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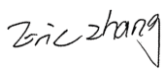
TEST REPORT

Report Reference No. ..... :	**GTI20191834E**
FCC ID ..... :	**2ANTM-MD44014**
Applicant's name ..... :	**NumberFour AG**
Address.....:	Schoenhauser Allee 8, 10119 Berlin, Germany
Manufacturer.....:	NumberFour AG
Address.....:	Schoenhauser Allee 8, 10119 Berlin, Germany
Test item description..... :	**Mobile POS System**
Trade Mark .....:	-
Model/Type reference.....:	HVN:ED100
Listed Model(s) .....:	HVN:MD44014
Standard ..... :	**FCC 47 CFR Part2.1093** **IEEE 1528: 2013** **ANSI/IEEE C95.1: 2005**
Date of receipt of test sample…….:	Aug.17, 2019
Date of testing……...:	Aug.17, 2019 to Aug.30, 2019
Date of issue…….:	Sept. 02, 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 2.1093 Radiofrequency Radiation Exposure Evaluation:Portable 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 248227 D01 802 11 Wi-Fi SAR v02r02: SAR Measurement Proceduresfor802.11 a/b/g Transmitters
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
KDB 941225 D06 Hotspot Mode v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities
KDB 941225 D07 UMPC Mini Tablet v01r02: SAR Evaluation Procedures for UMPC Mini-tablet Devices.
Report version
KDB 941225 D05 SAR for LTE Devices v02r05: SAR Evaluation Considerations for LTE Devices

1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-09-02	Original

2. Summary

2.1. Client Information

Applicant:	NumberFour AG
Address:	Schoenhauser Allee 8, 10119 Berlin, Germany
Manufacturer:	NumberFour AG
Address:	Schoenhauser Allee 8, 10119 Berlin, Germany

2.2. Product Description

Name of EUT:	Mobile POS System			
Trade Mark:	-			
Model No.:	HVN:ED100			
Listed Model(s):	HVN:MD44014			
Power supply:	DC3.85V			
Device Category:	Portable			
Product stage:	Production unit			
RF Exposure Environment:	General Population / Uncontrolled			
Hardware version:	A267C			
Software version:	ED100-1.x.x-1.x			
Maximum SAR Value				
Separation Distance:	Body: 5mm			
Max Report SAR Value (1g):	Test location:	PCE	DTS	Simultaneous TX
	Body:	0.643W/Kg	0.666W/Kg	1.309W/Kg
	Hotspot:	0.643W/Kg	0.666W/Kg	1.309W/Kg
WCDMA				
Operation Band:	WCDMA Band II			
Power Class:	Power Class 3			
Modulation Type:	QPSK/16QAM/64QAM/HSUPA/HSDPA			
Antenna type:	FPC Antenna			

LTE	
Operation Band:	FDD Band 2,FDD Band 4,FDD Band 7,FDD Band 13,FDD Band 25,TDD Band 41
Modulation Type:	QPSK,16QAM
Antenna type:	FPC Antenna
WIFI 2.4G	
Supported type:	802.11b/802.11g/802.11n(HT20)/802.11n(HT40)
Modulation Type:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)/802.11n(HT40)
Operation frequency:	2412MHz~2462MHz
Channel number:	11
Channel separation:	5MHz
Antenna type:	FPC Antenna
WIFI 5G	
Supported type:	802.11a/802.11n HT20/802.11n HT40/802.11ac VHT20/802.11ac VHT40 /802.11ac VHT80
Modulation Type:	BPSK /QPSK /16QAM /64QAM/128QAM/256QAM
Operation frequency:	5.180GHz~5.825GHz
Channel Bandwidth	802.11a/n H20/ac VHT20:20MHz 802.11n H40/ac VHT40:40MHz 802.11ac VHT80:80MHz
Antenna type:	FPC Antenna
Bluetooth	
Version:	Supported BT3.0+EDR
Modulation:	GFSK, π/4DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	FPC Antenna
Bluetooth-BLE	
Version:	BLE
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	FPC Antenna

Remark:

1. *The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power*

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	2019/05/27
E-field Probe	SPEAG	EX3DV4	3974	2019/05/21	2019/06/20
System Validation Dipole	SPEAG	D750V3	1105	2018/08/27	2021/08/26
System Validation Dipole	SPEAG	D1750V2	1110	201/06/07	201/06/06
System Validation Dipole	SPEAG	D1900V2	5d115	2018/08/26	2021/08/25
System Validation Dipole	SPEAG	D2450V2	928	2018/10/12	2021/10/11
System Validation Dipole	SPEAG	D2600V2	1126	2018/08/29	2021/08/28
System Validation Dipole	SPEAG	D5GHzV2	1171	2018/10/13	2021/10/12
Network analyzer	Agilent	E5071C	MY46520333	2019/08/13	2020/08/12
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMU200	117824	2018/10/22	2019/10/21
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMW500	102414	2018/12/29	2019/12/28
Signal Generator	Agilent	N5182A	MY47420864	2018/12/29	2019/12/28
Power sensor	Mini-Circuits	PWR-8GHS	11609010017	2019/08/13	2020/08/12
Power sensor	Mini-Circuits	PWR-8GHS	11607130056	2019/08/13	2020/08/12
Power Amplifier	Mini-Circuits	ZVE-8G+	103201624	2019/08/13	2020/08/12
Power Amplifier	Mini-Circuits	ZHL-42W+	051701624	2019/08/13	2020/08/12
BI-DIRECTIONAL COUPLER	Mini-Circuits	ZGBDC20-33HP+	996201615	2019/08/13	2020/08/12
BI-DIRECTIONAL COUPLER	Mini-Circuits	ZGBDC35-93HP+	415101623	2019/08/13	2020/08/12
Attenuator	MCL	BW-N20W5+	1552	2019/08/13	2020/08/12
Attenuator	MCL	BW-N3W5+	1608	2019/08/13	2020/08/12
Attenuator	MCL	/	/	2019/08/13	2020/08/12

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.

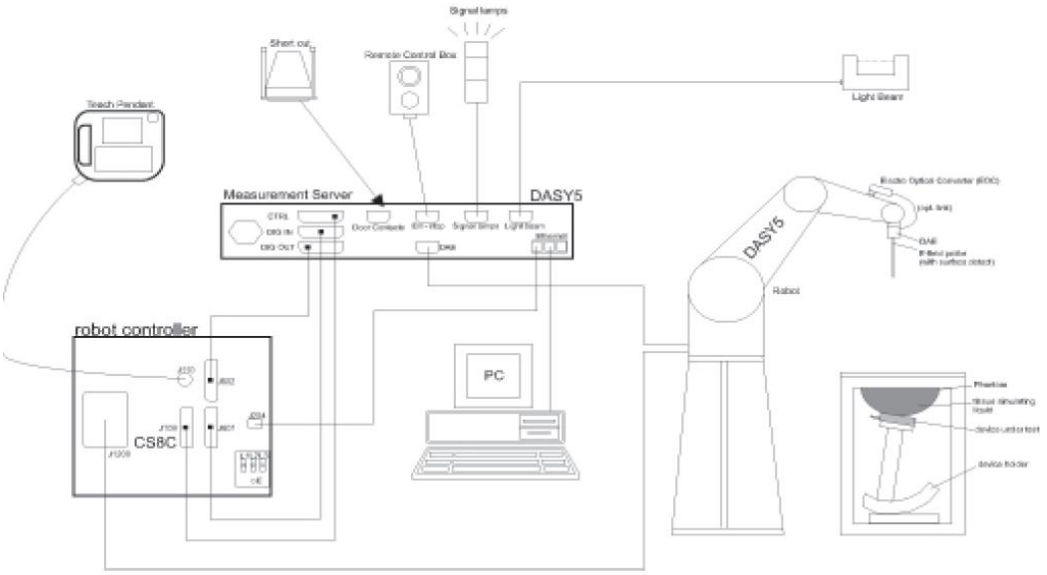
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

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.

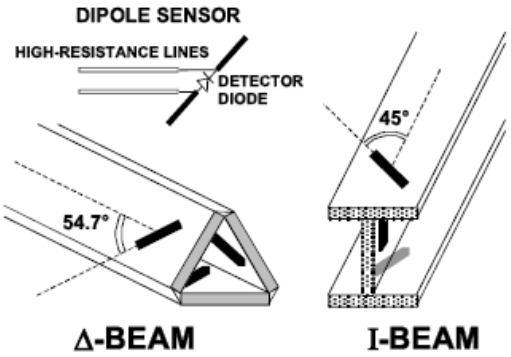
- **Probe Specification**

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

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	½·δ·ln(2) mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			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 ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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 *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 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.

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:

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

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

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

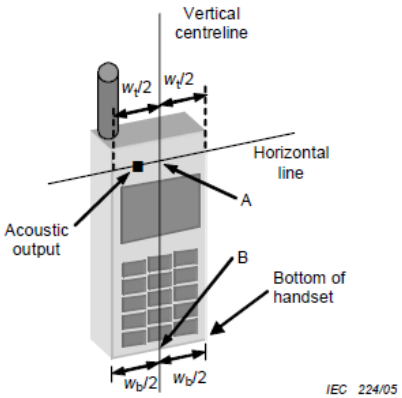
8.1. Head Position

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.

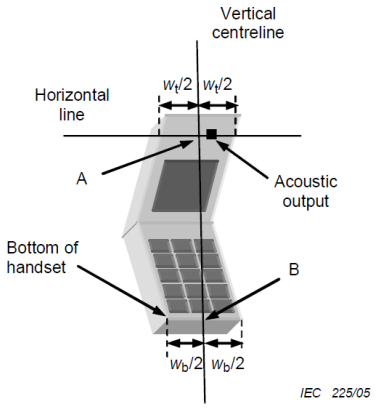
The vertical centreline passes through two points on the front side of the handset: the midpoint of the width W_t of the handset at the level of the acoustic output (point A in Figures 5a and 5b), and the midpoint of the width W_b of the bottom of the handset (point B).

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.



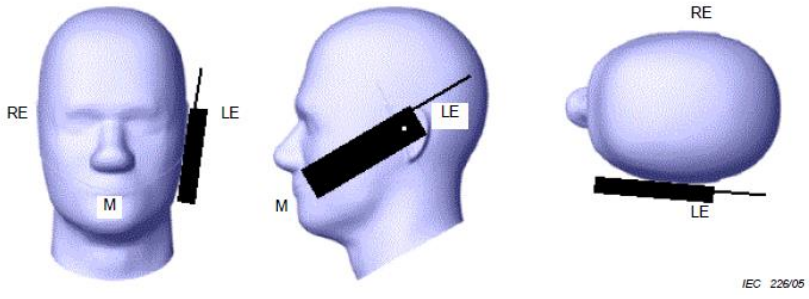
Figures 5a



Figures 5b

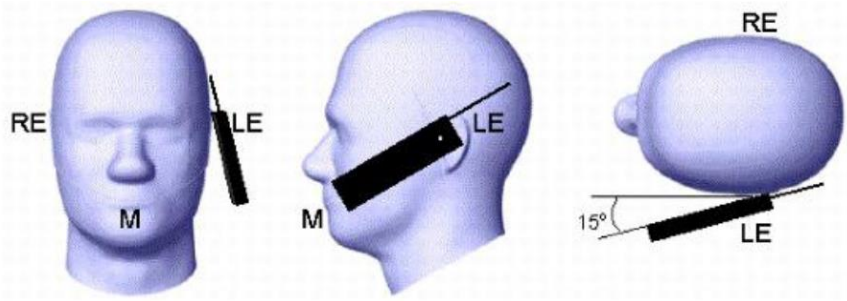
W_t Width of the handset at the level of the acoustic
W_b Width of the bottom of the handset
A Midpoint of the widthwt of the handset at the level of the acoustic output
B Midpoint of the width wb of the bottom of the handset

Cheek position



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

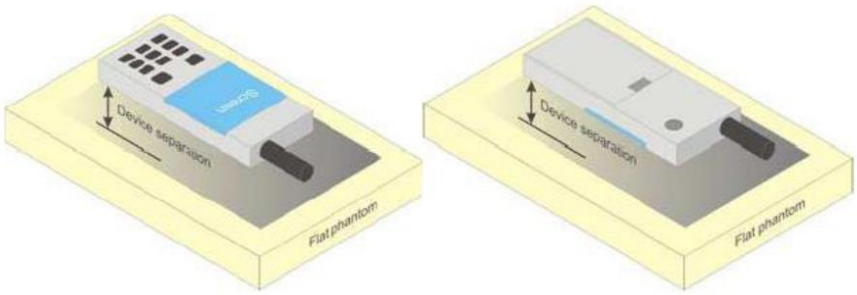
Tilt position



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

8.2. Body Position

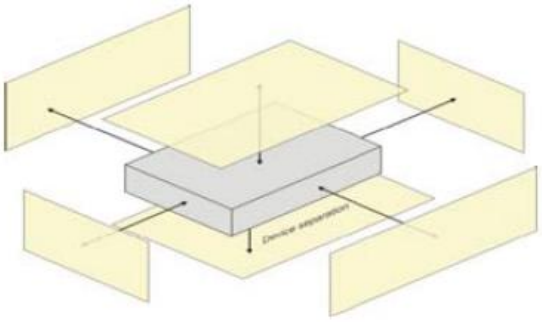
Devices that support transmission while used with body-worn accessories must be tested for body-worn accessory SAR compliance, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics.
Devices that 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 body		
Target Frequency	Body	
(MHz)	εr	σ(s/m)
750	55.5	0.96
1750	53.4	1.49
1800-2000	53.3	1.52
2450	52.7	1.95
2600	52.5	2.16
5250	48.95	5.36
5600	48.47	5.77
5750	48.27	5.94

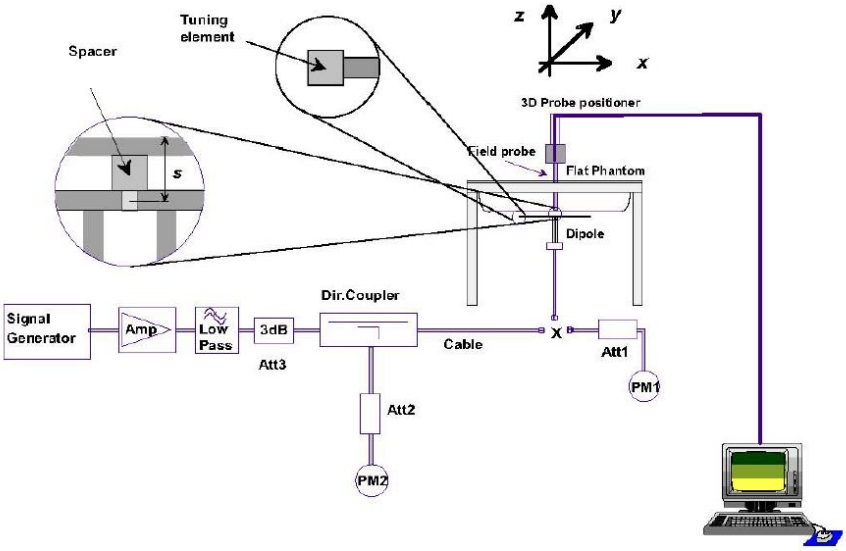
Check Result:

