CTC Laboratories,Inc.
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TEST REPORT

Report Reference No. ....:	**GTI20191152F**
FCC ID ....:	**SRQ-ZTEF322**
Applicant's name ....:	**ZTE Corporation**
Address .... :	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China
Manufacturer.....................................:	ZTE Corporation
Address...:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China
Test item description ....:	**WCDMA/GSM Feature Phone**
Trade Mark....................................... :	ZTE
Model/Type reference .... :	ZTE F322
Listed Model(s)................................ :	-
Standard...:	**FCC 47 CFR Part2.1091** **IEEE 1528: 2013** **ANSI/IEEE C95.1: 2005**
Date of receipt of test sample……….:	Jun.03, 2019
Date of testing………………………...:	Jun.07, 2019 to Jun.11, 2019
Date of issue………………………….:	Jun.12, 2019
Result ....…………………...:	**PASS**
Compiled by (position+printedname+signature) .. :	Charley Wu
Supervised by (position+printedname+signature) .. :	Eric Zhang
Approved by (position+printedname+signature) .. :	Walter Chen
Testing Laboratory Name..............:	**CTC Laboratories,Inc.**
Address .... :	2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

Contents

1. Test Standards and Report version

1.1. Test Standards

The tests were performed according to following standards:

FCC 47 Part 2.1091:Radiofrequency Radiation Exposure Evaluation:Mobile Devices
IEEE Std C95.1:2005: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz.
IEEE Std 1528™-2013: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.
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
KDB 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB 648474 D04 Handset SAR v01r03: SAR Evaluation Considerations for Wireless Handsets
KDB 941225 D01 3G SAR Procedures v03r01: SAR Measurement Procedures for 3G Devices

1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-06-12	Original

2. Summary

2.1. Client Information

Applicant:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China
Manufacturer:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China

2.2. Product Description

Name of EUT:	WCDMA/GSM Feature Phone		
Trade Mark:	ZTE		
Model No.:	ZTE F322		
Listed Model(s):	-		
Power supply:	3.7Vdc		
Battery 1#:	Model: Li3708T42P3h533456 3.7Vdc 800mAh		
Battery 2#:	Model: 5C0802 3.7Vdc 800mAh		
Device Category:	Portable		
Product stage:	Production unit		
RF Exposure Environment:	General Population / Uncontrolled		
Hardware version:	HS520_MB_V2.0		
Software version:	ZTE_F322V1.0_20190603		
Maximum SAR Value			
Separation Distance:	Head: 0mm Body: 10mm		
Max Report SAR Value (1g):	Test location:	PCE	Simultaneous TX
	Head:	**1.007W/Kg**	**1.379W/Kg**
	Body:	**1.091W/Kg**	**1.277W/Kg**
GSM			
Support Network:	GSM,GPRS		
Support Band:	GSM850,PCS1900		
Modulation Type:	GSM/GPRS:GMSK		
GPRS Class:	12		
EGPRS Class:	12		
Antenna type:	Internal Antenna		

WCDMA	
Operation Band:	WCDMA Band I,WCDMA Band II,WCDMA Band V
Power Class:	Power Class 3
Modulation Type:	QPSK/16QAM/64QAM
Antenna type:	Internal Antenna
Bluetooth	
Version:	Supported BT2.1+EDR
Modulation:	GFSK, π/4DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	Internal Antenna

Remark:

1. *The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power*
2. *The Test EUT support two SIM card(SIM1,SIM2),so all the tests are performed at each SIM card (SIM1,SIM2) mode, the datum recorded is the worst case for all the mode at SIM1 Card mode.*

3. Test Environment

3.1. Test laboratory

CTC Laboratories, Inc.
Add: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

3.2. Test Facility

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

CNAS-Lab Code: L5365
CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01
CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Registration No.: CN0029
The 3m alternate test site of CTC Laboratories, Inc.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: CN0029 on Dec, 2018.

FCC-Registration No.: CN1208
CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration CN1208, Sep 07, 2017

4. Equipments Used during the Test

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
Data Acquisition Electronics DAEx	SPEAG	DAE4	1423	2019/05/24	2020/05/23
E-field Probe	SPEAG	EX3DV4	3974	2018/06/21	2019/06/20
System Validation Dipole	SPEAG	D835V2	4d134	2018/10/10	2021/10/09
System Validation Dipole	SPEAG	D900V2	1d163	201/06/05	2021/06/04
System Validation Dipole	SPEAG	D1900V2	5d115	2018/08/26	2021/08/25
Network analyzer	Agilent	E5071C	MY46520333	2018/08/23	2019/08/22
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMU200	117824	2018/01/05	2019/01/04
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMW500	102414	2018/01/05	2019/01/04
Signal Generator	Agilent	N5182A	MY47420864	2018/12/29	2019/12/28
Power sensor	Mini-Circuits	PWR-8GHS	11609010017	2018/08/23	2019/08/22
Power sensor	Mini-Circuits	PWR-8GHS	11607130056	2018/08/23	2019/08/22
Power Amplifier	Mini-Circuits	ZHL-42W+	051701624	2018/08/23	2019/08/22
BI-DIRECTIONAL COUPLER	Mini-Circuits	ZGBDC20-33HP+	996201615	2018/08/23	2019/08/22
Attenuator	MCL	BW-N20W5+	1552	2018/08/23	2019/08/22
Attenuator	MCL	BW-N3W5+	1608	2018/08/23	2019/08/22
Attenuator	MCL	/	/	2018/08/23	2019/08/22

Note:

1. *The Probe,Dipole and DAE calibration reference to the Appendix A*
2. *Referring to KDB865664 D01, the dipole calibration interval can be extended to 3 years with justifcatio. The dipole are also not physically damaged or repaired during the interval.*

5. Measurement Uncertainty

Measurement Uncertainty										
No.	Error Description	Type	Uncertainty Value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement System										
1	Probe calibration	B	6.0%	N	1	1	1	6.0%	6.0%	∞
2	Axial isotropy	B	4.70%	R	$\sqrt{3}$	0.7	0.7	1.90%	1.90%	∞
3	Hemispherical isotropy	B	9.60%	R	$\sqrt{3}$	0.7	0.7	3.90%	3.90%	∞
4	Boundary Effects	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
5	Probe Linearity	B	4.70%	R	$\sqrt{3}$	1	1	2.70%	2.70%	∞
6	Detection limit	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
7	RF ambient conditions-noise	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
8	RF ambient conditions-reflection	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
9	Response time	B	0.80%	R	$\sqrt{3}$	1	1	0.50%	0.50%	∞
10	Integration time	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
11	RF ambient	B	3.00%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
12	Probe positioned mech. restrictions	B	0.40%	R	$\sqrt{3}$	1	1	0.20%	0.20%	∞
13	Probe positioning with respect to phantom shell	B	2.90%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
14	Max.SAR evalation	B	3.90%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
Test Sample Related										
15	Test sample positioning	A	1.86%	N	1	1	1	1.86%	1.86%	∞
16	Device holder uncertainty	A	1.70%	N	1	1	1	1.70%	1.70%	∞
17	Drift of output power	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
Phantom and Set-up										
18	Phantom uncertainty	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
19	Liquid conductivity (target)	B	5.00%	R	$\sqrt{3}$	0.64	0.43	1.80%	1.20%	∞
20	Liquid conductivity (meas.)	A	0.50%	N	1	0.64	0.43	0.32%	0.26%	∞
21	Liquid permittivity (target)	B	5.00%	R	$\sqrt{3}$	0.64	0.43	1.80%	1.20%	∞
22	Liquid cpermittivity (meas.)	A	0.16%	N	1	0.64	0.43	0.10%	0.07%	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$		/	/	/	/	9.79%	9.67%	∞
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		R	K=2	/	/	19.57%	19.34%	∞

System Check Uncertainty

No.	Error Description	Type	Uncertainty Value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement System										
1	Probe calibration	B	6.0%	N	1	1	1	6.0%	6.0%	∞
2	Axial isotropy	B	4.70%	R	$\sqrt{3}$	0.7	0.7	1.90%	1.90%	∞
3	Hemispherical isotropy	B	9.60%	R	$\sqrt{3}$	0.7	0.7	3.90%	3.90%	∞
4	Boundary Effects	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
5	Probe Linearity	B	4.70%	R	$\sqrt{3}$	1	1	2.70%	2.70%	∞
6	Detection limit	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
7	RF ambient conditions-noise	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
8	RF ambient conditions-reflection	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
9	Response time	B	0.80%	R	$\sqrt{3}$	1	1	0.50%	0.50%	∞
10	Integration time	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
11	RF ambient	B	3.00%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
12	Probe positioned mech. restrictions	B	0.40%	R	$\sqrt{3}$	1	1	0.20%	0.20%	∞
13	Probe positioning with respect to phantom shell	B	2.90%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
14	Max.SAR evalation	B	3.90%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
System validation source-dipole										
15	Deviation of experimental dipole from numerical dipole	A	1.58%	N	1	1	1	1.58%	1.58%	∞
16	Dipole axis to liquid distance	A	1.35%	N	1	1	1	1.35%	1.35%	∞
17	Input power and SAR drift	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
Phantom and Set-up										
18	Phantom uncertainty	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
20	Liquid conductivity (meas.)	A	0.50%	N	1	0.64	0.43	0.32%	0.26%	∞
22	Liquid cpermittivity (meas.)	A	0.16%	N	1	0.64	0.43	0.10%	0.07%	∞
Combined standard uncertainty		$u_c=\sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$		/	/	/	/	8.80%	8.79%	∞
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		R	K=2	/	/	17.59%	17.58%	∞

6. SAR Measurements System Configuration

6.1. SAR Measurement Set-up

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

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating 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 electronic (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.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

