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Shenzhen Branch

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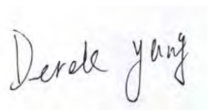
FCC SAR TEST REPORT

Application No:	SZEM1806004920RG
Applicant:	Treswave LLC
Manufacturer:	Treswave LLC
Factory:	Treswave LLC
Product Name:	TW801
Model No.(EUT):	TW801
Trade Mark:	Treswave
FCC ID:	2AP6Q-TW801
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2018-04-25
Date of Test:	2018-04-28 to 2018-05-29
Date of Issue:	2018-07-25
Test conclusion:	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Derek Yang

Wireless Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

REVISION HISTORY

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-07-25		Original

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)		
	Head	Body-worn	Hotspot
CDMA BC0	0.39	0.40	0.65
CDMA BC1	0.38	0.68	1.42
CDMA BC10	0.48	0.48	0.58
LTE Band 13	0.40	0.61	0.84
LTE Band 25	0.16	0.52	1.44
LTE Band 26	0.30	0.42	0.56
LTE Band 41	0.50	0.61	1.28
WI-FI (2.4GHz)	0.40	<0.10	<0.10
SAR Limited(W/kg)	1.6		
Maximum Simultaneous Transmission SAR (W/kg)			
Scenario	Head	Body-worn	Hotspot
Sum SAR	0.90	0.73	1.53
SPLSR	NA	NA	NA
SPLSR Limited	0.04		

Approved & Released by

Simon Ling

SAR Manager

Tested by

Mark Liu

SAR Engineer

CONTENTS

1 General Information

1.1 Details of Client

Applicant:	Treswave LLC
Address:	Treswave LLC, 12775 CRAWFORD DR，USTIN, CA 92782，USA
Manufacturer:	Treswave LLC
Address:	Treswave LLC, 12775 CRAWFORD DR，USTIN, CA 92782，USA
Factory:	Treswave LLC
Address:	Treswave LLC, 12775 CRAWFORD DR，USTIN, CA 92782，USA

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057
Telephone:	+86 (0) 755 2601 2053
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E-mail:	ee.shenzhen@sgs.com

1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

1.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	TW801		
Model No.(EUT):	TW801		
FCC ID:	2AP6Q-TW801		
Trade Mark:	Treswave		
Product Phase:	production unit		
Hardware Version:	Q5005_V1.0		
Software Version:	TW801_01.01.01143422		
Antenna Type:	internal		
Device Operating Configurations :			
Modulation Mode:	CDMA: QPSK LTE: QPSK,16QAM; WIFI: DSSS; OFDM; BT: GFSK, π/4DQPSK,8DPSK		
Device Class:	B		
Power Class	3, tested with power control “all 1”(CDMA BC0/BC10/BC1)		
	3, tested with power control Max Power(LTE Band 2/4/5/13/25/26/41		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	CDMA BC10	817~824	862~869
	CDMA BC0	824~849	869~894
	CDMA BC1	1850-1910	1930-1990
	LTE Band 13	777~787	746~756
	LTE Band 25	1850~1915	1930~1995
	LTE Band 26	814~849	859~894
	LTE Band 41	2498.5~2687.5	2498.5~2687.5
	WIFI2.4G	2412~2462	2412~2462
	BT	2402~2480	2402~2480
Battery Information:	Model: Q5003		
	Rated capacity: 3.8V 2000mAh		
	Manufacturer: Dongguan Guoxiao Electronic Technology Co., Ltd.		

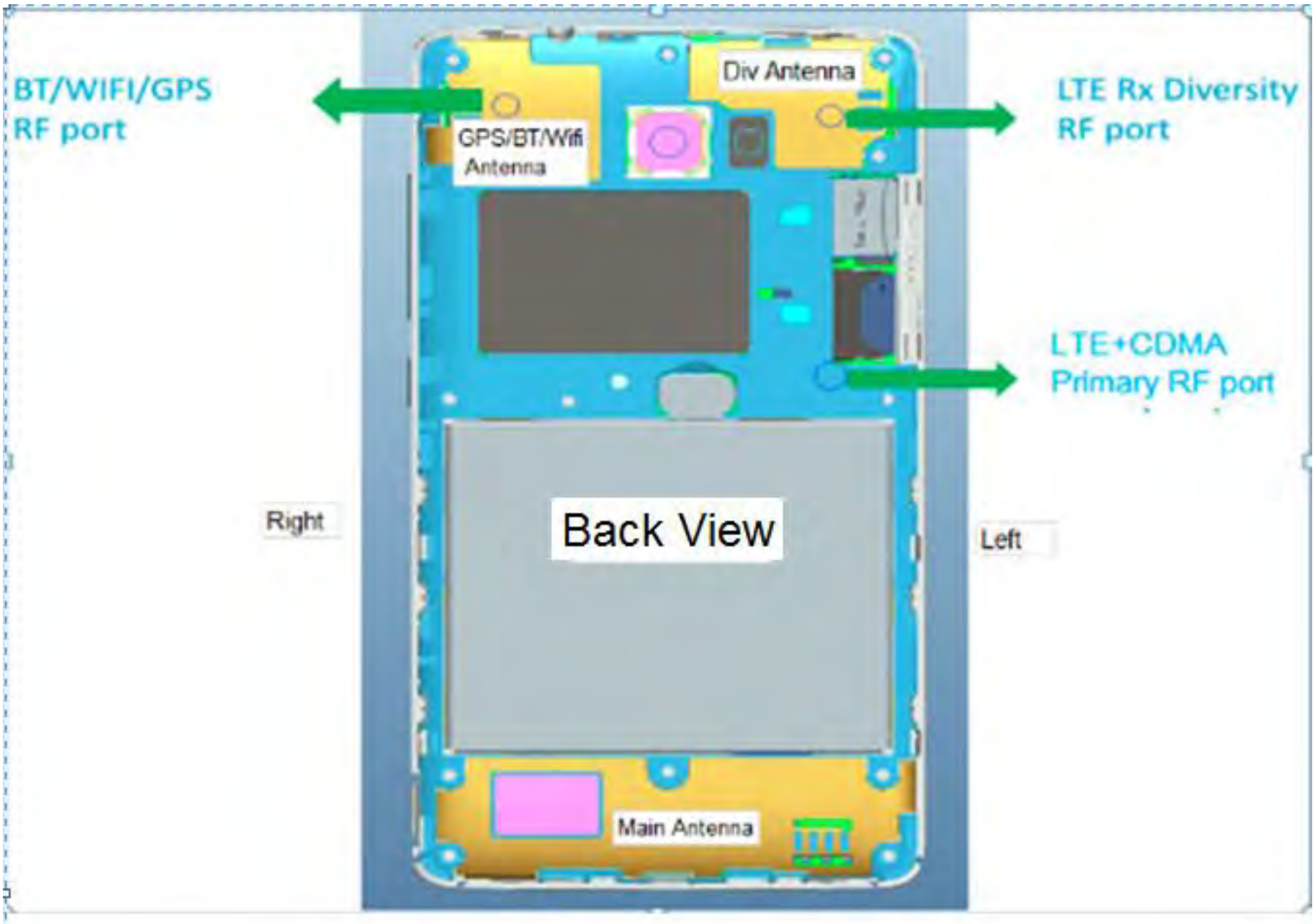
The difference between old and new are show as below. Other parts of the mobile phone are the same.

The equipment, is the identical design and construction, with only difference on the software version to reduce the frequency band (LTE Band 2/4/5) to the original FCC Grant cited above.

1. The software change is only reduce some frequency band, will not change the electrical/IO/RF characteristics, and antenna.
2. Color change: color change to black from sliver
3. ID change: change top material of a short glass to plastic. It is not the functional area.
4. Camera lens shape change: from square to round

Note:
According to the difference above, the TW801 is share the same data of the report SZEM180300241707 for CDMA BC0/BC1/BC10 & LTE Band 13/25/26/41 & WiFi/BT.

1.4.1 DUT Antenna Locations(Back View)



The test device is a Smartphone. The display diagonal dimension is 127mm and the overall diagonal dimension of this device is 156mm.

According to the distance between LTE/CDMA antennas and the sides of the EUT we can draw the conclusion that:

EUT Sides for SAR Testing						
Mode	Front	Back	Left	Right	Top	Bottom
Main Antenna	Yes	Yes	Yes	Yes	No	Yes
2.4G WIFI	Yes	Yes	No	Yes	Yes	No

Table 1：EUT Sides for SAR Testing

Note:

1) When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE Std C95.1 – 1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D01 3G SAR Procedures v03r01	3G SAR Measurement Procedures
KDB 248227 D01 802.11 Wi-Fi SAR v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 941225 D05 SAR for LTE Devices v02r05	SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES
KDB 941225 D06 Hotspot Mode SAR v02r01	SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities
KDB 648474 D04 Handset SAR v01r03	SAR Evaluation Considerations for Wireless Handsets
KDB447498 D01 General RF Exposure Guidance v06	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
KDB447498 D03 Supplement C Cross-Reference v01	OET Bulletin 65, Supplement C Cross-Reference
KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting v01r02	RF Exposure Compliance Reporting and Documentation Considerations

1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	**1.60 W/kg**	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

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 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.

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

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.)

2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

Table 2 : The Ambient Conditions

3 SAR Measurements System Configuration

3.1 The SAR Measurement System

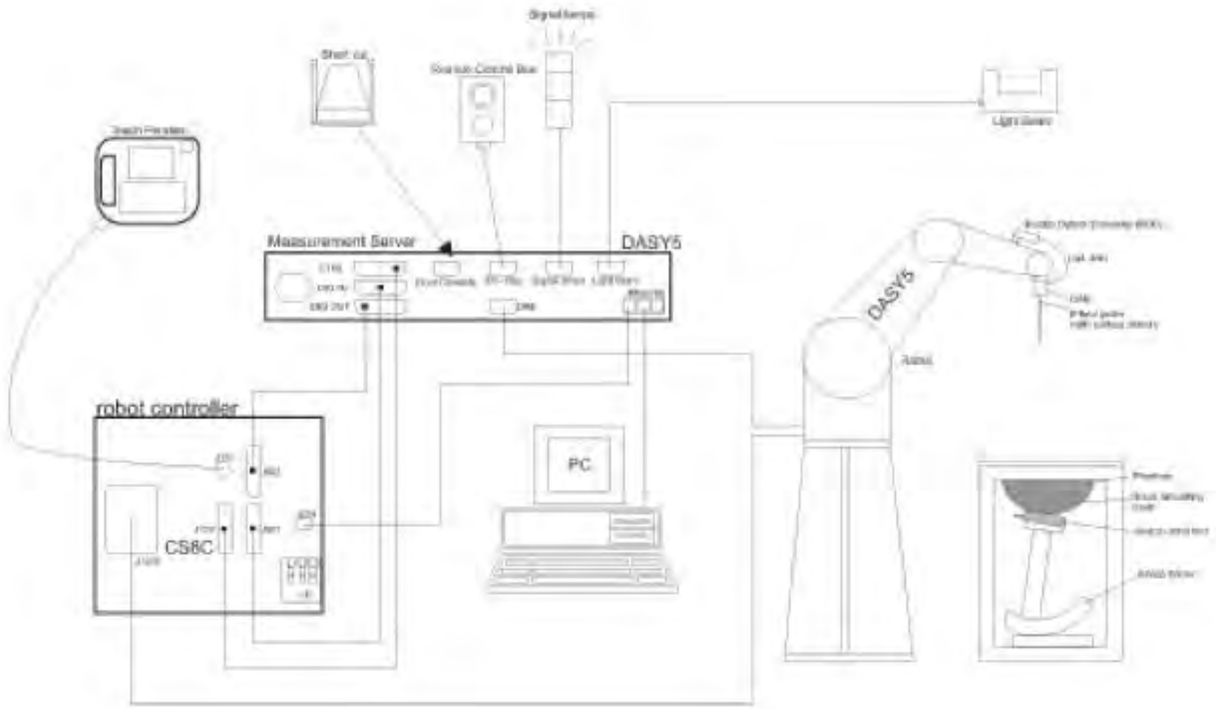
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY5 system for performing compliance tests consists of the following items:
A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software. An arm extension for accommodation the data acquisition electronics (DAE).

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.

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 between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

- 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

	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 TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
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
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

3.3 Data Acquisition Electronics (DAE)

Model	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 f A
Dimensions	60 x 60 x 68 mm

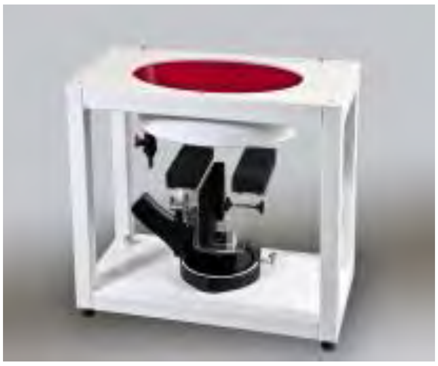
3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table

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.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

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.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.

3.6 Device Holder for Transmitters

F-2. **Device Holder for Transmitters**

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity 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.

3.7 Measurement procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The "reference" and "drift" measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: *Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

Around this point, a volume of 32mm*32mm*30mm (f≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

Except when area scan based 1-g SAR estimation applies, a zoom scan measurement is required at the highest peak SAR location determined in the area scan to determine the 1-g SAR. When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR (per KDB publication 865664 D01), and the DASY System will be set up based on this condition to ensure that the measurement results is the maximum SAR.

<table>
<tr><td colspan="3"></td><td>$\leq$ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>$\leq$ 2 GHz: $\leq$ 15 mm
2 – 3 GHz: $\leq$ 12 mm</td><td>3 – 4 GHz: $\leq$ 12 mm
4 – 6 GHz: $\leq$ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>$\leq$ 2 GHz: $\leq$ 8 mm
2 – 3 GHz: $\leq$ 5 mm*</td><td>3 – 4 GHz: $\leq$ 5 mm*
4 – 6 GHz: $\leq$ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>$\leq$ 5 mm</td><td>3 – 4 GHz: $\leq$ 4 mm
4 – 5 GHz: $\leq$ 3 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>$\leq$ 4 mm</td><td>3 – 4 GHz: $\leq$ 3 mm
4 – 5 GHz: $\leq$ 2.5 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>$\geq$ 30 mm</td><td>3 – 4 GHz: $\geq$ 28 mm
4 – 5 GHz: $\geq$ 25 mm
5 – 6 GHz: $\geq$ 22 mm</td></tr>
</table>

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %

3.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

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

Probe parameters: - Sensitivity Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point Dcpi
Device parameters: - Frequency f
- Crest factor cf
Media parameters: - Conductivity ε
- 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:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

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)

dcp i = diode compression point (DASY parameter)

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

E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(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):

$$E_{tot} = (E_X^2 + E_Y^2 + E_Z^2)^{1/2}$$

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

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g

Etot = total field strength in V/m

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

ε= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

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

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

4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) 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 (~ 10% from the 1-g SAR limit).

4) 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.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

4.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, 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. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

5 Description of Test Position

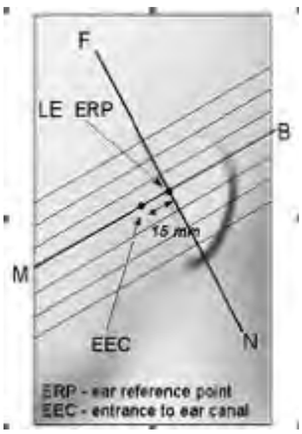
5.1 Head Exposure Condition

5.1.1 SAM Phantom Shape

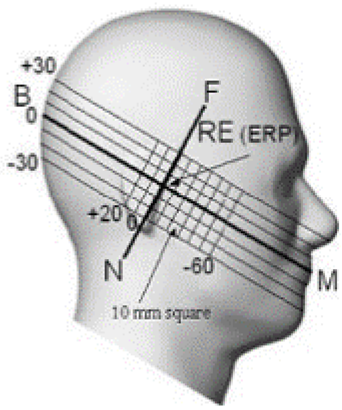
F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

Note: The centre strip including the nose region has a different thickness tolerance.

F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

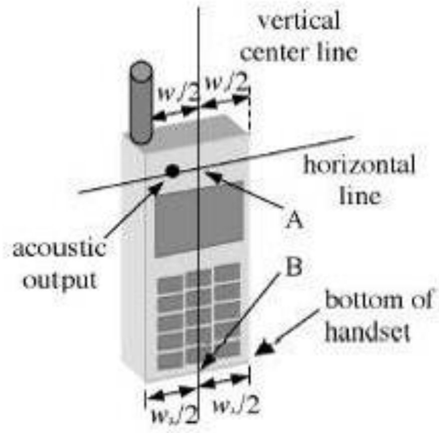


F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

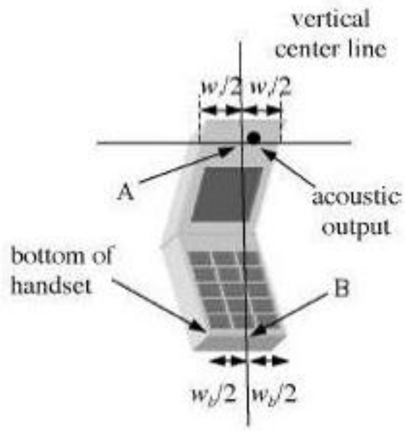


F-6. Side view of the phantom showing relevant markings and seven cross-sectional plane locations

5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines-“fixed case”



F-8. Handset vertical and horizontal reference lines-“clam-shell case”

5.1.3 Definition of the “cheek” position

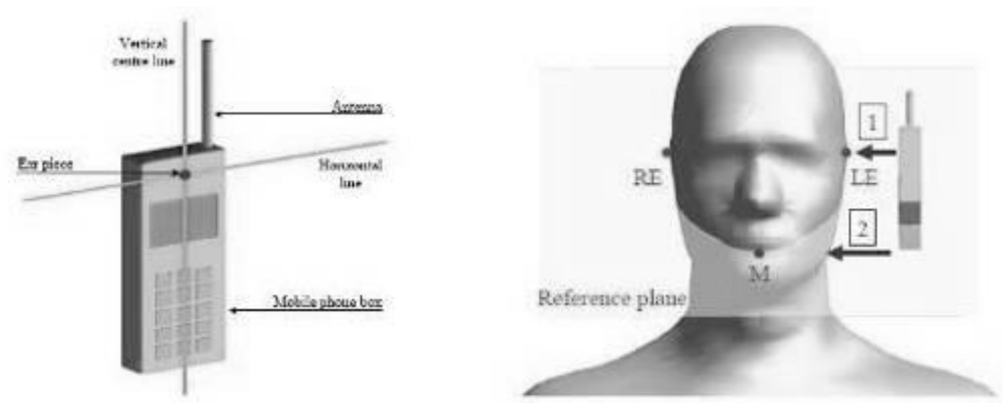
a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom ("initial position"). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.

b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

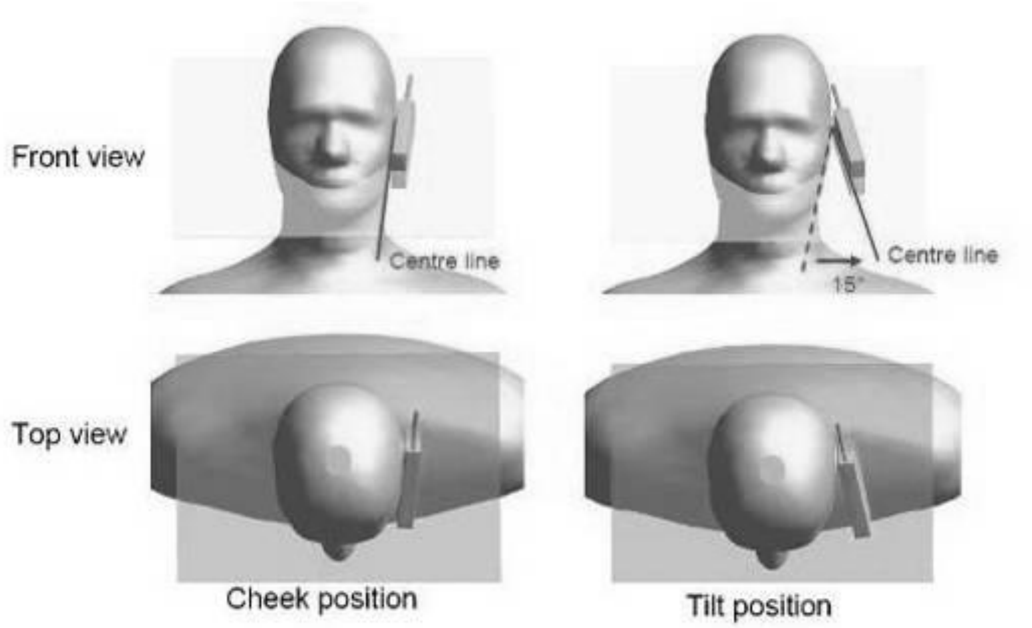
5.1.4 Definition of the "tilted" position

a) Position the device in the "cheek" position described above;

b) While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



F-9. **Definition of the reference lines and points, on the phone and on the phantom and initial position**



F-10. **"Cheek" and "tilt" positions of the mobile phone on the left side**

5.2 Body Exposure Condition

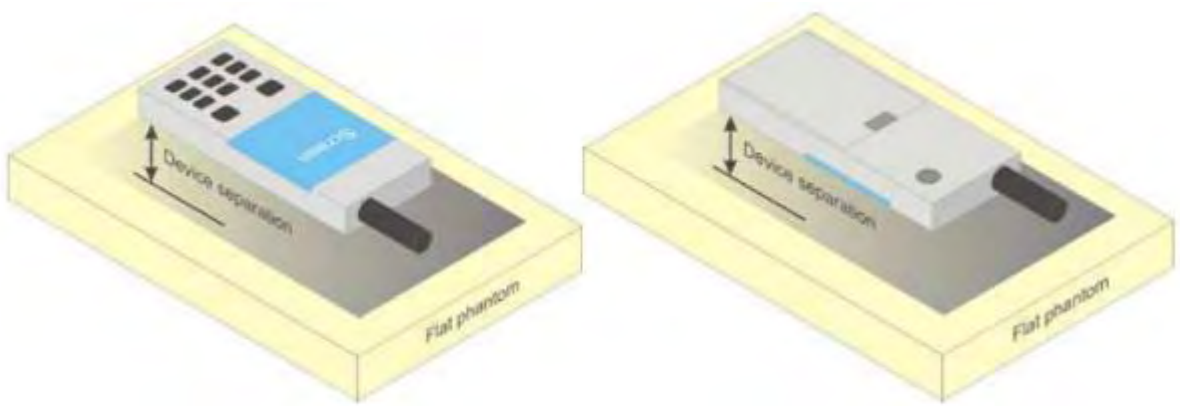
5.2.1 Body-worn accessory exposure conditions

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.



F-11. **Test positions for body-worn devices**

5.2.2 Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. For devices with form factors smaller than 9 cm x 5 cm, a test separation distance of 5 mm is required.

