
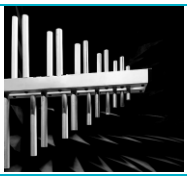
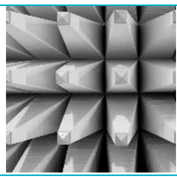

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TEST REPORT

Test Report No.: 1-1521/16-04-02-A

DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing Laboratory

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Accredited Test Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Applicant

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Manufacturer

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Test Standard/s

IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR)in the Human Head from Wireless Communications Devices: Measurement Techniques
RSS-102 Issue 5	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	IPC
Device type:	tablet
Model name:	**ITP1000**
S/N serial number:	10
Hardware status:	1.0
Software status:	1.0
FCC-ID:	LYHITP1000
IC:	267AA-ITP1000
HVIN:	ITP1000
PMN:	ITP1000
Wireless module:	Intel® Dual Band Wireless-AC 8260
Frequency:	see technical details
Antenna:	integrated antenna
Battery option:	integrated battery
Test sample status:	identical prototype
Exposure category:	general population / uncontrolled environment

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test Report authorised:

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Marco Scigliano
Testing Manager
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1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2016-12-19
Date of receipt of test item:	2016-12-19
Start of test:	2016-12-20
End of test:	2016-12-22
Person(s) present during the test:	

2.3 Statement of compliance

The SAR values found for the ITP1000 IPC are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1 g tissue according to the FCC rule §2.1093, the ANSI/IEEE C 95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Health Canada's Safety Code 6 and the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure.

2.4 Technical details

Band tested for this test report	Technology	Lowest transmit frequency/MHz	Highest transmit frequency/MHz	Lowest receive Frequency/MHz	Highest receive Frequency/MHz	Kind of modulation	Tested power control level	Test channel low	Test channel middle	Test channel high	Maximum averaged output power/dBm)*
☒	WLAN US	2412	2462	2412	2462	CCK OFDM	max	1	6	11	13.1
☒	WLAN	5180	5240	5180	5240	OFDM	max	36	--	48	11.7
☒	WLAN	5260	5320	5260	5320	OFDM	max	56	--	64	11.9
☒	WLAN	5500	5700	5500	5700	OFDM	max	104	--	132	12.5
☒	WLAN	5745	5825	5745	5825	OFDM	max	--	--	165	11.7
☐	BT	2402	2480	2402	2480	GFSK	max	0	39	78	6.58

)*: measured averaged max. RMS power for WLAN and BT.

2.5 Transmitter and Antenna Operating Configurations

Simultaneous transmission conditions		
Antenna A		Antenna B
BT/BLE[1]	+	WLAN 2.4GHz
BT/BLE[1]	+	WLAN 5GHz
WLAN 2.4GHz	+	BT/BLE[1]
WLAN 5GHz	+	BT/BLE[1]
WLAN 2.4GHz	+	WLAN 2.4GHz
WLAN 5GHz	+	WLAN 5GHz

Table 1: Simultaneous transmission conditions

Note: BT and WLAN can be active at the same time, but only with interleaving of packages switched on board level. That means that they don't transmit at the same time.

BLE[1] - Bluetooth low energy

3 Test standards/ procedures references

Test Standard	Version	Test Standard Description
IEEE 1528-2013	2013-06	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
RSS-102 Issue 5	2015-03	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Canada's Safety Code No. 6	2015-06	Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
IEEE Std. C95-3	2002	IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave
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.
IEC 62209-2	2010	Human exposure to radio frequency fields from hand-held and bodymounted wireless communication devices. Human models, instrumentation, and procedures. Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)

FCC KDBs:

KDB 865664D01v01	August 7, 2015	FCC OET SAR measurement requirements 100 MHz to 6 GHz
KDB 865664D02v01	October 23, 2015	RF Exposure Compliance Reporting and Documentation Considerations
KDB 447498D01v06	October 23, 2015	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
KDB 648474D04v01	October 23, 2015	SAR Evaluation Considerations for Wireless Handsets
KDB 941225D07v01	October 23, 2015	UMPS Mini Tablet
KDB 248227D01v02	October 23, 2015	SAR Measurement Procedures for 802.11 a/b/g Transmitters
KDB 616217D04v01	October 23, 2015	SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers.

3.1 RF exposure limits

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

Table 2: RF exposure limits

The limit applied in this test report is shown in bold letters

Notes:

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

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

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

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

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

4 Summary of Measurement Results

☒	**No deviations from the technical specifications ascertained**		
☐	Deviations from the technical specifications ascertained		
Maximum value reported (W/kg)			
		DTS	**UNII**
body worn 0 mm distance SAR_{1g}		**0.222**	**0.212**
collocated situations	**ΣSAR evaluation**	**0.327**	
extremities 0 mm distance SAR_{10g}		**0.597**	**0.674**
collocated situations	**ΣSAR evaluation**	**0.674**	

5 Test Environment

Ambient temperature: 20 – 24 °C
Tissue Simulating liquid: 20 – 24 °C

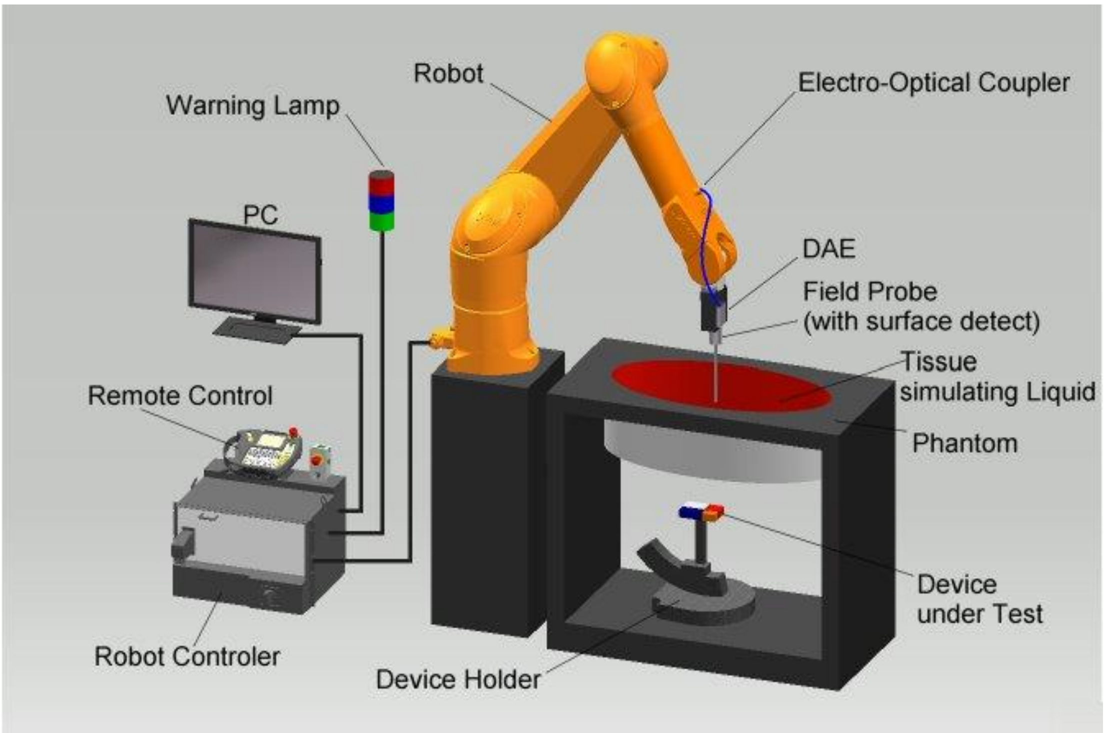
Relative humidity content: 40 – 50 %
Air pressure: not relevant for this kind of testing
Power supply: 230 V / 50 Hz

Exact temperature values for each test are shown in the table(s) under 7.1 and/or on the measurement plots.

6 Test Set-up

6.1 Measurement system

6.1.1 System Description



- The DASY 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 DASY measurement server.
- The DASY 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 7.
- DASY 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 check dipoles allowing to validate the proper functioning of the system.

6.1.2 Test environment

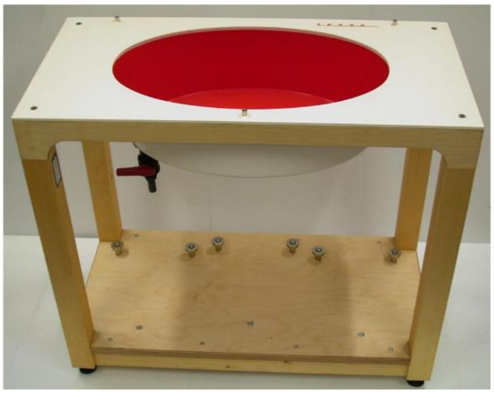
The DASY measurement system is placed at the head end of a room with dimensions:
5 x 2.5 x 3 m³, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m² array of pyramid absorbers is installed to reduce reflections from the ceiling. Picture 1 of the photo documentation shows a complete view of the test environment.
The system allows the measurement of SAR values larger than 0.005 mW/g.

6.1.3 Probe description

Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements	
Technical data according to manufacturer information	
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	10 MHz to >6 GHz (dosimetry); 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 mW/g; Linearity: ± 0.2 dB (noise: typically<1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20mm) Tip length: 2.5 mm (Body: 12mm) Typical distance from probe tip to dipole centers: 1mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

6.1.4 Phantom description

The used ELI4 Phantom meets the requirements specified in KDB865664 D01 for Specific Absorption Rate (SAR) measurements. The phantom consists of a fibreglass shell integrated in a wooden table.



The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI4 is fully compatible with the standard IEC 62209-2 and all known tissue simulating liquids.

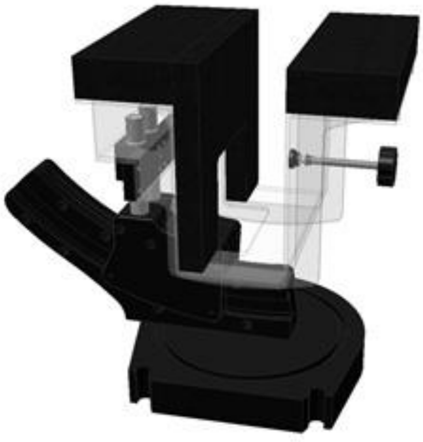
6.1.5 Device holder description

The DASY device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.

Larger DUT's (e.g. notebooks) cannot be tested using the device holder without the extension kit described below.

6.1.6 Laptop Extension Kit for Device holder

SPEAG released a simple but effective extension for their Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc).



The extension is lightweight and made of POM, PET-G acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner.

6.1.7 Scanning procedure

- The DASY installation includes predefined files with recommended procedures for measurements and system check. 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 highest integrated SAR value is the main concern in compliance test applications. These values can mostly be found at the inner surface of the phantom and cannot be measured directly due to the sensor offset in the probe. To extrapolate the surface values, the measurement distances to the surface must be known accurately. A distance error of 0.5mm could produce SAR errors of 6% at 1800 MHz. Using predefined locations for measurements is not accurate enough. Any shift of the phantom (e.g., slight deformations after filling it with liquid) would produce high uncertainties. For an automatic and accurate detection of the phantom surface, the DASY5 system uses the mechanical surface detection. The detection is always at touch, but the probe will move backward from the surface the indicated distance before starting the measurement.

- The „area scan“ measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The scan uses different grid spacings for different frequency measurements. Standard grid spacing for head measurements in frequency ranges ≤ 2GHz is 15 mm in x- and y- dimension. For higher frequencies a finer resolution is needed, thus for the grid spacing is reduced according the following table:

Area scan grid spacing for different frequency ranges	
Frequency range	Grid spacing
≤ 2 GHz	≤ 15 mm
2 – 4 GHz	≤ 12 mm
4 – 6 GHz	≤ 10 mm

  Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation. Results of this coarse scan are shown in annex B.

- A „zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous „coarse“ scan. It uses a fine meshed grid where the robot moves the probe in steps along all the 3 axis (x, y and z-axis) starting at the bottom of the Phantom. The grid spacing for the cube measurement is varied according to the measured frequency range, the dimensions are given in the following table:

Zoom scan grid spacing and volume for different frequency ranges			
Frequency range	Grid spacing for	Grid spacing	Minimum zoom
≤ 2 GHz	≤ 8 mm	≤ 5 mm	≥ 30 mm
2 – 3 GHz	≤ 5 mm*	≤ 5 mm	≥ 28 mm
3 – 4 GHz	≤ 5 mm*	≤ 4 mm	≥ 28 mm
4 – 5 GHz	≤ 4 mm*	≤ 3 mm	≥ 25 mm
5 – 6 GHz	≤ 4 mm*	≤ 2 mm	≥ 22 mm

  * 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.

  DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in annex B. Test results relevant for the specified standard (see section 3) are shown in table form in section 7.

6.1.8 Spatial Peak SAR Evaluation

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 7 x 7 x 7 points. The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.

- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.

- All neighbouring volumes are evaluated until no neighbouring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY uses the advanced extrapolation option which is able to compensate boundary effects on E-field probes.

6.1.9 Data Storage and Evaluation

Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4", ".DA5x". 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], [mW/g], [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 by SEMCAD

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

Probe parameters:	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

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

with	V_i	= compensated signal of channel i	(i = x, y, z)
	U_i	= input signal of channel i	(i = x, y, z)
	cf	= crest factor of exciting field	(DASY parameter)
	dcp_i	= diode compression point	(DASY parameter)

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

E-field probes: $$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

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

with	V_i	= compensated signal of channel i	(i = x, y, z)
	$Norm_i$	= sensor sensitivity of channel i [mV/(V/m)^2] for E-field Probes	(i = x, y, z)
	ConvF	= sensitivity enhancement in solution	
	a_{ij}	= sensor sensitivity factors for H-field probes	
	f	= carrier frequency [GHz]	
	E_i	= electric field strength of channel i in V/m	
	H_i	= magnetic field strength of channel i in A/m	

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

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

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

$$SAR = (E_{tot}^2 \cdot \sigma) / (\rho \cdot 1000)$$

with	SAR	= local specific absorption rate in mW/g
	E_{tot}	= total field strength in V/m
	σ	= conductivity in [mho/m] or [Siemens/m]
	ρ	= equivalent tissue density in g/cm^3

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

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

with	P_{pwe}	= equivalent power density of a plane wave in mW/cm^2
	E_{tot}	= total electric field strength in V/m
	H_{tot}	= total magnetic field strength in A/m

6.1.10 Tissue simulating liquids: dielectric properties

The following materials are used for producing the tissue-equivalent materials.

(Liquids used for tests described in section 7. are marked with ☒):

Ingredients (% of weight)	Frequency (MHz)								
frequency band	☐ 450	☐ 750	☐ 835	☐ 900	☐ 1450	☐ 1750	☐ 1900	☒ 2450	☒ 5000
Water	51.16	51.7	52.4	56.0	71.40	71.45	71.56	71.65	64 - 78
Salt (NaCl)	1.49	0.9	1.40	0.76	0.55	0.5	0.39	0.3	2 - 3
Sugar	46.78	47.2	45.0	41.76	0.0	0.0	0.0	0.0	0.0
HEC	0.52	0.0	1.0	1.21	0.0	0.0	0.0	0.0	0.0
Bactericide	0.05	0.1	0.1	0.27	0.1	0.1	0.1	0.1	0.0
Tween 20	0.0	0.0	0.0	0.0	27.95	27.95	27.95	27.95	0.0
Emulsifiers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9 - 15
Mineral Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11 - 18

Table 3: Body tissue dielectric properties

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16MΩ+ resistivity

HEC: Hydroxyethyl Cellulose

Tween 20: Polyoxyethylene (20) sorbitan monolaurate

6.1.11 Tissue simulating liquids: parameters

Liquid MSL	Freq. (MHz)	Target body tissue		Measurement **body** tissue					Measurement date
		Permittivity	Conductivity (S/m)	Permittivity	Dev.	Conductivity ε"	Conductivity (S/m)	Dev.	
2450	2412	52.75	1.91	51.1	-3.1%	14.82	1.99	3.9%	2016-12-21
	2437	52.72	1.94	51.1	-3.1%	14.92	2.02	4.4%	
	2450	52.70	1.95	51.1	-3.1%	14.94	2.04	4.4%	
	2462	52.68	1.97	51.0	-3.1%	14.99	2.05	4.4%	
	2472	52.67	1.98	51.0	-3.1%	15.06	2.07	4.5%	
5GHz	5180	49.04	5.28	48.2	-1.7%	18.20	5.24	-0.6%	2016-12-22
	5200	49.01	5.30	48.1	-1.8%	18.17	5.26	-0.8%	
	5240	48.96	5.35	48.1	-1.8%	18.22	5.31	-0.7%	
	5280	48.91	5.39	48.0	-1.9%	18.28	5.37	-0.4%	
	5320	48.85	5.44	47.9	-1.9%	18.27	5.41	-0.6%	
	5500	48.61	5.65	47.7	-1.9%	18.46	5.65	0.0%	
	5520	48.58	5.67	47.6	-2.0%	18.48	5.67	0.0%	
	5660	48.39	5.84	47.4	-2.1%	18.66	5.87	0.7%	
	5765	48.25	5.96	47.3	-2.0%	18.73	6.01	0.8%	
	5800	48.20	6.00	47.2	-2.0%	18.78	6.06	1.0%	
	5825	48.20	6.00	47.1	-2.2%	18.80	6.09	1.5%	

Table 4: Parameter of the body tissue simulating liquid

Note: The dielectric properties have been measured using the contact probe method at 22°C.

