SAR Test Report

Project Number: 3699218
Report Number: 3699218EMC07 **Revision Level:** 1
Client: Cross Match Technologies
FCC ID: Q9YSENTRY3
Equipment Under Test: GSM/WCDMA module
Model Number: Verifer-Sentry1 containing GSM/WCDMA module model PHS8-P

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

Report issued on: 31 March 2015
Test Result: Compliant

Equipment Class	Mode	Band	Frequency (MHz)	SAR W/kg		
				1g Head	1g Body	10g Extremety
PCE	GSM	850	824.2 - 848.8	N/A	0.219	0.450
PCE	GSM	1950	1850.2 - 1909.8	N/A	0.372	2.197
PCE	WCDMA	Band V	826.4 - 846.6	N/A	0.171	0.487
PCE	WCDMA	Band II	1852.4 - 1907.6	N/A	0.296	3.932
Simultaneous SAR per KDB 690783 D01v01r02				N/A	**N/A**	**N/A**

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: Crossmatch
Address: 3950 RCA Blvd, Suite 5001
City, State, Zip, Country: Palm Beach Gardens, FL 33410, USA

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: 170f49d4f645327
Build Number:: Claimcheck-eng 4.2.2 1.1.0-rc3 25aea06 dev-keys
Android Version: 4.2.2
Baseband Version: REVISION 03.001
Kernel Version: 3.0.35cc-1.00-00003-g13513a8 jenkins@hulk #1
IMEI Number: 359998042509358
Antenna: Integral
Rated Voltage: 3.6 VDC 4400mAh Rechargeable Battery

Sample Received Date: 2 February 2015
Dates of testing: 4 February to 24 February 2015

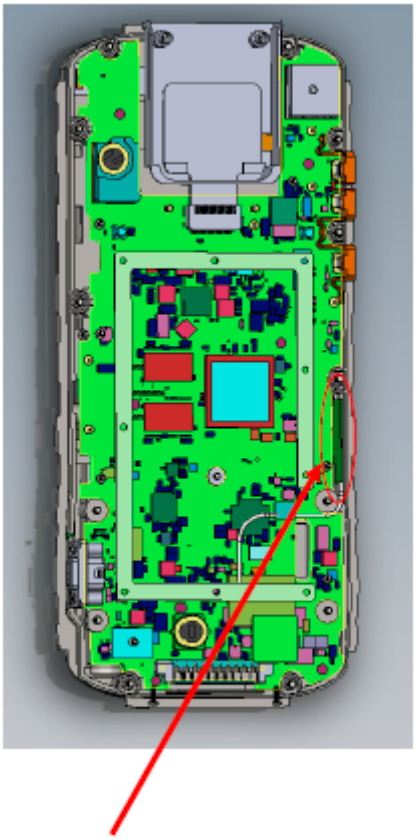
1.4 EQUIPMENT UNDER TEST

The Verifier Sentry handheld solution is designed to rapidly authenticate the identity of an individual using their secure credentials and biometrics.

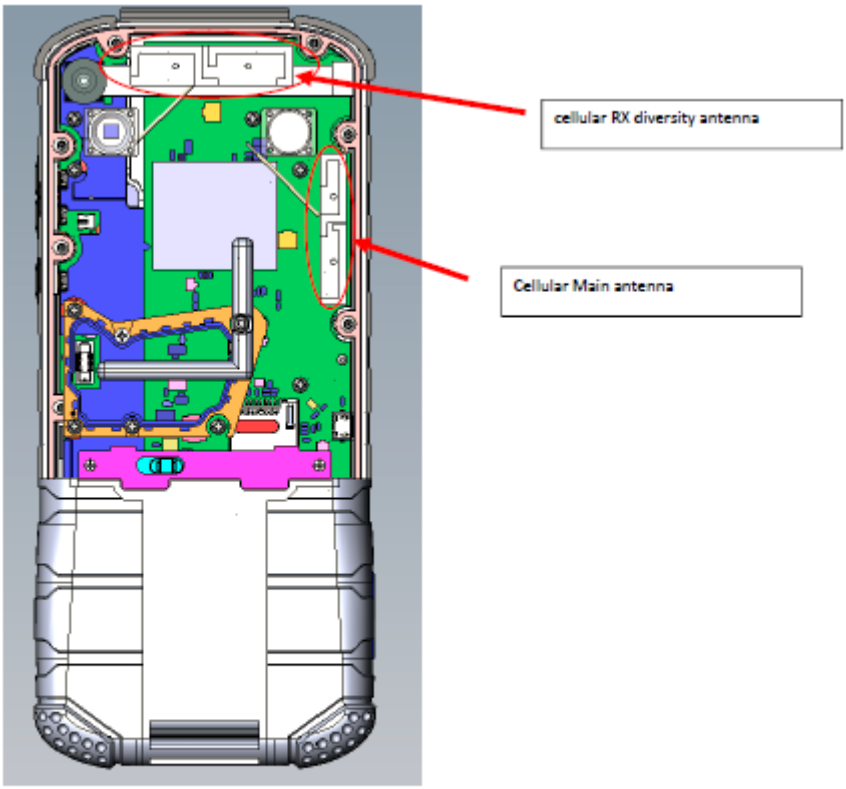
EUT	Mobile Computer
Normal operation:	Hand held or worn on body (LCD facing user; LCD facing away from user) with 14.04 mm separation distance
Body Worn Accessory	Case can be worn on left or right side. EUT can be seated in Position 1(P1) screen towards body or Position 2(P2) screen away from body.
Device category:	Portable
Exposure category:	General Population/Uncontrolled Exposure
Positions Tested:	Position 1 (P1) EUT screen towards phantom Position 2 (P2) EUT screen away from phantom Position 3 (P3) EUT left side towards phantom Postion 4 (P4) EUT right side towards phantom
Power Specifications:	GSM 850 (824-849 MHz): 33 dBm Nominal, 33.5 dBm Maximum
	GSM 1900 (1850-1910 MHz): 30 dBm Nominal, 30.5 dBm Maximum
	WCDMA Band V (824-849 MHz): 23.7 dBm Nominal, 24.2 dBm Maximum
	WCDMA Band II (1850-1910 MHz): 23.7 dBm Nominal, 24.2 dBm Maximum

