

SAR Test Report

Report No. : SF200522C02
Applicant : Trimble Inc.
Address : 5475 Kellenburger Rd, Dayton, OH 45424
Product : 10" Handheld computer
FCC ID : (WWAN) S9E-EM7565
 (WLAN) PD99560NG
Brand : Trimble Inc.
Model No. : 121800
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 616217 D04 v01r02,
 KDB 941225 D01 v03r01, KDB 941225 D05 v02r05
 KDB 941225 D05A v01r02
Sample Received Date : May. 21, 2020
Date of Testing : Jun. 02, 2020 ~ Jun. 29, 2020
Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location : No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City, Taiwan

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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FCC Accredited No.: TW0003

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Release Control Record

Report No.	Reason for Change	Date Issued
SF200522C02	Initial release	Jul. 09, 2020

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest SAR-1g Body-worn (W/kg)
PCB	WCDMA II	1.16
	WCDMA IV	1.17
	WCDMA V	1.15
	LTE 2	1.19
	LTE 4 & 66	1.18
	LTE 5	1.11
	LTE 7	1.18
	LTE 12	0.76
	LTE 13	1.11
	LTE 26	1.11
	LTE 41	1.18
DTS	2.4G WLAN	0.35
NII	5.3G WLAN	1.15
	5.6G WLAN	0.86
	5.8G WLAN	0.57
DSS	Bluetooth	0.00

Highest Simultaneous Transmission SAR	Highest SAR-1g Body-worn (W/kg)
	1.56

Note:

- 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.
- This device supports both LTE band 66 and band 4. The frequency span of LTE band 66 can completely cover LTE band 4, and they has the same tune-up power. SAR was tested for LTE band 66 only.

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2. Description of Equipment Under Test

EUT Type	10" Handheld computer
FCC ID	(WWAN) S9E-EM7565 (WLAN) PD99560NG
Brand Name	Trimble Inc.
Model Name	121800
Tx Frequency Bands (Unit: MHz)	WCDMA Band II : 1852.4 ~ 1907.6 WCDMA Band IV : 1712.4 ~ 1752.6 WCDMA Band V : 826.4 ~ 846.6 LTE Band 2 : 1850.7 ~ 1909.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 5 : 824.7 ~ 848.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 7 : 2502.5 ~ 2567.5 (BW: 5M, 10M, 15M, 20M) LTE Band 12 : 699.7 ~ 715.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 13 : 779.5 ~ 784.5 (BW: 5M, 10M) LTE Band 26 : 814.7 ~ 848.3 (BW: 1.4M, 3M, 5M, 10M, 15M) LTE Band 41 : 2498.5 ~ 2687.5 (BW: 5M, 10M, 15M, 20M) LTE Band 66 : 1710.7 ~ 1779.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) WLAN : 2412 ~ 2472, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5720, 5745 ~ 5825 Bluetooth : 2402 ~ 2480
Uplink Modulations	GSM & GPRS : GMSK EDGE : 8PSK WCDMA : QPSK LTE : QPSK, 16QAM, 64QAM 802.11b : DSSS 802.11a/g/n/ac : OFDM Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.6.1 of this report
Antenna Type	Refer to Note as below
EUT Stage	Identical Prototype

Note:

1. The antenna information is listed as below.

WLAN Antenna							
Ant. Type	Manufacturer	Parts Number		Antenna Gain (dBi)			
				WLAN 2.4 GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.725 GHz	WLAN 5.725~5.85 GHz
PIFA	AWAN	Ant0_Main	1415-07NC000 (AYP6Y-100092)	-2.09	0.87	1.02	1.14
		Ant1_Aux.	1415-07N8000 (AYP6Y-100093)	-0.90	0.30	-0.52	-1.61

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.

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:

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be related to the electrical field in the tissue by

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

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 DASY6 System

DASY6 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 DASY6 software defined. The DASY6 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 from the optical into digital electric signal of the DAE and transfers data to the PC.

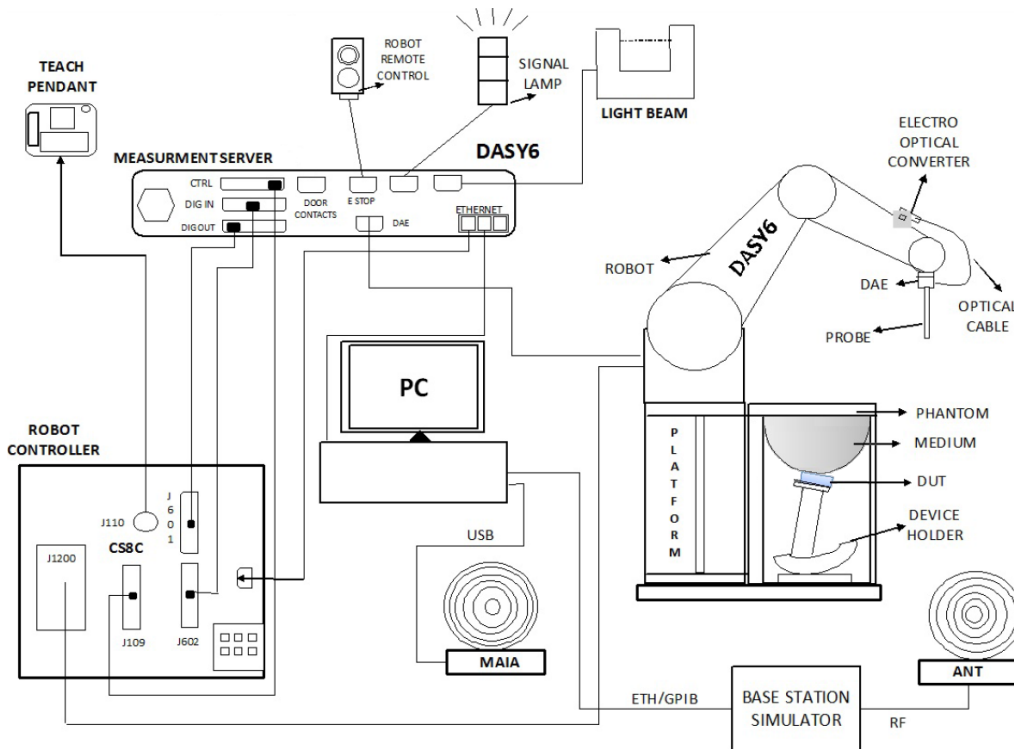


Fig-3.1 SPEAG DASY6 System Setup

3.2.1 Robot

The DASY6 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 DASY6 System


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3.2.2 Probes

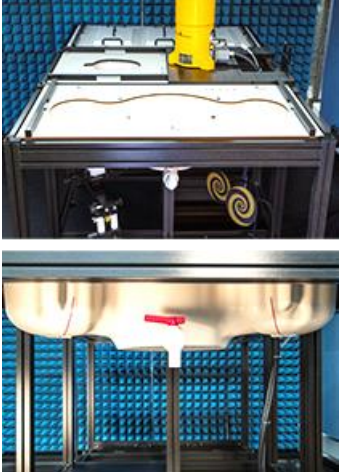
The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

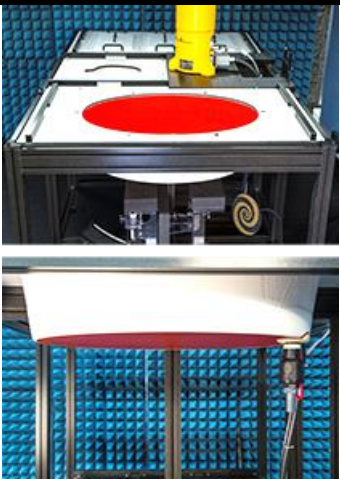
Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	4 MHz to 10 GHz Linearity: ± 0.2 dB	
Directivity	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/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	

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	< 5 μ V (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	


3.2.4 Phantoms


Model	SAM-Twin Phantom	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE Std 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, fiberglass reinforced (VE-GF)	
Shell Thickness	2 \pm 0.2 mm (6 \pm 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	The ELI phantom is used for compliance testing of handheld and body-mounted wireless devices. 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, fiberglass 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	MD4HHTV5 - Mounting Device for Hand-Held Transmitters	
Construction	In combination with the Twin SAM or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	Polyoxymethylene (POM)	


Model	MDA4WTV5 - Mounting Device Adaptor for Ultra Wide Transmitters	
Construction	An upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.	
Material	Polyoxymethylene (POM)	

Model	MDA4SPV6 - Mounting Device Adaptor for Smart Phones	
Construction	The solid low-density MDA4SPV6 adaptor assuring no impact on the DUT radiation performance and is conform with any DUT design and shape.	
Material	ROHACELL	


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Model	MD4LAPV5 - Mounting Device for Laptops and other Body-Worn Transmitters	
Construction	In combination with the Twin SAM or ELI phantoms, the Mounting Device (Body-Worn) enables testing of transmitter devices according to IEC 62209-2 specifications. The device holder can be locked for positioning at a flat phantom section.	
Material	Polyoxymethylene (POM), PET-G, Foam	

3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with 1/4 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 Power Source

Model	Powersource1	
Signal Type	Continuous Wave	
Operating Frequencies	600 MHz to 5850 MHz	
Output Power	-5.0 dBm to +17.0 dBm	
Power Supply	5V DC, via USB jack	
Power Consumption	<3 W	
Applications	System performance check and validation with a CW signal.	

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3.2.8 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 10 % are listed in Table-3.1.

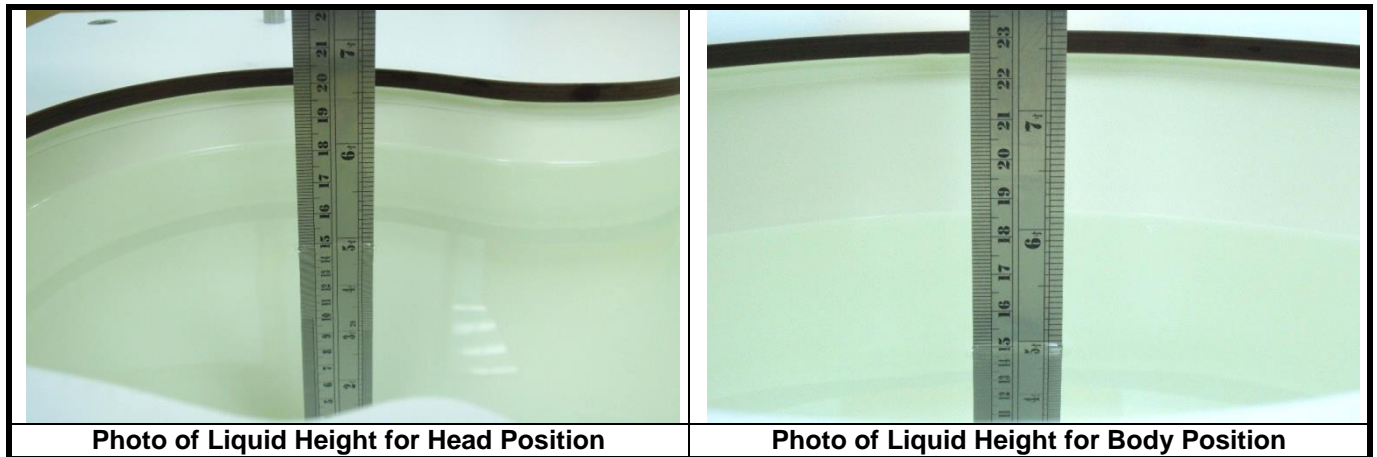


Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of $\pm 10\%$	Target Conductivity	Range of $\pm 10\%$
450	43.5	39.2 ~ 47.9	0.87	0.78 ~ 0.96
750	41.9	37.7 ~ 46.1	0.89	0.80 ~ 0.98
835	41.5	37.4 ~ 45.7	0.90	0.81 ~ 0.99
900	41.5	37.4 ~ 45.7	0.97	0.87 ~ 1.07
1450	40.5	36.5 ~ 44.6	1.20	1.08 ~ 1.32
1500	40.4	36.4 ~ 44.4	1.23	1.11 ~ 1.35
1640	40.2	36.2 ~ 44.2	1.31	1.18 ~ 1.44
1750	40.1	36.1 ~ 44.1	1.37	1.23 ~ 1.51
1800	40.0	36.0 ~ 44.0	1.40	1.26 ~ 1.54
1900	40.0	36.0 ~ 44.0	1.40	1.26 ~ 1.54
2000	40.0	36.0 ~ 44.0	1.40	1.26 ~ 1.54
2100	39.8	35.8 ~ 43.8	1.49	1.34 ~ 1.64
2300	39.5	35.6 ~ 43.5	1.67	1.50 ~ 1.84
2450	39.2	35.3 ~ 43.1	1.80	1.62 ~ 1.98
2600	39.0	35.1 ~ 42.9	1.96	1.76 ~ 2.16
3000	38.5	34.7 ~ 42.4	2.40	2.16 ~ 2.64
3500	37.9	34.1 ~ 41.7	2.91	2.62 ~ 3.20
4000	37.4	33.7 ~ 41.1	3.43	3.09 ~ 3.77
4500	36.8	33.1 ~ 40.5	3.94	3.55 ~ 4.33
5000	36.2	32.6 ~ 39.8	4.45	4.01 ~ 4.90
5200	36.0	32.4 ~ 39.6	4.66	4.19 ~ 5.13
5400	35.8	32.2 ~ 39.4	4.86	4.37 ~ 5.35
5600	35.5	32.0 ~ 39.1	5.07	4.56 ~ 5.58
5800	35.3	31.8 ~ 38.8	5.27	4.74 ~ 5.80
6000	35.1	31.6 ~ 38.6	5.48	4.93 ~ 6.03

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The dielectric properties of the tissue simulating liquids are defined in IEC 62209-1 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.

Since the range of $\pm 10\%$ of the required target values is used to measure relative permittivity and conductivity, the SAR correction procedure is applied to correct measured SAR for the deviations in permittivity and conductivity. Only positive correction has been used to scale up the measured SAR, and SAR result would not be corrected if the correction Δ SAR has a negative sign.

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

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.

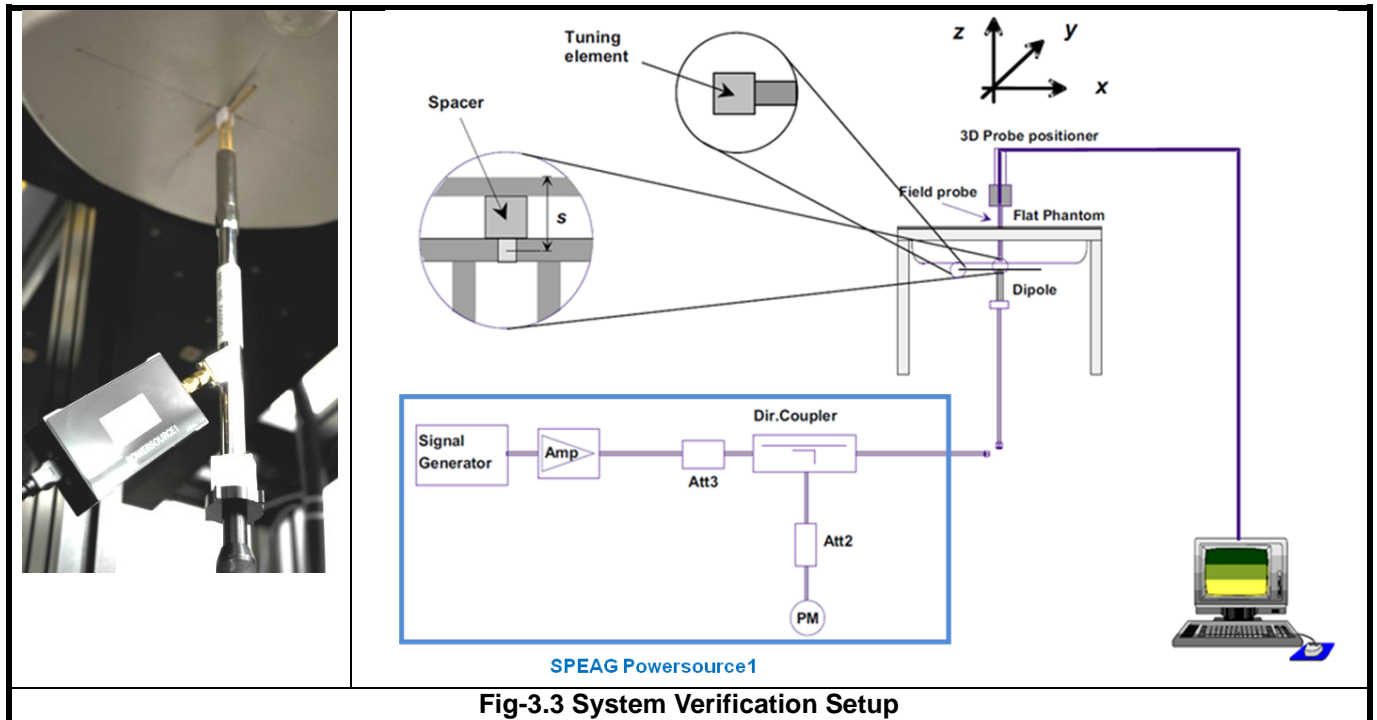


Fig-3.3 System Verification Setup

The SPEAG Powersource1 is a portable and very stable RF source providing a continuous wave (CW) signal. It is designed for conducting SAR system checks and SAR system validation of DASY and is compatible with IEC 62209-1, IEC 62209-2 and IEEE Std 1528 standards. The Powersource1 has been calibrated by SPEAG's ISO/IEC 17025-accredited calibration center. When using Powersource1, the setup can be simplified, as shown in Fig-3.3. The signal purity is warranted by design. Since the Powersource1 is calibrated, no additional equipment is needed and the Powersource1 can directly be connected to the SMA connector of the dipole without a cable as all separate components (signal generator, amplifier, coupler and power meter) are built into the unit.

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 Powersource1 is adjusted for the desired forward power of 17 dBm at the dipole connector and the RF output power would be turned on. 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 Scan and 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.

Measure the local SAR at a test point at 1.4 mm of the inner surface of the phantom recommended by SEPAG. The area scan (two-dimensional SAR distribution) is performed cover at least an area larger than the projection of the EUT or antenna. The measurement resolution and spatial resolution for interpolation shall be chosen to allow identification of the local peak locations to within one-half of the linear dimension of the corresponding side of the zoom scan volume. Following table provides the measurement parameters required for the area scan.

Parameter	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 6 \text{ GHz}$
Maximum distance from closest measurement point to phantom surface	5 ± 1	$\delta \ln(2)/2 \pm 0.5$
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$	$\leq 2 \text{ GHz: } \leq 15 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 12 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 12 \text{ mm}$ $4 - 6 \text{ GHz: } \leq 10 \text{ mm}$

From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that will not be within the zoom scan of other peaks. Additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g. 1 W/kg for 1.6 W/kg, 1 g limit; or 1.26 W/kg for 2 W/kg, 10 g limit).

The zoom scan (three-dimensional SAR distribution) is performed at the local maxima locations identified in previous area scan procedure. The zoom scan volume must be larger than the required minimum dimensions. When graded grids are used, which only applies in the direction normal to the phantom surface, the initial grid separation closest to the phantom surface and subsequent graded grid increment ratios must satisfy the required protocols. The 1-g SAR averaging volume must be fully contained within the zoom scan measurement volume boundaries; otherwise, the measurement must be repeated by shifting or expanding the zoom scan volume. The similar requirements also apply to 10-g SAR measurements. Following table provides the measurement parameters required for the zoom scan.

Parameter		$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 6 \text{ GHz}$
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$		$\leq 2 \text{ GHz: } \leq 8 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 5 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 5 \text{ mm}$ $4 - 6 \text{ GHz: } \leq 4 \text{ mm}$
Maximum zoom scan spatial resolution, normal to phantom surface	<i>uniform grid:</i> $\Delta z_{\text{Zoom}}(n)$	$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 4 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 3 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
	<i>graded grids:</i> $\Delta z_{\text{Zoom}}(1)$	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 3.0 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2.0 \text{ mm}$
	$\Delta z_{\text{Zoom}}(n>1)$	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1) \text{ mm}$	
Minimum zoom scan volume (x, y, z)		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz: } \geq 28 \text{ mm}$ $4 - 5 \text{ GHz: } \geq 25 \text{ mm}$ $5 - 6 \text{ GHz: } \geq 22 \text{ mm}$

Per IEC 62209-2 AMD1, the successively higher resolution zoom scan is required if the zoom scan measured as defined above complies with both of the following criteria, or if the peak spatial-average SAR is below 0.1 W/kg, no additional measurements are needed:

- (1) The smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak shall be larger than the horizontal grid steps in both x and y directions ($\Delta x, \Delta y$). This shall be checked for the measured zoom scan plane conformal to the phantom at the distance z_{M1} .
- (2) The ratio of the SAR at the second measured point (M2) to the SAR at the closest measured point (M1) at the x-y location of the measured maximum SAR value shall be at least 30 %.

If one or both of the above criteria are not met, the zoom scan measurement shall be repeated using a finer resolution. New horizontal and vertical grid steps shall be determined from the measured SAR distribution so that the above criteria are met. Compliance with the above two criteria shall be demonstrated for the new measured zoom scan.

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 from 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 Proximity Sensor>

The device supports WWAN, WLAN, and Bluetooth capabilities. It is designed with a proximity sensor which can trigger/not trigger power reduction for WCDMA and LTE on Top Side of EUT for SAR compliance. Others RF capability (WLAN and Bluetooth) have no power reduction. The power levels for all wireless technologies and the power reduction please refer to section 4.6 of this report.

Proximity Sensor Triggering Distances (KDB 616217 D04 §6.2)

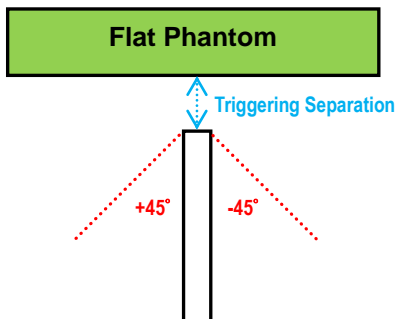
The proximity sensor triggering distance was determined per KDB 616217 for rear face and applicable edge. Summary for power verification per distance was tabulated in the below table.

Output Power Verification in dBm for EUT Top Edge											
Distance (mm)	2	3	4	5	6	7	8	9	10	11	12
WCDMA II	20.5	20.8	20.8	20.4	20.4	20.5	23.2	23.2	23.4	22.9	23.0
WCDMA IV	22.1	22.1	22.1	22.4	22.5	22.4	23.3	23.0	23.5	23.5	23.3
WCDMA V	22.5	22.0	22.0	22.4	22.3	22.3	23.1	23.5	23.1	23.3	23.5
LTE 2	20.6	20.4	20.3	20.4	20.4	20.6	22.5	22.5	23.0	22.8	22.6
LTE 4	21.9	22.2	22.1	22.2	21.9	21.9	23.4	22.9	23.0	23.0	23.0
LTE 5	22.0	22.1	22.1	22.3	22.1	22.1	22.9	22.9	23.3	23.3	22.8
LTE 7	18.7	18.8	18.8	18.8	18.9	18.8	21.3	21.4	21.7	21.5	21.2
LTE 26	22.1	22.2	22.4	22.5	22.4	22.3	23.4	23.2	23.1	22.9	23.0
LTE 41	20.3	20.5	20.2	20.1	20.5	20.3	21.7	21.8	21.6	21.6	21.5
LTE 66	21.8	22.0	21.8	22.2	22.2	21.9	23.0	23.0	22.9	23.0	22.8

SAR Test Report

Proximity Sensor Tilt Angle Influences (KDB 616217 D04 §6.4)

The proximity sensor tilt angle influence was determined per KDB 616217 for applicable edge. Summary for proximity sensor tilt angle influence is shown in below.



Orientation	Separation Distance (mm)	Tilt Angle										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
Top Edge	6	On	On	On	On	On	On	On	On	On	On	On

Summary for Proximity Sensor Triggering Test

According to the procedures noticed in KDB 616217 D04, the proximity sensor triggering distance is 7 mm for EUT Top Side. The separation distance of 6 mm determined by the smallest triggering distance on Top Side is used to access the tilt angle influence and the sensor does not release during ± 45 degree. Therefore, the smallest separation distance for tilt angle influence is 6 mm for the Top Side. The conservation triggering distances based on the separation distance for the sensor trigger / not triggered as EUT with power reduction at 0 mm, and EUT without power reduction at 5 mm for Top Side were used to test SAR.

The power reduction is depends on the proximity sensor input. For a steady SAR test, the power reduction was enabled or disabled manually by engineering software during SAR testing.

<Connections between EUT and System Simulator>

For WWAN SAR testing, the EUT was linked and controlled by base station emulator. Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

SAR Test Report

<Considerations Related to WCDMA for Setup and Testing>

Release 5 HSDPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH / HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c , β_d), and HS-DPCCH power offset parameters (Δ_{ACK} , Δ_{NACK} , Δ_{CQI}) are set according to values indicated in below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-test	β_c	β_d	β_d (SF)	β_d/β_c	$\beta_{HS}^{(1)(2)}$	CM ⁽³⁾ (dB)	MPR ⁽³⁾ (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	12/15 ⁽⁴⁾	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.
 Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.
 Note 3: CM = 1 for $\beta_d/\beta_c = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
 Note 4: For subtest 2 the β_d/β_c ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF0) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Release 6 HSUPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode. Otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing. Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in below.

SAR Test Report

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{HS}^{(1)}$	β_{ec}	$\beta_{ed}^{(4/5)}$	β_{ed} (SF)	β_{ed} (Codes)	CM ⁽²⁾ (dB)	MPR ^(2/6) (dB)	AG ⁽⁵⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{HS} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

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

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

DC-HSDPA SAR Guidance

The 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 5 HSDPA, SAR is required for Rel. 8 DC-HSDPA. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

SAR Test Report

<Considerations Related to LTE for Setup and Testing>

This device contains LTE transmitter which follows 3GPP standards, is category 3, supports both QPSK and 16QAM modulations, and supported LTE band and channel bandwidth is listed in below. The output power was tested per 3GPP TS 36.521-1 maximum transmit procedures for both QPSK and 16QAM modulation. The results please refer to section 4.6 of this report.

EUT Supported LTE Band and Channel Bandwidth						
LTE Band	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz
2	V	V	V	V	V	V
4	V	V	V	V	V	V
5	V	V	V	V		
7			V	V	V	V
12	V	V	V	V		
13			V	V		
26	V	V	V	V	V	
41			V	V	V	V
66	V	V	V	V	V	V

The LTE maximum power reduction (MPR) in accordance with 3GPP TS 36.101 is active all times during LTE operation. The allowed MPR for the maximum output power is specified in below.

Modulation	Channel Bandwidth / RB Configurations						LTE MPR Setting (dB)
	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	<= 5	<= 4	<= 8	<= 12	<= 16	<= 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	<= 5	<= 4	<= 8	<= 12	<= 16	<= 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3

Note: MPR is according to the standard and implemented in the circuit (mandatory).

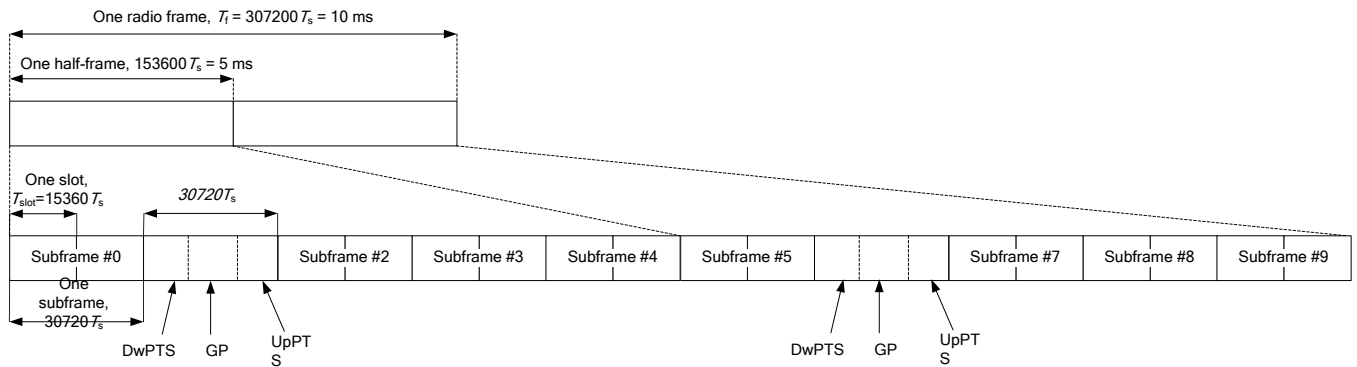
In addition, the device is compliant with additional maximum power reduction (A-MPR) requirements defined in 3GPP TS 36.101 section 6.2.4 that was disabled for all FCC compliance testing.

During LTE SAR testing, the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB was set in base station simulator. When the EUT has registered and communicated to base station simulator, the simulator set to make EUT transmitting the maximum radiated power.

TDD-LTE Setup Configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.

SAR Test Report



3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2

Special Subframe Configuration	Normal Cyclic Prefix in Downlink			Extended Cyclic Prefix in Downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts
1	19760 · Ts			20480 · Ts		
2	21952 · Ts			23040 · Ts		
3	24144 · Ts			25600 · Ts		
4	26336 · Ts			7680 · Ts		
5	6592 · Ts	4384 · Ts	5120 · Ts	20480 · Ts	4384 · Ts	5120 · Ts
6	19760 · Ts			23040 · Ts		
7	21952 · Ts			12800 · Ts		
8	24144 · Ts			-		
9	13168 · Ts	-	-	-	-	-

3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number										
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	
1	5 ms	D	S	U	U	D	D	S	U	U	D	
2	5 ms	D	S	U	D	D	D	S	U	D	D	
3	10 ms	D	S	U	U	U	D	D	D	D	D	
4	10 ms	D	S	U	U	D	D	D	D	D	D	
5	10 ms	D	S	U	D	D	D	D	D	D	D	
6	5 ms	D	S	U	U	U	D	S	U	U	D	

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The variety of different TD-LTE uplink-downlink configurations allows a network operator to allocate the network's capacity between uplink and downlink traffic to meet the needs of the network. The uplink duty cycle of these seven configurations can readily be computed and shown in below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Considering the highest transmission duty cycle, TDD-LTE was tested using Uplink-Downlink Configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using extended cyclic prefix uplink. Therefore, SAR testing for TDD-LTE was performed at the maximum output power with highest transmission duty cycle of 63.33%.

LTE Uplink Carrier Aggregation (CA) Setup Configurations

This device supports LTE uplink CA for band 41 only with a maximum of two 20 MHz carrier components in the uplink. The maximum output power for uplink intra-band contiguous CA specified in Table 6.2.2A-1 of 3GPP TS 36.101 is the same as single carrier specified in Table 6.2.2-1 of 3GPP TS 36.101. In Table 6.2.3A-1 of 3GPP TS 36.101, the MPR (maximum power reduction) for several dB is allowed due to modulation and contiguously aggregated transmit bandwidth configuration. All the RF parameters in this device have followed above 3GPP criteria.

<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.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following.

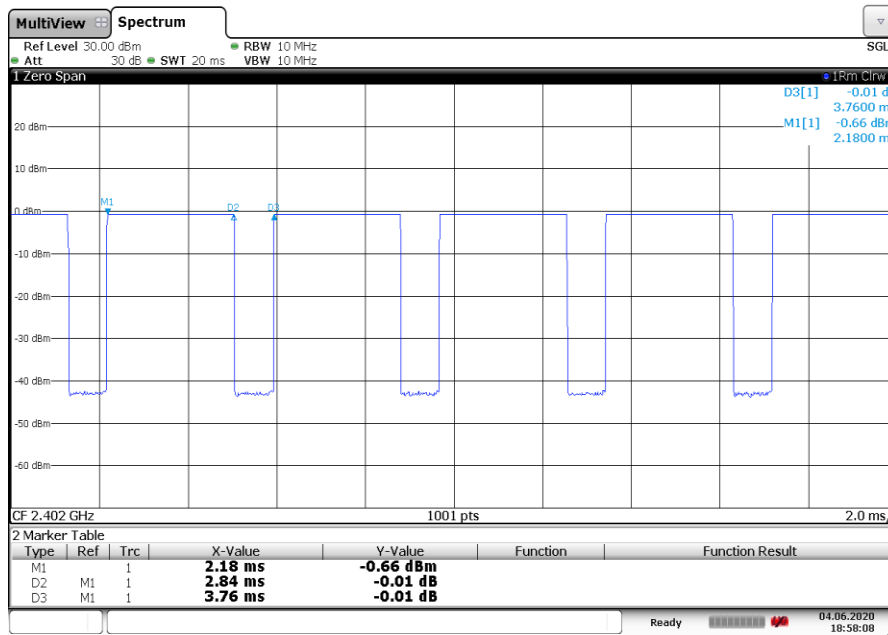
- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition).
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

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<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.

The Bluetooth call box has been used during SAR measurement and the EUT was set to DH5 mode at the maximum output power. Its duty factor was calculated as below and the measured SAR for Bluetooth would be scaled to the 100% transmission duty factor to determine compliance.



Date: 4 JUN 2020 18:58:08

Time-domain plot for Bluetooth transmission signal

The duty factor of Bluetooth signal has been calculated as following.

$$\text{Duty Factor} = \text{Pulse Width} / \text{Total Period} = 2.84 / 3.76 = 75.53 \%$$

4.2 EUT Testing Position

4.2.1 Body Exposure Conditions

For full-size tablet, according to KDB 616217 D04, SAR evaluation is required for back surface and edges of the devices. The back surface and edges of the tablet are tested with the tablet touching the phantom. Exposures from antennas through the front surface of the display section of a tablet are generally limited to the user's hands. Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary. When voice mode is supported on a tablet and it is limited to speaker mode or headset operations only, additional SAR testing for this type of voice use is not required.

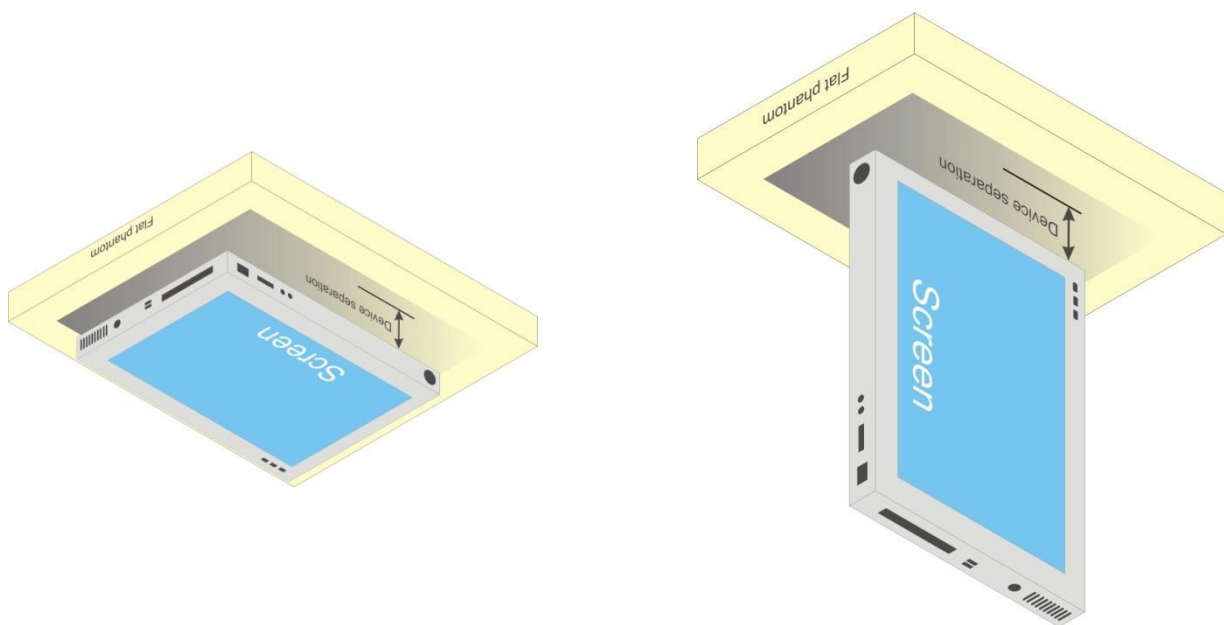


Fig-4.1 Illustration for Tablet Setup

4.3 Tissue Verification

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

Frequency (MHz)	Liquid Temp. (°C)	Measured Conductivity (σ)	Measured Permittivity (ϵ_r)	Target Conductivity (σ)	Target Permittivity (ϵ_r)	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
750	23.3	0.893	43.384	0.89	41.9	0.34	3.54	Jun. 05, 2020
750	23.2	0.888	43.067	0.89	41.9	-0.22	2.79	Jun. 08, 2020
835	23.5	0.905	42.447	0.9	41.5	0.56	2.28	Jun. 04, 2020
835	23.2	0.909	41.664	0.9	41.5	1.00	0.40	Jun. 09, 2020
1750	23.5	1.326	38.855	1.37	40.1	-3.21	-3.10	Jun. 04, 2020
1750	23.2	1.325	38.941	1.37	40.1	-3.28	-2.89	Jun. 09, 2020
1900	23.3	1.453	40.451	1.4	40	3.79	1.13	Jun. 05, 2020
1900	23.2	1.455	38.385	1.4	40	3.93	-4.04	Jun. 09, 2020
1900	23.3	1.464	38.164	1.4	40	4.57	-4.59	Jun. 15, 2020
1900	23.5	1.454	40.464	1.4	40	3.86	1.16	Jun. 16, 2020
1900	23.5	1.468	38.358	1.4	40	4.86	-4.11	Jun. 18, 2020
2450	23.2	1.882	38.31	1.8	39.2	4.56	-2.27	Jun. 08, 2020
2450	23.3	1.827	38.941	1.8	39.2	1.50	-0.66	Jun. 29, 2020
2600	23.3	2.035	37.413	1.96	39	3.83	-4.07	Jun. 05, 2020
2600	23.2	2.053	39.392	1.96	39	4.74	1.01	Jun. 08, 2020
2600	23.2	2.031	38.237	1.96	39	3.62	-1.96	Jun. 09, 2020
2600	23.3	1.998	37.891	1.96	39	1.94	-2.84	Jun. 15, 2020
2600	23.5	2.02	37.839	1.96	39	3.06	-2.98	Jun. 18, 2020
2600	23.1	1.989	37.881	1.96	39	1.48	-2.87	Jun. 23, 2020
5250	23.3	4.597	36.617	4.71	35.9	-2.40	2.00	Jun. 03, 2020
5600	23.2	5.217	35.199	5.07	35.5	2.90	-0.85	Jun. 10, 2020
5750	23.2	5.381	34.848	5.22	35.4	3.08	-1.56	Jun. 10, 2020

Note:

The dielectric properties of the tissue simulating liquid have been measured within 24 hours before the SAR testing and within $\pm 10\%$ of the target values. Liquid temperature during the SAR testing has kept within $\pm 2^\circ\text{C}$.