6.1.12 Measurement uncertainty evaluation for SAR test

DASY5 Uncertainty Budget According to IEEE 1528/2003 and IEC 62209-1 for the 300 MHz - 3 GHz range								
Source of uncertainty	Uncertainty Value ± %	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.0 %	Normal	1	1	1	± 6.0 %	± 6.0 %	∞
Axial isotropy	± 4.7 %	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 9.6 %	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary effects	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Probe linearity	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8 %	Rectangular	√3	1	1	± 0.5 %	± 0.5 %	∞
Integration time	± 2.6 %	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF ambient noise	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.4 %	Rectangular	√3	1	1	± 0.2 %	± 0.2 %	∞
Probe positioning	± 2.9 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Max.SAR evaluation	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Test Sample Related								
Device positioning	± 2.9 %	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device holder uncertainty	± 3.6 %	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power drift	± 5.0 %	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0 %	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Liquid conductivity (target)	± 5.0 %	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid permittivity (target)	± 5.0 %	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %	∞
Combined Std.						± 11.1 %	± 10.8 %	387
Expanded Std.						± **22.1** %	± **21.6** %	

Table 5: Measurement uncertainties
Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528/2003.
The budget is valid for 2G and 3G communication signals and frequency range 300MHz - 3 GHz.
For these conditions it represents a worst-case analysis. For specifc tests and configurations, the uncertainty could be considerable smaller.

Relative DASY5 Uncertainty Budget for SAR Tests According to IEEE 1528/2013 and IEC62209/2011 for the 0.3 - 3GHz range								
Error Description	Uncertainty Value ± %	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	 ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.0 %	Normal	1	1	1	± 6.0 %	± 6.0 %	∞
Axial isotropy	± 4.7 %	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 9.6 %	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary effects	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Probe linearity	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Modulation Response	± 2.4 %	Rectangular	√3	1	1	± 1.4 %	± 1.4 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8 %	Rectangular	√3	1	1	± 0.5 %	± 0.5 %	∞
Integration time	± 2.6 %	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF ambient noise	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.4 %	Rectangular	√3	1	1	± 0.2 %	± 0.2 %	∞
Probe positioning	± 2.9 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Max. SAR evaluation	± 2.0 %	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Test Sample Related								
Device positioning	± 2.9 %	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device holder uncertainty	± 3.6 %	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power drift	± 5.0 %	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Set-up								
Phantom uncertainty	± 6.1 %	Rectangular	√3	1	1	± 3.5 %	± 3.5 %	∞
SAR correction	± 1.9 %	Rectangular	√3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√3	0.78	0.71	± 2.3 %	± 2.0 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√3	0.26	0.26	± 0.8 %	± 0.8 %	∞
Temp. Unc. - Conductivity	± 3.4 %	Rectangular	√3	0.78	0.71	± 1.5 %	± 1.4 %	∞
Temp. Unc. - Permittivity	± 0.4 %	Rectangular	√3	0.23	0.26	± 0.1 %	± 0.1 %	∞
Combined Uncertainty						± 11.3 %	± 11.3 %	330
Expanded Std. Uncertainty						± **22.7** %	± **22.5** %	

Table 6: Measurement uncertainties

Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528/2013 and IEC 62209-1/2011 standards. The budget is valid for the frequency range 300MHz -3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

DASY5 Uncertainty Budget According to IEC 62209-2/2010 for the 300 MHz - 6 GHz range								
Source of uncertainty	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Axial isotropy	± 4.7 %	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 9.6 %	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary effects	± 2.0 %	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Probe linearity	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Modulation Response	± 2.4 %	Rectangular	√3	1	1	± 1.4 %	± 1.4 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8 %	Rectangular	√3	1	1	± 0.5 %	± 0.5 %	∞
Integration time	± 2.6 %	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF ambient noise	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√3	1	1	± 3.9 %	± 3.9 %	∞
Post-processing	± 4.0 %	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device positioning	± 2.9 %	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device holder uncertainty	± 3.6 %	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power drift	± 5.0 %	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Set-up								
Phantom uncertainty	± 7.9 %	Rectangular	√3	1	1	± 4.6 %	± 4.6 %	∞
SAR correction	± 1.9 %	Rectangular	√3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√3	0.78	0.71	± 2.3 %	± 2.0 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√3	0.26	0.26	± 0.8 %	± 0.8 %	∞
Temp. Unc. - Conductivity	± 3.4 %	Rectangular	√3	0.78	0.71	± 1.5 %	± 1.4 %	∞
Temp. Unc. - Permittivity	± 0.4 %	Rectangular	√3	0.23	0.26	± 0.1 %	± 0.1 %	∞
Combined Uncertainty						± 12.7 %	± 12.6 %	330
Expanded Std. Uncertainty						± **25.4** %	± **25.3** %	

Table 7: Measurement uncertainties.
Worst-Case uncertainty budget for DASY5 assessed according to according to IEC 62209-2/2010 standard. The budget is valid for the frequency range 300MHz - 6 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

Relative DASY5 Uncertainty Budget for SAR Tests								
According to IEEE 1528/2003 and IEC 62209-1 for the 3 - 6 GHz range								
Error Description	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Axial isotropy	± 4.7 %	Rectangular	√ 3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 9.6 %	Rectangular	√ 3	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary effects	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
Probe linearity	± 4.7 %	Rectangular	√ 3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Integration time	± 2.6 %	Rectangular	√ 3	1	1	± 1.5 %	± 1.5 %	∞
RF ambient noise	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√ 3	1	1	± 3.9 %	± 3.9 %	∞
Max. SAR evaluation	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device positioning	± 2.9 %	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device holder uncertainty	± 3.6 %	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power drift	± 5.0 %	Rectangular	√ 3	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
Liquid conductivity (target)	± 5.0 %	Rectangular	√ 3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√ 3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid permittivity (target)	± 5.0 %	Rectangular	√ 3	0.6	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√ 3	0.6	0.49	± 1.7 %	± 1.4 %	∞
Combined Uncertainty						± 12.1 %	± 11.9 %	330
Expanded Std. Uncertainty						± **24.3** %	± **23.8** %	

Table 8: Measurement uncertainties

Worst-Case uncertainty budget for DASY5 valid for 3G communication signals and frequency range 3 - 6 GHz. Probe calibration error reflects uncertainty of the EX3D probe. For specific tests and configurations, the uncertainty could be considerable smaller.

Relative DASY5 Uncertainty Budget for SAR Tests								
According to IEEE 1528/2013 and IEC62209-1/2011 (3-6GHz range)								
Error Description	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Axial isotropy	± 4.7 %	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 9.6 %	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary effects	± 2.0 %	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Probe linearity	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√3	1	1	± 0.6 %	± 0.6 %	∞
Modulation Response	± 2.4 %	Rectangular	√3	1	1	± 1.4 %	± 1.4 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8 %	Rectangular	√3	1	1	± 0.5 %	± 0.5 %	∞
Integration time	± 2.6 %	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF ambient noise	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√3	1	1	± 3.9 %	± 3.9 %	∞
Max. SAR evaluation	± 4.0 %	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device positioning	± 2.9 %	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device holder uncertainty	± 3.6 %	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power drift	± 5.0 %	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Set-up								
Phantom uncertainty	± 6.6 %	Rectangular	√3	1	1	± 3.8 %	± 3.8 %	∞
SAR correction	± 1.9 %	Rectangular	√3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√3	0.78	0.71	± 2.3 %	± 2.0 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√3	0.26	0.26	± 0.8 %	± 0.8 %	∞
Temp. Unc. - Conductivity	± 3.4 %	Rectangular	√3	0.78	0.71	± 1.5 %	± 1.4 %	∞
Temp. Unc. - Permittivity	± 0.4 %	Rectangular	√3	0.23	0.26	± 0.1 %	± 0.1 %	∞
Combined Uncertainty						± 12.4 %	± 12.4 %	330
Expanded Std. Uncertainty						± **24.9** %	± **24.8** %	

Table 9: Measurement uncertainties
Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528/2013 and IEC 62209-1/2011 standards. The budget is valid for the frequency range 3GHz -6GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

6.1.13 Measurement uncertainty evaluation for System Check

Uncertainty of a System Performance Check with DASY5 System for the 0.3 - 3 GHz range								
Source of uncertainty	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.0 %	Normal	1	1	1	± 6.0 %	± 6.0 %	∞
Axial isotropy	± 4.7 %	Rectangular	√ 3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 0.0 %	Rectangular	√ 3	0.7	0.7	± 0.0 %	± 0.0 %	∞
Boundary effects	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Probe linearity	± 4.7 %	Rectangular	√ 3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
Integration time	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
RF ambient conditions	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.4 %	Rectangular	√ 3	1	1	± 0.2 %	± 0.2 %	∞
Probe positioning	± 2.9 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Max. SAR evaluation	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Test Sample Related								
Dev. of experimental dipole	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
Source to liquid distance	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
Power drift	± 3.4 %	Rectangular	√ 3	1	1	± 2.0 %	± 2.0 %	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Normal	1	0.78	0.71	± 3.9 %	± 3.6 %	∞
Liquid permittivity (meas.)	± 5.0 %	Normal	1	0.26	0.26	± 1.3 %	± 1.3 %	∞
Temp. unc. - Conductivity	± 1.7 %	Rectangular	√ 3	0.78	0.71	± 0.8 %	± 0.7 %	∞
Temp. unc. - Permittivity	± 0.3 %	Rectangular	√ 3	0.23	0.26	± 0.0 %	± 0.0 %	∞
Combined Uncertainty						± 9.1 %	± 8.9 %	330
Expanded Std. Uncertainty						± **18.2** %	± **17.9** %	

Table 10: Measurement uncertainties of the System Check with DASY5 (0.3-3GHz)

Uncertainty of a System Performance Check with DASY5 System for the 3 - 6 GHz range								
Source of uncertainty	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Axial isotropy	± 4.7 %	Rectangular	√ 3	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical isotropy	± 0.0 %	Rectangular	√ 3	0.7	0.7	± 0.0 %	± 0.0 %	∞
Boundary effects	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Probe linearity	± 4.7 %	Rectangular	√ 3	1	1	± 2.7 %	± 2.7 %	∞
System detection limits	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
Integration time	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
RF ambient conditions	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√ 3	1	1	± 3.9 %	± 3.9 %	∞
Max. SAR evaluation	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Test Sample Related								
Dev. of experimental dipole	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
Source to liquid distance	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
Power drift	± 3.4 %	Rectangular	√ 3	1	1	± 2.0 %	± 2.0 %	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Normal	1	0.78	0.71	± 3.9 %	± 3.6 %	∞
Liquid permittivity (meas.)	± 5.0 %	Normal	1	0.26	0.26	± 1.3 %	± 1.3 %	∞
Temp. unc. - Conductivity	± 1.7 %	Rectangular	√ 3	0.78	0.71	± 0.8 %	± 0.7 %	∞
Temp. unc. - Permittivity	± 0.3 %	Rectangular	√ 3	0.23	0.26	± 0.0 %	± 0.0 %	∞
Combined Uncertainty						± 10.1 %	± 10.0 %	330
Expanded Std. Uncertainty						± **20.2** %	± **19.9** %	

Table 11: Measurement uncertainties of the System Check with DASY5 (3-6GHz)

Note: Worst case probe calibration uncertainty has been applied for all probes used during the measurements.

6.1.14 System check

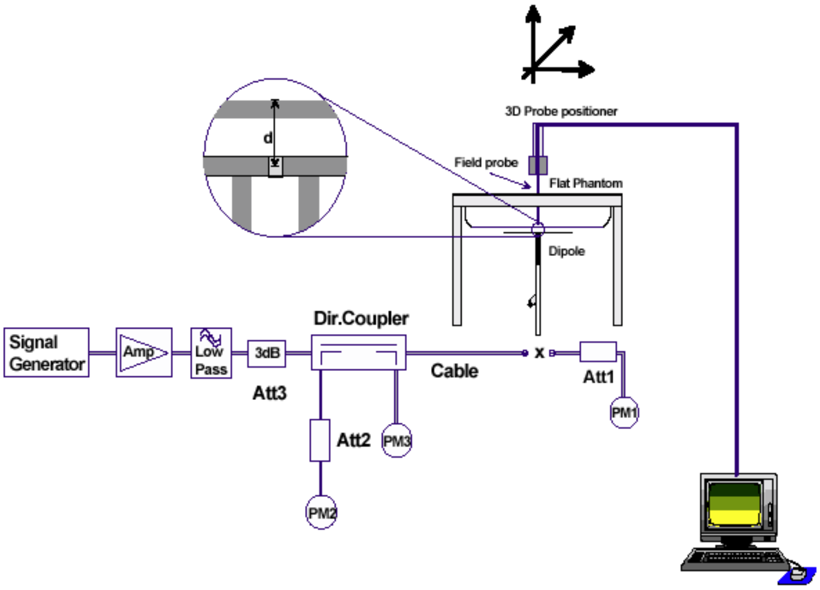
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE 1528. The following table shows system check results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

System performence check (1000 mW)									
System validation Kit	Probe	Frequency	Target SAR_{1g} /mW/g (+/-10%)	Target SAR_{10g} /mW/g (+/-10%)	Measured SAR_{1g} / mW/g	SAR_{1g} dev.	Measured SAR_{10g} / mW/g	SAR_{10g} dev.	Measured date
D2450V2 S/N: 710	EX3DV4 S/N: 3944	2450 MHz body	51.10	24.20	51.70	1.2%	23.90	-1.2%	2016-12-21
D5GHzV2 S/N: 1055	EX3DV4 S/N: 3944	5200 MHz body	76.60	21.50	76.50	-0.1%	21.60	0.5%	2016-12-22
D5GHzV2 S/N: 1055	EX3DV4 S/N: 3944	5500 MHz body	83.80	23.30	78.40	-6.4%	22.10	-5.2%	2016-12-22
D5GHzV2 S/N: 1055	EX3DV4 S/N: 3944	5800 MHz body	80.30	22.20	75.50	-6.0%	21.20	-4.5%	2016-12-22

Table 12: Results system check

6.1.15 System check procedure

The system check is performed by using a validation dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 1000 mW for frequencies below 2 GHz or 100 mW for frequencies above 2 GHz. To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).
System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



6.1.16 System validation

The system validation is performed in a similar way as a system check. It needs to be performed once a SAR measurement system has been established and allows an evaluation of the system accuracy with all components used together with the specified system. It has to be repeated at least once a year or when new system components are used (DAE, probe, phantom, dipole, liquid type).
In addition to the procedure used during system check a system validation also includes checks of probe isotropy, probe modulation factor and RF signal.

