FCC SAR Test Report

Report No.	**: SA171130C28**
Applicant	**: Honeywell International Inc.**
Address	**: 9680 Old Bailes Road, Fort Mill, SC 29707 USA**
Product	**: Dolphin CN80**
FCC ID	**: HD5-CN80L0N**
Brand	**: Honeywell**
Model No.	**: CN80L0N**
Standards	**: FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013 KDB 865664 D01 v01r04, KDB 865664 D02 v01r02 KDB 248227 D01 v02r02, KDB 447498 D01 v06, KDB 648474 D04 v01r03**
Sample Received Date	**: Dec. 04, 2017**
Date of Testing	**: Jan. 30, 2018 ~ Feb, 09, 2018**
Lab Address	**: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.**
Test Location	**: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)**

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Report No.	Reason for Change	Date Issued
SA171130C28	Initial release	Feb. 14, 2018

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest SAR-1g Head (W/kg)	Highest SAR-1g Body-worn (W/kg)	Highest SAR-1g Head (W/kg)	Highest SAR-1g Body-worn (W/kg)
		EX20		N6603ER	
DTS	2.4G WLAN	0.86	0.19	0.97	0.26
NII	5G WLAN	1.19	0.21	1.19	0.20
DSS	Bluetooth Ant0	0.00	0.00	0.07	0.01
DSS	Bluetooth Ant1	N/A	N/A	N/A	N/A
DSS	Zigbee	N/A	N/A	N/A	N/A
DXX	NFC	N/A	N/A	N/A	N/A
Highest Simultaneous Transmission SAR		Head	Body-worn	Head	Body-worn
		1.30	0.25	1.30	0.30

Note:

1. The SAR criteria **(Head & Body: SAR-1g 1.6 W/kg, and Extremity: SAR-10g 4.0 W/kg)** for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.
2. Bluetooth Ant 1 function only can be activated when EUT is in power off mode. Furthermore, Bluetooth Ant 1 cannot be operated with other Tx function.

2. Description of Equipment Under Test

EUT Type	Dolphin CN80
IC	HD5-CN80L0N
Brand Name	Honeywell
Model Name	CN80L0N
EUT Configurations	Sample 1: Short K/B-Qwety + Scanner (EX20) Sample 2: Short K/B-number + Scanner (EX20) Sample 3: Short K/B-Qwety + Scanner (N6603ER) Sample 4: Short K/B-number + Scanner (N6603ER)
Tx Frequency Bands (Unit: MHz)	WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480 Zigbee : 2405 ~ 2480 NFC : 13.56
Uplink Modulations	802.11b : DSSS 802.11a/g/n/ac : OFDM Bluetooth : GFSK, π/4-DQPSK, 8-DPSK Zigbee : O-QPSK NFC : ASK
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.6.1 of this report
Antenna Type	PIFA Antenna (Peak Antenna Gain : -0.38 dBi for BT Ant0, -0.03 dBi for BT Ant1/Zigbee, 3.36 dBi for WLAN2.4GHz, 3.46 dBi for WLAN5GHz)
EUT Stage	Engineering Sample

Note:

1. All Scanners are listed as below.

item	Model	Difference
Scanner	EX20	20.53 mm (L) x 7.8 mm (W) x 3.97 mm (H) (8.08 in x 3.07 in x 1.56 in) Weight: 500 grams (17.6 oz) with battery pack
	N6603ER	20.4 mm (L) x 7.8 mm (W) x 3.32 mm (H (8.03 in x 3.07 in x 1.31 in) Weight: 550 grams (19.4 oz) with battery pack
* All scanners are appearance and size different.		

2. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory:

Battery	**Brand Name**	Inventus Power, Inc. / Honeywell
	Model Name	CW-BAT
	Power Rating	3.85Vdc, 5800mAh
	Type	Li-ion

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

3.2 SPEAG DASY52 System

DASY52 system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY52 software defined. The DASY52 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

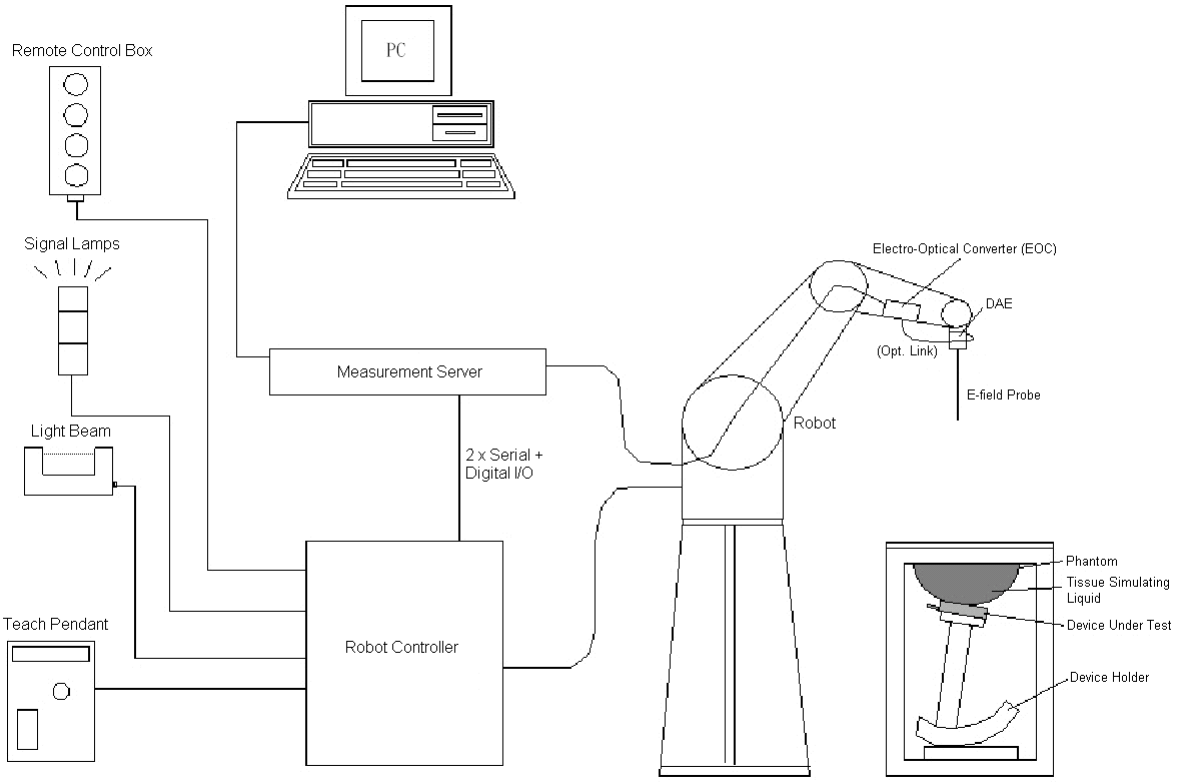


Fig-3.1 SPEAG DASY52 System Setup

3.2.1 Robot

The DASY52 system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version of CS8c from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Fig-3.2 SPEAG DASY52 System

3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

Model	EX3DV4
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB
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: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

Model	ES3DV3
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm

Model	ET3DV6
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 2.3 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.4 dB in TSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm

3.2.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset Voltage	< 5µV (with auto zero)
Input Bias Current	< 50 fA
Dimensions	60 x 60 x 68 mm

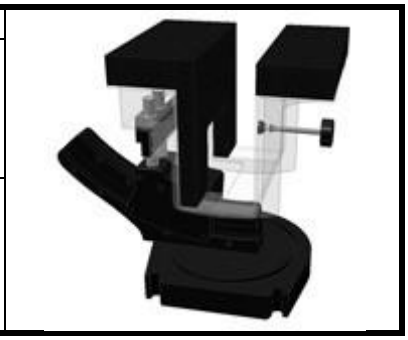
3.2.4 Phantoms

Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.
Material	Vinylester, glass fiber reinforced (VE-GF)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters

Model	ELI
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.
Material	Vinylester, glass fiber reinforced (VE-GF)
Shell Thickness	2.0 ± 0.2 mm (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	approx. 30 liters

3.2.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.

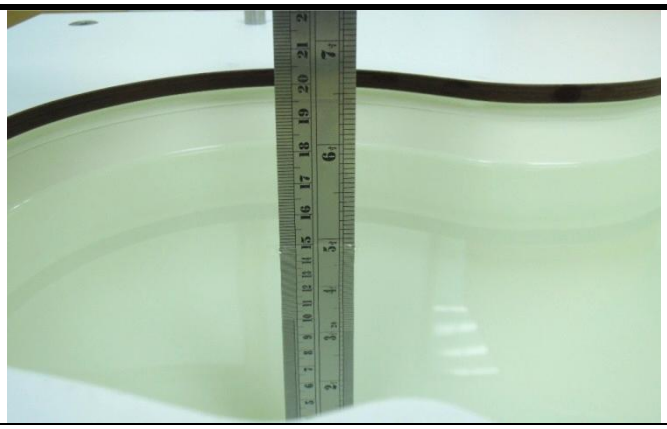
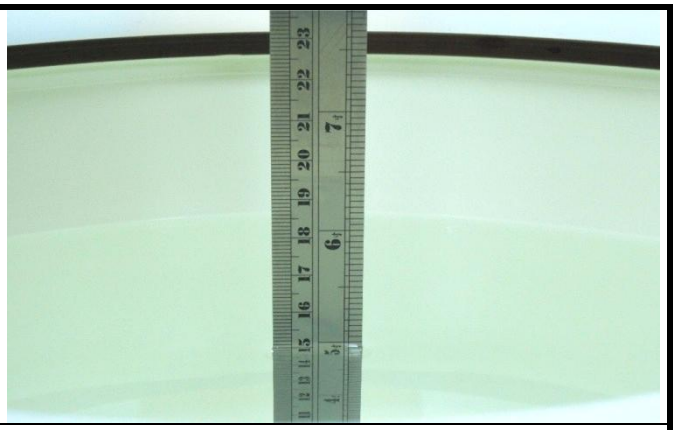
	

Photo of Liquid Height for Head Position	**Photo of Liquid Height for Body Position**

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 and IEC 62209-1. For the body tissue simulating liquids, the dielectric properties are defined in RSS-102 Annex D and IEC 62209-2. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.

Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
For Body				
750	55.5	52.7 ~ 58.3	0.96	0.91 ~ 1.01
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
900	55.0	52.3 ~ 57.8	1.05	1.00 ~ 1.10
1450	54.0	51.3 ~ 56.7	1.30	1.24 ~ 1.37
1640	53.8	51.1 ~ 56.5	1.40	1.33 ~ 1.47
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1800	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2000	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2300	52.9	50.3 ~ 55.5	1.81	1.72 ~ 1.90
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
2600	52.5	49.9 ~ 55.1	2.16	2.05 ~ 2.27
3500	51.3	48.7 ~ 53.9	3.31	3.14 ~ 3.48
5200	49.0	46.6 ~ 51.5	5.30	5.04 ~ 5.57
5300	48.9	46.5 ~ 51.3	5.42	5.15 ~ 5.69
5500	48.6	46.2 ~ 51.0	5.65	5.37 ~ 5.93
5600	48.5	46.1 ~ 50.9	5.77	5.48 ~ 6.06
5800	48.2	45.8 ~ 50.6	6.00	5.70 ~ 6.30

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.5	56.0	-	42.1	-
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H900	0.2	-	0.2	1.4	58.0	-	40.2	-
H1450	-	43.3	-	0.6	-	-	56.1	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1800	-	44.5	-	0.3	-	-	55.2	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2000	-	44.5	-	0.1	-	-	55.4	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.5	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	31.0	-	0.2	-	-	68.8	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

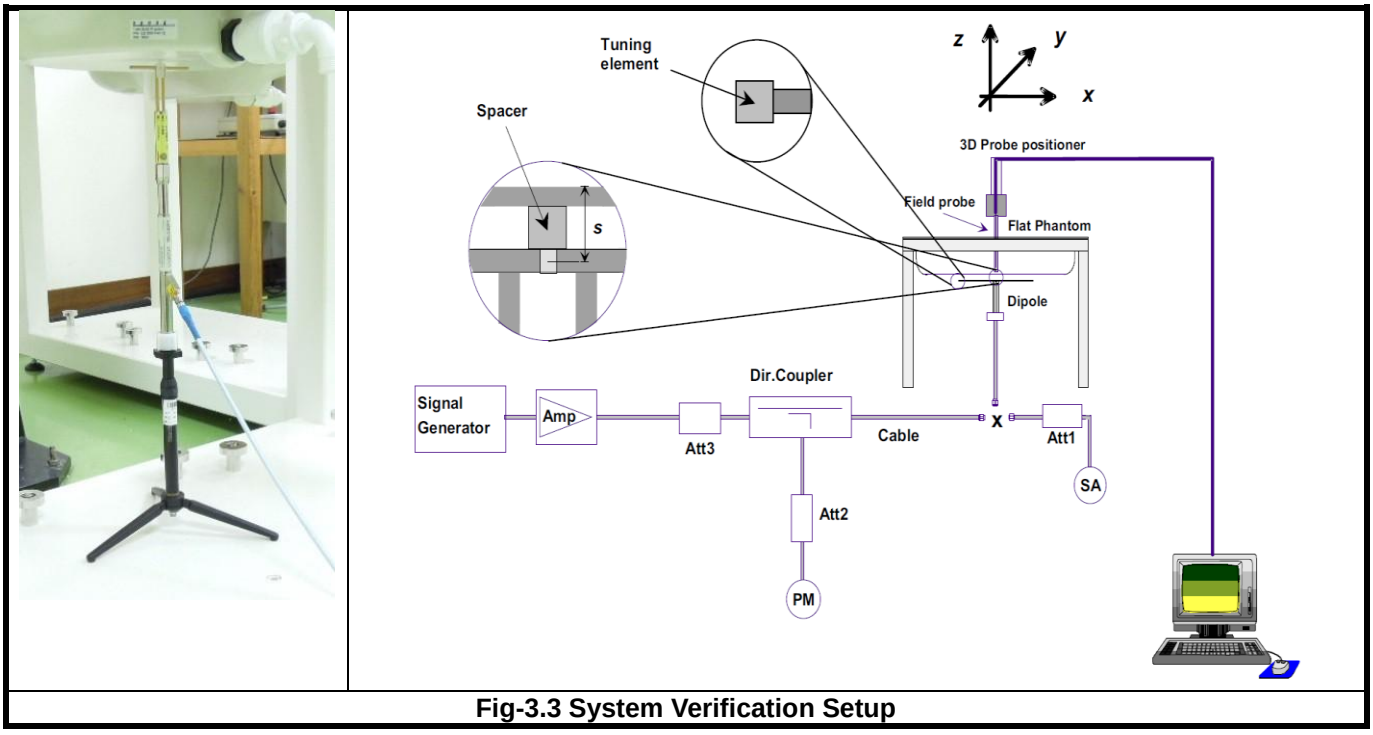


Fig-3.3 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit maximum output power
(b) Measure conducted output power through RF cable
(c) Place the EUT in the specific position of phantom
(d) Perform SAR testing steps on the DASY system
(e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	<= 2 GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan (Δx, Δy)	<= 15 mm	<= 12 mm	<= 12 mm	<= 10 mm	<= 10 mm
Zoom Scan (Δx, Δy)	<= 8 mm	<= 5 mm	<= 5 mm	<= 4 mm	<= 4 mm
Zoom Scan (Δz)	<= 5 mm	<= 5 mm	<= 4 mm	<= 3 mm	<= 2 mm
Zoom Scan Volume	>= 30 mm	>= 30 mm	>= 28 mm	>= 25 mm	>= 22 mm

Note:

When zoom scan is required and report SAR is <= 1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3GHz: <= 8 mm, 3-4GHz: <= 7 mm, 4-6GHz: <= 5 mm) may be applied.

3.4.2 Volume Scan Procedure

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

3.4.3 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

3.4.4 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard’s method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

<Considerations Related to WLAN for Setup and Testing>

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

1) The channel closest to mid-band frequency is selected for SAR measurement.

2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

<Considerations Related to Bluetooth for Setup and Testing>

This device has installed Bluetooth engineering testing software which can provide continuous transmitting RF signal. During Bluetooth SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

4.2 EUT Testing Position

According to KDB 648474 D04, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

4.2.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2003 using the SAM phantom illustrated as below.

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

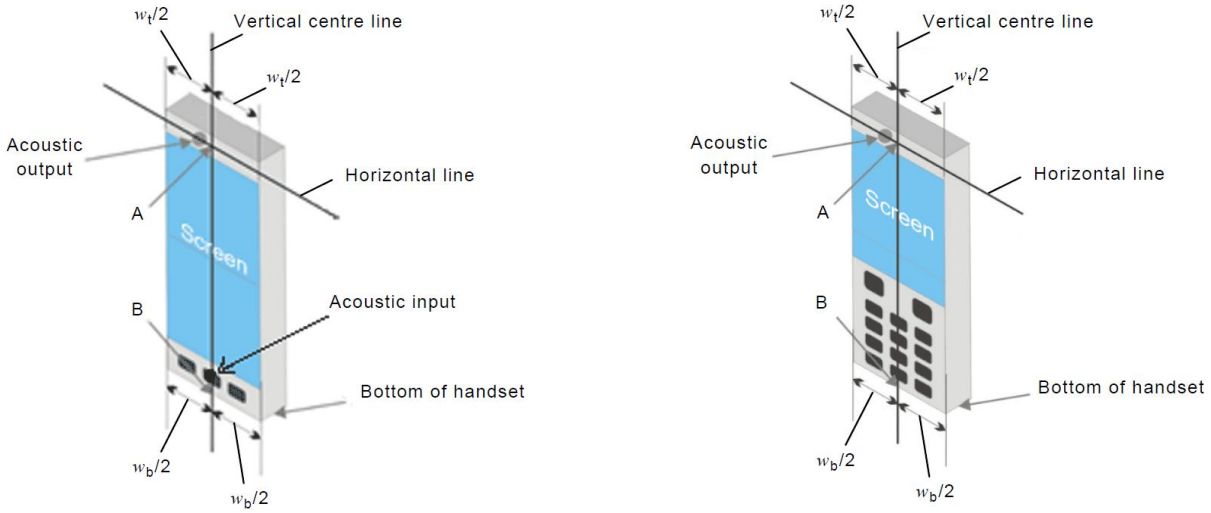


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

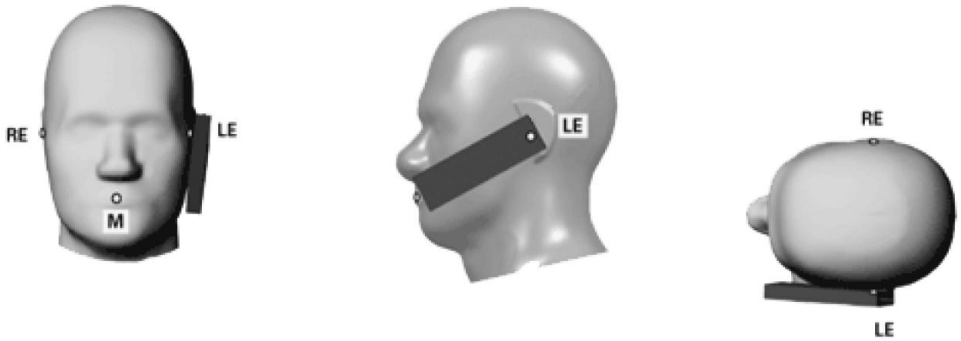


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig-4.3).

