TESTING CERT #3478.01

TEST REPORT

EUT Description	**Mobile Phone**
Brand Name	**Unimax Communications**
Model Name	**U307TG / MXG308**
Serial Number	**S/N: MB27560400023 / MB27560400050** (see section 4)
FCC ID	**P46-UMX35INT**
Antenna type	**N/A**
Hardware/Software Version	**HW Config: B1.1, B1.2 / SW: 01.37.ww39_p3.2016** **Test SW : Phone Tool version 218**
Date of Sample Receipt	**2016-03-09**
Date of Test Start/End	**2016-03-09 / 2016-05-1**
Features	**GSM850 / GPRS850 / EDGE850, Multislot Class 12, Power Class 4** **GSM1900 / GPRS1900 / EDGE1900, Multislot Class 12, Power Class 1** **WCDMA II, V / HSDPA, HSUPA, Power Class 3** **WLAN 802.11b/g/n (2.4GHz)** **Bluetooth BDR/EDR v2.1 - Bluetooth LE v4.0** **GNSS** (see section 7)

Applicant	**Unimax Communications**
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Contact Person	**Dan Gannon**
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Reference Standards	**FCC 47 CFR Part §2.1093** (see section 1)	
RF Exposure Environment	**Portable devices - General population/uncontrolled exposure**	
	SAR Result	SAR Limit
Maximum SAR Result & Limit	**1.19 W/kg (1g)**	**1.6 W/kg (1g)**
Min. test separation distance	**2.14mm**	

Test Report number	**160223-01.TR04**
Revision Control	**Rev. 01**

The test results relate only to the samples tested.
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Table of Contents

1. Standards, reference documents and applicable test methods

1. FCC 47 CFR Part §2.1093 - Radiofrequency radiation exposure evaluation: portable devices.
2. FCC OET KDB 248227 D01 v02r02 – SAR guidance for IEEE 802.11 (Wi-Fi) transmitters.
3. FCC OET KDB 447498 D01 v06 – RF exposure procedures and equipment authorization policies for mobile and portable devices.
4. FCC OET KDB 648474 D04 v01r03– SAR Evaluation Considerations for Wireless Handsets.
5. FCC OET KDB 865664 D01 v01r04 – SAR Measurement Requirements for 100 MHz to 6 GHz.
6. FCC OET KDB 865664 D02 v01r02 – RF Exposure Compliance Reporting and Documentation Considerations
7. FCC OET KDB 941225 D01 v03r01– 3G SAR Measurement Procedures.
8. FCC OET KDB 941225 D06 v02r01– SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities.
9. FCC OET KDB 690783 D01 v01r03 SAR Listings on Equipment Authorization Grants
10. IEEE Std 1528-2013 – IEEE Recommended Practice Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communication Devices: Measurement Techniques.
11. R&S Application note 1CM95 – WCDMA RF Measurements with the R&S®CMW500 according to 3GPP TS 34.121.
12. R&S Application note 1CM96 – HSDPA RF Measurements with the R&S®CMW500 in line with 3GPP TS 34.121.
13. R&S Application note 1CM97 – HSUPA RF Measurements with the R&S®CMW500 in line with 3GPP TS 34.121.

2. General conditions, competences and guarantees

- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is a testing laboratory accredited by the American Association for Laboratory Accreditation (A2LA).
- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm listed by the FCC, with Designation Number FR0011.
- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is a Registered Test Site listed by IC, with IC Assigned Code 1000Y.
- ✓ test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.
- ✓ Complete or partial reproduction of the report cannot be made without written permission of Intel WRF Lab.

3. Environmental Conditions

✓ All tests were performed in a laboratory with an environment which avoids influence on SAR measurements by ambient EM sources and any reflection from the environment itself, and the following limits were not exceeded during the tests:

Temperature	22ºC ± 2ºC
Humidity	46% ± 10%
Liquid Temperature	22ºC ± 2ºC

4. Test samples

Sample	Test Item #	Description	Model	Serial #	Date of receipt
#01	16022301.S03	Smartphone Pre-production	U307TG / MXG308	MB27560400023	2016-03-09
#02	16022301.S09	Smartphone Pre-production	U307TG / MXG308	MB27560400050	2016-03-09

✓ Sample #01 has undergone all tests requested by the applicant, following the standards specified in section 1.
✓ Sample #02 has undergone all the conducted power tests requested by the applicant, following the standards specified in section 1.

5. Remarks and comments

1. All power measurements for 3G modes (WCDMA, HSDPA and HSUPA) were performed using a R&S CMW500, properly configured according to FCC OET KDB 941225 D01, and the corresponding R&S application notes detailed in *section 1*.
2. Only the plots for the test positions with the highest measured SAR per band/mode are included in Annex C, as required per FCC OET KDB 865664 D02. Bluetooth plots were not reported as the SAR measurement was close to the noise floor measurement.
3. As per FCC OET KDB 648474 D04, when the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, using the same wireless mode test configuration for voice and data, such as WCDMA, LTE and Wi-Fi, and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).

6. Document Revision History

Revision #	Date	Modified By	Details
Rev. 00	2016-06-01	Cheiel In	First Issue
Rev. 01	2016-06-22	R. Quiroz	• All EDGE-8PSK information was removed. • Device GSM class included in section 7. • Liquid recipes specifications included in A.5. • Liquid parameters updated in B.3. • SAR values corrected in B.4. • SAR values included for 2450MHz in B.4. • SAR Results included in sections B.5.3 and B.5.5. • SAR plots included in Annex C. • Dipoles parameters added in Annex E. • Liquid level photos included in Annex F.

7. Equipment Under Test

Brand Name	Unimax Communications
Model Name	U307TG / MXG308
FCC ID	P46-UMX35INT
Hardware Version	B1.1, B1.2
Software Version	SW: 01.37.ww39_p3.2016
Driver Version	4.31
Prototype / Production	Pre-Production
Dimension	122 x 65.4 x 11 mm
Operational Conditions	Voltage: 3.6 V_{DC} to 4.2 V_{DC}. Rechargeable Li-ion Battery.
Exposure Conditions	Held next to the ear Body worn Personal Wireless Router (hotspot)
Supported Radios	GSM850 / GPRS850 / EDGE850, GSM Class B, Multislot Class 12, Power Class 4 GSM1900 / GPRS1900 / EDGE1900, Multislot Class 12, Power Class 1 WCDMA II, V /HSDPA:,HSUPA, Power Class 3 WLAN 802.11b/g/n (2.4GHz) Bluetooth BDR/EDR v2.1 - Bluetooth LE v4.0 GNSS
Simultaneous Transmission configuration	WLAN 2.4GHz + Cellular BT + Cellular
Antenna Information	See Annex F for more detail information
Additional Information	No proximity sensor is implemented

Supported Radios

Mode	Duty Cycle		Modulation	Band	UL Freq Range (MHz)	Measured Max. Conducted Power (dBm)
GSM	12.5%		GMSK	GSM850	824-849	32.37
				PCS1900	1850-1910	29.59
(E)GPRS	1slot	12.5%	GMSK	GSM850	824-849	26.72
	2slot	25.0%				
	3slot	37.5%		PCS1900	1850-1910	25.34
	4slot	50.0%				
WCDMA HSPA	100%		QPSK 16QAM	FDD II	1850-1910	23.45
				FDD V	824-849	23.69
BDR/EDR v2.1	77%		GFSK π/4 DQPSK	2.4GHz	2400-2483.5	5.45
Bluetooth LE v4.0	62%		GFSK	2.4GHz	2400-2483.5	4.94
802.11b/g/n	100%		BPSK QPSK 16QAM 64QAM	2.4GHz	2400-2483.5	15.81
GNSS	N/A		BPSK	L1	1575.42	N/A

Maximum Output power tune-up tolerance

Band	UL Slot #	Factory Upper Tolerance (dBm)	
		GSM-GMSK	GPRS-GMSK
GSM850	1	33.00	33.00
	2	-	30.00
	3	-	28.20
	4	-	27.00
GSM1900	1	30.00	30.00
	2	-	27.00
	3	-	25.20
	4	-	24.00

Mode	Band	Factory Upper Tolerance (dBm)
WCDMA	FDD II	23.80
	FDD V	23.80

Band	Mode	Data Rate	Factory Upper Tolerance (dBm)
2.4GHz DTS	802.11b	1Mbps	16.00
	802.11g	6Mbps	11.00
	802.11n20	HT0	10.00

Band	Mode	Data Rate	Factory Upper Tolerance (dBm)
2.4GHz DTS	802.15	BDR	5.50
		EDR1/EDR2	5.50
		BLE	5.50

8. Test Verdicts summary

Mode	Band	Highest Reported SAR (1g) (W/kg)		Verdict
		Head	Body	
GSM / GPRS	GSM 850	0.34	0.73	P
	PCS 1900	0.39	0.71	P
WCDMA / HSPA	FDD II	0.76	1.19	P
	FDD V	0.18	0.76	P
802.11b/g/n	2.4GHz	0.31	0.08	P
Bluetooth	2.4GHz	0.04	0.03	P

P: Pass
F: Fail
NM: Not Measured
NA: Not Applicable

According to the FCC OET KDB 690783 D01, this is the summary of the values for the Grant Listing:

Highest Reported SAR (1g) (W/kg)			
Exposure Condition	Equipment Class		
	PCE	DTS	DSS
Head	0.76	0.31	0.04
Simultaneous Tx Head	Sum:0.87	Sum:0.87	Sum:0.80
Body Worn	1.19	0.08	0.03
Simultaneous Tx Body	Sum:1.27	Sum:1.27	Sum:1.20

Considering the results of the performed test according to FCC 47 CFR Part 2.1093 the item under test is IN COMPLIANCE with the requested specifications specified in *section 1.*

Annex A. Test & System Description

A.1 SAR Definition

Specific Absorption rate is defined as the time derivative of the incremental energy (dW) absorbed by (dissipated in) and incremental mass (dm) contained in a volume element (dV) of a given density (ρ).

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

SAR is expressed in units of watts per kilogram (W/kg). SAR can be related to the electric field at a point by

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

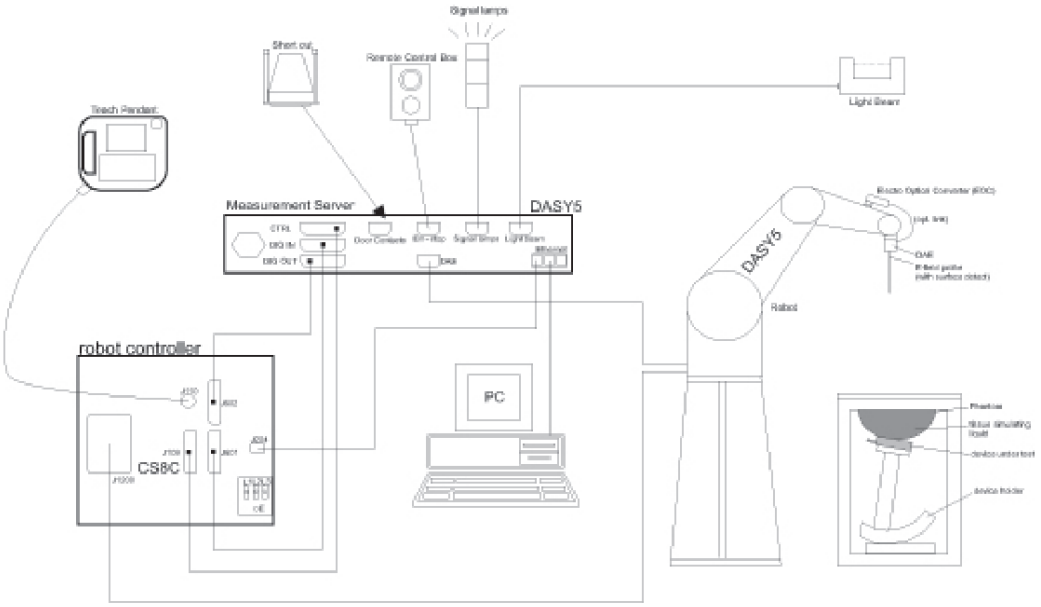
Where:

σ = Conductivity of the tissue (S/m)
ρ = Mass density of the tissue (kg/m3)
E = RMS electric field strength (V/m)

A.2 SPEAG SAR Measurement System

A.2.1 SAR Measurement Setup

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



- ✓ A standard high precision 6-axis robot (Staübli TX/RX family) with controller, teach pendant and software. It includes an arm extension for accommodating the data acquisition electronics (DAE)
- ✓ An isotropic field probe optimized and calibrated for the targeted measurements.
- ✓ 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.
- ✓ The Electro-optical Converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. The EOC signal is transmitted to the measurement server.
- ✓ The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movements interrupts.
- ✓ The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- ✓ A computer running Win7 professional operating system and the DASY5 software.
- ✓ Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- ✓ The phantom, the device holder and other accessories according to the targeted measurement.
- ✓ Tissue simulating liquid.
- ✓ System Validation dipoles.
- ✓ Network emulator or RF test tool

A.2.2 E-Field Measurement Probe

The probe is constructed using three orthogonal dipole sensors arranged on an interlocking, triangular prism core. The probe has built-in shielding against static charges and is contained within a PEEK cylindrical enclosure material at the tip.