The power specifications incorporate the coaxial cable that attaches the antenna to the 2G/3G cellular module.

1.5 ANTENNA LOCATIONS



Wifi antenna location – FRONT view



Cellular antenna locations – BACK VIEW

1.6 DUT ACCESSORIES

14.04mm spacing to user, contains metal parts

2 TEST METHODOLOGY

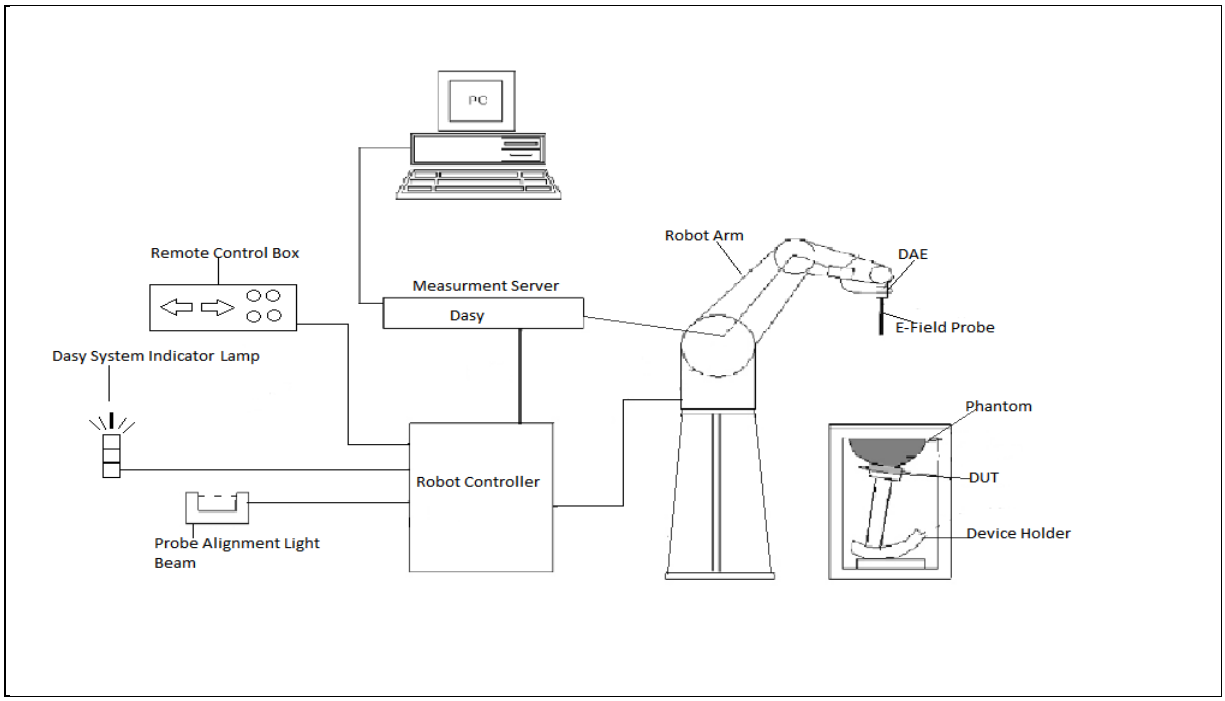
Testing was performed in accordance with EEE STD 1528: 2013 as well as the following:

- 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	
Data Acquisition Electronics	DAE4	Speag	1287	1/20/2015	
Phantom	Twin Sam	Speag	1665	NA	
Oval Phantom	ELI5	Speag	1146	NA	
Device Holder	SD 00 HO1 HA	Speag	NA	NA	
System Validation Dipole	D835V2	Speag	4d123	1/23/2015	1yr
System Validation Dipole	D1900V2	Speag	5d144	1/26/2015	1yr
Body Simulating Liquid	BSL835	SGS	NSN	Prior to testing	
Body Simulating Liquid	BSL1900	SGS	NSN	Prior to testing	
E-Field Probe	EX3DV4	Speag	3812	1/26/2015	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	9/26/2014	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	11692D	Hewlett Packard	1212A02572	8/6/14	3yr
Signal Generator	SMB100A	Rohde & Schwarz	104999	6/18/13	3yr
Thermometer	DTM3000	LKM Electronic	2952	6/16/14	1yr
Dielectric Probe Kit	Dak-3.5	Speag	1109	1/21/15	1yr
Wideband Communication Tester	CMW 500	Rohde & Schwarz	127722	10/17/2013	2yr

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 ± 0.2mm (6 ± 0.2mm 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 ± 0.2mm (bottom plate)
Dimensions:	Major axis: 600, Minor axis: 400
Filling Volume:	approx. 30L
EX3DV4 Probe:	Isotropic E-Field Probe
Directivity:	±0.3dB in TSL(rotation around probe axis), ±0.5 dB in TSL (roation 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 ±5% of the target values in table 1. The measured permittivity tolerances can be relaxed to no more than the ±10%. All efforts should be made to obtain the target values as closely as possible.

The head tissue dielectric parameters recommended by the IEEE1528-2013 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 Condcutivity, σ S/m	Target Dielectric Constant, ε	Target Condcutivity, σ S/m	% deviation, ε	% deviation, σ
21.2	2/4/2015	835B	824	52.96	0.95	55.2	0.97	-4.1%	-2.1%
			826	52.90	0.95	55.2	0.97	-4.2%	-2.1%
			836	52.83	0.96	55.2	0.97	-4.3%	-1.0%
			846	52.70	0.97	55.2	0.97	-4.5%	0.0%
			848	52.71	0.97	55.2	0.97	-4.5%	0.0%
20.7	2/5/2015	835B	824	52.35	0.94	55.2	0.97	-5.2%	-3.1%
			826	52.32	0.94	55.2	0.97	-5.2%	-3.1%
			836	52.21	0.95	55.2	0.97	-5.4%	-2.1%
			846	52.11	0.96	55.2	0.97	-5.6%	-1.0%
			848	52.07	0.96	55.2	0.97	-5.7%	-1.0%
21.3	2/6/2015	835B	826	52.08	0.94	55.2	0.97	-5.7%	-3.1%
			836	52.00	0.95	55.2	0.97	-5.8%	-2.1%
			846	51.93	0.96	55.2	0.97	-5.9%	-1.0%
21.74	2/10/2015	1900B	1850	52.010	1.48	53.3	1.52	-2.4%	-2.8%
			1880	51.900	1.49	53.3	1.52	-2.6%	-1.7%
			1909	51.730	1.52	53.3	1.52	-2.9%	-0.1%
21.75	2/11/2015	1900B	1850	52.820	1.51	53.3	1.52	-0.9%	-0.7%
			1880	52.760	1.52	53.3	1.52	-1.0%	0.0%
			1909	52.650	1.55	53.3	1.52	-1.2%	2.0%

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 ±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 (*IEEE1528-2013*)

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 Verification										
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_{10} (W/kg)	Deviation (%)
2/4/2015	22.4	21.21	0.100	835	4d123	Body	0.97	9.49	9.70	2.2%
2/5/2015	21.8	20.70	0.100	835	4d123	Body	0.96	9.49	9.60	1.2%
2/6/2015	22.3	21.33	0.100	835	4d123	Body	0.97	9.49	9.70	2.2%
2/10/2015	22.28	21.74	0.100	1900	5d144	Body	3.99	40.10	39.90	-0.5%
2/11/2015	21.77	21.75	0.100	1900	5d144	Body	4.11	40.10	41.10	2.5%

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 dimensial 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