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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
Jun. 05, 2020	3820	750	0.893	43.384	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 08, 2020	3820	750	0.888	43.067	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 04, 2020	3820	835	0.905	42.447	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 09, 2020	3820	835	0.909	41.664	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 04, 2020	3820	1750	1.326	38.855	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 09, 2020	3820	1750	1.325	38.941	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 05, 2020	3820	1900	1.453	40.451	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 09, 2020	3820	1900	1.455	38.385	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 15, 2020	7350	1900	1.464	38.164	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 16, 2020	3650	1900	1.454	40.464	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 18, 2020	3650	1900	1.468	38.358	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 08, 2020	3820	2450	1.882	38.31	Pass	Pass	Pass	OFDM	N/A	Pass
Jun. 29, 2020	3971	2450	1.827	38.941	Pass	Pass	Pass	OFDM	N/A	Pass
Jun. 05, 2020	3820	2600	2.035	37.413	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 08, 2020	3820	2600	2.053	39.392	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 09, 2020	3820	2600	2.031	38.237	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 15, 2020	7350	2600	1.998	37.891	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 18, 2020	3650	2600	2.02	37.839	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 23, 2020	3650	2600	1.989	37.881	Pass	Pass	Pass	N/A	N/A	N/A
Jun. 03, 2020	3971	5250	4.597	36.617	Pass	Pass	Pass	OFDM	N/A	Pass
Jun. 10, 2020	3820	5600	5.217	35.199	Pass	Pass	Pass	OFDM	N/A	Pass
Jun. 10, 2020	3820	5750	5.381	34.848	Pass	Pass	Pass	OFDM	N/A	Pass

4.5 System Verification

The measuring result for system verification is tabulated as below.

Test Date	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
Jun. 05, 2020	750	8.56	0.396	7.92	-7.48	1013	3820	917
Jun. 08, 2020	750	8.56	0.391	7.82	-8.64	1013	3820	917
Jun. 04, 2020	835	9.61	0.457	9.14	-4.89	4d121	3820	917
Jun. 09, 2020	835	9.61	0.459	9.18	-4.47	4d121	3820	917
Jun. 04, 2020	1750	37.00	1.83	36.60	-1.08	1055	3820	917
Jun. 09, 2020	1750	37.00	1.83	36.60	-1.08	1055	3820	917
Jun. 05, 2020	1900	40.30	2.01	40.20	-0.25	5d036	3820	917
Jun. 09, 2020	1900	40.30	2.02	40.40	0.25	5d036	3820	917
Jun. 15, 2020	1900	40.30	2.01	40.20	-0.25	5d036	7350	917
Jun. 16, 2020	1900	40.30	1.86	37.20	-7.69	5d036	3650	861
Jun. 18, 2020	1900	40.30	1.96	39.20	-2.73	5d036	3650	861
Jun. 08, 2020	2450	52.70	2.65	53.00	0.57	737	3820	917
Jun. 29, 2020	2450	52.70	2.62	52.40	-0.57	737	3971	1277
Jun. 05, 2020	2600	57.30	2.97	59.40	3.66	1020	3820	917
Jun. 08, 2020	2600	57.30	3.05	61.00	6.46	1020	3820	917
Jun. 09, 2020	2600	57.30	2.98	59.60	4.01	1020	3820	917
Jun. 15, 2020	2600	57.30	2.95	59.00	2.97	1020	7350	917
Jun. 18, 2020	2600	57.30	2.77	55.40	-3.32	1020	3650	861
Jun. 23, 2020	2600	57.30	2.75	55.00	-4.01	1020	3650	861
Jun. 03, 2020	5250	79.70	4.08	81.60	2.38	1019	3971	1277
Jun. 10, 2020	5600	83.80	4.56	91.20	8.83	1019	3820	917
Jun. 10, 2020	5750	80.40	4.2	84.00	4.48	1019	3820	917

Note:

Comparing to the reference SAR value provided by SPEAG in dipole calibration certificate, the deviation of system check results is within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots please refer to Appendix A of this report.

4.6 Maximum Output Power

4.6.1 Maximum Target Conducted Power

Refer to Appendix C

4.6.2 Measured Conducted Power Result

Refer to Appendix D

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

When SAR is not measured at the maximum power level allowed for production units, the measured SAR will be scaled to the maximum tune-up tolerance limit to determine compliance. The scaling factor for the tune-up power is defined as maximum tune-up limit (mW) / measured conducted power (mW). The reported SAR would be calculated by measured SAR x tune-up power scaling factor.

The SAR has been measured with highest transmission duty factor supported by the test mode tools for WLAN and/or Bluetooth. When the transmission duty factor could not achieve 100%, the reported SAR will be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up power. The scaling factor for the duty factor is defined as 100% / transmission duty cycle (%). The reported SAR would be calculated by measured SAR x tune-up power scaling factor x duty cycle scaling factor.

<KDB 941225 D01, 3G SAR Measurement Procedures>

The mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

<KDB 941225 D05, SAR Evaluation Considerations for LTE Devices>

(1) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

(2) QPSK with 100% RB allocation

SAR is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

(3) Higher order modulations

SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> 1/2$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

(4) Other channel bandwidth

SAR is required when the highest maximum output power of the smaller channel bandwidth is $> 1/2$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

<Power Confirmation for SAR Testing for LTE Uplink CA>

The conducted power for uplink CA active was measured on the highest reported SAR configuration for each exposure condition with both two carrier components was set to largest channel bandwidth.

SAR Measurements for Intra-Band Contiguous CA

The SAR testing was performed with the single carrier (uplink CA is inactive) for all test positions for each exposure condition. The LTE uplink CA active was verified with maximum output power on the highest SAR configuration of single carrier for each exposure condition. For intra-band contiguous CA, the SCC channel was set to closest available contiguous channel.

CA Measure Power refer to Appendix D

<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 5GHz, 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.

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4.7.2 SAR Results for Body Exposure Condition

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	P-Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	WCDMA II	RMC12.2K	Rear Face	0	9538	w/o	24.00	23.39	1.15	0.07	0.814	0.94
	WCDMA II	RMC12.2K	Left Side	0	9538	w/o	24.00	23.39	1.15	0	<0.001	0.00
	WCDMA II	RMC12.2K	Right Side	0	9538	w/o	24.00	23.39	1.15	0.05	0.796	0.92
	WCDMA II	RMC12.2K	Top Side	5	9538	w/o	24.00	23.39	1.15	0.01	0.851	0.98
	WCDMA II	RMC12.2K	Bottom Side	0	9538	w/o	24.00	23.39	1.15	0	<0.001	0.00
	WCDMA II	RMC12.2K	Rear Curve	0	9538	w/o	24.00	23.39	1.15	-0.01	0.701	0.81
	WCDMA II	RMC12.2K	Left Curve	0	9538	w/o	24.00	23.39	1.15	0	<0.001	0.00
	WCDMA II	RMC12.2K	Right Curve	0	9538	w/o	24.00	23.39	1.15	0.02	0.616	0.71
	WCDMA II	RMC12.2K	Top Curve	5	9538	w/o	24.00	23.39	1.15	0.05	0.762	0.88
	WCDMA II	RMC12.2K	Bottom Curve	0	9538	w/o	24.00	23.39	1.15	0	<0.001	0.00
	WCDMA II	RMC12.2K	Top Side	0	9538	w/	21.50	20.79	1.18	0.08	0.874	1.03
	WCDMA II	RMC12.2K	Top Curve	0	9538	w/	21.50	20.79	1.18	0.02	0.865	1.02
	WCDMA II	RMC12.2K	Rear Face	0	9262	w/o	24.00	23.24	1.19	0.05	0.818	0.97
	WCDMA II	RMC12.2K	Rear Face	0	9400	w/o	24.00	23.31	1.17	0.11	0.83	0.97
	WCDMA II	RMC12.2K	Right Side	0	9262	w/o	24.00	23.24	1.19	0.12	0.97	1.15
	WCDMA II	RMC12.2K	Right Side	0	9400	w/o	24.00	23.31	1.17	-0.05	0.975	1.14
01	WCDMA II	RMC12.2K	Top Side	5	9262	w/o	24.00	23.24	1.19	-0.07	0.978	1.16
	WCDMA II	RMC12.2K	Top Side	5	9400	w/o	24.00	23.31	1.17	-0.02	0.947	1.11
	WCDMA II	RMC12.2K	Rear Curve	0	9262	w/o	24.00	23.24	1.19	0.06	0.651	0.77
	WCDMA II	RMC12.2K	Rear Curve	0	9400	w/o	24.00	23.31	1.17	0.11	0.821	0.96
	WCDMA II	RMC12.2K	Top Curve	5	9262	w/o	24.00	23.24	1.19	0.14	0.94	1.12
	WCDMA II	RMC12.2K	Top Curve	5	9400	w/o	24.00	23.31	1.17	0.05	0.902	1.06
	WCDMA II	RMC12.2K	Top Side	0	9262	w/	21.50	20.55	1.24	-0.07	0.909	1.13
	WCDMA II	RMC12.2K	Top Side	0	9400	w/	21.50	20.72	1.20	-0.02	0.901	1.08
	WCDMA II	RMC12.2K	Top Curve	0	9262	w/	21.50	20.55	1.24	-0.16	0.56	0.69
	WCDMA II	RMC12.2K	Top Curve	0	9400	w/	21.50	20.72	1.20	0.09	0.55	0.66
	WCDMA II	RMC12.2K	Top Side	5	9262	w/o	24.00	23.24	1.19	-0.07	0.968	1.15
	WCDMA IV	RMC12.2K	Rear Face	0	1413	w/o	24.00	23.53	1.11	0.06	0.476	0.53
	WCDMA IV	RMC12.2K	Left Side	0	1413	w/o	24.00	23.53	1.11	0	<0.001	0.00
	WCDMA IV	RMC12.2K	Right Side	0	1413	w/o	24.00	23.53	1.11	-0.01	0.64	0.71
	WCDMA IV	RMC12.2K	Top Side	5	1413	w/o	24.00	23.53	1.11	-0.04	0.847	0.94
	WCDMA IV	RMC12.2K	Bottom Side	0	1413	w/o	24.00	23.53	1.11	0	<0.001	0.00
	WCDMA IV	RMC12.2K	Rear Curve	0	1413	w/o	24.00	23.53	1.11	0.03	0.369	0.41
	WCDMA IV	RMC12.2K	Left Curve	0	1413	w/o	24.00	23.53	1.11	0	<0.001	0.00
	WCDMA IV	RMC12.2K	Right Curve	0	1413	w/o	24.00	23.53	1.11	-0.12	0.477	0.53
	WCDMA IV	RMC12.2K	Top Curve	5	1413	w/o	24.00	23.53	1.11	0.06	0.646	0.72
	WCDMA IV	RMC12.2K	Bottom Curve	0	1413	w/o	24.00	23.53	1.11	0	<0.001	0.00
	WCDMA IV	RMC12.2K	Top Side	0	1413	w/	23.00	22.45	1.14	0.12	0.854	0.97
02	WCDMA IV	RMC12.2K	Top Curve	0	1413	w/	23.00	22.45	1.14	0.05	1.03	1.17
	WCDMA IV	RMC12.2K	Top Side	5	1312	w/o	24.00	23.51	1.12	0.05	0.846	0.95
	WCDMA IV	RMC12.2K	Top Side	5	1513	w/o	24.00	23.43	1.14	0.01	0.843	0.96
	WCDMA IV	RMC12.2K	Top Side	0	1312	w/	23.00	22.39	1.15	0.12	0.864	0.99
	WCDMA IV	RMC12.2K	Top Side	0	1513	w/	23.00	22.25	1.19	0.09	0.898	1.07
	WCDMA IV	RMC12.2K	Top Curve	0	1312	w/	23.00	22.39	1.15	-0.15	0.974	1.12
	WCDMA IV	RMC12.2K	Top Curve	0	1513	w/	23.00	22.25	1.19	0.06	0.965	1.15
	WCDMA IV	RMC12.2K	Top Curve	0	1413	w/	23.00	22.45	1.14	0.03	0.99	1.13
	WCDMA V	RMC12.2K	Rear Face	0	4132	w/o	24.00	23.50	1.12	-0.11	0.644	0.72
	WCDMA V	RMC12.2K	Left Side	0	4132	w/o	24.00	23.50	1.12	0	<0.001	0.00
	WCDMA V	RMC12.2K	Right Side	0	4132	w/o	24.00	23.50	1.12	0.06	0.334	0.37
	WCDMA V	RMC12.2K	Top Side	5	4132	w/o	24.00	23.50	1.12	0.16	0.477	0.53
	WCDMA V	RMC12.2K	Bottom Side	0	4132	w/o	24.00	23.50	1.12	0	<0.001	0.00
	WCDMA V	RMC12.2K	Rear Curve	0	4132	w/o	24.00	23.50	1.12	0.06	0.728	0.82
	WCDMA V	RMC12.2K	Left Curve	0	4132	w/o	24.00	23.50	1.12	0	<0.001	0.00
	WCDMA V	RMC12.2K	Right Curve	0	4132	w/o	24.00	23.50	1.12	-0.02	0.394	0.44
	WCDMA V	RMC12.2K	Top Curve	5	4132	w/o	24.00	23.50	1.12	-0.02	0.585	0.66
	WCDMA V	RMC12.2K	Bottom Curve	0	4132	w/o	24.00	23.50	1.12	0	<0.001	0.00
	WCDMA V	RMC12.2K	Top Side	0	4132	w/	23.00	22.46	1.13	-0.03	0.846	0.96
	WCDMA V	RMC12.2K	Top Curve	0	4132	w/	23.00	22.46	1.13	0.05	0.95	1.07
	WCDMA V	RMC12.2K	Rear Curve	0	4182	w/o	24.00	23.42	1.14	0.06	0.792	0.90
	WCDMA V	RMC12.2K	Rear Curve	0	4233	w/o	24.00	23.44	1.14	0.06	0.727	0.83
	WCDMA V	RMC12.2K	Top Side	0	4182	w/	23.00	22.44	1.14	-0.03	0.891	1.02
	WCDMA V	RMC12.2K	Top Side	0	4233	w/	23.00	22.36	1.16	-0.03	0.851	0.99
03	WCDMA V	RMC12.2K	Top Curve	0	4182	w/	23.00	22.44	1.14	-0.02	1.01	1.15
	WCDMA V	RMC12.2K	Top Curve	0	4233	w/	23.00	22.36	1.16	0.03	0.911	1.06
	WCDMA V	RMC12.2K	Top Curve	0	4182	w/	23.00	22.44	1.14	0.03	0.98	1.12

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

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Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB	offset	P-Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	LTE 2	QPSK20M	Rear Face	0	19100	1	0	w/o	24.00	22.99	1.26	-0.01	0.644	0.81
	LTE 2	QPSK20M	Left Side	0	19100	1	0	w/o	24.00	22.99	1.26	0	<0.001	0.00
	LTE 2	QPSK20M	Right Side	0	19100	1	0	w/o	24.00	22.99	1.26	0.05	0.634	0.80
04	LTE 2	QPSK20M	Top Side	5	19100	1	0	w/o	24.00	22.99	1.26	-0.17	0.945	1.19
	LTE 2	QPSK20M	Bottom Side	0	19100	1	0	w/o	24.00	22.99	1.26	0	<0.001	0.00
	LTE 2	QPSK20M	Rear Curve	0	19100	1	0	w/o	24.00	22.99	1.26	0.15	0.419	0.53
	LTE 2	QPSK20M	Left Curve	0	19100	1	0	w/o	24.00	22.99	1.26	0	<0.001	0.00
	LTE 2	QPSK20M	Right Curve	0	19100	1	0	w/o	24.00	22.99	1.26	0.06	0.545	0.69
	LTE 2	QPSK20M	Top Curve	5	19100	1	0	w/o	24.00	22.99	1.26	0.05	0.622	0.78
	LTE 2	QPSK20M	Bottom Curve	0	19100	1	0	w/o	24.00	22.99	1.26	0	<0.001	0.00
	LTE 2	QPSK20M	Rear Face	0	19100	50	0	w/o	23.00	22.05	1.24	0.06	0.506	0.63
	LTE 2	QPSK20M	Left Side	0	19100	50	0	w/o	23.00	22.05	1.24	0	<0.001	0.00
	LTE 2	QPSK20M	Right Side	0	19100	50	0	w/o	23.00	22.05	1.24	0.02	0.522	0.65
	LTE 2	QPSK20M	Top Side	5	19100	50	0	w/o	23.00	22.05	1.24	0.02	0.769	0.95
	LTE 2	QPSK20M	Bottom Side	0	19100	50	0	w/o	23.00	22.05	1.24	0	<0.001	0.00
	LTE 2	QPSK20M	Rear Curve	0	19100	50	0	w/o	23.00	22.05	1.24	-0.11	0.343	0.43
	LTE 2	QPSK20M	Left Curve	0	19100	50	0	w/o	23.00	22.05	1.24	0	<0.001	0.00
	LTE 2	QPSK20M	Right Curve	0	19100	50	0	w/o	23.00	22.05	1.24	0.05	0.412	0.51
	LTE 2	QPSK20M	Top Curve	5	19100	50	0	w/o	23.00	22.05	1.24	0.11	0.621	0.77
	LTE 2	QPSK20M	Bottom Curve	0	19100	50	0	w/o	23.00	22.05	1.24	0	<0.001	0.00
	LTE 2	QPSK20M	Rear Face	0	19100	100	0	w/o	23.00	22.01	1.26	-0.01	0.535	0.67
	LTE 2	QPSK20M	Right Side	0	19100	100	0	w/o	23.00	22.01	1.26	0.05	0.514	0.65
	LTE 2	QPSK20M	Top Side	5	19100	100	0	w/o	23.00	22.01	1.26	-0.17	0.718	0.90
	LTE 2	QPSK20M	Top Side	0	19100	1	0	w/	21.50	20.81	1.17	-0.13	0.528	0.62
	LTE 2	QPSK20M	Top Curve	0	19100	1	0	w/	21.50	20.81	1.17	-0.1	0.867	1.01
	LTE 2	QPSK20M	Top Side	0	19100	50	0	w/	21.50	20.63	1.22	0.04	0.417	0.51
	LTE 2	QPSK20M	Top Curve	0	19100	50	0	w/	21.50	20.63	1.22	0.04	0.775	0.95
	LTE 2	QPSK20M	Top Side	0	19100	100	0	w/	21.50	20.42	1.28	0.05	0.802	1.03
	LTE 2	QPSK20M	Rear Face	0	18700	1	0	w/o	23.00	22.81	1.04	0.11	0.713	0.74
	LTE 2	QPSK20M	Rear Face	0	18900	1	0	w/o	23.00	22.78	1.05	0.02	0.675	0.71
	LTE 2	QPSK20M	Right Side	0	18700	1	0	w/o	23.00	22.81	1.04	0.11	0.787	0.82
	LTE 2	QPSK20M	Right Side	0	18900	1	0	w/o	23.00	22.78	1.05	0.05	0.857	0.90
	LTE 2	QPSK20M	Top Side	5	18700	1	0	w/o	23.00	22.81	1.04	0.05	0.893	0.93
	LTE 2	QPSK20M	Top Side	5	18900	1	0	w/o	23.00	22.78	1.05	0.06	0.885	0.93
	LTE 2	QPSK20M	Top Side	5	18700	50	0	w/o	23.00	21.87	1.30	0.12	0.755	0.98
	LTE 2	QPSK20M	Top Side	5	18900	50	0	w/o	23.00	21.84	1.31	0.02	0.745	0.98
	LTE 2	QPSK20M	Top Curve	0	18700	1	0	w/	21.50	20.32	1.31	-0.06	0.845	1.11
	LTE 2	QPSK20M	Top Curve	0	18900	1	0	w/	21.50	20.21	1.35	0.05	0.784	1.06
	LTE 2	QPSK20M	Top Curve	0	18700	50	0	w/	21.50	20.17	1.36	0.01	0.799	1.09
	LTE 2	QPSK20M	Top Curve	0	18900	50	0	w/	21.50	20.03	1.40	0.12	0.772	1.08
	LTE 2	QPSK20M	Top Side	5	19100	1	0	w/o	24.00	22.99	1.26	-0.15	0.923	1.16
	LTE 5	QPSK10M	Rear Face	0	20525	1	0	w/o	24.00	23.31	1.17	-0.06	0.624	0.73
	LTE 5	QPSK10M	Left Side	0	20525	1	0	w/o	24.00	23.31	1.17	0	<0.001	0.00
	LTE 5	QPSK10M	Right Side	0	20525	1	0	w/o	24.00	23.31	1.17	-0.11	0.288	0.34
	LTE 5	QPSK10M	Top Side	5	20525	1	0	w/o	24.00	23.31	1.17	0.05	0.544	0.64
	LTE 5	QPSK10M	Bottom Side	0	20525	1	0	w/o	24.00	23.31	1.17	0	<0.001	0.00
	LTE 5	QPSK10M	Rear Curve	0	20525	1	0	w/o	24.00	23.31	1.17	0.06	0.575	0.67
	LTE 5	QPSK10M	Left Curve	0	20525	1	0	w/o	24.00	23.31	1.17	0	<0.001	0.00
	LTE 5	QPSK10M	Right Curve	0	20525	1	0	w/o	24.00	23.31	1.17	0.06	0.425	0.50
	LTE 5	QPSK10M	Top Curve	5	20525	1	0	w/o	24.00	23.31	1.17	0.05	0.601	0.70
	LTE 5	QPSK10M	Bottom Curve	0	20525	1	0	w/o	24.00	23.31	1.17	0	<0.001	0.00
	LTE 5	QPSK10M	Rear Face	0	20525	25	0	w/o	23.00	22.35	1.16	0.01	0.469	0.54
	LTE 5	QPSK10M	Left Side	0	20525	25	0	w/o	23.00	22.35	1.16	0	<0.001	0.00
	LTE 5	QPSK10M	Right Side	0	20525	25	0	w/o	23.00	22.35	1.16	0.01	0.281	0.33
	LTE 5	QPSK10M	Top Side	5	20525	25	0	w/o	23.00	22.35	1.16	-0.16	0.441	0.51
	LTE 5	QPSK10M	Bottom Side	0	20525	25	0	w/o	23.00	22.35	1.16	0	<0.001	0.00
	LTE 5	QPSK10M	Rear Curve	0	20525	25	0	w/o	23.00	22.35	1.16	0.07	0.177	0.21
	LTE 5	QPSK10M	Left Curve	0	20525	25	0	w/o	23.00	22.35	1.16	0	<0.001	0.00
	LTE 5	QPSK10M	Right Curve	0	20525	25	0	w/o	23.00	22.35	1.16	-0.17	0.356	0.41
	LTE 5	QPSK10M	Top Curve	5	20525	25	0	w/o	23.00	22.35	1.16	0.05	0.532	0.62
	LTE 5	QPSK10M	Bottom Curve	0	20525	25	0	w/o	23.00	22.35	1.16	0	<0.001	0.00
	LTE 5	QPSK10M	Top Side	0	20525	1	0	w/	23.00	22.39	1.15	-0.03	0.791	0.91
05	LTE 5	QPSK10M	Top Curve	0	20525	1	0	w/	23.00	22.39	1.15	-0.09	0.968	1.11
	LTE 5	QPSK10M	Top Side	0	20525	25	0	w/	23.00	22.39	1.15	0.04	0.776	0.89
	LTE 5	QPSK10M	Top Curve	0	20525	25	0	w/	23.00	22.37	1.16	0.01	0.958	1.11
	LTE 5	QPSK10M	Top Side	0	20525	50	0	w/	23.00	22.36	1.16	0.06	0.755	0.88
	LTE 5	QPSK10M	Top Curve	0	20525	50	0	w/	23.00	22.36	1.16	0.06	0.906	1.05
	LTE 5	QPSK10M	Top Side	0	20450	1	0	w/	23.00	22.29	1.18	0.02	0.751	0.89
	LTE 5	QPSK10M	Top Side	0	20600	1	0	w/	23.00	22.33	1.17	-0.01	0.762	0.89
	LTE 5	QPSK10M	Top Side	0	20450	25	0	w/	23.00	22.27	1.18	-0.02	0.717	0.85
	LTE 5	QPSK10M	Top Side	0	20600	25	0	w/	23.00	22.31	1.17	0.05	0.739	0.86
	LTE 5	QPSK10M	Top Curve	0	20450	1	0	w/	23.00	22.29	1.18	0.02	0.937	1.11
	LTE 5	QPSK10M	Top Curve	0	20600	1	0	w/	23.00	22.33	1.17	-0.01	0.936	1.10
	LTE 5	QPSK10M	Top Curve	0	20450	25	0	w/	23.00	22.27	1.18	-0.02	0.938	1.11
	LTE 5	QPSK10M	Top Curve	0	20600	25	0	w/	23.00	22.31	1.17	0.05	0.924	1.08
	LTE 5	QPSK10M	Top Curve	0	20525	1	0	w/	23.00	22.39	1.15	-0.09	0.946	1.09

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

SAR Test Report

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB	offset	P-Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	LTE 7	QPSK20M	Rear Face	0	21350	1	0	w/o	23.00	21.73	1.34	-0.09	0.566	0.76
	LTE 7	QPSK20M	Left Side	0	21350	1	0	w/o	23.00	21.73	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Right Side	0	21350	1	0	w/o	23.00	21.73	1.34	-0.02	0.258	0.35
	LTE 7	QPSK20M	Top Side	5	21350	1	0	w/o	23.00	21.73	1.34	0.09	0.304	0.41
	LTE 7	QPSK20M	Bottom Side	0	21350	1	0	w/o	23.00	21.73	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Rear Curve	0	21350	1	0	w/o	23.00	21.73	1.34	0.06	0.489	0.66
	LTE 7	QPSK20M	Left Curve	0	21350	1	0	w/o	23.00	21.73	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Right Curve	0	21350	1	0	w/o	23.00	21.73	1.34	-0.18	0.32	0.43
	LTE 7	QPSK20M	Top Curve	5	21350	1	0	w/o	23.00	21.73	1.34	0.011	0.591	0.79
	LTE 7	QPSK20M	Bottom Curve	0	21350	1	0	w/o	23.00	21.73	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Rear Face	0	21350	50	0	w/o	22.00	20.72	1.34	0.03	0.329	0.44
	LTE 7	QPSK20M	Left Side	0	21350	50	0	w/o	22.00	20.72	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Right Side	0	21350	50	0	w/o	22.00	20.72	1.34	0.01	0.216	0.29
	LTE 7	QPSK20M	Top Side	5	21350	50	0	w/o	22.00	20.72	1.34	0.02	0.194	0.26
	LTE 7	QPSK20M	Bottom Side	0	21350	50	0	w/o	22.00	20.72	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Rear Curve	0	21350	50	0	w/o	22.00	20.72	1.34	0.12	0.366	0.49
	LTE 7	QPSK20M	Left Curve	0	21350	50	0	w/o	22.00	20.72	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Right Curve	0	21350	50	0	w/o	22.00	20.72	1.34	0.1	0.166	0.22
	LTE 7	QPSK20M	Top Curve	5	21350	50	0	w/o	22.00	20.72	1.34	0.14	0.503	0.67
	LTE 7	QPSK20M	Bottom Curve	0	21350	50	0	w/o	22.00	20.72	1.34	0	<0.001	0.00
	LTE 7	QPSK20M	Top Side	0	21350	1	0	w/	20.00	19.05	1.24	-0.11	0.246	0.31
06	LTE 7	QPSK20M	Top Curve	0	21350	1	0	w/	20.00	19.05	1.24	-0.01	0.953	1.18
	LTE 7	QPSK20M	Top Side	0	21350	50	0	w/	20.00	18.76	1.33	0.15	0.355	0.47
	LTE 7	QPSK20M	Top Curve	0	21350	50	0	w/	20.00	18.76	1.33	0.11	0.771	1.03
	LTE 7	QPSK20M	Top Curve	0	21350	100	0	w/	20.00	18.75	1.33	0.11	0.751	1.00
	LTE 7	QPSK20M	Top Curve	0	20850	1	0	w/	20.00	18.72	1.34	0.14	0.875	1.17
	LTE 7	QPSK20M	Top Curve	0	21100	1	0	w/	20.00	18.88	1.29	0.05	0.865	1.12
	LTE 7	QPSK20M	Top Curve	0	20850	50	50	w/	20.00	18.41	1.44	0.05	0.761	1.10
	LTE 7	QPSK20M	Top Curve	0	21100	50	25	w/	20.00	18.51	1.41	0.11	0.751	1.06
	LTE 7	QPSK20M	Top Curve	0	PCC:21100 SCC:21298	PCC:1 SCC:1	PCC:99 SCC:0	w/	20.00	19.74	1.06	0.05	0.914	0.97
	LTE 7	QPSK20M	Top Curve	0	PCC:20850 SCC:21048	PCC:1 SCC:1	PCC:99 SCC:0	w/	20.00	19.58	1.10	-0.03	0.952	1.05
	LTE 7	QPSK20M	Top Curve	0	PCC:21152 SCC:21350	PCC:1 SCC:1	PCC:99 SCC:0	w/	20.00	19.73	1.06	0.12	0.909	0.96
	LTE 7	QPSK20M	Top Curve	0	21350	1	0	w/	20.00	19.05	1.24	-0.01	0.952	1.18
	LTE 12	QPSK10M	Rear Face	0	23130	1	0	w/o	24.00	23.42	1.14	-0.06	0.420	0.48
	LTE 12	QPSK10M	Left Side	0	23130	1	0	w/o	24.00	23.42	1.14	0	<0.001	0.00
	LTE 12	QPSK10M	Right Side	0	23130	1	0	w/o	24.00	23.42	1.14	0.09	0.190	0.22
	LTE 12	QPSK10M	Top Side	0	23130	1	0	w/o	24.00	23.42	1.14	0.08	0.526	0.60
	LTE 12	QPSK10M	Bottom Side	0	23130	1	0	w/o	24.00	23.42	1.14	0	<0.001	0.00
	LTE 12	QPSK10M	Rear Curve	0	23130	1	0	w/o	24.00	23.42	1.14	-0.08	0.452	0.52
	LTE 12	QPSK10M	Left Curve	0	23130	1	0	w/o	24.00	23.42	1.14	0	<0.001	0.00
	LTE 12	QPSK10M	Right Curve	0	23130	1	0	w/o	24.00	23.42	1.14	0.04	0.240	0.27
07	LTE 12	QPSK10M	Top Curve	0	23130	1	0	w/o	24.00	23.42	1.14	0.09	0.669	0.76
	LTE 12	QPSK10M	Bottom Curve	0	23130	1	0	w/o	24.00	23.42	1.14	0	<0.001	0.00
	LTE 12	QPSK10M	Rear Face	0	23130	25	0	w/o	23.00	22.40	1.15	-0.11	0.340	0.39
	LTE 12	QPSK10M	Left Side	0	23130	25	0	w/o	23.00	22.40	1.15	0	<0.001	0.00
	LTE 12	QPSK10M	Right Side	0	23130	25	0	w/o	23.00	22.40	1.15	-0.06	0.187	0.22
	LTE 12	QPSK10M	Top Side	0	23130	25	0	w/o	23.00	22.40	1.15	-0.01	0.558	0.64
	LTE 12	QPSK10M	Bottom Side	0	23130	25	0	w/o	23.00	22.40	1.15	0	<0.001	0.00
	LTE 12	QPSK10M	Rear Curve	0	23130	25	0	w/o	23.00	22.40	1.15	-0.12	0.361	0.42
	LTE 12	QPSK10M	Left Curve	0	23130	25	0	w/o	23.00	22.40	1.15	0	<0.001	0.00
	LTE 12	QPSK10M	Right Curve	0	23130	25	0	w/o	23.00	22.40	1.15	-0.01	0.188	0.22
	LTE 12	QPSK10M	Top Curve	0	23130	25	0	w/o	23.00	22.40	1.15	0.12	0.543	0.62
	LTE 12	QPSK10M	Bottom Curve	0	23130	25	0	w/o	23.00	22.40	1.15	0	<0.001	0.00
	LTE 12	QPSK10M	Top Curve	0	23060	1	0	w/o	24.00	23.31	1.17	-0.02	0.590	0.69
	LTE 12	QPSK10M	Top Curve	0	23095	1	0	w/o	24.00	23.37	1.16	-0.07	0.626	0.73

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

SAR Test Report

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB	offset	P-Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	LTE 13	QPSK10M	Rear Face	0	23230	1	0	w/o	24.00	23.32	1.17	-0.1	0.604	0.71
	LTE 13	QPSK10M	Left Side	0	23230	1	0	w/o	24.00	23.32	1.17	0	<0.001	0.00
	LTE 13	QPSK10M	Right Side	0	23230	1	0	w/o	24.00	23.32	1.17	-0.01	0.288	0.34
	LTE 13	QPSK10M	Top Side	0	23230	1	0	w/o	24.00	23.32	1.17	0.05	0.823	0.96
	LTE 13	QPSK10M	Bottom Side	0	23230	1	0	w/o	24.00	23.32	1.17	0	<0.001	0.00
	LTE 13	QPSK10M	Rear Curve	0	23230	1	0	w/o	23.00	22.42	1.14	0.01	0.667	0.76
	LTE 13	QPSK10M	Left Curve	0	23230	1	0	w/o	23.00	22.42	1.14	0	<0.001	0.00
	LTE 13	QPSK10M	Right Curve	0	23230	1	0	w/o	23.00	22.42	1.14	0.02	0.419	0.48
08	LTE 13	QPSK10M	Top Curve	0	23230	1	0	w/o	23.00	22.42	1.14	0.13	0.970	1.11
	LTE 13	QPSK10M	Bottom Curve	0	23230	1	0	w/o	23.00	22.42	1.14	0	<0.001	0.00
	LTE 13	QPSK10M	Rear Face	0	23230	25	0	w/o	23.00	22.42	1.14	-0.07	0.488	0.56
	LTE 13	QPSK10M	Left Side	0	23230	25	0	w/o	23.00	22.42	1.14	0	<0.001	0.00
	LTE 13	QPSK10M	Right Side	0	23230	25	0	w/o	23.00	22.42	1.14	-0.01	0.277	0.32
	LTE 13	QPSK10M	Top Side	0	23230	25	0	w/o	23.00	22.42	1.14	0.05	0.713	0.81
	LTE 13	QPSK10M	Bottom Side	0	23230	25	0	w/o	23.00	22.42	1.14	0	<0.001	0.00
	LTE 13	QPSK10M	Rear Curve	0	23230	25	0	w/o	23.00	22.42	1.14	-0.16	0.551	0.63
	LTE 13	QPSK10M	Left Curve	0	23230	25	0	w/o	23.00	22.42	1.14	0	<0.001	0.00
	LTE 13	QPSK10M	Right Curve	0	23230	25	0	w/o	23.00	22.42	1.14	0.01	0.345	0.39
	LTE 13	QPSK10M	Top Curve	0	23230	25	0	w/o	23.00	22.42	1.14	0.05	0.857	0.98
	LTE 13	QPSK10M	Bottom Curve	0	23230	25	0	w/o	23.00	22.42	1.14	0	<0.001	0.00
	LTE 13	QPSK10M	Top Side	0	23230	50	0	w/o	23.00	22.34	1.16	0.05	0.654	0.76
	LTE 13	QPSK10M	Top Curve	0	23230	50	0	w/o	23.00	22.34	1.16	0.13	0.811	0.94
	LTE 13	QPSK10M	Top Curve	0	23230	1	0	w/o	24.00	23.42	1.14	0.13	0.961	1.10
	LTE 26	QPSK15M	Rear Face	0	26965	1	0	w/o	24.00	23.43	1.14	-0.05	0.631	0.72
	LTE 26	QPSK15M	Left Side	0	26965	1	0	w/o	24.00	23.43	1.14	0	<0.001	0.00
	LTE 26	QPSK15M	Right Side	0	26965	1	0	w/o	24.00	23.43	1.14	-0.02	0.632	0.72
	LTE 26	QPSK15M	Top Side	5	26965	1	0	w/o	24.00	23.43	1.14	0.04	0.65	0.74
	LTE 26	QPSK15M	Bottom Side	0	26965	1	0	w/o	24.00	23.43	1.14	0	<0.001	0.00
	LTE 26	QPSK15M	Rear Curve	0	26965	1	0	w/o	24.00	23.43	1.14	-0.01	0.664	0.76
	LTE 26	QPSK15M	Left Curve	0	26965	1	0	w/o	24.00	23.43	1.14	0	<0.001	0.00
	LTE 26	QPSK15M	Right Curve	0	26965	1	0	w/o	24.00	23.43	1.14	0.11	0.41	0.47
	LTE 26	QPSK15M	Top Curve	5	26965	1	0	w/o	24.00	23.43	1.14	0.05	0.65	0.74
	LTE 26	QPSK15M	Bottom Curve	0	26965	1	0	w/o	24.00	23.43	1.14	0	<0.001	0.00
	LTE 26	QPSK15M	Rear Face	0	26965	36	0	w/o	23.00	22.54	1.11	0.01	0.500	0.56
	LTE 26	QPSK15M	Left Side	0	26965	36	0	w/o	23.00	22.54	1.11	0	<0.001	0.00
	LTE 26	QPSK15M	Right Side	0	26965	36	0	w/o	23.00	22.54	1.11	0.06	0.497	0.55
	LTE 26	QPSK15M	Top Side	5	26965	36	0	w/o	23.00	22.54	1.11	0.19	0.515	0.57
	LTE 26	QPSK15M	Bottom Side	0	26965	36	0	w/o	23.00	22.54	1.11	0	<0.001	0.00
	LTE 26	QPSK15M	Rear Curve	0	26965	36	0	w/o	23.00	22.54	1.11	0.02	0.53	0.59
	LTE 26	QPSK15M	Left Curve	0	26965	36	0	w/o	23.00	22.54	1.11	0	<0.001	0.00
	LTE 26	QPSK15M	Right Curve	0	26965	36	0	w/o	23.00	22.54	1.11	-0.04	0.328	0.36
	LTE 26	QPSK15M	Top Curve	5	26965	36	0	w/o	23.00	22.54	1.11	0.05	0.546	0.61
	LTE 26	QPSK15M	Bottom Curve	0	26965	36	0	w/o	23.00	22.54	1.11	0	<0.001	0.00
	LTE 26	QPSK15M	Top Side	0	26965	1	0	w/	23.00	22.47	1.13	-0.03	0.801	0.91
09	LTE 26	QPSK15M	Top Curve	0	26965	1	0	w/	23.00	22.47	1.13	0.05	0.985	1.11
	LTE 26	QPSK15M	Top Side	0	26965	36	0	w/	23.00	22.45	1.14	0.05	0.808	0.92
	LTE 26	QPSK15M	Top Curve	0	26965	36	0	w/	23.00	22.45	1.14	0.06	0.961	1.10
	LTE 26	QPSK15M	Top Side	0	26965	75	0	w/	23.00	22.34	1.16	-0.03	0.678	0.79
	LTE 26	QPSK15M	Top Curve	0	26965	75	0	w/	23.00	22.34	1.16	0.09	0.934	1.08
	LTE 26	QPSK15M	Top Side	0	26765	1	0	w/	23.00	22.33	1.17	-0.01	0.776	0.91
	LTE 26	QPSK15M	Top Side	0	26865	1	0	w/	23.00	22.44	1.14	-0.01	0.779	0.89
	LTE 26	QPSK15M	Top Side	0	26765	36	0	w/	23.00	22.31	1.17	0.02	0.645	0.75
	LTE 26	QPSK15M	Top Side	0	26865	36	0	w/	23.00	22.42	1.14	0.05	0.668	0.76
	LTE 26	QPSK15M	Top Curve	0	26765	1	0	w/	23.00	22.33	1.17	-0.01	0.912	1.07
	LTE 26	QPSK15M	Top Curve	0	26865	1	0	w/	23.00	22.44	1.14	-0.01	0.937	1.07
	LTE 26	QPSK15M	Top Curve	0	26765	36	0	w/	23.00	22.31	1.17	0.02	0.942	1.10
	LTE 26	QPSK15M	Top Curve	0	26865	36	0	w/	23.00	22.42	1.14	0.05	0.929	1.06
	LTE 26	QPSK15M	Top Curve	0	26965	1	0	w/	23.00	22.47	1.13	0.05	0.955	1.08

