

SAR Test Report

Project Number: 3720850
Report Number: 3720850EMC02 **Revision Level:** 1
Client: Hi-P (SINGAPORE) TECHNOLOGY PTE LTD
FCC ID: 2ACUZH375I
Equipment Under Test: iDEN Cellular Phone with Bluetooth
Model Number: H375i

Applicable Standards: IEEE STD 1528: 2013
EN 62209-2:2010

Report issued on: 29 April 2015
Test Result: Compliant

Transmit Band	Head SAR 1g w/kg	Dispatch / Push to talk SAR 1g w/kg	Body SAR 1g w/kg
iDEN 800	0.809	0.256	0.275
iDEN 900	1.092	0.44	0.33
Bluetooth	0.09	0.09	0.09
Simultaneous	1.182	0.53	0.42

Tested by:


Fabian Nica, Senior Engineering Technician

Reviewed by:


David Schramm, EMC/RF/SAR/HAC Manager

Remarks: This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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1 GENERAL INFORMATION

1.1 CLIENT INFORMATION

Name: Hi-P (SINGAPORE) TECHNOLOGY PTE LTD
 Address: 12 ANG MO KIO STREET 64 #03-02, UE BIZHUB CENTRAL (BLK A)
 City, State, Zip, Country: Singapore 569088

1.2 TEST LABORATORY

Name: SGS North America, Inc.
 Address: 620 Old Peachtree Road NW, Suite 100
 City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
 Type of lab: Testing Laboratory
 Certificate Number: 3212.01

1.3 GENERAL INFORMATION OF EUT

Serial Number: 364KRE0088
 Antenna: Integral
 Rated Voltage: 3.7 VDC 1830mAh Rechargeable Battery

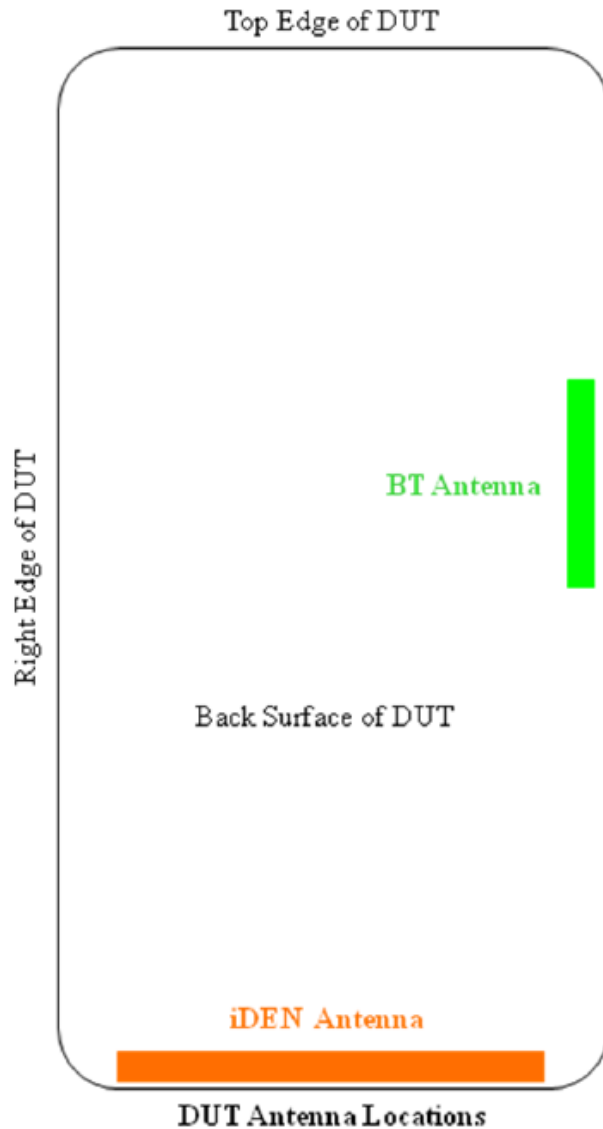
 Sample Received Date: 31 March 2015
 Dates of testing: 16 April to 20 April 2015

1.4 EQUIPMENT UNDER TEST

EUT	iDEN Cellular Phone with Bluetooth
Normal operation:	Hand held, worn on body, or held to face
Body Worn Accessory	None provided
Device category:	Portable
Exposure category:	General Population/Uncontrolled Exposure
Positions Tested:	Position 1 Right Head Cheek Touch Position 2 Right Head 15° Tilt Position 3 Left Head Cheek Touch Position 4 Left Head 15° Tilt Position 5 Front of EUT towards phantom with 25mm spacing for body worn and dispatch / push to talk Position 6 Back of EUT towards phantom with 25mm spacing for body worn

1.5 ANTENNA LOCATIONS

iDEN (800/900MHz) Antenna			Bluetooth Antenna		
Type	Internal		Type	Internal	
Location	Bottom of Transceiver		Location	Right-Side Read of Transceiver	
Dimensions	Width	13.56mm	Dimensions	Width	5.5mm
	Length	40.49mm		Length	21.9mm



1.6 DUT ACCESSORIES

None provided

1.7 SAR EXCLUSION / ESTIMATED SAR

The following shows that the Bluetooth radio in the device is excluded from SAR and provides the estimated SAR.

Stand Alone SAR Test Exclusion According to KDB447498D01 General RF Exposure Guidance v05r02							
Frequency, GHz	Min Separation distance to Body mm	Min Separation distance to Extremity mm	Max Power + Tolerance dBm	Antenna gain, dBi	Calculated Max Power, mW EIPR	1g head / body	10g Extremity
2.450	25.0	25.0	10.50	0.00	11	0.69	0.69
<p>SAR DOES NOT apply for head / body worn operating conditions SAR DOES NOT apply for extremity operating conditions</p> <p>1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:</p> <p>$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{GHz}}}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,²⁵ where</p> <ul style="list-style-type: none"> f_{GHz} is the RF channel transmit frequency in GHz Power and distance are rounded to the nearest mW and mm before calculation²⁶ The result is rounded to one decimal place for comparison 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below 							

Estimated SAR According to KDB447498D01 General RF Exposure Guidance v05r02	
Max. power of channel, including tune-up tolerance, mW:	11
Min. test separation distance, mm:	25
Square Root of F(GHz):	1.5652
Estimated SAR for Body 1-g (W/kg):	0.09
Max. power of channel, including tune-up tolerance, mW:	11
Min. test separation distance, mm:	25
Square Root of F(GHz):	1.5652
Estimated SAR for Extremity 10g (W/kg):	0.04
<p>2) When the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:³⁰</p> <ul style="list-style-type: none"> $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f_{\text{GHz}}} / x] \text{ W/kg}$ for test separation distances ≤ 50 mm; where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR. 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.³¹ <p>This SAR estimation formula has been considered, in conjunction with the SAR Test Exclusion Thresholds, to result in substantially conservative SAR values of ≤ 0.4 W/kg. When SAR is estimated, the peak SAR location is assumed to be at the feed-point or geometric center of the antenna, whichever provides a smaller antenna separation distance, and must be clearly identified in test reports. The estimated SAR is only used to determine simultaneous transmission SAR test exclusion; it should not be reported as the standalone SAR. When SAR is estimated, it must be applied to determine the sum of 1-g SAR test exclusion. When SAR to peak location separation ratio test exclusion is applied, the highest reported SAR for simultaneous transmission can be an estimated standalone SAR if the estimated SAR is the highest among the simultaneously transmitting antennas (see KDB 690783). For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion. The estimated SAR values at selected frequencies, distances and power levels are illustrated in Appendix D.</p>	

2 TEST METHODOLOGY

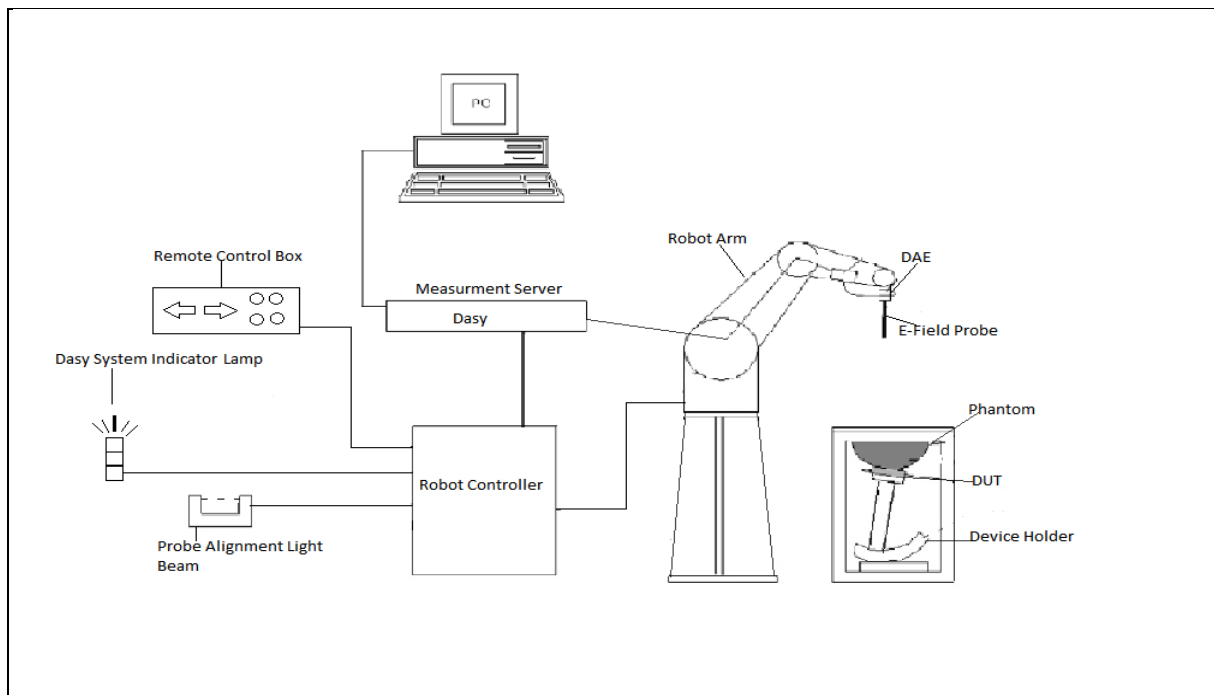
Testing was performed in accordance with the IEEE STD 1528: 2013 as well as the following:

- IEC 62209-2
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB 865664 D02 RF Exposure Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 648474 D04 Handset SAR v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03

3 TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial Number	Cal Date	Cal Int
Dasy5 Controller	SP1D	Stäubli	S-1188	NA	
PC	Compaq 8000 Elite	HP	CZC1231RWS	NA	
Probe Alignment Beam	LB5/80	Speag	SEUKS030AA	NA	
Phantom	Twin Sam	Speag	1665	NA	
Oval Phantom	ELI5	Speag	1146	NA	
Device Holder	SD 00 HO1 HA	Speag	NA	NA	
Data Acquisition Electronics	DAE4	Speag	1287	1/20/15	
Dielectric Probe Kit	Dak-3.5	Speag	1109	1/21/15	1yr
Body Simulating Liquid	BSL835	SGS	NSN	Prior to testing	
Head Simulating Liquid	HSL835	SGS	NSN	Prior to testing	
E-Field Probe	EX3DV4	Speag	3812	1/26/15	1yr
System Validation Dipole	D835V2	Speag	4d123	1/23/2015	1yr
RF Cable	SF106	Huber & Suhner	247436 004	8/4/14	1yr
RF Cable	SF106	Huber & Suhner	247439001	8/4/14	1yr
Network Analyzer	E5062A	Agilent	MY44102097	9/26/14	1yr
Power Meter	E4419B	Agilent	G839511059	8/8/14	1yr
Power Sensor	E9300B	Agilent	2702A61269	8/8/14	1yr
Power Sensor	E9300B	Agilent	MY41094585	8/8/14	1yr
Dual Directional Coupler	778D	Hewlett Packard	2604A13577	8/6/14	3yr
Signal Generator	SMB100A	Rohde & Schwarz	104999	6/18/13	3yr
Thermometer	DTM3000	LKM Electronic	2952	6/16/14	1yr

3.1 TEST SYSTEM BLOCK DIAGRAM



The Dasy5 SAR test system consists of:

- 1 Stäubli Robot and system controller cabinet
- 1 Electro Optical Converter mounted on robots arm
- Robot stand
- Robot remote controller
- Light beam for E-field probe alignment
- DASY5 measurement server
- SAM Twin Phantom
- Hand-Held/ Laptop device holder
- HP PC with DASY5 software
- Data Acquisition Electronics(DAE)
- System validation dipole kit
- Head/Body simulating liquid
- E-field probe
- Warning lamps

Specifications listed bellow correspond with defined parameters in IEEE 1528 and IEC 62209-1	
Twin SAM Phantom:	Specific Anthropomorphic Mannequin
Material:	Vinylester, fiber glass reinforced
Shell Thickness:	$2 \pm 0.2\text{mm}$ ($6 \pm 0.2\text{mm}$ at ear point)
Dimensions (wooden support incl):	1000mm length, 500mm width, adjustable feet for height
Filling Volume:	approx. 25L
ELI Phantom	
Material:	Vinylester, fiber glass reinforced
Shell Thickness:	$2.0 \pm 0.2\text{mm}$ (bottom plate)
Dimensions:	Major axis: 600, Minor axis: 400
Filling Volume:	approx. 30L
EX3DV4 Probe:	Isotropic E-Field Probe
Directivity:	$\pm 0.3\text{dB}$ in TSL(rotation around probe axis), $\pm 0.5\text{ dB}$ in TSL (rotation normal to probe axis)
Dimensions:	Overall length: 337mm (tip 20mm), Tip diameter: 2.5mm (Body: 12mm), Typical distance from probe tip to dipole centers: 1mm
Mounting Device for Hand-Held Transmitters:	Enables mounting and enables rotation of the mounted transmitter to specified spherical coordinates
	Transmitter devices can be accurately positioned according to IEC 62209-1, IEEE 1528, FCC or other specifications
Material:	Polyoxymethylene

4 LIQUID PARAMETERS CHECK

The tissue dielectric parameters shall be measured at the beginning of the test or within 24 hours of the first SAR test. All dielectric parameters should be within the tolerance values shown in Table 3-1. For frequencies in 300 MHz to just under 6 GHz, the measured conductivity and relative permittivity should be within $\pm 5\%$ of the target values in table 1. The measured permittivity tolerances can be relaxed to no more than the $\pm 10\%$. All efforts should be made to obtain the target values as closely as possible.