The following table lists the system validations relevant for this test report:

Frequency (MHz)	DASY SW	Dipole Type /SN	Probe Type / SN	Calibrated signal type(s)	DAE unit Type / SN	body validation
2450	V52.8.7	D2450V2 / 710	EX3DV4 / 3944	CW	DAE3/ 477	2016-09-20
5200	V52.8.7	D5GHzV2 / 1055	EX3DV4 / 3944	CW	DAE3/ 477	2016-10-25
5500	V52.8.7	D5GHzV2 / 1055	EX3DV4 / 3944	CW	DAE3/ 477	2016-10-26
5800	V52.8.7	D5GHzV2 / 1055	EX3DV4 / 3944	CW	DAE3/ 477	2016-10-27

7 Detailed Test Results

7.1 Conducted power measurements

7.1.1 Conducted power measurements WLAN 2450 MHz

Results for Antenna 1 (port/transmit chain A) [topside – left]

802.11b		maximum average conducted output power [dBm]			
Band	**Ch**	**1Mbps**	**2Mbps**	**5.5Mbps**	**11Mbps**
2450MHz	1	**12.9**	12.6	12.6	12.2
	6	12.8	12.6	12.5	12.2
	11	12.7	12.5	12.5	12.2

Table 13: Test results conducted power measurement 802.11b.

802.11g		maximum average conducted output power [dBm]							
Band	**Ch**	**6Mbps**	**9Mbps**	**12Mbps**	**18Mbps**	**24Mbps**	**36Mbps**	**48Mbps**	**54Mbps**
2450MHz	1	12.9	12.9	12.9	12.8	12.9	12.8	12.7	12.7
	6	12.7	12.6	12.7	12.7	12.7	12.6	12.6	12.6
	11	12.8	12.8	12.8	12.7	12.8	12.7	12.7	12.6

Table 14: Test results conducted power measurement 802.11g.

802.11n HT-20		maximum average conducted output power [dBm]							
Band	**Ch**	**MCS-0 6.5Mbps**	**MCS-1 13Mbps**	**MCS-2 19.5Mbps**	**MCS-3 26Mbps**	**MCS-4 39Mbps**	**MCS-5 52Mbps**	**MCS-6 58.5Mbps**	**MCS-7 65Mbps**
2450MHz	1	12.8	12.6	12.5	12.6	12.5	12.5	12.4	12.3
	6	12.4	12.4	12.3	12.5	12.4	12.3	12.3	12.2
	11	12.7	12.6	12.4	12.4	12.4	12.4	12.3	12.2

Table 15: Test results conducted power measurement 802.11n HT-20.

802.11n HT-40		maximum average conducted output power [dBm]							
Band	**Ch**	**MCS-0 13.5Mbps**	**MCS-1 27Mbps**	**MCS-2 40.5Mbps**	**MCS-3 54Mbps**	**MCS-4 81Mbps**	**MCS-5 108Mbps**	**MCS-6 121.5Mbps**	**MCS-7 135Mbps**
2450MHz	3	12.9	12.8	12.8	12.6	12.6	12.5	12.3	12.4
	6	12.8	12.7	12.7	12.5	12.5	12.4	12.4	12.3
	9	12.5	12.5	12.3	12.2	12.3	12.1	12.2	12.2

Table 16: Test results conducted power measurement 802.11n HT-40.

MIMO		maximum average conducted output power [dBm]		
Band	**Ch**	**802.11n HT-20**	**Ch**	**802.11n HT-40**
2450MHz	1	9.2	3	8.7
	6	9.0	6	8.5
	11	9.0	9	7.2

Table 17: Test results conducted power measured with **antenna A and B active – <u>results for antenna/port A</u>**

Results for Antenna 2 (port/transmit chain B) [right side – upper corner]

802.11b		maximum average conducted output power [dBm]			
Band	Ch	1Mbps	2Mbps	5.5Mbps	11Mbps
2450MHz	1	**12.9**	12.7	12.7	12.3
	6	12.7	12.5	12.5	12.1
	11	12.6	12.6	12.5	12.0

Table 18: Test results conducted power measurement 802.11b

802.11g		maximum average conducted output power [dBm]							
Band	Ch	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
2450MHz	1	13.1	13.1	13.1	13.0	13.1	13.0	12.9	12.9
	6	13.0	12.9	12.9	13.0	13.0	12.9	12.8	12.7
	11	12.9	12.9	12.8	12.9	12.9	12.8	12.7	12.7

Table 19: Test results conducted power measurement 802.11g

802.11n HT-20		maximum average conducted output power [dBm]							
Band	Ch	MCS-0 6.5Mbps	MCS-1 13Mbps	MCS-2 19.5Mbps	MCS-3 26Mbps	MCS-4 39Mbps	MCS-5 52Mbps	MCS-6 58.5Mbps	MCS-7 65Mbps
2450MHz	1	13.0	12.8	12.7	12.8	12.7	12.7	12.6	12.5
	6	12.9	12.7	12.6	12.7	12.7	12.7	12.5	12.4
	11	12.8	12.6	12.6	12.6	12.6	12.5	12.4	12.4

Table 20: Test results conducted power measurement 802.11n HT-20

802.11n HT-40		maximum average conducted output power [dBm]							
Band	Ch	MCS-0 13.5Mbps	MCS-1 27Mbps	MCS-2 40.5Mbps	MCS-3 54Mbps	MCS-4 81Mbps	MCS-5 108Mbps	MCS-6 121.5Mbps	MCS-7 135Mbps
2450MHz	3	13.0	12.9	12.9	12.7	12.7	12.6	12.5	12.5
	6	12.9	12.8	12.8	12.6	12.6	12.5	12.5	12.4
	9	12.6	12.5	12.5	12.4	12.4	12.3	12.3	12.4

Table 21: Test results conducted power measurement 802.11n HT-40

MIMO		maximum average conducted output power [dBm]		
Band	Ch	802.11n HT-20	Ch	802.11n HT-40
2450MHz	1	9.3	3	8.8
	6	9.0	6	8.6
	11	9.0	9	7.3

Table 22: Test results conducted power measured with **antenna A and B active – results for antenna/port B**

7.1.2 Conducted power measurements WLAN 5 GHz

Results for Antenna 1 (port/transmit chain A) [topside – left]

802.11a		maximum average conducted output power [dBm]							
Band	Ch	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
5200	36	**11.6**	11.2	10.8	10.3	9.8	9.3	8.8	8.2
	40	11.5	11.1	10.7	10.2	9.7	9.2	8.7	8.1
	44	11.4	11.0	10.6	10.1	9.6	9.1	8.6	8.0
	48	11.3	10.9	10.5	10.0	9.5	9.0	8.5	7.9
5300	52	11.6	11.2	10.8	10.3	9.8	9.3	8.8	8.2
	56	**11.8**	11.4	11.0	10.5	10.0	9.5	9.0	8.4
	60	11.7	11.3	10.9	10.4	9.9	9.4	8.9	8.3
	64	11.6	11.2	10.8	10.3	9.8	9.3	8.8	8.2
5600	100	11.4	11.0	10.6	10.1	9.6	9.1	8.6	8.0
	104	12.0	11.6	11.2	10.7	10.2	9.7	9.2	8.6
	108	11.9	11.5	11.1	10.6	10.1	9.6	9.1	8.5
	112	11.9	11.5	11.1	10.6	10.1	9.6	9.1	8.5
	116	11.8	11.4	11.0	10.5	10.0	9.5	9.0	8.4
	120	11.8	11.4	11.0	10.5	10.0	9.5	9.0	8.4
	124	11.9	11.5	11.1	10.6	10.1	9.6	9.1	8.5
	128	12.3	11.9	11.5	11.0	10.5	10.0	9.5	8.9
	132	**12.4**	12.0	11.6	11.1	10.6	10.1	9.6	9.0
	136	12.1	11.7	11.3	10.8	10.3	9.8	9.3	8.7
	140	12.1	11.7	11.3	10.8	10.3	9.8	9.3	8.7
5800	149	11.5	11.1	10.7	10.2	9.7	9.2	8.7	8.1
	153	**11.6**	11.2	10.8	10.3	9.8	9.3	8.8	8.2
	157	11.5	11.1	10.7	10.2	9.7	9.2	8.7	8.1
	161	11.4	11.0	10.6	10.1	9.6	9.1	8.6	8.0
	165	11.4	11.0	10.6	10.1	9.6	9.1	8.6	8.0

Table 23: Test results conducted power measurement 802.11a

802.11n HT-20 / 802.11ac VHT-20 maximum average conducted output power [dBm]										
Band [MHz]	Ch	MCS-0 6.5Mbps	MCS-1 13Mbps	MCS-2 19.5Mbps	MCS-3 26Mbps	MCS-4 39Mbps	MCS-5 52Mbps	MCS-6 58.5Mbps	MCS-7 65Mbps	MCS-8 78Mbps
5200	36	11.0	11.0	11.0	10.8	10.9	10.8	10.9	10.8	10.4
	40	11.0	11.0	10.9	10.9	10.8	10.8	10.8	10.7	10.4
	44	11.2	11.1	10.9	11.1	11.0	10.9	11.0	10.9	10.6
	48	11.3	11.2	11.0	11.1	11.0	10.8	11.0	10.8	10.8
5300	52	11.3	11.3	11.2	11.1	11.0	10.9	11.0	10.7	10.7
	56	11.4	11.3	11.3	11.3	11.2	11.2	11.2	11.1	10.8
	60	11.5	11.3	11.3	11.3	11.2	11.2	11.2	11.1	10.8
	64	11.5	11.5	11.4	11.3	11.1	11.2	11.1	11.1	10.9
5600	100	11.9	11.8	11.8	11.8	11.7	11.5	11.6	11.5	11.2
	104	12.3	12.3	12.4	12.3	12.4	12.3	12.3	12.1	11.8
	108	12.2	12.2	12.1	12.1	11.9	12.0	12.0	11.9	11.6
	112	12.0	11.8	11.9	11.8	11.5	11.7	11.7	11.6	11.2
	116	12.0	12.0	11.9	11.9	11.8	11.8	11.7	11.6	11.3
	120	11.8	11.7	11.7	11.7	11.6	11.5	11.5	11.5	11.0
	124	11.7	11.6	11.5	11.5	11.4	11.4	11.4	11.3	11.0
	128	11.8	11.7	11.6	11.6	11.5	11.5	11.5	11.4	10.9
	132	11.6	11.5	11.4	11.4	11.4	11.4	11.4	11.4	11.0
	136	11.2	11.1	11.0	11.0	10.9	10.9	10.8	10.7	10.4
	140	10.9	10.8	10.7	10.7	10.6	10.6	10.6	10.5	10.2
5800	149	10.8	10.7	10.6	10.6	10.5	10.5	10.5	10.4	10.1
	153	11.1	11.0	10.9	10.9	10.8	10.7	10.7	10.6	10.2
	157	11.2	11.2	11.2	11.2	11.1	11.1	11.1	11.0	10.7
	161	11.4	11.3	11.2	11.2	11.1	11.1	11.1	11.1	10.7
	165	11.4	11.3	11.2	11.2	11.1	11.0	11.0	10.9	10.6

Table 24: Test results conducted power measurement 802.11n HT-20 / 802.11ac VHT-20

MIMO 802.11n HT-20 / 802.11ac VHT-20 maximum average conducted output power[dBm]									
Band [MHz]	Ch	ht-8 13.5Mbps	ht-9 27Mbps	ht-10 40.5Mbps	ht-11 54Mbps	ht-12 81Mbps	ht-13 108Mbps	ht-14 121.5Mbps	ht-15 135Mbps
5200	36	11.5	10.9	10.8	10.6	10.7	10.6	10.7	10.6
	40	11.4	11.0	10.9	10.9	10.8	10.7	10.7	10.7
	44	11.6	11.0	10.9	11.0	10.9	10.7	10.8	10.7
	48	11.7	11.1	10.9	11.0	10.9	10.7	10.8	10.6
5300	52	10.6	10.1	10.0	9.9	9.8	9.7	9.8	9.5
	56	10.8	10.2	10.2	10.2	10.2	10.1	10.1	10.0
	60	10.8	10.2	10.2	10.2	10.1	10.1	10.1	10.0
	64	10.8	10.3	10.3	10.2	10.1	10.2	10.1	10.1
5600	100	12.3	11.8	11.8	11.8	11.7	11.5	11.6	11.5
	104	12.4	12.1	12.0	11.8	11.7	11.6	11.5	11.3
	108	12.5	12.0	11.9	11.9	11.7	11.8	11.8	11.7
	112	12.4	11.7	11.8	11.7	11.4	11.6	11.6	11.5
	116	12.4	11.9	11.8	11.8	11.7	11.7	11.6	11.5
	120	12.2	11.7	11.7	11.7	11.6	11.5	11.5	11.5
	124	12.1	11.5	11.4	11.4	11.3	11.3	11.3	11.2
	128	12.3	11.7	11.6	11.6	11.5	11.5	11.5	11.4
	132	12.0	11.5	11.4	11.4	11.4	11.4	11.4	11.4
	136	11.7	11.2	11.1	11.1	11.0	11.0	10.9	10.8
	140	11.4	10.8	10.7	10.7	10.6	10.6	10.6	10.5
5800	149	9.4	8.8	8.7	8.7	8.6	8.6	8.6	8.5
	153	9.6	9.1	9.0	9.0	8.9	8.8	8.8	8.7
	157	9.8	9.3	9.3	9.3	9.2	9.2	9.2	9.1
	161	9.9	9.4	9.3	9.3	9.2	9.2	9.2	9.2
	165	10.0	9.4	9.3	9.3	9.2	9.1	9.1	9.0

Table 25: Test results conducted power measured with **antenna A and B active – results for antenna/port A**

802.11n HT-40 / 802.11ac VHT-40 maximum average conducted output power [dBm]											
Band [MHz]	Ch	MCS-0 13.5Mbps	MCS-1 27Mbps	MCS-2 40.5Mbps	MCS-3 54Mbps	MCS-4 81Mbps	MCS-5 108Mbps	MCS-6 121.5Mbps	MCS-7 135Mbps	MCS-8 162Mbps	MCS-9 180Mbps
5200	38	11.1	11.1	11.1	10.9	11.0	10.9	11.0	10.9	10.6	10.8
	46	11.3	11.3	11.2	11.2	11.1	11.1	11.1	11.0	10.7	10.9
5300	54	11.3	11.2	11.0	11.1	11.0	10.8	10.9	10.8	10.5	10.6
	62	11.6	11.5	11.3	11.4	11.4	11.2	11.3	11.1	11.0	11.0
5600	102	11.9	12.0	11.9	11.8	11.7	11.6	11.7	11.4	11.5	11.5
	110	12.2	12.1	12.1	12.1	12.1	12.0	12.0	11.9	11.6	11.6
	118	12.0	11.8	11.8	11.8	11.7	11.7	11.7	11.6	11.3	11.4
	126	11.6	11.6	11.6	11.5	11.4	11.5	11.4	11.4	11.2	11.2
	134	11.6	11.6	11.6	11.6	11.5	11.3	11.4	11.3	11.0	11.0
5800	151	11.0	12.3	12.4	12.3	12.4	12.3	12.3	12.1	11.8	11.8
	159	11.4	11.4	11.3	11.3	11.1	11.2	11.2	11.1	10.8	10.7

Table 26: Test results conducted power measurement 802.11n HT-40 / 802.11ac VHT-40

MIMO 802.11n HT-40 / 802.11ac VHT-40 maximum average conducted output power [dBm]									
Band [MHz]	Ch	ht8 29.3Mbps	ht9 58.5Mbps	ht10 87.8Mbps	ht11 117Mbps	ht12 175.5Mbps	ht13 234Mbps	ht14 263.3Mbps	ht15 292.5Mbps
5200	38	10.4	10.1	10.0	9.7	9.6	9.5	9.6	9.6
	46	10.5	10.3	10.2	10.0	9.9	9.8	9.8	9.8
5300	54	11.1	10.8	10.7	10.7	10.5	10.3	10.4	10.3
	62	10.5	10.2	10.0	10.1	10.0	9.8	9.9	9.7
5600	102	11.3	11.1	11.0	10.8	10.6	10.4	10.4	10.2
	110	12.1	11.8	11.7	11.5	11.3	11.2	11.1	11.0
	118	11.8	11.3	11.3	11.1	11.0	11.0	11.0	10.9
	126	11.5	11.3	11.3	11.2	11.1	11.2	11.1	11.1
	134	11.5	11.1	11.1	11.1	10.9	10.7	10.8	10.7
5800	151	8.9	8.6	8.6	8.4	8.3	8.3	8.3	8.2
	159	8.9	8.5	8.4	8.4	8.2	8.3	8.3	8.2

Table 27: Test results conducted power measured with **antenna A and B active – results for antenna/port A**