The probe's characteristics are:

Frequency Range	30MHz – 6GHz
Length	337 mm
Probe tip external diameter	2.5 mm
Typical distance between dipoles and the probe tip	1 mm
Axial Isotropy (in human-equivalent liquids)	±0.3 dB
Hemispherical Isotropy (in human-equivalent liquids)	±0.5 dB
Linearity	±0.2 dB
Maximum operating SAR	100 W/kg
Lower SAR detection threshold	0.001 W/kg

A.2.3 SAM Phantom

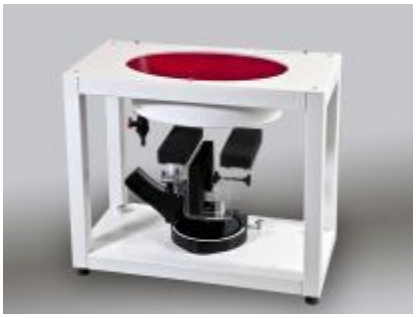
The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the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

The phantom's characteristics are:

Material	Vinylester, glass fiber reinforced (VE-GF)
Shell thickness	2 mm ± 0.2 mm
Shell thickness at ERP	6 ± 0.2 mm
Filling volume	25 Liters
Dimensions	Length: 1000mm / Width: 500mm

A.2.4 Flat Phantom

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



The phantom's characteristics are:

Material	Vinylester, glass fiber reinforced (VE-GF)
Shell thickness	2 mm ± 0.2 mm
Filling volume	30 Liters approx.
Dimensions	Major axis: 600mm / Minor axis: 400mm

A.2.5 Device Positioner

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

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

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.

A simple but effective and easy-to-use extension for the Mounting Device; facilitates testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.); lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI and other Flat Phantoms.

A.3 Data Evaluation

- **Power Reference measurement**

The robot measures the E field in a specified reference position that can be either the selected section's grid reference point or a user point in this section at 4mm of the inner surface of the phantom, 2mm for frequencies above 3GHz.

- **Area Scan**

Measurement procedures for evaluating SAR from wireless handsets typically start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. The SAR distribution is scanned along the inside surface of one side of the phantom head, at least for an area larger than the projection of the handset and antenna. The distance between the measured points and phantom surface should be less than 8 mm, and should remain constant (with variation less than ± 1 mm) during the entire scan in order to determine the locations of the local peak SAR with sufficient accuracy. The angle between the probe axis and the surface normal line is recommended but not required to be less than 30°. If this angle is larger than 30° and the closest point on the probe-tip housing to the phantom surface is closer than a probe diameter, the boundary effect may become larger and polarization dependent. This additional uncertainty needs to be analyzed and accounted for. To achieve this, modified test procedures and additional uncertainty analyses not described in this recommended practice may be required. The measurement and interpolation point spacing should be chosen such as to allow identification of the local peak locations to within one-half of the linear dimension of a side of the zoom-scan volume. Because a local peak having specific amplitude and steep gradients may produce a lower peak spatial-average SAR compared to peaks with slightly lower amplitude and less steep gradients, it is necessary to evaluate these other peaks as well. However, since the spatial gradients of local SAR peaks are a function of the wavelength inside the tissue-equivalent liquid and the incident magnetic field strength, it is not necessary to evaluate local peaks that are less than 2 dB or more below the global maximum peak. Two-dimensional spline algorithms (Brishoual et al. 2001; Press et al., 1996) are typically used to determine the peaks and gradients within the scanned area. If a peak is found at a distance from the scan border of less than one-half the edge dimension of the desired 1 g or 10 g cube, the measurement area should be enlarged if possible.

- **Zoom Scan**

To evaluate the peak spatial-average SAR values for 1 g or 10 g cubes, fine resolution volume scans, called zoom scans, are performed at the peak SAR locations identified during the area scan. The minimum zoom scan volume size should extend at least 1.5 times the edge dimension of a 1 g cube in all directions from the center of the scan volume, for both 1 g and 10 g peak spatial-average SAR evaluations. Along the phantom curved surfaces, the front face of the volume facing the tissue/liquid interface conforms to the curved boundary, to ensure that all SAR peaks are captured. The back face should be equally distorted to maintain the correct averaging mass. The flatness and orientation of the four side faces are unchanged from that of a cube whose orientation is within ± 30° of the line normal to the phantom at the center of the cube face next to the phantom surface. The peak local SAR locations that were determined in the area scan (interpolated values) should be used for the centers of the zoom scans. If a scan volume cannot be centered due to proximity of a phantom shape feature, the probe should be tilted to allow scan volume enlargement. If probe tilt is not feasible, the zoom-scan origin may be shifted, but not by more than half of the 1 g or 10 g cube edge dimension.

After the zoom-scan measurement, extrapolations from the closest measured points to the surface, for example along lines parallel to the zoom-scan centerline, and interpolations to a finer resolution between all measured and extrapolated points are performed. Extrapolation algorithm considerations are described in 6.5.3, and 3-D spline methods (Brishoual et al., 2001; Kreyszig, 1983; Press et al., 1996) can be used for interpolation. The peak spatial-average SAR is finally determined by a numerical averaging of the local SAR values in the interpolation grid, using for example a trapezoidal algorithm for the integration (averaging).

In some areas of the phantom, such as the jaw and upper head regions, the angle of the probe with respect to the line normal to the surface may be relatively large, e.g., greater than ± 30º, which could increase the boundary effect error to a larger level. In these cases, during the zoom scan a change in the orientation of the probe, the phantom, or both is recommended but not required for the duration of

the zoom scan, so that the angle between the probe axis and the line normal to the surface is within 30º for all measurement points.

- **Power Drift measurement**

The robot re-measures the E-Field in the same reference location measured at the Power Reference. The drift measurement gives the field difference in dB from the first to the last reference reading. This allows a user to monitor the power drift of the device under test that must remain within a maximum variation of ±5%.

- **Post-processing**

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE1528 and IEC 62209-1/2 standards. It can be conducted for 1g and 10g.

The software allows evaluations that combine measured data and robot positions, such as:

- ✓ Maximum search
- ✓ Extrapolation
- ✓ Boundary correction
- ✓ Peak search for averaged SAR

Interpolation between the measured points is performed when the resolution of the grid is not fine enough to compute the average SAR over a given mass.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation.

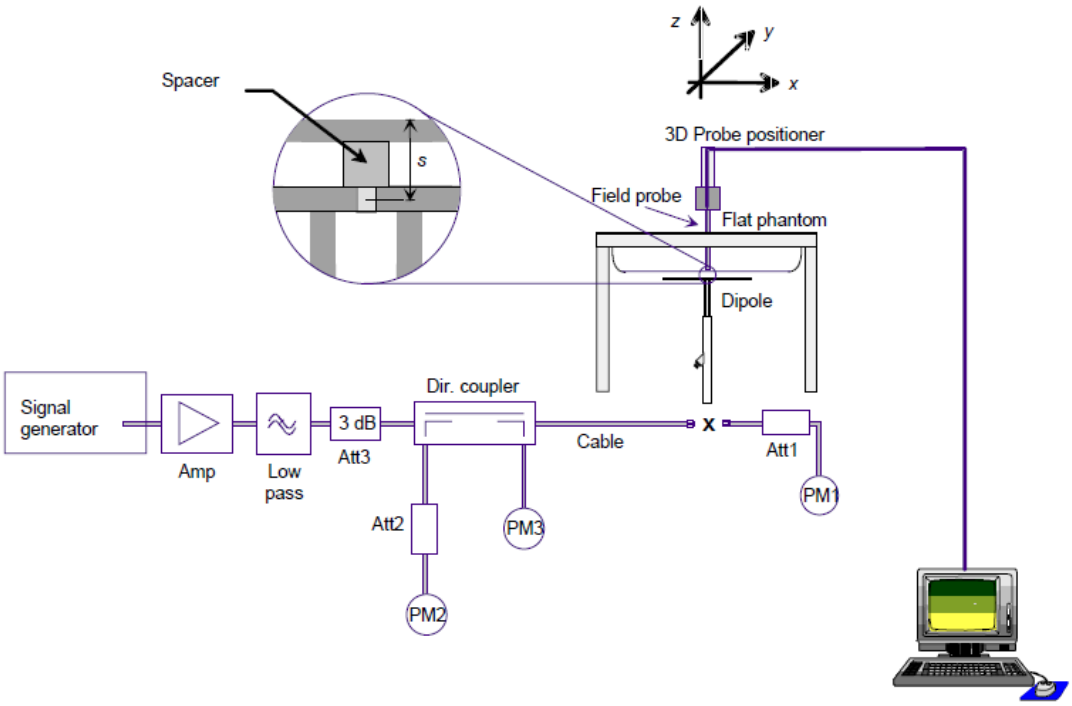
A.4 System and Liquid Check

A.4.1 System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results.

The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

In the simplified setup for system check, the EUT is replaced by a calibrated dipole and the power source is replaced by a controlled continuous wave generated by a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the phantom at the correct distance.



The equipment setup is shown below:

- ✓ Signal Generator
- ✓ Amplifier
- ✓ Directional coupler
- ✓ Power meter
- ✓ Calibrated dipole

The output power on dipole port must be set to 20dBm (100mW) and SAR results are normalized to a forward power of 1W to compare the values with the calibration reports results as described at IEEE 1528 and IEC 62209 standards.

A.4.2 Liquid Check

The dielectric parameters check is done prior to the use of the tissue simulating liquid. The verification is made by comparing the relative permittivity and conductivity to the values recommended by the applicable standards.

The liquid verification was performed using the following test setup:

- ✓ VNA (Vector Network Analyzer)
- ✓ Open-Short-Load calibration kit
- ✓ RF Cable
- ✓ Open-Ended Coaxial probe
- ✓ DAK software tool
- ✓ SAR Liquid
- ✓ De-ionized water
- ✓ Thermometer

These are the target dielectric properties of the tissue-equivalent liquid material as defined in FCC OET KDB 865664 D01.

Frequency	Body SAR		Head SAR	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	61.9	0.80	52.3	0.76
300	58.2	0.92	45.3	0.87
450	56.7	0.94	43.5	0.87
835	55.2	0.97	41.5	0.90
900	55.0	1.05	41.5	0.97
1450	54.0	1.30	40.5	1.20
1800-2000	53.3	1.52	40.0	1.40
2450	52.7	1.95	39.2	1.80

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)

The measurement system implement a SAR error compensation algorithm as documented in IEEE Std 1528-2013 (equivalent to draft standard IEEE P1528-2011) to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters (applied to only scale up the measured SAR, and not downward) so, according to FCC OET KDB 865664 D01, the tolerance for ε_r and σ may be relaxed to ± 10%.

A.5 Test Equipment List

SPEAG SAR System

Device	Type/Model	Serial Number	Manufacturer	Calibration Date	Calibration Due
Dosimetric E-field Probe	EX3DV4	3978	SPEAG	2015-06-15	2016-06-15
Data Acquisition Electronics	DAE4	1429	SPEAG	2015-06-11	2016-06-11
Electro-Optical Converter	EOC60	-	SPEAG	NA	NA
Light Beam Unit	LB5 / 80	-	di-soric	NA	NA
6-axis Robot	TX60 L	F12/5MZ3A1/A/01	STAÜBLI	NA	NA
Robot Controller	CS8C	F12/5MZ3A1/C/01	STAÜBLI	NA	NA
Measurement Server	DASY5 P/N: SE UMS 011 EA	1444	SPEAG	NA	NA
SAM Phantom	Twin SAM v5.0	1838	SPEAG	NA	NA
Oval Flat Phantom	ELI v5.0	1260	SPEAG	NA	NA
Handset Positioner	P/N SD 000 H01 KA	-	SPEAG	NA	NA
Dielectric Probe Kit	DAKS-3.5	1037	SPEAG	2014-06-24	2016-06-24
Vector Reflectometer	PLANAR R140	0131013	Copper Mountain Technologies	2015-08-06	2017-08-06
835MHz System Validation Dipole	D835V2	4d192	SPEAG	2015-01-23	2017-01-23
1900MHz System Validation Dipole	D1900V2	5d197	SPEAG	2015-01-14	2017-01-14
2450MHz System Validation Dipole	D2450V2	937	SPEAG	2014-06-24	2016-06-24
DASY software	-	9-618AE2F1	SPEAG	NA	NA
DAKS software	-	9-2687B491	SPEAG	NA	NA