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

SAR Test Report

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB	offset	P-Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	LTE 41	QPSK20M	Rear Face	0	40620	1	0	w/o	23.00	21.92	1.28	-0.09	0.378	0.48
	LTE 41	QPSK20M	Left Side	0	40620	1	0	w/o	23.00	21.92	1.28	0	<0.001	0.00
	LTE 41	QPSK20M	Right Side	0	40620	1	0	w/o	23.00	21.92	1.28	-0.06	0.165	0.21
	LTE 41	QPSK20M	Top Side	5	40620	1	0	w/o	23.00	21.92	1.28	0.06	0.144	0.18
	LTE 41	QPSK20M	Bottom Side	0	40620	1	0	w/o	23.00	21.92	1.28	0	<0.001	0.00
	LTE 41	QPSK20M	Rear Curve	0	40620	1	0	w/o	23.00	21.92	1.28	0.06	0.394	0.50
	LTE 41	QPSK20M	Left Curve	0	40620	1	0	w/o	23.00	21.92	1.28	0	<0.001	0.00
	LTE 41	QPSK20M	Right Curve	0	40620	1	0	w/o	23.00	21.92	1.28	0.11	0.137	0.18
	LTE 41	QPSK20M	Top Curve	5	40620	1	0	w/o	23.00	21.92	1.28	-0.02	0.41	0.52
	LTE 41	QPSK20M	Bottom Curve	0	40620	1	0	w/o	23.00	21.92	1.28	0	<0.001	0.00
	LTE 41	QPSK20M	Rear Face	0	40620	50	0	w/o	22.00	20.81	1.32	-0.05	0.216	0.29
	LTE 41	QPSK20M	Left Side	0	40620	50	0	w/o	22.00	20.81	1.32	0	<0.001	0.00
	LTE 41	QPSK20M	Right Side	0	40620	50	0	w/o	22.00	20.81	1.32	-0.12	0.124	0.16
	LTE 41	QPSK20M	Top Side	5	40620	50	0	w/o	22.00	20.81	1.32	0.12	0.205	0.27
	LTE 41	QPSK20M	Bottom Side	0	40620	50	0	w/o	22.00	20.81	1.32	0	<0.001	0.00
	LTE 41	QPSK20M	Rear Curve	0	40620	50	0	w/o	22.00	20.81	1.32	0.12	0.305	0.40
	LTE 41	QPSK20M	Left Curve	0	40620	50	0	w/o	22.00	20.81	1.32	0	<0.001	0.00
	LTE 41	QPSK20M	Right Curve	0	40620	50	0	w/o	22.00	20.81	1.32	0.02	0.11	0.15
	LTE 41	QPSK20M	Top Curve	5	40620	50	0	w/o	22.00	20.81	1.32	0.11	0.398	0.53
	LTE 41	QPSK20M	Bottom Curve	0	40620	50	0	w/o	22.00	20.81	1.32	0	<0.001	0.00
	LTE 41	QPSK20M	Top Side	0	40620	1	0	w/	21.50	20.55	1.24	-0.03	0.217	0.27
10	LTE 41	QPSK20M	Top Curve	0	40620	1	0	w/	21.50	20.55	1.24	-0.17	0.954	1.18
	LTE 41	QPSK20M	Top Side	0	40620	50	0	w/	21.50	20.37	1.30	-0.12	0.182	0.24
	LTE 41	QPSK20M	Top Curve	0	40620	50	0	w/	21.50	20.37	1.30	-0.11	0.783	1.02
	LTE 41	QPSK20M	Top Curve	0	40620	100	0	w/	21.50	20.31	1.32	0.03	0.801	1.06
	LTE 41	QPSK20M	Top Curve	0	39750	1	0	w/	21.50	20.39	1.29	0.01	0.892	1.15
	LTE 41	QPSK20M	Top Curve	0	40185	1	0	w/	21.50	20.31	1.32	0.01	0.846	1.12
	LTE 41	QPSK20M	Top Curve	0	41055	1	0	w/	21.50	20.47	1.27	0.08	0.875	1.11
	LTE 41	QPSK20M	Top Curve	0	41490	1	0	w/	21.50	20.43	1.28	0.06	0.901	1.15
	LTE 41	QPSK20M	Top Curve	0	39750	50	0	w/	21.50	20.16	1.36	-0.09	0.836	1.14
	LTE 41	QPSK20M	Top Curve	0	40185	50	0	w/	21.50	20.13	1.37	0.05	0.783	1.07
	LTE 41	QPSK20M	Top Curve	0	41055	50	0	w/	21.50	20.29	1.32	-0.01	0.792	1.05
	LTE 41	QPSK20M	Top Curve	0	41490	50	0	w/	21.50	20.28	1.32	0.01	0.801	1.06
	LTE 41	QPSK20M	Top Curve	0	PCC:40620 SCC:40818	PCC:1 SCC:1	PCC:99 SCC:0	w/	21.50	21.21	1.07	-0.14	0.887	0.95
	LTE 41	QPSK20M	Top Curve	0	PCC:39750 SCC:39948	PCC:1 SCC:1	PCC:99 SCC:0	w/	21.50	21.19	1.07	0.04	0.875	0.94
	LTE 41	QPSK20M	Top Curve	0	PCC:40185 SCC:40383	PCC:1 SCC:1	PCC:99 SCC:0	w/	21.50	21.18	1.08	0.12	0.797	0.86
	LTE 41	QPSK20M	Top Curve	0	PCC:41055 SCC:41253	PCC:1 SCC:1	PCC:99 SCC:0	w/	21.50	21.18	1.08	0.09	0.802	0.87
	LTE 41	QPSK20M	Top Curve	0	PCC:41292 SCC:41490	PCC:1 SCC:1	PCC:99 SCC:0	w/	21.50	21.14	1.09	0.05	0.794	0.87
	LTE 41	QPSK20M	Top Curve	0	40620	1	0	w/	21.50	20.55	1.24	-0.17	0.947	1.17

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

SAR Test Report

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB	offset	P-Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	LTE 66	QPSK20M	Rear Face	0	132572	1	0	w/o	24.00	23.25	1.19	-0.05	0.72	0.86
	LTE 66	QPSK20M	Left Side	0	132572	1	0	w/o	24.00	23.25	1.19	0	<0.001	0.00
	LTE 66	QPSK20M	Right Side	0	132572	1	0	w/o	24.00	23.25	1.19	0.05	0.974	1.16
	LTE 66	QPSK20M	Top Side	5	132572	1	0	w/o	24.00	23.25	1.19	0.04	0.995	1.18
	LTE 66	QPSK20M	Bottom Side	0	132572	1	0	w/o	24.00	23.25	1.19	0	<0.001	0.00
	LTE 66	QPSK20M	Rear Curve	0	132572	1	0	w/o	24.00	23.25	1.19	0.05	0.454	0.54
	LTE 66	QPSK20M	Left Curve	0	132572	1	0	w/o	24.00	23.25	1.19	0	<0.001	0.00
	LTE 66	QPSK20M	Right Curve	0	132572	1	0	w/o	24.00	23.25	1.19	0.05	0.746	0.89
	LTE 66	QPSK20M	Top Curve	5	132572	1	0	w/o	24.00	23.25	1.19	0.07	0.874	1.04
	LTE 66	QPSK20M	Bottom Curve	0	132572	1	0	w/o	24.00	23.25	1.19	0	<0.001	0.00
	LTE 66	QPSK20M	Rear Face	0	132572	50	0	w/o	23.00	22.18	1.21	0.01	0.554	0.67
	LTE 66	QPSK20M	Left Side	0	132572	50	0	w/o	23.00	22.18	1.21	0	<0.001	0.00
	LTE 66	QPSK20M	Right Side	0	132572	50	0	w/o	23.00	22.18	1.21	-0.05	0.745	0.90
	LTE 66	QPSK20M	Top Side	5	132572	50	0	w/o	23.00	22.18	1.21	-0.06	0.784	0.95
	LTE 66	QPSK20M	Bottom Side	0	132572	50	0	w/o	23.00	22.18	1.21	0	<0.001	0.00
	LTE 66	QPSK20M	Rear Curve	0	132572	50	0	w/o	23.00	22.18	1.21	0.06	0.354	0.43
	LTE 66	QPSK20M	Left Curve	0	132572	50	0	w/o	23.00	22.18	1.21	0	<0.001	0.00
	LTE 66	QPSK20M	Right Curve	0	132572	50	0	w/o	23.00	22.18	1.21	-0.11	0.583	0.71
	LTE 66	QPSK20M	Top Curve	5	132572	50	0	w/o	23.00	22.18	1.21	0.01	0.7	0.85
	LTE 66	QPSK20M	Bottom Curve	0	132572	50	0	w/o	23.00	22.18	1.21	0	<0.001	0.00
	LTE 66	QPSK20M	Rear Face	0	132572	100	0	w/o	23.00	22.08	1.24	0.14	0.505	0.63
	LTE 66	QPSK20M	Right Side	0	132572	100	0	w/o	23.00	22.08	1.24	0.13	0.668	0.83
	LTE 66	QPSK20M	Top Side	5	132572	100	0	w/o	23.00	22.08	1.24	0.19	0.747	0.93
	LTE 66	QPSK20M	Right Curve	0	132572	100	0	w/o	23.00	22.08	1.24	-0.01	0.404	0.50
	LTE 66	QPSK20M	Top Curve	5	132572	100	0	w/o	23.00	22.08	1.24	-0.12	0.609	0.76
	LTE 66	QPSK20M	Top Side	0	132572	1	0	w/	23.00	22.31	1.17	-0.09	0.93	1.09
11	LTE 66	QPSK20M	Top Curve	0	132572	1	0	w/	23.00	22.31	1.17	0.02	1.01	1.18
	LTE 66	QPSK20M	Top Side	0	132572	50	0	w/	23.00	22.31	1.17	0.05	0.826	0.97
	LTE 66	QPSK20M	Top Curve	0	132572	50	0	w/	23.00	22.31	1.17	0.05	0.992	1.16
	LTE 66	QPSK20M	Top Side	0	132572	100	0	w/	23.00	22.12	1.22	-0.19	0.858	1.05
	LTE 66	QPSK20M	Top Curve	0	132572	100	0	w/	23.00	22.12	1.22	0.01	0.873	1.07
	LTE 66	QPSK20M	Rear Face	0	132072	1	0	w/o	24.00	23.01	1.26	0.08	0.547	0.69
	LTE 66	QPSK20M	Rear Face	0	132322	1	0	w/o	24.00	23.21	1.20	-0.07	0.609	0.73
	LTE 66	QPSK20M	Right Side	0	132072	1	0	w/o	24.00	23.01	1.26	-0.11	0.703	0.89
	LTE 66	QPSK20M	Right Side	0	132322	1	0	w/o	24.00	23.21	1.20	0.01	0.765	0.92
	LTE 66	QPSK20M	Top Side	5	132072	1	0	w/o	24.00	23.01	1.26	-0.05	0.809	1.02
	LTE 66	QPSK20M	Top Side	5	132322	1	0	w/o	24.00	23.21	1.20	0.04	0.848	1.02
	LTE 66	QPSK20M	Right Curve	0	132072	1	0	w/o	24.00	23.01	1.26	0.03	0.602	0.76
	LTE 66	QPSK20M	Right Curve	0	132322	1	0	w/o	24.00	23.21	1.20	-0.06	0.619	0.74
	LTE 66	QPSK20M	Top Curve	5	132072	1	0	w/o	24.00	23.01	1.26	0.09	0.532	0.67
	LTE 66	QPSK20M	Top Curve	5	132322	1	0	w/o	24.00	23.21	1.20	0.15	0.581	0.70
	LTE 66	QPSK20M	Right Side	0	132072	50	0	w/o	23.00	21.94	1.28	-0.14	0.583	0.75
	LTE 66	QPSK20M	Right Side	0	132322	50	0	w/o	23.00	22.14	1.22	-0.17	0.627	0.76
	LTE 66	QPSK20M	Top Side	5	132072	50	0	w/o	23.00	21.94	1.28	-0.11	0.708	0.91
	LTE 66	QPSK20M	Top Side	5	132322	50	0	w/o	23.00	22.14	1.22	0.12	0.715	0.87
	LTE 66	QPSK20M	Top Curve	5	132072	50	0	w/o	23.00	21.94	1.28	-0.14	0.504	0.65
	LTE 66	QPSK20M	Top Curve	5	132322	50	0	w/o	23.00	22.14	1.22	-0.03	0.559	0.68
	LTE 66	QPSK20M	Top Side	0	132072	1	0	w/	23.00	22.15	1.22	-0.03	0.878	1.07
	LTE 66	QPSK20M	Top Side	0	132322	1	0	w/	23.00	22.27	1.18	0.18	0.811	0.96
	LTE 66	QPSK20M	Top Curve	0	132072	1	0	w/	23.00	22.15	1.22	-0.15	0.974	1.19
	LTE 66	QPSK20M	Top Curve	0	132322	1	0	w/	23.00	22.27	1.18	0.03	0.938	1.11
	LTE 66	QPSK20M	Top Side	0	132072	50	0	w/	23.00	22.15	1.22	-0.10	0.867	1.06
	LTE 66	QPSK20M	Top Side	0	132322	50	0	w/	23.00	22.27	1.18	0.06	0.859	1.01
	LTE 66	QPSK20M	Top Curve	0	132072	50	0	w/	23.00	22.15	1.22	0.02	0.865	1.06
	LTE 66	QPSK20M	Top Curve	0	132322	50	0	w/	23.00	22.27	1.18	-0.07	0.900	1.06
	LTE 66	QPSK20M	Top Curve	0	132572	1	0	w/	23.00	22.31	1.17	0.05	0.990	1.16

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

SAR Test Report

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	Ant Status	Duty Cycle	Crest Factor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
12	WLAN2.4G	802.11b	Rear Face	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0.03	0.161	0.16
	WLAN2.4G	802.11b	Left Side	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0.15	0.347	0.35
	WLAN2.4G	802.11b	Right Side	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0	<0.001	0.00
	WLAN2.4G	802.11b	Top Side	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0.05	0.237	0.24
	WLAN2.4G	802.11b	Bottom Side	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0	<0.001	0.00
	WLAN2.4G	802.11b	Rear Curve	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0	<0.001	0.00
	WLAN2.4G	802.11b	Left Curve	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0.11	0.341	0.35
	WLAN2.4G	802.11b	Right Curve	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0	<0.001	0.00
	WLAN2.4G	802.11b	Top Curve	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	-0.03	0.211	0.22
	WLAN2.4G	802.11b	Bottom Curve	0	6	Ant 0	99.00	1.01	15.50	15.45	1.01	0	<0.001	0.00
	WLAN2.4G	802.11b	Rear Face	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	-0.12	0.071	0.08
	WLAN2.4G	802.11b	Left Side	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0	<0.001	0.00
	WLAN2.4G	802.11b	Right Side	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0.09	0.109	0.12
	WLAN2.4G	802.11b	Top Side	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0	<0.001	0.00
	WLAN2.4G	802.11b	Bottom Side	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	-0.13	0.21	0.22
	WLAN2.4G	802.11b	Rear Curve	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0.04	0.121	0.13
	WLAN2.4G	802.11b	Left Curve	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0	<0.001	0.00
	WLAN2.4G	802.11b	Right Curve	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0.04	0.121	0.13
	WLAN2.4G	802.11b	Top Curve	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	0	<0.001	0.00
	WLAN2.4G	802.11b	Bottom Curve	0	6	Ant 1	99.00	1.01	15.50	15.30	1.05	-0.03	0.058	0.06
WLAN2.4G	802.11b	Left Side	0	1	Ant 0	99.00	1.01	15.50	15.22	1.07	0.09	0.116	0.13	
WLAN2.4G	802.11b	Left Side	0	11	Ant 0	99.00	1.01	15.50	15.30	1.05	0.12	0.166	0.18	
WLAN2.4G	802.11b	Left Side	0	12	Ant 0	99.00	1.01	15.50	15.20	1.07	-0.04	0.206	0.22	
WLAN2.4G	802.11b	Left Side	0	13	Ant 0	99.00	1.01	15.50	15.43	1.02	0.06	0.188	0.19	
13	WLAN5.3G	802.11ac VHT160	Rear Face	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0.07	0.143	0.17
	WLAN5.3G	802.11ac VHT160	Left Side	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0.05	0.083	0.10
	WLAN5.3G	802.11ac VHT160	Right Side	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Top Side	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0.05	0.132	0.16
	WLAN5.3G	802.11ac VHT160	Bottom Side	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Rear Curve	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0.02	0.046	0.06
	WLAN5.3G	802.11ac VHT160	Left Curve	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0.01	0.052	0.06
	WLAN5.3G	802.11ac VHT160	Right Curve	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Top Curve	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0.03	0.057	0.07
	WLAN5.3G	802.11ac VHT160	Bottom Curve	0	50	Ant 0	84.30	1.19	14.00	13.97	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Rear Face	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.11	0.071	0.08
	WLAN5.3G	802.11ac VHT160	Left Side	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Right Side	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.05	0.021	0.03
	WLAN5.3G	802.11ac VHT160	Top Side	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Bottom Side	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.17	0.964	1.15
	WLAN5.3G	802.11ac VHT160	Rear Curve	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.12	0.065	0.08
	WLAN5.3G	802.11ac VHT160	Left Curve	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Right Curve	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.06	0.053	0.06
	WLAN5.3G	802.11ac VHT160	Top Curve	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0	<0.001	0.00
	WLAN5.3G	802.11ac VHT160	Bottom Curve	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.03	0.577	0.69
WLAN5.3G	802.11ac VHT160	Bottom Side	0	50	Ant 1	84.80	1.18	14.00	13.94	1.01	0.05	0.953	1.14	

Note:

1. The "< 0.001" means there is no SAR value or the SAR is too low to be measured.
2. All of the WLAN MIMO max tune up power are less or equal than the WLAN SISO max tune up power, so there are no need to add MIMO mode testing.

SAR Test Report

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	Ant Status	Duty Cycle	Crest Factor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Scaling Factor	Power Drift	SAR 1g	Scaled 1g SAR
	WLAN5.6G	802.11ac VHT80	Rear Face	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0.03	0.211	0.26
	WLAN5.6G	802.11ac VHT80	Left Side	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0.05	0.305	0.38
	WLAN5.6G	802.11ac VHT80	Right Side	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Top Side	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0.12	0.158	0.20
	WLAN5.6G	802.11ac VHT80	Bottom Side	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Rear Curve	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Left Curve	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	-0.04	0.296	0.37
	WLAN5.6G	802.11ac VHT80	Right Curve	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Top Curve	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0.06	0.218	0.27
	WLAN5.6G	802.11ac VHT80	Bottom Curve	0	106	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Rear Face	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0.08	0.192	0.25
	WLAN5.6G	802.11ac VHT80	Left Side	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Right Side	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0.11	0.071	0.09
	WLAN5.6G	802.11ac VHT80	Top Side	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0	<0.001	0.00
14	WLAN5.6G	802.11ac VHT80	Bottom Side	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	-0.03	0.666	0.86
	WLAN5.6G	802.11ac VHT80	Rear Curve	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Left Curve	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Right Curve	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0.03	0.061	0.08
	WLAN5.6G	802.11ac VHT80	Top Curve	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0	<0.001	0.00
	WLAN5.6G	802.11ac VHT80	Bottom Curve	0	106	Ant 1	82.10	1.22	14.00	13.76	1.06	0.04	0.467	0.60
	WLAN5.6G	802.11ac VHT80	Bottom Side	0	138	Ant 1	82.10	1.22	14.00	13.53	1.11	0.09	0.545	0.74
	WLAN5.8G	802.11ac VHT80	Rear Face	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	-0.07	0.21	0.26
	WLAN5.8G	802.11ac VHT80	Left Side	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0.06	0.263	0.33
	WLAN5.8G	802.11ac VHT80	Right Side	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Top Side	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0.01	0.203	0.25
	WLAN5.8G	802.11ac VHT80	Bottom Side	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Rear Curve	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Left Curve	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0.03	0.179	0.22
	WLAN5.8G	802.11ac VHT80	Right Curve	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Top Curve	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	-0.12	0.296	0.37
	WLAN5.8G	802.11ac VHT80	Bottom Curve	0	155	Ant 0	84.20	1.19	14.00	13.84	1.04	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Rear Face	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	-0.04	0.138	0.18
	WLAN5.8G	802.11ac VHT80	Left Side	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Right Side	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0	0.015	0.02
	WLAN5.8G	802.11ac VHT80	Top Side	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0	<0.001	0.00
15	WLAN5.8G	802.11ac VHT80	Bottom Side	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	-0.05	0.439	0.57
	WLAN5.8G	802.11ac VHT80	Rear Curve	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Left Curve	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Right Curve	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0.05	0.049	0.06
	WLAN5.8G	802.11ac VHT80	Top Curve	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0	<0.001	0.00
	WLAN5.8G	802.11ac VHT80	Bottom Curve	0	155	Ant 1	82.10	1.22	14.00	13.73	1.06	0.12	0.331	0.43
	BT	BDR	Rear Face	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Left Side	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Right Side	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Top Side	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Bottom Side	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Rear Curve	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Left Curve	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Right Curve	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Top Curve	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Bottom Curve	0	78	Ant 1	75.50	1.32	11.50	11.15	1.08	0	<0.001	0.00
	BT	BDR	Bottom Side	0	0	Ant 1	75.50	1.32	11.50	10.41	1.29	0	<0.001	0.00
	BT	BDR	Bottom Side	0	39	Ant 1	75.50	1.32	11.50	10.87	1.16	0	<0.001	0.00

Note:

1. The "< 0.001" means there is no SAR value or the SAR is too low to be measured.
2. All of the WLAN MIMO max tune up power are less or equal than the WLAN SISO max tune up power, so there are no need to add MIMO mode testing.

SAR Test Report

4.7.3 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 maybe 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.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3. If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 , or when the original or repeated measurement is ≥ 1.45 W/kg, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 , and the original, first or second repeated measurement is ≥ 1.5 W/kg, perform a third repeated measurement.

Band	Mode	Test Position	Ch.	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
WCDMA II	RMC12.2K	Top Side	9262	0.978	0.968	1.01	N/A	N/A	N/A	N/A
WCDMA IV	RMC12.2K	Top Curve	1413	1.03	0.99	1.04	N/A	N/A	N/A	N/A
WCDMA V	RMC12.2K	Top Curve	4182	1.01	0.98	1.03	N/A	N/A	N/A	N/A
LTE 2	QPSK20M	Top Side	19100	0.945	0.923	1.02	N/A	N/A	N/A	N/A
LTE 5	QPSK10M	Top Curve	20525	0.968	0.946	1.02	N/A	N/A	N/A	N/A
LTE 7	QPSK20M	Top Curve	21350	0.953	0.952	1.00	N/A	N/A	N/A	N/A
LTE 13	QPSK10M	Top Curve	23230	0.970	0.961	1.01	N/A	N/A	N/A	N/A
LTE 26	QPSK15M	Top Curve	26965	0.985	0.955	1.03	N/A	N/A	N/A	N/A
LTE 41	QPSK20M	Top Curve	40620	0.954	0.947	1.01	N/A	N/A	N/A	N/A
LTE 66	QPSK20M	Top Curve	132572	1.01	0.99	1.02	N/A	N/A	N/A	N/A
WLAN5.3G	802.11ac VHT160	Bottom Side	50	0.964	0.953	1.01	N/A	N/A	N/A	N/A

SAR Test Report

4.7.4 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	Body Exposure Condition
1	WWAN + WLAN2.4G_Ant0	Yes
2	WWAN + WLAN2.4G_Ant1	Yes
3	WWAN + WLAN5G_Ant0	Yes
4	WWAN + WLAN5G_Ant1	Yes
5	WWAN + BT_Ant1	Yes
6	WWAN + WLAN2.4G_Ant0 + BT_Ant1	Yes
7	WWAN + WLAN5G_Ant0 + BT_Ant1	Yes
8	WWAN + WLAN2.4G_Ant0 +WLAN2.4G_Ant1	Yes
9	WWAN + WLAN5G_Ant0 +WLAN5G_Ant1	Yes
10	WWAN + WLAN5G_Ant0 +WLAN5G_Ant1 + BT_Ant1	Yes

Note :

1. Combination1 is covered by Combination8
2. Combination2 is covered by Combination8
3. Combination3 is covered by Combination10
4. Combination4 is covered by Combination10
5. Combination5 is covered by Combination10
6. Combination7 is covered by Combination10
7. Combination9 is covered by Combination10

SAR Test Report

<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.

Band	Position	1g SAR W/kg						Summing result 1g SAR W/kg		
		A	B	C	D	E	F	A+B+F	A+B+C	A+D+E+F
		Max WWAN	WLAN 2.4GHz Ant 0	WLAN 2.4GHz Ant 1	WLAN 5GHz Ant 0	WLAN 5GHz Ant 1	BT Ant 1			
WCDMA II	Rear Face	0.97	0.16	0.08	0.26	0.25	0.00	1.13	1.21	1.48
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	1.15	0.00	0.12	0.00	0.09	0.00	1.15	1.27	1.24
	Top Side	1.16	0.24	0.00	0.25	0.00	0.00	1.40	1.40	1.41
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.96	0.00	0.13	0.06	0.08	0.00	0.96	1.09	1.10
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.71	0.00	0.13	0.06	0.08	0.00	0.71	0.84	0.85
	Top Curve	1.12	0.22	0.00	0.37	0.00	0.00	1.34	1.34	1.49
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
WCDMA IV	Rear Face	0.53	0.16	0.08	0.26	0.25	0.00	0.69	0.77	1.04
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.71	0.00	0.12	0.00	0.09	0.00	0.71	0.83	0.80
	Top Side	1.07	0.24	0.00	0.25	0.00	0.00	1.31	1.31	1.32
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.41	0.00	0.13	0.06	0.08	0.00	0.41	0.54	0.55
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.53	0.00	0.13	0.06	0.08	0.00	0.53	0.66	0.67
	Top Curve	1.17	0.22	0.00	0.37	0.00	0.00	1.39	1.39	1.54
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69

SAR Test Report

Band	Position	1g SAR W/kg						Summing result 1g SAR W/kg		
		A	B	C	D	E	F	A+B+F	A+B+C	A+D+E+F
		Max WWAN	WLAN 2.4GHz Ant 0	WLAN 2.4GHz Ant 1	WLAN 5GHz Ant 0	WLAN 5GHz Ant 1	BT Ant 1			
WCDMA V	Rear Face	0.72	0.16	0.08	0.26	0.25	0.00	0.88	0.96	1.23
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.37	0.00	0.12	0.00	0.09	0.00	0.37	0.49	0.46
	Top Side	0.96	0.24	0.00	0.25	0.00	0.00	1.20	1.20	1.21
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.90	0.00	0.13	0.06	0.08	0.00	0.90	1.03	1.04
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.44	0.00	0.13	0.06	0.08	0.00	0.44	0.57	0.58
	Top Curve	1.15	0.22	0.00	0.37	0.00	0.00	1.37	1.37	1.52
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
LTE 2	Rear Face	0.81	0.16	0.08	0.26	0.25	0.00	0.97	1.05	1.32
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.90	0.00	0.12	0.00	0.09	0.00	0.90	1.02	0.99
	Top Side	1.19	0.24	0.00	0.25	0.00	0.00	1.43	1.43	1.44
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.53	0.00	0.13	0.06	0.08	0.00	0.53	0.66	0.67
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.69	0.00	0.13	0.06	0.08	0.00	0.69	0.82	0.83
	Top Curve	1.11	0.22	0.00	0.37	0.00	0.00	1.33	1.33	1.48
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
LTE 5	Rear Face	0.73	0.16	0.08	0.26	0.25	0.00	0.89	0.97	1.24
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.34	0.00	0.12	0.00	0.09	0.00	0.34	0.46	0.43
	Top Side	0.91	0.24	0.00	0.25	0.00	0.00	1.15	1.15	1.16
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.67	0.00	0.13	0.06	0.08	0.00	0.67	0.80	0.81
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.50	0.00	0.13	0.06	0.08	0.00	0.50	0.63	0.64
	Top Curve	1.11	0.22	0.00	0.37	0.00	0.00	1.33	1.33	1.48
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69

SAR Test Report

Band	Position	1g SAR W/kg						Summing result 1g SAR W/kg		
		A	B	C	D	E	F	A+B+F	A+B+C	A+D+E+F
		Max WWAN	WLAN 2.4GHz Ant 0	WLAN 2.4GHz Ant 1	WLAN 5GHz Ant 0	WLAN 5GHz Ant 1	BT Ant 1			
LTE 7	Rear Face	0.76	0.16	0.08	0.26	0.25	0.00	0.92	1.00	1.27
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.35	0.00	0.12	0.00	0.09	0.00	0.35	0.47	0.44
	Top Side	0.47	0.24	0.00	0.25	0.00	0.00	0.71	0.71	0.72
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.66	0.00	0.13	0.06	0.08	0.00	0.66	0.79	0.80
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.43	0.00	0.13	0.06	0.08	0.00	0.43	0.56	0.57
	Top Curve	1.18	0.22	0.00	0.37	0.00	0.00	1.40	1.40	1.55
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
LTE 12	Rear Face	0.48	0.16	0.08	0.26	0.25	0.00	0.64	0.72	0.99
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.22	0.00	0.12	0.00	0.09	0.00	0.22	0.34	0.31
	Top Side	0.64	0.24	0.00	0.25	0.00	0.00	0.88	0.88	0.89
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.52	0.00	0.13	0.06	0.08	0.00	0.52	0.65	0.66
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.27	0.00	0.13	0.06	0.08	0.00	0.27	0.40	0.41
	Top Curve	0.76	0.22	0.00	0.37	0.00	0.00	0.98	0.98	1.13
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
LTE 13	Rear Face	0.71	0.16	0.08	0.26	0.25	0.00	0.87	0.95	1.22
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.34	0.00	0.12	0.00	0.09	0.00	0.34	0.46	0.43
	Top Side	0.96	0.24	0.00	0.25	0.00	0.00	1.20	1.20	1.21
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.76	0.00	0.13	0.06	0.08	0.00	0.76	0.89	0.90
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.48	0.00	0.13	0.06	0.08	0.00	0.48	0.61	0.62
	Top Curve	1.11	0.22	0.00	0.37	0.00	0.00	1.33	1.33	1.48
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69

SAR Test Report

Band	Position	1g SAR W/kg						Summing result 1g SAR W/kg		
		A	B	C	D	E	F	A+B+F	A+B+C	A+D+E+F
		Max WWAN	WLAN 2.4GHz Ant 0	WLAN 2.4GHz Ant 1	WLAN 5GHz Ant 0	WLAN 5GHz Ant 1	BT Ant 1			
LTE 26	Rear Face	0.72	0.16	0.08	0.26	0.25	0.00	0.88	0.96	1.23
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.72	0.00	0.12	0.00	0.09	0.00	0.72	0.84	0.81
	Top Side	0.92	0.24	0.00	0.25	0.00	0.00	1.16	1.16	1.17
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.76	0.00	0.13	0.06	0.08	0.00	0.76	0.89	0.90
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.47	0.00	0.13	0.06	0.08	0.00	0.47	0.60	0.61
	Top Curve	1.11	0.22	0.00	0.37	0.00	0.00	1.33	1.33	1.48
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
LTE 41	Rear Face	0.48	0.16	0.08	0.26	0.25	0.00	0.64	0.72	0.99
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	0.21	0.00	0.12	0.00	0.09	0.00	0.21	0.33	0.30
	Top Side	0.27	0.24	0.00	0.25	0.00	0.00	0.51	0.51	0.52
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.50	0.00	0.13	0.06	0.08	0.00	0.50	0.63	0.64
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.18	0.00	0.13	0.06	0.08	0.00	0.18	0.31	0.32
	Top Curve	1.18	0.22	0.00	0.37	0.00	0.00	1.40	1.40	1.55
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69
LTE 66	Rear Face	0.86	0.16	0.08	0.26	0.25	0.00	1.02	1.10	1.37
	Left Side	0.00	0.35	0.00	0.38	0.00	0.00	0.35	0.35	0.38
	Right Side	1.16	0.00	0.12	0.00	0.09	0.00	1.16	1.28	1.25
	Top Side	1.18	0.24	0.00	0.25	0.00	0.00	1.42	1.42	1.43
	Bottom Side	0.00	0.00	0.22	0.00	1.15	0.00	0.00	0.22	1.15
	Rear Curve	0.54	0.00	0.13	0.06	0.08	0.00	0.54	0.67	0.68
	Left Curve	0.00	0.35	0.00	0.37	0.00	0.00	0.35	0.35	0.37
	Right Curve	0.89	0.00	0.13	0.06	0.08	0.00	0.89	1.02	1.03
	Top Curve	1.19	0.22	0.00	0.37	0.00	0.00	1.41	1.41	1.56
	Bottom Curve	0.00	0.00	0.06	0.00	0.69	0.00	0.00	0.06	0.69

Test Engineer : Willy Chang, and Mars Chang

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1013	Aug. 23, 2019	1 Year
System Validation Dipole	SPEAG	D835V2	4d121	Aug. 23, 2019	1 Year
System Validation Dipole	SPEAG	D1750V2	1055	Aug. 23, 2019	1 Year
System Validation Dipole	SPEAG	D1900V2	5d036	Jan. 21, 2020	1 Year
System Validation Dipole	SPEAG	D2450V2	737	Aug. 26, 2019	1 Year
System Validation Dipole	SPEAG	D2600V2	1020	Aug. 26, 2019	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Mar. 13, 2020	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3971	Jan. 27, 2020	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3820	Jun. 25, 2019	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3650	Mar. 25, 2020	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7350	Dec. 16, 2019	1 Year
Data Acquisition Electronics	SPEAG	DAE4	861	May. 07, 2020	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1277	Jan. 24, 2020	1 Year
Data Acquisition Electronics	SPEAG	DAE4	917	Dec. 17, 2019	1 Year
Universal Radio Communication Tester	Anritsu	MT8821C	6261786083	Jun. 27, 2019	1 Year
Spectrum Analyzer	R&S	FSL6	102006	Mar. 26, 2020	1 Year
Universal Wireless Test Set	Anritsu	MT8870A/MU8 87000A	6201699387	Oct. 07, 2019	1 Year
Thermometer	YFE	YF-160A	120702365	Aug. 06, 2019	1 Year
Dielectric Assessment Kit	SPEAG	DAKS-3.5	0004	Jun. 25, 2019	1 Year
Powersource1	SPEAG	SE_UMS_160 BA	4010	Aug. 21, 2019	1 Year

6. Measurement Uncertainty

According to KDB 865664 D01, SAR measurement uncertainty analysis is required in SAR reports only when the highest measured SAR in a frequency band is ≥ 1.5 W/kg for 1-g SAR, and ≥ 3.75 W/kg for 10-g SAR. The procedures described in IEEE Std 1528-2013 should be applied. The expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. When the highest measured SAR within a frequency band is < 1.5 W/kg for 1-g and < 3.75 W/kg for 10-g, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. Hence, the measurement uncertainty analysis is not required in this SAR report because the test result met the condition.