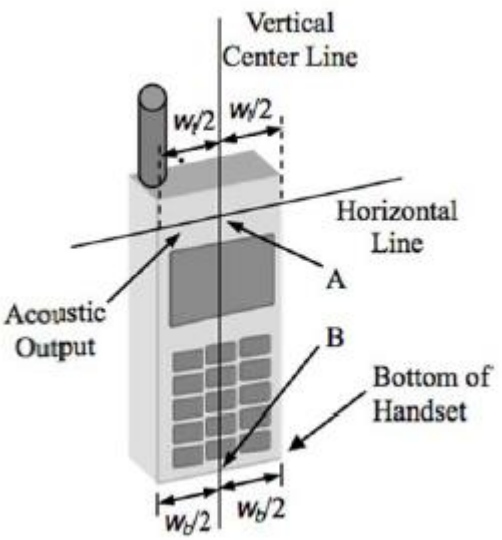
6.1.1 SAM SPECIFICATIONS

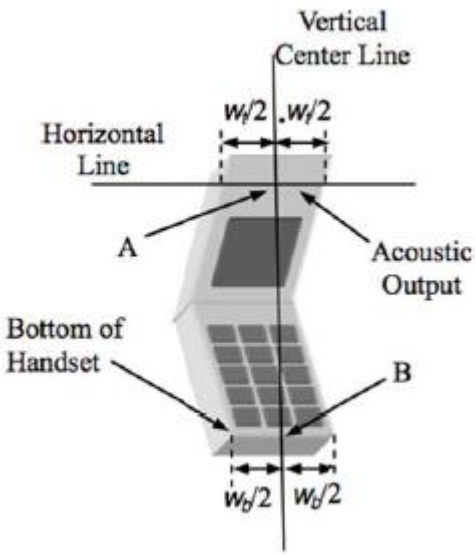
The Specific Anthropomorphic Mannequin (SAM) phantom corresponds to specifications defined in IEEE 1528 and IEC 62209-1. It allows dosimetric evaluation of the left, right, hand phone usage as well as body mounted usage at the flat region of the phantom

6.1.2 HANDSET REFERENCE POINTS

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

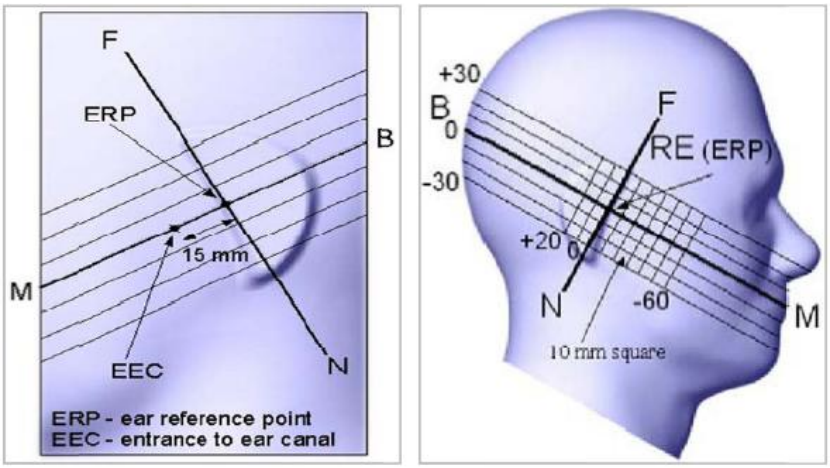
- The vertical centreline passes through two points on the front side of the handset. The midpoint of the width at the acoustic output and the midpoint of the width of the bottom of handset.
- The horizontal line is perpendicular to the vertical centreline and passes through the center of the acoustic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