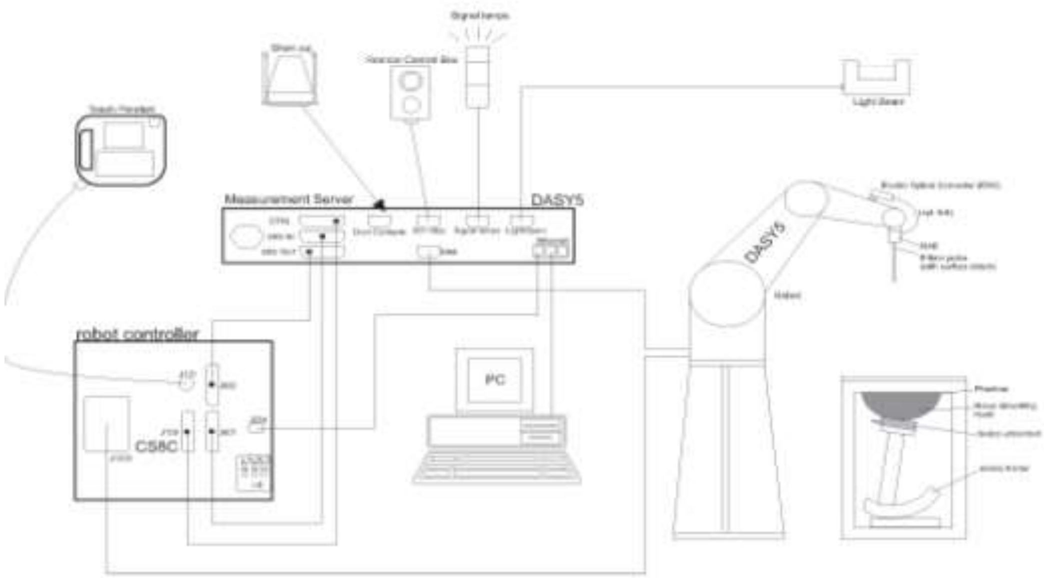
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



6.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

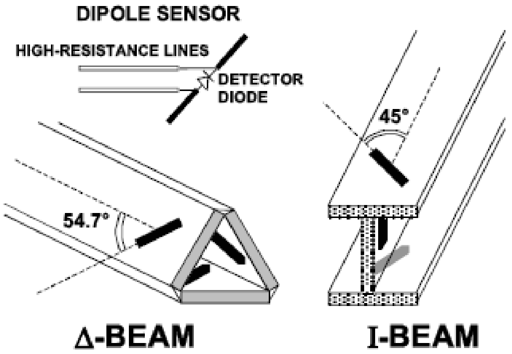
- **Probe Specification**

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	4 MHz to 10 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 W/kg; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 6 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

- **Isotropic E-Field Probe**

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



6.3. Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

6.4. Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

Device holder supplied by SPEAG

7. SAR Test Procedure

7.1. Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

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. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan
After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm.

Spatial Peak Detection
The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses.The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard’s method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.
They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard’s method for extrapolation.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

Table 1: Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v04

<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 mm ± 1 mm</td><td>½·δ·ln(2) mm ± 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">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ mm</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>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the <u>*reported*</u> SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

7.2. Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors),s 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 ".DA4". 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], [W/kg], [mW/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.

Data Evaluation

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:	σ
	Density:	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

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

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

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

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

$$\text{E}-\text{fieldprobes}: \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

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

Vi: compensated signal of channel (i = x, y, z)
Normi: sensor sensitivity of channel (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):

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

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

SAR: local specific absorption rate in W/kg
Etot: total field strength in V/m
σ: conductivity in [mho/m] or [Siemens/m]
ρ: equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

8. Position of the wireless device in relation to the phantom

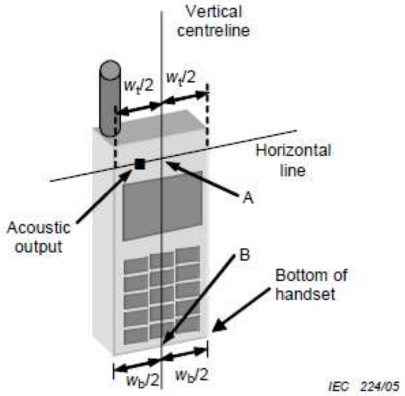
8.1. Head Position

The wireless device define two imaginary lines on the handset, the vertical centreline and the horizontal line, for the handset in vertical orientation as shown in Figures 5a and 5b.

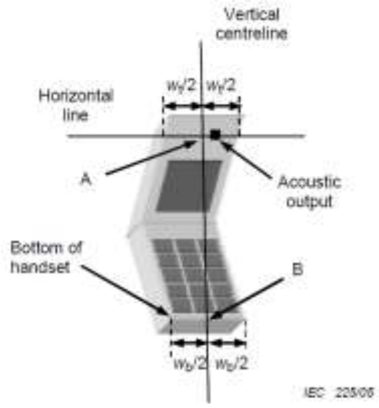
The vertical centreline passes through two points on the front side of the handset: the midpoint of the width W_t of the handset at the level of the acoustic output (point A in Figures 5a and 5b), and the midpoint of the width W_b of the bottom of the handset (point B).

The horizontal line is perpendicular to the vertical centreline and passes through the centre of the acoustic output (see Figures 5a and 5b). The two lines intersect at point A.

Note that for many handsets, point A coincides with the centre of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centreline is not necessarily parallel to the front face of the handset (see Figure 5b), especially for clam-shell handsets, handsets with flip cover pieces, and other irregularly shaped handsets.



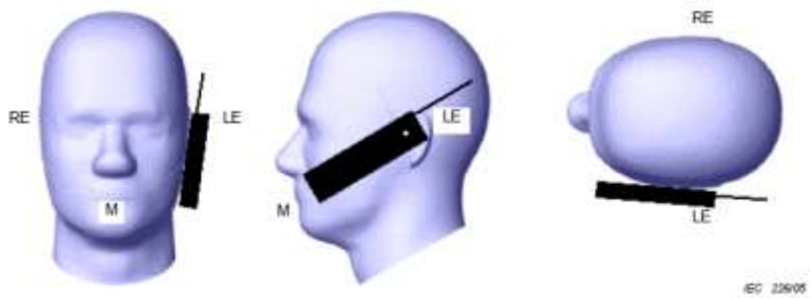
Figures 5a



Figures 5b

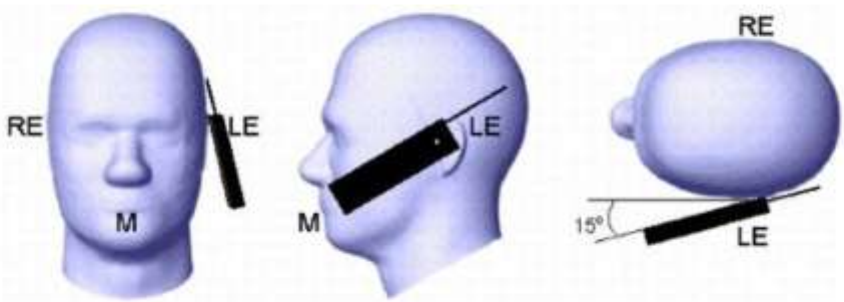
W_t	Width of the handset at the level of the acoustic
W_b	Width of the bottom of the handset
A	Midpoint of the widthwt of the handset at the level of the acoustic output
B	Midpoint of the width wb of the bottom of the handset

Cheek position



Picture 2 Cheek position of the wireless device on the left side of SAM

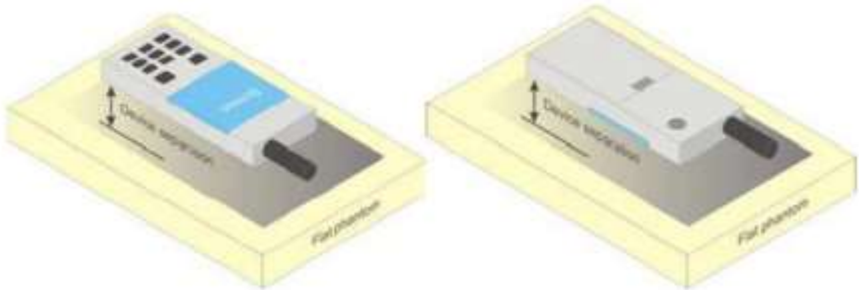
Tilt position



Picture 3 Tilt position of the wireless device on the left side of SAM

8.2. Body Position

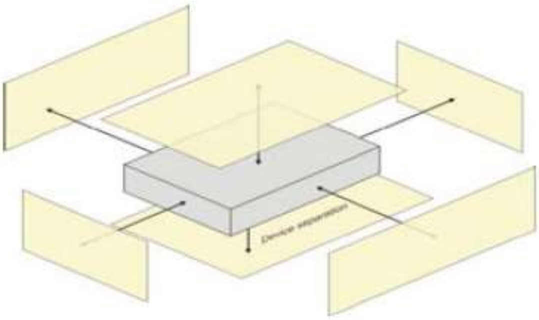
Devices that support transmission while used with body-worn accessories must be tested for body-worn accessory SAR compliance, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics.
Devices that are designed to operate on the body of users using lanyards and straps or without requiring additional body-worn accessories must be tested for SAR compliance using a conservative minimum test separation distance **≤ 10 mm** to support compliance.



Picture 4 Test positions for body-worn devices

8.3. Hotspot Mode Exposure conditions

The hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. This typically applies to the back and front surfaces of a handset when SAR is required for both hotspot mode and body-worn accessory exposure conditions. Depending on the form factor and dimensions of a device, the test separation distance used for hotspot mode SAR measurement is either 10 mm or that used in the body-worn accessory configuration, whichever is less for devices with dimension > 9 cm x 5 cm. For smaller devices with dimensions ≤ 9 cm x 5 cm because of a greater potential for next to body use a test separation of ≤ 5 mm must be used.