Dielectric performance of Body tissue simulating liquid									
Frequency (MHz)	εr		σ(s/m)		Delta (εr)	Delta (σ)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
750	55.50	55.65	0.96	0.93	0.27%	-2.63%	±5%	22	2019-08-19
1750	53.40	53.91	1.49	1.44	0.96%	-3.29%	±5%	22	2019-08-20
1900	53.30	53.72	1.52	1.55	0.79%	2.17%	±5%	22	2019-08-21
2450	52.70	53.03	1.95	2.00	0.63%	2.62%	±5%	22	2019-08-22
2600	52.51	52.78	2.16	2.15	0.51%	-0.46%	±5%	22	2019-08-23
5250	48.95	47.94	5.36	5.52	-2.07%	2.89%	±5%	22	2019-08-26
5600	48.47	47.35	5.77	5.96	-2.31%	3.34%	±5%	22	2019-08-27
5750	48.27	46.94	5.94	6.20	-2.75%	4.44%	±5%	22	2019-08-28

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

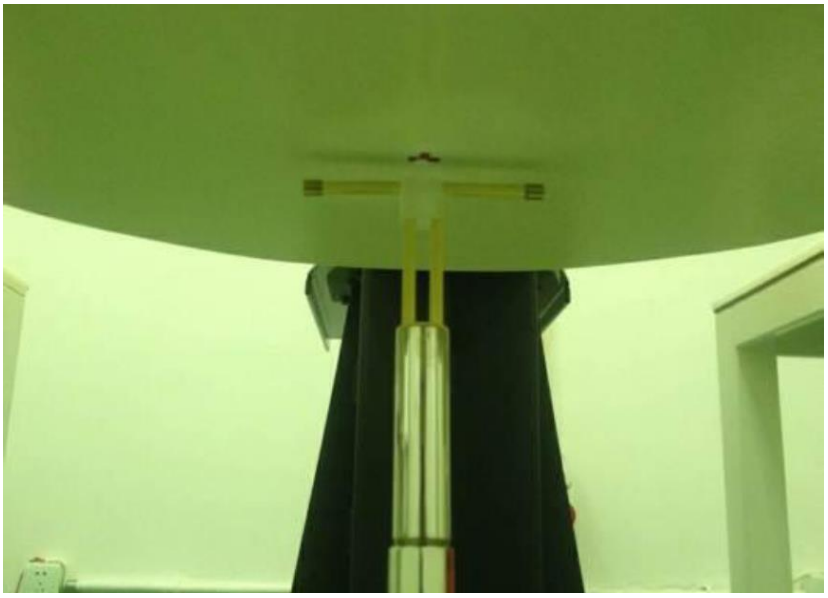


Photo of Dipole Setup

Check Result:

Body									
Frequency (MHz)	1g SAR		10g SAR		Delta (1g)	Delta (10g)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
750	2.16	2.10	1.45	1.40	-2.78%	-3.45%	±10%	22	2019-08-19
1750	9.57	9.39	5.11	5.04	-1.88%	-1.37%	±10%	22	2019-08-20
1900	10.10	10.40	5.30	5.42	2.97%	2.26%	±10%	22	2019-08-21
2450	12.60	12.50	5.96	5.83	-0.79%	-2.18%	±10%	22	2019-08-22
2600	13.50	14.70	6.00	6.59	8.89%	9.83%	±10%	22	2019-08-23
5250	7.58	7.37	2.14	2.07	-2.77%	-3.27%	±10%	22	2019-08-26
5600	8.10	7.80	2.28	2.16	-3.70%	-5.26%	±10%	22	2019-08-27
5750	7.47	7.28	2.10	2.02	-2.54%	-3.81%	±10%	22	2019-08-28

Note:
1. the graph results see below.

System Performance Check at 750 MHz Body
DUT: D750V3; Type: D750V3; Serial: 1105
Date: 2019-08-19
Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.931 S/m; ε_r = 55.65; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

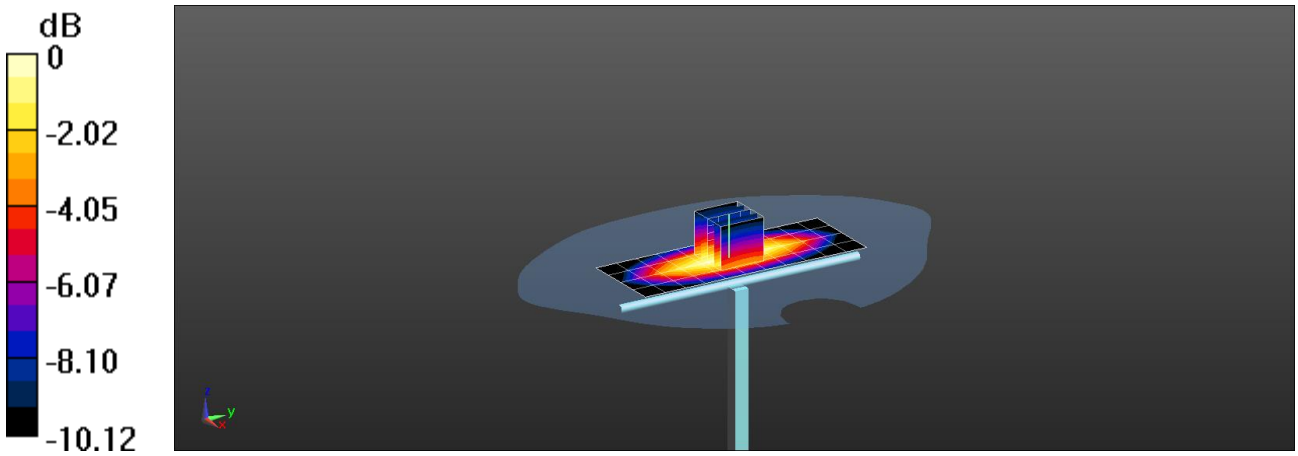
- Probe: EX3DV4 - SN3974; ConvF(10.62, 10.62, 10.62); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm,Pin=250mW/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.78 W/kg

Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 57.056 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.4 W/kg
Maximum value of SAR (measured) = 2.81 W/kg



0 dB = 2.81 W/kg = 4.49 dBW/kg

System Performance Check at 1750 MHz Body
DUT: D1750V2; Type: D1750V2; Serial: 1110
Date: 2019-08-20
Communication System: UID 0, CW (0); Frequency: 1750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.441 S/m; ε_r = 53.908; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

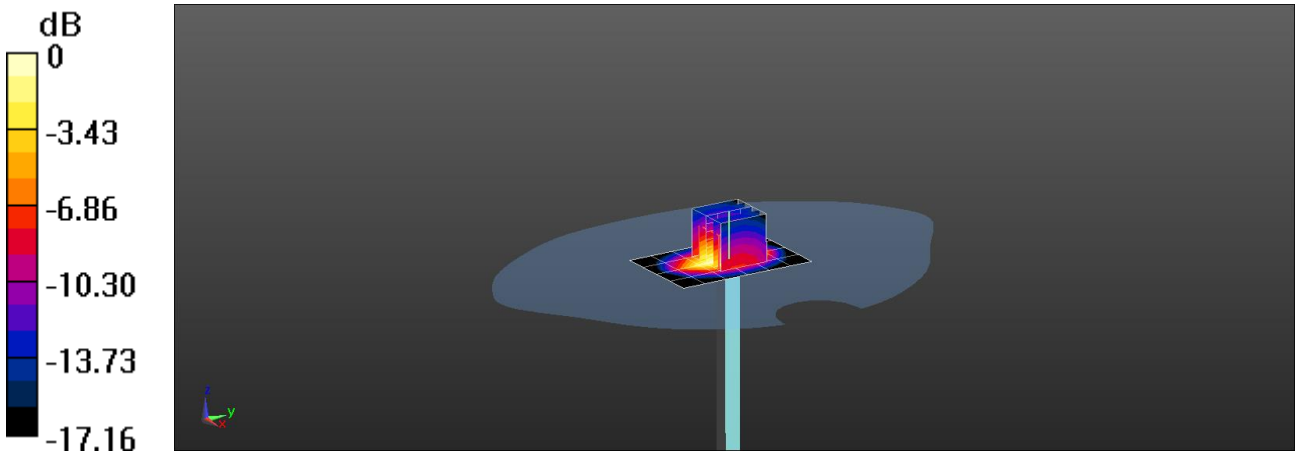
- Probe: EX3DV4 - SN3974; ConvF(8.42, 8.42, 8.42); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm,Pin=250mW/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 14.1 W/kg

Body/d=10mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 102.2 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.39 W/kg; SAR(10 g) = 5.04 W/kg



0 dB = 14.1 W/kg = 11.49 dBW/kg

System Performance Check at 1900 MHz Body
DUT: D1900V2; Type: D1900V2; Serial: 5d115
Date: 2019-08-21
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:

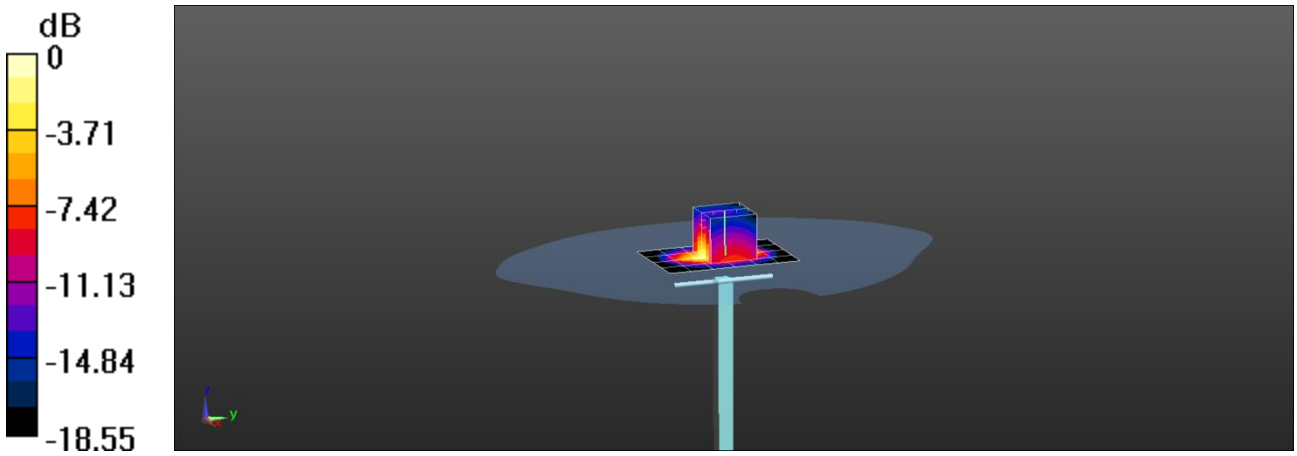
- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

System Performance Check at 2450 MHz Body
DUT: D2450V2; Type: D2450V2; Serial: 928
Date: 2019-08-22
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 2.001 S/m; εr = 53.03; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY5 Configuration:

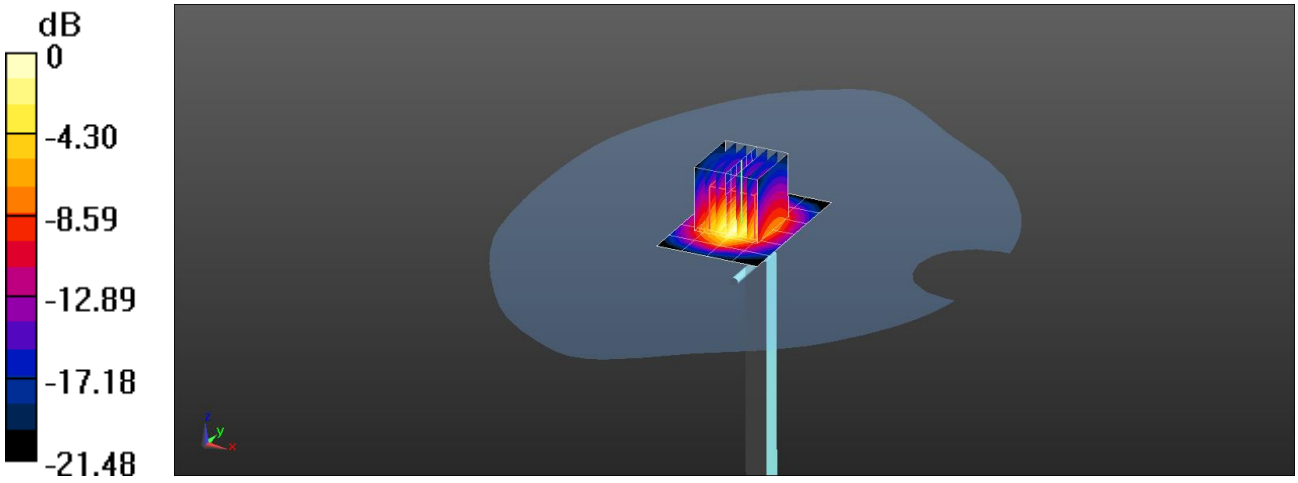
- Probe: EX3DV4 - SN3974; ConvF(8.00, 8.00, 8.00); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm,Pin=250mW/Area Scan (5x7x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 21.1 W/kg

Body/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.6 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 25.7 W/kg
SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.83 W/kg
Maximum value of SAR (measured) = 20.7 W/kg



0 dB = 20.7 W/kg = 13.16 dBW/kg

System Performance Check at 2600 MHz Body
DUT: D2600V2; Type: D2600V2; Serial: 1126
Date: 2019-08-23
Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.15 S/m; ε_r = 52.78; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

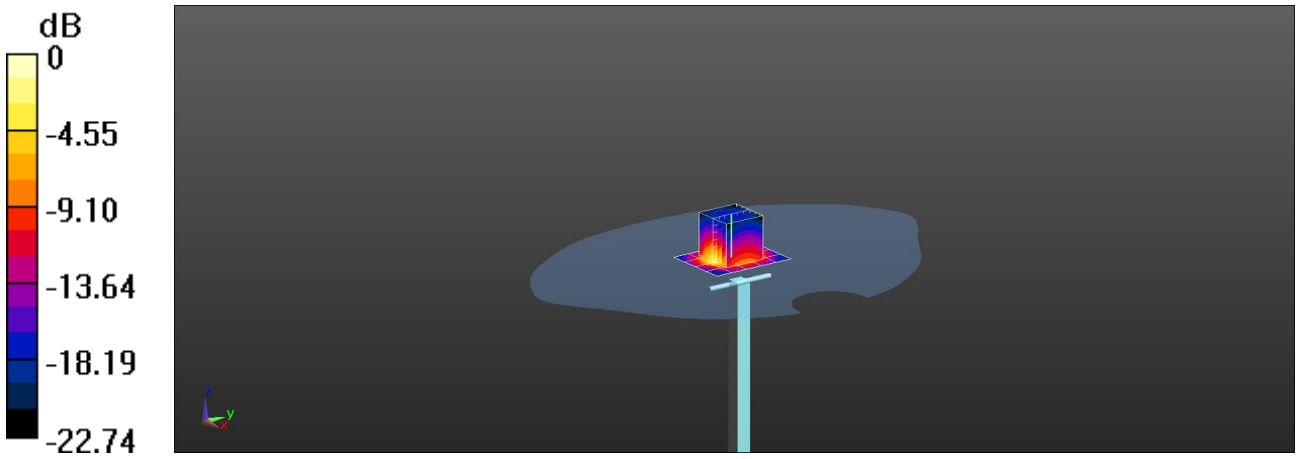
- Probe: EX3DV4 - SN3974; ConvF(7.52, 7.52, 7.52); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm,Pin=250mW/Area Scan (5x6x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 22.6 W/kg

Body/d=10mm,Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 110.2 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 31.6 W/kg
SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.59 W/kg
Maximum value of SAR (measured) = 25.1 W/kg



0 dB = 25.1 W/kg = 14.00 dBW/kg

System Performance Check at 5250 MHz Body
DUT: D5GHzV2; Type: D5GHzV2; Serial: 1171
Date: 2019-08-26
Communication System: UID 0, A-CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 5.515 S/m; ε_r = 47.936; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

