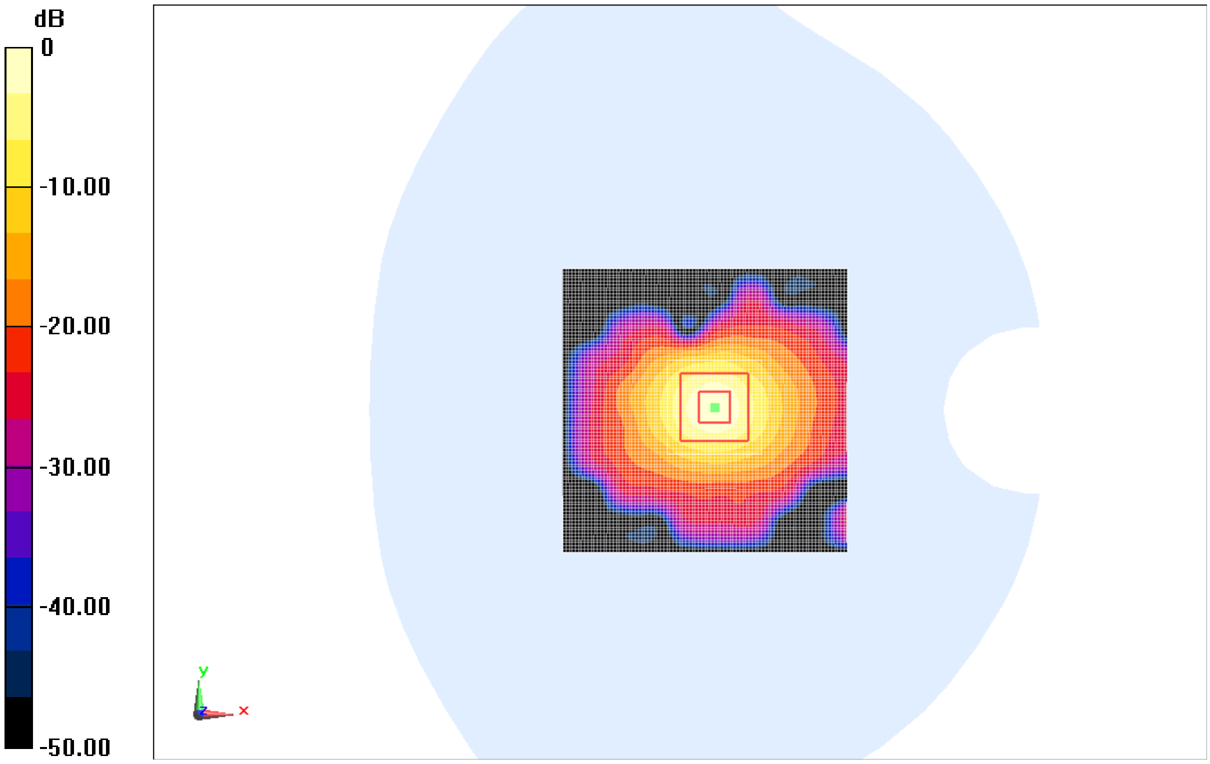
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 58.227 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 30.4 W/kg

SAR(1 g) = 8.09 W/kg; SAR(10 g) = 2.28 W/kg

Maximum value of SAR (measured) = 21.3 W/kg



0 dB = 21.3W/kg = 13.23 dB W/kg

Fig.B.11 validation 5800MHz 100mW

5800MHz

Date: 9/26/2017

Electronics: DAE4 Sn786

Medium: Body 5800 MHz

Medium parameters used: f = 5800 MHz; σ = 6.233 S/m; ε_r = 46.841; ρ = 1000 kg/m^3

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: CW Frequency: 5800 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.46, 4.46, 4.46); Calibrated: 1/23/2017

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 18.7 W/kg

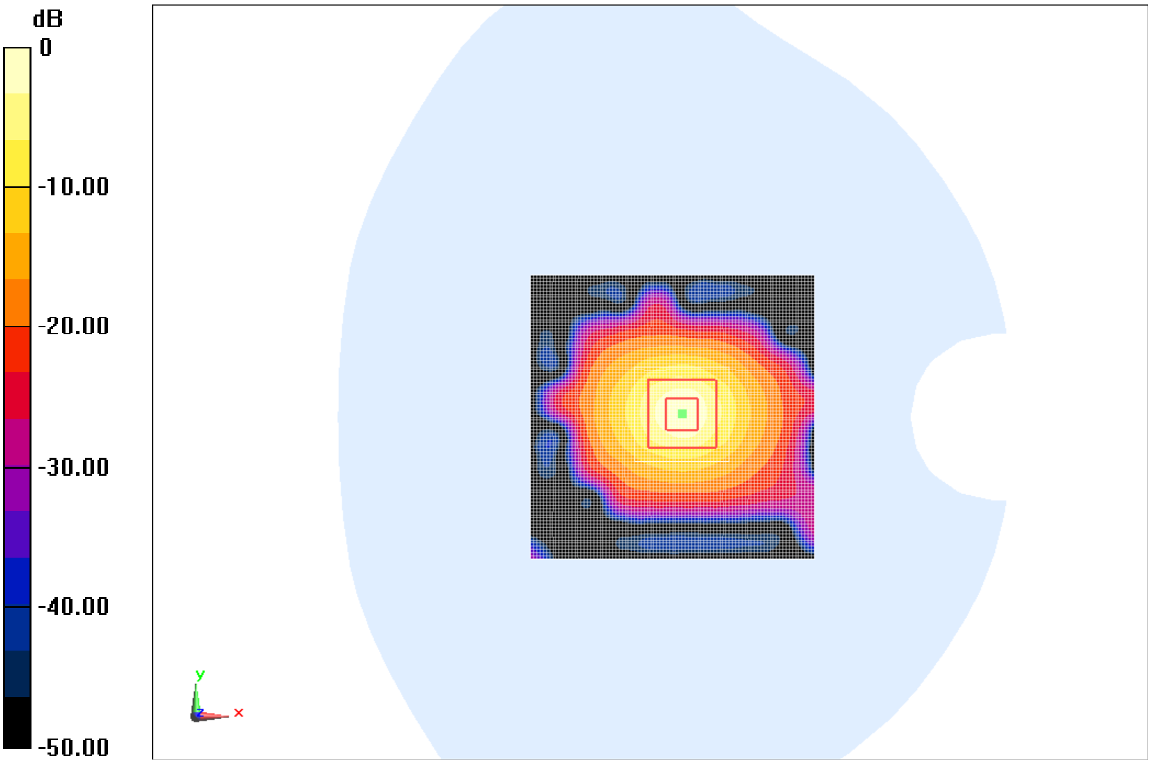
System Validation /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 61.489 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) =25.8 W/kg

SAR(1 g) = 7.44 W/kg; SAR(10 g) = 2.07 W/kg

Maximum value of SAR (measured) = 16.6 W/kg



0 dB = 16.6W/kg = 12.20 dB W/kg

Fig.B.12 validation 5800MHz 100mW

Appendix B - SAR Measurement Data

GSM850 Head

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 848.8 MHz; σ = 0.918 S/m; ε_r = 40.791; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, GSM (0) Frequency: 848.8 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Left/Left Cheek High/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

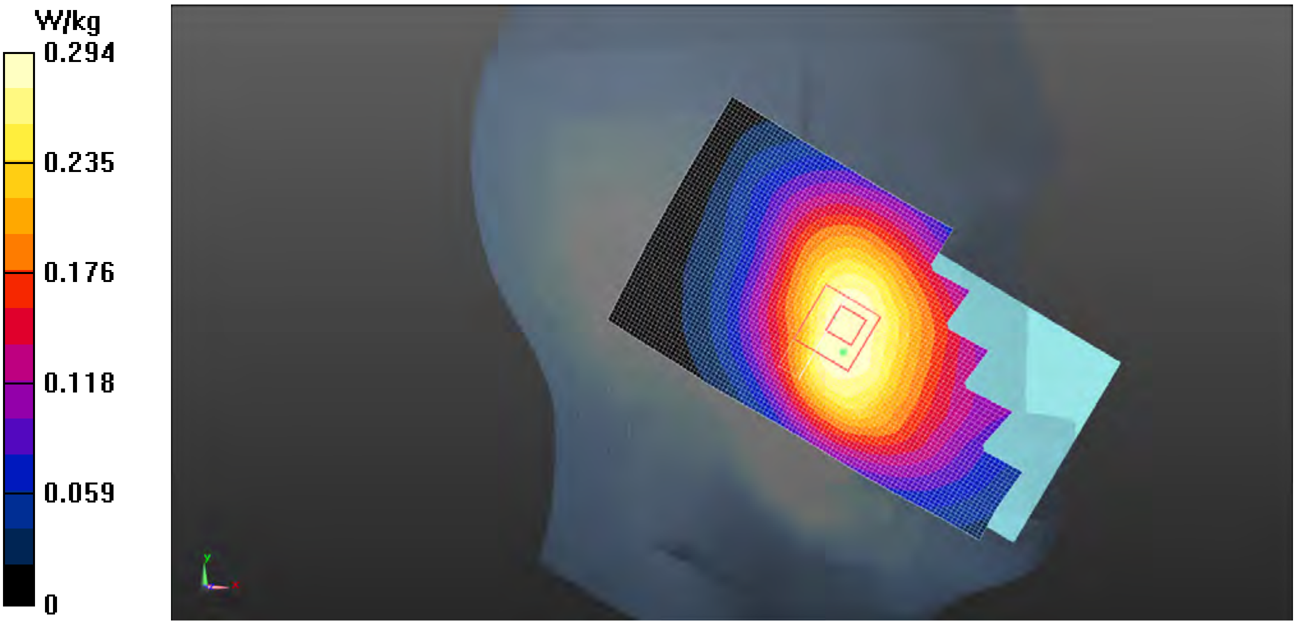
Left/Left Cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.115 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.351 W/kg

SAR(1 g) = 0.284 W/kg; SAR(10 g) = 0.212 W/kg

Maximum value of SAR (measured) = 0.294 W/kg



GSM 1900 Head

Date: 9/11/2017

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: f = 1850.2 MHz; σ = 1.425 S/m; ε_r = 39.004; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, GSM 1900 Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 - SN3633 ConvF(8.00, 8.00, 8.00); Calibrated: 1/23/2017

Configuration/Left Cheek Low/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

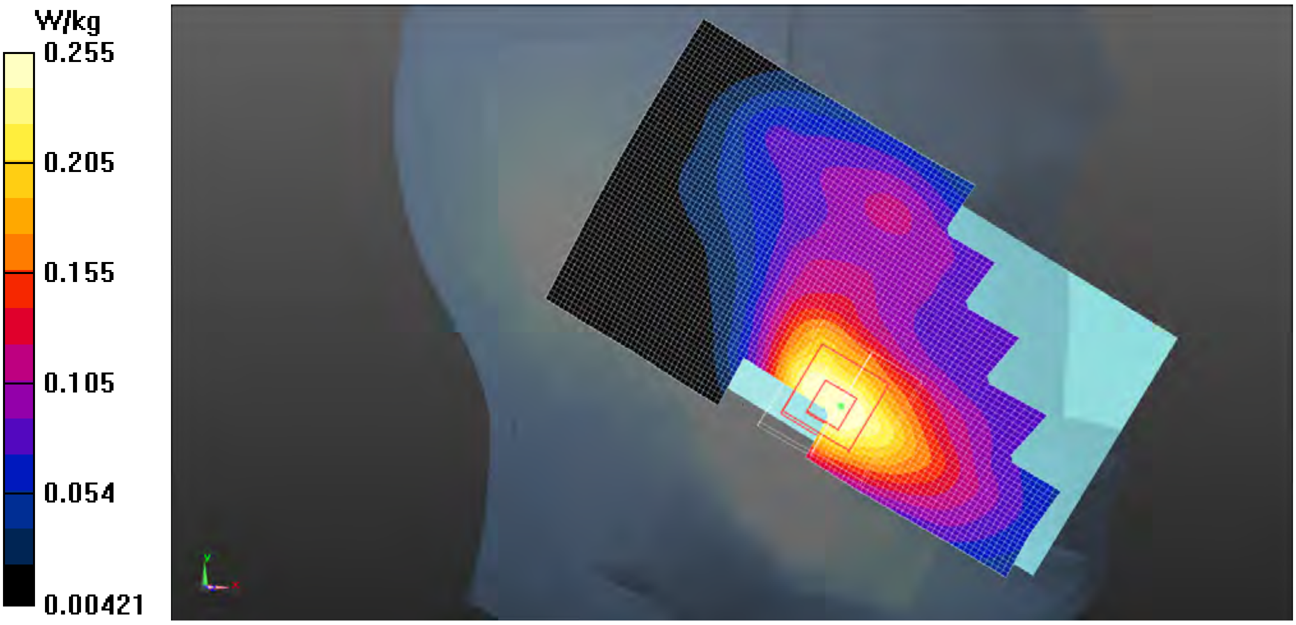
Configuration/Left Cheek Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.273 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.367 W/kg

SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.146 W/kg

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



W850 Head

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 836.6 MHz; σ = 0.907 S/m; ε_r = 40.931; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 836.6 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Left/Left Cheek Middle/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

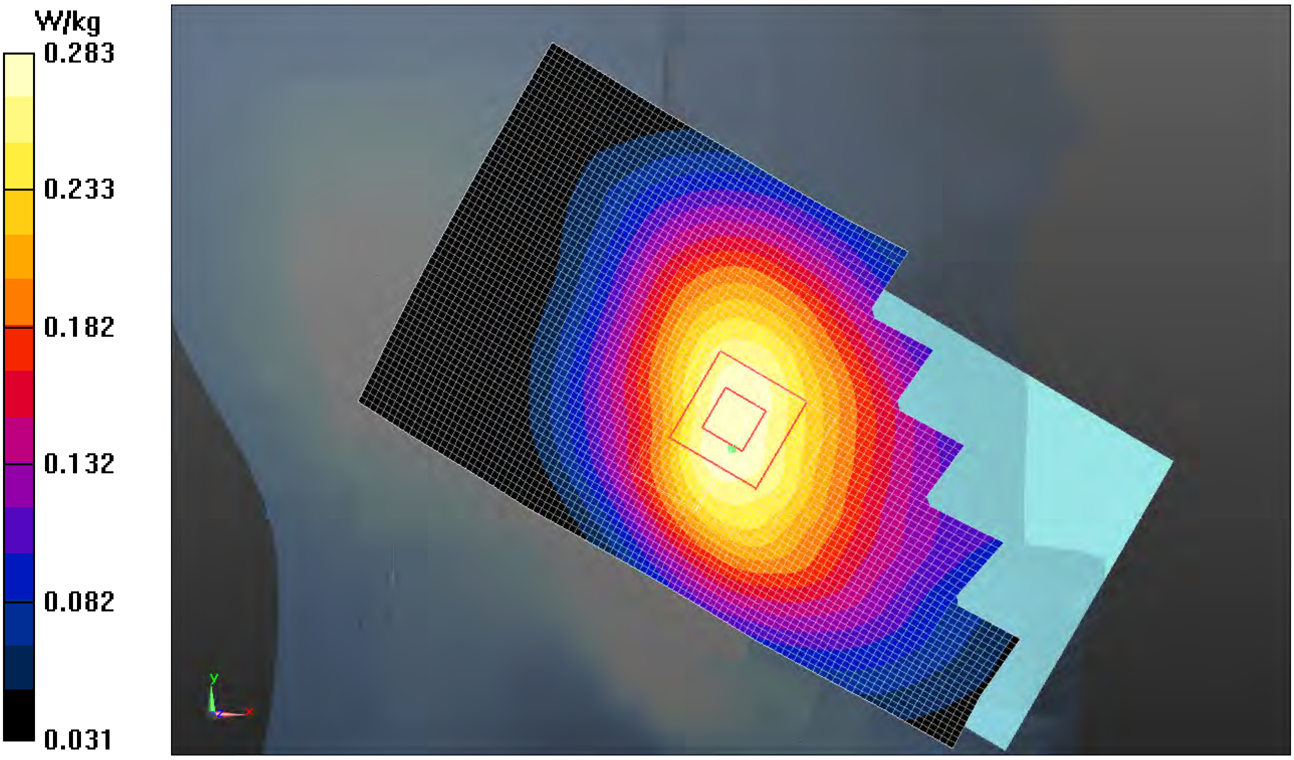
Left/Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.199 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.337 W/kg

SAR(1 g) = 0.273 W/kg; SAR(10 g) = 0.210 W/kg

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



WCDMA 1700 Head

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 1800 MHz

Medium parameters used: f = 1712.4 MHz; σ = 1.296 S/m; ε_r = 39.592; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, WCDMA Band4 Frequency: 1712.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.08, 8.08, 8.08); Calibrated: 1/23/2017

Configuration/Right cheek High/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

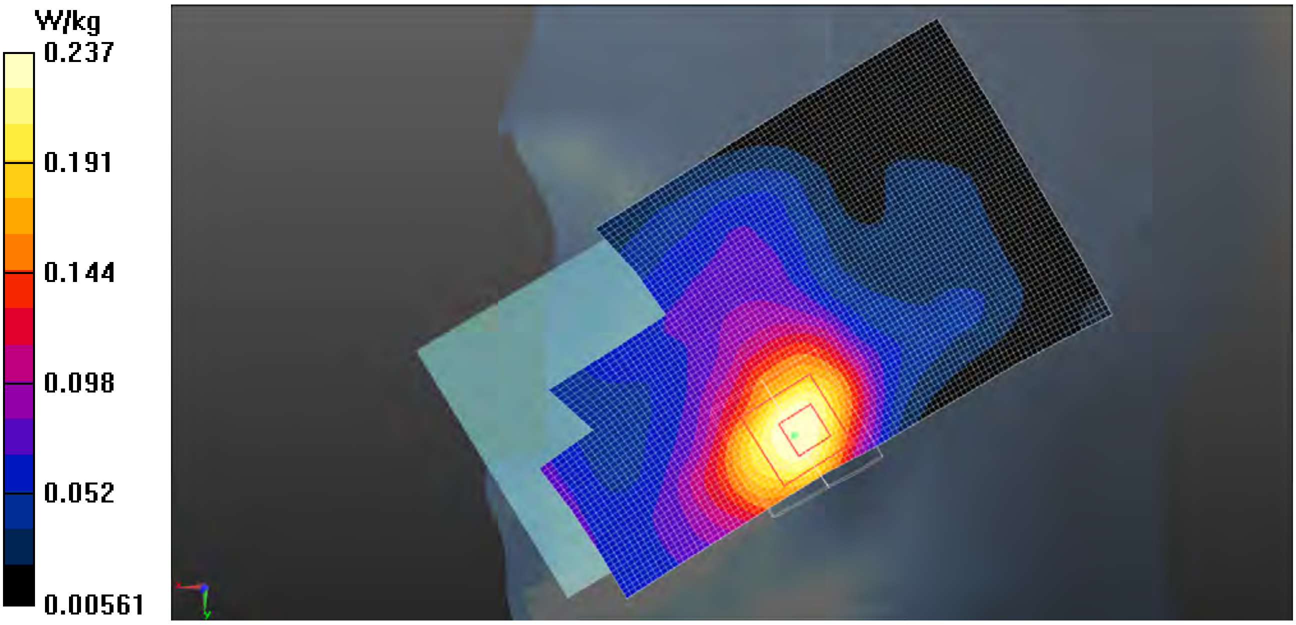
Configuration/Right cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.871 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.310 W/kg

SAR(1 g) = 0.223 W/kg; SAR(10 g) = 0.145 W/kg

Maximum value of SAR (measured) = 0.237 W/kg



WCDMA 1900 Head

Date: 9/11/2017

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.451 S/m; ε_r = 38.897; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, W-CDMA 1900(Band2) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.00, 8.00, 8.00); Calibrated: 1/23/2017

Configuration/Left Cheek Middle/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.633 W/kg