Picture 5 Test positions for Hotspot Mode

9. System Check

9.1. Tissue Dielectric Parameters

The liquid is consisted of water,salt,Glycol,Sugar,Preventol and Cellulose.The liquid has previously been proven to be suited for worst-case. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB865664.

Tissue dielectric parameters for head and body phantoms				
Target Frequency	Head		Body	
(MHz)	εr	σ(s/m)	εr	σ(s/m)
835	41.5	0.90	55.2	0.97
1800-2000	40.0	1.40	53.3	1.52

Check Result:

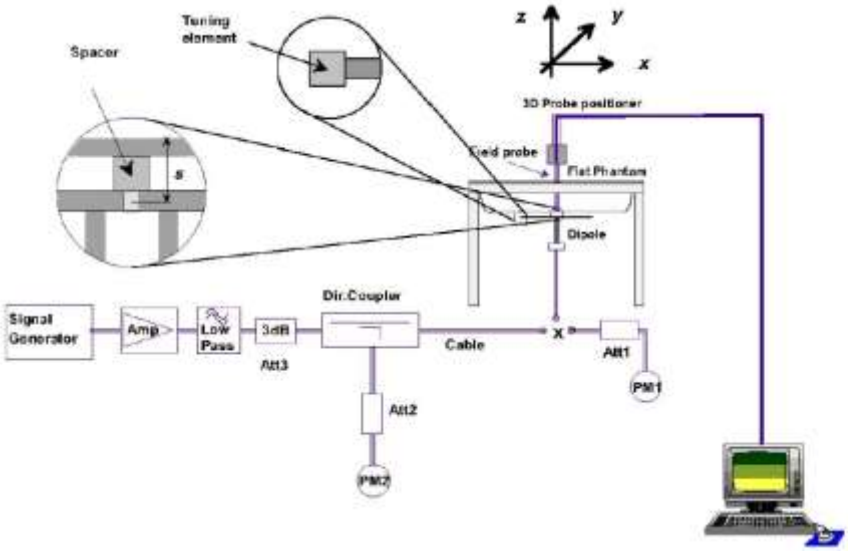
Dielectric performance of Head tissue simulating liquid									
Frequency (MHz)	εr		σ(s/m)		Delta (εr)	Delta (σ)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
835	41.50	42.90	0.90	0.93	3.37%	3.56%	±5%	22	2019-06-07
1900	40.00	41.67	1.40	1.47	4.18%	4.71%	±5%	22	2019-06-10

Dielectric performance of Body tissue simulating liquid									
Frequency (MHz)	εr		σ(s/m)		Delta (εr)	Delta (σ)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
835	55.20	55.40	0.97	0.97	0.36%	-0.40%	±5%	22	2019-06-07
1900	53.30	53.72	1.52	1.55	0.79%	2.17%	±5%	22	2019-06-10

9.2. SAR System Check

The purpose of the system check is to verify that the system operates within its specifications at the decice test frequency.The system check is simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10%).
System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



System Performance Check Setup

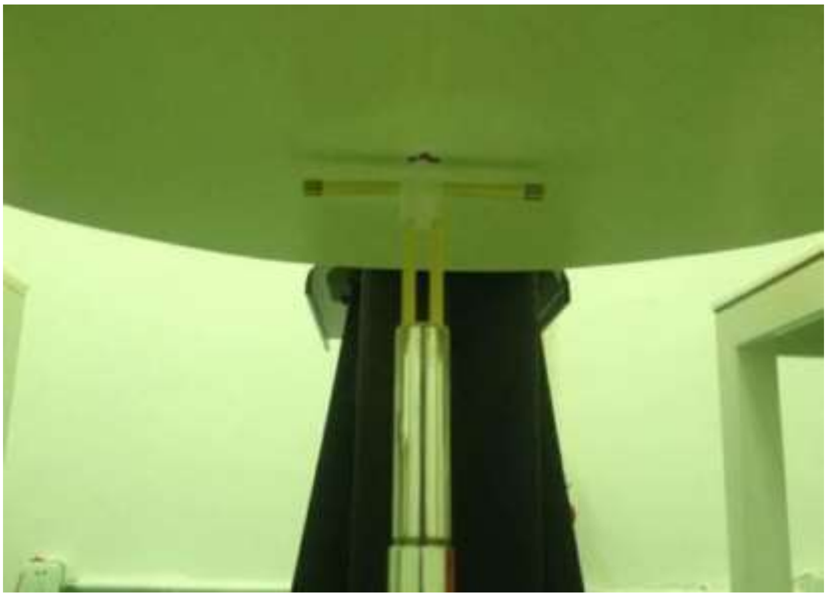


Photo of Dipole Setup

Check Result:

Head									
Frequency (MHz)	1g SAR		10g SAR		Delta (1g)	Delta (10g)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
835	2.37	2.48	1.56	1.63	4.64%	4.49%	±10%	22	2019-06-07
1900	10.00	10.40	5.16	5.42	4.00%	5.04%	±10%	22	2019-06-10

Body									
Frequency (MHz)	1g SAR		10g SAR		Delta (1g)	Delta (10g)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
835	2.36	2.52	1.57	1.66	6.78%	5.73%	±10%	22	2019-06-07
1900	10.10	10.40	5.30	5.42	2.97%	2.26%	±10%	22	2019-06-10

Note:

1) the graph results see follow.

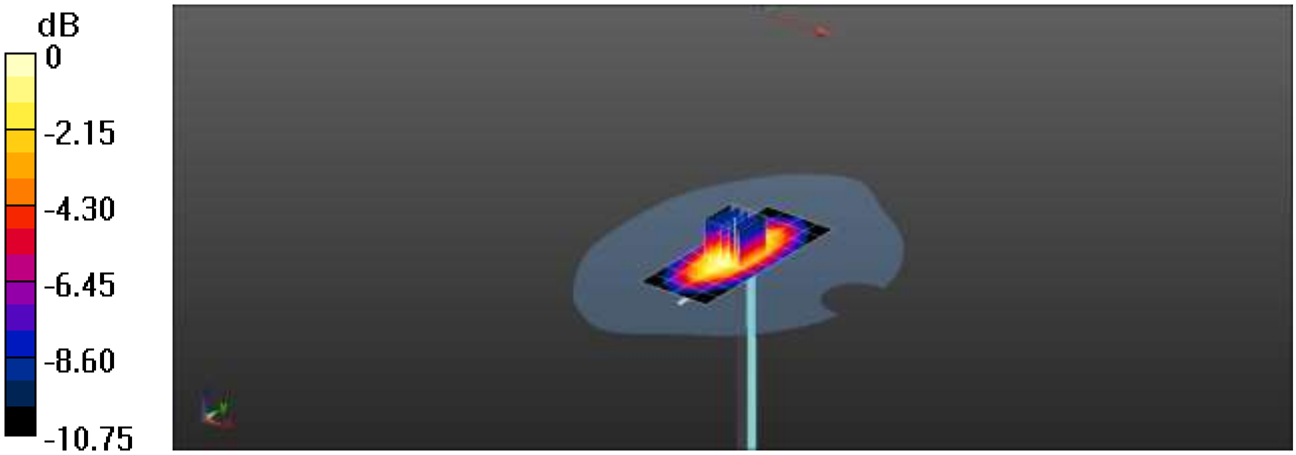
System Performance Check at 835 MHz Head

DUT: D835V2; Type: D835V2; Serial: 4d134
Date: 2019-06-07
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.932 S/m; ε_r = 42.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.12, 10.12, 10.12); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/d=15mm, Pin=250mW/Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.51 W/kg
Head/d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 66.376 V/m; Power Drift = -0.59 dB
Peak SAR (extrapolated) = 3.78 W/kg
SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.63 W/kg
Maximum value of SAR (measured) = 3.34 W/kg



0 dB = 3.34 W/kg = 5.24 dBW/kg

System Performance Check at 1900 MHz Head

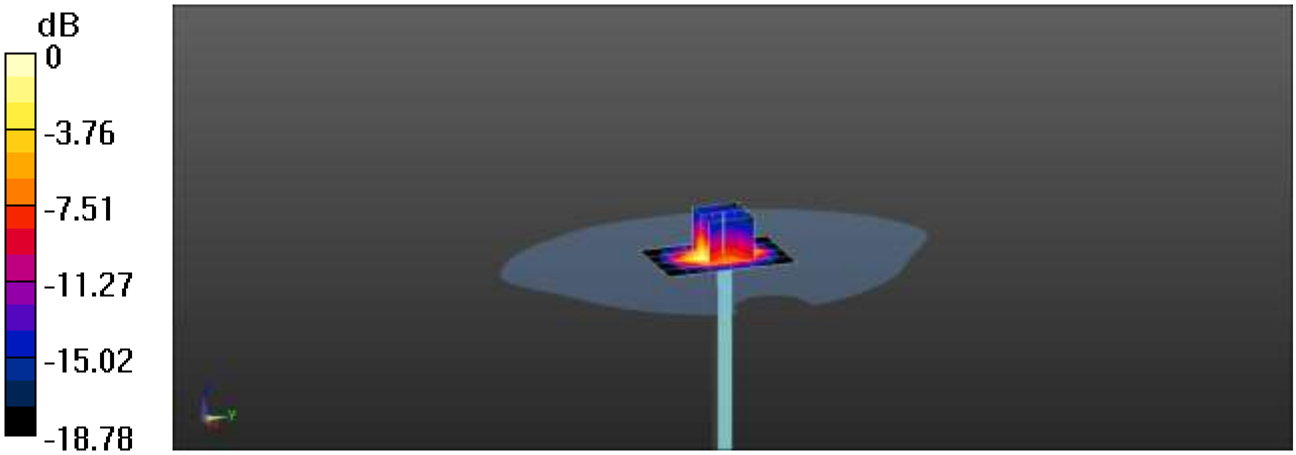
DUT: D1900V2; Type: D1900V2; Serial: 5d115
Date: 2019-06-10
Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.466 S/m; ε_r = 41.665; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.49, 8.49, 8.49); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/d=10mm,Pin=250mW/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 16.8 W/kg