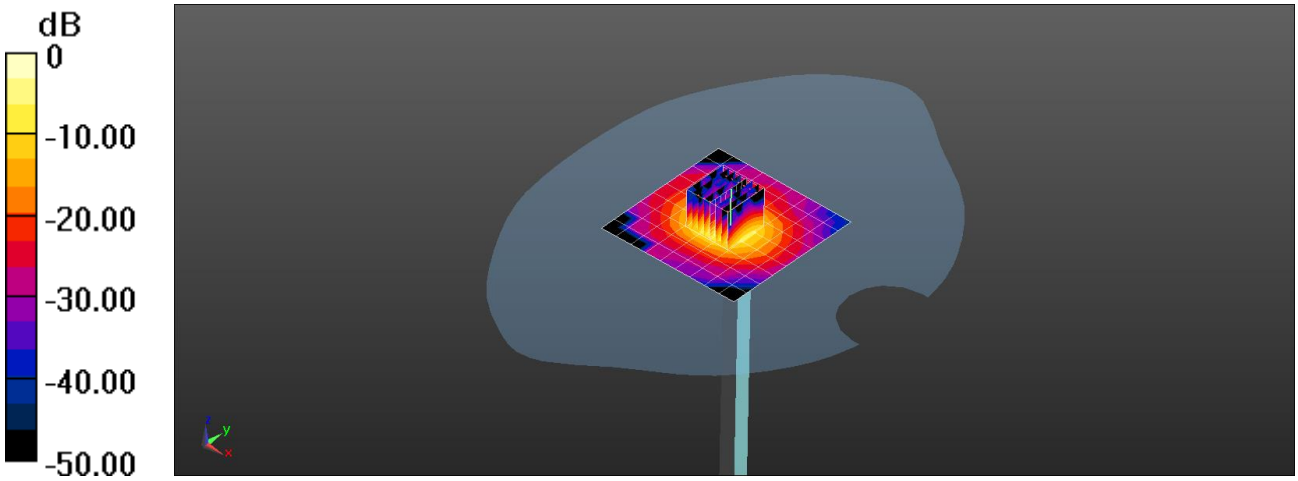
- Probe: EX3DV4 - SN3974; ConvF(5.72, 5.72, 5.72); Calibrated: 2019/05/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm, Pin=100mW/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 11.1 W/kg

Body/d=10mm, Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.132 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 31.6 W/kg
SAR(1 g) = 7.37 W/kg; SAR(10 g) = 2.07 W/kg
Maximum value of SAR (measured) = 17.8 W/kg



0 dB = 17.8 W/kg = 12.50 dBW/kg

System Performance Check at 5600 MHz Body
DUT: D5GHzV2; Type: D5GHzV2; Serial: 1171
Date: 2019-08-27
Communication System: UID 0, A-CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.963 S/m; ε_r = 47.347; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

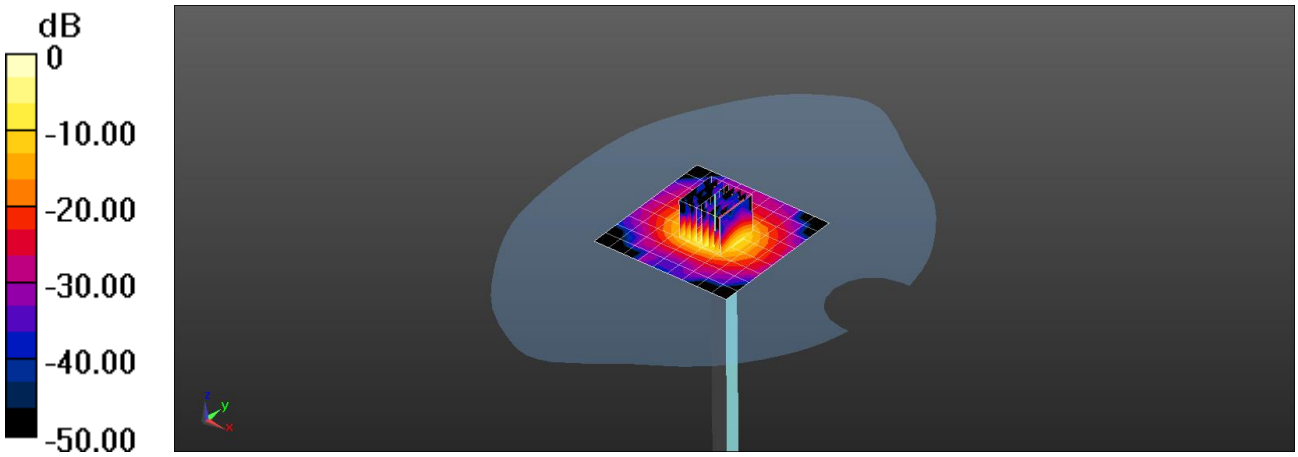
- Probe: EX3DV4 - SN3974; ConvF(4.46, 4.46, 4.46); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/d=10mm, Pin=100mW/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

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

Body/d=10mm, Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.095 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 36.9 W/kg
SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.16 W/kg
Maximum value of SAR (measured) = 19.7 W/kg



0 dB = 19.7 W/kg = 12.94 dBW/kg

System Performance Check at 5725 MHz Body
DUT: D5GHzV2; Type: D5GHzV2; Serial: 1171
Date: 2019-08-28
Communication System: UID 0, A-CW (0); Frequency: 5725 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5725 MHz; σ = 6.20 S/m; ε_r = 46.943; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

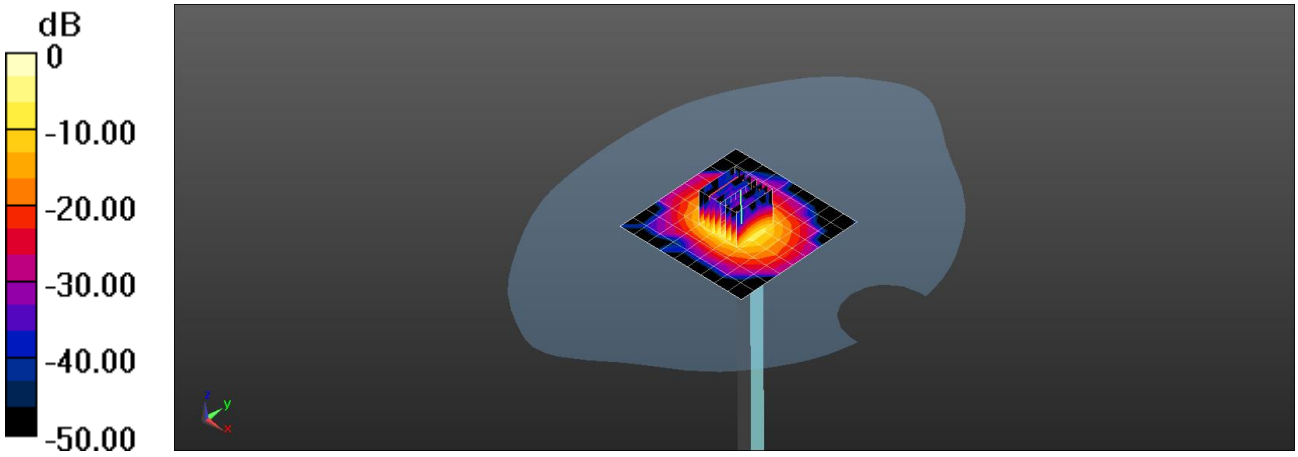
- Probe: EX3DV4 - SN3974; ConvF(5.01, 5.01, 5.01); Calibrated: 2019/05/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Head/d=10mm, Pin=100mW/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

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

Head/d=10mm, Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 62.072 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 36.2 W/kg
SAR(1 g) = 7.28 W/kg; SAR(10 g) = 2.02 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 18.8 W/kg = 12.74 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

Power control specification

1. There is no power sensor for power control of this product
2. When hotspot mode becomes active,there is no Power reduction or other changes for conducted power.

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 β_{hs} = 30/15 * β_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 β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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		
		Conducted Power (dBm)		
		CH9262	CH9400	CH9538
		1852.4	1880.0	1907.6
RMC 12.2K		23.07	**23.21**	23.07
HSDPA	Subtest-1	22.12	21.92	22.05
	Subtest-2	21.65	21.48	21.68
	Subtest-3	21.58	21.53	21.70
	Subtest-4	21.59	21.45	21.69
HSUPA	Subtest-1	20.67	19.52	20.21
	Subtest-2	20.83	22.74	22.11
	Subtest-3	20.85	21.73	21.98
	Subtest-4	20.69	22.41	22.14
	Subtest-5	23.18	22.54	22.67

LTE Conducted Power

General Note:

1. CMW500 base station simulator was used to setup the connection with EUT; the frequency band, channel,bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUTtransmitting at maximum power and at different configurations which are requested to be reported to FCC, forconducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and powermeasurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RBallocation, using the RB offset and required test channel combination with the highest maximum output power for RBoffsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.
6. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than thesame configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, smaller bandwidth output power for each RB allocation configuration is > not ½ dBhigher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supportedbandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

LTE-FDD Band 2				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
1.4	QPSK	1	Low	23.04	22.90	23.00
			Middle	23.08	22.99	23.13
			High	23.12	22.89	23.04
		3	Low	23.06	23.00	23.18
			Middle	23.06	22.99	22.91
			High	23.09	23.08	22.80
		6	/	22.05	21.93	21.85
	16QAM	1	Low	21.79	21.78	22.36
			Middle	22.03	21.97	22.38
			High	21.88	22.14	22.06
		3	Low	23.05	22.99	23.17
			Middle	22.97	22.99	22.92
			High	23.08	23.08	22.80
		6	/	20.81	21.15	20.98
3	QPSK	1	Low	23.31	23.23	22.71
			Middle	22.99	23.10	22.69
			High	22.96	22.83	22.71
		8	Low	21.66	22.19	21.80
			Middle	21.97	22.68	21.55
			High	22.01	22.74	21.46
		15	/	21.94	21.89	21.99
	16QAM	1	Low	21.75	22.24	21.70
			Middle	21.96	22.63	21.77
			High	22.01	22.35	21.63
		8	Low	21.65	22.18	21.80
			Middle	21.96	22.48	21.54
			High	22.00	22.73	21.44
		15	/	20.88	20.81	20.86

5	QPSK	1	Low	23.09	23.03	22.68
			Middle	23.15	23.00	23.13
			High	23.06	23.00	22.98
		12	Low	21.94	21.90	21.84
			Middle	21.98	21.91	21.87
			High	21.97	21.92	21.97
		25	/	21.99	21.77	21.89
	16QAM	1	Low	22.23	21.90	21.61
			Middle	22.11	22.06	21.85
			High	21.91	22.00	21.65
		12	Low	21.95	21.89	21.87
			Middle	22.05	21.88	21.86
			High	22.00	22.00	21.96
		25	/	20.90	21.00	21.08
10	QPSK	1	Low	22.96	22.99	22.74
			Middle	23.19	23.32	23.22
			High	22.97	23.03	23.07
		25	Low	22.00	21.98	21.94
			Middle	21.99	21.97	21.92
			High	21.93	22.06	22.07
		50	/	21.95	21.94	21.82
	16QAM	1	Low	22.10	22.05	21.83
			Middle	22.18	22.62	22.41
			High	22.00	22.85	22.58
		25	Low	22.00	21.96	21.92
			Middle	21.99	21.95	21.92
			High	21.92	22.05	22.13
		50	/	20.99	20.89	20.87

15	QPSK	1	Low	22.82	22.64	22.73
			Middle	22.74	23.13	22.98
			High	22.64	23.06	23.03
		38	Low	22.00	21.61	21.77
			Middle	21.77	22.48	22.58
			High	21.15	22.97	21.97
		75	/	22.01	21.83	21.93
	16QAM	1	Low	21.98	21.61	21.86
			Middle	21.76	23.10	21.97
			High	21.18	22.98	22.01
		38	Low	21.99	21.59	21.76
			Middle	21.88	22.47	21.97
			High	21.17	22.97	21.97
		75	/	21.05	20.91	20.95
20	QPSK	1	Low	22.87	**23.47**	23.01
			Middle	23.28	23.45	22.82
			High	22.69	22.83	23.17
		50	Low	22.06	22.13	21.87
			Middle	22.07	21.86	21.87
			High	21.82	22.04	21.96
		100	/	21.97	21.88	21.88
	16QAM	1	Low	22.24	21.58	22.01
			Middle	22.73	22.29	22.31
			High	22.18	21.73	22.26
		50	Low	22.06	21.82	21.85
			Middle	22.06	21.82	21.87
			High	21.83	21.96	21.93
		100	/	20.92	20.93	20.93

LTE-FDD Band 4				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
1.4	QPSK	1	Low	23.70	23.44	23.21
			Middle	23.59	23.42	23.12
			High	23.47	23.42	23.10
		3	Low	23.62	23.35	23.26
			Middle	23.60	23.35	23.25
			High	23.46	23.45	23.22
		6	/	22.61	22.47	22.24
	16QAM	1	Low	22.98	22.40	22.21
			Middle	22.93	22.41	22.51
			High	22.75	22.14	22.16
		3	Low	23.61	23.35	23.26
			Middle	23.59	23.45	23.25
			High	23.45	23.45	23.15
		6	/	21.83	21.35	21.13
3	QPSK	1	Low	23.55	23.84	23.12
			Middle	23.41	23.75	23.06
			High	23.10	23.83	23.10
		8	Low	22.76	22.88	22.07
			Middle	22.62	22.79	22.00
			High	22.33	22.89	21.89
		15	/	22.61	22.44	22.32
	16QAM	1	Low	22.81	22.94	22.09
			Middle	22.72	23.09	22.01
			High	22.35	23.28	21.68
		8	Low	22.59	22.93	22.08
			Middle	22.67	22.84	21.99
			High	22.22	22.89	21.92
		15	/	21.53	21.55	21.12

5	QPSK	1	Low	23.28	23.55	23.28
			Middle	23.34	23.60	23.33
			High	22.66	23.57	22.91
		12	Low	22.58	22.32	22.26
			Middle	22.49	22.32	22.31
			High	22.49	22.36	22.15
		25	/	22.48	22.33	22.19
	16QAM	1	Low	22.42	22.64	22.51
			Middle	22.52	22.41	22.45
			High	21.85	22.36	21.97
		12	Low	22.57	22.32	22.27
			Middle	22.54	22.32	22.27
			High	22.48	22.35	22.09
		25	/	21.51	21.21	21.27
10	QPSK	1	Low	22.58	23.23	23.33
			Middle	22.91	23.68	23.54
			High	22.22	23.53	22.93
		25	Low	22.81	22.30	22.29
			Middle	22.48	22.40	22.21
			High	22.36	22.40	22.08
		50	/	22.47	22.34	22.20
	16QAM	1	Low	21.92	22.42	22.73
			Middle	22.26	22.55	22.67
			High	21.53	22.56	22.32
		25	Low	22.49	22.40	22.21
			Middle	22.47	22.30	22.21
			High	22.40	22.41	22.00
		50	/	21.44	21.38	21.20

