

SAR Report

Applicant : 訊崙技術有限公司
Product Type : 手持式行動電話機(LTE/WCDMA FDD 900/2100;
GSM/Bluetooth/WLAN/NFC/WPC)
Trade Name : HUAWEI
Model Number : ELS-NX9
Applicable Standard : CNS 14959 / CNS 14958-1
ANSI/IEEE C95.1
IEEE 1528 / IEC 62209-1 / PLMN01 / PLMN08 / PLMN10
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Revision History

Rev.	Issued Date	Revisions	Revised By
00	Feb. 24, 2020	Initial Issue	Jennifer Liu
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1. General Information

1.1 Reference Applicable Standard

Standard	Description	Version
ANSI/IEEE C95.1	American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York.	2005
IEEE 1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques.	2013
IEC 62209-1	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)	2016
CNS 14959	Limit for exposing to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)	2005-12
CNS 14958-1	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)	2005-12
PLMN01	GSM900 及 DCS1800 行動電話機技術規範	101 年 5 月 09 日
PLMN08	第三代行動通信終端設備技術規範	107 年 8 月 14 日
PLMN10	行動寬頻業務終端設備技術規範	107 年 3 月 12 日

1.2 Test Site Environment

Items	Required (IEEE 1528-2013)	Actual
Temperature (°C)	18-25	21-23

1.3 Laboratory Information

Issue Location

Site Name: A Test Lab Techno Corp.

<http://www.atl-lab.com.tw/e-index.htm>

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2. Description of Equipment under Test (EUT)

Applicant	訊崙技術有限公司 臺北市內湖區洲子街 55、57 號 3 樓				
Manufacturer	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, China				
Product Type	手持式行動電話機(LTE/WCDMA FDD 900/2100; GSM/Bluetooth/WLAN/NFC/WPC)				
Trade Name	HUAWEI				
Model Number	ELS-NX9				
IMEI No.	IMEI 1: 861968040081510, IMEI 2: 861968040081511				
Test Device	Production Unit				
TX Frequency	890.2 - 914.8 MHz (PGSM 900) 1922.4 - 1977.6 MHz (WCDMA Band 1) 887.4 - 912.6 MHz (WCDMA Band 8) 1920 - 1980 MHz LTE Band 1 (BW 5, 10, 15, 20 MHz) 1710 - 1785 MHz LTE Band 3 (BW 1.4, 3, 5, 10, 15, 20 MHz) 2500 - 2570 MHz LTE Band 7 (BW 5, 10, 15, 20 MHz) 885 - 915 MHz LTE Band 8 (BW 1.4, 3, 5, 10 MHz) 703 - 748 MHz LTE Band 28 (BW 3, 5, 10, 15, 20 MHz) 2570 - 2620 MHz LTE Band 38 (BW 5, 10, 15, 20 MHz) 2500 - 2690 MHz LTE Band 41 (BW 5, 10, 15, 20 MHz)				
Max. Avg. Conducted Power	2.046	W /	33.11	dBm	PGSM 900
	0.241	W /	23.82	dBm	WCDMA Band 1
	0.256	W /	24.09	dBm	WCDMA Band 8
	0.278	W /	24.44	dBm	LTE Band 1
	0.275	W /	24.39	dBm	LTE Band 3
	0.219	W /	23.40	dBm	LTE Band 7
	0.267	W /	24.27	dBm	LTE Band 8
	0.246	W /	23.91	dBm	LTE Band 28
	0.213	W /	23.29	dBm	LTE Band 38
	0.197	W /	22.95	dBm	LTE Band 41
Max. SAR Measurement	1.28 W/kg Head SAR				
Antenna Type	IFA Antenna				
Device Category	Portable				
RF Exposure Environment	General Population / Uncontrolled				
Battery Option	Standard				
Application Type	Certification				

Note:

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment / general population exposure limits specified in Std. C95.1-2005 & CNS14959 & PLMN10 and had been tested in accordance with the measurement procedures specified in IEEE Std. 1528-2013 and IEC 62209-1.

3. **Introduction**

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user. The test procedures, as described in IEC 62209-1 / CNS14959 / PLMN10 were employed and they specify the maximum exposure limit of 2.0W/kg as averaged over any 10 gram of tissue. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment are included within this test report.

4. **SAR Definition**

Specific Absorption Rate (SAR) is defined as 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). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

SAR Mathematical Equation

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

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 = conductivity of the tissue (S/m)

ρ = mass density of the tissue (kg/m³)

E = RMS electric field strength (V/m)

*** Note :**

The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane [2]

5. **SAR Measurement Setup**

These measurements were performed with the automated near-field scanning system DASY52 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ± 0.025 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length = 300 mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick) and remote control, and is used to drive the robot motors. The Measurement Server is based on a PC/104 CPU board with a 166 MHz low-power Pentium, 32 MB chipdisk and 64MB RAM. The necessary circuits for communication with either the DAE4 electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY52 I/O-board, which is directly connected to the PC/104 bus of the CPU board. The PC consists of the Intel Pentium 4 2.4 GHz computer with Windows XP system and SAR Measurement Software DASY52, Post Processor SEMCAD, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection...etc. is connected to the Electro-optical converter (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the Measurement Server.

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in [3] .

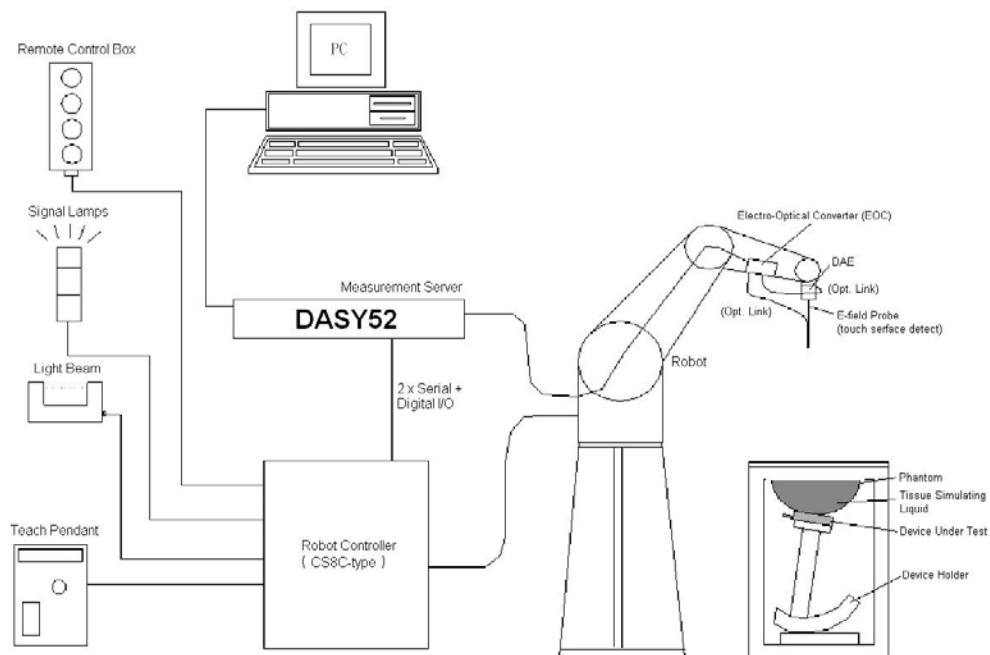


Figure 1. SAR Lab Test Measurement Setup

6. System Components

6.1 DASY52 E-Field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration [3] and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY52 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

6.1.1 E-Field Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.q., glycol)
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at specific frequencies (accuracy $\pm 8\%$) calibration for other liquids and frequencies upon request
Frequency	10 to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation normal probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surface(ET3DV6 only)
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

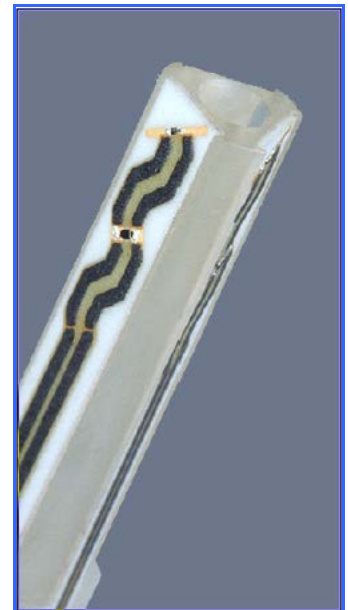


Figure 2.
E-field Probe



Figure 3.
Probe setup on robot

6.1.2 E-Field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure described in [4] with accuracy better than $\pm 10 \%$. The spherical isotropy was evaluated with the procedure described in [5] and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

Where :

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

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

Where :

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

6.2 Data Acquisition Electronic (DAE) System

Cell Controller

Processor : Intel Core i7-6700
Clock Speed : 3.4 GHz
Operating System : Windows 8.1 Professional

Data Converter

Features : Signal Amplifier, multiplexer, A/D converter, and control logic
Software : DASY52 v52.8.8.1258 & SEMCAD v14.6.10
Connecting Lines : Optical downlink for data and status info
Optical uplink for commands and clock

6.3 Robot

Positioner : Stäubli Unimation Corp. Robot Model: TX90XL
Repeatability : ± 0.025 mm
No. of Axis : 6

6.4 Measurement Server

Processor : PC/104 with a 166 MHz low-power Pentium
I/O-board : Link to DAE4
16-bit A/D converter for surface detection system
Digital I/O interface
Serial link to robot
Direct emergency stop output for robot

6.5 Device Holder for Transmitters

In combination with the SAM Twin Phantom V4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeat ably positioned according to the IEEE SCC34-SC2 and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, and flat phantom).

*** Note :** A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations [6] . To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Larger DUT cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.



Figure 4. Device Holder

6.6 Phantom - SAM v4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2013 and IEC 62209-1 2005. 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 manually teaching three points with the robot.

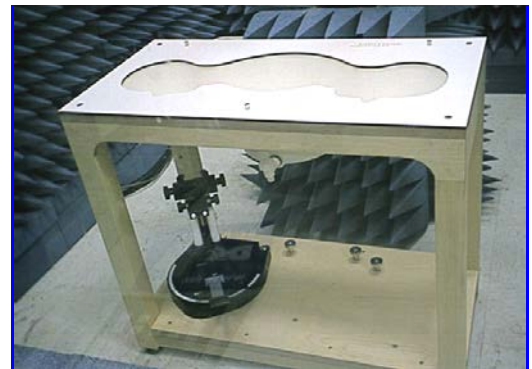


Figure 5. SAM Twin Phantom

Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	810×1000×500 mm (H×L×W)

Table 1. Specification of SAM v4.0

6.7.1 Data Storage

6.7.2 Data Evaluation

Media parameters : - Conductivity σ
- Density ρ

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

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

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

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

E-field probes : $E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$

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

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

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

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

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with **SAR** = local specific absorption rate in mW/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm³

*** Note :** That the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

The power flow density is calculated assuming the excitation field to be a free space field.

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

with ***Ppwe*** = equivalent power density of a plane wave in mW/cm²

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

7. Test Equipment List

Testing Engineer: Kris Pan , Jason Tsao

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Cal. Date	Cal.Period
SPEAG	750MHz System Validation Kit	D750V3	1004	2019/11/20	1 year
SPEAG	900MHz System Validation Kit	D900V2	073	2019/04/23	1 year
SPEAG	1800MHz System Validation Kit	D1800V2	265	2019/04/20	1 year
SPEAG	1950MHz System Validation Kit	D1950V3	1117	2019/04/19	1 year
SPEAG	2600MHz System Validation Kit	D2600V2	1007	2019/10/24	1 year
SPEAG	Dosimetric E-Field Probe	EX3DV4	3847	2019/05/16	1 year
SPEAG	Data Acquisition Electronics	DAE4	541	2019/03/19	1 year
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Phantom	SAM V4.0	TP-1009	NCR	
SPEAG	Robot	Staubli TX90XL	F16/54FTA1/A/01	NCR	
SPEAG	Software	DASY52 V52.10 (3)	N/A	NCR	
SPEAG	Software	SEMCAD X V14.6.10(7331)	N/A	NCR	
R&S	Wireless Communication Test Set	CMU200	112387	2019/03/11	1 year
Anritsu	Radio Communication Analyzer	MT8820C	6201342039	2019/12/11	1 year
SPEAG	Network Analyzer	DAKS_VNA R140	0010318	2019/05/03	1 year
SPEAG	Dielectric Probe Kit	DAKS-3.5	1101	2019/05/02	1 year
HILA	Digital Thermometer	TM-906A	1500033	2019/10/28	1 year
Agilent	Power Sensor	8481H	3318A20779	2019/06/11	1 year
Agilent	Power Meter	EDM Series E4418B	GB40206143	2019/06/11	1 year
Agilent	Signal Generator	E8257D	MY44320425	2019/03/05	1 year
Agilent	Dual Directional Coupler	778D	50334	NCR	
Woken	Dual Directional Coupler	0100AZ20200801O	11012409517	NCR	
Mini-Circuits	Power Amplifier	EMC014225P	980292	NCR	
Mini-Circuits	Power Amplifier	EMC2830P	980293	NCR	
Aisi	Attenuator	IEAT 3dB	N/A	NCR	

Table 2. Test Equipment List

8. Tissue Simulating Liquids

The Head and Muscle mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide is added and visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

Ingredient	Frequency				
	HSL750 - Head	HSL900 - Head	HSL1800 - Head	HSL1950 - Head	HSL2600 - Head
	(698 - 750 MHz)	(800 - 1000 MHz)	(1700 - 2000 MHz)	(1920 - 1978 MHz)	(2500 - 2600 MHz)
Water	49.23 %	51.07 %	54.88 %	55.27 %	55.67 %
HEC	0.27 %	0.23 %	0 %	0 %	0 %
Sugar	48.93 %	47.31 %	0 %	0 %	0 %
Preventol	0.29 %	0.24 %	0 %	0 %	0 %
Salt	1.28 %	1.15 %	0.21 %	0.26 %	0.29 %
Glycol monobutyl	0 %	0 %	44.91 %	44.47 %	44.04 %

Table 3. Recipes for Head Tissue Simulating Liquids

Target Frequency	Head	
(MHz)	ϵ_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 - 2000	40.0	1.40
2450	39.2	1.80
3000	38.5	2.40
5800	35.3	5.27
(ϵ_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m ³)		
Table 4. Tissue dielectric parameters for head phantoms		

9. **Measurement Process**

9.1 **Device and Test Conditions**

The device was put in operation using the **R&S CMU200** or **Agilent E5515C (8960) wireless Communication Test Set**. Communication between device and tester was established by air-link in order to simulate the actual usage as close as possible. The spatial peak SAR values were assessed for the lowest, middle and highest channels defined by **PGSM 900** (#01=890.2 MHz, #62=902.4 MHz, #124=914.8 MHz) and **WCDMA BAND 1** (#9612=1922.4 MHz, #9750=1950.0 MHz, #9888=1977.6 MHz) and **WCDMA BAND 8** (#2737= 887.4 MHz, #2800= 900.0 MHz, #2863= 912.6 MHz) systems. Power level was set to its maximum, i.e., **PGSM 900** nominal maximum output power class 4 (PCL 5, 33 dBm) and **WCDMA BAND 1** nominal maximum output power class 3 and **WCDMA BAND 8** nominal maximum output power class 3. These parameters will need to be replaced for the individual phone tested. All SAR measurements for LTE were performed using the **Anritsu MT8820C**. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements. Configure the base station to support LTE tests, and set channel, RB allocation number, RB allocation offset, and send continuously up power control commands to the device. MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

9.2 System Performance Check

9.2.1 Symmetric Dipoles for System Validation

Construction

Symmetrical dipole with 1/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with brain simulating solutions. Includes distance holder and tripod adaptor. Calibrated SAR value for specified position and input power at the flat phantom in brain simulating solutions.