The head tissue dielectric parameters recommended by the IEEE1528-2003 Standard have been incorporated in Table 3-1.

Table 3-1

Target dielectric properties of tissue equivalent material in the 300-2450 MHz frequency range

Frequency (MHz)	Head		Body	
	Relative permittivity (ϵ_r)	Conductivity(σ) (S/m)	Relative permittivity (ϵ_r)	Conductivity(σ) (S/m)
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55	1.05
1450	40.5	1.20	54	1.3
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95

Table 3-2

Tissue Simulating Liquid Formulations

	835 MHz		1900 MHz		2450 MHz		5200-5800 MHz	
	Head	Body	Head	Body	Head	Body	Head	Body
Bactericide	0.10	0.10					See Note 2	See Note 3
DGBE								
HEC	1.00	1.00						
NaCL	1.45	0.94	1.03	0.70	0.00	0.30		
Sucrose	57.00	44.90						
Polysorbate (Tween) 20			46.10	28.00	45.25	28.00		
Water	40.45	53.06	52.87	71.30	55.75	71.70		

Note 1: Speag proprietary - Water 50-65%; Mineral Oil 10-30%; Emulsifiers 8-25%; NaCL 0-1.5%; Hexylene Glycol 1.0-2.8%

Note 2: Speag proprietary - Water 60-80%; Esters, Emulsifiers, Inhibitors 20-40%; NaCL 0-1.5%; Oleic acid 10-28%

4.1 TABLE 3-2 TISSUE VERIFICATION MEASURED

Tissue Verification									
Liquid Temp °C	Date	Tissue Type	Measured Frequency (MHz)	Measured Dielectric Constant, ϵ	Measured Conductivity, σ S/m	Target Dielectric Constant, ϵ	Target Conductivity, σ S/m	% deviation, ϵ	% deviation, σ
22.53	4/16/2015	835H	815	38.66	0.88	41.5	0.90	-6.8%	-2.2%
			835	38.49	0.90	41.5	0.90	-7.3%	0.0%
			898	37.40	0.94	41.5	0.90	-9.9%	4.4%
22.1	4/17/2015	835H	898	37.41	0.95	41.5	0.90	-9.9%	5.6%
			835	38.68	0.93	41.5	0.90	-6.8%	3.3%
22.55	4/17/2015	835B	815	52.26	0.92	55.2	0.97	-5.3%	-5.2%
			835	52.04	0.94	55.2	0.97	-5.7%	-3.1%
			898	51.50	1.00	55.2	0.97	-6.7%	3.1%
22.03	4/20/2015	835B	815	52.26	0.92	55.2	0.97	-5.3%	-5.2%
			835	51.99	0.94	55.2	0.97	-5.8%	-3.1%
			898	51.41	1.01	55.2	0.97	-6.9%	4.1%

Using the DASY52, compensation was enabled to correct only in the positive direction.

5 SAR MEASUREMENT SYSTEM VERIFICATION

The system performance verification verifies the system operates within the $\pm 10\%$ limit. Each performance check is performed prior to any SAR testing to measure accuracy.

5.1 PERFORMANCE CHECK MEASUREMENT CONDITIONS

- Measurements are performed in the flat section of the SAM phantom
- Phantom is filled with Head or Body simulating liquids
- DASY5 system parameters are tested using a Isotropic E-field probe
- The dipole is mounted on an extendable tripod that is positioned below the flat phantom center. The dipole is oriented parallel with the body's axis. The standard measuring distance is 10 mm above 1 GHz or 15 mm below 1 GHz from the dipole to the simulating liquids surface.
- A grid spacing of 15 mm is aligned with the dipole
- 7x7x7 cube is selected for a zoom scan
- A 4 mm distance is set between the probe and phantom surface
- Dipole input power(forward power) is set to 100 mW
- Results are normalized to 1 W input power

5.2 SAR REFERENCE VALUES FOR HEAD AND BODY CALIBRATION

**Numerical reference SAR values (W/kg) for dipole and flat phantom
 (IEEE1528-2003 Table 7)**

Frequency (MHz)	1g SAR	10g SAR
300	3.0	2.0
450	4.9	3.3
835	9.5	6.2
900	10.8	6.9
1450	29.0	16.0
1800	38.1	19.8
1900	39.7	20.5
2000	41.1	21.1
2450	52.4	24.0

5.2.1 SYSTEM VERIFICATION

System Check											
Scan	Date	Ambient Temp (°C)	Liquid Temp (°C)	Input Power (W)	Tissue Frequency (MHz)	Dipole SN	Tissue Type	Measured SAR _{1g} (W/kg)	1W Target SAR _{1g} (W/kg)	1W Normalized SAR ₁ (W/kg)	Deviation (%)
C1	4/16/2015	23.25	22.53	0.100	835	4d123	Head	0.934	9.25	9.34	1.0%
C2	4/17/2015	23.12	22.1	0.100	835	4d123	Head	0.927	9.25	9.27	0.2%
C3	4/17/2015	23.65	22.55	0.100	835	4d123	Body	0.955	9.49	9.55	0.6%
C4	4/20/2015	23.23	22.03	0.100	835	4d123	Body	0.952	9.49	9.52	0.3%

6 SAR MEASUREMENT PROCEDURE

- Area Scan is used for a fast scan in two dimension to find the area of high field values before any finer measurement around the hotspot. The routines implemented in the DASY5 software can find the maximum locations.
- Zoom Scan is used to assess the peak spatial values within a cubic averaging volume containing 1g and 10g of simulated tissue. The scan measures a 7x7x7 area within the cube. Once measurement is done the values are displayed within the job's label.
- Power Drift will measure the field at the same location as the most recent power reference measurement within the same procedure and settings. The Power Drift Measurement gives the field difference in dB.
- Z- Scan measure points along a straight vertical line. The lines run along the z-axis of a one dimensional grid. To get a reasonable extrapolation the extrapolated distance should not be larger than the step size in z direction.

6.1 HEAD SAR CONFIGURATION

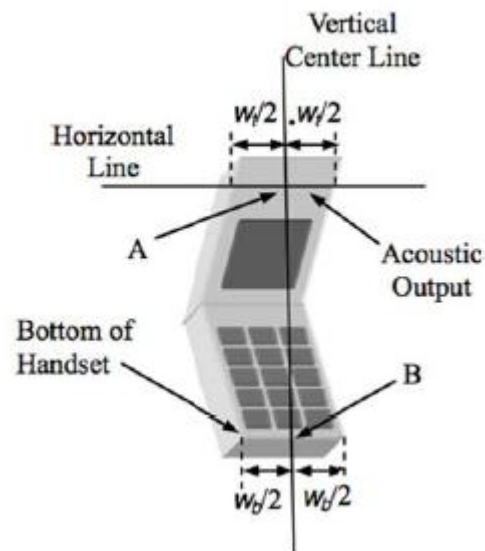
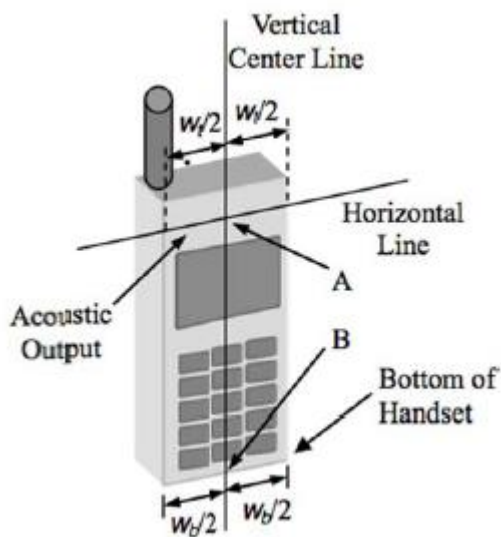
6.1.1 SAM SPECIFICATIONS

The Specific Anthropomorphic Mannequin (SAM) phantom corresponds to specifications defined in IEEE 1528 and IEC 62209-1. It allows dosimetric evaluation of the left, right, hand phone usage as well as body mounted usage at the flat region of the phantom

6.1.2 HANDSET REFERENCE POINTS

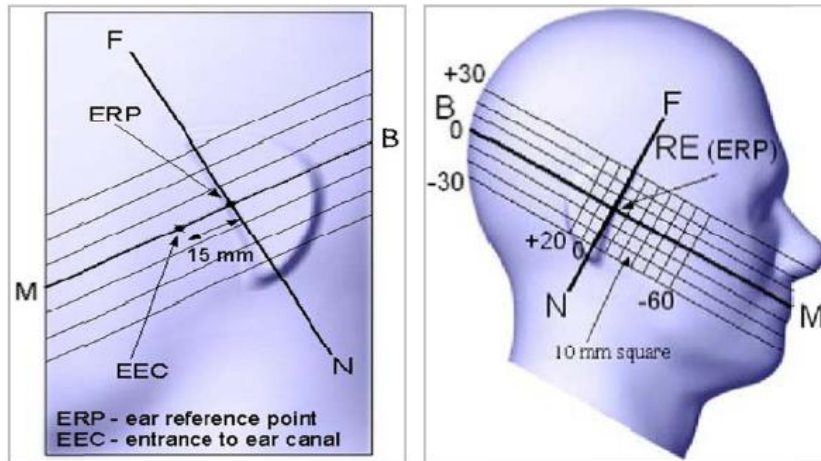
In order to identify reference points on the handset, define two imaginary lines on the handset

- The vertical centreline passes through two points on the front side of the handset. The midpoint of the width at the acoustic output and the midpoint of the width of the bottom of handset.
- The horizontal line is perpendicular to the vertical centreline and passes through the center of the acoustic output.
- The two lines intersect at point A.



6.1.3 EAR REFERENCE

This category includes most wireless handsets. The handset should have its earpieces located within the upper part of the device or along the centerline. The handset should be positioned with the earpiece region pressed against the ear spacer of the phantom.

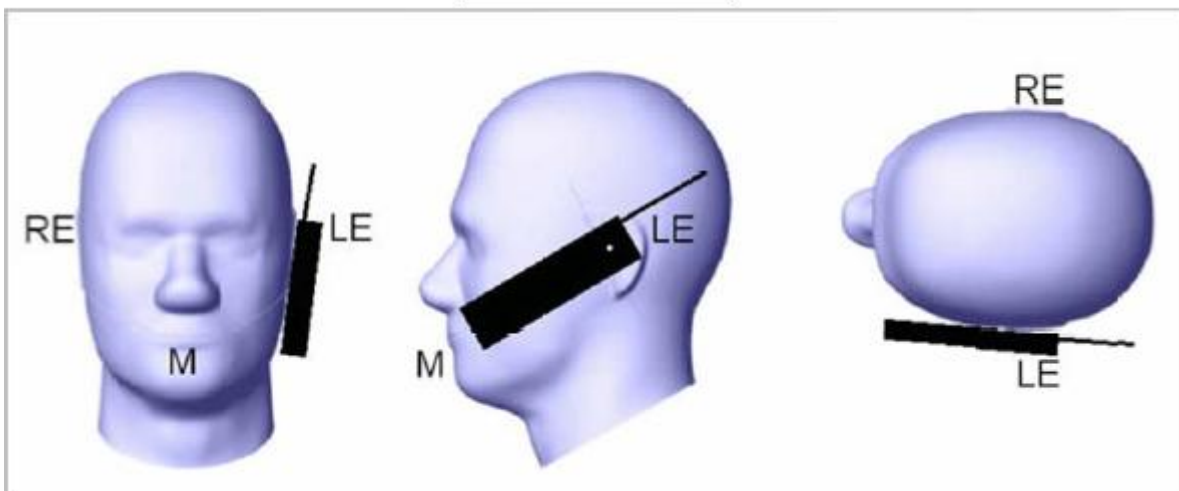


6.1.4 CHEEK POSITIONS

The device is attached toward the mouth part of the phantom by pivoting against the ear reference point. The test position is established when:

- Any point on the display, keypad or mouthpiece portion of the EUT is in contact with the phantom

Cheek / Touch Position

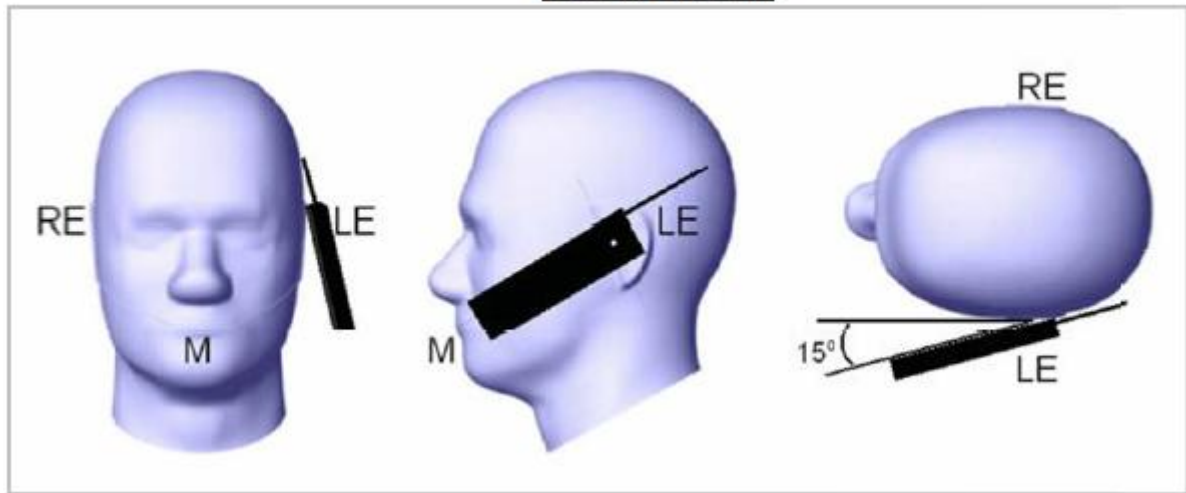


6.1.5 TILT POSITION

The test position is established when:

- Repeat the cheek touch position setup
- While maintaining the orientation of the handset move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
- Rotate the handset around the horizontal line by 15°
- While maintain the orientation of the handset move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear.
- The tilt position is obtained when the contact point is on the pinna and the antenna is at the back of the phantoms head.