Shared Instrumentation

Device	Type/Model	Serial Number	Manufacturer	Calibration Date	Calibration Due
Communication Tester	CMW500	152720	R&S	2015-03-19	2017-03-19
Temperature & Humidity Logger	TR-72NW-H + HHA-3151	Logger: 62180216 / Sensor: 0202622A	TandD	2016-02-01	2018-02-01
USB Power Sensor	NRP-Z81	102278	R&S	2015-09-10	2017-09-10
USB Power Sensor	NRP-Z81	102279	R&S	2015-09-10	2017-09-10
Vector Signal Generator	ESG E4438C	MY45092885	Agilent	NA	NA
Thermometer	TESTO 922	33622932	Testo	2015-09-29	2017-09-29
Power Amplifier	-	MODU-023-B-0001	SATIMO	NA	NA
Coupler	CD0.5-8-20-30	1251-002	Amd-group	NA	NA
Antenna	ANTA39	26/12 ANTA39	SATIMO	NA	NA
Vector Network Analizer	MS2025B	1301107	Anritsu	2015-09-23	2017-09-23

Tissue Simulant Liquids

TSL	Manufacturer / Model	Freq Range (MHz)	Main Ingredients
Head 835	SATIMO HL835	800-900	1-2 Propanediol (64.81%), H_2O (34.4%), NaCl (0.79%)
Head 1900	SATIMO HL1900	1800-1900	Triton X-100 (30.45%), H_2O (55.36%), NaCl (0.35%), DGBE (13.84%)
Head 2450	SPEAG HSL2450V2	2400-2700	H_2O (49.75%), NaCl (0.5%), DGBE (49.75%)
Body 835	SATIMO BL835	800-900	1-2 Propanediol (64.81%), H_2O (34.4%), NaCl (0.79)
Body 1900	SATIMO BL1900	1800-1900	Triton X-100 (30.45%), H_2O (55.36%), NaCl (0.35%), DGBE (13.84%)
Body 2450	SPEAG MSL2450V2	2400-2700	H_2O (49.75%), NaCl (0.5%), DGBE (49.75%)

A.6 Measurement Uncertainty Evaluation

DASY5 Uncertainty Budget According to IEEE 1528-2013 and IEC 62209-1/2011 (3 - 6 GHz range)								
Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) veff
Measurement System								
Probe Calibration	±6.55 %	N	1	1	1	±6.55 %	±6.55 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±2.0 %	R	√3	1	1	±1.2 %	±1.2 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Modulation Response	±2.4 %	R	√3	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Probe Positioning	±6.7 %	R	√3	1	1	±3.9 %	±3.9 %	∞
Max. SAR Eval.	±4.0 %	R	√3	1	1	±2.3 %	±2.3 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Power Scaling	±0 %	R	√3	1	1	±0.0 %	±0.0 %	∞
Phantom and Setup								
Phantom Uncertainty	±6.6 %	R	√3	1	1	±3.8 %	±3.8 %	∞
SAR correction	±1.9 %	R	√3	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.)DAK	±2.5 %	R	√3	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) DAK	±2.5 %	R	√3	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity BB	±3.4 %	R	√3	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity BB	±0.4 %	R	√3	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±12.3 %	±12.2 %	748
Expanded STD Uncertainty						**±24.6 %**	**±24.5 %**	

SPEAG System Uncertainty budget (IEEE 1528-2013 & IEC 62209-1:2011)

DASY5 Uncertainty Budget According to IEC 62209-2/2010 (30 MHz - 6 GHz range)								
Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) veff
Measurement System								
Probe Calibration	±6.55 %	N	1	1	1	±6.55 %	±6.55 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
Modulation Response	±2.4 %	R	√3	1	1	±1.4 %	±1.4 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Boundary Effects	±2.0 %	R	√3	1	1	±1.2 %	±1.2 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Probe Positioning	±6.7 %	R	√3	1	1	±3.9 %	±3.9 %	∞
Post-processing	±4.0 %	R	√3	1	1	±2.3 %	±2.3 %	∞
Test Sample Related								
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Test sample Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Power Scaling	±0 %	R	√3	1	1	±0.0 %	±0.0 %	∞
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Phantom and Setup								
Phantom Uncertainty	±7.9 %	R	√3	1	1	±4.4 %	±4.4 %	∞
SAR correction	±1.9 %	R	√3	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.)DAK	±2.5 %	R	√3	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) DAK	±2.5 %	R	√3	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity BB	±3.4 %	R	√3	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity BB	±0.4 %	R	√3	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±12.5 %	±12.4 %	748
Expanded STD Uncertainty						**±25.1 %**	**±25.0 %**	

SPEAG System Uncertainty budget (IEC 62209-2:2010)

A.7 RF Exposure Limits

SAR assessments have been made in line with the requirements of FCC 47 CFR Part §2.1093 on the limitation of exposure of the general population / uncontrolled exposure for portable devices.

Exposure Type	General Population / Uncontrolled Environment
Peak spatial-average SAR (averaged over any 1 gram of tissue)	**1.6 W/kg**
Whole body average SAR	**0.08 W/kg**
Peak spatial-average SAR (extremities) (averaged over any 10 grams of tissue)	**4.0 W/kg**

Annex B. Test Results

B.1 Test Conditions

B.1.1 SAR Test positions relative to the phantom

For both voice (GSM, WCDMA) and only-data modes (GPRS, EDGE, HSPA, 802.11b/g/n), the EUT was tested for head and body-worn exposure conditions.

For head tests, the EUT was placed in cheek and tilt position on the right/left side of the SAM phantom.

For body worn[1] tests, according to the hotspot mode described in FCC OET KDB 648474 D04 and FCC OET 941225 D06, all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge was placed against the flat phantom surface using a 10mm separation distance. Considering the antenna location diagrams in *Annex* F the surfaces/edges to be measured are:

- Cellular Antenna: Front Face, Back Face, Left Edge, Right Edge and Bottom Edge.
- WLAN Antenna: Front Face, Back Face, Right Edge, Left Edge and Top Edge.

B.1.2 Test signal, Output power and Test Frequencies

For cellular (2G,3G) modes, the device was put into operation by using a R&S CMW500 as base station simulator.

For WLAN 802.11b/g/n (2.4GHz) mode,the device was put into operation by using an own control software (Phone Tool version 218) to program the test mode required for select the continuous transmission with 100% duty cycle.

The output power of the device was set to transmit at maximum power for all tests.

[1] See comment 3 in section *5. Remarks and comments*

B.1.3 Evaluation Exclusion and Test Reductions

SAR test reduction

General SAR test reduction

According to FCC OET KDB 447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

SAR Test reduction

Transmission Mode	SAR test exclusion/reduction
WLAN SAR test reduction	
DSSS	According to FCC OET KDB 248227 D01 v02r02, an *initial test configuration* is determined for OFDM and DSSS transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. SAR test reduction for subsequent highest output test channels is determined according to reported SAR of the initial test configuration. According to FCC OET KDB 248227 D01 v02r02, SAR is measured for 2.4 GHz 802.11b, SAR test reduction is determined according to the following: ▪ When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration. ▪ When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel.
OFDM	According to FCC OET KDB 248227 D01 v02r02, SAR is not required for 2.4 GHz OFDM conditions 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
WWAN SAR test reduction	
GPRS EDGE	According to FCC OET KDB 941225 D01 and FCC Public Notice DA 02-1438, SAR evaluation for low-power modes is required only when the SAR produced for the highest power mode is larger 0.8W/kg.
HSDPA HSUPA	According to FCC OET KDB 941225 D01, SAR evaluation is not required when the maximum output power and tune-up tolerance specified for production units in a secondary mode (HSPA) is ≤ ¼ dB higher than the primary mode (RMC) 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
All – Hotspot mode	According to FCC OET KDB 941225 D06, SAR must be measured for all sides (edges) and surfaces with a transmitting antenna located at ≤ 25 mm from that surface or edge, for the data modes, wireless technologies and frequency bands supporting hotspot mode.

B.2 Conducted Power Measurements

B.2.1 GSM / GPRS

Band	Mode	# UL slots	Channel	Freq. (MHz)	Burst Averaged Power (dBm)	Calculated Time Averaged Power (dBm)	Factory Upper Tolerance (dBm)
GSM850	GSM	1	128	824.2	32.24	23.21	33.00
			190	836.6	32.28	23.25	33.00
			251	848.8	**32.37**	23.34	33.00
	GPRS GMSK	1	128	824.2	32.24	22.44	33.00
			190	836.6	32.28	22.55	33.00
			251	848.8	32.37	22.57	33.00
		2	128	824.2	28.56	22.54	30.00
			190	836.6	28.50	22.48	30.00
			251	848.8	28.55	22.53	30.00
		3	128	824.2	26.71	22.45	28.20
			190	836.6	26.67	22.41	28.20
			251	848.8	26.68	22.42	28.20
		4	128	824.2	25.50	22.49	27.00
			190	836.6	25.53	22.52	27.00
			251	848.8	25.50	22.49	27.00

Max value

$$Calculated\ Time\ Averaged\ Power\ = Burst\ Averaged\ Power - 10log\left(\frac{1}{\#UL\ Slots/_8}\right)$$

Band	Mode	# UL slots	Channel	Freq. (MHz)	Burst Averaged Power (dBm)	Calculated Time Averaged Power (dBm)	Factory Upper Tolerance (dBm)
GSM1900	GSM	1	512	1850.2	29.10	20.07	30.00
			661	1880	29.22	20.19	30.00
			810	1909.8	**29.59**	20.56	30.00
	GPRS GMSK	1	512	1850.2	29.10	20.07	30.00
			661	1880	29.22	20.19	30.00
			810	1909.8	29.59	20.56	30.00
		2	512	1850.2	26.05	20.03	27.00
			661	1880	26.06	20.04	27.00
			810	1909.8	26.13	20.11	27.00
		3	512	1850.2	24.03	20.02	25.20
			661	1880	24.08	20.04	25.20
			810	1909.8	24.60	20.04	25.20
		4	512	1850.2	22.80	19.79	24.00
			661	1880	22.86	19.85	24.00
			810	1909.8	22.85	19.84	24.00

Max value

$$Calculated\ Time\ Averaged\ Power\ = Burst\ Averaged\ Power - 10log\left(\frac{1}{\#UL\ Slots/8}\right)$$

B.2.2 WCDMA / HSPA

Mode	Band	Channel	Frequency(MHz)	Power (dBm) 12.2kbps RMC	Factory Upper Tolerance (dBm)
WCDMA	FDD II	9262	1852.4	23.38	23.80
		9400	1880	**23.45**	23.80
		9538	1907.6	23.31	23.80
	FDD V	4132	826.4	**23.69**	23.80
		4175	835	23.57	23.80
		4233	846.6	23.50	23.80

Max value

Mode	Band	Channel	Freq. (MHz)	Averaged Power (dBm) Subtest 1	Subtest 2	Subtest 3	Subtest 4
HSDPA	FDD II	9262	1852.4	22.71	22.73	22.72	22.75
		9400	1880	22.75	22.76	22.8	22.79
		9538	1907.6	22.56	22.53	22.55	22.57
	FDD V	4132	826.4	23.38	23.43	23.43	23.43
		4175	835	23.15	23.15	23.15	23.15
		4233	846.6	23.12	23.14	23.13	23.13

Mode	Band	Channel	Freq. (MHz)	Averaged Power (dBm) Subtest 1	Subtest 2	Subtest 3	Subtest 4	Subtest 5
HSUPA	FDD II	9262	1852.4	21.68	22.21	21.18	22.49	23.40
		9400	1880	21.71	22.20	21.22	22.53	23.42
		9538	1907.6	21.56	22.08	21.08	22.33	23.42
	FDD V	4132	826.4	22.12	22.91	21.8	23.19	22.15
		4175	835	22.20	22.70	21.63	22.96	23.44
		4233	846.6	22.13	22.64	21.62	22.91	23.40

B.2.3 WLAN 2.4GHz (DTS)

Band	Mode	Data Rate	Ch #	Freq [MHz]	Main		SAR Test?
					Avg Pwr [dBm]	Tune-up Pwr [dBm]	
2.4GHz (DTS)	802.11b	1Mbps	1	2412	15.63	16.00	Yes
			6	2437	**15.81**	16.00	
			11	2462	15.71	16.00	
	802.11g	6Mbps	1	2412	NR[1]	11.00	No[2]
			6	2437		11.00	
			11	2462		11.00	
	802.11n20	HT0	1	2412		10.00	No[2]
			6	2437		10.00	
			11	2462		10.00	

Initial test configuration

1. NR: Not Required
2. As per FCC OET KDB 248227 D01, conducted output power and SAR testing are not required for 802.11g/n20/n40 channels 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 ≤ 1.2W/kg

B.2.4 Bluetooth

Band	Mode	Data Rate	Channel	Frequency (MHz)	Avg Pwr [dBm])	Max output Pwr [dBm])
2.4GHz	Bluetooth v2.1	Basic rate GFSK	0	2402	5.20	5.50
			39	2441	4.76	5.50
			78	2480	4.30	5.50
	Bluetooth v2.1	Basic rate π/4-DQPSK	0	2402	**5.45**	5.50
			39	2441	5.08	5.50
			78	2480	4.70	5.50
	Bluetooth v2.1	Basic rate 8-DPSK	0	2402	5.43	5.50
			39	2441	5.07	5.50
			78	2480	4.62	5.50
	Bluetooth v4.0	Low energy GFSK	0	2402	4.94	5.00
			19	2441	4.61	5.00
			39	2480	4.21	5.00

Initial test configuration

B.3 Tissue Parameters Measurement

Head TSL

Freq. (MHz)	Target Parameters		Measured TSL Parameters		Deviation (%)		Date
	ε'	σ	ε'	σ	ε'	σ	
835	41.55	0.91	39.40	0.89	-5.20	-2.53	2016-03-22
1900	40.00	1.40	38.59	1.44	-3.52	2.59	2016-03-15
2450	39.20	1.80	35.73	1.93	-8.85	7.39	2016-06-14

Body TSL

Freq. (MHz)	Target Parameters		Measured TSL Parameters		Deviation (%)		Date
	ε'	σ	ε'	σ	ε'	σ	
835	55.21	0.98	53.36	0.99	-3.34	0.52	2016-03-23
1900	53.30	1.52	50.06	1.59	-6.08	4.71	2016-03-15
2450	52.70	1.95	47.69	2.06	-9.50	5.82	2016-06-14

See Annex D for more details.