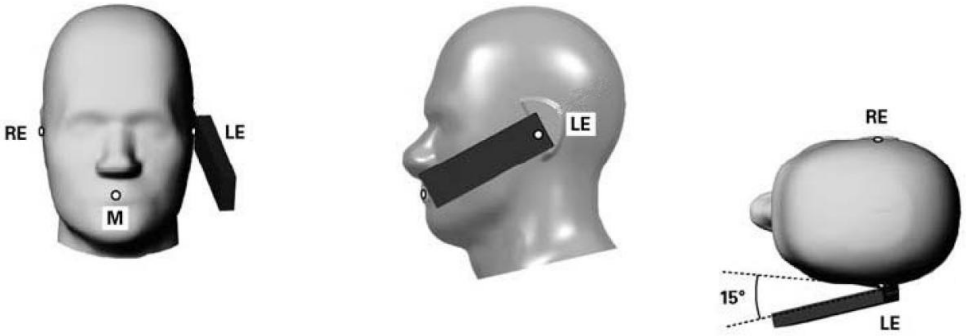


Fig-4.3 Illustration for Tilted Position

4.2.2 Body-worn Accessory Exposure Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.

A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.

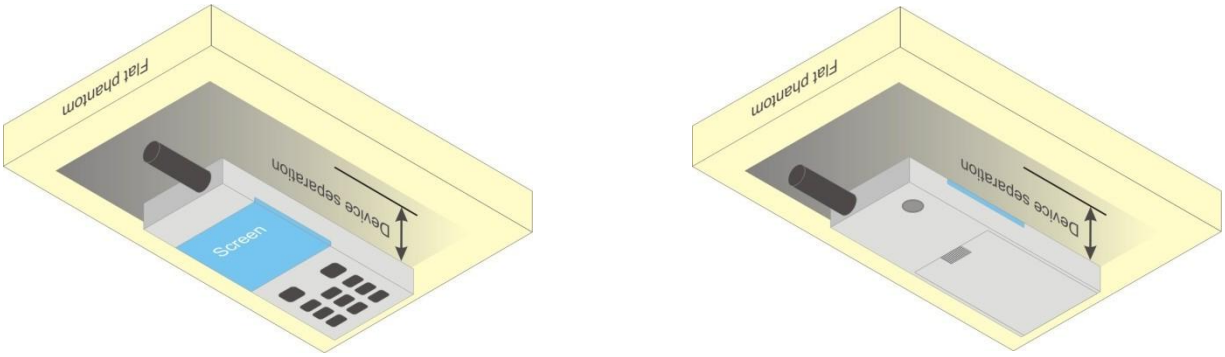


Fig-4.4 Illustration for Body Worn Position

4.2.3 SAR Test Exclusion Evaluations

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

$$\frac{\mathbf{Max.\ Tune\ up\ Power_{(mW)}}}{\mathbf{Min.\ Test\ Separation\ Distance_{(mm)}}} \times \sqrt{\mathbf{f_{(GHz)}}} \leq \mathbf{3.0\ for\ SAR\text{-}1g,\ \leq 7.5\ for\ SAR\text{-}10g}$$

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

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Rear Face			Top Side			Left Side			Right Side			Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Ant. to Surface (mm)	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
BT Ant 1	4	2.51	5	0.79	No	84.58	441 mw	No	19.16	0.21	No	28.62	0.14	No	119.43	790 mw	No
Zigbee	4	2.51	5	0.79	No	84.58	441 mw	No	19.16	0.21	No	28.62	0.14	No	119.43	790 mw	No

Note:

1. When separation distance <= 50 mm and the calculated result shown in above table is <= 3.0 for SAR-1g exposure condition, or <= 7.5 for SAR-10g exposure condition, the SAR testing exclusion is applied.
2. When separation distance > 50 mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

4.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Jan. 30, 2018	Head	2450	23.3	1.87	37.896	1.8	39.2	3.89	-3.33
Feb. 09, 2018	Head	5250	23.2	4.898	36.736	4.71	35.9	3.99	2.33
Jan. 30, 2018	Head	5600	23.2	5.243	36.236	5.07	35.5	3.41	2.07
Jan. 30, 2018	Head	5800	23.3	5.501	35.873	5.27	35.3	4.38	1.62
Jan. 30, 2018	Body	2450	23.3	2.015	50.694	1.95	52.7	3.33	-3.81
Feb. 09, 2018	Body	5250	23.2	5.439	47.681	5.36	48.9	1.47	-2.49
Jan. 30, 2018	Body	5600	23.3	5.8	47.531	5.77	48.5	0.52	-2.00
Jan. 30, 2018	Body	5800	23.3	6.075	47.233	6	48.2	1.25	-2.01

Note:

1. The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.
2. Since the maximum deviation of dielectric properties of the tissue simulating liquid is within 5%, SAR correction is evaluated in the measurement uncertainty shown on section 6 of this report.

4.4 System Validation

The SAR measurement system was validated according to procedures in KDB 865664 D01. The validation status in tabulated summary is as below.

Test Date	Probe S/N	Calibration Point		Measured Conductivity (σ)	Measured Permittivity (ε_r)	Validation for CW			Validation for Modulation		
						Sensitivity Range	Probe Linearity	Probe Isotropy	Modulation Type	Duty Factor	PAR
Jan. 30, 2018	7375	Head	2450	1.870	37.896	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 09, 2018	3971	Head	5250	4.898	36.736	Pass	Pass	Pass	OFDM	N/A	Pass
Jan. 30, 2018	7375	Head	5600	5.243	36.236	Pass	Pass	Pass	OFDM	N/A	Pass
Jan. 30, 2018	7375	Head	5800	5.501	35.873	Pass	Pass	Pass	OFDM	N/A	Pass
Jan. 30, 2018	7375	Body	2450	2.015	50.694	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 09, 2018	3971	Body	5250	5.439	47.681	Pass	Pass	Pass	OFDM	N/A	Pass
Jan. 30, 2018	7375	Body	5600	5.800	47.531	Pass	Pass	Pass	OFDM	N/A	Pass
Jan. 30, 2018	7375	Body	5800	6.075	47.233	Pass	Pass	Pass	OFDM	N/A	Pass

4.5 System Verification

The measuring result for system verification is tabulated as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Jan. 30, 2018	Head	2450	50.80	12.8	51.20	0.79	737	7375	579
Feb. 09, 2018	Head	5250	78.60	8.48	84.80	7.89	1019	3971	861
Jan. 30, 2018	Head	5600	83.70	8.57	85.70	2.39	1019	7375	579
Jan. 30, 2018	Head	5800	79.70	8.06	80.60	1.13	1019	7375	579
Jan. 30, 2018	Body	2450	49.70	12.3	49.20	-1.01	737	7375	579
Feb. 09, 2018	Body	5250	76.50	7.47	74.70	-2.35	1019	3971	861
Jan. 30, 2018	Body	5600	79.70	7.54	75.40	-5.40	1019	7375	579
Jan. 30, 2018	Body	5800	76.90	7.66	76.60	-0.39	1019	7375	579

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4.6 Maximum Output Power

4.6.1 Maximum Target Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11b	Ant 0: 20.5 Ant 1: 20.5 Ant 0+1: 23.5	N/A	N/A	N/A	N/A
802.11g	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5	N/A	N/A	N/A	N/A
802.11a	N/A	Ant 0: 15.0 Ant 1: 15.0 Ant 0+1: 18.0	Ant 0: 15.5 Ant 1: 15.5 Ant 0+1: 18.5	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5
802.11n HT20	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5	Ant 0: 15.0 Ant 1: 15.0 Ant 0+1: 18.0	Ant 0: 15.5 Ant 1: 15.5 Ant 0+1: 18.5	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5
802.11n HT40	N/A	Ant 0: Ch 38: 14.5 Ch 46: 15.5 Ant 1: Ch 38: 14.5 Ch 46: 15.5 Ant 0+1: Ch 38: 17.5 Ch 46: 18.5	Ant 0: Ch 54: 15.5 Ch 62: 13.5 Ant 1: Ch 54: 15.5 Ch 62: 13.5 Ant 0+1: Ch 54: 18.5 Ch 62: 16.5	Ant 0: Ch 102: 15.5 Ch110-142:17.5 Ant 1: Ch 102: 15.5 Ch110-142:17.5 Ant 0+1: Ch 102: 18.5 Ch110-142:20.5	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5
802.11ac VHT80	N/A	Ant 0: 14.5 Ant 1: 14.5 Ant 0+1: 17.5	Ant 0: 14.0 Ant 1: 14.0 Ant 0+1: 17.0	Ant 0: Ch 106: 15.0 Ch 138: 17.5 Ant 1: Ch 106: 15.0 Ch 138: 17.5 Ant 0+1: Ch 106: 18.0 Ch 138: 20.5	Ant 0: 17.5 Ant 1: 17.5 Ant 0+1: 20.5

Mode	2.4G Bluetooth Ant0
Bluetooth DH	10.5
Bluetooth LE	2.0

Mode	2.4G Bluetooth Ant1
Bluetooth LE	4.0

Mode	
Zigbee	4.0

4.6.2 Measured Conducted Power Result

The measuring conducted average power (Unit: dBm) is shown as below.

<WLAN 2.4G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11b	1	2412	18.97	19.12	22.06
	6	2437	19.02	19.04	22.04
	11	2462	19.15	18.84	22.01
802.11g	1	2412	16.13	16.03	19.09
	6	2437	16.12	16.08	19.11
	11	2462	16.16	15.86	19.02
802.11n (HT20)	1	2412	16.12	15.98	19.06
	6	2437	16.23	16.02	19.14
	11	2462	16.22	15.96	19.10

<WLAN 5.2G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11a	36	5180	14.06	13.32	16.72
	40	5200	13.62	13.37	16.51
	44	5220	13.45	13.29	16.48
	48	5240	13.56	13.74	16.66
802.11n (HT20)	36	5180	13.78	13.27	16.54
	40	5200	13.72	13.71	16.73
	44	5220	13.37	13.24	16.51
	48	5240	13.40	13.85	16.64
802.11n (HT40)	38	5190	12.90	13.10	16.01
	46	5230	13.96	14.42	17.21
802.11ac (VHT80)	42	5210	13.55	13.38	16.48

<WLAN 5.3G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11a	52	5260	14.03	14.33	17.19
	56	5280	14.00	14.30	17.15
	60	5300	14.05	14.32	17.20
	64	5320	13.88	14.42	17.17
802.11n (HT20)	52	5260	13.96	14.45	17.22
	56	5280	13.95	14.39	17.19
	60	5300	13.99	14.38	17.2
	64	5320	13.88	14.24	17.07
802.11n (HT40)	54	5270	14.05	14.39	17.23
	62	5310	11.76	12.36	15.08
802.11ac (VHT80)	58	5290	12.56	12.99	15.79

<WLAN 5.6G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11a	100	5500	16.23	16.32	19.29
	116	5580	16.07	16.46	19.28
	132	5660	15.62	16.28	19.16
	140	5700	15.88	16.61	19.27
	144	5720	15.67	16.65	19.2
802.11n (HT20)	100	5500	16.12	16.43	19.29
	116	5580	16.09	16.45	19.28
	132	5660	15.58	16.35	19.16
	140	5700	15.77	16.67	19.25
	144	5720	15.65	16.67	19.2
802.11n (HT40)	102	5510	14.22	14.35	17.3
	110	5550	15.98	16.12	19.06
	118	5590	15.82	16.09	19.01
	134	5670	16.01	16.55	19.3
	142	5710	15.89	16.46	19.19
802.11ac (VHT80)	106	5530	13.62	13.92	16.78
	138	5690	15.53	16.44	19.02

<WLAN 5.8G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11a	149	5745	15.52	16.62	19.12
	153	5765	15.53	16.55	19.02
	157	5785	15.57	16.75	19.21
	161	5805	15.51	16.52	19.00
	165	5825	15.65	16.81	19.28
802.11n (HT20)	149	5745	15.52	16.76	19.19
	153	5765	15.55	16.53	19.00
	157	5785	15.51	16.68	19.14
	161	5805	15.53	16.50	19.01
	165	5825	15.54	16.54	19.08
802.11n (HT40)	151	5755	15.52	16.67	19.14
	159	5795	15.67	16.68	19.21
802.11ac (VHT80)	155	5775	15.52	16.67	19.14

<Bluetooth Ant0>

Mode	Channel	Frequency (MHz)	Average Power
Bluetooth EDR	0	2402	9.81
	39	2441	8.79
	78	2480	8.74
Bluetooth LE	0	2402	0.90
	19	2440	0.19
	39	2480	0.45

<Bluetooth Ant1>

Mode	Channel	Frequency (MHz)	Average Power
Bluetooth LE	0	2402	2.75
	19	2440	2.74
	39	2480	2.76

<Zigbee>

Mode	Channel	Frequency (MHz)	Average Power
Bluetooth LE	11	2402	2.89
	18	2440	2.82
	26	2480	2.73

4.7 SAR Testing Results

4.7.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

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

(2) ≤ 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

(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

(1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.

(2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.

(3) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.

(4) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.7.2 SAR Results for Head Exposure Condition

Sample EX20:

Plot No.	Band	Mode	Test Position	Ch.	Sample	Ant Status	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
01	WLAN2.4G	802.11b	Right Cheek	1	1	Ant 0+1	23.5	22.06	1.39	-0.15	0.619	**0.86**
	WLAN2.4G	802.11b	Right Tilted	1	1	Ant 0+1	23.5	22.06	1.39	0.15	0.435	0.61
	WLAN2.4G	802.11b	Left Cheek	1	1	Ant 0+1	23.5	22.06	1.39	0.13	0.595	0.83
	WLAN2.4G	802.11b	Left Tilted	1	1	Ant 0+1	23.5	22.06	1.39	0.11	0.393	0.55
	WLAN2.4G	802.11b	Right Cheek	6	1	Ant 0+1	23.5	22.04	1.40	0.15	0.447	0.63
	WLAN2.4G	802.11b	Right Cheek	11	1	Ant 0+1	23.5	22.01	1.41	0.12	0.453	0.64
	WLAN2.4G	802.11b	Right Cheek	1	1	Ant 0+1	23.5	22.06	1.39	-0.05	0.602	0.84
	WLAN2.4G	802.11b	Right Cheek	1	2	Ant 0+1	23.5	22.06	1.39	-0.17	0.613	0.85
02	WLAN5G	802.11n HT40	Right Cheek	54	1	Ant 0+1	18.5	17.23	1.34	0.11	0.889	**1.19**
	WLAN5G	802.11n HT40	Right Tilted	54	1	Ant 0+1	18.5	17.23	1.34	0.03	0.154	0.21
	WLAN5G	802.11n HT40	Left Cheek	54	1	Ant 0+1	18.5	17.23	1.34	-0.05	0.334	0.45
	WLAN5G	802.11n HT40	Left Tilted	54	1	Ant 0+1	18.5	17.23	1.34	0.08	0.108	0.14
	WLAN5G	802.11n HT40	Right Cheek	62	1	Ant 0+1	16.5	15.08	1.39	0.06	0.370	0.51
	WLAN5G	802.11n HT40	Right Cheek	54	1	Ant 0+1	18.5	17.23	1.34	-0.02	0.874	1.17
	WLAN5G	802.11n HT40	Right Cheek	54	2	Ant 0+1	18.5	17.23	1.34	-0.05	0.743	1.00
	WLAN5G	802.11ac VHT80	Right Cheek	138	1	Ant 0+1	20.5	19.02	1.41	0.03	0.255	0.36
	WLAN5G	802.11ac VHT80	Right Tilted	138	1	Ant 0+1	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Cheek	138	1	Ant 0+1	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Tilted	138	1	Ant 0+1	20.5	19.02	1.41	0	0.001	0.00
03	WLAN5G	802.11ac VHT80	Right Cheek	106	1	Ant 0+1	18.0	16.78	1.32	-0.06	0.299	**0.40**
	WLAN5G	802.11ac VHT80	Right Cheek	106	2	Ant 0+1	18.0	16.78	1.32	0.03	0.297	0.39
04	WLAN5G	802.11ac VHT80	Right Cheek	155	1	Ant 0+1	20.5	19.14	1.37	-0.15	0.124	**0.17**
	WLAN5G	802.11ac VHT80	Right Tilted	155	1	Ant 0+1	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Cheek	155	1	Ant 0+1	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Tilted	155	1	Ant 0+1	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Right Cheek	155	2	Ant 0+1	20.5	19.14	1.37	-0.03	0.12	0.16

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

Plot No.	Band	Mode	Test Position	Ch.	Sample	Ant Status	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	BT	BR / EDR	Right Cheek	0	1	Ant 0	10.5	9.81	1.17	0.04	0.00142	0.00
	BT	BR / EDR	Right Tilted	0	1	Ant 0	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Left Cheek	0	1	Ant 0	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Left Tilted	0	1	Ant 0	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Right Cheek	39	1	Ant 0	10.5	8.79	1.48	0.12	0.00135	0.00
05	BT	BR / EDR	Right Cheek	78	1	Ant 0	10.5	8.74	1.50	0.15	0.00149	**0.00**
	BT	BR / EDR	Right Cheek	78	2	Ant 0	10.5	8.74	1.50	-0.03	0.001	0.00

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

Sample N6603ER:

Plot No.	Band	Mode	Test Position	Ch.	Sample	Ant Status	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
06	WLAN2.4G	802.11b	Right Cheek	1	3	Ant 0+1	23.5	22.06	1.39	-0.15	0.696	**0.97**
	WLAN2.4G	802.11b	Right Tilted	1	3	Ant 0+1	23.5	22.06	1.39	0.15	0.362	0.50
	WLAN2.4G	802.11b	Left Cheek	1	3	Ant 0+1	23.5	22.06	1.39	0.13	0.404	0.56
	WLAN2.4G	802.11b	Left Tilted	1	3	Ant 0+1	23.5	22.06	1.39	0.12	0.237	0.33
	WLAN2.4G	802.11b	Right Cheek	6	3	Ant 0+1	23.5	22.04	1.40	0.15	0.477	0.67
	WLAN2.4G	802.11b	Right Cheek	11	3	Ant 0+1	23.5	22.01	1.41	0.15	0.624	0.88
	WLAN2.4G	802.11b	Right Cheek	1	3	Ant 0+1	23.5	22.06	1.39	0.01	0.681	0.95
	WLAN2.4G	802.11b	Right Cheek	1	4	Ant 0+1	23.5	22.06	1.39	-0.02	0.504	0.70
07	WLAN5G	802.11n HT40	Right Cheek	54	3	Ant 0+1	18.5	17.23	1.34	-0.01	0.885	**1.19**
	WLAN5G	802.11n HT40	Right Tilted	54	3	Ant 0+1	18.5	17.23	1.34	0.07	0.167	0.22
	WLAN5G	802.11n HT40	Left Cheek	54	3	Ant 0+1	18.5	17.23	1.34	0.03	0.435	0.58
	WLAN5G	802.11n HT40	Left Tilted	54	3	Ant 0+1	18.5	17.23	1.34	0.01	0.132	0.18
	WLAN5G	802.11n HT40	Right Cheek	62	3	Ant 0+1	16.5	15.08	1.39	0.08	0.454	0.63
	WLAN5G	802.11n HT40	Right Cheek	54	3	Ant 0+1	18.5	17.23	1.34	0.05	0.877	1.17
	WLAN5G	802.11n HT40	Right Cheek	54	4	Ant 0+1	18.5	17.23	1.34	-0.08	0.873	1.17
	WLAN5G	802.11ac VHT80	Right Cheek	138	3	Ant 0+1	20.5	19.02	1.41	0.03	0.275	0.39
	WLAN5G	802.11ac VHT80	Right Tilted	138	3	Ant 0+1	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Cheek	138	3	Ant 0+1	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Tilted	138	3	Ant 0+1	20.5	19.02	1.41	0	0.001	0.00
08	WLAN5G	802.11ac VHT80	Right Cheek	106	3	Ant 0+1	18.0	16.78	1.32	-0.09	0.389	**0.52**
	WLAN5G	802.11ac VHT80	Right Cheek	106	4	Ant 0+1	18.0	16.78	1.32	-0.03	0.254	0.34

Plot No.	Band	Mode	Test Position	Ch.	Sample	Ant Status	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
09	WLAN5G	802.11ac VHT80	Right Cheek	155	3	Ant 0+1	20.5	19.14	1.37	-0.15	0.163	**0.22**
	WLAN5G	802.11ac VHT80	Right Tilted	155	3	Ant 0+1	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Left Cheek	155	3	Ant 0+1	20.5	19.14	1.37	0.08	0.134	0.18
	WLAN5G	802.11ac VHT80	Left Tilted	155	3	Ant 0+1	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Right Cheek	155	4	Ant 0+1	20.5	19.14	1.37	-0.06	0.157	0.21
	BT	BR / EDR	Right Cheek	0	3	Ant 0	10.5	9.81	1.17	0.15	0.045	0.05
	BT	BR / EDR	Right Tilted	0	3	Ant 0	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Left Cheek	0	3	Ant 0	10.5	9.81	1.17	0.12	0.031	0.04
	BT	BR / EDR	Left Tilted	0	3	Ant 0	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Right Cheek	39	3	Ant 0	10.5	8.79	1.48	0.11	0.042	0.06
10	BT	BR / EDR	Right Cheek	78	3	Ant 0	10.5	8.74	1.50	0.02	0.046	**0.07**
	BT	BR / EDR	Right Cheek	78	4	Ant 0	10.5	8.74	1.50	0	0.001	0.00

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

4.7.3 SAR Results for Body-worn Exposure Condition

Sample EX20:

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Ch.	Sample	Ant Status	Holster	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
11	WLAN2.4G	802.11b	Front Face	15	1	1	Ant 0+1	w/o	23.5	22.06	1.39	-0.02	0.135	**0.19**
	WLAN2.4G	802.11b	Rear Face	15	1	1	Ant 0+1	w/o	23.5	22.06	1.39	-0.03	0.117	0.16
	WLAN2.4G	802.11b	Front Face_ Panel inside	0	1	1	Ant 0+1	w/	23.5	22.06	1.39	0.06	0.063	0.09
	WLAN2.4G	802.11b	Front Face_ Panel outside	0	1	1	Ant 0+1	w/	23.5	22.06	1.39	-0.12	0.071	0.10
	WLAN2.4G	802.11b	Front Face	15	6	1	Ant 0+1	w/o	23.5	22.04	1.40	-0.08	0.122	0.17
	WLAN2.4G	802.11b	Front Face	15	11	1	Ant 0+1	w/o	23.5	22.01	1.41	-0.02	0.130	0.18
	WLAN2.4G	802.11b	Front Face	15	1	2	Ant 0+1	w/o	23.5	22.06	1.39	0.08	0.133	0.19
12	WLAN5G	802.11n HT40	Front Face	15	54	1	Ant 0+1	w/o	18.5	17.23	1.34	-0.10	0.157	**0.21**
	WLAN5G	802.11n HT40	Rear Face	15	54	1	Ant 0+1	w/o	18.5	17.23	1.34	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face_ Panel inside	0	54	1	Ant 0+1	w/	18.5	17.23	1.34	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face_ Panel outside	0	54	1	Ant 0+1	w/	18.5	17.23	1.34	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face	15	62	1	Ant 0+1	w/o	16.5	15.08	1.39	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face	15	54	2	Ant 0+1	w/o	18.5	17.23	1.34	-0.04	0.107	0.14
13	WLAN5G	802.11ac VHT80	Front Face	15	138	1	Ant 0+1	w/o	20.5	19.02	1.41	0.11	0.055	**0.08**
	WLAN5G	802.11ac VHT80	Rear Face	15	138	1	Ant 0+1	w/o	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face_ Panel inside	0	138	1	Ant 0+1	w/	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face_ Panel outside	0	138	1	Ant 0+1	w/	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face	15	106	1	Ant 0+1	w/o	18.0	16.78	1.32	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face	15	138	2	Ant 0+1	w/o	20.5	19.02	1.41	0	0.001	0.00

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Ch.	Sample	Ant Status	Holster	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	WLAN5G	802.11ac VHT80	Front Face	15	155	1	Ant 0+1	w/o	20.5	19.14	1.37	0	0.001	0.00
14	WLAN5G	802.11ac VHT80	Rear Face	15	155	1	Ant 0+1	w/o	20.5	19.14	1.37	-0.05	0.038	**0.05**
	WLAN5G	802.11ac VHT80	Front Face_ Panel inside	0	155	1	Ant 0+1	w/	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face_ Panel outside	0	155	1	Ant 0+1	w/	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Rear Face	15	155	2	Ant 0+1	w/o	20.5	19.14	1.37	0	0.001	0.00
15	BT	BR / EDR	Front Face	15	0	1	Ant 0	w/o	10.5	9.81	1.17	-0.06	0.00185	**0.00**
	BT	BR / EDR	Rear Face	15	0	1	Ant 0	w/o	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Front Face_ Panel inside	0	0	1	Ant 0	w/	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Front Face_ Panel outside	0	0	1	Ant 0	w/	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Front Face	15	39	1	Ant 0	w/o	10.5	8.79	1.48	0	0.001	0.00
	BT	BR / EDR	Front Face	15	78	1	Ant 0	w/o	10.5	8.74	1.50	0	0.001	0.00
	BT	BR / EDR	Front Face	15	0	2	Ant 0	w/o	10.5	9.81	1.17	0	0.001	0.00

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

Sample N6603ER:

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Ch.	Sample	Ant Status	Holster	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
16	WLAN2.4G	802.11b	Front Face	15	1	3	Ant 0+1	w/o	23.5	22.06	1.39	0	0.185	**0.26**
	WLAN2.4G	802.11b	Rear Face	15	1	3	Ant 0+1	w/o	23.5	22.06	1.39	-0.03	0.100	0.14
	WLAN2.4G	802.11b	Front Face_ Panel inside	0	1	3	Ant 0+1	w/	23.5	22.06	1.39	0.09	0.078	0.11
	WLAN2.4G	802.11b	Front Face_ Panel outside	0	1	3	Ant 0+1	w/	23.5	22.06	1.39	0.12	0.064	0.09
	WLAN2.4G	802.11b	Front Face	15	6	3	Ant 0+1	w/o	23.5	22.04	1.40	-0.02	0.121	0.17
	WLAN2.4G	802.11b	Front Face	15	11	3	Ant 0+1	w/o	23.5	22.01	1.41	0.09	0.113	0.16
	WLAN2.4G	802.11b	Front Face	15	1	4	Ant 0+1	w/o	23.5	22.06	1.39	-0.05	0.16	0.22
17	WLAN5G	802.11n HT40	Front Face	15	54	3	Ant 0+1	w/o	18.5	17.23	1.34	-0.13	0.151	**0.20**
	WLAN5G	802.11n HT40	Rear Face	15	54	3	Ant 0+1	w/o	18.5	17.23	1.34	0.15	0.104	0.14
	WLAN5G	802.11n HT40	Front Face_ Panel inside	0	54	3	Ant 0+1	w/	18.5	17.23	1.34	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face_ Panel outside	0	54	3	Ant 0+1	w/	18.5	17.23	1.34	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face	15	62	3	Ant 0+1	w/o	16.5	15.08	1.39	0	0.001	0.00
	WLAN5G	802.11n HT40	Front Face	15	54	4	Ant 0+1	w/o	18.5	17.23	1.34	-0.03	0.112	0.15
18	WLAN5G	802.11ac VHT80	Front Face	15	138	3	Ant 0+1	w/o	20.5	19.02	1.41	0.02	0.064	**0.09**
	WLAN5G	802.11ac VHT80	Rear Face	15	138	3	Ant 0+1	w/o	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face_ Panel inside	0	138	3	Ant 0+1	w/	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face_ Panel outside	0	138	3	Ant 0+1	w/	20.5	19.02	1.41	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face	15	106	3	Ant 0+1	w/o	18.0	16.78	1.32	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face	15	138	4	Ant 0+1	w/o	20.5	19.02	1.41	0	0.001	0.00

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Ch.	Sample	Ant Status	Holster	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	WLAN5G	802.11ac VHT80	Front Face	15	155	3	Ant 0+1	w/o	20.5	19.14	1.37	0	0.001	0.00
19	WLAN5G	802.11ac VHT80	Rear Face	15	155	3	Ant 0+1	w/o	20.5	19.14	1.37	0.04	0.034	**0.05**
	WLAN5G	802.11ac VHT80	Front Face_ Panel inside	0	155	3	Ant 0+1	w/	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Front Face_ Panel outside	0	155	3	Ant 0+1	w/	20.5	19.14	1.37	0	0.001	0.00
	WLAN5G	802.11ac VHT80	Rear Face	15	155	4	Ant 0+1	w/o	20.5	19.14	1.37	0	0.001	0.00
20	BT	BR / EDR	Front Face	15	0	3	Ant 0	w/o	10.5	9.81	1.17	-0.09	0.00848	**0.01**
	BT	BR / EDR	Rear Face	15	0	3	Ant 0	w/o	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Front Face_ Panel inside	0	0	3	Ant 0	w/	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Front Face_ Panel outside	0	0	3	Ant 0	w/	10.5	9.81	1.17	0	0.001	0.00
	BT	BR / EDR	Front Face	15	39	3	Ant 0	w/o	10.5	8.79	1.48	0	0.001	0.00
	BT	BR / EDR	Front Face	15	78	3	Ant 0	w/o	10.5	8.74	1.50	0	0.001	0.00
	BT	BR / EDR	Front Face	15	0	4	Ant 0	w/o	10.5	9.81	1.17	0	0.001	0.00

Note: The "< 0.001" means there is no SAR value or the SAR is too low to be measured.

4.7.4 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

Since all the measured SAR are less than 0.8 W/kg, the repeated measurement is not required.

4.7.5 Simultaneous Multi-band Transmission Evaluation

<Possibilities of Simultaneous Transmission>

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous TX Combination	Capable Transmit Configurations	Head Exposure Condition	Body Exposure Condition
1	WLAN 2.4G + NFC + Zigbee	Yes	Yes
2	WLAN 5G + NFC + Zigbee	Yes	Yes
3	BT + NFC + Zigbee	Yes	Yes

Note:

1. The WLAN 2.4G and WLAN 5G cannot transmit simultaneously.
2. The WLAN and Bluetooth cannot transmit simultaneously.

<Estimated SAR Calculation>

According to KDB 447498 D01, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR was estimated according to following formula to result in substantially conservative SAR values of <= 0.4 W/kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \frac{\sqrt{f_{(\text{GHz})}}}{7.5}$$

If the minimum test separation distance is < 5 mm, a distance of 5 mm is used for estimated SAR calculation. When the test separation distance is > 50 mm, the 0.4 W/kg is used for SAR-1g.

Mode / Band	Frequency (GHz)	Max. Tune-up Power (dBm)	Test Position	Separation Distance (mm)	Estimated SAR (W/kg)
BT (DSS)	2.48	4.0	Head	5	0.11
BT (DSS)	2.48	4.0	Body-worn	15	0.04

Note:

1. The separation distance is determined from the outer housing of the EUT to the user.
2. When standalone SAR testing is not required, an estimated SAR can be applied to determine simultaneous transmission SAR test exclusion.

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

Sample EX20:

No.	Conditions (SAR1+SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	WLAN (DTS) + Zigbee	Head	Right Cheek	0.86	0.11	0.97	Σ SAR < 1.6, Not required
			Right Tilted	0.61	0.11	0.72	Σ SAR < 1.6, Not required
			Left Cheek	0.83	0.11	0.94	Σ SAR < 1.6, Not required
			Left Tilted	0.55	0.11	0.66	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.19	0.04	0.23	Σ SAR < 1.6, Not required
			Rear Face	0.16	0.04	0.20	Σ SAR < 1.6, Not required
2	WLAN (NII) + Zigbee	Head	Right Cheek	1.19	0.11	1.30	Σ SAR < 1.6, Not required
			Right Tilted	0.21	0.11	0.32	Σ SAR < 1.6, Not required
			Left Cheek	0.45	0.11	0.56	Σ SAR < 1.6, Not required
			Left Tilted	0.14	0.11	0.25	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.21	0.04	0.25	Σ SAR < 1.6, Not required
			Rear Face	0.05	0.04	0.09	Σ SAR < 1.6, Not required
3	BT (DSS) + Zigbee	Head	Right Cheek	0.00	0.11	0.11	Σ SAR < 1.6, Not required
			Right Tilted	0.00	0.11	0.11	Σ SAR < 1.6, Not required
			Left Cheek	0.00	0.11	0.11	Σ SAR < 1.6, Not required
			Left Tilted	0.00	0.11	0.11	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.00	0.04	0.04	Σ SAR < 1.6, Not required
			Rear Face	0.00	0.04	0.04	Σ SAR < 1.6, Not required

Sample N6603ER:

No.	Conditions (SAR1+SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	WLAN (DTS) + Zigbee	Head	Right Cheek	0.97	0.11	1.08	Σ SAR < 1.6, Not required
			Right Tilted	0.50	0.11	0.61	Σ SAR < 1.6, Not required
			Left Cheek	0.56	0.11	0.67	Σ SAR < 1.6, Not required
			Left Tilted	0.33	0.11	0.44	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.26	0.04	0.30	Σ SAR < 1.6, Not required
			Rear Face	0.14	0.04	0.18	Σ SAR < 1.6, Not required
2	WLAN (NII) + Zigbee	Head	Right Cheek	1.19	0.11	1.30	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.11	0.33	Σ SAR < 1.6, Not required
			Left Cheek	0.58	0.11	0.69	Σ SAR < 1.6, Not required
			Left Tilted	0.18	0.11	0.29	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.20	0.04	0.24	Σ SAR < 1.6, Not required
			Rear Face	0.14	0.04	0.18	Σ SAR < 1.6, Not required
3	BT (DSS) + Zigbee	Head	Right Cheek	0.07	0.11	0.18	Σ SAR < 1.6, Not required
			Right Tilted	0.00	0.11	0.11	Σ SAR < 1.6, Not required
			Left Cheek	0.04	0.11	0.15	Σ SAR < 1.6, Not required
			Left Tilted	0.00	0.11	0.11	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.01	0.04	0.05	Σ SAR < 1.6, Not required
			Rear Face	0.00	0.04	0.04	Σ SAR < 1.6, Not required

Test Engineer： Ben Liu, and Blake Wang

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D2450V2	737	Aug. 17, 2017	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Aug. 23, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3971	Mar. 24, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7375	Dec. 18, 2017	1 Year
Data Acquisition Electronics	SPEAG	DAE3	579	Aug. 17, 2017	1 Year
Data Acquisition Electronics	SPEAG	DAE4	861	May. 22, 2017	1 Year
Spectrum Analyzer	R&S	FSL6	102006	Mar. 27, 2017	1 Year
ENA Series Network Analyzer	Agilent	E5071C	MY46214281	Jun. 09, 2017	1 Year
Vector Signal Generator	Anritsu	MG3710A	6201599977	Mar. 27, 2017	1 Year
Power Meter	Anritsu	ML2495A	1218009	Jul. 12, 2017	1 Year
Power Sensor	Anritsu	MA2411B	1207252	Jul. 12, 2017	1 Year
Universal Wireless Test Set	Anritsu	MT8870A/MU887000A	6201699387	Sep. 14, 2017	1 Year
Thermometer	YFE	YF-160A	130504591	Mar. 24, 2017	1 Year
Power Amplifier	AR	5S1G4	0339656	Sep. 20, 2017	1 Year
Power Amplifier	mini-circuits	ZVE-8G	05770420A	Sep. 15, 2017	1 Year
Attenuator	MTJ	MTJ6011-03	N/A	Sep. 15, 2017	1 Year
Attenuator	Woken	00800A1G01L-10	N/A	Sep. 15, 2017	1 Year
Directional Coupler	Woken	0110A05602O-10	11122702	Sep. 15, 2017	1 Year
Dielectric Assessment Kit	SPEAG	DAK-3.5	1047	Aug. 15, 2017	1 Year