15	QPSK	1	Low	22.25	23.06	23.41
			Middle	22.89	23.36	23.34
			High	22.66	23.29	22.65
		38	Low	21.50	21.63	23.28
			Middle	22.22	22.17	22.44
			High	21.98	22.29	22.08
		75	/	22.42	22.35	22.23
	16QAM	1	Low	21.55	22.45	22.58
			Middle	22.23	22.22	22.49
			High	21.98	22.10	22.05
		38	Low	21.50	21.65	23.24
			Middle	22.21	22.24	22.44
			High	21.98	22.16	22.05
		75	/	21.38	21.35	21.19
20	QPSK	1	Low	23.14	**23.74**	23.21
			Middle	23.03	23.41	23.40
			High	23.46	23.22	22.98
		50	Low	22.19	22.20	22.17
			Middle	22.31	22.11	22.17
			High	22.27	22.07	22.08
		100	/	22.25	22.08	22.21
	16QAM	1	Low	21.40	21.78	21.96
			Middle	22.34	22.52	22.34
			High	22.39	22.55	21.43
		50	Low	21.30	21.18	21.16
			Middle	21.29	21.26	21.20
			High	21.32	21.30	20.95
		100	/	21.30	21.24	21.16

LTE-FDD Band 7				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5	QPSK	1	Low	22.29	22.32	21.95
			Middle	22.62	22.49	22.17
			High	22.56	22.30	21.90
		12	Low	21.13	21.30	21.10
			Middle	21.13	21.31	21.12
			High	21.34	21.30	20.96
		25	/	21.20	21.26	21.02
	16QAM	1	Low	21.25	21.24	20.85
			Middle	20.96	21.35	20.61
			High	21.34	21.50	20.56
		12	Low	21.16	21.31	21.12
			Middle	21.19	21.30	21.12
			High	21.24	21.24	21.04
		25	/	20.32	20.35	20.32
10	QPSK	1	Low	22.41	22.50	21.97
			Middle	22.55	22.50	22.03
			High	22.50	22.33	21.96
		25	Low	21.25	21.33	21.21
			Middle	21.26	21.33	21.21
			High	21.49	21.35	21.08
		50	/	21.34	21.34	21.23
	16QAM	1	Low	21.62	21.82	21.14
			Middle	22.17	21.81	21.17
			High	21.20	21.76	20.66
		25	Low	21.25	21.33	21.19
			Middle	21.25	21.33	21.21
			High	21.49	21.35	21.04
		50	/	20.54	20.56	20.35

15	QPSK	1	Low	22.33	22.51	22.27
			Middle	22.67	22.49	22.13
			High	22.19	22.23	21.84
		38	Low	21.12	21.77	22.01
			Middle	21.44	21.64	20.98
			High	21.00	22.15	20.56
		75	/	21.48	21.29	21.19
	16QAM	1	Low	21.29	21.80	21.26
			Middle	21.44	22.23	20.99
			High	21.00	22.16	20.59
		38	Low	21.21	21.55	22.00
			Middle	21.42	22.22	21.00
			High	21.24	22.15	20.61
		75	/	20.56	20.49	20.30
20	QPSK	1	Low	22.31	**22.81**	22.19
			Middle	22.87	22.72	22.59
			High	22.08	22.09	21.74
		50	Low	21.40	21.49	21.47
			Middle	21.41	21.41	21.47
			High	21.37	21.40	21.16
		100	/	21.40	21.41	21.26
	16QAM	1	Low	21.67	21.25	21.54
			Middle	21.95	21.36	21.66
			High	21.60	21.15	21.29
		50	Low	21.40	21.41	21.47
			Middle	21.41	21.40	21.45
			High	21.37	21.41	21.21
		100	/	20.41	20.50	20.43

LTE-FDD Band 13				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5	QPSK	1	Low	24.70	24.43	24.19
			Middle	24.79	24.66	24.34
			High	24.69	24.52	24.10
		12	Low	23.51	23.37	23.22
			Middle	23.42	23.42	23.22
			High	23.43	23.40	23.14
		25	/	23.36	23.21	23.20
	16QAM	1	Low	23.41	23.36	23.15
			Middle	23.37	23.58	23.01
			High	23.31	23.60	22.80
		12	Low	23.41	23.37	23.22
			Middle	23.51	23.45	23.21
			High	23.43	23.36	23.15
		25	/	22.31	22.60	22.35
10	QPSK	1	Low	/	24.35	/
			Middle	/	**24.55**	/
			High	/	24.22	/
		25	Low	/	23.34	/
			Middle	/	23.33	/
			High	/	23.27	/
		50	/	/	23.39	/
	16QAM	1	Low	/	23.56	/
			Middle	/	24.23	/
			High	/	23.23	/
		25	Low	/	23.33	/
			Middle	/	23.43	/
			High	/	23.30	/
		50	/	/	22.34	/

LTE-FDD Band 25				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
1.4	QPSK	1	Low	22.88	22.88	22.66
			Middle	23.09	22.88	22.70
			High	23.02	22.92	22.67
		3	Low	23.05	22.88	22.76
			Middle	23.14	23.14	22.90
			High	23.05	22.89	22.98
		6	/	22.06	21.91	21.74
	16QAM	1	Low	21.92	22.17	21.67
			Middle	22.23	22.49	21.78
			High	22.04	22.14	21.87
		3	Low	22.07	21.94	21.60
			Middle	22.30	21.92	21.56
			High	22.29	22.04	21.56
		6	/	20.86	20.64	20.95
3	QPSK	1	Low	22.93	22.73	23.23
			Middle	23.04	22.96	22.99
			High	23.01	23.22	23.08
		8	Low	21.55	21.55	22.26
			Middle	21.76	22.12	22.16
			High	21.81	22.04	22.27
		15	/	22.02	21.88	22.04
	16QAM	1	Low	21.79	21.68	22.31
			Middle	21.83	21.91	22.19
			High	21.85	22.10	22.24
		8	Low	21.88	21.55	22.35
			Middle	21.77	22.09	22.20
			High	21.72	22.09	22.28
		15	/	20.98	20.83	20.69

5	QPSK	1	Low	23.15	22.75	22.79
			Middle	23.21	23.13	22.89
			High	23.18	23.06	22.83
		12	Low	21.99	21.89	21.94
			Middle	21.99	21.88	21.94
			High	22.08	22.00	21.89
		25	/	22.04	21.84	21.87
	16QAM	1	Low	21.79	21.75	21.63
			Middle	22.11	22.22	21.48
			High	22.09	22.12	21.26
		12	Low	21.98	21.88	21.94
			Middle	21.99	21.95	21.94
			High	22.07	21.97	21.82
		25	/	20.96	20.97	20.89
10	QPSK	1	Low	23.15	22.72	23.00
			Middle	23.26	23.24	23.31
			High	22.93	23.13	22.67
		25	Low	21.99	21.89	21.95
			Middle	21.98	21.97	21.89
			High	21.99	22.02	21.77
		50	/	22.05	21.84	21.87
	16QAM	1	Low	21.95	21.76	22.10
			Middle	22.67	22.69	22.49
			High	21.97	22.25	21.79
		25	Low	21.98	21.97	21.89
			Middle	21.98	21.96	21.90
			High	21.99	22.02	21.77
		50	/	21.06	20.74	21.03

15	QPSK	1	Low	22.97	23.09	22.92
			Middle	23.13	23.25	23.08
			High	22.88	22.96	22.42
		38	Low	21.84	21.91	22.27
			Middle	21.83	22.35	22.03
			High	21.30	22.85	21.63
		75	/	22.06	21.88	22.10
	16QAM	1	Low	22.02	22.01	21.94
			Middle	21.93	22.29	22.05
			High	21.53	22.85	21.69
		38	Low	21.84	21.89	21.94
			Middle	21.98	22.36	22.04
			High	21.31	22.85	21.70
		75	/	21.02	20.78	21.14
20	QPSK	1	Low	22.64	**23.34**	22.68
			Middle	23.09	23.05	23.21
			High	22.40	22.45	22.20
		50	Low	21.85	21.93	21.62
			Middle	21.84	21.53	21.62
			High	21.66	21.74	21.69
		100	/	21.75	21.64	21.69
	16QAM	1	Low	22.12	21.56	21.87
			Middle	22.31	21.71	22.40
			High	21.93	21.42	21.52
		50	Low	21.86	21.51	21.65
			Middle	21.86	21.56	21.62
			High	21.66	21.77	21.71
		100	/	20.88	20.71	20.71

LTE Band 41				Actual output Power (dBm)		
Band-width	Modulation	RB allocation	RB offset	Low	Middle	High
5	QPSK	1	Low	22.54	22.44	22.85
			Middle	22.52	22.52	22.85
			High	22.45	22.55	22.51
		12	Low	20.83	21.74	22.26
			Middle	21.27	21.67	22.30
			High	21.01	21.95	22.04
		25	/	21.59	21.63	21.73
	16QAM	1	Low	20.84	21.75	22.11
			Middle	21.29	21.65	22.31
			High	20.99	21.95	22.04
		12	Low	20.83	21.74	22.26
			Middle	21.30	21.61	22.37
			High	20.99	21.95	22.41
		25	/	20.75	20.66	20.95
10	QPSK	1	Low	22.80	22.62	22.94
			Middle	22.80	23.03	23.06
			High	22.76	22.79	22.85
		25	Low	21.73	21.65	21.92
			Middle	21.73	21.65	21.93
			High	21.76	21.87	22.02
		50	/	21.67	21.76	21.98
	16QAM	1	Low	22.03	22.00	22.00
			Middle	22.39	22.57	22.36
			High	21.68	22.18	21.97
		25	Low	21.73	21.65	21.93
			Middle	21.73	21.65	21.93
			High	21.78	21.87	22.02
		50	/	20.81	20.76	21.01

15	QPSK	1	Low	22.74	22.67	23.00
			Middle	22.64	22.93	23.00
			High	22.67	22.80	22.93
		38	Low	21.75	22.22	22.21
			Middle	21.85	22.41	21.83
			High	21.74	22.24	21.80
		75	/	21.63	21.66	21.91
	16QAM	1	Low	21.76	22.25	22.30
			Middle	21.86	22.42	21.77
			High	21.74	22.24	21.88
		38	Low	21.74	22.24	22.06
			Middle	21.84	22.42	21.89
			High	21.74	22.26	21.76
		75	/	20.76	20.71	20.99
20	QPSK	1	Low	22.34	**23.02**	22.62
			Middle	22.75	22.94	22.87
			High	22.21	22.34	22.29
		50	Low	21.30	21.81	21.73
			Middle	21.31	21.31	21.74
			High	21.33	21.39	21.57
		100	/	21.31	21.30	22.10
	16QAM	1	Low	21.91	21.20	22.07
			Middle	22.27	21.19	22.31
			High	21.56	21.05	21.79
		50	Low	20.47	20.43	20.88
			Middle	20.48	20.51	20.78
			High	20.52	20.44	20.49
		100	/	20.44	20.35	20.90

WLAN Conducted Power

For 2.4GHz WLAN SAR testing, highest average RF output power channel for the lowest data rate for 802.11b were for SAR evaluation. 802.11g/n were not investigated since the average putput powers over all channels and data rates were not more than 0.25dB higher than the tested channel in the lowest data rate of 802.11b mode.

WIFI 2.4G			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11b	01	2412	15.24
	06	2437	**15.72**
	11	2462	15.60
802.11g	01	2412	13.60
	06	2437	14.47
	11	2462	14.40
802.11n(HT20)	01	2412	12.93
	06	2437	13.84
	11	2462	13.75
802.11n(HT40)	03	2422	14.42
	06	2437	14.43
	09	2452	14.14

U-NII-1 (WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	36	5180	12.82
	40	5200	13.53
	48	5240	**13.97**
802.11n HT20	36	5180	12.81
	40	5200	12.72
	48	5240	13.21
802.11n HT40	38	5190	11.62
	46	5230	11.72
802.11ac VHT20	36	5180	12.67
	44	5220	12.32
	48	5240	12.78
802.11ac VHT40	38	5190	11.32
	46	5230	11.45
802.11ac VHT80	42	5210	9.85

U-NII-2A (WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	52	5260	**14.22**
	56	5280	14.02
	64	5320	13.45
802.11n HT20	52	5260	13.47
	56	5280	13.33
	64	5320	13.74
802.11n HT40	54	5270	12.14
	62	5310	11.52
802.11ac VHT20	52	5260	13.01
	56	5280	12.81
	64	5320	12.24
802.11ac VHT40	54	5270	11.82
	62	5310	11.19
802.11ac VHT80	58	5290	9.92

U-NII-2C (WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	100	5500	14.76
	116	5580	**15.25**
	140	5700	13.15
	144	5720	12.44
802.11n HT20	100	5500	13.65
	116	5580	14.23
	140	5700	12.54
	144	5720	11.88
802.11n HT40	102	5510	11.53
	110	5550	11.42
	134	5670	12.01
	142	5710	11.44
802.11ac VHT20	100	5500	13.21
	116	5580	13.77
	140	5700	12.07
	144	5720	11.36
802.11ac VHT40	102	5510	11.18
	110	5550	11.15
	134	5670	11.72
	142	5710	10.75
802.11ac VHT80	106	5530	9.24
	138	5690	9.86

U-NII-3 (WIFI 5G)			
Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)
802.11a	149	5745	12.46
	157	5785	**13.59**
	165	5825	12.88
802.11n HT20	149	5745	11.73
	157	5785	12.84
	165	5825	12.39
802.11n HT40	151	5755	11.02
	159	5795	11.65
802.11ac VHT20	149	5745	11.38
	157	5785	12.44
	165	5825	11.84
802.11ac VHT40	151	5755	10.71
	159	5795	11.44
802.11ac VHT80	155	5775	9.38

*Note:*The output power was test all data rate and recorded worst case at recorded data rate.

Bluetooth Conducted Power

Bluetooth			
Mode	Channel	Frequency (MHz)	Conducted power (dBm)
GFSK	0	2402	3.84
	39	2441	5.28
	78	2480	3.60
π/4QPSK	0	2402	3.95
	39	2441	**5.38**
	78	2480	3.63
8DPSK	0	2402	4.34
	39	2441	5.92
	78	2480	4.02
BLE	0	2402	-0.79
	19	2440	0.19
	39	2480	-1.67

12. Maximum Tune-up Limit

WCDMA	
Mode	Maximum Tune-up (dBm)
	WCDMA Band II
RMC 12.2Kbps	23.50
HSDPA Subtest-1	22.50
HSDPA Subtest-2	22.00
HSDPA Subtest-3	22.00
HSDPA Subtest-4	22.00
HSUPA Subtest-1	21.00
HSUPA Subtest-2	23.00
HSUPA Subtest-3	22.00
HSUPA Subtest-4	22.50
HSUPA Subtest-5	23.50

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 2	1.4	QPSK	1	23.50
			3	23.50
			6	22.50
		16QAM	1	22.50
			3	23.50
			6	21.50
	3	QPSK	1	23.50
			8	23.00
			15	22.00
		16QAM	1	23.00
			8	23.00
			15	21.00
	5	QPSK	1	23.50
			12	22.00
			25	22.00
		16QAM	1	22.50
			12	22.50
			25	21.50
	10	QPSK	1	23.50
			25	22.50
			50	22.00
		16QAM	1	23.00
			25	22.50
			50	21.00
	15	QPSK	1	23.50
			38	23.00
			75	22.50
		16QAM	1	23.50
			38	23.00
			75	21.50
	20	QPSK	1	23.50
			50	22.50
			100	22.00
		16QAM	1	23.00
			50	22.50
			100	21.00

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 4	1.4	QPSK	1	24.00
			3	24.00
			6	23.00
		16QAM	1	23.00
			3	24.00
			6	22.00
	3	QPSK	1	24.00
			8	23.00
			15	23.00
		16QAM	1	23.50
			8	23.00
			15	22.00
	5	QPSK	1	24.00
			12	23.00
			25	22.50
		16QAM	1	23.00
			12	23.00
			25	22.00
	10	QPSK	1	24.00
			25	23.00
			50	22.50
		16QAM	1	23.00
			25	22.50
			50	21.50
	15	QPSK	1	23.50
			38	23.50
			75	22.50
		16QAM	1	23.00
			38	23.50
			75	21.50
	20	QPSK	1	24.00
			50	22.50
			100	22.50
		16QAM	1	23.00
			50	21.50
			100	21.50