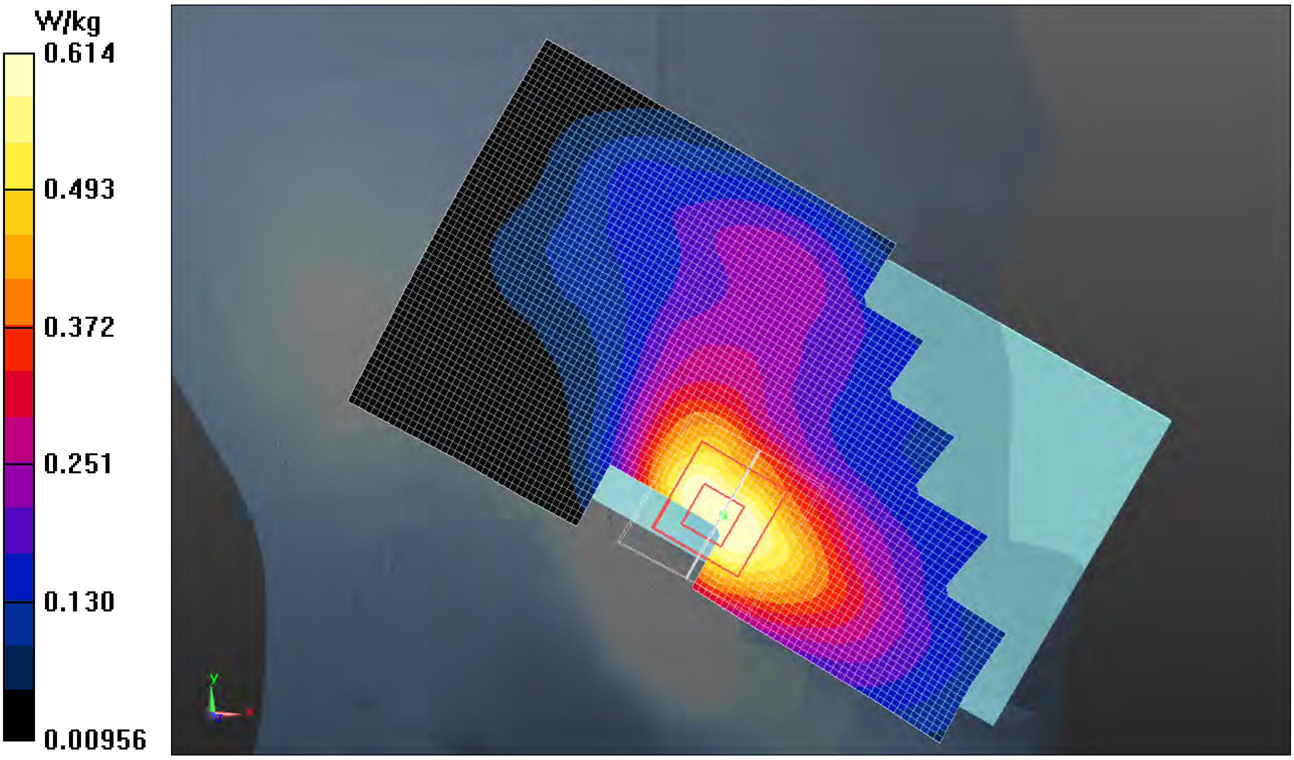
Configuration/Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.790 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.880 W/kg

SAR(1 g) = 0.568 W/kg; SAR(10 g) = 0.349 W/kg

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



CDMA BC0 Head

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 836.41 MHz; σ = 0.906 S/m; ε_r = 40.932; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, CDMA850 Frequency: 836.41 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Configuration/Right cheek Mid/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

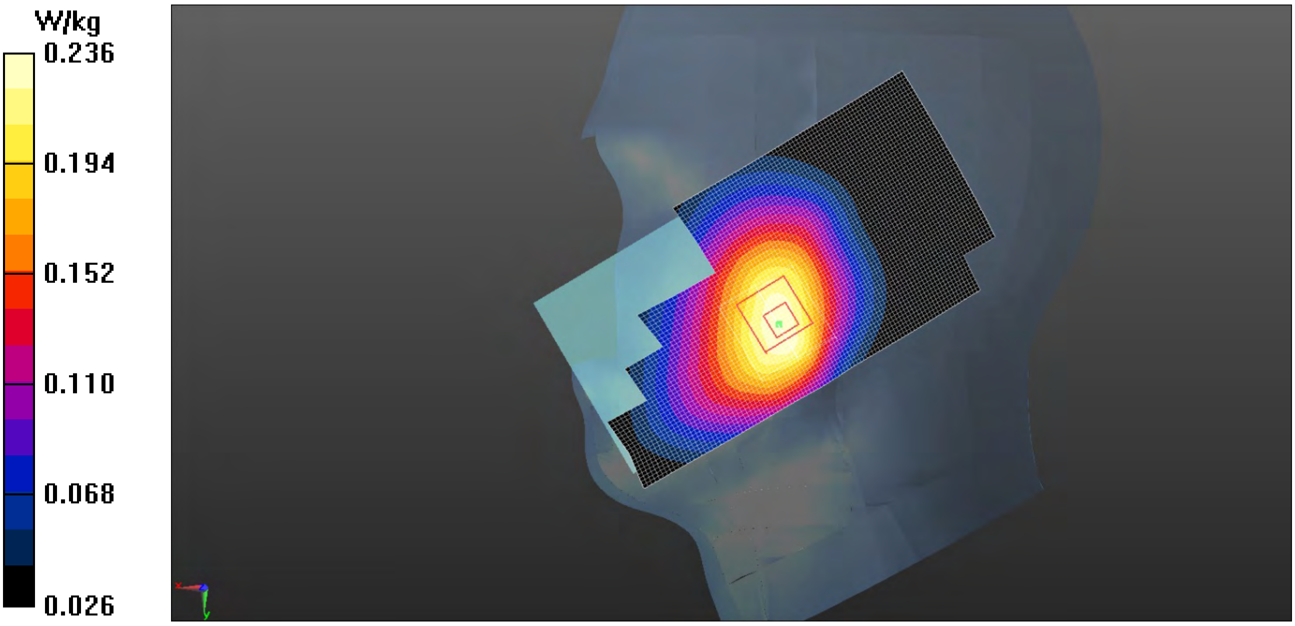
Configuration/Right cheek Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.731 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.287 W/kg

SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.170 W/kg

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



CDMA BC1 Head

Date: 9/11/2017

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: f = 1908.75 MHz; σ = 1.477 S/m; ε_r = 38.816; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, cdma bc1 Frequency: 1908.75 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.00, 8.00, 8.00); Calibrated: 1/23/2017

Configuration/Right cheek High/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.445 W/kg

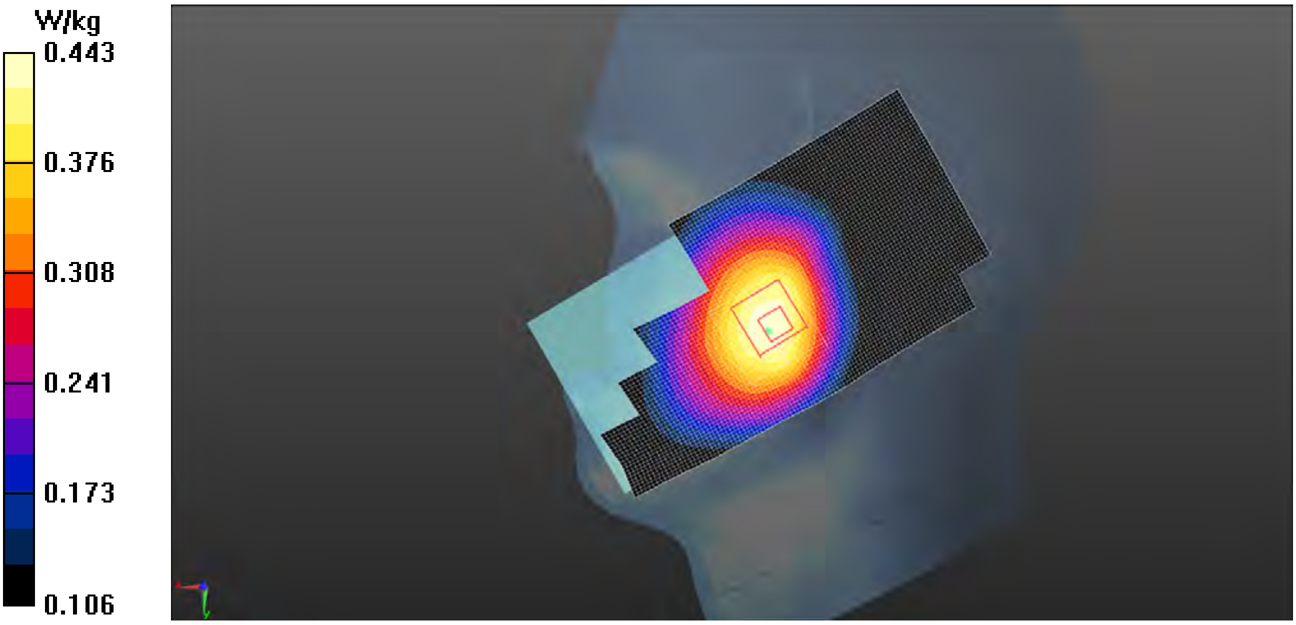
Configuration/Right cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.349 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.481 W/kg

SAR(1 g) = 0.431 W/kg; SAR(10 g) = 0.364 W/kg

Maximum value of SAR (measured) = 0.443 W/kg



CDMA BC10 Head

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 818 MHz; σ = 0.861 S/m; ε_r = 41.512; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, cdma bc10 Frequency: 817.9 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Configuration/Right cheek Low/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

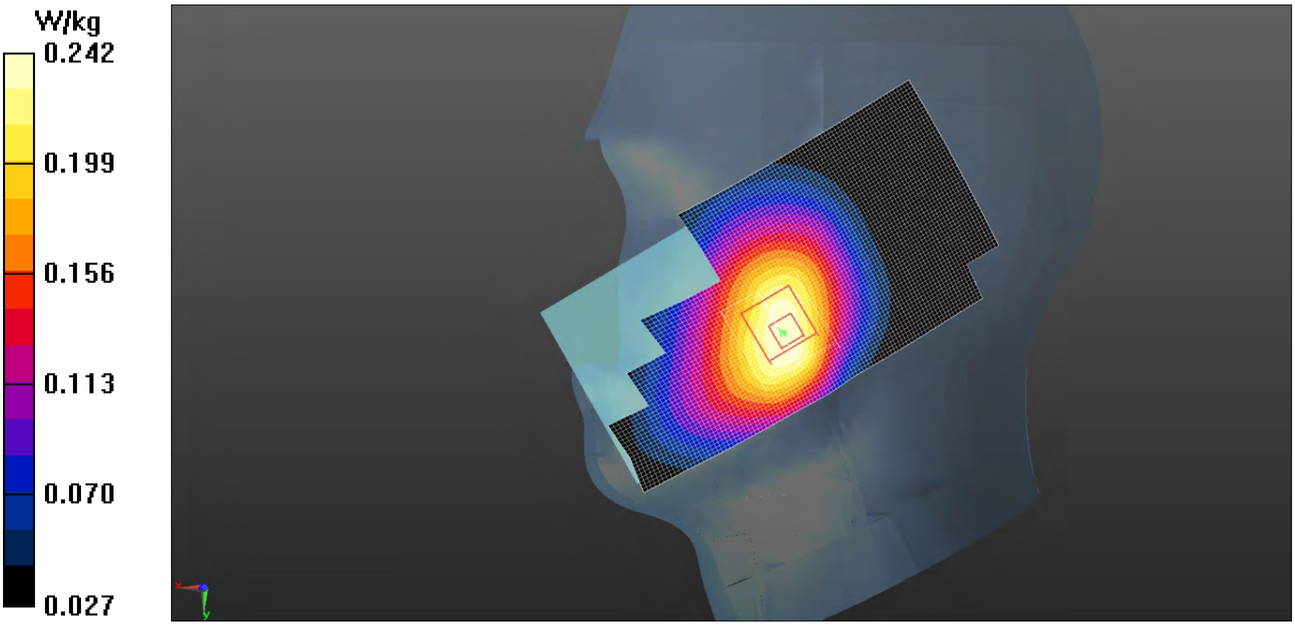
Configuration/Right cheek Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.739 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.297 W/kg

SAR(1 g) = 0.232 W/kg; SAR(10 g) = 0.176 W/kg

Maximum value of SAR (measured) = 0.242 W/kg



LTE Band2 Head

Date: 9/11/2017

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: f = 1860 MHz; σ = 1.433 S/m; ε_r = 38.965; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, LTE 1800 Band2 Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.00, 8.00, 8.00); Calibrated: 1/23/2017

Configuration/Left Cheek Low 1RB_Low/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.426 W/kg

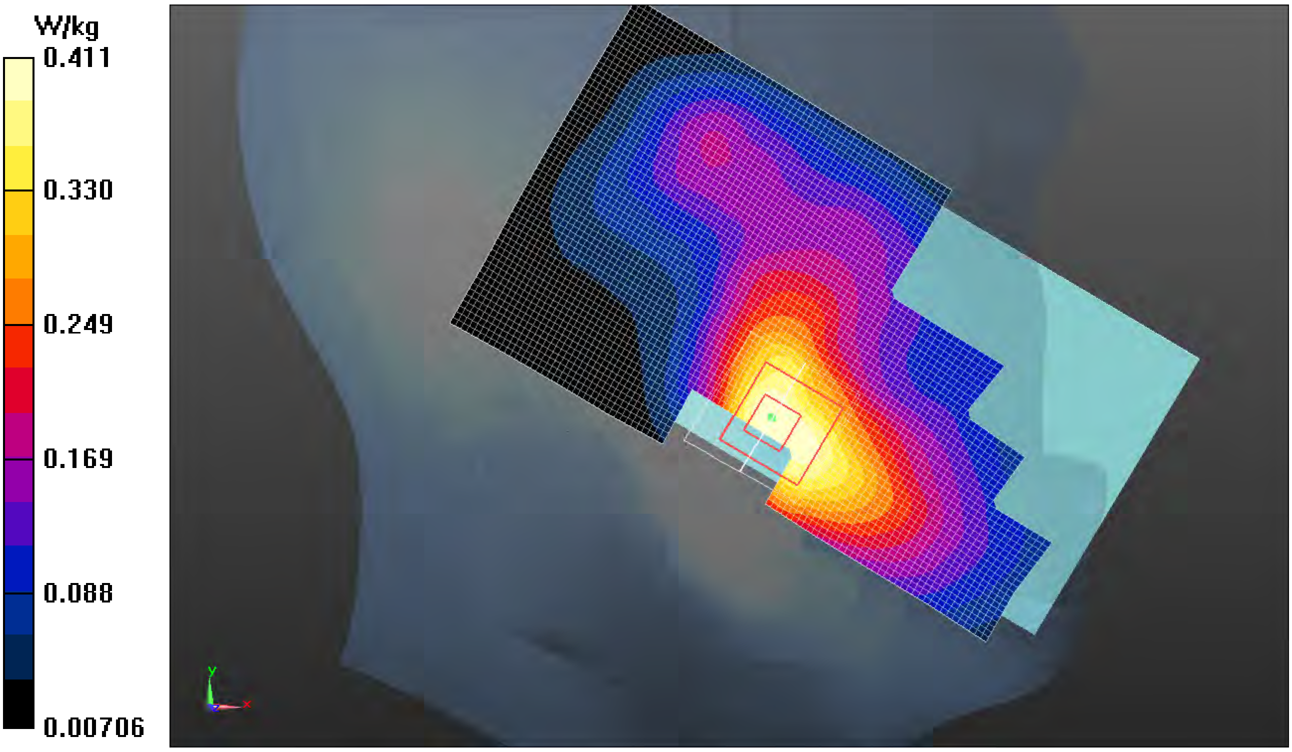
Configuration/Left Cheek Low 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.773 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.569 W/kg

SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.239 W/kg

Maximum value of SAR (measured) = 0.411 W/kg



LTE Band 4 Head

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 1800 MHz

Medium parameters used: f = 1745 MHz; σ = 1.329 S/m; ε_r = 39.475; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE1800(Band4) Frequency: 1745 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.08, 8.08, 8.08); Calibrated: 1/23/2017

Configuration/Left Chee High 1RB_Low/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

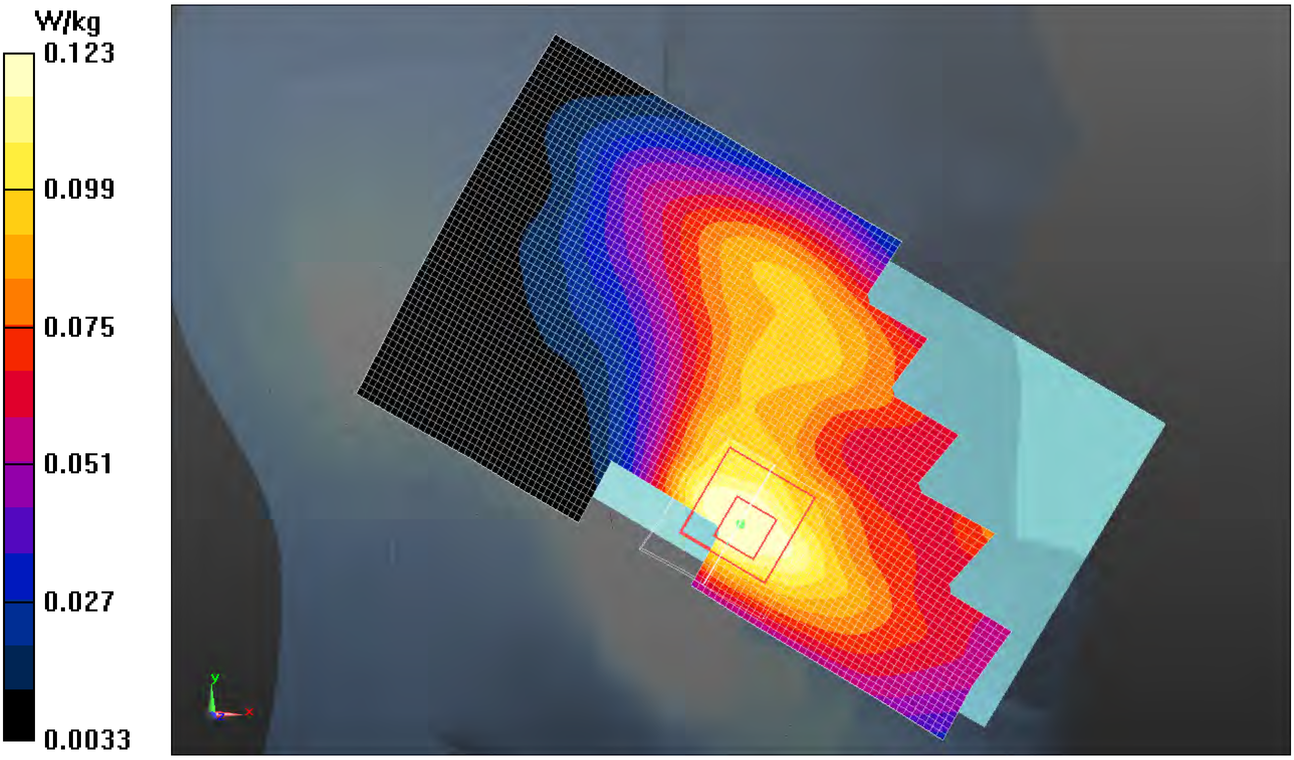
Configuration/Left Chee High 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.642 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.179 W/kg

SAR(1 g) = 0.115 W/kg; SAR(10 g) = 0.075 W/kg

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



LTE Band 5 Head

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 844 MHz; σ = 0.885 S/m; ε_r = 41.252; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE 835((Band5) Frequency: 844 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Configuration/Left Cheek High 1RB_High/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.184 W/kg

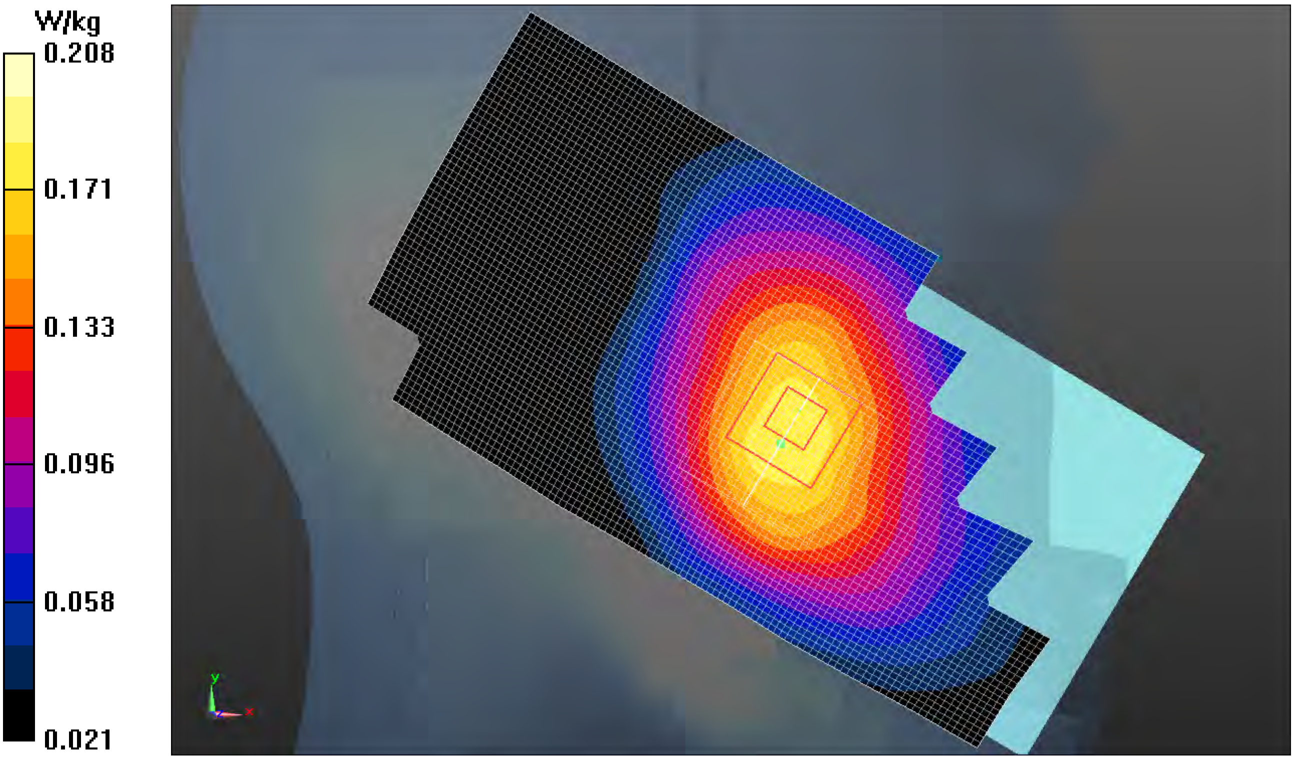
Configuration/Left Cheek High 1RB_High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.393 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.241 W/kg