Frequency 750, 900, 1800, 1950, 2600 MHz

Return Loss > 20 dB at specified validation position

Power Capability > 100 W ($f < 1$ GHz); > 40 W ($f > 1$ GHz)

Options

Dipoles for other frequencies or solutions and other calibration conditions are available upon request

Dimensions

D750V3 : Dipole length 177 mm; overall height 300 mm

D900V2 : Dipole length 149 mm; overall height 330 mm

D1800V2 : Dipole length 72 mm; overall height 300 mm

D1950V3 : Dipole length 62 mm; overall height 300 mm

D2600V2 : Dipole length 62 mm; overall height 300 mm



Figure 6. Validation Kit

9.2.2 Validation

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$.

Mixture Type	Frequency (MHz)	Power	Probe	Dipole	SAR _{1g} (W/Kg)	Normalize to 1 Watt 1 g (W/Kg)	1 W Target SAR _{1g} (W/Kg)	SAR _{10g} (W/Kg)	Normalize to 1 Watt 10 g (W/Kg)	1 W Target SAR _{10g} (W/Kg)	Difference percentage 1 g	Difference percentage 10 g	Date
			Model / Serial No.	Model / Serial No.									
Head	750	250 mW	EX3DV4-SN3847	D750V3 – SN1004	2.15	8.6	8.42	1.42	5.68	5.61	2.1%	1.2%	Feb. 15, 2020
Head	750	250 mW	EX3DV4-SN3847	D750V3 – SN1004	2.14	8.56	8.42	1.36	5.44	5.61	1.6%	-3.1%	Feb. 18, 2020
Head	900	250 mW	EX3DV4-SN3847	D900V2 – SN073	2.63	10.52	10.80	1.67	6.68	7.11	-2.7%	-6.4%	Feb. 15, 2020
Head	900	250 mW	EX3DV4-SN3847	D900V2 – SN073	2.66	10.64	10.80	1.7	6.8	7.11	-1.5%	-4.6%	Feb. 18, 2020
Head	1800	250 mW	EX3DV4-SN3847	D1800V2 – SN265	9.61	38.44	39.50	5.09	20.36	20.40	-2.8%	-0.2%	Feb. 14, 2020
Head	1800	250 mW	EX3DV4-SN3847	D1800V2 – SN265	9.94	39.76	39.50	5.27	21.08	20.40	0.7%	3.2%	Feb. 17, 2020
Head	1950	250 mW	EX3DV4-SN3847	D1950V3 – SN1117	9.69	38.76	40.80	4.94	19.76	20.70	-5.3%	-4.8%	Feb. 14, 2020
Head	1950	250 mW	EX3DV4-SN3847	D1950V3 – SN1117	9.48	37.92	40.80	4.88	19.52	20.70	-7.6%	-6.0%	Feb. 17, 2020
Head	2600	250 mW	EX3DV4-SN3847	D2600V2 – SN1007	14.1	56.4	56.00	6.24	24.96	24.80	0.7%	0.6%	Feb. 14, 2020
Head	2600	250 mW	EX3DV4-SN3847	D2600V2 – SN1007	13.7	54.8	56.00	6.15	24.6	24.80	-2.2%	-0.8%	Feb. 17, 2020

9.3 Dosimetric Assessment Setup

9.3.1 Handset Test Position - Head Position

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the “N-F” line defined along the base of the ear spacer that contains the “ear reference point”. For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The “test device reference point” is aligned to the “ear reference point” on the head phantom and the “vertical centerline” is aligned to the “phantom reference plane”. This is called the “initial ear position”. While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR :

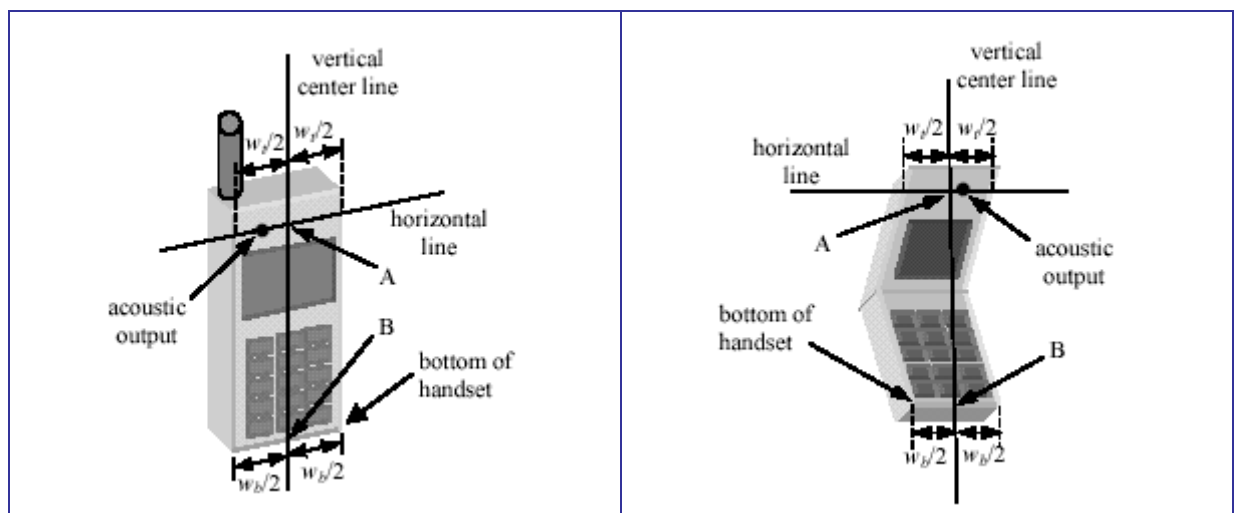


**Figure 7. Handset vertical and horizontal Reference Lines
- Fixed Case & Clam Shell**

- 1) “Cheek/Touch Position” - the device is brought toward the mouth of the head phantom by pivoting against the “ear reference point” or along the “N-F” line for the SCC-34/SC-2 head phantom.

This test position is established:

- i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- ii) (Or) when any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms - when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touch the cheek of the phantom or breaks its last contact from the ear spacer.

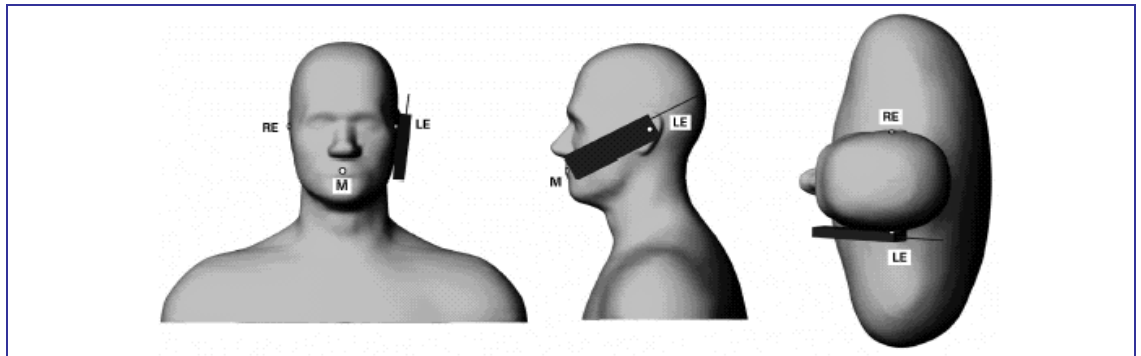


Figure 8. Phone Position 1, Cheek or Touch Position

- 2) “Ear/Tilt Position” - With the handset aligned in the “Cheek/Touch Position”:
- i) If the earpiece of the handset is not in full contact with the phantom’s ear spacer (in the “Cheek/Touch position”) and the peak SAR location for the “Cheek/Touch” position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the “initial ear position” by rotation it away from the mouth until the earpiece is in full contact with the ear spacer.
 - ii) (Otherwise) the handset should be moved (translated) away from the cheek perpendicular to the line passes through both “ear reference points” (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3cm. While it is in this position, the handset is tilted away from the mouth with respect to the “test device reference point” by 15°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both “ear reference points” until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

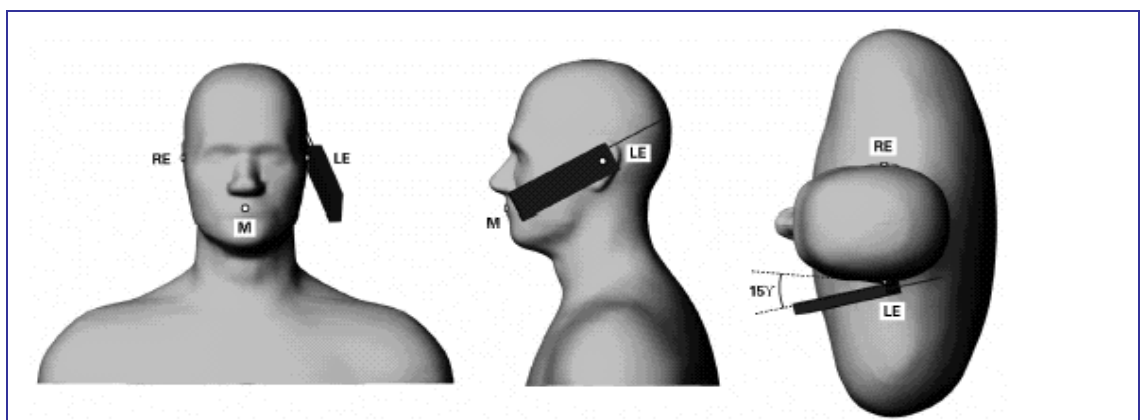


Figure 9. Phone Position 2, Tilted Position

9.3.2 Measurement Procedures

The evaluation was performed with the following procedures :

Surface Check :

A surface checks job gathers data used with optical surface detection. It determines the distance from the phantom surface where the reflection from the optical detector has its peak. Any following measurement jobs using optical surface detection will then rely on this value. The surface check performs its search a specified number of times, so that the repeatability can be verified.

Reference :

The reference job measures the field at a specified reference position, at 2 mm from the selected section's grid reference point.

Area Scan :

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines can find the maximum locations even in relatively coarse grids. When an area scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. Any following zoom scan within the same procedure will then perform fine scans around these maxima. The area covered the entire dimension of the EUT and the horizontal grid spacing was 15 mm × 15 mm.

Zoom Scan :

Zoom scans are used to assess the highest averaged SAR for cubic averaging volumes with 1 g and 10 g of simulated tissue. The zoom scan measures 5 x 5 x 7 points in a 32 x 32 x 30 mm cube whose base faces are centered around the maxima returned from a preceding area scan within the same procedure.

Drift :

The drift job measures the field at the same location as the most recent reference job within the same procedure, with the same settings. The drift measurement gives the field difference in dB from the last reference measurement. Several drift measurements are possible for each reference measurement. This allows monitoring of the power drift of the device in the batch process. If the value changed by more than 5 %, the evaluation was repeated.

9.4 Spatial Peak SAR Evaluation

The DASY52 software includes all numerical procedures necessary to evaluate the spatial peak SAR values. Based on the Draft: SCC-34, SC-2, WG-2 - Computational Dosimetry, IEEE P1529/D0.0 (Draft Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) Associated with the Use of Wireless Handsets - Computational Techniques), a new algorithm has been implemented. The spatial-peak SAR can be computed over any required mass.

The base for the evaluation is a "cube" measurement in a volume of (32x32x30) mm³ (5x5x7 points). The measured volume must include the 1 g and 10 g 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. If the 10 g cube or both cubes are not entirely inside the measured volumes, the system issues a warning regarding the evaluated spatial peak values within the Postprocessing engine (SEMCAD). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location.

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

Interpolation and Extrapolation

The probe is calibrated at the center of the dipole sensors which is located 1 to 2.7 mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY52, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search and SAR extrapolation routines. The interpolation, Maxima Search and extrapolation routines are all based on the modified Quadratic Shepard's method [7].

10. **Measurement Uncertainty**

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR to be less than $\pm 30\%$ [8] .

According to Std. C95.3[9], the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ± 1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ± 2 dB can be expected.

According to CENELEC [10] , typical worst-case uncertainty of field measurements is ± 5 dB. For well-defined modulation characteristics the uncertainty can be reduced to ± 3 dB.

Decision Rule

- ☒ Uncertainty is not included.
- ☐ Uncertainty is included.

Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	c_i (1 g)	c_i (10 g)	Std. Unc. (1-g)	Std. Unc. (10-g)	V_i or V_{eff}
Measurement System									
u1	Probe Calibration ($k=1$)	$\pm 6.1 \%$	Normal	1	1	1	$\pm 6.1 \%$	$\pm 6.1 \%$	∞
u2	Axial Isotropy	$\pm 4.7 \%$	Rectangular	1.732	0.7	0.7	$\pm 1.9 \%$	$\pm 1.9 \%$	∞
u3	Hemispherical Isotropy	$\pm 9.6 \%$	Rectangular	1.732	0.7	0.7	$\pm 3.9 \%$	$\pm 3.9 \%$	
u4	Boundary Effect	$\pm 1.0 \%$	Rectangular	1.732	1	1	$\pm 0.6 \%$	$\pm 0.6 \%$	∞
u5	Linearity	$\pm 4.7 \%$	Rectangular	1.732	1	1	$\pm 2.7 \%$	$\pm 2.7 \%$	∞
u6	System Detection Limit	$\pm 0.25 \%$	Rectangular	1.732	1	1	$\pm 0.1 \%$	$\pm 0.1 \%$	∞
u7	Readout Electronics	$\pm 0.3 \%$	Normal	1	1	1	$\pm 0.3 \%$	$\pm 0.3 \%$	∞
u8	Response Time	$\pm 0.0 \%$	Rectangular	1.732	1	1	$\pm 0.0 \%$	$\pm 0.0 \%$	∞
u9	Integration Time	$\pm 2.6 \%$	Rectangular	1.732	1	1	$\pm 1.5 \%$	$\pm 1.5 \%$	∞
u10	RF Ambient Noise	$\pm 3.0 \%$	Rectangular	1.732	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u11	RF Ambient Reflections	$\pm 3.0 \%$	Rectangular	1.732	1	1	$\pm 1.7 \%$	$\pm 1.7 \%$	∞
u12	Probe Positioner	$\pm 0.02 \%$	Rectangular	1.732	1	1	$\pm 0.01 \%$	$\pm 0.01 \%$	∞
u13	Probe Positioning	$\pm 0.4 \%$	Rectangular	1.732	1	1	$\pm 0.2 \%$	$\pm 0.2 \%$	∞
u14	Max. SAR Evaluation	$\pm 2.0 \%$	Rectangular	1.732	1	1	$\pm 1.2 \%$	$\pm 1.2 \%$	∞
Test sample Related									
u15	Test sample Positioning	$\pm 2.9 \%$	Normal	1	1	1	$\pm 2.9 \%$	$\pm 2.9 \%$	145
u16	Device Holder Uncertainty	$\pm 3.6 \%$	Normal	1	1	1	$\pm 3.6 \%$	$\pm 3.6 \%$	7
u17	SAR drift measurement	$\pm 5.0 \%$	Rectangular	1.732	1	1	$\pm 2.9 \%$	$\pm 2.9 \%$	∞
Phantom and Tissue Parameters									
u18	Phantom Uncertainty	$\pm 6.1 \%$	Rectangular	1.732	1	1	$\pm 3.5 \%$	$\pm 3.5 \%$	∞
u19	Liquid Conductivity (Target)	$\pm 5.0 \%$	Rectangular	1.732	0.78	0.71	$\pm 2.3 \%$	$\pm 2.0 \%$	∞
u20	Liquid Conductivity (Measurement)	$\pm 4.8 \%$	Rectangular	1.732	0.78	0.71	$\pm 2.2 \%$	$\pm 2.0 \%$	∞
u21	Liquid Permittivity (Target)	$\pm 5.0 \%$	Rectangular	1.732	0.23	0.26	$\pm 0.7 \%$	$\pm 0.8 \%$	∞
u22	Liquid Permittivity (Measurement)	$\pm 4.8 \%$	Rectangular	1.732	0.23	0.26	$\pm 0.6 \%$	$\pm 0.7 \%$	∞
Combined standard uncertainty			RSS	-			$\pm 11.2 \%$	$\pm 11.2 \%$	642
Expanded uncertainty (95 % CONFIDENCE LEVEL)			$k=2$	-			$\pm 22.4 \%$	$\pm 22.3 \%$	

Table 5. Uncertainty Budget for frequency range 300 MHz to 3 GHz

11. SAR Test Results Summary

11.1 Test Results

Top Antenna							
PGSM 900 MHz SAR Test Results - Head							
Ambient		Temperature (°C) : 22 ± 2			Relative HUMIDITY (%) : 40-70		
Liquid		Liquid Temperature (°C) : 22			Depth of liquid (cm) : 15		
		Mixture Type : HSL900					
		Conductivity : 0.972			Dielectric Constant : 40.673		
Measurement		Duty Cycle : 1:8.3			Probe S/N : 3847		
Frequency		Test Mode	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz						
62	902.4	Voice	Right-Cheek	0	0.24	0.240	Ant Upper
62	902.4	Voice	Right-Tilted	0	0.047	0.047	Ant Upper
62	902.4	Voice	Left-Cheek	0	0.362	0.362	Ant Upper
1	890.2	Voice	Left-Cheek	0	0.275	0.275	Ant Upper
124	914.8	Voice	Left-Cheek	0	0.382	0.382	Ant Upper
62	902.4	Voice	Left-Tilted	0	0.047	0.047	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959				Head 2.0 W/kg Averaged over 10 gram			

WCDMA Band 1 SAR Test Results - Head							
Ambient		Temperature (°C) : 22 ± 2			Relative HUMIDITY (%) : 40-70		
Liquid		Liquid Temperature (°C) : 22			Depth of liquid (cm) : 15		
		Mixture Type : HSL1950					
		Conductivity : 1.39			Dielectric Constant : 39.654		
Measurement		Duty Cycle : 1: 1			Probe S/N : 3847		
Frequency		Modulation or Sub-Test	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz						
9888	1977.6	RMC12.2K	Right-Cheek	0	0.983	0.983	Ant Upper
9750	1950	RMC12.2K	Right-Cheek	0	1.01	1.010	Ant Upper
9612	1922.4	RMC12.2K	Right-Cheek	0	1.13	1.130	Ant Upper
9888	1977.6	RMC12.2K	Right-Tilted	0	0.762	0.762	Ant Upper
9888	1977.6	RMC12.2K	Left-Cheek	0	0.456	0.456	Ant Upper
9888	1977.6	RMC12.2K	Left-Tilted	0	0.61	0.610	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959				Head 2.0 W/kg Averaged over 10 gram			

WCDMA Band 8 SAR Test Results - Head							
Ambient		Temperature (°C) : 22 ± 2			Relative HUMIDITY (%) : 40-70		
Liquid		Liquid Temperature (°C) : 22			Depth of liquid (cm) : 15		
		Mixture Type : HSL900					
		Conductivity : 0.972			Dielectric Constant : 40.673		
Measurement		Duty Cycle : 1: 1			Probe S/N : 3847		
Frequency		Modulation or Sub-Test	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz						
2800	900	RMC12.2K	Right-Cheek	0	0.241	0.241	Ant Upper
2800	900	RMC12.2K	Right-Tilted	0	0.05	0.050	Ant Upper
2800	900	RMC12.2K	Left-Cheek	0	0.387	0.387	Ant Upper
2737	887.4	RMC12.2K	Left-Cheek	0	0.289	0.289	Ant Upper
2863	912.6	RMC12.2K	Left-Cheek	0	0.412	0.412	Ant Upper
2800	900	RMC12.2K	Left-Tilted	0	0.048	0.048	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959				Head 2.0 W/kg Averaged over 10 gram			

LTE Band 1 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL1950							
		Conductivity : 1.39				Dielectric Constant : 39.654			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
18300	1950	20M	1	0	Right-Cheek	0	1.16	1.160	Ant Upper
18100	1930	20M	1	0	Right-Cheek	0	1.17	1.170	Ant Upper
18500	1970	20M	1	0	Right-Cheek	0	1.19	1.190	Ant Upper
18300	1950	20M	1	0	Right-Tilted	0	0.909	0.909	Ant Upper
18300	1950	20M	1	0	Left-Cheek	0	0.555	0.555	Ant Upper
18300	1950	20M	1	0	Left-Tilted	0	0.715	0.715	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 3 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL1800							
		Conductivity : 1.432				Dielectric Constant : 40.459			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
19575	1747.5	20M	1	99	Right-Cheek	0	1.22	1.220	Ant Upper
19300	1720	20M	1	99	Right-Cheek	0	1.28	1.280	Ant Upper
19850	1775	20M	1	99	Right-Cheek	0	1.11	1.110	Ant Upper
19575	1747.5	20M	1	99	Right-Tilted	0	1.12	1.120	Ant Upper
19300	1720	20M	1	99	Right-Tilted	0	1.1	1.100	Ant Upper
19850	1775	20M	1	99	Right-Tilted	0	1.09	1.090	Ant Upper
19575	1747.5	20M	1	99	Left-Cheek	0	0.545	0.545	Ant Upper
19575	1747.5	20M	1	99	Left-Tilted	0	0.755	0.755	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 7 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL2600							
		Conductivity : 1.961				Dielectric Constant : 39.224			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
21100	2535	20M	18	82	Right-Cheek	0	1.18	1.180	Ant Upper
20850	2510	20M	18	82	Right-Cheek	0	1.16	1.160	Ant Upper
21350	2560	20M	18	82	Right-Cheek	0	1.13	1.130	Ant Upper
21100	2535	20M	18	82	Right-Tilted	0	1.2	1.200	Ant Upper
20850	2510	20M	18	82	Right-Tilted	0	1.14	1.140	Ant Upper
21350	2560	20M	18	82	Right-Tilted	0	1.26	1.260	Ant Upper
21100	2535	20M	18	82	Left-Cheek	0	0.712	0.712	Ant Upper
21100	2535	20M	18	82	Left-Tilted	0	0.794	0.794	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 8 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL900							
		Conductivity : 0.972				Dielectric Constant : 40.673			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
21650	900	10M	1	49	Right-Cheek	0	0.287	0.287	Ant Upper
21650	900	10M	1	49	Right-Tilted	0	0.056	0.056	Ant Upper
21650	900	10M	1	49	Left-Cheek	0	0.418	0.418	Ant Upper
21550	890	10M	1	49	Left-Cheek	0	0.362	0.362	Ant Upper
21750	910	10M	1	49	Left-Cheek	0	0.454	0.454	Ant Upper
21650	900	10M	1	49	Left-Tilted	0	0.057	0.057	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 28 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL750							
		Conductivity : 0.895				Dielectric Constant : 42.039			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
27435	725.5	20M	18	0	Right-Cheek	0	0.117	0.117	Ant Upper
27435	725.5	20M	18	0	Right-Tilted	0	0.025	0.025	Ant Upper
27435	725.5	20M	18	0	Left-Cheek	0	0.156	0.156	Ant Upper
27310	713	20M	18	0	Left-Cheek	0	0.215	0.215	Ant Upper
27560	738	20M	18	0	Left-Cheek	0	0.358	0.358	Ant Upper
27435	725.5	20M	18	0	Left-Tilted	0	0.024	0.024	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 38 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL2600							
		Conductivity : 1.961				Dielectric Constant : 39.224			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
38000	2595	20M	1	0	Right-Cheek	0	0.792	0.792	Ant Upper
38000	2595	20M	1	0	Right-Tilted	0	0.843	0.843	Ant Upper
37850	2580	20M	1	0	Right-Tilted	0	0.863	0.863	Ant Upper
38150	2610	20M	1	0	Right-Tilted	0	0.868	0.868	Ant Upper
38000	2595	20M	1	0	Left-Cheek	0	0.449	0.449	Ant Upper
38000	2595	20M	1	0	Left-Tilted	0	0.507	0.507	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 41 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL2600							
		Conductivity : 1.961				Dielectric Constant : 39.224			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
40640	2595	20M	18	82	Right-Cheek	0	0.817	0.817	Ant Upper
40640	2595	20M	18	82	Right-Tilted	0	0.903	0.903	Ant Upper
39790	2510	20M	18	82	Right-Tilted	0	0.732	0.732	Ant Upper
41490	2680	20M	18	82	Right-Tilted	0	0.858	0.858	Ant Upper
40640	2595	20M	18	82	Left-Cheek	0	0.47	0.470	Ant Upper
40640	2595	20M	18	82	Left-Tilted	0	0.531	0.531	Ant Upper
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

Bottom Antenna

PGSM 900 MHz SAR Test Results - Head							
Ambient		Temperature (°C) : 22 ± 2			Relative HUMIDITY (%) : 40-70		
Liquid		Liquid Temperature (°C) : 22			Depth of liquid (cm) : 15		
		Mixture Type : HSL900					
		Conductivity : 0.966			Dielectric Constant : 40.454		
Measurement		Duty Cycle : 1:8.3			Probe S/N : 3847		
Frequency		Test Mode	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz						
62	902.4	Voice	Right-Cheek	0	0.15	0.150	Ant Lower
1	890.2	Voice	Right-Cheek	0	0.104	0.104	Ant Lower
124	914.8	Voice	Right-Cheek	0	0.179	0.179	Ant Lower
62	902.4	Voice	Right-Tilted	0	0.03	0.030	Ant Lower
62	902.4	Voice	Left-Cheek	0	0.082	0.082	Ant Lower
62	902.4	Voice	Left-Tilted	0	0.027	0.027	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959				Head 2.0 W/kg Averaged over 10 gram			

WCDMA Band 1 SAR Test Results - Head							
Ambient		Temperature (°C) : 22 ± 2			Relative HUMIDITY (%) : 40-70		
Liquid		Liquid Temperature (°C) : 22			Depth of liquid (cm) : 15		
		Mixture Type : HSL1950					
		Conductivity : 1.394			Dielectric Constant : 39.721		
Measurement		Duty Cycle : 1: 1			Probe S/N : 3847		
Frequency		Modulation or Sub-Test	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz						
9750	1950	RMC12.2K	Right-Cheek	0	0.072	0.072	Ant Lower
9612	1922.4	RMC12.2K	Right-Cheek	0	0.101	0.101	Ant Lower
9888	1977.6	RMC12.2K	Right-Cheek	0	0.078	0.078	Ant Lower
9750	1950	RMC12.2K	Right-Tilted	0	0.052	0.052	Ant Lower
9750	1950	RMC12.2K	Left-Cheek	0	0.058	0.058	Ant Lower
9750	1950	RMC12.2K	Left-Tilted	0	0.031	0.031	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959				Head 2.0 W/kg Averaged over 10 gram			

WCDMA Band 8 SAR Test Results - Head							
Ambient		Temperature (°C) : 22 ± 2			Relative HUMIDITY (%) : 40-70		
Liquid		Liquid Temperature (°C) : 22			Depth of liquid (cm) : 15		
		Mixture Type : HSL900					
		Conductivity : 0.966			Dielectric Constant : 40.454		
Measurement		Duty Cycle : 1: 1			Probe S/N : 3847		
Frequency		Modulation or Sub-Test	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz						
2800	900	RMC12.2K	Right-Cheek	0	0.142	0.142	Ant Lower
2737	887.4	RMC12.2K	Right-Cheek	0	0.122	0.122	Ant Lower
2863	912.6	RMC12.2K	Right-Cheek	0	0.169	0.169	Ant Lower
2800	900	RMC12.2K	Right-Tilted	0	0.032	0.032	Ant Lower
2800	900	RMC12.2K	Left-Cheek	0	0.108	0.108	Ant Lower
2800	900	RMC12.2K	Left-Tilted	0	0.028	0.028	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959				Head 2.0 W/kg Averaged over 10 gram			