7. Information of 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.

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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_H750_200608

DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

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

Medium: H06T09N1_0608 Medium parameters used: $f = 750$ MHz; $\sigma = 0.888$ S/m; $\epsilon_r = 43.067$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.62, 9.62, 9.62) @ 750 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.507 W/kg

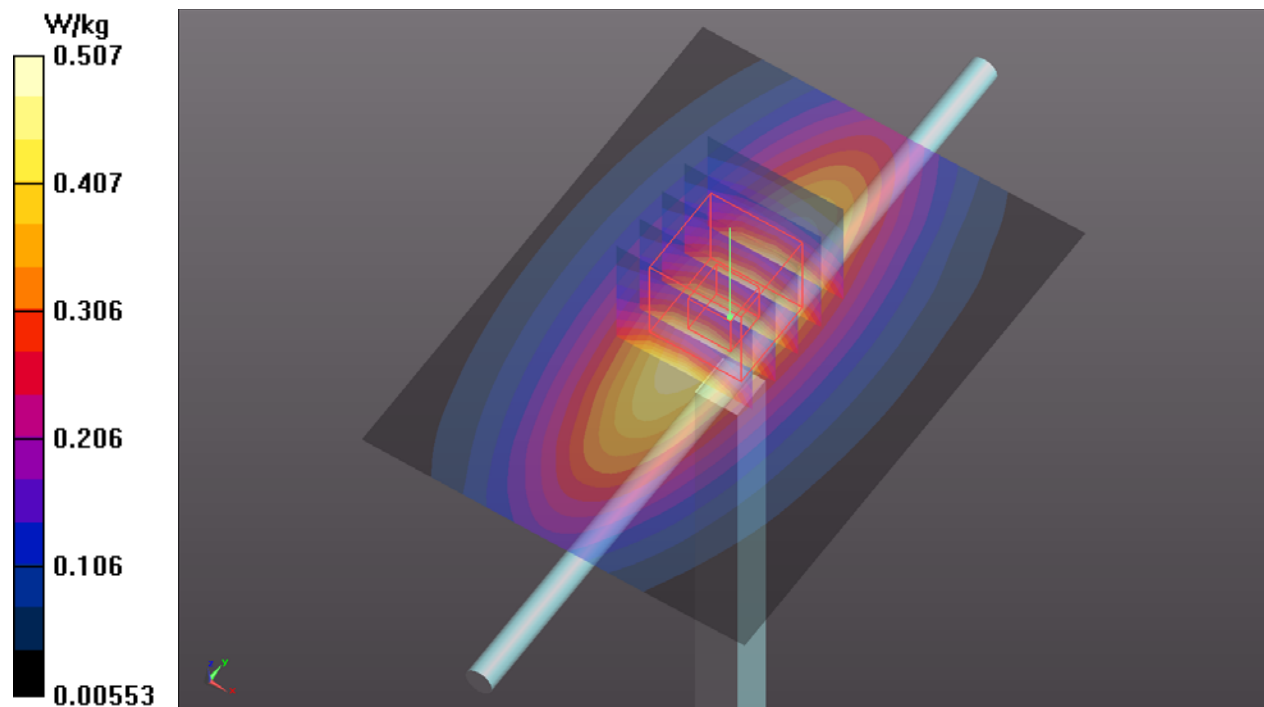
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.97 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.577 W/kg

SAR(1 g) = 0.391 W/kg; SAR(10 g) = 0.258 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.514 W/kg



System Check_H835_200604

DUT: Dipole 835 MHz; Type: D835V2; SN: 4d121

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

Medium: H07T10N4_0604 Medium parameters used: $f = 835$ MHz; $\sigma = 0.905$ S/m; $\epsilon_r = 42.447$; $\rho = 1000$ kg/m³

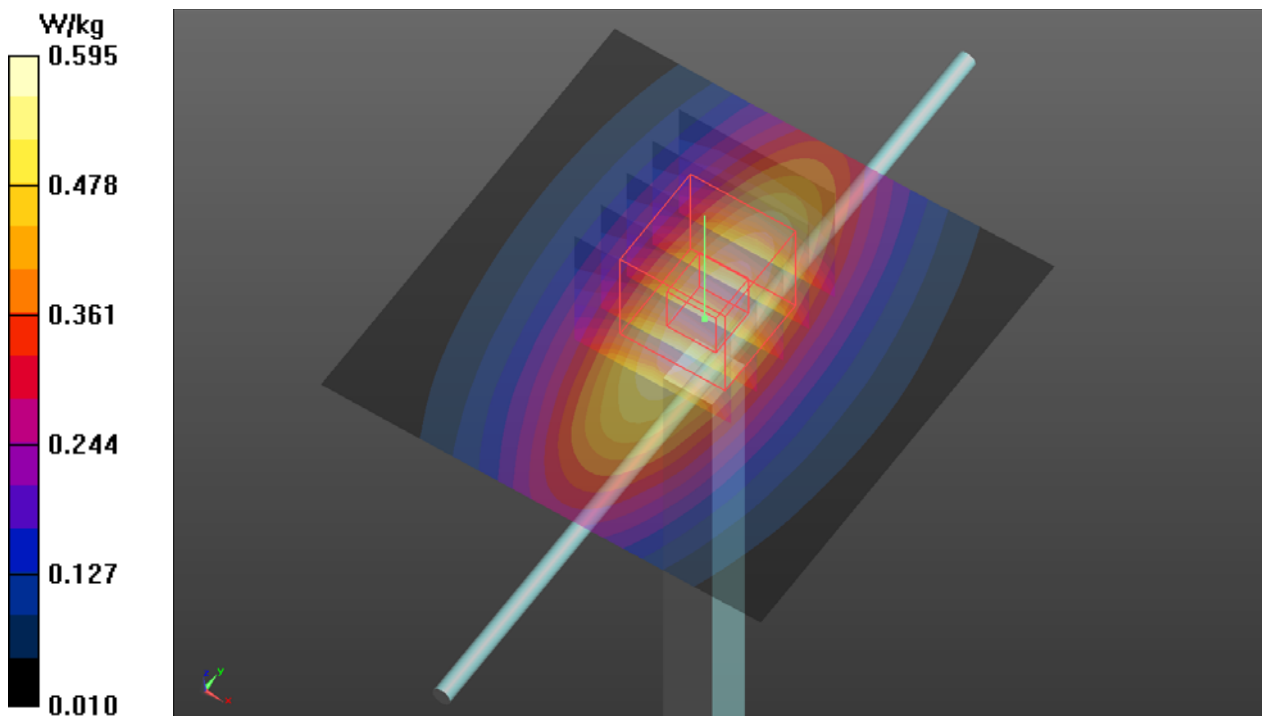
Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.27, 9.27, 9.27) @ 835 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.595 W/kg

Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.99 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.677 W/kg
SAR(1 g) = 0.457 W/kg; SAR(10 g) = 0.300 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.604 W/kg



System Check_H1750_200604

DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: H16T20N4_0604 Medium parameters used: $f = 1750$ MHz; $\sigma = 1.326$ S/m; $\epsilon_r = 38.855$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(7.85, 7.85, 7.85) @ 1750 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.77 W/kg

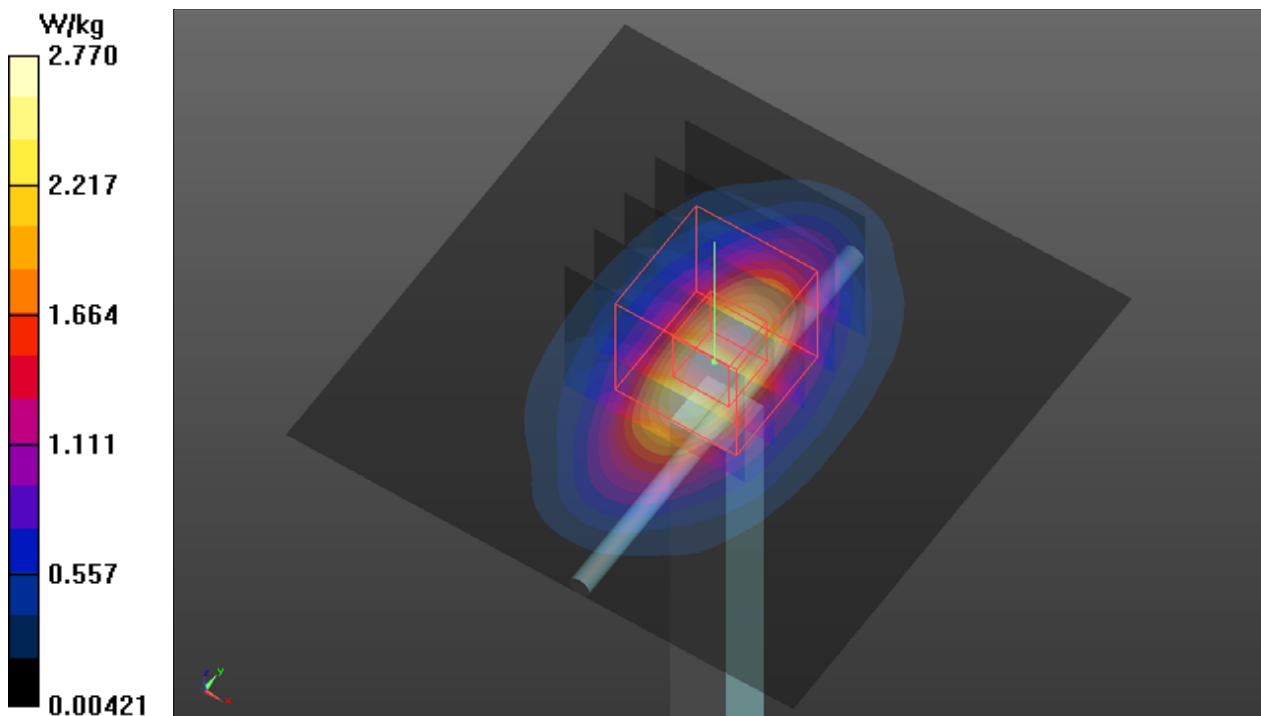
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.31 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 3.28 W/kg

SAR(1 g) = 1.83 W/kg; SAR(10 g) = 0.980 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 2.77 W/kg



System Check_H1900_200616

DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

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

Medium: H16T20N4_0616 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.454$ S/m; $\epsilon_r = 40.464$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.23, 8.23, 8.23) @ 1900 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2020/05/27
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.96 W/kg

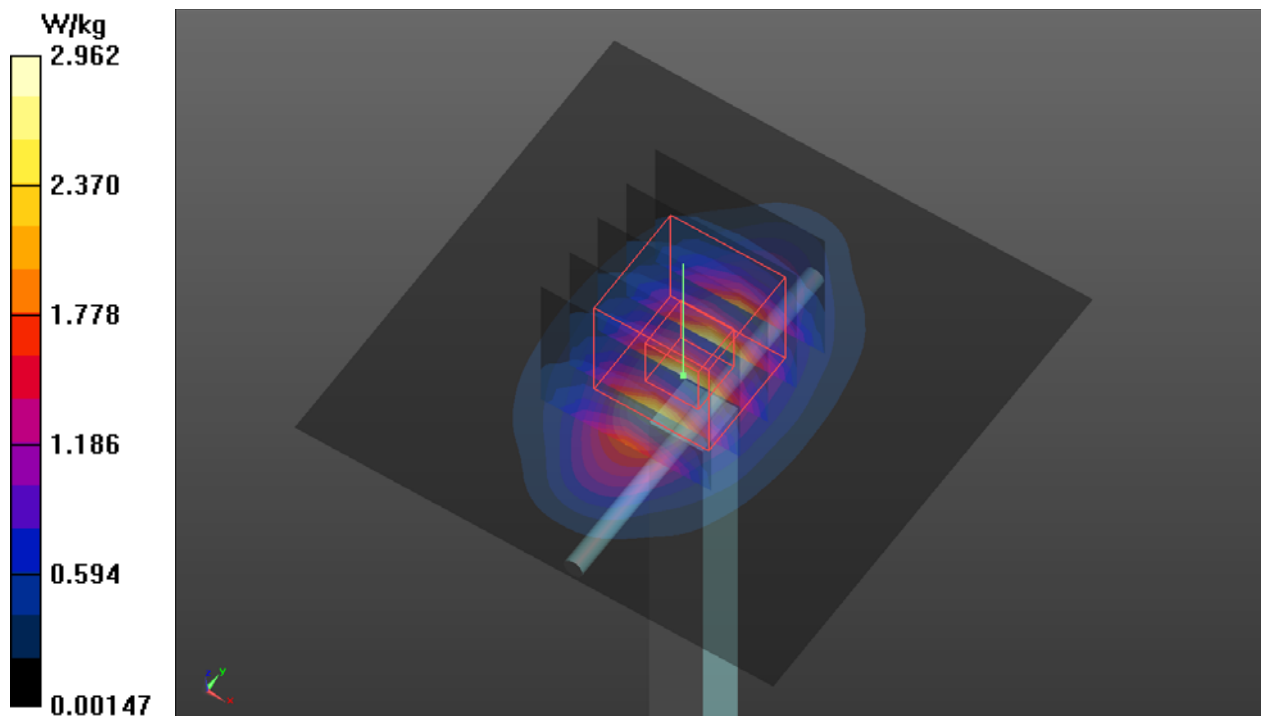
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.15 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.51 W/kg

SAR(1 g) = 1.86 W/kg; SAR(10 g) = 0.979 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 2.96 W/kg



System Check_H2450_200608

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

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

Medium: H19T27N1_0608 Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.882$ S/m; $\epsilon_r = 38.31$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(6.95, 6.95, 6.95) @ 2450 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 4.42 W/kg

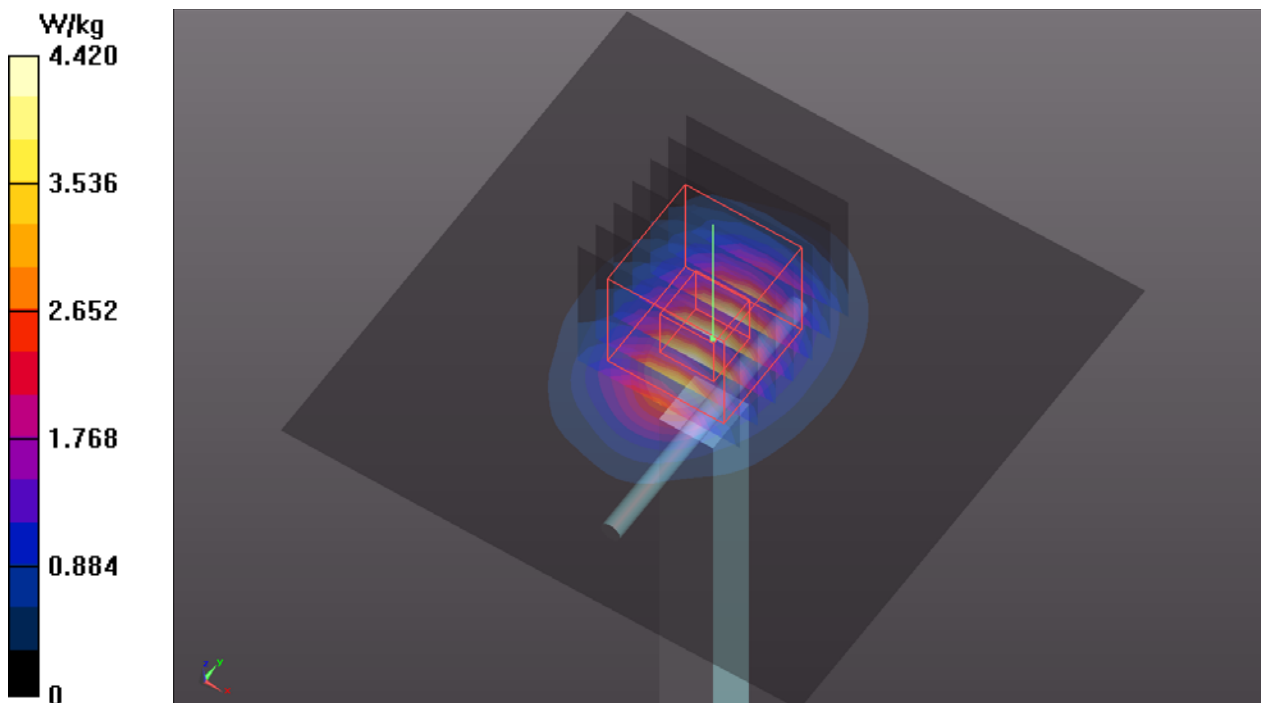
Pin=50mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 48.69 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 5.61 W/kg

SAR(1 g) = 2.65 W/kg; SAR(10 g) = 1.26 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 4.54 W/kg



System Check_H2600_200608

DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1020

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

Medium: H19T27N3_0608 Medium parameters used: $f = 2600$ MHz; $\sigma = 2.053$ S/m; $\epsilon_r = 39.392$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(6.77, 6.77, 6.77) @ 2600 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 5.20 W/kg

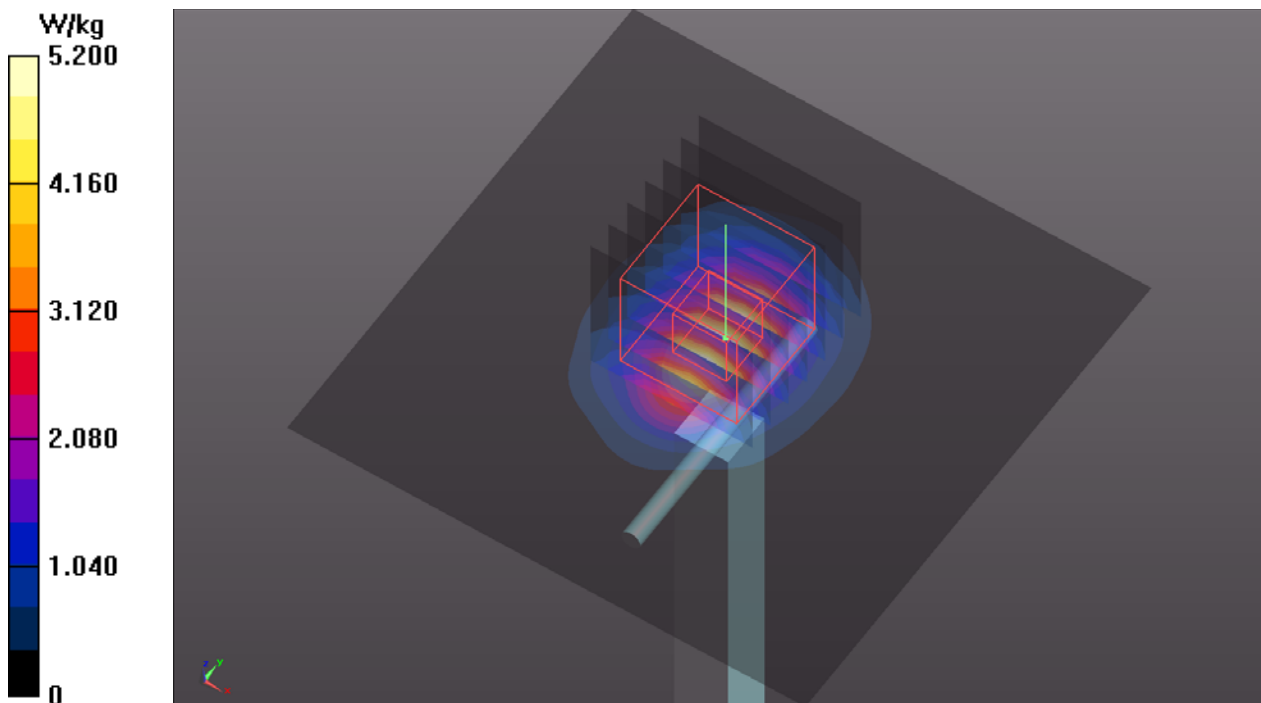
Pin=50mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.73 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 6.46 W/kg

SAR(1 g) = 3.05 W/kg; SAR(10 g) = 1.4 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 5.22 W/kg



System Check_H5250_200603

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

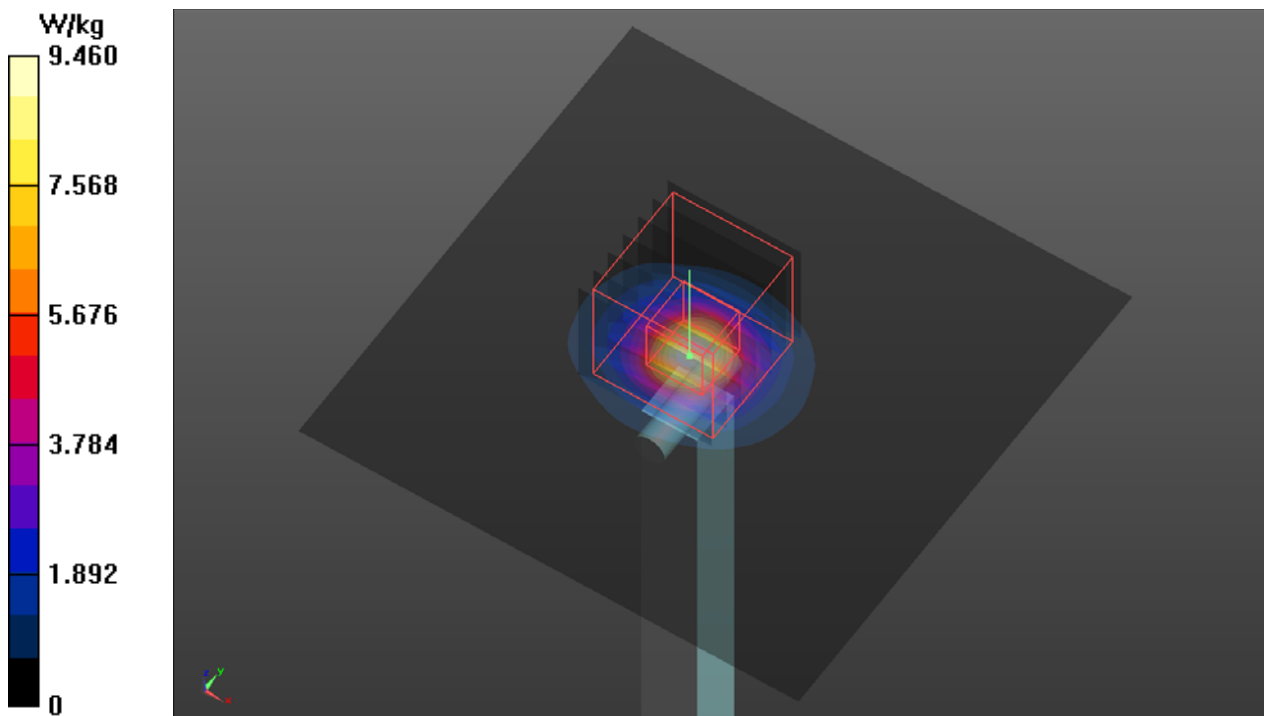
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: H34T60N4_0603 Medium parameters used: $f = 5250$ MHz; $\sigma = 4.597$ S/m; $\epsilon_r = 36.617$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(5.28, 5.28, 5.28) @ 5250 MHz; Calibrated: 2020/01/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2020/01/24
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 9.46 W/kg

Pin=50mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 46.84 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 15.2 W/kg
SAR(1 g) = 4.08 W/kg; SAR(10 g) = 1.19 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 9.96 W/kg



System Check_H5600_200610

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

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: H34T60N2_0610 Medium parameters used: $f = 5600$ MHz; $\sigma = 5.217$ S/m; $\epsilon_r = 35.199$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(4.42, 4.42, 4.42) @ 5600 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 11.0 W/kg

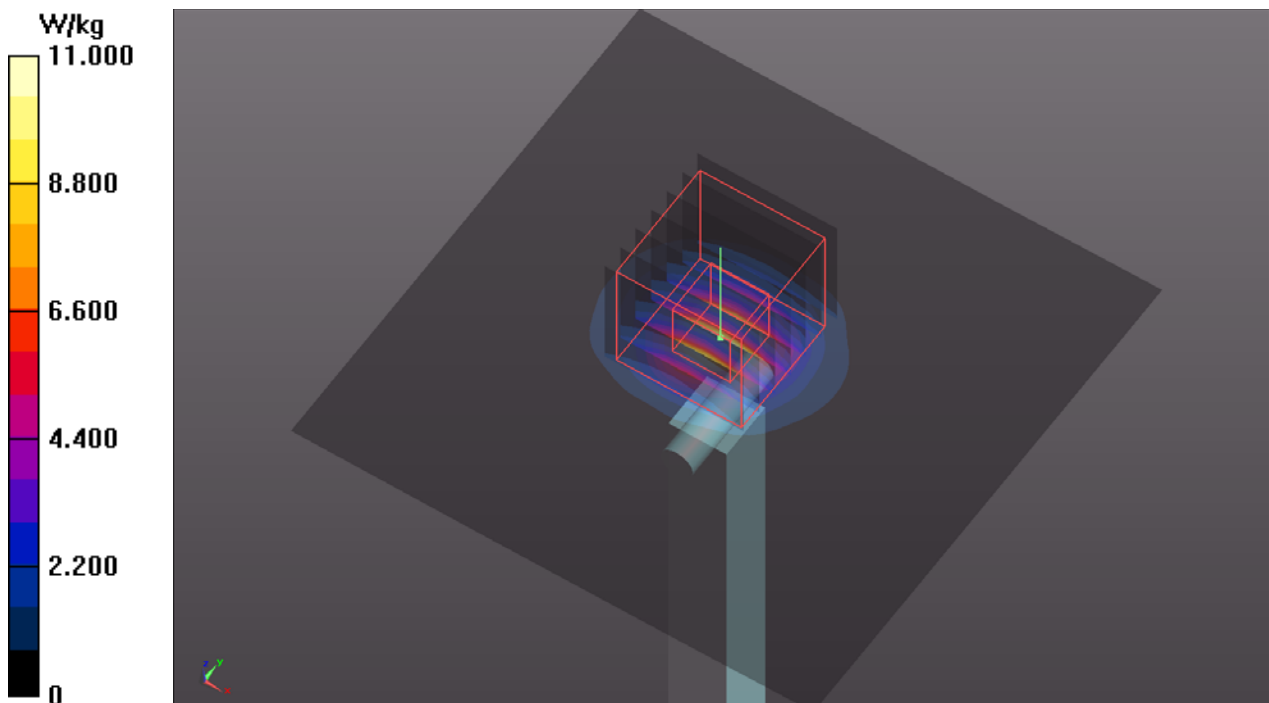
Pin=50mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 46.70 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 19.2 W/kg

SAR(1 g) = 4.56 W/kg; SAR(10 g) = 1.33 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 11.7 W/kg



System Check_H5750_200610

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

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: H34T60N2_0610 Medium parameters used: $f = 5750$ MHz; $\sigma = 5.381$ S/m; $\epsilon_r = 34.848$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(4.41, 4.41, 4.41) @ 5750 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 10.2 W/kg

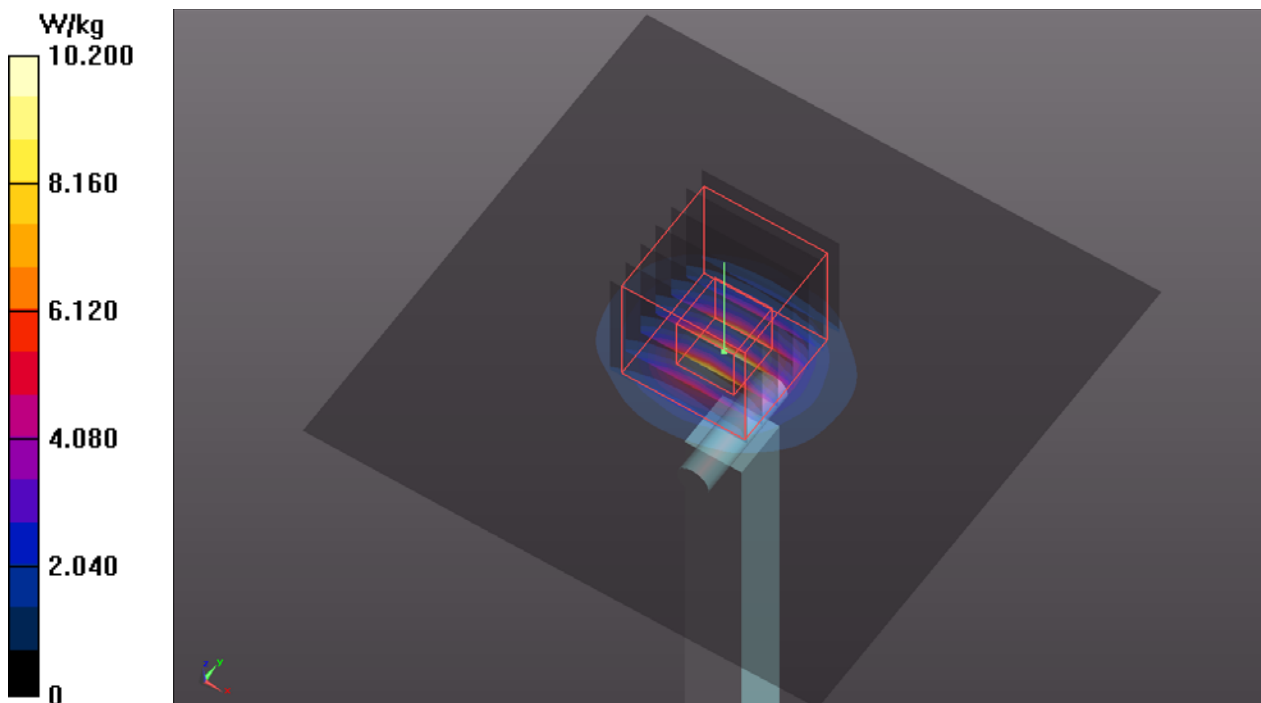
Pin=50mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 48.47 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 4.2 W/kg; SAR(10 g) = 1.23 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 10.8 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 WCDMA II_RMC12.2K_Top Side_5mm_Ch9262_P-Sensor_w_o

DUT: 200521C36

Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 1852.4 MHz; Duty Cycle: 1:1.95

Medium: H16T20N4_0616 Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.415$ S/m; $\epsilon_r = 40.584$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.23, 8.23, 8.23) @ 1852.4 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2020/05/27
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.49 W/kg

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

Reference Value = 32.96 V/m; Power Drift = -0.07 dB

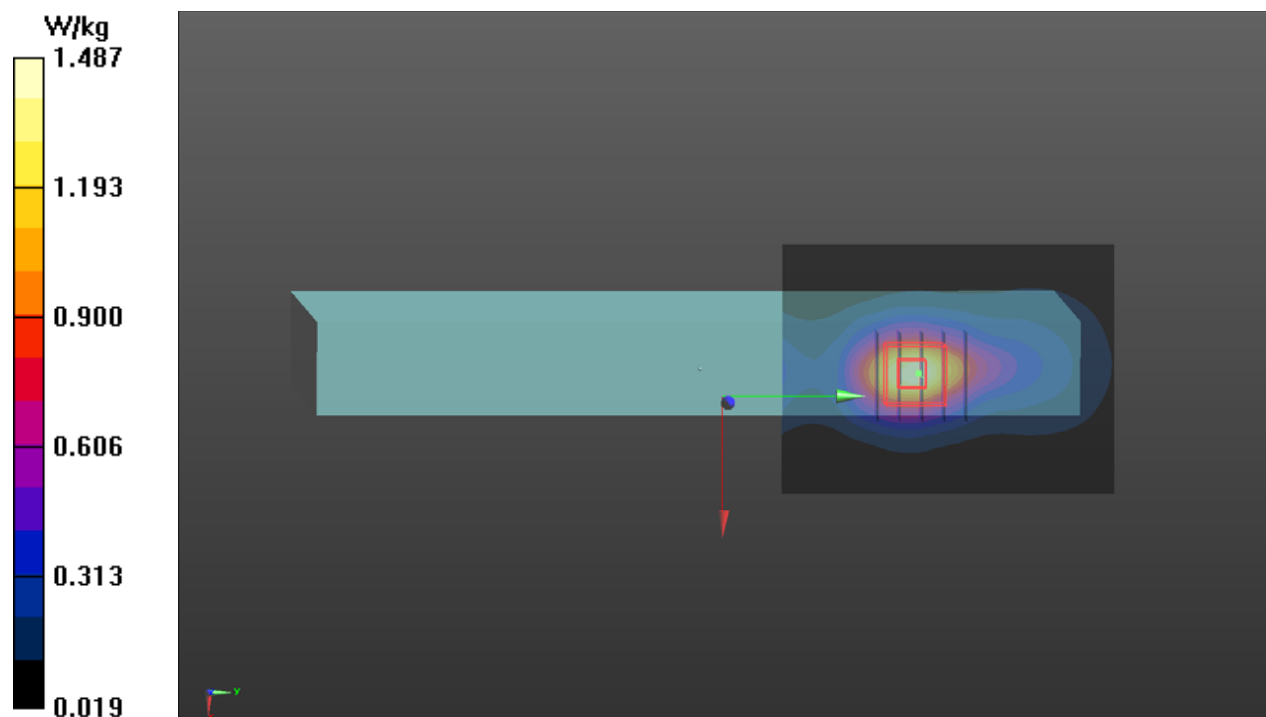
Peak SAR (extrapolated) = 1.64 W/kg

SAR(1 g) = 0.978 W/kg; SAR(10 g) = 0.556 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 12.8 mm

Ratio of SAR at M2 to SAR at M1 = 60.8%

Maximum value of SAR (measured) = 1.39 W/kg



P02 WCDMA IV_RMC12.2K_Top Curve_0mm_Ch1413_P-Sensor_w

DUT: 200521C36

Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 1732.6 MHz; Duty Cycle: 1:1.95

Medium: H16T20N4_0604 Medium parameters used: $f = 1733$ MHz; $\sigma = 1.311$ S/m; $\epsilon_r = 38.921$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(7.85, 7.85, 7.85) @ 1732.6 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.27 W/kg

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

Reference Value = 31.62 V/m; Power Drift = 0.05 dB

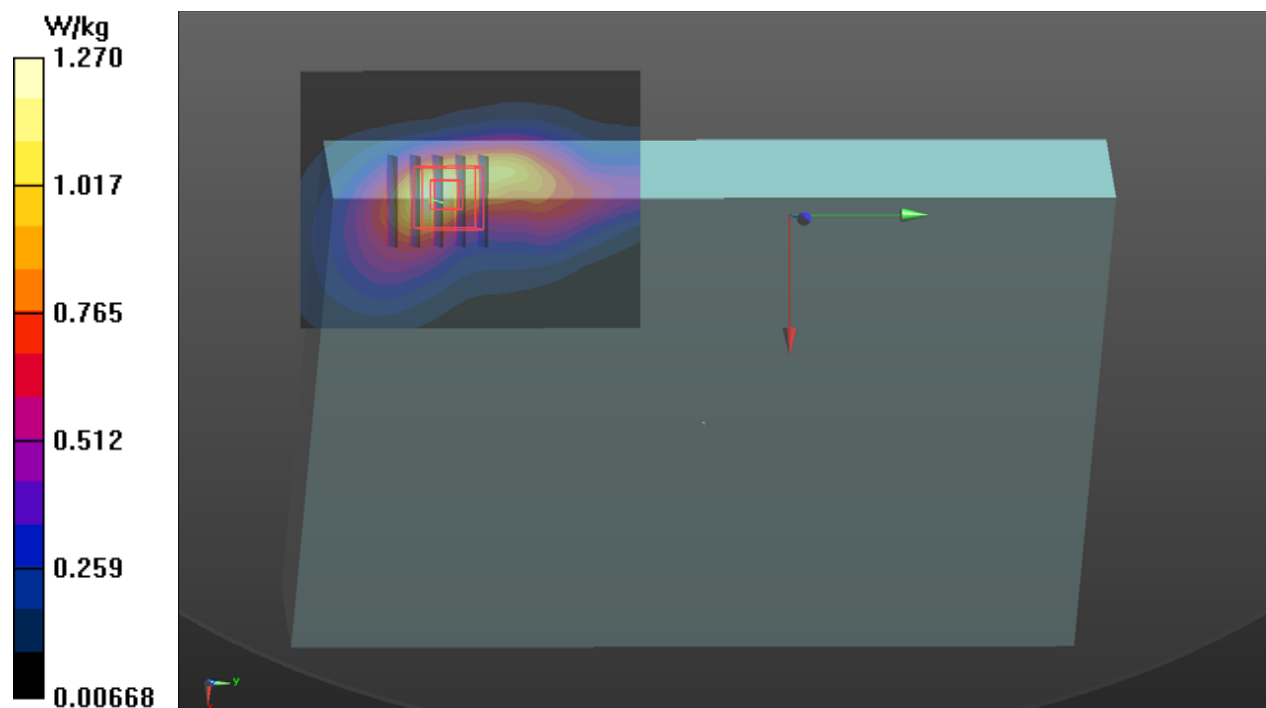
Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.547 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 9.6 mm

Ratio of SAR at M2 to SAR at M1 = 56.4%

Maximum value of SAR (measured) = 1.48 W/kg



P03 WCDMA V_RMC12.2K_Top Curve_0mm_Ch4182_P-Sensor_w

DUT: 200521C36

Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 836.4 MHz; Duty Cycle: 1:1.95

Medium: H07T10N4_0604 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.907$ S/m; $\epsilon_r = 42.43$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.27, 9.27, 9.27) @ 836.4 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.38 W/kg

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

Reference Value = 37.72 V/m; Power Drift = -0.02 dB

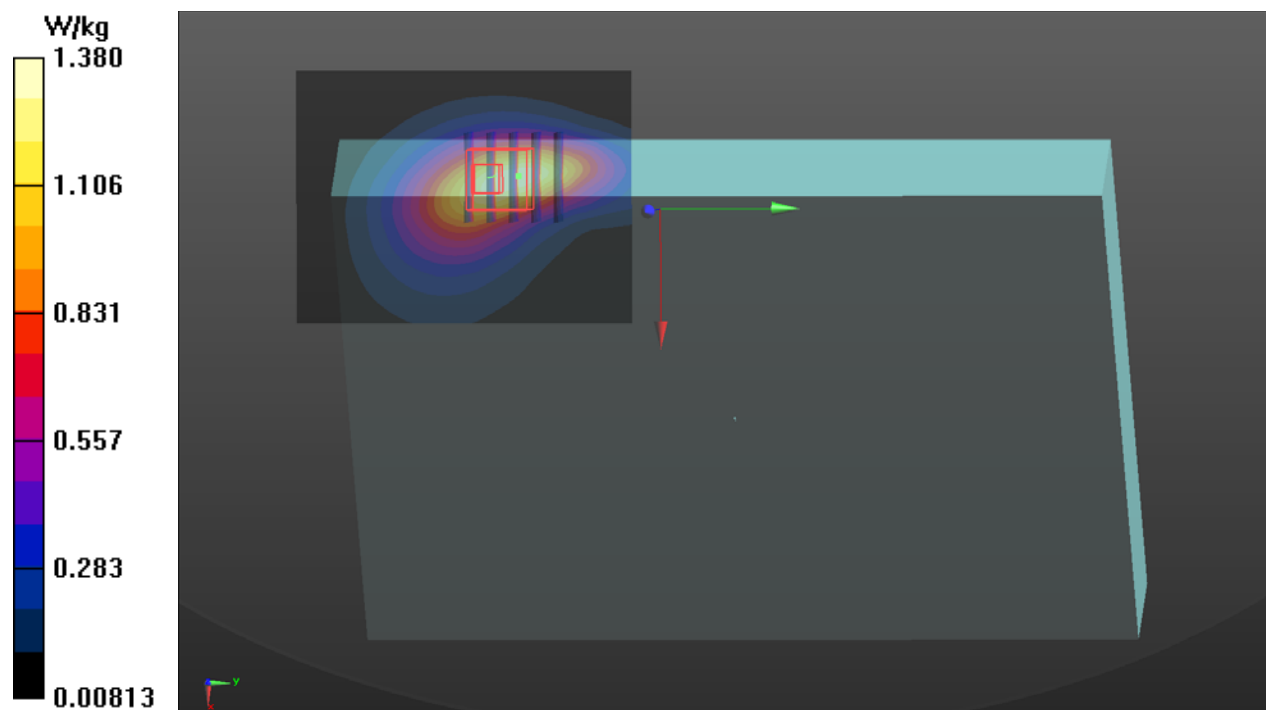
Peak SAR (extrapolated) = 1.85 W/kg

SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.599 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 10.7 mm

Ratio of SAR at M2 to SAR at M1 = 55.6%

Maximum value of SAR (measured) = 1.57 W/kg



P04 LTE 2_QPSK20M_Top Side_5mm_Ch19100_1RB_OS0_P-Sensor_w_o

DUT: 200521C36

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK);

Frequency: 1900 MHz; Duty Cycle: 1:3.74

Medium: H16T20N1_0609 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.455$ S/m; $\epsilon_r = 38.385$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(7.47, 7.47, 7.47) @ 1900 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x201x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.55 W/kg