SAR(1 g) = 0.188 W/kg; SAR(10 g) = 0.138 W/kg

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



LTE-Band 12 Head

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 750 MHz

Medium parameters used: f = 704 MHz; σ = 0.812 S/m; ε_r = 41.269; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Left/Left Cheek Low 1RB_Mid/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.172 W/kg

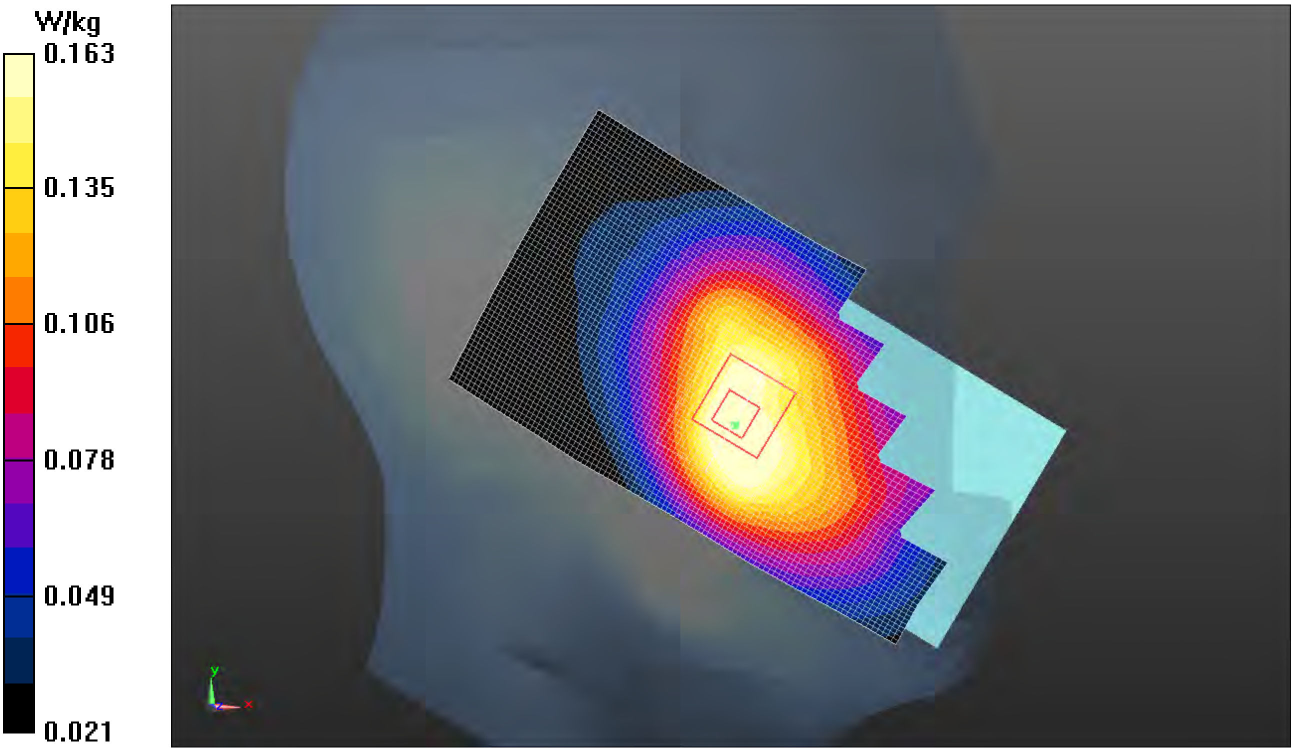
Left/Left Cheek Low 1RB_Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.720 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.190 W/kg

SAR(1 g) = 0.157 W/kg; SAR(10 g) = 0.124 W/kg

Maximum value of SAR (measured) = 0.163 W/kg



LTE-Band 13 Head

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 750 MHz

Medium parameters used: f = 782 MHz; σ = 0.875 S/m; ε_r = 40.154; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Left/Left Cheek Low 1RB_Mid/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

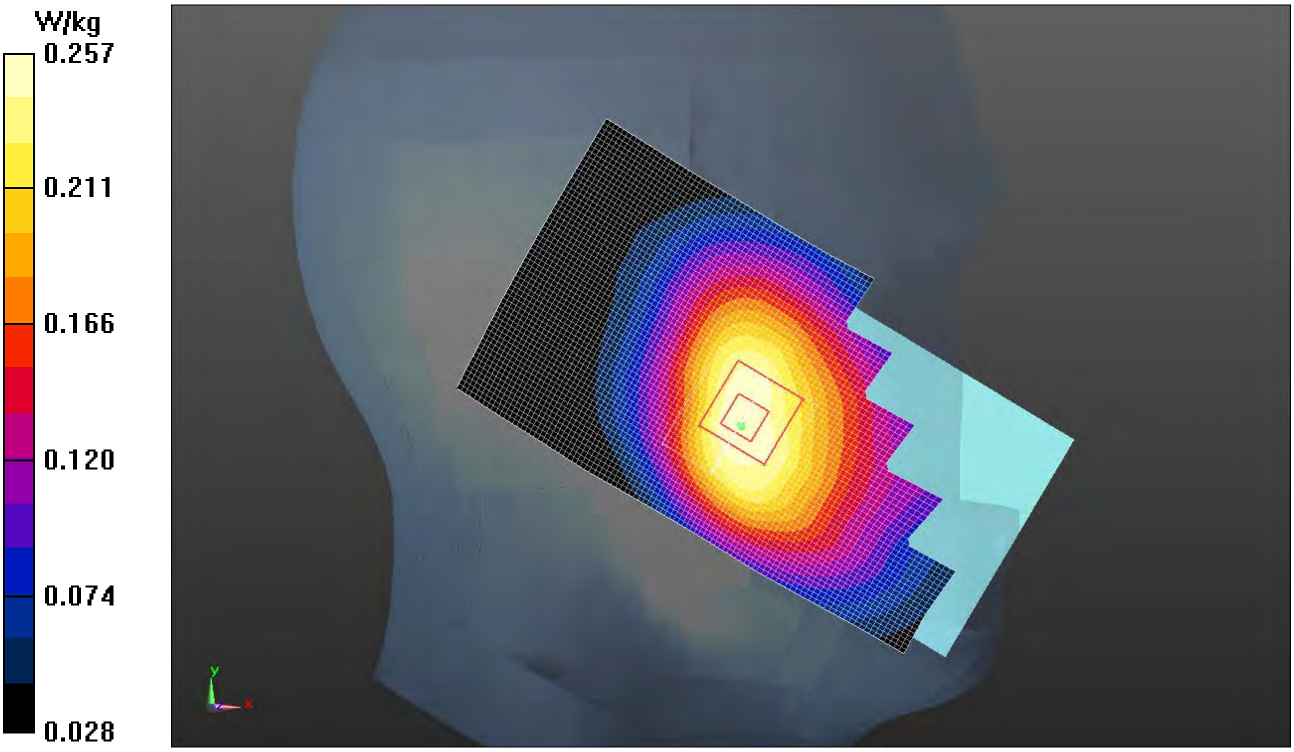
Left/Left Cheek Low 1RB_Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.186 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.299 W/kg

SAR(1 g) = 0.244 W/kg; SAR(10 g) = 0.191 W/kg

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



LTE-Band 17 Head

Date: 9/10/2017

Electronics: DAE4 Sn786

Medium: Head 750 MHz

Medium parameters used: f = 709 MHz; σ = 0.816 S/m; ε_r = 41.189; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 709 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Left/Left Cheek Low 1RB_Mid/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.169 W/kg

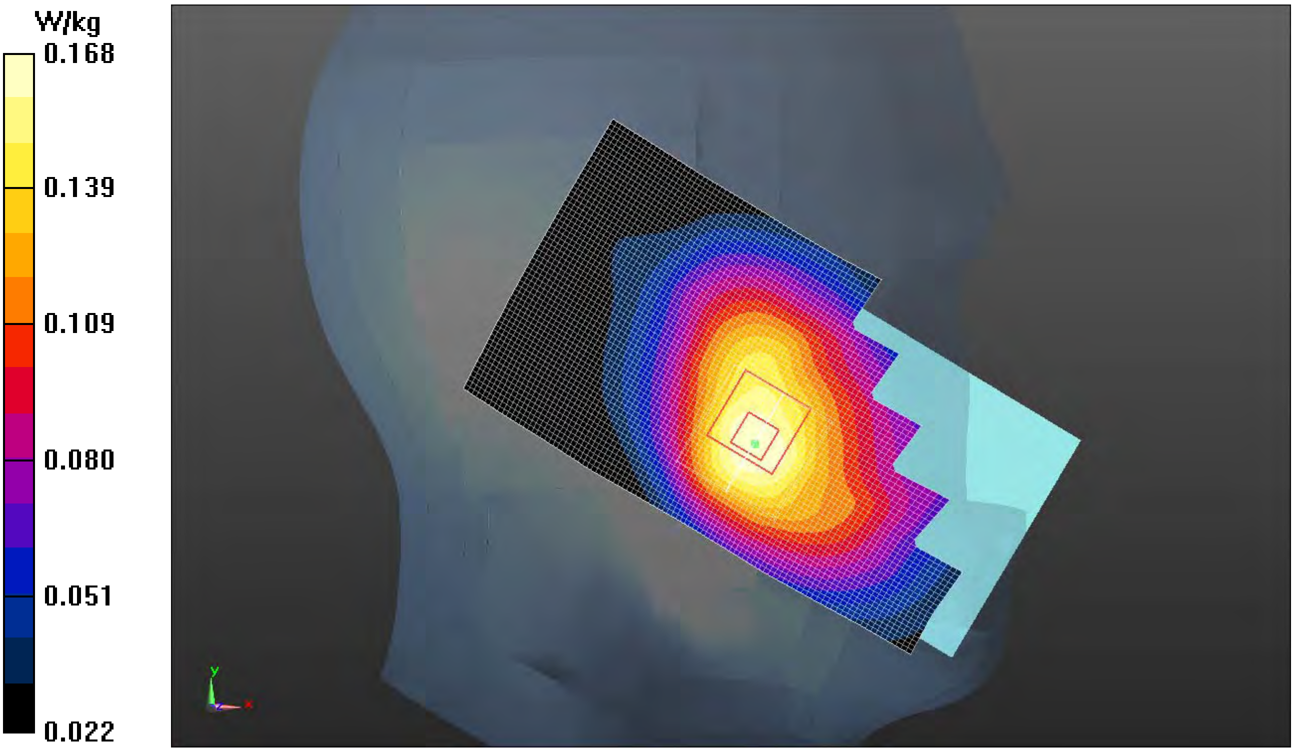
Left/Left Cheek Low 1RB_Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.516 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.201 W/kg

SAR(1 g) = 0.155 W/kg; SAR(10 g) = 0.121 W/kg

Maximum value of SAR (measured) = 0.168 W/kg



LTE Band 25 Head

Date: 9/11/2017

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: f = 1860 MHz; σ = 1.433 S/m; ε_r = 38.965; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, LTE B25 Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(8.00, 8.00, 8.00); Calibrated: 1/23/2017

Configuration/Left Cheek Low1RB_Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.419 W/kg

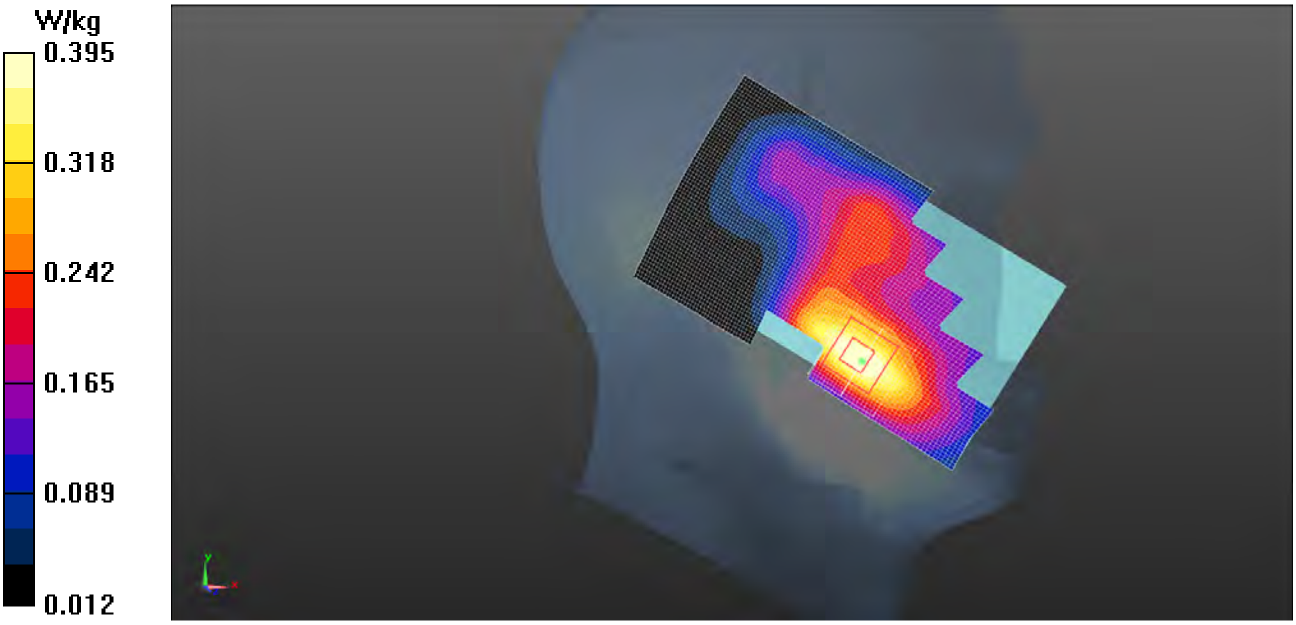
Configuration/Left Cheek Low1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.866 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.574 W/kg

SAR(1 g) = 0.361 W/kg; SAR(10 g) = 0.222 W/kg

Maximum value of SAR (measured) = 0.395 W/kg



LTE Band 26 Head

Date: 9/9/2017

Electronics: DAE4 Sn786

Medium: Head 900 MHz

Medium parameters used: f = 822.5 MHz; σ = 0.909 S/m; ε_r = 39.632; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 822.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.04, 9.04, 9.04); Calibrated: 1/23/2017

Left/Left Cheek Low 1RB_Low 2/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.298 W/kg

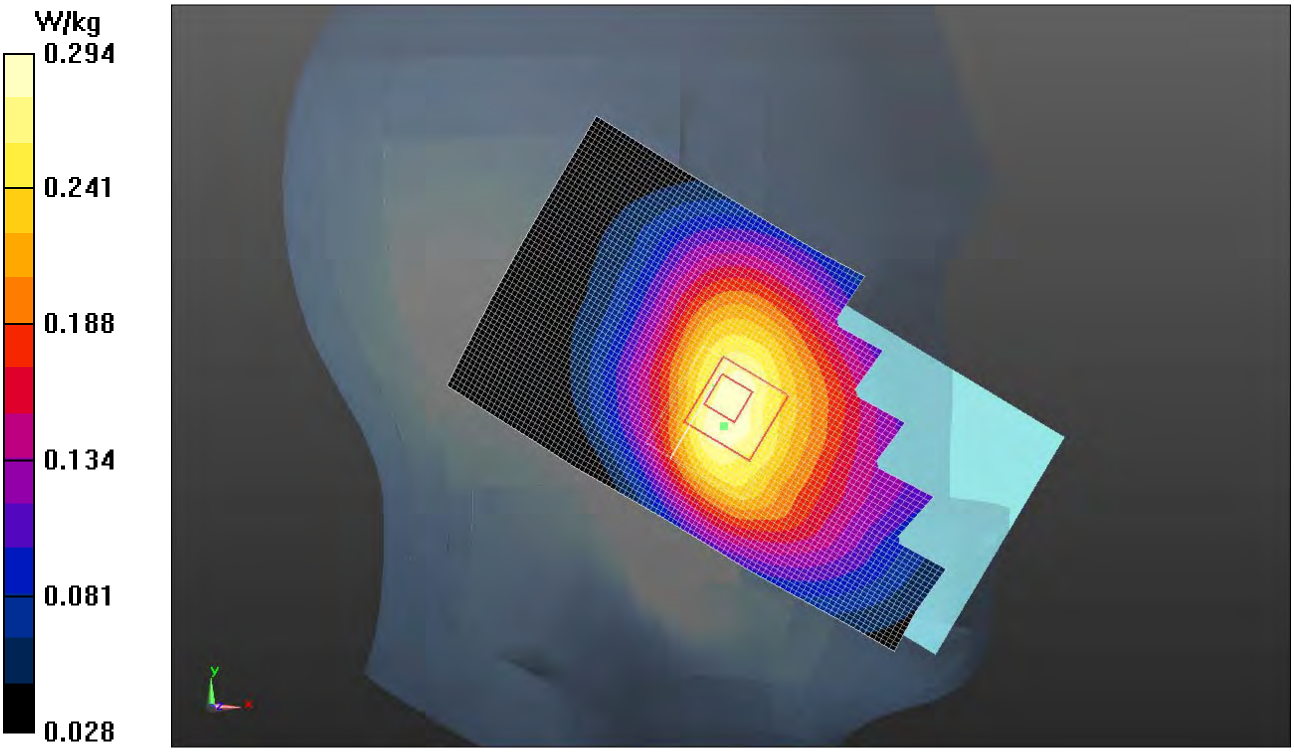
Left/Left Cheek Low 1RB_Low 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.879 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.352 W/kg

SAR(1 g) = 0.282 W/kg; SAR(10 g) = 0.218 W/kg

Maximum value of SAR (measured) = 0.294 W/kg



LTE-Band 41 Head

Date: 10/11/2017

Electronics: DAE4 Sn786

Medium: Head 2600 MHz

Medium parameters used: f = 2680 MHz; σ = 2.132 S/m; ε_r = 37.861; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:1.5787

Probe: EX3DV4 - SN3633 ConvF(7.27, 7.27, 7.27); Calibrated: 1/23/2017

Left/Left Cheek High 1RB_Low/Area Scan (61x111x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.225 W/kg

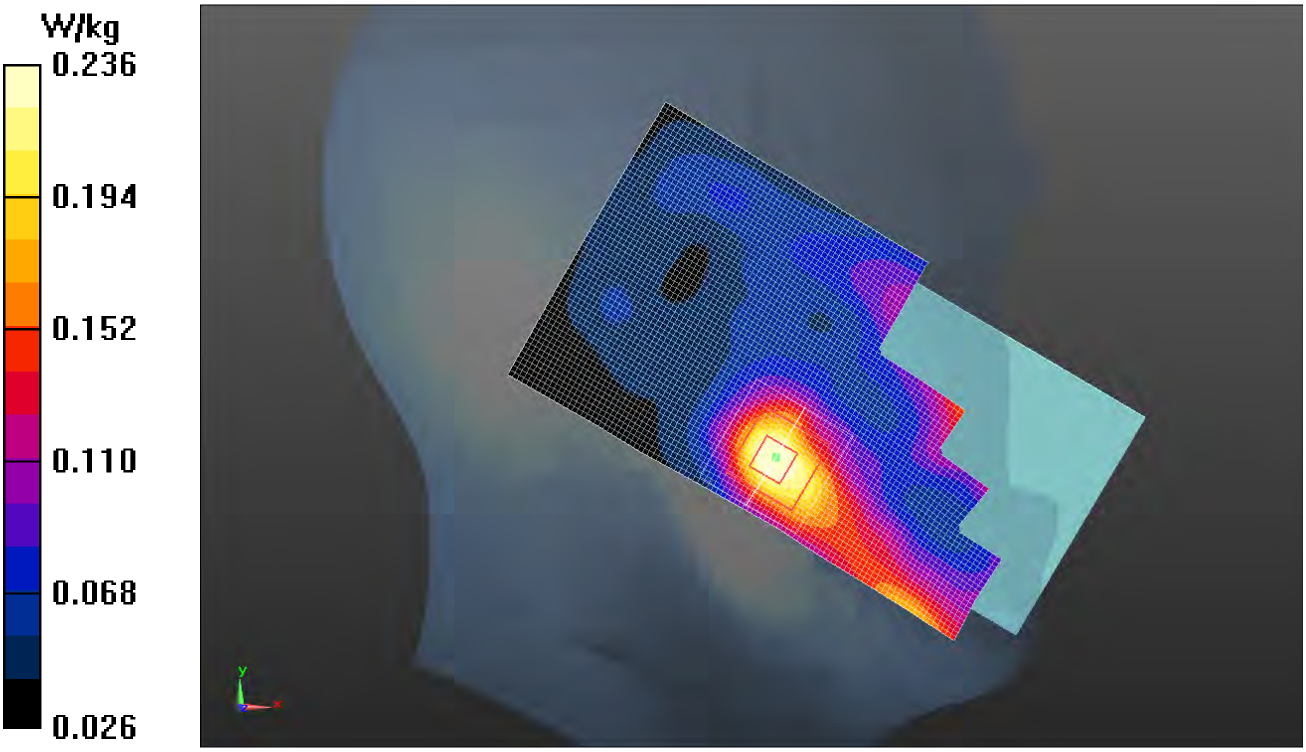
Left/Left Cheek High 1RB_Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.512 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.421 W/kg