Head/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 112.4 V/m; Power Drift = -0.27 dB
Peak SAR (extrapolated) = 19.5 W/kg
SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.42 W/kg
Maximum value of SAR (measured) = 16.1 W/kg



0 dB = 16.1 W/kg = 12.07 dBW/kg

System Performance Check at 835 MHz Body

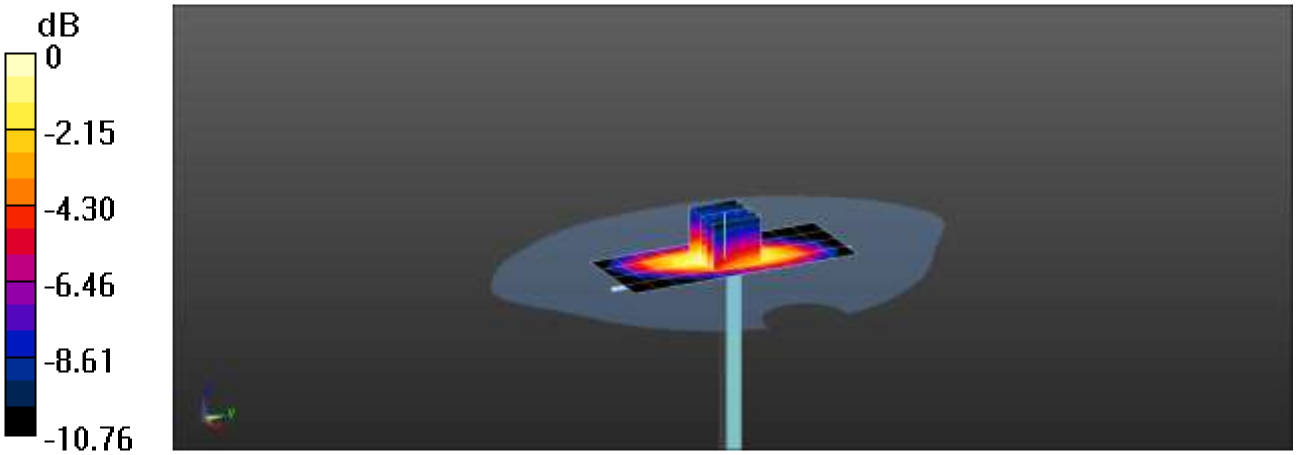
DUT: D835V2; Type: D835V2; Serial: 4d134
Date: 2019-06-07
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.966 S/m; ε_r = 55.403; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=15mm,Pin=250mW/Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.39 W/kg

Body/d=15mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 61.674 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.97 W/kg
SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.66 W/kg
Maximum value of SAR (measured) = 3.44 W/kg



0 dB = 3.44 W/kg = 5.37 dBW/kg

System Performance Check at 1900 MHz Body

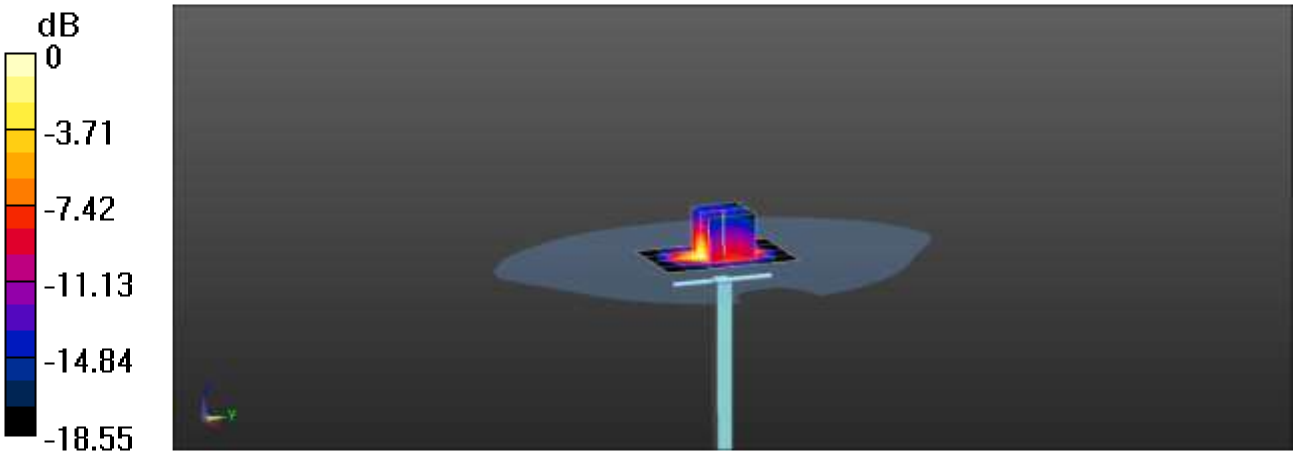
DUT: D1900V2; Type: D1900V2; Serial: 5d115
Date: 2019-06-10
Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.553 S/m; ε_r = 53.719; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm,Pin=250mW/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 16.3 W/kg

Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 105.9 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.9 W/kg
SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.42 W/kg
Maximum value of SAR (measured) = 15.7 W/kg



0 dB = 15.7 W/kg = 11.96 dBW/kg

10. SAR Exposure Limits

SAR assessments have been made in line with the requirements of ANSI/IEEE C95.1-1992

Type Exposure	Limit (W/kg)	
	General Population / Uncontrolled Exposure Environment	Occupational / Controlled Exposure Environment
Spatial Average SAR (whole body)	0.08	0.4
Spatial Peak SAR (1g cube tissue for head and trunk)	1.6	8.0
Spatial Peak SAR (10g for limb)	4.0	20.0

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

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

11. Conducted Power Measurement Results

GSM Conducted Power

1. *Per KDB 447498 D01, the maximum output power channel is used for SAR testing and further SAR test reduction*
2. *Per KDB 941225 D01, considering the possibility of e.g. 3rd party VoIP operation for Head and Body-worn SAR test reduction for GSM and GPRS modes is determined by the source-base time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (2Tx slots) for GSM850 and GPRS (2Tx slots) for PCS1900.*
3. *Per KDB941225 D01, for hotspot SAR test reduction for GPRS modes is determined by the source-based time-averaged output power including tune-up tolerance, For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (2Tx slots) for GSM850 and GPRS (2Tx slots) for PCS1900.*

Mode: GSM850		**Conducted Power (dBm)**			Division Factors	**Averager Power (dBm)**		
		CH128	CH190	CH251		CH128	CH190	CH251
		824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
GSM		31.19	33.00	34.08	-9.03	22.16	23.97	25.05
GPRS (GMSK)	1TXslot	31.67	33.37	34.28	-9.03	22.64	24.34	25.25
	2TXslots	30.66	33.75	33.63	-6.02	24.64	**27.73**	27.61
	3TXslots	28.21	30.05	31.17	-4.26	23.95	25.79	26.91
	4TXslots	26.88	28.72	29.89	-3.01	23.87	25.71	26.88
Mode: PCS1900		**Conducted Power (dBm)**			Division Factors	**Averager Power (dBm)**		
		CH512	CH661	CH810		CH512	CH661	CH810
		1850.2MHz	1880.0MHz	1909.8MHz		1850.2MHz	1880.0MHz	1909.8MHz
GSM		28.68	28.67	29.95	-9.03	19.65	19.64	20.92
GPRS (GMSK)	1TXslot	28.19	28.15	29.31	-9.03	19.16	19.12	20.28
	2TXslots	27.56	29.56	29.04	-6.02	21.54	**23.54**	23.02
	3TXslots	25.11	25.25	26.54	-4.26	20.85	20.99	22.28
	4TXslots	23.56	23.75	25.04	-3.01	20.55	20.74	22.03

Note:

2) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

WCDMA Conducted Power

1. *The following tests were conducted according to the test requirements outlines in 3GPP TS34.121 specification.*
2. *The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode to determine SAR test exclusion*

A summary of thest setting are illustrated belowe:

HSDPA Setup Configureation:

a) The EUT was connected to base station RS CMU200 referred to the setup configuration
b) The RF path losses were compensated into the measurements
c) A call was established between EUT and base station with following setting:
   i. Set Gain Factors (βc and βd) and parameters were set according to each specific sub-test in the following table, C10.1.4, Quoted from the TS 34.121
   ii. Set RMC 12.2Kbps + HSDPA mode
   iii. Set Cell Power=-86dBm
   iv. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   v. Select HSDPA uplink parameters
   vi. Set Delta ACK, Delta NACK and Delta CQI=8
   vii. Set Ack-Nack repetition Factor to 3
   viii. Set CQI Feedback Cycle (K) to 4ms
   ix. Set CQI repetition factor to 2
   x. Power ctrl mode= all up bits
d) The transmitter maximum output power waw recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configureation:

a) The EUT was connected to base station RS CMU200 referred to the setup configuration
b) The RF path losses were compensated into the measurements
c) A call was established between EUT and base station with following setting:
   i. Call configs = 5.2b, 5.9b, 5.10b, and 5.13.2B with QPSK
   ii. Set Gain Factors (βc and βd) and parameters (AG index) were set according to each specific sub-test in the following table, C11.1.3, Quoted from the TS 34.121
   iii. Set Cell Power=-86dBm
   iv. Set channel type= 12.2Kbps + HSPA mode
   v. Set UE Target power
   vi. Set Ctrl mode=Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal the target E-TFCI of 75 for Sub-test 1, and other subtest's E-TFCI
d) The transmitter maximum output power waw recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

General Note:

1. Per KDB 941225 D01, SAR for Head / Hotsport / Body-worn Exposure is measured using a 12.2Kbps RMC with TPC bit ocnfigured to all 1s
2. Per KDB 941225 D01 RMC12.2Kbps setting is used to evaluate SAR. If the maximum output power and Tune-up tolerance specified for production units in HSDPA/HSUPA is ≦1/4dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio fo specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC 12.2Kbps and the adjusted SAR is ≦1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA.