802.11ac VHT-80 maximum average conducted output power [dBm]											
Band	Ch	MCS-0 29.3Mbps	MCS-1 58.5Mbps	MCS-2 87.8Mbps	MCS-3 117Mbps	MCS-4 175.5Mbps	MCS-5 234Mbps	MCS-6 263.3Mbps	MCS-7 292.5Mbps	MCS-8 351Mbps	MCS-9 390Mbps
5200	42	11.8	11.8	11.7	11.5	11.6	11.5	11.6	11.5	11.3	11.5
5300	58	7.9	8.0	7.9	7.9	7.8	7.7	7.7	7.7	7.5	7.6
5600	106	11.6	11.5	11.4	11.5	11.4	11.2	11.3	11.2	11.0	11.1
	122	11.6	11.5	11.3	11.4	11.3	11.1	11.2	11.0	10.9	11.1
5800	155	10.7	10.8	10.7	10.6	10.5	10.4	10.5	10.2	10.2	10.2

Table 28: Test results conducted power measurement 802.11ac VHT-80

MIMO 802.11ac VHT-80 maximum average conducted output power [dBm]											
Band	Ch	vht-0 58.5Mbps	vht-1 117Mbps	vht-2 175.5Mbps	vht-3 234Mbps	vht-4 351Mbps	vht-5 468Mbps	vht-6 526.5Mbps	vht-7 585Mbps	vht-8 702Mbps	vht-9 780Mbps
5200	42	9.0	8.7	8.6	8.3	8.2	8.1	8.0	8.0	6.9	5.1
5300	58	7.4	7.2	7.1	6.8	6.7	6.6	6.5	6.5	5.5	3.5
5600	106	9.3	9.0	8.9	8.9	8.7	8.5	8.6	8.7	7.9	6.0
	122	11.4	11.1	10.9	10.7	10.6	10.3	10.3	10.3	9.4	7.1
5800	155	8.0	7.9	7.9	7.7	7.5	7.4	7.4	7.3	6.6	4.5

Table 29: Test results conducted power measured with **antenna A and B active – results for antenna/port A**

Results for Antenna 2 (port/transmit chain B) [right side – upper corner]

802.11a		maximum average conducted output power [dBm]							
Band	**Ch**	**6Mbps**	**9Mbps**	**12Mbps**	**18Mbps**	**24Mbps**	**36Mbps**	**48Mbps**	**54Mbps**
5200	36	11.3	11.2	11.2	11.1	11.1	11.1	11.1	11.0
	40	11.3	11.2	11.1	11.1	11.0	11.0	11.0	10.9
	44	11.6	11.5	11.4	11.4	11.3	11.3	11.3	11.2
	48	**11.7**	11.6	11.5	11.5	11.4	11.4	11.4	11.3
5300	52	11.6	11.5	11.4	11.3	11.2	11.2	11.2	11.1
	56	11.7	11.6	11.6	11.6	11.5	11.5	11.5	11.5
	60	11.8	11.7	11.6	11.6	11.5	11.5	11.5	11.4
	64	**11.9**	11.8	11.7	11.6	11.5	11.5	11.5	11.4
5600	100	12.2	12.1	12.0	12.0	11.9	11.8	11.8	11.7
	104	**12.5**	12.4	12.5	12.5	12.5	12.4	12.4	12.3
	108	12.4	12.4	12.3	12.3	12.2	12.2	12.2	12.1
	112	12.3	12.2	12.1	12.0	11.9	11.9	11.9	11.8
	116	12.3	12.3	12.2	12.2	12.1	12.1	12.0	11.9
	120	12.1	12.0	12.0	12.0	11.9	11.8	11.8	11.8
	124	12.0	11.9	11.8	11.8	11.7	11.7	11.7	11.6
	128	12.2	12.1	12.0	12.0	11.9	11.9	11.9	11.8
	132	11.9	11.8	11.7	11.7	11.7	11.7	11.7	11.7
	136	11.5	11.4	11.3	11.3	11.2	11.2	11.1	11.0
	140	11.2	11.1	11.0	11.0	10.9	10.9	10.9	10.8
5800	149	11.0	10.9	10.8	10.8	10.7	10.7	10.7	10.6
	153	11.2	11.1	11.0	11.0	10.9	10.8	10.8	10.7
	157	11.5	11.5	11.5	11.5	11.4	11.4	11.4	11.3
	161	11.7	11.6	11.5	11.5	11.4	11.4	11.4	11.4
	165	**11.7**	11.6	11.5	11.5	11.4	11.3	11.3	11.2

Table 30: Test results conducted power measurement 802.11a

802.11n HT-20 / 802.11ac VHT-20 maximum average conducted output power [dBm]										
Band [MHz]	Ch	MCS-0 6.5Mbps	MCS-1 13Mbps	MCS-2 19.5Mbps	MCS-3 26Mbps	MCS-4 39Mbps	MCS-5 52Mbps	MCS-6 58.5Mbps	MCS-7 65Mbps	MCS-8 78Mbps
5200	36	11.1	11.1	11.1	11.0	11.0	11.0	11.0	10.9	10.7
	40	11.2	11.1	11.0	11.0	10.9	10.9	10.9	10.8	10.6
	44	11.4	11.3	11.2	11.2	11.1	11.1	11.1	11.0	10.8
	48	11.4	11.3	11.2	11.2	11.1	11.1	11.1	11.0	10.9
5300	52	11.5	11.4	11.3	11.2	11.1	11.1	11.1	11.0	10.8
	56	11.5	11.4	11.4	11.4	11.3	11.3	11.3	11.3	11.0
	60	11.6	11.5	11.4	11.4	11.3	11.3	11.3	11.2	11.0
	64	11.7	11.6	11.5	11.4	11.3	11.3	11.3	11.2	11.0
5600	100	12.1	12.0	11.9	11.9	11.8	11.7	11.7	11.6	11.3
	104	12.4	12.4	12.5	12.5	12.5	12.4	12.4	12.3	12.0
	108	12.3	12.3	12.2	12.2	12.1	12.1	12.1	12.0	11.7
	112	12.2	12.1	12.0	11.9	11.8	11.8	11.8	11.7	11.3
	116	12.1	12.1	12.0	12.0	11.9	11.9	11.8	11.7	11.4
	120	11.9	11.8	11.8	11.8	11.7	11.6	11.6	11.6	11.1
	124	11.8	11.7	11.6	11.6	11.5	11.5	11.5	11.4	11.1
	128	11.9	11.8	11.7	11.7	11.6	11.6	11.6	11.5	11.0
	132	11.7	11.6	11.5	11.5	11.5	11.5	11.5	11.5	11.1
	136	11.3	11.2	11.1	11.1	11.0	11.0	10.9	10.8	10.5
	140	11.0	10.9	10.8	10.8	10.7	10.7	10.7	10.6	10.3
5800	149	10.9	10.8	10.7	10.7	10.6	10.6	10.6	10.5	10.2
	153	11.2	11.1	11.0	11.0	10.9	10.8	10.8	10.7	10.3
	157	11.3	11.3	11.3	11.3	11.2	11.2	11.2	11.1	10.8
	161	11.5	11.4	11.3	11.3	11.2	11.2	11.2	11.2	10.8
	165	11.5	11.4	11.3	11.3	11.2	11.1	11.1	11.0	10.7

Table 31: Test results conducted power measurement 802.11n HT-20 / 802.11ac VHT-20

MIMO 802.11n HT-20 / 802.11ac VHT-20 maximum average conducted output power[dBm]									
Band [MHz]	Ch	ht-8 13.5Mbps	ht-9 27Mbps	ht-10 40.5Mbps	ht-11 54Mbps	ht-12 81Mbps	ht-13 108Mbps	ht-14 121.5Mbps	ht-15 135Mbps
5200	36	11.6	11.0	10.9	10.8	10.8	10.8	10.8	10.7
	40	11.6	11.1	11.0	11.0	10.9	10.8	10.8	10.8
	44	11.8	11.2	11.2	11.1	11.0	10.9	10.9	10.8
	48	11.8	11.2	11.1	11.1	11.0	11.0	10.9	10.8
5300	52	10.8	10.2	10.1	10.0	9.9	9.9	9.9	9.8
	56	10.9	10.3	10.3	10.3	10.3	10.2	10.2	10.2
	60	10.9	10.4	10.3	10.3	10.2	10.2	10.2	10.1
	64	11.0	10.4	10.4	10.3	10.3	10.3	10.3	10.2
5600	100	12.5	12.0	11.9	11.9	11.8	11.7	11.7	11.6
	104	12.5	12.2	12.1	12.0	11.8	11.7	11.6	11.5
	108	12.5	12.1	12.0	12.0	11.9	11.9	11.9	11.8
	112	12.4	12.0	11.9	11.8	11.7	11.7	11.7	11.6
	116	12.5	12.0	11.9	11.9	11.8	11.8	11.7	11.6
	120	12.3	11.8	11.8	11.8	11.7	11.6	11.6	11.6
	124	12.2	11.6	11.5	11.5	11.4	11.4	11.4	11.3
	128	12.4	11.8	11.7	11.7	11.6	11.6	11.6	11.5
	132	12.1	11.6	11.5	11.5	11.5	11.5	11.5	11.5
	136	11.8	11.3	11.2	11.2	11.1	11.1	11.0	10.9
	140	11.5	10.9	10.8	10.8	10.7	10.7	10.7	10.6
5800	149	9.5	8.9	8.8	8.8	8.7	8.7	8.7	8.6
	153	9.7	9.2	9.1	9.1	9.0	8.9	8.9	8.8
	157	9.9	9.4	9.4	9.4	9.3	9.3	9.3	9.2
	161	10.0	9.5	9.4	9.4	9.3	9.3	9.3	9.3
	165	10.1	9.5	9.4	9.4	9.3	9.2	9.2	9.1

Table 32: Test results conducted power measured with **antenna A and B active – results for antenna/port B**

802.11n HT-40 / 802.11ac VHT-40 maximum average conducted output power [dBm]											
Band [MHz]	Ch	MCS-0 13.5Mbps	MCS-1 27Mbps	MCS-2 40.5Mbps	MCS-3 54Mbps	MCS-4 81Mbps	MCS-5 108Mbps	MCS-6 121.5Mbps	MCS-7 135Mbps	MCS-8 162Mbps	MCS-9 180Mbps
5200	38	11.2	11.2	11.2	11.1	11.1	11.1	11.1	11.0	10.9	10.8
	46	11.5	11.4	11.3	11.3	11.2	11.2	11.2	11.1	10.9	10.9
5300	54	11.5	11.4	11.3	11.2	11.1	11.0	11.0	10.9	10.7	10.6
	62	11.7	11.6	11.5	11.5	11.5	11.5	11.4	11.3	11.1	11.0
5600	102	12.1	12.1	12.0	11.9	11.8	11.8	11.8	11.7	11.6	11.5
	110	12.3	12.2	12.2	12.2	12.2	12.1	12.1	12.1	11.8	11.6
	118	12.1	12.0	11.9	11.9	11.8	11.8	11.8	11.7	11.5	11.4
	126	11.8	11.7	11.7	11.6	11.6	11.6	11.6	11.5	11.3	11.2
	134	11.8	11.8	11.7	11.7	11.6	11.5	11.5	11.4	11.1	11.0
5800	151	11.1	12.4	12.5	12.5	12.5	12.4	12.4	12.3	12.0	11.8
	159	11.5	11.5	11.4	11.4	11.3	11.3	11.3	11.2	10.9	10.7

Table 33: Test results conducted power measurement 802.11n HT-40 / 802.11ac VHT-40

MIMO 802.11n HT-40 / 802.11ac VHT-40 maximum average conducted output power [dBm]									
Band [MHz]	Ch	ht8 29.3Mbps	ht9 58.5Mbps	ht10 87.8Mbps	ht11 117Mbps	ht12 175.5Mbps	ht13 234Mbps	ht14 263.3Mbps	ht15 292.5Mbps
5200	38	10.5	10.2	10.1	9.9	9.7	9.7	9.7	9.7
	46	10.7	10.4	10.3	10.1	10.0	9.9	9.9	9.9
5300	54	11.3	11.0	11.0	10.8	10.6	10.5	10.5	10.4
	62	10.6	10.3	10.2	10.2	10.1	10.1	10.0	9.9
5600	102	11.5	11.2	11.1	10.9	10.7	10.6	10.5	10.5
	110	12.2	11.9	11.8	11.6	11.4	11.3	11.2	11.2
	118	11.9	11.5	11.4	11.2	11.1	11.1	11.1	11.0
	126	11.7	11.4	11.4	11.3	11.3	11.3	11.3	11.2
	134	11.7	11.3	11.2	11.2	11.0	10.9	10.9	10.8
5800	151	9.0	8.7	8.7	8.6	8.4	8.4	8.4	8.4
	159	9.0	8.6	8.5	8.5	8.4	8.4	8.4	8.3

Table 34: Test results conducted power measured with **antenna A and B active – <u>results for antenna/port B</u>**

802.11ac VHT-80 maximum average conducted output power [dBm]											
Band	Ch	MCS-0 29.3Mbps	MCS-1 58.5Mbps	MCS-2 87.8Mbps	MCS-3 117Mbps	MCS-4 175.5Mbps	MCS-5 234Mbps	MCS-6 263.3Mbps	MCS-7 292.5Mbps	MCS-8 351Mbps	MCS-9 390Mbps
5200	42	11.9	11.9	11.8	11.7	11.7	11.7	11.7	11.6	11.6	11.5
5300	58	8.1	8.1	8.0	8.0	7.9	7.8	7.8	7.8	7.7	7.6
5600	106	11.8	11.7	11.7	11.6	11.5	11.4	11.4	11.3	11.2	11.1
	122	11.7	11.6	11.5	11.5	11.4	11.4	11.3	11.2	11.0	11.1
5800	155	10.9	10.9	10.8	10.7	10.6	10.6	10.6	10.5	10.3	10.2

Table 35: Test results conducted power measurement 802.11ac VHT-80

MIMO 802.11ac VHT-80 maximum average conducted output power [dBm]											
Band	Ch	vht-0 58.5Mbps	vht-1 117Mbps	vht-2 175.5Mbps	vht-3 234Mbps	vht-4 351Mbps	vht-5 468Mbps	vht-6 526.5Mbps	vht-7 585Mbps	vht-8 702Mbps	vht-9 780Mbps
5200	42	9.1	8.8	8.7	8.5	8.3	8.3	8.1	8.1	7.2	5.1
5300	58	7.6	7.3	7.2	6.9	6.8	6.7	6.6	6.6	5.7	3.5
5600	106	9.5	9.2	9.2	9.0	8.8	8.7	8.7	8.8	8.1	6.0
	122	11.5	11.2	11.1	10.8	10.7	10.6	10.4	10.5	9.5	7.1
5800	155	8.2	8.0	8.0	7.8	7.6	7.6	7.5	7.6	6.7	4.5

Table 36: Test results conducted power measured with **antenna A and B active – <u>results for antenna/port B</u>**

7.1.1 Conducted average power Bluetooth 2.4 GHz

Channel	Frequency (MHz)	Average power (dBm)				
		Limit	BR	EDR2	EDR3	LE
0	2402	7.0	6.52	6.49	6.58	6.38
39	2441	7.0	6.55	6.41	6.57	6.39
78	2480	7.0	6.58	6.46	6.52	6.44

Table 37: Conducted average power Bluetooth 2.4 GHz

7.1.2 Standalone SAR Test Exclusion according to FCC KDB 447498 D01

Standalone SAR test exclusion considerations for **body** position							
Communication system	freq. (MHz)	distance (mm)	P_{avg}* (dBm)	P_{avg}* (mW)	**$threshold_{1g}$ comparison value**	**SAR_{1g} test exclusion thresholds**	SAR_{1g} test exclusion
WLAN 2450 b	2450	5	14.0	25.1	7.9	3.0	no
WLAN 2450 g	2450	5	14.0	25.1	7.9	3.0	no
WLAN 2450 n	2450	5	14.0	25.1	7.9	3.0	no
WLAN 5.2 GHz	5200	5	12.5	17.8	8.1	3.0	no
WLAN 5.3 GHz	5300	5	12.5	17.8	8.2	3.0	no
WLAN 5.6 GHz	5600	5	12.5	17.8	8.4	3.0	no
WLAN 5.8 GHz	5800	5	12.5	17.8	8.6	3.0	no
BT BR-DER (GFSK)	2450	5	7.0	5.0	1.6	3.0	yes
BT BR-DER (8 DPSK)	2450	5	7.0	5.0	1.6	3.0	yes
BT LE	2450	5	7.0	5.0	1.6	3.0	yes

Table 38: Standalone SAR test exclusion considerations in body position.