SAR(1 g) = 0.213 W/kg; SAR(10 g) = 0.122 W/kg

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



WIFI 2.4 Head

Date: 9/22/2017

Electronics: DAE4 Sn786

Medium: 2450Head

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.858 S/m; ε_r = 38.785; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, WiFi (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.4, 7.4, 7.4); Calibrated: 1/23/2017

Left/Left Cheek Mid 2/Area Scan (61x111x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.339 W/kg

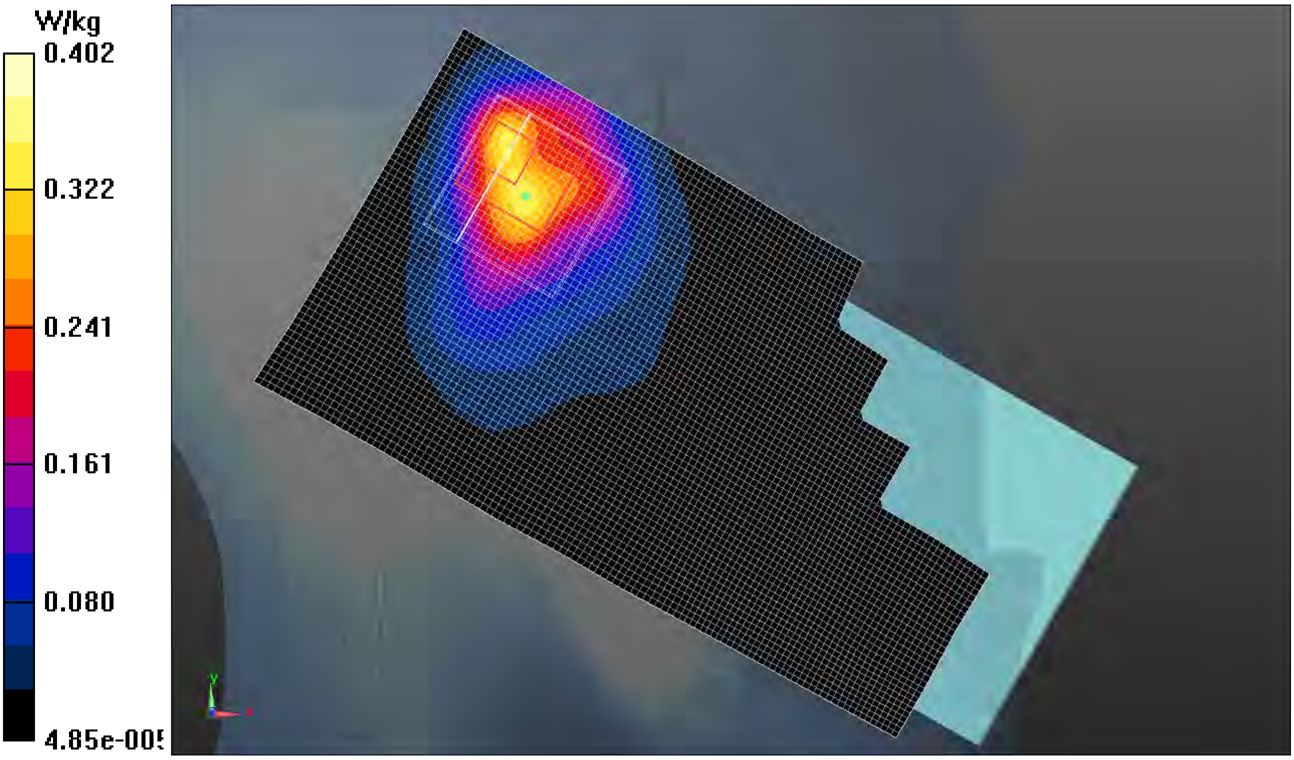
Left/Left Cheek Mid 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.590 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.834 W/kg

SAR(1 g) = 0.333 W/kg; SAR(10 g) = 0.155 W/kg

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



WIFI 5G Head

Date: 9/23/2017

Electronics: DAE4 Sn786

Medium: Head 5000

Medium parameters used: f = 5270.5 MHz; σ = 4.839 S/m; ε_r = 35.036; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, WIFI 5G (0) Frequency: 5270 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(5.32, 5.32, 5.32); Calibrated: 1/23/2017

Left/Left Cheek Low/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.518 W/kg

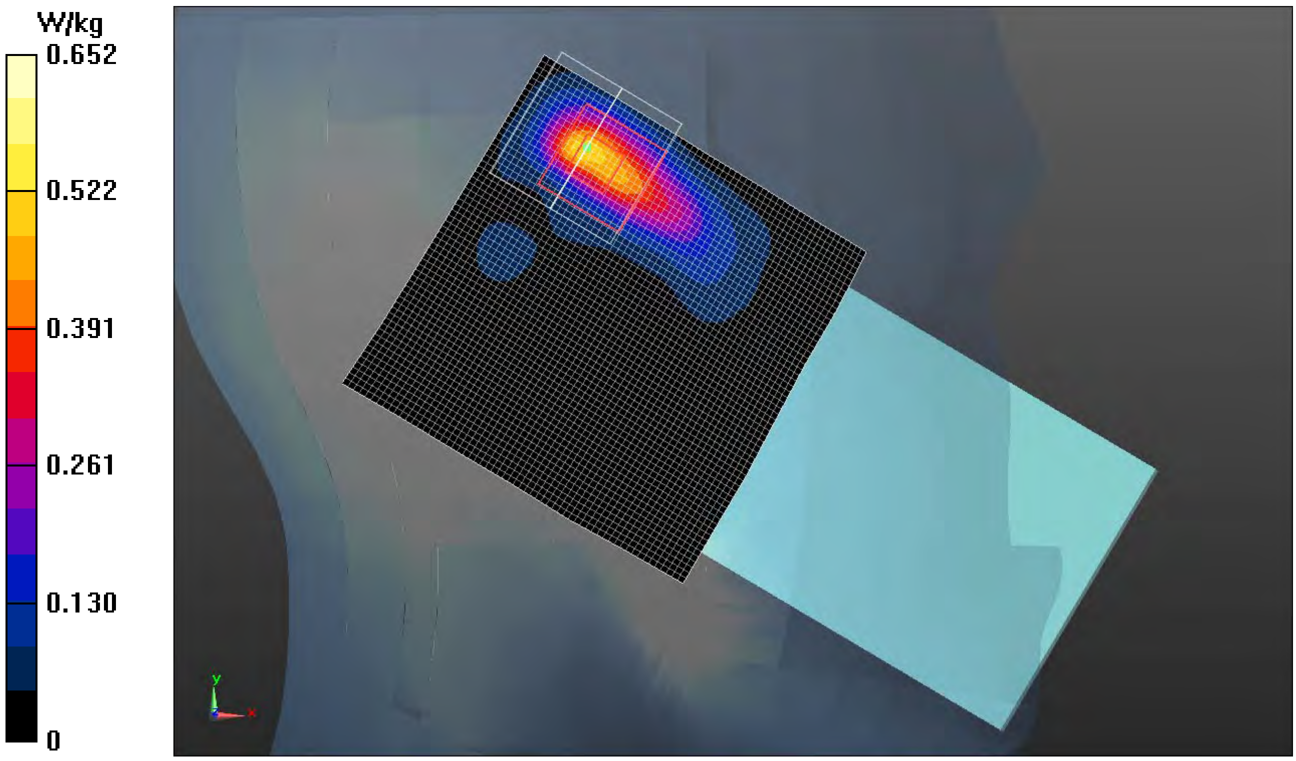
Left/Left Cheek Low/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.034 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 2.30 W/kg

SAR(1 g) = 0.568 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.652 W/kg



GSM850 Body

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 848.8 MHz; σ = 1.003 S/m; ε_r = 52.555; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, 2 slot GPRS (0) Frequency: 848.8 MHz Duty Cycle: 1:4

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear Side High/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.578 W/kg

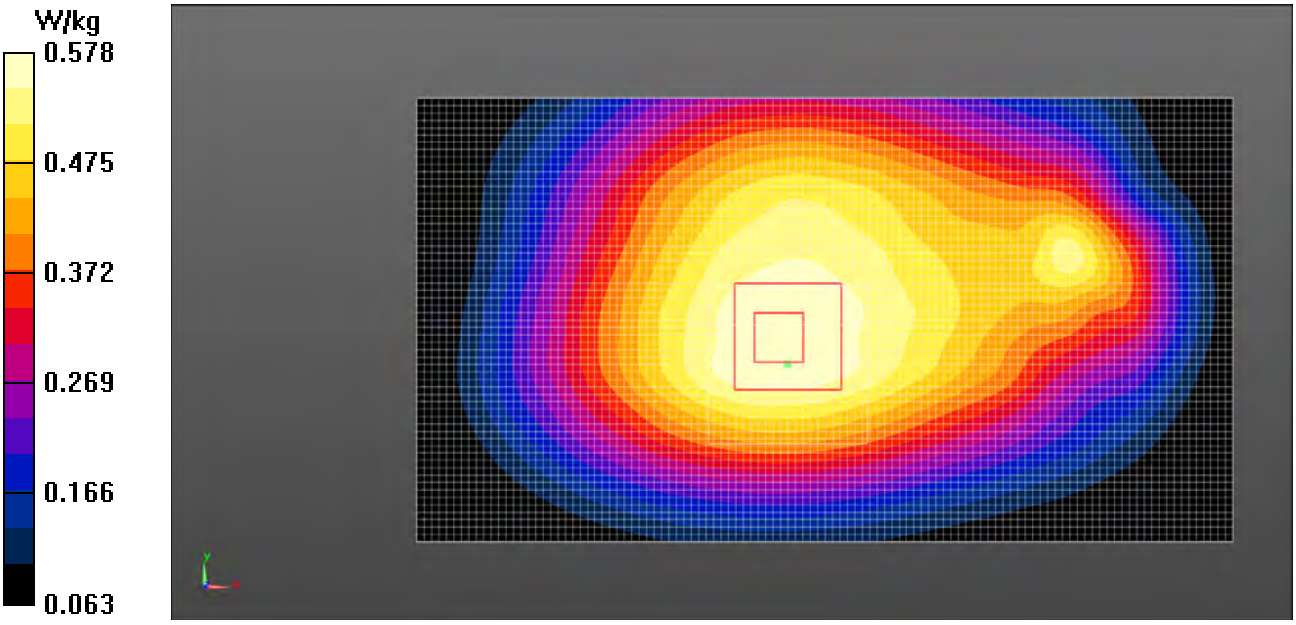
Body/Rear Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.00 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.717 W/kg

SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.418 W/kg

Maximum value of SAR (measured) = 0.578 W/kg



GSM 1900 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1850.2 MHz; σ = 1.532 S/m; ε_r = 53.064; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, 2 slot GPRS (0) Frequency: 1850.2 MHz Duty Cycle: 1:4

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

Body/Bottom side Mid/Area Scan (61x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

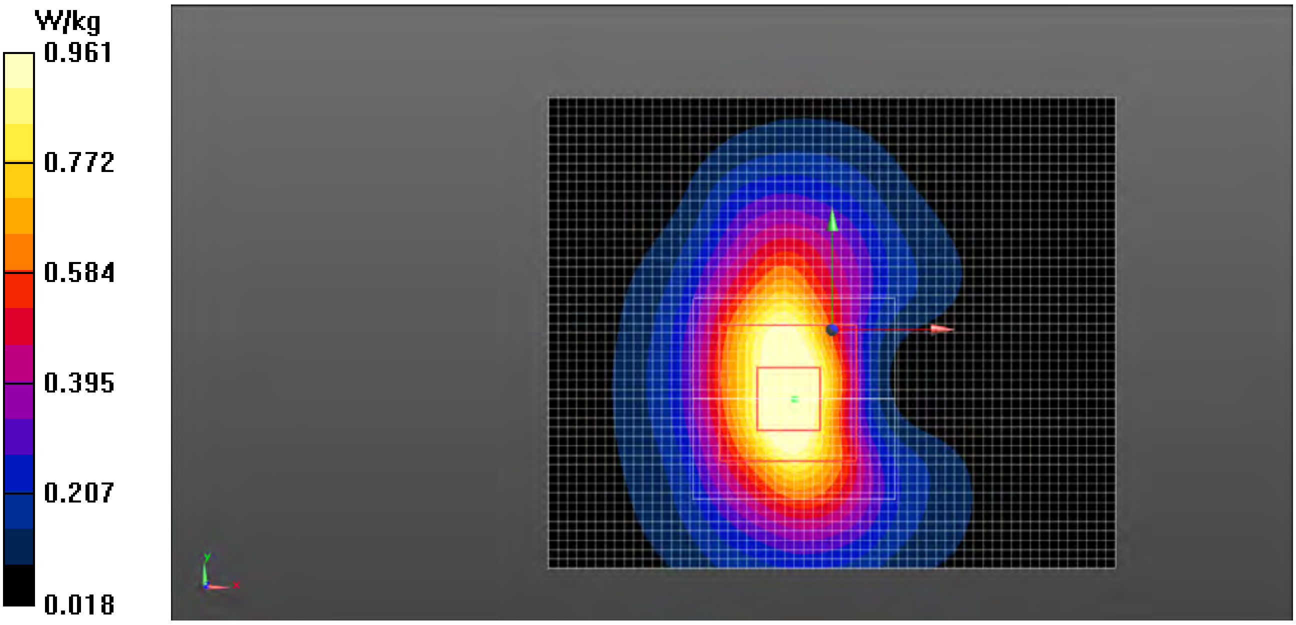
Body/Bottom side Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.74 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.861 W/kg; SAR(10 g) = 0.481 W/kg

Maximum value of SAR (measured) = 0.961 W/kg



WCDMA Band5 Body

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 836.4 MHz; σ = 1.001 S/m; ε_r = 52.576; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear side Mid/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.374 W/kg

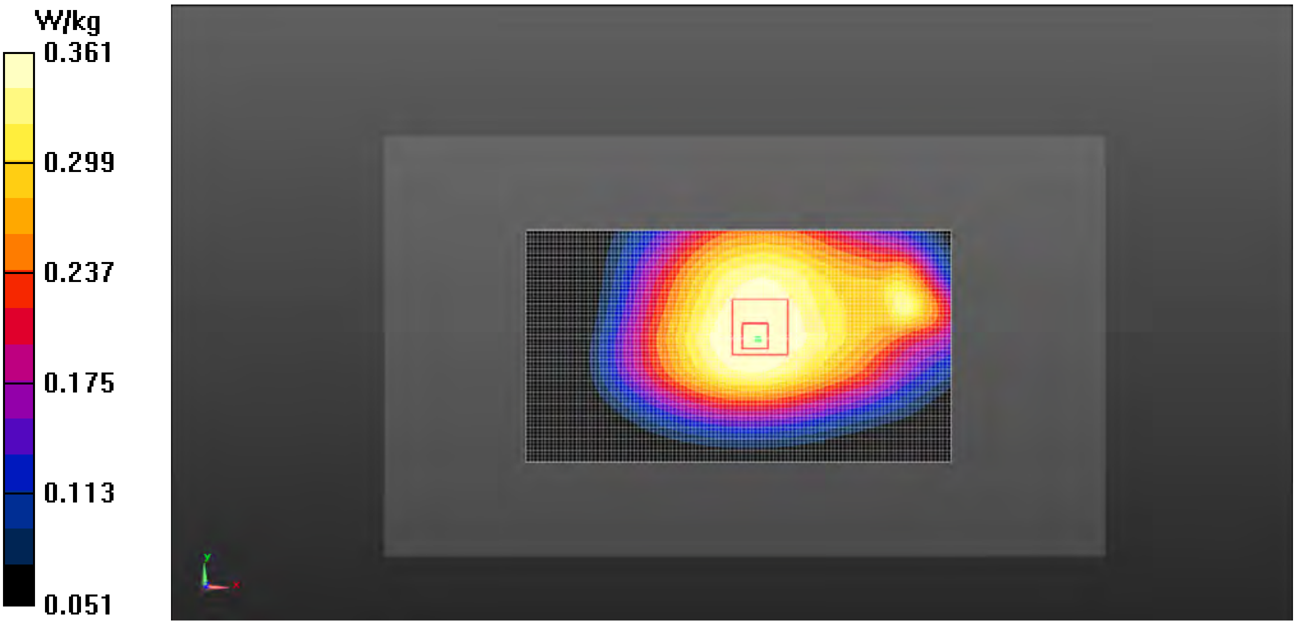
Body/Rear side Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.86 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.444 W/kg

SAR(1 g) = 0.312 W/kg; SAR(10 g) = 0.220 W/kg

Maximum value of SAR (measured) = 0.361 W/kg



WCDMA Band4 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1800 MHz

Medium parameters used: f = 1752.6 MHz; σ = 1.44 S/m; ε_r = 53.382; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 1752.6 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.9, 7.9, 7.9); Calibrated: 1/23/2017

Body/Bottom side High/Area Scan (61x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

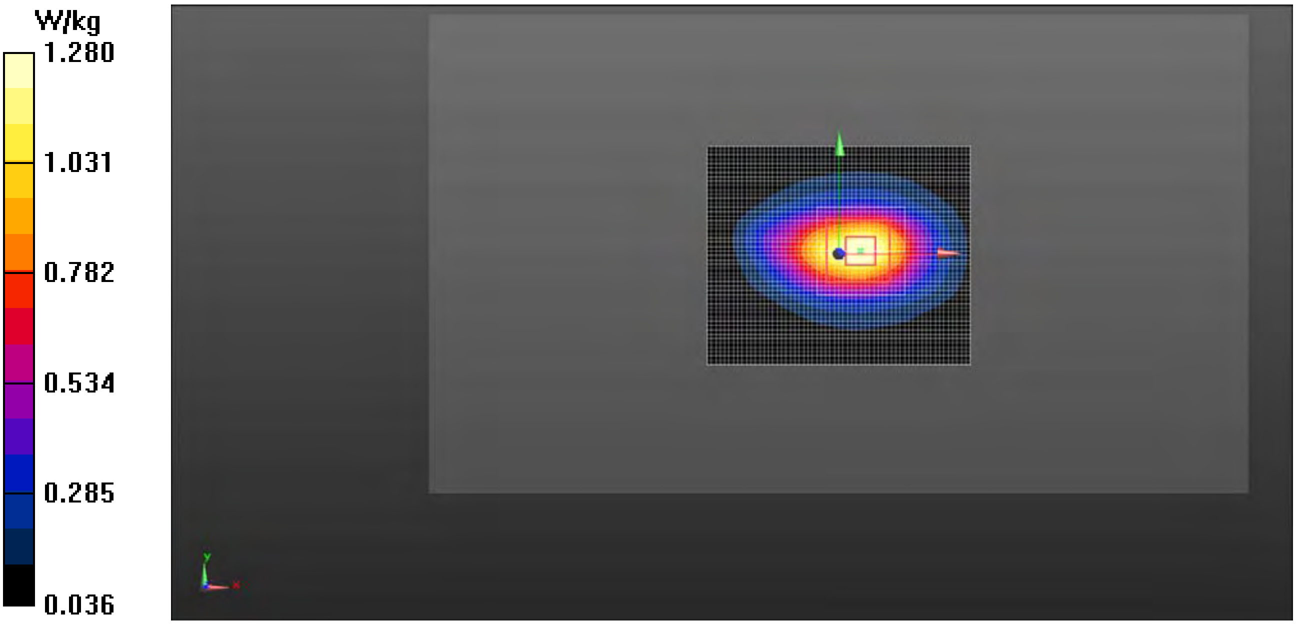
Body/Bottom side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.53 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.85 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.642 W/kg

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



WCDMA 1900 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1852.4 MHz; σ = 1.534 S/m; ε_r = 53.06; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 1852.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

Body/Bottom side Low/Area Scan (61x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.20 W/kg