Mode	WCDMA Band II			WCDMA Band V		
	Conducted Power (dBm)			Conducted Power (dBm)		
	CH9262	CH9400	CH9538	CH4132	CH4183	CH4233
	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2K	21.96	**23.06**	22.08	21.59	**21.60**	21.37

Bluetooth Conducted Power

Bluetooth			
Mode	Channel	Frequency (MHz)	Conducted power (dBm)
GFSK	0	2402	8.35
	39	2441	9.15
	78	2480	**9.47**
π/4QPSK	0	2402	7.46
	39	2441	8.35
	78	2480	8.43
8DPSK	0	2402	7.41
	39	2441	8.09
	78	2480	8.40

12. Maximum Tune-up Limit

GSM		
Mode	Maximum Tune-up (dBm)	
	GSM850	PCS1900
GSM (GMSK, 1Tx Slot)	34.50	30.00
GPRS (GMSK, 1Tx Slot)	34.50	30.00
GPRS (GMSK, 2Tx Slot)	34.00	30.00
GPRS (GMSK, 3Tx Slot)	31.50	27.00
GPRS (GMSK, 4Tx Slot)	30.00	25.50

WCDMA		
Mode	Maximum Tune-up (dBm)	
	WCDMA Band II	WCDMA Band V
RMC 12.2Kbps	23.50	22.00

Bluetooth	
Mode	Maximum Tune-up (dBm)
GFSK	9.50
π/4QPSK	8.50
8DPSK	8.50

Per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100MHz to 6GHz at test separation distances ≦50mm are determined by:

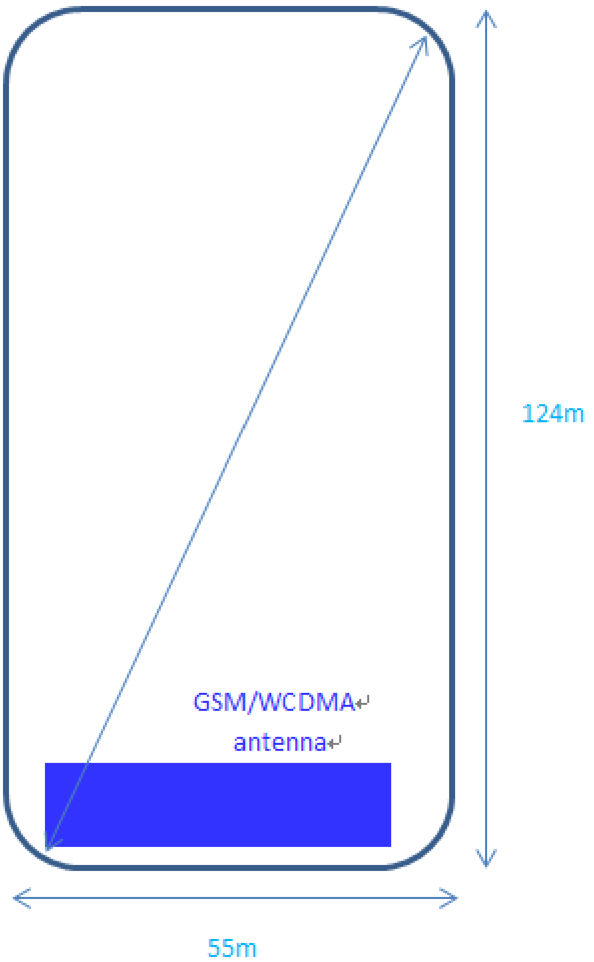
[(max. Power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] * [√f(GHz)] ≦3.0 for 1-g SAR

Band/Mode	F(GHz)	Position	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.45	Head	10	9.50	8.91	Yes
		Body	19	9.50	8.91	Yes

Per KDB 447498 D01, when the minimum test separation distance is <5mm, a distance of 5mm is applied to determine SAR test exclusion.

The test exclusion thereshold is ≦3, SAR testing is not required.

13. Antenna Location



Back View

Referring to KDB941225 D06, when the overall device length and width are >9cm*5cm, the test distance is 10mm. This typically applies to the back and front surfaces of a handset when SAR is required for both hotspot mode and body-worn accessory exposure conditions.

14. SAR Measurement Results

Head SAR

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
GPRS (2Tx slot)	Left-Cheek	128	824.2	30.66	34.00	2.16	0.11	0.401	0.865	-
		190	836.6	33.75	34.00	1.06	0.04	0.833	0.882	-
		251	848.8	33.63	34.00	1.09	0.15	0.719	0.783	-
	Left-Tilt	128	824.2	30.66	34.00	2.16	-	-	-	-
		190	836.6	33.75	34.00	1.06	-0.04	0.637	0.675	-
		251	848.8	33.63	34.00	1.09	-	-	-	-
	Right-Cheek	128	824.2	30.66	34.00	2.16	0.14	0.411	0.887	-
		190	836.6	33.75	34.00	1.06	-0.20	0.951	**1.007**	H1
		251	848.8	33.63	34.00	1.09	0.08	0.902	0.982	-
	Right-Tilt	128	824.2	30.66	34.00	2.16	-	-	-	-
		190	836.6	33.75	34.00	1.06	0.02	0.720	0.763	-
		251	848.8	33.63	34.00	1.09	-	-	-	-
	Test Data at the worst case with Battery 2#									
	Right-Cheek	190	836.6	33.75	34.00	1.06	0.11	0.944	1.000	-

PCS1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
GPRS (2Tx slot)	Left-Cheek	512	1850.2	27.56	30.00	1.75	-	-	-	-
		661	1880.0	29.56	30.00	1.11	-0.11	0.574	0.635	-
		810	1909.8	29.04	30.00	1.25	-	-	-	-
	Left-Tilt	512	1850.2	27.56	30.00	1.75	-	-	-	-
		661	1880.0	29.56	30.00	1.11	-0.08	0.462	0.511	-
		810	1909.8	29.04	30.00	1.25	-	-	-	-
	Right-Cheek	512	1850.2	27.56	30.00	1.75	-	-	-	-
		661	1880.0	29.56	30.00	1.11	0.18	0.610	**0.675**	H2
		810	1909.8	29.04	30.00	1.25	-	-	-	-
	Right-Tilt	512	1850.2	27.56	30.00	1.75	-	-	-	-
		661	1880.0	29.56	30.00	1.11	0.07	0.480	0.531	-
		810	1909.8	29.04	30.00	1.25	-	-	-	-
	Test Data at the worst case with Battery 2#									
	Right-Cheek	661	1880.0	29.56	30.00	1.11	0.05	0.594	0.659	-

Note:
Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
RMC 12.2K bps	Left-Cheek	9262	1852.4	21.98	23.50	1.42	-	-	-	-
		9400	1880.0	23.09	23.50	1.10	0.13	0.338	**0.371**	H3
		9538	1907.6	22.09	23.50	1.38	-	-	-	-
	Left-Tilt	9262	1852.4	21.98	23.50	1.42	-	-	-	-
		9400	1880.0	23.09	23.50	1.10	0.11	0.278	0.305	-
		9538	1907.6	22.09	23.50	1.38	-	-	-	-
	Right-Cheek	9262	1852.4	21.98	23.50	1.42	-	-	-	-
		9400	1880.0	23.09	23.50	1.10	0.18	0.323	0.354	-
		9538	1907.6	22.09	23.50	1.38	-	-	-	-
	Right-Tilt	9262	1852.4	21.98	23.50	1.42	-	-	-	-
		9400	1880.0	23.09	23.50	1.10	-0.06	0.258	0.284	-
		9538	1907.6	22.09	23.50	1.38	-	-	-	-
	Test Data at the worst case with Battery 2#									
	Left-Cheek	9400	1880.0	23.09	23.50	1.10	0.12	0.322	0.354	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
RMC 12.2K bps	Left-Cheek	4132	826.4	21.61	22.00	1.09	-	-	-	-
		4183	836.6	21.63	22.00	1.09	0.20	0.183	**0.199**	H5
		4233	846.6	21.38	22.00	1.15	-	-	-	-
	Left-Tilt	4132	826.4	21.61	22.00	1.09	-	-	-	-
		4183	836.6	21.63	22.00	1.09	0.11	0.147	0.160	-
		4233	846.6	21.38	22.00	1.15	-	-	-	-
	Right-Cheek	4132	826.4	21.61	22.00	1.09	-	-	-	-
		4183	836.6	21.63	22.00	1.09	-0.14	0.177	0.192	-
		4233	846.6	21.38	22.00	1.15	-	-	-	-
	Right-Tilt	4132	826.4	21.61	22.00	1.09	-	-	-	-
		4183	836.6	21.63	22.00	1.09	-0.11	0.139	0.151	-
		4233	846.6	21.38	22.00	1.15	-	-	-	-
	Test Data at the worst case with Battery 2#									
	Left-Cheek	4183	836.6	21.63	22.00	1.09	0.08	0.175	0.191	-

Note:
Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

Body SAR

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
GPRS (2Tx slot)	Front	128	824.2	30.66	34.00	2.16	-	-	-	-
		190	836.6	33.75	34.00	1.06	0.00	0.667	0.706	-
		251	848.8	33.63	34.00	1.09	-	-	-	-
	Back with earphone	128	824.2	30.66	34.00	2.16	0.03	0.488	1.053	-
		190	836.6	33.75	34.00	1.06	-0.01	1.010	**1.070**	B1
		251	848.8	33.63	34.00	1.09	0.18	0.954	1.039	-
	Test Data at the worst case with Battery 2#									
	Back with earphone	190	836.6	33.75	34.00	1.06	0.12	0.947	1.003	-