6 SAR System Check Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

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

Ingredients (% by weight)	Frequency (MHz)							
	450		835		1800-2000		2300-2700	
Tissue Type	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**
Water	38.56	51.16	40.30	50.75	55.24	70.17	55.00	68.53
Salt (NaCl)	3.95	1.49	1.38	0.94	0.31	0.39	0.2	0.1
Sucrose	56.32	46.78	57.90	48.21	0	0	0	0
HEC	0.98	0.52	0.24	0	0	0	0	0
Bactericide	0.19	0.05	0.18	0.10	0	0	0	0
Tween	0	0	0	0	44.45	29.44	44.80	31.37
Salt: 99^{+}% Pure Sodium Chloride Water: De-ionized, 16 $M\Omega^{+}$ resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate					Sucrose: 98^{+}% Pure Sucrose HEC: Hydroxyethyl Cellulose			
HSL5GHz is composed of the following ingredients： Water：50-65% Mineral oil：10-30% Emulsifiers：8-25% Sodium salt：0-1.5%								
MSL5GHz is composed of the following ingredients： Water：64-78% Mineral oil：11-18% Emulsifiers：9-15% Sodium salt：2-3%								

Table 3：Recipe of Tissue Simulate Liquid

6.1.2 Measurement for Tissue Simulate Liquid

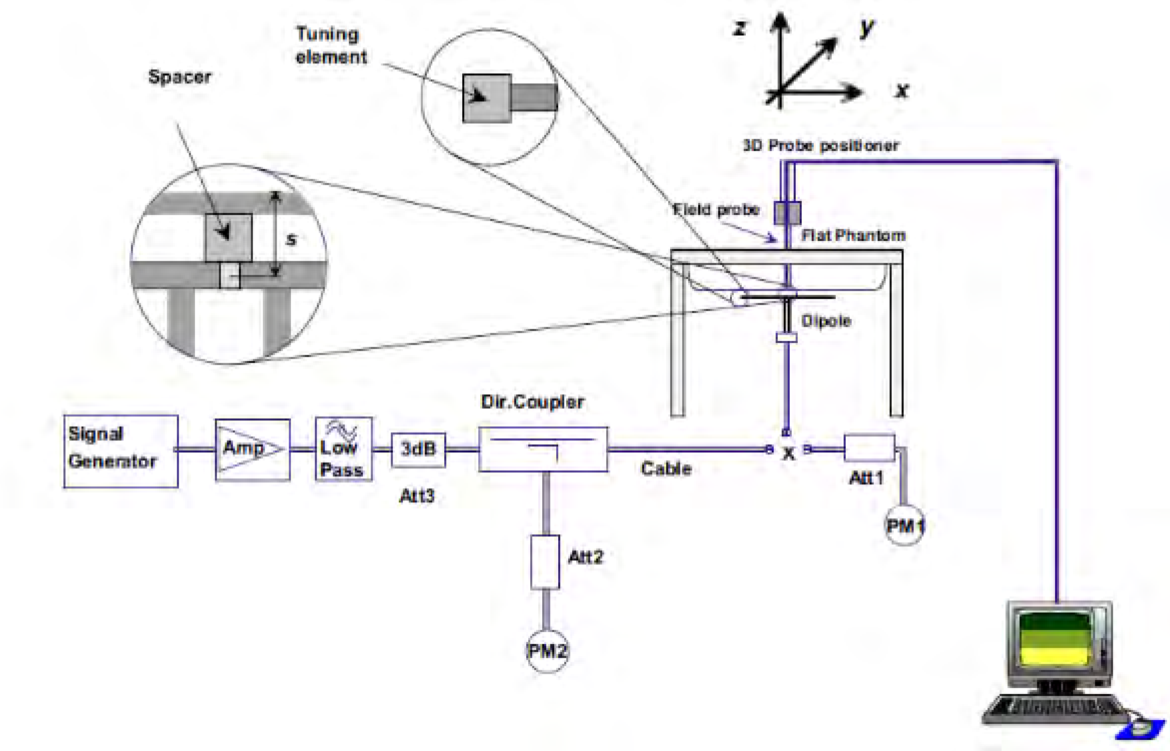
The dielectric properties for this Tissue Simulate Liquids were measured by using the Agilent Model 85070E Dielectric Probe in conjunction with Agilent E5071C Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Tissue Type	Measured Frequency （MHz）	Target Tissue (±5%)		Measured Tissue		Liquid Temp.	Measured Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	(℃)	
750 Head	750	41.9 (39.81~44)	0.89 (0.85~0.94)	42.786	0.879	22.1	2018/4/28
750 Body	750	55.5 52.73~58.28)	0.96 (0.91~1.00)	56.833	0.96	22.1	2018/4/28
750 Body	750	55.5 52.73~58.28)	0.96 (0.91~1.00)	56.279	0.956	22.1	2018/5/29
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	42.233	0.904	22.1	2018/5/4
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	42.422	0.898	22.1	2018/5/4
835 Body	835	55.2 (52.44~57.96)	0.97 (0.92~1.02)	53.955	0.98	22.1	2018/5/5
1900 Head	1900	40.0 38.00~42.00)	1.40 (1.33~1.47)	41.171	1.437	22.3	2018/5/9
1900 Body	1900	53.3 (50.64~55.97)	1.52 (1.44~1.60)	52.421	1.519	22.3	2018/5/9
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.226	1.802	22	2018/5/5
2450 Body	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	52.32	1.963	22	2018/5/6
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	37.767	1.968	22.1	2018/5/7
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	39.429	1.994	22.1	2018/5/16
2600 Body	2600	52.50 49.88~55.13)	2.16 (2.05~2.27)	51.94	2.138	22.1	2018/5/7
2600 Body	2600	52.50 49.88~55.13)	2.16 (2.05~2.27)	52.093	2.158	22.1	2018/5/16

Table 1 : Measurement result of Tissue electric parameters

6.2 SAR System Check

The microwave circuit arrangement for system check is sketched in bellow figure. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table. During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-12. the microwave circuit arrangement used for SAR system check

6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, 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. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.
a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) Return-loss is within 10% of calibrated measurement;
d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

6.2.2 Summary System Check Result(s)

SAR System Validation Result(s)										
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1w)	Measured SAR (normalized to 1w)	Target SAR (normalized to 1w) (±10%)	Target SAR (normalized to 1w) (±10%)	Liquid Temp. (℃)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g (W/kg)	10-g (W/kg)		
D750 V3	Head	1.95	1.29	7.8	5.16	8.17 (7.35~8.99)	5.36 (4.82~5.9)	22.1	2018/4/28
	Body	2.13	1.41	8.52	5.64	8.57 (7.71~9.43)	5.66 (5.09~6.23)	22.1	2018/4/28
	Body	2.26	1.52	9.04	6.08	8.57 (7.71~9.43)	5.66 (5.09~6.23)	22.1	2018/5/29
D835 V2	Head	2.48	1.62	9.92	6.48	9.59 (8.63~10.55)	6.29 (5.66~6.92)	22.1	2018/5/4
	Head	2.46	1.61	9.84	6.44	9.59 (8.63~10.55)	6.29 (5.66~6.92)	22.1	2018/5/4
	Body	2.46	1.63	9.84	6.52	9.65 (8.69~10.62)	6.46 (5.81~7.11)	22.1	2018/5/5
D1900 V2	Head	10.6	5.51	42.4	22.04	40.7 (36.63~44.77)	21.1 (18.99~23.21)	22.3	2018/5/9
	Body	10.3	5.46	41.2	21.84	41.6 (37.44~45.76)	21.4 (19.26~23.54)	22.3	2018/5/9
D2450 V2	Head	13.2	6.08	52.8	24.32	53.1 (47.79~58.41)	24.9 (22.41~27.39)	22	2018/5/5
	Body	12.7	5.83	50.8	23.32	51.0 (45.9~56.1)	23.5 (21.15~25.85)	22	2018/5/6
D2600 V2	Head	14	6.15	56	24.6	56.6 (50.94~62.26)	25.4 (22.86~27.94)	22.1	2018/5/7
	Head	14.1	6.23	56.4	24.92	56.6 (50.94~62.26)	25.4 (22.86~27.94)	22.1	2018/5/16
	Body	13.4	6.01	53.6	24.04	54.2 (48.78~59.62)	24.3 (21.87~26.73)	22.1	2018/5/7
	Body	13.3	6.01	53.2	24.04	54.2 (48.78~59.62)	24.3 (21.87~26.73)	22.1	2018/5/16

Table 2： SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A

7 Test Configuration

7.1 3G SAR Test Reduction Procedure

According to KDB 941225D01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. 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. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

7.2.1 CDMA Test Configuration

1）. <u>1x RTT Handsets</u>

The following procedures apply to CDMA 2000 Release 0 and Release A single carrier (1x RTT) handsets operating with Mobile Protocol Revision 6 or 7 (MOB_P_REV 6 or 7). The default test configuration is to measure SAR in RC3 with an established radio link between the handset and a communication test set. SAR in RC1 is selectively confirmed according to the 3G SAR test reduction procedure with RC3 as the primary mode. The forward and reverse links are configured with the same RC for SAR measurement. Maximum output power is verified by applying the procedures defined in 3GPP2 C. S0011 and TIA-98-E. SAR must be measured according to these maximum output conditions and requirements in KDB Publication 447498 D01.

2）. <u>Output Power Verification</u>

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. Results for at least steps 3, 4 and 10 of the power measurement procedures are required in the SAR report. Steps 3 and 4 are measured using Loopback Service Option SO55 with power control bits in “All Up” condition. TDSO/SO32 may be used instead of SO55 for step 4. Step 10 is measured using TDSO/SO32 with power control bits in the “Bits Hold” condition (i.e. alternative Up/Down Bits). All power measurements defined in C.S0011/TIA-98-E that are inapplicable to the handset or cannot be measured due to technical or equipment limitations must be clearly identified in the test report.

3）. <u>Head SAR</u>

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest reported SAR in RC3.

4）. <u>Body-Worn Accessory SAR</u>

Body-worn accessory SAR is measured in RC3 with the handset configured in TDSO/SO32 to transmit at full rate on FCH only with all other code channels disabled. The body-worn accessory procedures in KDB Publication 447498 D01 are applied. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCHn), with FCH at full rate and SCH0 enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

5）. Handsets with built-in Ev-Do

For handsets with Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

The 3G SAR test reduction procedure is applied separately to Rev. A and Rev. B, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode. Otherwise, SAR is required for Rev. A or Rev. B, with a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 and 3 Physical Layer configurations, using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0 or RC3, as appropriate.

A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with ACK Channel transmitting in all slots is configured in the downlink for Rev. 0, Rev. A and Rev. B

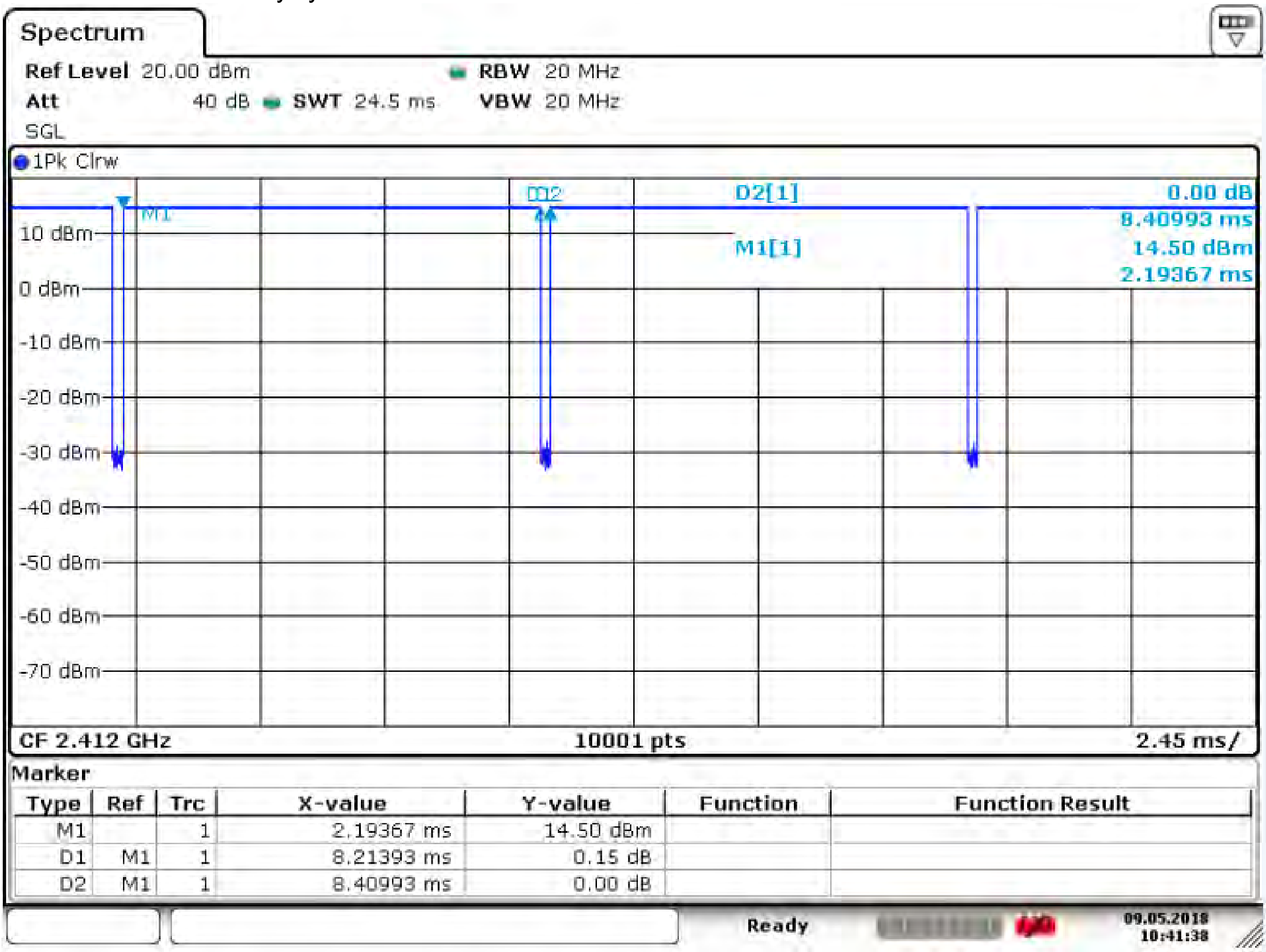
7.2.2 WiFi Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.2.2.1 Duty cycle

2.4GHz Wi-Fi 802.11b:

WIFI1 802.11b 11M: Duty cycle=8.21393/8.40993=97.67%



7.2.2.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

1） . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
2） . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g
3） SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
4） . For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.2.2.3 Initial Test Configuration Procedures

An initial test configuration is determined for OFDM 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. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to reported SAR of the initial test configuration.
For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.
When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until reported SAR is ≤ 1.2 W/kg or all required channels are tested.

7.2.2.4 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

1）. When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.

2）. When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

3）. The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.

   a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.

   b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.

4）. SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:

   a) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)

   b) replace “initial test configuration” with “all tested higher output power configurations”

7.2.2.5 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1）. 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.

2）. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

1）. When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.

2）. 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 Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.2.3 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:

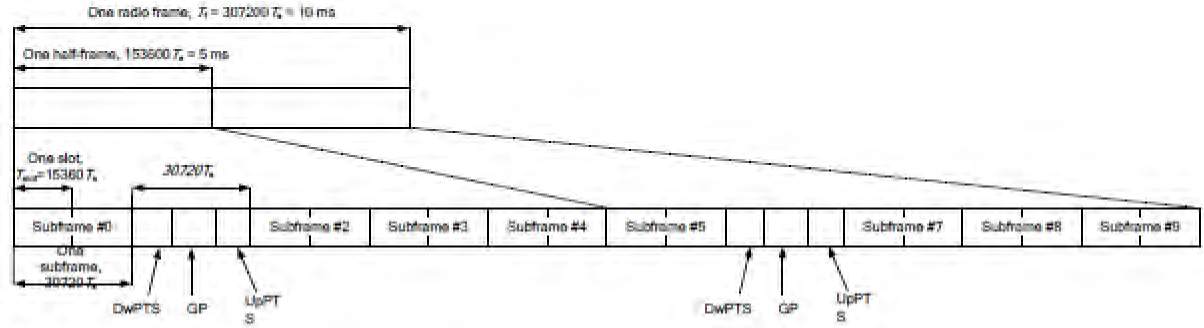


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	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	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts			7680.Ts	4384.Ts	5120.Ts
5	6592.Ts	4384.Ts	5120.Ts	20480.Ts		
6	19760.Ts			23040.Ts		
7	21952.Ts			25600.Ts		
8	24144.Ts			-	-	-
9	13168.Ts			-	-	-

Table 4.2-2: Uplink-downlink configurations.

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

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 V13.5.0 (201609) Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
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

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

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. 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. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation
The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation
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 1) and 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.

4) Higher order modulations
For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, 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.

E) Other channel bandwidth standalone SAR test requirements
For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure 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.

8 Test Result

8.1 Measurement of RF Conducted Power

8.1.1 Conducted Power Of CDMA

CDMA BC0(850MHz)				
Average Conducted Power(dBm)				
Channel	1013	384	777	Tune up
1XRTT RC1 SO55	24.04	23.96	23.86	25
1XRTT RC3 SO55	24.11	24.08	23.95	25
1XRTT RC3 SO32(FCH)	24.18	24.04	24.02	25
1XRTT RC3 SO32(FCH + SCH)	24.17	24.12	24.09	25
1XEVDO RTAP153.6Kbps	24.14	23.98	24.02	25
1XEVDO RETAP4096Bits	24.12	23.91	24.01	25
CDMA BC1(1900MHz)				
Average Conducted Power(dBm)				
Channel	25	600	1175	Tune up
1XRTT RC1 SO55	21.27	21.15	21.23	21.5
1XRTT RC3 SO55	21.17	21.15	21.26	21.5
1XRTT RC3 SO32(FCH)	21.28	21.11	21.26	21.5
1XRTT RC3 SO32(FCH + SCH)	21.23	21.11	21.33	21.5
1XEVDO RTAP153.6Kbps	21.26	21.15	21.21	21.5
1XEVDO RETAP4096Bits	21.25	21.11	21.20	21.5
CDMA BC10(850MHz)				
Average Conducted Power(dBm)				
Channel	476	580	684	Tune up
1XRTT RC1 SO55	24.23	24.12	23.90	25
1XRTT RC3 SO55	24.18	24.23	24.04	25
1XRTT RC3 SO32(FCH)	24.26	24.17	23.93	25
1XRTT RC3 SO32(FCH + SCH)	24.16	24.26	24.07	25
1XEVDO RTAP153.6Kbps	24.14	24.06	24.15	25
1XEVDO RETAP4096Bits	24.09	24.13	24.16	25

Table 3： Conducted Power Of CDMA

8.1.2 Conducted Power Of LTE

LTE Band 13				Conducted Power(dBm)			Tune up
Bandwidth	Modulation	RB size	RB offset	Channel 23205	Channel 23230	Channel 23255	
5MHz	QPSK	1	0	23.58	23.32	23.58	24.5
		1	13	23.39	23.56	23.72	24.5
		1	24	23.49	23.36	23.28	24.5
		12	0	22.76	22.74	22.67	23.5
		12	6	22.55	22.78	22.86	23.5
		12	13	22.69	22.75	22.79	23.5
		25	0	22.59	22.73	22.72	23.5
	16QAM	1	0	22.6	22.98	22.06	23.5
		1	13	22.48	22.63	22.26	23.5
		1	24	21.93	22.78	22.4	23.5
		12	0	21.75	21.7	21.52	22.4
		12	6	21.57	21.58	21.56	22.4
		12	13	21.58	21.85	21.65	22.4
		25	0	21.75	21.85	21.62	22.4
Bandwidth	Modulation	RB size	RB offset	Channel NA	Channel 23230	Channel NA	Tune up
10MHz	QPSK	1	0	NA	23.32	NA	24.5
		1	25	NA	**23.8**	NA	24.5
		1	49	NA	23.62	NA	24.5
		25	0	NA	22.79	NA	23.5
		25	13	NA	**22.87**	NA	23.5
		25	25	NA	22.81	NA	23.5
		50	0	NA	**22.74**	NA	23.5
	16QAM	1	0	NA	23.17	NA	23.5
		1	25	NA	22.99	NA	23.5
		1	49	NA	22.36	NA	23.5
		25	0	NA	21.8	NA	22.4
		25	13	NA	21.92	NA	22.4
		25	25	NA	21.75	NA	22.4
		50	0	NA	21.8	NA	22.4

LTE Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 26047	Channel 26365	Channel 26683	Tune up
1.4MHz	QPSK	1	0	20.76	20.73	20.76	21.5
		1	2	20.73	20.82	20.86	21.5
		1	5	20.88	20.66	20.85	21.5
		3	0	20.98	20.92	20.9	21.5
		3	2	20.77	20.99	20.94	21.5
		3	3	20.8	20.92	21.06	21.5
		6	0	19.78	19.89	19.85	20.5
	16QAM	1	0	19.87	19.38	19.13	20.5
		1	2	19.83	19.4	19.02	20.5
		1	5	19.91	18.81	19.42	20.5
		3	0	19.66	19.57	19.56	20.5
		3	2	19.65	19.81	19.8	20.5
		3	3	19.63	19.76	19.73	20.5
		6	0	18.59	18.72	18.91	19.5
Bandwidth	Modulation	RB size	RB offset	Channel 26055	Channel 26365	Channel 26675	Tune up
3MHz	QPSK	1	0	20.9	20.43	20.66	21.5
		1	7	20.7	20.74	20.8	21.5
		1	14	20.75	20.55	20.66	21.5
		8	0	19.82	19.8	19.92	20.5
		8	4	19.91	19.82	19.87	20.5
		8	7	19.83	19.77	19.94	20.5
		15	0	19.83	19.88	19.92	20.5
	16QAM	1	0	19.97	19.4	20.35	20.5
		1	7	19.97	19.1	19.31	20.5
		1	14	20.26	19.54	19.6	20.5
		8	0	18.62	18.87	18.9	19.5
		8	4	18.87	19	18.94	19.5
		8	7	18.85	18.84	18.98	19.5
		15	0	19	18.94	19.05	19.5
Bandwidth	Modulation	RB size	RB offset	Channel 26065	Channel 26365	Channel 26665	Tune up
5MHz	QPSK	1	0	20.7	20.57	20.6	21.5
		1	13	20.63	20.54	20.64	21.5
		1	24	20.67	20.57	20.66	21.5
		12	0	19.76	19.79	19.79	20.5
		12	6	19.83	19.93	19.82	20.5
		12	13	19.72	19.87	19.84	20.5
		25	0	19.75	19.86	19.9	20.5
	16QAM	1	0	20.1	19.73	20.04	20.5
		1	13	19.58	19.73	19.16	20.5
		1	24	19.66	19.98	19.5	20.5
		12	0	18.68	18.62	18.76	19.5
		12	6	18.66	18.77	18.91	19.5

		12	13	18.62	18.93	18.77	19.5
		25	0	18.63	18.8	18.73	19.5
Bandwidth	Modulation	RB size	RB offset	Channel 26090	Channel 26365	Channel 26640	Tune up
10MHz	QPSK	1	0	20.57	20.61	20.59	21.5
		1	25	20.6	20.89	20.82	21.5
		1	49	20.71	20.6	20.78	21.5
		25	0	19.8	20.03	19.84	20.5
		25	13	19.9	20.02	19.84	20.5
		25	25	19.93	19.89	19.81	20.5
		50	0	19.84	19.96	19.86	20.5
	16QAM	1	0	19	18.89	19.5	20.5
		1	25	19.87	19.15	19.37	20.5
		1	49	19.65	19.55	19.44	20.5
		25	0	18.79	18.89	19.05	19.5
		25	13	18.99	19.12	18.96	19.5
		25	25	18.8	18.89	18.83	19.5
		50	0	18.88	18.97	18.87	19.5
Bandwidth	Modulation	RB size	RB offset	Channel 26115	Channel 26365	Channel 26615	Tune up
15MHz	QPSK	1	0	20.73	20.68	20.66	21.5
		1	38	20.76	20.82	20.95	21.5
		1	74	20.71	20.71	20.77	21.5
		36	0	19.9	20.02	19.9	20.5
		36	18	19.84	19.93	19.93	20.5
		36	39	19.82	19.96	19.71	20.5
		75	0	19.9	19.93	19.82	20.5
	16QAM	1	0	19.59	19.84	19.83	20.5
		1	38	19.4	19.91	19.66	20.5
		1	74	18.84	19.79	19.4	20.5
		36	0	18.95	19.05	18.89	19.5
		36	18	18.77	18.95	18.88	19.5
		36	39	18.95	19	18.89	19.5
		75	0	18.99	18.97	18.85	19.5
Bandwidth	Modulation	RB size	RB offset	Channel 26140	Channel 26365	Channel 26590	Tune up
20MHz	QPSK	1	0	20.61	20.41	20.66	21.5
		1	50	**21.02**	21.01	21.00	21.5
		1	99	20.47	20.47	20.74	21.5
		50	0	**20.02**	20.01	19.91	20.5
		50	25	19.85	19.94	19.84	20.5
		50	50	19.85	19.91	19.95	20.5
		100	0	19.91	**19.99**	19.81	20.5
	16QAM	1	0	19.35	19.60	19.43	20.5
		1	50	19.81	19.75	19.33	20.5
		1	99	19.17	19.00	19.44	20.5
		50	0	19.04	19.00	19.02	19.5
		50	25	18.75	19.14	19.02	19.5

		50	50	19.04	19.05	19.05	19.5
		100	0	18.93	19.06	18.96	19.5

LTE FDD Band 26				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 26697	Channel 26865	Channel 27033	Tune up
1.4MHz	QPSK	1	0	23.62	23.48	23.48	24.5
		1	2	23.73	23.64	23.46	24.5
		1	5	23.55	23.47	23.27	24.5
		3	0	23.56	23.6	23.41	24.5
		3	2	23.64	23.59	23.33	24.5
		3	3	23.77	23.65	23.38	24.5
		6	0	22.46	22.6	22.31	23.5
	16QAM	1	0	21.8	22.2	21.73	23.5
		1	2	22.14	22.2	22.11	23.5
		1	5	21.76	21.52	21.26	23.5
		3	0	22.48	22.43	22.08	23.5
		3	2	22.51	22.67	22.09	23.5
		3	3	22.52	22.58	22.23	23.5
		6	0	21.42	21.51	21.19	22.4
Bandwidth	Modulation	RB size	RB offset	Channel 26705	Channel 26865	Channel 27025	Tune up
3MHz	QPSK	1	0	23.66	23.36	23.61	24.5
		1	7	23.45	23.57	23.45	24.5
		1	14	23.09	23.37	23.04	24.5
		8	0	22.47	22.5	22.39	23.5
		8	4	22.56	22.53	22.34	23.5
		8	7	22.33	22.44	22.28	23.5
		15	0	22.54	22.49	22.42	23.5
	16QAM	1	0	22.11	22.43	22.28	23.5
		1	7	22.11	22.13	21.65	23.5
		1	14	22.05	22.1	21.79	23.5
		8	0	21.5	21.66	21.45	22.4
		8	4	21.61	21.63	21.31	22.4
		8	7	21.77	21.57	21.39	22.4
		15	0	21.7	21.62	21.28	22.4
Bandwidth	Modulation	RB size	RB offset	Channel 26715	Channel 26865	Channel 27015	Tune up
5MHz	QPSK	1	0	23.61	23.58	23.38	24.5
		1	13	23.55	23.66	23.63	24.5
		1	24	23.23	23.44	23.27	24.5
		12	0	22.56	22.34	22.34	23.5
		12	6	22.53	22.48	22.41	23.5
		12	13	22.37	22.37	22.27	23.5
		25	0	22.4	22.54	22.34	23.5
	16QAM	1	0	22.29	22.78	21.97	23.5
		1	13	22.54	22.03	21.68	23.5