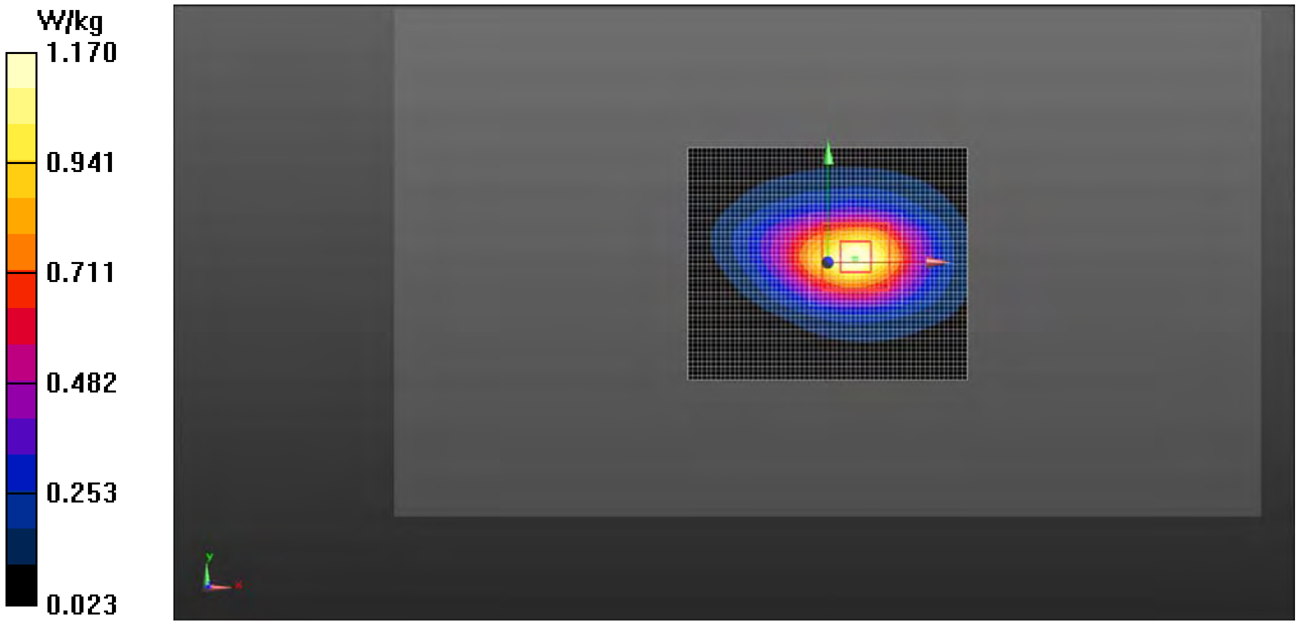
Body/Bottom side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.34 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.72 W/kg

SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.572 W/kg

Maximum value of SAR (measured) = 1.17 W/kg



CDMA BC0 Body

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 836.52 MHz; σ = 0.99 S/m; ε_r = 52.672; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, CDMA (0) Frequency: 836.52 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear side Mid/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.458 W/kg

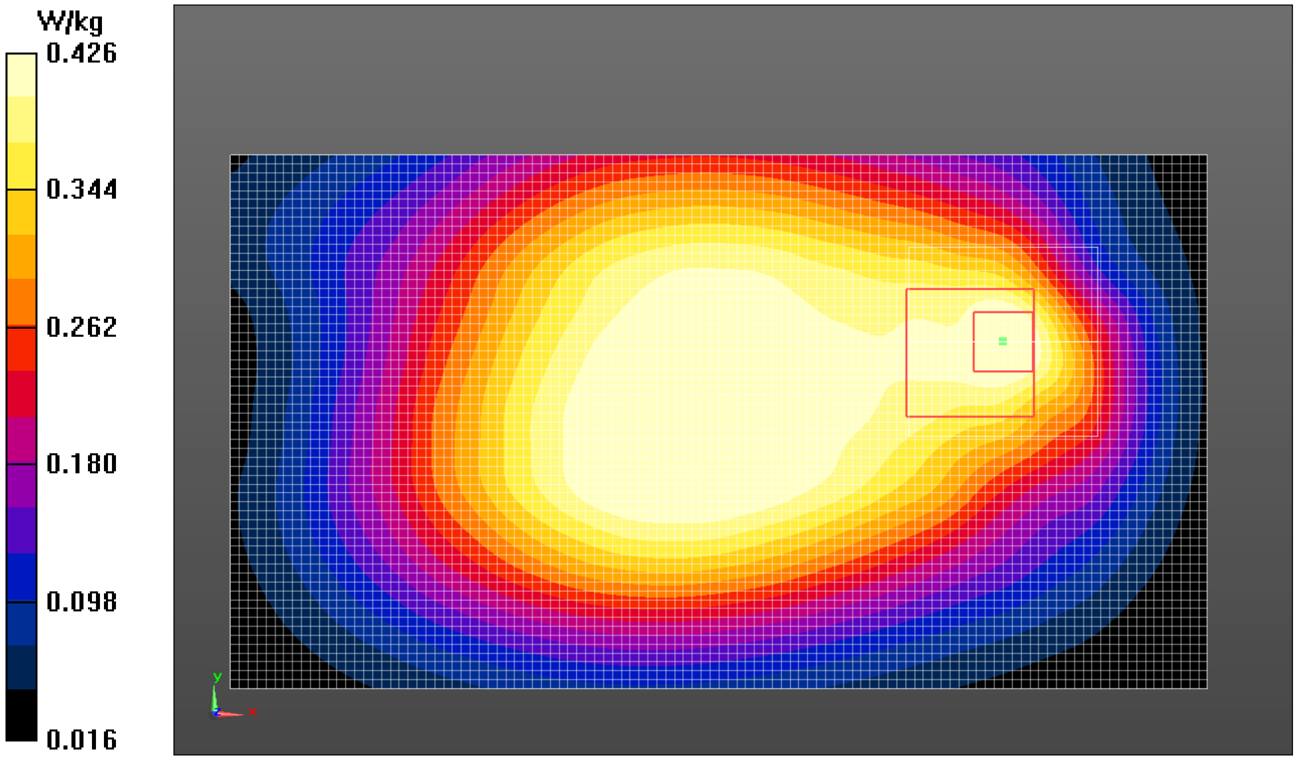
Body/Rear side Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.69 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.609 W/kg

SAR(1 g) = 0.393 W/kg; SAR(10 g) = 0.266 W/kg

Maximum value of SAR (measured) = 0.426 W/kg



CDMA BC1 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.557 S/m; ε_r = 52.992; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, CDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

Body/Rear side Mid/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.868 W/kg

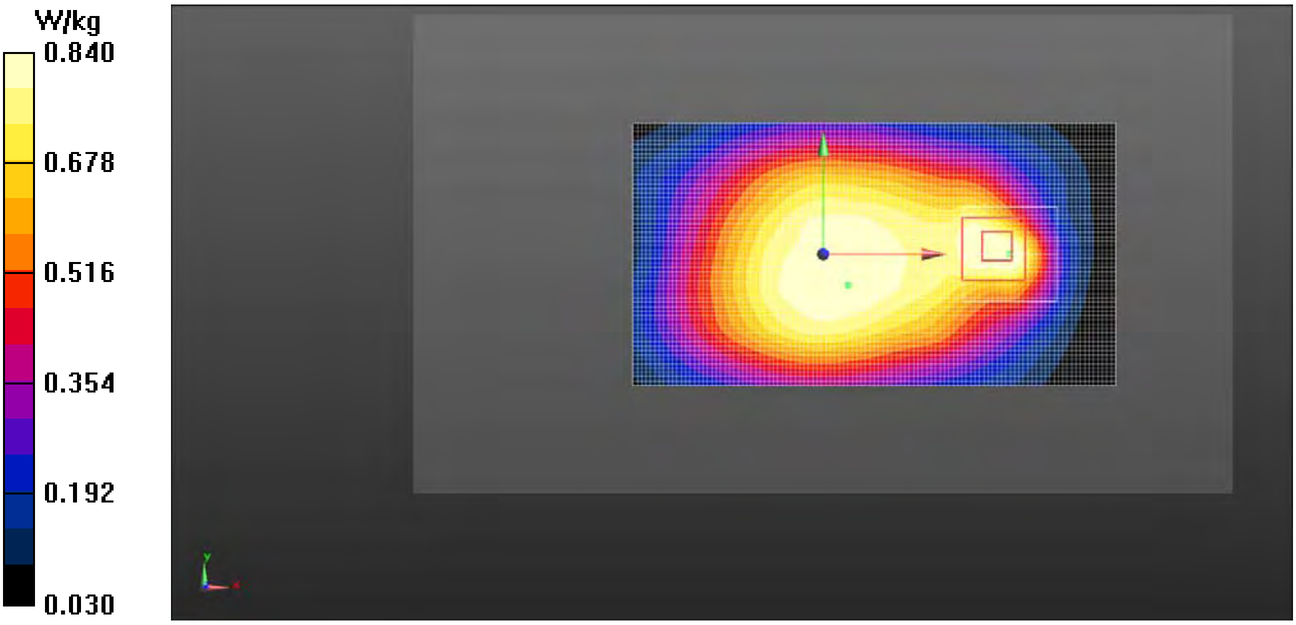
Body/Rear side Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.00 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.794 W/kg; SAR(10 g) = 0.522 W/kg

Maximum value of SAR (measured) = 0.840 W/kg



CDMA BC10 Body

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 818 MHz; σ = 0.971 S/m; ε_r = 52.86; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, CDMA (0) Frequency: 817.9 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear side Low/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.458 W/kg

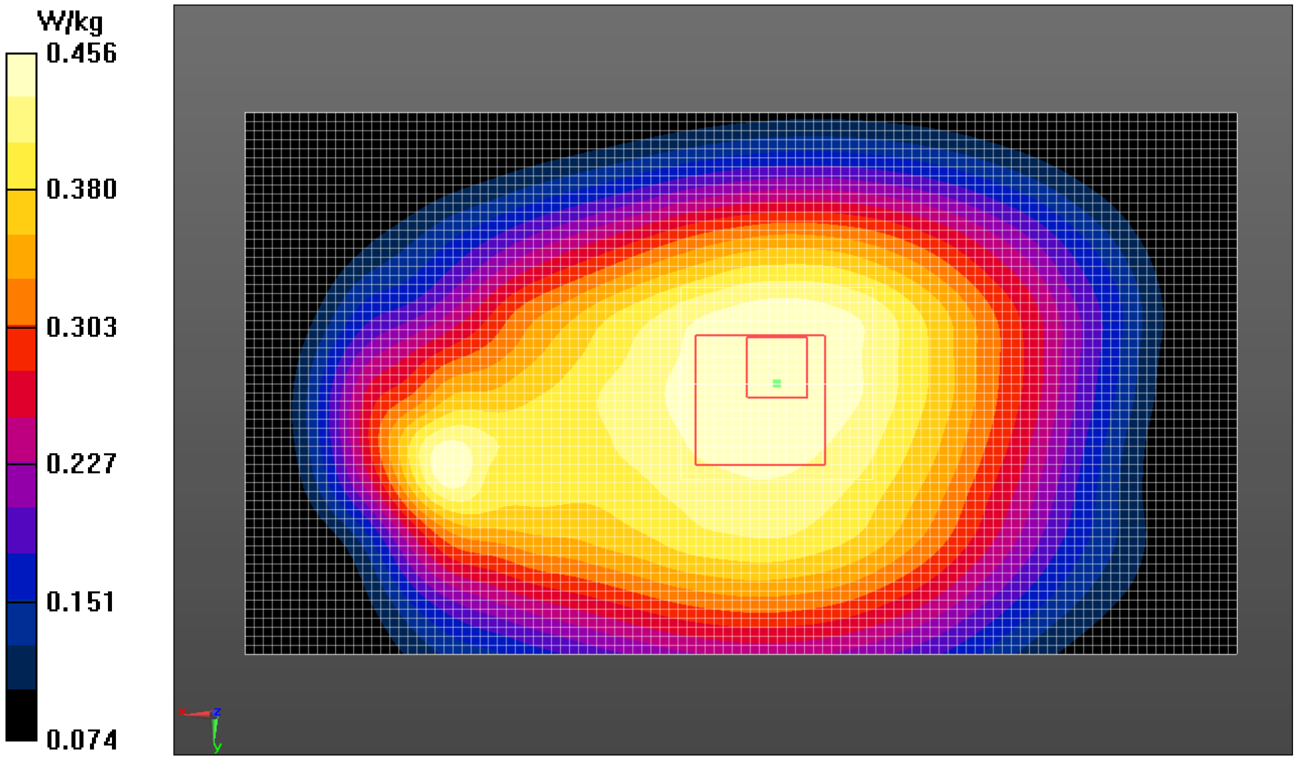
Body/Rear side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.42 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.556 W/kg

SAR(1 g) = 0.437 W/kg; SAR(10 g) = 0.336 W/kg

Maximum value of SAR (measured) = 0.456 W/kg



LTE Band 2 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1860 MHz; σ = 1.54 S/m; ε_r = 53.039; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

Body/Bottom side Low 1RB_Low/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

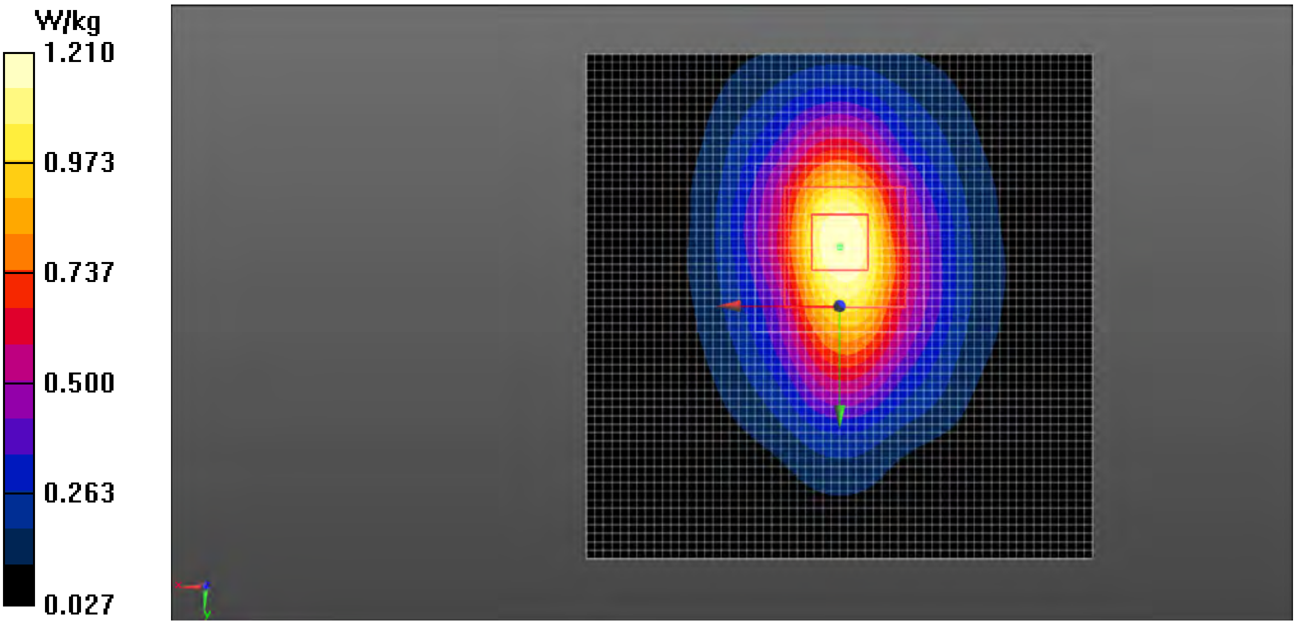
Body/Bottom side Low 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.08 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.594 W/kg

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



LTE Band 2 Body

Date: 10/19/2017

Electronics: DAE4 Sn786

Medium: Body 1800 MHz

Medium parameters used: f = 1860 MHz; σ = 1.531 S/m; ε_r = 53.821; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

Body/Bottom side Low 1RB_Low-0mm/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 6.79 W/kg

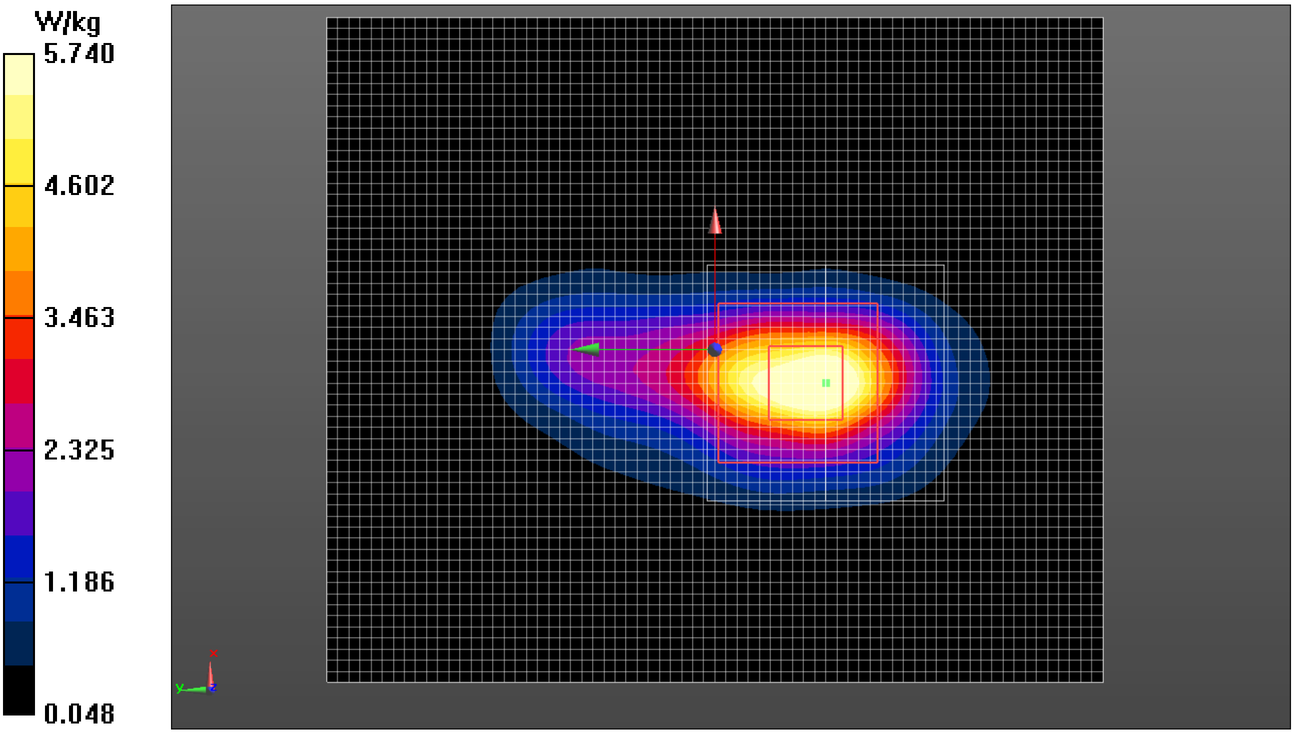
Body/Bottom side Low 1RB_Low-0mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 46.00 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 10.1 W/kg

SAR(1 g) = 5.05 W/kg; SAR(10 g) = 2.3 W/kg

Maximum value of SAR (measured) = 5.74 W/kg



LTE Band 4 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1800 MHz

Medium parameters used: f = 1745 MHz; σ = 1.433 S/m; ε_r = 53.4; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C   Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 1745 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.9, 7.9, 7.9); Calibrated: 1/23/2017

Body/Bottom side High 1RB_Low/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.15 W/kg

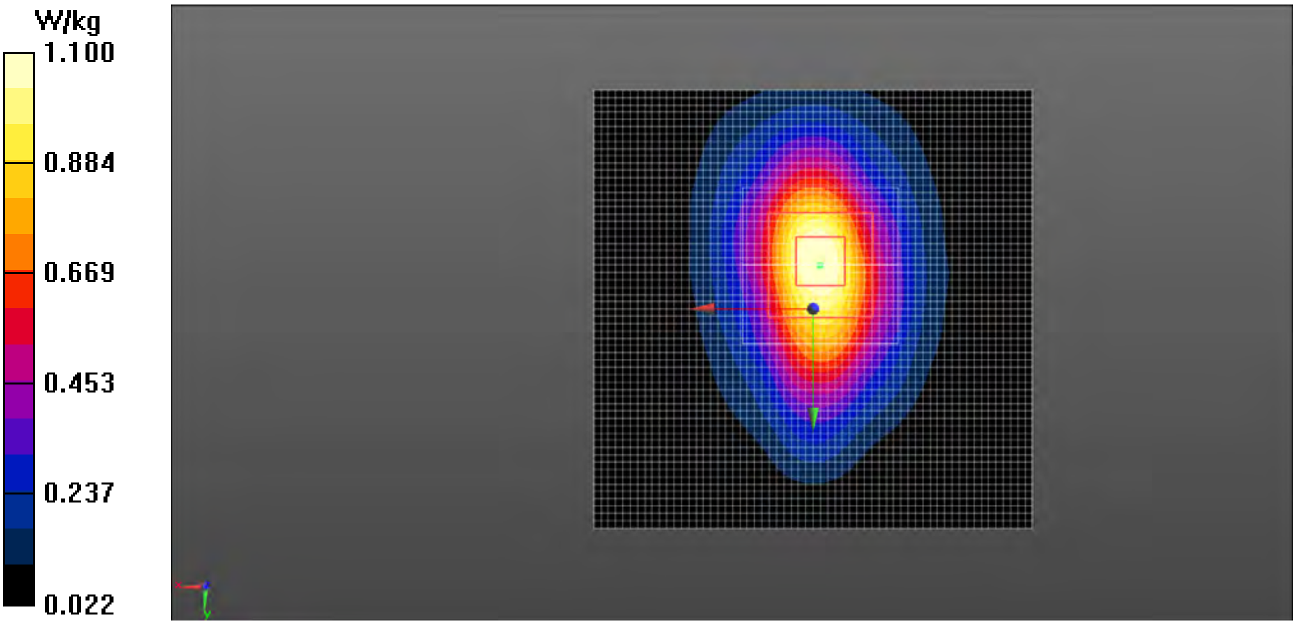
Body/Bottom side High 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.43 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.988 W/kg; SAR(10 g) = 0.557 W/kg