6. Measurement Uncertainty

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Axial Isotropy	4.7	Rectangular	√3	√0.5	√0.5	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	√0.5	√0.5	3.9	3.9	∞
Boundary Effect	1.0	Rectangular	√3	1	1	0.6	0.6	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
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	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	2.9	Rectangular	√3	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Test Sample Related								
Test Sample Positioning	3.9 / 2.06	Normal	1	1	1	3.9	2.1	35
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	6.1	Rectangular	√3	1	1	3.5	3.5	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√3	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	√3	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty						± 11.4 %	± 11.2 %	
Expanded Uncertainty (K=2)						**± 22.8 %**	**± 22.4 %**	

Head SAR Uncertainty Budget for Frequency Range of 300 MHz to 3 GHz

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.55	Normal	1	1	1	6.55	6.55	∞
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 Effect	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
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	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	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								
Test Sample Positioning	3.9 / 2.06	Normal	1	1	1	3.9	2.1	35
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	6.6	Rectangular	√3	1	1	3.8	3.8	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√3	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	√3	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty						± 12.5 %	± 12.3 %	
Expanded Uncertainty (K=2)						**± 25.0 %**	**± 24.6 %**	

Head SAR Uncertainty Budget for Frequency Range of 3 GHz to 6 GHz

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Axial Isotropy	4.7	Rectangular	√3	√0.5	√0.5	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	√0.5	√0.5	3.9	3.9	∞
Boundary Effect	1.0	Rectangular	√3	1	1	0.6	0.6	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
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	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	2.9	Rectangular	√3	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Test Sample Related								
Test Sample Positioning	4.38 / 1.35	Normal	1	1	1	4.4	1.4	29
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.2	Rectangular	√3	1	1	4.2	4.2	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√3	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	√3	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty						± 11.8 %	± 11.3 %	
Expanded Uncertainty (K=2)						**± 23.6 %**	**± 22.6 %**	

Body SAR Uncertainty Budget for Frequency Range of 300 MHz to 3 GHz

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.55	Normal	1	1	1	6.55	6.55	∞
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 Effect	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
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	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	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								
Test Sample Positioning	4.38 / 1.35	Normal	1	1	1	4.4	1.4	29
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.6	Rectangular	√3	1	1	4.4	4.4	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√3	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	√3	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty						± 12.8 %	± 12.4 %	
Expanded Uncertainty (K=2)						**± 25.6 %**	**± 24.8 %**	

Body SAR Uncertainty Budget for Frequency Range of 3 GHz to 6 GHz

7. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The road map of all our labs can be found in our web site also.

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Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

System Check_H2450_180130

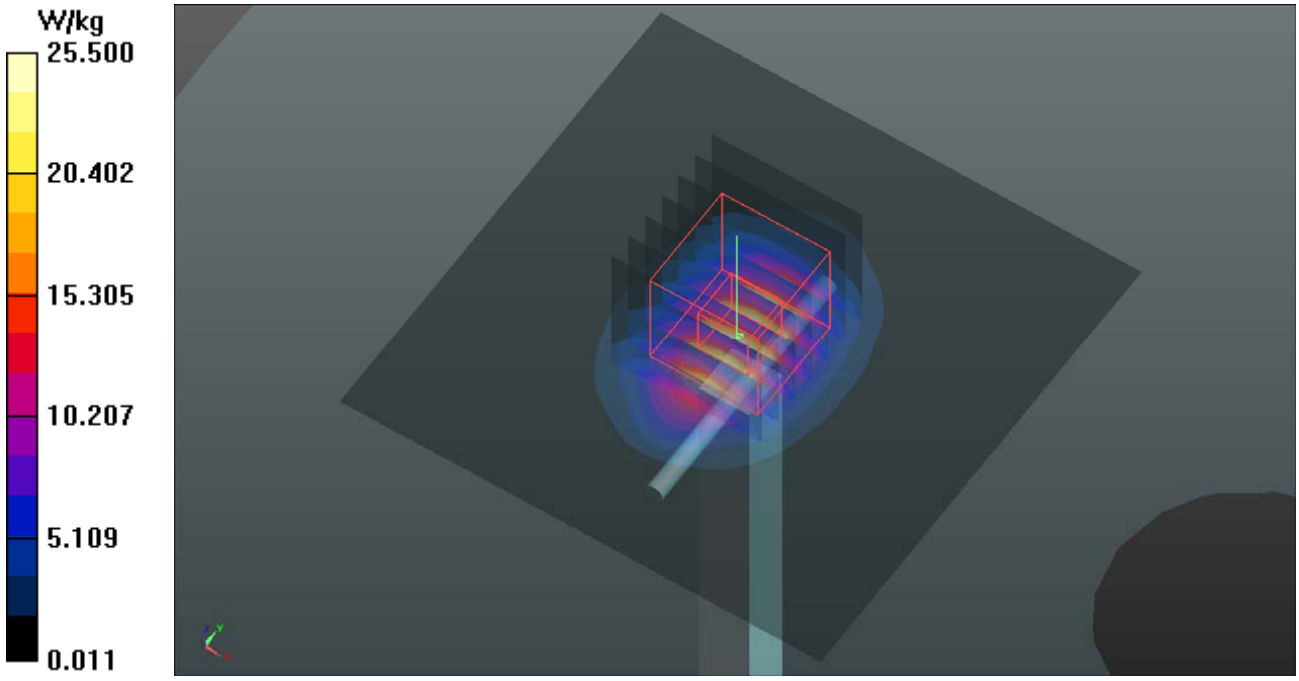
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 737

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0130 Medium parameters used: f = 2450 MHz; σ = 1.87 S/m; ε_r = 37.896; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.65, 7.65, 7.65); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 25.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 112.4 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 32.1 W/kg
SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.72 W/kg
Maximum value of SAR (measured) = 25.5 W/kg



System Check_H5250_180209

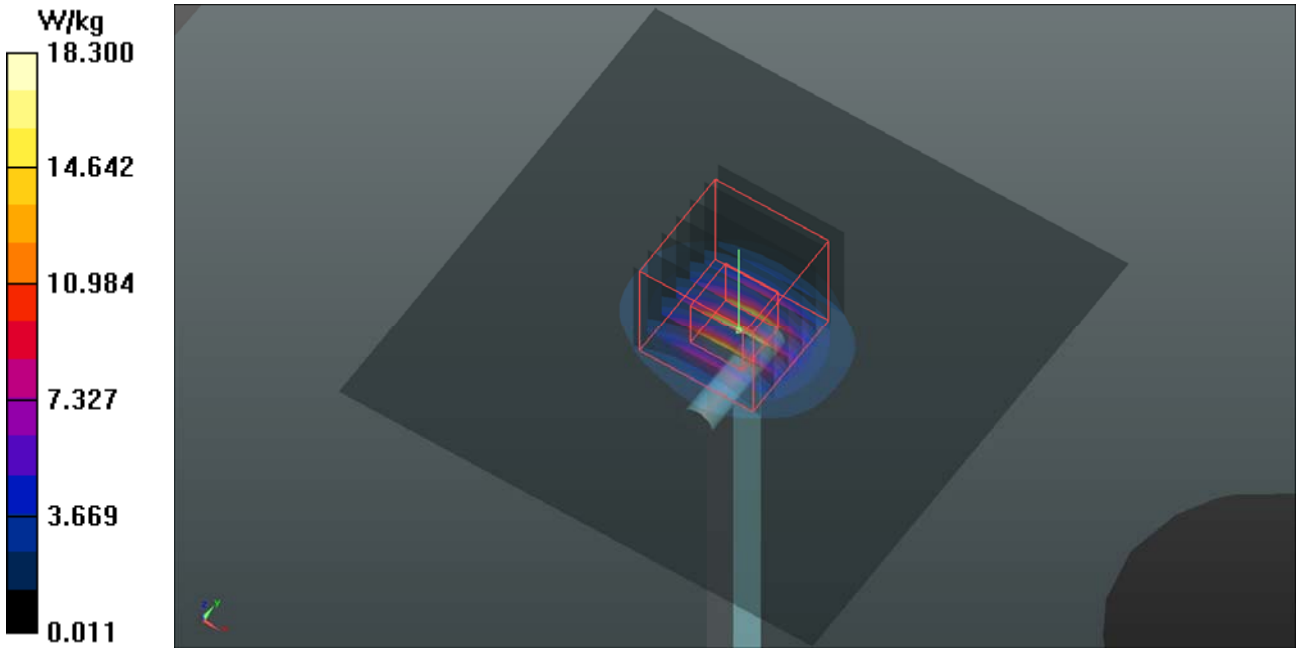
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0209 Medium parameters used: f = 5250 MHz; σ = 4.898 S/m; ε_r = 36.736; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(5.34, 5.34, 5.34); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.3 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 65.16 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 36.6 W/kg
SAR(1 g) = 8.48 W/kg; SAR(10 g) = 2.39 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



System Check_H5600_180130

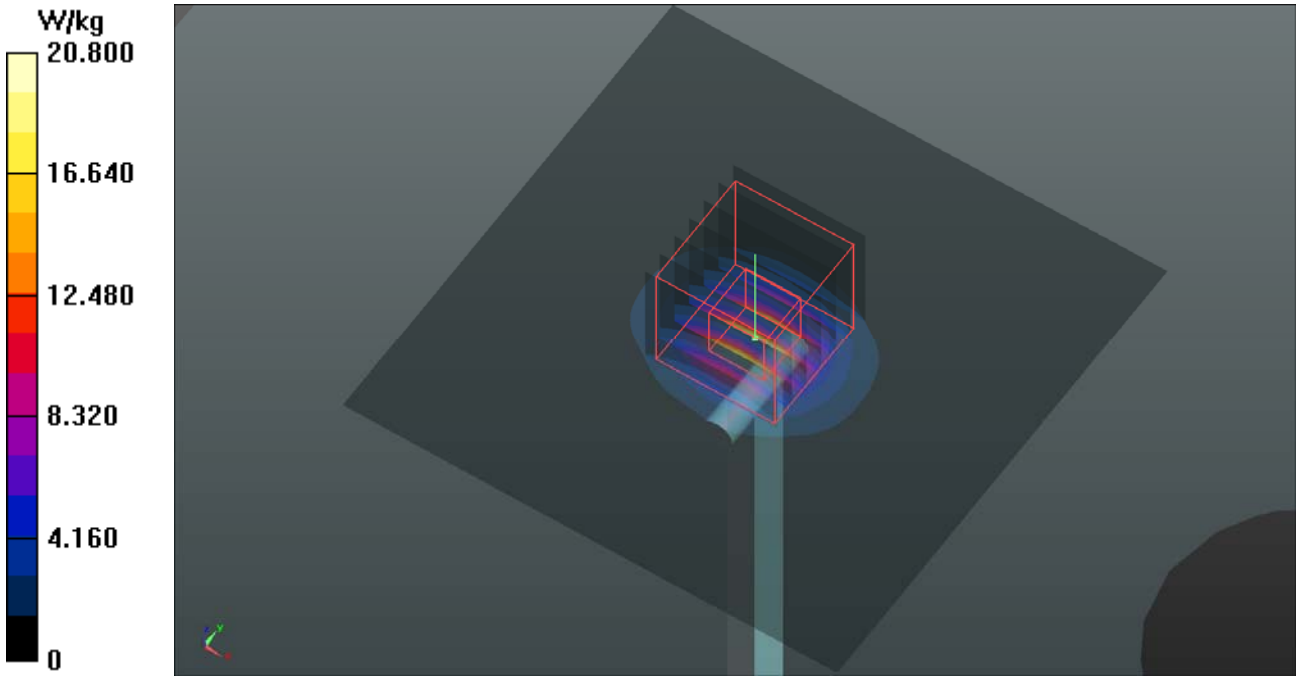
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0130 Medium parameters used: f = 5600 MHz; σ = 5.243 S/m; ε_r = 36.236; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.72, 4.72, 4.72); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 20.8 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 72.40 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 36.0 W/kg
SAR(1 g) = 8.57 W/kg; SAR(10 g) = 2.47 W/kg
Maximum value of SAR (measured) = 21.8 W/kg



System Check_H5800_180130

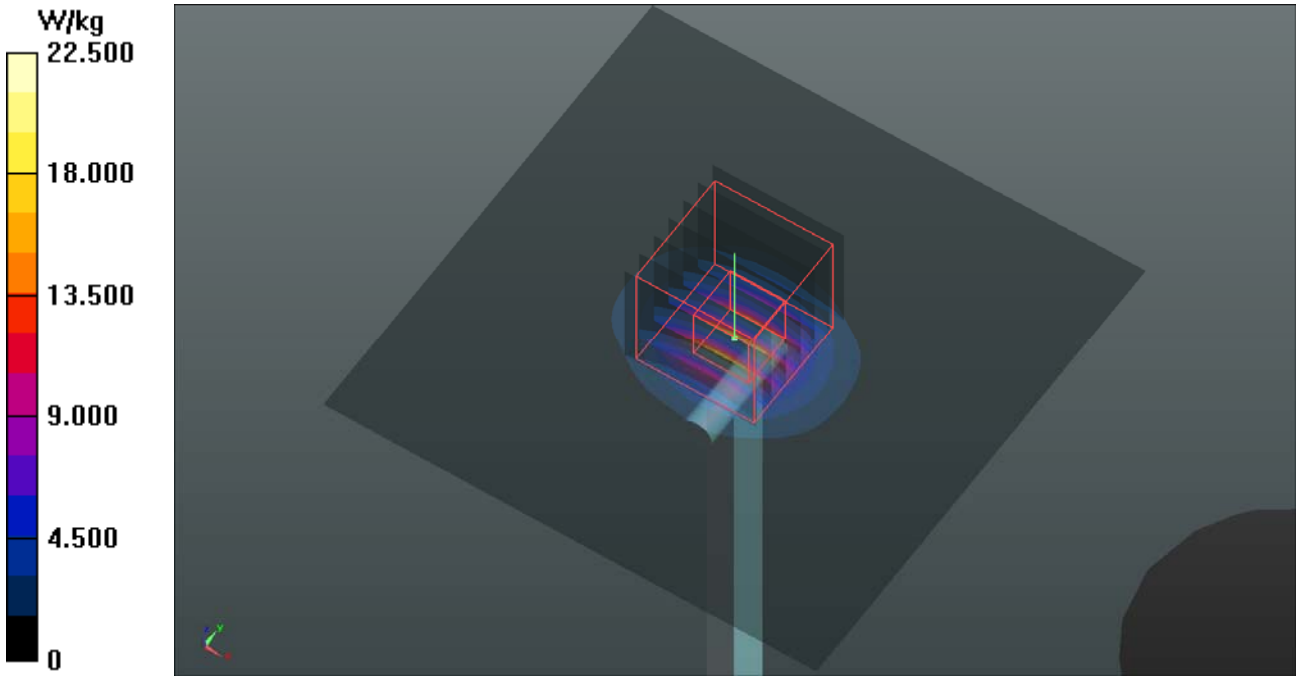
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0130 Medium parameters used: f = 5800 MHz; σ = 5.501 S/m; ε_r = 35.873; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.8, 4.8, 4.8); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 22.5 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 72.84 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 34.8 W/kg
SAR(1 g) = 8.06 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 20.4 W/kg



System Check_B2450_180130

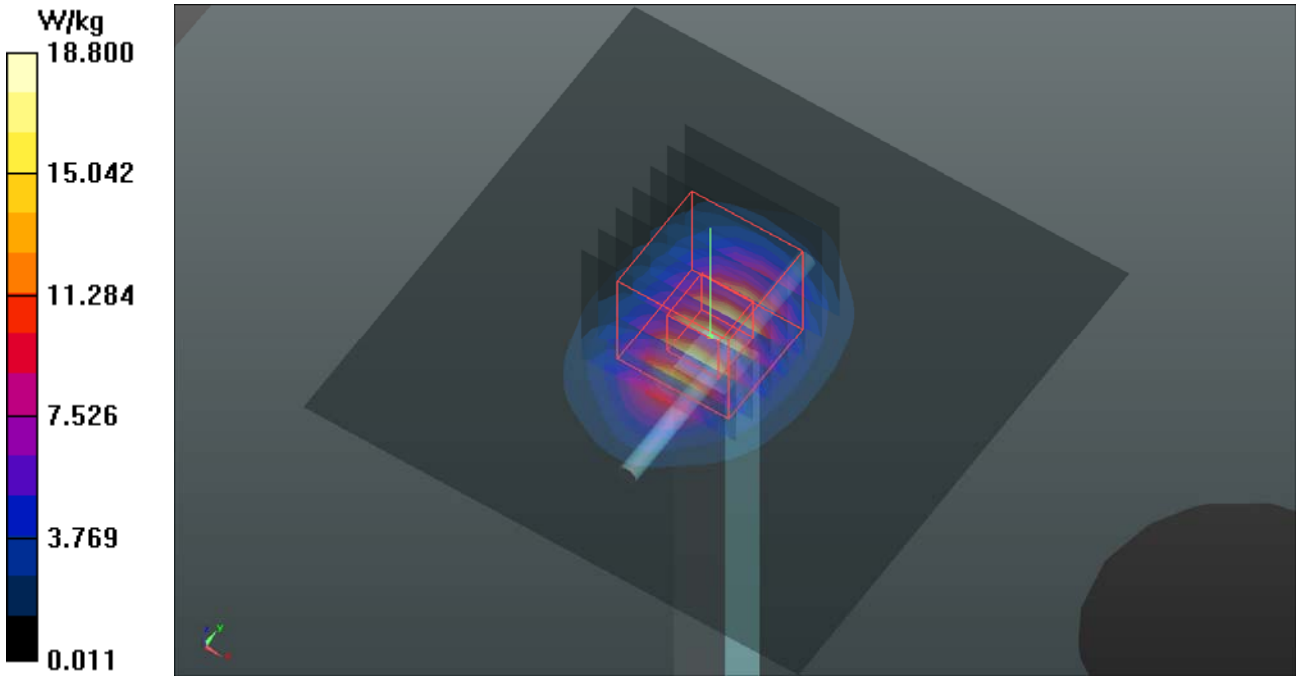
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 737