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 7	5	QPSK	1	23.00
			12	21.50
			25	21.50
		16QAM	1	21.50
			12	21.50
			25	20.50
	10	QPSK	1	23.00
			25	21.50
			50	21.50
		16QAM	1	22.50
			25	21.50
			50	21.00
	15	QPSK	1	23.00
			38	22.50
			75	21.50
		16QAM	1	22.50
			38	22.50
			75	21.00
	20	QPSK	1	23.00
			50	21.50
			100	21.50
		16QAM	1	22.00
			50	21.50
			100	20.50

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 13	5	QPSK	1	25.00
			12	24.00
			25	23.50
		16QAM	1	24.00
			12	24.00
			25	23.00
	10	QPSK	1	25.00
			25	23.50
			50	23.50
		16QAM	1	25.00
			25	23.50
			50	22.50

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 25	1.4	QPSK	1	23.50
			3	23.50
			6	22.50
		16QAM	1	22.50
			3	22.50
			6	21.00
	3	QPSK	1	23.50
			8	22.50
			15	22.50
		16QAM	1	22.50
			8	22.50
			15	21.00
	5	QPSK	1	23.50
			12	22.50
			25	22.50
		16QAM	1	22.50
			12	22.50
			25	21.00
	10	QPSK	1	23.50
			25	22.50
			50	22.50
		16QAM	1	23.00
			25	22.50
			50	21.50
	15	QPSK	1	23.50
			38	23.00
			75	22.50
		16QAM	1	23.00
			38	23.00
			75	21.50
	20	QPSK	1	23.50
			50	22.00
			100	22.00
		16QAM	1	22.50
			50	22.00
			100	21.00

LTE				
Fequency Band	Band-width(MHz)	Modulation	RB allocation	Maximum Tune-up (dBm)
LTE Band 41	5	QPSK	1	23.00
			12	22.50
			25	22.00
		16QAM	1	22.50
			12	22.50
			25	21.00
	10	QPSK	1	23.50
			25	22.50
			50	22.00
		16QAM	1	23.00
			25	22.50
			50	21.50
	15	QPSK	1	23.00
			38	22.50
			75	22.00
		16QAM	1	22.50
			38	22.50
			75	21.00
	20	QPSK	1	23.50
			50	22.00
			100	22.50
		16QAM	1	22.50
			50	21.00
			100	21.00

LTE MPR will followup 3GPP setting as below:

Modulation	Channel bandwidth / Transmission bandwidth (NRB)						MPR (dB)
	1.4MHz	3.0MHz	5MHz	10MHz	15MHz	20MHz	
QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
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

WIFI 2.4G	
Mode	Maximum Tune-up (dBm) Burst Average Power
802.11b	16.00
802.11g	14.50
802.11n(HT20)	14.00
802.11n(HT40)	14.50

WIFI 5G		
Band	Mode	Maximum Tune-up (dBm) Burst Average Power
U-NII-1	802.11a	14.00
U-NII-2A		14.50
U-NII-2C		15.50
U-NII-3		14.00
U-NII-1	802.11n HT20	13.50
U-NII-2A		14.00
U-NII-2C		14.50
U-NII-3		13.00
U-NII-1	802.11n HT40	12.00
U-NII-2A		12.50
U-NII-2C		12.50
U-NII-3		12.00
U-NII-1	802.11ac VHT20	13.00
U-NII-2A		13.50
U-NII-2C		14.00
U-NII-3		12.50
U-NII-1	802.11ac VHT40	12.00
U-NII-2A		12.00
U-NII-2C		12.00
U-NII-3		11.50
U-NII-1	802.11ac VHT80	10.00
U-NII-2A		10.00
U-NII-2C		10.00
U-NII-3		9.50

Bluetooth	
Mode	Maximum Tune-up (dBm)
GFSK	5.50
π/4QPSK	4.00
8DPSK	6.00
BLE	0.50

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:

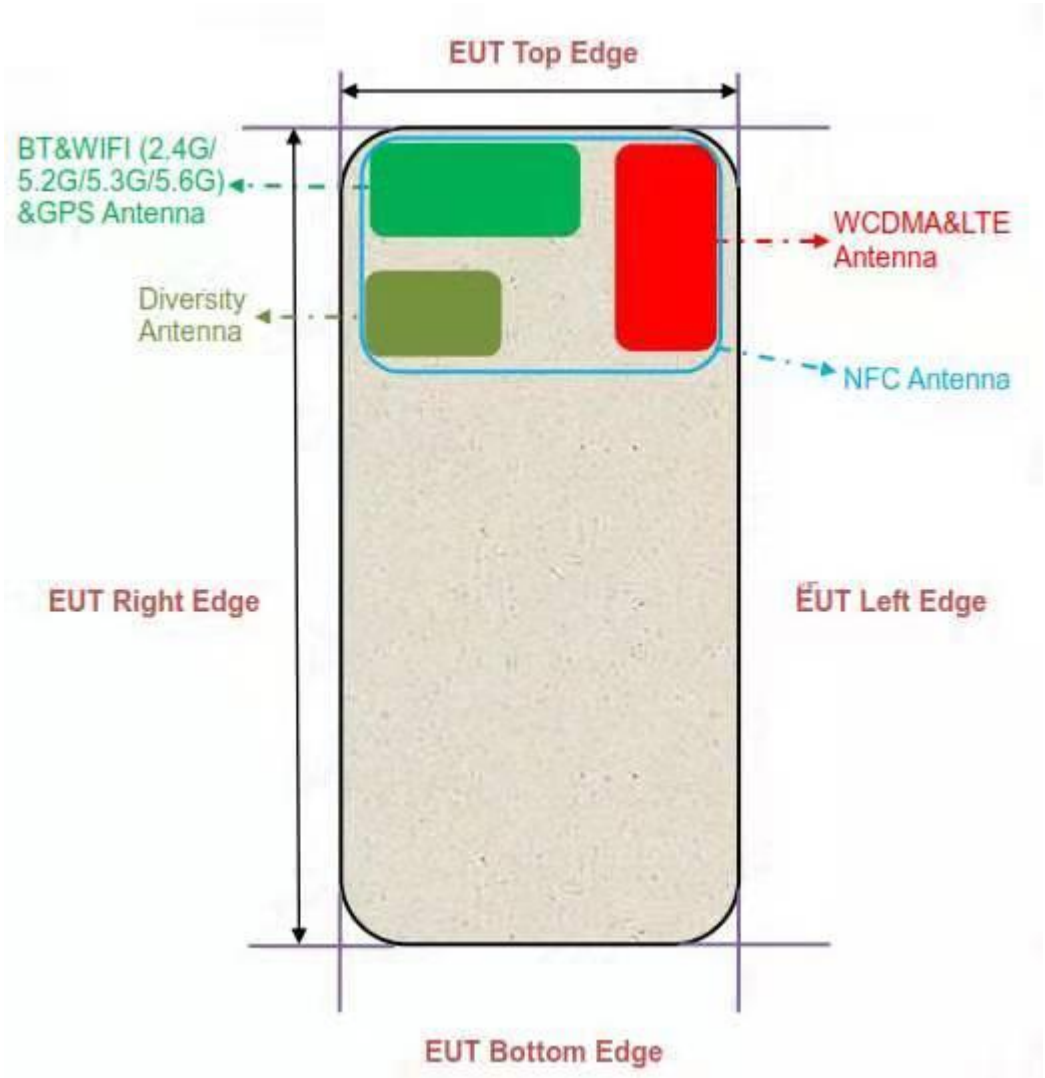
[(max. Power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] * [√f(GHz)] ≤3.0 for 1-g SAR

Band/Mode	F(GHz)	Position	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.45	Body	10	6	3.98	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



General note:
Referring to KDB941225 D07 , when the overall device length and width are >9cm*5cm, the test distance is 5mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge,but we test all sides and surfaces in this report.

14. SAR Measurement Results

General note:

1. When simultaneously transmitting, the standalone SAR compliance still uses the standalone SAR results tested at the maximum output power level without any power changes
2. The simultaneously transmitting SAR value of body and Hotspot is same ,because of the same standalone SAR results

Body / Hotspot SAR

WCDMA Band II										
Mode	Test Position (side)	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	23.10	23.50	1.10	-	-	-	
		9400	1880.0	23.24	23.50	1.06	0.01	0.549	0.582	
		9538	1907.6	23.08	23.50	1.10	-	-	-	
	Back	9262	1852.4	23.10	23.50	1.10	-	-	-	
		9400	1880.0	23.24	23.50	1.06	-0.01	0.607	**0.643**	B1
		9538	1907.6	23.08	23.50	1.10	-	-	-	
	Left	9400	1880.0	23.24	23.50	1.06	0.14	0.408	0.432	
	Right	9400	1880.0	23.24	23.50	1.06	-0.17	0.176	0.187	
	Top	9400	1880.0	23.24	23.50	1.06	0.19	0.043	0.046	
	Bottom	9400	1880.0	23.24	23.50	1.06	0.17	0.040	0.042	

Note:

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

LTE Band 2										
Mode	Test Position (side)	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							
20M_1RB	Front	18700	1860.0	22.87	23.50	1.16	-	-	-	
		18900	1880.0	23.47	23.50	1.01	0.01	0.441	0.445	
		19100	1900.0	23.01	23.50	1.12	-	-	-	
	Back	18700	1860.0	22.87	23.50	1.16	-	-	-	
		18900	1880.0	23.47	23.50	1.01	-0.14	0.476	**0.481**	B2
		19100	1900.0	23.01	23.50	1.12	-	-	-	
	Left	18900	1880.0	23.47	23.50	1.01	-0.13	0.465	0.470	
	Right	18900	1880.0	23.47	23.50	1.01	-0.05	0.113	0.114	
	Top	18900	1880.0	23.47	23.50	1.01	0.00	0.084	0.085	
	Bottom	18900	1880.0	23.47	23.50	1.01	-0.14	0.060	0.061	
20M_50RB	Front	18700	1860.0	22.06	22.50	1.11	-	-	-	
		18900	1880.0	22.13	22.50	1.09	-0.03	0.317	0.346	
		19100	1900.0	21.87	22.50	1.16	-	-	-	
	Back	18700	1860.0	22.06	22.50	1.11	-	-	-	
		18900	1880.0	22.13	22.50	1.09	0.17	0.328	0.358	
		19100	1900.0	21.87	22.50	1.16	-	-	-	
	Left	18900	1880.0	22.13	22.50	1.09	-0.04	0.212	0.231	
	Right	18900	1880.0	22.13	22.50	1.09	-0.04	0.100	0.109	
	Top	18900	1880.0	22.13	22.50	1.09	0.08	0.065	0.071	
	Bottom	18900	1880.0	22.13	22.50	1.09	0.18	0.044	0.048	

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.

LTE Band 4										
Mode	Test Position (side)	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							
20M_1RB	Front	20050	1720.0	23.14	24.00	1.22	-	-	-	
		20175	1732.5	23.74	24.00	1.06	0.01	0.126	0.134	
		20300	1745.0	23.21	24.00	1.20	-	-	-	
	Back	20050	1720.0	23.14	24.00	1.22	-	-	-	
		20175	1732.5	23.74	24.00	1.06	-0.02	0.140	**0.148**	B3
		20300	1745.0	23.21	24.00	1.20	-	-	-	
	Left	20175	1732.5	23.74	24.00	1.06	0.01	0.123	0.130	
	Right	20175	1732.5	23.74	24.00	1.06	-0.01	0.033	0.035	
	Top	20175	1732.5	23.74	24.00	1.06	0.00	0.025	0.027	
	Bottom	20175	1732.5	23.74	24.00	1.06	-0.02	0.018	0.019	
20M_50RB	Front	20050	1720.0	22.19	22.50	1.07	-	-	-	
		20175	1732.5	22.20	22.50	1.07	-0.02	0.099	0.106	
		20300	1745.0	22.17	22.50	1.08	-	-	-	
	Back	20050	1720.0	22.19	22.50	1.07	-	-	-	
		20175	1732.5	22.20	22.50	1.07	0.11	0.102	0.109	
		20300	1745.0	22.17	22.50	1.08	-	-	-	
	Left	20175	1732.5	22.20	22.50	1.07	-0.03	0.066	0.071	
	Right	20175	1732.5	22.20	22.50	1.07	-0.03	0.031	0.033	
	Top	20175	1732.5	22.20	22.50	1.07	0.05	0.020	0.021	
	Bottom	20175	1732.5	22.20	22.50	1.07	0.11	0.014	0.015	

Note:

3. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
4. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.

LTE Band 7										
Mode	Test Position (side)	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							
20M_1RB	Front	20850	2510	22.31	23.00	1.17	-	-	-	-
		21100	2535	22.81	23.00	1.04	-0.06	0.535	0.556	-
		21350	2560	22.19	23.00	1.21	-	-	-	-
	Back	20850	2510	22.31	23.00	1.17	-	-	-	-
		21100	2535	22.81	23.00	1.04	0.13	0.594	**0.618**	B4
		21350	2560	22.19	23.00	1.21	-	-	-	-
	Left	21100	2535	22.81	23.00	1.04	-0.07	0.522	0.543	-
	Right	21100	2535	22.81	23.00	1.04	0.05	0.141	0.147	-
	Top	21100	2535	22.81	23.00	1.04	0.00	0.105	0.109	-
	Bottom	21100	2535	22.81	23.00	1.04	0.13	0.075	0.078	-
20M_50RB	Front	20850	2510	21.40	21.50	1.02	-	-	-	-
		21100	2535	21.49	21.50	1.00	-0.03	0.397	0.397	-
		21350	2560	21.47	21.50	1.01	-	-	-	-
	Back	20850	2510	21.40	21.50	1.02	-	-	-	-
		21100	2535	21.49	21.50	1.00	0.17	0.411	0.411	-
		21350	2560	21.47	21.50	1.01	-	-	-	-
	Left	21100	2535	21.49	21.50	1.00	-0.04	0.266	0.266	-
	Right	21100	2535	21.49	21.50	1.00	-0.04	0.125	0.125	-
	Top	21100	2535	21.49	21.50	1.00	0.08	0.081	0.081	-
	Bottom	21100	2535	21.49	21.50	1.00	0.18	0.055	0.055	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.

LTE Band 13										
Mode	Test Position (side)	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							
10M_1RB	Front	-	-	-	-	-	-	-	-	-
		23230	782	24.55	25.00	1.11	-0.08	0.296	0.329	-
		-	-	-	-	-	-	-	-	-
	Back	-	-	-	-	-	-	-	-	-
		23230	782	24.55	25.00	1.11	0.16	0.328	**0.364**	B5
		-	-	-	-	-	-	-	-	-
	Left	23230	782	24.55	25.00	1.11	-0.09	0.288	0.320	-
	Right	23230	782	24.55	25.00	1.11	0.06	0.078	0.087	-
	Top	23230	782	24.55	25.00	1.11	0.00	0.058	0.064	-
	Bottom	23230	782	24.55	25.00	1.11	0.16	0.042	0.047	-
10M_25RB	Front	-	-	-	-	-	-	-	-	-
		23230	782	23.34	23.50	1.04	-0.01	0.207	0.215	-
		-	-	-	-	-	-	-	-	-
	Back	-	-	-	-	-	-	-	-	-
		23230	782	23.34	23.50	1.04	0.06	0.214	0.223	-
		-	-	-	-	-	-	-	-	-
	Left	23230	782	23.34	23.50	1.04	-0.02	0.138	0.144	-
	Right	23230	782	23.34	23.50	1.04	-0.01	0.065	0.068	-
	Top	23230	782	23.34	23.50	1.04	0.03	0.042	0.044	-
	Bottom	23230	782	23.34	23.50	1.04	0.06	0.028	0.029	-

Note:

1. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
2. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.