		1	24	21.74	22.12	21.16	23.5
		12	0	21.4	21.36	21.38	22.4
		12	6	21.42	21.33	21.25	22.4
		12	13	21.23	21.14	21.17	22.4
		25	0	21.52	21.62	21.47	22.4
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26750	26865	26990	
10MHz	QPSK	1	0	23.5	23.6	23.24	24.5
		1	25	23.54	23.73	23.47	24.5
		1	49	23.39	23.38	23.54	24.5
		25	0	22.52	22.54	22.56	23.5
		25	13	22.55	22.58	22.43	23.5
		25	25	22.53	22.41	22.37	23.5
		50	0	22.59	22.49	22.47	23.5
	16QAM	1	0	22.16	21.88	22.17	23.5
		1	25	22.1	22.03	23	23.5
		1	49	22.06	22.22	22.21	23.5
		25	0	21.64	21.6	21.47	22.4
		25	13	21.57	21.56	21.72	22.4
		25	25	21.74	21.51	21.34	22.4
		50	0	21.82	21.57	21.46	22.4
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26775	26865	26965	
15MHz	QPSK	1	0	**23.72**	23.51	23.33	24.5
		1	38	23.64	23.68	23.59	24.5
		1	74	23.4	23.5	23.34	24.5
		36	0	22.56	22.63	22.61	23.5
		36	18	**22.63**	22.53	22.46	23.5
		36	39	22.5	22.46	22.53	23.5
		75	0	**22.63**	22.46	22.58	23.5
	16QAM	1	0	23.04	22.2	22.2	23.5
		1	38	23.05	22.09	22.27	23.5
		1	74	22.56	22.02	21.77	23.5
		36	0	21.49	21.64	21.65	22.4
		36	18	21.64	21.53	21.45	22.4
		36	39	21.48	21.48	21.47	22.4
		75	0	21.63	21.58	21.67	22.4

LTE FDD Band 41(Class 2)				Conducted Power(dBm)					
Bandwidth	Modulation	RB size	RB offset	Channel 39675	Channel 40148	Channel 40620	Channel 41093	Channel 41565	Tune up
5MHz	QPSK	1	0	25.64	26.64	25.31	25.42	24.26	27.5
		1	13	25.36	26.75	25.86	25.46	24.08	27.5
		1	24	25.63	26.7	26.54	25.39	23.52	27.5
		12	0	24.86	25.81	25.32	25.08	20.9	26.5
		12	6	25.14	25.64	24.53	24.52	21.07	26.5
		12	13	25.53	25.64	25.91	24.99	25.59	26.5
		25	0	24.15	25.52	25.88	24.58	26.12	26.5
	16QAM	1	0	24.06	25.82	24.57	24.15	25.46	26.5
		1	13	24.52	26.36	24.77	24.25	25.34	26.5
		1	24	24.89	25.98	24.71	24	25.02	26.5
		12	0	23.28	24.84	23.61	23.29	24.08	25.5
		12	6	22.77	25.39	23.42	23.08	23.57	25.5
		12	13	24.27	22.29	24.8	23.43	24.89	25.5
		25	0	25.83	21.38	24.93	23.25	23.99	25.5
Bandwidth	Modulation	RB size	RB offset	Channel 39700	Channel 40160	Channel 40620	Channel 41080	Channel 41540	Tune up
10MHz	QPSK	1	0	25.46	26.85	26.06	25.1	25.97	27.5
		1	25	25.82	26.4	26.07	25.25	26.12	27.5
		1	49	25.74	26.92	25.96	24.83	25.91	27.5
		25	0	24.82	26.21	25.51	24.56	25.29	26.5
		25	13	25.24	25.54	25.2	24.87	25.54	26.5
		25	25	25.1	25.32	24.93	24.57	25.29	26.5
		50	0	24.6	26.09	24.86	24.06	24.94	26.5
	16QAM	1	0	24.36	26.15	24.66	24.28	25.06	26.5
		1	25	24.89	26.32	24.96	25.07	25.31	26.5
		1	49	25.01	26.1	24.49	24.59	25.25	26.5
		25	0	24.09	25.3	24.78	23.91	23.96	25.5
		25	13	23.97	25.07	24.22	23.87	24.54	25.5
		25	25	24.19	24.76	24.61	23.75	24.57	25.5
		50	0	23.55	24.71	24.22	23.29	24.09	25.5
Bandwidth	Modulation	RB size	RB offset	Channel 39725	Channel 40173	Channel 40620	Channel 41068	Channel 41515	Tune up
15MHz	QPSK	1	0	25.92	26.29	26.31	25.61	26.32	27.5
		1	38	26.27	26.17	26.8	25.65	26.45	27.5
		1	74	26.58	26.15	26.59	25.27	26.21	27.5
		36	0	25.26	26.36	25.62	24.92	25.44	26.5
		36	18	25.43	26.23	25.84	24.98	25.41	26.5
		36	39	25.57	26.22	25.67	24.78	25.54	26.5
		75	0	25.16	26.14	24.97	24.73	25.44	26.5
	16QAM	1	0	24.83	26.15	25.45	25.07	25.33	26.5
		1	38	25.69	26.05	25.96	24.8	25.72	26.5
		1	74	26.25	25.98	25.82	24.41	25.52	26.5
		36	0	23.75	24.27	23.89	23.62	23.86	25.5

		36	18	23.91	23.96	23.92	23.38	24.08	25.5
		36	39	24.26	24.45	23.85	23.49	24.27	25.5
		75	0	24.06	25.32	23.78	23.18	24.35	25.5
Bandwidth	Modulation	RB size	RB offset	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490	Tune up
20MHz	QPSK	1	0	25.67	25.22	26.67	25.60	26.14	27.5
		1	50	26.79	26.37	26.69	25.57	26.28	27.5
		1	99	**26.83**	25.69	26.32	25.66	26.04	27.5
		50	0	24.93	25.83	25.55	24.54	24.94	26.5
		50	25	25.59	**26.16**	25.82	24.85	25.35	26.5
		50	50	25.32	26.01	25.3	24.52	25.36	26.5
		100	0	24.94	**26.17**	25.49	24.13	25.12	26.5
	16QAM	1	0	24.83	26.4	25.88	24.56	24.75	26.5
		1	50	25.82	26.31	25.97	24.88	25.32	26.5
		1	99	25.72	25.8	24.93	23.94	25.08	26.5
		50	0	24.01	25.22	24.72	23.61	24	25.5
		50	25	24.54	24.5	24.18	23.76	24.33	25.5
		50	50	24.43	24.45	24.57	23.77	24.18	25.5
		100	0	23.95	25.22	23.81	23.48	24.12	25.5

LTE FDD Band 41(Class 3)				**Conducted Power(dBm)**					
Bandwidth	Modulation	RB size	RB offset	Channel 39675	Channel 40148	Channel 40620	Channel 41093	Channel 41565	Tune up
5MHz	QPSK	1	0	22.79	22.97	22.73	23.18	22.89	24
		1	13	22.95	23.05	22.96	23.31	22.91	24
		1	24	22.89	22.73	22.84	23.01	22.66	24
		12	0	22.96	22.93	23.11	23.35	23.07	24
		12	6	23.05	22.84	22.82	22.93	23.02	24
		12	13	22.7	23.07	23.31	23.02	23.03	24
		25	0	22.98	22.87	22.62	22.53	22.62	24
	16QAM	1	0	21.99	21.76	21.8	23.42	22.26	24
		1	13	22.49	21.87	22.41	22.28	22.3	24
		1	24	22.11	21.67	22.46	22.07	22.08	24
		12	0	23.94	22.56	23.01	22.77	22.31	24
		12	6	22.86	22.81	23.3	22.66	22.98	24
		12	13	23.15	22.9	22.99	22.89	22.82	24
		25	0	22.95	23.02	22.94	22.49	22.75	24
Bandwidth	Modulation	RB size	RB offset	Channel 39700	Channel 40160	Channel 40620	Channel 41080	Channel 41540	Tune up
10MHz	QPSK	1	0	22.99	22.9	22.83	23.26	22.92	24
		1	25	23.04	22.96	22.97	23.26	22.98	24
		1	49	22.95	22.78	22.9	23.04	22.86	24
		25	0	23.07	23	22.94	23.24	23.15	24
		25	13	23.23	22.8	23.04	23.16	23.01	24
		25	25	23.05	22.94	23.1	23.19	22.99	24
		50	0	23.16	23.11	23.01	23.33	23.08	24
	16QAM	1	0	22.3	22.31	22.77	23.28	22.49	24

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Channel	Tune up
		1	25	22.91	22.58	22.68	22.89	22.54	24
		1	49	22.33	22.23	22.57	22.38	21.99	24
		25	0	23.05	22.03	23.05	22.83	22.71	24
		25	13	23.37	23.1	23.08	22.94	23.11	24
		25	25	23.31	22.93	23.16	22.9	23.07	24
		50	0	22.96	22.89	23	22.42	23.19	24
Bandwidth	Modulation	RB size	RB offset	Channel 39725	Channel 40173	Channel 40620	Channel 41068	Channel 41515	Tune up
15MHz	QPSK	1	0	22.81	23.01	22.82	23.23	23.03	24
		1	38	22.8	23.01	22.92	23.3	23.06	24
		1	74	22.78	22.66	22.83	22.97	22.86	24
		36	0	23.07	23	22.92	23.35	22.94	24
		36	18	23.21	22.97	23.02	23.3	22.86	24
		36	39	23.35	22.89	22.17	23.19	23.01	24
		75	0	23.03	22.95	22.69	23.11	22.93	24
	16QAM	1	0	22.26	23.01	22.24	22.77	23.23	24
		1	38	22.6	22.49	22.32	22.84	22.61	24
		1	74	22.18	22.24	21.97	22.35	22.43	24
		36	0	22.85	22.97	23.3	22.71	23.08	24
		36	18	23.18	22.42	23.04	22.73	23.04	24
		36	39	23.08	22.83	23.16	22.89	22.96	24
		75	0	22.73	22.77	23.07	22.31	22.95	24
Bandwidth	Modulation	RB size	RB offset	Channel 39750	Channel 40185	Channel 40620	Channel 41055	Channel 41490	Tune up
20MHz	QPSK	1	0	22.96	22.86	22.85	23.27	23.17	24
		1	50	**23.42**	23.05	23.4	23.24	23.36	24
		1	99	22.91	22.76	22.93	22.94	22.88	24
		50	0	23.09	23.01	22.94	23.3	23.12	24
		50	25	**23.31**	23.02	23.07	23.3	23.17	24
		50	50	23.21	23.15	23.04	23.29	23.21	24
		100	0	**23.32**	23.15	23.06	23.24	23.03	24
	16QAM	1	0	22.33	22.48	22.16	22.69	22.5	24
		1	50	22.79	22.56	22.38	22.8	22.8	24
		1	99	23.01	22.14	22.13	22.3	22.48	24
		50	0	23.06	22.82	23.06	22.58	23.17	24
		50	25	23.07	23.11	23.16	22.7	22.96	24
		50	50	22.83	22.98	23.01	22.87	23.12	24
		100	0	22.99	23.25	22.99	22.12	23.07	24

Table 4： Conducted Power Of LTE

8.1.3 Conducted Power of WIFI and BT

Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Tune up	Average Power (dBm)	SAR Test
802.11b	1	2412	1	14	12.51	NO
	6	2437		14	12.76	NO
	11	2462		14	**13.63**	Yes
802.11g	1	2412	6	13	11.08	NO
	6	2437		13	11.71	NO
	11	2462		13	12.16	NO
802.11n HT20 SISO	1	2412	6.5	13	11.04	NO
	6	2437		13	11.72	NO
	11	2462		13	12.16	NO

Table 5： Conducted Power Of WIFI

Note:

a) Power must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band.

b) Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.

1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.

2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

c) For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured.

BT			Tune up (dBm)	Average Conducted Power(dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	5	**3.44**
	39	2441	5	2.89
	78	2480	5	2.57
π/4DQPSK	0	2402	3	1.32
	39	2441	3	1.91
	78	2480	3	1.06
8DPSK	0	2402	3	1.37
	39	2441	3	1.89
	78	2480	3	1.15

BLE			Tune up (dBm)	Average Conducted Power(dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	-0.5	-1.58
	19	2440	-0.5	-1.37
	39	2480	-0.5	-2.03

Table 6： Conducted Power Of BT

8.2 Stand-alone SAR test evaluation

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

Freq. Band	Frequency (GHz)	Position	Average Power		Test Separation (mm)	Calculate Value	Exclusion Threshold	Exclusion (Y/N)
			dBm	mW				
Wi-Fi	2.45	Head	14	25.1	0	7.9	3	N
		Body-worn	14	25.1	15	2.6	3	Y
		hotspot	14	25.1	10	3.9	3	N
Bluetooth	2.48	Head	5	3.2	0	1.0	3	Y
		Body-worn	5	3.2	15	0.3	3	Y
		hotspot	5	3.2	10	0.5	3	Y

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

• f(GHz) is the RF channel transmit frequency in GHz

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

• The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

8.3 Measurement of SAR Data

8.3.1 SAR Result Of CDMA BC10

Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted Power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp
Head Test data										
Left cheek	1xRTT (RC3 SO55)	580/820.5	1:1	0.34	0.07	24.23	25	1.194	0.406	22.1
Left tilted	1xRTT (RC3 SO55)	580/820.5	1:1	0.267	0.09	24.23	25	1.194	0.319	22.1
Right cheek	1xRTT (RC3 SO55)	580/820.5	1:1	0.402	0.19	24.23	25	1.194	**0.480**	22.1
Right tilted	1xRTT (RC3 SO55)	580/820.5	1:1	0.221	0.14	24.23	25	1.194	0.264	22.1
Body worn Test data(Separate 15mm)										
Front side	1xRTT (RC3 SO32)	580/820.5	1:1	0.315	0.03	24.17	25	1.211	0.381	22.1
Back side	1xRTT (RC3 SO32)	580/820.5	1:1	0.399	-0.01	24.17	25	1.211	**0.483**	22.1
Hotspot Test data(Separate 10mm)										
Front side	1xRTT (RC3 SO32)	580/820.5	1:1	0.315	0	24.17	25	1.211	0.381	22.1
Back side	1xRTT (RC3 SO32)	580/820.5	1:1	0.481	0.08	24.17	25	1.211	**0.582**	22.1
Left side	1xRTT (RC3 SO32)	580/820.5	1:1	0.246	0.05	24.17	25	1.211	0.298	22.1
Right side	1xRTT (RC3 SO32)	580/820.5	1:1	0.422	0.16	24.17	25	1.211	0.511	22.1
Bottom side	1xRTT (RC3 SO32)	580/820.5	1:1	0.224	0.03	24.17	25	1.211	0.271	22.1

Table 7： SAR of CDMA BC10 for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph Results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.3.2 SAR Result Of CDMA BC0

Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted Power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp
Head Test data										
Left cheek	1xRTT (RC3 SO55)	384/836.52	1:1	0.267	0.02	24.08	25	1.236	0.330	22.1
Left tilted	1xRTT (RC3 SO55)	384/836.52	1:1	0.212	0.04	24.08	25	1.236	0.262	22.1
Right cheek	1xRTT (RC3 SO55)	384/836.52	1:1	0.313	-0.08	24.08	25	1.236	**0.387**	22.1
Right tilted	1xRTT (RC3 SO55)	384/836.52	1:1	0.184	0.09	24.08	25	1.236	0.227	22.1
Body worn Test data(Separate 15mm)										
Front side	1xRTT (RC3 SO32)	384/836.52	1:1	0.238	-0.09	24.04	25	1.247	0.297	22.1
Back side	1xRTT (RC3 SO32)	384/836.52	1:1	0.321	-0.01	24.04	25	1.247	**0.400**	22.1
Hotspot Test data(Separate 10mm)										
Front side	1xRTT (RC3 SO32)	384/836.52	1:1	0.236	-0.13	24.04	25	1.247	0.294	22.1
Back side	1xRTT (RC3 SO32)	384/836.52	1:1	0.517	0.05	24.04	25	1.247	**0.645**	22.1
Left side	1xRTT (RC3 SO32)	384/836.52	1:1	0.171	-0.01	24.04	25	1.247	0.213	22.1
Right side	1xRTT (RC3 SO32)	384/836.52	1:1	0.376	0.07	24.04	25	1.247	0.469	22.1
Bottom side	1xRTT (RC3 SO32)	384/836.52	1:1	0.257	0.04	24.04	25	1.247	0.321	22.1

Table 8： SAR of CDMA BC0 for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.3.3 SAR Result Of CDMA BC1

Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted Power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp
Head Test data										
Left cheek	1xRTT (RC3 SO55)	600/1880	1:1	0.208	0.17	21.15	21.5	1.084	0.225	22.3
Left tilted	1xRTT (RC3 SO55)	600/1880	1:1	0.0722	0.02	21.15	21.5	1.084	0.078	22.3
Right cheek	1xRTT (RC3 SO55)	600/1880	1:1	0.35	0.11	21.15	21.5	1.084	**0.379**	22.3
Right tilted	1xRTT (RC3 SO55)	600/1880	1:1	0.185	0.03	21.15	21.5	1.084	0.201	22.3
Body worn Test data(Separate 15mm)										
Front side	1xRTT (RC3 SO32)	600/1880	1:1	0.167	-0.13	21.11	21.5	1.094	0.183	22.3
Back side	1xRTT (RC3 SO32)	600/1880	1:1	0.623	0.07	21.11	21.5	1.094	**0.682**	22.3
Hotspot Test data(Separate 10mm)										
Front side	1xRTT (RC3 SO32)	600/1880	1:1	0.567	0.06	21.11	21.5	1.094	0.620	22.3
Back side	1xRTT (RC3 SO32)	600/1880	1:1	1.19	0.19	21.11	21.5	1.094	1.302	22.3
Left side	1xRTT (RC3 SO32)	600/1880	1:1	0.238	0.14	21.11	21.5	1.094	0.260	22.3
Right side	1xRTT (RC3 SO32)	600/1880	1:1	0.0852	-0.01	21.11	21.5	1.094	0.093	22.3
Bottom side	1xRTT (RC3 SO32)	600/1880	1:1	0.717	0	21.11	21.5	1.094	0.784	22.3
Back side	1xRTT (RC3 SO32)	25/1851.25	1:1	0.871	0.12	21.28	21.5	1.052	0.916	22.3
Back side	1xRTT (RC3 SO32)	1175/1908.75	1:1	1.34	0.07	21.26	21.5	1.057	**1.416**	22.3
Back side-repeat	1xRTT (RC3 SO32)	1175/1908.75	1:1	1.33	-0.04	21.26	21.5	1.057	1.406	22.3
Back side	1XEVDO RTAP 153.6Kbps	600/1880	1:1	1.12	0.06	21.15	21.5	1.084	1.214	22.3
Back side	1XEVDO RTAP 153.6Kbps	25/1851.25	1:1	0.808	0.01	21.26	21.5	1.057	0.854	22.3
Back side	1XEVDO RTAP 153.6Kbps	1175/1908.75	1:1	1.27	-0.04	21.21	21.5	1.069	1.358	22.3
Back side	1XEVDO RETAP 4096Bits	600/1880	1:1	1.14	0.17	21.11	21.5	1.094	1.247	22.3
Back side	1XEVDO RETAP 4096Bits	25/1851.25	1:1	0.822	0.11	21.25	21.5	1.059	0.871	22.3
Back side	1XEVDO RETAP 4096Bits	1175/1908.75	1:1	1.29	-0.02	21.2	21.5	1.072	1.382	22.3

Table 9： SAR of CDMA BC1 for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.3.4 SAR Result Of LTE Band 13

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp.
Head Test data(1RB_25 offset)											
Left cheek	10	QPSK	23230/782	1:1	0.289	0.05	23.8	24.5	1.175	0.340	22.1
Left tilted	10	QPSK	23230/782	1:1	0.199	0.05	23.8	24.5	1.175	0.234	22.1
Right cheek	10	QPSK	23230/782	1:1	0.342	0.06	23.8	24.5	1.175	**0.402**	22.1
Right tilted	10	QPSK	23230/782	1:1	0.221	0.03	23.8	24.5	1.175	0.260	22.1
Head Test data(50%RB_13 offset)											
Left cheek	10	QPSK	23230/782	1:1	0.217	0.09	22.87	23.5	1.156	0.251	22.1
Left tilted	10	QPSK	23230/782	1:1	0.153	-0.01	22.87	23.5	1.156	0.177	22.1
Right cheek	10	QPSK	23230/782	1:1	0.249	0.08	22.87	23.5	1.156	0.288	22.1
Right tilted	10	QPSK	23230/782	1:1	0.168	0.15	22.87	23.5	1.156	0.194	22.1
Body worn Test data(Separate 15mm 1RB_25 offset)											
Front side	10	QPSK	23230/782	1:1	0.396	0.02	23.8	24.5	1.175	0.465	22.1
Back side	10	QPSK	23230/782	1:1	0.519	-0.03	23.8	24.5	1.175	**0.610**	22.1
Body worn Test data (Separate 15mm 50%RB_13 offset)											
Front side	10	QPSK	23230/782	1:1	0.386	-0.03	22.87	23.5	1.156	0.446	22.1
Back side	10	QPSK	23230/782	1:1	0.3	-0.12	22.87	23.5	1.156	0.347	22.1
Hotspot Test data(Separate 10mm 1RB_25 offset)											
Front side	10	QPSK	23230/782	1:1	0.513	-0.16	23.8	24.5	1.175	0.603	22.1
Back side	10	QPSK	23230/782	1:1	0.718	-0.11	23.8	24.5	1.175	**0.844**	22.1
Left side	10	QPSK	23230/782	1:1	0.554	0.05	23.8	24.5	1.175	0.651	22.1
Right side	10	QPSK	23230/782	1:1	0.605	-0.01	23.8	24.5	1.175	0.711	22.1
Bottom side	10	QPSK	23230/782	1:1	0.111	0.05	23.8	24.5	1.175	0.130	22.1
Hotspot Test data (Separate 10mm 50%RB_13 offset)											
Front side	10	QPSK	23230/782	1:1	0.325	-0.09	22.87	23.5	1.156	0.376	22.1
Back side	10	QPSK	23230/782	1:1	0.521	-0.06	22.87	23.5	1.156	0.602	22.1
Left side	10	QPSK	23230/782	1:1	0.438	-0.03	22.87	23.5	1.156	0.506	22.1
Right side	10	QPSK	23230/782	1:1	0.481	-0.05	22.87	23.5	1.156	0.556	22.1
Bottom side	10	QPSK	23230/782	1:1	0.088	-0.09	22.87	23.5	1.156	0.102	22.1
Hotspot Test data (Separate 10mm 100%RB_0 offset)											
Back side	10	QPSK	23230/782	1:1	0.519	-0.02	22.74	23.5	1.191	0.618	22.1

Table 10： SA SAR of LTE Band 13 for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.3.5 SAR Result Of LTE Band 25