B.4 System Check Measurements

Head Measurements

Frequency (MHz)	Average	Target SAR (W/g)	Measured SAR (W/g)	Drift (%)	Limit (%)	Date
835	1g	9.17	9.07	-1.07	10	2016-03-22
	10g	6.00	5.93	-1.10		
1900	1g	40.30	38.67	-4.05		2016-03-15
	10g	21.20	20.18	-4.80		
2450	1g	52.80	55.66	5.41		2016-06-14
	10g	24.80	25.53	2.93		

Body Measurements

Frequency (MHz)	Average	Target SAR (W/g)	Measured SAR (W/g)	Drift (%)	Limit (%)	Date
835	1g	9.41	9.83	4.48	10	2016-03-16
	10g	6.18	6.51	5.30		
1900	1g	40.50	42.36	4.59		2016-03-15
	10g	21.50	21.98	2.22		
2450	1g	51.00	52.47	2.89		2016-06-14
	10g	24.00	24.38	1.58		

See Annex C for more details.

B.5 Cellular SAR Test Results

B.5.1 GSM / GPRS – GSM 850

Head

Mode	Channel	Freq (MHz)	Position	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot#
GSM / Voice 1UL	251	848.8	Left Tilt	0.63	0.136	0.16	
			Left Touch	0.63	0.212	0.25	
			Right Tilt	0.63	0.162	0.19	
			Right Touch	0.63	0.298	0.34	**1**

Body

Mode	Channel	Freq (MHz)	Position	Dist (mm)	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
GSM / Voice 1UL	251	848.8	Front face	10	0.63	0.392	0.45	
			Back face		0.63	0.635	0.73	**2**
			Left edge		0.63	0.260	0.30	
			Right edge		0.63	0.241	0.28	
			Bottom edge		0.63	0.071	0.08	

B.5.2 GSM / GPRS – PCS 1900

Head

Mode	Channel	Freq (MHz)	Position	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot#
GSM / Voice 1UL	810	1909.8	Left Tilt	0.41	0.093	0.10	
			Left Touch	0.41	0.207	0.23	
			Right Tilt	0.41	0.115	0.13	
			Right Touch	0.41	0.352	0.39	**3**

Body

Mode	Channel	Freq (MHz)	Position	Dist (mm)	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
GSM / Voice 1UL	810	1909.8	Front face	10	0.41	0.352	0.39	
			Back face		0.41	0.648	0.71	**4**
			Left edge		0.41	0.068	0.08	
			Right edge		0.41	0.162	0.18	
			Bottom edge		0.41	0.381	0.42	

B.5.3 WCDMA / HSPA – FDD II

Head

Mode	Channel	Freq (MHz)	Position	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
12.2kbps RMC	9400	1880	Left Tilt	0.35	0.147	0.16	
			Left Touch	0.35	0.465	0.50	
			Right Tilt	0.35	0.152	0.16	
			Right Touch	0.35	0.704	0.76	**5**

Body

Mode	Channel	Freq (MHz)	Position	Dist (mm)	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
12.2kbps RMC	9400	1880	Front face	10	0.35	0.681	0.74	
			Back face		0.35	1.100	1.19	**6**
			Left edge		0.35	0.114	0.12	
			Right edge		0.35	0.282	0.31	
			Bottom edge		0.35	0.663	0.72	
12.2kbps RMC	9262	1852.4	Back face	10	0.42	1.040	1.15	
12.2kbps RMC	9538	1907.6	Back face	10	0.49	0.999	1.12	

B.5.4 WCDMA / HSPA – FDD V

Head

Mode	Channel	Freq (MHz)	Position	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
12.2kbps RMC	4132	826.4	Left Tilt	0.11	0.104	0.11	
			Left Touch	0.11	0.175	0.18	**7**
			Right Tilt	0.11	0.120	0.12	
			Right Touch	0.11	0.171	0.18	

Body

Mode	Channel	Freq (MHz)	Position	Dist (mm)	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
12.2kbps RMC	4132	826.4	Front face	10	0.11	0.310	0.32	
			Back face		0.11	0.741	0.76	**8**
			Left edge		0.11	0.232	0.24	
			Right edge		0.11	0.262	0.27	
			Bottom edge		0.11	0.057	0.06	

B.5.5 802.11b/g/n – 2.4GHz – DTS

Head

Mode	Channel	Freq (MHz)	Position	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
802.11b 1Mbps	6	2437	Left Tilt	0.17	0.123	0.13	
			Left Touch	0.17	0.301	0.31	**9**
			Right Tilt	0.17	0.053	0.06	
			Right Touch	0.17	0.102	0.11	

Body

Mode	Channel	Freq (MHz)	Position	Dist (mm)	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
802.11b 1Mbps	6	2437	Front face	10	0.17	0.040	0.04	
			Back face		0.17	0.078	0.08	**10**
			Left edge		0.17	0.020	0.02	
			Right edge		0.17	0.014	0.01	
			Top edge		0.17	0.044	0.05	

B.5.6 Bluetooth – 2.4GHz – DSSS

Head

Mode	Channel	Freq (MHz)	Position	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
802.15 EDR1	0	2402	Left Tilt	0.05	0.002	0.00	
			Left Touch	0.05	0.000	0.00	
			Right Tilt	0.05	0.004	0.00	
			Right Touch	0.05	0.038	0.04	

Body

Mode	Channel	Freq (MHz)	Position	Dist (mm)	Correct Factor (dB)	SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Plot #
802.15 EDR1	0	2402	Front face	10	0.05	0.000	0.00	
			Back face		0.05	0.007	0.01	
			Left edge		0.05	0.015	0.02	
			Right edge		0.05	0.003	0.00	
			Top edge		0.05	0.029	0.03	

B.6 SAR Measurement Variability

According to FCC OET KDB 865664, SAR Measurement variability is assessed when the maximum initial measured SAR is >0.8 W/kg for a certain band/mode. If the measured SAR value of the initial repeated measurement is <1.45 W/kg with <20% variation, only one repeated measurement is required to confirm that the results are not expected to have substantial variations.

Band / Mode	Position	Channel	Freq. (MHz)	Measured SAR 1g (W/kg)	Repeated SAR 1g (W/Kg)	Ratio
12.2kbps RMC	Back face	9400	1880	1.10	1.09	1.01

B.7 Simultaneous Transmission SAR Evaluation

According to FCC OET KDB 447498 D01, when the sum of 1g SAR for all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

Position		Highest Reported SAR 1g (W/kg)		
		Cellular [PCE]	WLAN 2.4GHz [DTS]	Bluetooth [DSS]
HEAD	Left Tilt	0.16	0.13	0.00
	Left Touch	0.50	0.31	0.00
	Right Tilt	0.19	0.06	0.00
	Right Touch	0.76	0.11	0.04
BODY	Front Face	0.74	0.04	0.00
	Back Face	1.19	0.08	0.01
	Left Edge	0.30	0.02	0.02
	Right Edge	0.31	0.01	0.00

Σ SAR 1g (W/Kg)								
Simultaneous Tx Antenna Combination	HEAD				BODY			
	Left Tilt	Left Touch	Right Tilt	RightTouch	Front Face	Back Face	Left Edge	Right Edge
WLAN 2.4GHz + Cellular	0.29	0.81	0.25	0.87	0.78	1.27	0.32	0.32
BT + Cellular	0.16	0.50	0.19	0.80	0.74	1.20	0.32	0.31

Considering the results described above and according to the simultaneous transmission evaluation exclusions described in FCC OET KDB 447498 D01, no SAR to peak location ratio measurements are required.

Annex C. Test System Plots

1. GSM850, Voice 1UL, CH251 / Head Right Touch

Test Laboratory: Intel WRF Lab; Date/Time: 3/22/2016 12:20:55 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.0 - 849.0 MHz); Frequency: 848.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.904 S/m; ε_r = 39.179; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(9.33, 9.33, 9.33); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 33.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

GSM-850, CH 251 848.8MHz, Head Right Touch /Area Scan (51x101x1):

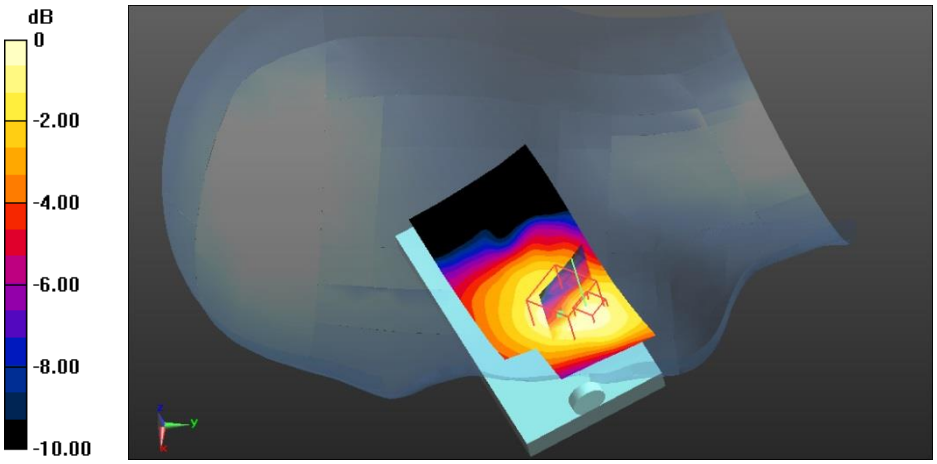
Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.333 W/kg

GSM-850, CH 251 848.8MHz, Head Right Touch/Zoom Scan (5x6x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 5.828 V/m; Power Drift = -0.28 dB
Peak SAR (extrapolated) = 0.415 W/kg
SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.211 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.330 W/kg



0 dB = 0.330 W/kg = -4.81 dBW/kg

2. GSM850, Voice 1UL, CH251 / Body Back Face

Test Laboratory: Intel WRF Lab; Date/Time: 3/16/2016 11:42:24 AM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.0 - 849.0 MHz); Frequency: 848.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used (interpolated): f = 848.8 MHz; σ = 1.002 S/m; ε_r = 53.258; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(9.06, 9.06, 9.06); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 33.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

GSM-850, CH 251 848.8MHz, Body Back Face/Area Scan (61x101x1):

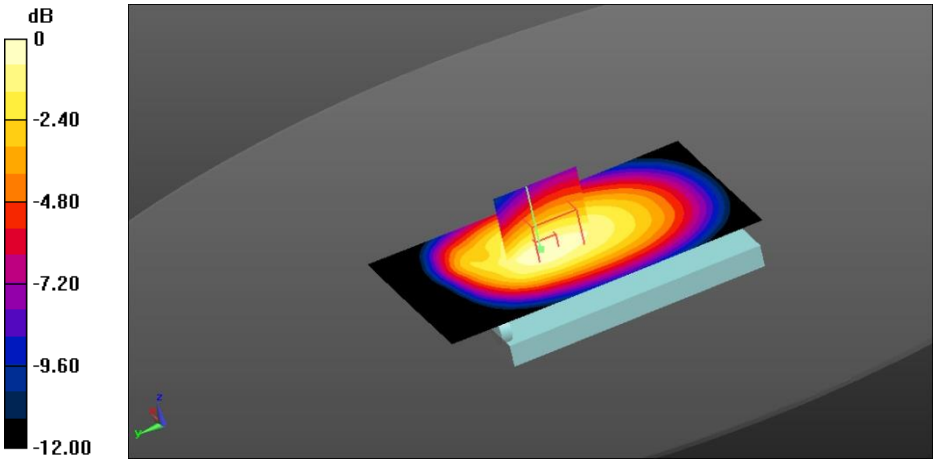
Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.669 W/kg