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: B19T27N5_0130 Medium parameters used: f = 2450 MHz; σ = 2.015 S/m; ε_r = 50.694; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.83, 7.83, 7.83); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 18.8 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.05 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 25.0 W/kg
SAR(1 g) = 12.3 W/kg; SAR(10 g) = 5.75 W/kg
Maximum value of SAR (measured) = 18.7 W/kg



System Check_B5250_180209

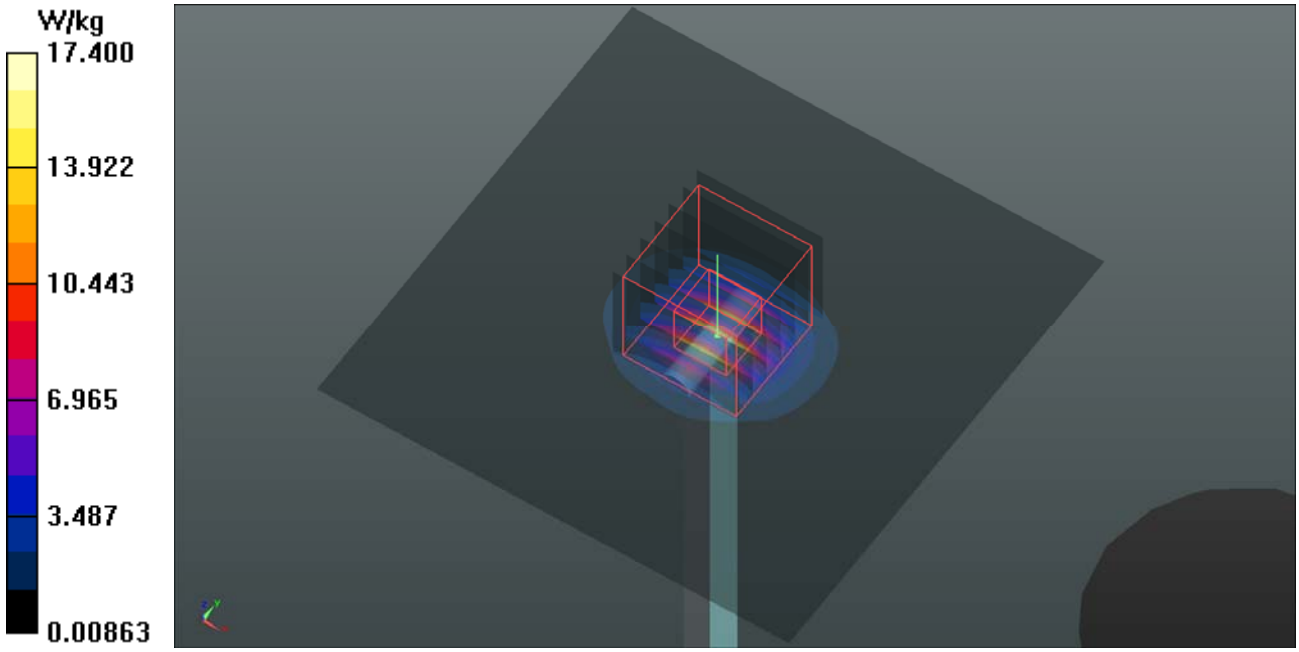
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0209 Medium parameters used: f = 5250 MHz; σ = 5.439 S/m; ε_r = 47.681; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.7, 4.7, 4.7); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.4 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 56.30 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 30.1 W/kg
SAR(1 g) = 7.47 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 18.9 W/kg



System Check_B5600_180130

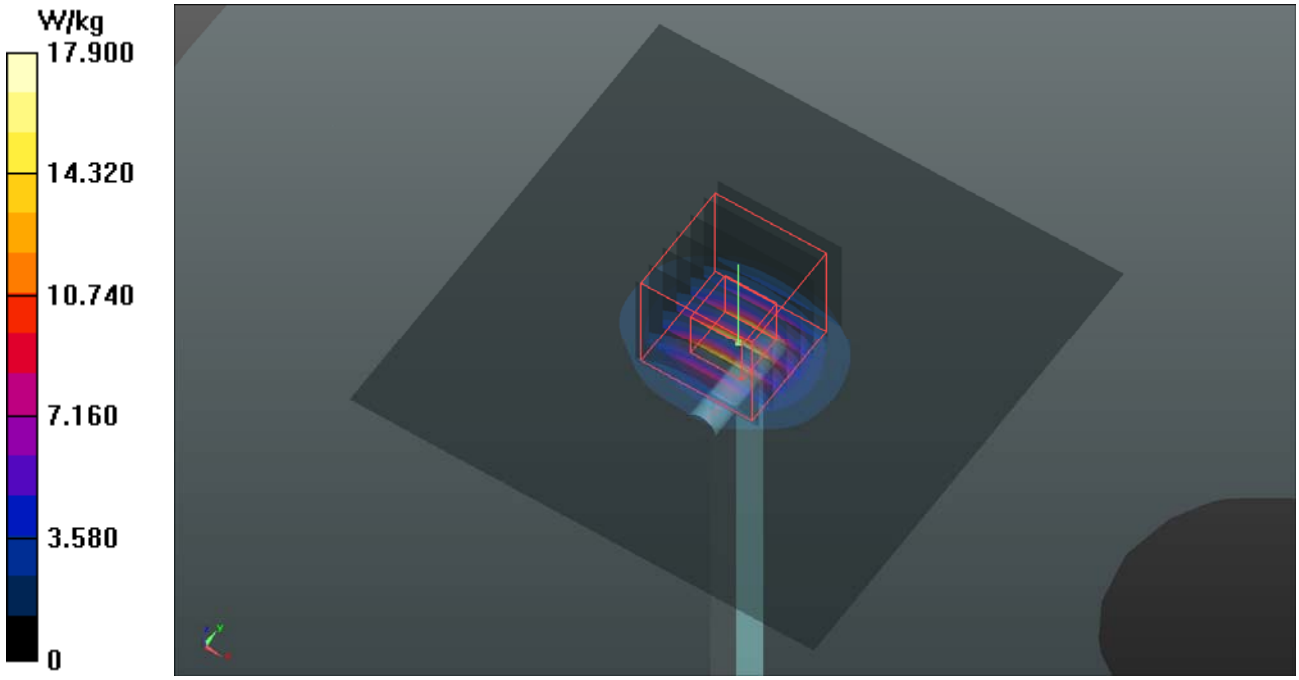
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0130 Medium parameters used: f = 5600 MHz; σ = 5.8 S/m; ε_r = 47.531; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.1, 4.1, 4.1); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.9 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 56.69 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 32.6 W/kg
SAR(1 g) = 7.54 W/kg; SAR(10 g) = 2.12 W/kg
Maximum value of SAR (measured) = 19.1 W/kg



System Check_B5800_180130

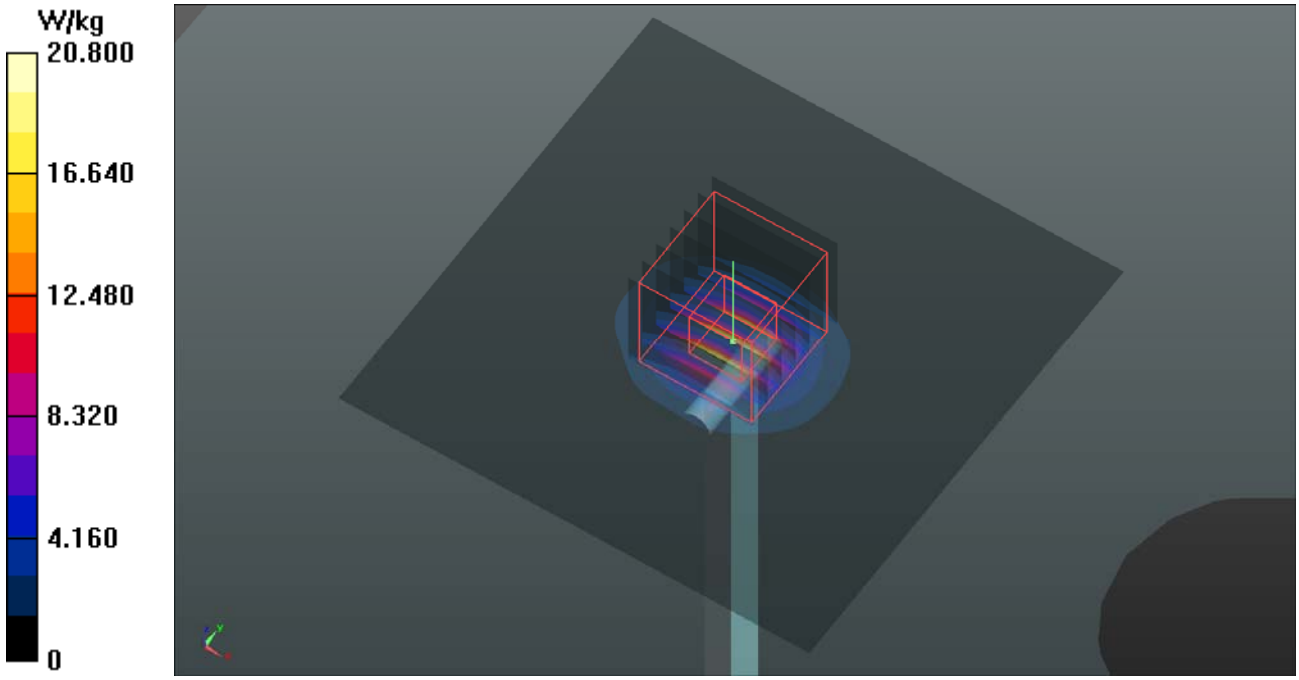
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0130 Medium parameters used: f = 5800 MHz; σ = 6.075 S/m; ε_r = 47.233; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.41, 4.41, 4.41); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 20.8 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 68.42 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 41.5 W/kg
SAR(1 g) = 7.66 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (measured) = 22.9 W/kg



Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

P01 WLAN2.4G_802.11b_Right Cheek_Ch1_Sample1_Ant 0+1

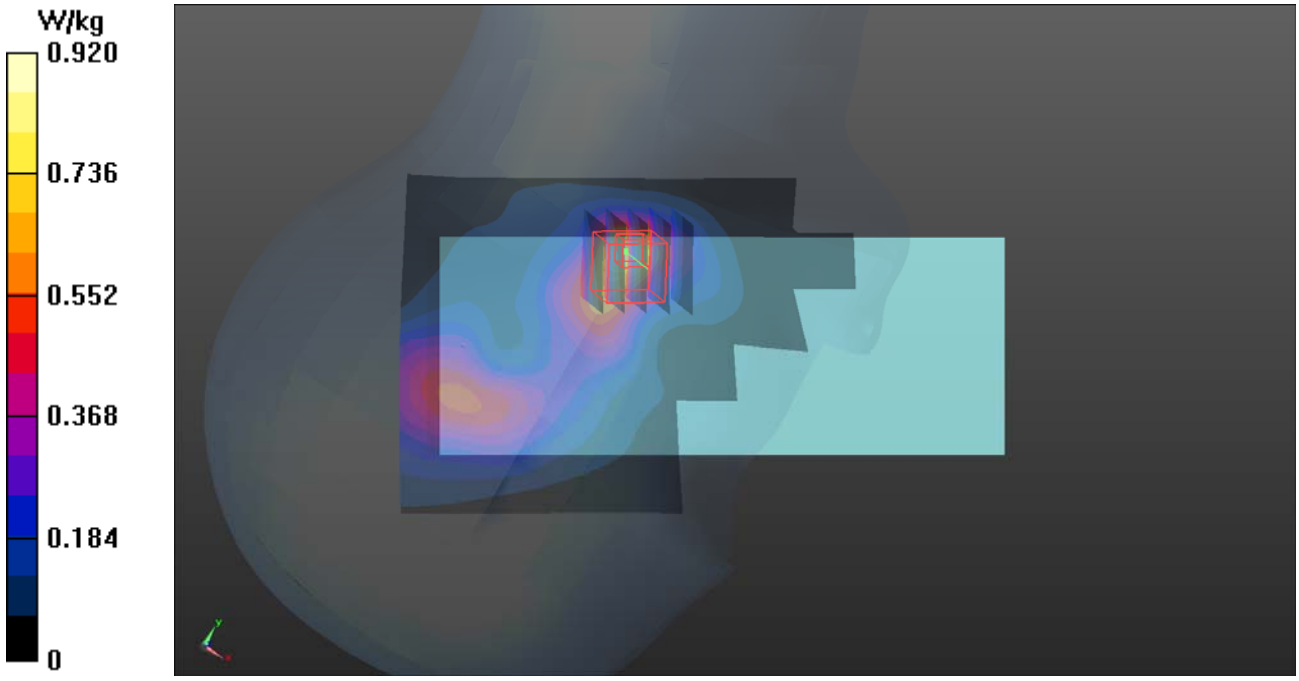
DUT: 171130C29

Communication System: WLAN_2.4G; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0130 Medium parameters used: f = 2412 MHz; σ = 1.829 S/m; ε_r = 38.045; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.65, 7.65, 7.65); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.920 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.71 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.619 W/kg; SAR(10 g) = 0.303 W/kg
Maximum value of SAR (measured) = 1.08 W/kg



P02 WLAN5G_802.11n HT40_Right Cheek_Ch54_Sample1_Ant 0+1

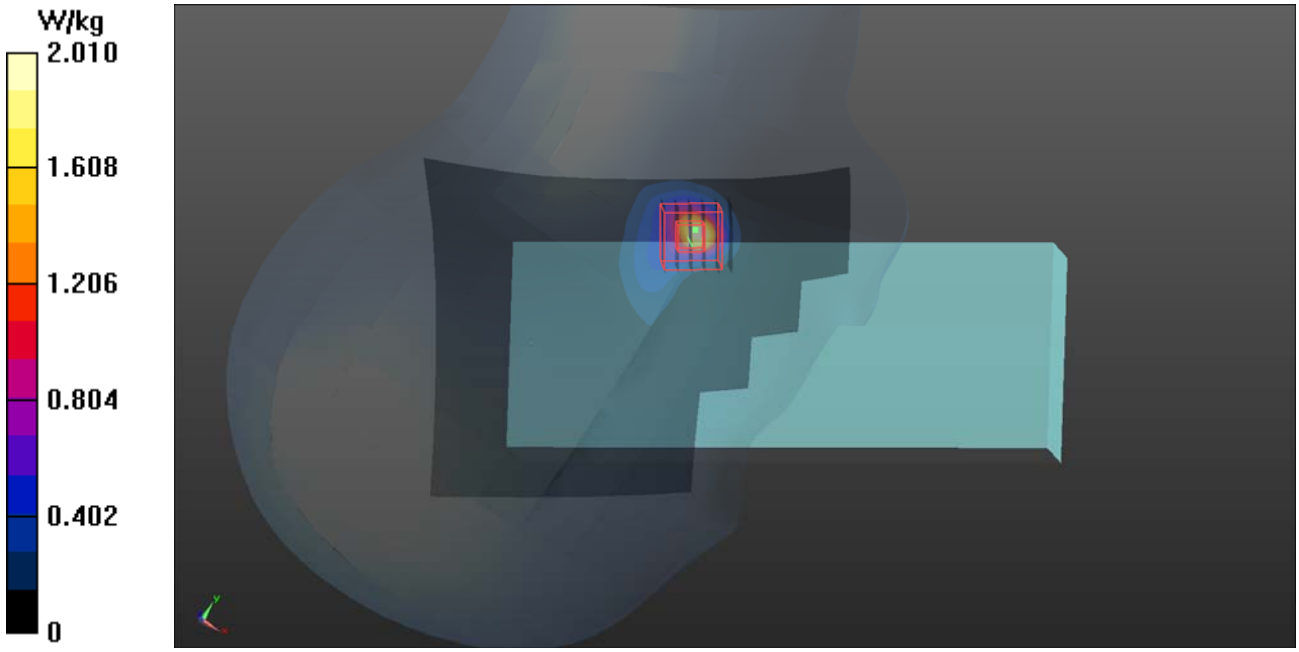
DUT: 171130C28

Communication System: WLAN_5G; Frequency: 5270 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0209 Medium parameters used: f = 5270 MHz; σ = 4.865 S/m; ε_r = 36.629; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(5.34, 5.34, 5.34); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x241x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.01 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 19.97 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 4.38 W/kg
SAR(1 g) = 0.889 W/kg; SAR(10 g) = 0.203 W/kg
Maximum value of SAR (measured) = 2.57 W/kg



P03 WLAN5G_802.11ac VHT80_Right Cheek_Ch106_Sample1_Ant 0+1

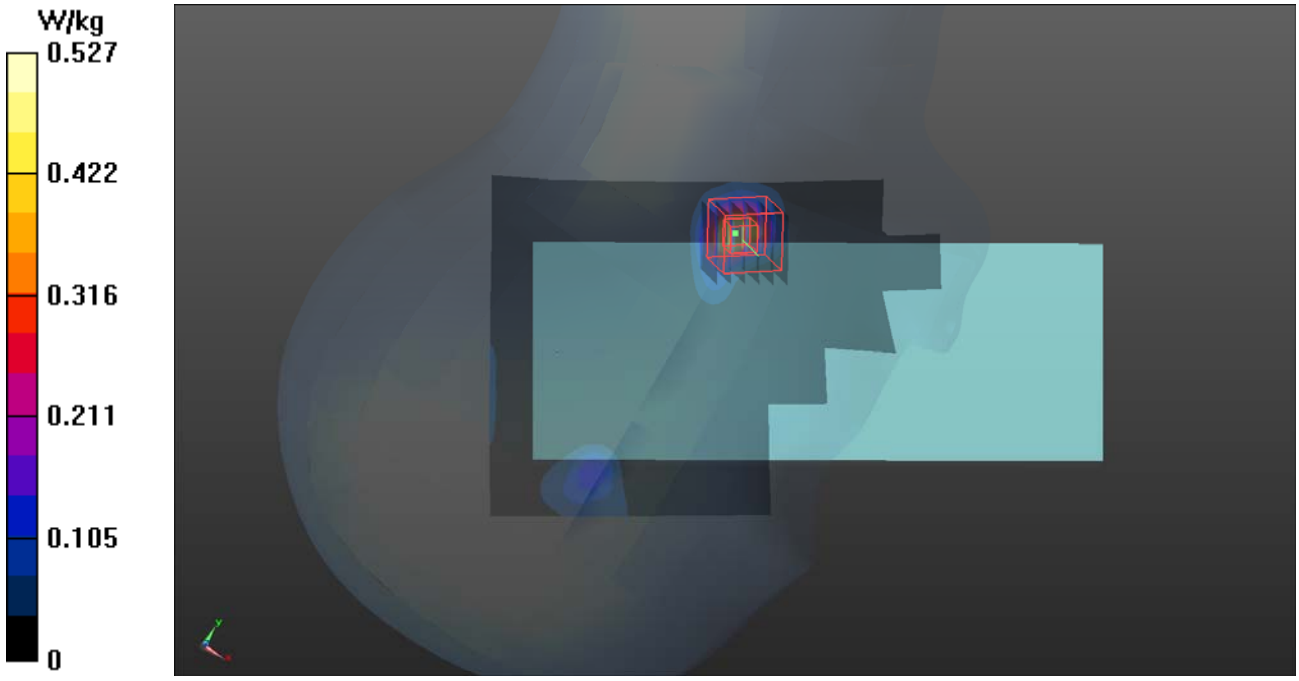
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5530 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0130 Medium parameters used: f = 5530 MHz; σ = 5.142 S/m; ε_r = 36.046; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.94, 4.94, 4.94); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.527 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 8.905 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.299 W/kg; SAR(10 g) = 0.072 W/kg
Maximum value of SAR (measured) = 0.725 W/kg