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp.
Head Test data(1RB_50 offset)											
Left cheek	20	QPSK	26140/1860	1:1	0.143	0.15	21.02	21.5	1.117	**0.160**	22.3
Left tilted	20	QPSK	26140/1860	1:1	0.0556	0.02	21.02	21.5	1.117	0.062	22.3
Right cheek	20	QPSK	26140/1860	1:1	0.14	0.04	21.02	21.5	1.117	0.156	22.3
Right tilted	20	QPSK	26140/1860	1:1	0.0488	0.11	21.02	21.5	1.117	0.055	22.3
Head Test data(50%RB_0 offset)											
Left cheek	20	QPSK	26140/1860	1:1	0.105	0.14	20.02	20.5	1.117	0.117	22.3
Left tilted	20	QPSK	26140/1860	1:1	0.0421	0.02	20.02	20.5	1.117	0.047	22.3
Right cheek	20	QPSK	26140/1860	1:1	0.118	0.02	20.02	20.5	1.117	0.132	22.3
Right tilted	20	QPSK	26140/1860	1:1	0.0372	0.06	20.02	20.5	1.117	0.042	22.3
Body worn Test data(Separate 15mm 1RB_50 offset)											
Front side	20	QPSK	26140/1860	1:1	0.118	0.05	21.02	21.5	1.117	0.132	22.3
Back side	20	QPSK	26140/1860	1:1	0.465	0.08	21.02	21.5	1.117	**0.519**	22.3
Body worn Test data (Separate 15mm 50%RB_0 offset)											
Front side	20	QPSK	26140/1860	1:1	0.0893	0.01	20.02	20.5	1.117	0.100	22.3
Back side	20	QPSK	26140/1860	1:1	0.363	0.18	20.02	20.5	1.117	0.405	22.3
Hotspot Test data(Separate 10mm 1RB_50 offset)											
Front side	20	QPSK	26140/1860	1:1	0.203	0.06	21.02	21.5	1.117	0.227	22.3
Back side	20	QPSK	26140/1860	1:1	0.965	0.02	21.02	21.5	1.117	1.078	22.3
Left side	20	QPSK	26140/1860	1:1	0.175	0.18	21.02	21.5	1.117	0.195	22.3
Right side	20	QPSK	26140/1860	1:1	0.0949	0.03	21.02	21.5	1.117	0.106	22.3
Bottom side	20	QPSK	26140/1860	1:1	0.454	-0.06	21.02	21.5	1.117	0.507	22.3
Back side	20	QPSK	26365/1882.5	1:1	1.23	0.17	21.01	21.5	1.119	1.377	22.3
Back side	20	QPSK	26590/1905	1:1	1.28	0.17	21.00	21.5	1.122	**1.436**	22.3
Back side -repeat	20	QPSK	26590/1905	1:1	1.24	-0.11	21.00	21.5	1.122	1.391	22.3
Hotspot Test data (Separate 10mm 50%RB_0 offset)											
Front side	20	QPSK	26140/1860	1:1	0.152	0.04	20.02	20.5	1.117	0.170	22.3

Back side	20	QPSK	26140/1860	1:1	1.01	-0.11	20.02	20.5	1.117	1.128	22.3
Left side	20	QPSK	26140/1860	1:1	0.132	0.03	20.02	20.5	1.117	0.147	22.3
Right side	20	QPSK	26140/1860	1:1	0.0778	0.09	20.02	20.5	1.117	0.087	22.3
Bottom side	20	QPSK	26140/1860	1:1	0.346	-0.03	20.02	20.5	1.117	0.386	22.3
Back side	20	QPSK	26365/1882.5	1:1	0.918	-0.01	20.10	20.5	1.096	1.007	22.3
Back side	20	QPSK	26590/1905	1:1	0.928	0.06	19.91	20.5	1.146	1.063	22.3
Hotspot Test data (Separate 10mm 100%RB_0 offset)											
Back side	20	QPSK	26365/1882.5	1:1	0.949	0.11	19.99	20.5	1.125	1.067	22.3

Table 11： SAR of LTE Band 25 for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.3.6 SAR Result Of LTE Band 26

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp.
Head Test data (1RB_0 offset)											
Left cheek	15	QPSK	26775/822.5	1:1	0.201	-0.14	23.72	24.5	1.197	0.241	22.1
Left tilted	15	QPSK	26775/822.5	1:1	0.156	0.06	23.72	24.5	1.197	0.187	22.1
Right cheek	15	QPSK	26775/822.5	1:1	0.25	0.04	23.72	24.5	1.197	**0.299**	22.1
Right tilted	15	QPSK	26775/822.5	1:1	0.156	0.01	23.72	24.5	1.197	0.187	22.1
Head Test data (50%RB_18 offset)											
Left cheek	15	QPSK	26775/822.5	1:1	0.151	-0.04	22.63	23.5	1.222	0.184	22.1
Left tilted	15	QPSK	26775/822.5	1:1	0.109	-0.09	22.63	23.5	1.222	0.133	22.1
Right cheek	15	QPSK	26775/822.5	1:1	0.183	-0.01	22.63	23.5	1.222	0.224	22.1
Right tilted	15	QPSK	26775/822.5	1:1	0.114	0.09	22.63	23.5	1.222	0.139	22.1
Body worn Test data (Separate 15mm 1RB_0 offset)											
Front side	15	QPSK	26775/822.5	1:1	0.354	-0.05	23.72	24.5	1.197	**0.424**	22.1
Back side	15	QPSK	26775/822.5	1:1	0.29	0.02	23.72	24.5	1.197	0.347	22.1
Body worn Test data (Separate 15mm 50%RB_18 offset)											
Front side	15	QPSK	26775/822.5	1:1	0.277	-0.1	22.63	23.5	1.222	0.338	22.1
Back side	15	QPSK	26775/822.5	1:1	0.23	0.01	22.63	23.5	1.222	0.281	22.1
Hotspot Test data (Separate 10mm 1RB_0 offset)											
Front side	15	QPSK	26775/822.5	1:1	0.342	-0.06	23.72	24.5	1.197	0.409	22.1
Back side	15	QPSK	26775/822.5	1:1	0.446	0.238	23.72	24.5	1.197	0.534	22.1
Left side	15	QPSK	26775/822.5	1:1	0.331	-0.02	23.72	24.5	1.197	0.396	22.1
Right side	15	QPSK	26775/822.5	1:1	0.47	0.08	23.72	24.5	1.197	**0.562**	22.1
Bottom side	15	QPSK	26775/822.5	1:1	0.186	0.01	23.72	24.5	1.197	0.223	22.1
Hotspot Test data (Separate 10mm 50%RB_18 offset)											
Front side	15	QPSK	26775/822.5	1:1	0.267	-0.03	22.63	23.5	1.222	0.326	22.1
Back side	15	QPSK	26775/822.5	1:1	0.348	0.05	22.63	23.5	1.222	0.425	22.1
Left side	15	QPSK	26775/822.5	1:1	0.247	-0.19	22.63	23.5	1.222	0.302	22.1
Right side	15	QPSK	26775/822.5	1:1	0.348	0.02	22.63	23.5	1.222	0.425	22.1
Bottom side	15	QPSK	26775/822.5	1:1	0.16	0L.01	22.63	23.5	1.222	0.195	22.1

Table 12：SAR of LTE Band 26 for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

8.3.7 SAR Result Of LTE Band 41(Class 3)

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp.
Head Test data (1RB_50 offset)											
Left cheek	20	QPSK	39750/2506	1:1.58	0.205	0.04	23.42	24	1.143	0.234	22.1
Left tilted	20	QPSK	39750/2506	1:1.58	0.0921	0.05	23.42	24	1.143	0.105	22.1
Right cheek	20	QPSK	39750/2506	1:1.58	0.107	-0.05	23.42	24	1.143	0.122	22.1
Right tilted	20	QPSK	39750/2506	1:1.58	0.0664	-0.17	23.42	24	1.143	0.076	22.1
Head Test data (50%RB_25 offset)											
Left cheek	20	QPSK	39750/2506	1:1.58	0.397	-0.05	23.31	24	1.172	**0.465**	22.1
Left tilted	20	QPSK	39750/2506	1:1.58	0.0903	0.02	23.31	24	1.172	0.106	22.1
Right cheek	20	QPSK	39750/2506	1:1.58	0.104	0.07	23.31	24	1.172	0.122	22.1
Right tilted	20	QPSK	39750/2506	1:1.58	0.0638	0	23.31	24	1.172	0.075	22.1
Body worn Test data (Separate 15mm 1RB_50 offset)											
Front side	20	QPSK	39750/2506	1:1.58	0.143	-0.01	23.42	24	1.143	0.163	22.1
Back side	20	QPSK	39750/2506	1:1.58	0.414	0.03	23.42	24	1.143	**0.473**	22.1
Body worn Test data (Separate 15mm 50%RB_25 offset)											
Front side	20	QPSK	39750/2506	1:1.58	0.113	0.19	23.31	24	1.172	0.132	22.1
Back side	20	QPSK	39750/2506	1:1.58	0.383	-0.08	23.31	24	1.172	0.449	22.1
Hotspot Test data (Separate 10mm 1RB_50 offset)											
Front side	20	QPSK	39750/2506	1:1.58	0.285	0.07	23.42	24	1.143	0.326	22.1
Back side	20	QPSK	39750/2506	1:1.58	0.991	0.16	23.42	24	1.143	**1.133**	22.1
Left side	20	QPSK	39750/2506	1:1.58	0.425	0.1	23.42	24	1.143	0.486	22.1
Right side	20	QPSK	39750/2506	1:1.58	0.041	-0.1	23.42	24	1.143	0.047	22.1
Bottom side	20	QPSK	39750/2506	1:1.58	0.219	-0.19	23.42	24	1.143	0.250	22.1
Back side	20	QPSK	40620/2593	1:1.58	0.678	-0.03	23.4	24	1.148	0.778	22.1
Back side	20	QPSK	41490/2680	1:1.58	0.295	-0.01	23.36	24	1.159	0.342	22.1
Back side	20	QPSK	40185/2549.5	1:1.58	0.887	0.07	23.05	24	1.245	1.104	22.1
Back side	20	QPSK	41055/2636.5	1:1.58	0.323	0.04	23.24	24	1.191	0.385	22.1
Back side-repeat	20	QPSK	39750/2506	1:1.58	0.973	0.18	23.42	24	1.143	1.112	22.1
Hotspot Test data (Separate 10mm 50%RB_25 offset)											
Front side	20	QPSK	39750/2506	1:1.58	0.231	-0.12	23.31	24	1.172	0.271	22.1
Back side	20	QPSK	39750/2506	1:1.58	0.853	-0.08	23.31	24	1.172	1.000	22.1
Left side	20	QPSK	39750/2506	1:1.58	0.327	-0.04	23.31	24	1.172	0.383	22.1
Right side	20	QPSK	39750/2506	1:1.58	0.0419	0.03	23.31	24	1.172	0.049	22.1
Bottom side	20	QPSK	39750/2506	1:1.58	0.169	-0.07	23.31	24	1.172	0.198	22.1
Back side	20	QPSK	40620/2593	1:1.58	0.351	-0.09	23.07	24	1.239	0.435	22.1
Back side	20	QPSK	41490/2680	1:1.58	0.347	-0.05	23.17	24	1.211	0.420	22.1

Back side	20	QPSK	40185/2549.5	1:1.58	0.745	-0.06	23.02	24	1.253	0.934	22.1
Back side	20	QPSK	41055/2636.5	1:1.58	0.264	0.17	23.3	24	1.175	0.310	22.1
Hotspot Test data (Separate 10mm 100%RB_0 offset)											
Back side	20	QPSK	39750/2506	1:1.58	0.81	0.01	23.32	24	1.169	0.947	22.1

Table 13：SAR of LTE Band 41(Class 3) for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

3) 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:

a) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

b) ≤ 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

c) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

4) This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3% using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behaviour, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition.

8.3.8 SAR Result Of LTE Band 41(Class 2)

Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power Drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp.
Head Test data (1RB_99 offset)											
Left cheek	20	QPSK	39750/2506	1:2.31	0.426	0.01	26.83	27.5	1.167	**0.497**	22.1
Left tilted	20	QPSK	39750/2506	1:2.31	0.135	0.04	26.83	27.5	1.167	0.158	22.1
Right cheek	20	QPSK	39750/2506	1:2.31	0.244	0.04	26.83	27.5	1.167	0.285	22.1
Right tilted	20	QPSK	39750/2506	1:2.31	0.148	-0.01	26.83	27.5	1.167	0.173	22.1
Head Test data (50%RB_25 offset)											
Left cheek	20	QPSK	40185/2549.5	1:2.31	0.353	0.05	26.16	26.5	1.081	0.382	22.1
Left tilted	20	QPSK	40185/2549.5	1:2.31	0.0669	-0.04	26.16	26.5	1.081	0.072	22.1
Right cheek	20	QPSK	40185/2549.5	1:2.31	0.153	-0.17	26.16	26.5	1.081	0.165	22.1
Right tilted	20	QPSK	40185/2549.5	1:2.31	0.098	0.16	26.16	26.5	1.081	0.106	22.1
Body worn Test data (Separate 15mm 1RB_99 offset)											
Front side	20	QPSK	39750/2506	1:2.31	0.229	0.13	26.83	27.5	1.167	0.267	22.1
Back side	20	QPSK	39750/2506	1:2.31	0.524	0.09	26.83	27.5	1.167	**0.611**	22.1
Body worn Test data (Separate 15mm 50%RB_25 offset)											
Front side	20	QPSK	40185/2549.5	1:2.31	0.18	0.01	26.16	26.5	1.081	0.195	22.1
Back side	20	QPSK	40185/2549.5	1:2.31	0.431	0.19	26.16	26.5	1.081	0.466	22.1
Hotspot Test data (Separate 10mm 1RB_99 offset)											
Front side	20	QPSK	39750/2506	1:2.31	0.384	-0.11	26.83	27.5	1.167	0.448	22.1
Back side	20	QPSK	39750/2506	1:2.31	1.1	0.08	26.83	27.5	1.167	**1.283**	22.1
Back side	20	QPSK	40185/2549.5	1:2.31	0.739	-0.16	25.69	27.5	1.517	1.121	22.1
Back side	20	QPSK	40620/2593	1:2.31	0.464	-0.14	26.32	27.5	1.312	0.609	22.1
Back side	20	QPSK	41055/2636.5	1:2.31	0.282	0.05	25.66	27.5	1.726	0.431	22.1
Back side	20	QPSK	41490/2680	1:2.31	0.409	-0.06	26.04	27.5	1.400	0.572	22.1
Left side	20	QPSK	39750/2506	1:2.31	0.631	-0.03	26.83	27.5	1.167	0.736	22.1
Left side	20	QPSK	40185/2549.5	1:2.31	0.42	-0.07	25.69	27.5	1.517	0.637	22.1
Left side	20	QPSK	40620/2593	1:2.31	0.19	-0.16	26.32	27.5	1.312	0.249	22.1
Left side	20	QPSK	41055/2636.5	1:2.31	0.138	-0.07	25.66	27.5	1.726	0.211	22.1
Left side	20	QPSK	41490/2680	1:2.31	0.109	-0.02	26.04	27.5	1.400	0.153	22.1
Right side	20	QPSK	39750/2506	1:2.31	0.041	0.04	26.83	27.5	1.167	0.048	22.1
Bottom side	20	QPSK	39750/2506	1:2.31	0.219	0.02	26.83	27.5	1.167	0.256	22.1
Back side-repeat	20	QPSK	39750/2506	1:2.31	1.05	0.08	26.83	27.5	1.167	1.225	22.1
Hotspot Test data (Separate 10mm 50%RB_25 offset)											
Front side	20	QPSK	40185/2549.5	1:2.31	0.272	-0.05	26.16	26.5	1.081	0.294	22.1
Back side	20	QPSK	40185/2549.5	1:2.31	0.913	0.01	26.16	26.5	1.081	0.987	22.1
Back side	20	QPSK	39750/2506	1:2.31	0.714	0.04	25.59	26.5	1.233	0.880	22.1
Back side	20	QPSK	40620/2593	1:2.31	0.381	0.02	25.82	26.5	1.169	0.446	22.1

Back side	20	QPSK	41055/2636.5	1:2.31	0.236	0.09	24.85	26.5	1.462	0.345	22.1
Back side	20	QPSK	41490/2680	1:2.31	0.342	0.05	25.35	26.5	1.303	0.446	22.1
Left side	20	QPSK	40185/2549.5	1:2.31	0.529	-0.19	26.16	26.5	1.081	0.572	22.1
Right side	20	QPSK	40185/2549.5	1:2.31	0.022	0.02	26.16	26.5	1.081	0.024	22.1
Bottom side	20	QPSK	40185/2549.5	1:2.31	0.217	0.04	26.16	26.5	1.081	0.235	22.1
Hotspot Test data (Separate 10mm 100%RB_0 offset)											
Back side	20	QPSK	40185/2549.5	1:2.31	1.09	0.08	26.17	26.5	1.079	1.176	22.1
Left side	20	QPSK	40185/2549.5	1:2.31	0.67	-0.14	26.17	26.5	1.079	0.723	22.1

Table 14： SAR of LTE Band 41(Class 2) for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

3) 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:

a) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

b) ≤ 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

c) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

4) This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3% using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition.

8.3.9 SAR Result Of 2.4GHz WIFI

Test position	Test mode	Test Ch./Freq.	Duty Cycle %	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp.
Head Test data											
Left cheek	802.11b	11/2462	97.67	1.024	0.358	-0.10	13.63	14	1.089	**0.399**	22
Left tilted	802.11b	11/2462	97.67	1.024	0.279	0.08	13.63	14	1.089	0.311	22
Right cheek	802.11b	11/2462	97.67	1.024	0.160	-0.03	13.63	14	1.089	0.178	22
Right tilted	802.11b	11/2462	97.67	1.024	0.146	-0.19	13.63	14	1.089	0.163	22
Body worn Test data(Separate 15mm)											
Front side	802.11b	11/2462	97.67	1.024	0.024	-0.06	13.63	14	1.089	0.027	22
Back side	802.11b	11/2462	97.67	1.024	0.031	0.12	13.63	14	1.089	**0.035**	22
Hotspot Test data (Separate 10mm)											
Front side	802.11b	11/2462	97.67	1.024	0.045	0.08	13.63	14	1.089	0.050	22
Back side	802.11b	11/2462	97.67	1.024	0.085	0.13	13.63	14	1.089	**0.095**	22
Right side	802.11b	11/2462	97.67	1.024	0.059	0.07	13.63	14	1.089	0.066	22
Top side	802.11b	11/2462	97.67	1.024	0.043	0.04	13.63	14	1.089	0.048	22

Table 15：SAR of 2.4GHz WIFI for Head and Body (Original report SZEM180300241707)

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B

2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

3) Each channel was tested at the lowest data rate.

4) 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, 802.11g/n OFDM SAR Test is not required.

8.4 Multiple Transmitter Evaluation

8.4.1 Simultaneous SAR SAR test evaluation

Simultaneous Transmission

NO.	Simultaneous Transmission Configuration	Head	Body worn	Hotspot
1	CDMA(Voice) + WiFi	Yes	Yes	No
2	CDMA(Voice) + BT	Yes	Yes	No
3	CDMA(Data) + WiFi	No	Yes	Yes
4	CDMA(Data) + BT	No	Yes	Yes
5	LTE(Data) + WiFi	Yes	Yes	Yes
6	LTE(Data) + BT	Yes	Yes	Yes
7	BT+WIFI	No	No	No

Note:
1) Wi-Fi and Bluetooth share the same Txantenna and can’t transmit simultaneously.

8.4.2 Estimated SAR

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:

• (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;

Where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

• 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

Estimated SAR Result

	Frequency (GHz)	Test Position	max. power(dBm)	Max. power(mW)	Test Separation (mm)	Estimated 1g SAR (W/kg)
Bluetooth	2.48	Head	5	3.2	0	0.133
		Body-worn	5	3.2	15	0.044
		hotspot	5	3.2	10	0.066

1) Simultaneous Transmission SAR Summation Scenario for head

WWAN Band	Exposure position	① MAX.WWAN SAR(W/kg)	② MAX.WLAN SAR(W/kg)	③ MAX.BT SAR(W/kg)	Summed SAR ①+②	Summed SAR ①+③	Case NO.
CDMA BC0	Left Touch	0.330	0.399	0.133	0.729	0.463	No
	Left Tilt	0.262	0.311	0.133	0.573	0.395	No
	Right Touch	0.387	0.178	0.133	0.565	0.520	No
	Right Tilt	0.227	0.163	0.133	0.390	0.360	No
CDMA BC1	Left Touch	0.225	0.399	0.133	0.624	0.358	No
	Left Tilt	0.078	0.311	0.133	0.389	0.211	No
	Right Touch	0.379	0.178	0.133	0.557	0.512	No
	Right Tilt	0.201	0.163	0.133	0.364	0.334	No
CDMA BC10	Left Touch	0.406	0.399	0.133	0.805	0.539	No
	Left Tilt	0.319	0.311	0.133	0.630	0.452	No
	Right Touch	0.480	0.178	0.133	0.658	0.613	No
	Right Tilt	0.264	0.163	0.133	0.427	0.397	No
LTE Band 13	Left Touch	0.340	0.399	0.133	0.739	0.473	No
	Left Tilt	0.234	0.311	0.133	0.545	0.367	No
	Right Touch	0.402	0.178	0.133	0.580	0.535	No
	Right Tilt	0.260	0.163	0.133	0.423	0.393	No
LTE Band 25	Left Touch	0.160	0.399	0.133	0.559	0.293	No
	Left Tilt	0.062	0.311	0.133	0.373	0.195	No
	Right Touch	0.156	0.178	0.133	0.334	0.289	No
	Right Tilt	0.055	0.163	0.133	0.218	0.188	No
LTE Band 26	Left Touch	0.241	0.399	0.133	0.640	0.374	No
	Left Tilt	0.187	0.311	0.133	0.498	0.320	No
	Right Touch	0.299	0.178	0.133	0.477	0.432	No
	Right Tilt	0.187	0.163	0.133	0.350	0.320	No
LTE Band 41 (Class 2)	Left Touch	0.497	0.399	0.133	**0.896**	0.630	No
	Left Tilt	0.158	0.311	0.133	0.469	0.291	No
	Right Touch	0.285	0.178	0.133	0.463	0.418	No
	Right Tilt	0.173	0.163	0.133	0.336	0.306	No
	Left Touch	0.465	0.399	0.133	0.864	0.598	No

LTE Band 41 (Class 3)	Left Tilt	0.106	0.311	0.133	0.417	0.239	No
	Right Touch	0.122	0.178	0.133	0.300	0.255	No
	Right Tilt	0.076	0.163	0.133	0.239	0.209	No

2) Simultaneous Transmission SAR Summation Scenario for body worn

WWAN Band	Exposure position	① MAX.WWAN SAR(W/kg)	② MAX.WLAN SAR(W/kg)	③ MAX.BT SAR(W/kg)	Summed SAR ①+②	Summed SAR ①+③	Case NO.
CDMA BC0	Front	0.297	0.027	0.044	0.324	0.341	No
	Back	0.400	0.035	0.044	0.435	0.444	No
CDMA BC1	Front	0.183	0.027	0.044	0.210	0.227	No
	Back	0.682	0.035	0.044	0.717	**0.726**	No
CDMA BC10	Front	0.381	0.027	0.044	0.408	0.425	No
	Back	0.483	0.035	0.044	0.518	0.527	No
LTE Band 13	Front	0.465	0.027	0.044	0.492	0.509	No
	Back	0.610	0.035	0.044	0.645	0.654	No
LTE Band 25	Front	0.132	0.027	0.044	0.159	0.176	No
	Back	0.519	0.035	0.044	0.554	0.563	No
LTE Band 26	Front	0.424	0.027	0.044	0.451	0.468	No
	Back	0.347	0.035	0.044	0.382	0.391	No
LTE Band 41 (Class 2)	Front	0.267	0.027	0.044	0.294	0.311	No
	Back	0.611	0.035	0.044	0.646	0.655	No
LTE Band 41 (Class 3)	Front	0.163	0.027	0.044	0.190	0.207	No
	Back	0.473	0.035	0.044	0.508	0.517	No

3) **Simultaneous Transmission SAR Summation Scenario for hotspot**

WWAN Band	Exposure position	① MAX.WWAN SAR(W/kg)	② MAX.WLAN SAR(W/kg)	③ MAX.BT SAR(W/kg)	Summed SAR ①+②	Summed SAR ①+③	Case NO.
CDMA BC0	Front	0.294	0.050	0.066	0.344	0.360	No
	Back	0.652	0.095	0.066	0.747	0.718	No
	Left	0.213	0.000	0.066	0.213	0.279	No
	Right	0.469	0.066	0.066	0.535	0.535	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.321	0.000	0.066	0.321	0.387	No
CDMA BC1	Front	0.620	0.050	0.066	0.670	0.686	No
	Back	1.416	0.095	0.066	1.511	1.482	No
	Left	0.260	0.000	0.066	0.260	0.326	No
	Right	0.093	0.066	0.066	0.159	0.159	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.784	0.000	0.066	0.784	0.850	No
CDMA BC10	Front	0.381	0.050	0.066	0.431	0.447	No
	Back	0.582	0.095	0.066	0.677	0.648	No
	Left	0.298	0.000	0.066	0.298	0.364	No
	Right	0.511	0.066	0.066	0.577	0.577	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.271	0.000	0.066	0.271	0.337	No
LTE Band 13	Front	0.603	0.050	0.066	0.653	0.669	No
	Back	0.844	0.095	0.066	0.939	0.910	No
	Left	0.651	0.000	0.066	0.651	0.717	No
	Right	0.711	0.066	0.066	0.777	0.777	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.130	0.000	0.066	0.130	0.196	No
LTE Band 25	Front	0.227	0.050	0.066	0.277	0.293	No
	Back	1.436	0.095	0.066	**1.531**	1.502	No
	Left	0.195	0.000	0.066	0.195	0.261	No
	Right	0.106	0.066	0.066	0.172	0.172	No