LTE Band 25										
Mode	Test Position (side)	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							
20M_1RB	Front	26140	1860.0	22.64	23.50	1.22	-	-	-	-
		26365	1882.5	23.34	23.50	1.04	0.02	0.326	0.339	-
		26590	1905.0	22.68	23.50	1.21	-	-	-	-
	Back	26140	1860.0	22.64	23.50	1.22	-	-	-	-
		26365	1882.5	23.34	23.50	1.04	-0.05	0.362	**0.376**	B6
		26590	1905.0	22.68	23.50	1.21	-	-	-	-
	Left	26365	1882.5	23.34	23.50	1.04	0.03	0.318	0.331	-
	Right	26365	1882.5	23.34	23.50	1.04	-0.02	0.086	0.089	-
	Top	26365	1882.5	23.34	23.50	1.04	0.00	0.064	0.067	-
	Bottom	26365	1882.5	23.34	23.50	1.04	-0.05	0.046	0.048	-
20M_50RB	Front	26140	1860.0	21.85	22.00	1.04	-	-	-	-
		26365	1882.5	21.93	22.00	1.02	-0.02	0.207	0.211	-
		26590	1905.0	21.62	22.00	1.09	-	-	-	-
	Back	26140	1860.0	21.85	22.00	1.04	-	-	-	-
		26365	1882.5	21.93	22.00	1.02	0.15	0.214	0.218	-
		26590	1905.0	21.62	22.00	1.09	-	-	-	-
	Left	26365	1882.5	21.93	22.00	1.02	-0.04	0.138	0.141	-
	Right	26365	1882.5	21.93	22.00	1.02	0.04	0.065	0.066	-
	Top	26365	1882.5	21.93	22.00	1.02	0.07	0.042	0.043	-
	Bottom	26365	1882.5	21.93	22.00	1.02	0.16	0.028	0.029	-

Note:

3. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
4. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.

LTE Band 41										
Mode	Test Position (side)	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							
20M_1RB	Front	40340	2565	22.34	23.50	1.31	-	-	-	-
		40740	2605	23.02	23.50	1.12	-0.02	0.185	0.207	-
		41140	2645	22.62	23.50	1.22	-	-	-	-
	Back	40340	2565	22.34	23.50	1.31	-	-	-	-
		40740	2605	23.02	23.50	1.12	0.04	0.205	**0.230**	B7
		41140	2645	22.62	23.50	1.22	-	-	-	-
	Left	40740	2605	23.02	23.50	1.12	-0.02	0.180	0.202	-
	Right	40740	2605	23.02	23.50	1.12	0.01	0.049	0.055	-
	Top	40740	2605	23.02	23.50	1.12	0.00	0.036	0.040	-
	Bottom	40740	2605	23.02	23.50	1.12	0.04	0.022	0.025	-
20M_50RB	Front	40340	2565	21.30	22.00	1.17	-	-	-	-
		40740	2605	21.81	22.00	1.04	-0.01	0.121	0.126	-
		41140	2645	21.73	22.00	1.06	-	-	-	-
	Back	40340	2565	21.30	22.00	1.17	-	-	-	-
		40740	2605	21.81	22.00	1.04	0.09	0.125	0.130	-
		41140	2645	21.73	22.00	1.06	-	-	-	-
	Left	40740	2605	21.81	22.00	1.04	-0.02	0.081	0.084	-
	Right	40740	2605	21.81	22.00	1.04	-0.02	0.038	0.040	-
	Top	40740	2605	21.81	22.00	1.04	0.04	0.025	0.026	-
	Bottom	40740	2605	21.81	22.00	1.04	0.09	0.017	0.018	-

Note:

5. Per KDB865664 D01v01r04, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg
6. Per KDB 941225 D05v02r03, for QPSK with 100% RB allocation, SAR is not required when the highest maximumoutput power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations andthe highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highestoutput power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also betested.

WIFI 2.4G										
Mode	Test Position (side)	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							
802.11b 1Mbps	Front	1	2412	15.24	16.00	1.19	-	-	-	-
		6	2437	15.72	16.00	1.07	-0.14	0.191	0.204	-
		11	2462	15.60	16.00	1.10	-	-	-	-
	Back	1	2412	15.24	16.00	1.19	-	-	-	-
		6	2437	15.72	16.00	1.07	-0.15	0.532	**0.569**	B8
		11	2462	15.60	16.00	1.10	-	-	-	-
	Left	6	2437	15.72	16.00	1.07	0.10	0.011	0.012	-
	Right	6	2437	15.72	16.00	1.07	0.12	0.073	0.078	-
	Top	6	2437	15.72	16.00	1.07	-0.14	0.416	0.445	-
	Bottom	6	2437	15.72	16.00	1.07	0.00	0.000	0.000	-

U-NII-1 (WIFI 5G)										
Mode	Test Position (side)	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							
802.11a 6Mbps	Front	36	5180	12.82	14.00	1.31	-	-	-	-
		40	5200	13.53	14.00	1.11	-0.06	0.260	0.289	-
		48	5240	13.97	14.00	1.01	-	-	-	-
	Back	36	5180	12.82	14.00	1.31	-	-	-	-
		40	5200	13.53	14.00	1.11	0.12	0.394	**0.437**	B9
		48	5240	13.97	14.00	1.01	-	-	-	-
	Left	40	5200	12.82	14.00	1.31	-0.07	0.045	0.059	-
	Right	40	5200	13.53	14.00	1.11	0.04	0.047	0.052	-
	Top	40	5200	13.97	14.00	1.01	0.09	0.317	0.320	-
	Bottom	40	5200	12.82	14.00	1.31	0.00	0.000	0.000	-

U-NII-2A (WIFI 5G)										
Mode	Test Position (side)	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							
802.11a 6Mbps	Front	52	5260	14.22	14.50	1.07	-	-	-	-
		56	5280	14.02	14.50	1.12	-0.06	0.282	0.316	-
		64	5320	13.45	14.50	1.27	-	-	-	-
	Back	52	5260	14.22	14.50	1.07	-	-	-	-
		56	5280	14.02	14.50	1.12	0.13	0.424	**0.475**	B10
		64	5320	13.45	14.50	1.27	-	-	-	-
	Left	56	5280	14.22	14.50	1.07	-0.07	0.049	0.052	-
	Right	56	5280	14.22	14.50	1.07	0.05	0.050	0.054	-
	Top	56	5280	14.22	14.50	1.07	0.11	0.362	0.387	-
	Bottom	56	5280	14.22	14.50	1.07	0.00	0.000	0.000	-

U-NII-2C (WIFI 5G)										
Mode	Test Position (side)	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							
802.11a 6Mbps	Front	100	5500	14.76	15.50	1.19	-	-	-	-
		116	5580	15.25	15.50	1.06	-0.10	0.417	0.442	-
		140	5700	13.15	15.50	1.72	-	-	-	-
	Back	100	5500	15.25	15.50	1.06	-	-	-	-
		116	5580	15.25	15.50	1.06	0.20	0.628	**0.666**	B11
		140	5700	15.25	15.50	1.06	-	-	-	-
	Left	116	5580	15.25	15.50	1.06	-0.11	0.072	0.076	-
	Right	116	5580	15.25	15.50	1.06	0.07	0.075	0.080	-
	Top	116	5580	15.25	15.50	1.06	0.17	0.536	0.568	-
	Bottom	116	5580	15.25	15.50	1.06	0.00	0.000	0.000	-

U-NII-3 (WIFI 5G)										
Mode	Test Position (side)	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							
802.11a 6Mbps	Front	149	5745	12.46	14.00	1.43	-	-	-	-
		157	5785	13.59	14.00	1.10	-0.08	0.212	0.233	-
		165	5825	12.88	14.00	1.29	-	-	-	-
	Back	149	5745	12.46	14.00	1.43	-	-	-	-
		157	5785	13.59	14.00	1.10	0.17	0.320	**0.352**	B12
		165	5825	12.88	14.00	1.29	-	-	-	-
	Left	157	5785	13.59	14.00	1.10	-0.10	0.037	0.041	-
	Right	157	5785	13.59	14.00	1.10	0.06	0.038	0.042	-
	Top	157	5785	13.59	14.00	1.10	0.15	0.273	0.300	-
	Bottom	157	5785	13.59	14.00	1.10	0.00	0.000	0.000	-

Note:

1. According to the above table, the initial test position for body is “Back”, and its reported SAR is≤ 0.4W/kg. Thus further SAR measurement is not required for the other (remaining) test positions. Because the reported SAR of the highest measured maximum output power channel for the exposureconfiguration is ≤ 0.8W/kg, no further SAR testing is required for 802.11b DSSS in that exposureconfiguration.
2. When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
   a) When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
   b) 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. the 802.11g/n is not required

SAR Test Data Plots

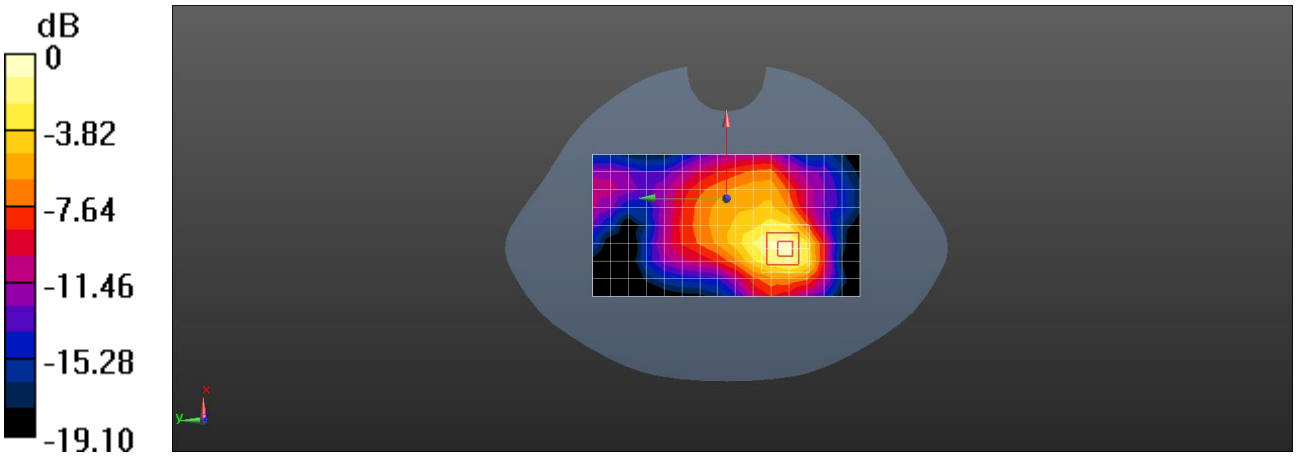
Test band:	WCDMA Band II	Test Position:	Back side	Test Plot:	B1

Date:2019-08-21
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: 2019/05/21;
- 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 (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.610 W/kg
Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.559 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.607 W/kg; SAR(10 g) = 0.317 W/kg
Maximum value of SAR (measured) = 0.680 W/kg



0 dB = 0.680 W/kg = -1.67 dBW/kg

Test band:	LTE Band 2	Test Position:	Back side	Test Plot:	B2

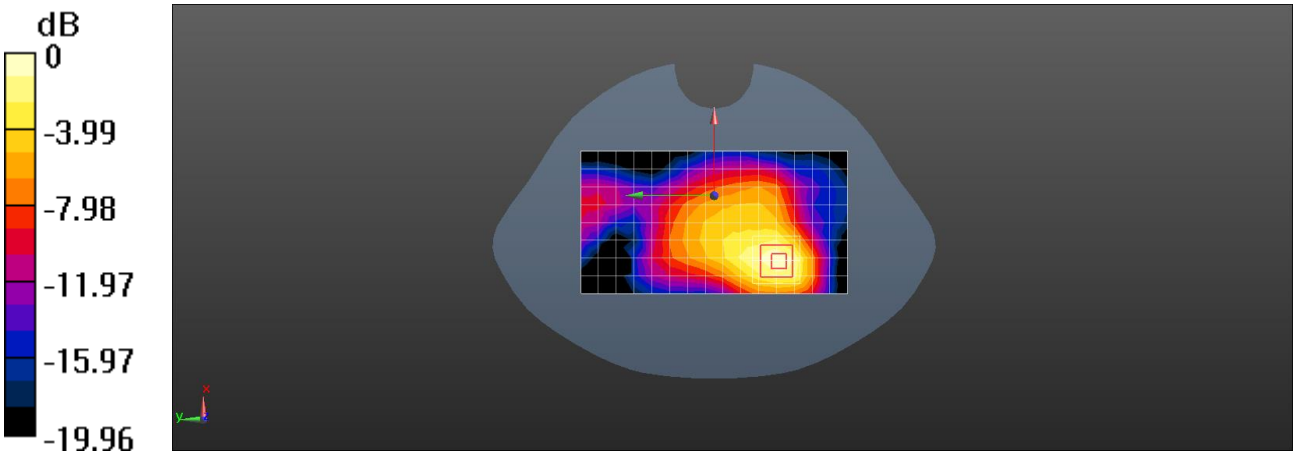
Date:2019-08-21
Communication System: UID 0, Generic LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.539 S/m; ε_r = 53.741; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2019/05/21;
- 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 (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.522 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.760 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.925 W/kg
SAR(1 g) = 0.476 W/kg; SAR(10 g) = 0.245 W/kg
Maximum value of SAR (measured) = 0.524 W/kg



0 dB = 0.524 W/kg = -2.81 dBW/kg

Test band:	LTE Band 4	Test Position:	Back side	Test Plot:	B6

Date:2019-08-20
Communication System: UID 0, Generic LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.43 S/m; ε_r = 53.892; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.42, 8.42, 8.42); Calibrated: 2019/05/21;
- 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)

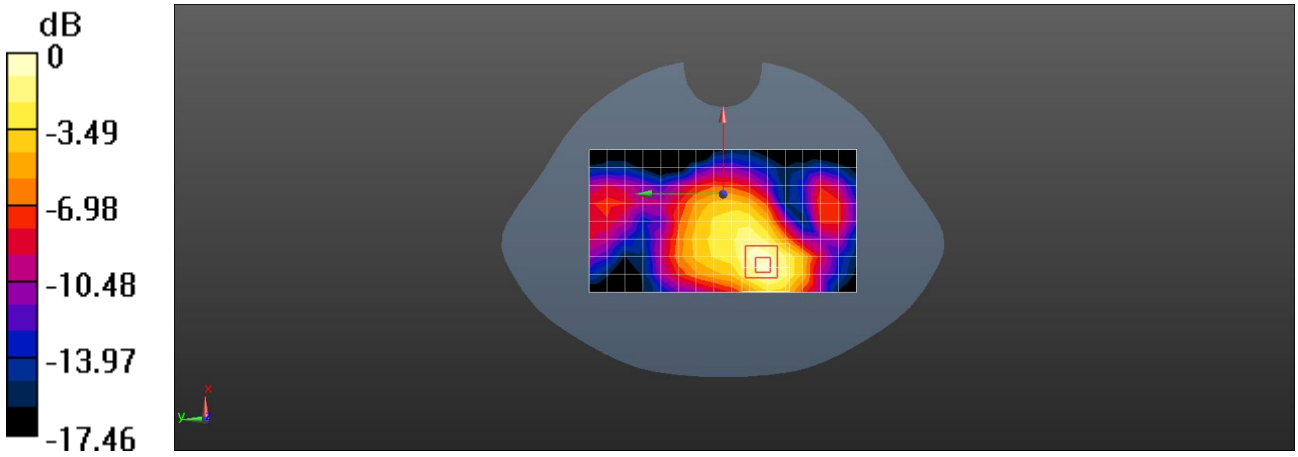
Body/Back side/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.139 W/kg