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

Reference Value = 32.61 V/m; Power Drift = -0.17 dB

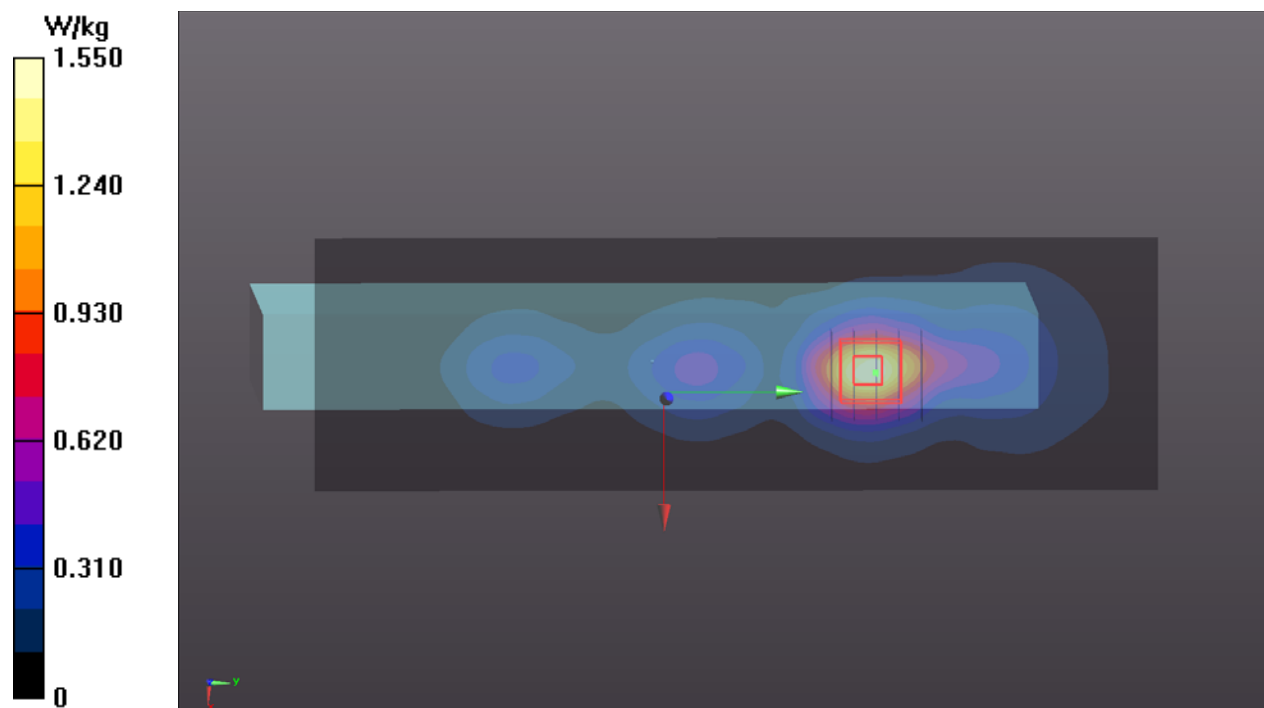
Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 0.945 W/kg; SAR(10 g) = 0.557 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 12.8 mm

Ratio of SAR at M2 to SAR at M1 = 58.1%

Maximum value of SAR (measured) = 1.48 W/kg



P05 LTE 5_QPSK10M_Top Curve_0mm_Ch20525_1RB_OS0_P-Sensor_w

DUT: 200521C36

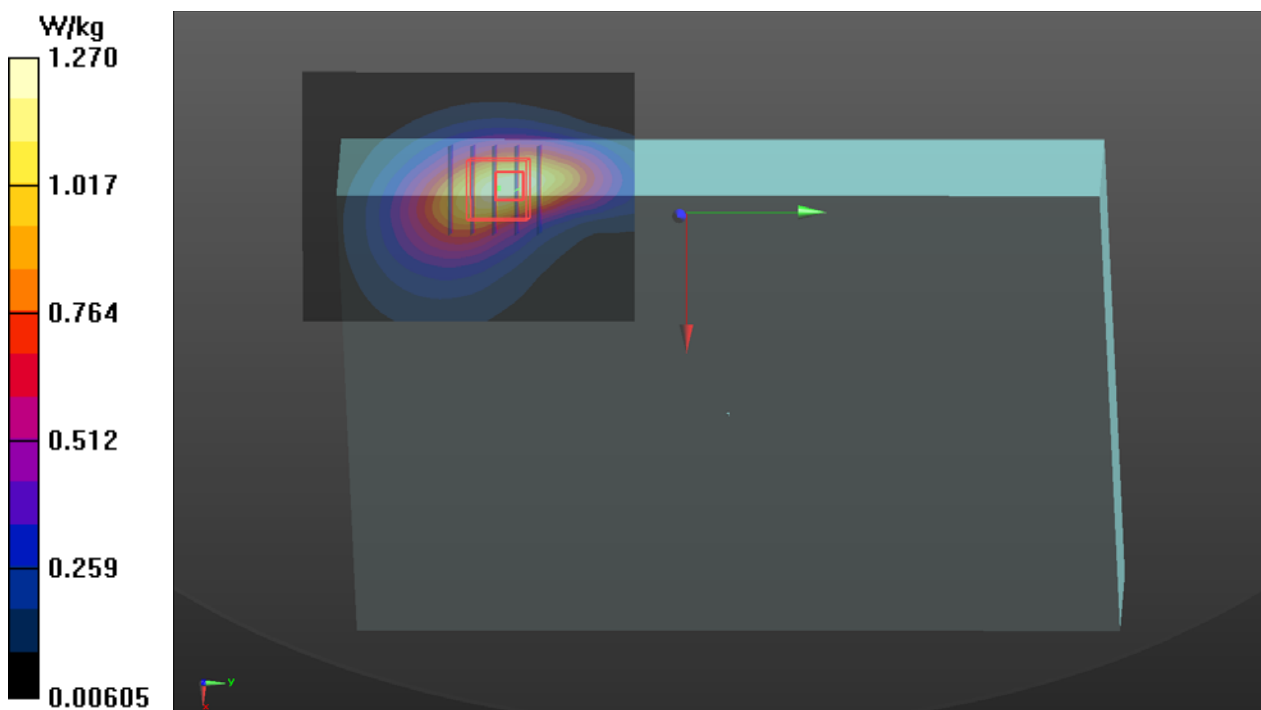
Communication System: UID 10175 - CAG, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK);
Frequency: 836.5 MHz; Duty Cycle: 1:3.74
Medium: H07T10N4_0604 Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.907$ S/m;
 $\epsilon_r = 42.43$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.27, 9.27, 9.27) @ 836.5 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.27 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.03 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 0.968 W/kg; SAR(10 g) = 0.585 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 10.7 mm
Ratio of SAR at M2 to SAR at M1 = 58%
Maximum value of SAR (measured) = 1.39 W/kg



P06 LTE 7_QPSK20M_Top Curve_0mm_Ch21350_1RB_OS0_P-Sensor_w

DUT: 200521C36

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK);

Frequency: 2560 MHz; Duty Cycle: 1:3.74

Medium: H19T27N1_0615 Medium parameters used: $f = 2560$ MHz; $\sigma = 1.955$ S/m; $\epsilon_r = 38.047$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN7350; ConvF(7.48, 7.48, 7.48) @ 2560 MHz; Calibrated: 2019/12/16

- Sensor-Surface: 1.4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn917; Calibrated: 2019/12/17

- Phantom: ELI Phantom_1204; Type: QDOVA;

- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.63 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.67 V/m; Power Drift = -0.01 dB

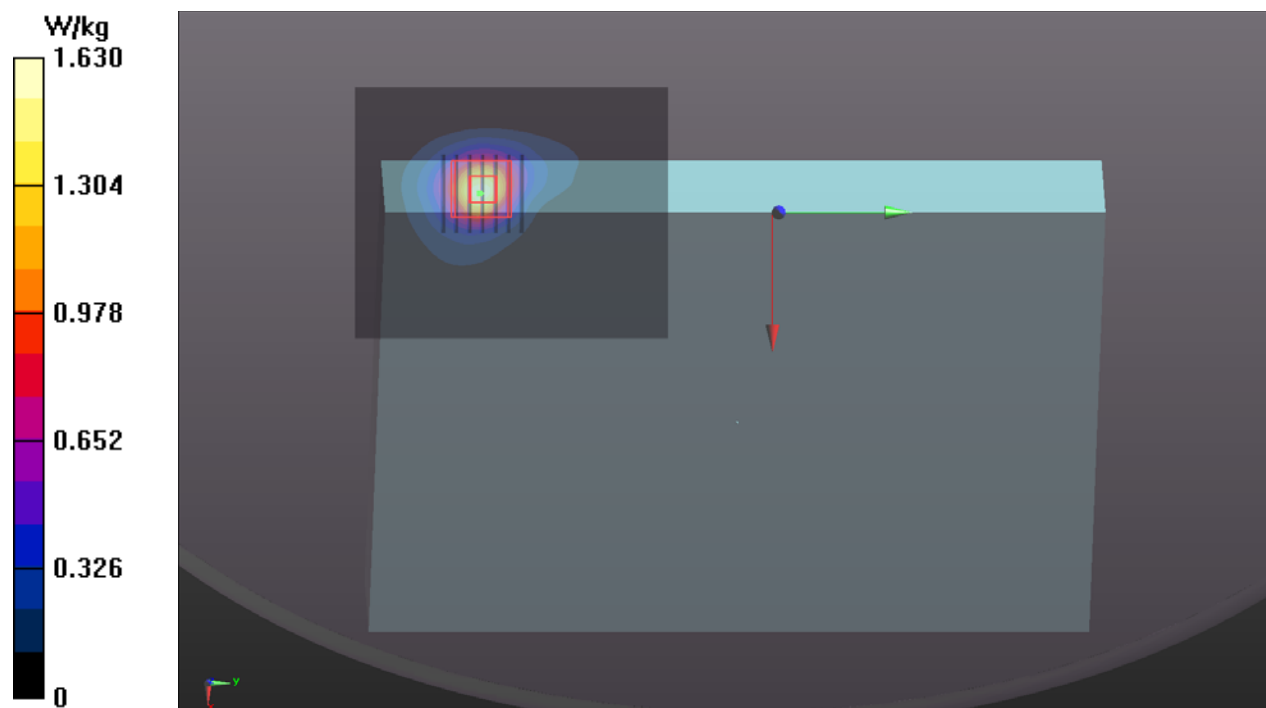
Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.953 W/kg; SAR(10 g) = 0.444 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 10 mm

Ratio of SAR at M2 to SAR at M1 = 51.6%

Maximum value of SAR (measured) = 1.57 W/kg



P07 LTE 12_QPSK10M_Top Curve_0mm_Ch23130_1RB_OS0_P-Sensor_w_o

DUT: 200521C36

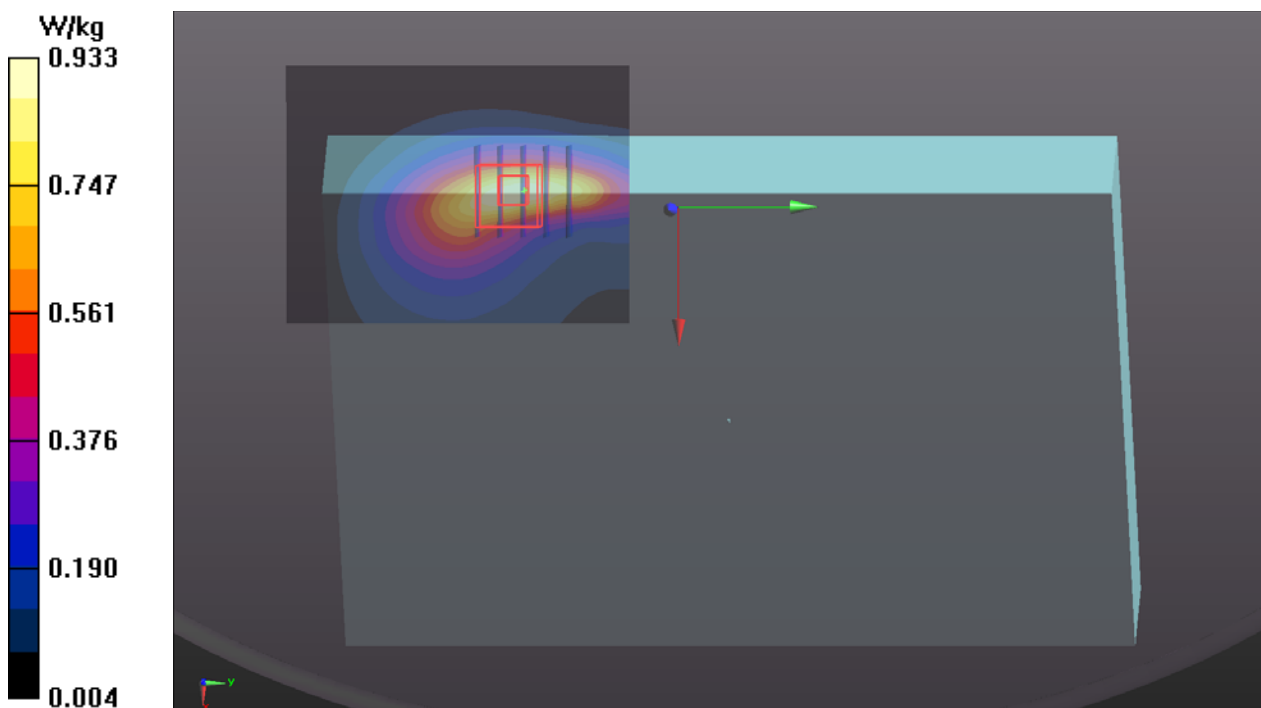
Communication System: UID 10175 - CAG, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK);
Frequency: 711 MHz; Duty Cycle: 1:3.74
Medium: H06T09N1_0608 Medium parameters used: $f = 711 \text{ MHz}$; $\sigma = 0.853 \text{ S/m}$; $\epsilon_r = 43.575$; $\rho = 1000 \text{ kg/m}^3$
Ambient Temperature : $23.3 \text{ }^\circ\text{C}$; Liquid Temperature : $23.2 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.62, 9.62, 9.62) @ 711 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Maximum value of SAR (interpolated) = 0.933 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 34.53 V/m ; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.669 W/kg ; SAR(10 g) = 0.391 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 8.2 mm
Ratio of SAR at M2 to SAR at M1 = 49.1%
Maximum value of SAR (measured) = 1.06 W/kg



P08 LTE 13_QPSK10M_Top Curve_0mm_Ch23230_1RB_OS0_P-Sensor_w_o

DUT: 200521C36

Communication System: UID 10175 - CAG, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK);

Frequency: 782 MHz; Duty Cycle: 1:3.74

Medium: H06T09N1_0608 Medium parameters used: $f = 782 \text{ MHz}$; $\sigma = 0.918 \text{ S/m}$; $\epsilon_r = 42.674$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.3 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.62, 9.62, 9.62) @ 782 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x101x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.53 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 42.43 V/m; Power Drift = 0.13 dB

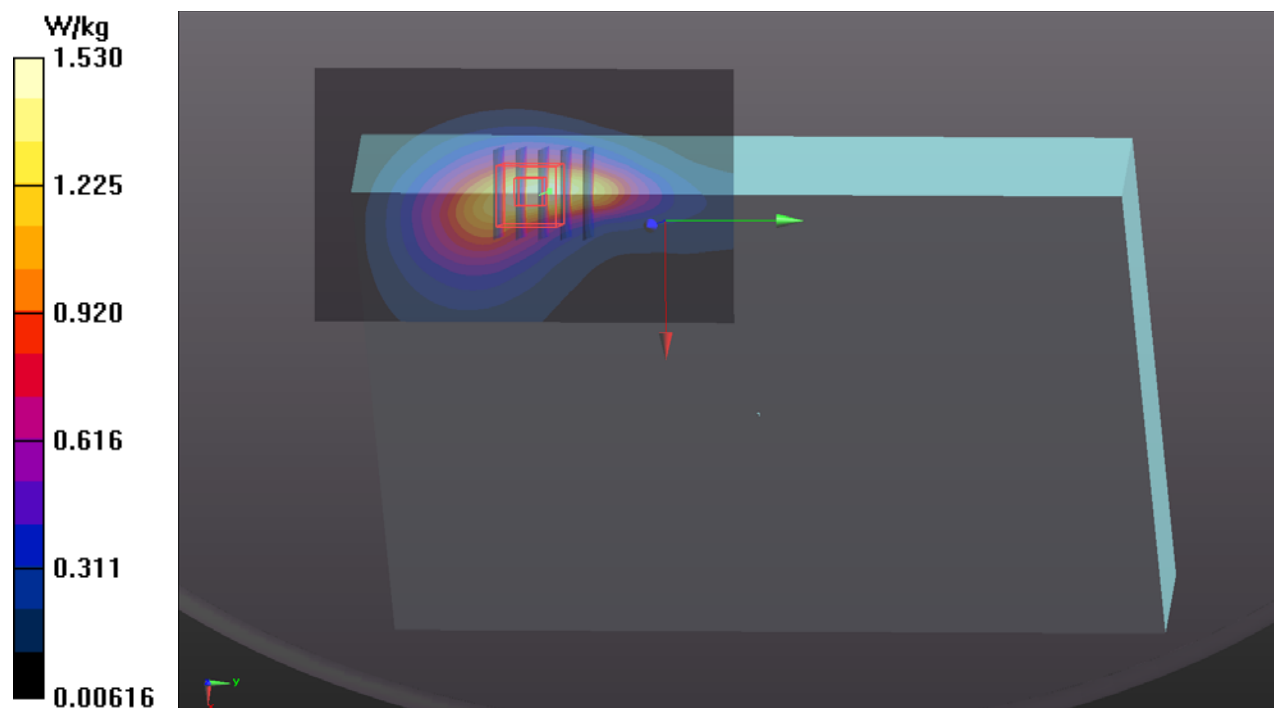
Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 0.970 W/kg; SAR(10 g) = 0.622 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 10.1 mm

Ratio of SAR at M2 to SAR at M1 = 54.1%

Maximum value of SAR (measured) = 1.59 W/kg



P09 LTE 26_QPSK15M_Top Curve_0mm_Ch26965_1RB_OS0_P-Sensor_w

DUT: 200521C36

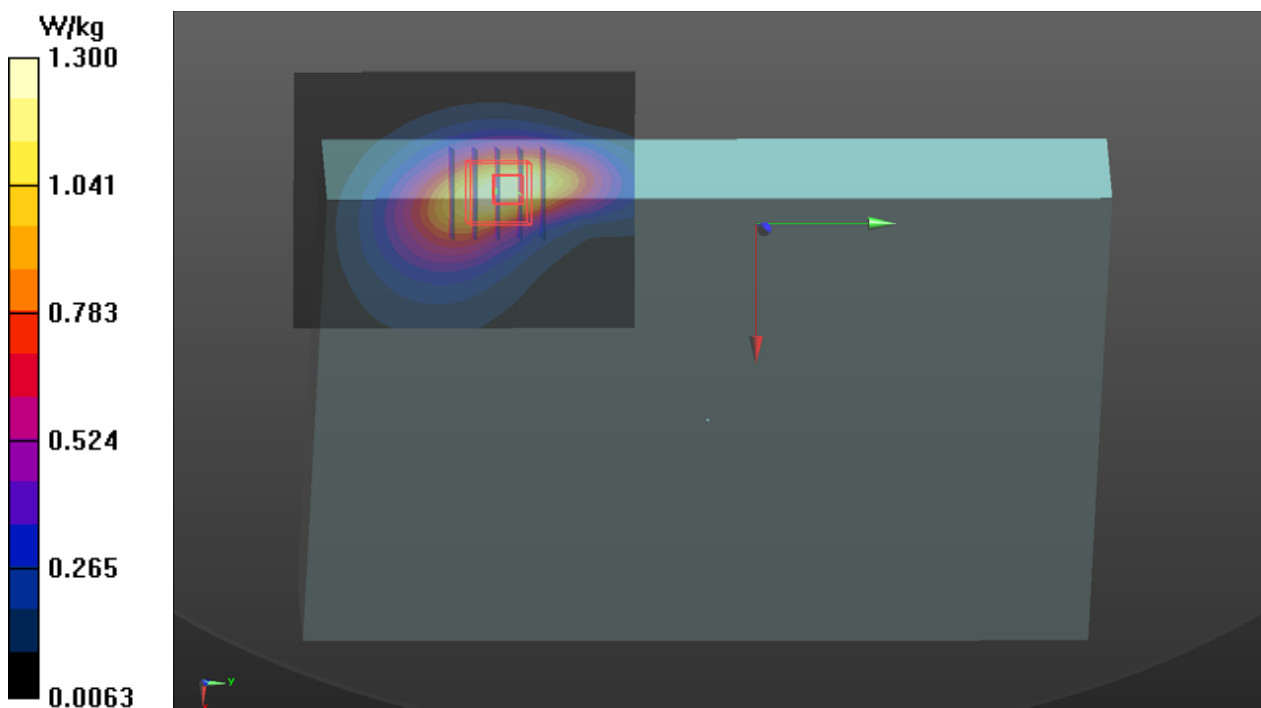
Communication System: UID 10181 - CAE, LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK);
Frequency: 841.5 MHz; Duty Cycle: 1:3.74
Medium: H07T10N4_0604 Medium parameters used (interpolated): $f = 841.5 \text{ MHz}$; $\sigma = 0.912 \text{ S/m}$;
 $\epsilon_r = 42.371$; $\rho = 1000 \text{ kg/m}^3$
Ambient Temperature : $23.7 \text{ }^\circ\text{C}$; Liquid Temperature : $23.5 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(9.27, 9.27, 9.27) @ 841.5 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Maximum value of SAR (interpolated) = 1.30 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 38.55 V/m ; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 0.985 W/kg; SAR(10 g) = 0.596 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 10.7 mm
Ratio of SAR at M2 to SAR at M1 = 57.7%
Maximum value of SAR (measured) = 1.43 W/kg



P10 LTE 41_QPSK20M_Top Curve_0mm_Ch40620_1RB_OS0_P-Sensor_w

DUT: 200521C36

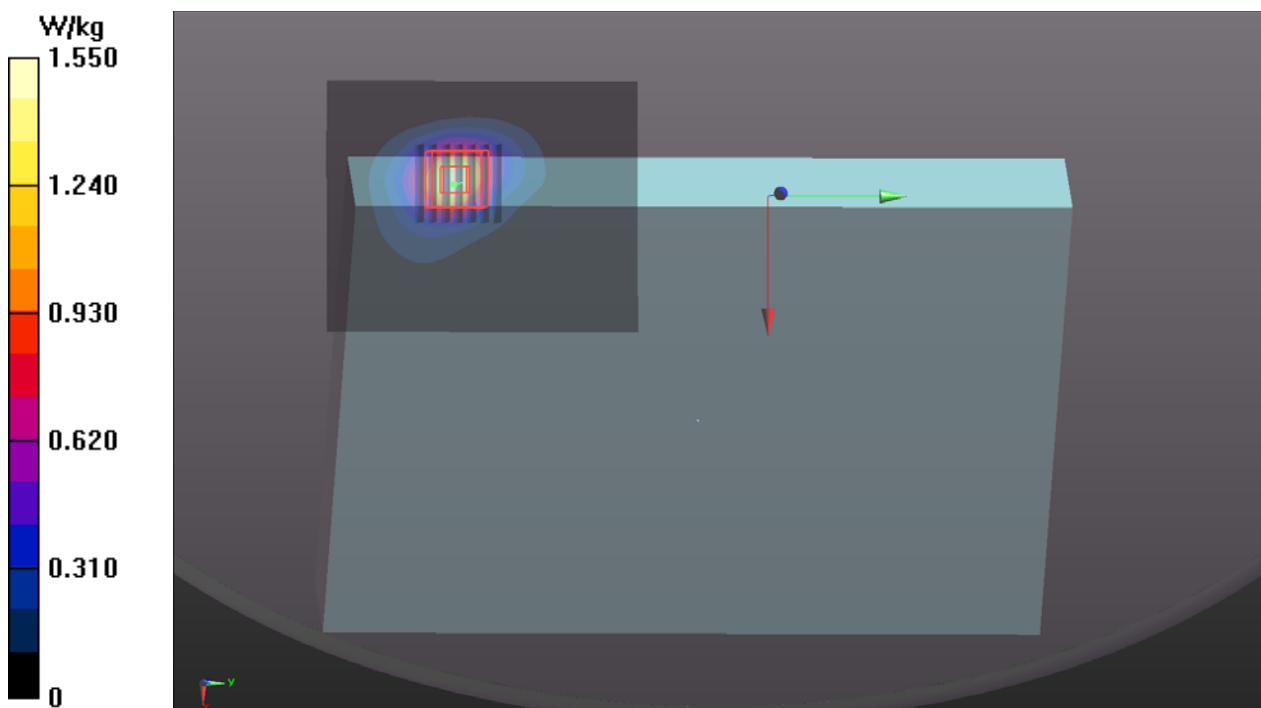
Communication System: UID 10172 - CAG, LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK);
Frequency: 2593 MHz; Duty Cycle: 1:8.33
Medium: H19T27N1_0615 Medium parameters used (interpolated): $f = 2593$ MHz; $\sigma = 1.99$ S/m; $\epsilon_r = 37.918$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN7350; ConvF(7.48, 7.48, 7.48) @ 2593 MHz; Calibrated: 2019/12/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.55 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.52 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 0.954 W/kg; SAR(10 g) = 0.451 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 10.6 mm
Ratio of SAR at M2 to SAR at M1 = 52.1%
Maximum value of SAR (measured) = 1.54 W/kg



P11 LTE 66_QPSK20M_Top Curve_0mm_Ch132572_1RB_OS0_P-Sensor_w

DUT: 200521C36

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK);

Frequency: 1770 MHz; Duty Cycle: 1:3.74

Medium: H16T20N4_0604 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.343$ S/m; $\epsilon_r = 38.788$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(7.85, 7.85, 7.85) @ 1770 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.51 W/kg

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

Reference Value = 32.65 V/m; Power Drift = 0.02 dB

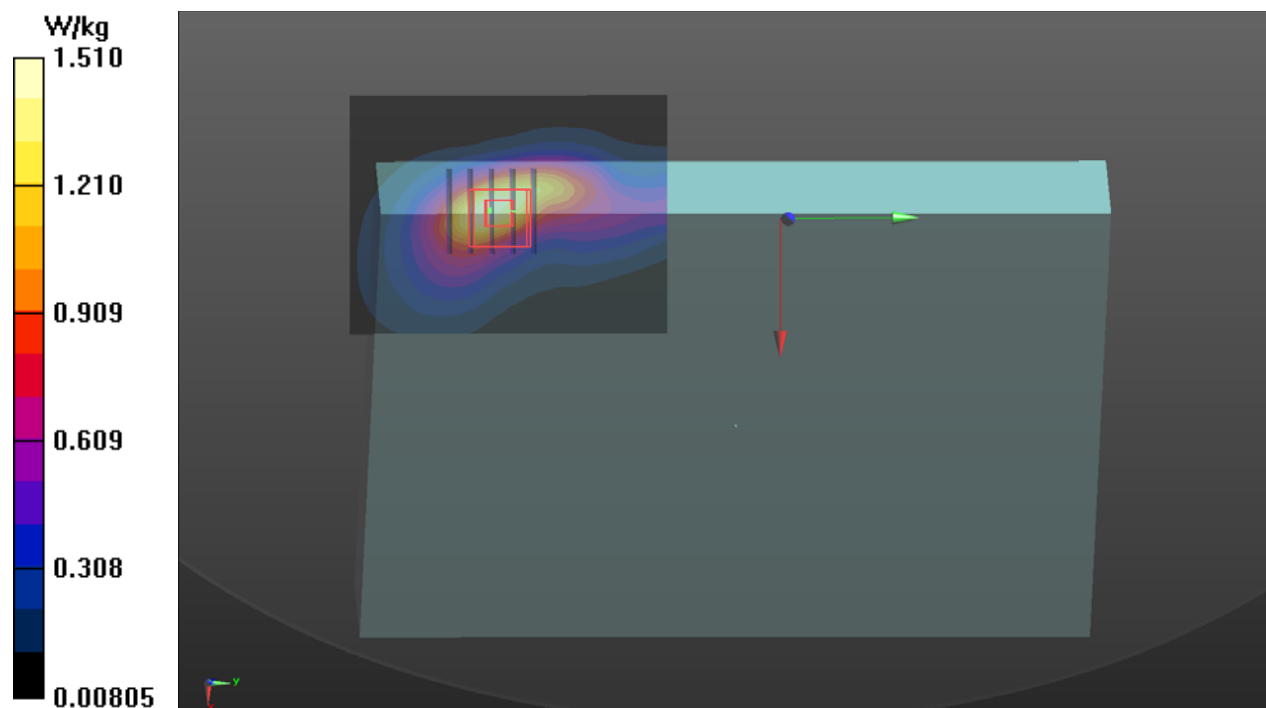
Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.569 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 9.3 mm

Ratio of SAR at M2 to SAR at M1 = 53.1%

Maximum value of SAR (measured) = 1.73 W/kg



P12 WLAN2.4G_802.11b_Left Side_0mm_Ch6_Ant0

DUT: 200521C36

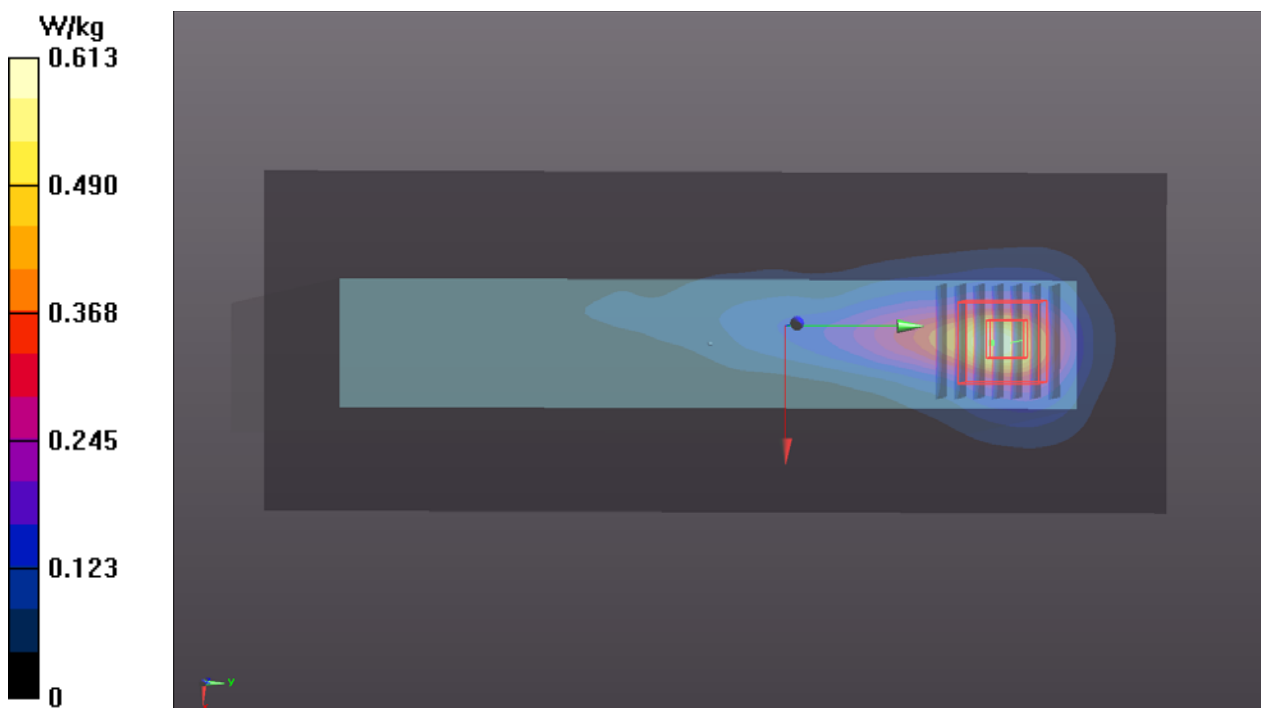
Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps);
Frequency: 2437 MHz; Duty Cycle: 1:1.01
Medium: H19T27N1_0608 Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.868$ S/m;
 $\epsilon_r = 38.359$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(6.95, 6.95, 6.95) @ 2437 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x201x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.613 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.69 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.808 W/kg
SAR(1 g) = 0.347 W/kg; SAR(10 g) = 0.165 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 9.2 mm
Ratio of SAR at M2 to SAR at M1 = 43.8%
Maximum value of SAR (measured) = 0.635 W/kg



P13 WLAN5.3G_802.11ac VHT160_Bottom Side_0mm_Ch50_Ant 1

DUT: 200521C36

Communication System: UID 10554 - AAC, IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle); Frequency: 5250 MHz; Duty Cycle: 1:1.18

Medium: H34T60N4_0603 Medium parameters used: $f = 5250$ MHz; $\sigma = 4.597$ S/m; $\epsilon_r = 36.617$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(5.28, 5.28, 5.28) @ 5250 MHz; Calibrated: 2020/01/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2020/01/24
- Phantom: ELI Phantom_1245; Type: QDOVA002AA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.37 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 20.89 V/m; Power Drift = 0.17 dB

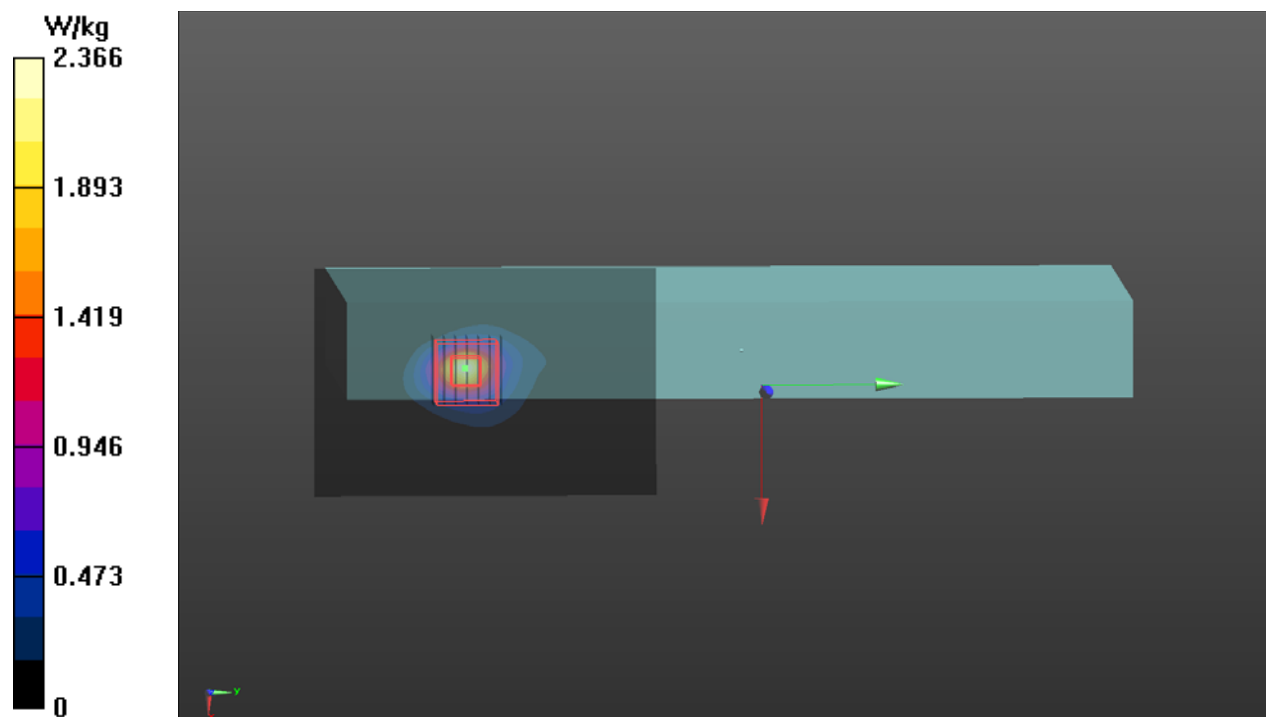
Peak SAR (extrapolated) = 3.23 W/kg

SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.310 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 68.9%

Maximum value of SAR (measured) = 2.18 W/kg



P14 WLAN5.6G_802.11ac VHT80_Bottom Side_0mm_Ch106_Ant 1

DUT: 200521C36

Communication System: UID 10626 - AAB, IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle); Frequency: 5530 MHz; Duty Cycle: 1:1.22

Medium: H34T60N2_0610 Medium parameters used: $f = 5530$ MHz; $\sigma = 5.137$ S/m; $\epsilon_r = 35.26$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(4.51, 4.51, 4.51) @ 5530 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.64 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 17.51 V/m; Power Drift = -0.03 dB

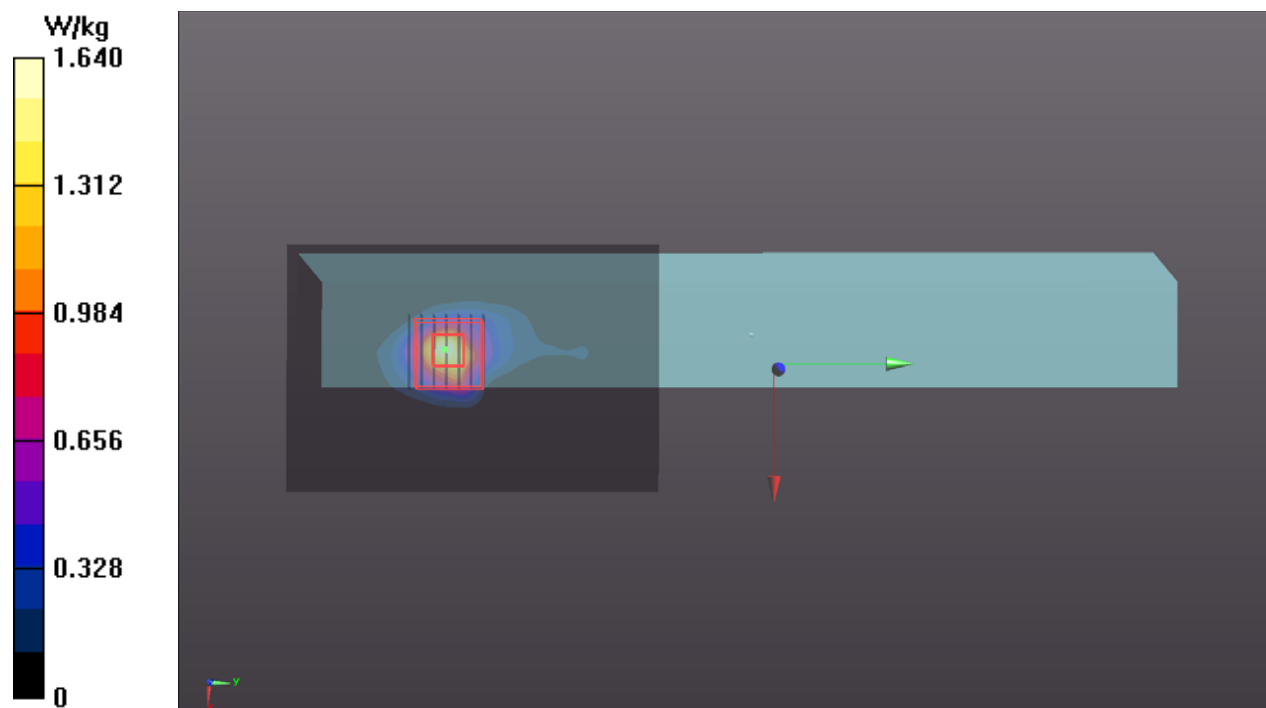
Peak SAR (extrapolated) = 2.61 W/kg

SAR(1 g) = 0.666 W/kg; SAR(10 g) = 0.211 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 64.2%

Maximum value of SAR (measured) = 1.63 W/kg



P15 WLAN5.8G_802.11ac VHT80_Bottom Side_0mm_Ch155_Ant 1

DUT: 200521C36

Communication System: UID 10626 - AAB, IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle); Frequency: 5775 MHz; Duty Cycle: 1:1.22

Medium: H34T60N2_0610 Medium parameters used: $f = 5775$ MHz; $\sigma = 5.425$ S/m; $\epsilon_r = 34.829$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3820; ConvF(4.41, 4.41, 4.41) @ 5775 MHz; Calibrated: 2019/06/25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.18 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 14.77 V/m; Power Drift = -0.05 dB