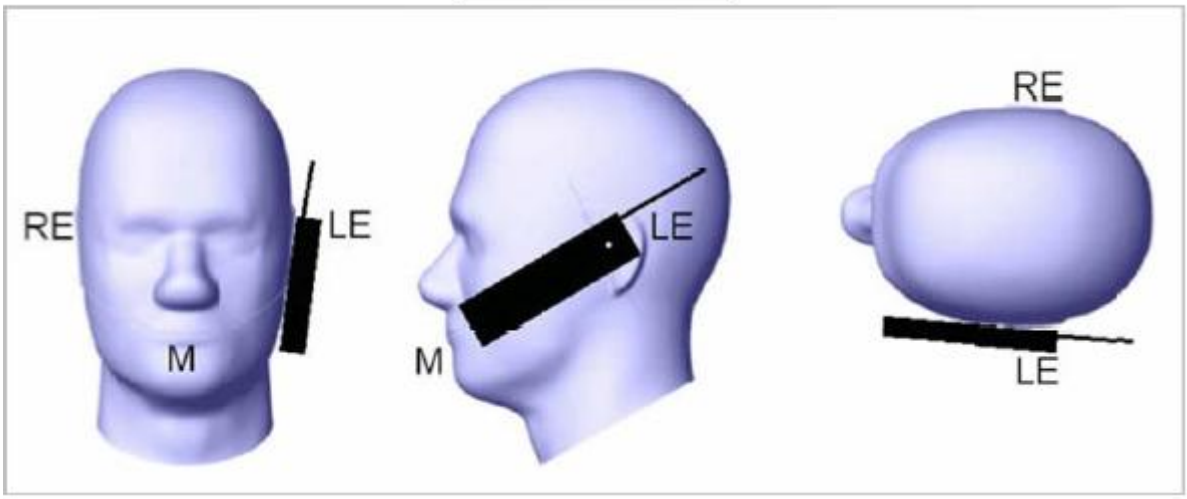
6.1.4 CHEEK POSITIONS

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

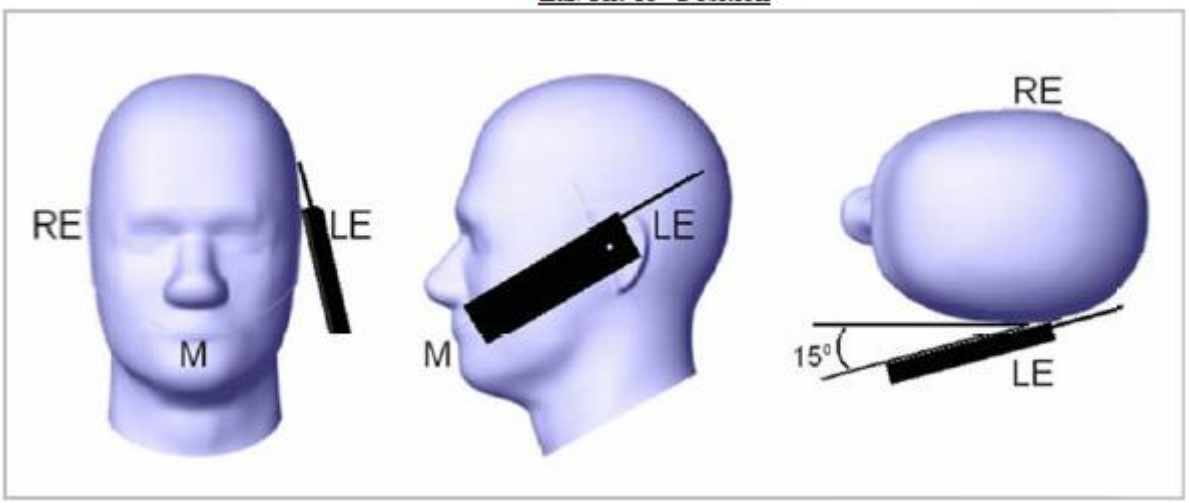


6.1.5 TILT POSITION

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

7.1 GSM

Mode	Type	Test mode	**Burst** Power					
			Cellular Band, GSM850			PCS Band, GSM1900		
			128 824.2MHz	190 836.6MHz	251 848.8MHz	512 1850.2MHz	661 1880MHz	810 1909.8MHz
GSM	Voice		N/A	N/A	N/A	N/A	N/A	N/A
GPRS	Data	1 slot	33.30	33.30	32.90	30.10	30.20	30.20
		2 slot	29.90	29.90	29.70	26.50	26.30	26.60
EDGE	Data	1 slot	26.80	26.90	26.80	26.00	25.70	25.60
		2 slot	26.70	26.80	26.70	25.80	25.50	25.50

Mode	Type	Test mode	Average **Frame** Power					
			Cellular Band, GSM850			PCS Band, GSM1900		
			128 824.2MHz	190 836.6MHz	251 848.8MHz	512 1850.2MHz	661 1880MHz	810 1909.8MHz
GSM	Voice		N/A	N/A	N/A	N/A	N/A	N/A
GPRS	Data	1 slot	24.27	24.27	23.87	21.07	21.17	21.17
		2 slot	23.88	23.88	23.68	20.48	20.28	20.58
EDGE	Data	1 slot	17.77	17.87	17.77	16.97	16.67	16.57
		2 slot	20.68	20.78	20.68	19.78	19.48	19.48

Note: Frame power includes the averaging of the power across all time slots.

7.2 WCDMA

Release Version	Subtest mode	Cellular Band, FDD VIII			PCS Band, FDD III		
		4132 826.4MHz	4183 836.6MHz	4233 846.6MHz	9262 1852.4MHz	9400 1880MHz	9538 1907.7MHz
99	12.2 kbps RMC	22.40	22.90	22.50	22.50	22.40	22.50
6	Subtest 1	22.50	23.00	22.60	22.90	22.80	22.60
	Subtest 2	22.30	22.90	22.50	22.20	22.70	22.50
	Subtest 3	22.00	22.50	22.40	22.00	22.70	22.10
	Subtest 4	21.80	22.60	22.20	22.10	22.80	22.40
6	Subtest 1	21.30	22.40	21.80	21.70	22.30	21.90
	Subtest 2	20.50	20.80	20.70	20.50	21.00	20.70
	Subtest 3	20.70	21.30	21.20	20.80	21.40	21.20
	Subtest 4	20.50	21.10	21.00	20.80	21.00	20.80
	Subtest 5	21.30	22.40	21.90	21.60	22.10	21.90

Subtests HSDPA						
Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{hs}(1)	CM (dB)(2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: ΔACK, ΔNACK and ΔCQI = 8 Ahs = βhs/βc = 30/15 βhs= 30/15 *βc
Note 2: CM = 1 for βc/βd =12/15, βhs/βc=24/15.
Note 3: For subtest 2 the βc/βd ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 11/15 and βd = 15/15.

Subtests HSPA													
Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} *(SF)*	β_{ed} *(codes)*	CM (dB)(2)	MPR (dB)	AG(4) Index	E-TFCI
1	15/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: ΔACK, ΔNACK and ΔCQI = 8 Ahs = βhs/βc = 30/15 βhs= 30/15 *βc.
Note 2: CM = 1 for βc/βd =12/15, βhs/βc=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and EDPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.
Note 4: For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: βed cannot be set directly; it is set by Absolute Grant Value.

8 SIMULTANEOUS TRANSMISSION

This device operates with a multiple radios but they do not operate simultaneously.