	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.507	0.000	0.066	0.507	0.573	No
LTE Band 26	Front	0.409	0.050	0.066	0.459	0.475	No
	Back	0.534	0.095	0.066	0.629	0.600	No
	Left	0.396	0.000	0.066	0.396	0.462	No
	Right	0.562	0.066	0.066	0.628	0.628	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.223	0.000	0.066	0.223	0.289	No
LTE Band 41 (Class 2)	Front	0.448	0.050	0.066	0.498	0.514	No
	Back	1.283	0.095	0.066	1.378	1.349	No
	Left	0.736	0.000	0.066	0.736	0.802	No
	Right	0.048	0.066	0.066	0.114	0.114	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.256	0.000	0.066	0.256	0.322	No
LTE Band 41 (Class 3)	Front	0.326	0.050	0.066	0.376	0.392	No
	Back	1.133	0.095	0.066	1.228	1.199	No
	Left	0.486	0.000	0.066	0.486	0.552	No
	Right	0.049	0.066	0.066	0.115	0.115	No
	Top	0.000	0.048	0.066	0.048	0.066	No
	Bottom	0.250	0.000	0.066	0.250	0.316	No

9 Equipment list

Test Platform	SPEAG DASY5 Professional
Location	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Description	SAR Test System (Frequency range 300MHz-6GHz)
Software Reference	DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Hardware Reference

	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Robot	Staubli	TX60L	F14/5T2NA1/A/01	NCR	NCR
☒	Robot	Staubli	TX60L	F13/5PP1B1/A/01	NCR	NCR
☒	ELI	SPEAG	ELI V5.0	1239	NCR	NCR
☒	ELI	SPEAG	ELI V5.0	1143	NCR	NCR
☒	Twin Phantom	SPEAG	SAM 1	1141	NCR	NCR
☒	Twin Phantom	SPEAG	SAM 1	1824	NCR	NCR
☒	DAE	SPEAG	DAE4	1267	2017-11-28	2018-11-27
☒	E-Field Probe	SPEAG	EX3DV4	3923	2017-08-24	2018-08-23
☒	Validation Kits	SPEAG	D750V3	1160	2016-06-22	2019-06-21
☒	Validation Kits	SPEAG	D835V2	4d105	2016-12-08	2019-12-07
☐	Validation Kits	SPEAG	D1750V2	1149	2016-06-23	2019-06-22
☒	Validation Kits	SPEAG	D1900V2	5d028	2016-12-07	2019-12-06
☒	Validation Kits	SPEAG	D2450V2	733	2016-12-07	2019-12-06
☒	Validation Kits	SPEAG	D2600V2	1125	2016-06-22	2019-06-21
☒	Agilent Network Analyzer	Agilent	E5071C	MY46523590	2018-03-13	2019-03-12
☒	Dielectric Probe Kit	Agilent	85070E	US01440210	NCR	NCR
☒	Universal Radio Communication Tester	R&S	CMW500	124587	2017/11/24	2018/11/23
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	Agilent	N5171B	MY53050736	2018-03-13	2019-03-12
☒	Preamplifier	Mini-Circuits	ZHL-42W	15542	NCR	NCR
☒	Power Meter	Agilent	E4416A	GB41292095	2018-03-13	2019-03-12
☒	Power Sensor	Agilent	8481H	MY41091234	2018-03-13	2019-03-12
☒	Power Sensor	R&S	NRP-Z92	100025	2018-03-13	2019-03-12
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
☒	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
☒	50 Ω coaxial load	Mini-Circuits	KARN-50+	00850	NCR	NCR
☒	DC POWER SUPPLY	SAKO	SK1730SL 5A	NA	NCR	NCR

☒	Speed reading thermometer	MingGao	T809	NA	2018-03-13	2019-03-12
☒	Humidity and Temperature Indicator	KIMTOKA	KIMTOKA	NA	2018-03-13	2019-03-12

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Validation Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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Appendix A

Detailed System Validation Results

1. System Performance Check
System Performance Check 750 MHz Head
System Performance Check 750 MHz Body
System Performance Check 750 MHz Body
System Performance Check 835 MHz Head
System Performance Check 835 MHz Head
System Performance Check 835 MHz Body
System Performance Check 1900MHz Head
System Performance Check 1900MHz Body
System Performance Check 2450 MHz Head
System Performance Check 2450 MHz Body
System Performance Check 2600 MHz Head
System Performance Check 2600 MHz Head
System Performance Check 2600 MHz Body
System Performance Check 2600 MHz Body

Date: 2018/4/28

Test Laboratory: SGS-SAR Lab

System Performance Check 750 MHz Head

DUT: D750V3; Type: D750V3; Serial: 1160

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1

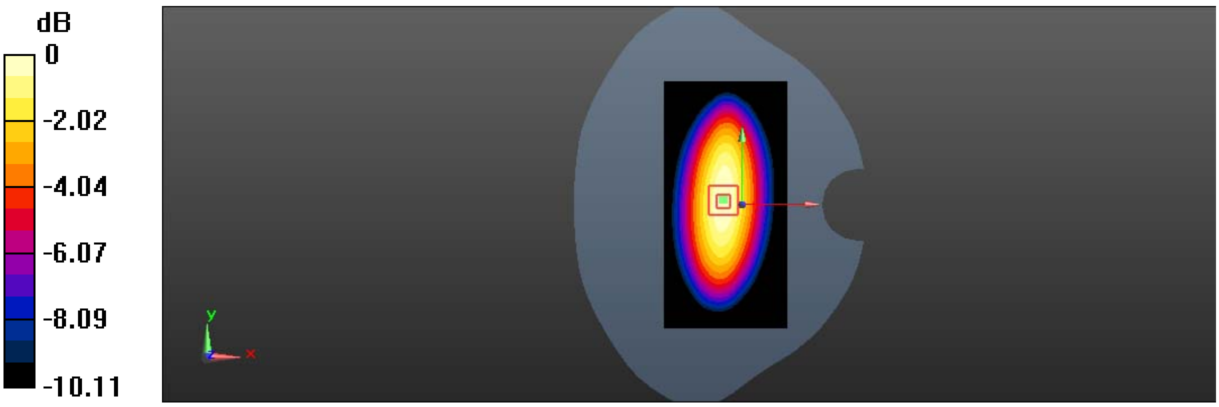
Medium: HSL750;Medium parameters used: f = 750 MHz; σ = 0.879 S/m; ε_r = 42.786; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.82, 10.82, 10.82); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=15mm, Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.11 W/kg

Body/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 48.68 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.95 W/kg
SAR(1 g) = 1.95 W/kg; SAR(10 g) = 1.29 W/kg
Maximum value of SAR (measured) = 2.10 W/kg



0 dB = 2.10 W/kg = 3.22 dBW/kg

Date: 2018/4/28

Test Laboratory: SGS-SAR Lab

System Performance Check 750 MHz Body

DUT: D750V3; Type: D750V3; Serial: 1160

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1

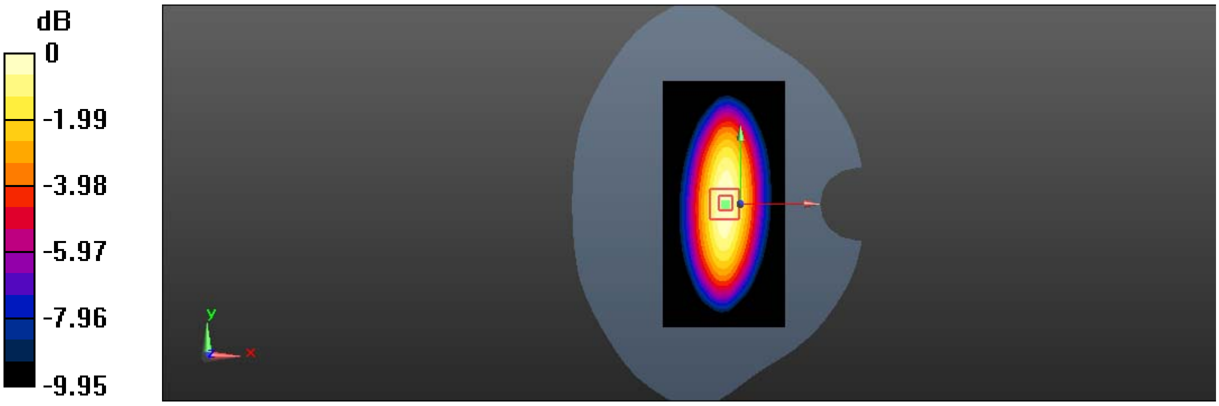
Medium: MSL750;Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 56.833; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.82, 10.82, 10.82); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=15mm, Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.67 W/kg

Body/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.97 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.14 W/kg
SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.67 W/kg



0 dB = 2.67 W/kg = 4.27 dBW/kg

Date: 2018/5/29

Test Laboratory: SGS-SAR Lab

System Performance Check 750 MHz Body

DUT: D750V3; Type: D750V3; Serial: 1160

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1

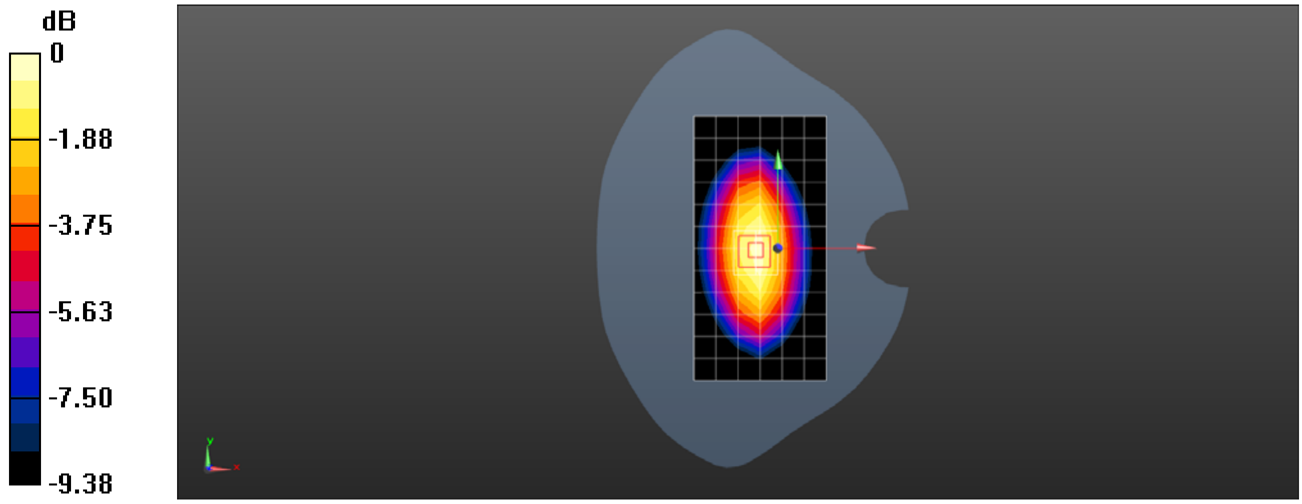
Medium: MSL750;Medium parameters used: f = 750 MHz; σ = 0.956 S/m; ε_r = 56.279; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.82, 10.82, 10.82); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=15mm, Pin=250mW/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.37 W/kg

Body/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.66 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.26 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 2.43 W/kg



0 dB = 2.43 W/kg = 3.86 dBW/kg

Date: 2018/5/4

Test Laboratory: SGS-SAR Lab

System Performance Check 835 MHz Head

DUT: D835V2; Type: D835V2; Serial: 4d105

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1

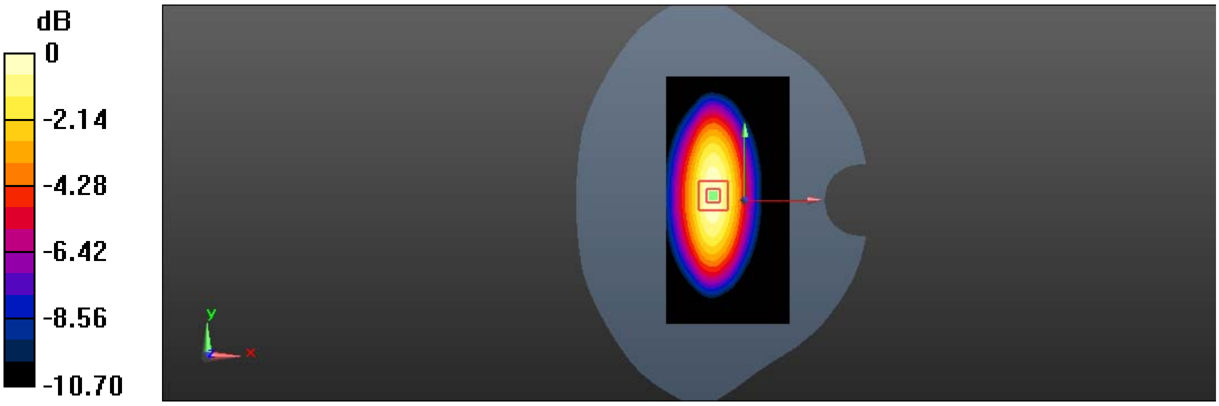
Medium: HSL835;Medium parameters used: f = 835 MHz; σ = 0.904 S/m; ε_r = 42.233; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.50, 10.50, 10.50); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=15mm, Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.14 W/kg

Body/d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.18 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 3.17 W/kg



0 dB = 3.17 W/kg = 5.01 dBW/kg

Date: 2018/5/4

Test Laboratory: SGS SAR Lab

System Performance Check 835 MHz Head

DUT: D835V2; Type: D835V2; Serial: 4d105

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1

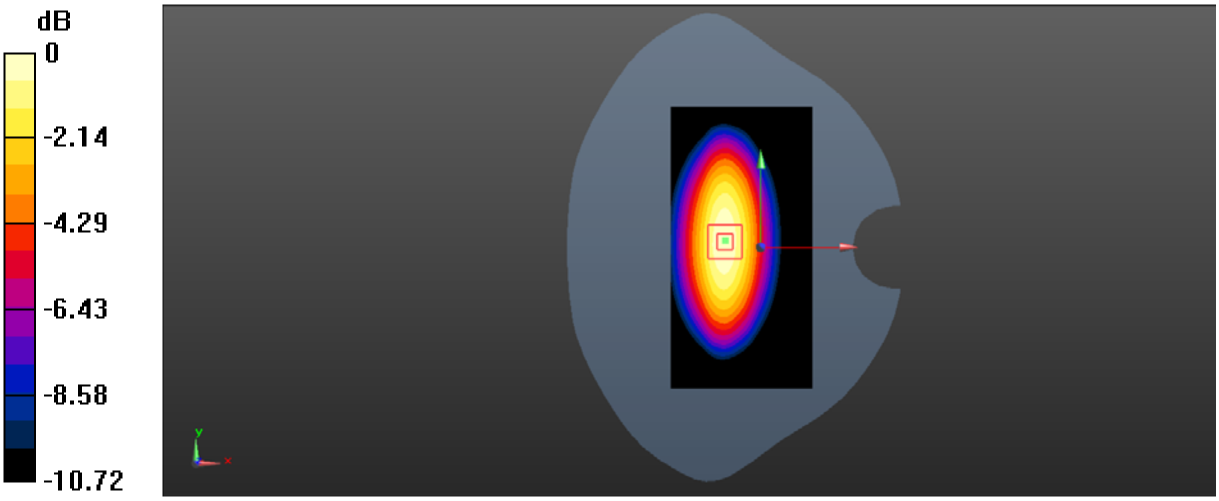
Medium: HSL850;Medium parameters used: f = 835 MHz; σ = 0.898 S/m; ε_r = 42.422; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.5, 10.5, 10.5); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=15mm, Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.12 W/kg

Body/d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.11 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.71 W/kg
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (measured) = 3.14 W/kg



0 dB = 3.14 W/kg = 4.97 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

System Performance Check 835 MHz Body

DUT: D835V2; Type: D835V2; Serial: 4d105

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1

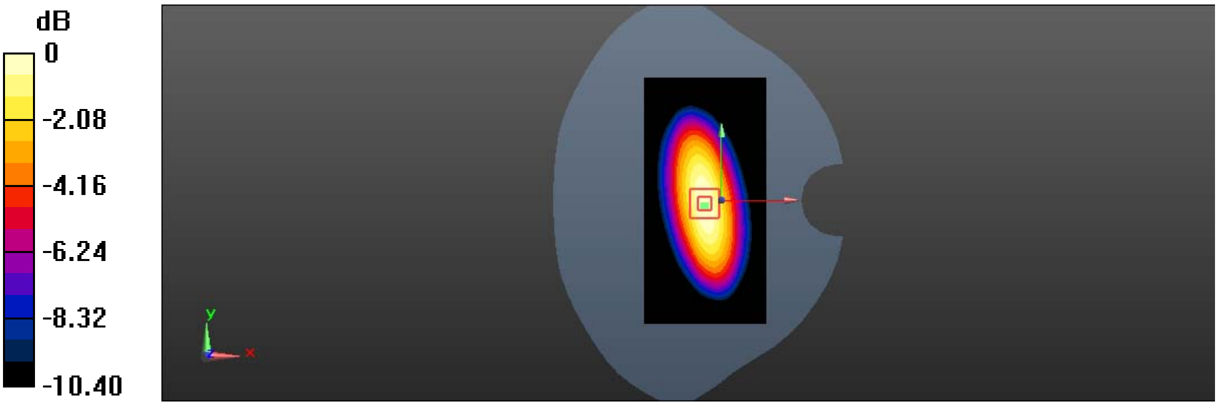
Medium: MSL835;Medium parameters used: f = 835 MHz; σ = 0.98 S/m; ε_r = 53.955; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=15mm, Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.12 W/kg

Body/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.78 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.63 W/kg
Maximum value of SAR (measured) = 3.10 W/kg



0 dB = 3.10 W/kg = 4.91 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

System Performance Check 1900 MHz Head

DUT: D1900V2; Type: D1900V2; Serial: 5d028

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1

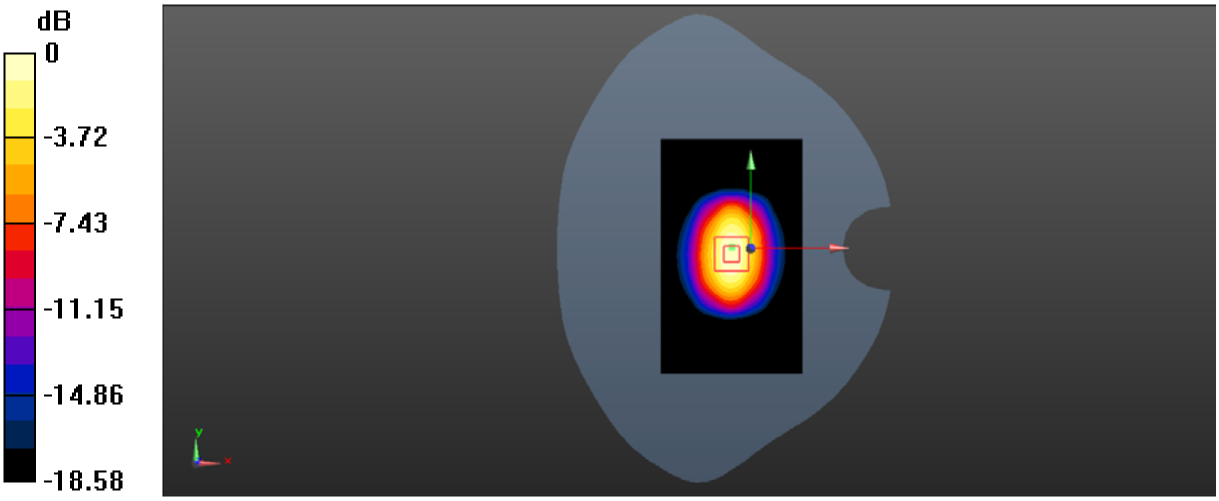
Medium: HSL1900;Medium parameters used: f = 1900 MHz; σ = 1.437 S/m; ε_r = 41.171; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.75, 8.75, 8.75); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.2 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.20 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 20.2 W/kg
SAR(1 g) = 10.6 W/kg; SAR(10 g) = 5.51 W/kg
Maximum value of SAR (measured) = 11.9 W/kg



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

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

System Performance Check 1900 MHz Body

DUT: D1900V2; Type: D1900V2; Serial: 5d028

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1

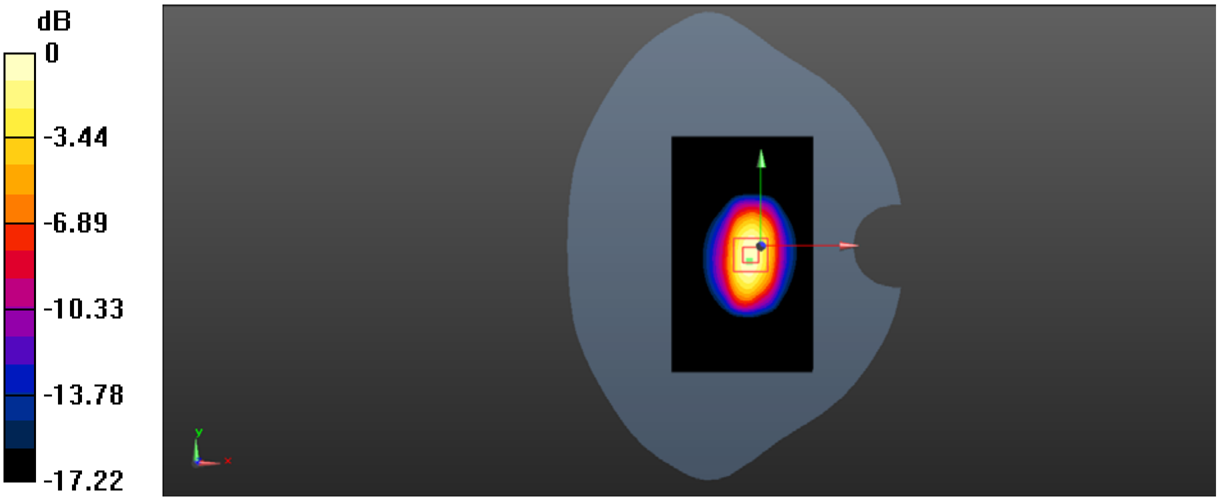
Medium: MSL1900;Medium parameters used: f = 1900 MHz; σ = 1.519 S/m; ε_r = 52.421; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.44, 8.44, 8.44); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 14.5 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.09 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.46 W/kg
Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

System Performance Check 2450MHz Head

DUT: D2450V2; Type: D2450V2; Serial: 733

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

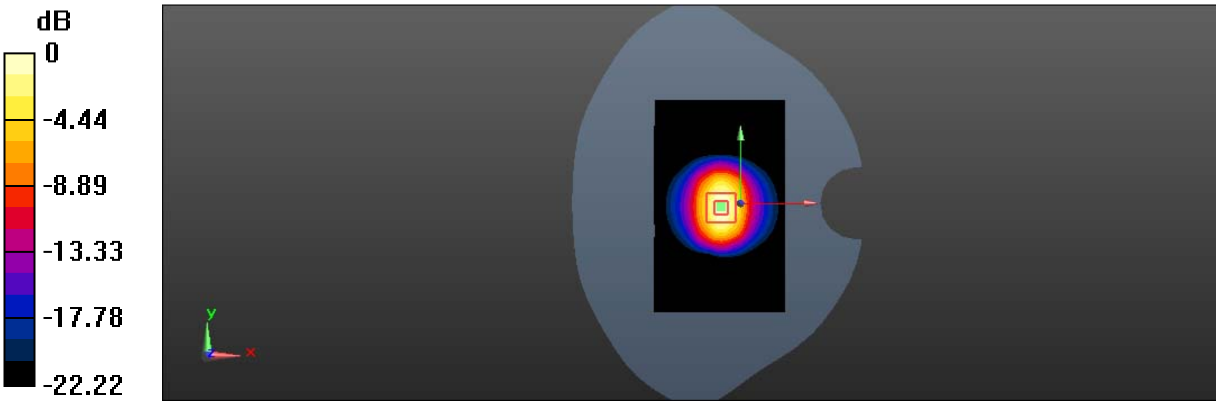
Medium: HSL2450;Medium parameters used: f = 2450 MHz; σ = 1.802 S/m; ε_r = 38.226; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.81, 7.81, 7.81); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 15.3 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.58 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 27.6 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.08 W/kg
Maximum value of SAR (measured) = 15.0 W/kg



0 dB = 15.0 W/kg = 11.76 dBW/kg

Date: 2018/5/6

Test Laboratory: SGS-SAR Lab

System Performance Check 2450MHz Body

DUT: D2450V2; Type: D2450V2; Serial: 733

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

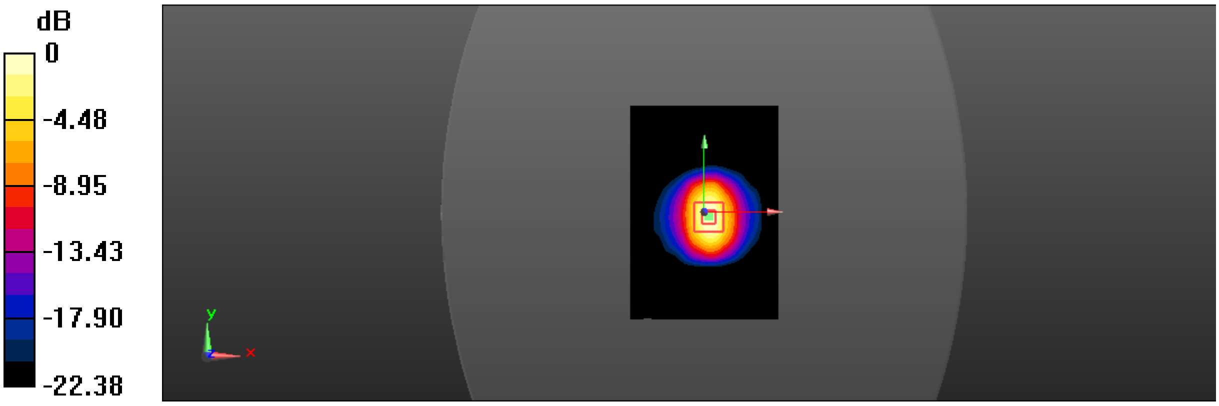
Medium: MSL2450;Medium parameters used: f = 2450 MHz; σ = 1.963 S/m; ε_r = 52.32; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.93, 7.93, 7.93); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: ELI v5.0 Left ; Type: ELI V5.0 ; Serial: TP:1239
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (91x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 14.8 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 80.36 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 26.1 W/kg
SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.83 W/kg
Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dBW/kg