Ear/Tilt 15° Position



7 CONDUCTED OUTPUT POWER VERIFICATION

Conducted power for iDEN modes (dBm)			
Band	Frequency (MHz)	Interconnect 2:6	Maximum Rated Power
iDEN 800	806.0125	27.92	28.06
	815.5125	27.98	
	824.9875	27.92	
iDEN 900	896.01875	27.86	
	898.99375	27.85	
	901.98125	27.88	

8 IDEN 800 HEAD SAR RESULTS

The EUT is iDEN capable. The sample was placed in a test mode which allows control of the transmitter without the need to establish a connection to a base station simulator. Software was configured to proper channels, transmitter power levels and transmit modes of operation.

The results listed below summarize the data obtained after the device was tested in the operating conditions described previously.

Date	Frequency MHz	CH	Mode	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position		Duty Cycle	1g SAR W/kg	Scaling factor	Scaled SAR 1g W/kg	Plot #
4/16/2015	815.5125	Mid	Interconnect	28.06	27.98	-0.05	Right	Touch	2:6	0.794	1.019	0.809	1
				28.06	27.98	0.05	Right	Tilt		0.282	1.019	0.287	
				28.06	27.98	-0.09	Left	Touch		0.610	1.019	0.621	
				28.06	27.98	0.10	Left	Tilt		0.260	1.019	0.265	
				28.06	27.98	0.01	Right	Touch		0.682	1.019	0.695	2
			Interconnect Dispatch PTT	28.06	27.98	-0.04	PTT Front	2.5cm	2:06	0.251	1.019	0.256	3

9 IDEN 900 HEAD SAR RESULTS

Date	Frequency MHz	CH	Mode	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position		Duty Cycle	1g SAR W/kg	Scaling factor	Scaled SAR 1g W/kg	Plot #
4/16/2015	898.99375	Mid	Interconnect	28.06	27.85	0.00	Right	Touch	2:6	0.877	1.050	0.920	
				28.06	27.85	0.11	Right	Tilt		0.427	1.050	0.448	
				28.06	27.85	0.22	Left	Touch		0.917	1.050	0.962	4
				28.06	27.85	-0.36	Left	Tilt		0.452	1.050	0.474	
				28.06	27.85	0.09	Left	Touch		1.04	1.050	1.092	5
4/17/2015			Interconnect Dispatch PTT	28.06	27.85	0.00	PTT Front	2.5cm	1:6	0.419	1.050	0.440	6

10 IDEN 800 BODY SAR RESULTS

Date	Frequency MHz	CH	Mode	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position	Duty Cycle	1g SAR W/kg	Scaling factor	Scaled SAR 1g W/kg	Plot #
4/17/2015	815.5125	Mid	Interconnect	28.06	27.98	0.09	2.5cm Front	1:6	0.270	1.019	0.275	7
4/20/2015			Interconnect Dispatch PTT	28.06	27.98	-0.14	2.5cm Back		0.201	1.019	0.205	

11 IDEN 900 BODY SAR RESULTS

Date	Frequency MHz	CH	Mode	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position	Duty Cycle	1g SAR W/kg	Scaling factor	Scaled SAR 1g W/kg	Plot #
4/20/2015	898.99375	Mid	Interconnect Dispatch PTT	28.06	27.85	0.08	2.5cm Front	1:6	0.314	1.050	0.330	8
				28.06	27.85	0.09	2.5cm Back		0.224	1.050	0.235	

12 UNCERTAINTY BUDGET 0.3 – 3 GHZ RANGE

Test Name:	SAR 62209-2 (0.3 to 6 GHz range)
Instrument(s) Used:	SAR Measurement Sytem
Standard(s) Reference:	IEC 62209-2:2010

Symbol	Source of Uncertainty	Value	Probability Distribution	Divisor	ci (1g)	ci (10g)	Std. Unc. (1g)	Std. Unc. (10g)	vi or veff
	MEASUREMENT DESCRIPTION								
	Probe Calibration	6.6%	N1	1	1	1	6.6%	6.6%	inf
	Axial Isotropy	4.7%	R	1.732	0.7	0.7	1.9%	1.9%	inf
	Hemispherical Isotropy	9.6%	R	1.732	0.7	0.7	3.9%	3.9%	inf
	Linearity	4.7%	R	1.732	1	1	2.7%	2.7%	inf
	System Detection Limits	1.0%	R	1.732	1	1	0.6%	0.6%	inf
	Modulation Response	2.4%	R	1.732	1	1	1.4%	1.4%	inf
	Boundary Effects	2.0%	R	1.732	1	1	1.2%	1.2%	inf
	Readout Electronics	0.3%	N1	1	1	1	0.3%	0.3%	inf
	Response Time	0.8%	R	1.732	1	1	0.5%	0.5%	inf
	Integration Time	2.6%	R	1.732	1	1	1.5%	1.5%	inf
	RF Ambient Noise	3.0%	R	1.732	1	1	1.7%	1.7%	inf
	RF Ambient Reflections	3.0%	R	1.732	1	1	1.7%	1.7%	inf
	Probe Positioner	0.8%	R	1.732	1	1	0.5%	0.5%	inf
	Probe Positioning	6.7%	R	1.732	1	1	3.9%	3.9%	inf
	Post Processing	4.0%	R	1.732	1	1	2.3%	2.3%	inf
	TEST SAMPLE RELATED								
	Device Positioning	2.9%	N1	1	1	1	2.9%	2.9%	inf
	Device Holder	3.6%	N1	1	1	1	3.6%	3.6%	inf
	Power Drift	5.0%	R	1.732	1	1	2.9%	2.9%	inf
	Power Scaling	0.0%	R	1.732	1	1	0.0%	0.0%	inf
	PHANTOM AND SETUP								
	Phantom Uncertainty	7.9%	R	1.732	1	1	4.6%	4.6%	inf
	SAR correction	1.9%	R	1.732	1	0.84	1.1%	0.9%	inf
	Liquid Conductivity(meas.)	2.5%	N1	1	0.78	0.71	2.0%	1.8%	inf
	Liquid Permittivity(meas.)	2.5%	N1	1	0.26	0.26	0.7%	0.7%	inf
	Temp. unc. - Conductivity	1.7%	R	1.732	0.78	0.71	0.8%	0.7%	inf
	Temp. unc. - Permittivity	0.3%	R	1.732	0.23	0.26	0.0%	0.0%	inf
			n1	1	1	1	0.0%	0.0%	inf

uc(Fs)	Combined Standard Uncertainty	N1	1	12.6%	12.5%
U(Fs)	Expanded Uncertainty	Normal k=	2	25.1%	25.1%

The Expanded Uncertainty is 25.1% for a Normal k factor equal to 2

13 SYSTEM CHECK PLOTS

C1

Date/Time: 4/16/2015 8:48:27 AM

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d123

Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.905 \text{ S/m}$; $\epsilon_r = 38.489$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.18, 9.18, 9.18); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/835MHz HSL System Validation/Area Scan (41x131x1): Interpolated grid:

$dx = 1.500 \text{ mm}$, $dy = 1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.13 W/kg

Configuration/835MHz HSL System Validation/Zoom Scan (7x7x7)/Cube 0:

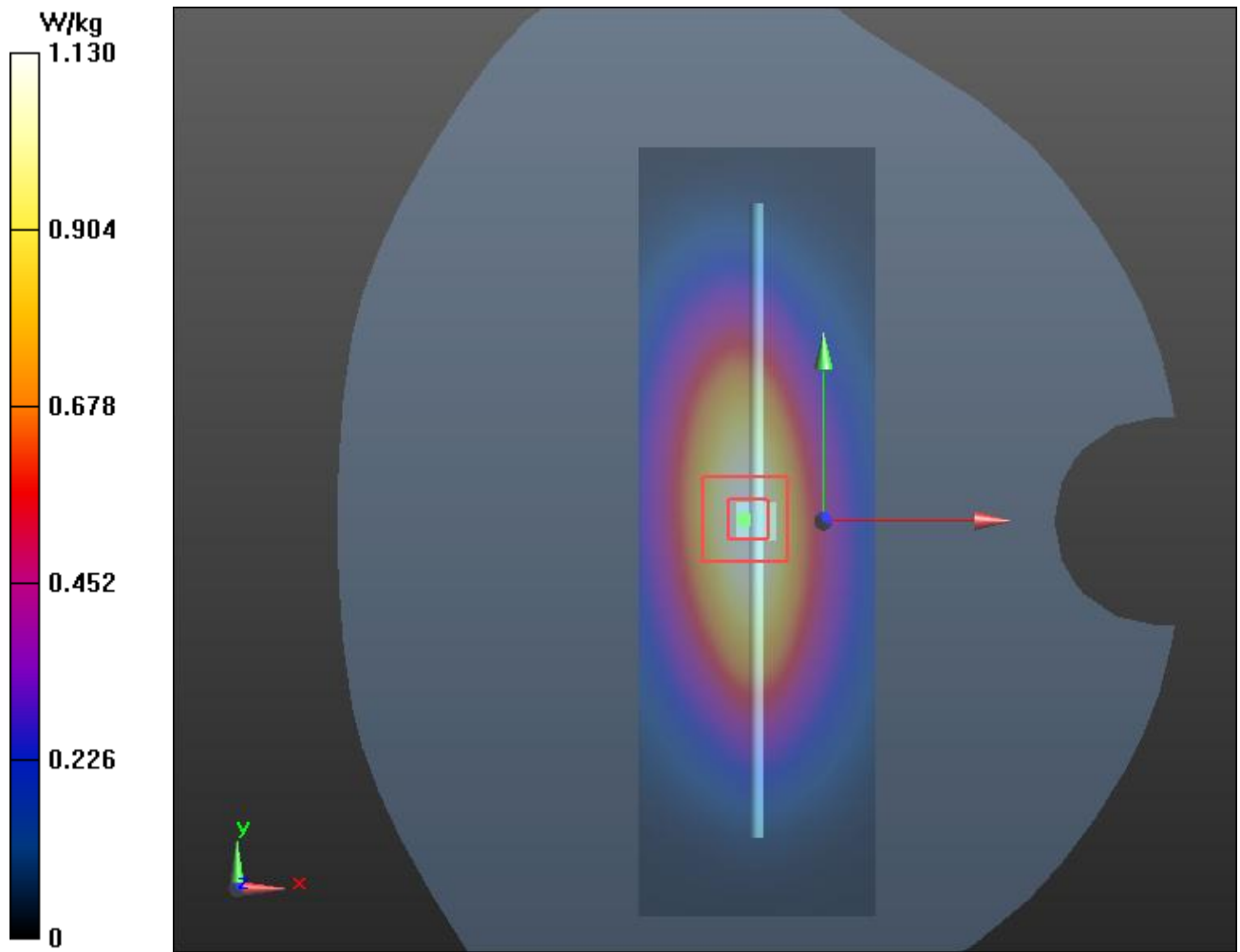
Measurement grid: $dx = 5 \text{ mm}$, $dy = 5 \text{ mm}$, $dz = 5 \text{ mm}$

Reference Value = 35.95 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.934 W/kg; SAR(10 g) = 0.615 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.15 W/kg



C2

Date/Time: 4/17/2015 10:02:15 AM

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d123

Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.931 \text{ S/m}$; $\epsilon_r = 38.683$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.18, 9.18, 9.18); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/835MHz HSL System Validation/Area Scan (41x131x1): Interpolated grid:

$dx = 1.500 \text{ mm}$, $dy = 1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.15 W/kg

Configuration/835MHz HSL System Validation/Zoom Scan (7x7x7)/Cube 0:

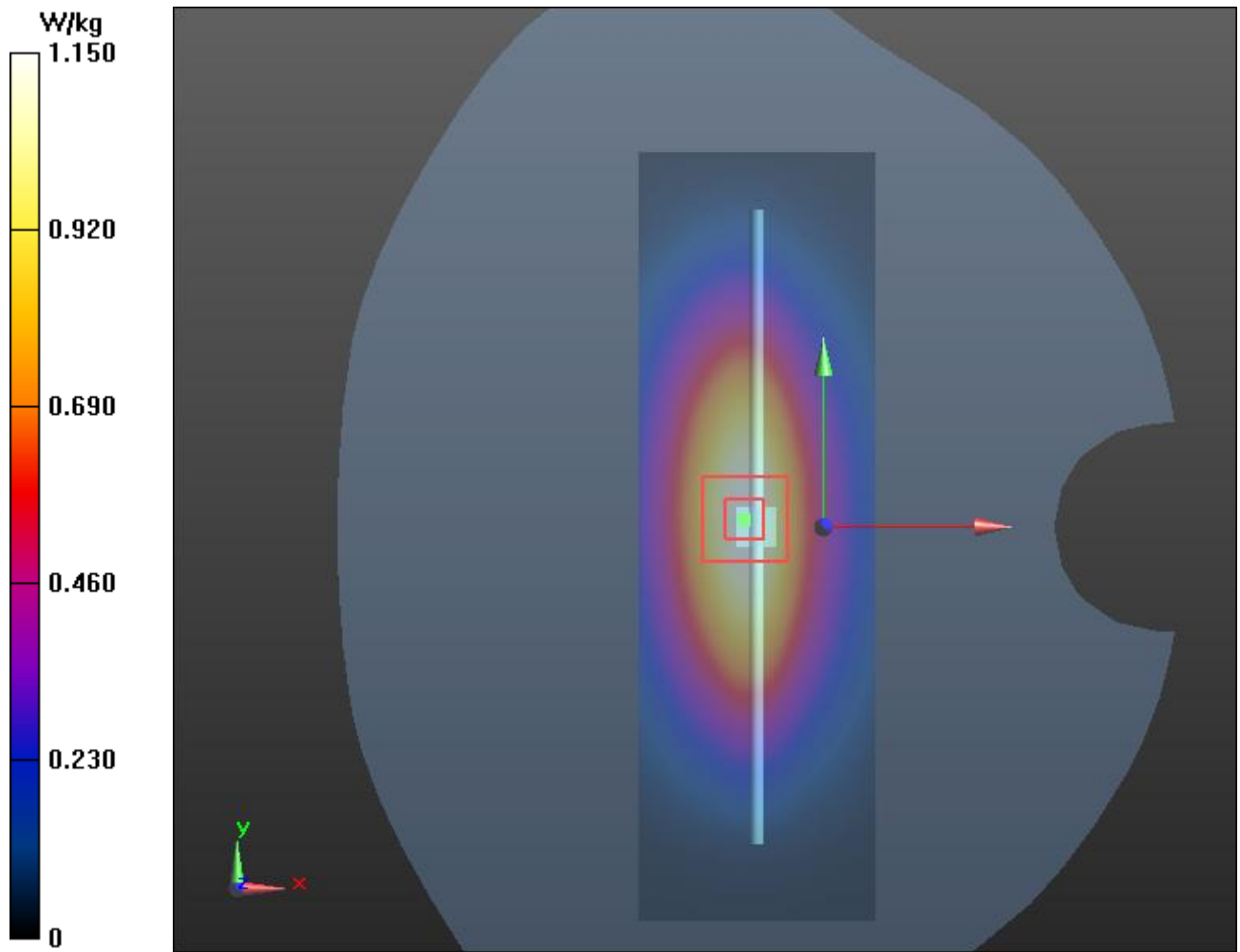
Measurement grid: $dx = 5 \text{ mm}$, $dy = 5 \text{ mm}$, $dz = 5 \text{ mm}$

Reference Value = 35.51 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.927 W/kg; SAR(10 g) = 0.616 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.16 W/kg



C3

Date/Time: 4/17/2015 2:16:39 PM

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d123

Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.943 \text{ S/m}$; $\epsilon_r = 52.04$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(8.99, 8.99, 8.99); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/835MHz BSL System Validation/Area Scan (41x131x1): Interpolated grid:

$dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.13 W/kg

Configuration/835MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:

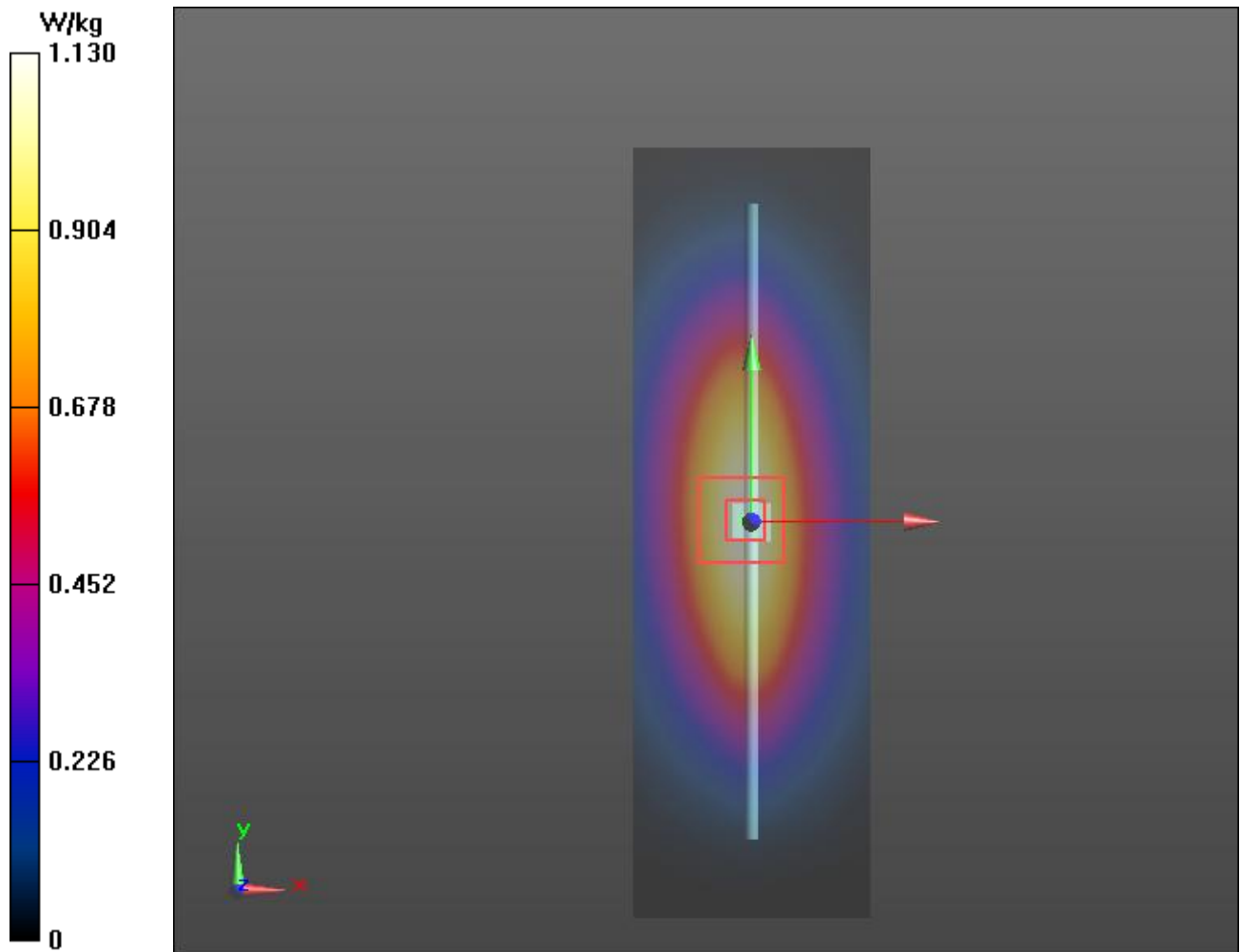
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 35.02 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.955 W/kg; SAR(10 g) = 0.632 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.13 W/kg



C4

Date/Time: 4/20/2015 8:43:20 AM

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d123

Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.946 \text{ S/m}$; $\epsilon_r = 51.994$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(8.99, 8.99, 8.99); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/835MHz BSL System Validation/Area Scan (41x131x1): Interpolated grid:

$dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.12 W/kg

Configuration/835MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:

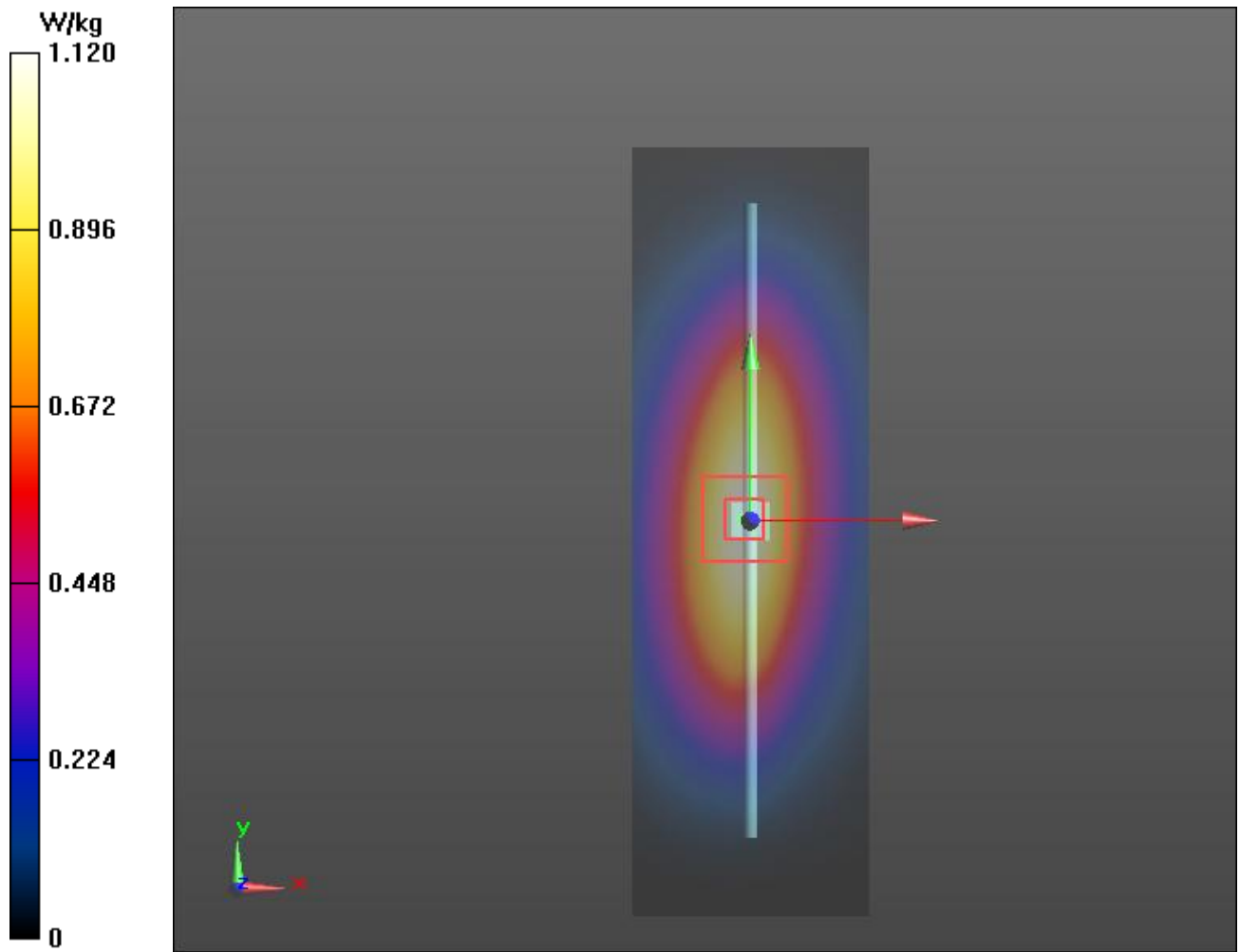
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 35.05 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.952 W/kg; SAR(10 g) = 0.630 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.13 W/kg



14 SAR PLOTS

Plot 1

DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 800; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 815.513 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 816$ MHz; $\sigma = 0.885$ S/m; $\epsilon_r = 38.654$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY Configuration:

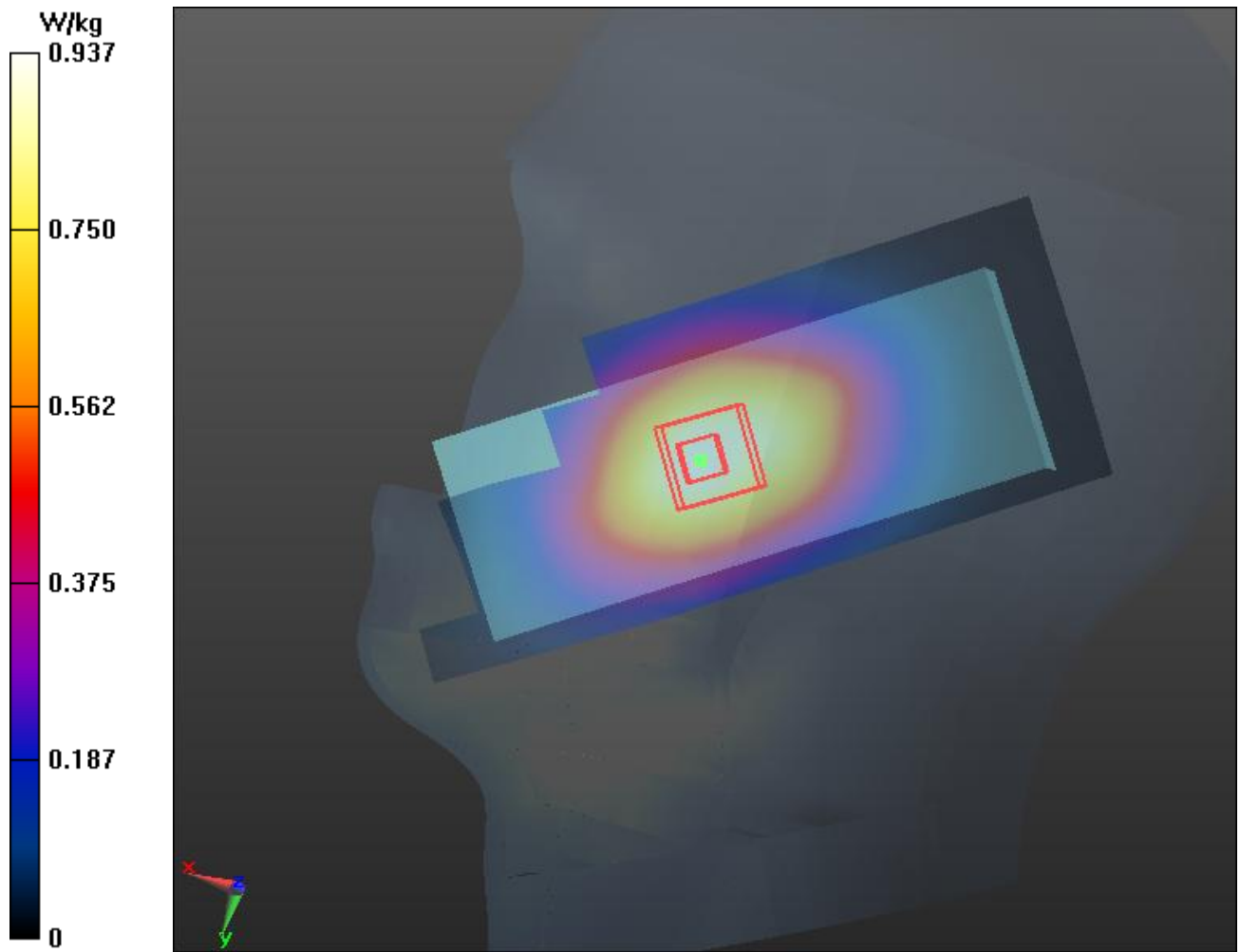
- Probe: EX3DV4 - SN3812; ConvF(9.18, 9.18, 9.18); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = -7.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 101/Area Scan (51x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Reference Value = 14.65 V/m; Power Drift = -0.05 dB

Fast SAR: SAR(1 g) = 0.794 W/kg; SAR(10 g) = 0.542 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 0.937 W/kg



Plot 2

DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 800; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 815.513 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 816 \text{ MHz}$; $\sigma = 0.885 \text{ S/m}$; $\epsilon_r = 38.654$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.18, 9.18, 9.18); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = -7.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 101 Z/Area Scan (51x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.804 W/kg

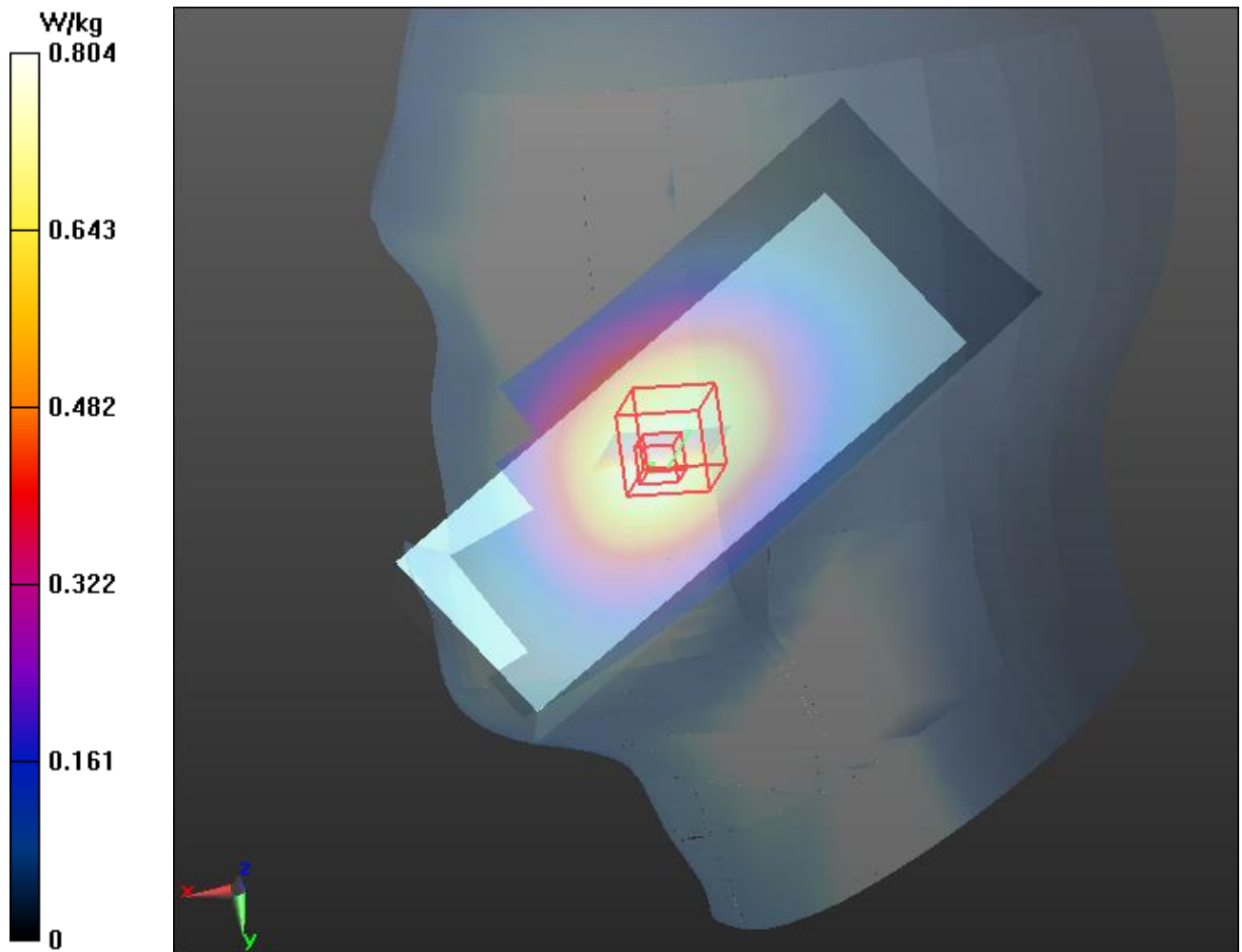
Configuration/Scan 101 Z/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.99 V/m ; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.820 W/kg

SAR(1 g) = 0.682 W/kg ; SAR(10 g) = 0.514 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.762 W/kg



Plot 3

DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 800; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 815.513 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 816 \text{ MHz}$; $\sigma = 0.885 \text{ S/m}$; $\epsilon_r = 38.654$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.18, 9.18, 9.18); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 107 Z/Area Scan (51x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.283 W/kg

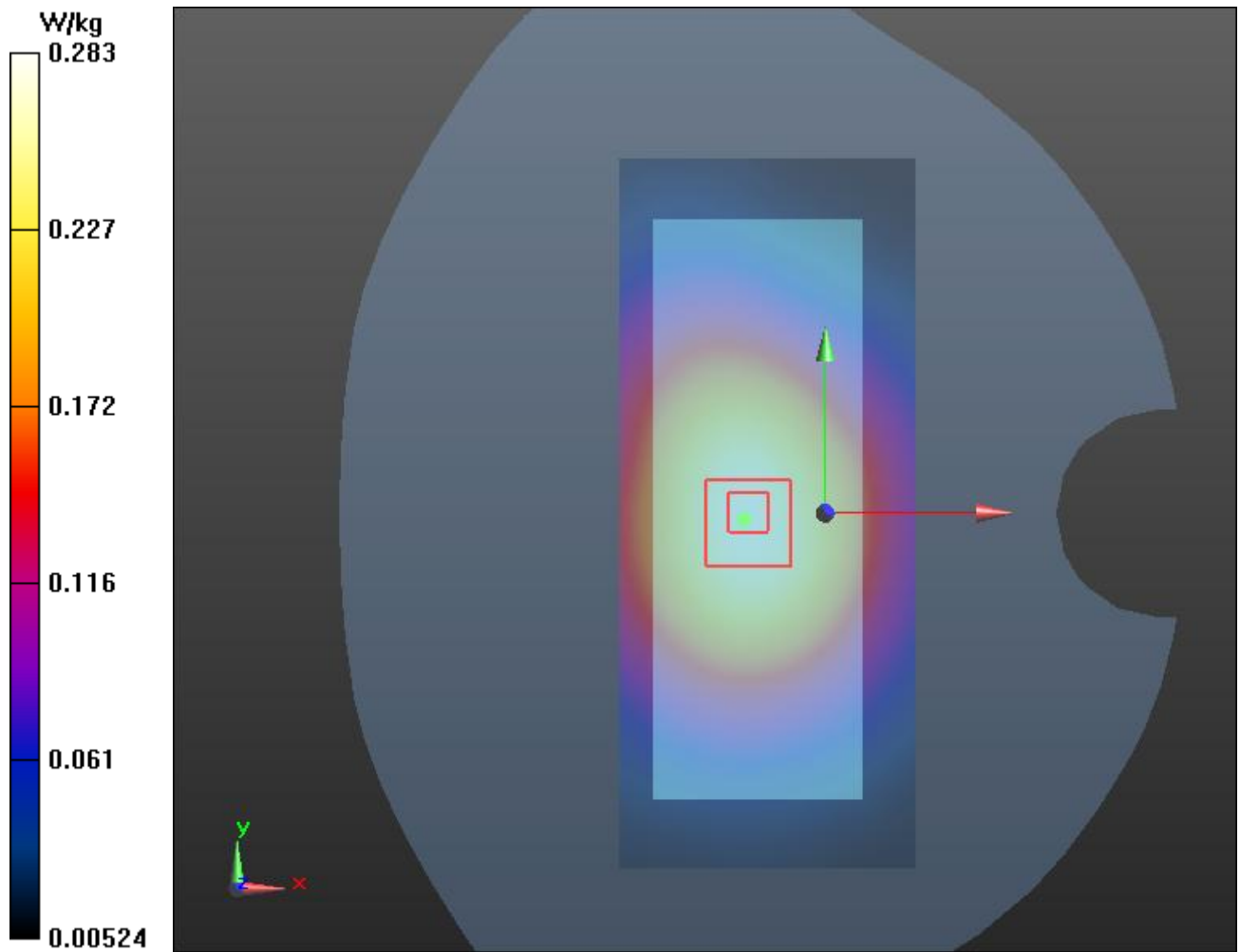
Configuration/Scan 107 Z/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.31 V/m ; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.322 W/kg

SAR(1 g) = 0.251 W/kg ; SAR(10 g) = 0.188 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.287 W/kg



Plot 4

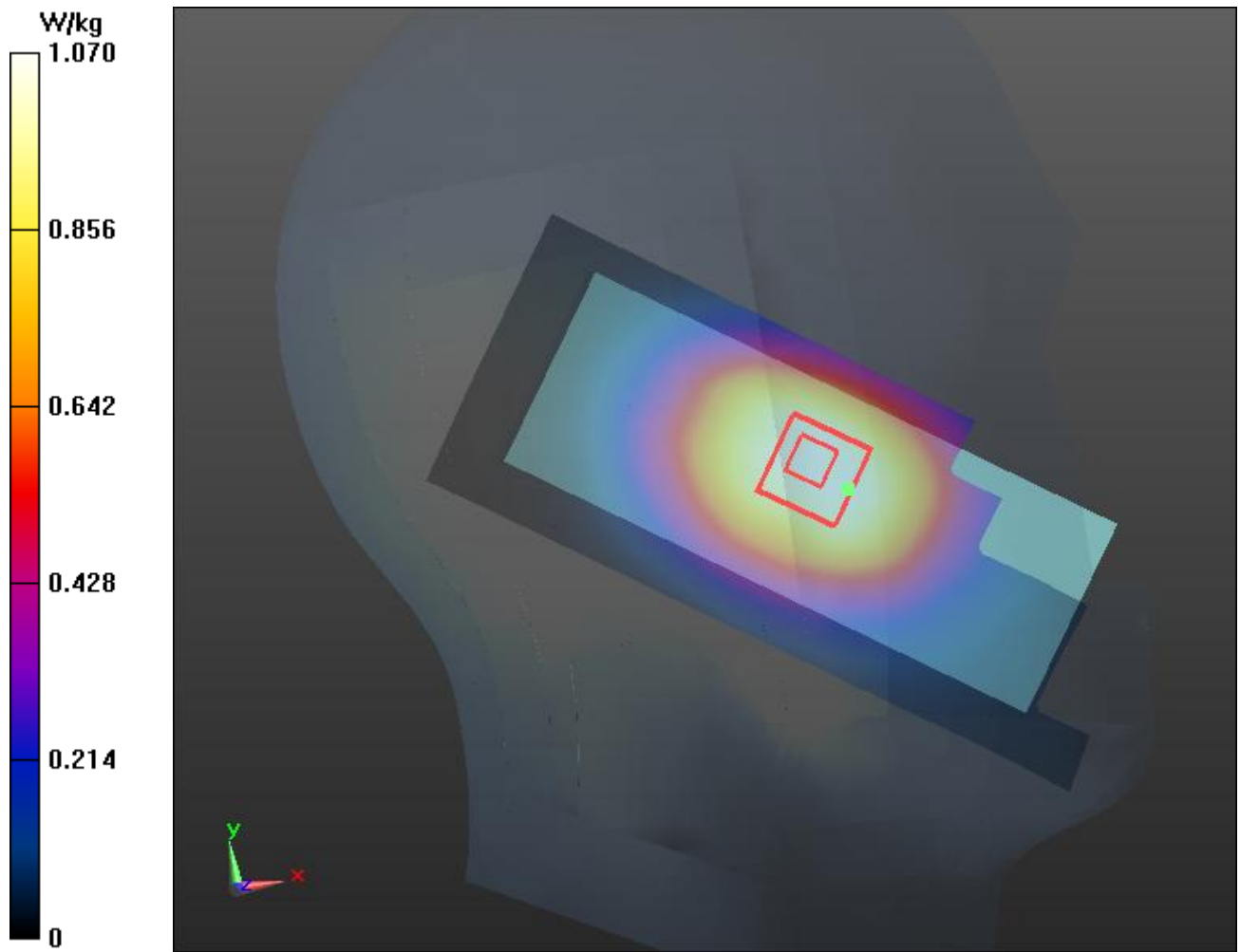
DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 900; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 898.994 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 899 \text{ MHz}$; $\sigma = 0.942 \text{ S/m}$; $\epsilon_r = 37.391$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.05, 9.05, 9.05); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = -5.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 203/Area Scan (51x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
 Reference Value = 17.83 V/m; Power Drift = 0.22 dB
Fast SAR: SAR(1 g) = 0.917 W/kg; SAR(10 g) = 0.642 W/kg (SAR corrected for target medium)
 Maximum value of SAR (interpolated) = 1.07 W/kg