9 GSM/WCDMA

9.1 Body SAR Measurement Results

Date	Frequency MHz	CH	Mode	Service	Data Rate Mbps	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position		Duty Cycle	1g SAR W/kg	Scaling factor	Scaled SAR 1g W/kg	Plot #
2/4/2015	836.6	190	GSM	GPRS	1 slt	33.50	33.30	0.12	Case	P1	1:8	0.099	1.047	0.104	
	836.6	190	GSM	GPRS	1 slt	33.50	33.30	0.14	Case	P2	1:8	0.148	1.047	0.155	
	824.2	128	GSM	GPRS	1 slt	33.50	33.30	0.11	Case	CP2	1:8	0.206	1.047	0.216	1
	848.8	251	GSM	GPRS	1 slt	33.50	32.90	0.05	Case	CP2	1:8	0.105	1.148	0.121	
	824.2	128	GSM	GPRS	1 slt	33.50	33.30	0.00	Case	CP2	1:8	0.209	1.047	0.219	2
2/6/2015	836.6	4183	WCDMA	HSUPA	Subtest 1	24.20	23.10	0.06	Case	P1	1:1	0.092	1.288	0.119	
	836.6	4183	WCDMA	HSUPA	Subtest 1	24.20	23.10	0.05	Case	P2	1:1	0.129	1.288	0.166	
	826.4	4132	WCDMA	HSUPA	Subtest 1	24.20	23.40	0.05	Case	P2	1:1	0.122	1.202	0.147	
	846.6	4233	WCDMA	HSUPA	Subtest 1	24.20	23.30	0.05	Case	P2	1:1	0.101	1.230	0.124	
	836.6	4183	WCDMA	HSUPA	Subtest 1	24.20	23.10	0.09	Case	P2	1:1	0.133	1.288	0.171	5

Date	Frequency MHz	CH	Mode	Service	Data Rate Mbps	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position		Duty Cycle	1g SAR W/kg	Scaling factor	Scaled SAR 1g W/kg	Plot #
2/10/2015	1880.0	661	GSM	GPRS	1 slt	30.50	30.20	0.25	Case	P1	1:8	0.072	1.072	0.077	
	1880.0	661	GSM	GPRS	1 slt	30.50	30.20	0.18	Case	P2	1:8	0.305	1.072	0.327	
	1850.2	512	GSM	GPRS	1 slt	30.50	30.10	-0.17	Case	P2	1:8	0.043	1.096	0.047	
	1909.8	810	GSM	GPRS	1 slt	30.50	30.20	0.18	Case	P2	1:8	0.347	1.072	0.372	7
	1909.8	810	GSM	GPRS	1 slt	30.50	30.20	0.25	Case	P2	1:8	0.340	1.072	0.364	8
2/11/2015	1880.0	9400	WCDMA	HSUPA	Subtest 1	24.20	22.80	0.08	Case	P1	1:1	0.082	1.380	0.113	
	1880.0	9400	WCDMA	HSUPA	Subtest 1	24.20	22.80	-0.13	Case	P2	1:1	0.169	1.380	0.233	
	1852.4	9262	WCDMA	HSUPA	Subtest 1	24.20	22.90	0.3	Case	P2	1:1	0.153	1.349	0.206	
	1907.7	9538	WCDMA	HSUPA	Subtest 1	24.20	22.60	0.19	Case	P2	1:1	0.174	1.445	0.252	
	1907.7	9538	WCDMA	HSUPA	Subtest 1	24.20	22.60	0.19	Case	P2	1:1	0.205	1.445	0.296	10

Note: When the SAR measurement is less than 0.1 W/kg, the drift may vary more the 0.4 dB.

9.2 EXTREMETY SAR MEASUREMENT RESULTS

Date	Frequency MHz	CH	Mode	Service	Data Rate Mbps	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position		Duty Cycle	10g SAR W/kg	Scaling factor	Scaled SAR 10g W/kg	Plot #
2/5/2015	836.6	190	GSM	GPRS	1 slt	33.50	32.90	0.03	Hand Held	P1	1:8	0.224	1.148	0.257	
	836.6	190	GSM	GPRS	1 slt	33.50	32.90	0.12	Hand Held	P2	1:8	0.332	1.148	0.381	
	836.6	190	GSM	GPRS	1 slt	33.50	32.90	0.06	Hand Held	P3	1:8	0.264	1.148	0.303	
	824.2	128	GSM	GPRS	1 slt	33.50	32.90	0.06	Hand Held	P2	1:8	0.392	1.148	0.450	3
	848.8	251	GSM	GPRS	1 slt	33.50	32.90	0.15	Hand Held	P2	1:8	0.282	1.148	0.324	
	824.2	128	GSM	GPRS	1 slt	33.50	32.90	0.07	Hand Held	P2	1:8	0.353	1.148	0.405	4
2/6/2015	836.6	4183	WCDMA	HSUPA	Subtest 1	24.20	23.10	0.06	Hand Held	P1	1:1	0.263	1.288	0.339	
	836.6	4183	WCDMA	HSUPA	Subtest 1	24.20	23.10	0.12	Hand Held	P2	1:1	0.376	1.288	0.484	
	836.6	4183	WCDMA	HSUPA	Subtest 1	24.20	23.10	0.04	Hand Held	P3	1:1	0.233	1.288	0.300	
	826.4	4132	WCDMA	HSUPA	Subtest 1	24.20	23.40	0.05	Hand Held	P2	1:1	0.399	1.202	0.480	
	846.6	4233	WCDMA	HSUPA	Subtest 1	24.20	23.30	0.07	Hand Held	P2	1:1	0.192	1.230	0.236	
	826.4	4132	WCDMA	HSUPA	Subtest 1	24.20	23.40	0.06	Hand Held	P2	1:1	0.405	1.202	0.487	6