P04 WLAN5G_802.11ac VHT80_Right Cheek_Ch155_Sample1_Ant 0+1

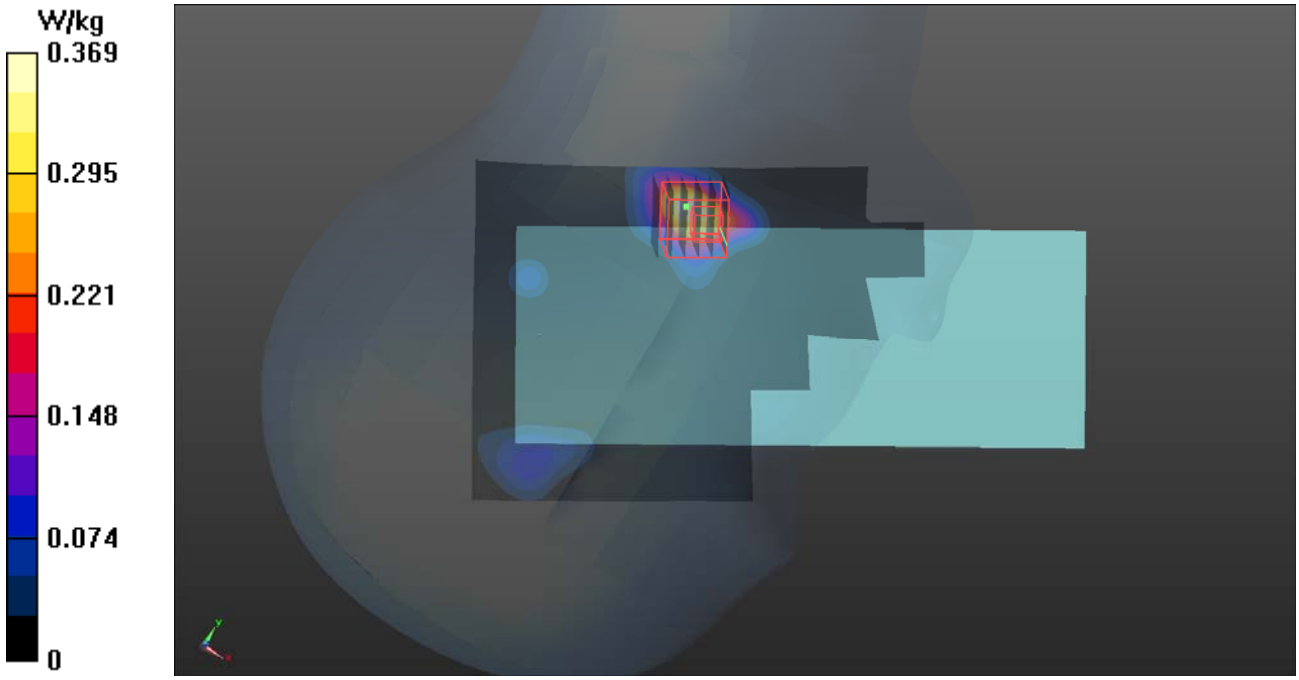
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0130 Medium parameters used: f = 5775 MHz; σ = 5.46 S/m; ε_r = 35.73; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.8, 4.8, 4.8); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.369 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 8.412 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.468 W/kg
SAR(1 g) = 0.124 W/kg; SAR(10 g) = 0.034 W/kg
Maximum value of SAR (measured) = 0.315 W/kg



P05 BT_BR_EDR_Right Cheek_Ch78_Sample1_Ant 0

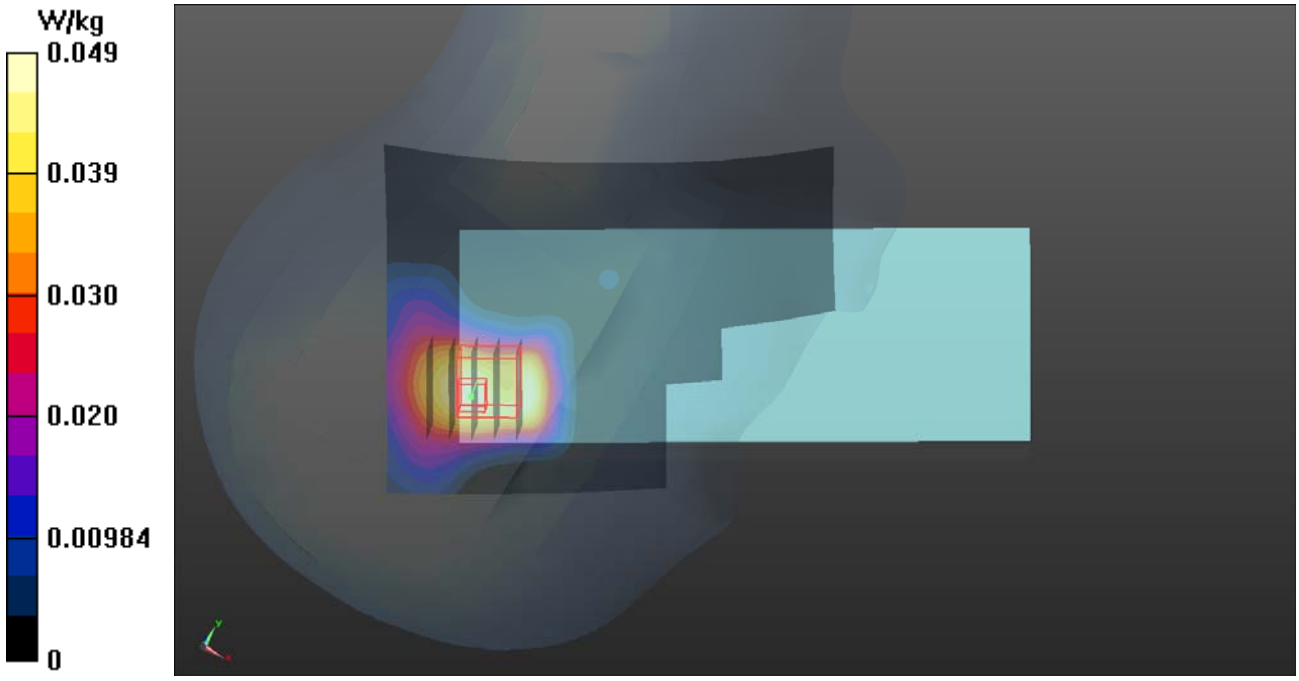
DUT: 171130C29

Communication System: BT; Frequency: 2480 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0130 Medium parameters used: f = 2480 MHz; σ = 1.902 S/m; ε_r = 37.823; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.65, 7.65, 7.65); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0492 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.0280 W/kg
SAR(1 g) = 0.00149 W/kg; SAR(10 g) = 0.000238 W/kg
Maximum value of SAR (measured) = 0.0271 W/kg



P06 WLAN2.4G_802.11b_Right Cheek_Ch1_Sample3_Ant 0+1

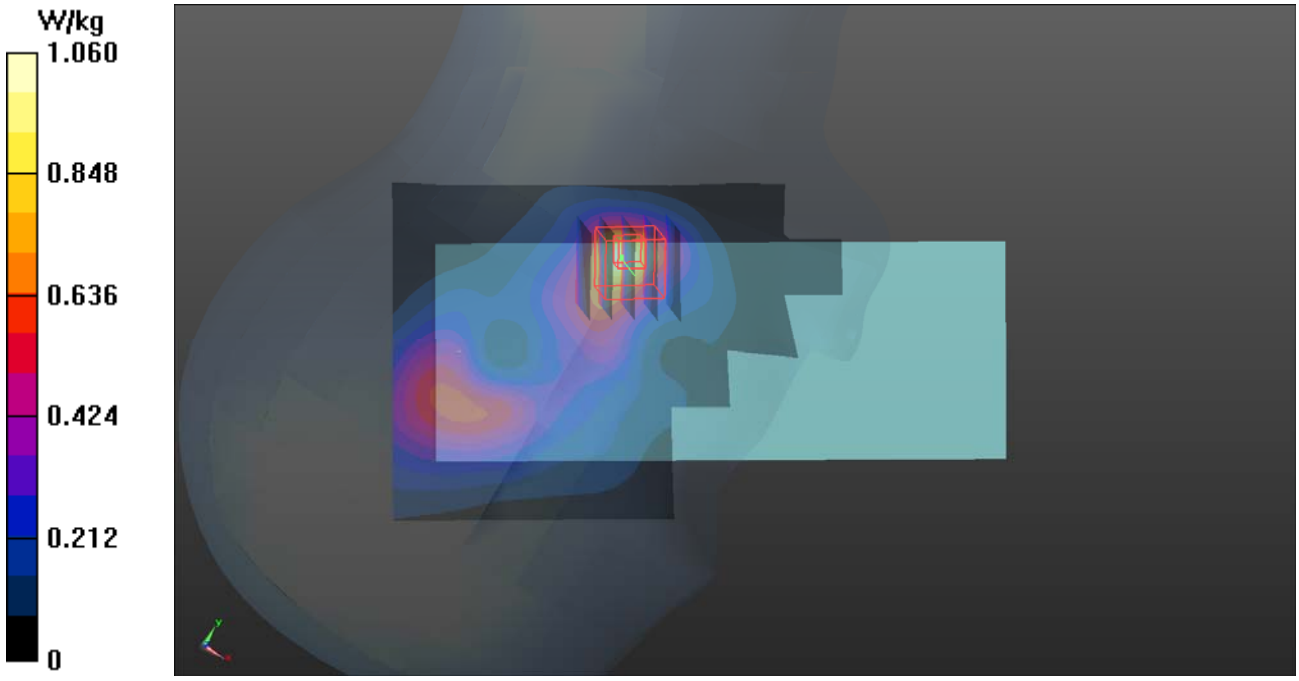
DUT: 171130C29

Communication System: WLAN_2.4G; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0130 Medium parameters used: f = 2412 MHz; σ = 1.829 S/m; ε_r = 38.045; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.65, 7.65, 7.65); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.06 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.16 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.696 W/kg; SAR(10 g) = 0.346 W/kg
Maximum value of SAR (measured) = 1.09 W/kg



P07 WLAN5G_802.11n HT40_Right Cheek_Ch54_Sample3_Ant 0+1

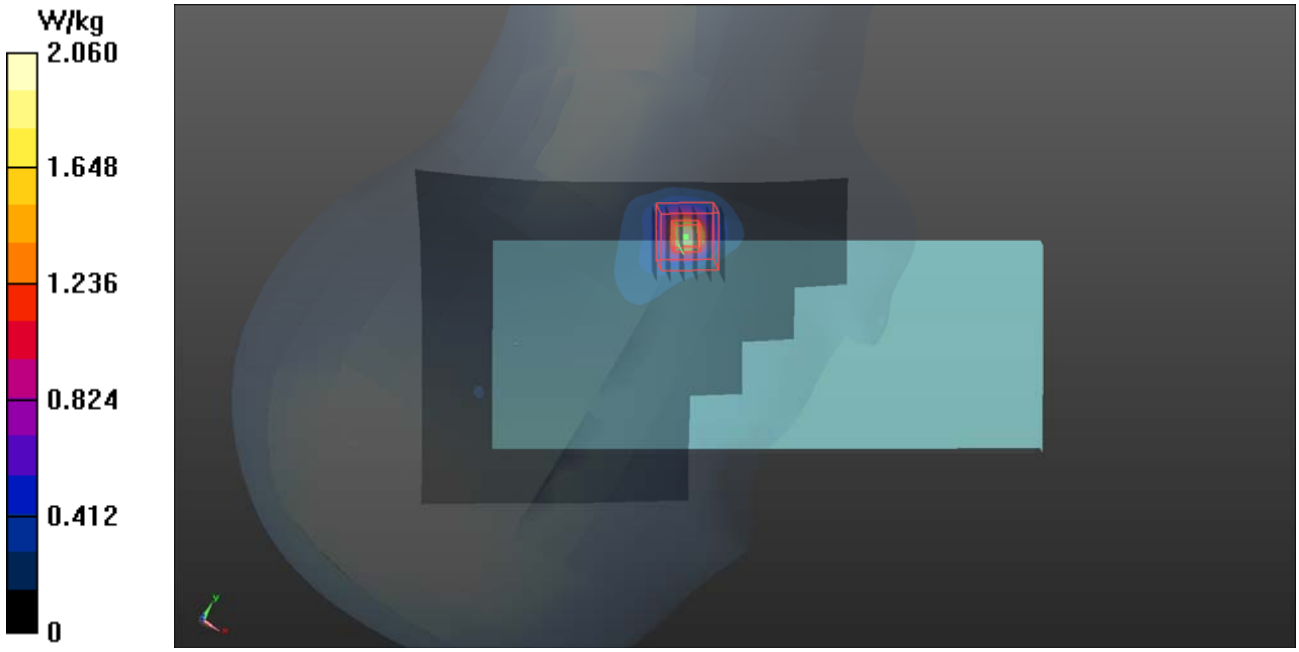
DUT: 171130C28

Communication System: WLAN_5G; Frequency: 5270 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0209 Medium parameters used: f = 5270 MHz; σ = 4.865 S/m; ε_r = 36.629; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(5.34, 5.34, 5.34); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x241x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.06 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 21.92 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 0.885 W/kg; SAR(10 g) = 0.245 W/kg
Maximum value of SAR (measured) = 1.92 W/kg



P08 WLAN5G_802.11ac VHT80_Right Cheek_Ch106_Sample3_Ant 0+1

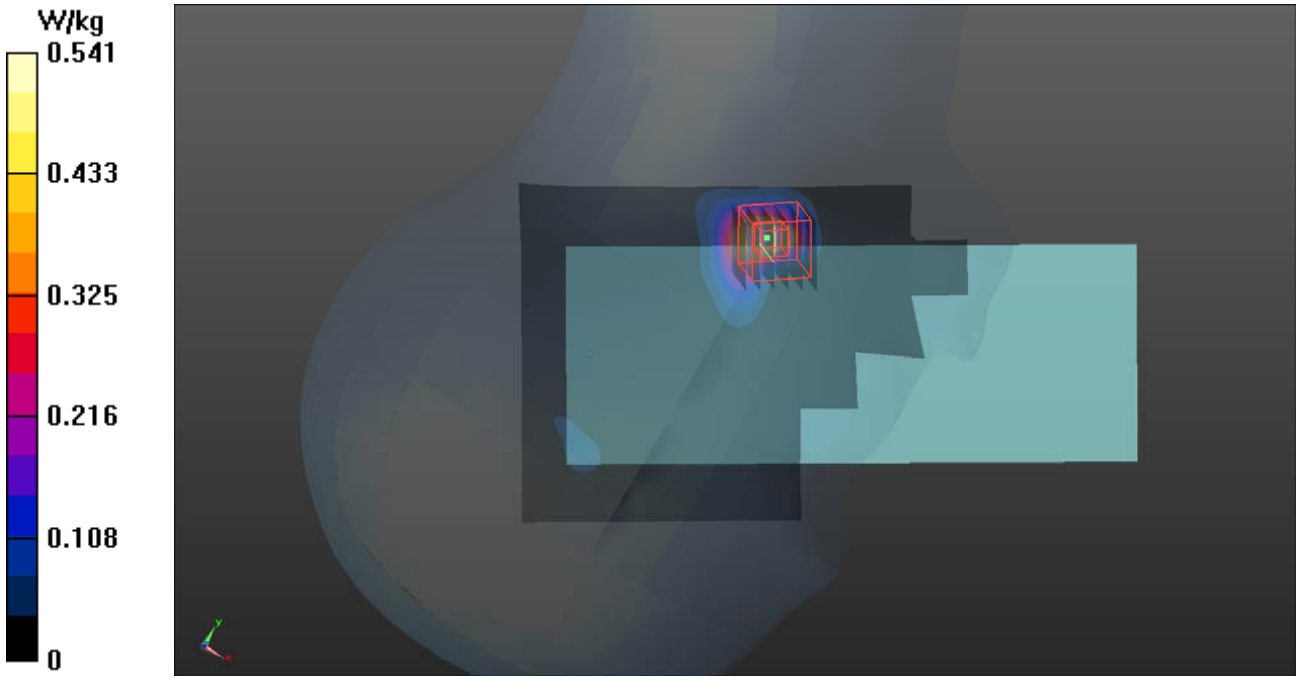
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5530 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0130 Medium parameters used: f = 5530 MHz; σ = 5.142 S/m; ε_r = 36.046; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.94, 4.94, 4.94); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.541 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 10.43 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 0.389 W/kg; SAR(10 g) = 0.094 W/kg
Maximum value of SAR (measured) = 0.957 W/kg