Date: 2018/5/7

Test Laboratory: SGS-SAR Lab

System Performance Check 2600MHz Head

DUT: Dipole D2600V2; Type: D2600V2; Serial: 1125

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1

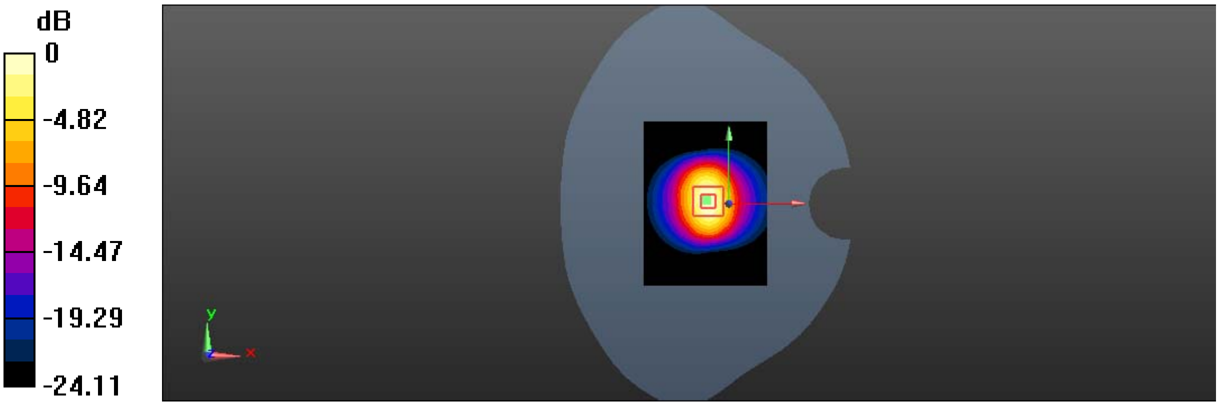
Medium: HSL2600;Medium parameters used: f = 2600 MHz; σ = 1.968 S/m; ε_r = 37.767; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.64, 7.64, 7.64); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (91x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.9 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.54 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 31.4 W/kg
SAR(1 g) = 14 W/kg; SAR(10 g) = 6.15 W/kg
Maximum value of SAR (measured) = 15.9 W/kg



0 dB = 15.9 W/kg = 12.01 dBW/kg

Date: 2018/5/16

Test Laboratory: SGS-SAR Lab

System Performance Check 2600MHz Head

DUT: Dipole D2600V2; Type: D2600V2; Serial: 1125

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1

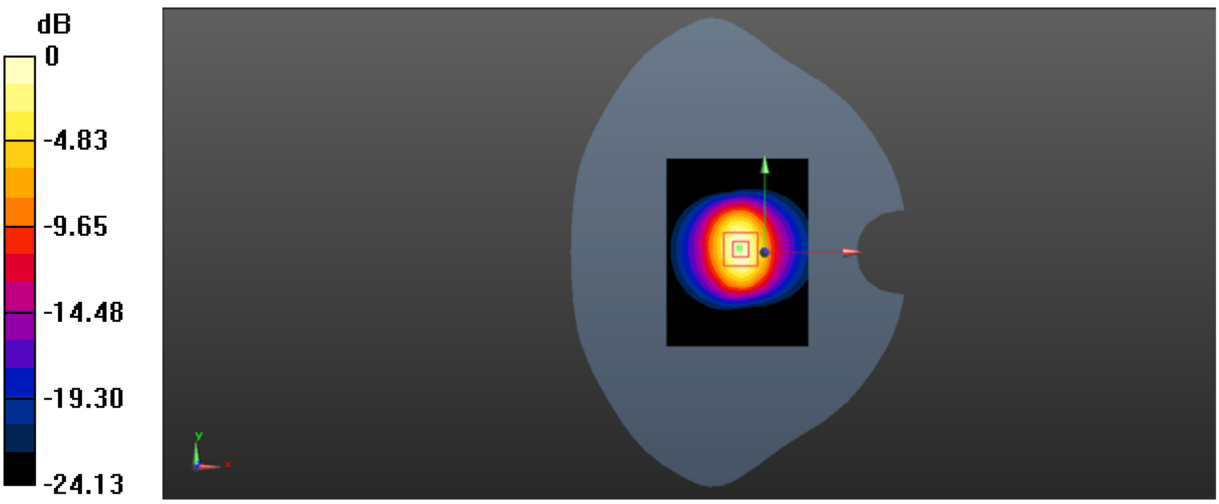
Medium: HSL2600;Medium parameters used: f = 2600 MHz; σ = 1.994 S/m; ε_r = 39.429; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -1.0, 32.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (91x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 16.1 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.53 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 31.8 W/kg
SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.23 W/kg
Maximum value of SAR (measured) = 16.2 W/kg



0 dB = 16.2 W/kg = 12.10 dBW/kg

Date: 2018/5/7

Test Laboratory: SGS-SAR Lab

System Performance Check 2600MHz Body

DUT: D2600V2; Type: D2600V2; Serial: 1125

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1

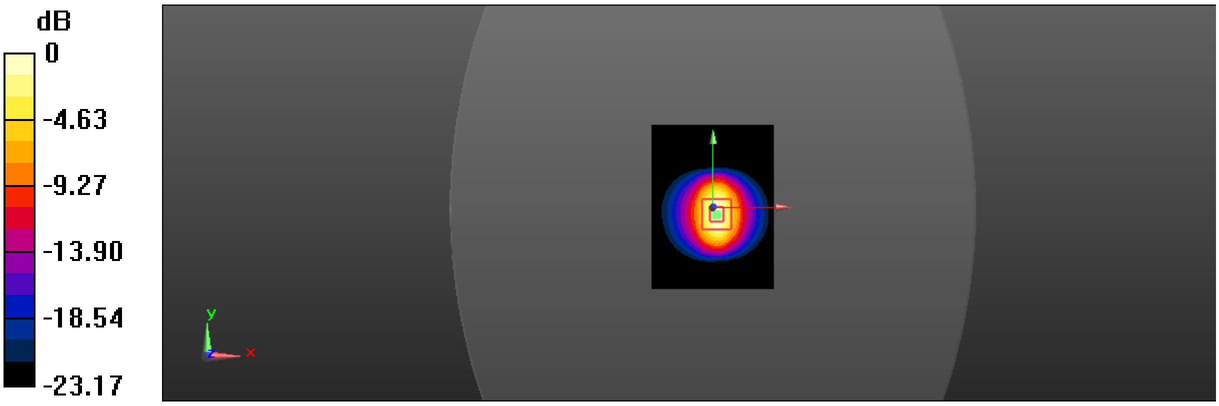
Medium: MSL2600;Medium parameters used: f = 2600 MHz; σ = 2.138 S/m; ε_r = 51.94; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: ELI v5.0 Left ; Type: ELI V5.0 ; Serial: TP:1239
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (91x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 21.0 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 80.78 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 27.6 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.01 W/kg
Maximum value of SAR (measured) = 20.8 W/kg



0 dB = 20.8 W/kg = 13.18 dBW/kg

Date: 2018/5/16

Test Laboratory: SGS-SAR Lab

System Performance Check 2600MHz Body

DUT: D2600V2; Type: D2600V2; Serial: 1125

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1

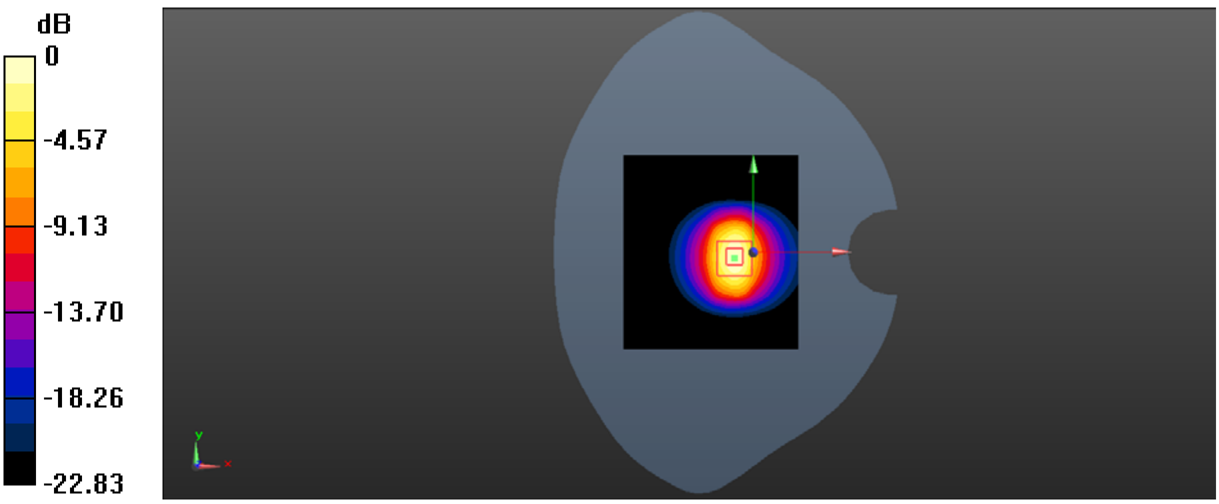
Medium: MSL2600;Medium parameters used: f = 2600 MHz; σ = 2.158 S/m; ε_r = 52.093; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Body/d=10mm, Pin=250mW/Area Scan (91x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.4 W/kg

Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 76.35 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 27.4 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.01 W/kg
Maximum value of SAR (measured) = 20.6 W/kg



0 dB = 20.6 W/kg = 13.14 dBW/kg

Appendix B

Detailed Test Results

1. CDMA
CDMA BC10 for Head & Body Worn & Hotspot
CDMA BC0 for Head & Body Worn & Hotspot
CDMA BC1 for Head & Body Worn & Hotspot
2. LTE
LTE Band 13 for Head & Body Worn & Hotspot
LTE Band 25 for Head & Body Worn & Hotspot
LTE Band 26 for Head & Body Worn & Hotspot
LTE Band 41 for Head & Body Worn & Hotspot
3. WIFI
WIFI 802.11b for Head & Body Worn & Hotspot

Date: 2018/5/4

Test Laboratory: SGS SAR Lab

CDMA BC10 1xRTT(RC3 SO32) 580CH Right cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, CDMA (0); Frequency: 820.5 MHz;Duty Cycle: 1:1

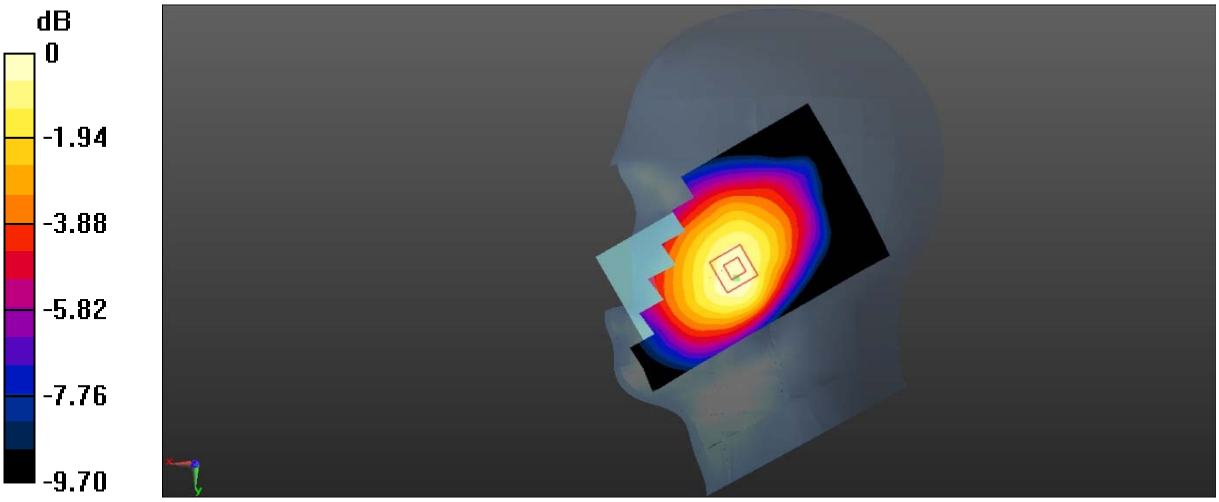
Medium: HSL850;Medium parameters used (interpolated): f = 820.5 MHz; σ = 0.881 S/m; ε_r = 42.627; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.5, 10.5, 10.5); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.471 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.791 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.402 W/kg; SAR(10 g) = 0.306 W/kg
Maximum value of SAR (measured) = 0.456 W/kg



0 dB = 0.456 W/kg = -3.41 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

CDMA BC10 1xRTT(RC3 SO32) 580CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, CDMA (0); Frequency: 820.5 MHz;Duty Cycle: 1:1

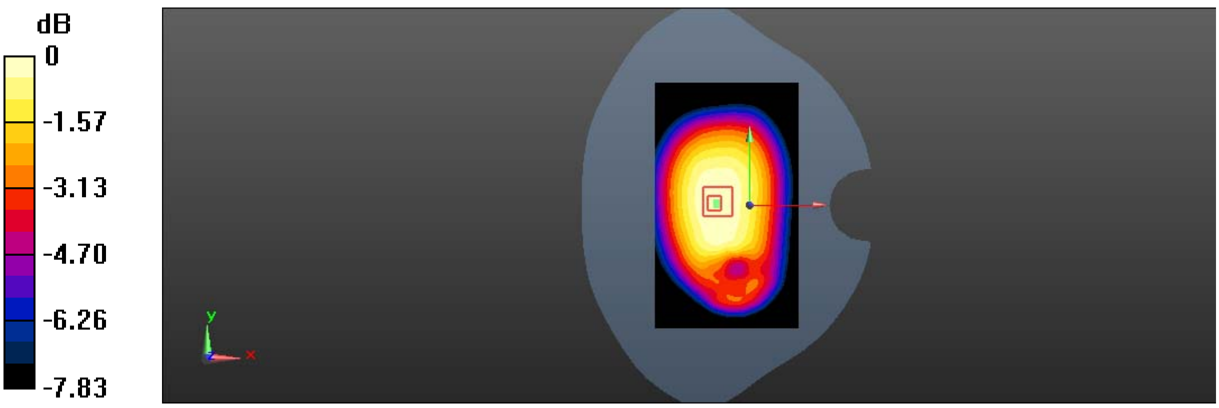
Medium: MSL835;Medium parameters used: f = 820.5 MHz; σ = 0.97 S/m; ε_r = 54.266; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.458 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.50 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.510 W/kg
SAR(1 g) = 0.399 W/kg; SAR(10 g) = 0.306 W/kg
Maximum value of SAR (measured) = 0.460 W/kg



0 dB = 0.460 W/kg = -3.37 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

CDMA BC10 1xRTT(RC3 SO32) 580CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, CDMA (0); Frequency: 820.5 MHz;Duty Cycle: 1:1

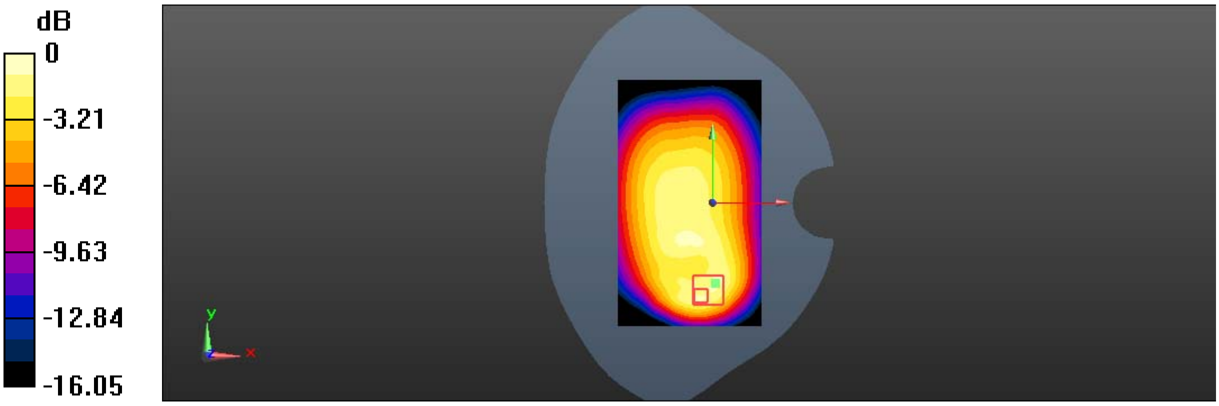
Medium: MSL835;Medium parameters used: f = 820.5 MHz; σ = 0.97 S/m; ε_r = 54.266; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.583 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.24 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.872 W/kg
SAR(1 g) = 0.481 W/kg; SAR(10 g) = 0.252 W/kg
Maximum value of SAR (measured) = 0.686 W/kg



0 dB = 0.686 W/kg = -1.64 dBW/kg

Date: 2018/5/4

Test Laboratory: SGS SAR Lab

CDMA BC0 1xRTT(RC3 SO32) 384CH Right cheek

DUT: TW801; Type: TW801; Serial: NA

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

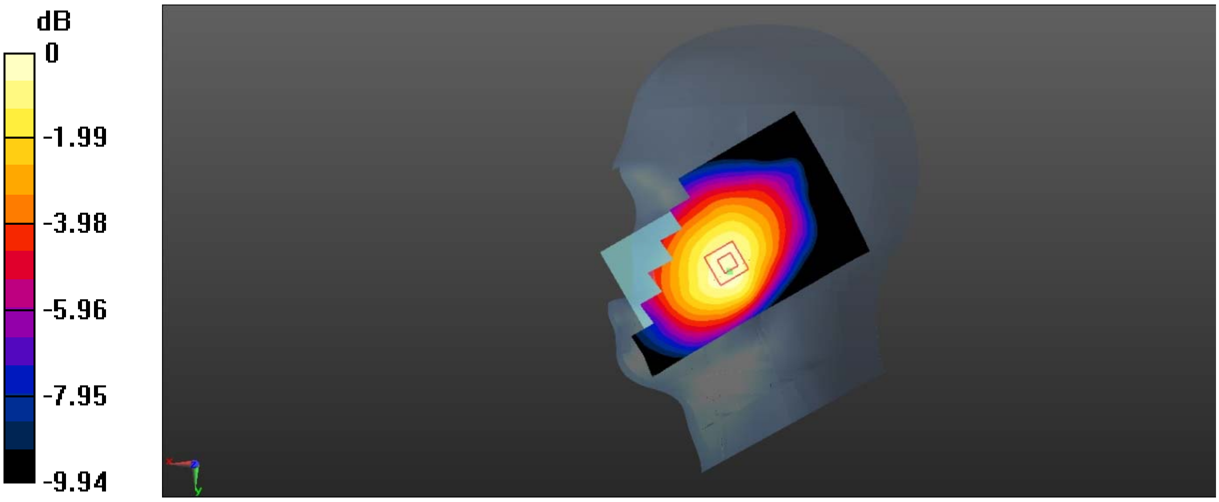
Medium: HSL850;Medium parameters used: f = 837 MHz; σ = 0.893 S/m; ε_r = 42.469; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.5, 10.5, 10.5); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.371 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.699 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.401 W/kg
SAR(1 g) = 0.313 W/kg; SAR(10 g) = 0.239 W/kg
Maximum value of SAR (measured) = 0.360 W/kg



0 dB = 0.360 W/kg = -4.44 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

CDMA BC0 1xRTT(RC3 SO32) 384CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

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

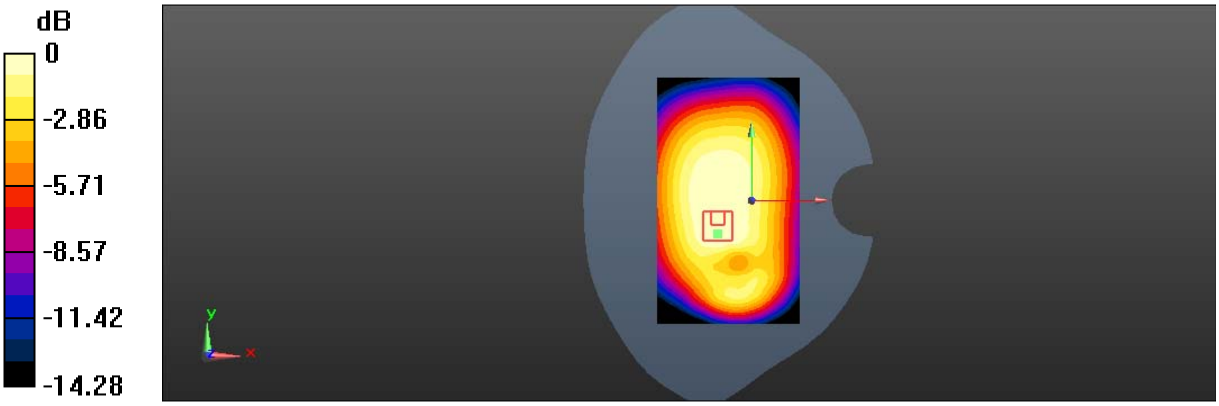
Medium: MSL835;Medium parameters used: f = 837 MHz; σ = 0.979 S/m; ε_r = 53.749; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.378 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.33 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.406 W/kg
SAR(1 g) = 0.321 W/kg; SAR(10 g) = 0.242 W/kg
Maximum value of SAR (measured) = 0.368 W/kg



0 dB = 0.368 W/kg = -4.34 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

CDMA BC0 1xRTT(RC3 SO32) 384CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

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

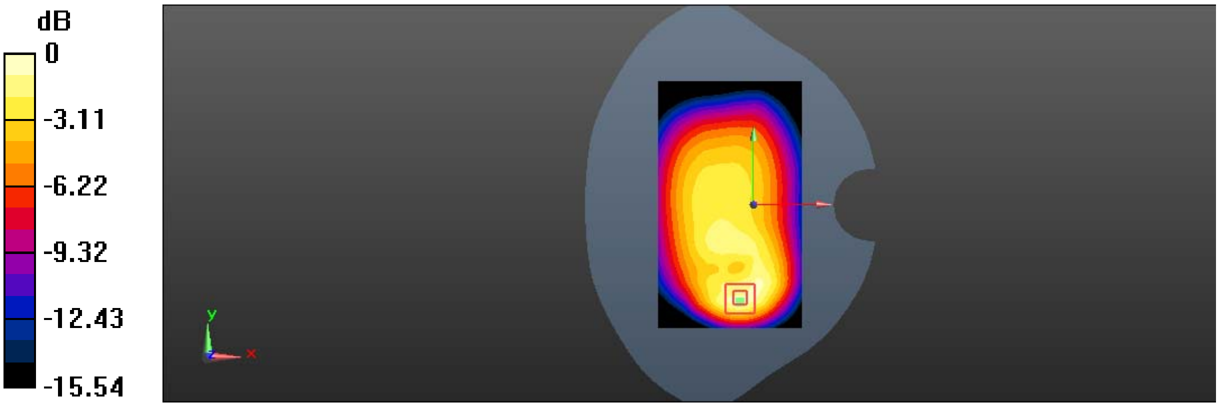
Medium: MSL835;Medium parameters used: f = 837 MHz; σ = 0.979 S/m; ε_r = 53.749; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.605 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.07 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.942 W/kg
SAR(1 g) = 0.517 W/kg; SAR(10 g) = 0.279 W/kg
Maximum value of SAR (measured) = 0.672 W/kg