Plot 5

DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 900; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 898.994 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 899 \text{ MHz}$; $\sigma = 0.942 \text{ S/m}$; $\epsilon_r = 37.391$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.05, 9.05, 9.05); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = -5.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 203 Z/Area Scan (51x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

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

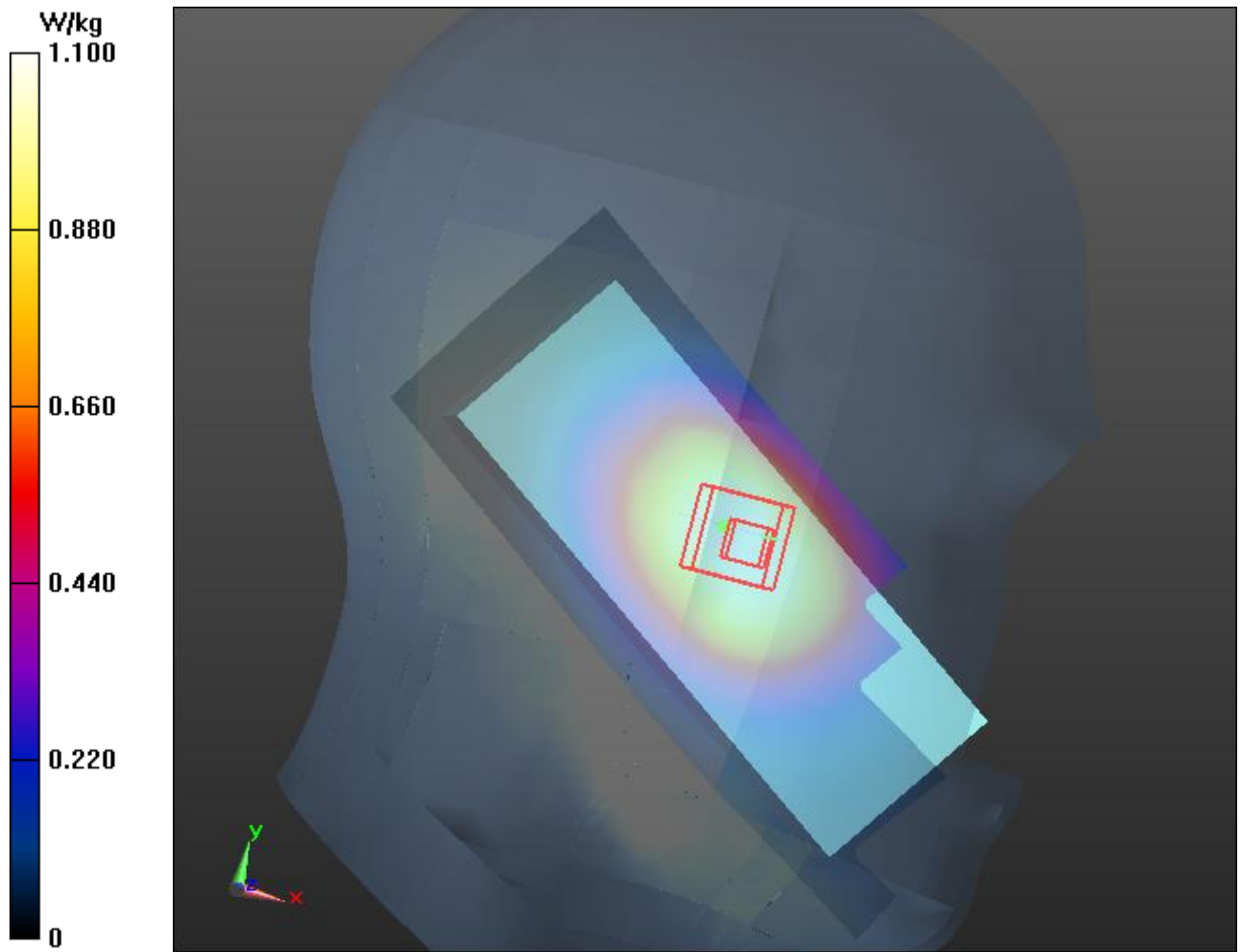
Configuration/Scan 203 Z/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.18 V/m ; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 1.04 W/kg ; SAR(10 g) = 0.792 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.17 W/kg



Plot 6

DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 900; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 898.994 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 899 \text{ MHz}$; $\sigma = 0.956 \text{ S/m}$; $\epsilon_r = 37.403$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(9.05, 9.05, 9.05); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 1.0, 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1665
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 207 Z/Area Scan (51x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.478 W/kg

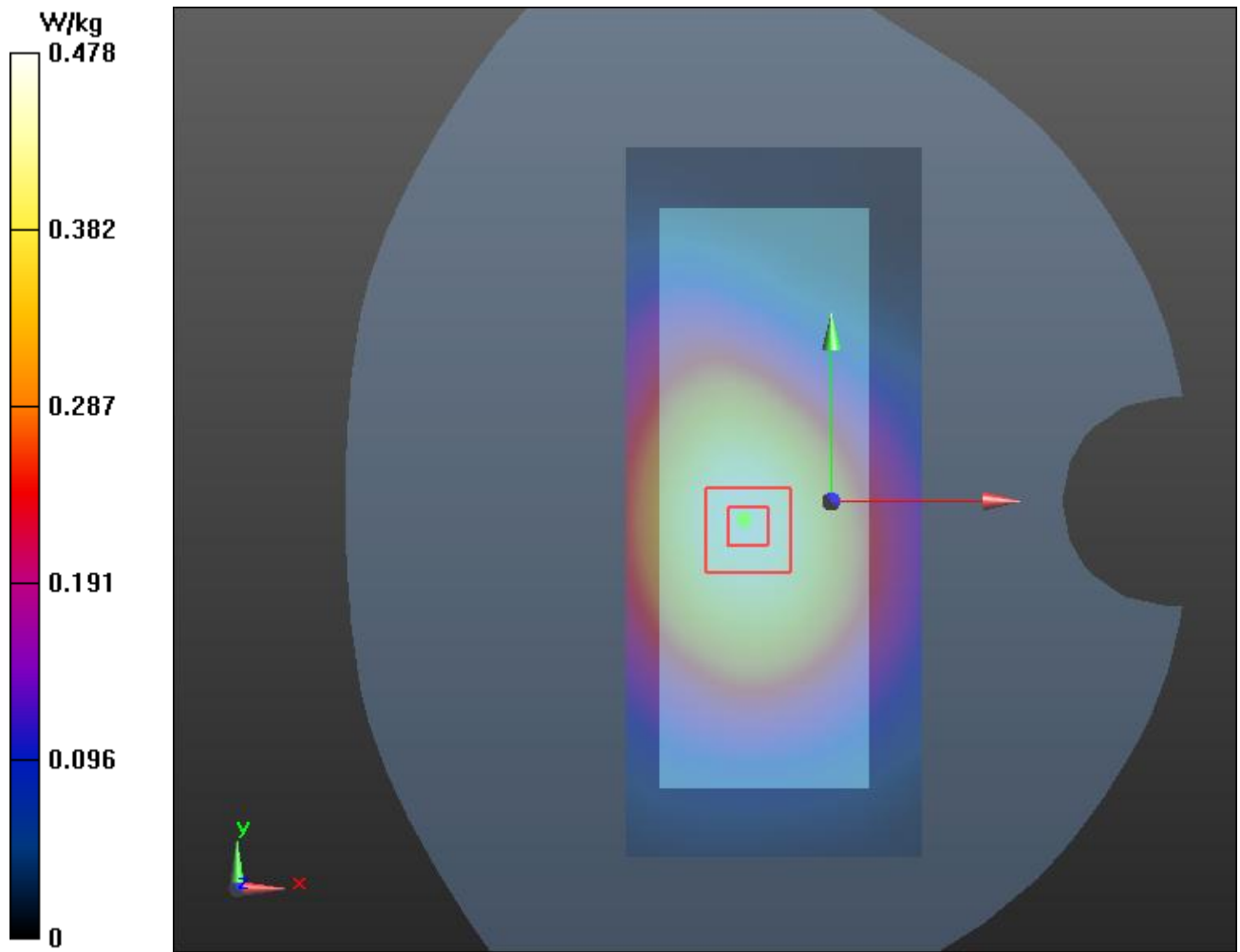
Configuration/Scan 207 Z/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.26 V/m ; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.550 W/kg

SAR(1 g) = 0.419 W/kg ; SAR(10 g) = 0.306 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.493 W/kg



Plot 7

DUT: Hi-P Electronics; Type: iDen Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 800; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 815.513 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 816 \text{ MHz}$; $\sigma = 0.921 \text{ S/m}$; $\epsilon_r = 52.241$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(8.99, 8.99, 8.99); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 300/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.23 V/m; Power Drift = 0.09 dB

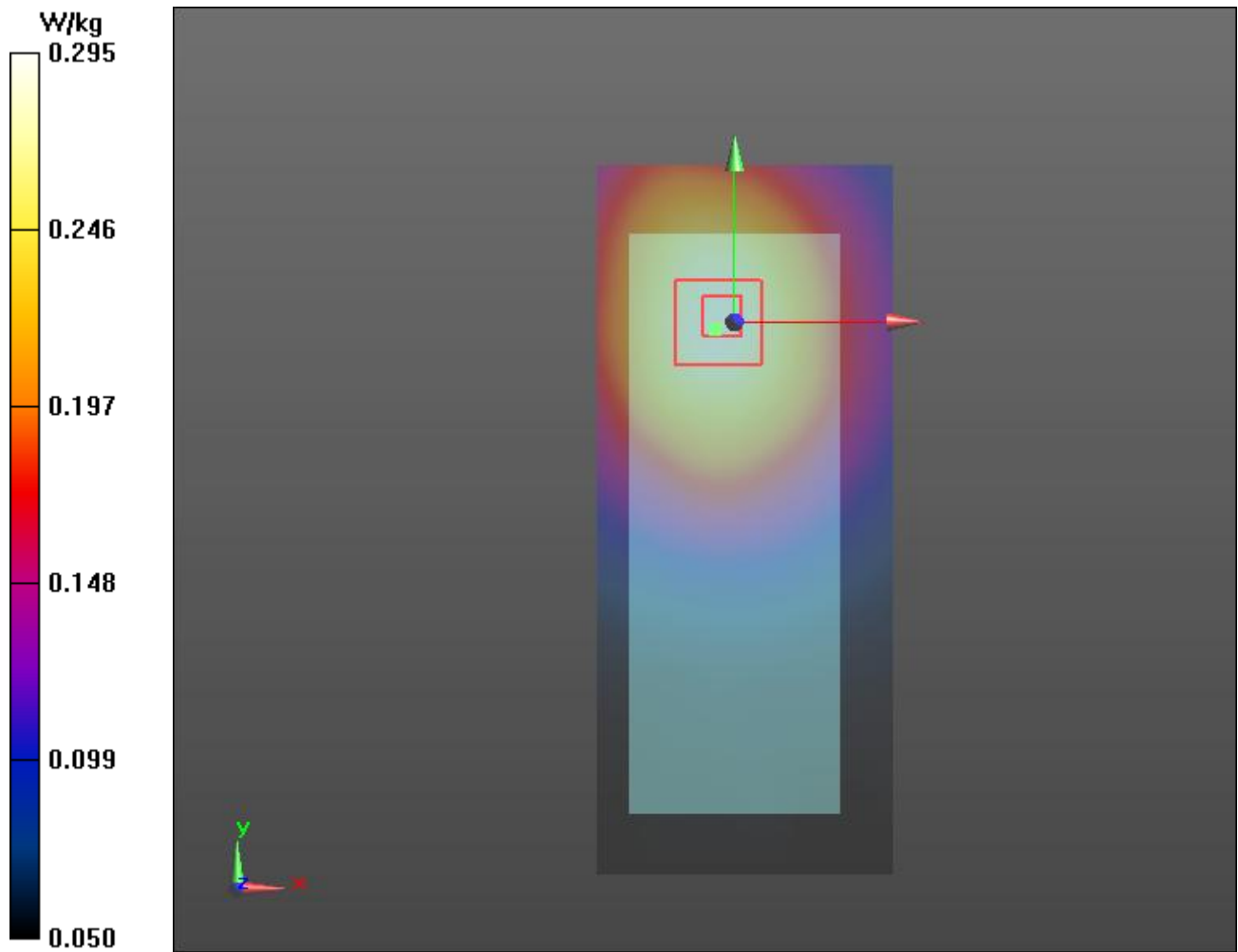
Peak SAR (extrapolated) = 0.332 W/kg

SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.202 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.295 W/kg