Maximum value of SAR (measured) = 1.10 W/kg



LTE Band 5 Body

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 844 MHz; σ = 0.998 S/m; ε_r = 52.603; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 844 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear Side High_1RB_High/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.379 W/kg

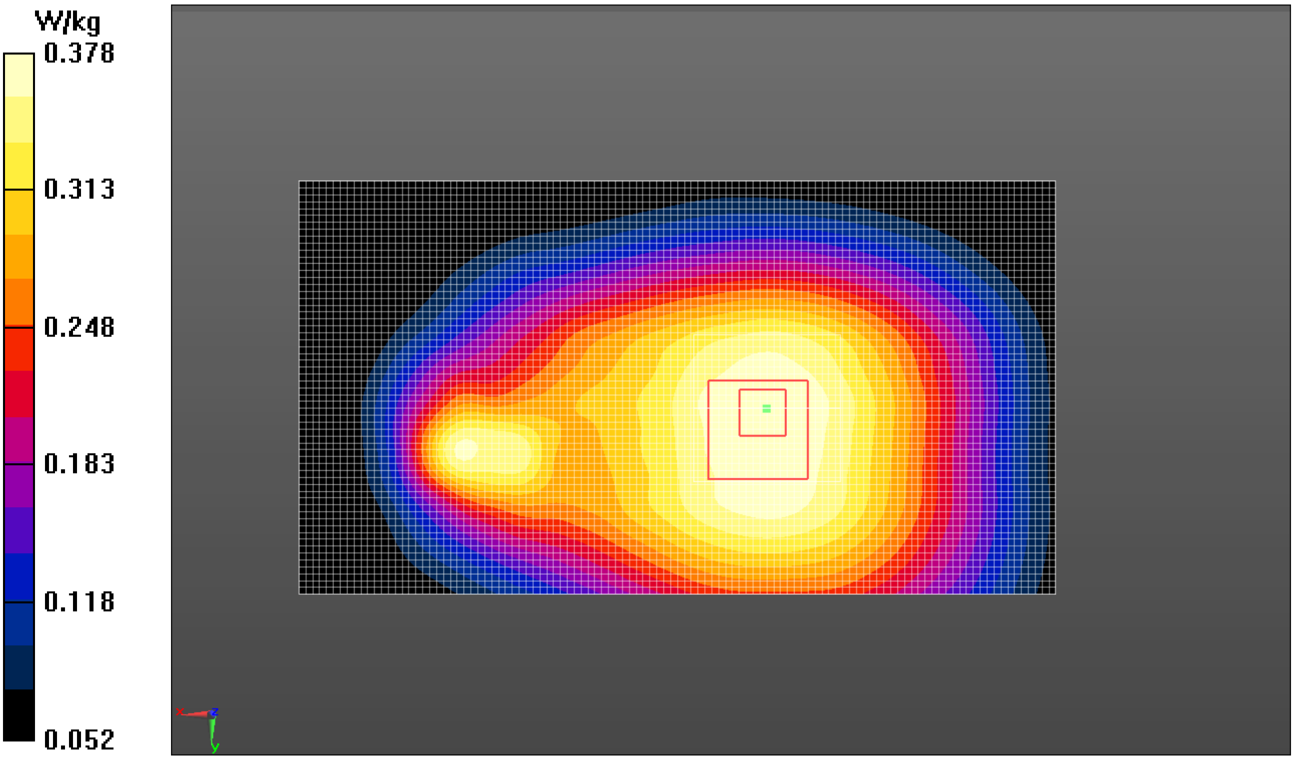
Body/Rear Side High_1RB_High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.04 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.455 W/kg

SAR(1 g) = 0.360 W/kg; SAR(10 g) = 0.278 W/kg

Maximum value of SAR (measured) = 0.378 W/kg



LTE Band 12 Body

Date: 9/12/2017

Electronics: DAE4 Sn786

Medium: Body 750 MHz

Medium parameters used: f = 704 MHz; σ = 0.858 S/m; ε_r = 54.127; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear side Low 1RB_Mid 2/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

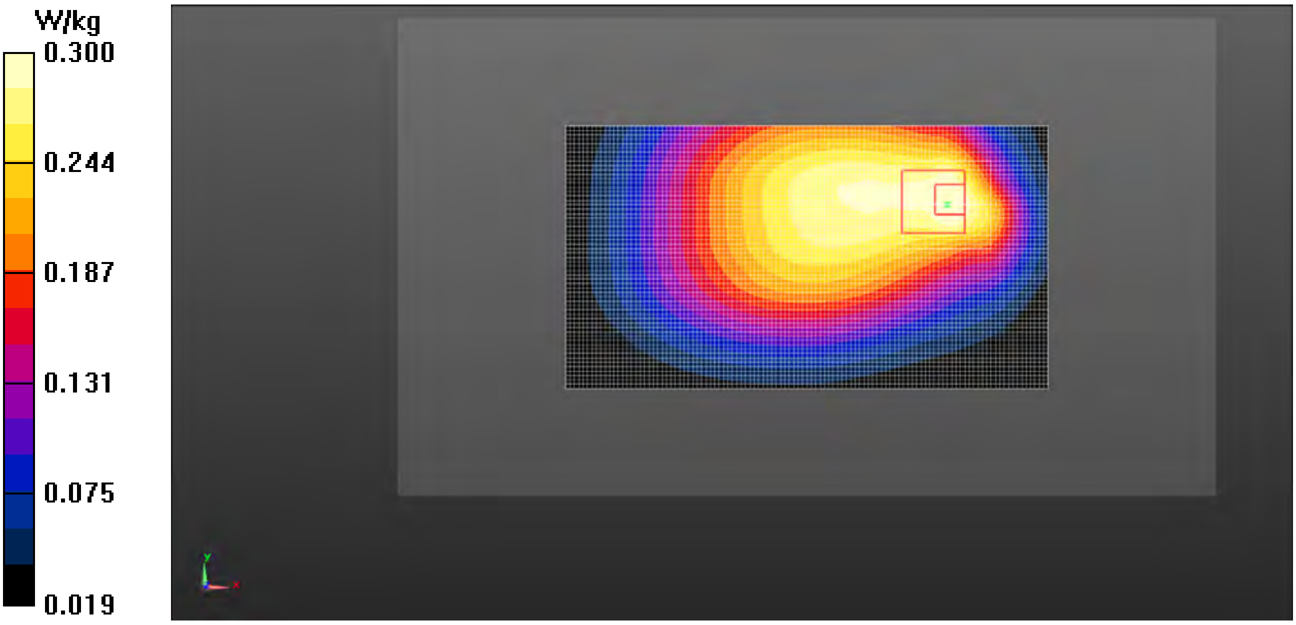
Body/Rear side Low 1RB_Mid 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.35 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.410 W/kg

SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.201 W/kg

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



LTE Band 13 Body

Date: 9/12/2017

Electronics: DAE4 Sn786

Medium: Body 750 MHz

Medium parameters used: f = 782 MHz; σ = 0.936 S/m; ε_r = 53.25; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/FC-Rear side Mid 1RB_Mid/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

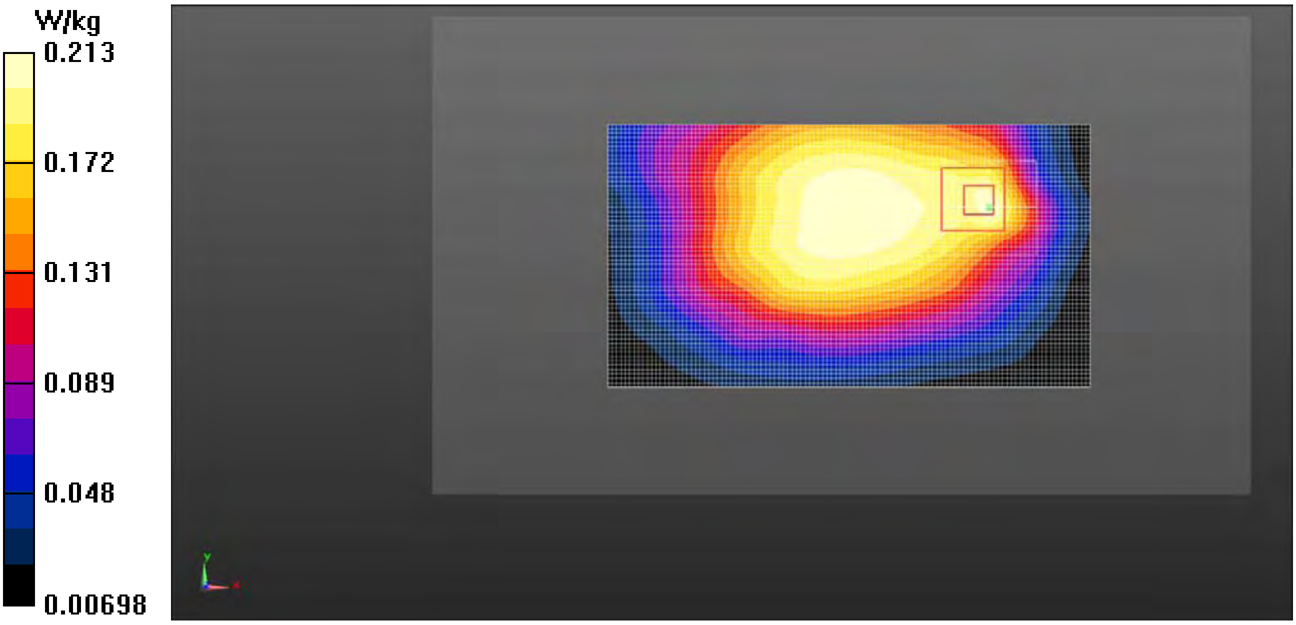
Body/FC-Rear side Mid 1RB_Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.73 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.305 W/kg

SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.140 W/kg

Maximum value of SAR (measured) = 0.213 W/kg



LTE Band 17 Body

Date: 9/12/2017

Electronics: DAE4 Sn786

Medium: Body 750 MHz

Medium parameters used: f = 709 MHz; σ = 0.862 S/m; ε_r = 54.069; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 709 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear side Low 1RB_Mid 2 2/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.306 W/kg

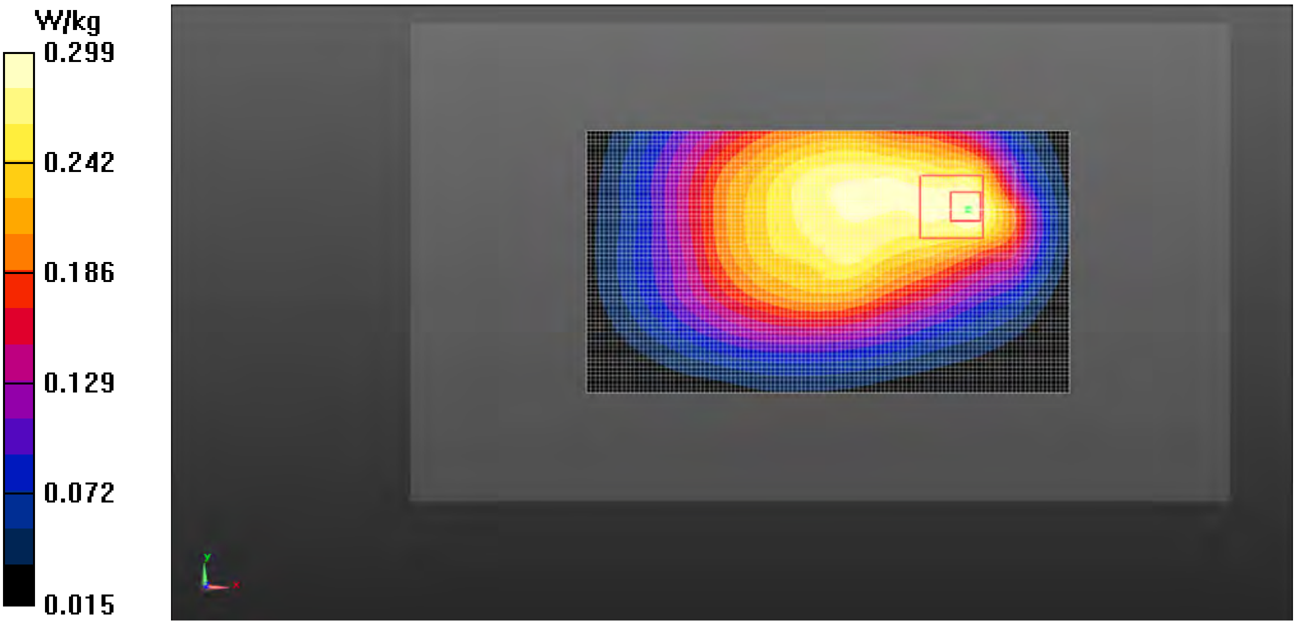
Body/Rear side Low 1RB_Mid 2 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.15 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.404 W/kg

SAR(1 g) = 0.277 W/kg; SAR(10 g) = 0.195 W/kg

Maximum value of SAR (measured) = 0.299 W/kg



LTE Band 25 Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: f = 1860 MHz; σ = 1.54 S/m; ε_r = 53.039; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.55, 7.55, 7.55); Calibrated: 1/23/2017

Body/Bottom side Low 1RB_Low/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.20 W/kg

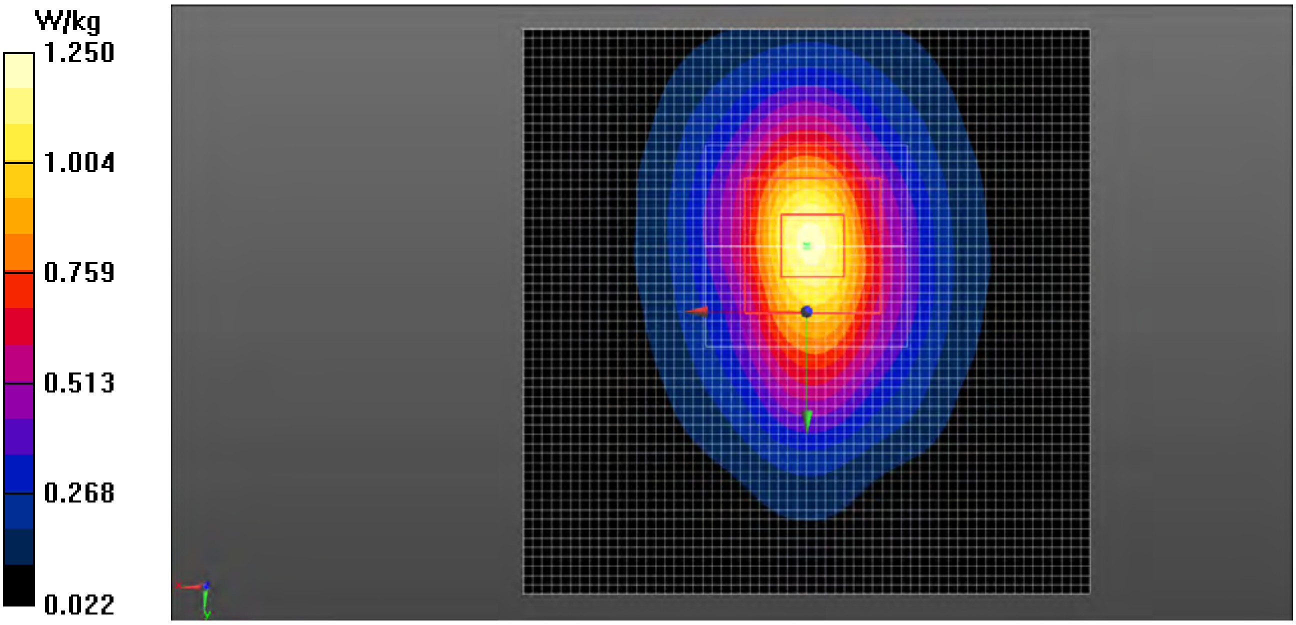
Body/Bottom side Low 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.12 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.595 W/kg

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



LTE Band 26 Body

Date: 9/13/2017

Electronics: DAE4 Sn786

Medium: Body 900 MHz

Medium parameters used: f = 822.5 MHz; σ = 0.976 S/m; ε_r = 52.809; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 822.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(9.41, 9.41, 9.41); Calibrated: 1/23/2017

Body/Rear Side Low_1RB_Low/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

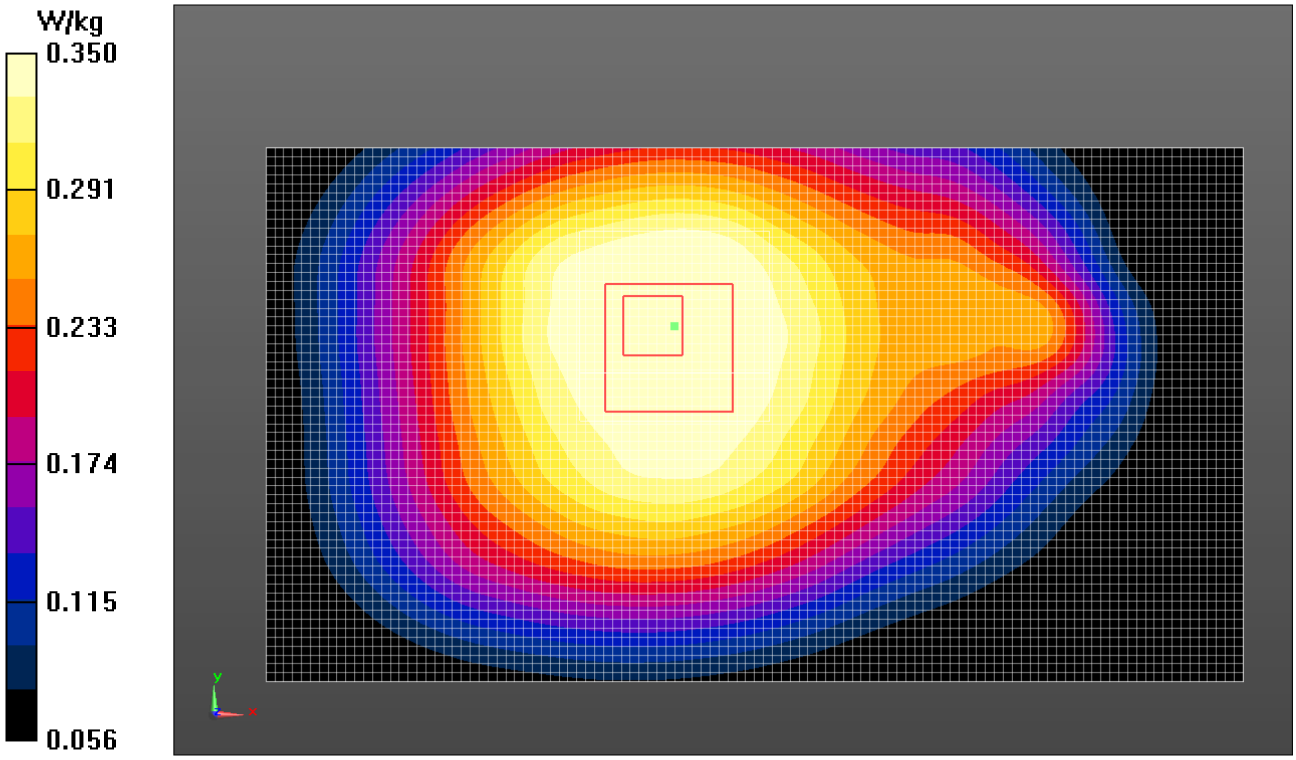
Body/Rear Side Low_1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.97 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.420 W/kg

SAR(1 g) = 0.335 W/kg; SAR(10 g) = 0.261 W/kg

Maximum value of SAR (measured) = 0.350 W/kg



LTE Band 41 Body

Date: 10/11/2017

Electronics: DAE4 Sn786

Medium: 2600Body MHz

Medium parameters used: f = 2549.5 MHz; σ = 2.046 S/m; ε_r = 51.602; ρ = 1000 kg/m^3

Ambient Temperature:22.0^{o}C Liquid Temperature:21.5^{o}C

Communication System: UID 0, LTE_TDD (0) Frequency: 2549.5 MHz Duty Cycle: 1:1.5787

Probe: EX3DV4 - SN3633 ConvF(7.24, 7.24, 7.24); Calibrated: 1/23/2017

Body/Rear side Low-Mid 1RB_Low/Area Scan (121x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.692 W/kg