LTE Band 1 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL1950							
		Conductivity : 1.394				Dielectric Constant : 39.721			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
18300	1950	10M	1	0	Right-Cheek	0	0.057	0.057	Ant Lower
18050	1925	10M	1	0	Right-Cheek	0	0.123	0.123	Ant Lower
18550	1975	10M	1	0	Right-Cheek	0	0.091	0.091	Ant Lower
18300	1950	10M	1	0	Right-Tilted	0	0.047	0.047	Ant Lower
18300	1950	10M	1	0	Left-Cheek	0	0.037	0.037	Ant Lower
18300	1950	10M	1	0	Left-Tilted	0	0.03	0.030	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 3 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL1800							
		Conductivity : 1.428				Dielectric Constant : 40.395			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
19575	1747.5	1.4M	1	0	Right-Cheek	0	0.046	0.046	Ant Lower
19207	1710.7	1.4M	1	0	Right-Cheek	0	0.1	0.100	Ant Lower
19943	1784.3	1.4M	1	0	Right-Cheek	0	0.078	0.078	Ant Lower
19575	1747.5	1.4M	1	0	Right-Tilted	0	0.012	0.012	Ant Lower
19575	1747.5	1.4M	1	0	Left-Cheek	0	0.029	0.029	Ant Lower
19575	1747.5	1.4M	1	0	Left-Tilted	0	0.021	0.021	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 7 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL2600							
		Conductivity : 1.986				Dielectric Constant : 39.302			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
21100	2535	20M	1	99	Right-Cheek	0	0.043	0.043	Ant Lower
20850	2510	20M	1	99	Right-Cheek	0	0.04	0.040	Ant Lower
21350	2560	20M	1	99	Right-Cheek	0	0.058	0.058	Ant Lower
21100	2535	20M	1	99	Right-Tilted	0	0.036	0.036	Ant Lower
21100	2535	20M	1	99	Left-Cheek	0	0.033	0.033	Ant Lower
21100	2535	20M	1	99	Left-Tilted	0	0.025	0.025	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 8 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL900							
		Conductivity : 0.966				Dielectric Constant : 40.454			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
21650	900	1.4M	1	5	Right-Cheek	0	0.118	0.118	Ant Lower
21507	885.7	1.4M	1	5	Right-Cheek	0	0.103	0.103	Ant Lower
21793	914.3	1.4M	1	5	Right-Cheek	0	0.142	0.142	Ant Lower
21650	900	1.4M	1	5	Right-Tilted	0	0.045	0.045	Ant Lower
21650	900	1.4M	1	5	Left-Cheek	0	0.094	0.094	Ant Lower
21650	900	1.4M	1	5	Left-Tilted	0	0.03	0.030	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 28 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL750							
		Conductivity : 0.892				Dielectric Constant : 42.02			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
27435	725.5	15M	16	59	Right-Cheek	0	0.056	0.056	Ant Lower
27285	710.5	15M	16	59	Right-Cheek	0	0.05	0.050	Ant Lower
27585	740.5	15M	16	59	Right-Cheek	0	0.046	0.046	Ant Lower
27435	725.5	15M	16	59	Right-Tilted	0	0.03	0.030	Ant Lower
27435	725.5	15M	16	59	Left-Cheek	0	0.047	0.047	Ant Lower
27435	725.5	15M	16	59	Left-Tilted	0	0.021	0.021	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 38 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL2600							
		Conductivity : 1.986				Dielectric Constant : 39.302			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
38000	2595	5M	8	17	Right-Cheek	0	0.027	0.027	Ant Lower
37775	2572.5	5M	8	17	Right-Cheek	0	0.031	0.031	Ant Lower
38225	2617.5	5M	8	17	Right-Cheek	0	0.041	0.041	Ant Lower
38000	2595	5M	8	17	Right-Tilted	0	0.023	0.023	Ant Lower
38000	2595	5M	8	17	Left-Cheek	0	0.022	0.022	Ant Lower
38000	2595	5M	8	17	Left-Tilted	0	0.023	0.023	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

LTE Band 41 SAR Test Results - Head									
Ambient		Temperature (°C) : 22 ± 2				Relative HUMIDITY (%) : 40-70			
Liquid		Liquid Temperature (°C) : 22				Depth of liquid (cm) : 15			
		Mixture Type : HSL2600							
		Conductivity : 1.986				Dielectric Constant : 39.302			
Measurement		Duty Cycle : 1: 1				Probe S/N : 3847			
Frequency		Bandwidth (MHz)	RB Size	RB Offset	Test Position	Spacing (mm)	SAR _{10 g} (W/kg)	Reported SAR _{10 g}	Note
Ch.	MHz								
40640	2595	5M	8	17	Right-Cheek	0	0.029	0.029	Ant Lower
39715	2502.5	5M	8	17	Right-Cheek	0	0.031	0.031	Ant Lower
41565	2687.5	5M	8	17	Right-Cheek	0	0.035	0.035	Ant Lower
40640	2595	5M	8	17	Right-Tilted	0	0.022	0.022	Ant Lower
40640	2595	5M	8	17	Left-Cheek	0	0.022	0.022	Ant Lower
40640	2595	5M	8	17	Left-Tilted	0	0.022	0.022	Ant Lower
Safety Limit / Spatial Peak European Council Recommendation 1999 519 EC NCC CNS14959					Head 2.0 W/kg Averaged over 10 gram				

11.2 European Council Recommendation 1999 519 EC

Depending on frequency, the following physical quantities (dosimetric / exposimetric quantities) are used to specify the basic restrictions on electromagnetic fields :

- * between 0 and 1 Hz basic restrictions are provided for magnetic flux density for static magnetic fields (0 Hz) and current density for time-varying fields up to 1 Hz, in order to prevent effects on the cardiovascular and central nervous system,
- * between 1Hz and 10 MHz basic restrictions are provided for current density to prevent effects on nervous system functions,
- * Between 100 kHz and 10 GHz basic restrictions on SAR are provided to prevent whole-body heat stress and excessive localized heating of tissues. In the range 100 kHz to 10 MHz, restrictions on both current density and SAR are provided,
- * Between 10 GHz and 300 GHz basic restrictions on power density are provided to prevent heating in tissue at or near the body surface.

Frequency Range	Magnetic flux density (mT)	Current density (mA/m ²) (rms)	Whole body average SAR (W/kg)	Localized SAR (head and trunk) (W/kg)	Localized SAR (limbs) (W/kg)	Power density, S (W/m ²)
0	40	-----	-----	-----	-----	-----
> 0 - 1 Hz	-----	8	-----	-----	-----	-----
1 - 4 Hz	-----	8/f	-----	-----	-----	-----
4 - 1000 Hz	-----	2	-----	-----	-----	-----
1000 Hz - 100 kHz	-----	f/500	-----	-----	-----	-----
100 kHz - 10 MHz	-----	f/500	0.08	2	4	-----
10 MHz - 10 GHz	-----	-----	0.08	2	4	-----
10 - 300 GHz	-----	-----	-----	-----	-----	10
Table 5. Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz, unperturbed RMS values)						

12. Conclusion

The SAR test values found for the portable mobile phone are below the maximum recommended level of 2.0 W/kg (W/kg).

13. References

- [1] Std. C95.1-2005, "American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz", New York: IEEE, Aug. 1992.
- [2] NCRP, National Council on Radiation Protection and Measurements, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields", NCRP report NO. 86, 1986.
- [3] T. Schmid, O. Egger, and N. Kuster, "Automatic E-field scanning system for dosimetric assessments", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.
- [4] K. Poković, T. Schmid, and N. Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.
- [5] K. Poković, T. Schmid, and N. Kuster, "E-field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.
- [6] N. Kuster, and Q. Balzano, "Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz", IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.
- [7] Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988 , pp. 139-148.
- [8] N. Kuster, R. Kastle, T. Schmid, "Dosimetric evaluation of mobile communications equipment with known precision", IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.
- [9] Std. C95.3-1991, "IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave, New York: IEEE, Aug. 1992.
- [10] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10 KHz-300GHz, Jan. 1995.

Appendix A - System Performance Check

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/15

System Performance Check at 750MHz_20200215_Head

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1004

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

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.895 \text{ S/m}$; $\epsilon_r = 42.039$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.67, 9.67, 9.67) @ 750 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 750MHz/Area Scan (61x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 2.93 W/kg

System Performance Check at 750MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.19 V/m; Power Drift = -0.08 dB

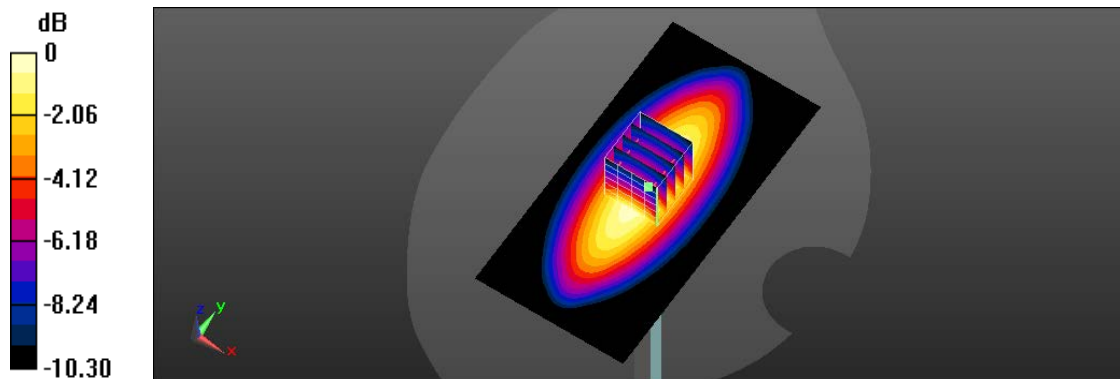
Peak SAR (extrapolated) = 3.36 W/kg

SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.42 W/kg

Smallest distance from peaks to all points 3 dB below = 17.2 mm

Ratio of SAR at M2 to SAR at M1 = 64.1%

Maximum value of SAR (measured) = 2.92 W/kg



0 dB = 2.92 W/kg = 4.65 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/18

System Performance Check at 750MHz_20200218Head

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1004

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

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.892 \text{ S/m}$; $\epsilon_r = 42.02$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.67, 9.67, 9.67) @ 750 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 750MHz/Area Scan (61x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 2.94 W/kg

System Performance Check at 750MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.01 V/m; Power Drift = 0.04 dB

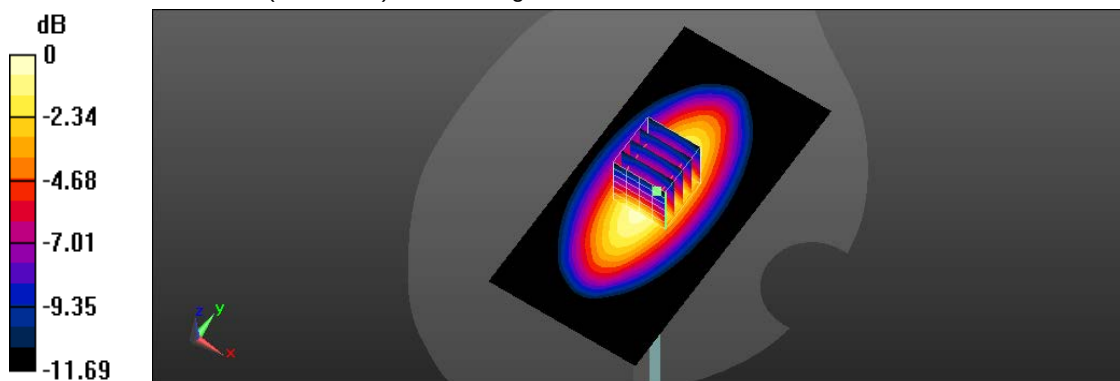
Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.36 W/kg

Smallest distance from peaks to all points 3 dB below = 16 mm

Ratio of SAR at M2 to SAR at M1 = 61.9%

Maximum value of SAR (measured) = 2.98 W/kg



0 dB = 2.98 W/kg = 4.74 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/15

System Performance Check at 900MHz_20200215_Head

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:073

Communication System: UID 0, CW (0); Frequency: 900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.972 \text{ S/m}$; $\epsilon_r = 40.673$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 900 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 900MHz/Area Scan (61x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 3.67 W/kg

System Performance Check at 900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 62.73 V/m; Power Drift = -0.01 dB

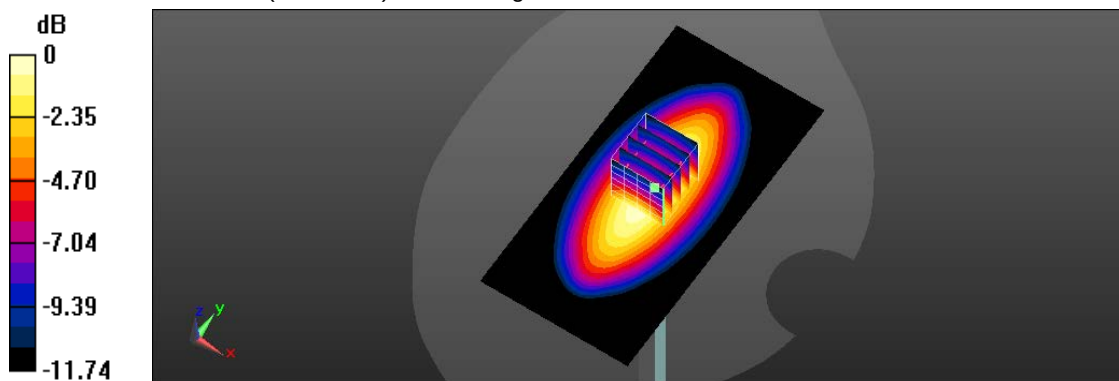
Peak SAR (extrapolated) = 4.28 W/kg

SAR(1 g) = 2.63 W/kg; SAR(10 g) = 1.67 W/kg

Smallest distance from peaks to all points 3 dB below = 16 mm

Ratio of SAR at M2 to SAR at M1 = 61.3%

Maximum value of SAR (measured) = 3.67 W/kg



0 dB = 3.67 W/kg = 5.65 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/18

System Performance Check at 900MHz_20200218_Head

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:073

Communication System: UID 0, CW (0); Frequency: 900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.966 \text{ S/m}$; $\epsilon_r = 40.454$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 900 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 900MHz/Area Scan (61x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 3.68 W/kg

System Performance Check at 900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 62.25 V/m; Power Drift = 0.07 dB