PCS1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
GPRS (2Tx slot)	Front	512	1850.2	27.56	30.00	1.75	-	-	-	-
		661	1880.0	29.56	30.00	1.11	0.15	0.574	0.635	-
		810	1909.8	29.04	30.00	1.25	-	-	-	-
	Back with earphone	512	1850.2	27.56	30.00	1.75	0.15	0.512	0.898	-
		661	1880.0	29.56	30.00	1.11	-0.20	0.907	**1.004**	B2
		810	1909.8	29.04	30.00	1.25	0.06	0.801	0.999	-
	Test Data at the worst case with Battery 2#									
	Back with earphone	661	1880.0	29.56	30.00	1.11	0	0.889	0.987	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
RMC 12.2Kbps	Front	9262	1852.4	21.98	23.50	1.42	-	-	-	-
		9400	1880.0	23.09	23.50	1.10	-0.05	0.707	0.776	-
		9538	1907.6	22.09	23.50	1.38	-	-	-	-
	Back with earphone	9262	1852.4	21.98	23.50	1.42	0.03	0.579	0.821	-
		9400	1880.0	23.09	23.50	1.10	0.12	0.993	**1.091**	B3
		9538	1907.6	22.09	23.50	1.38	0.10	0.741	1.025	-
	Test Data at the worst case with Battery 2#									
	Back with earphone	9400	1880.0	23.09	23.50	1.10	0.09	0.892	0.981	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune up limit (dBm)	Tune up scaling factor	Power Drift(dB)	Measured SAR(1g) (W/kg)	Report SAR(1g) (W/kg)	Test Plot
		CH	MHz							
RMC 12.2Kbps	Front	4132	826.4	21.61	22.00	1.09	-	-	-	-
		4183	836.6	21.63	22.00	1.09	0.08	0.299	0.325	-
		4233	846.6	21.38	22.00	1.15	-	-	-	-
	Back with earphone	4132	826.4	21.61	22.00	1.09	-	-	-	-
		4183	836.6	21.63	22.00	1.09	0.20	0.485	**0.528**	B5
		4233	846.6	21.38	22.00	1.15	-	-	-	-
	Test Data at the worst case with Battery 2#									
	Back with earphone	4183	836.6	21.63	22.00	1.09	0.14	0.433	0.472	-

Note:

2. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

SAR Test Data Plots

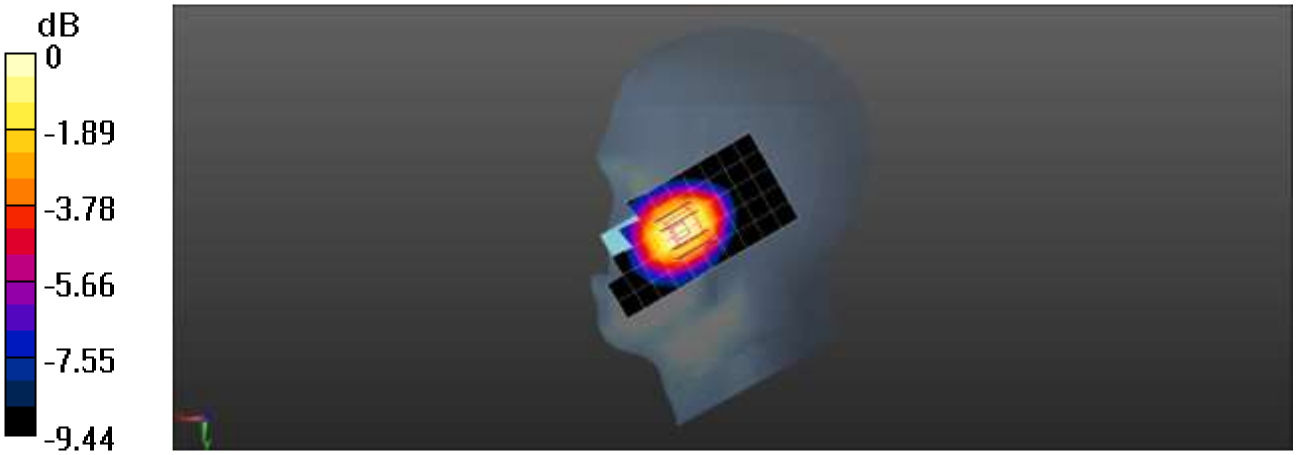
Test mode:	GPRS850 2Tx slot	Test Position:	Right Cheek	Test Plot:	H1

Date: 2019-06-07
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.933 S/m; ε_r = 43.899; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.12, 10.12, 10.12); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/ Right Touch Check/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.938 W/kg
Head/ Right Touch Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.975 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.951 W/kg; SAR(10 g) = 0.702 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.01 W/kg



0 dB = 1.01 W/kg = 0.04 dBW/kg

Test mode:	GPRS1900 2Tx slot	Test Position:	Right Cheek	Test Plot:	H2

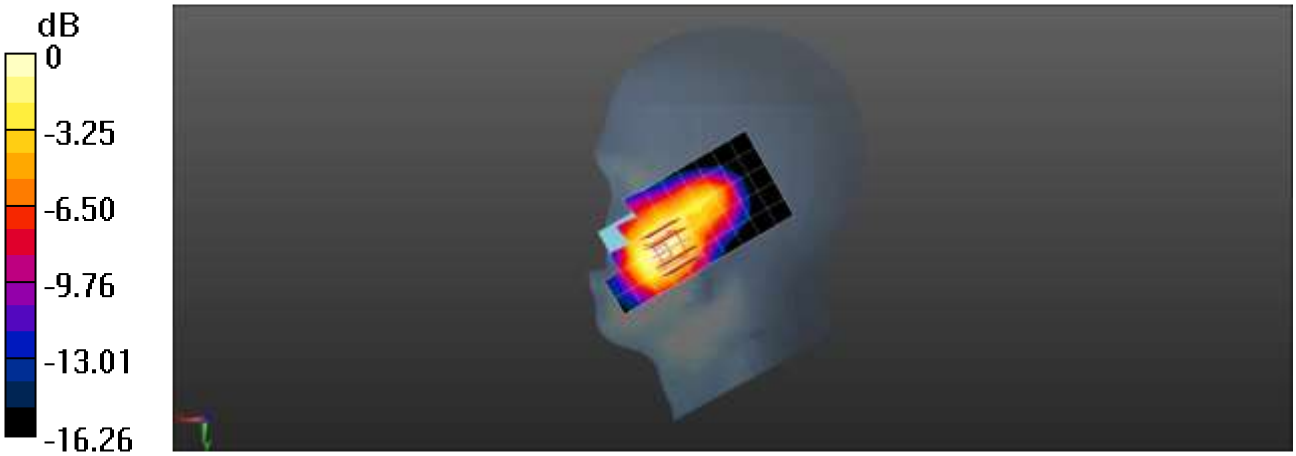
Date: 2019-06-10
Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.455 S/m; ε_r = 41.738; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.49, 8.49, 8.49); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/Right Touch Check/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.639 W/kg

Head/ Right Touch Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.033 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.964 W/kg
SAR(1 g) = 0.610 W/kg; SAR(10 g) = 0.374 W/kg
Maximum value of SAR (measured) = 0.660 W/kg



0 dB = 0.660 W/kg = -1.80 dBW/kg

Test mode:	WCDMA Band II	Test Position:	Left Cheek	Test Plot:	H3

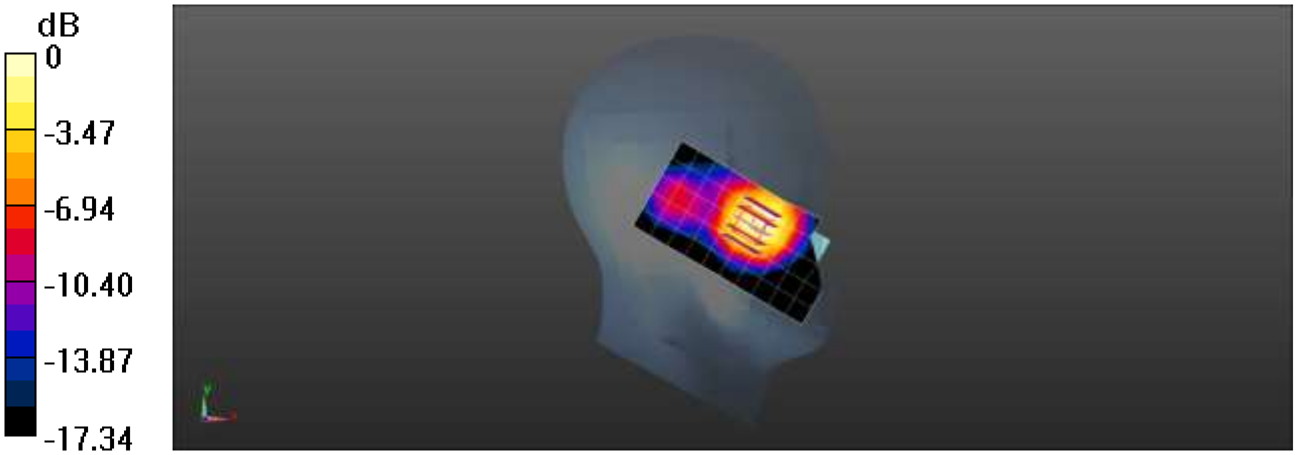
Date: 2019-06-10
Communication System: UID 0, Generic UMTS (WCDMA) (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.455 S/m; ε_r = 41.738; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.49, 8.49, 8.49); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/Left Touch Check/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.325 W/kg

Head/Left Touch Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.168 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.527 W/kg
SAR(1 g) = 0.338 W/kg; SAR(10 g) = 0.213 W/kg
Maximum value of SAR (measured) = 0.364 W/kg