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

Reference Value = 7.476 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.243 W/kg
SAR(1 g) = 0.140 W/kg; SAR(10 g) = 0.078 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.155 W/kg



0 dB = 0.155 W/kg = -8.10 dBW/kg

Test band:	LTE Band 7	Test Position:	Back side	Test Plot:	B8

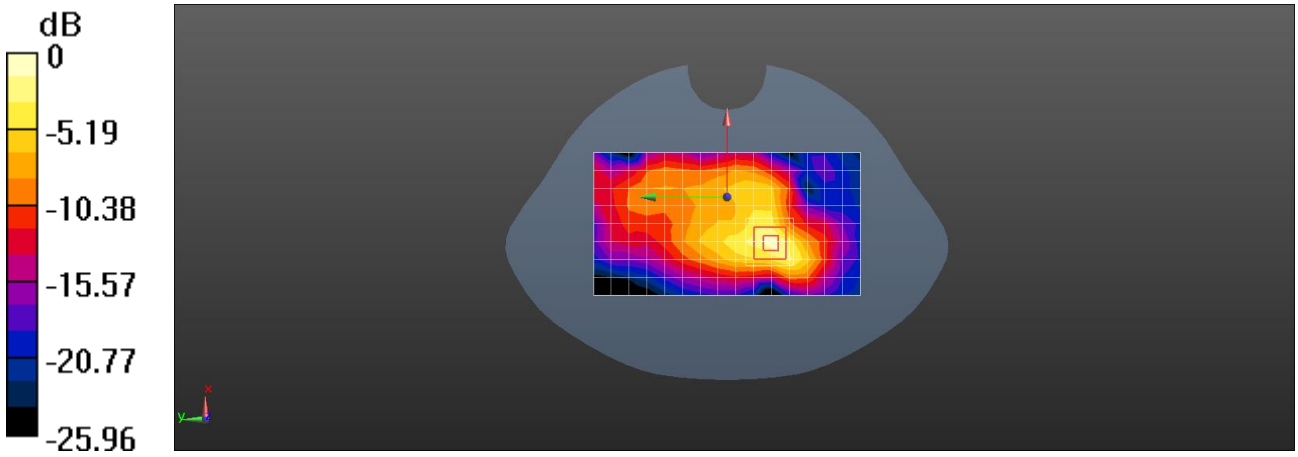
Date:2019-08-23
Communication System: UID 0, Generic LTE (0); Frequency: 2535 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2535 MHz; σ = 2.082 S/m; ε_r = 52.884; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8, 8, 8); Calibrated: 2019/05/21;
- 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 (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.722 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.489 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.237 W/kg
Maximum value of SAR (measured) = 0.737 W/kg



0 dB = 0.737 W/kg = -1.33 dBW/kg

Test band:	LTE Band 13	Test Position:	Back side	Test Plot:	B8

Date:2019-08-19
Communication System: UID 0, Generic LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 0.946 S/m; ε_r = 55.542; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

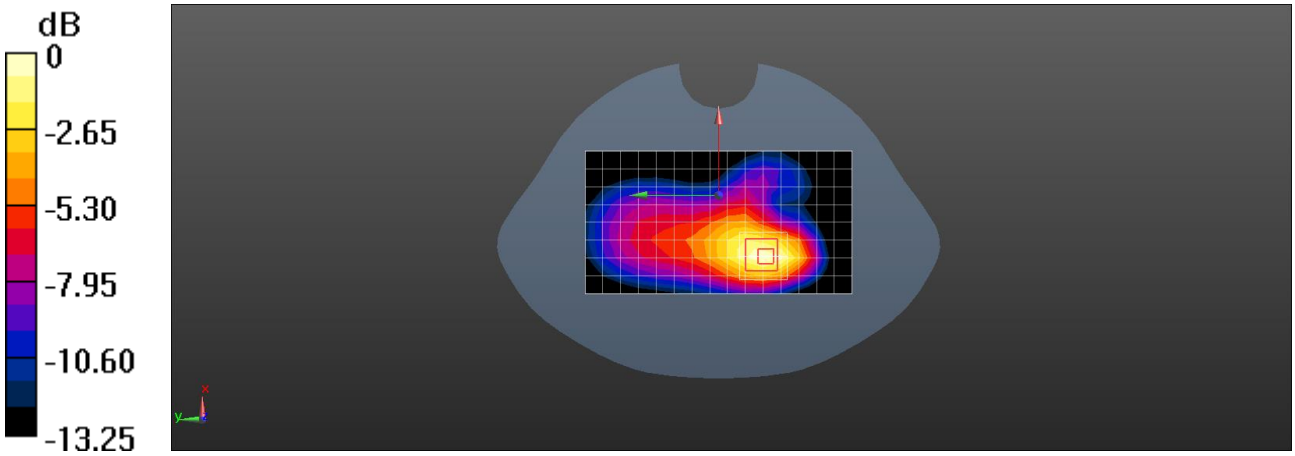
- Probe: EX3DV4 - SN3974; ConvF(10.62, 10.62, 10.62); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.359 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.014 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.328 W/kg; SAR(10 g) = 0.197 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.362 W/kg



0 dB = 0.362 W/kg = -4.41 dBW/kg

Test band:	LTE Band 25	Test Position:	Back side	Test Plot:	B8

Date:2019-08-21
Communication System: UID 0, Generic LTE (0); Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1882.5 MHz; σ = 1.541 S/m; ε_r = 53.736; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

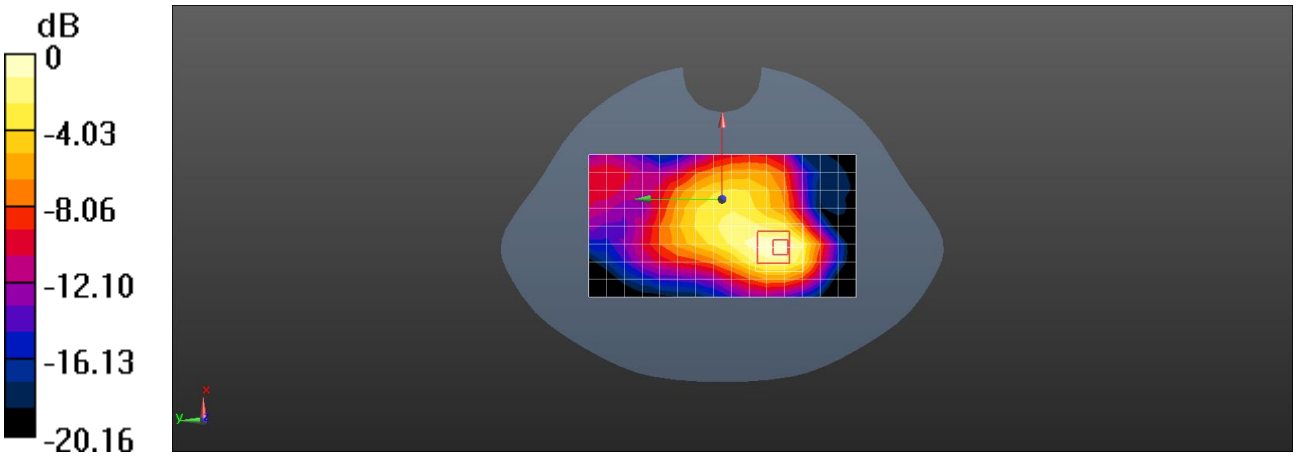
- Probe: EX3DV4 - SN3974; ConvF(8.09, 8.09, 8.09); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.384 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.213 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.716 W/kg
SAR(1 g) = 0.362 W/kg; SAR(10 g) = 0.194 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.396 W/kg



0 dB = 0.396 W/kg = -4.02 dBW/kg

Test band:	LTE Band 41	Test Position:	Back side	Test Plot:	B8

Date:2019-08-23
Communication System: UID 0, Generic LTE (0); Frequency: 2593 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.143 S/m; ε_r = 52.791; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

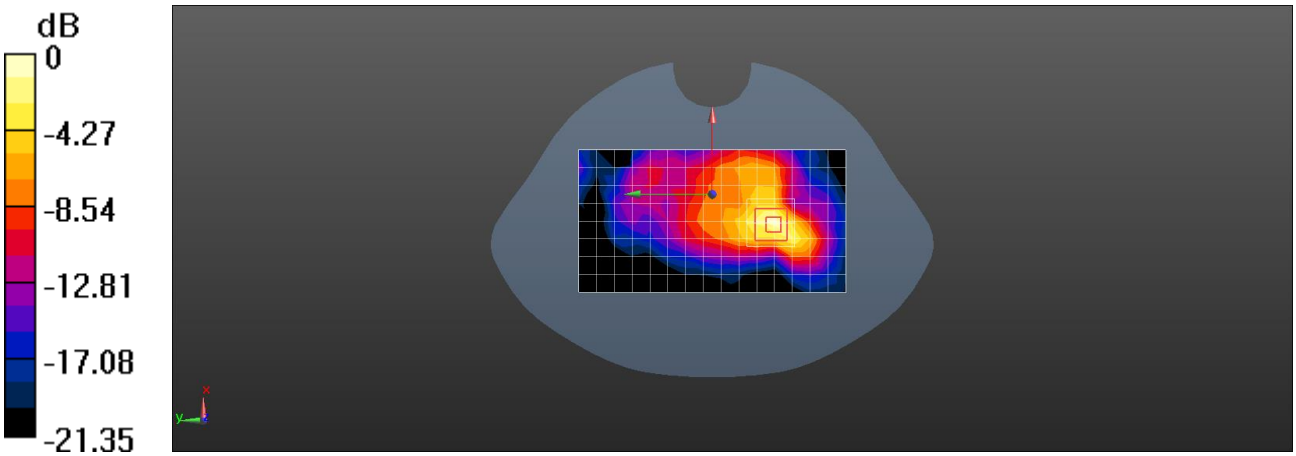
- Probe: EX3DV4 - SN3974; ConvF(7.52, 7.52, 7.52); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.239 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.751 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.514 W/kg
SAR(1 g) = 0.205 W/kg; SAR(10 g) = 0.079 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.252 W/kg



0 dB = 0.252 W/kg = -5.99 dBW/kg

Test band:	WIFI 2.4G	Test Position:	Back side	Test Plot:	B9

Date:2019-08-22
Communication System: UID 0, WI-FI(2412-2462) (0); Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.991 S/m; ε_r = 53.023; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

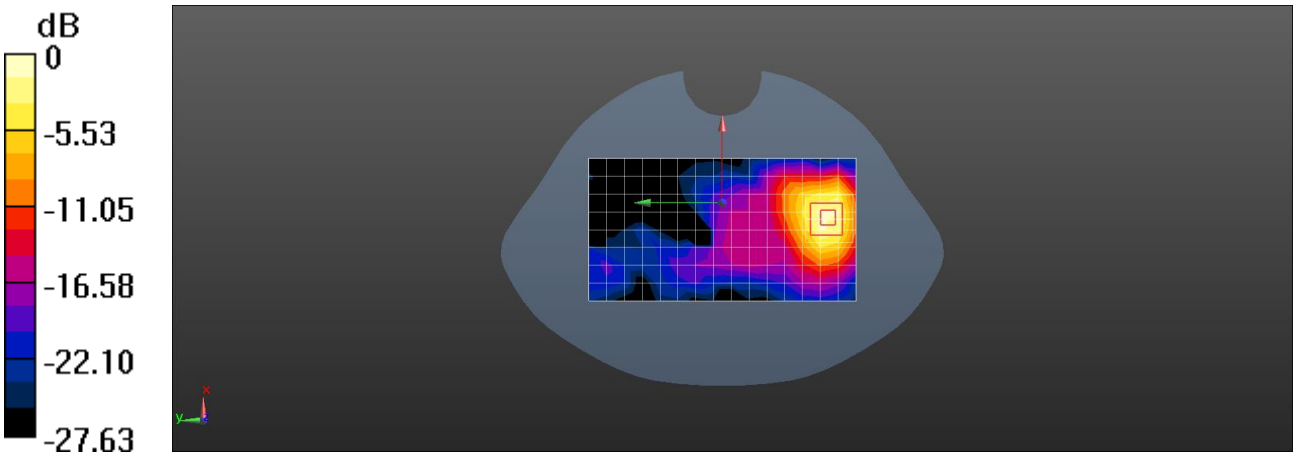
- Probe: EX3DV4 - SN3974; ConvF(8, 8, 8); Calibrated: 2019/05/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM1; Type: Twin SAM V5.0; Serial: 1812
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.463 W/kg

Body/Back side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.905 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.532 W/kg; SAR(10 g) = 0.229 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.610 W/kg



0 dB = 0.610 W/kg = -2.15 dBW/kg

Test band:	U-NII-1 (WIFI 5G)	Test Position:	Back side	Test Plot:	B9

Date:2019-08-26
Communication System: UID 0, WI-FI(U-NII-1) (0); Frequency: 5240 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5240 MHz; σ = 5.441 S/m; ε_r = 48.046; ρ = 1000 kg/m^3
Phantom section: Flat Section

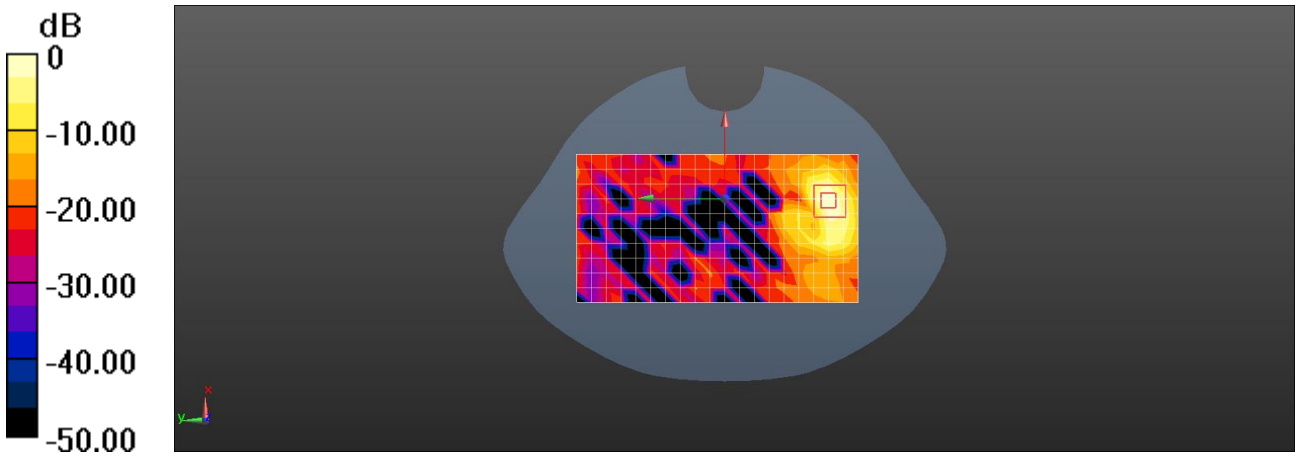
DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.24, 5.24, 5.24); Calibrated: 2018/06/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (11x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.455 W/kg

Body/Back side/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.654 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.394 W/kg; SAR(10 g) = 0.121 W/kg