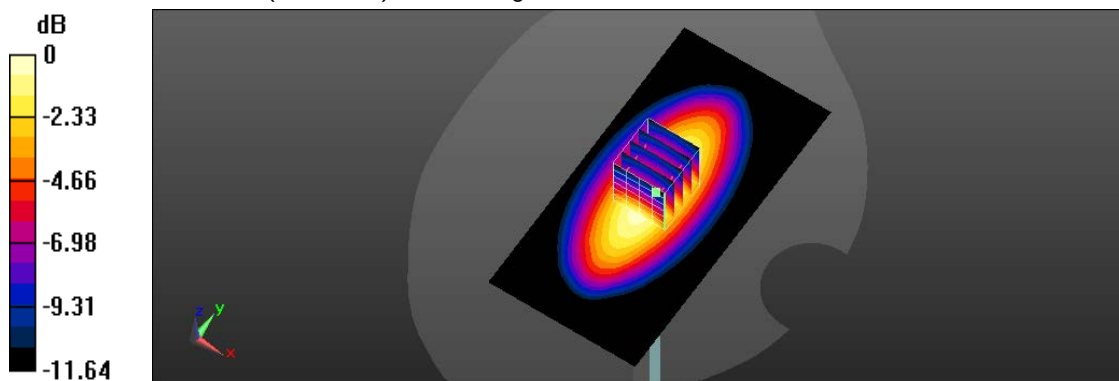
Peak SAR (extrapolated) = 4.28 W/kg

SAR(1 g) = 2.66 W/kg; SAR(10 g) = 1.7 W/kg

Smallest distance from peaks to all points 3 dB below = 17.6 mm

Ratio of SAR at M2 to SAR at M1 = 62.1%

Maximum value of SAR (measured) = 3.69 W/kg



0 dB = 3.69 W/kg = 5.67 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

System Performance Check at 1800MHz_20200214_Head

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:265

Communication System: UID 0, CW (0); Frequency: 1800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1800 \text{ MHz}$; $\sigma = 1.432 \text{ S/m}$; $\epsilon_r = 40.459$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(8.15, 8.15, 8.15) @ 1800 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 1800MHz/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 14.8 W/kg

System Performance Check at 1800MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 99.96 V/m; Power Drift = 0.02 dB

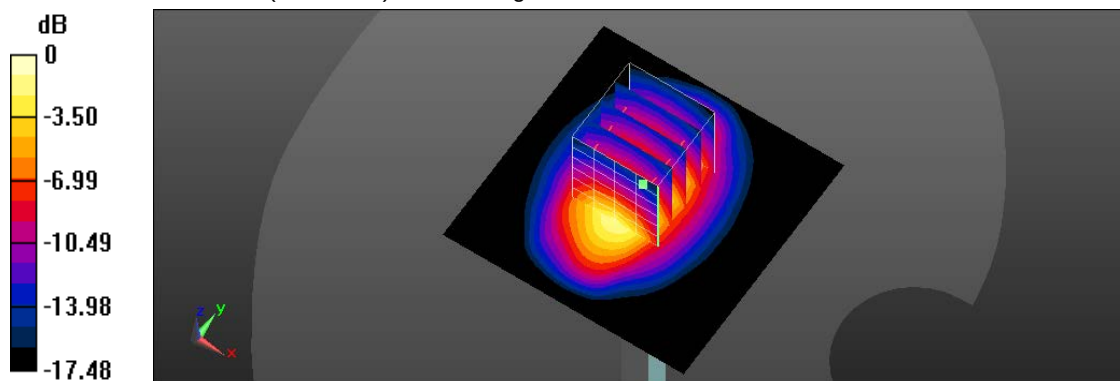
Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 9.61 W/kg; SAR(10 g) = 5.09 W/kg

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

Ratio of SAR at M2 to SAR at M1 = 54.7%

Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

System Performance Check at 1800MHz_20200217_Head

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:265

Communication System: UID 0, CW (0); Frequency: 1800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1800 \text{ MHz}$; $\sigma = 1.428 \text{ S/m}$; $\epsilon_r = 40.395$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(8.15, 8.15, 8.15) @ 1800 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 1800MHz/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

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

System Performance Check at 1800MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 105.4 V/m; Power Drift = 0.01 dB

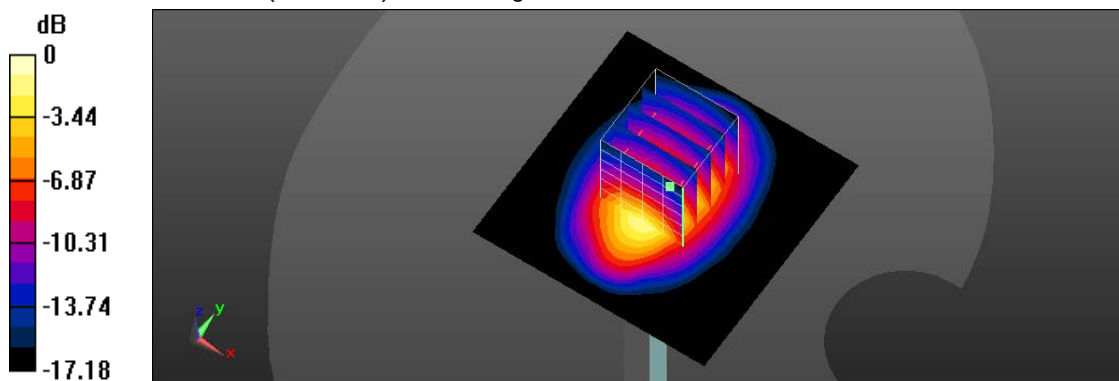
Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 9.94 W/kg; SAR(10 g) = 5.27 W/kg

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

Ratio of SAR at M2 to SAR at M1 = 54.6%

Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 11.85 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

System Performance Check at 1950MHz_20200214_Head

DUT: Dipole 1950 MHz D1950V3; Type: D1950V3; Serial: D1950V3 - SN:1117

Communication System: UID 0, CW (0); Frequency: 1950 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1950$ MHz; $\sigma = 1.39$ S/m; $\epsilon_r = 39.654$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.72, 7.72, 7.72) @ 1950 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 1950MHz/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 15.0 W/kg

System Performance Check at 1950MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 102.8 V/m; Power Drift = 0.08 dB

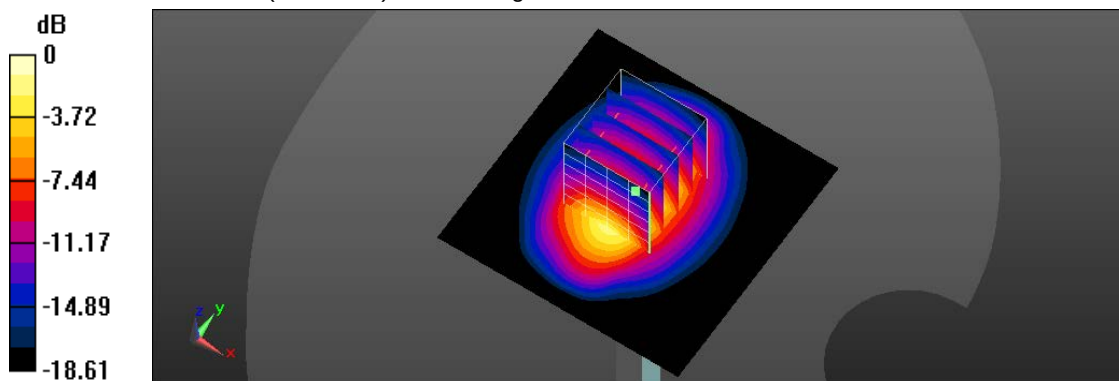
Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 9.69 W/kg; SAR(10 g) = 4.94 W/kg

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

Ratio of SAR at M2 to SAR at M1 = 52.9%

Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 11.85 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

System Performance Check at 1950MHz_20200217_Head

DUT: Dipole 1950 MHz; Type: D1950V3; Serial: D1950V3 - SN:1117

Communication System: UID 0, CW (0); Frequency: 1950 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1950$ MHz; $\sigma = 1.394$ S/m; $\epsilon_r = 39.721$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.72, 7.72, 7.72) @ 1950 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 1950MHz/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 15.0 W/kg

System Performance Check at 1950MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 105.2 V/m; Power Drift = 0.03 dB

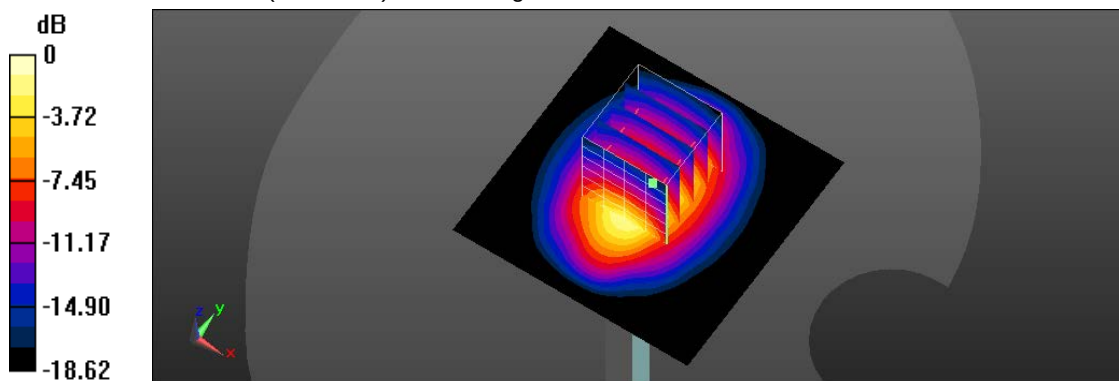
Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.48 W/kg; SAR(10 g) = 4.88 W/kg

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

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

Maximum value of SAR (measured) = 14.8 W/kg



0 dB = 14.8 W/kg = 11.70 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

System Performance Check at 2600MHz_20200214_Head

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1007

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

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.961$ S/m; $\epsilon_r = 39.224$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2600 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 2600MHz/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 23.3 W/kg

System Performance Check at 2600MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 109.1 V/m; Power Drift = 0.04 dB

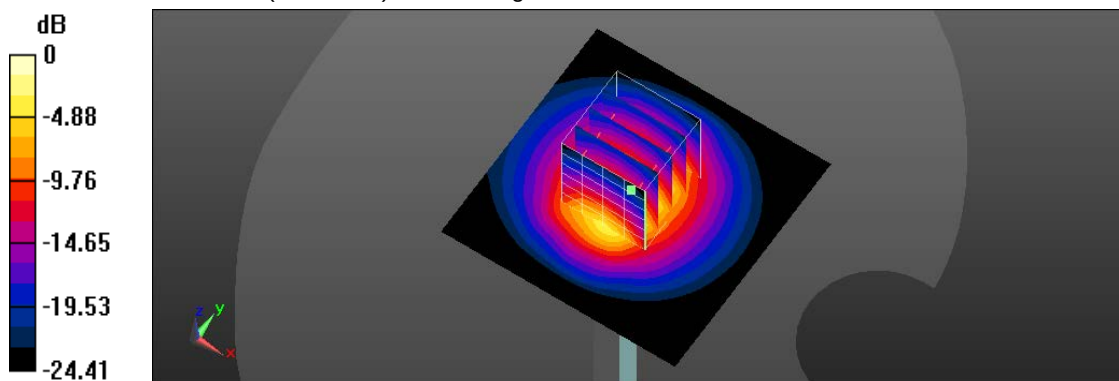
Peak SAR (extrapolated) = 30.1 W/kg

SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.24 W/kg

Smallest distance from peaks to all points 3 dB below = 8.6 mm

Ratio of SAR at M2 to SAR at M1 = 46.4%

Maximum value of SAR (measured) = 24.3 W/kg



0 dB = 24.3 W/kg = 13.86 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

System Performance Check at 2600MHz_20200217_Head

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1007

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

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.986$ S/m; $\epsilon_r = 39.302$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2600 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

System Performance Check at 2600MHz/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 23.0 W/kg

System Performance Check at 2600MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 110.2 V/m; Power Drift = 0.06 dB

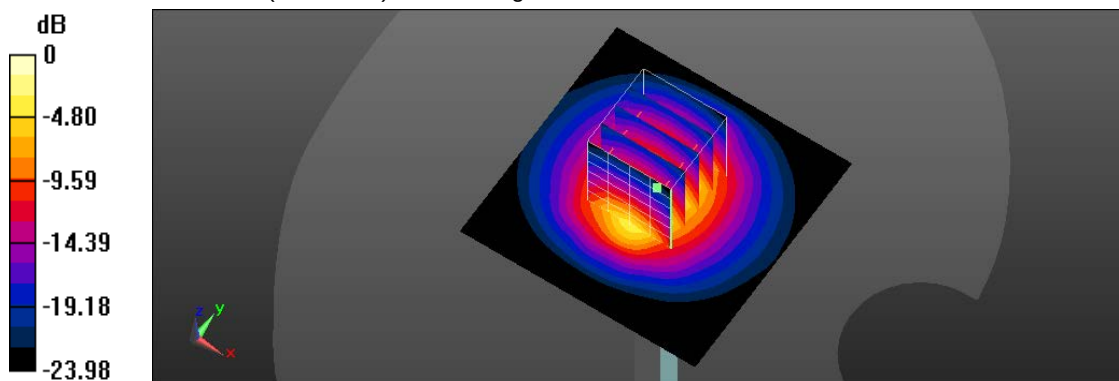
Peak SAR (extrapolated) = 29.4 W/kg

SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.15 W/kg

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

Ratio of SAR at M2 to SAR at M1 = 46.6%

Maximum value of SAR (measured) = 23.7 W/kg



0 dB = 23.7 W/kg = 13.75 dBW/kg

Appendix B - SAR Measurement Data

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/15

78_GSM900 CH 124_Left-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, GSM900 (0); Frequency: 914.8 MHz;Duty Cycle: 1:8.3

Medium parameters used: $f = 915$ MHz; $\sigma = 0.984$ S/m; $\epsilon_r = 40.539$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 914.8 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.899 W/kg

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

Reference Value = 20.99 V/m; Power Drift = -0.02 dB

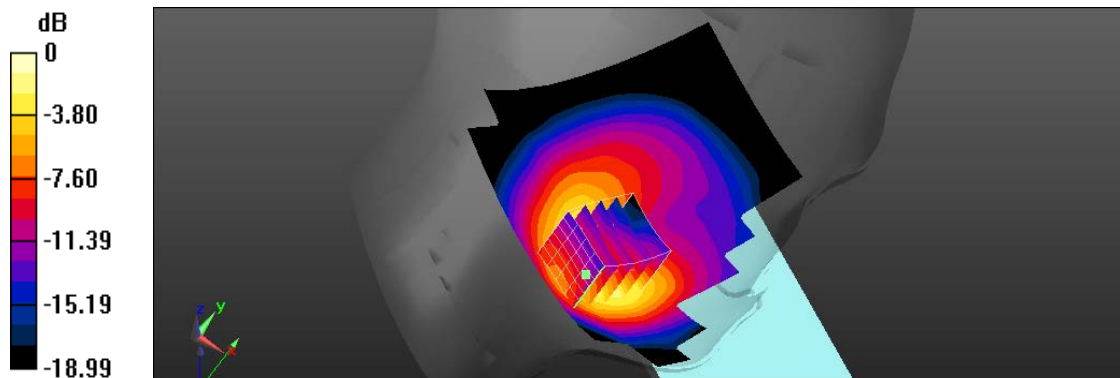
Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 0.744 W/kg; SAR(10 g) = 0.382 W/kg