P_{avg}* - maximum possible output power declared by manufacturer

The **1-g SAR test exclusion thresholds** for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)] ≤ **3.0** for 1-g SAR, where:

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

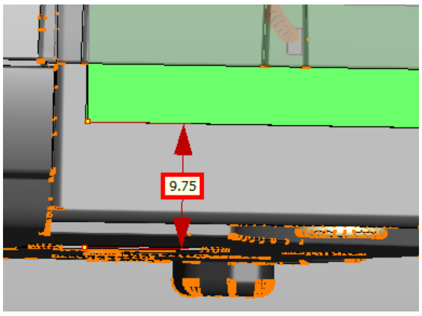
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

7.1.3 Standalone SAR Test Exclusion according to RSS-102 Issue 5

Standalone SAR test exclusion considerations for **body** position						
Communication system	freq. (MHz)	distance (mm)	P_{avg}* (dBm)	P_{avg}* (mW)	**Exemption Limits$_{1g}$ (mW)**	SAR test exclusion
WLAN 2450 b	2450	5	14.0	25.1	4.0	no
WLAN 2450 g	2450	5	14.0	25.1	4.0	no
WLAN 2450 n	2450	5	14.0	25.1	4.0	no
WLAN 5.2 GHz	5200	5	12.5	17.8	1.0	no
WLAN 5.3 GHz	5300	5	12.5	17.8	1.0	no
WLAN 5.6 GHz	5600	5	12.5	17.8	1.0	no
WLAN 5.8 GHz	5800	5	12.5	17.8	1.0	no
BT BR-DER (GFSK)	2450	5	7.0	5.0	4.0	no
BT BR-DER (8 DPSK)	2450	5	7.0	5.0	4.0	no
BT LE	2450	5	7.0	5.0	4.0	no
BT BR-DER (GFSK)	**2450**	**10**	**7.8**	**6.0**	**7.0**	**yes**
BT BR-DER (8 DPSK)	**2450**	**10**	**7.8**	**6.0**	**7.0**	**yes**
BT LE	**2450**	**10**	**7.8**	**6.0**	**7.0**	**yes**
Standalone SAR test exclusion considerations for **extremities** position						
Communication system	freq. (MHz)	distance (mm)	P_{avg}* (dBm)	P_{avg}* (mW)	**Exemption Limits$_{1g}$ (mW)**	SAR test exclusion
WLAN 2450 b	2450	5	14.0	25.1	10.0	no
WLAN 2450 g	2450	5	14.0	25.1	10.0	no
WLAN 2450 n	2450	5	14.0	25.1	10.0	no
WLAN 5.2 GHz	5200	5	12.5	17.8	2.5	no
WLAN 5.3 GHz	5300	5	12.5	17.8	2.5	no
WLAN 5.6 GHz	5600	5	12.5	17.8	2.5	no
WLAN 5.8 GHz	5800	5	12.5	17.8	2.5	no
BT BR-DER (GFSK)	**2450**	**5**	**10.0**	**10.0**	**10.0**	**yes**
BT BR-DER (8 DPSK)	**2450**	**5**	**10.0**	**10.0**	**10.0**	**yes**
BT LE	**2450**	**5**	**10.0**	**10.0**	**10.0**	**yes**

Table 39: Standalone SAR test exclusion considerations

P_{avg}* - maximum possible output power declared by manufacturer. Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1g of tissue applies, the exemption limits for routine evaluation in Table are multiplied by a factor of 5. For limb-worn devices where the 10g value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.
Antenna gain max. 2.4 GHz – 3.41dBi Horizontal; 0.77dBi Vertical
The distance from the Antenna to the bottom 9.75 mm



7.1.4 SAR measurement positions

SAR measurement positions body worn antenna 1						
mode	front	rear	left edge	right edge	top edge	bottom edge
WLAN 2450	no	yes	no	no	no	no
WLAN 5.2GHz	no	yes	no	no	no	no
WLAN 5.3GHz	no	yes	no	no	no	no
WLAN 5.6GHz	no	yes	no	no	no	no
WLAN 5.8GHz	no	yes	no	no	no	no
SAR measurement positions extremities antenna 1						
mode	front	rear	left edge	right edge	top edge	bottom edge
WLAN 2450	no	yes	yes	no	yes	no
WLAN 5.2GHz	no	yes	yes	no	yes	no
WLAN 5.3GHz	no	yes	yes	no	yes	no
WLAN 5.6GHz	no	yes	yes	no	yes	no
WLAN 5.8GHz	no	yes	yes	no	yes	no
SAR measurement positions body worn antenna 2						
mode	front	rear	left edge	right edge	top edge	bottom edge
WLAN 2450	no	yes	no	no	no	no
WLAN 5.2GHz	no	yes	no	no	no	no
WLAN 5.3GHz	no	yes	no	no	no	no
WLAN 5.6GHz	no	yes	no	no	no	no
WLAN 5.8GHz	no	yes	no	no	no	no
SAR measurement positions extremities antenna 2						
mode	front	rear	left edge	right edge	top edge	bottom edge
WLAN 2450	no	yes	no	yes	yes	no
WLAN 5.2GHz	no	yes	no	yes	yes	no
WLAN 5.3GHz	no	yes	no	yes	yes	no
WLAN 5.6GHz	no	yes	no	yes	yes	no
WLAN 5.8GHz	no	yes	no	yes	yes	no

Antennae position see in the photo documentation.

7.2 SAR test results

7.2.1 General description of test procedures

- The DUT is tested using a test software to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power.
- Test positions as described in the tables above are in accordance with the specified test standard.
- WLAN was tested in 802.11a/b mode with 1 MBit/s and 6 MBit/s.
- Required WLAN test channels were selected according to KDB 248227
- According to IEEE 1528 the SAR test shall be performed at middle channel. Testing of top and bottom channel is optional.
- According to KDB 447498 D01 testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
  - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- IEEE 1528-2013 requires the middle channel to be tested first. This generally applies to wireless devices that are designed to operate in technologies with tight tolerances for maximum output power variations across channels in the band. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

7.2.2 Results overview

measured / extrapolated SAR numbers - body - WLAN 2450 MHz														
Ch.	Freq. (MHz)	test cond.	Position 0 mm	cond. P_{max} (dBm)		SAR_{1g} (W/kg)			SAR_{10g} (W/kg)			power drift (dB)	liquid (°C)	Ant.
				declared*	meas.	meas.	extrap.	100% DF	meas.	extrap.	100% DF			
1	2412	1Mbit/s	rear	14.0	12.9	0.003	0.004	0.004	0.001	0.001	0.001	-0.08	21.1	A
1	2412	1Mbit/s	rear	14.0	12.9	**0.024**	**0.031**	**0.032**	0.011	0.014	0.014	0.09	21.1	B

Table 40: Test results body worn SAR WLAN 2450 MHz (see max. SAR plot Annex B.1: WLAN2450 page 48)

measured / extrapolated SAR numbers - Extremities - WLAN 2450 MHz											
Ch.	Freq. (MHz)	test cond.	Position	cond. P_{max} (dBm)		SAR_{10g} (W/kg)			power drift (dB)	liquid (°C)	Ant.
				declared*	meas.	meas.	extrap.	100% DF			
1	2412	1Mbit/s	left edge	14.0	12.9	0.000	0.000	0.000	-0.06	21.1	A
1	2412	1Mbit/s	top edge	14.0	12.9	0.036	0.046	0.047	-0.16	21.1	A
6	2437	1Mbit/s	top edge	14.0	12.8	0.036	0.047	0.048	-0.03	21.1	A
11	2462	1Mbit/s	top edge	14.0	12.7	0.041	0.056	0.056	0.18	21.1	A
1	2412	1Mbit/s	right edge	14.0	12.9	0.136	0.175	0.177	-0.02	21.1	B
6	2437	1Mbit/s	right edge	14.0	12.7	**0.146**	**0.197**	**0.199**	0.07	21.1	B
11	2462	1Mbit/s	right edge	14.0	12.6	0.137	0.189	0.191	0.12	21.1	B
1	2412	1Mbit/s	top edge	14.0	12.9	0.014	0.018	0.018	-0.10	21.1	B
13	2472	1Mbit/s	right edge	14.0	9.7	0.044	0.119	0.120	-0.08	21.1	B

Table 41: Test results Extremities SAR WLAN 2450 MHz (see max. SAR plot Annex B.1: WLAN2450)
* - maximum possible output power declared by manufacturer

measured / extrapolated SAR numbers - body - WLAN 5 GHz														
Ch.	Freq. (MHz)	test cond.	Position	cond. P_{max} (dBm)		SAR_{1g} (W/kg)			SAR_{10g} (W/kg)			power drift (dB)	liquid (°C)	Ant.
				declared*	meas.	meas.	extrap.	100% DF	meas.	extrap.	100% DF			
36	5180	6Mbit/s	rear	12.5	11.6	0.064	0.079	0.079	0.019	0.024	0.024	-0.17	20.8	A
56	5280	6Mbit/s	rear	12.5	11.8	0.079	0.093	0.094	0.023	0.027	0.027	-0.14	20.8	A
132	5660	6Mbit/s	rear	12.5	12.4	0.077	0.078	0.079	0.018	0.018	0.018	-0.18	20.8	A
153	5765	6Mbit/s	rear	12.5	11.6	0.056	0.068	0.069	0.017	0.021	0.021	-0.11	20.8	A
48	5240	6Mbit/s	rear	12.5	11.7	0.099	0.119	0.120	0.033	0.039	0.039	-0.14	20.8	B
64	5320	6Mbit/s	rear	12.5	11.9	0.108	0.124	0.125	0.034	0.039	0.040	-0.11	20.8	B
104	5520	6Mbit/s	rear	12.5	12.5	**0.210**	0.210	0.212	0.069	0.069	0.070	-0.04	20.8	B
165	5825	6Mbit/s	rear	12.5	11.7	0.183	**0.220**	**0.222**	0.061	0.073	0.074	-0.04	20.8	B

Table 42: Test results body worn SAR WLAN 5 GHz (see max. SAR plot Annex B.2: WLAN 5GHz page 50)

measured / extrapolated SAR numbers - Extremities - WLAN 5GHz - Limit for 10g: 4W/Kg											
Ch.	Freq. (MHz)	test cond.	Position	cond. P_{max} (dBm)		SAR_{10g} (W/kg)			power drift (dB)	liquid (°C)	Ant.
				declared**	meas.	meas.	extrap.	100% DF			
36	5180	6Mbit/s	left edge	12.5	11.6	0.001	0.002	0.002	-0.05	20.8	A
36	5180	6Mbit/s	top edge	12.5	11.6	0.163	0.201	0.203	0.14	20.8	A
56	5280	6Mbit/s	left edge	12.5	11.8	0.000	0.000	0.000	0.05	20.8	A
56	5280	6Mbit/s	top edge	12.5	11.8	0.190	0.223	0.225	0.08	20.8	A
132	5660	6Mbit/s	left edge	12.5	12.4	0.001	0.001	0.001	0.03	20.8	A
132	5660	6Mbit/s	top edge	12.5	12.4	0.361	0.369	0.373	0.07	20.8	A
153	5765	6Mbit/s	left edge	12.5	11.6	0.000	0.000	0.000	-0.06	20.8	A
153	5765	6Mbit/s	top edge	12.5	11.6	0.285	0.351	0.354	0.09	20.8	A
48	5240	6Mbit/s	right edge	12.5	11.7	0.204	0.245	0.248	0.01	20.8	B
48	5240	6Mbit/s	top edge	12.5	11.7	0.008	0.009	0.009	-0.05	20.8	B
64	5320	6Mbit/s	right edge	12.5	11.9	0.203	0.233	0.235	-0.02	20.8	B
64	5320	6Mbit/s	top edge	12.5	11.9	0.007	0.008	0.008	-0.05	20.8	B
104	5520	6Mbit/s	right edge	12.5	12.5	**0.591**	0.591	0.597	-0.04	20.8	B
104	5520	6Mbit/s	top edge	12.5	12.5	0.017	0.017	0.017	-0.02	20.8	B
165	5825	6Mbit/s	right edge	12.5	11.7	0.555	**0.667**	**0.674**	0.06	20.8	B
165	5825	6Mbit/s	top edge	12.5	11.7	0.013	0.015	0.015	0.06	20.8	B

Table 43: Test results body worn SAR WLAN 5 GHz (see max. SAR plot Annex B.2: WLAN 5GHz)

* - maximum possible output power declared by manufacturer

Estimated stand alone SAR.					
Communication system	freq. (GHz)	distance (mm)	P_{avg} (dBm)	P_{avg} (mW)	$estimated_{1-g}$ (W/kg)
Bluetooth 2450	2.45	5	7	5.0	0.209
Bluetooth 2450	2.45	10	7	5.0	0.105
Bluetooth 2450	2.45	15	7	5.0	0.070

Table 44: Estimated stand alone SAR_{max} for Bluetooth 2450MHz

7.2.3 Multiple Transmitter Information

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498D01 General RF Exposure Guidance v05.

reported SAR BT, WLAN2.4GHz and 5GHz, ΣSAR_{1g} evaluation, rear				
Antenna A \ Antenna B		BT2450	WLAN2450	WLAN5GHz
		0.105	0.032	0.222
BT2450	0.105	0.210	0.137	**0.327**
WLAN2450	0.004	0.109	0.036	0.226
WLAN5GHz	0.094	0.199	0.126	0.316

Table 45: SAR_{max} ΣSAR evaluation body worn

reported SAR BT, WLAN2.4GHz and 5GHz, ΣSAR_{10g} evaluation, left				
Antenna A \ Antenna B		BT2450	WLAN2450	WLAN5GHz
		0.000	0.000	0.000
BT2450	0.105	0.105	0.105	0.105
WLAN2450	0.000	0.000	0.000	0.000
WLAN5GHz	0.002	0.002	0.002	0.002
reported SAR BT, WLAN2.4GHz and 5GHz, ΣSAR_{10g} evaluation, top				
Antenna A \ Antenna B		BT2450	WLAN2450	WLAN5GHz
		0.105	0.018	0.017
BT2450	0.209	0.314	0.227	0.226
WLAN2450	0.056	0.161	0.074	0.073
WLAN5GHz	0.375	0.480	0.393	0.392
reported SAR BT, WLAN2.4GHz and 5GHz, ΣSAR_{10g} evaluation, right				
Antenna A \ Antenna B		BT2450	WLAN2450	WLAN5GHz
		0.209	0.199	0.674
BT2450	0.000	0.209	0.199	0.674
WLAN2450	0.000	0.209	0.199	0.674
WLAN5GHz	0.000	0.209	0.199	0.674

Table 46: SAR_{max} ΣSAR evaluation extremities

Conclusion:

ΣSAR < 1.6 W/kg, therefore simultaneous transmissions SAR measurement with the enlarged zoom scan measurement and volume scan post-processing procedures is **not** required.