P09 WLAN5G_802.11ac VHT80_Right Cheek_Ch155_Sample1_Ant 0+1

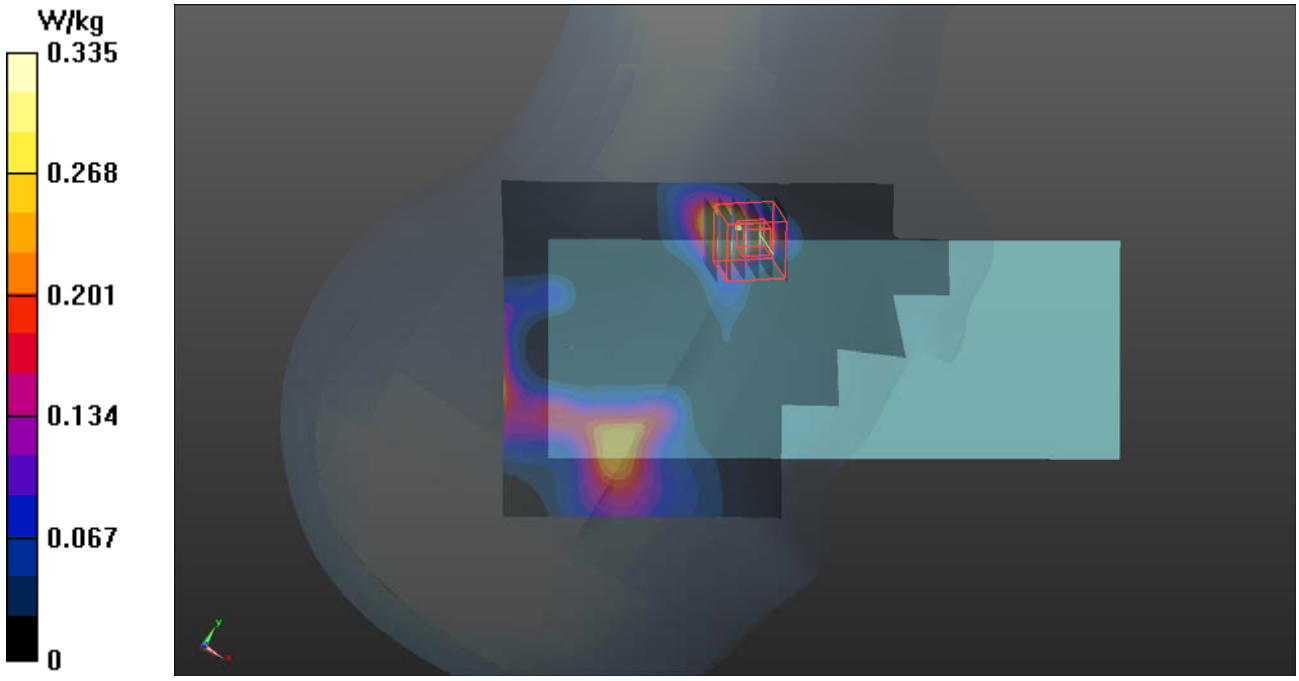
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0130 Medium parameters used: f = 5775 MHz; σ = 5.46 S/m; ε_r = 35.73; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.8, 4.8, 4.8); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.335 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 8.300 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.163 W/kg; SAR(10 g) = 0.045 W/kg
Maximum value of SAR (measured) = 0.412 W/kg



P10 BT_BR_EDR_Right Cheek_Ch78_Sample1_Ant 0

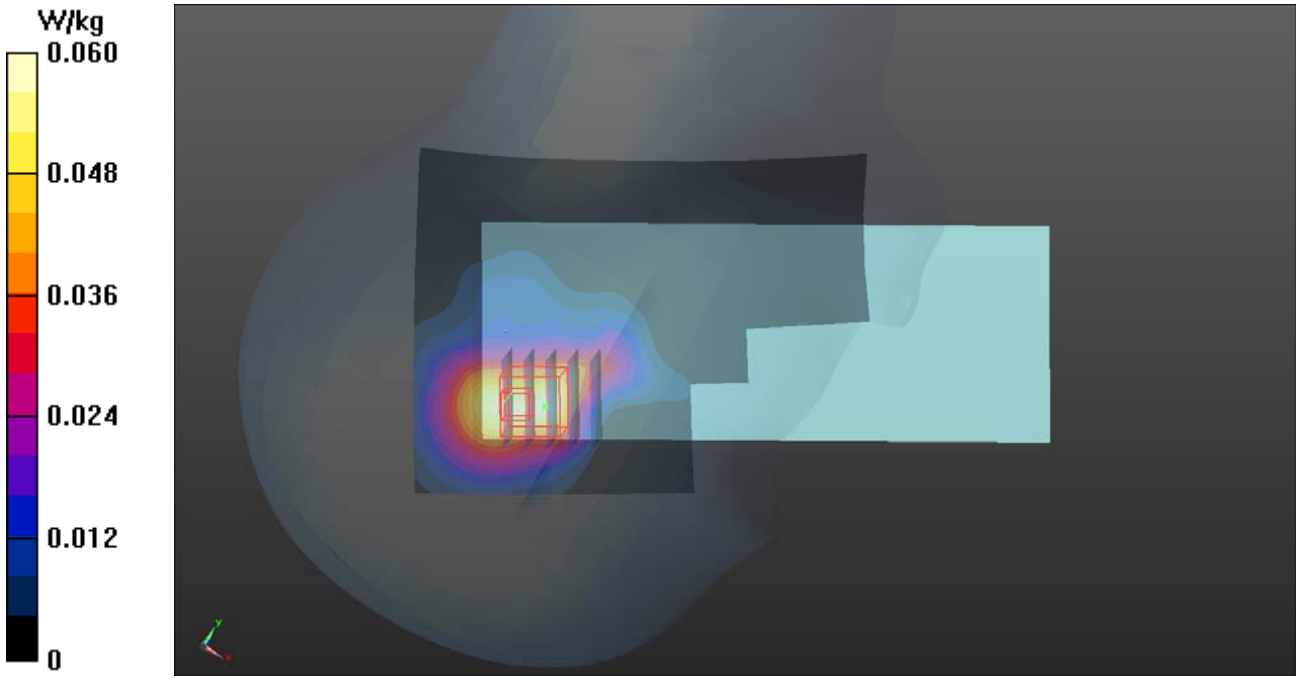
DUT: 171130C29

Communication System: BT; Frequency: 2480 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0130 Medium parameters used: f = 2480 MHz; σ = 1.902 S/m; ε_r = 37.823; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.65, 7.65, 7.65); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0595 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.903 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.0970 W/kg
SAR(1 g) = 0.046 W/kg; SAR(10 g) = 0.022 W/kg
Maximum value of SAR (measured) = 0.0782 W/kg



P11 WLAN2.4G_802.11b_Front Face_15mm_Ch1_Sample1_Ant 0+1

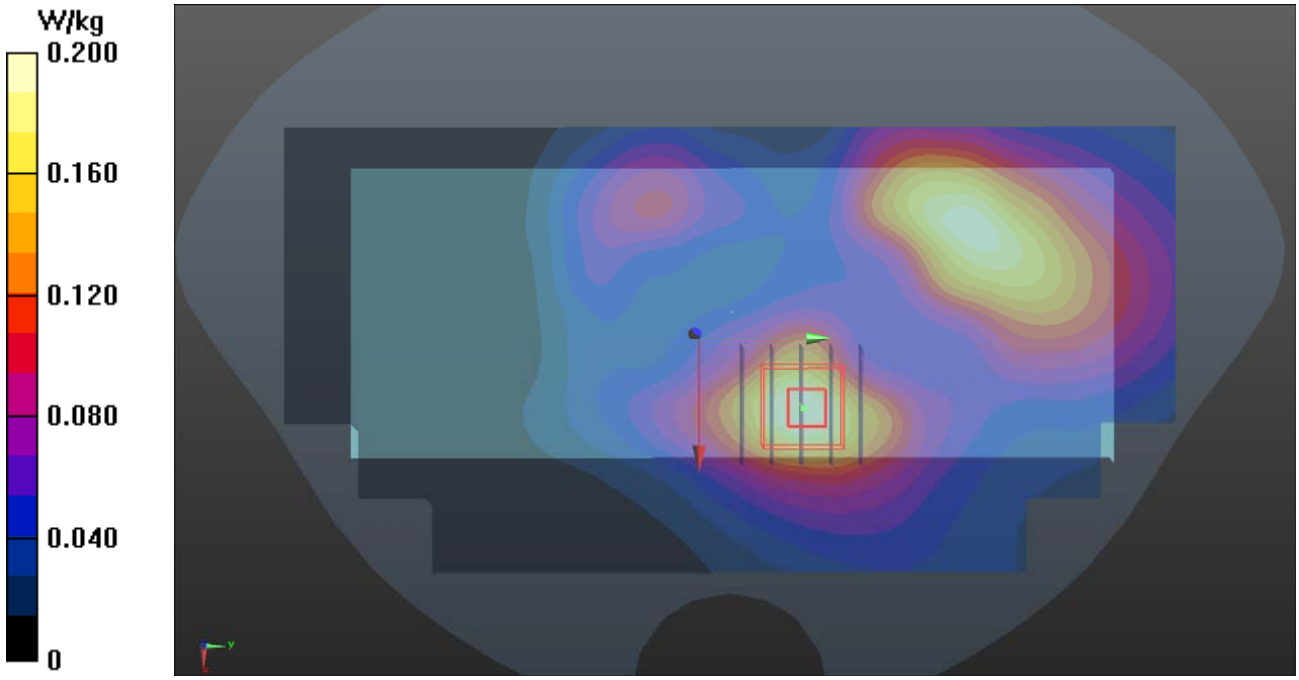
DUT: 171130C29

Communication System: WLAN_2.4G; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: B19T27N5_0130 Medium parameters used: f = 2412 MHz; σ = 1.98 S/m; ε_r = 50.892; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.83, 7.83, 7.83); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x201x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.200 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.37 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.239 W/kg
SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.078 W/kg
Maximum value of SAR (measured) = 0.199 W/kg



P12 WLAN5G_802.11n HT40_Front Face15mm_Ch54_Sample1_Ant 0+1

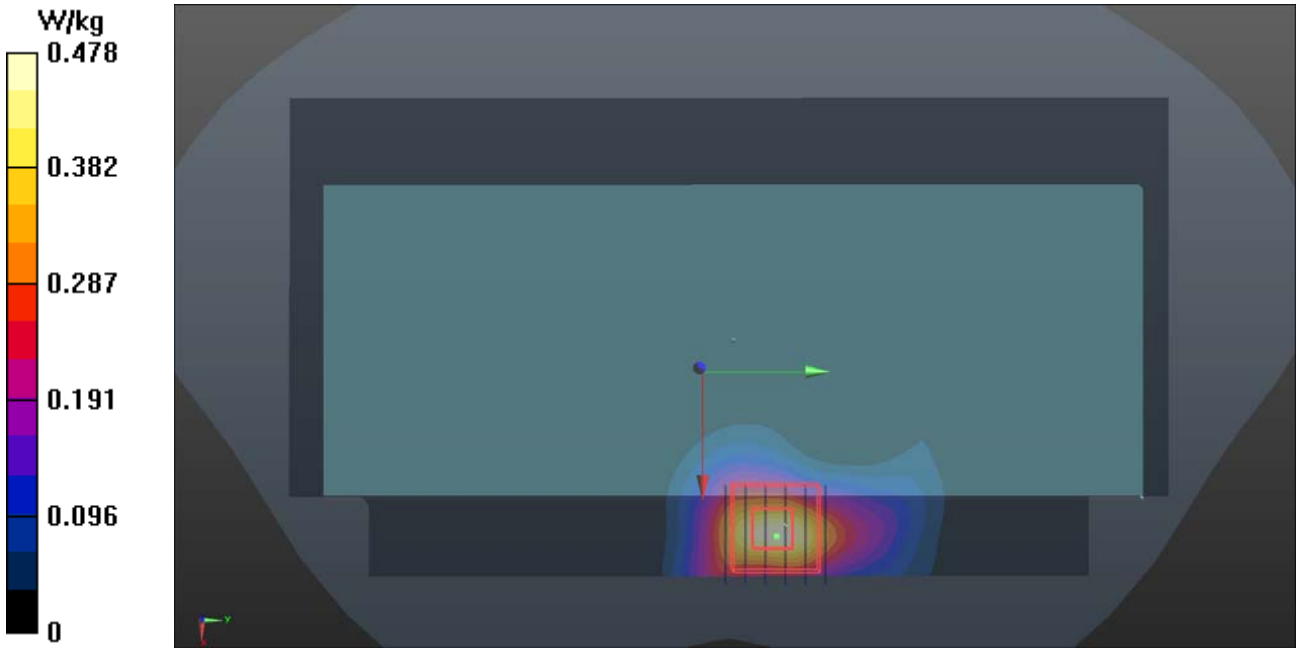
DUT: 171130C28

Communication System: WLAN_5G; Frequency: 5270 MHz;Duty Cycle: 1:1
Medium: B34T60N3_0209 Medium parameters used: f = 5270 MHz; σ = 5.461 S/m; ε_r = 47.658; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.7, 4.7, 4.7); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.478 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 8.142 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.157 W/kg; SAR(10 g) = 0.062 W/kg
Maximum value of SAR (measured) = 0.329 W/kg



P13 WLAN5G_802.11ac VHT80_Front Face_15mm_Ch138_Sample1_Ant 0+1

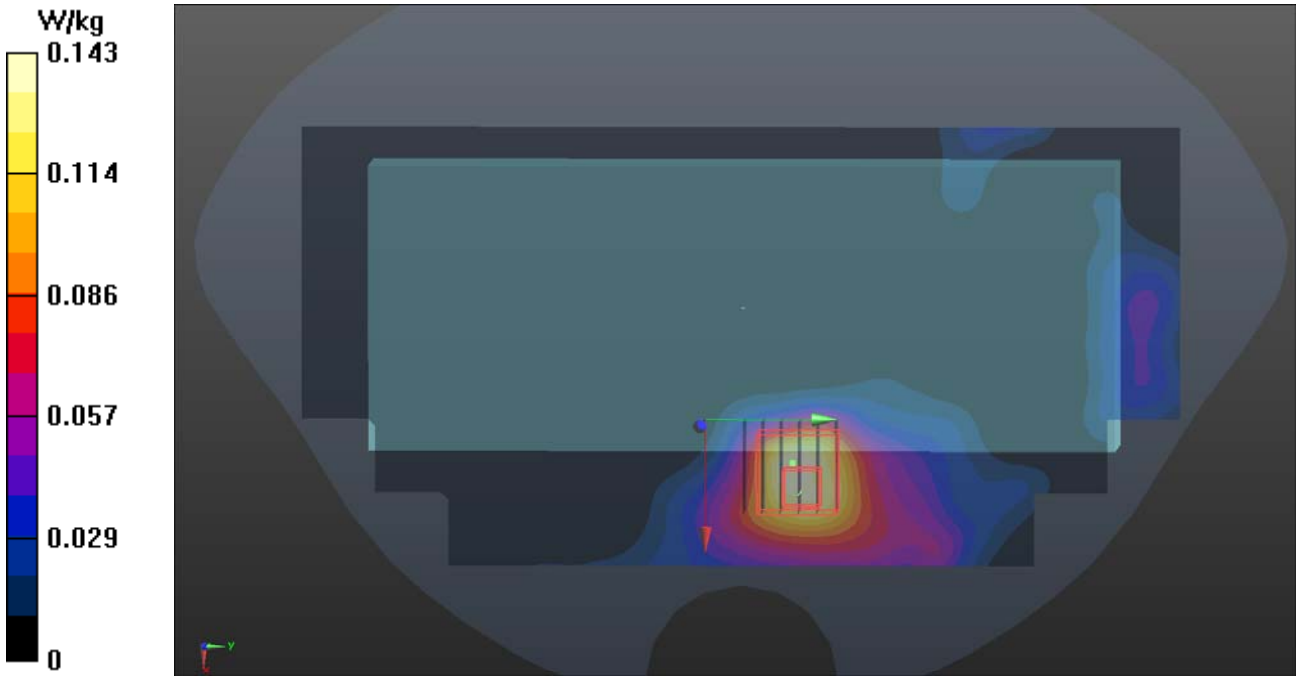
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5690 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0130 Medium parameters used: f = 5690 MHz; σ = 5.931 S/m; ε_r = 47.404; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.1, 4.1, 4.1); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x241x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.143 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 5.246 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.231 W/kg
SAR(1 g) = 0.055 W/kg; SAR(10 g) = 0.021 W/kg
Maximum value of SAR (measured) = 0.137 W/kg



P14 WLAN5G_802.11ac VHT80_Front Face_15mm_Ch155_Sample1_Ant 0+1

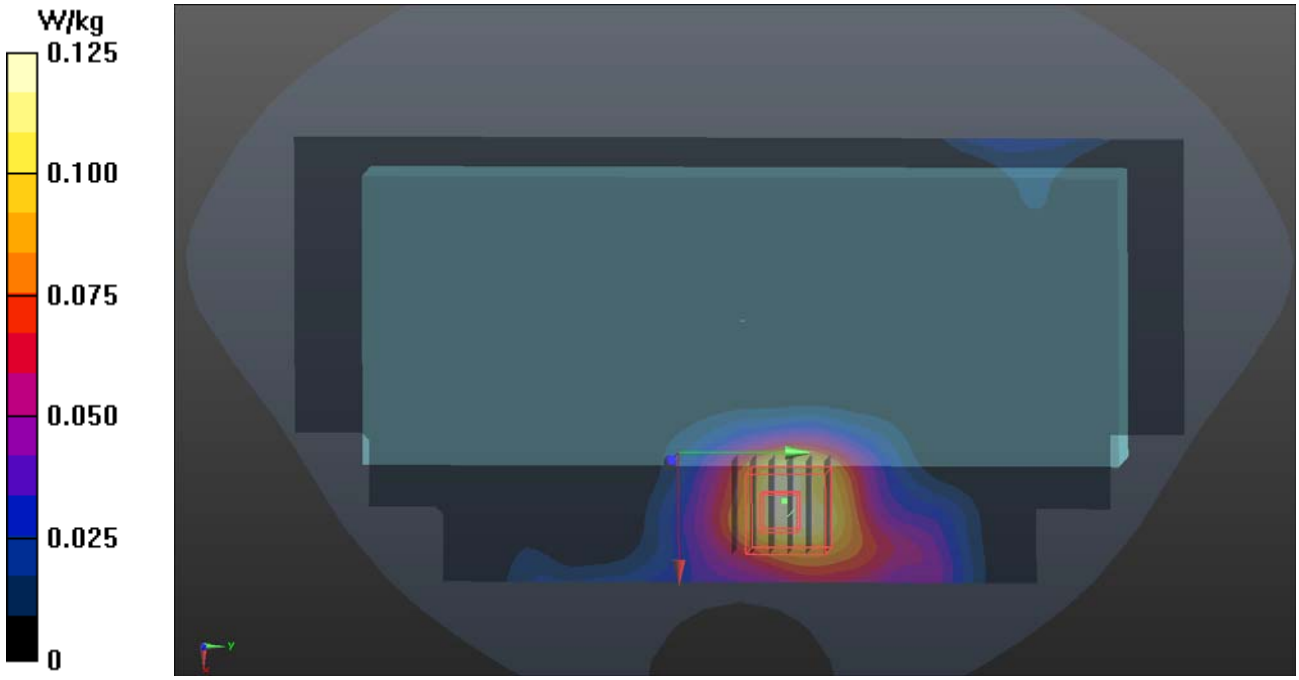
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0130 Medium parameters used: f = 5775 MHz; σ = 6.047 S/m; ε_r = 47.222; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.41, 4.41, 4.41); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x241x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.125 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 4.825 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.138 W/kg
SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.015 W/kg
Maximum value of SAR (measured) = 0.117 W/kg