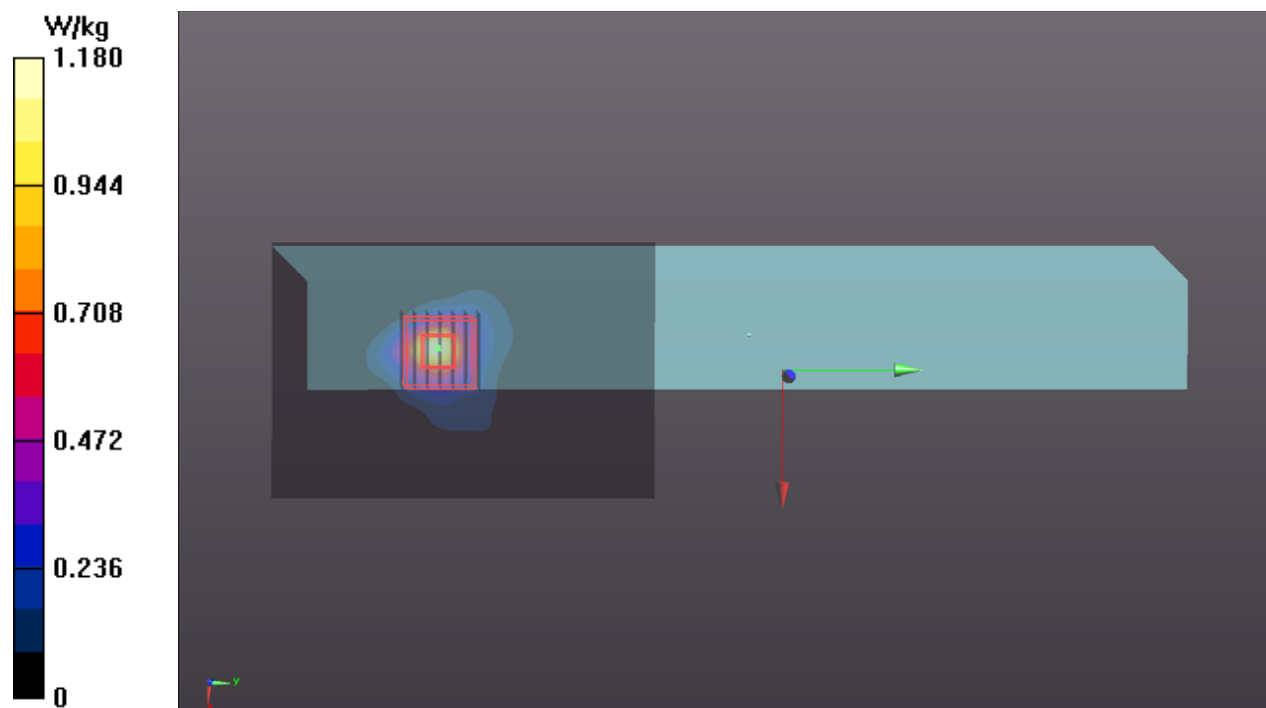
Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 0.439 W/kg; SAR(10 g) = 0.134 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 7.5 mm

Ratio of SAR at M2 to SAR at M1 = 61.7%

Maximum value of SAR (measured) = 1.11 W/kg



Appendix C. Maximum Target Conducted Power

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

FCC Full Power			
Mode	RMC 12.2K	HSDPA / DC- HSDPA / HSUPA	
	Maximum Target Power	Maximum Target Power	
WCDMA Band II	24.0	23.0	
WCDMA Band IV	24.0	23.0	
WCDMA Band V	24.0	23.0	
Mode	QPSK	16QAM	64QAM
	Maximum Target Power	Maximum Target Power	Maximum Target Power
LTE 2	24.0	23.0	22.0
LTE 4	24.0	23.0	22.0
LTE 5	24.0	23.0	22.0
LTE 7	23.0	22.0	21.0
LTE 12	24.0	23.0	22.0
LTE 13	24.0	23.0	22.0
LTE 26	24.0	23.0	22.0
LTE 66	24.0	23.0	22.0
LTE 41	23.0	22.0	21.0

FCC Reduction Power			
Mode	RMC 12.2K	HSDPA / DC- HSDPA / HSUPA	
	Maximum Target Power	Maximum Target Power	
WCDMA Band II	21.5	20.5	
WCDMA Band IV	23.0	22.0	
WCDMA Band V	23.0	22.0	
Mode	QPSK	16QAM	64QAM
	Maximum Target Power	Maximum Target Power	Maximum Target Power
LTE 2	21.5	21.5	21.5
LTE 4	23.0	23.0	22.0
LTE 5	23.0	23.0	22.0
LTE 7	20.0	20.0	20.0
LTE 26	23.0	23.0	22.0
LTE 66	23.0	23.0	22.0
LTE 41	21.5	21.5	20.5

WLAN 2.4GHz					
Mode	Channel	Frequency	SISO Ant 0 Max Tune up	SISO Ant 1 Max Tune up	MIMO Ant 0+1 Max Tune up
802.11b	1	2412	15.5	15.5	18.5
	6	2437	15.5	15.5	18.5
	11	2462	15.5	15.5	18.5
	12	2467	15.5	15.5	18.5
	13	2472	15.5	15.5	18.5
802.11g	1	2412	15.5	15.5	18.5
	6	2437	15.5	15.5	18.5
	11	2462	15.5	15.5	18.5
	12	2467	15.5	15.5	18.5
	13	2472	15.5	15.5	18.5
802.11n HT20	1	2412	15.5	15.5	18.5
	6	2437	15.5	15.5	18.5
	11	2462	15.5	15.5	18.5
	12	2467	15.5	15.5	18.5
	13	2472	15.5	15.5	18.5
802.11n HT40	3	2422	15.5	15.5	18.5
	6	2437	15.5	15.5	18.5
	9	2452	15.5	15.5	18.5
	10	2457	15.5	15.5	18.5
	11	2462	15.5	15.5	18.5
802.11ac VHT20	1	2412	15.5	15.5	18.5
	6	2437	15.5	15.5	18.5
	11	2462	15.5	15.5	18.5
	12	2467	15.5	15.5	18.5
	13	2472	15.5	15.5	18.5
802.11ac VHT40	3	2422	15.5	15.5	18.5
	6	2437	15.5	15.5	18.5
	9	2452	15.5	15.5	18.5
	10	2457	15.5	15.5	18.5
	11	2462	15.5	15.5	18.5

Bluetooth				
Mode	Channel	Frequency	Ant 0 Max Tune up	Ant 1 Max Tune up
BR / EDR	0	2402		11.5
	39	2441		11.5
	78	2480		11.5
LE	0	2402		9.5
	19	2440		9.5
	39	2480		9.5

WLAN 5.2GHz					
Mode	Channel	Frequency	SISO Ant 0 Max Tune up	SISO Ant 1 Max Tune up	MIMO Ant 0+1 Max Tune up
802.11a	36	5180	14.0	14.0	17.0
	40	5200	14.0	14.0	17.0
	44	5220	14.0	14.0	17.0
	48	5240	14.0	14.0	17.0
802.11n HT20	36	5180	14.0	14.0	17.0
	40	5200	14.0	14.0	17.0
	44	5220	14.0	14.0	17.0
	48	5240	14.0	14.0	17.0
802.11n HT40	38	5190	14.0	14.0	17.0
	46	5230	14.0	14.0	17.0
802.11ac VHT20	36	5180	14.0	14.0	17.0
	40	5200	14.0	14.0	17.0
	44	5220	14.0	14.0	17.0
	48	5240	14.0	14.0	17.0
802.11ac VHT40	38	5190	14.0	14.0	17.0
	46	5230	14.0	14.0	17.0
802.11ac VHT80	42	5210	14.0	14.0	17.0

WLAN 5.3GHz					
Mode	Channel	Frequency	SISO Ant 0 Max Tune up	SISO Ant 1 Max Tune up	MIMO Ant 0+1 Max Tune up
802.11a	52	5260	14.0	14.0	17.0
	56	5280	14.0	14.0	17.0
	60	5300	14.0	14.0	17.0
	64	5320	14.0	14.0	17.0
802.11n HT20	52	5260	14.0	14.0	17.0
	56	5280	14.0	14.0	17.0
	60	5300	14.0	14.0	17.0
	64	5320	14.0	14.0	17.0
802.11n HT40	54	5270	14.0	14.0	17.0
	62	5310	14.0	14.0	17.0
802.11ac VHT20	52	5260	14.0	14.0	17.0
	56	5280	14.0	14.0	17.0
	60	5300	14.0	14.0	17.0
	64	5320	14.0	14.0	17.0
802.11ac VHT40	54	5270	14.0	14.0	17.0
	62	5310	14.0	14.0	17.0
802.11ac VHT80	58	5290	14.0	14.0	17.0
802.11ac VHT160	50	5250	14.0	14.0	17.0

WLAN 5.6GHz					
Mode	Channel	Frequency	SISO Ant 0 Max Tune up	SISO Ant 1 Max Tune up	MIMO Ant 0+1 Max Tune up
802.11a	100	5500	14.0	14.0	17.0
	116	5580	14.0	14.0	17.0
	132	5660	14.0	14.0	17.0
	140	5700	14.0	14.0	17.0
	144	5720	14.0	14.0	17.0
802.11n HT20	100	5500	14.0	14.0	17.0
	116	5580	14.0	14.0	17.0
	132	5660	14.0	14.0	17.0
	140	5700	14.0	14.0	17.0
	144	5720	14.0	14.0	17.0
802.11n HT40	102	5510	14.0	14.0	17.0
	110	5550	14.0	14.0	17.0
	134	5670	14.0	14.0	17.0
	142	5710	14.0	14.0	17.0
802.11ac VHT20	100	5500	14.0	14.0	17.0
	116	5580	14.0	14.0	17.0
	132	5660	14.0	14.0	17.0
	140	5700	14.0	14.0	17.0
	144	5720	14.0	14.0	17.0
802.11ac VHT40	102	5510	14.0	14.0	17.0
	110	5550	14.0	14.0	17.0
	134	5670	14.0	14.0	17.0
	142	5710	14.0	14.0	17.0
802.11ac VHT80	106	5530	14.0	14.0	17.0
	138	5690	14.0	14.0	17.0
802.11ac VHT160	114	5570	14.0	14.0	17.0

WLAN 5.8GHz					
Mode	Channel	Frequency	SISO Ant 0 Max Tune up	SISO Ant 1 Max Tune up	MIMO Ant 0+1 Max Tune up
802.11a	149	5745	14.0	14.0	17.0
	153	5765	14.0	14.0	17.0
	157	5785	14.0	14.0	17.0
	161	5805	14.0	14.0	17.0
	165	5825	14.0	14.0	17.0
802.11n HT20	149	5745	14.0	14.0	17.0
	153	5765	14.0	14.0	17.0
	157	5785	14.0	14.0	17.0
	161	5805	14.0	14.0	17.0
	165	5825	14.0	14.0	17.0
802.11n HT40	151	5755	14.0	14.0	17.0
	159	5795	14.0	14.0	17.0
802.11ac VHT20	149	5745	14.0	14.0	17.0
	153	5765	14.0	14.0	17.0
	157	5785	14.0	14.0	17.0
	161	5805	14.0	14.0	17.0
	165	5825	14.0	14.0	17.0
802.11ac VHT40	151	5755	14.0	14.0	17.0
	159	5795	14.0	14.0	17.0
802.11ac VHT80	155	5775	14.0	14.0	17.0

Appendix D. Measured Conducted Power Result

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

Full Power

Band	WCDMA II			WCDMA IV			WCDMA V		
TX Channel	9262	9400	9538	1312	1413	1513	4132	4182	4233
Rx Channel	9662	9800	9938	1537	1638	1738	4357	4407	4458
Frequency	1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6
RMC 12.2K	23.24	23.31	23.39	23.51	23.53	23.43	23.50	23.42	23.44
HSDPA Subtest-1	22.28	22.35	22.43	22.41	22.43	22.33	22.55	22.47	22.49
HSDPA Subtest-2	22.21	22.28	22.36	22.39	22.41	22.31	22.53	22.45	22.47
HSDPA Subtest-3	21.84	21.91	21.99	21.88	21.90	21.80	22.04	21.96	21.98
HSDPA Subtest-4	21.75	21.82	21.90	21.87	21.89	21.79	22.03	21.95	21.97
DC-HSDPA Subtest-1	22.17	22.24	22.32	22.32	22.34	22.24	22.43	22.35	22.37
DC-HSDPA Subtest-2	22.10	22.17	22.25	22.30	22.32	22.22	22.41	22.33	22.35
DC-HSDPA Subtest-3	21.73	21.80	21.88	21.79	21.81	21.71	21.92	21.84	21.86
DC-HSDPA Subtest-4	21.64	21.71	21.79	21.78	21.80	21.70	21.91	21.83	21.85
HSUPA Subtest-1	22.19	22.26	22.34	22.37	22.39	22.29	22.51	22.43	22.45
HSUPA Subtest-2	20.29	20.36	20.44	20.45	20.47	20.37	20.56	20.48	20.50
HSUPA Subtest-3	21.18	21.25	21.33	21.29	21.31	21.21	21.55	21.47	21.49
HSUPA Subtest-4	20.21	20.28	20.36	20.36	20.38	20.28	20.49	20.41	20.43
HSUPA Subtest-5	22.05	22.12	22.20	22.30	22.32	22.22	22.40	22.32	22.34

Reduction Power

Band	WCDMA II			WCDMA IV			WCDMA V		
TX Channel	9262	9400	9538	1312	1413	1513	4132	4182	4233
Rx Channel	9662	9800	9938	1537	1638	1738	4357	4407	4458
Frequency	1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6
RMC 12.2K	20.55	20.72	20.79	22.39	22.45	22.25	22.46	22.44	22.36
HSDPA Subtest-1	19.65	19.71	19.78	21.42	21.48	21.28	21.50	21.48	21.40
HSDPA Subtest-2	19.60	19.75	19.81	21.38	21.44	21.24	21.49	21.47	21.39
HSDPA Subtest-3	19.04	19.34	19.32	20.86	20.92	20.72	21.00	20.98	20.90
HSDPA Subtest-4	19.14	19.27	19.25	20.85	20.91	20.71	20.99	20.97	20.89
DC-HSDPA Subtest-1	19.61	19.68	19.66	21.31	21.37	21.17	21.41	21.39	21.31
DC-HSDPA Subtest-2	19.61	19.65	19.65	21.27	21.33	21.13	21.40	21.38	21.30
DC-HSDPA Subtest-3	19.11	19.25	19.19	20.75	20.81	20.61	20.91	20.89	20.81
DC-HSDPA Subtest-4	19.07	19.19	19.21	20.74	20.80	20.60	20.90	20.88	20.80
HSUPA Subtest-1	19.52	19.76	19.70	21.33	21.39	21.19	21.51	21.49	21.41
HSUPA Subtest-2	17.60	17.80	17.77	19.32	19.38	19.18	19.48	19.46	19.38
HSUPA Subtest-3	18.62	18.73	18.79	20.35	20.41	20.21	20.49	20.47	20.39
HSUPA Subtest-4	17.60	17.74	17.88	19.32	19.38	19.18	19.46	19.44	19.36
HSUPA Subtest-5	19.40	19.60	19.70	21.16	21.22	21.02	21.44	21.42	21.34

Full Power						
LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	22.81	22.78	22.99
		1	50	22.78	22.75	22.96
		1	99	22.71	22.68	22.89
		50	0	21.87	21.84	22.05
		50	25	21.84	21.81	22.02
		50	50	21.80	21.77	21.98
		100	0	21.83	21.80	22.01
	16QAM	1	0	21.85	21.82	22.03
		1	50	21.82	21.79	22.00
		1	99	21.78	21.75	21.96
		50	0	20.82	20.79	21.00
		50	25	20.78	20.75	20.96
		50	50	20.74	20.71	20.92
		100	0	20.82	20.79	21.00
	64QAM	1	0	20.84	20.81	21.02
		1	50	20.82	20.79	21.00
		1	99	20.78	20.75	20.96
		50	0	19.82	19.79	20.00
		50	25	19.77	19.74	19.95
		50	50	19.74	19.71	19.92
		100	0	19.85	19.82	20.03
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	22.77	22.69	22.90
		1	37	22.71	22.75	22.91
		1	74	22.65	22.68	22.79
		36	0	21.79	21.84	22.05
		36	19	21.74	21.74	21.98
		36	39	21.72	21.72	21.92
		75	0	21.75	21.72	22.00
	16QAM	1	0	21.82	21.79	21.99
		1	37	21.74	21.71	21.91
		1	74	21.69	21.66	21.96
		36	0	20.72	20.71	20.90
		36	19	20.72	20.69	20.87
		36	39	20.66	20.63	20.86
		75	0	20.73	20.72	20.94
	64QAM	1	0	20.82	20.71	20.98
		1	37	20.73	20.70	20.95
		1	74	20.78	20.69	20.93
		36	0	19.82	19.72	19.94
		36	19	19.71	19.68	19.87
		36	39	19.68	19.63	19.86
		75	0	19.85	19.82	19.93

Full Power						
LTE Band 2						
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	22.76	22.68	22.91
		1	24	22.63	22.63	22.84
		1	49	22.54	22.57	22.78
		25	0	21.77	21.79	22.03
		25	12	21.63	21.71	21.89
		25	25	21.73	21.62	21.93
		50	0	21.66	21.64	21.94
	16QAM	1	0	21.67	21.66	21.85
		1	24	21.59	21.72	21.85
		1	49	21.68	21.63	21.85
		25	0	20.71	20.76	20.96
		25	12	20.70	20.60	20.85
		25	25	20.59	20.66	20.76
		50	0	20.73	20.75	20.93
	64QAM	1	0	20.72	20.67	21.00
		1	24	20.69	20.73	20.82
		1	49	20.73	20.54	20.90
		25	0	19.67	19.69	19.95
		25	12	19.73	19.70	19.93
		25	25	19.69	19.63	19.81
		50	0	19.84	19.60	19.90
BW	MCS Index	Channel		18625	18900	19175
5M	QPSK	Frequency (MHz)		1852.5	1880	1907.5
		1	0	22.58	22.72	22.68
		1	12	22.58	22.58	22.89
		1	24	22.54	22.51	22.59
		12	0	21.73	21.76	21.94
		12	6	21.72	21.69	21.81
		12	13	21.67	21.67	21.77
	25	0	21.65	21.71	21.84	
	16QAM	1	0	21.71	21.59	22.00
		1	12	21.77	21.64	21.94
		1	24	21.56	21.53	21.81
		12	0	20.66	20.67	20.94
		12	6	20.63	20.62	20.75
		12	13	20.58	20.63	20.72
		25	0	20.72	20.65	20.99
	64QAM	1	0	20.75	20.58	20.91
		1	12	20.78	20.65	20.89
		1	24	20.70	20.67	20.91
		12	0	19.67	19.75	19.90
		12	6	19.72	19.68	19.91
		12	13	19.59	19.66	19.69
25		0	19.72	19.68	19.98	

Full Power						
LTE Band 2						
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	22.74	22.70	22.79
		1	7	22.66	22.51	22.75
		1	14	22.53	22.50	22.82
		8	0	21.83	21.83	21.85
		8	3	21.77	21.68	21.82
		8	7	21.69	21.57	21.86
		15	0	21.73	21.57	21.84
	16QAM	1	0	21.76	21.64	21.90
		1	7	21.79	21.57	21.96
		1	14	21.59	21.62	21.73
		8	0	20.62	20.68	20.97
		8	3	20.60	20.67	20.76
		8	7	20.57	20.67	20.72
	64QAM	15	0	20.67	20.62	20.89
		1	0	20.76	20.60	20.88
		1	7	20.66	20.64	20.77
		1	14	20.74	20.61	20.74
		8	0	19.73	19.55	19.93
		8	3	19.67	19.64	19.84
		8	7	19.67	19.55	19.86
	15	0	19.68	19.78	19.88	
BW	MCS Index	Channel		18607	18900	19193
1.4M	QPSK	Frequency (MHz)		1850.7	1880	1909.3
		1	0	22.64	22.77	22.95
		1	2	22.71	22.60	22.82
		1	5	22.47	22.60	22.84
		3	0	22.83	22.82	22.91
		3	1	22.76	22.66	22.80
		3	3	22.66	22.65	22.87
	16QAM	6	0	21.63	21.57	21.92
		1	0	21.80	21.78	21.91
		1	2	21.75	21.67	21.88
		1	5	21.65	21.61	21.85
		3	0	21.62	21.63	21.85
		3	1	21.67	21.64	21.78
		3	3	21.66	21.57	21.79
	64QAM	6	0	20.69	20.67	20.97
		1	0	20.70	20.63	20.88
		1	2	20.73	20.76	20.89
		1	5	20.70	20.72	20.90
		3	0	20.70	20.64	20.85
		3	1	20.60	20.57	20.94
		3	3	20.66	20.53	20.76
6	0	19.69	19.65	19.88		

Full Power						
LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	23.36	23.43	23.39
		1	50	23.34	23.41	23.37
		1	99	23.30	23.37	23.33
		50	0	22.32	22.39	22.35
		50	25	22.29	22.36	22.32
		50	50	22.26	22.33	22.29
		100	0	22.25	22.32	22.28
	16QAM	1	0	22.29	22.36	22.32
		1	50	22.26	22.33	22.29
		1	99	22.20	22.27	22.23
		50	0	21.12	21.19	21.15
		50	25	21.05	21.12	21.08
		50	50	21.04	21.11	21.07
		100	0	21.02	21.09	21.05
	64QAM	1	0	21.26	21.33	21.29
		1	50	21.24	21.31	21.27
		1	99	21.21	21.28	21.24
		50	0	20.17	20.24	20.20
		50	25	20.15	20.22	20.18
		50	50	20.10	20.17	20.13
		100	0	20.06	20.13	20.09
BW	MCS Index	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	23.30	23.39	23.35
		1	37	23.32	23.39	23.36
		1	74	23.24	23.28	23.26
		36	0	22.32	22.39	22.28
		36	19	22.27	22.34	22.31
		36	39	22.23	22.31	22.19
		75	0	22.20	22.28	22.25
	16QAM	1	0	22.19	22.31	22.22
		1	37	22.19	22.28	22.28
		1	74	22.12	22.20	22.15
		36	0	21.04	21.10	21.05
		36	19	21.02	21.09	21.05
		36	39	21.02	21.08	21.01
		75	0	20.98	20.99	21.04
	64QAM	1	0	21.17	21.25	21.25
		1	37	21.22	21.25	21.24
		1	74	21.18	21.26	21.20
		36	0	20.09	20.23	20.11
		36	19	20.10	20.16	20.12
		36	39	20.04	20.12	20.08
		75	0	20.06	20.11	19.99

Full Power						
LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	23.24	23.32	23.31
		1	24	23.21	23.32	23.19
		1	49	23.14	23.30	23.18
		25	0	22.18	22.28	22.17
		25	12	22.19	22.27	22.20
		25	25	22.04	22.23	22.16
		50	0	22.20	22.21	22.07
	16QAM	1	0	22.14	22.27	22.27
		1	24	22.24	22.20	22.15
		1	49	22.07	22.16	22.08
		25	0	21.00	21.05	20.95
		25	12	20.89	21.04	20.95
		25	25	20.88	21.06	20.97
		50	0	20.89	20.99	20.89
	64QAM	1	0	21.14	21.25	21.21
		1	24	21.12	21.20	21.12
		1	49	21.16	21.12	21.13
		25	0	19.95	20.18	20.00
		25	12	19.94	20.09	20.01
		25	25	19.91	20.14	19.91
		50	0	20.01	19.99	20.01
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	23.24	23.25	23.21
		1	12	23.19	23.31	23.20
		1	24	23.13	23.25	23.23
		12	0	22.12	22.27	22.12
		12	6	22.09	22.25	22.16
		12	13	22.16	22.23	22.05
		25	0	22.17	22.10	22.05
	16QAM	1	0	22.23	22.33	22.26
		1	12	22.18	22.13	22.13
		1	24	22.00	22.18	22.09
		12	0	21.04	21.16	21.05
		12	6	20.94	21.10	20.91
		12	13	21.02	21.00	20.92
		25	0	20.96	20.96	20.85
	64QAM	1	0	21.06	21.29	21.07
		1	12	21.11	21.14	21.13
		1	24	21.12	21.19	21.10
		12	0	20.13	20.12	20.09
		12	6	20.13	20.09	20.03
		12	13	19.92	20.05	20.03
		25	0	19.93	20.00	20.07

Full Power						
LTE Band 4						
BW	MCS Index	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	23.28	23.38	23.30
		1	7	23.19	23.26	23.29
		1	14	23.20	23.26	23.12
		8	0	22.16	22.37	22.22
		8	3	22.08	22.26	22.15
		8	7	22.19	22.23	22.08
		15	0	22.09	22.21	22.18
	16QAM	1	0	22.18	22.25	22.20
		1	7	22.07	22.19	22.27
		1	14	22.15	22.12	22.11
		8	0	21.04	21.08	21.04
		8	3	20.92	20.90	20.95
		8	7	20.88	20.88	20.90
		15	0	20.86	21.07	20.90
	64QAM	1	0	21.10	21.21	21.16
		1	7	21.02	21.21	21.10
		1	14	21.17	21.17	21.16
		8	0	20.05	20.14	20.10
		8	3	20.13	20.08	19.94
		8	7	19.89	20.05	19.96
		15	0	19.96	20.01	19.93
BW	MCS Index	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	23.21	23.27	23.22
		1	2	23.29	23.29	23.22
		1	5	23.27	23.23	23.25
		3	0	23.16	23.23	23.33
		3	1	23.16	23.29	23.08
		3	3	23.18	23.28	23.26
		6	0	22.09	22.09	22.25
	16QAM	1	0	22.07	22.13	22.18
		1	2	22.15	22.15	22.15
		1	5	21.99	22.08	22.16
		3	0	21.90	22.04	22.02
		3	1	21.82	21.96	22.04
		3	3	21.89	21.99	22.00
		6	0	20.93	20.89	20.97
	64QAM	1	0	21.10	21.19	21.23
		1	2	21.09	21.26	21.25
		1	5	21.04	21.05	21.03
		3	0	21.06	21.00	21.11
		3	1	21.04	21.08	21.06
		3	3	20.95	21.09	21.04
		6	0	19.92	19.92	19.93

Full Power						
LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	23.22	23.31	23.25
		1	24	23.19	23.28	23.22
		1	49	23.05	23.14	23.08
		25	0	22.26	22.35	22.29
		25	12	22.25	22.34	22.28
		25	25	22.19	22.28	22.22
		50	0	22.22	22.31	22.25
	16QAM	1	0	22.40	22.49	22.43
		1	24	22.38	22.47	22.41
		1	49	22.32	22.41	22.35
		25	0	21.36	21.45	21.39
		25	12	21.34	21.43	21.37
		25	25	21.23	21.32	21.26
		50	0	21.30	21.39	21.33
	64QAM	1	0	21.36	21.45	21.39
		1	24	21.32	21.41	21.35
		1	49	21.26	21.35	21.29
		25	0	20.34	20.43	20.37
		25	12	20.29	20.38	20.32
		25	25	20.22	20.31	20.25
		50	0	20.32	20.41	20.35
BW	MCS Index	Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	23.12	23.30	23.24
		1	12	23.10	23.27	23.13
		1	24	23.05	23.07	23.06
		12	0	22.21	22.26	22.23
		12	6	22.16	22.32	22.20
		12	13	22.16	22.21	22.18
		25	0	22.20	22.24	22.23
	16QAM	1	0	22.34	22.39	22.37
		1	12	22.32	22.42	22.36
		1	24	22.32	22.36	22.33
		12	0	21.29	21.37	21.32
		12	6	21.29	21.35	21.37
		12	13	21.16	21.24	21.23
		25	0	21.25	21.39	21.33
	64QAM	1	0	21.28	21.38	21.36
		1	12	21.23	21.37	21.33
		1	24	21.18	21.27	21.22
		12	0	20.26	20.37	20.32
		12	6	20.25	20.30	20.31
		12	13	20.18	20.31	20.16
		25	0	20.28	20.40	20.30

Full Power						
LTE Band 5						
BW	MCS Index	Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	23.13	23.19	23.13
		1	7	22.99	23.08	23.02
		1	14	22.95	23.03	22.99
		8	0	22.21	22.13	22.08
		8	3	22.02	22.20	22.20
		8	7	22.10	22.15	22.08
		15	0	22.04	22.18	22.03
	16QAM	1	0	22.19	22.47	22.37
		1	7	22.30	22.32	22.31
		1	14	22.27	22.29	22.24
		8	0	21.25	21.32	21.28
		8	3	21.18	21.27	21.31
		8	7	21.07	21.22	21.13
		15	0	21.27	21.30	21.18
	64QAM	1	0	21.21	21.40	21.29
		1	7	21.16	21.27	21.33
		1	14	21.15	21.22	21.09
		8	0	20.24	20.24	20.32
		8	3	20.17	20.18	20.22
		8	7	20.08	20.20	20.07
		15	0	20.09	20.33	20.24
BW	MCS Index	Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	23.08	23.16	23.14
		1	2	23.00	23.09	23.07
		1	5	22.96	22.94	22.90
		3	0	23.11	23.13	23.10
		3	1	23.12	23.24	23.23
		3	3	23.09	23.06	23.15
		6	0	22.13	22.21	22.14
	16QAM	1	0	22.26	22.38	22.29
		1	2	22.19	22.26	22.36
		1	5	22.26	22.24	22.22
		3	0	22.29	22.37	22.28
		3	1	22.28	22.32	22.29
		3	3	22.15	22.29	22.14
		6	0	21.21	21.29	21.21
	64QAM	1	0	21.20	21.35	21.28
		1	2	21.23	21.26	21.28
		1	5	21.10	21.20	21.18
		3	0	21.18	21.32	21.30
		3	1	21.22	21.31	21.25
		3	3	21.01	21.17	21.24
		6	0	20.26	20.24	20.30

Full Power						
LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	QPSK	1	0	21.45	21.67	21.73
		1	50	21.34	21.56	21.62
		1	99	21.32	21.54	21.60
		50	0	20.44	20.66	20.72
		50	25	20.42	20.64	20.70
		50	50	20.36	20.58	20.64
		100	0	20.39	20.61	20.67
	16QAM	1	0	20.76	20.98	21.04
		1	50	20.73	20.95	21.01
		1	99	20.59	20.81	20.87
		50	0	19.46	19.68	19.74
		50	25	19.33	19.55	19.61
		50	50	19.29	19.51	19.57
		100	0	19.30	19.52	19.58
	64QAM	1	0	20.63	20.85	20.91
		1	50	20.61	20.83	20.89
		1	99	20.55	20.77	20.83
		50	0	19.43	19.65	19.71
		50	25	19.33	19.55	19.61
		50	50	19.29	19.51	19.57
		100	0	19.25	19.47	19.53
BW	MCS Index	Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	QPSK	1	0	21.43	21.66	21.72
		1	37	21.24	21.51	21.62
		1	74	21.29	21.51	21.53
		36	0	20.42	20.61	20.69
		36	19	20.36	20.59	20.67
		36	39	20.33	20.52	20.56
		75	0	20.37	20.61	20.66
	16QAM	1	0	20.69	20.88	21.04
		1	37	20.73	20.88	20.94
		1	74	20.56	20.72	20.83
		36	0	19.44	19.67	19.70
		36	19	19.28	19.51	19.57
		36	39	19.21	19.47	19.52
		75	0	19.30	19.50	19.52
	64QAM	1	0	20.59	20.77	20.81
		1	37	20.60	20.79	20.81
		1	74	20.51	20.77	20.83
		36	0	19.39	19.65	19.66
		36	19	19.25	19.55	19.56
		36	39	19.28	19.43	19.48
		75	0	19.17	19.43	19.49

Full Power						
LTE Band 7						
BW	MCS Index	Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	QPSK	1	0	21.40	21.53	21.62
		1	24	21.26	21.44	21.55
		1	49	21.27	21.37	21.58
		25	0	20.28	20.54	20.60
		25	12	20.27	20.41	20.67
		25	25	20.13	20.55	20.45
		50	0	20.21	20.52	20.47
	16QAM	1	0	20.74	20.84	20.81
		1	24	20.51	20.88	20.91
		1	49	20.41	20.78	20.74
		25	0	19.37	19.55	19.50
		25	12	19.25	19.43	19.59
		25	25	19.19	19.45	19.46
	64QAM	50	0	19.15	19.42	19.40
		1	0	20.52	20.65	20.86
		1	24	20.54	20.66	20.79
		1	49	20.48	20.66	20.78
		25	0	19.22	19.50	19.54
		25	12	19.11	19.46	19.41
		25	25	19.24	19.40	19.38
	50	0	19.18	19.37	19.33	
BW	MCS Index	Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	QPSK	1	0	21.33	21.55	21.53
		1	12	21.19	21.49	21.27
		1	24	21.14	21.38	21.45
		12	0	20.28	20.57	20.53
		12	6	20.26	20.44	20.49
		12	13	20.13	20.34	20.41
		25	0	20.26	20.39	20.39
	16QAM	1	0	20.60	20.96	20.99
		1	12	20.62	20.86	20.91
		1	24	20.46	20.80	20.78
		12	0	19.38	19.63	19.62
		12	6	19.19	19.36	19.53
		12	13	19.21	19.35	19.49
	64QAM	25	0	19.24	19.35	19.42
		1	0	20.47	20.79	20.73
		1	12	20.42	20.82	20.70
		1	24	20.40	20.72	20.71
		12	0	19.20	19.56	19.52
		12	6	19.16	19.46	19.47
		12	13	19.14	19.41	19.47
	25	0	19.10	19.37	19.31	

Full Power						
LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	23.31	23.37	23.42
		1	24	23.25	23.31	23.36
		1	49	22.21	22.27	22.32
		25	0	22.29	22.35	22.40
		25	12	22.24	22.30	22.35
		25	25	22.22	22.28	22.33
		50	0	22.19	22.25	22.30
	16QAM	1	0	22.35	22.41	22.46
		1	24	22.32	22.38	22.43
		1	49	22.26	22.32	22.37
		25	0	21.25	21.31	21.36
		25	12	21.19	21.25	21.30
		25	25	21.12	21.18	21.23
		50	0	21.10	21.16	21.21
	64QAM	1	0	21.33	21.39	21.44
		1	24	21.29	21.35	21.40
		1	49	21.25	21.31	21.36
		25	0	20.16	20.22	20.27
		25	12	20.11	20.17	20.22
		25	25	20.09	20.15	20.20
		50	0	20.10	20.16	20.21
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	23.30	23.27	23.40
		1	12	23.22	23.30	23.27
		1	24	22.11	22.22	22.22
		12	0	22.28	22.28	22.35
		12	6	22.20	22.22	22.29
		12	13	22.14	22.18	22.26
		25	0	22.09	22.19	22.27
	16QAM	1	0	22.35	22.39	22.37
		1	12	22.24	22.34	22.40
		1	24	22.26	22.26	22.31
		12	0	21.21	21.30	21.36
		12	6	21.18	21.18	21.27
		12	13	21.02	21.11	21.15
		25	0	21.04	21.06	21.12
	64QAM	1	0	21.27	21.36	21.40
		1	12	21.24	21.34	21.37
		1	24	21.25	21.21	21.33
		12	0	20.09	20.13	20.20
		12	6	20.07	20.11	20.16
		12	13	20.07	20.14	20.10
		25	0	20.01	20.14	20.19

Full Power						
LTE Band 12						
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	23.22	23.18	23.28
		1	7	23.17	23.14	23.22
		1	14	22.01	22.12	22.31
		8	0	22.14	22.23	22.34
		8	3	22.19	22.27	22.29
		8	7	22.06	22.13	22.28
		15	0	22.03	22.19	22.23
	16QAM	1	0	22.25	22.26	22.37
		1	7	22.27	22.25	22.30
		1	14	22.19	22.19	22.20
		8	0	21.16	21.20	21.23
		8	3	21.06	21.10	21.26
		8	7	20.98	21.06	21.07
	64QAM	15	0	20.92	21.12	21.03
		1	0	21.13	21.26	21.36
		1	7	21.16	21.24	21.20
		1	14	21.14	21.09	21.13
		8	0	19.93	20.04	20.11
		8	3	20.11	20.12	20.16
		8	7	20.04	19.92	20.14
	15	0	19.91	20.05	20.05	
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	23.14	23.33	23.29
		1	2	23.10	23.14	23.28
		1	5	22.13	22.03	22.14
		3	0	23.19	23.22	23.19
		3	1	23.15	23.20	23.17
		3	3	23.11	23.21	23.17
		6	0	22.12	22.14	22.29
	16QAM	1	0	22.26	22.33	22.30
		1	2	22.30	22.30	22.32
		1	5	22.20	22.22	22.28
		3	0	22.05	22.28	22.26
		3	1	22.12	22.14	22.25
		3	3	21.96	22.11	22.21
	64QAM	6	0	20.85	21.06	21.09
		1	0	21.23	21.31	21.30
		1	2	21.21	21.17	21.23
		1	5	21.13	21.13	21.13
		3	0	21.10	21.10	21.12
		3	1	20.94	21.00	21.16
		3	3	20.94	20.99	21.10
	6	0	19.93	19.94	20.09	

Full Power							
LTE Band 13							
BW	MCS Index	RB Size	RB Offset		Mid		
		Channel				23230	
		Frequency (MHz)				782	
10M	QPSK	1	0		23.32		
		1	24		23.28		
		1	49		23.23		
		25	0		22.42		
		25	12		22.39		
		25	25		22.37		
		50	0		22.34		
	16QAM	1	0		22.46		
		1	24		22.41		
		1	49		22.37		
		25	0		21.44		
		25	12		21.42		
		25	25		21.38		
		50	0		21.43		
	64QAM	1	0		21.46		
		1	24		21.43		
		1	49		21.42		
		25	0		20.44		
		25	12		20.41		
		25	25		20.38		
		50	0		20.42		
BW	MCS Index	Channel			23205	23230	23255
		Frequency (MHz)			779.5	782	784.5
5M	QPSK	1	0	23.15	23.20	23.11	
		1	12	23.11	23.16	23.07	
		1	24	23.06	23.11	23.02	
		12	0	22.25	22.30	22.21	
		12	6	22.22	22.27	22.18	
		12	13	22.20	22.25	22.16	
		25	0	22.17	22.22	22.13	
	16QAM	1	0	22.29	22.34	22.25	
		1	12	22.24	22.29	22.20	
		1	24	22.20	22.25	22.16	
		12	0	21.27	21.32	21.23	
		12	6	21.25	21.30	21.21	
		12	13	21.21	21.26	21.17	
		25	0	21.26	21.31	21.22	
	64QAM	1	0	21.29	21.34	21.25	
		1	12	21.26	21.31	21.22	
		1	24	21.25	21.30	21.21	
		12	0	20.27	20.32	20.23	
		12	6	20.24	20.29	20.20	
		12	13	20.21	20.26	20.17	
		25	0	20.25	20.30	20.21	