8 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

Equipment	Type	Manufacturer	Serial No.	Last Calibration	Frequency (months)
Dosimetric E-Field Probe	EX3DV4	Schmid & Partner Engineering AG	3944	August 23, 2016	12
2450 MHz System Validation Dipole	D2450V2	Schmid & Partner Engineering AG	710	August 15, 2016	24
5 GHz System Validation Dipole	D5GHzV 2	Schmid & Partner Engineering AG	1055	August 14, 2015	24
Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	477	May 11, 2016	12
Software	DASY52 52.8.7	Schmid & Partner Engineering AG	---	N/A	--
Phantom ELI 4.0	QDOVA0 01BA	Schmid & Partner Engineering AG	1046	N/A	--
Network Analyser 300 kHz to 6 GHz	8753ES	Hewlett Packard)*	US39174436	January 29, 2015	24
Dielectric Probe Kit	85070C	Hewlett Packard	US99360146	N/A	12
Signal Generator	8671B	Hewlett Packard	2823A00656	January 29, 2015	24
Amplifier	25S1G4 (25 Watt)	Amplifier Reasearch	20452	N/A	--
Power Meter	NRP	Rohde & Schwarz	101367	February 1, 2016	24
Power Meter Sensor	NRP Z22	Rohde & Schwarz	100227	February 1, 2016	12
Power Meter Sensor	NRP Z22	Rohde & Schwarz	100234	February 1, 2016	12
Directional Coupler	778D	Hewlett Packard	19171	February 1, 2016	12

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

9 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A: System performance check

Date/Time: 21.12.2016 13:56:30

SystemPerformanceCheck-D2450 MSL 2016-12-21

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 710

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: f = 2450 MHz; σ = 2.036 S/m; ε_r = 51.058; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3944; ConvF(7.8, 7.8, 7.8); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL2450/d=10mm, Pin=1000 mW, dist=1.4mm/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 88.3 W/kg

MSL2450/d=10mm, Pin=1000 mW, dist=1.4mm/Zoom Scan (7x7x7)/Cube 0:

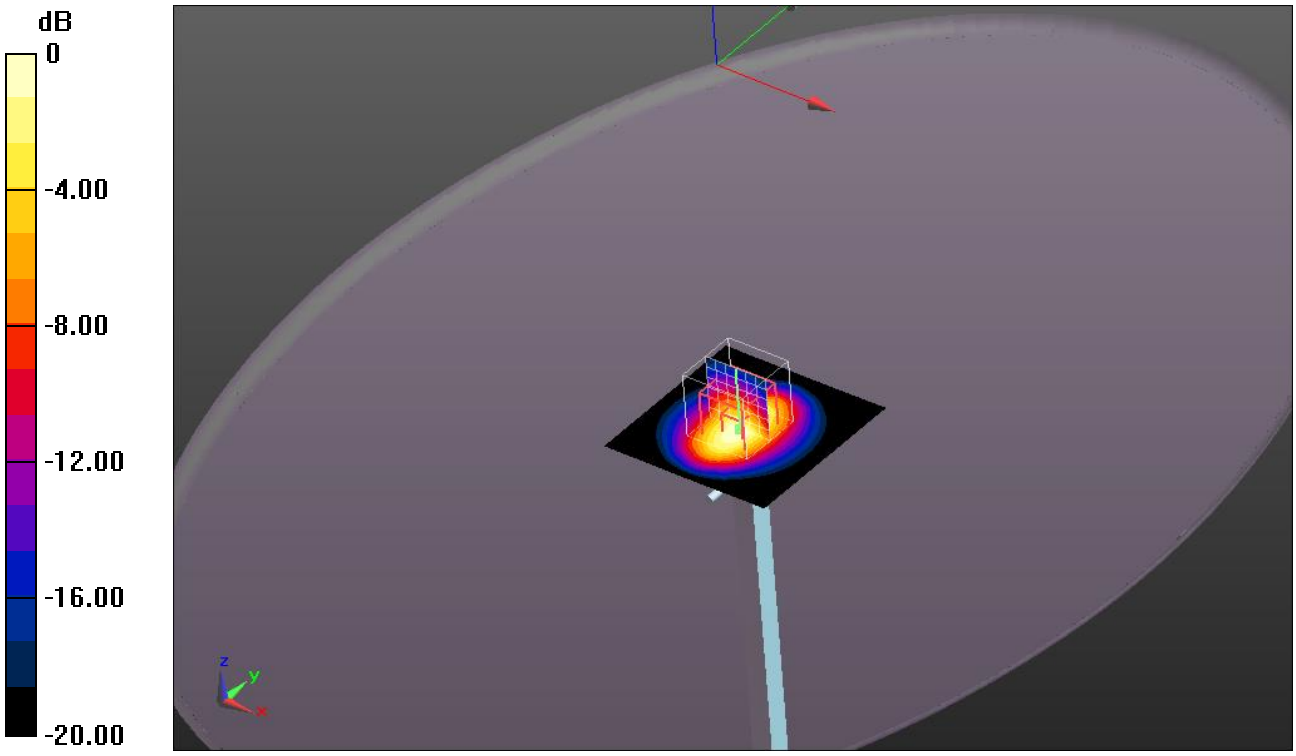
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 212.6 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 108 W/kg

SAR(1 g) = 51.7 W/kg; SAR(10 g) = 23.9 W/kg

Maximum value of SAR (measured) = 87.5 W/kg



0 dB = 87.5 W/kg = 19.42 dBW/kg

Additional information:

ambient temperature: 23.0°C; liquid temperature: 21.1°C

Date/Time: 22.12.2016 07:05:10

SystemPerformanceCheck-D5GHz MSL 2016-12-22

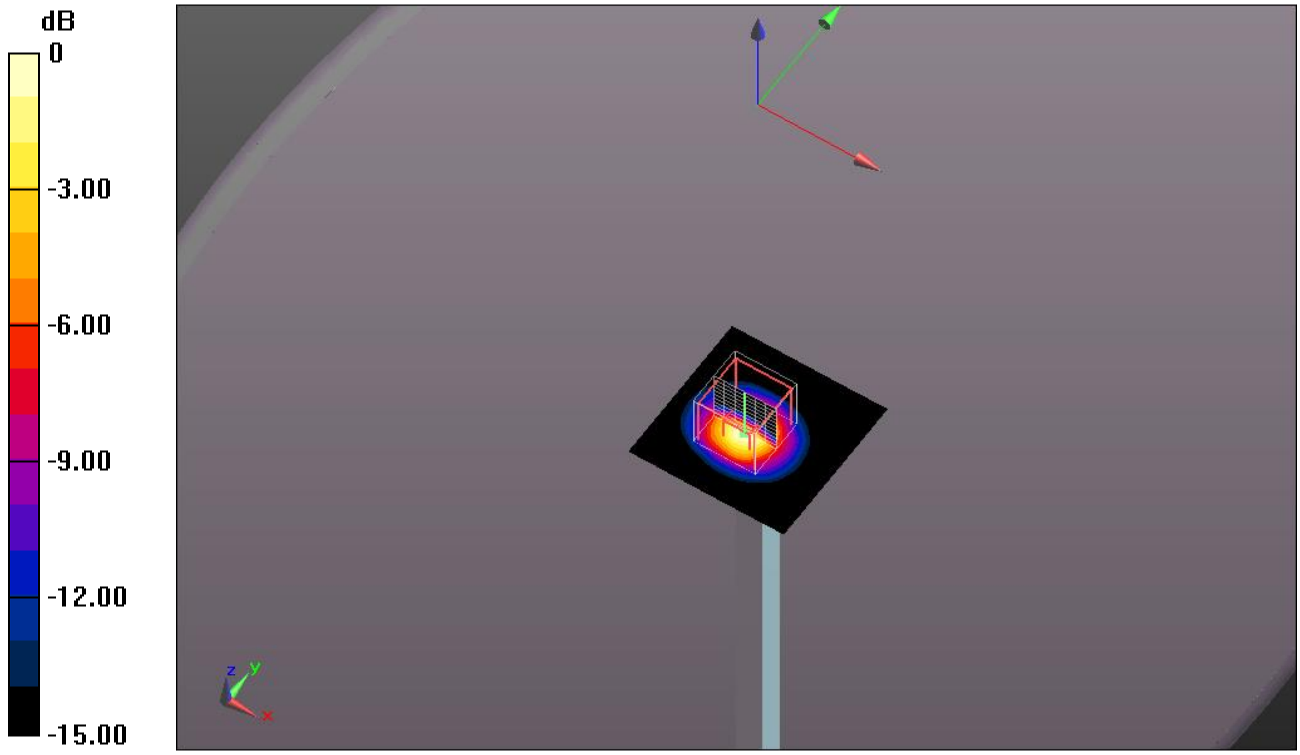
DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1055
Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5200 MHz; σ = 5.255 S/m; ε_r = 48.142; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3944; ConvF(4.85, 4.85, 4.85); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL/d=10mm, Pin=1000mW 5.2GHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 201 W/kg

MSL/d=10mm, Pin=1000mW 5.2GHz/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 195.9 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 303 W/kg
SAR(1 g) = 76.5 W/kg; SAR(10 g) = 21.6 W/kg
Maximum value of SAR (measured) = 193 W/kg



0 dB = 193 W/kg = 22.86 dBW/kg

Additional information:
ambient temperature: 22.9°C; liquid temperature: 20.8°C

Date/Time: 22.12.2016 07:28:14

SystemPerformanceCheck-D5GHz MSL 2016-12-22

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1055

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: f = 5500 MHz; σ = 5.649 S/m; ε_r = 47.668; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3944; ConvF(4.26, 4.26, 4.26); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL/d=10mm, Pin=1000mW 5.5GHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 233 W/kg

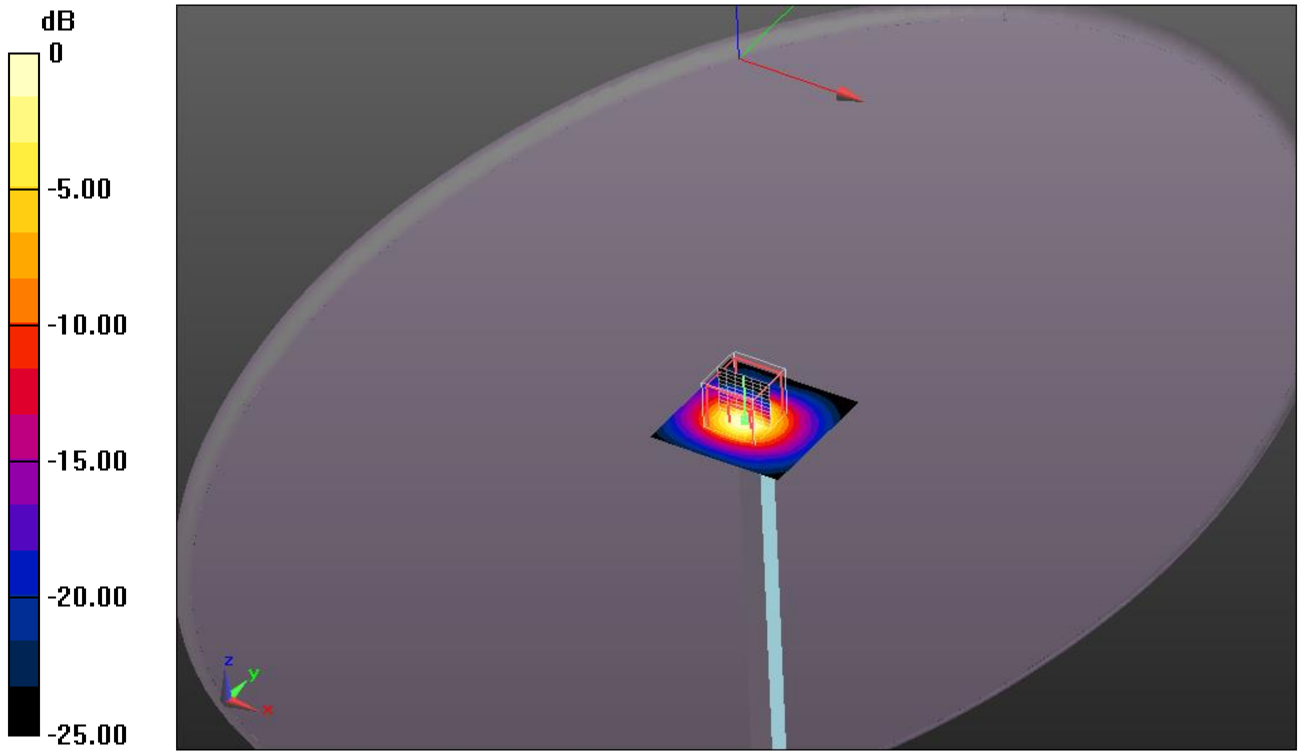
MSL/d=10mm, Pin=1000mW 5.5GHz/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 200.1 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 315 W/kg

SAR(1 g) = 78.4 W/kg; SAR(10 g) = 22.1 W/kg

Maximum value of SAR (measured) = 196 W/kg



0 dB = 196 W/kg = 22.92 dBW/kg

Additional information:

ambient temperature: 22.9°C; liquid temperature: 20.8°C

Date/Time: 22.12.2016 07:59:53

SystemPerformanceCheck-D5GHz MSL 2016-12-22

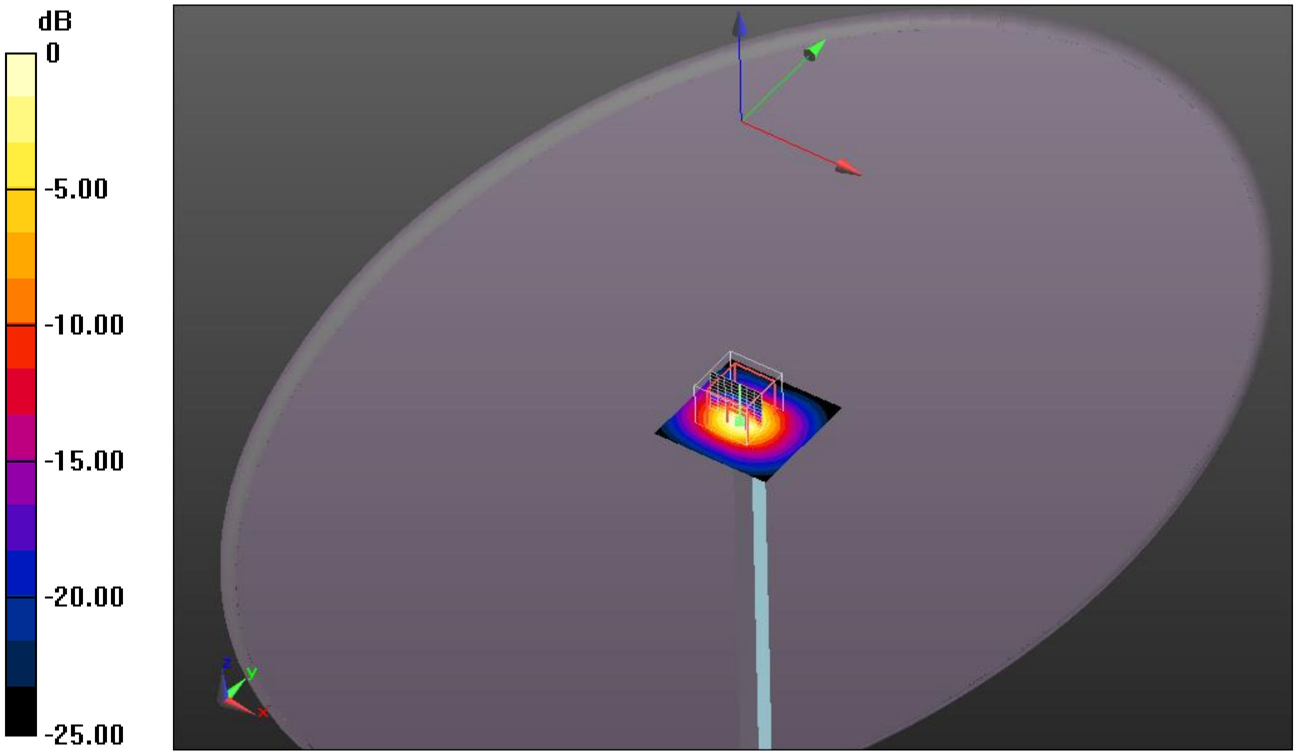
DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1055
Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5800 MHz; σ = 6.061 S/m; ε_r = 47.218; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3944; ConvF(4.13, 4.13, 4.13); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL/d=10mm, Pin=1000mW 5.8GHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 233 W/kg

MSL/d=10mm, Pin=1000mW 5.8GHz/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 201.2 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 323 W/kg
SAR(1 g) = 75.5 W/kg; SAR(10 g) = 21.2 W/kg
Maximum value of SAR (measured) = 195 W/kg



0 dB = 195 W/kg = 22.90 dBW/kg

Additional information:
ambient temperature: 22.9°C; liquid temperature: 20.8°C

Annex B: DASY5 measurement results

Annex 1.1.1 SAR plots for **the highest measured SAR** in each exposure configuration, wireless mode and frequency band combination according to FCC KDB 865664 D02