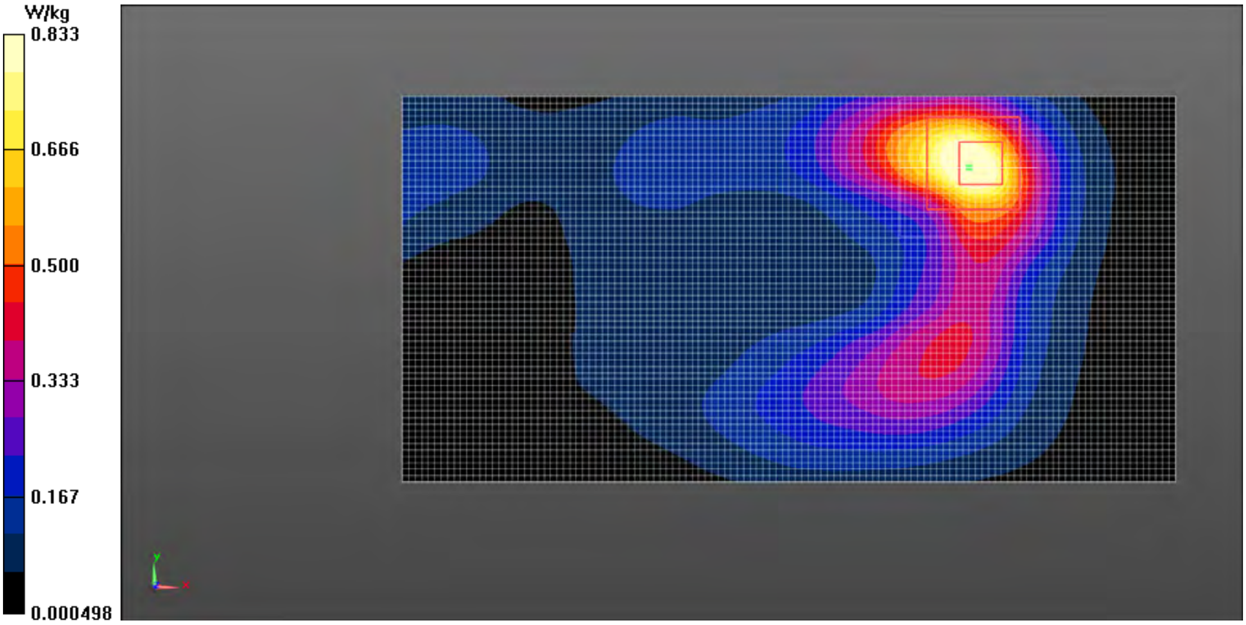
Body/Rear side Low-Mid 1RB_Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.721 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.684 W/kg; SAR(10 g) = 0.323 W/kg

Maximum value of SAR (measured) = 0.693 W/kg



LTE Band 41 Body-HP

Date/Time: 10/11/2017 5:11:47 PM

Electronics: DAE4 Sn786

Medium: 2450Body MHz

Medium parameters used: f = 2680 MHz; σ = 2.206 S/m; ε_r = 49.818; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, LTE_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:1.5787

Probe: EX3DV4 - SN3633 ConvF(7.24, 7.24, 7.24); Calibrated: 1/23/2017

Body/Rear side High 1RB_Low 2/Area Scan 2 (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.807 W/kg

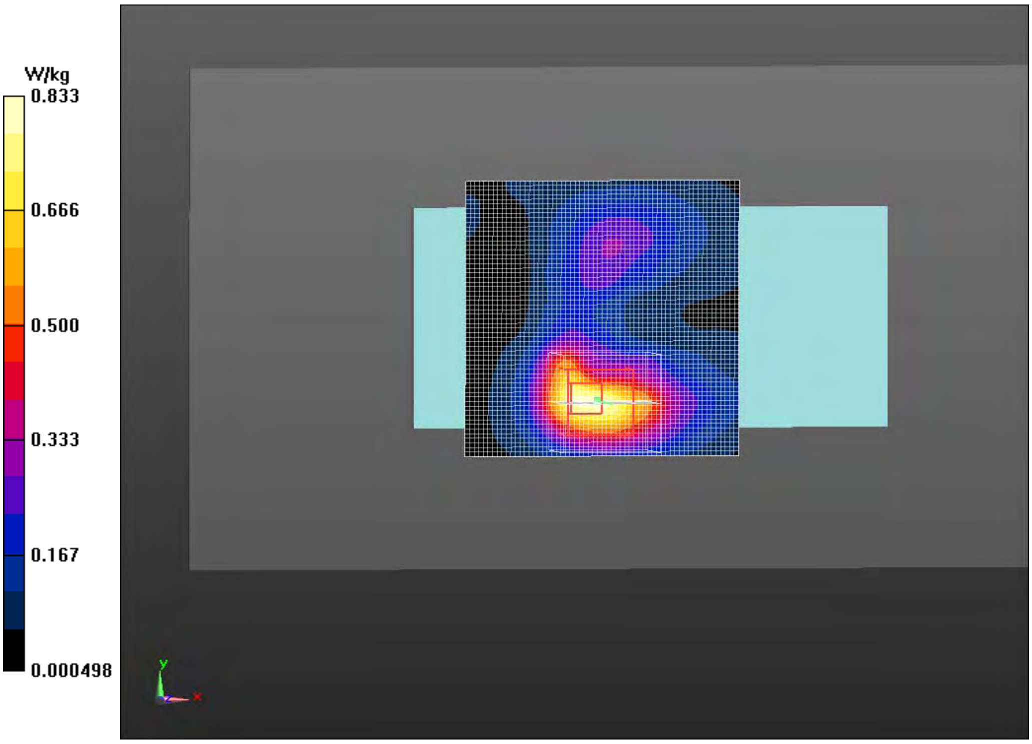
Body/Rear side High 1RB_Low 2/Zoom Scan 2 2 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.124 V/m; Power Drift = not measured

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 0.761 W/kg; SAR(10 g) = 0.367 W/kg

Maximum value of SAR (measured) = 0.833 W/kg



Wifi 2.4G Body

Date: 9/14/2017

Electronics: DAE4 Sn786

Medium: 2450Body MHz

Medium parameters used: f = 2437 MHz; σ = 1.911 S/m; ε_r = 50.568; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C   Liquid Temperature:21.5°C

Communication System: UID 0, WiFi (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(7.37, 7.37, 7.37); Calibrated: 1/23/2017

Body/Rear side Mid/Area Scan (121x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0402 W/kg

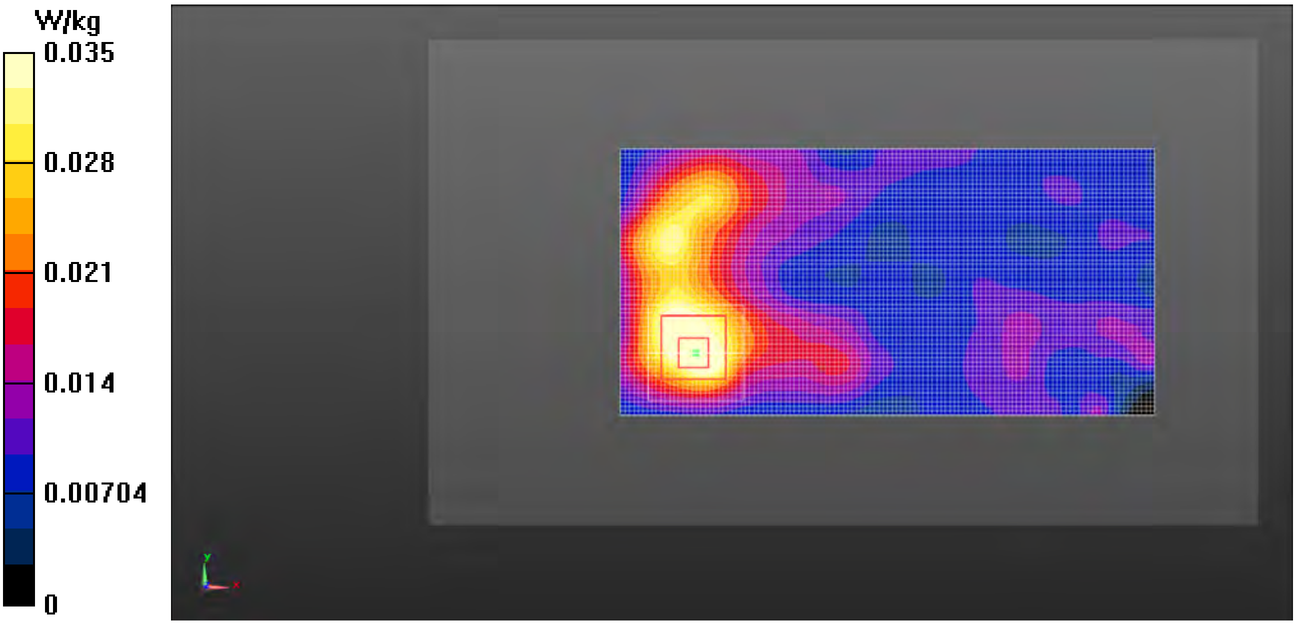
Body/Rear side Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.560 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.0540 W/kg

SAR(1 g) = 0.034 W/kg; SAR(10 g) = 0.025 W/kg

Maximum value of SAR (measured) = 0.0352 W/kg



WIFI5G Body

Date: 9/26/2017

Electronics: DAE4 Sn786

Medium: Body 5000

Medium parameters used: f = 5180 MHz; σ = 5.302 S/m; ε_r = 48.668; ρ = 1000 kg/m^3

Ambient Temperature:22.0°C Liquid Temperature:21.5°C

Communication System: UID 0, WIFI 5G (0) Frequency: 5180 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3633 ConvF(4.82, 4.82, 4.82); Calibrated: 1/23/2017

Body/Rear side Mid/Area Scan (51x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.368 W/kg

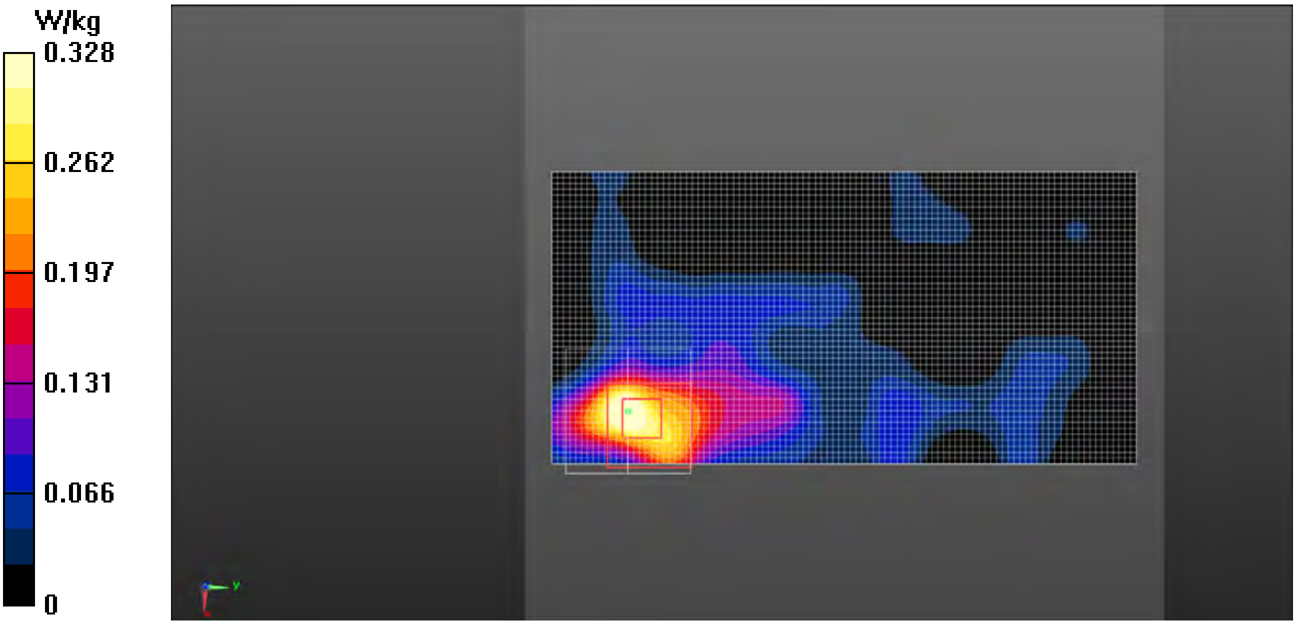
Body/Rear side Mid/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.709 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.631 W/kg

SAR(1 g) = 0.278 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.328 W/kg



Appendix C - Calibration

- Dipole _ D750V3 SN:1163 Calibration No. D750V3-1163_Sep. 16
- Dipole _ D835V2 SN:4d057 Calibration No.Z15-97173
- Dipole _ D18000V2 SN:2d147 Calibration No. Z15-97178
- Dipole _ D1900V2 SN:5d088 Calibration No. Z15-97179
- Dipole _ D2450V2 SN:873 Calibration No. Z15-97180
- Dipole _ D2550V2 SN:1010 Calibration No. D2550V2-1010_Jul. 15
- Dipole _ D5GHzV2 SN:1238 Calibration No. D5GHzV2-1238_Sep. 16
- Probe _ EX3DV4 SN:3633, Calibration No.Z17-97013
- DAE _ DAE4 SN:786 Calibration No. DAE4-786_Dec16

Note: Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dBm, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

Justification of Extended Calibration SAR Dipole D750V3– serial no.1163

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2016-9-19	-26.8		54.5		-1.8	
2017-9-17	-25.4	5.2	53.2	1.3	-2.5	-0.7

Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2016-9-19	-29.0		49.8		-3.5	
2017-9-17	-25.2	13.1	46.9	2.9	-2.8	0.7

Justification of Extended Calibration SAR Dipole D835V2– serial no.4d057

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-22	-29.8		49.2		-3.12	
2016-10-20	-26.7	10.4	47.5	-1.7	-5.74	-2.62

Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-22	-24.7		48.1		-5.38	
2016-10-20	-22.4	9.3	46.7	1.4	-4.86	0.52

Justification of Extended Calibration SAR Dipole D1800V2– serial no.2d147

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-3	-26.9		47.6		-3.68	
2016-9-28	-25.7	4.4	45.8	-1.8	-2.81	0.87
2017-9-25	-25.1	6.7	48.2	0.6	-5.20	-1.52

Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-3	-21.1		44.4		-6.17	
2016-9-28	-22.8	-8.1	46.2	1.8	-5.56	0.61
2017-9-25	-22.9	-8.5	46.8	2.4	-5.32	0.85

Justification of Extended Calibration SAR Dipole D1900V2– serial no.5d088

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-4	-22.4		52.7		7.33	
2016-9-28	-25.3	-12.9	50.8	-1.9	5.82	1.51
2017-9-25	-24.9	-11.2	51.2	-1.5	6.22	1.11

Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-4	-25.4		50.9		5.36	
2016-9-28	-23.7	6.7	48.9	-2.0	2.74	-2.62
2017-9-25	-23.2	8.7	48.3	-2.6	3.84	-1.52

Justification of Extended Calibration SAR Dipole D2450V2– serial no.873

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-30	-26.6		53.4		3.42	
2016-10-20	-25.1	5.6	55.1	1.7	2.91	0.51

Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-10-30	-23.7		50.5		6.53	
2016-10-20	-24.9	5.1	49.2	1.3	7.28	0.75

Justification of Extended Calibration SAR Dipole D2550V2– serial no.1010

Head						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-7-24	-29.5		52.8		-2.0	
2016-7-22	-26.4	10.5	51.1	1.7	-2.62	-0.62
2017-7.21	-27.3	7.5	53.9	1.1	-3.84	-1.84

Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2015-7-24	-36.6		50.0		-1.5	
2016-7-22	-34.2	6.6	52.8	2.8	-2.67	-1.17
2017-7-21	-37.5	-2.5	52.4	2.4	-3.11	-1.61

Justification of Extended Calibration SAR Dipole D5GHzV2– serial no.1238

Head							
Date of Measurement	Frequency	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2016-9-21	5200MHz	-23.6		47.1		5.8	
2017-9-20	5200MHz	-21.7	8.1	48.3	1.2	2.38	2.42
2016-9-21	5300MHz	-29.8		50.5		3.2	
2017-9-20	5300MHz	-27.8	6.7	51.9	1.4	4.51	1.31
2016-9-21	5500MHz	-31.2		49.0		2.5	
2017-9-20	5500MHz	-29.5	5.4	50.3	1.3	1.24	1.26
2016-9-21	5600MHz	-44.1		50.0		0.6	
2017-9-20	5600MHz	-42.6	3.4	51.5	1.5	2.55	1.95
2016-9-21	5800MHz	-25.1		55.6		1.9	
2017-9-20	5800MHz	-23.8	5.2	56.9	1.3	3.04	1.14

Body							
Date of Measurement	Frequency	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (johm)	Delta (johm)
2016-9-21	5200MHz	-28.6		48.6		3.4	
2017-9-20	5200MHz	-26.4	7.7	50.0	1.4	3.72	0.32
2016-9-21	5300MHz	-32.3		49.6		2.4	
2017-9-20	5300MHz	-30.5	5.6	51.3	1.7	3.64	1.24
2016-9-21	5500MHz	-31.7		49.5		2.5	
2017-9-20	5500MHz	-29.8	6.0	51.4	1.9	4.25	1.75
2016-9-21	5600MHz	-31.7		50.8		2.5	
2017-9-20	5600MHz	-29.5	6.9	52.3	1.5	2.91	0.41
2016-9-21	5800MHz	-24.0		56.0		3.0	
2017-9-20	5800MHz	-22.8	5.0	57.3	1.3	4.23	1.23

The Return-Loss is <-20dB, and within 20% of prior calibration; the impedance is within 5 ohm of prior calibration.

Therefore the value result should support extended calibration.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S **Schweizerischer Kalibrierdienst**
C **Service suisse d'étalonnage**
S **Servizio svizzero di taratura**
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **TMC-SZ (Auden)**

Certificate No: D750V3-1163_Sep16

CALIBRATION CERTIFICATE

Object: D750V3 - SN:1163

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: September 19, 2016

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 19, 2016

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, “SAR Measurement Requirements for 100 MHz to 6 GHz”

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.0 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.11 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.26 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.43 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.9 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.20 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.58 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.64 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.5 Ω - 1.8 jΩ
Return Loss	- 26.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.8 Ω - 3.5 jΩ
Return Loss	- 29.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 23, 2016

DASY5 Validation Report for Head TSL

Date: 19.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

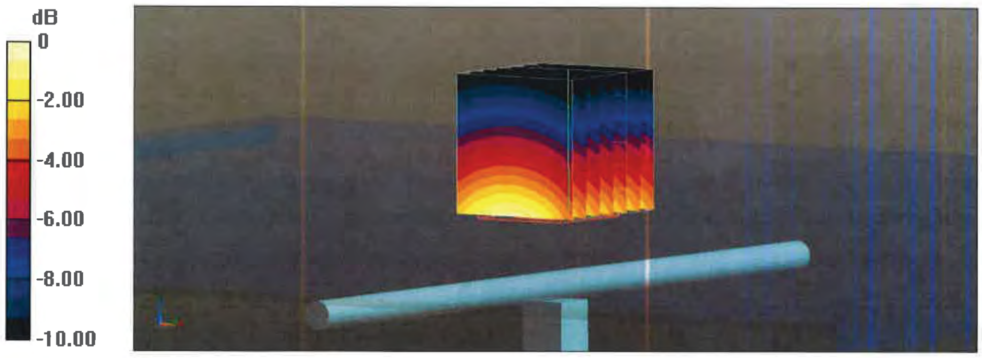
DUT: D750V3 - SN1163; Type: D750V3; Serial: SN1163

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

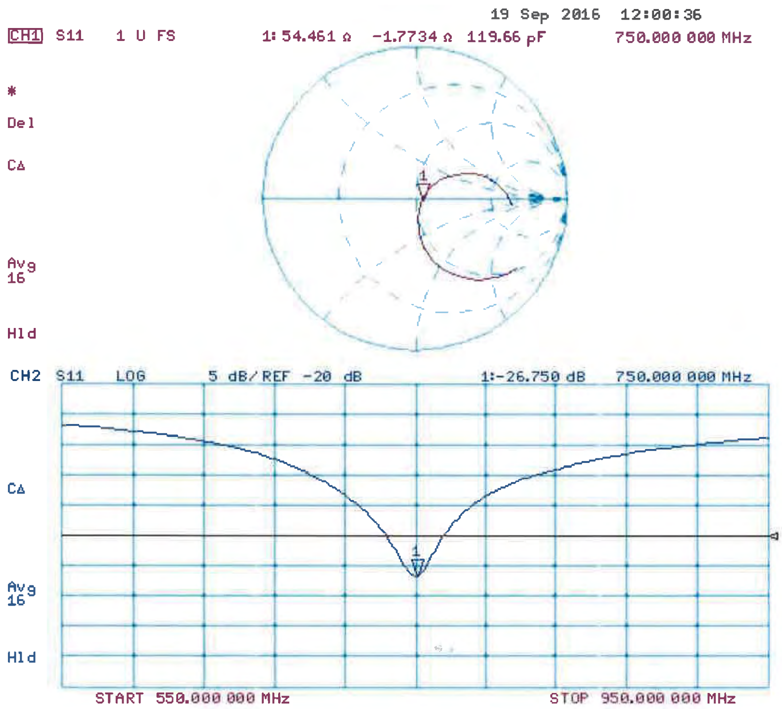
- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.31 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.38 W/kg
Maximum value of SAR (measured) = 2.79 W/kg