GSM-850, CH 251 848.8MHz, Body Back Face /Zoom Scan (5x6x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 23.08 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.835 W/kg
SAR(1 g) = 0.635 W/kg; SAR(10 g) = 0.463 W/kg (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.671 W/kg



0 dB = 0.671 W/kg = -1.73 dBW/kg

3. GSM1900, Voice 1UL, CH810 / Head Right Touch

Test Laboratory: Intel WRF Lab; Date/Time: 3/15/2016 12:04:09 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz); Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1910 MHz; σ = 1.447 S/m; ε_r = 36.155; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

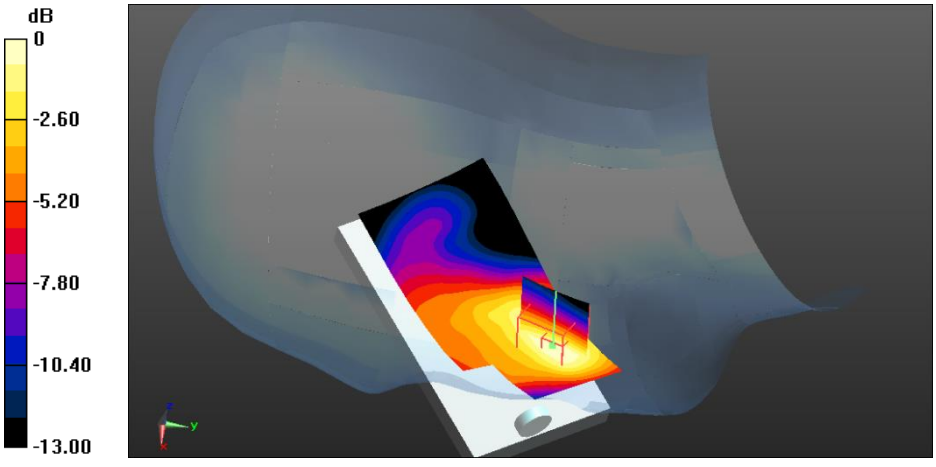
- Probe: EX3DV4 - SN3978; ConvF(7.69, 7.69, 7.69); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

GSM-1900, CH 810 1909.8MHz, Head Right Touch/Area Scan (51x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.388 W/kg

GSM-1900, CH 810 1909.8MHz, Head Right Touch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.719 V/m; Power Drift = -0.22 dB
Peak SAR (extrapolated) = 0.582 W/kg
SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.204 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.387 W/kg



0 dB = 0.387 W/kg = -4.12 dBW/kg

4. GSM1900, Voice 1UL, CH810 / Body Back Face

Test Laboratory: Intel WRF Lab; Date/Time: 3/15/2016 4:08:47 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz); Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1910 MHz; σ = 1.601 S/m; ε_r = 50.013; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

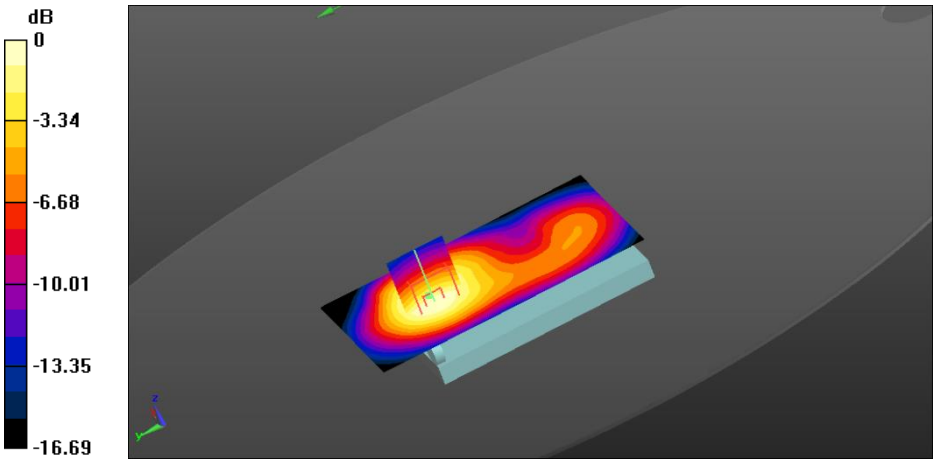
- Probe: EX3DV4 - SN3978; ConvF(7.45, 7.45, 7.45); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 33.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

GSM 1900-CH 810, 1909.8MHz, Body Back Face /Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.731 W/kg

GSM1900 -CH 810 - 1909.8MHz Body Back Face /Zoom Scan (5x5x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 9.359 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.648 W/kg; SAR(10 g) = 0.397 W/kg
Maximum value of SAR (measured) = 0.695 W/kg



0 dB = 0.695 W/kg = -1.58 dBW/kg

5. WCDMA FDD II, 12.2kbps RMC, CH9400 / Head Right Touch

Test Laboratory: Intel WRF Lab; Date/Time: 3/15/2016 10:16:39 AM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic 3G (0); Communication System Band: Band II UTRA/FDD;
Frequency: 1880 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1880 MHz; σ = 1.42 S/m; ε_r = 36.295; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

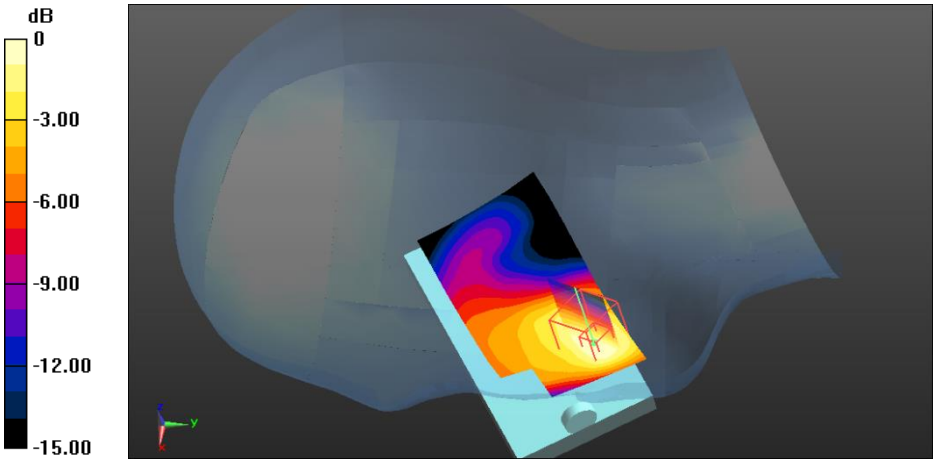
- Probe: EX3DV4 - SN3978; ConvF(7.69, 7.69, 7.69); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

WCDMA FDD II, RMC, 12.2kbps, CH 9400, 1880MHz, Head Right Touch/Area Scan (51x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.762 W/kg

WCDMA FDD II, RMC, 12.2kbps, CH 9400, 1880MHz, Head Right Touch/Zoom Scan (5x5x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 8.471 V/m; Power Drift = 0.35 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.704 W/kg; SAR(10 g) = 0.415 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.769 W/kg



0 dB = 0.769 W/kg = -1.14 dBW/kg

6. WCDMA FDD II, 12.2kbps RMC, CH9400 / Body Back Face

Test Laboratory: Intel WRF Lab; Date/Time: 3/15/2016 6:57:01 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic 3G (0); Communication System Band: Band II UTRA/FDD; Frequency: 1880 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1880 MHz; σ = 1.573 S/m; ε_r = 50.158; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

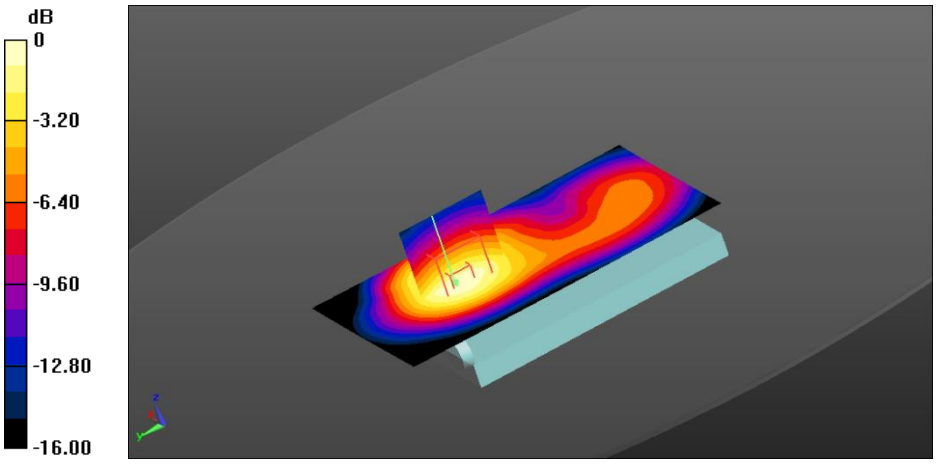
- Probe: EX3DV4 - SN3978; ConvF(7.45, 7.45, 7.45); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 33.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

WCDMA FDD II, RMC, 12.2kbps, CH 9400, 1880MHz, Body Back-Face/Area Scan 2 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

WCDMA FDD II, RMC, 12.2kbps, CH 9400, 1880MHz, Body Back-Face/Zoom Scan (6x6x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 13.34 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.674 W/kg
Maximum value of SAR (measured) = 1.19 W/kg



0 dB = 1.19 W/kg = 0.76 dBW/kg

7. WCDMA FDD V, 12.2kbps RMC, CH4132 / Head Left Touch

Test Laboratory: Intel WRF Lab; Date/Time: 3/22/2016 4:10:51 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic 3G (0); Communication System Band: Band V UTRA/FDD;
Frequency: 826.4 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.877 S/m; ε_r = 39.532; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(9.33, 9.33, 9.33); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

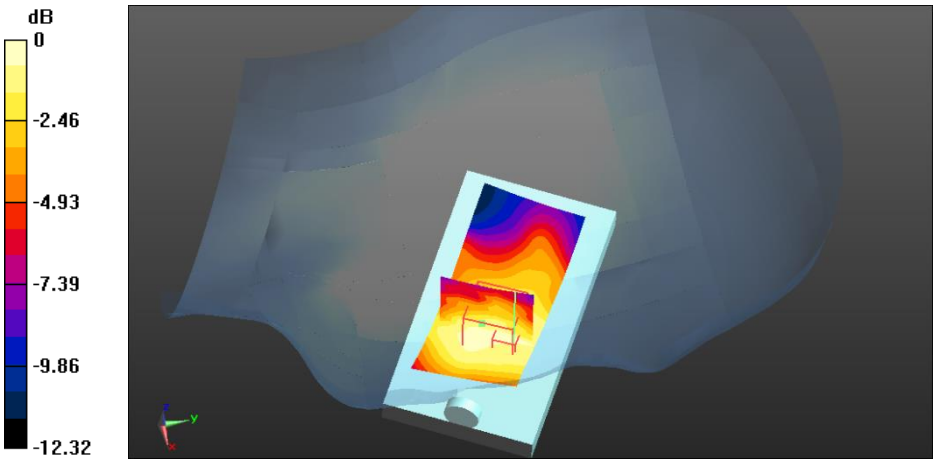
WCDMA FDD V, RMC, 12.2kbps, CH 4132, 826.4MHz, Head Left Touch/Area Scan (101x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.171 W/kg

WCDMA FDD V, RMC, 12.2kbps, CH 4132, 826.4MHz, Head Left Touch/Zoom Scan (6x6x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 13.49 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.175 W/kg; SAR(10 g) = 0.134 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.180 W/kg



0 dB = 0.180 W/kg = -7.45 dBW/kg

8. WCDMA FDD V, 12.2kbps RMC, CH4132 / Body Back Face

Test Laboratory: Intel WRF Lab; Date/Time: 3/16/2016 1:47:36 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, Generic 3G (0); Communication System Band: Band V UTRA/FDD; Frequency: 826.4 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.978 S/m; ε_r = 53.43; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(9.06, 9.06, 9.06); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 33.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

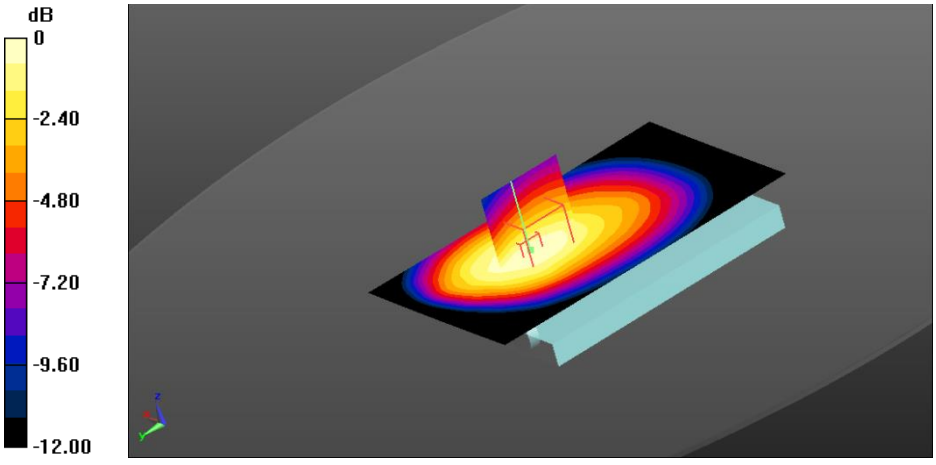
WCDMA FDD V, RMC, 12.2kbps, CH 4132, 826.4MHz, Body Back-Face/Area Scan 2 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.777 W/kg