Date	Frequency MHz	CH	Mode	Service	Data Rate Mbps	Max Pwr dBm	Meas Pwr dBm	Power Drift dB	Position		Duty Cycle	10g SAR W/kg	Scaling factor	Scaled SAR 10g W/kg	Plot #
2/10/2015	1880.0	661	GSM	GPRS	1 slt	30.50	30.20	0.07	Hand Held	P1	1:8	0.171	1.072	0.183	
	1880.0	661	GSM	GPRS	1 slt	30.50	30.20	-0.10	Hand Held	P2	1:8	1.030	1.072	1.104	
	1880.0	661	GSM	GPRS	1 slt	30.50	30.20	0.24	Hand Held	P3	1:8	1.080	1.072	1.157	
	1850.2	512	GSM	GPRS	1 slt	30.50	30.10	-0.13	Hand Held	P3	1:8	1.180	1.096	1.294	
	1909.8	810	GSM	GPRS	1 slt	30.50	30.20	0.02	Hand Held	P3	1:8	1.790	1.072	1.918	
	1909.8	810	GSM	GPRS	1 slt	30.50	30.20	0.00	Hand Held	P3	1:8	2.050	1.072	2.197	9
2/11/2015	1880.0	9400	WCDMA	HSUPA	Subtest 1	24.20	22.80	-0.32	Hand Held	P1	1:1	0.198	1.380	0.273	
	1880.0	9400	WCDMA	HSUPA	Subtest 1	24.20	22.80	0.2	Hand Held	P2	1:1	0.707	1.380	0.976	
	1880.0	9400	WCDMA	HSUPA	Subtest 1	24.20	22.80	0.23	Hand Held	P3	1:1	2.200	1.380	3.037	
	1852.4	9262	WCDMA	HSUPA	Subtest 1	24.20	22.90	0.09	Hand Held	P3	1:1	2.480	1.349	3.345	11
	1907.7	9538	WCDMA	HSUPA	Subtest 1	24.20	22.60	-0.07	Hand Held	P3	1:1	1.920	1.445	2.775	
	1852.4	9262	WCDMA	HSUPA	Subtest 1	24.20	22.60	0.26	Hand Held	P3	1:1	2.720	1.445	3.932	12

10 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

11 SYSTEM CHECK PLOTS

System Check Plot 1

Date/Time: 2/4/2015 9:48:56 AM

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

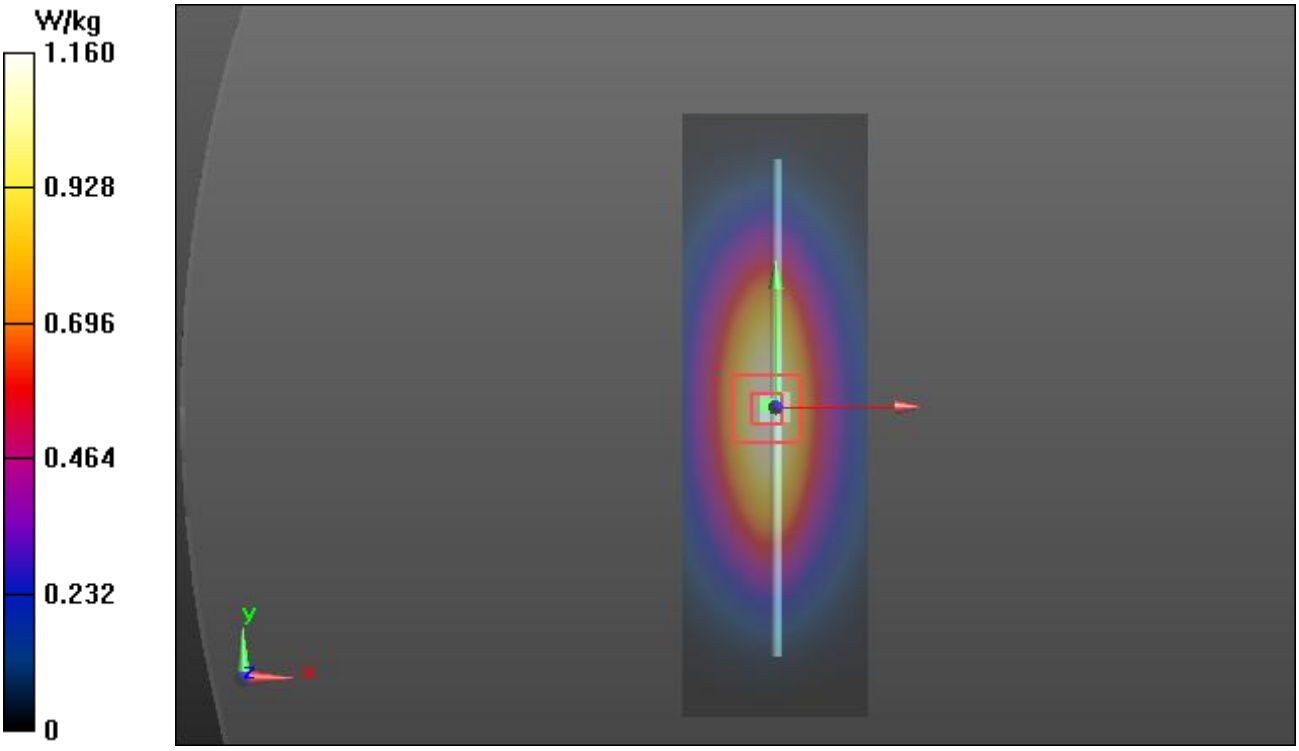
Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.964 S/m; ε_r = 52.836; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