0 dB = 0.672 W/kg = -1.73 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

CDMA BC1 1xRTT(RC3 SO55) 600CH Right cheek

DUT: TW801; Type: TW801; Serial: NA

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

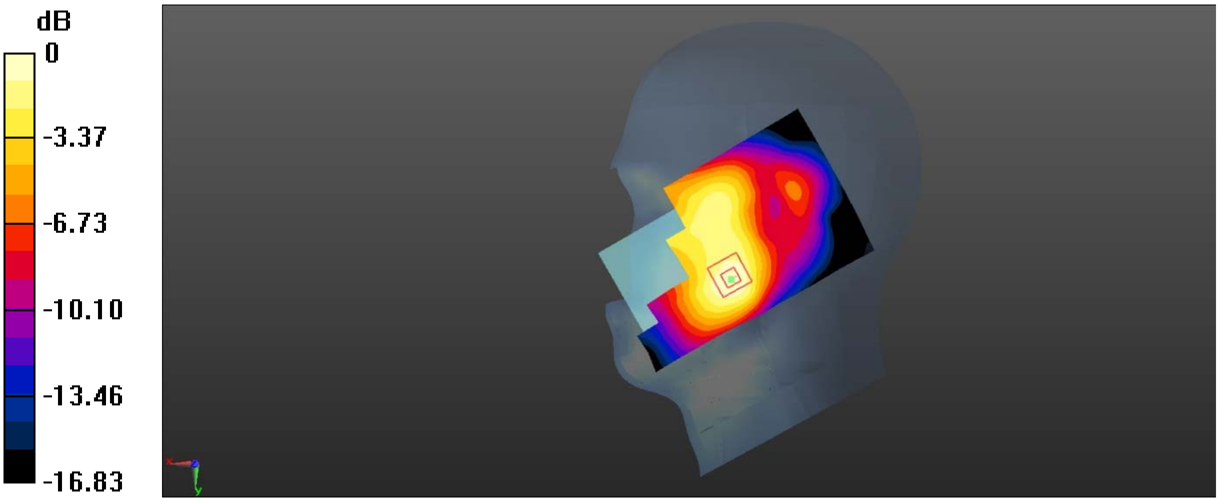
Medium: HSL1900;Medium parameters used: f = 1880 MHz; σ = 1.418 S/m; ε_r = 41.237; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.75, 8.75, 8.75); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.449 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.605 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.521 W/kg
SAR(1 g) = 0.350 W/kg; SAR(10 g) = 0.221 W/kg
Maximum value of SAR (measured) = 0.444 W/kg



0 dB = 0.444 W/kg = -3.53 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

CDMA BC1 1xRTT(RC3 SO32) 600CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

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

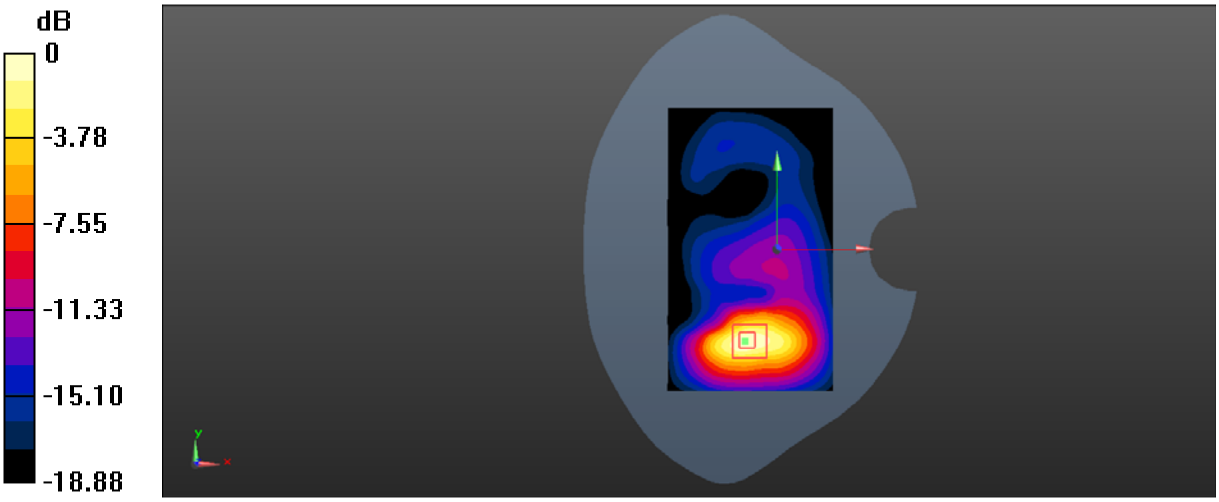
Medium: MSL1900;Medium parameters used: f = 1880 MHz; σ = 1.5 S/m; ε_r = 52.471; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.44, 8.44, 8.44); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.855 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.251 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.623 W/kg; SAR(10 g) = 0.337 W/kg
Maximum value of SAR (measured) = 0.846 W/kg



0 dB = 0.846 W/kg = -0.73 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

CDMA BC1 1xRTT(RC3 SO32) 1175CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, CDMA (0); Frequency: 1908.75 MHz;Duty Cycle: 1:1

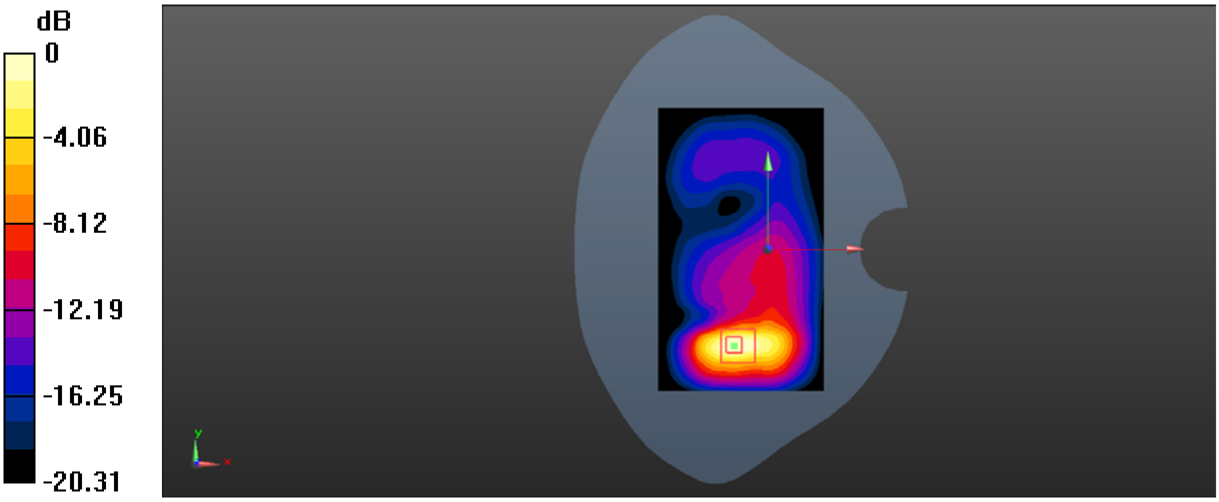
Medium: MSL1900;Medium parameters used: f = 1909 MHz; σ = 1.527 S/m; ε_r = 52.391; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.44, 8.44, 8.44); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.09 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.671 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 2.42 W/kg
SAR(1 g) = 1.34 W/kg; SAR(10 g) = 0.669 W/kg
Maximum value of SAR (measured) = 1.88 W/kg



0 dB = 1.88 W/kg = 2.74 dBW/kg

Date: 2018/4/28

Test Laboratory: SGS-SAR Lab

LTE Band 13 10M Bandwidth QPSK 1RB25 offset 23230CH Right cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 10MHZ (0); Frequency: 782 MHz;Duty Cycle: 1:1

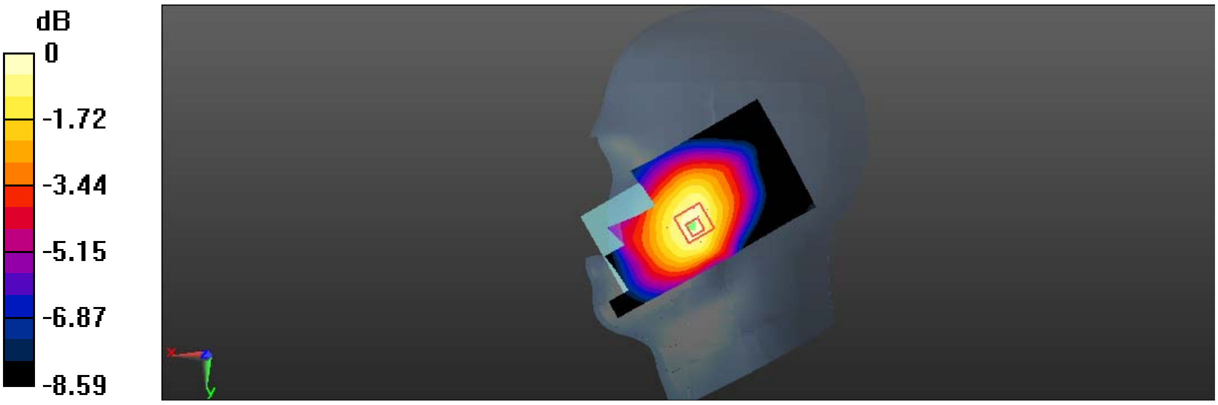
Medium: HSL750;Medium parameters used: f = 782 MHz; σ = 0.911 S/m; ε_r = 42.087; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.8, 10.8, 10.8); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.362 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.429 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.435 W/kg
SAR(1 g) = 0.342 W/kg; SAR(10 g) = 0.261 W/kg
Maximum value of SAR (measured) = 0.386 W/kg



0 dB = 0.386 W/kg = -4.13 dBW/kg

Date: 2018/4/28

Test Laboratory: SGS-SAR Lab

LTE Band 13 10M Bandwidth QPSK 1RB25 offset 23230CH Back Side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 10MHZ (0); Frequency: 782 MHz;Duty Cycle: 1:1

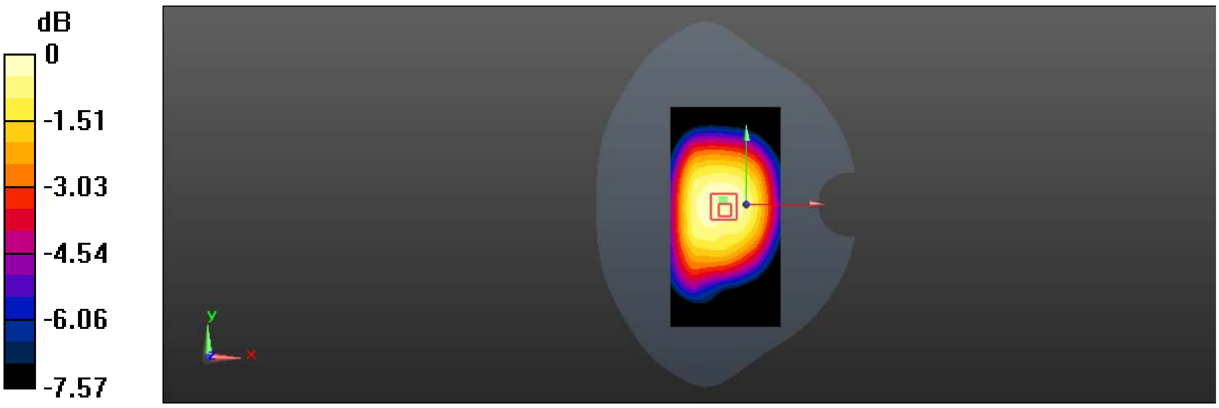
Medium: MSL750;Medium parameters used: f = 782 MHz; σ = 0.975 S/m; ε_r = 56.769; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.82, 10.82, 10.82); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.598 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.44 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.648 W/kg
SAR(1 g) = 0.519 W/kg; SAR(10 g) = 0.396 W/kg
Maximum value of SAR (measured) = 0.600 W/kg



0 dB = 0.600 W/kg = -2.22 dBW/kg

Date: 2018/4/28

Test Laboratory: SGS-SAR Lab

LTE Band 13 10M Bandwidth QPSK 1RB25 offset 23230CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 10MHZ (0); Frequency: 782 MHz;Duty Cycle: 1:1

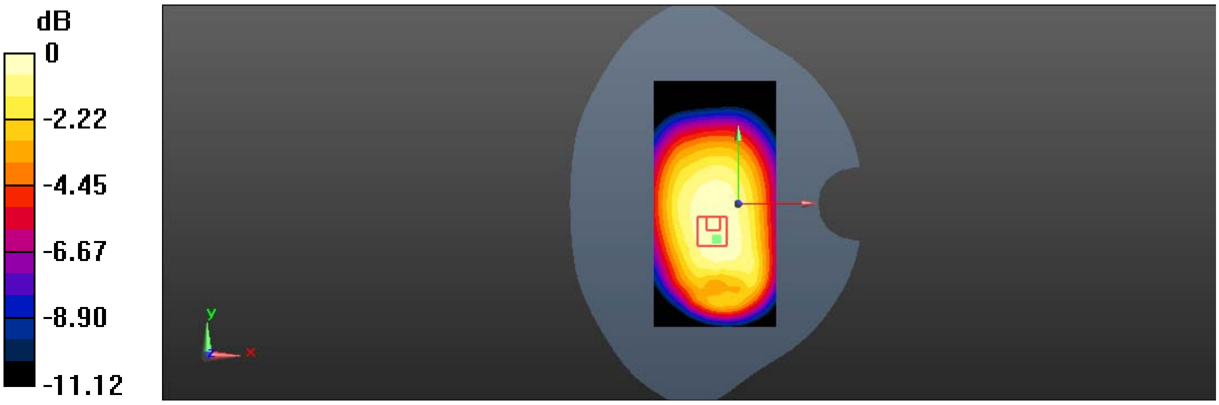
Medium: MSL750;Medium parameters used: f = 782 MHz; σ = 0.975 S/m; ε_r = 56.769; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.82, 10.82, 10.82); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.819 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.91 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.904 W/kg
SAR(1 g) = 0.718 W/kg; SAR(10 g) = 0.540 W/kg
Maximum value of SAR (measured) = 0.822 W/kg



0 dB = 0.822 W/kg = -0.85 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

LTE Band 25 20MHz bandwidth QPSK 1RB50 Offset 26140CH Left cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 20MHz (0); Frequency: 1860 MHz;Duty Cycle: 1:1

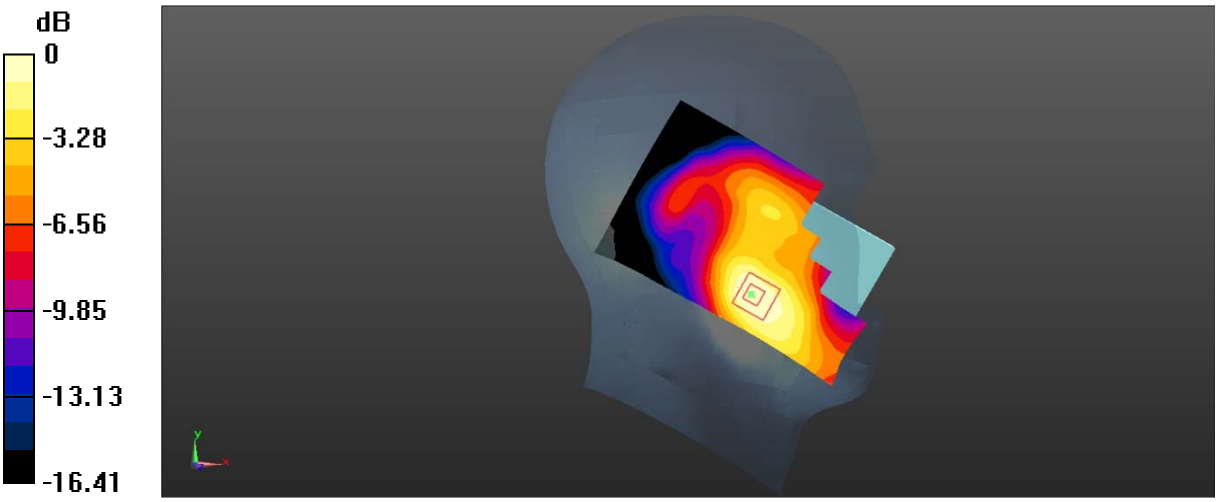
Medium: HSL1900;Medium parameters used: f = 1860 MHz; σ = 1.396 S/m; ε_r = 41.325; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.75, 8.75, 8.75); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.179 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.766 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.143 W/kg; SAR(10 g) = 0.091 W/kg
Maximum value of SAR (measured) = 0.186 W/kg



0 dB = 0.186 W/kg = -7.30 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

LTE Band 25 20MHz bandwidth QPSK 1RB50 Offset 26140CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 20MHz (0); Frequency: 1860 MHz;Duty Cycle: 1:1

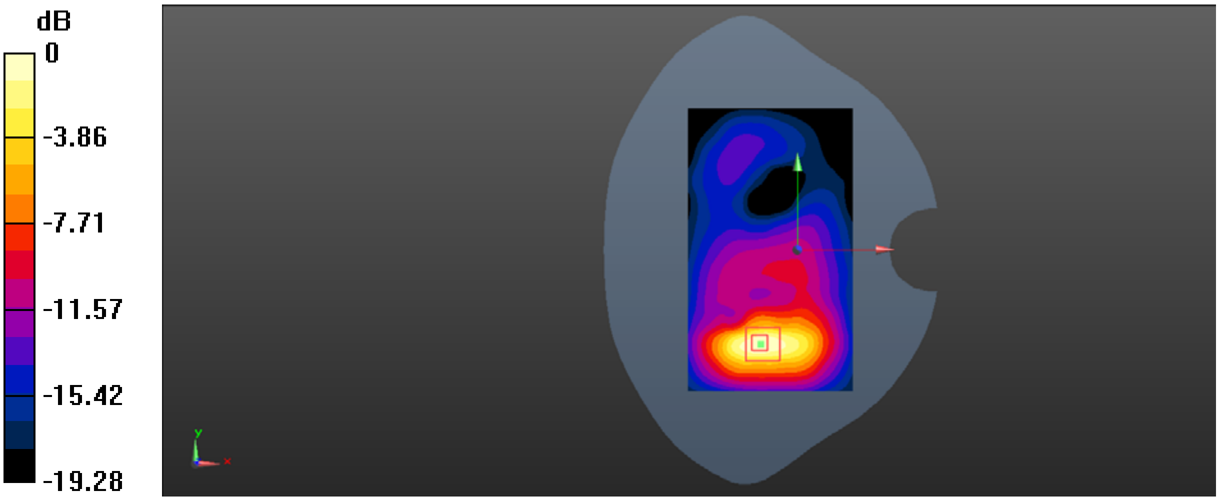
Medium: MSL1900;Medium parameters used: f = 1860 MHz; σ = 1.478 S/m; ε_r = 52.531; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.44, 8.44, 8.44); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.618 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.128 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.783 W/kg
SAR(1 g) = 0.465 W/kg; SAR(10 g) = 0.255 W/kg
Maximum value of SAR (measured) = 0.606 W/kg



0 dB = 0.606 W/kg = -2.18 dBW/kg

Date: 2018/5/9

Test Laboratory: SGS-SAR Lab

LTE Band 25 20MHz bandwidth QPSK 1RB50 Offset 26590CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 20MHz (0); Frequency: 1905 MHz;Duty Cycle: 1:1

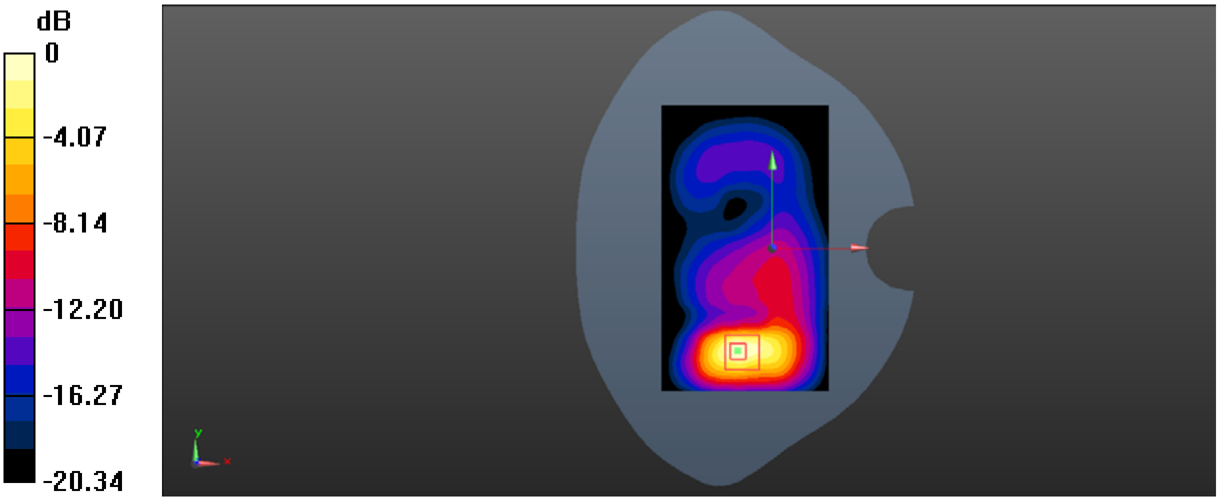
Medium: MSL1900;Medium parameters used: f = 1905 MHz; σ = 1.523 S/m; ε_r = 52.406; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(8.44, 8.44, 8.44); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin phantom; Type: SAM1; Serial: 1141
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.95 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.064 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.645 W/kg
Maximum value of SAR (measured) = 1.85 W/kg



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

Date: 2018/5/4

Test Laboratory: SGS-SAR Lab

LTE Band 26 15M Bandwidth QPSK 1RB0 offset 26775CH Right cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 15MHz (0); Frequency: 822.5 MHz;Duty Cycle: 1:1

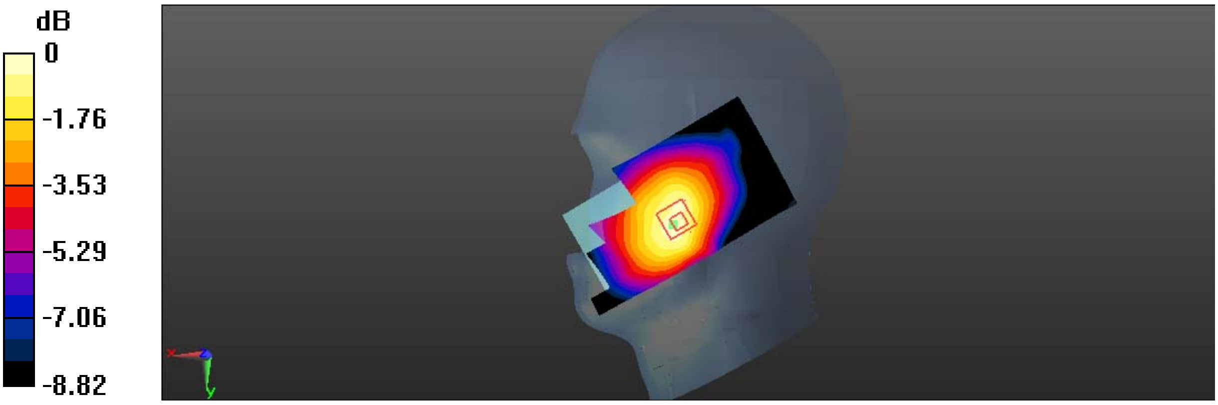
Medium: HSL835;Medium parameters used: f = 822.5 MHz; σ = 0.893 S/m; ε_r = 42.303; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.5, 10.5, 10.5); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.275 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.225 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.320 W/kg
SAR(1 g) = 0.250 W/kg; SAR(10 g) = 0.191 W/kg
Maximum value of SAR (measured) = 0.287 W/kg



0 dB = 0.287 W/kg = -5.42 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

LTE Band 26 15M Bandwidth QPSK 1RB0 offset 26775CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 15MHz (0); Frequency: 822.5 MHz;Duty Cycle: 1:1

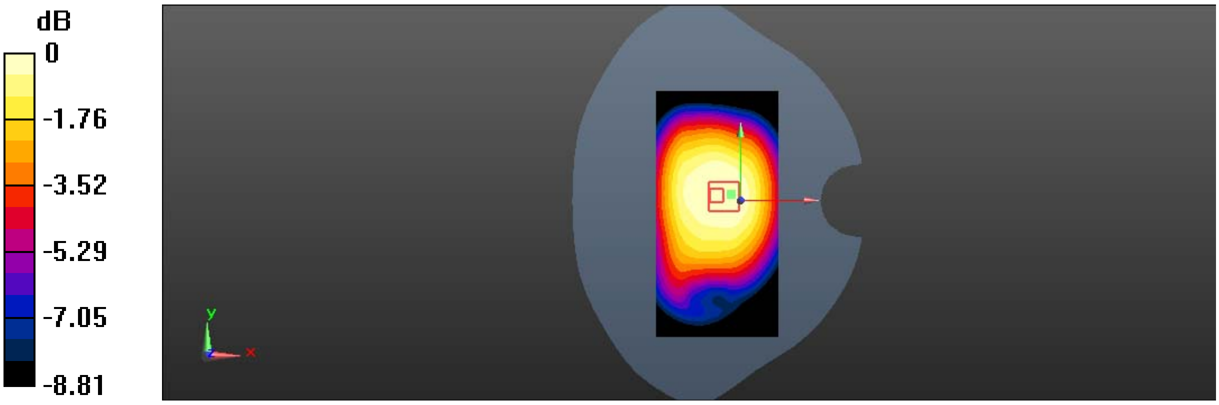
Medium: MSL835;Medium parameters used: f = 822.5 MHz; σ = 0.963 S/m; ε_r = 54.053; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.420 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.69 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.446 W/kg
SAR(1 g) = 0.354 W/kg; SAR(10 g) = 0.271 W/kg
Maximum value of SAR (measured) = 0.408 W/kg