P15 BT_BR_EDR_Front Face_15mm_Sample1_Ch0_Ant 0

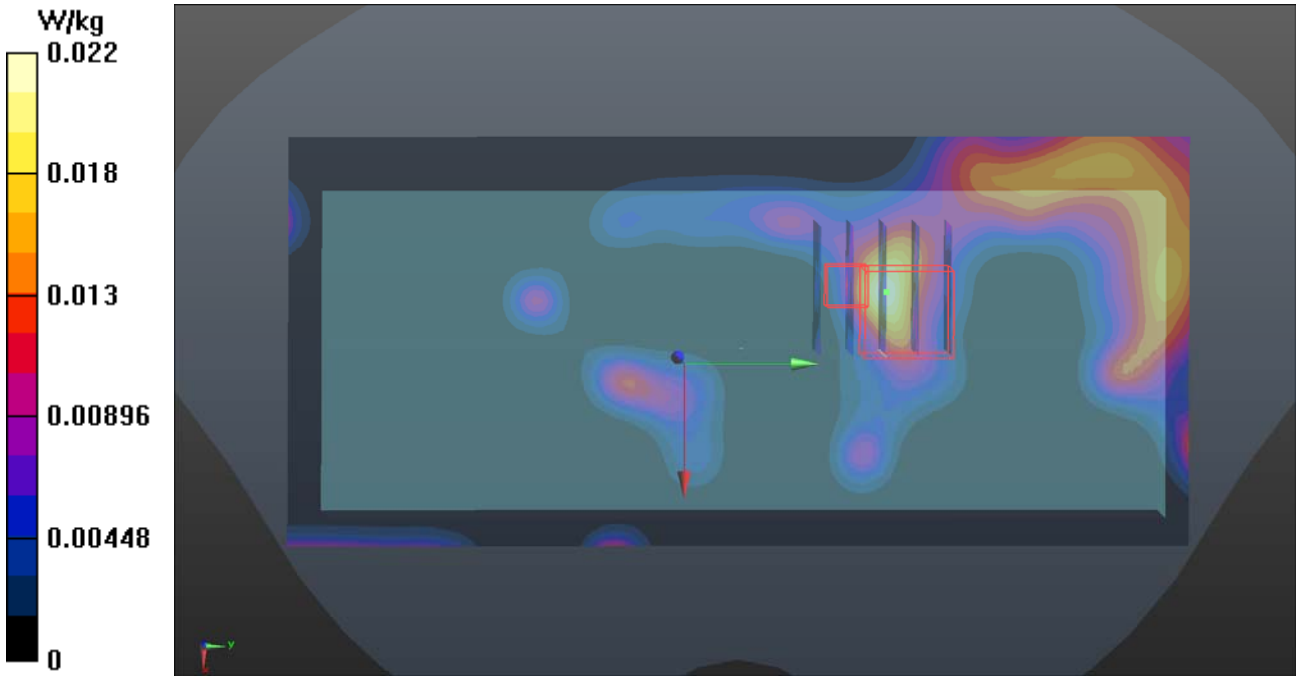
DUT: 171130C29

Communication System: BT; Frequency: 2402 MHz;Duty Cycle: 1:1
Medium: B19T27N5_0130 Medium parameters used: f = 2402 MHz; σ = 1.971 S/m; ε_r = 50.921; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.83, 7.83, 7.83); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0224 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.565 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.0300 W/kg
SAR(1 g) = 0.00185 W/kg; SAR(10 g) = 0.000359 W/kg
Maximum value of SAR (measured) = 0.0196 W/kg



P16 WLAN2.4G_802.11b_Front Face_15mm_Ch1_Sample3_Ant 0+1

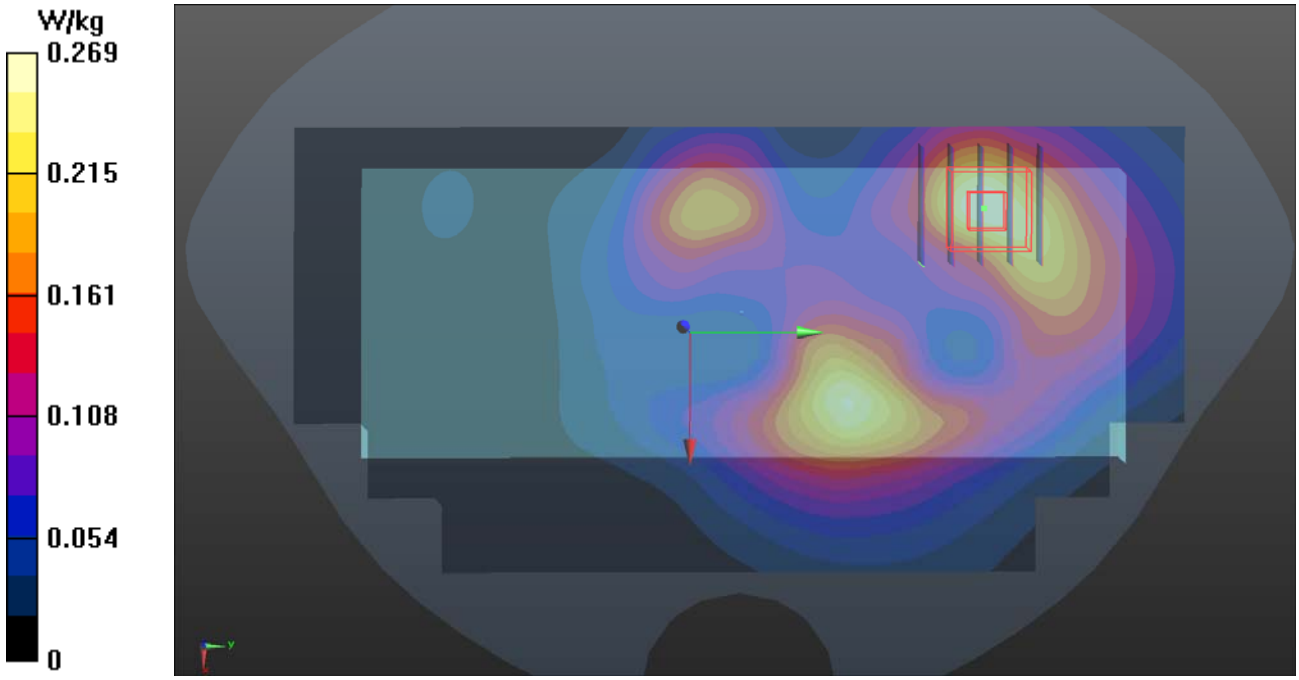
DUT: 171130C29

Communication System: WLAN_2.4G; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: B19T27N5_0130 Medium parameters used: f = 2412 MHz; σ = 1.98 S/m; ε_r = 50.892; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.83, 7.83, 7.83); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x201x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.269 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.73 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.317 W/kg
SAR(1 g) = 0.185 W/kg; SAR(10 g) = 0.105 W/kg
Maximum value of SAR (measured) = 0.265 W/kg



P17 WLAN5G_802.11n HT40_Front Face_15mm_Ch54_Sample3_Ant 0+1

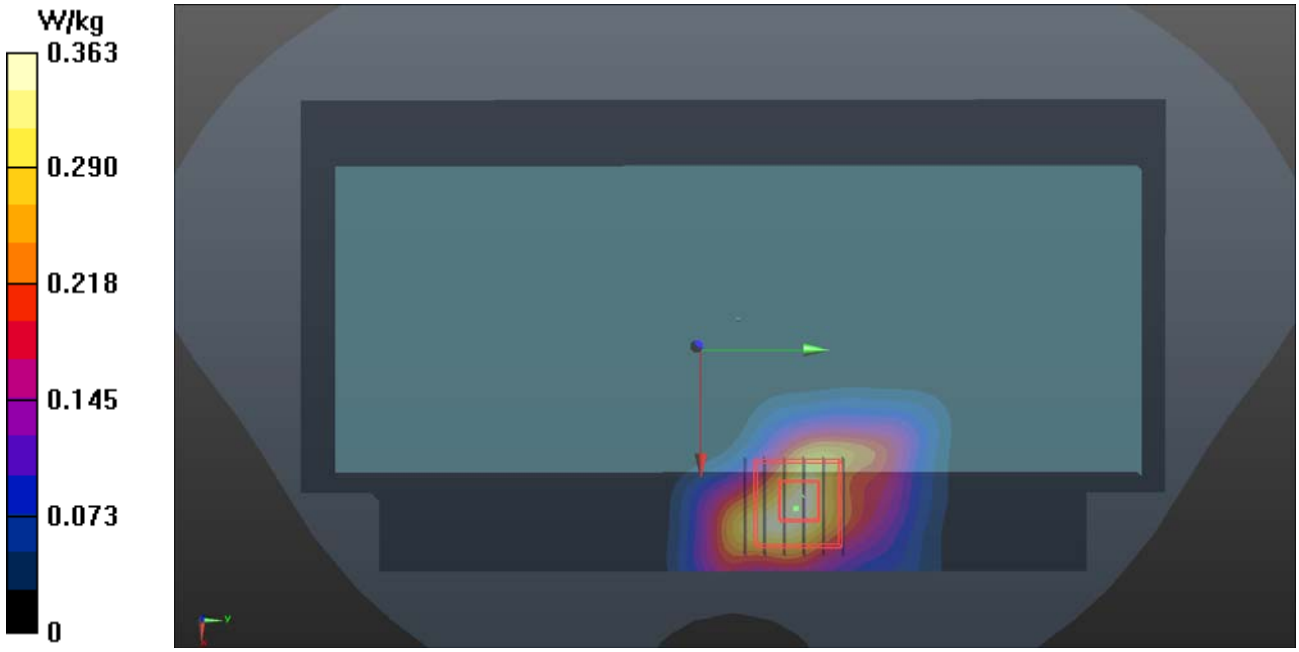
DUT: 171130C28

Communication System: WLAN_5G; Frequency: 5270 MHz;Duty Cycle: 1:1
Medium: B34T60N3_0209 Medium parameters used: f = 5270 MHz; σ = 5.461 S/m; ε_r = 47.658; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.7, 4.7, 4.7); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.363 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 8.338 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.511 W/kg
SAR(1 g) = 0.151 W/kg; SAR(10 g) = 0.061 W/kg
Maximum value of SAR (measured) = 0.324 W/kg



P18 WLAN5G_802.11ac VHT80_Front Face_15mm_Ch138_Sample3_Ant 0+1

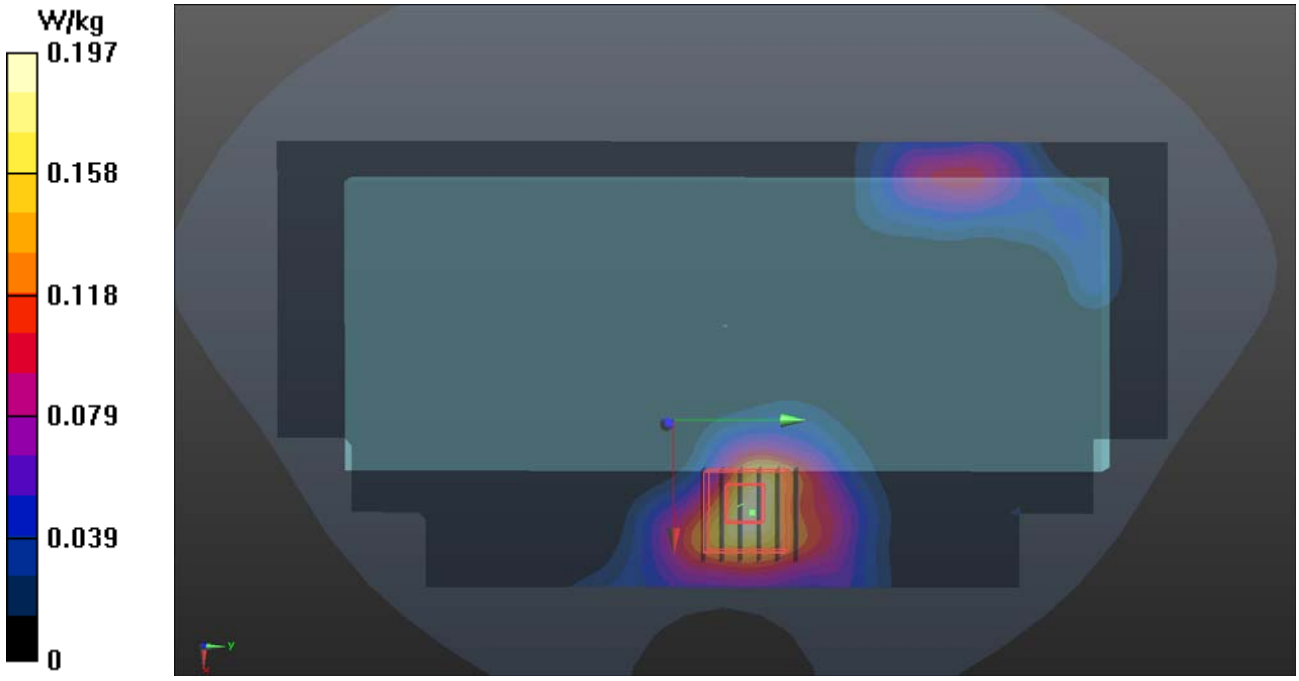
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5690 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0130 Medium parameters used: f = 5690 MHz; σ = 5.931 S/m; ε_r = 47.404; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.1, 4.1, 4.1); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x241x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.197 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 5.598 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.064 W/kg; SAR(10 g) = 0.025 W/kg
Maximum value of SAR (measured) = 0.167 W/kg



P19 WLAN5G_802.11ac VHT80_Front Face_15mm_Ch155_Sample3_Ant 0+1

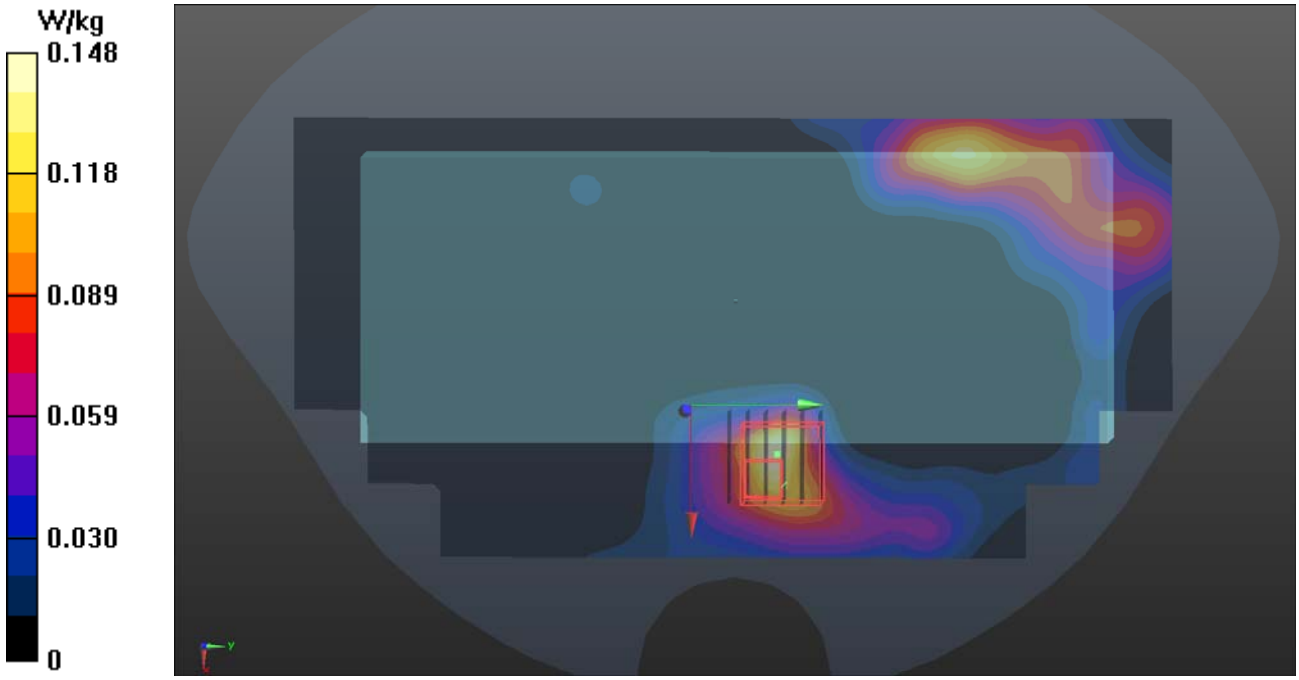
DUT: 171130C29

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0130 Medium parameters used: f = 5775 MHz; σ = 6.047 S/m; ε_r = 47.222; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(4.41, 4.41, 4.41); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x241x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.148 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 4.384 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.344 W/kg
SAR(1 g) = 0.034 W/kg; SAR(10 g) = 0.014 W/kg
Maximum value of SAR (measured) = 0.107 W/kg



P20 BT_BR_EDR_Front Face_15mm_Ch0_Sample3_Ant 0

DUT: 171130C29

Communication System: BT; Frequency: 2402 MHz;Duty Cycle: 1:1
Medium: B19T27N5_0130 Medium parameters used: f = 2402 MHz; σ = 1.971 S/m; ε_r = 50.921; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7375; ConvF(7.83, 7.83, 7.83); Calibrated: 2017/12/18;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2017/08/17
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0357 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.934 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.0320 W/kg
SAR(1 g) = 0.00848 W/kg; SAR(10 g) = 0.00246 W/kg
Maximum value of SAR (measured) = 0.0162 W/kg