0 dB = 0.364 W/kg = -4.39 dBW/kg

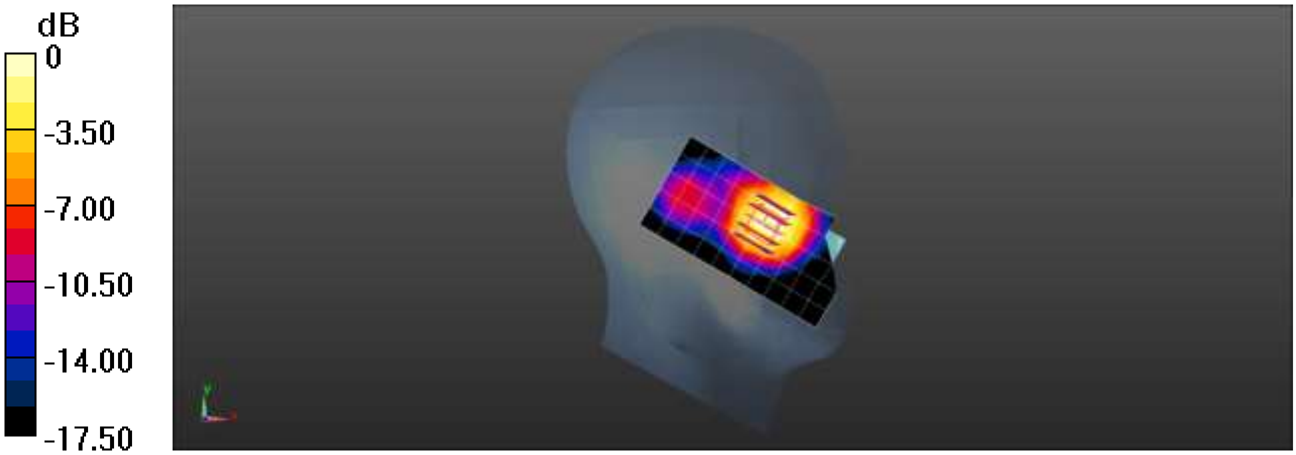
Test mode:	WCDMA Band V	Test Position:	Left Cheek	Test Plot:	H4

Date: 2019-06-07
Communication System: UID 0, Generic UMTS (WCDMA) (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.933 S/m; ε_r = 43.899; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.12, 10.12, 10.12); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/Left Touch Check/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.176 W/kg
Head/Left Touch Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.680 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.183 W/kg; SAR(10 g) = 0.115 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.197 W/kg



0 dB = 0.197 W/kg = -7.06 dBW/kg

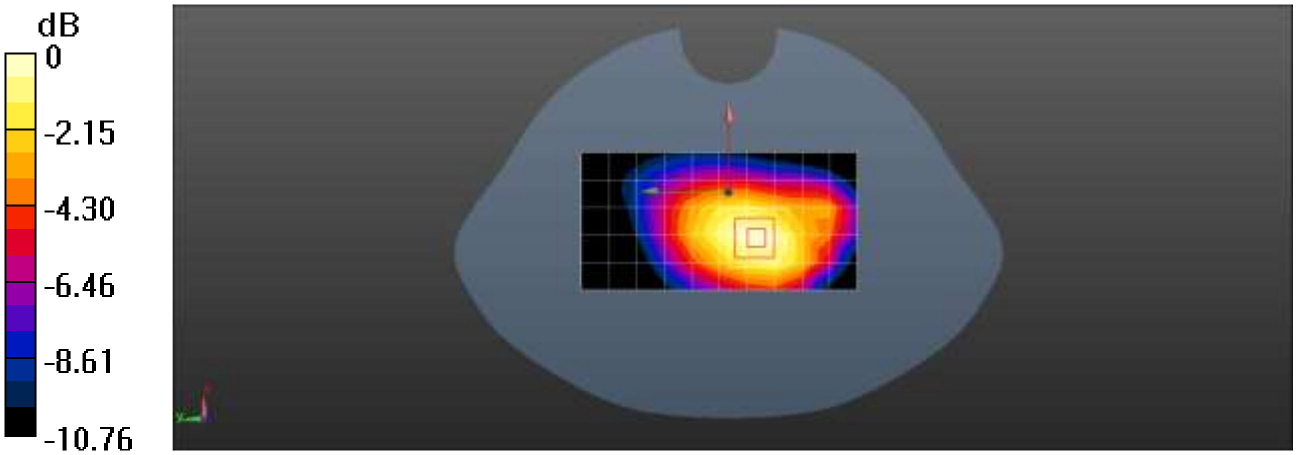
Test mode:	GPRS850 2Tx slot	Test Position:	Back with earphone	Test Plot:	B1

Date: 2019-06-07
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.967 S/m; ε_r = 55.399; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.42 W/kg
Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.642 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.81 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.960 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.46 W/kg



0 dB = 1.46 W/kg = 1.64 dBW/kg

Test mode:	GPRS1900 2Tx slot	Test Position:	Back with earphone	Test Plot:	B2

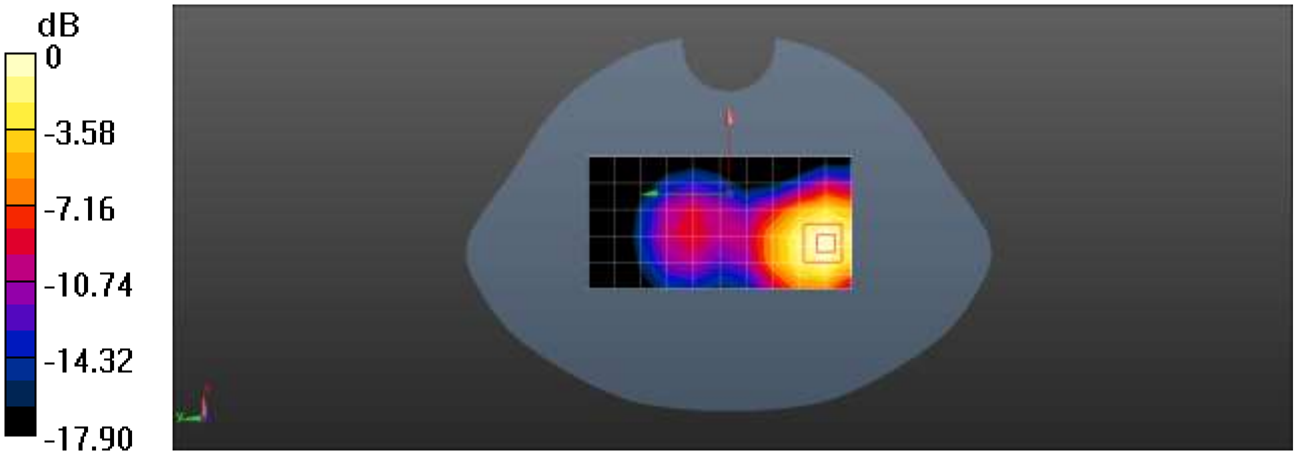
Date: 2019-06-11
Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.539 S/m; ε_r = 53.741; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.62 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.856 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 2.61 W/kg
SAR(1 g) = 0.907 W/kg; SAR(10 g) = 0.751 W/kg
Maximum value of SAR (measured) = 1.59 W/kg



0 dB = 1.59 W/kg = 2.01 dBW/kg

Test mode:	WCDMA Band II	Test Position:	Back with earphone	Test Plot:	B3

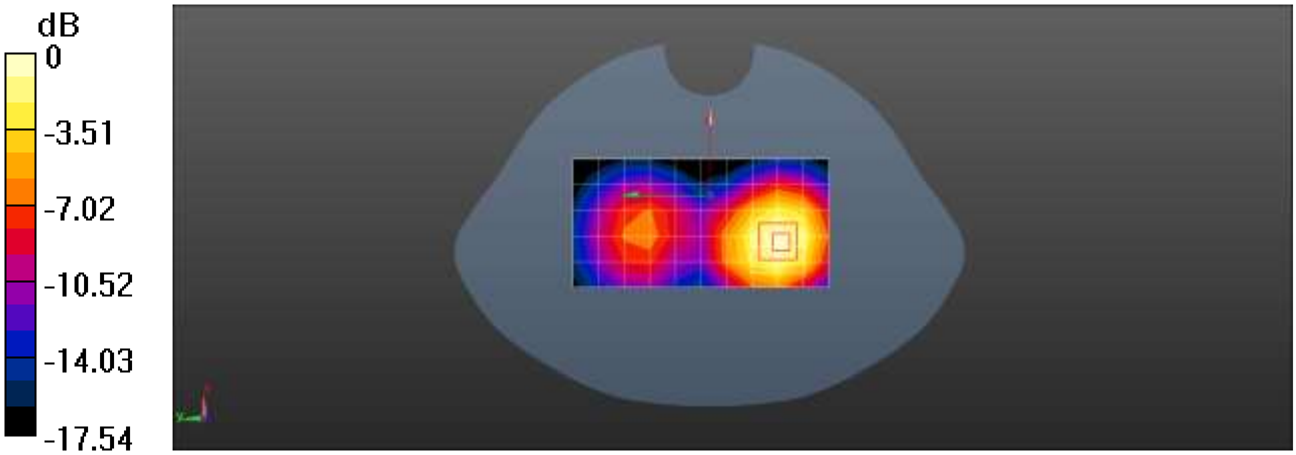
Date: 2019-06-10
Communication System: UID 0, Generic UMTS (WCDMA) (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.539 S/m; ε_r = 53.741; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.04 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.662 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.993 W/kg; SAR(10 g) = 0.580 W/kg
Maximum value of SAR (measured) = 1.07 W/kg