Full Power						
LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26765	26865	26965
		Frequency (MHz)		821.5	831.5	841.5
15M	QPSK	1	0	23.31	23.38	23.43
		1	37	23.27	23.34	23.39
		1	74	23.15	23.22	23.27
		36	0	22.42	22.49	22.54
		36	19	22.36	22.43	22.48
		36	39	22.31	22.38	22.43
		75	0	22.34	22.41	22.46
	16QAM	1	0	22.39	22.46	22.51
		1	37	22.35	22.42	22.47
		1	74	22.34	22.41	22.46
		36	0	21.36	21.43	21.48
		36	19	21.34	21.41	21.46
		36	39	21.28	21.35	21.40
		75	0	21.35	21.42	21.47
	64QAM	1	0	21.35	21.42	21.47
		1	37	21.30	21.37	21.42
		1	74	21.28	21.35	21.40
		36	0	20.37	20.44	20.49
		36	19	20.30	20.37	20.42
		36	39	20.28	20.35	20.40
		75	0	20.32	20.39	20.44
BW	MCS Index	Channel		26740	26865	26990
		Frequency (MHz)		819	831.5	844
10M	QPSK	1	0	23.25	23.33	23.37
		1	24	23.24	23.34	23.38
		1	49	23.07	23.21	23.21
		25	0	22.35	22.42	22.47
		25	12	22.28	22.43	22.39
		25	25	22.26	22.34	22.41
		50	0	22.27	22.40	22.36
	16QAM	1	0	22.30	22.46	22.42
		1	24	22.26	22.37	22.47
		1	49	22.26	22.40	22.37
		25	0	21.31	21.34	21.43
		25	12	21.34	21.37	21.38
		25	25	21.22	21.33	21.40
		50	0	21.30	21.42	21.37
	64QAM	1	0	21.30	21.32	21.37
		1	24	21.29	21.33	21.42
		1	49	21.20	21.26	21.35
		25	0	20.27	20.39	20.43
		25	12	20.21	20.36	20.36
		25	25	20.18	20.32	20.30
		50	0	20.27	20.33	20.37

Full Power						
LTE Band 26						
BW	MCS Index	Channel		26715	26865	27015
		Frequency (MHz)		816.5	831.5	846.5
5M	QPSK	1	0	23.22	23.36	23.24
		1	12	23.09	23.14	23.26
		1	24	23.09	23.01	23.13
		12	0	22.30	22.26	22.46
		12	6	22.32	22.28	22.35
		12	13	22.24	22.24	22.30
		25	0	22.16	22.34	22.26
	16QAM	1	0	22.28	22.26	22.34
		1	12	22.18	22.28	22.38
		1	24	22.30	22.30	22.37
		12	0	21.23	21.25	21.28
		12	6	21.28	21.26	21.32
		12	13	21.22	21.33	21.30
		25	0	21.24	21.32	21.36
	64QAM	1	0	21.14	21.33	21.26
		1	12	21.17	21.24	21.34
		1	24	21.16	21.32	21.31
		12	0	20.29	20.29	20.38
		12	6	20.18	20.18	20.32
		12	13	20.11	20.28	20.19
		25	0	20.15	20.26	20.28
BW	MCS Index	Channel		26705	26865	27025
3M	QPSK	Frequency (MHz)		815.5	831.5	847.5
		1	0	23.13	23.37	23.18
		1	7	23.18	23.16	23.12
		1	14	23.01	23.05	23.08
		8	0	22.27	22.31	22.33
		8	3	22.26	22.22	22.25
		8	7	22.24	22.21	22.16
	15	0	22.14	22.25	22.39	
	16QAM	1	0	22.27	22.37	22.36
		1	7	22.26	22.30	22.40
		1	14	22.18	22.20	22.30
		8	0	21.16	21.24	21.31
		8	3	21.21	21.27	21.37
		8	7	21.14	21.31	21.31
		15	0	21.20	21.32	21.44
	64QAM	1	0	21.23	21.25	21.32
		1	7	21.08	21.21	21.25
		1	14	21.22	21.22	21.19
		8	0	20.32	20.26	20.39
		8	3	20.06	20.19	20.30
		8	7	20.18	20.28	20.15
15		0	20.24	20.20	20.37	

Full Power						
LTE Band 26						
BW	MCS Index	Channel		26697	26865	27033
		Frequency (MHz)		814.7	831.5	848.3
1.4M	QPSK	1	0	23.15	23.31	23.33
		1	2	23.08	23.26	23.25
		1	5	23.01	23.02	23.22
		3	0	23.42	23.38	23.43
		3	1	23.27	23.34	23.35
		3	3	23.21	23.37	23.32
		6	0	22.27	22.37	22.27
	16QAM	1	0	22.19	22.30	22.42
		1	2	22.20	22.17	22.37
		1	5	22.16	22.19	22.41
		3	0	22.24	22.24	22.32
		3	1	22.27	22.23	22.36
		3	3	22.07	22.34	22.35
		6	0	21.19	21.37	21.37
	64QAM	1	0	21.25	21.28	21.24
		1	2	21.17	21.31	21.28
		1	5	21.14	21.26	21.37
		3	0	21.25	21.25	21.35
		3	1	21.12	21.28	21.37
		3	3	21.12	21.20	21.31
		6	0	20.19	20.26	20.36

Full Power						
LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	23.01	23.21	23.25
		1	50	22.93	23.13	23.17
		1	99	22.89	23.09	23.13
		50	0	21.94	22.14	22.18
		50	25	21.88	22.08	22.12
		50	50	21.87	22.07	22.11
		100	0	21.84	22.04	22.08
	16QAM	1	0	22.26	22.46	22.50
		1	50	22.12	22.32	22.36
		1	99	22.08	22.28	22.32
		50	0	21.04	21.24	21.28
		50	25	20.96	21.16	21.20
		50	50	20.91	21.11	21.15
		100	0	20.88	21.08	21.12
	64QAM	1	0	21.16	21.36	21.40
		1	50	21.02	21.22	21.26
		1	99	20.99	21.19	21.23
		50	0	19.96	20.16	20.20
		50	25	19.93	20.13	20.17
		50	50	19.89	20.09	20.13
		100	0	19.87	20.07	20.11
BW	MCS Index	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	22.97	23.20	23.21
		1	37	22.93	23.12	23.07
		1	74	22.86	23.05	23.09
		36	0	21.94	22.08	22.15
		36	19	21.85	21.98	22.04
		36	39	21.77	22.06	22.08
		75	0	21.74	22.03	22.02
	16QAM	1	0	22.26	22.37	22.47
		1	37	22.11	22.31	22.36
		1	74	22.00	22.25	22.22
		36	0	21.00	21.18	21.21
		36	19	20.92	21.14	21.12
		36	39	20.81	21.04	21.07
		75	0	20.88	20.99	21.04
	64QAM	1	0	21.09	21.35	21.38
		1	37	20.94	21.22	21.26
		1	74	20.97	21.15	21.21
		36	0	19.96	20.11	20.19
		36	19	19.90	20.12	20.17
		36	39	19.84	19.99	20.12
		75	0	19.78	20.07	20.08

Full Power						
LTE Band 66						
BW	MCS Index	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	22.97	23.08	23.11
		1	24	22.91	23.01	22.97
		1	49	22.75	23.01	23.00
		25	0	21.91	22.02	22.13
		25	12	21.81	22.01	21.97
		25	25	21.69	21.89	21.95
		50	0	21.79	21.84	21.89
	16QAM	1	0	22.11	22.30	22.27
		1	24	22.05	22.23	22.23
		1	49	21.92	22.11	22.23
		25	0	20.91	21.09	21.09
		25	12	20.85	21.01	21.17
		25	25	20.86	21.04	20.98
		50	0	20.77	20.92	21.03
	64QAM	1	0	21.03	21.29	21.29
		1	24	20.99	21.07	21.23
		1	49	20.91	21.12	21.16
		25	0	19.86	19.95	20.03
		25	12	19.83	19.94	20.04
		25	25	19.67	19.96	20.02
		50	0	19.82	19.85	19.97
BW	MCS Index	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	22.92	23.06	23.04
		1	12	22.83	22.99	22.87
		1	24	22.79	22.95	22.84
		12	0	21.92	22.03	22.09
		12	6	21.76	21.88	22.00
		12	13	21.69	21.94	21.82
		25	0	21.73	21.82	22.01
	16QAM	1	0	22.15	22.42	22.35
		1	12	22.08	22.22	22.22
		1	24	21.88	22.21	22.25
		12	0	21.03	21.07	21.08
		12	6	20.77	21.06	21.04
		12	13	20.81	21.00	21.10
		25	0	20.69	20.88	21.03
	64QAM	1	0	21.01	21.24	21.40
		1	12	20.95	21.18	21.12
		1	24	20.87	21.07	21.06
		12	0	19.83	20.05	20.11
		12	6	19.74	19.96	19.97
		12	13	19.76	19.86	19.93
		25	0	19.79	19.87	19.86

Full Power						
LTE Band 66						
BW	MCS Index	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	22.85	23.06	23.09
		1	7	22.83	22.99	22.92
		1	14	22.81	22.90	23.02
		8	0	21.84	22.09	22.15
		8	3	21.70	21.89	22.07
		8	7	21.79	21.95	21.94
		15	0	21.73	21.89	22.00
	16QAM	1	0	22.15	22.31	22.40
		1	7	21.99	22.23	22.28
		1	14	22.07	22.13	22.22
		8	0	20.87	21.17	21.22
		8	3	20.82	20.97	21.04
		8	7	20.69	20.99	20.91
	64QAM	15	0	20.67	20.86	20.92
		1	0	21.07	21.20	21.25
		1	7	20.87	21.07	21.08
		1	14	20.82	21.14	21.11
		8	0	19.76	20.03	20.06
		8	3	19.85	19.94	20.02
		8	7	19.81	20.01	19.89
	15	0	19.84	19.83	20.06	
BW	MCS Index	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	22.88	23.15	23.11
		1	2	22.78	22.99	23.05
		1	5	22.72	22.87	23.06
		3	0	22.75	23.10	23.00
		3	1	22.73	22.99	22.99
		3	3	22.79	22.99	23.03
		6	0	21.77	22.03	22.00
	16QAM	1	0	22.16	22.39	22.38
		1	2	21.91	22.14	22.24
		1	5	21.96	22.15	22.12
		3	0	22.02	22.10	22.22
		3	1	21.81	22.01	22.18
		3	3	21.82	22.05	22.11
		6	0	20.83	20.89	21.03
	64QAM	1	0	21.11	21.24	21.39
		1	2	20.77	20.98	21.20
		1	5	20.84	21.04	21.00
		3	0	20.79	21.13	21.06
		3	1	20.76	20.96	21.04
		3	3	20.84	20.85	21.03
		6	0	19.73	19.92	20.01

Full Power								
LTE Band 41								
BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High
		Channel		39750	40185	40620	41055	41490
		Frequency (MHz)		2506	2549.5	2593	2636.5	2680
20M	QPSK	1	0	21.64	21.83	21.92	21.78	21.71
		1	50	21.43	21.62	21.71	21.57	21.50
		1	99	21.37	21.56	21.65	21.51	21.44
		50	0	20.53	20.72	20.81	20.67	20.60
		50	25	20.36	20.55	20.64	20.50	20.43
		50	50	20.27	20.46	20.55	20.41	20.34
		100	0	20.24	20.43	20.52	20.38	20.31
	16QAM	1	0	20.70	20.89	20.98	20.84	20.77
		1	50	20.54	20.73	20.82	20.68	20.61
		1	99	20.43	20.62	20.71	20.57	20.50
		50	0	19.75	19.67	19.95	19.88	19.81
		50	25	19.71	19.61	19.91	19.71	19.81
		50	50	19.61	19.48	19.80	19.50	19.71
		100	0	19.41	19.58	19.67	19.66	19.67
	64QAM	1	0	19.68	19.87	19.96	19.82	19.75
		1	50	19.52	19.71	19.80	19.66	19.59
		1	99	19.41	19.60	19.69	19.55	19.48
		50	0	18.45	18.64	18.73	18.59	18.52
		50	25	18.38	18.57	18.66	18.52	18.45
		50	50	18.25	18.44	18.53	18.39	18.32
		100	0	18.37	18.56	18.65	18.51	18.44
BW	MCS Index	Channel		39725	40173	40620	41068	41515
		Frequency (MHz)		2503.5	2548.3	2593	2637.8	2682.5
15M	QPSK	1	0	21.61	21.80	21.89	21.75	21.68
		1	37	21.40	21.59	21.68	21.54	21.47
		1	74	21.34	21.53	21.62	21.48	21.41
		36	0	20.50	20.69	20.78	20.64	20.57
		36	19	20.33	20.52	20.61	20.47	20.40
		36	39	20.24	20.43	20.52	20.38	20.31
		75	0	20.21	20.40	20.49	20.35	20.28
	16QAM	1	0	20.67	20.86	20.95	20.81	20.74
		1	37	20.51	20.70	20.79	20.65	20.58
		1	74	20.40	20.59	20.68	20.54	20.47
		36	0	19.94	19.82	20.08	19.96	19.98
		36	19	19.73	19.76	20.02	19.89	19.83
		36	39	19.44	19.43	19.62	19.55	19.53
		75	0	20.11	19.94	20.28	20.19	20.14
	64QAM	1	0	19.62	19.81	19.90	19.76	19.69
		1	37	19.46	19.65	19.74	19.60	19.53
		1	74	19.35	19.54	19.63	19.49	19.42
		36	0	18.39	18.58	18.67	18.53	18.46
		36	19	18.32	18.51	18.60	18.46	18.39
		36	39	18.19	18.38	18.47	18.33	18.26
		75	0	18.31	18.50	18.59	18.45	18.38

Full Power								
LTE Band 41								
BW	MCS Index	Channel		39700	40160	40620	41080	41540
		Frequency (MHz)		2501	2547	2593	2639	2685
10M	QPSK	1	0	21.57	21.76	21.85	21.71	21.64
		1	24	21.36	21.55	21.64	21.50	21.43
		1	49	21.30	21.49	21.58	21.44	21.37
		25	0	20.46	20.65	20.74	20.60	20.53
		25	12	20.29	20.48	20.57	20.43	20.36
		25	25	20.20	20.39	20.48	20.34	20.27
		50	0	20.17	20.36	20.45	20.31	20.24
	16QAM	1	0	20.63	20.82	20.91	20.77	20.70
		1	24	20.47	20.66	20.75	20.61	20.54
		1	49	20.36	20.55	20.64	20.50	20.43
		25	0	19.87	19.77	20.08	19.95	19.91
		25	12	19.65	19.68	19.96	19.85	19.78
		25	25	19.43	19.39	19.60	19.54	19.44
		50	0	19.99	19.93	20.20	20.06	19.98
	64QAM	1	0	19.50	19.69	19.78	19.64	19.57
		1	24	19.34	19.53	19.62	19.48	19.41
		1	49	19.23	19.42	19.51	19.37	19.30
		25	0	18.27	18.46	18.55	18.41	18.34
		25	12	18.20	18.39	18.48	18.34	18.27
		25	25	18.10	18.29	18.38	18.24	18.17
		50	0	18.19	18.38	18.47	18.33	18.26
BW	MCS Index	Channel		39675	40148	40620	41093	41565
		Frequency (MHz)		2498.5	2545.8	2593	2640.3	2687.5
5M	QPSK	1	0	21.51	21.70	21.79	21.65	21.58
		1	12	21.30	21.49	21.58	21.44	21.37
		1	24	21.24	21.43	21.52	21.38	21.31
		12	0	20.40	20.59	20.68	20.54	20.47
		12	6	20.23	20.42	20.51	20.37	20.30
		12	13	20.14	20.33	20.42	20.28	20.21
		25	0	20.11	20.30	20.39	20.25	20.18
	16QAM	1	0	20.57	20.76	20.85	20.71	20.64
		1	12	20.41	20.60	20.69	20.55	20.48
		1	24	20.30	20.49	20.58	20.44	20.37
		12	0	19.82	19.81	20.05	19.93	19.94
		12	6	19.70	19.66	19.86	19.85	19.84
		12	13	19.42	19.33	19.51	19.57	19.48
		25	0	20.06	19.92	20.22	20.09	20.12
	64QAM	1	0	19.45	19.64	19.73	19.59	19.52
		1	12	19.29	19.48	19.57	19.43	19.36
		1	24	19.18	19.37	19.46	19.32	19.25
		12	0	18.85	18.81	19.07	18.97	18.91
		12	6	18.79	18.66	18.87	18.86	18.78
		12	13	18.41	18.28	18.50	18.55	18.52
		25	0	19.05	18.94	19.21	19.10	19.12

Reduction Power						
LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	20.32	20.21	20.81
		1	50	20.22	20.11	20.71
		1	99	20.16	20.05	20.65
		50	0	20.17	20.03	20.63
		50	25	20.07	19.95	20.56
		50	50	19.95	19.84	20.44
		100	0	19.93	19.82	20.42
	16QAM	1	0	20.30	20.19	20.79
		1	50	20.20	20.09	20.69
		1	99	20.21	20.07	20.67
		50	0	20.03	19.92	20.52
		50	25	19.92	19.71	20.41
		50	50	19.89	19.78	20.38
		100	0	19.90	19.79	20.39
	64QAM	1	0	20.22	20.12	20.71
		1	50	20.08	19.97	20.57
		1	99	20.08	19.97	20.57
		50	0	19.43	19.39	19.99
		50	25	19.39	19.28	19.88
		50	50	19.45	19.29	19.91
		100	0	19.44	19.33	19.93
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	20.22	20.16	20.74
		1	37	20.15	20.04	20.66
		1	74	20.13	19.96	20.65
		36	0	20.13	20.03	20.57
		36	19	20.01	19.85	20.50
		36	39	19.86	19.77	20.37
		75	0	19.93	19.82	20.33
	16QAM	1	0	20.23	20.19	20.70
		1	37	20.10	20.06	20.63
		1	74	20.15	20.04	20.63
		36	0	20.01	19.89	20.47
		36	19	19.83	19.65	20.33
		36	39	19.80	19.75	20.35
		75	0	19.89	19.79	20.30
	64QAM	1	0	20.13	20.03	20.70
		1	37	20.02	19.87	20.52
		1	74	20.02	19.94	20.51
		36	0	19.42	19.36	19.99
		36	19	19.34	19.24	19.84
		36	39	19.41	19.23	19.88
		75	0	19.42	19.31	19.90

Reduction Power						
LTE Band 2						
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	20.23	20.07	20.63
		1	24	20.11	19.98	20.62
		1	49	20.04	19.96	20.61
		25	0	20.14	19.91	20.39
		25	12	19.95	19.74	20.46
		25	25	19.88	19.61	20.40
		50	0	19.78	19.72	20.27
	16QAM	1	0	20.13	19.97	20.62
		1	24	20.03	19.94	20.58
		1	49	20.09	19.95	20.57
		25	0	19.86	19.84	20.46
		25	12	19.74	19.64	20.21
		25	25	19.68	19.60	20.28
		50	0	19.73	19.70	20.24
	64QAM	1	0	20.07	19.98	20.64
		1	24	19.94	19.88	20.40
		1	49	20.02	19.76	20.44
		25	0	19.27	19.22	19.85
		25	12	19.18	19.16	19.72
		25	25	19.36	19.27	19.70
		50	0	19.35	19.21	19.89
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	20.18	20.14	20.57
		1	12	19.99	19.92	20.63
		1	24	20.08	19.86	20.56
		12	0	20.04	19.91	20.43
		12	6	19.90	19.83	20.49
		12	13	19.77	19.75	20.30
		25	0	19.79	19.65	20.34
	16QAM	1	0	20.17	20.05	20.73
		1	12	20.12	19.92	20.59
		1	24	20.10	20.03	20.60
		12	0	19.89	19.78	20.37
		12	6	19.71	19.51	20.25
		12	13	19.76	19.70	20.28
		25	0	19.78	19.77	20.37
	64QAM	1	0	20.10	20.03	20.64
		1	12	19.94	19.96	20.49
		1	24	19.90	19.85	20.54
		12	0	19.33	19.18	19.92
		12	6	19.31	19.13	19.75
		12	13	19.29	19.19	19.73
		25	0	19.40	19.16	19.87

Reduction Power						
LTE Band 2						
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	20.13	20.06	20.64
		1	7	20.08	20.03	20.61
		1	14	20.03	19.80	20.42
		8	0	20.00	19.87	20.51
		8	3	19.93	19.82	20.45
		8	7	19.72	19.74	20.33
		15	0	19.85	19.71	20.36
	16QAM	1	0	20.13	20.10	20.70
		1	7	20.04	20.03	20.53
		1	14	20.12	19.91	20.52
		8	0	19.85	19.78	20.49
		8	3	19.83	19.70	20.29
		8	7	19.79	19.64	20.25
		15	0	19.73	19.66	20.24
	64QAM	1	0	20.17	19.98	20.68
		1	7	19.93	19.82	20.46
		1	14	19.96	19.83	20.40
		8	0	19.41	19.19	19.85
		8	3	19.28	19.07	19.79
		8	7	19.23	19.15	19.77
		15	0	19.30	19.11	19.88
BW	MCS Index	Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	20.22	20.09	20.72
		1	2	20.15	20.02	20.63
		1	5	20.01	19.91	20.59
		3	0	20.08	19.91	20.48
		3	1	19.97	19.88	20.49
		3	3	19.93	19.70	20.36
		6	0	19.74	19.75	20.26
	16QAM	1	0	20.14	20.02	20.70
		1	2	20.20	19.93	20.56
		1	5	20.11	19.92	20.59
		3	0	19.93	19.84	20.29
		3	1	19.91	19.68	20.32
		3	3	19.76	19.73	20.30
		6	0	19.79	19.72	20.15
	64QAM	1	0	20.06	19.96	20.59
		1	2	19.98	19.83	20.42
		1	5	19.98	19.82	20.43
		3	0	19.32	19.31	19.89
		3	1	19.20	19.21	19.63
		3	3	19.38	19.18	19.79
		6	0	19.26	19.13	19.75

Reduction Power						
LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	22.36	22.42	22.40
		1	50	22.32	22.39	22.35
		1	99	22.28	22.35	22.31
		50	0	22.35	22.41	22.37
		50	25	22.28	22.35	22.31
		50	50	22.21	22.28	22.24
		100	0	22.32	22.35	22.31
	16QAM	1	0	22.33	22.39	22.37
		1	50	22.28	22.34	22.32
		1	99	22.26	22.32	22.30
		50	0	21.16	21.22	21.20
		50	25	21.11	21.17	21.15
		50	50	21.06	21.12	21.10
		100	0	21.07	21.13	21.11
	64QAM	1	0	21.29	21.35	21.33
		1	50	21.25	21.31	21.29
		1	99	21.22	21.28	21.26
		50	0	20.25	20.31	20.29
		50	25	20.23	20.29	20.27
		50	50	20.12	20.18	20.16
		100	0	20.19	20.25	20.23
BW	MCS Index	Channel		20025	20175	20325
15M	QPSK	Frequency (MHz)		1717.5	1732.5	1747.5
		1	0	22.28	22.38	22.39
		1	37	22.25	22.35	22.25
		1	74	22.27	22.32	22.21
		36	0	22.26	22.33	22.37
		36	19	22.23	22.28	22.29
		36	39	22.17	22.28	22.20
	75	0	22.25	22.29	22.22	
	16QAM	1	0	22.24	22.33	22.27
		1	37	22.25	22.34	22.27
		1	74	22.17	22.27	22.22
		36	0	21.08	21.15	21.12
		36	19	21.09	21.12	21.15
		36	39	21.01	21.12	21.10
		75	0	20.97	21.11	21.01
	64QAM	1	0	21.25	21.29	21.28
		1	37	21.19	21.29	21.29
		1	74	21.21	21.19	21.16
		36	0	20.23	20.28	20.24
		36	19	20.15	20.28	20.23
		36	39	20.07	20.11	20.12
75		0	20.09	20.19	20.20	

Reduction Power						
LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	22.25	22.23	22.34
		1	24	22.26	22.29	22.28
		1	49	22.16	22.23	22.19
		25	0	22.19	22.24	22.22
		25	12	22.12	22.10	22.18
		25	25	22.03	22.17	22.16
		50	0	22.20	22.18	22.18
	16QAM	1	0	22.26	22.22	22.27
		1	24	22.19	22.16	22.19
		1	49	22.20	22.18	22.22
		25	0	20.91	21.14	21.07
		25	12	20.96	21.09	21.05
		25	25	20.91	20.93	20.97
		50	0	20.99	20.93	20.91
	64QAM	1	0	21.12	21.30	21.25
		1	24	21.23	21.13	21.08
		1	49	21.15	21.16	21.09
		25	0	20.11	20.07	20.15
		25	12	20.07	20.26	20.20
		25	25	20.01	20.06	20.07
		50	0	20.12	20.10	20.12
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	22.29	22.23	22.29
		1	12	22.18	22.36	22.10
		1	24	22.17	22.31	21.98
		12	0	22.21	22.39	22.23
		12	6	22.12	22.24	22.12
		12	13	22.00	22.15	21.97
		25	0	22.21	22.21	22.19
	16QAM	1	0	22.23	22.24	22.19
		1	12	22.13	22.14	22.14
		1	24	22.18	22.10	22.26
		12	0	21.06	21.20	21.00
		12	6	20.94	20.94	21.09
		12	13	20.93	20.97	21.00
		25	0	20.98	20.95	21.03
	64QAM	1	0	21.23	21.21	21.16
		1	12	21.14	21.24	21.13
		1	24	21.07	21.14	21.07
		12	0	20.07	20.17	20.19
		12	6	20.10	20.08	20.25
		12	13	19.97	19.97	20.01
		25	0	20.05	20.22	20.19

Reduction Power						
LTE Band 4						
BW	MCS Index	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	22.28	22.30	22.26
		1	7	22.27	22.18	22.25
		1	14	22.14	22.22	22.16
		8	0	22.22	22.21	22.13
		8	3	22.23	22.24	22.14
		8	7	22.15	22.16	22.12
		15	0	22.23	22.15	22.10
	16QAM	1	0	22.21	22.22	22.21
		1	7	22.14	22.22	22.13
		1	14	22.13	22.32	22.11
		8	0	21.12	21.15	20.95
		8	3	21.08	21.16	21.01
		8	7	20.94	21.08	20.99
		15	0	20.91	21.00	20.91
	64QAM	1	0	21.16	21.19	21.31
		1	7	21.16	21.23	21.06
		1	14	21.02	21.13	21.25
		8	0	20.18	20.19	20.24
		8	3	20.07	20.13	20.08
		8	7	19.96	20.05	20.12
		15	0	20.03	20.08	20.11
BW	MCS Index	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	22.25	22.27	22.23
		1	2	22.24	22.15	22.22
		1	5	22.11	22.19	22.13
		3	0	22.19	22.18	22.10
		3	1	22.20	22.21	22.11
		3	3	22.12	22.13	22.09
		6	0	22.20	22.12	22.07
	16QAM	1	0	22.18	22.19	22.18
		1	2	22.11	22.19	22.10
		1	5	22.10	22.29	22.08
		3	0	21.09	21.12	20.92
		3	1	21.05	21.13	20.98
		3	3	20.91	21.05	20.96
		6	0	20.88	20.97	20.88
	64QAM	1	0	21.13	21.16	21.28
		1	2	21.13	21.20	21.03
		1	5	20.99	21.10	21.22
		3	0	20.15	20.16	20.21
		3	1	20.04	20.10	20.05
		3	3	19.93	20.02	20.09
		6	0	20.00	20.05	20.08

Reduction Power						
LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	22.29	22.39	22.33
		1	24	22.28	22.38	22.32
		1	49	22.21	22.31	22.25
		25	0	22.27	22.37	22.31
		25	12	22.25	22.35	22.29
		25	25	22.18	22.28	22.22
		50	0	22.26	22.36	22.30
	16QAM	1	0	22.26	22.36	22.30
		1	24	22.24	22.34	22.28
		1	49	22.22	22.32	22.26
		25	0	21.28	21.38	21.32
		25	12	21.25	21.35	21.29
		25	25	21.21	21.31	21.25
		50	0	21.23	21.33	21.27
	64QAM	1	0	21.31	21.41	21.35
		1	24	21.29	21.39	21.33
		1	49	21.27	21.37	21.31
		25	0	20.28	20.38	20.32
		25	12	20.27	20.37	20.31
		25	25	20.19	20.29	20.23
		50	0	20.22	20.32	20.26
BW	MCS Index	Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	22.27	22.31	22.29
		1	12	22.19	22.30	22.30
		1	24	22.17	22.22	22.18
		12	0	22.19	22.28	22.25
		12	6	22.21	22.32	22.23
		12	13	22.14	22.26	22.20
		25	0	22.17	22.30	22.30
	16QAM	1	0	22.24	22.31	22.26
		1	12	22.22	22.28	22.26
		1	24	22.17	22.29	22.19
		12	0	21.25	21.33	21.25
		12	6	21.22	21.30	21.21
		12	13	21.21	21.31	21.21
		25	0	21.23	21.24	21.19
	64QAM	1	0	21.24	21.40	21.25
		1	12	21.26	21.34	21.26
		1	24	21.19	21.37	21.22
		12	0	20.27	20.28	20.31
		12	6	20.25	20.34	20.29
		12	13	20.10	20.24	20.17
		25	0	20.14	20.26	20.16

Reduction Power						
LTE Band 5						
BW	MCS Index	Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	22.15	22.28	22.16
		1	7	22.21	22.18	22.28
		1	14	22.11	22.20	22.22
		8	0	22.27	22.32	22.09
		8	3	22.11	22.23	22.21
		8	7	22.13	22.15	22.18
		15	0	22.16	22.31	22.20
	16QAM	1	0	22.12	22.36	22.09
		1	7	22.19	22.28	22.10
		1	14	22.06	22.18	22.18
		8	0	21.14	21.28	21.25
		8	3	21.05	21.17	21.20
		8	7	21.13	21.14	21.25
		15	0	21.12	21.28	21.09
	64QAM	1	0	21.09	21.25	21.24
		1	7	21.18	21.35	21.17
		1	14	21.11	21.21	21.24
		8	0	20.09	20.36	20.26
		8	3	20.07	20.30	20.23
		8	7	20.01	20.16	20.13
		15	0	20.10	20.20	20.11
BW	MCS Index	Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	22.16	22.27	22.17
		1	2	22.12	22.21	22.12
		1	5	22.09	22.17	21.99
		3	0	22.22	22.12	22.26
		3	1	22.12	22.18	22.01
		3	3	22.04	22.08	21.87
		6	0	22.14	22.26	22.22
	16QAM	1	0	22.14	22.19	22.09
		1	2	22.13	22.24	22.06
		1	5	22.22	22.23	22.10
		3	0	21.13	21.23	21.22
		3	1	21.08	21.26	21.14
		3	3	21.01	21.13	21.06
		6	0	21.18	21.14	21.07
	64QAM	1	0	21.27	21.35	21.26
		1	2	21.07	21.28	21.19
		1	5	21.16	21.14	21.15
		3	0	20.18	20.30	20.23
		3	1	20.24	20.21	20.08
		3	3	19.98	20.13	20.14
		6	0	20.12	20.24	20.04

Reduction Power						
LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	QPSK	1	0	18.72	18.88	19.05
		1	50	18.39	18.58	18.75
		1	99	18.21	18.34	18.51
		50	0	18.33	18.49	18.76
		50	25	18.22	18.51	18.68
		50	50	18.41	18.41	18.59
		100	0	18.67	18.58	18.75
	16QAM	1	0	18.66	18.84	19.01
		1	50	18.42	18.59	18.76
		1	99	18.31	18.44	18.64
		50	0	18.26	18.39	18.59
		50	25	18.33	18.39	18.56
		50	50	18.26	18.29	18.48
		100	0	18.15	18.29	18.46
	64QAM	1	0	18.68	18.84	19.01
		1	50	18.51	18.67	18.84
		1	99	18.32	18.48	18.65
		50	0	18.49	18.66	18.82
		50	25	18.45	18.61	18.78
		50	50	18.34	18.45	18.67
		100	0	18.50	18.66	18.83
BW	MCS Index	Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	QPSK	1	0	18.69	18.85	18.96
		1	37	18.39	18.54	18.66
		1	74	18.17	18.30	18.41
		36	0	18.30	18.49	18.67
		36	19	18.14	18.50	18.60
		36	39	18.35	18.40	18.58
		75	0	18.57	18.49	18.65
	16QAM	1	0	18.61	18.83	18.97
		1	37	18.40	18.56	18.71
		1	74	18.31	18.39	18.57
		36	0	18.16	18.33	18.57
		36	19	18.28	18.39	18.54
		36	39	18.20	18.26	18.41
		75	0	18.14	18.22	18.45
	64QAM	1	0	18.60	18.83	18.91
		1	37	18.42	18.58	18.84
		1	74	18.27	18.43	18.57
		36	0	18.48	18.59	18.79
		36	19	18.40	18.57	18.71
		36	39	18.27	18.40	18.65
		75	0	18.46	18.57	18.81

Reduction Power						
LTE Band 7						
BW	MCS Index	Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	QPSK	1	0	18.68	18.88	19.01
		1	24	18.31	18.58	18.74
		1	49	18.18	18.32	18.49
		25	0	18.28	18.45	18.69
		25	12	18.16	18.46	18.65
		25	25	18.39	18.36	18.51
		50	0	18.63	18.54	18.68
	16QAM	1	0	18.65	18.80	18.95
		1	24	18.34	18.54	18.70
		1	49	18.29	18.39	18.57
		25	0	18.19	18.38	18.59
		25	12	18.28	18.32	18.53
		25	25	18.21	18.25	18.44
		50	0	18.10	18.24	18.43
	64QAM	1	0	18.66	18.82	18.98
		1	24	18.50	18.57	18.84
		1	49	18.24	18.45	18.62
		25	0	18.42	18.59	18.82
		25	12	18.45	18.57	18.75
		25	25	18.29	18.45	18.59
		50	0	18.42	18.65	18.83
BW	MCS Index	Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	QPSK	1	0	18.71	18.83	19.02
		1	12	18.36	18.56	18.70
		1	24	18.14	18.24	18.49
		12	0	18.31	18.39	18.69
		12	6	18.14	18.44	18.59
		12	13	18.37	18.34	18.58
		25	0	18.59	18.53	18.70
	16QAM	1	0	18.65	18.78	18.97
		1	12	18.41	18.52	18.69
		1	24	18.29	18.39	18.54
		12	0	18.16	18.32	18.49
		12	6	18.24	18.32	18.55
		12	13	18.23	18.20	18.45
		25	0	18.14	18.26	18.40
	64QAM	1	0	18.60	18.80	18.96
		1	12	18.45	18.66	18.81
		1	24	18.29	18.44	18.62
		12	0	18.40	18.64	18.82
		12	6	18.41	18.54	18.70
		12	13	18.30	18.37	18.62
		25	0	18.42	18.66	18.79

Reduction Power						
LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26765	26865	26965
		Frequency (MHz)		821.5	831.5	841.5
15M	QPSK	1	0	22.33	22.44	22.47
		1	37	22.30	22.41	22.44
		1	74	22.17	22.28	22.31
		36	0	22.31	22.42	22.45
		36	19	22.28	22.39	22.42
		36	39	22.21	22.32	22.35
		75	0	22.20	22.31	22.34
	16QAM	1	0	22.31	22.42	22.45
		1	37	22.28	22.39	22.42
		1	74	22.25	22.36	22.39
		36	0	21.20	21.31	21.34
		36	19	21.16	21.27	21.30
		36	39	21.10	21.21	21.24
		75	0	21.15	21.26	21.29
	64QAM	1	0	21.32	21.43	21.46
		1	37	21.30	21.41	21.44
		1	74	21.27	21.38	21.41
		36	0	20.34	20.45	20.48
		36	19	20.33	20.44	20.47
		36	39	20.27	20.38	20.41
		75	0	20.34	20.45	20.48
BW	MCS Index	Channel		26740	26865	26990
		Frequency (MHz)		819	831.5	844
10M	QPSK	1	0	22.28	22.35	22.37
		1	24	22.20	22.38	22.41
		1	49	22.07	22.24	22.23
		25	0	22.26	22.34	22.36
		25	12	22.26	22.31	22.37
		25	25	22.19	22.31	22.29
		50	0	22.16	22.30	22.31
	16QAM	1	0	22.28	22.42	22.38
		1	24	22.20	22.33	22.42
		1	49	22.21	22.34	22.32
		25	0	21.18	21.24	21.34
		25	12	21.16	21.23	21.24
		25	25	21.10	21.12	21.15
		50	0	21.06	21.20	21.19
	64QAM	1	0	21.28	21.43	21.40
		1	24	21.20	21.31	21.44
		1	49	21.26	21.28	21.38
		25	0	20.30	20.36	20.39
		25	12	20.25	20.39	20.47
		25	25	20.25	20.36	20.35
		50	0	20.28	20.35	20.45

Reduction Power						
LTE Band 26						
BW	MCS Index	Channel		26715	26865	27015
		Frequency (MHz)		816.5	831.5	846.5
5M	QPSK	1	0	22.14	22.26	22.40
		1	12	22.21	22.26	22.43
		1	24	22.06	22.11	22.16
		12	0	22.20	22.34	22.32
		12	6	22.13	22.33	22.25
		12	13	22.02	22.17	22.17
		25	0	22.02	22.16	22.19
	16QAM	1	0	22.24	22.24	22.30
		1	12	22.22	22.36	22.28
		1	24	22.21	22.20	22.17
		12	0	21.14	21.19	21.27
		12	6	20.99	21.06	21.06
		12	13	20.95	21.09	21.09
		25	0	20.96	21.18	21.22
	64QAM	1	0	21.20	21.27	21.40
		1	12	21.22	21.28	21.29
		1	24	21.14	21.16	21.28
		12	0	20.23	20.29	20.35
		12	6	20.21	20.38	20.32
		12	13	20.16	20.30	20.32
		25	0	20.21	20.29	20.32
BW	MCS Index	Channel		26705	26865	27025
3M	QPSK	Frequency (MHz)		815.5	831.5	847.5
		1	0	22.20	22.23	22.27
		1	7	22.23	22.21	22.26
		1	14	22.07	22.14	22.16
		8	0	22.10	22.30	22.19
		8	3	22.18	22.27	22.26
		8	7	22.11	22.20	22.14
	15	0	22.07	22.19	22.17	
	16QAM	1	0	22.17	22.33	22.22
		1	7	22.09	22.26	22.38
		1	14	22.21	22.16	22.20
		8	0	20.99	21.25	21.25
		8	3	21.03	21.11	21.24
		8	7	20.96	21.15	21.07
		15	0	21.03	21.10	21.25
	64QAM	1	0	21.30	21.31	21.36
		1	7	21.09	21.32	21.21
		1	14	21.12	21.21	21.27
		8	0	20.24	20.41	20.39
		8	3	20.24	20.29	20.32
		8	7	20.18	20.24	20.27
15		0	20.19	20.23	20.40	