Configuration/Scan 300/Area Scan (51x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.306 W/kg



Plot 8

DUT: Hi-P Electronics; Type: Cellular Phone; Serial: 364KRE0088

Communication System: UID 0, iDEN 900; Communication System Band: FullSpan (0.0 - 6000.0 MHz); Frequency: 898.994 MHz; Communication System PAR: 0 dB; PMF: 1
 Medium parameters used: $f = 899$ MHz; $\sigma = 1.011$ S/m; $\epsilon_r = 51.4$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(8.85, 8.85, 8.85); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), $z = 31.0$
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Scan 400/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 18.74 V/m; Power Drift = 0.08 dB

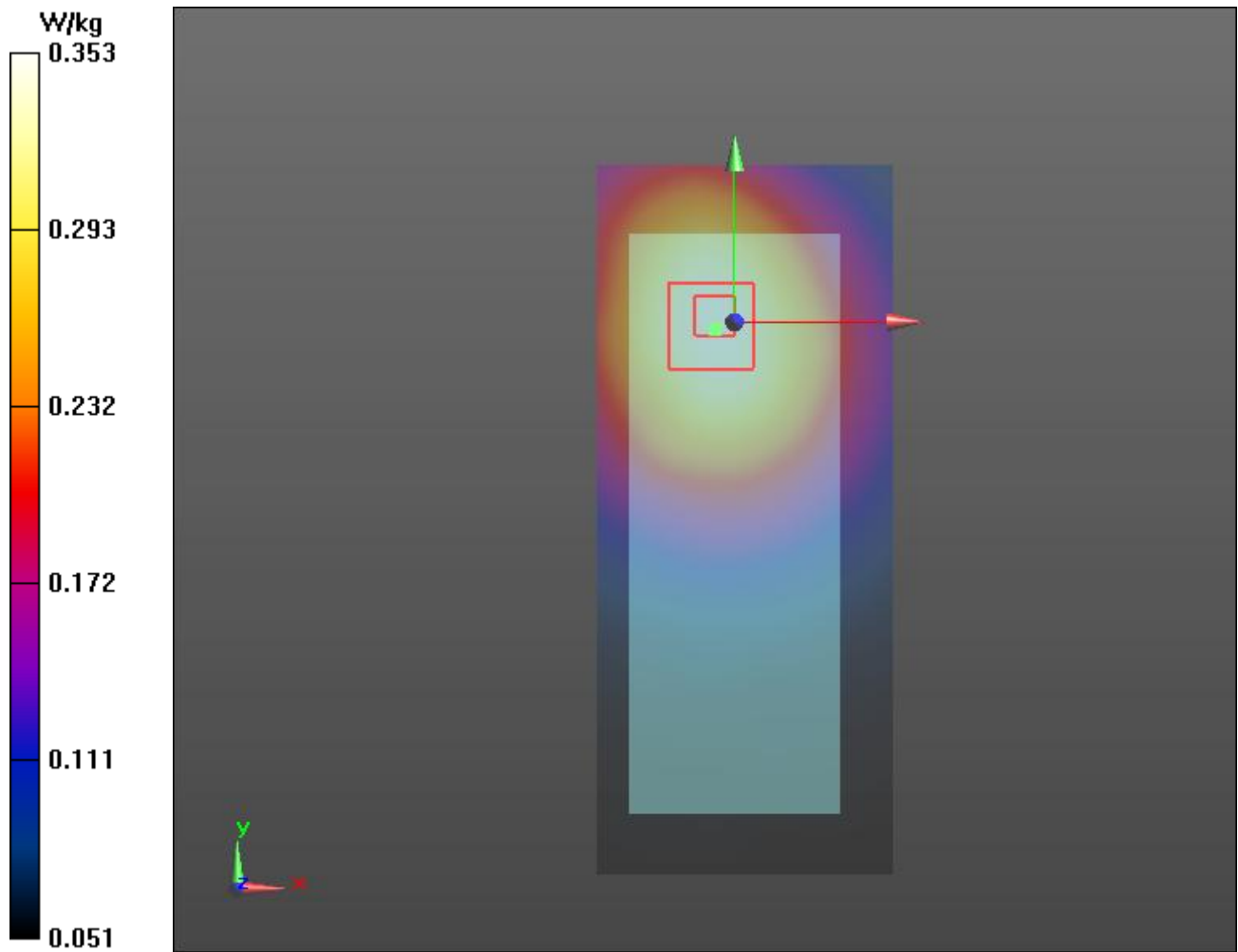
Peak SAR (extrapolated) = 0.392 W/kg

SAR(1 g) = 0.314 W/kg; SAR(10 g) = 0.231 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.353 W/kg

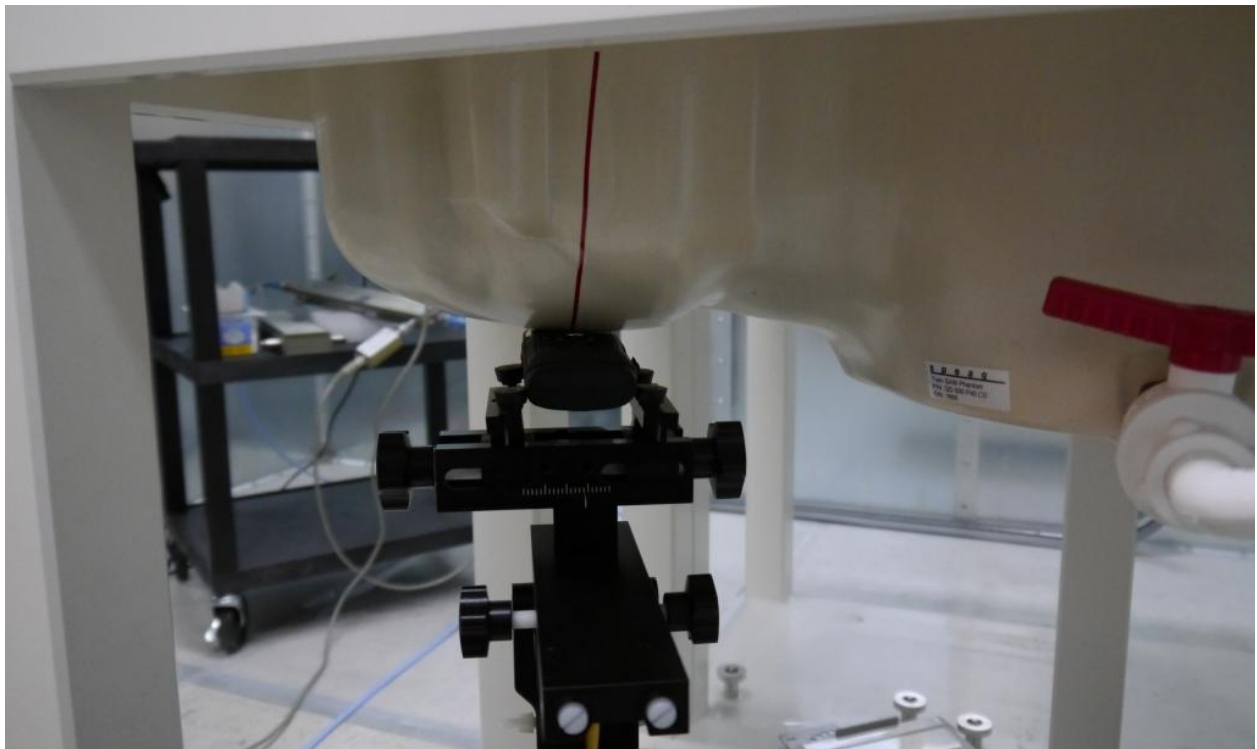
Configuration/Scan 400/Area Scan (51x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.357 W/kg