Smallest distance from peaks to all points 3 dB below = 6.7 mm

Ratio of SAR at M2 to SAR at M1 = 55.9%

Maximum value of SAR (measured) = 1.10 W/kg



0 dB = 1.10 W/kg = 0.41 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/18

147_GSM900 CH 124_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, GSM900 (0); Frequency: 914.8 MHz;Duty Cycle: 1:8.3

Medium parameters used: $f = 915$ MHz; $\sigma = 0.978$ S/m; $\epsilon_r = 40.319$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 914.8 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.385 W/kg

Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.62 V/m; Power Drift = 0.14 dB

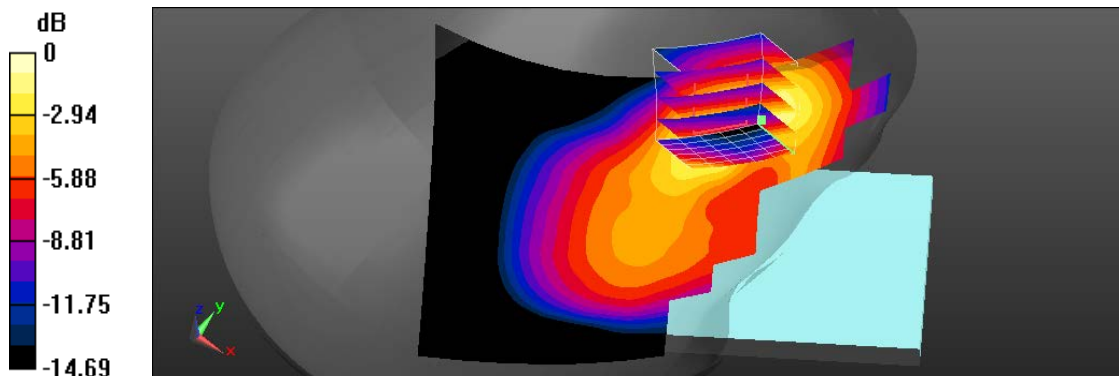
Peak SAR (extrapolated) = 0.543 W/kg

SAR(1 g) = 0.292 W/kg; SAR(10 g) = 0.179 W/kg

Smallest distance from peaks to all points 3 dB below = 8.2 mm

Ratio of SAR at M2 to SAR at M1 = 58.9%

Maximum value of SAR (measured) = 0.420 W/kg



0 dB = 0.420 W/kg = -3.77 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

06_WCDMA Band I CH 9888_Right-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, WCDMA Band I (0); Frequency: 1977.6 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1978 \text{ MHz}$; $\sigma = 1.416 \text{ S/m}$; $\epsilon_r = 39.524$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.93, 7.93, 7.93) @ 1977.6 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 4.00 W/kg

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

Reference Value = 46.00 V/m; Power Drift = -0.06 dB

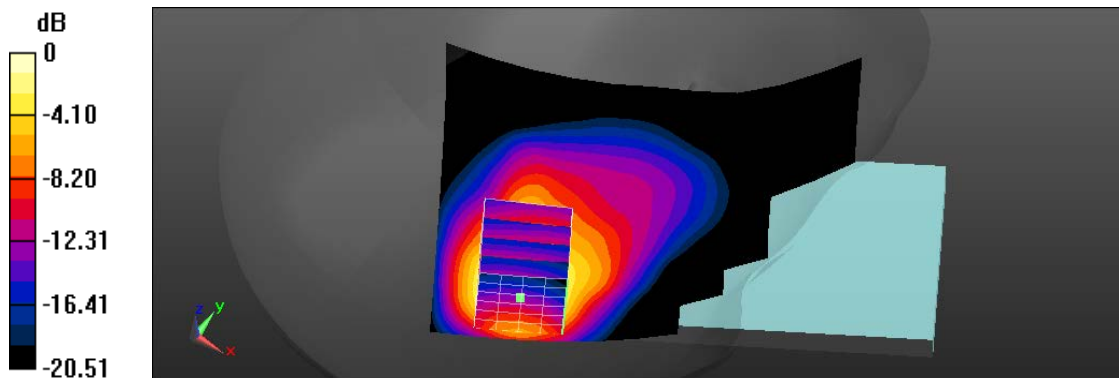
Peak SAR (extrapolated) = 4.39 W/kg

SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.13 W/kg

Smallest distance from peaks to all points 3 dB below = 9.1 mm

Ratio of SAR at M2 to SAR at M1 = 44.2%

Maximum value of SAR (measured) = 3.41 W/kg



0 dB = 3.41 W/kg = 5.33 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

134_WCDMA Band I CH 9612_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, WCDMA Band I (0); Frequency: 1922.4 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1922.4$ MHz; $\sigma = 1.371$ S/m; $\epsilon_r = 39.871$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.72, 7.72, 7.72) @ 1922.4 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.240 W/kg

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

Reference Value = 13.12 V/m; Power Drift = 0.06 dB

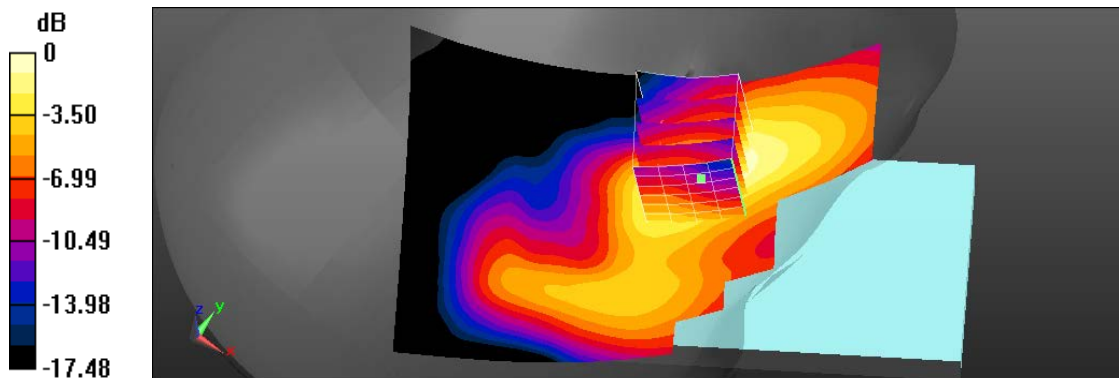
Peak SAR (extrapolated) = 0.272 W/kg

SAR(1 g) = 0.168 W/kg; SAR(10 g) = 0.101 W/kg

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 62%

Maximum value of SAR (measured) = 0.224 W/kg



0 dB = 0.224 W/kg = -6.50 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/15

70_WCDMA Band VIII CH 2863_Left-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, WCDMA Band VIII (0); Frequency: 912.6 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 913 \text{ MHz}$; $\sigma = 0.983 \text{ S/m}$; $\epsilon_r = 40.557$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 912.6 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.976 W/kg

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

Reference Value = 21.80 V/m; Power Drift = 0.00 dB

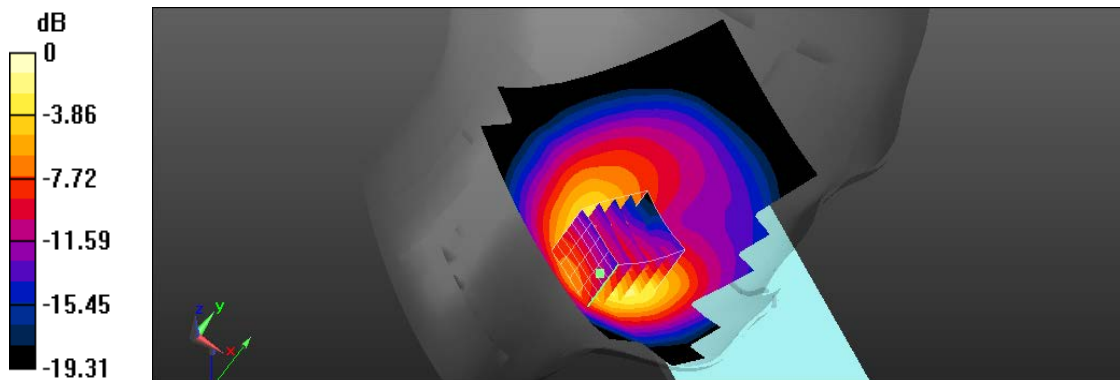
Peak SAR (extrapolated) = 1.72 W/kg

SAR(1 g) = 0.796 W/kg; SAR(10 g) = 0.412 W/kg

Smallest distance from peaks to all points 3 dB below = 6.7 mm

Ratio of SAR at M2 to SAR at M1 = 55.1%

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



0 dB = 1.18 W/kg = 0.72 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/18

141_WCDMA Band VIII CH 2863_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, WCDMA Band VIII (0); Frequency: 912.6 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 913 \text{ MHz}$; $\sigma = 0.976 \text{ S/m}$; $\epsilon_r = 40.337$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 912.6 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.350 W/kg

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

Reference Value = 14.45 V/m; Power Drift = -0.06 dB

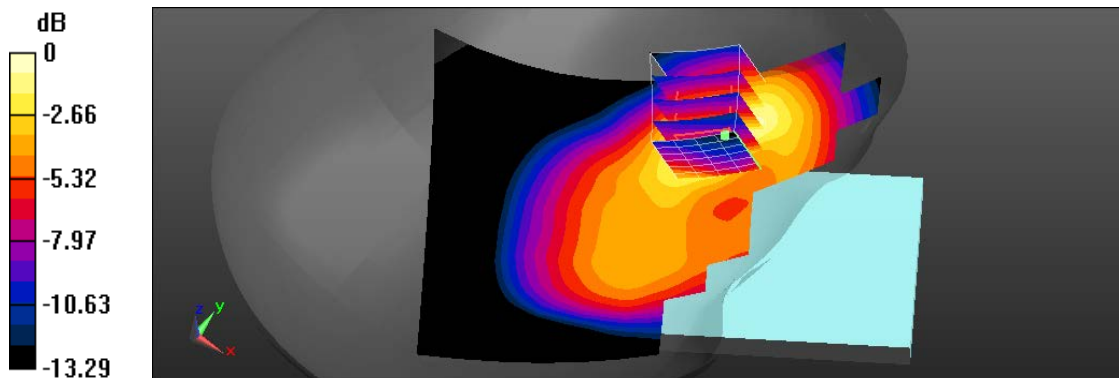
Peak SAR (extrapolated) = 0.488 W/kg

SAR(1 g) = 0.278 W/kg; SAR(10 g) = 0.169 W/kg

Smallest distance from peaks to all points 3 dB below = 11.9 mm

Ratio of SAR at M2 to SAR at M1 = 60%

Maximum value of SAR (measured) = 0.394 W/kg



0 dB = 0.394 W/kg = -4.05 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

11_LTE Band 1 CH 18500_QPSK_BW 20M_1RB Size 0RB Offset_Right-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 1970 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1970$ MHz; $\sigma = 1.408$ S/m; $\epsilon_r = 39.558$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.93, 7.93, 7.93) @ 1970 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.78 W/kg

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

Reference Value = 46.21 V/m; Power Drift = 0.02 dB

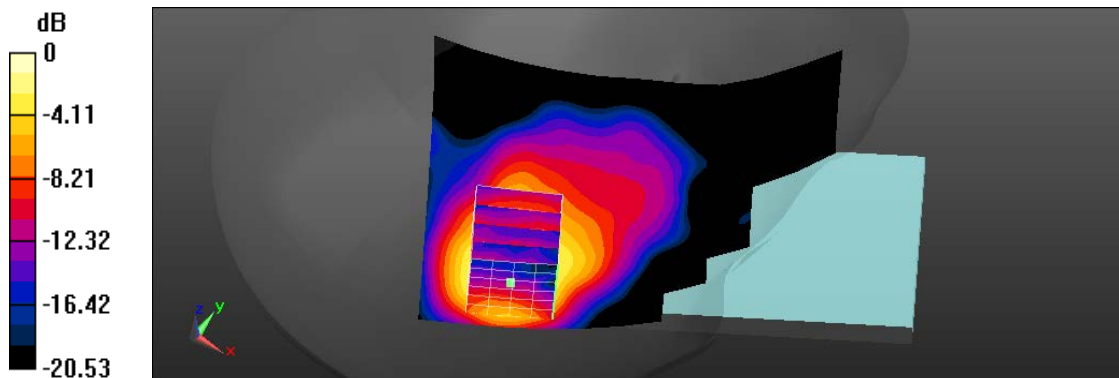
Peak SAR (extrapolated) = 3.93 W/kg

SAR(1 g) = 1.98 W/kg; SAR(10 g) = 1.19 W/kg

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

Ratio of SAR at M2 to SAR at M1 = 49.4%

Maximum value of SAR (measured) = 3.04 W/kg



0 dB = 3.04 W/kg = 4.83 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

122_LTE Band 1 CH 18050_QPSK_BW 10M_1RB Size 0RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 1925 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1925$ MHz; $\sigma = 1.373$ S/m; $\epsilon_r = 39.858$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.72, 7.72, 7.72) @ 1925 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.271 W/kg

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

Reference Value = 13.80 V/m; Power Drift = -0.06 dB

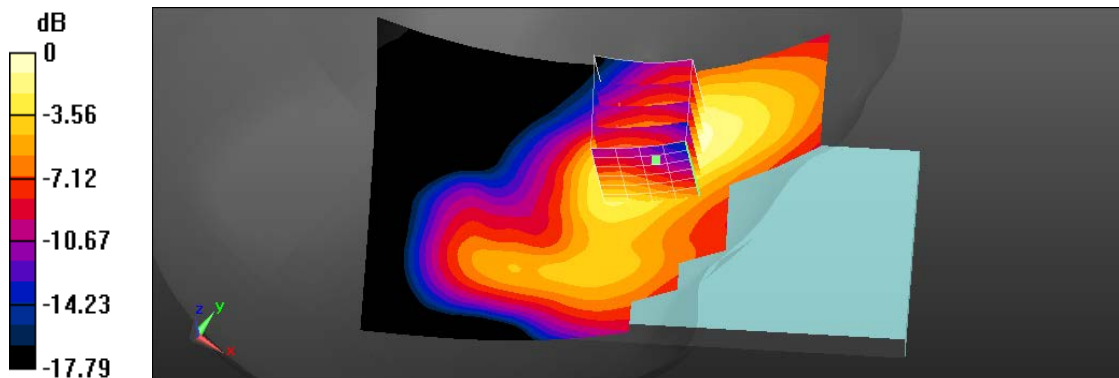
Peak SAR (extrapolated) = 0.317 W/kg

SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.123 W/kg

Smallest distance from peaks to all points 3 dB below = 10.5 mm

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

Maximum value of SAR (measured) = 0.267 W/kg



0 dB = 0.267 W/kg = -5.73 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

18_LTE Band 3 CH 19300_QPSK_BW 20M_1RB Size 99RB Offset_Right-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1720$ MHz; $\sigma = 1.362$ S/m; $\epsilon_r = 40.674$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(8.15, 8.15, 8.15) @ 1720 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.84 W/kg