WCDMA FDD V, RMC, 12.2kbps, CH 4132, 826.4MHz, Body Back-Face/Zoom Scan (6x6x9)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=4mm

Reference Value = 25.11 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.00 W/kg
SAR(1 g) = 0.741 W/kg; SAR(10 g) = 0.536 W/kg (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.779 W/kg



0 dB = 0.779 W/kg = -1.08 dBW/kg

9. 2.4GHz - 802.11b, CH6,Head/ Left Touch

Test Laboratory: Intel WRF Lab; Date/Time: 6/14/2016 1:38:54 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, 802.11 (0); Communication System Band: 2.4GHz; Frequency: 2437 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.918 S/m; ε_r = 35.791; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN7325; ConvF(7.28, 7.28, 7.28); Calibrated: 12/11/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE4 Sn1496; Calibrated: 5/17/2016
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

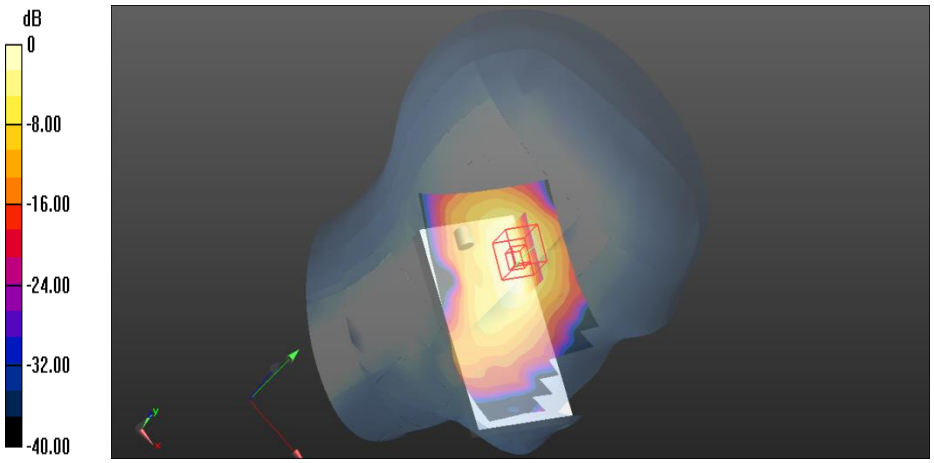
Head Left 2450MHz _802.11b - 11Mbps-CH6, 2437MHz, Left Touch/Area Scan (121x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.330 W/kg

Head Left 2450MHz _802.11b - 11Mbps-CH6, 2437MHz, Left Touch/Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.995 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.758 W/kg
SAR(1 g) = 0.301 W/kg; SAR(10 g) = 0.138 W/kg (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.335 W/kg



0 dB = 0.335 W/kg = -4.75 dBW/kg

10.2.4GHz - 802.11b, CH6, Body/ Back Face

Test Laboratory: Intel WRF Lab; Date/Time: 6/14/2016 3:17:44 PM

DUT: U307TG ; Type: Handset; Serial: MB27560400023

Communication System: UID 0, 802.11 (0); Communication System Band: 2.4GHz; Frequency: 2437 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 2437 MHz; σ = 2.046 S/m; ε_r = 47.75; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN7325; ConvF(7.41, 7.41, 7.41); Calibrated: 12/11/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 33.0
- Electronics: DAE4 Sn1496; Calibrated: 5/17/2016
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

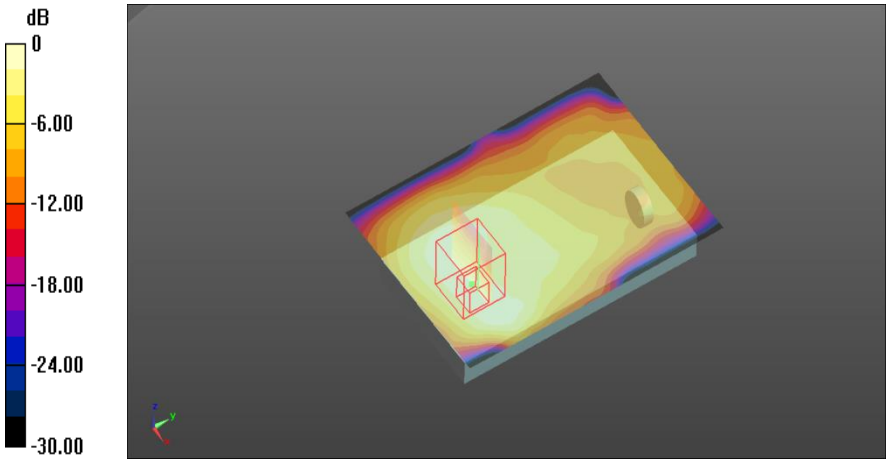
DTS_802.11b-11Mbps-ch6- 2437MHz - Back Face – Main Antenna/Area Scan 2 (81x111x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.0876 W/kg

DTS_802.11b-11Mbps-ch6- 2437MHz - Back Face – Main Antenna/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.670 V/m; Power Drift = -0.38 dB
Peak SAR (extrapolated) = 0.156 W/kg
SAR(1 g) = 0.078 W/kg; SAR(10 g) = 0.039 W/kg (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.0879 W/kg



0 dB = 0.0879 W/kg = -10.56 dBW/kg

11. System Check Head Liquid 835MHz

Test Laboratory: Intel WRF Lab; Date/Time: 3/22/2016 10:08:33 AM

DUT: Dipole 835 MHz ; Type: D835V2; Serial: 4d192

Communication System: UID 0, CW (0); Communication System Band: CD835 (835.0 MHz);
Frequency: 835 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 835 MHz; σ = 0.887 S/m; ε_r = 39.396; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

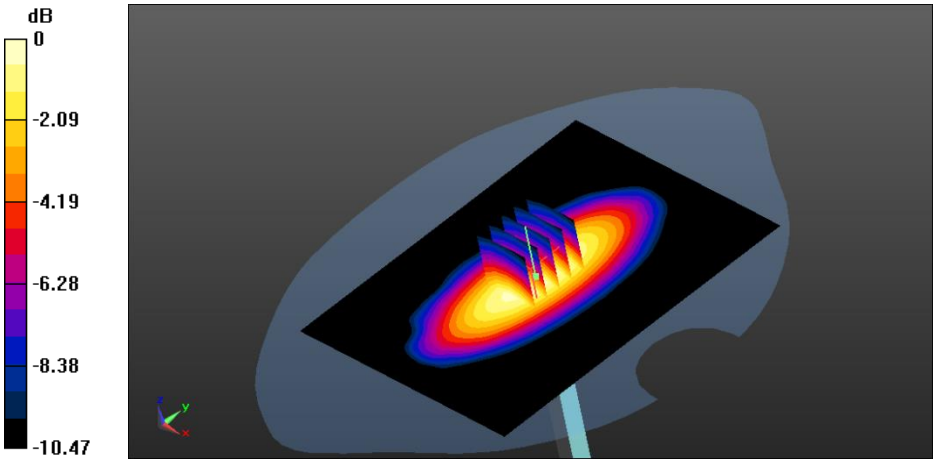
- Probe: EX3DV4 - SN3978; ConvF(9.33, 9.33, 9.33); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

System check, 835MHz, Head/Area Scan (91x121x1): Interpolated grid:
dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.964 W/kg

System check, 835MHz, Head/Zoom Scan (5x5x7)/Cube 0: Measurement
grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.26 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.902 W/kg; SAR(10 g) = 0.590 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.978 W/kg



0 dB = 0.978 W/kg = -0.10 dBW/kg

13. System Check Body Liquid 835MHz

Test Laboratory: Intel WRF Lab; Date/Time: 3/16/2016 4:02:32 PM

DUT: Dipole 835 MHz ; Type: D835V2; Serial: 4d192

Communication System: UID 0, CW (0); Communication System Band: CD835 (835.0 MHz);
Frequency: 835 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 835 MHz; σ = 0.987 S/m; ε_r = 53.364; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(9.06, 9.06, 9.06); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

System check, 835MHz, Body/System check/Area Scan (91x121x1):

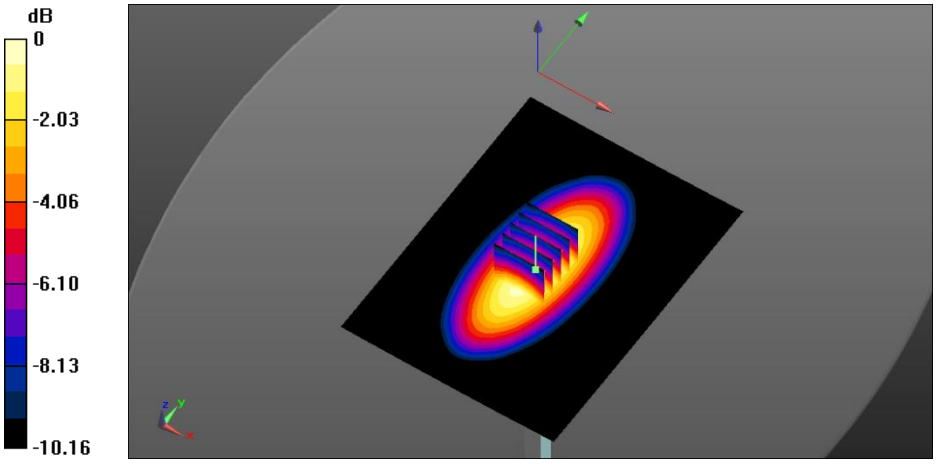
Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.06 W/kg

System check, 835MHz, Body/Zoom Scan (5x5x7)/Cube 0: Measurement

grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.23 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.982 W/kg; SAR(10 g) = 0.650 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.06 W/kg



0 dB = 1.06 W/kg = 0.25 dBW/kg

14. System Check Head Liquid 1900MHz

Test Laboratory: Intel WRF Lab; Date/Time: 3/15/2016 2:35:54 PM

DUT: Dipole 1900 MHz; Type: D1900V2; Serial:5d197

Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz);
Frequency: 1900 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1900 MHz; σ = 1.436 S/m; ε_r = 38.593; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

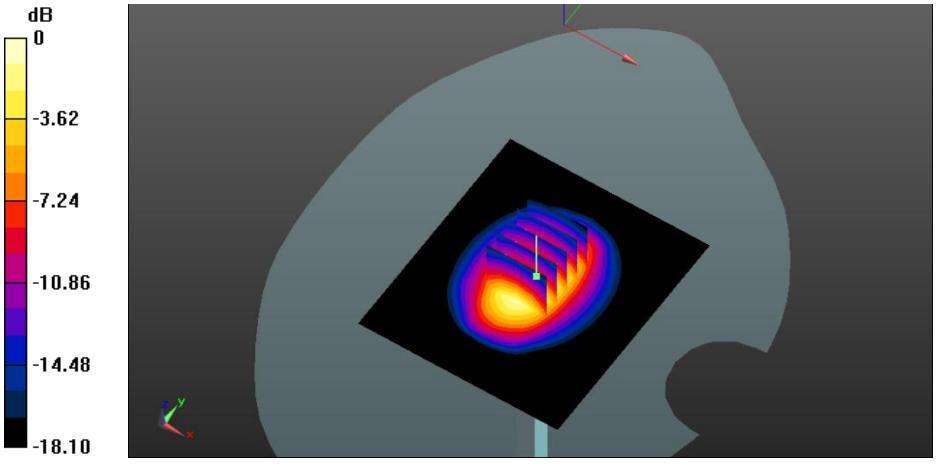
- Probe: EX3DV4 - SN3978; ConvF(7.69, 7.69, 7.69); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

System check, 1900MHz, Head/System check/Area Scan 2 (71x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.63 W/kg

System check, 1900MHz, Head/Zoom Scan (5x5x7)/Cube 0: Measurement

grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 64.81 V/m; Power Drift = -0.26 dB
Peak SAR (extrapolated) = 7.18 W/kg
SAR(1 g) = 3.87 W/kg; SAR(10 g) = 2.02 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.29 W/kg