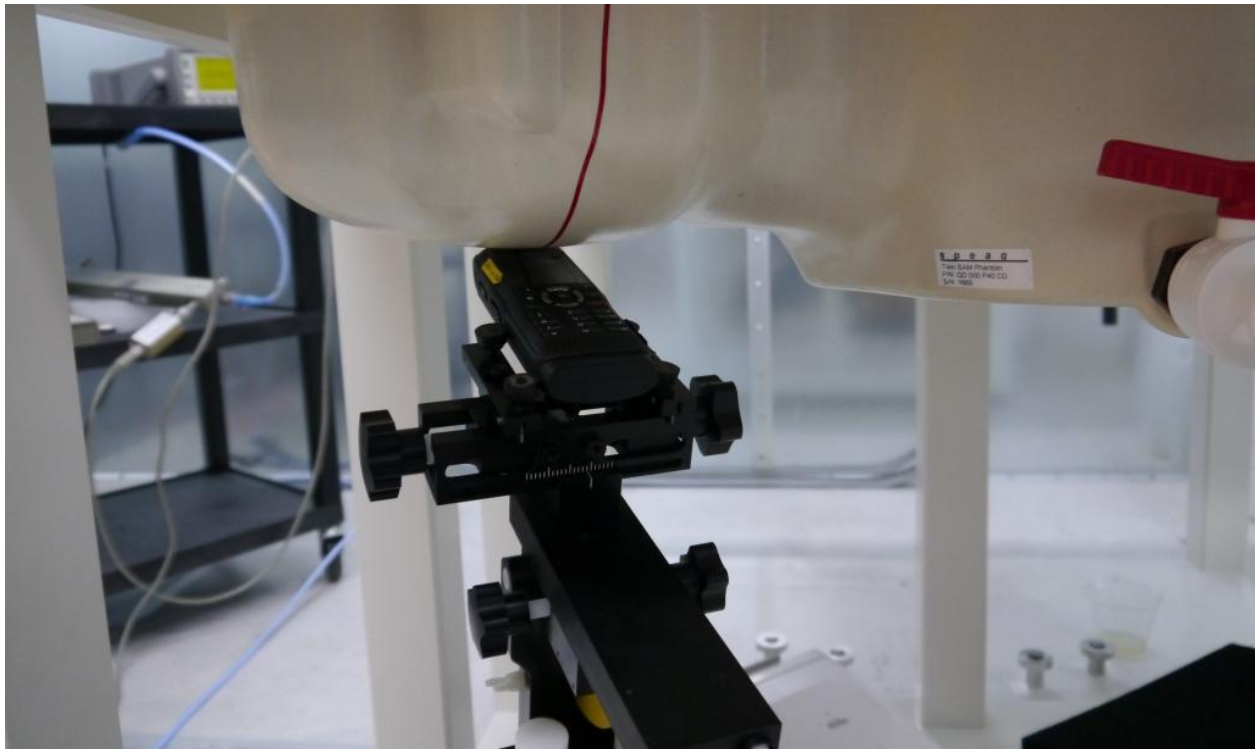


15 SETUP PHOTOGRAPHS

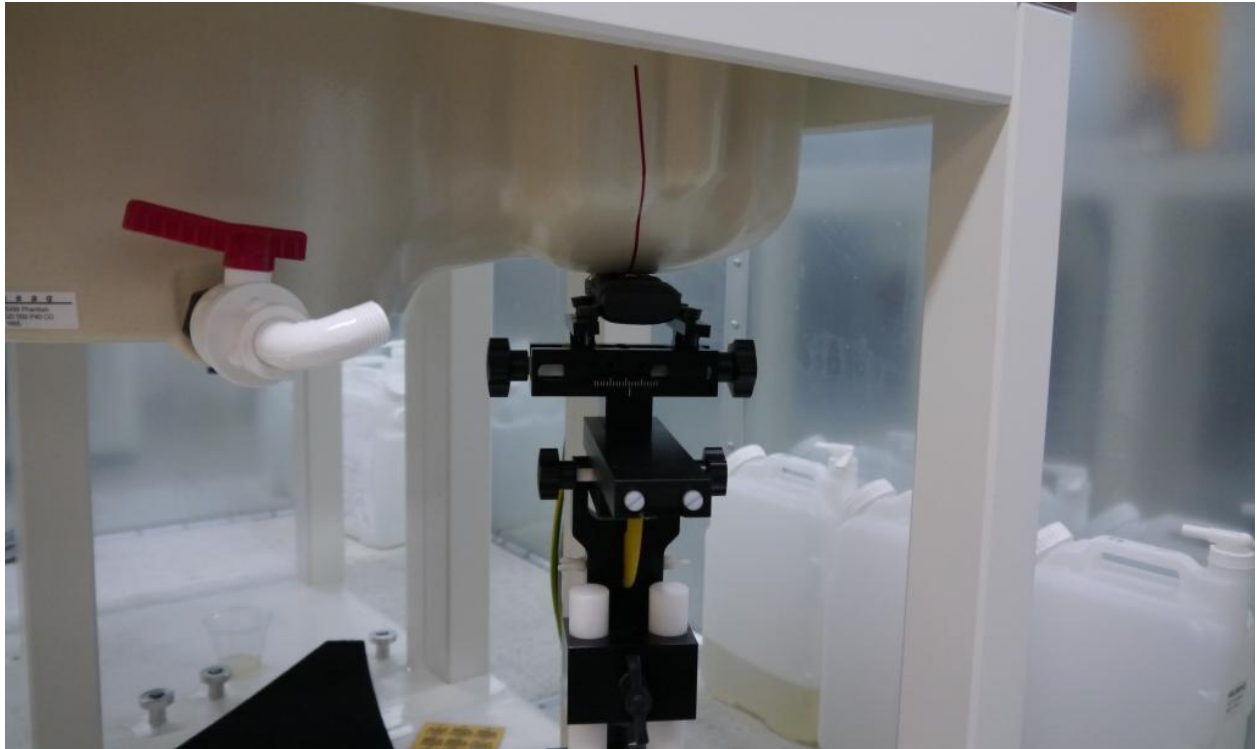
Right Cheek Touch



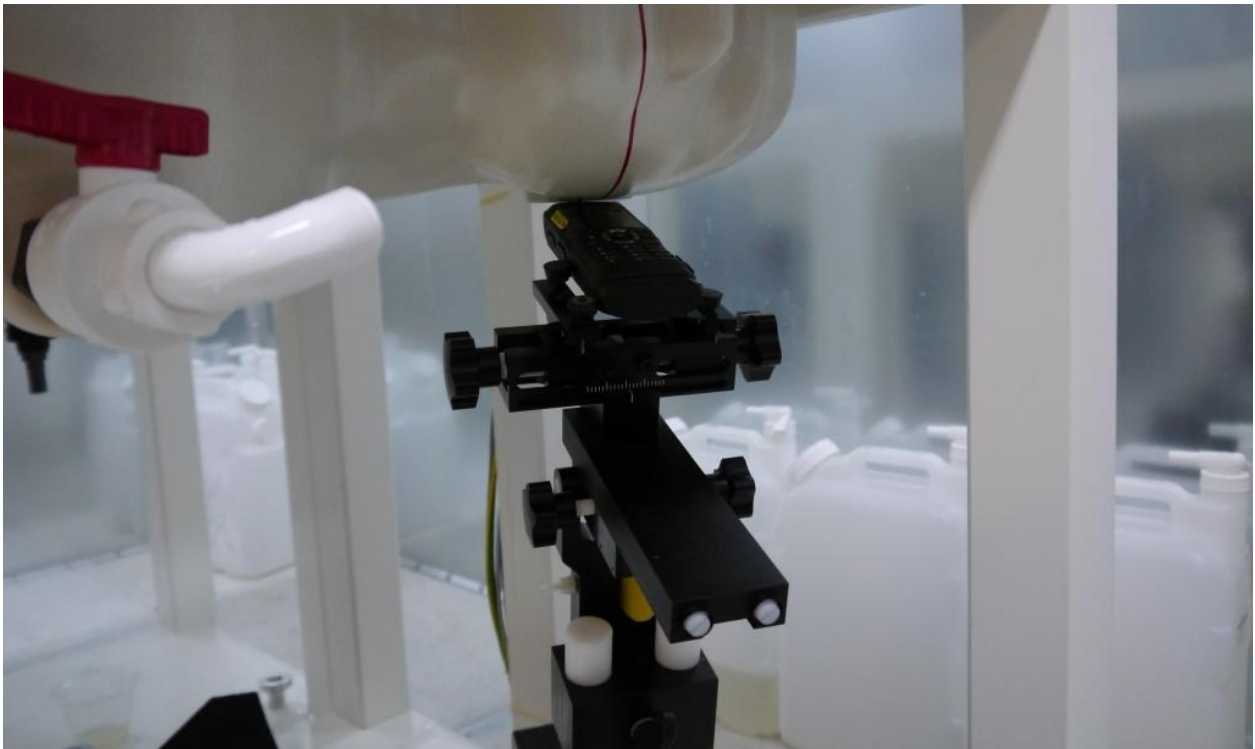
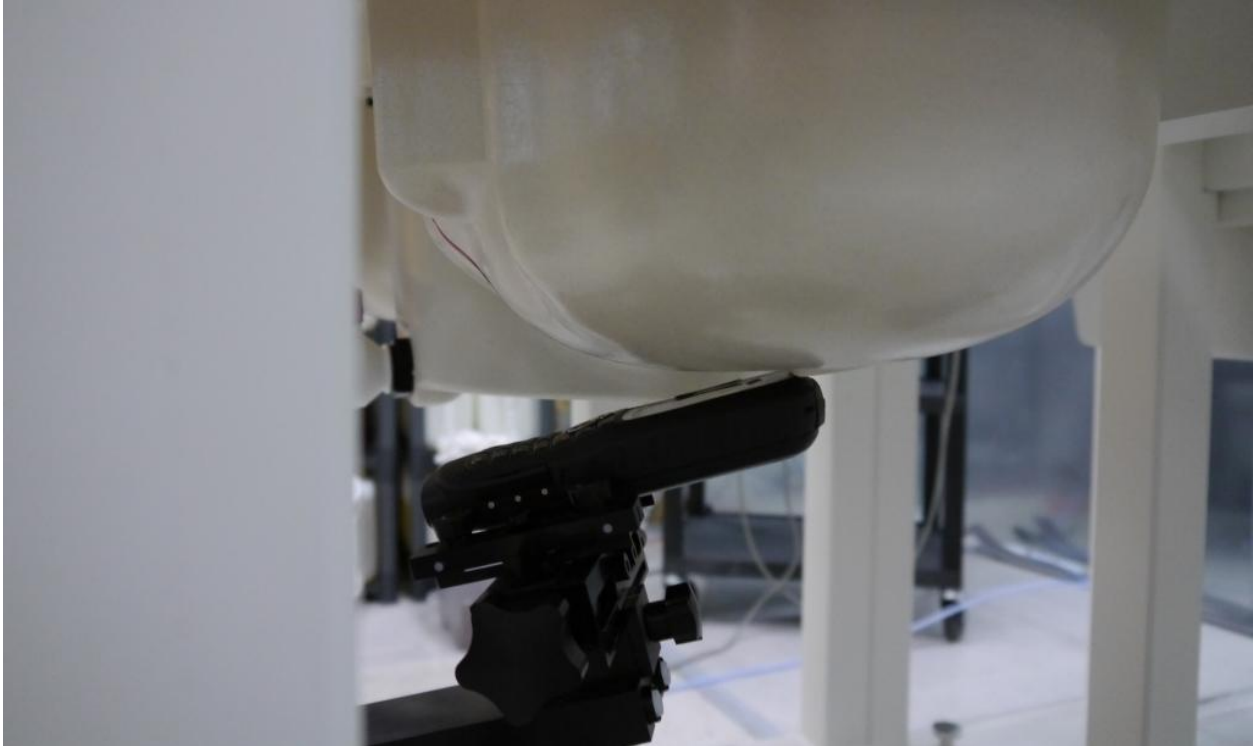
Right 15° Tilt



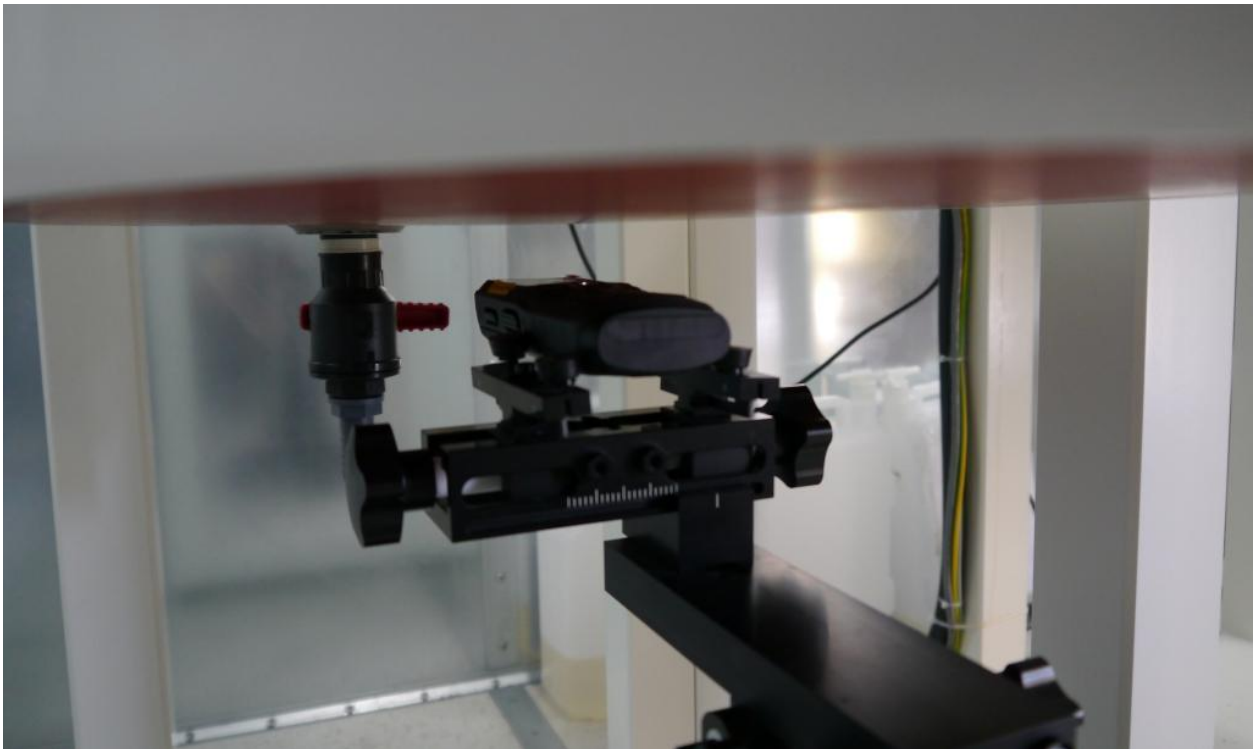
Left Cheek Touch



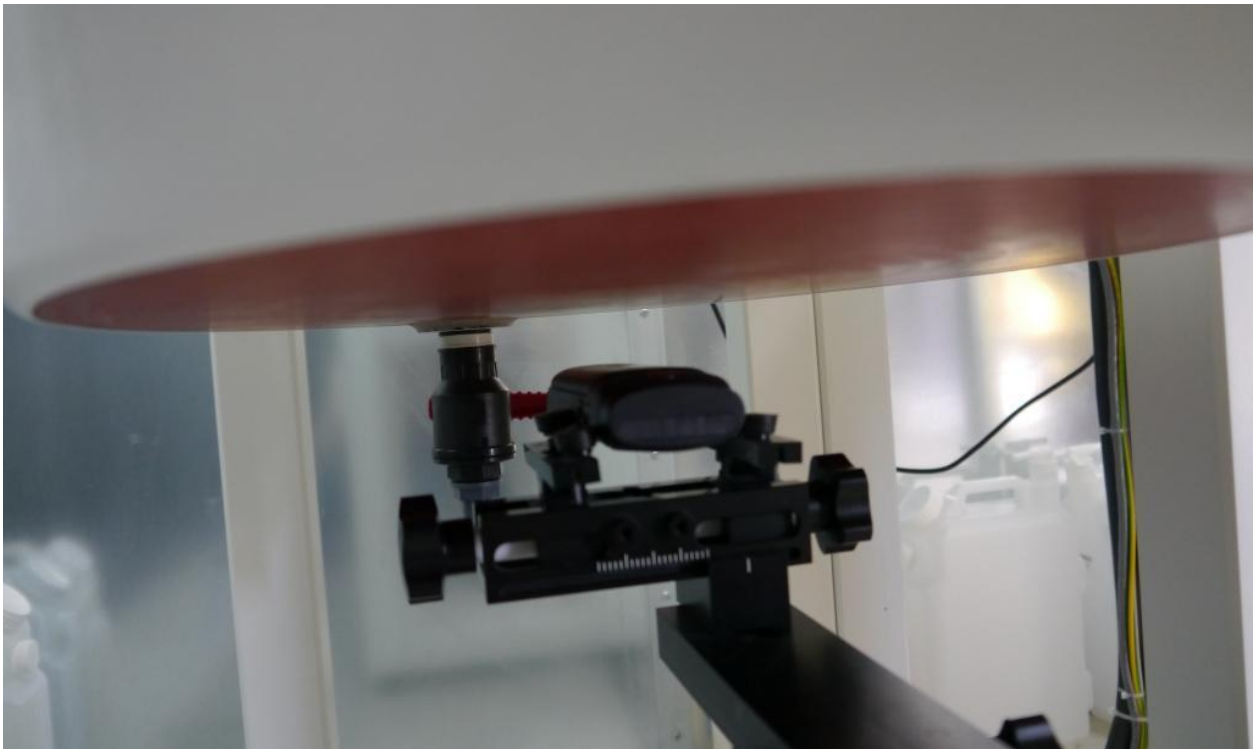
Left 15° Tilt



Dispatch Push to Talk front of phone with 25mm spacing



Dispatch Push to Talk back of phone with 25mm spacing



16 REVISION HISTORY

Revision Level	Description of changes	Revision Date
0	Initial release	24 April 2015
1	Corrected FCC ID Corrected typo, page 6 Added Plot #8	29 June 2015