0 dB = 1.07 W/kg = 0.29 dBW/kg

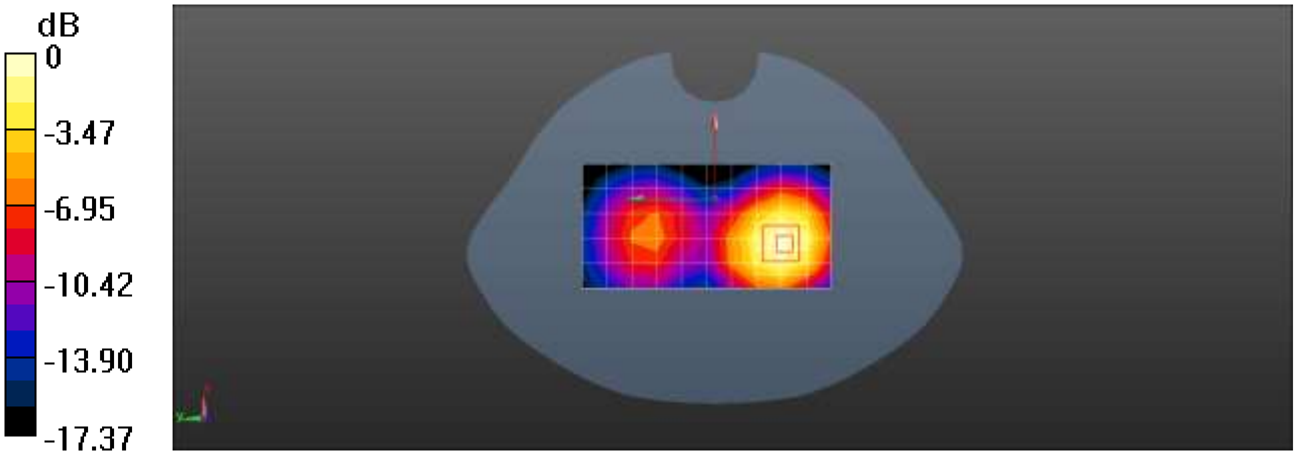
Test mode:	WCDMA Band V	Test Position:	Back with earphone	Test Plot:	B4

Date: 2019-06-07
Communication System: UID 0, Generic UMTS (WCDMA) (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.967 S/m; ε_r = 55.399; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.33, 10.33, 10.33); Calibrated: 2018/06/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.511 W/kg
Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.627 V/m; Power Drift = 0.20dB
Peak SAR (extrapolated) = 0.797 W/kg
SAR(1 g) = 0.485 W/kg; SAR(10 g) = 0.283 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.523 W/kg



0 dB = 0.523 W/kg = -2.81 dBW/kg

15. Simultaneous Transmission analysis

No.	Simultaneous Transmission Configurations	Head	Body-worn	Note
1	GSM(voice) + Bluetooth (data)	Yes	Yes	
3	WCDMA(voice) + Bluetooth (data)	Yes	Yes	
5	GPRS (data) + Bluetooth (data)	Yes	Yes	
7	WCDMA (data) + Bluetooth (data)	Yes	Yes	

General note:

1. The reported SAR summation is calculated based on the same configuration and test position
2. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 based on the formula below
   a) [(max. Power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] * [√f(GHz)/x]W/kg for test separation distances ≦50mm; whetn x=7.5 for 1-g SAR, and x=18.75 for 10-g SAR.
   b) When the minimum separation distance is <5mm, the distance is used 5mm to determine SAR test exclusion
   c) 0.4 W/kg for 1-g SAR and 1.0W/kg for 10-g SAR, when the test separation distances is >50mm.

Bluetooth Max power	Exposure position	Head	Body worn
	Test separation	0mm	10mm
dBm	Estimated SAR (W/kg)	0.372	0.186

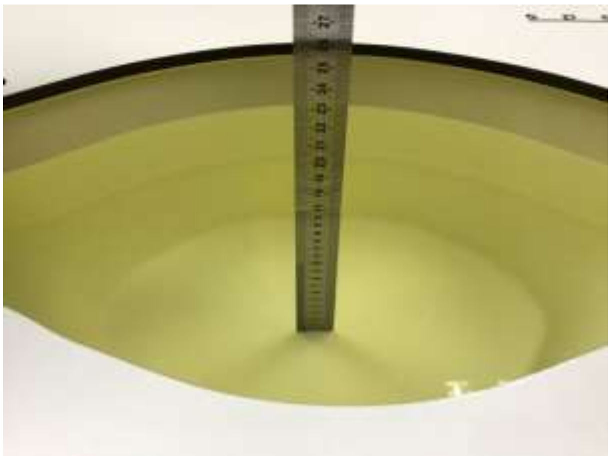
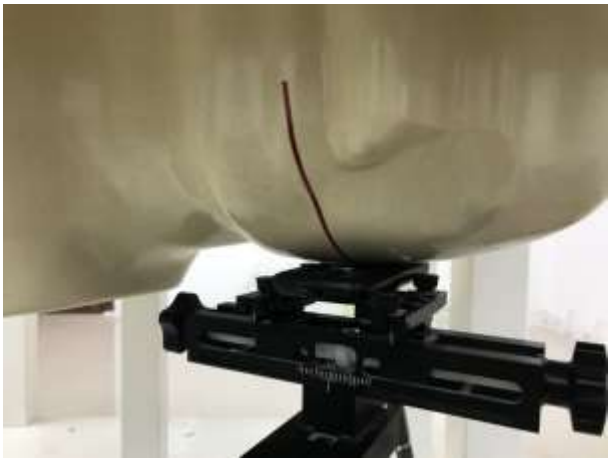
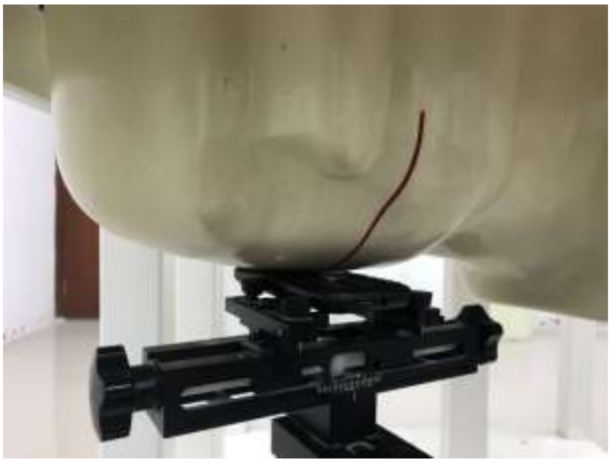
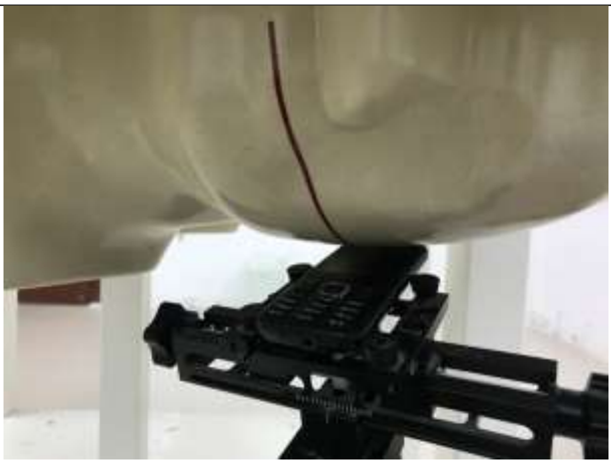
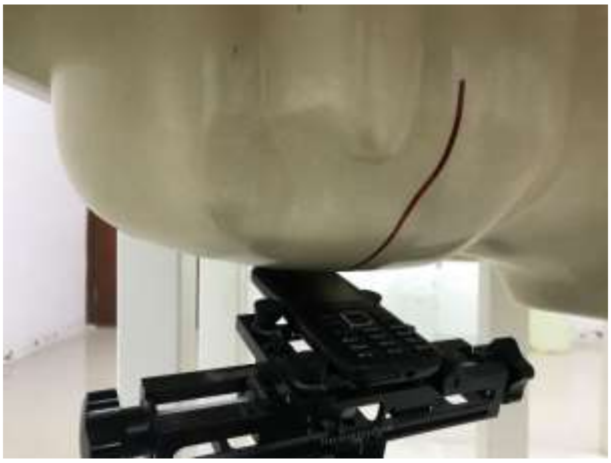
Maximum reported SAR value for Head

WWAN PCE + Bluetooth					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			WWAN PCE	Bluetooth	(W/kg)
GSM	GSM850	Left Cheek	0.882	0.372	1.254
		Left Tilted	0.675	0.372	1.047
		Right Cheek	1.007	0.372	**1.379**
		Right Tilted	0.763	0.372	1.135
	PCS1900	Left Cheek	0.635	0.372	1.007
		Left Tilted	0.511	0.372	0.883
		Right Cheek	0.675	0.372	1.047
		Right Tilted	0.531	0.372	0.903
WCDMA	Band II	Left Cheek	0.371	0.372	0.743
		Left Tilted	0.305	0.372	0.677
		Right Cheek	0.354	0.372	0.726
		Right Tilted	0.284	0.372	0.656
	Band V	Left Cheek	0.199	0.372	0.571
		Left Tilted	0.160	0.372	0.532
		Right Cheek	0.192	0.372	0.564
		Right Tilted	0.151	0.372	0.523

Maximum reported SAR value for Body

WWAN PCE + Bluetooth					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			WWAN PCE	Bluetooth	(W/kg)
GSM	GSM850	Front	0.706	0.186	0.892
		Back	1.070	0.186	1.256
	PCS1900	Front	0.635	0.186	0.821
		Back	1.004	0.186	1.190
WCDMA	Band II	Front	0.776	0.186	0.962
		Back	1.091	0.186	**1.277**
	Band V	Front	0.325	0.186	0.511
		Back	0.528	0.186	0.714

16. TestSetup Photos

	
Liquid depth in the Head phantom	Liquid depth in the Body phantom
	
Left Head Touch	Right Head Touch
	
Left Head Tilt (15^o)	Right Head Tilt (15^o)

	
Front side (10mm)	Back with earphone (10mm)

17. External and Internal Photos of the EUT

Please reference to the report No.: External Photographs and Internal Photographs

---------End of Report----------