0 dB = 4.29 W/kg = 6.32 dBW/kg

15. System Check Body Liquid 1900MHz

Test Laboratory: Intel WRF Lab; Date/Time: 3/15/2016 3:10:55 PM

DUT: Dipole 1900 MHz; Type: D1900V2; Serial:5d197

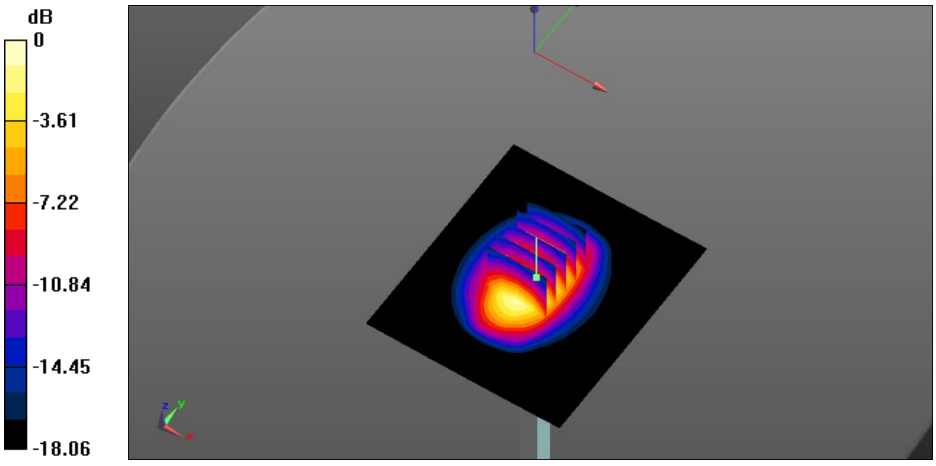
Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz);
Frequency: 1900 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1900 MHz; σ = 1.592 S/m; ε_r = 50.059; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(7.45, 7.45, 7.45); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

System check, 1900MHz, Body/Area Scan (71x81x1): Interpolated grid:
dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.97 W/kg

System check, 1900MHz, Body/System check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.31 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 7.85 W/kg
SAR(1 g) = 4.24 W/kg; SAR(10 g) = 2.2 W/kg
Maximum value of SAR (measured) = 4.69 W/kg



0 dB = 4.69 W/kg = 6.71 dBW/kg

16. System Check Head Liquid 2450MHz

Test Laboratory: Intel WRF Lab; Date/Time: 6/14/2016 1:36:17 PM

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 937

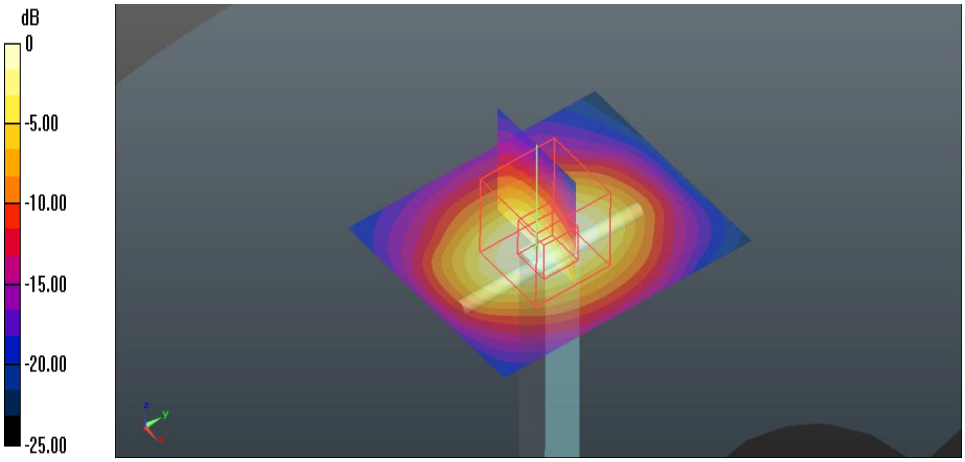
Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz);
Frequency: 2450 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2450 MHz; σ = 1.933 S/m; ε_r = 35.732; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(6.97, 6.97, 6.97); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.8(1222);

System Check-DTS-2450MHz/Area Scan (51x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 6.90 W/kg

System Check-DTS-2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.24 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 12.0 W/kg
SAR(1 g) = 5.56 W/kg; SAR(10 g) = 2.55 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 6.21 W/kg



0 dB = 6.21 W/kg = 7.93 dBW/kg

17. System Check Body Liquid 2450MHz

Test Laboratory: Intel WRF Lab; Date/Time: 6/14/2016 12:43:04 PM

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

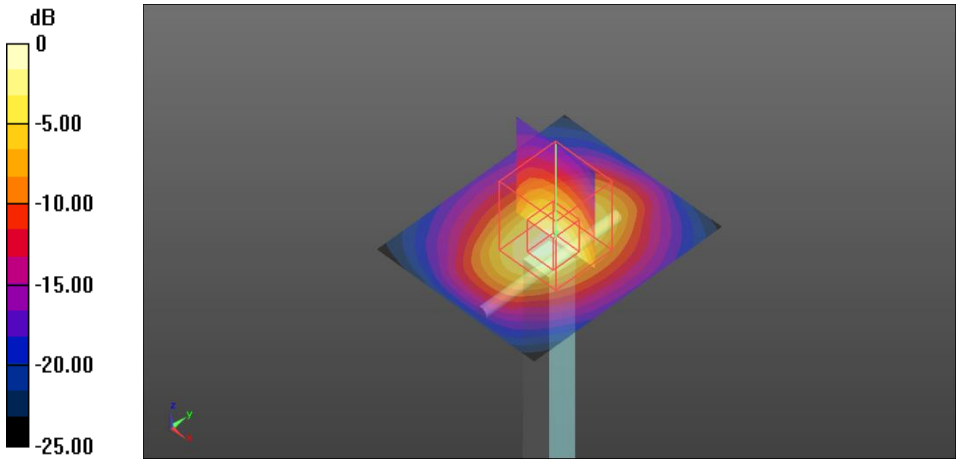
Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz);
Frequency: 2450 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2450 MHz; σ = 2.064 S/m; ε_r = 47.694; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3978; ConvF(7.22, 7.22, 7.22); Calibrated: 6/15/2015;
  - Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1429; Calibrated: 6/11/2015
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002BA;
- DASY52 52.8.8(1222);

System Check-DTS-2450MHz/Area Scan (51x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 6.53 W/kg

System Check-DTS-2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.74 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 10.8 W/kg
SAR(1 g) = 5.23 W/kg; SAR(10 g) = 2.43 W/kg
Maximum value of SAR (measured) = 7.92 W/kg

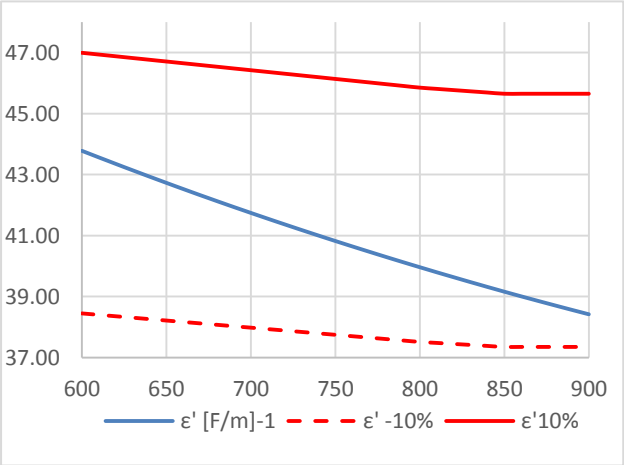


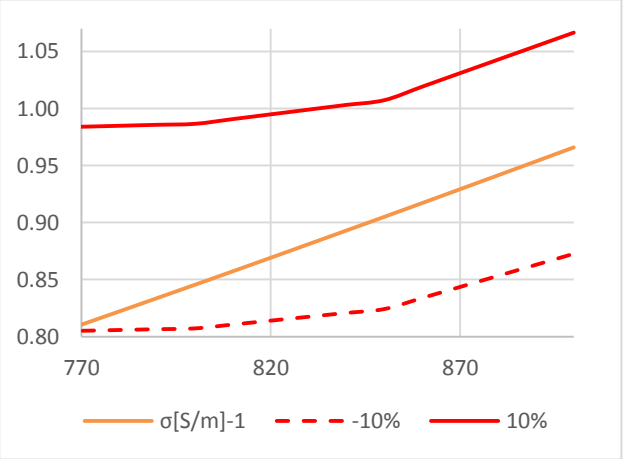
0 dB = 7.92 W/kg = 8.99 dBW/kg

Annex D. TSL Dielectric Parameters

Head 850MHz

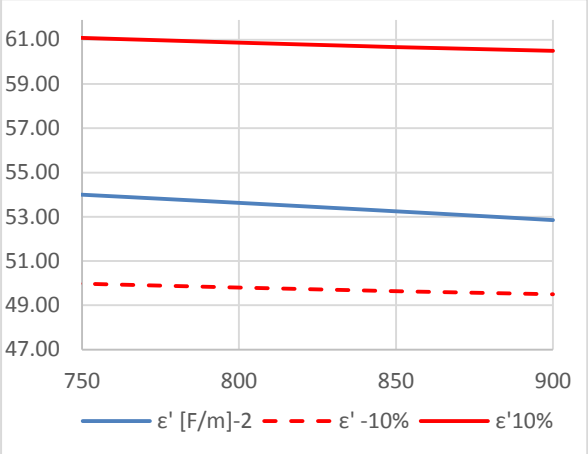
Freq. (MHz)	Target		Measured	
	ε’	σ	ε’	σ
770	41.84	0.89	40.47	0.81
780	41.79	0.90	40.30	0.82
790	41.73	0.90	40.13	0.83
800	41.68	0.90	39.96	0.85
810	41.65	0.90	39.80	0.86
820	41.61	0.90	39.64	0.87
830	41.57	0.91	39.47	0.88
835	41.55	0.91	39.40	0.89
840	41.54	0.91	39.32	0.893
850	41.50	0.92	39.16	0.91
860	41.50	0.93	39.01	0.92
870	41.50	0.94	38.86	0.93
880	41.50	0.95	38.71	0.94
890	41.50	0.96	38.56	0.95
900	41.50	0.97	38.42	0.97

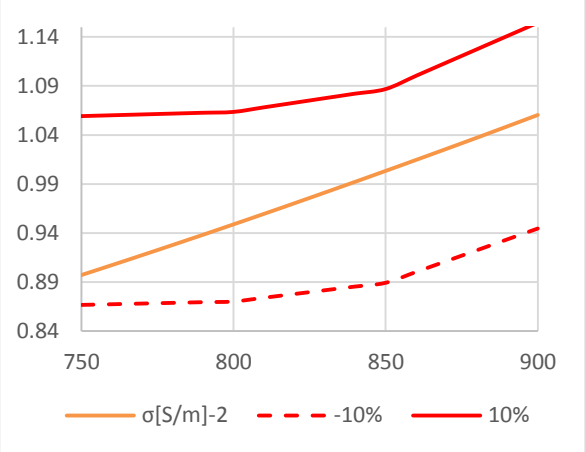




Body 850 MHz

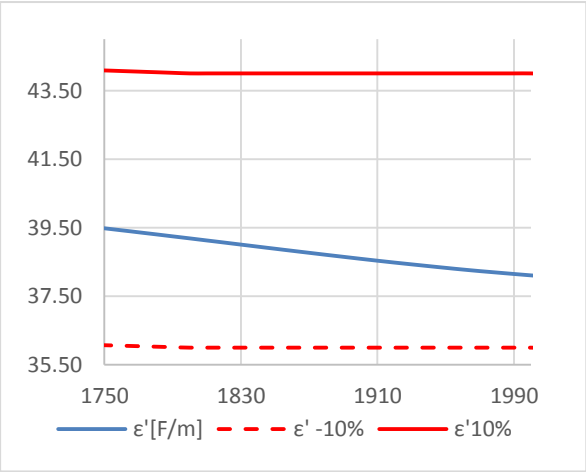
Freq. (MHz)	Target		Measured	
	ε’	σ	ε’	σ
770	55.45	0.96	53.85	0.92
780	55.41	0.97	53.78	0.93
790	55.38	0.97	53.71	0.94
800	55.34	0.97	53.63	0.95
810	55.30	0.97	53.56	0.96
820	55.26	0.98	53.48	0.97
830	55.23	0.98	53.40	0.98
835	55.21	0.98	53.36	0.99
840	55.19	0.98	53.33	0.99
850	55.15	0.99	53.25	1.00
860	55.12	1.00	53.17	1.01
870	55.09	1.01	53.09	1.03
880	55.06	1.02	53.01	1.04
890	55.03	1.04	52.93	1.05
900	55.00	1.05	52.85	1.06