Reduction Power						
LTE Band 26						
BW	MCS Index	Channel		26697	26865	27033
		Frequency (MHz)		814.7	831.5	848.3
1.4M	QPSK	1	0	22.23	22.31	22.40
		1	2	22.23	22.21	22.31
		1	5	22.04	22.14	22.23
		3	0	22.18	22.27	22.23
		3	1	22.19	22.25	22.21
		3	3	22.05	22.30	22.16
	6	0	21.95	22.12	22.18	
	16QAM	1	0	22.28	22.26	22.33
		1	2	22.07	22.25	22.33
		1	5	22.08	22.14	22.21
		3	0	21.04	21.21	21.16
		3	1	20.92	21.12	21.17
		3	3	21.02	21.08	21.16
	6	0	21.07	21.21	21.11	
	64QAM	1	0	21.23	21.27	21.32
		1	2	21.20	21.33	21.27
		1	5	21.12	21.31	21.29
		3	0	20.28	20.31	20.35
		3	1	20.25	20.29	20.44
		3	3	20.02	20.28	20.25
	6	0	20.18	20.37	20.42	

Reduction Power						
LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	22.15	22.27	22.31
		1	50	22.05	22.17	22.21
		1	99	22.03	22.15	22.19
		50	0	22.15	22.27	22.31
		50	25	22.03	22.15	22.19
		50	50	22.01	22.13	22.17
		100	0	21.96	22.08	22.12
	16QAM	1	0	22.13	22.25	22.29
		1	50	22.11	22.23	22.27
		1	99	22.07	22.19	22.23
		50	0	21.01	21.13	21.17
		50	25	20.99	21.11	21.15
		50	50	20.95	21.07	21.11
		100	0	20.97	21.09	21.13
	64QAM	1	0	21.11	21.23	21.27
		1	50	21.02	21.14	21.18
		1	99	21.00	21.12	21.16
		50	0	20.01	20.13	20.17
		50	25	19.95	20.07	20.11
		50	50	19.90	20.02	20.06
		100	0	19.93	20.05	20.09
BW	MCS Index	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	22.13	22.27	22.22
		1	37	22.05	22.12	22.19
		1	74	21.97	22.07	22.18
		36	0	22.15	22.23	22.26
		36	19	21.93	22.05	22.19
		36	39	21.92	22.13	22.08
		75	0	21.94	22.00	22.07
	16QAM	1	0	22.11	22.23	22.27
		1	37	22.01	22.13	22.19
		1	74	22.01	22.12	22.17
		36	0	20.92	21.13	21.09
		36	19	20.99	21.05	21.13
		36	39	20.95	21.05	21.01
		75	0	20.93	21.05	21.11
	64QAM	1	0	21.06	21.20	21.25
		1	37	20.93	21.11	21.10
		1	74	21.00	21.06	21.15
		36	0	19.92	20.03	20.13
		36	19	19.93	19.99	20.02
		36	39	19.90	19.95	19.98
		75	0	19.88	20.02	20.05

Reduction Power						
LTE Band 66						
BW	MCS Index	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	21.96	22.23	22.30
		1	24	21.94	22.07	22.06
		1	49	21.91	22.01	22.01
		25	0	22.00	22.11	22.20
		25	12	21.97	22.08	22.16
		25	25	21.94	21.92	22.10
		50	0	21.86	21.92	22.08
	16QAM	1	0	21.93	22.13	22.20
		1	24	22.07	22.14	22.04
		1	49	21.89	21.98	22.07
		25	0	20.93	21.00	21.06
		25	12	20.93	20.97	21.11
		25	25	20.93	20.95	21.04
		50	0	20.93	20.94	21.04
	64QAM	1	0	21.01	21.08	21.20
		1	24	20.81	21.02	21.01
		1	49	20.84	20.91	21.11
		25	0	19.85	20.04	20.06
		25	12	19.78	19.93	19.88
		25	25	19.68	19.80	20.04
		50	0	19.77	19.93	20.01
BW	MCS Index	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	21.97	22.11	22.03
		1	12	21.91	22.03	22.06
		1	24	21.92	21.94	22.04
		12	0	21.95	22.06	22.07
		12	6	21.96	21.96	22.10
		12	13	21.84	21.96	21.92
		25	0	21.89	21.96	21.96
	16QAM	1	0	22.12	22.13	22.23
		1	12	21.97	22.07	22.08
		1	24	22.01	22.01	22.01
		12	0	20.84	21.06	21.05
		12	6	20.86	21.00	21.04
		12	13	20.80	20.94	20.95
		25	0	20.86	20.93	20.92
	64QAM	1	0	20.98	21.14	21.20
		1	12	20.85	20.92	20.95
		1	24	20.88	21.03	21.14
		12	0	19.92	20.00	20.00
		12	6	19.77	19.89	20.07
		12	13	19.76	19.97	19.85
		25	0	19.82	19.98	20.03

Reduction Power						
LTE Band 66						
BW	MCS Index	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	21.95	22.19	22.12
		1	7	21.90	22.03	22.12
		1	14	21.84	22.02	22.03
		8	0	22.09	22.14	22.21
		8	3	21.85	22.09	22.03
		8	7	21.90	22.00	21.95
		15	0	21.74	21.93	22.00
	16QAM	1	0	22.01	22.15	22.15
		1	7	21.91	22.17	22.23
		1	14	21.93	22.13	22.17
		8	0	20.90	20.95	21.12
		8	3	20.87	21.03	20.98
		8	7	20.72	20.92	20.99
		15	0	20.83	20.90	21.06
	64QAM	1	0	20.99	21.04	21.23
		1	7	20.98	20.99	21.04
		1	14	20.77	21.03	21.02
		8	0	19.91	20.01	20.03
		8	3	19.84	19.92	19.96
		8	7	19.72	19.97	19.83
		15	0	19.76	19.81	19.90
BW	MCS Index	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	22.05	22.04	22.08
		1	2	21.82	21.99	22.05
		1	5	21.89	21.96	21.88
		3	0	21.95	22.05	22.00
		3	1	21.82	21.94	21.84
		3	3	21.80	22.08	21.98
		6	0	21.83	21.85	21.90
	16QAM	1	0	21.89	22.13	22.07
		1	2	21.94	22.17	22.04
		1	5	21.88	21.91	22.05
		3	0	20.73	20.97	20.96
		3	1	20.80	21.02	20.80
		3	3	20.67	20.93	20.86
		6	0	20.69	20.94	20.90
	64QAM	1	0	20.91	21.08	21.03
		1	2	20.78	21.07	21.06
		1	5	20.83	20.92	20.93
		3	0	19.87	19.99	19.82
		3	1	19.82	19.97	19.78
		3	3	19.68	19.83	19.85
		6	0	19.71	19.86	19.97

Reduction Power								
LTE Band 41								
BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High
		Channel		39750	40185	40620	41055	41490
		Frequency (MHz)		2506	2549.5	2593	2636.5	2680
20M	QPSK	1	0	20.39	20.31	20.55	20.47	20.43
		1	50	20.15	20.01	20.28	20.18	20.11
		1	99	20.01	19.95	20.16	20.01	20.04
		50	0	20.16	20.13	20.37	20.29	20.28
		50	25	19.79	19.81	20.02	19.95	19.92
		50	50	19.68	19.59	19.79	19.65	19.72
		100	0	20.15	20.02	20.31	20.21	20.18
	16QAM	1	0	20.33	20.11	20.54	20.41	20.41
		1	50	20.09	20.05	20.27	20.17	20.15
		1	99	19.95	19.89	20.14	20.05	20.02
		50	0	19.47	19.66	19.75	19.61	19.54
		50	25	19.40	19.59	19.68	19.54	19.47
		50	50	19.27	19.46	19.55	19.41	19.34
		100	0	19.39	19.39	19.59	19.53	19.67
	64QAM	1	0	19.19	19.38	19.47	19.33	19.26
		1	50	19.15	19.14	19.23	19.09	19.02
		1	99	19.03	19.02	19.11	19.07	19.01
		50	0	18.21	18.40	18.49	18.35	18.28
		50	25	18.17	18.36	18.45	18.31	18.24
		50	50	18.13	18.32	18.41	18.27	18.20
		100	0	18.09	18.28	18.37	18.23	18.16
BW	MCS Index	Channel		39725	40173	40620	41068	41515
		Frequency (MHz)		2503.5	2548.3	2593	2637.8	2682.5
15M	QPSK	1	0	20.35	20.29	20.41	20.43	20.43
		1	37	20.07	19.91	20.21	20.17	20.10
		1	74	19.91	19.90	20.09	20.01	19.99
		36	0	19.92	19.91	20.03	19.97	20.01
		36	19	19.75	19.79	19.97	19.90	19.82
		36	39	19.48	19.29	19.64	19.58	19.51
		75	0	20.07	19.96	20.28	20.21	20.16
	16QAM	1	0	20.32	20.21	20.53	20.37	20.43
		1	37	20.12	19.95	20.18	20.15	20.09
		1	74	19.99	19.94	20.11	19.93	19.96
		36	0	19.44	19.63	19.72	19.58	19.51
		36	19	19.37	19.56	19.60	19.51	19.44
		36	39	19.24	19.39	19.52	19.38	19.31
		75	0	19.36	19.55	19.64	19.50	19.43
	64QAM	1	0	19.12	19.31	19.40	19.26	19.19
		1	37	19.08	19.07	19.16	19.02	19.05
		1	74	19.03	19.05	19.04	19.01	19.03
		36	0	18.14	18.33	18.42	18.28	18.21
		36	19	18.10	18.29	18.38	18.24	18.17
		36	39	18.06	18.25	18.34	18.20	18.13
		75	0	18.02	18.21	18.30	18.16	18.09

Reduction Power								
LTE Band 41								
BW	MCS Index	Channel		39700	40160	40620	41080	41540
		Frequency (MHz)		2501	2547	2593	2639	2685
10M	QPSK	1	0	20.26	20.28	20.50	20.39	20.41
		1	24	20.12	19.97	20.14	20.08	19.93
		1	49	19.87	19.79	19.97	19.90	19.99
		25	0	19.89	19.78	20.06	19.87	19.91
		25	12	19.61	19.69	19.98	19.90	19.75
		25	25	19.47	19.25	19.53	19.46	19.45
		50	0	20.04	19.95	20.25	20.14	20.01
	16QAM	1	0	20.23	20.22	20.49	20.33	20.41
		1	24	20.06	19.97	20.17	20.03	19.92
		1	49	19.86	19.81	20.06	19.91	20.01
		25	0	19.40	19.59	19.68	19.54	19.47
		25	12	19.33	19.52	19.61	19.47	19.40
		25	25	19.20	19.27	19.48	19.34	19.27
		50	0	19.32	19.51	19.60	19.46	19.39
	64QAM	1	0	19.16	19.35	19.44	19.30	19.23
		1	24	19.12	19.11	19.20	19.06	19.03
		1	49	19.01	19.02	19.08	19.04	19.02
		25	0	18.18	18.37	18.46	18.32	18.25
		25	12	18.14	18.33	18.42	18.28	18.21
		25	25	18.07	18.26	18.35	18.21	18.14
		50	0	18.06	18.25	18.34	18.20	18.13
BW	MCS Index	Channel		39675	40148	40620	41093	41565
		Frequency (MHz)		2498.5	2545.8	2593	2640.3	2687.5
5M	QPSK	1	0	20.24	20.16	20.46	20.28	20.31
		1	12	20.11	19.98	20.24	20.08	19.92
		1	24	19.86	19.91	20.09	19.97	19.91
		12	0	19.78	19.85	19.97	19.91	19.91
		12	6	19.75	19.67	19.90	19.78	19.85
		12	13	19.46	19.23	19.51	19.55	19.48
		25	0	20.08	19.94	20.30	20.05	20.07
	16QAM	1	0	20.32	20.14	20.48	20.30	20.33
		1	12	20.08	19.93	20.20	20.01	19.92
		1	24	19.89	19.86	20.04	19.88	19.94
		12	0	19.34	19.53	19.62	19.48	19.41
		12	6	19.27	19.46	19.55	19.41	19.34
		12	13	19.14	19.27	19.42	19.28	19.21
		25	0	19.26	19.45	19.54	19.40	19.33
	64QAM	1	0	19.24	19.16	19.44	19.33	19.30
		1	12	19.01	18.89	19.21	19.00	19.01
		1	24	18.83	18.88	19.06	18.93	18.91
		12	0	18.22	18.41	18.50	18.36	18.29
		12	6	18.15	18.34	18.43	18.29	18.22
		12	13	18.02	18.21	18.30	18.16	18.09
		25	0	18.14	18.33	18.42	18.28	18.21

WLAN2.4GHz Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11b	1	2412	15.22
	6	2437	15.45
	11	2462	15.3
	12	2467	15.2
	13	2472	15.43



WLAN 5.3GHz Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ac VHT160	50	5250	13.97

WLAN 5.6GHz Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ac VHT160	114	5570	13.76

WLAN 5.8GHz Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ac VHT80	155	5775	13.84

WLAN2.4GHz Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11b	1	2412	15.24
	6	2437	15.3
	11	2462	15.04
	12	2467	15.22
	13	2472	15.15

Bluetooth Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
BR / EDR	0	2402	10.41
	39	2441	10.87
	78	2480	11.15
LE	0	2402	9.29
	19	2440	9.26
	39	2480	9.16

WLAN 5.3GHz Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ac VHT160	50	5250	13.94

WLAN 5.6GHz Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ac VHT160	114	5570	13.76

WLAN 5.8GHz Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ac VHT80	155	5775	13.73

WLAN2.4GHz Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11b	1	2412	15.43	15.3	18.38
	6	2437	15.41	15.17	18.3
	11	2462	15.36	15.23	18.31
	12	2467	15.2	15.15	18.19
	13	2472	15.31	15.1	18.22

WLAN 5.3GHz Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11ac VHT160	50	5250	13.61	13.66	16.65

WLAN 5.6GHz Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11ac VHT160	114	5570	13.72	13.81	16.78

WLAN 5.8GHz Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11ac VHT80	155	5775	13.82	13.83	16.84

Uplink Carrier Aggregation Scenarios Conducted Power

Configure	Combination	PCC							SCC							Measurement Power		
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Maximum Tune-up Power	MPR Level (dB)	TX Power with UL-CA Active (dBm)
																		Total
Intra Band Contiguous	7C	7	20	QPSK	1	0	20850	2510	7	20	QPSK	1	99	21048	2529.8	23	0-8.5	14.71
					1	99						23	0			22.42		
		7	20	QPSK	1	0	21100	2535	7	20	QPSK	1	99	21298	2554.8	23	0-8.5	14.83
					1	99						23	0			22.54		
		7	20	QPSK	1	0	21152	2540.2	7	20	QPSK	1	99	21350	2560	23	0-8.5	14.60
					1	99						23	0			22.54		
	41C	41	20	QPSK	1	0	39750	2506	41	20	QPSK	1	99	39948	2525.8	23	0-8.5	14.90
					1	99						23	0			22.61		
		41	20	QPSK	1	0	40185	2549.5	41	20	QPSK	1	99	40383	2569.3	23	0-8.5	14.67
					1	99						23	0			22.54		
		41	20	QPSK	1	0	40620	2593	41	20	QPSK	1	99	40818	2612.8	23	0-8.5	14.79
					1	99						23	0			22.49		
		41	20	QPSK	1	0	41055	2636.5	41	20	QPSK	1	99	41253	2656.3	23	0-8.5	14.86
					1	99						23	0			22.66		
		41	20	QPSK	1	0	41292	2660.2	41	20	QPSK	1	99	41490	2680	23	0-8.5	15.14
					1	99						23	0			22.54		

Appendix E. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **B.V. ADT (Auden)**

Certificate No: **D750V3-1013_Aug19**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1013**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **August 23, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	29-May-19 (No. EX3-7349_May19)	May-20
DAE4	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Jeton Kastrati** **Function**
Laboratory Technician

Approved by: **Katja Pokovic** **Technical Manager**

Signature

Issued: August 23, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

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Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.7 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.56 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.62 W/kg ± 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7 Ω - 0.2 j Ω
Return Loss	- 28.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.034 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 23.08.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1013

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.9$ S/m; $\epsilon_r = 42.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07) @ 750 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

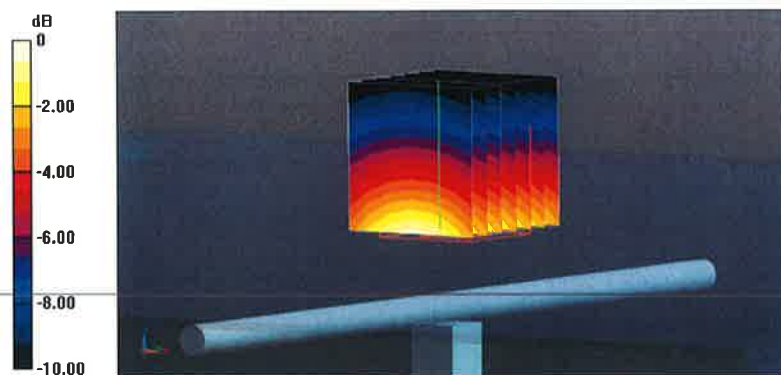
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.83 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.22 W/kg

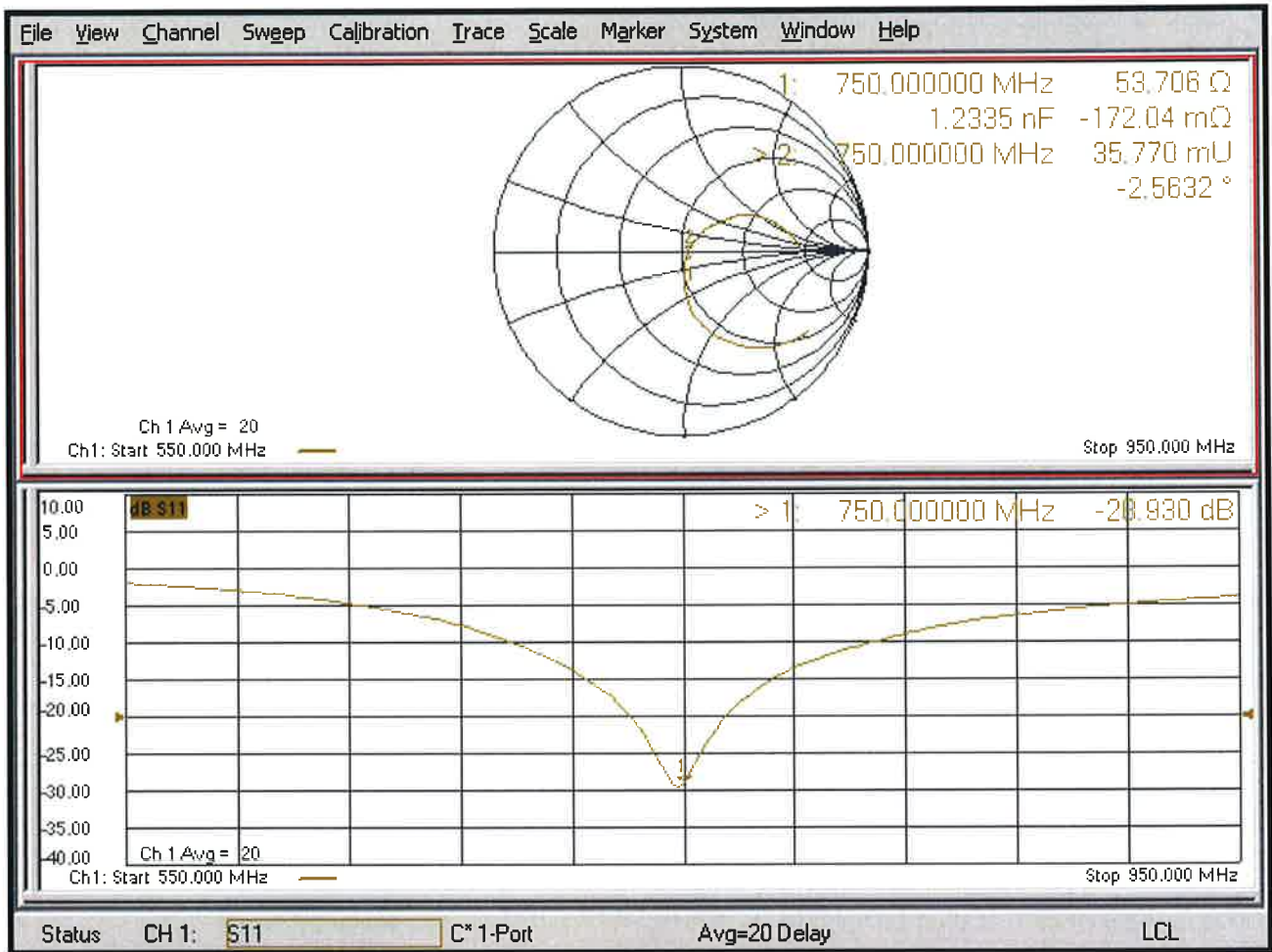
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (measured) = 2.86 W/kg



0 dB = 2.86 W/kg = 4.56 dBW/kg

Impedance Measurement Plot for Head TSL





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **B.V. ADT (Auden)**

Certificate No: **D835V2-4d121_Aug19**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d121**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **August 23, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	29-May-19 (No. EX3-7349_May19)	May-20
DAE4	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Jeton Kastrati** (Name) / **Laboratory Technician** (Function) / *[Signature]* (Signature)

Approved by: **Katja Pokovic** (Name) / **Technical Manager** (Function) / *[Signature]* (Signature)

Issued: August 23, 2019

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Accreditation No.: **SCS 0108**

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Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	42.5 \pm 6 %	0.92 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.61 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.22 W/kg \pm 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω - 2.7 $j\Omega$
Return Loss	- 31.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.395 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 23.08.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d121

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 42.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.89, 9.89, 9.89) @ 835 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

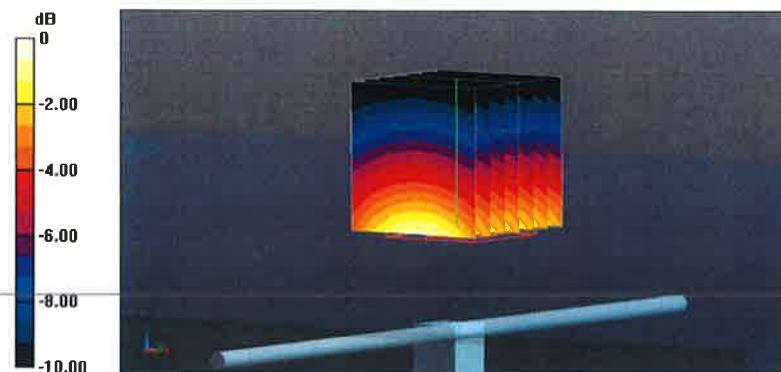
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 63.40 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.63 W/kg

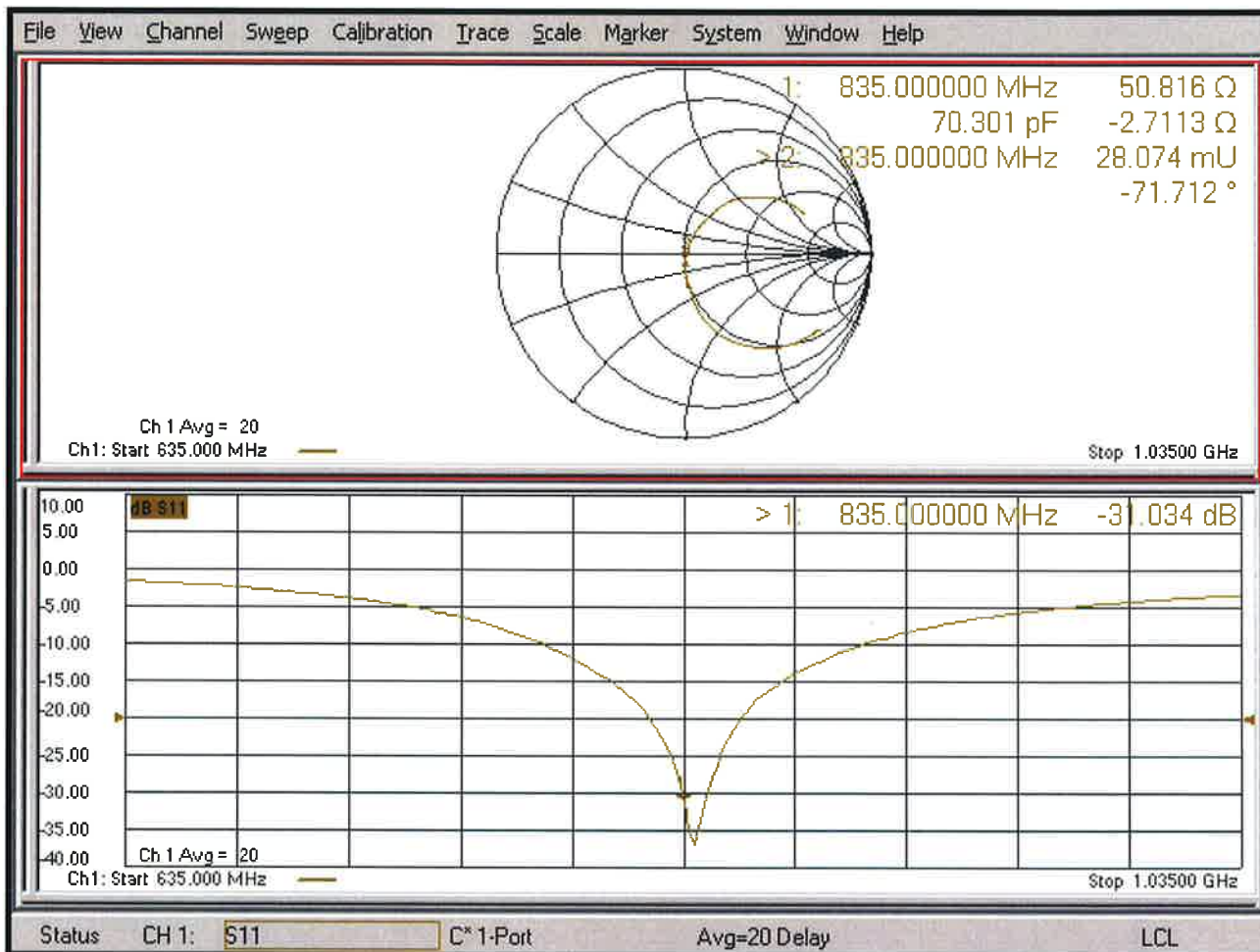
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (measured) = 3.23 W/kg



0 dB = 3.23 W/kg = 5.09 dBW/kg

Impedance Measurement Plot for Head TSL





Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **B.V. ADT (Auden)**

Certificate No: **D1750V2-1055_Aug19**

CALIBRATION CERTIFICATE

Object **D1750V2 - SN:1055**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **August 23, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	29-May-19 (No. EX3-7349_May19)	May-20
DAE4	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: August 23, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	37.0 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.85 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.5 W/kg ± 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω + 1.1 j Ω
Return Loss	- 39.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.221 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 23.08.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1055

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.36$ S/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.67, 8.67, 8.67) @ 1750 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

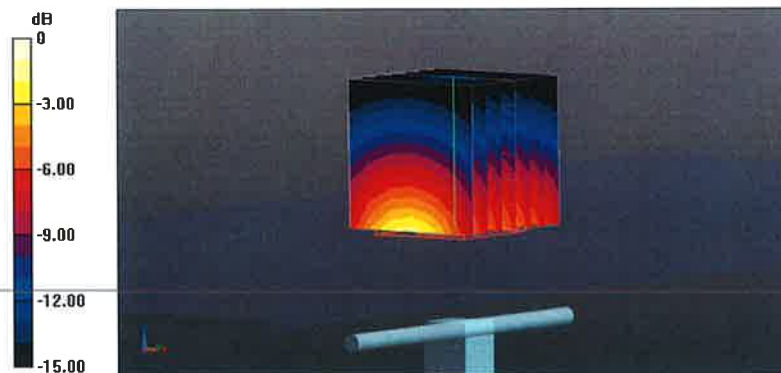
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.5 V/m; Power Drift = 0.06 dB

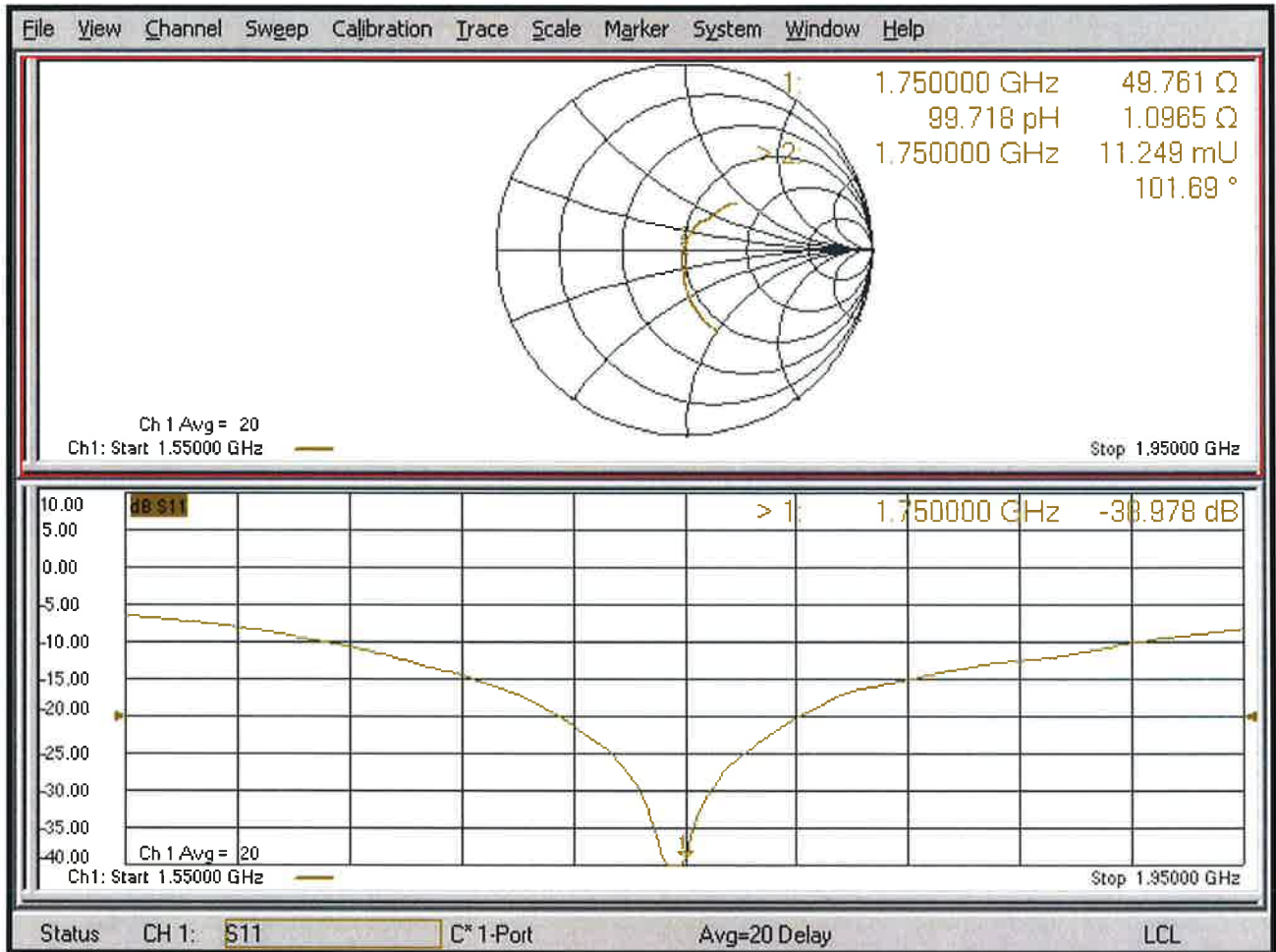
Peak SAR (extrapolated) = 17.0 W/kg

SAR(1 g) = 9.17 W/kg; SAR(10 g) = 4.85 W/kg

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



Impedance Measurement Plot for Head TSL





Accredited by the Swiss Accreditation Service (SAS)
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **B.V. ADT (Auden)**

Certificate No: **D1900V2-5d036_Jan20**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN:5d036**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **January 21, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	31-Dec-19 (No. EX3-7349_Dec19)	Dec-20
DAE4	SN: 601	27-Dec-19 (No. DAE4-601_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 22, 2020

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Accredited by the Swiss Accreditation Service (SAS)

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.3
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	41.4 \pm 6 %	1.39 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	40.3 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.9 W/kg \pm 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω + 5.4 j Ω
Return Loss	- 25.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.195 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 21.01.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d036

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.39$ S/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.6, 8.6, 8.6) @ 1900 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 109.0 V/m; Power Drift = 0.02 dB

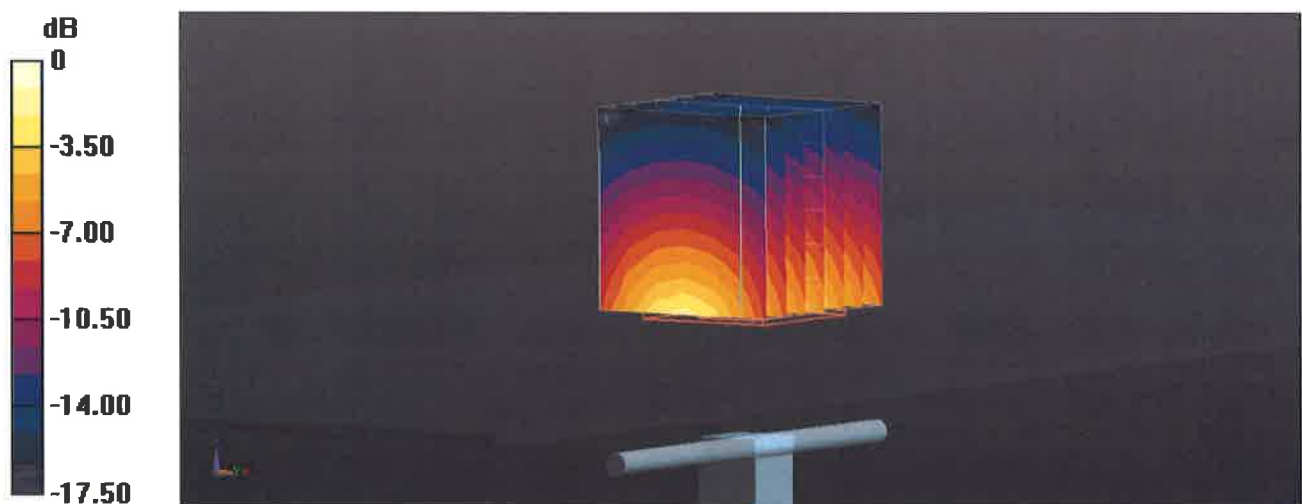
Peak SAR (extrapolated) = 18.6 W/kg

SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.18 W/kg

Smallest distance from peaks to all points 3 dB below = 9.8 mm

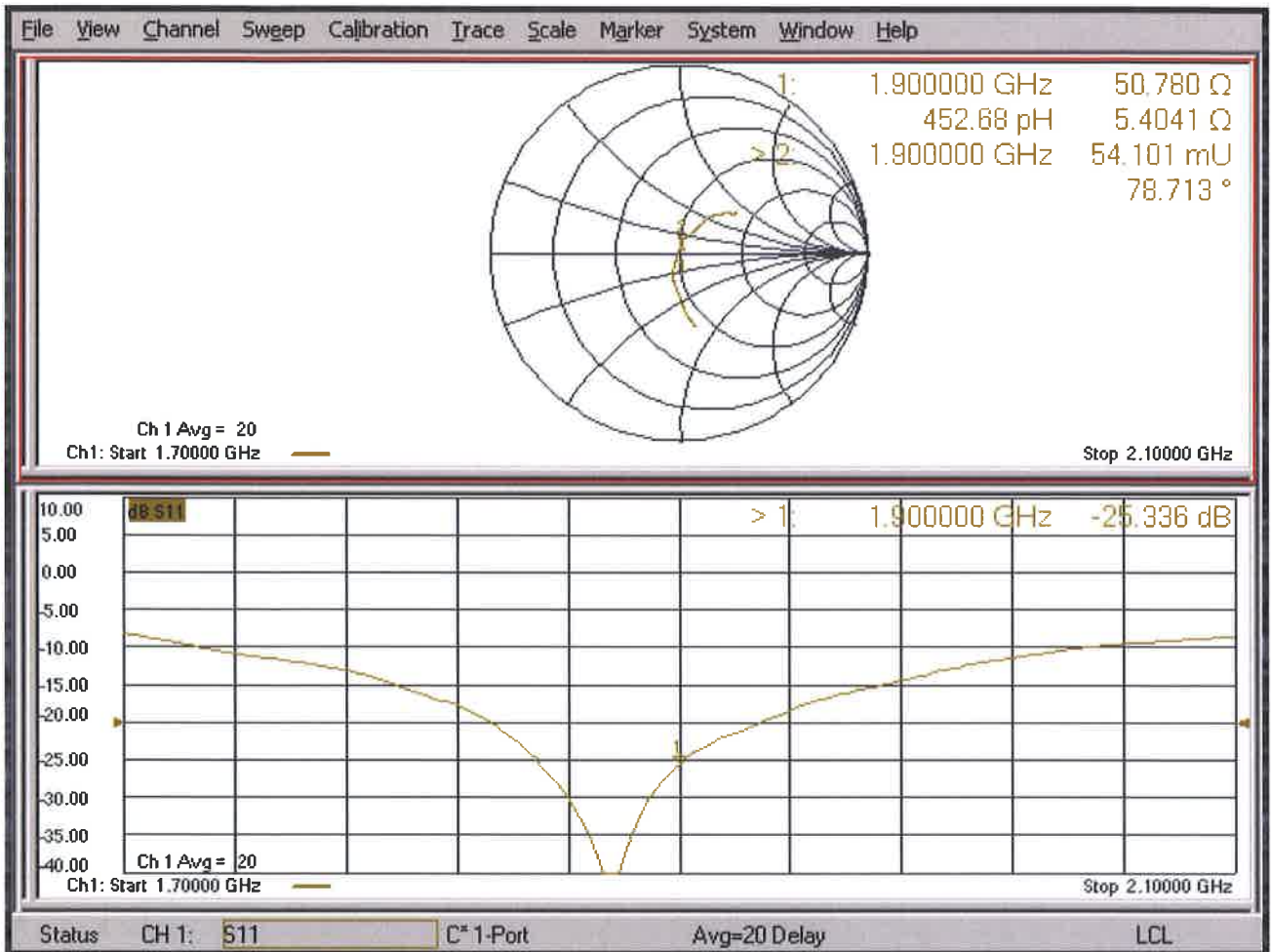
Ratio of SAR at M2 to SAR at M1 = 54.4%

Maximum value of SAR (measured) = 15.5 W/kg



0 dB = 15.5 W/kg = 11.90 dBW/kg

Impedance Measurement Plot for Head TSL





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **B.V. ADT (Auden)**

Certificate No: **D2450V2-737_Aug19**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN:737**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **August 26, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	29-May-19 (No. EX3-7349_May19)	May-20
DAE4	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Michael Weber** **Michael Weber** **Laboratory Technician**

Approved by: **Katja Pokovic** **Katja Pokovic** **Technical Manager**

Signature

Issued: August 26, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.8 ± 6 %	1.83 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.7 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.20 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg ± 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.3 Ω + 4.5 j Ω
Return Loss	- 24.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.162 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

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