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

Reference Value = 45.50 V/m; Power Drift = 0.08 dB

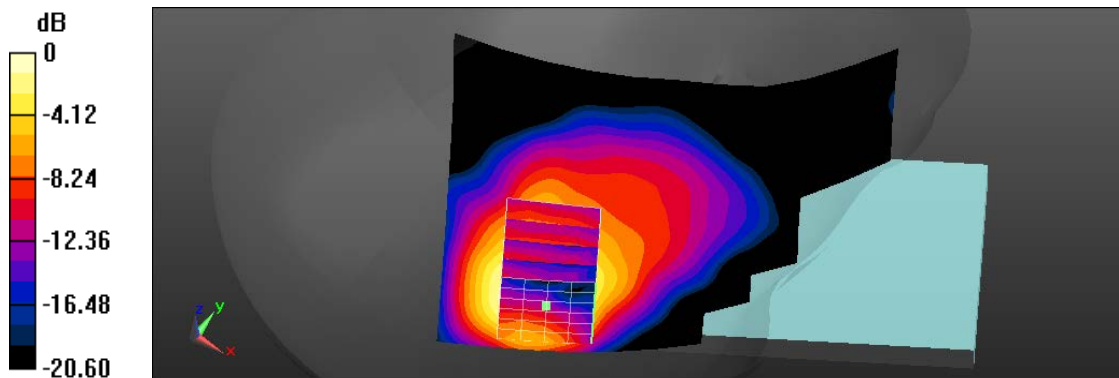
Peak SAR (extrapolated) = 3.81 W/kg

SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1.28 W/kg

Smallest distance from peaks to all points 3 dB below = 11.3 mm

Ratio of SAR at M2 to SAR at M1 = 50.2%

Maximum value of SAR (measured) = 3.00 W/kg



0 dB = 3.00 W/kg = 4.77 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

128_LTE Band 3 CH 19207_QPSK_BW 1.4M_1RB Size 0RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 1710.7 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1711$ MHz; $\sigma = 1.351$ S/m; $\epsilon_r = 40.624$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(8.15, 8.15, 8.15) @ 1710.7 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.185 W/kg

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

Reference Value = 11.91 V/m; Power Drift = 0.01 dB

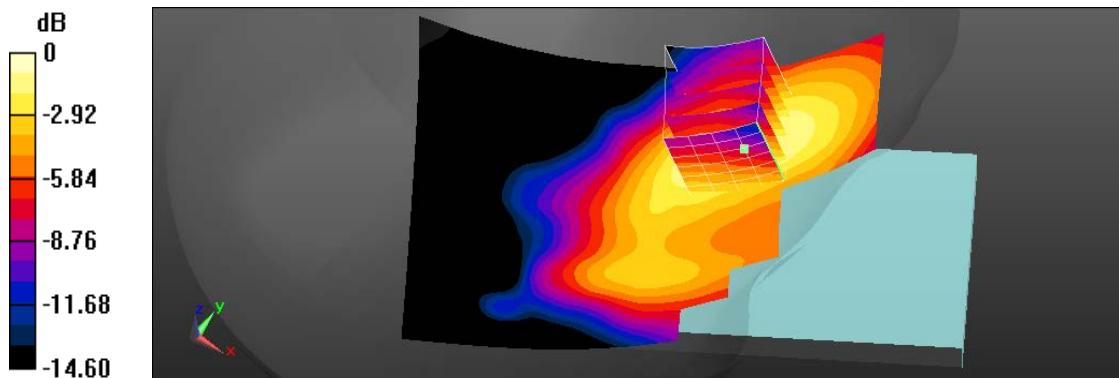
Peak SAR (extrapolated) = 0.221 W/kg

SAR(1 g) = 0.151 W/kg; SAR(10 g) = 0.100 W/kg

Smallest distance from peaks to all points 3 dB below = 13.6 mm

Ratio of SAR at M2 to SAR at M1 = 68.2%

Maximum value of SAR (measured) = 0.197 W/kg



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

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

28_LTE Band 7 CH 21350_QPSK_BW 20M_18RB Size 82RB Offset_Right-Tilted_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 2560 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2560$ MHz; $\sigma = 1.903$ S/m; $\epsilon_r = 39.383$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2560 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 4.76 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 49.90 V/m; Power Drift = -0.07 dB

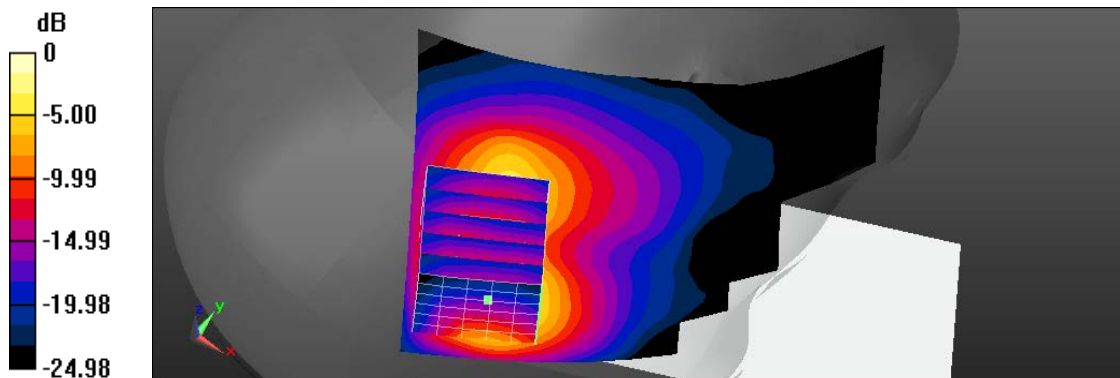
Peak SAR (extrapolated) = 6.07 W/kg

SAR(1 g) = 2.59 W/kg; SAR(10 g) = 1.26 W/kg

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

Ratio of SAR at M2 to SAR at M1 = 42.9%

Maximum value of SAR (measured) = 4.08 W/kg



0 dB = 4.08 W/kg = 6.11 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

105_LTE Band 7 CH 21350_QPSK_BW 20M_1RB Size 99RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 2560 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2560$ MHz; $\sigma = 1.928$ S/m; $\epsilon_r = 39.461$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2560 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.163 W/kg

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

Reference Value = 9.842 V/m; Power Drift = -0.00 dB

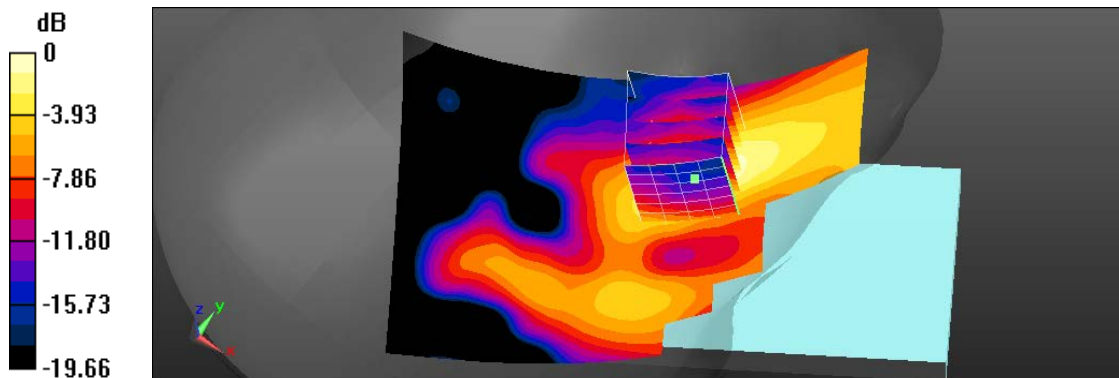
Peak SAR (extrapolated) = 0.210 W/kg

SAR(1 g) = 0.113 W/kg; SAR(10 g) = 0.058 W/kg

Smallest distance from peaks to all points 3 dB below = 8.1 mm

Ratio of SAR at M2 to SAR at M1 = 58.5%

Maximum value of SAR (measured) = 0.155 W/kg



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

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/15

54_LTE Band 8 CH 21750_QPSK_BW 10M_1RB Size 49RB Offset_Left-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 910 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 910 \text{ MHz}$; $\sigma = 0.98 \text{ S/m}$; $\epsilon_r = 40.581$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 910 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.07 W/kg

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

Reference Value = 22.77 V/m; Power Drift = -0.01 dB

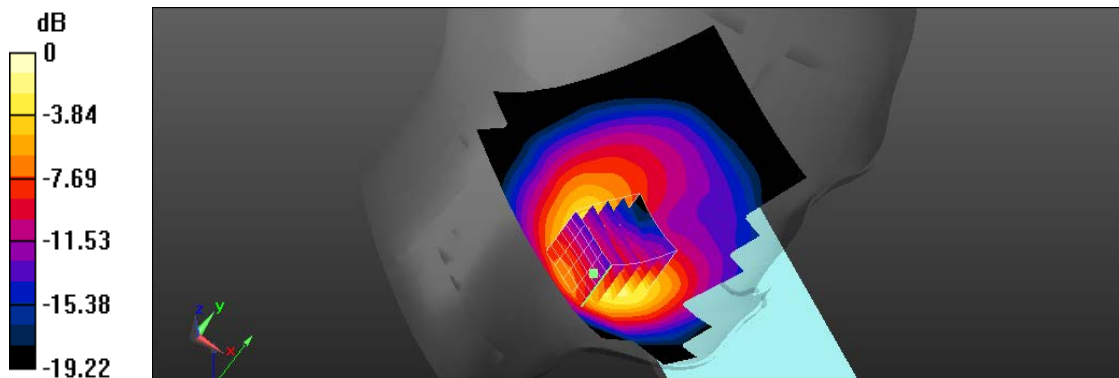
Peak SAR (extrapolated) = 1.87 W/kg

SAR(1 g) = 0.875 W/kg; SAR(10 g) = 0.454 W/kg

Smallest distance from peaks to all points 3 dB below = 8.2 mm

Ratio of SAR at M2 to SAR at M1 = 54.3%

Maximum value of SAR (measured) = 1.33 W/kg



0 dB = 1.33 W/kg = 1.24 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/18

150_LTE Band 8 CH 21793_QPSK_BW 1.4M_1RB Size 5RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 914.3 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 914.3$ MHz; $\sigma = 0.977$ S/m; $\epsilon_r = 40.326$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.29, 9.29, 9.29) @ 914.3 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.311 W/kg

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

Reference Value = 12.44 V/m; Power Drift = 0.07 dB

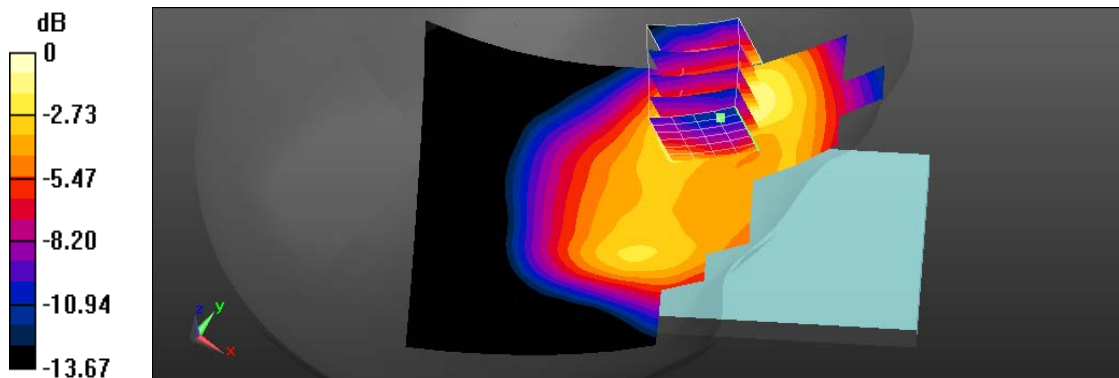
Peak SAR (extrapolated) = 0.396 W/kg

SAR(1 g) = 0.228 W/kg; SAR(10 g) = 0.142 W/kg

Smallest distance from peaks to all points 3 dB below = 11.7 mm

Ratio of SAR at M2 to SAR at M1 = 57.4%

Maximum value of SAR (measured) = 0.332 W/kg



0 dB = 0.332 W/kg = -4.79 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/15

62_LTE Band 28 CH 27560_QPSK_BW 20M_18RB Size 0RB Offset_Left-Cheek_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 738 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 738 \text{ MHz}$; $\sigma = 0.884 \text{ S/m}$; $\epsilon_r = 42.216$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.67, 9.67, 9.67) @ 738 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.816 W/kg

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

Reference Value = 22.36 V/m; Power Drift = 0.09 dB

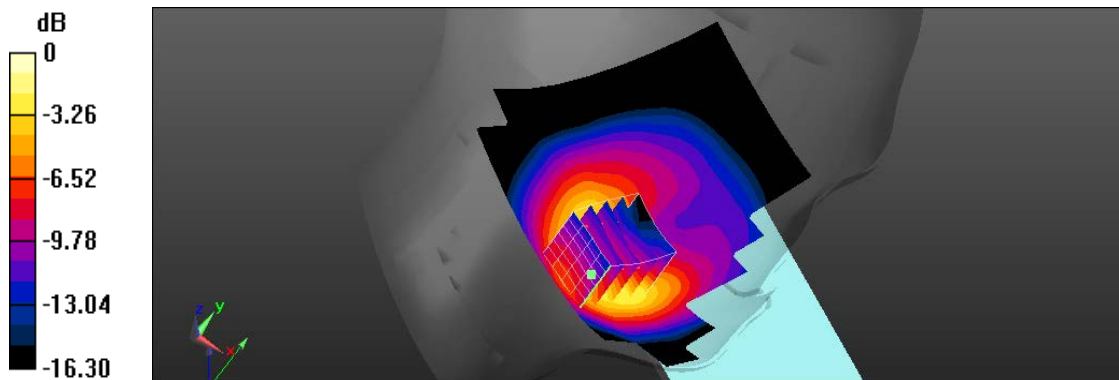
Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.697 W/kg; SAR(10 g) = 0.358 W/kg