0 dB = 2.79 W/kg = 4.46 dBW/kg

Impedance Measurement Plot for Head TSL



Certificate No: D750V3-1163_Sep16 Page 6 of 8

DASY5 Validation Report for Body TSL

Date: 19.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

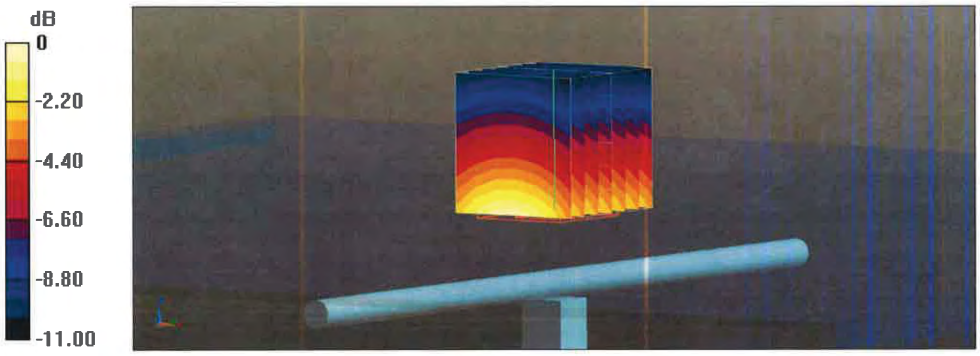
DUT: D750V3 - SN1163; Type: D750V3; Serial: SN1163

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

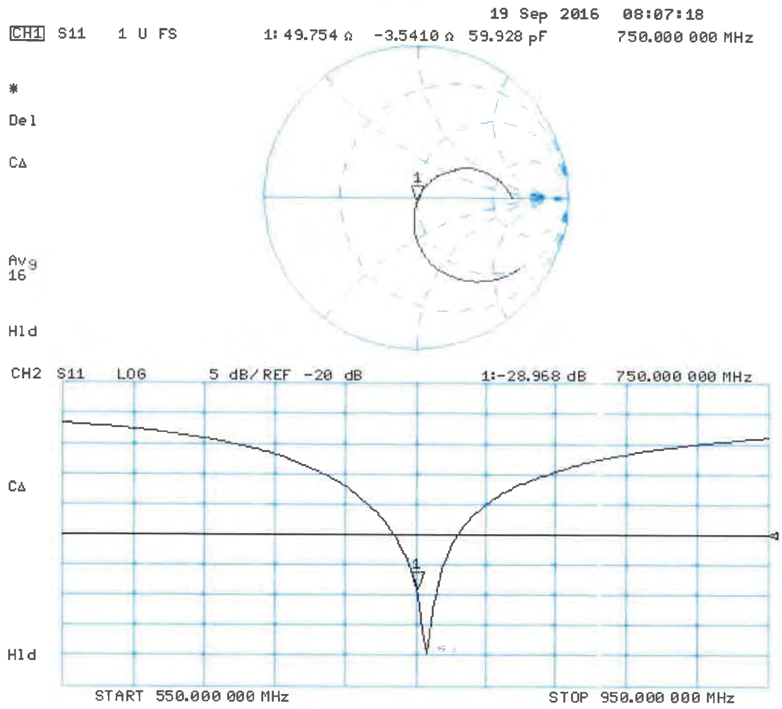
- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.12 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.2 W/kg; SAR(10 g) = 1.44 W/kg
Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

Impedance Measurement Plot for Body TSL



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CALIBRATION
No. L0570

Client CTTL(South Branch) **Certificate No: Z15-97173**

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d057
Calibration Procedure(s)	FD-Z11-2-003-01 Calibration Procedures for dipole validation kits
Calibration date:	October 22, 2015

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Power sensor NRP-Z91	101547	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Reference Probe EX3DV4	SN 3617	26-Aug-15(SPEAG,No.EX3-3617_Aug15)	Aug -16
DAE4	SN 777	26-Aug-15(SPEAG,No.DAE4-777_Aug15)	Aug -16
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	02-Feb-15 (CTTL, No.J15X00729)	Feb-16
Network Analyzer E5071C	MY46110673	03-Feb-15 (CTTL, No.J15X00728)	Feb-16

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	[signature]
Reviewed by:	Qi Dianyuan	SAR Project Leader	[signature]
Approved by:	Lu Bingsong	Deputy Director of the laboratory	[signature]

Issued: October 26, 2015

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Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY52	52.8.8.1222
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.2 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.31 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.22 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.51 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.03 mW /g ± 20.4 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.1 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.34 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.44 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.54 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.20 mW /g ± 20.4 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.2Ω- 3.12jΩ
Return Loss	- 29.8dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.1Ω- 5.38jΩ
Return Loss	- 24.7dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.500 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 10.22.2015

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d057

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.907 S/m; ε_r = 42.15; ρ = 1000 kg/m^3

Phantom section: Center Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.56, 9.56, 9.56); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

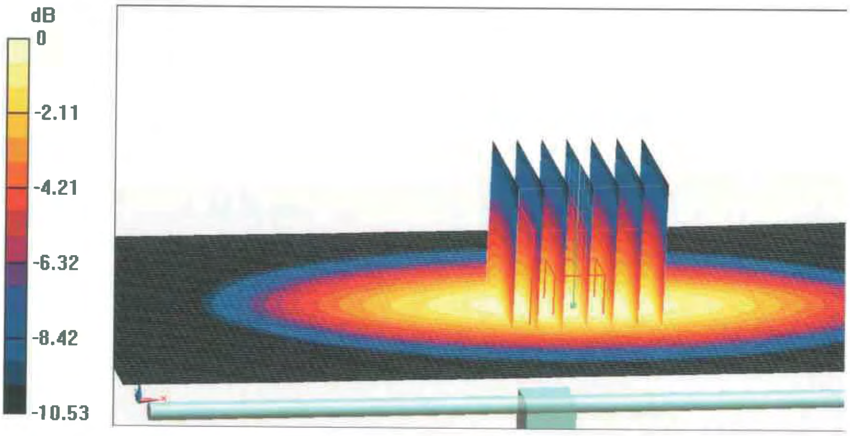
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.74 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.47 W/kg

SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.51 W/kg

Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

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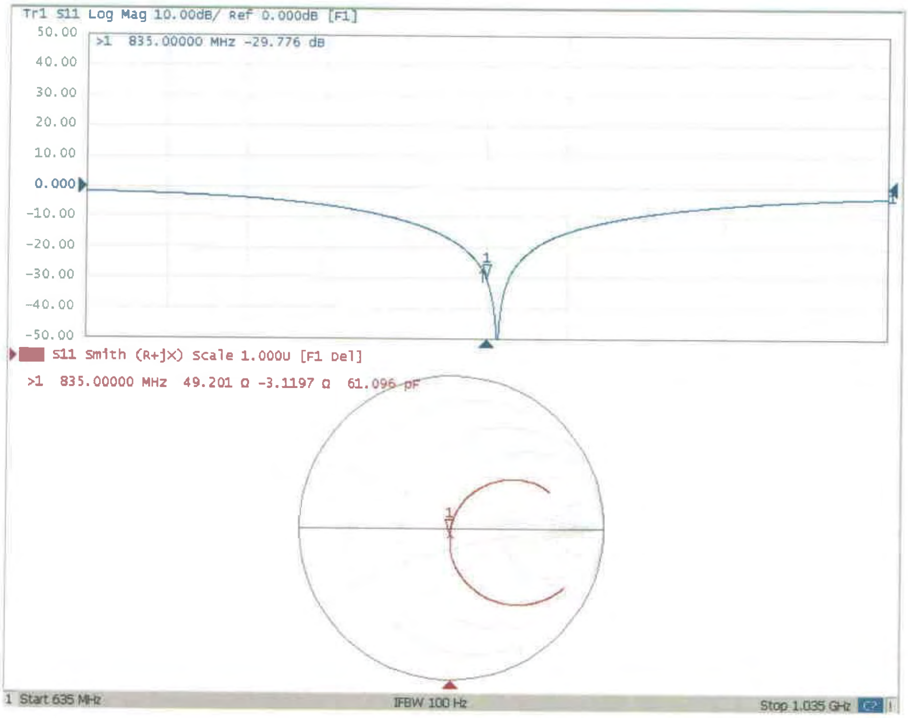
Impedance Measurement Plot for Head TSL



Certificate No: Z15-97173 Page 6 of 8

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DASY5 Validation Report for Body TSL Date: 10.22.2015

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d057

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.958 S/m; ε_r = 55.11; ρ = 1000 kg/m^3

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.71,9.71, 9.71); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

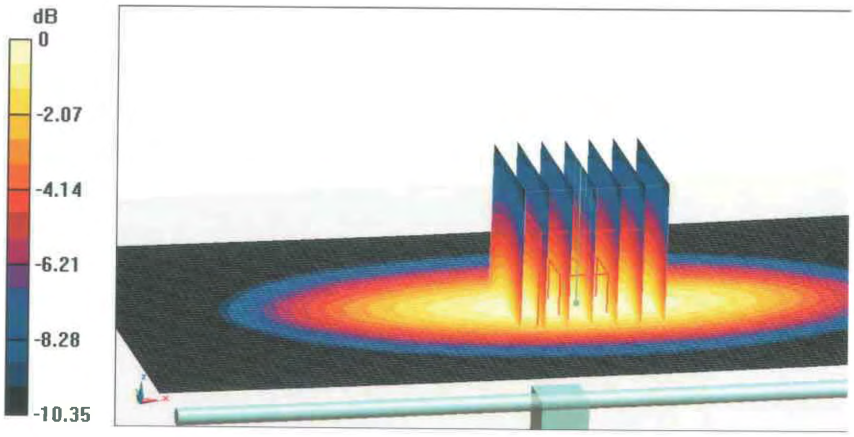
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.68 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.46 W/kg

SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (measured) = 2.95 W/kg



0 dB = 2.95 W/kg = 4.70 dBW/kg

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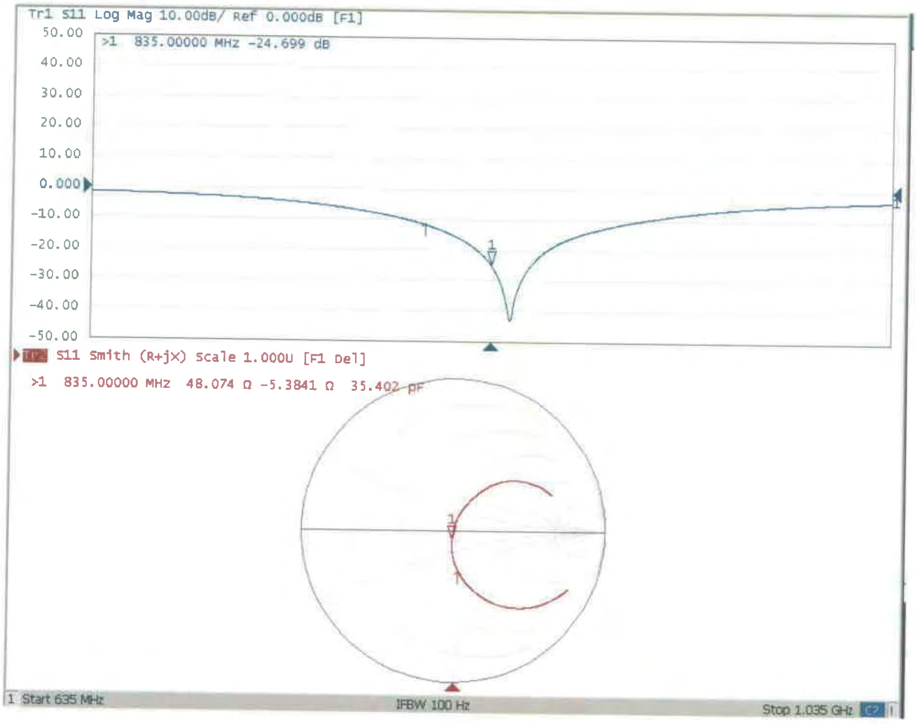
Impedance Measurement Plot for Body TSL



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CALIBRATION
No. L0570

Client CTTL(South Branch) **Certificate No: Z15-97178**

CALIBRATION CERTIFICATE

Object	D1800V2 - SN: 2d147
Calibration Procedure(s)	FD-Z11-2-003-01 Calibration Procedures for dipole validation kits
Calibration date:	November 3, 2015

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Power sensor NRP-Z91	101547	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Reference Probe EX3DV4	SN 3617	26-Aug-15(SPEAG,No.EX3-3617_Aug15)	Aug -16
DAE4	SN 777	26-Aug-15(SPEAG,No.DAE4-777_Aug15)	Aug -16
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	02-Feb-15 (CTTL, No.J15X00729)	Feb-16
Network Analyzer E5071C	MY46110673	03-Feb-15 (CTTL, No.J15X00728)	Feb-16

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: November 8, 2015

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY52	52.8.8.1222
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.70 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**38.8 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.14 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.6 mW /g ± 20.4 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.2 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.83 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**39.6 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.24 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.1 mW /g ± 20.4 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.6Ω- 3.68jΩ
Return Loss	- 26.9dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.4Ω- 6.17jΩ
Return Loss	- 21.1dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.321 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 11.03.2015

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d147

Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1800 MHz; σ = 1.388 S/m; εr = 38.94; ρ = 1000 kg/m3

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(8.13, 8.13, 8.13); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

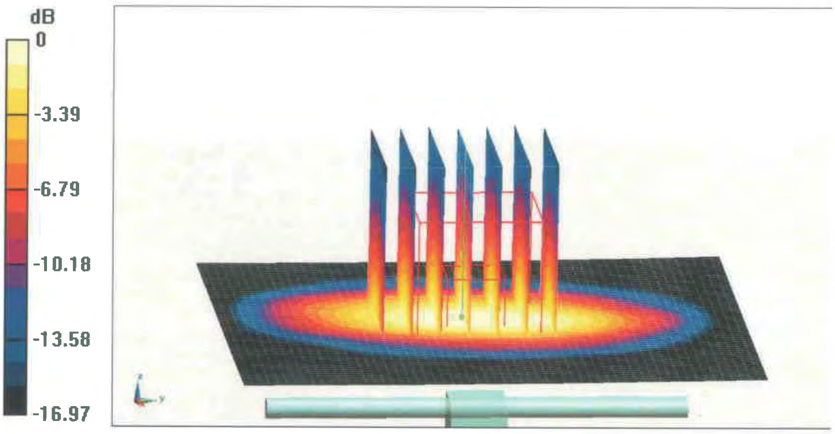
System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.6 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 17.7W/kg

SAR(1 g) = 9.7 W/kg; SAR(10 g) = 5.14 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

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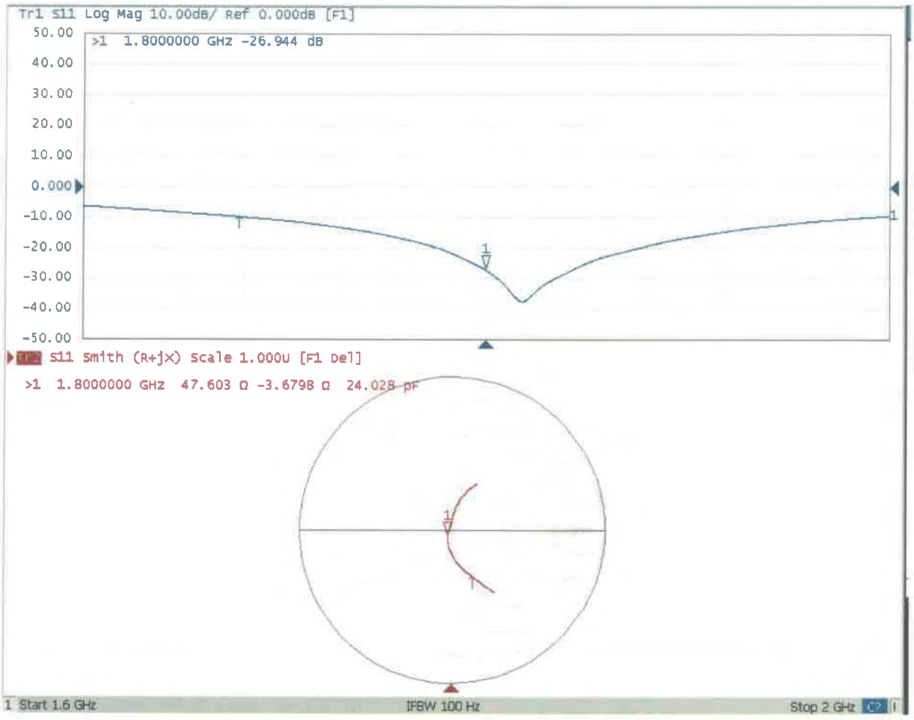
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 11.03.2015

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d147

Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1800 MHz; σ = 1.512 S/m; ε_r = 54.19; ρ = 1000 kg/m^3

Phantom section: Center Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(7.88, 7.88, 7.88); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

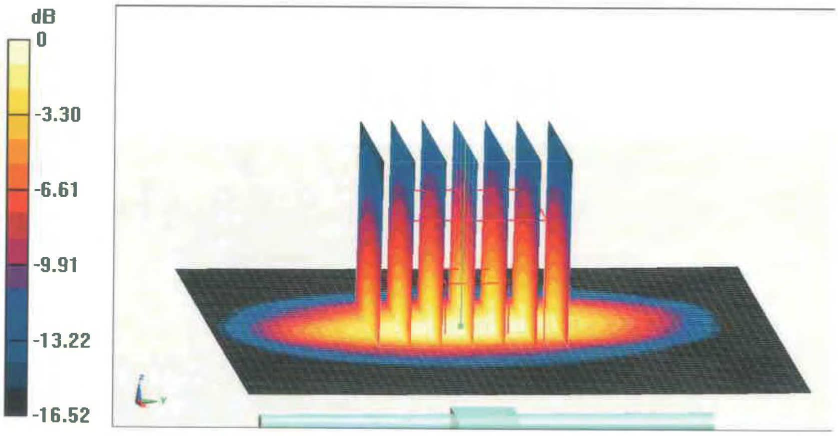
System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.79 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 17.4 W/kg

SAR(1 g) = 9.83 W/kg; SAR(10 g) = 5.24 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

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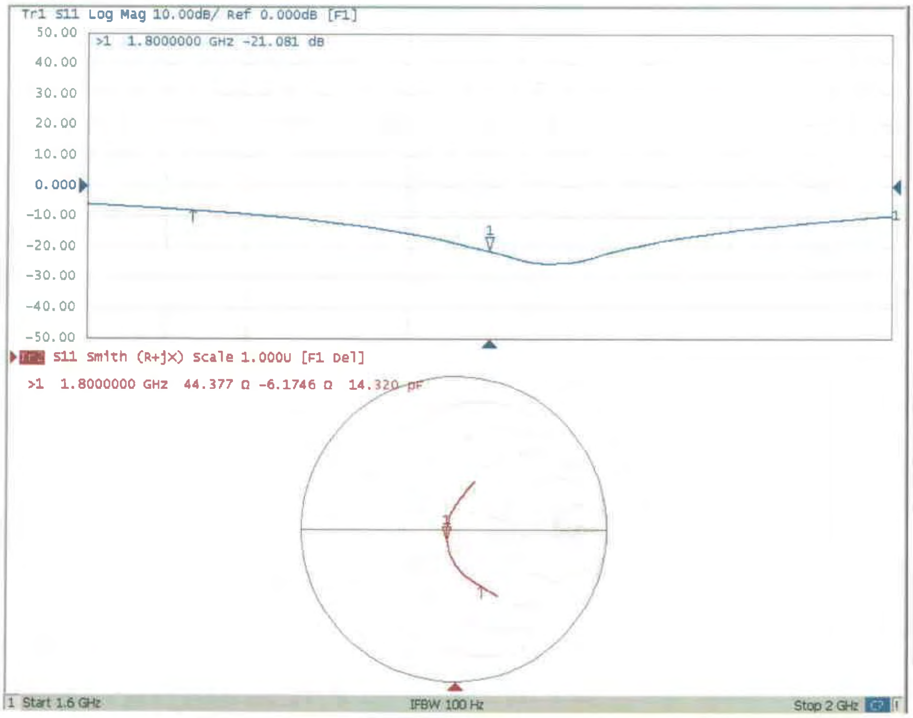
Impedance Measurement Plot for Body TSL



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CALIBRATION No. L0570

Client CTTL(South Branch) **Certificate No: Z15-97179**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d088
Calibration Procedure(s)	FD-Z11-2-003-01 Calibration Procedures for dipole validation kits
Calibration date:	November 4, 2015

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Power sensor NRP-Z91	101547	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Reference Probe EX3DV4	SN 3617	26-Aug-15(SPEAG,No.EX3-3617_Aug15)	Aug -16
DAE4	SN 777	26-Aug-15(SPEAG,No.DAE4-777_Aug15)	Aug -16
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	02-Feb-15 (CTTL, No.J15X00729)	Feb-16
Network Analyzer E5071C	MY46110673	03-Feb-15 (CTTL, No.J15X00728)	Feb-16

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: November 8, 2015

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY52	52.8.8.1222
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.6 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**40.8 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**21.0 mW /g ± 20.4 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.1 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**41.1 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.33 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.3 mW /g ± 20.4 % (k=2)**