Maximum value of SAR (measured) = 0.475 W/kg



0 dB = 0.475 W/kg = -3.23 dBW/kg

Test band:	U-NII-2A (WIFI 5G)	Test Position:	Back side	Test Plot:	B9

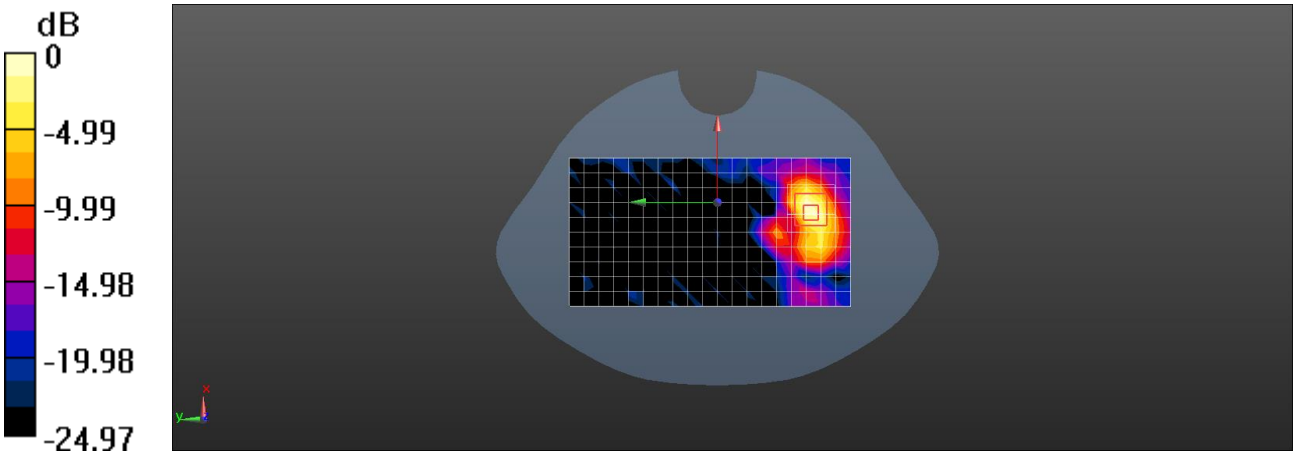
Date:2019-08-26
Communication System: UID 0, WI-FI(U-NII-2A) (0); Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5260 MHz; σ = 5.481 S/m; ε_r = 48.04; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.15, 5.15, 5.15); Calibrated: 2018/06/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (11x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.430 W/kg

Body/Back side/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.829 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.424 W/kg; SAR(10 g) = 0.127 W/kg
Maximum value of SAR (measured) = 0.507 W/kg



0 dB = 0.507 W/kg = -2.95 dBW/kg

Test band:	U-NII-2C (WIFI 5G)	Test Position:	Back side	Test Plot:	B9

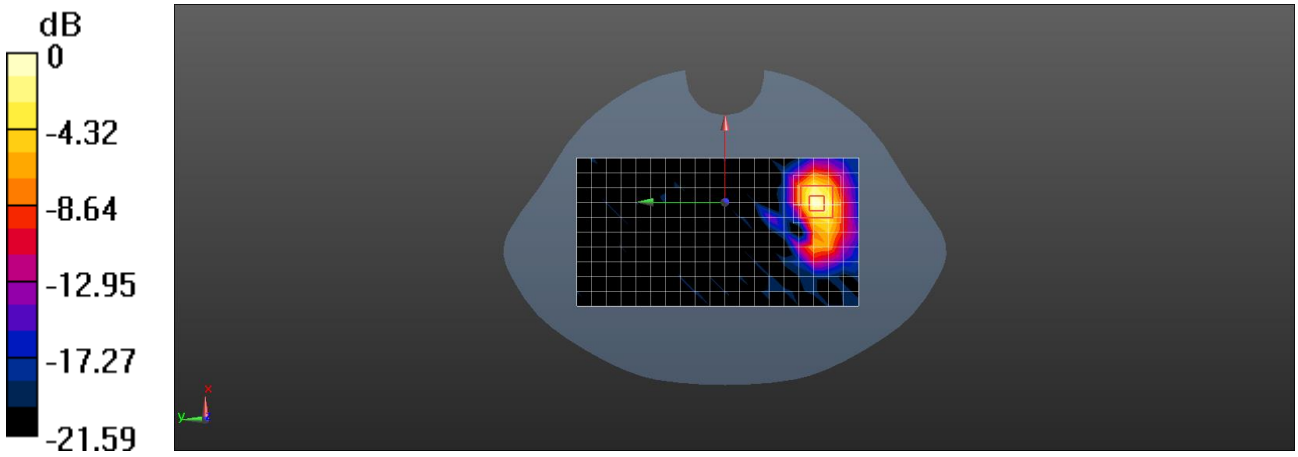
Date:2019-08-27
Communication System: UID 0, WI-FI(U-NII-2C) (0); Frequency: 5580 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5580 MHz; σ = 5.943 S/m; ε_r = 47.364; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(4.46, 4.46, 4.46); Calibrated: 2018/06/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (11x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.691 W/kg

Body/Back side/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.719 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 2.13 W/kg
SAR(1 g) = 0.628 W/kg; SAR(10 g) = 0.193 W/kg
Maximum value of SAR (measured) = 0.725 W/kg



0 dB = 0.725 W/kg = -1.40 dBW/kg

Test band::	U-NII-3 (WIFI 5G)	Test Position:	Back side	Test Plot:	B9

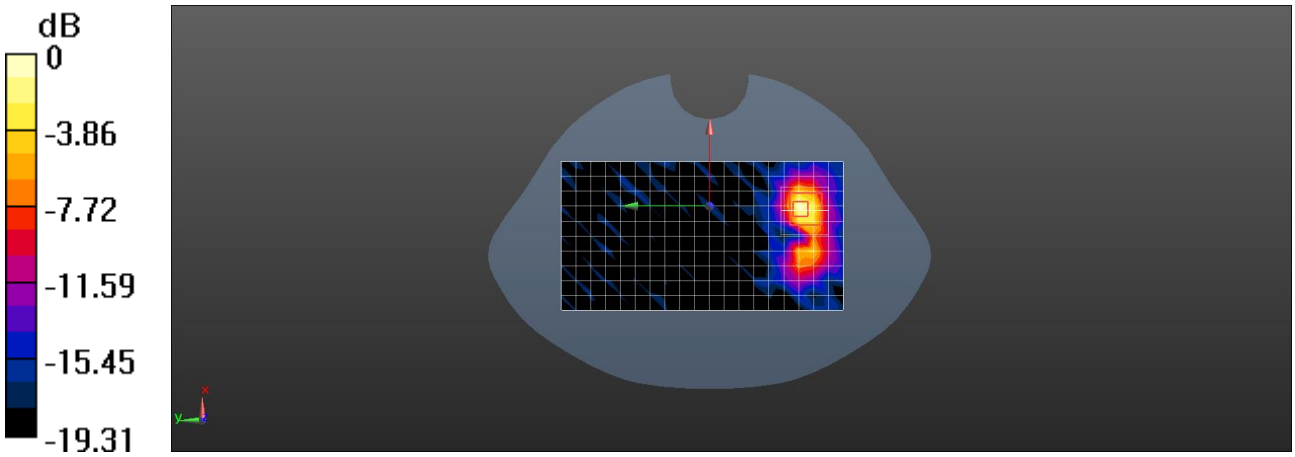
Date:2019-08-28
Communication System: UID 0, WI-FI(U-NII-3) (0); Frequency: 5785 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5785 MHz; σ = 6.244 S/m; ε_r = 46.958; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(4.58, 4.58, 4.58); Calibrated: 2018/06/14;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2019/05/24
- Phantom: SAM2; Type: Twin SAM V5.0; Serial: 1811
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Body/Back side/Area Scan (11x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.321 W/kg

Body/Back side/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.838 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 2.14 W/kg
SAR(1 g) = 0.320 W/kg; SAR(10 g) = 0.085 W/kg
Maximum value of SAR (measured) = 0.339 W/kg



0 dB = 0.339 W/kg = -4.70 dBW/kg

15. Simultaneous Transmission analysis

No.	Simultaneous Transmission Configurations	Body	Hotspot	Note
1	WCDMA (data) + Bluetooth (data)	Yes	NA	-
2	WCDMA (data) + WIFI (data)	Yes	Yes	-
3	LTE + Bluetooth (data)	Yes	NA	-
4	LTE + WIFI (data)	Yes	Yes	-

General note:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either GSM or WCDMA LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. The reported SAR summation is calculated based on the same configuration and test position
4. 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	Body
	Test separation	5mm
dBm	Estimated SAR (W/kg)	0.166

Maximum reported SAR value for Hotspot / Body

WWAN Band		Exposure Position	Max SAR (W/kg)				Summed SAR (W/kg)		
			Hotspot / Body			Body	Hotspot / Body		Body
			① WWAN	② 2.4G WIFI	③ 5G WIFI	④ BT	①+②	①+③	①+④
WCDMA	Band II	Front side	0.582	0.204	0.442	0.166	0.786	1.024	0.748
		Back side	0.643	0.569	0.666	0.166	**1.212**	**1.309**	**0.809**
		Left side	0.432	0.012	0.076	0.166	0.444	0.508	0.598
		Right side	0.187	0.078	0.080	0.166	0.265	0.267	0.353
		Top side	0.046	0.445	0.568	0.166	0.491	0.614	0.212
		Bottom side	0.042	0.000	0.000	0.166	0.042	0.042	0.208
LTE	B2 1RB	Front side	0.445	0.204	0.442	0.166	0.649	0.887	0.611
		Back side	0.481	0.569	0.666	0.166	1.050	1.147	0.647
		Left side	0.470	0.012	0.076	0.166	0.482	0.546	0.636
		Right side	0.114	0.078	0.080	0.166	0.192	0.194	0.280
		Top side	0.085	0.445	0.568	0.166	0.530	0.653	0.251
		Bottom side	0.061	0.000	0.000	0.166	0.061	0.061	0.227
	B2 50RB	Front side	0.346	0.204	0.442	0.166	0.550	0.788	0.512
		Back side	0.358	0.569	0.666	0.166	0.927	1.024	0.524
		Left side	0.231	0.012	0.076	0.166	0.243	0.307	0.397
		Right side	0.109	0.078	0.080	0.166	0.187	0.189	0.275
		Top side	0.071	0.445	0.568	0.166	0.516	0.639	0.237
		Bottom side	0.048	0.000	0.000	0.166	0.048	0.048	0.214
	B4 1RB	Front side	0.134	0.204	0.442	0.166	0.338	0.576	0.300
		Back side	0.148	0.569	0.666	0.166	0.717	0.814	0.314
		Left side	0.130	0.012	0.076	0.166	0.142	0.206	0.296
		Right side	0.035	0.078	0.080	0.166	0.113	0.115	0.201
		Top side	0.027	0.445	0.568	0.166	0.472	0.595	0.193
		Bottom side	0.019	0.000	0.000	0.166	0.019	0.019	0.185
	B4 50RB	Front side	0.106	0.204	0.442	0.166	0.310	0.548	0.272
		Back side	0.109	0.569	0.666	0.166	0.678	0.775	0.275
		Left side	0.071	0.012	0.076	0.166	0.083	0.147	0.237
		Right side	0.033	0.078	0.080	0.166	0.111	0.113	0.199
		Top side	0.021	0.445	0.568	0.166	0.466	0.589	0.187
		Bottom side	0.015	0.000	0.000	0.166	0.015	0.015	0.181

LTE	B7 1RB	Front side	0.556	0.204	0.442	0.166	0.760	0.998	0.722
		Back side	0.618	0.569	0.666	0.166	1.187	1.284	0.784
		Left side	0.543	0.012	0.076	0.166	0.555	0.619	0.709
		Right side	0.147	0.078	0.080	0.166	0.225	0.227	0.313
		Top side	0.109	0.445	0.568	0.166	0.554	0.677	0.275
		Bottom side	0.078	0.000	0.000	0.166	0.078	0.078	0.244
	B7 25RB	Front side	0.397	0.204	0.442	0.166	0.601	0.839	0.563
		Back side	0.411	0.569	0.666	0.166	0.980	1.077	0.577
		Left side	0.266	0.012	0.076	0.166	0.278	0.342	0.432
		Right side	0.125	0.078	0.080	0.166	0.203	0.205	0.291
		Top side	0.081	0.445	0.568	0.166	0.526	0.649	0.247
		Bottom side	0.055	0.000	0.000	0.166	0.055	0.055	0.221
	B13 1RB	Front side	0.329	0.204	0.442	0.166	0.533	0.771	0.495
		Back side	0.364	0.569	0.666	0.166	0.933	1.030	0.530
		Left side	0.320	0.012	0.076	0.166	0.332	0.396	0.486
		Right side	0.087	0.078	0.080	0.166	0.165	0.167	0.253
		Top side	0.064	0.445	0.568	0.166	0.509	0.632	0.230
		Bottom side	0.047	0.000	0.000	0.166	0.047	0.047	0.213
	B13 50RB	Front side	0.215	0.204	0.442	0.166	0.419	0.657	0.381
		Back side	0.223	0.569	0.666	0.166	0.792	0.889	0.389
		Left side	0.144	0.012	0.076	0.166	0.156	0.220	0.310
		Right side	0.068	0.078	0.080	0.166	0.146	0.148	0.234
		Top side	0.044	0.445	0.568	0.166	0.489	0.612	0.210
		Bottom side	0.029	0.000	0.000	0.166	0.029	0.029	0.195
	B25 1RB	Front side	0.339	0.204	0.442	0.166	0.543	0.781	0.505
		Back side	0.376	0.569	0.666	0.166	0.945	1.042	0.542
		Left side	0.331	0.012	0.076	0.166	0.343	0.407	0.497
		Right side	0.089	0.078	0.080	0.166	0.167	0.169	0.255
		Top side	0.067	0.445	0.568	0.166	0.512	0.635	0.233
		Bottom side	0.048	0.000	0.000	0.166	0.048	0.048	0.214
	B25 50RB	Front side	0.211	0.204	0.442	0.166	0.415	0.653	0.377
		Back side	0.218	0.569	0.666	0.166	0.787	0.884	0.384
		Left side	0.141	0.012	0.076	0.166	0.153	0.217	0.307
		Right side	0.066	0.078	0.080	0.166	0.144	0.146	0.232
		Top side	0.043	0.445	0.568	0.166	0.488	0.611	0.209
		Bottom side	0.029	0.000	0.000	0.166	0.029	0.029	0.195

LTE	B41 1RB	Front side	0.207	0.204	0.442	0.166	0.411	0.649	0.373
		Back side	0.230	0.569	0.666	0.166	0.799	0.896	0.396
		Left side	0.202	0.012	0.076	0.166	0.214	0.278	0.368
		Right side	0.055	0.078	0.080	0.166	0.133	0.135	0.221
		Top side	0.040	0.445	0.568	0.166	0.485	0.608	0.206
		Bottom side	0.025	0.000	0.000	0.166	0.025	0.025	0.191
	B41 50RB	Front side	0.126	0.204	0.442	0.166	0.330	0.568	0.292
		Back side	0.130	0.569	0.666	0.166	0.699	0.796	0.296
		Left side	0.084	0.012	0.076	0.166	0.096	0.160	0.250
		Right side	0.040	0.078	0.080	0.166	0.118	0.120	0.206
		Top side	0.026	0.445	0.568	0.166	0.471	0.594	0.192
		Bottom side	0.018	0.000	0.000	0.166	0.018	0.018	0.184

16. TestSetup Photos

Please reference to the report of SAR Test Set up Photos

17. External and Internal Photos of the EUT

Please reference to the report of Internal Photographs and External Photographs

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