Smallest distance from peaks to all points 3 dB below = 6.5 mm

Ratio of SAR at M2 to SAR at M1 = 42.1%

Maximum value of SAR (measured) = 0.997 W/kg



0 dB = 0.997 W/kg = -0.01 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/18

154_LTE Band 28 CH 27435_QPSK_BW 15M_16RB Size 59RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 725.5 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 725.5$ MHz; $\sigma = 0.87$ S/m; $\epsilon_r = 42.357$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.67, 9.67, 9.67) @ 725.5 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (81x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0967 W/kg

Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

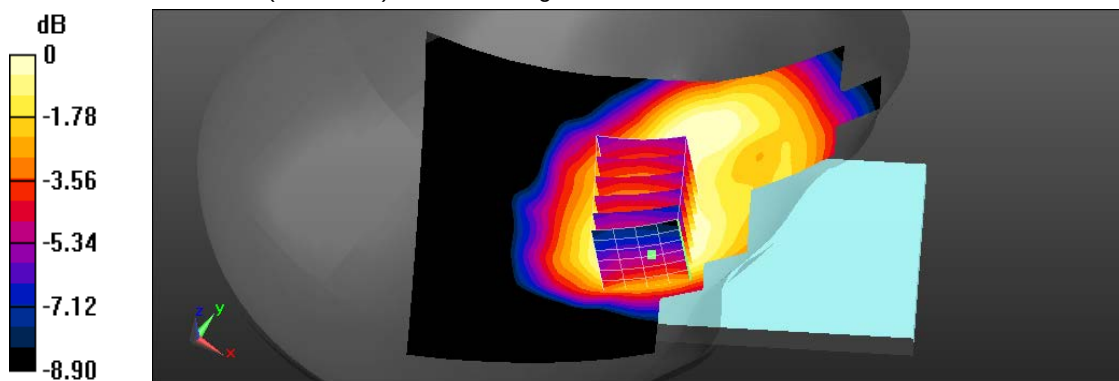
Reference Value = 9.987 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.0890 W/kg

SAR(1 g) = 0.071 W/kg; SAR(10 g) = 0.056 W/kg

Ratio of SAR at M2 to SAR at M1 = 80.6%

Maximum value of SAR (measured) = 0.0815 W/kg



0 dB = 0.0815 W/kg = -10.89 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

38_LTE Band 38 CH 38150_QPSK_BW 20M_1RB Size 0RB Offset_Right-Tilted_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 2610 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2610$ MHz; $\sigma = 1.975$ S/m; $\epsilon_r = 39.196$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2610 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.31 W/kg

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

Reference Value = 40.82 V/m; Power Drift = -0.11 dB

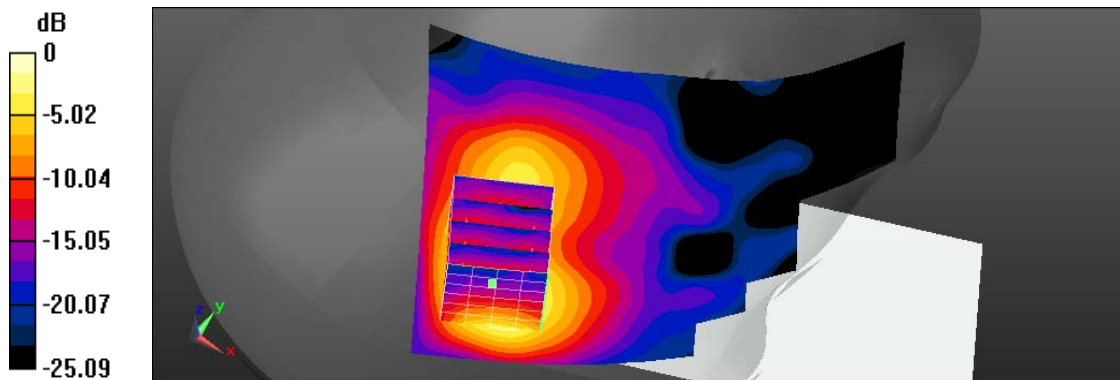
Peak SAR (extrapolated) = 3.75 W/kg

SAR(1 g) = 1.74 W/kg; SAR(10 g) = 0.868 W/kg

Smallest distance from peaks to all points 3 dB below = 9.4 mm

Ratio of SAR at M2 to SAR at M1 = 46.1%

Maximum value of SAR (measured) = 2.64 W/kg



0 dB = 2.64 W/kg = 4.22 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

111_LTE Band 38 CH 38225_QPSK_BW 5M_8RB Size 17RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 2617.5 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2618$ MHz; $\sigma = 2.01$ S/m; $\epsilon_r = 39.248$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2617.5 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.124 W/kg

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

Reference Value = 8.250 V/m; Power Drift = -0.08 dB

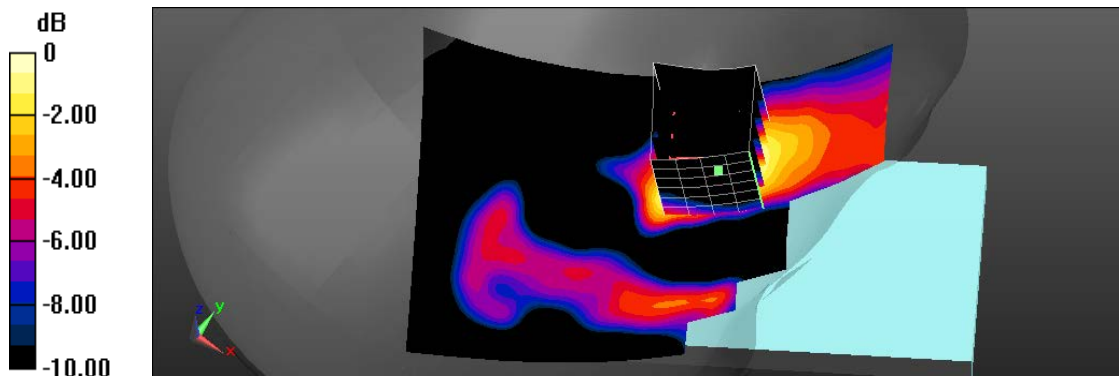
Peak SAR (extrapolated) = 0.150 W/kg

SAR(1 g) = 0.080 W/kg; SAR(10 g) = 0.041 W/kg

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 56.5%

Maximum value of SAR (measured) = 0.114 W/kg



0 dB = 0.114 W/kg = -9.43 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/14

42_LTE Band 41 CH 40640_QPSK_BW 20M_1RB Size 0RB Offset_Right-Tilted_Ant Upper

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 2595 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2595$ MHz; $\sigma = 1.953$ S/m; $\epsilon_r = 39.24$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2595 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.06 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 42.31 V/m; Power Drift = -0.16 dB

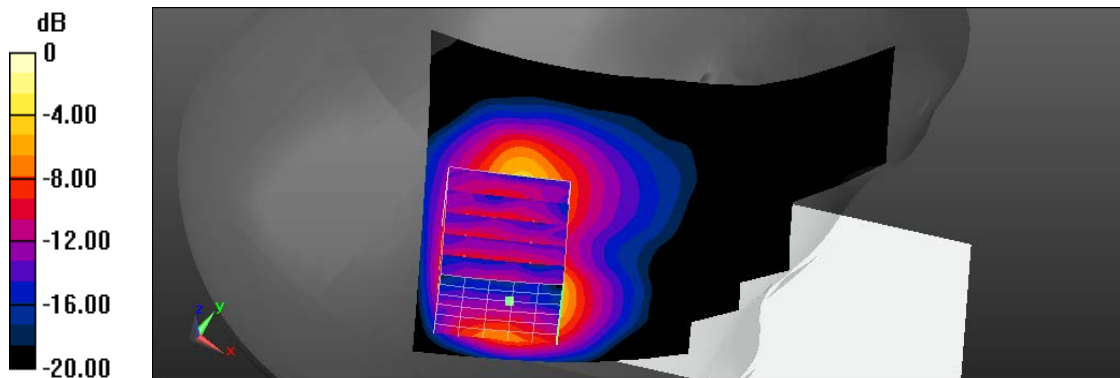
Peak SAR (extrapolated) = 4.05 W/kg

SAR(1 g) = 1.82 W/kg; SAR(10 g) = 0.903 W/kg

Smallest distance from peaks to all points 3 dB below = 10.8 mm

Ratio of SAR at M2 to SAR at M1 = 45.1%

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



0 dB = 3.06 W/kg = 4.86 dBW/kg

Test Laboratory: A Test Lab Techno Corp.

Date: 2020/2/17

117_LTE Band 41 CH 41565_QPSK_BW 5M_8RB Size 17RB Offset_Right-Cheek_Ant Lower

DUT:ELS-NX9;

Type: 手持式行動電話機(LTE/WCDMA FDD 900/2100;GSM/Bluetooth/WLAN/NFC/WPC)

Communication System: UID 0, Generic LTE (0); Frequency: 2687.5 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2688$ MHz; $\sigma = 2.094$ S/m; $\epsilon_r = 39.011$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.11, 7.11, 7.11) @ 2687.5 MHz; Calibrated: 2019/5/16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2019/3/19
- Phantom: Twin-SAM V4.0 (20deg probe tilt); Type: QD 000 P40 CD; Serial: TP-1009
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.10 (7331)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.114 W/kg

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

Reference Value = 7.832 V/m; Power Drift = -0.03 dB

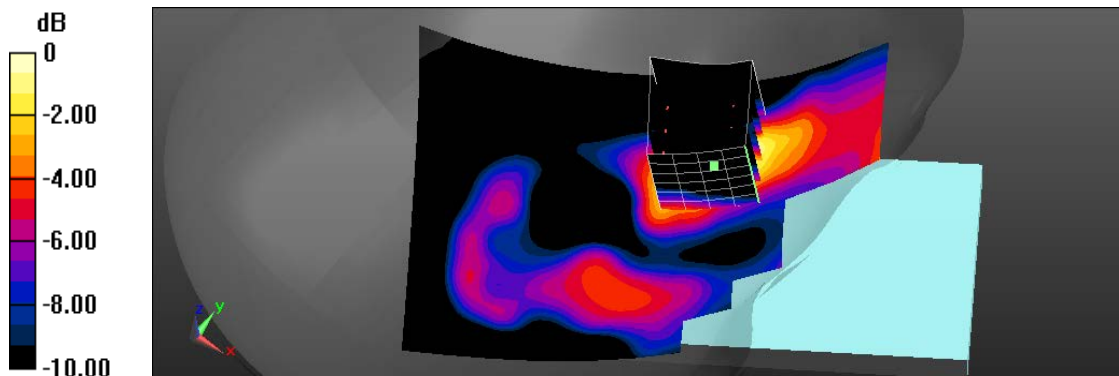
Peak SAR (extrapolated) = 0.131 W/kg

SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.035 W/kg

Smallest distance from peaks to all points 3 dB below = 11.3 mm

Ratio of SAR at M2 to SAR at M1 = 54.3%

Maximum value of SAR (measured) = 0.112 W/kg



0 dB = 0.112 W/kg = -9.51 dBW/kg



Appendix C - Calibration

All of the instruments Calibration information are listed below.

- Dipole _ D750V3 SN:1004
- Dipole _ D900V2 SN:073
- Dipole _ D1800V2 SN:265
- Dipole _ D1950V3 SN:1117
- Dipole _ D2600V2 SN:1007
- Probe _ EX3DV4 SN:3847
- DAE _ DAE4 SN:541

ST-040-19-225



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Client **ATL** Certificate No: **Z19-60323**

CALIBRATION CERTIFICATE

Object **D750V3 - SN: 1004**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **November 20, 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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106276	11-Apr-19 (CTTL, No.J19X02605)	Apr-20
Power sensor NRP6A	101369	11-Apr-19 (CTTL, No.J19X02605)	Apr-20
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1555	22-Aug-19(CTTL-SPEAG,No.Z19-60295)	Aug-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Yu Zongying	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: November 23, 2019

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Client **ATL**

Certificate No: **Z19-60125**

CALIBRATION CERTIFICATE

Object **D900V2 - SN:073**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **April 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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: April 26, 2019

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Certificate No: Z19-60125

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ST-001-19-087



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Client **ATL**

Certificate No: **Z19-60126**

CALIBRATION CERTIFICATE

Object **D1800V2 - SN: 265**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **April 20, 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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: April 25, 2019

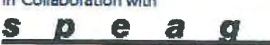
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Certificate No: Z19-60126

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ST-025-19-088

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Client **ATL**

Certificate No: **Z19-60127**

CALIBRATION CERTIFICATE

Object **D1950V3 - SN: 1117**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **April 19, 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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

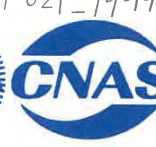
	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: April 25, 2019

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Certificate No: Z19-60127

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Certificate No:

Z19-60365

CALIBRATION CERTIFICATE

Object

D2600V2 - SN: 1007

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

October 24, 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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106276	11-Apr-19 (CTTL, No.J19X02605)	Apr-20
Power sensor NRP6A	101369	11-Apr-19 (CTTL, No.J19X02605)	Apr-20
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1555	22-Aug-19(CTTL-SPEAG,No.Z19-60295)	Aug-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
Network Analyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: October 28, 2019

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Client **ATL**

Certificate No: **Z19-60136**

CALIBRATION CERTIFICATE

Object **EX-045-19-119**
EX3DV4 - SN:3847

Calibration Procedure(s)

FF-Z11-004-01
Calibration Procedures for Dosimetric E-field Probes

Calibration date:

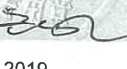
May 16, 2019

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Power sensor NRP-Z91	101547	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Power sensor NRP-Z91	101548	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Reference10dBAttenuator	18N50W-10dB	09-Feb-18(CTTL, No.J18X01133)	Feb-20
Reference20dBAttenuator	18N50W-20dB	09-Feb-18(CTTL, No.J18X01132)	Feb-20
Reference Probe EX3DV4	SN 7514	27-Aug-18(SPEAG,No.EX3-7514_Aug18/2)	Aug-19
DAE4	SN 1555	20-Aug-18(SPEAG, No.DAE4-1555_Aug18)	Aug -19
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	21-Jun-18 (CTTL, No.J18X05033)	Jun-19
Network Analyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan -20

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: May 18, 2019

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Certificate No: Z19-60136

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Client : ATL

Certificate No: Z19-60080

CALIBRATION CERTIFICATE

Object: DAE4 - SN: 541

Calibration Procedure(s): FF-Z11-002-01
Calibration Procedure for the Data Acquisition Electronics (DAEx)

Calibration date: March 19, 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(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	20-Jun-18 (CTTL, No.J18X05034)	June-19

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 20, 2019

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