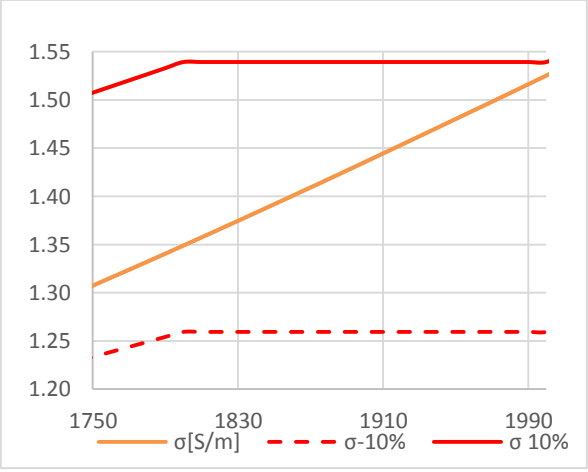




Head 1900 MHz

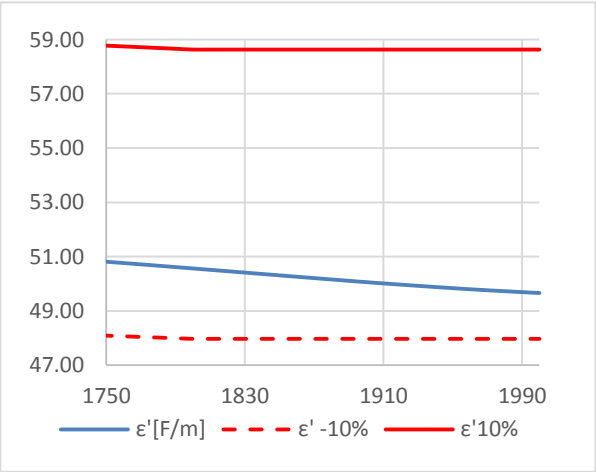
Freq. (MHz)	Target		Measured	
	ε’	σ	ε’	σ
1750	40.08	1.37	39.48	1.31
1760	40.06	1.38	39.42	1.32
1770	40.05	1.38	39.37	1.32
1780	40.03	1.39	39.31	1.33
1790	40.02	1.39	39.25	1.34
1800	40.00	1.40	39.19	1.35
1810	40.00	1.40	39.13	1.36
1820	40.00	1.40	39.07	1.37
1830	40.00	1.40	39.01	1.37
1840	40.00	1.40	38.95	1.38
1850	40.00	1.40	38.89	1.39
1860	40.00	1.40	38.83	1.40
1870	40.00	1.40	38.77	1.41
1880	40.00	1.40	38.71	1.42
1890	40.00	1.40	38.65	1.43
1900	40.00	1.40	38.59	1.44
1910	40.00	1.40	38.54	1.44
1920	40.00	1.40	38.48	1.45
1930	40.00	1.40	38.43	1.46
1940	40.00	1.40	38.38	1.47
1950	40.00	1.40	38.33	1.48
1960	40.00	1.40	38.28	1.49
1970	40.00	1.40	38.23	1.50
1980	40.00	1.40	38.19	1.51
1990	40.00	1.40	38.15	1.52
2000	40.00	1.40	38.11	1.53

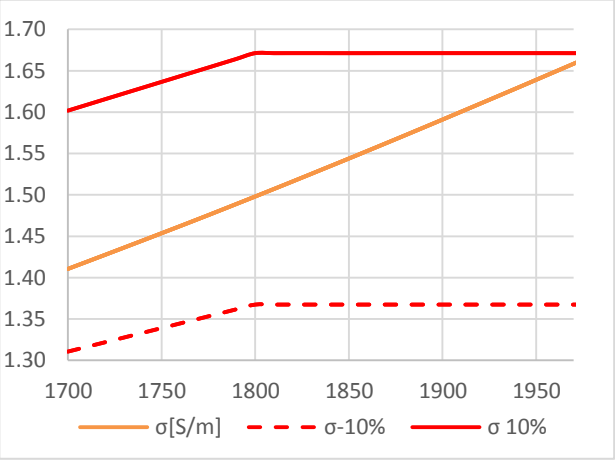




Body 1900 MHz

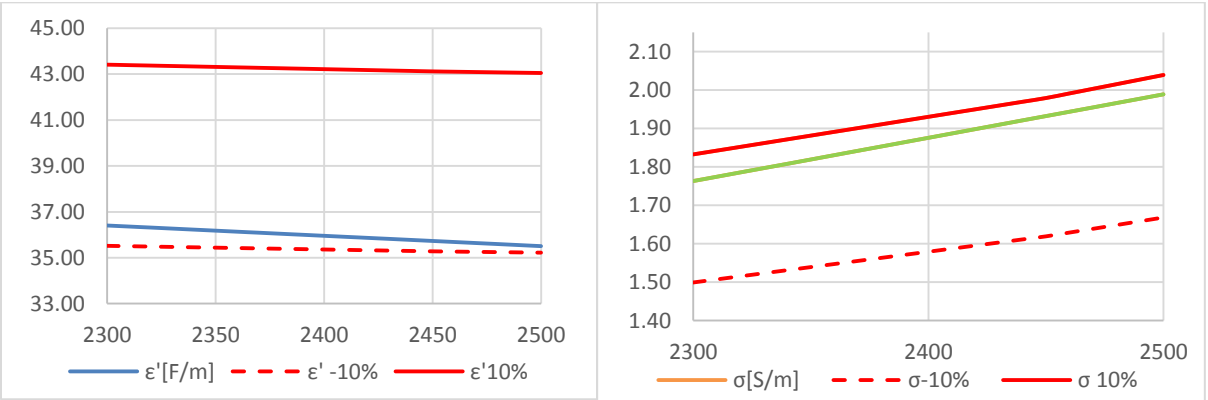
Freq. (MHz)	Target		Measured	
	ε’	σ	ε’	σ
1750	53.43	1.49	50.81	1.45
1760	53.41	1.49	50.76	1.46
1770	53.38	1.50	50.71	1.47
1780	53.35	1.51	50.66	1.48
1790	53.33	1.51	50.61	1.49
1800	53.30	1.52	50.56	1.50
1810	53.30	1.52	50.51	1.51
1820	53.30	1.52	50.46	1.52
1830	53.30	1.52	50.41	1.53
1840	53.30	1.52	50.36	1.53
1850	53.30	1.52	50.31	1.54
1860	53.30	1.52	50.26	1.55
1870	53.30	1.52	50.21	1.56
1880	53.30	1.52	50.16	1.57
1890	53.30	1.52	50.11	1.58
1900	53.30	1.52	50.06	1.59
1910	53.30	1.52	50.01	1.60
1920	53.30	1.52	49.97	1.61
1930	53.30	1.52	49.92	1.62
1940	53.30	1.52	49.88	1.63
1950	53.30	1.52	49.84	1.64
1960	53.30	1.52	49.80	1.65
1970	53.30	1.52	49.76	1.66
1980	53.30	1.52	49.73	1.67
1990	53.30	1.52	49.69	1.68
2000	53.30	1.52	49.66	1.69





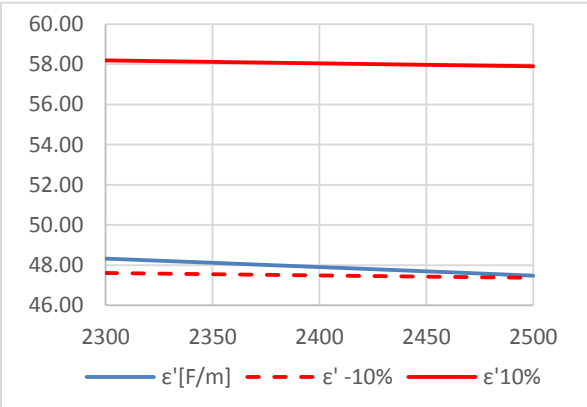
Head 2450 MHz

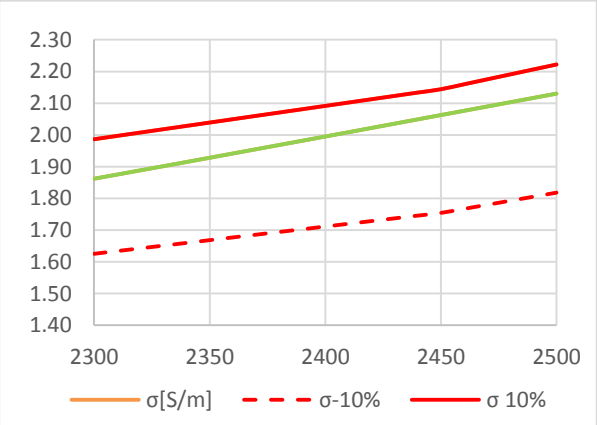
Freq. (MHz)	Target		Measured	
	ε’	σ	ε’	σ
2300	39.47	1.67	36.41	1.76
2310	39.45	1.67	36.36	1.77
2320	39.43	1.68	36.32	1.79
2330	39.41	1.69	36.27	1.80
2340	39.40	1.70	36.23	1.81
2350	39.38	1.71	36.18	1.82
2360	39.36	1.72	36.14	1.83
2370	39.34	1.73	36.09	1.84
2380	39.32	1.74	36.05	1.85
2390	39.31	1.75	36.00	1.86
2400	39.29	1.75	35.96	1.88
2410	39.27	1.76	35.91	1.89
2420	39.25	1.77	35.87	1.90
2430	39.24	1.78	35.82	1.91
2440	39.22	1.79	35.78	1.92
2450	39.20	1.80	35.73	1.93
2460	39.19	1.81	35.69	1.94
2470	39.17	1.82	35.64	1.95
2480	39.16	1.83	35.60	1.97
2490	39.15	1.84	35.55	1.98
2500	39.14	1.85	35.51	1.99



Body 2450 MHz

Freq. (MHz)	Target		Measured	
	ε’	σ	ε’	σ
2300	52.90	1.81	48.33	1.86
2310	52.89	1.82	48.29	1.88
2320	52.87	1.82	48.24	1.89
2330	52.86	1.83	48.20	1.90
2340	52.85	1.84	48.16	1.91
2350	52.83	1.85	48.12	1.93
2360	52.82	1.86	48.08	1.94
2370	52.81	1.87	48.03	1.95
2380	52.79	1.88	47.99	1.97
2390	52.78	1.89	47.95	1.98
2400	52.77	1.90	47.91	2.00
2410	52.75	1.91	47.86	2.01
2420	52.74	1.92	47.82	2.02
2430	52.73	1.93	47.78	2.04
2440	52.71	1.94	47.74	2.05
2450	52.70	1.95	47.69	2.06
2460	52.69	1.96	47.65	2.08
2470	52.67	1.98	47.61	2.09
2480	52.66	1.99	47.57	2.10
2490	52.65	2.01	47.52	2.12
2500	52.64	2.02	47.48	2.13





Annex E. Calibration Certificates

Device	Type/Model	Serial Number	Manufacturer	Calibration Certificate
Dosimetric E-field Probe	EX3DV4	3978	SPEAG	
835MHz System Validation Dipole	D835V2	4d192	SPEAG	
1900MHz System Validation Dipole	D1900V2	5d197	SPEAG	
2450MHz System Validation Dipole	D2450V2	937	SPEAG	

Dipole calibration

According to the KDB 865664 D01, a dipole must be calibrated using a fully validated SAR system according to the tissue dielectric parameters and SAR probe calibration frequency required for device testing. However, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements.

1. When the most recent return-loss result, measured at least annually, deviates by more than 20% from the previous measurement (i.e. value in dB × 0.2) or not meeting the required 20 dB minimum return-loss requirement.

2. When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5 Ω from the previous measurement.

The below results show the latest return loss and impedance measurements for each dipole performed by the lab:

Dipole 835MHz Head TSL			
	Return Loss [dB]	**Impedance [Ω]**	**Date**
Previous	-31.50	52 -1.8 j	2015-01-23
Last	-31.00	49.8 – 1.4 j	2016-01-21
Difference	10.87%	-2.5 + 0.4 j	
Dipole 835MHz Body TSL			
	Return Loss [dB]	**Impedance [Ω]**	**Date**
Previous	-27.30	47.8 – 3.6 j	2015-01-23
Last	-26.70	45.6 – 3.0 j	2016-01-21
Difference	12.90%	-2.2 + 0.6 j	
Dipole 1900MHz Head TSL			
	Return Loss [dB]	**Impedance [Ω]**	**Date**
Previous	-24.10	53.8 + 5.2 j	2015-01-14
Last	-23.70	51.7 + 2.6 j	2016-01-12
Difference	8.79%	-2.1 - 2.6 j	
Dipole 1900MHz Body TSL			
	Return Loss [dB]	**Impedance [Ω]**	**Date**
Previous	-24.50	49.5 + 5.9 j	2015-01-14
Last	-24.05	49.3 + 4.1 j	2016-01-12
Difference	9.85%	-0.2 - 1.8 j	
Dipole 2450MHz Head TSL			
	Return Loss [dB]	**Impedance [Ω]**	**Date**
Previous	-26.10	55.2 + 0.1 j	2015-06-22
Last	-25.50	51.57 + 0.57 j	2015-12-18
Difference	12.90%	-3.63 + 0.47 j	
Dipole 2450MHz Body TSL			
	Return Loss [dB]	**Impedance [Ω]**	**Date**
Previous	-30.10	51.6 + 2.7 j	2014-12-15
Last	-29.30	49.65 + 0.44 j	2015-12-18
Difference	16.80%	-1.95 – 2.26 j	