0 dB = 0.408 W/kg = -3.89 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

LTE Band 26 15M Bandwidth QPSK 1RB0 offset 26775CH Right side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-FDD BW 15MHz (0); Frequency: 822.5 MHz;Duty Cycle: 1:1

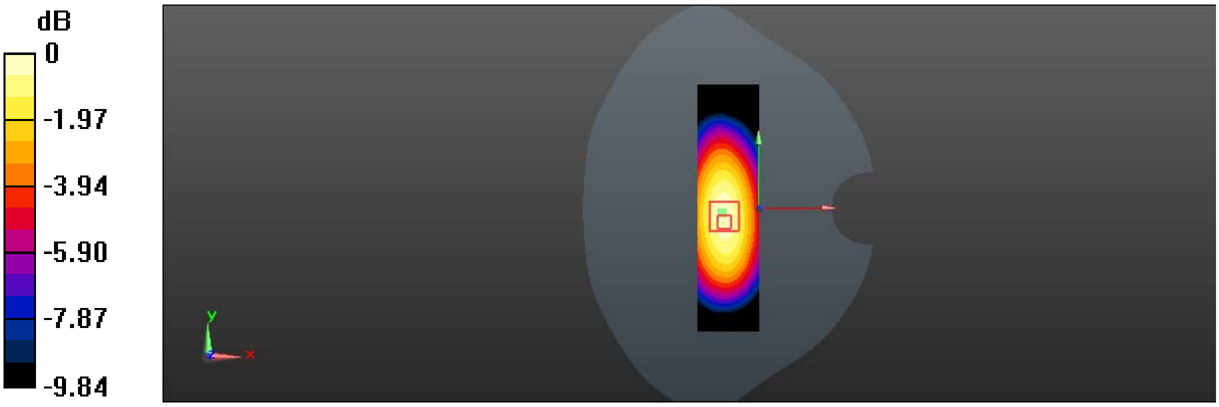
Medium: MSL835;Medium parameters used (interpolated): f = 822.5 MHz; σ = 0.963 S/m; ε_r = 54.053; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(10.58, 10.58, 10.58); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (31x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.565 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.01 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.668 W/kg
SAR(1 g) = 0.470 W/kg; SAR(10 g) = 0.322 W/kg
Maximum value of SAR (measured) = 0.580 W/kg



0 dB = 0.580 W/kg = -2.37 dBW/kg

Date: 2018/5/7

Test Laboratory: SGS-SAR Lab

LTE Band 41 20M Bandwidth QPSK 1RB99 offset 39750CH Left cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-TDD BW 20MHz (0); Frequency: 2506 MHz;Duty Cycle: 1:1.57906

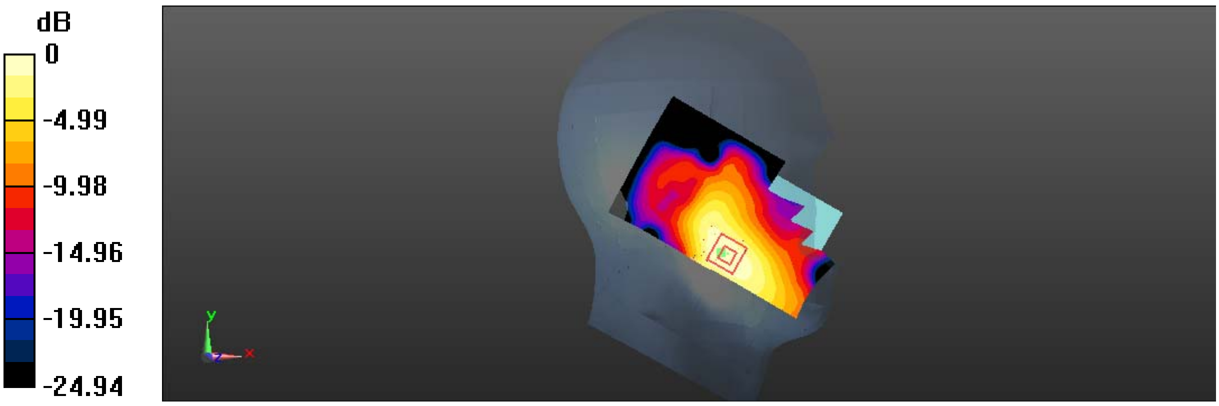
Medium: MSL2600;Medium parameters used: f = 2506 MHz; σ = 2.035 S/m; ε_r = 52.258; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.594 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.246 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.786 W/kg
SAR(1 g) = 0.426 W/kg; SAR(10 g) = 0.234 W/kg
Maximum value of SAR (measured) = 0.599 W/kg



0 dB = 0.599 W/kg = -2.23 dBW/kg

Date: 2018/5/7

Test Laboratory: SGS-SAR Lab

LTE Band 41 20M Bandwidth QPSK 1RB99 offset 39750CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-TDD BW 20MHz (0); Frequency: 2506 MHz;Duty Cycle: 1:1.57906

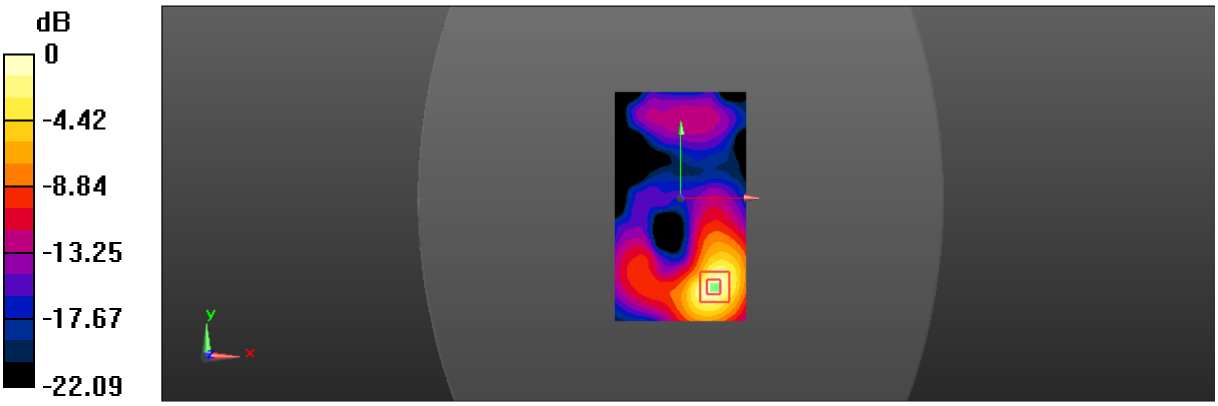
Medium: MSL2600;Medium parameters used: f = 2506 MHz; σ = 2.035 S/m; ε_r = 52.258; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: ELI v5.0 Left ; Type: ELI V5.0 ; Serial: TP:1239
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.747 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.524 W/kg; SAR(10 g) = 0.258 W/kg
Maximum value of SAR (measured) = 0.767 W/kg



0 dB = 0.767 W/kg = -1.15 dBW/kg

Date: 2018/5/7

Test Laboratory: SGS-SAR Lab

LTE Band 41 20M Bandwidth QPSK 1RB99 offset 39750CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-TDD BW 20MHz (0); Frequency: 2506 MHz;Duty Cycle: 1:1.57906

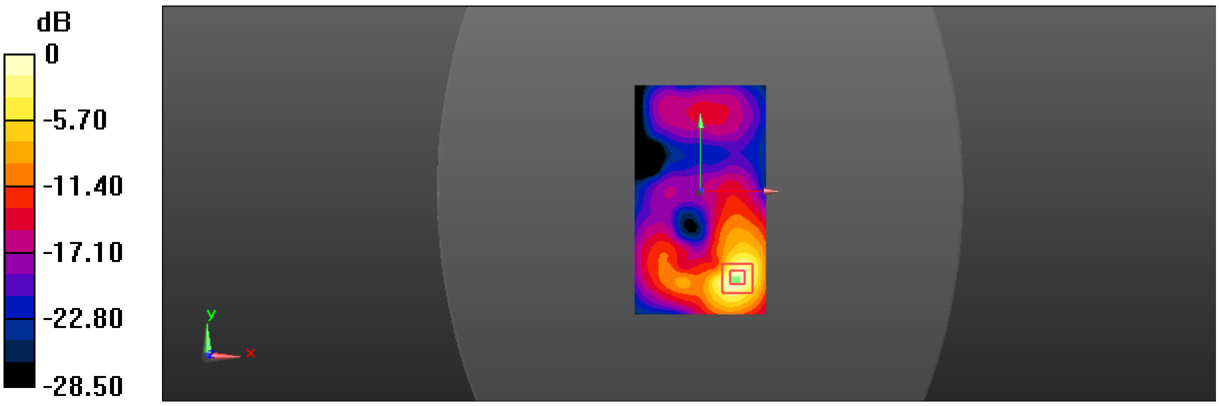
Medium: MSL2600;Medium parameters used: f = 2506 MHz; σ = 2.035 S/m; ε_r = 52.258; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: ELI v5.0 Left ; Type: ELI V5.0 ; Serial: TP:1239
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.64 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.656 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 2.31 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.487 W/kg
Maximum value of SAR (measured) = 1.65 W/kg



0 dB = 1.65 W/kg = 2.17 dBW/kg

Date: 2018/5/16

Test Laboratory: SGS-SAR Lab

LTE Band 41 20MHz bandwidth QPSK 50RB25 Offset 39750CH Left cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-TDD BW 20MHz (0); Frequency: 2506 MHz;Duty Cycle: 1:1.57906

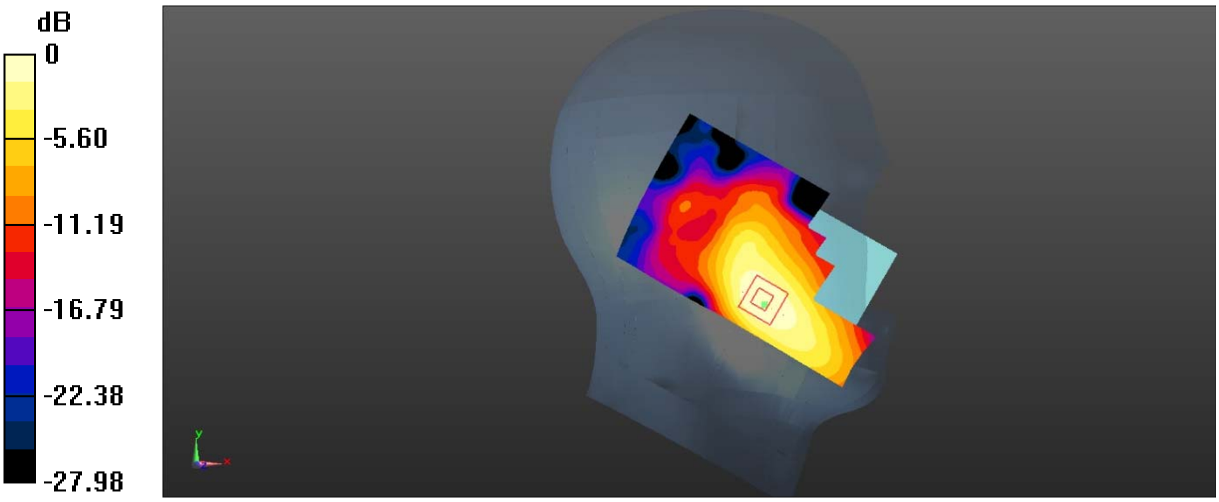
Medium: HSL2600;Medium parameters used: f = 2506 MHz; σ = 1.886 S/m; ε_r = 39.776; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -1.0, 32.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.569 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.609 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.710 W/kg
SAR(1 g) = 0.397 W/kg; SAR(10 g) = 0.218 W/kg
Maximum value of SAR (measured) = 0.560 W/kg



0 dB = 0.560 W/kg = -2.52 dBW/kg

Date: 2018/5/16

Test Laboratory: SGS-SAR Lab

LTE Band 41 20MHz bandwidth QPSK 1RB50 Offset 39750CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-TDD BW 20MHz (0); Frequency: 2506 MHz;Duty Cycle: 1:1.57906

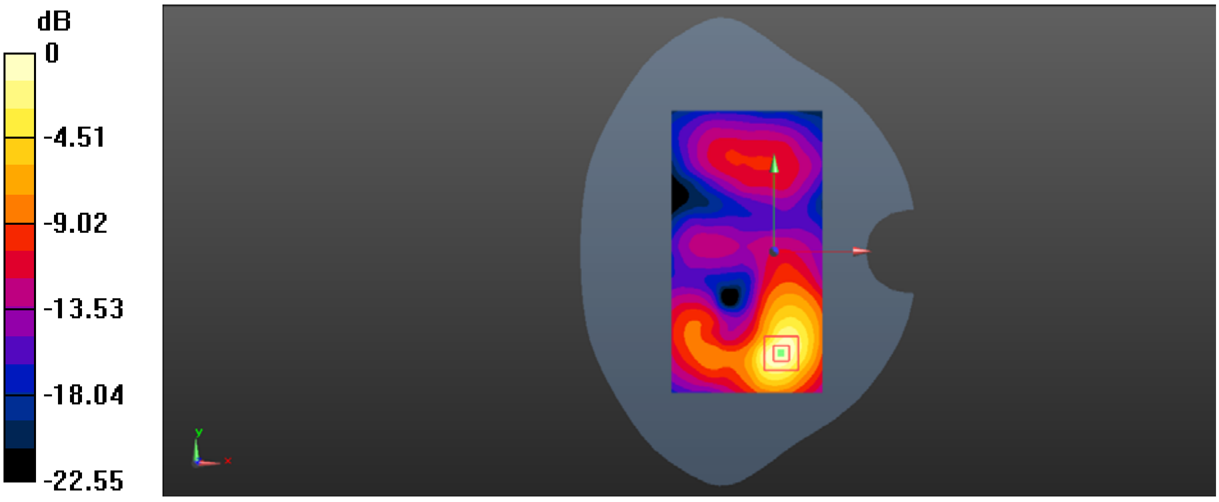
Medium: MSL2600;Medium parameters used: f = 2506 MHz; σ = 2.037 S/m; ε_r = 52.396; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.592 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.231 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.740 W/kg
SAR(1 g) = 0.414 W/kg; SAR(10 g) = 0.204 W/kg
Maximum value of SAR (measured) = 0.574 W/kg



0 dB = 0.574 W/kg = -2.41 dBW/kg

Date: 2018/5/16

Test Laboratory: SGS-SAR Lab

LTE Band 41 20MHz bandwidth QPSK 1RB50 Offset 39750CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, LTE-TDD BW 20MHz (0); Frequency: 2506 MHz;Duty Cycle: 1:1.57906

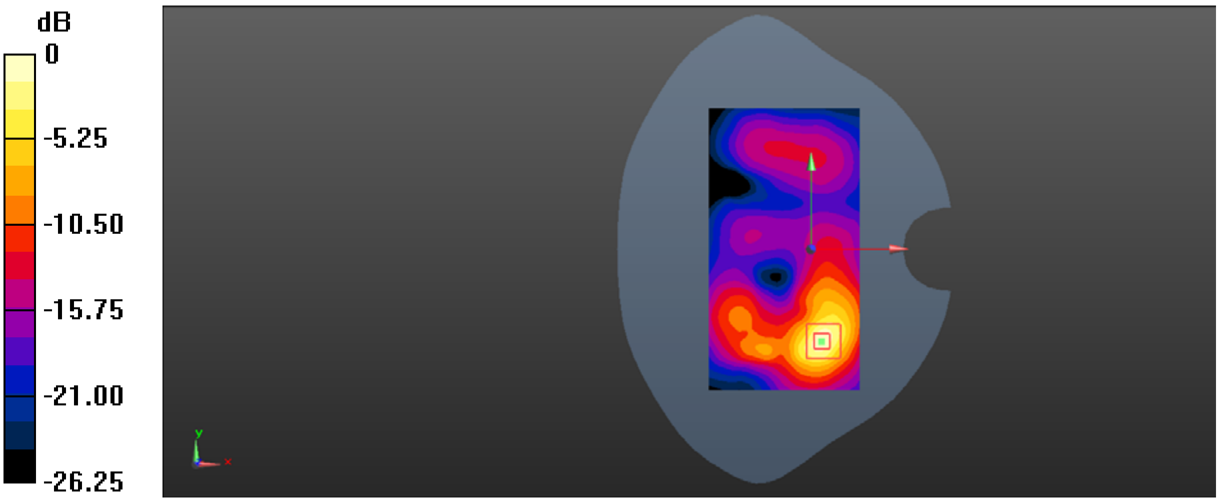
Medium: MSL2600;Medium parameters used: f = 2506 MHz; σ = 2.037 S/m; ε_r = 52.396; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.78, 7.78, 7.78); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.39 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.488 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 0.991 W/kg; SAR(10 g) = 0.434 W/kg
Maximum value of SAR (measured) = 1.56 W/kg



0 dB = 1.56 W/kg = 1.93 dBW/kg

Date: 2018/5/5

Test Laboratory: SGS-SAR Lab

Wifi 802.11b 11CH Left cheek

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, WI-FI(2.4GHz) (0); Frequency: 2462 MHz;Duty Cycle: 1:1

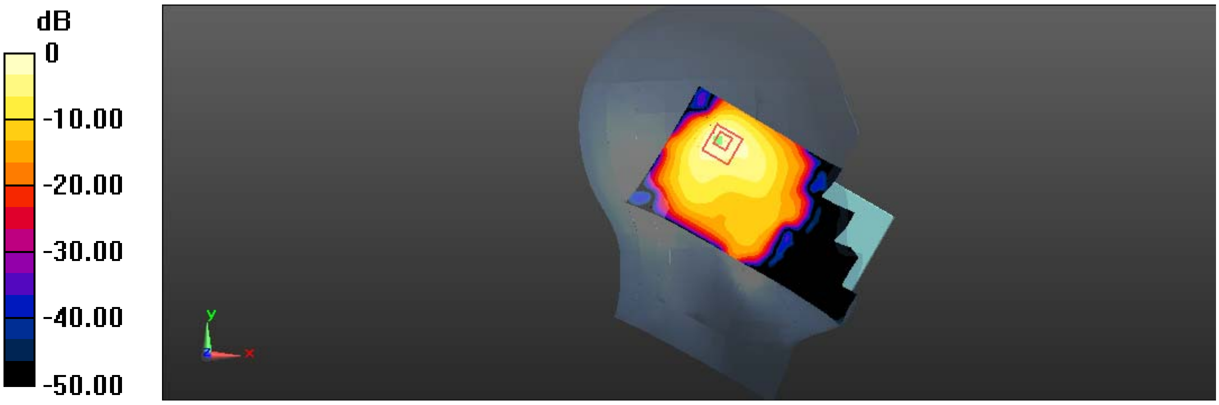
Medium: HSL2450;Medium parameters used: f = 2462 MHz; σ = 1.818 S/m; ε_r = 38.234; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.81, 7.81, 7.81); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: Twin Phantom; Type: SAM1; Serial: 1824
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Head/Area Scan (81x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.617 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.832 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.829 W/kg
SAR(1 g) = 0.358 W/kg; SAR(10 g) = 0.162 W/kg
Maximum value of SAR (measured) = 0.550 W/kg



0 dB = 0.550 W/kg = -2.60 dBW/kg

Date: 2018/5/6

Test Laboratory: SGS-SAR Lab

Wifi 802.11b 11CH Back side 15mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, WI-FI(2.4GHz) (0); Frequency: 2462 MHz;Duty Cycle: 1:1

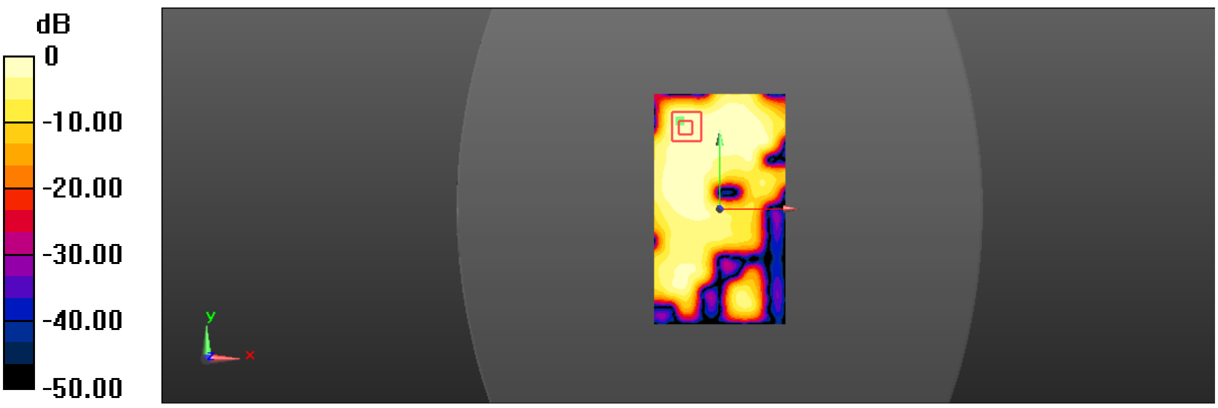
Medium: HSL2450;Medium parameters used: f = 2462 MHz; σ = 1.818 S/m; ε_r = 38.234; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.81, 7.81, 7.81); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: ELI v5.0 Left ; Type: ELI V5.0 ; Serial: TP:1239
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0547 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.449 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0840 W/kg
SAR(1 g) = 0.031 W/kg; SAR(10 g) = 0.012 W/kg
Maximum value of SAR (measured) = 0.0499 W/kg



0 dB = 0.0499 W/kg = -13.02 dBW/kg

Date: 2018/5/6

Test Laboratory: SGS-SAR Lab

Wifi 802.11b 11CH Back side 10mm

DUT: TW801; Type: TW801; Serial: NA

Communication System: UID 0, WI-FI(2.4GHz) (0); Frequency: 2462 MHz;Duty Cycle: 1:1

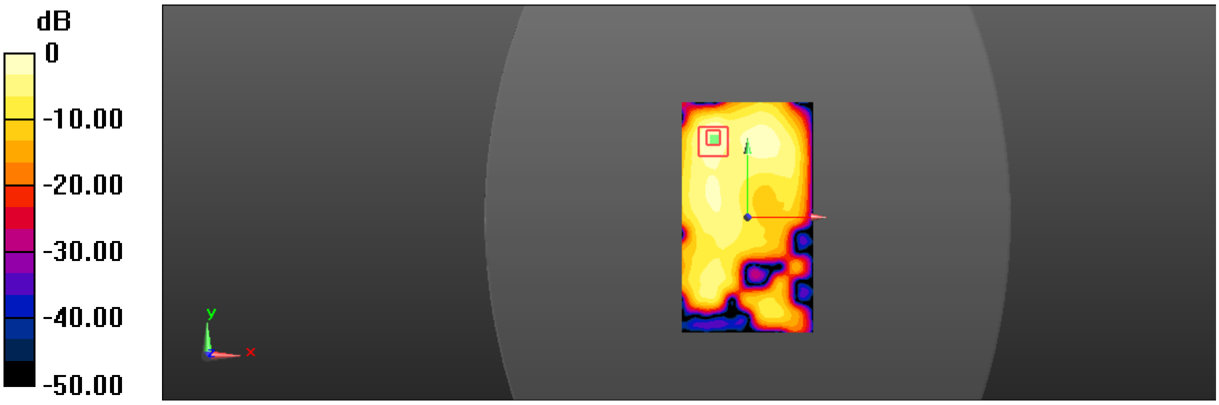
Medium: HSL2450;Medium parameters used: f = 2462 MHz; σ = 1.818 S/m; ε_r = 38.234; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY 5 Configuration:

- Probe: EX3DV4 - SN3923; ConvF(7.81, 7.81, 7.81); Calibrated: 2017/8/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -2.0, 31.0
- Electronics: DAE4 Sn1267; Calibrated: 2017/11/28
- Phantom: ELI v5.0 Left ; Type: ELI V5.0 ; Serial: TP:1239
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.142 W/kg

Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.214 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.198 W/kg
SAR(1 g) = 0.085 W/kg; SAR(10 g) = 0.036 W/kg
Maximum value of SAR (measured) = 0.135 W/kg



0 dB = 0.135 W/kg = -8.70 dBW/kg

Appendix C

Calibration certificate

1. Dipole
D750V3 - SN 1160(2016-06-22)
D835V2 - SN 4d105(2016-12-08)
D1900V2 - SN 5d028 (2016-12-07)
D2450V2 - SN 733(2016-12-07)
D2600V2 - SN 1125(2016-12-07)
D5GHzV2 - SN 1165(2016-12-13)
2. DAE
DAE4-SN 1267(2017-11-28)
3. Probe
EX3DV4 - SN 3923(2017-08-24)

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 **SGS-SZ (Auden)**

Certificate No: D750V3-1160_Jun16

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1160
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	June 22, 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: June 27, 2016

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%.