Annex B.1: WLAN2450

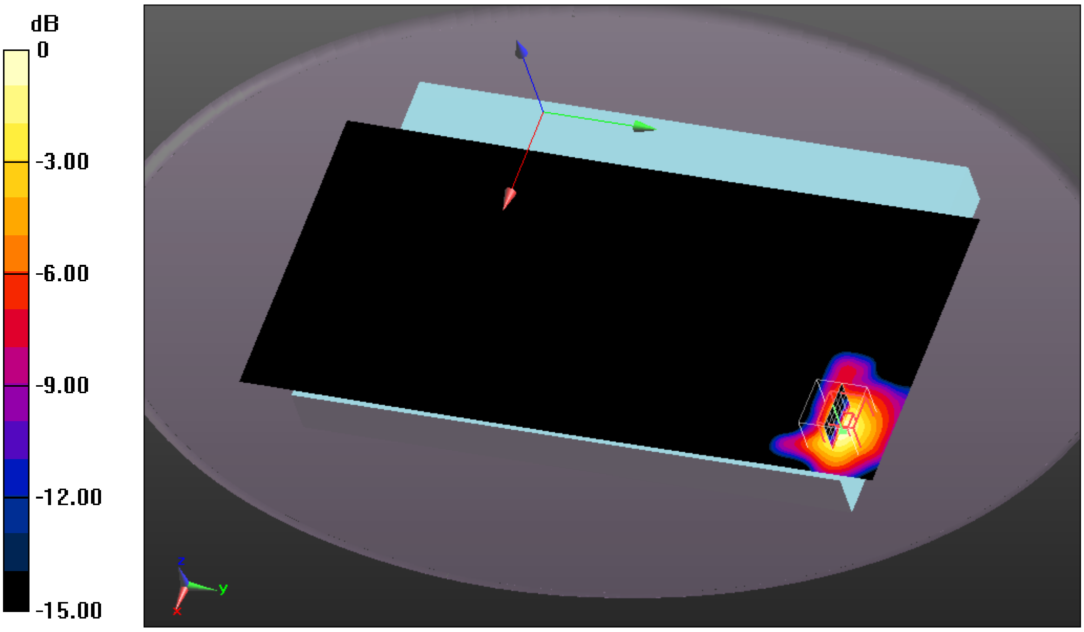
Date/Time: 21.12.2016 18:31:21

FCC_IEC-62209-2-WLAN2450 body

DUT: Siemens; Type: Simatic ITP1000; Serial: 10
Communication System: UID 0, WLAN 2450 (0); Communication System Band: 2.4 GHz; Frequency: 2412 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2412 MHz; σ = 1.988 S/m; ε_r = 51.129; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3944; ConvF(7.8, 7.8, 7.8); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 26.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL2450 Antenna B/Rear Position - Low/Area Scan (121x261x1): Interpolated grid:
dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0414 W/kg

MSL2450 Antenna B/Rear Position - Low/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 4.511 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.0510 W/kg
SAR(1 g) = 0.024 W/kg; SAR(10 g) = 0.011 W/kg
Maximum value of SAR (measured) = 0.0398 W/kg



0 dB = 0.0398 W/kg = -14.00 dBW/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 23.0°C; liquid temperature: 21.1°C

Date/Time: 21.12.2016 19:38:12

FCC_IEC-62209-2-WLAN2450 extremities

DUT: Siemens; Type: Simatic ITP1000; Serial: 10

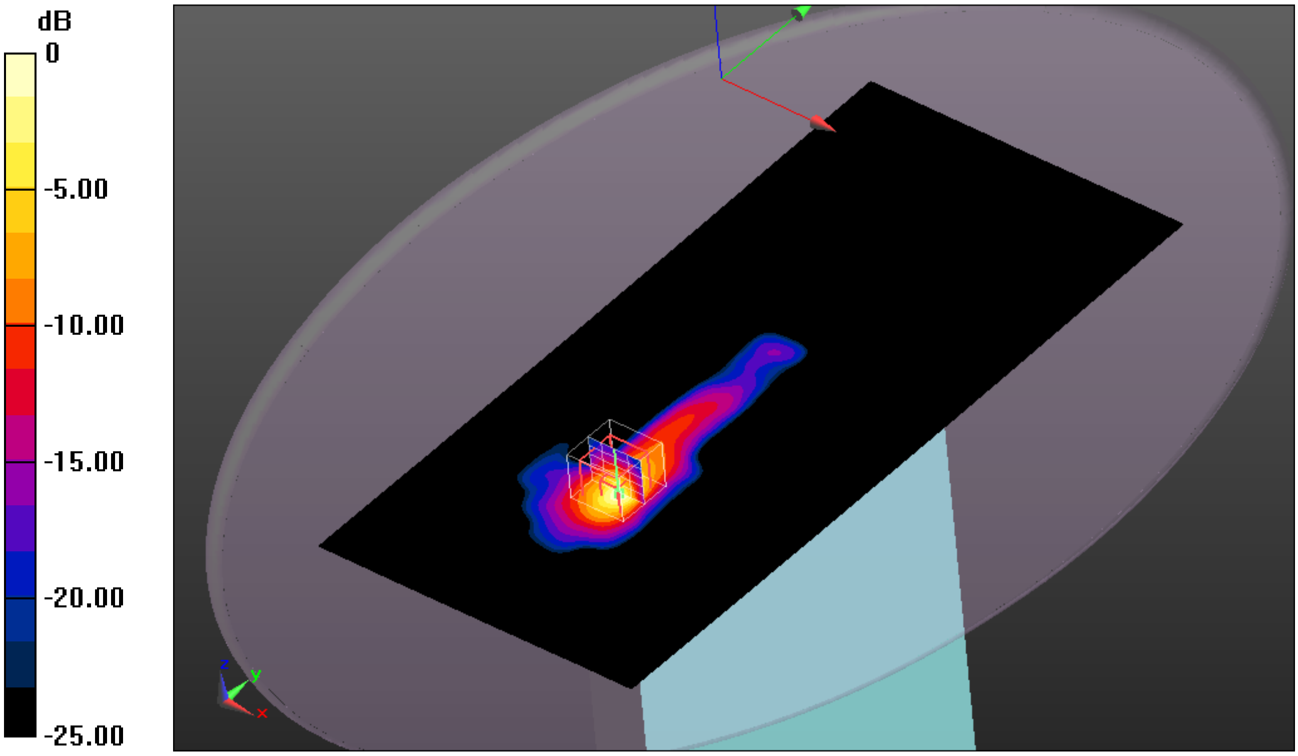
Communication System: UID 0, WLAN 2450 (0); Communication System Band: 2.4 GHz; Frequency: 2437 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2437 MHz; σ = 2.023 S/m; ε_r = 51.058; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3944; ConvF(7.8, 7.8, 7.8); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 26.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL2450 Antenna B/Right edge Position - Middle/Area Scan (121x261x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.854 W/kg

MSL2450 Antenna B/Right edge Position - Middle/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 19.926 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.403 W/kg; SAR(10 g) = 0.146 W/kg
Maximum value of SAR (measured) = 0.924 W/kg



0 dB = 0.924 W/kg = -0.34 dBW/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 23.0°C; liquid temperature: 21.1°C

Annex B.2: WLAN 5GHz

Date/Time: 22.12.2016 13:12:52

FCC_IEC-62209-2-WLAN5000 body

DUT: Siemens; Type: Simatic ITP1000; Serial: 10

Communication System: UID 0, WLAN 5GHz (0); Communication System Band: 5 GHz Band; Frequency: 5520 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: f = 5520 MHz; σ = 5.675 S/m; ε_r = 47.623; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3944; ConvF(4.26, 4.26, 4.26); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 26.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL5000 Antenna B/Rear Position - Ch104/Area Scan (121x251x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

MSL5000 Antenna B/Rear Position - Ch104/Zoom Scan (7x7x7)/Cube 0:

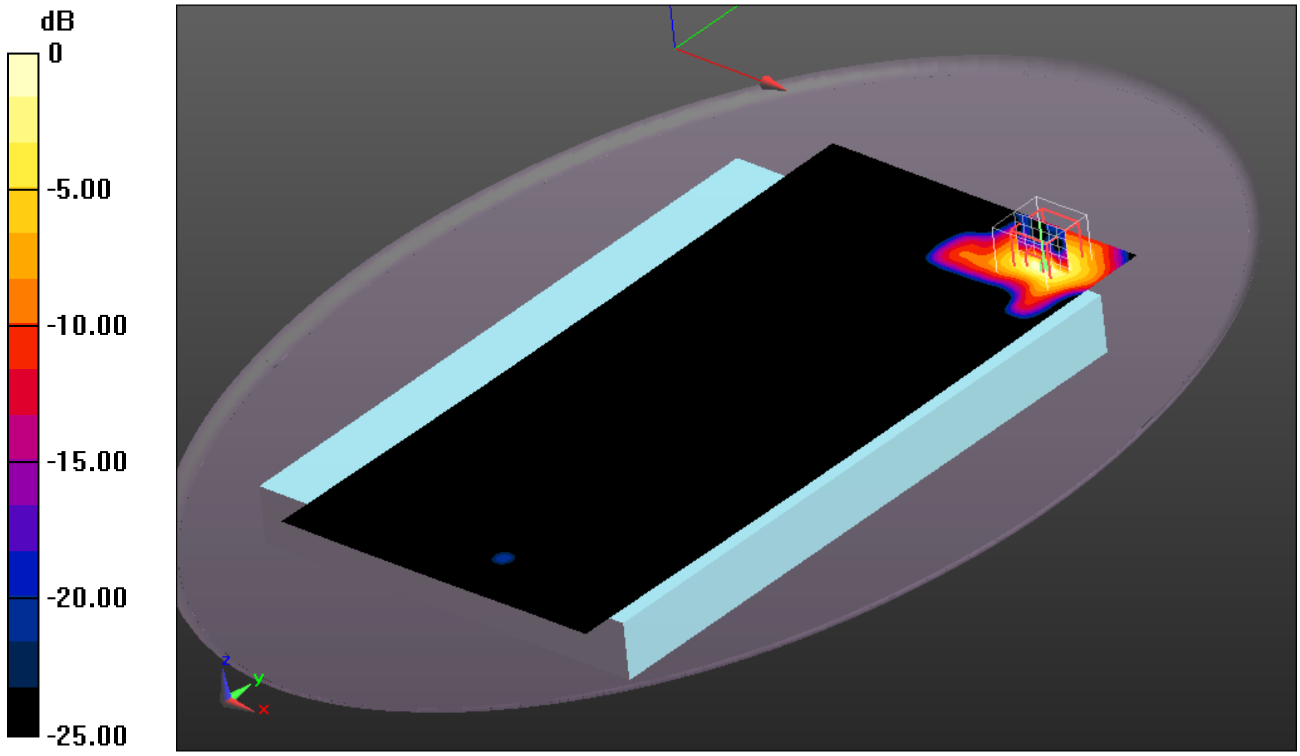
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.264 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.638 W/kg

SAR(1 g) = 0.210 W/kg; SAR(10 g) = 0.069 W/kg

Maximum value of SAR (measured) = 0.482 W/kg



0 dB = 0.482 W/kg = -3.17 dBW/kg

Additional information:

position or distance of DUT to SAM: 0 mm

ambient temperature: 22.9°C; liquid temperature: 20.8°C

Date/Time: 22.12.2016 13:40:10

FCC_IEC-62209-2-WLAN5000 body

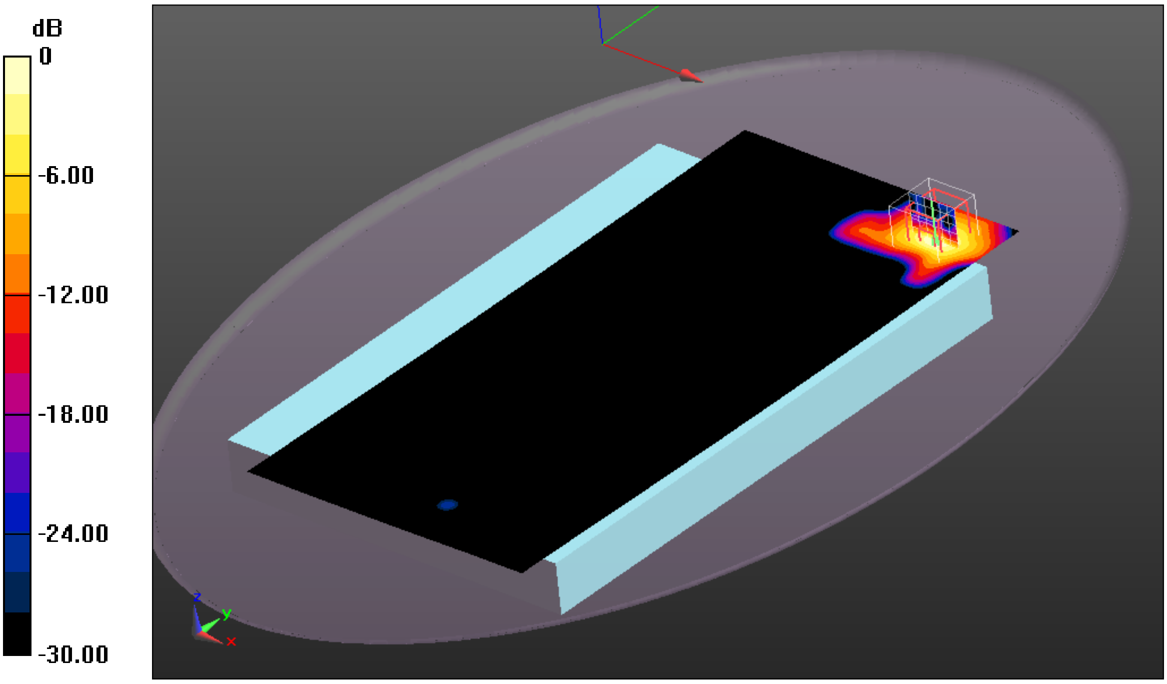
DUT: Siemens; Type: Simatic ITP1000; Serial: 10
Communication System: UID 0, WLAN 5GHz (0); Communication System Band: 5 GHz Band; Frequency: 5825 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5825 MHz; σ = 6.091 S/m; ε_r = 47.127; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3944; ConvF(4.13, 4.13, 4.13); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 26.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL5000 Antenna B/Rear Position - Ch165/Area Scan (121x251x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.321 W/kg

MSL5000 Antenna B/Rear Position - Ch165/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.836 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.830 W/kg
SAR(1 g) = 0.183 W/kg; SAR(10 g) = 0.061 W/kg
Maximum value of SAR (measured) = 0.431 W/kg



0 dB = 0.431 W/kg = -3.66 dBW/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 22.9°C; liquid temperature: 20.8°C

Date/Time: 22.12.2016 14:46:26

FCC_IEC-62209-2-WLAN5000 extremities

DUT: Siemens; Type: Simatic ITP1000; Serial: 10

Communication System: UID 0, WLAN 5GHz (0); Communication System Band: 5 GHz Band; Frequency: 5520 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: f = 5520 MHz; σ = 5.675 S/m; ε_r = 47.623; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3944; ConvF(4.26, 4.26, 4.26); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 26.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL5000 Antenna B/Right edge Position - Ch104/Area Scan (121x251x1):

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

Maximum value of SAR (interpolated) = 5.19 W/kg

MSL5000 Antenna B/Right edge Position - Ch104/Zoom Scan (7x7x7)/Cube 0:

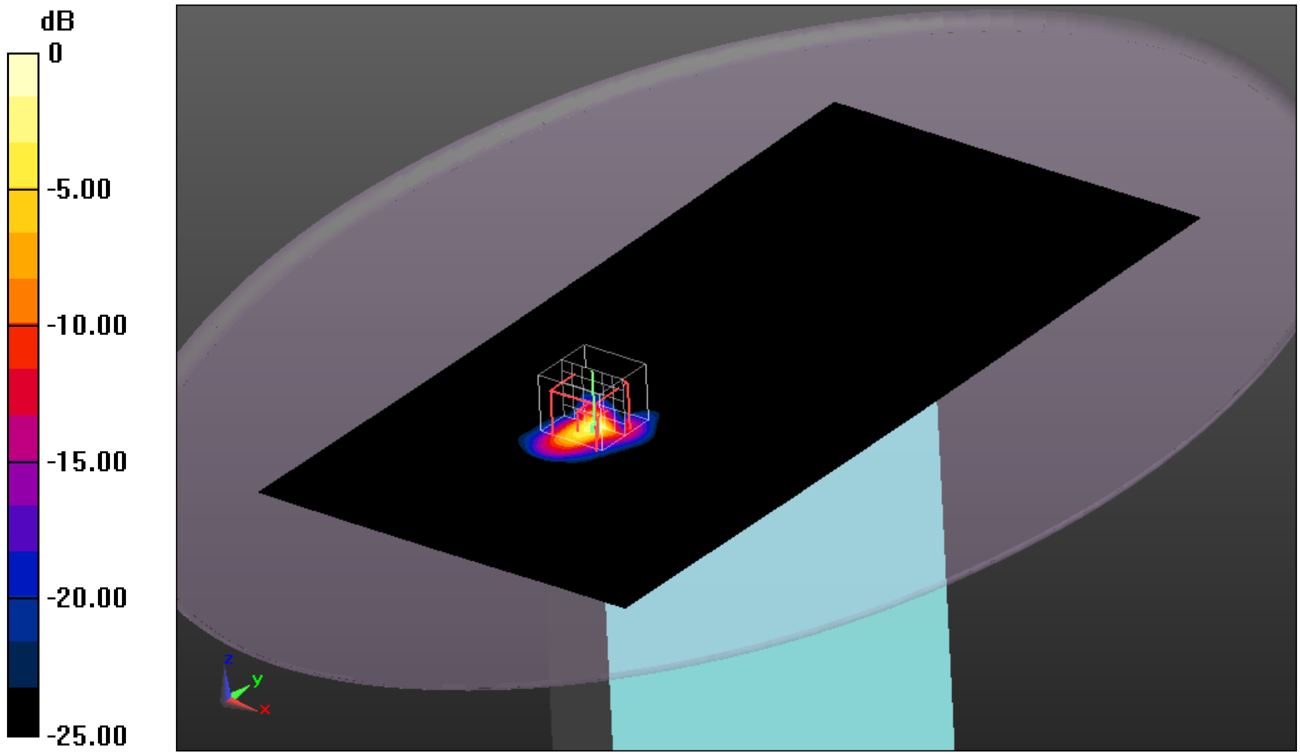
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.353 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 2.94 W/kg; SAR(10 g) = 0.591 W/kg

Maximum value of SAR (measured) = 8.93 W/kg



0 dB = 8.93 W/kg = 9.51 dBW/kg

Additional information:

position or distance of DUT to SAM: 0 mm

ambient temperature: 22.9°C; liquid temperature: 20.8°C

Date/Time: 22.12.2016 14:12:23

FCC_IEC-62209-2-WLAN5000 extremities

DUT: Siemens; Type: Simatic ITP1000; Serial: 10

Communication System: UID 0, WLAN 5GHz (0); Communication System Band: 5 GHz Band; Frequency: 5825 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: f = 5825 MHz; σ = 6.091 S/m; ε_r = 47.127; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3944; ConvF(4.13, 4.13, 4.13); Calibrated: 23.08.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 26.0
- Electronics: DAE3 Sn477; Calibrated: 11.05.2016
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

MSL5000 Antenna B/Right edge Position - Ch165/Area Scan (121x251x1):

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

Maximum value of SAR (interpolated) = 2.43 W/kg

MSL5000 Antenna B/Right edge Position - Ch165/Zoom Scan (7x7x7)/Cube 0:

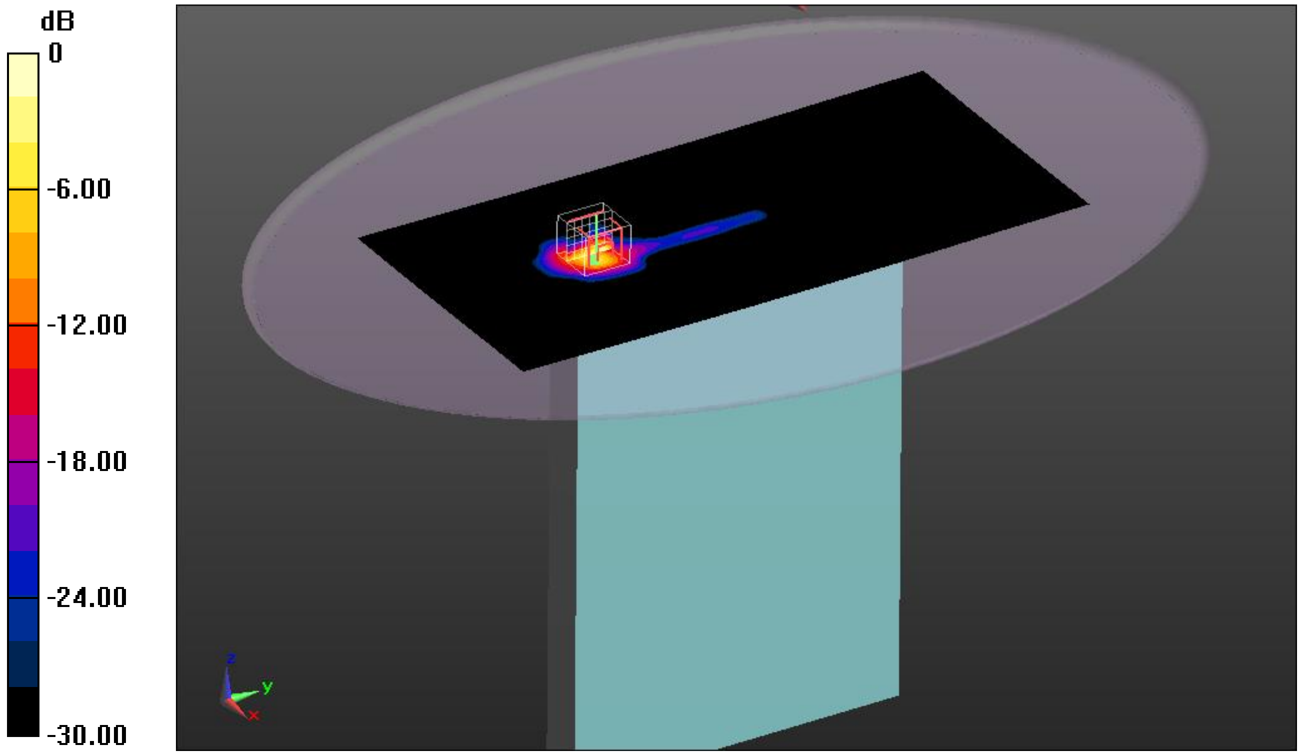
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.792 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 2.72 W/kg; SAR(10 g) = 0.555 W/kg

Maximum value of SAR (measured) = 7.75 W/kg



0 dB = 7.75 W/kg = 8.89 dBW/kg

Additional information:

position or distance of DUT to SAM: 0 mm

ambient temperature: 22.9°C; liquid temperature: 20.8°C

Annex B.3: Liquid depth

Photo 1: Liquid depth 2450 MHz body simulating liquid

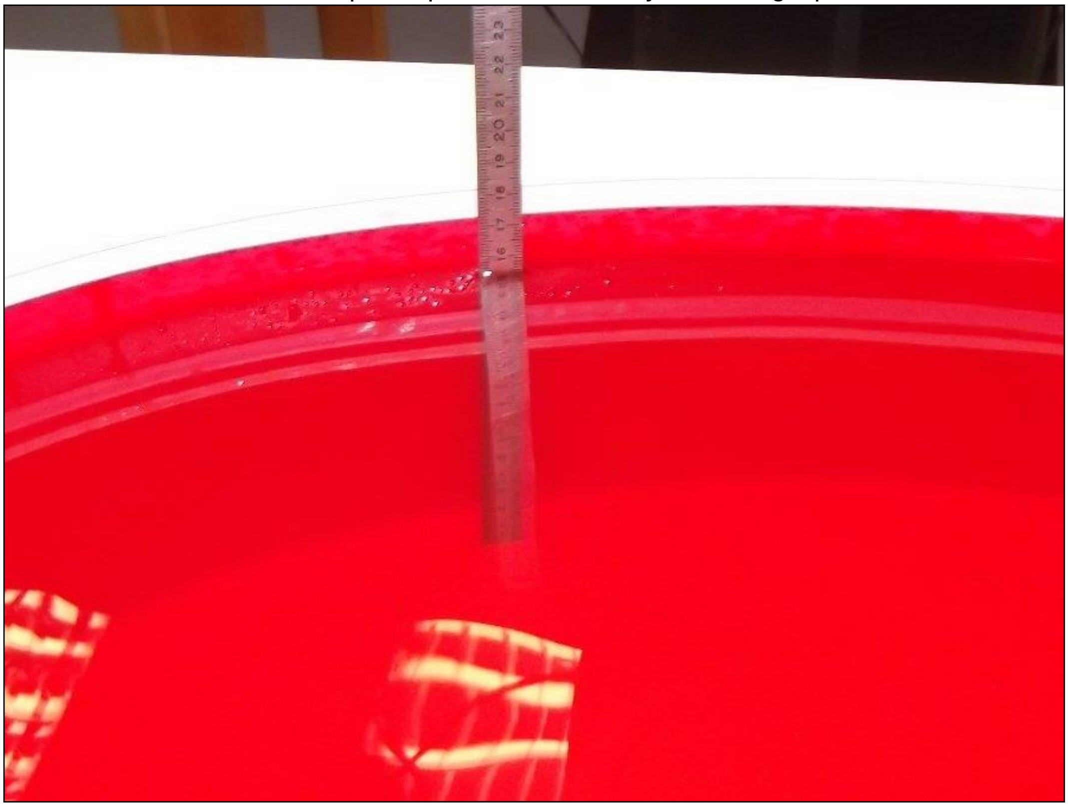
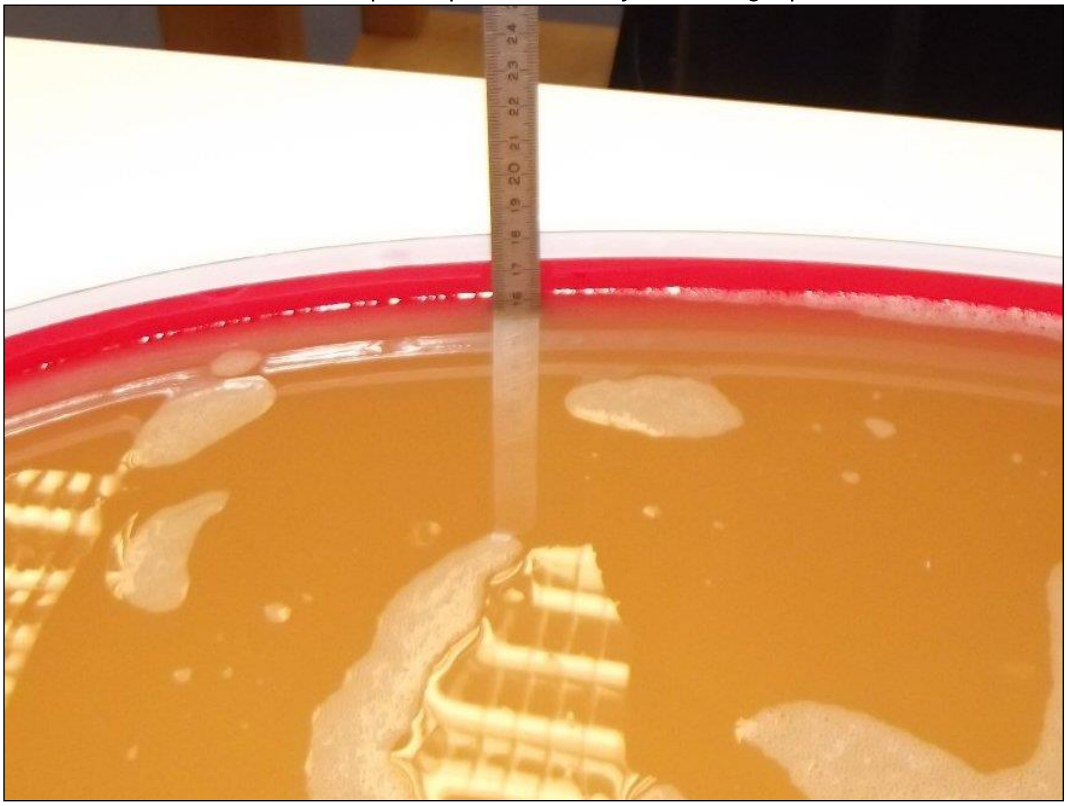


Photo 2: Liquid depth 5 GHz body simulating liquid



Annex C: Photo documentation

Photo documentation is described in the additional document:

Appendix to test report no. 1-1521/16-04-02-A Photo documentation

Annex D: Calibration parameters

Calibration parameters are described in the additional document:

Appendix to test report no. 1-1521/16-04-02-A
Calibration data, Phantom certificate
and detail information of the DASY5 System

Annex E: RF Technical Brief Cover Sheet acc. to RSS-102 Annex A

1. COMPANY NUMBER: **267AA**

2. PRODUCT MARKETING NAME (PNM): **ITP1000**

3. HARDWARE VERSION IDENTIFICATION NO. (HVIN): **ITP1000**

4. FIRMWARE VERSION IDENTIFICATION NO. (FVIN): **---**

5. HOST MARKETING NAME (HMN): **---**

6. IC CERTIFICATION NUMBER: **267AA-ITP1000**

7. APPLICANT: Siemens AG

8. SAR/RF EXPOSURE TEST LABORATORY: CTC advanced GmbH

9. TYPE OF EVALUATION:

(a) SAR Evaluation: **Device not used in the Vicinity of the Human Head**

(b) SAR Evaluation: **Body-Worn Device**

- Multiple transmitters: Yes ☒ No ☐
- Evaluated against exposure limits: General Public Use ☒ Controlled Use ☐
- Duty cycle used in evaluation: 100 %
- Standard used for evaluation:

RSS-102 Issue 5	(2015-03)	IEEE C95-3	(2002)
IEEE 1528-2013	(2014-06)	IEEE C95-1	(2005)
Safety Code No.6	(2015-06)	IEC 62209-2	(2010)

KDBs and further information follow in separate table below.

- SAR value: **0.222 W/kg**. Measured ☒ Computed ☐ Calculated ☐

(c) SAR Evaluation: **Limb-Worn Device**

- Multiple transmitters: Yes ☒ No ☐
- Evaluated against exposure limits: General Public Use ☒ Controlled Use ☐
- Duty cycle used in evaluation: 100 %
- Standard used for evaluation:

RSS-102 Issue 5	(2015-03)	IEEE C95-3	(2002)
IEEE 1528-2013	(2014-06)	IEEE C95-1	(2005)
Safety Code No.6	(2015-06)	IEC 62209-2	(2010)

KDBs and further information follow in separate table below.

- SAR value: **0.674 W/kg**. Measured ☒ Computed ☐ Calculated ☐

Annex E.1: Declaration of RF Exposure Compliance Annex B

ATTESTATION: I attest that the information provided in Annex E: is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Signature:

cn=Alexander Hnatovskiy, o=CTC advanced GmbH, ou=HNA-161129, email=Alexander.Hnatovskiy@ctcadvanced.com, c=DE
2017.01.30 13:37:37 +01'00'

NAME: **Alexander Hnatovskiy**

TITLE : Dipl.-Ing. (FH)

COMPANY : CTC advanced GmbH

PRODUCT MARKETING NAME (PMN): **---**

HARDWARE VERSION IDENTIFICATION NO. (HVIN): **ITP1000**

FIRMWARE VERSION IDENTIFICATION NO. (FVIN): **---**

HOST MARKETING NAME (HMN): **ITP1000**

IC CERTIFICATION NUMBER: **267AA-ITP1000**

Test Standard	**Version**	**FCC KDBs**	**Version**
IEEE 1528-2003	2003-04	KDB 865664D01v01r03	February 7, 2014
IEEE 1528-2013	2014-06	KDB 447498D01v05r02	February 7, 2014
RSS-102 Issue 5	2015-04	KDB 648474D04v01r02	December 4, 2013
Canada's Safety Code No. 6	2015-03	KDB 941225D07v01	May 28, 2013
IEEE Std. C95-3	2002	KDB 248227D01v02r01	June 8, 2015
IEEE Std. C95-1	2005	KDB 616217D04v01r01	May 28, 2013
IEC 62209-2	2010		

Annex F: Document History

Version	Applied Changes	Date of Release
	Initial Release	2017-01-13
-A	Corrected Annex E: RF Technical Brief Cover Sheet acc. to RSS-102 Annex A page 56 and 57.	2017-01-30

Annex G: Further Information

Glossary

BW	-	Bandwidth
DTS	-	Distributed Transmission System
DUT	-	Device under Test
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
OET	-	Office of Engineering and Technology
SAR	-	Specific Absorption Rate
S/N	-	Serial Number
SW	-	Software
UNII	-	Unlicensed National Information Infrastructure