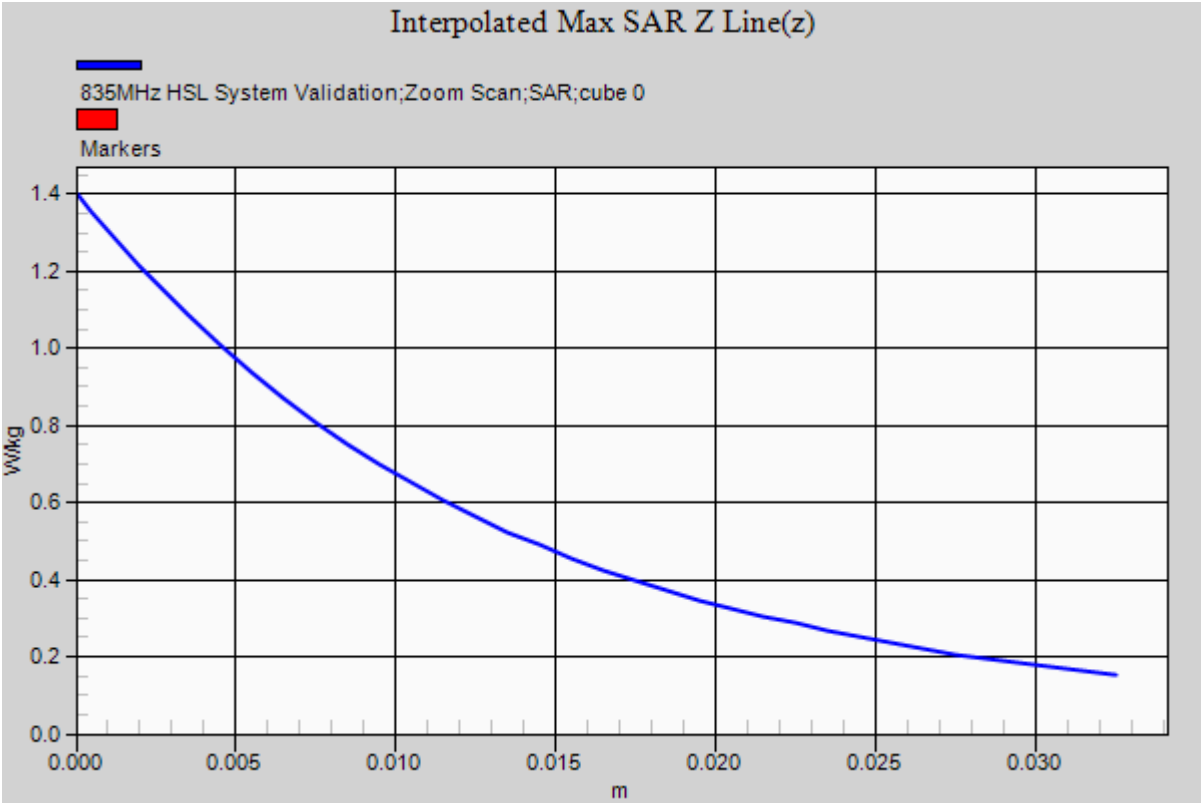
DASY Configuration:

- 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 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.16 W/kg

Configuration/835MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.01 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.976 W/kg; SAR(10 g) = 0.647 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.17 W/kg


W/kg
1.160
0.928
0.696
0.464
0.232
0
y
x


Interpolated Max SAR Z Line(z)
835MHz HSL System Validation;Zoom Scan;SAR;cube 0
Markers
W/kg
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

System Check Plot 2

Date/Time: 2/5/2015 7:21:37 AM

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

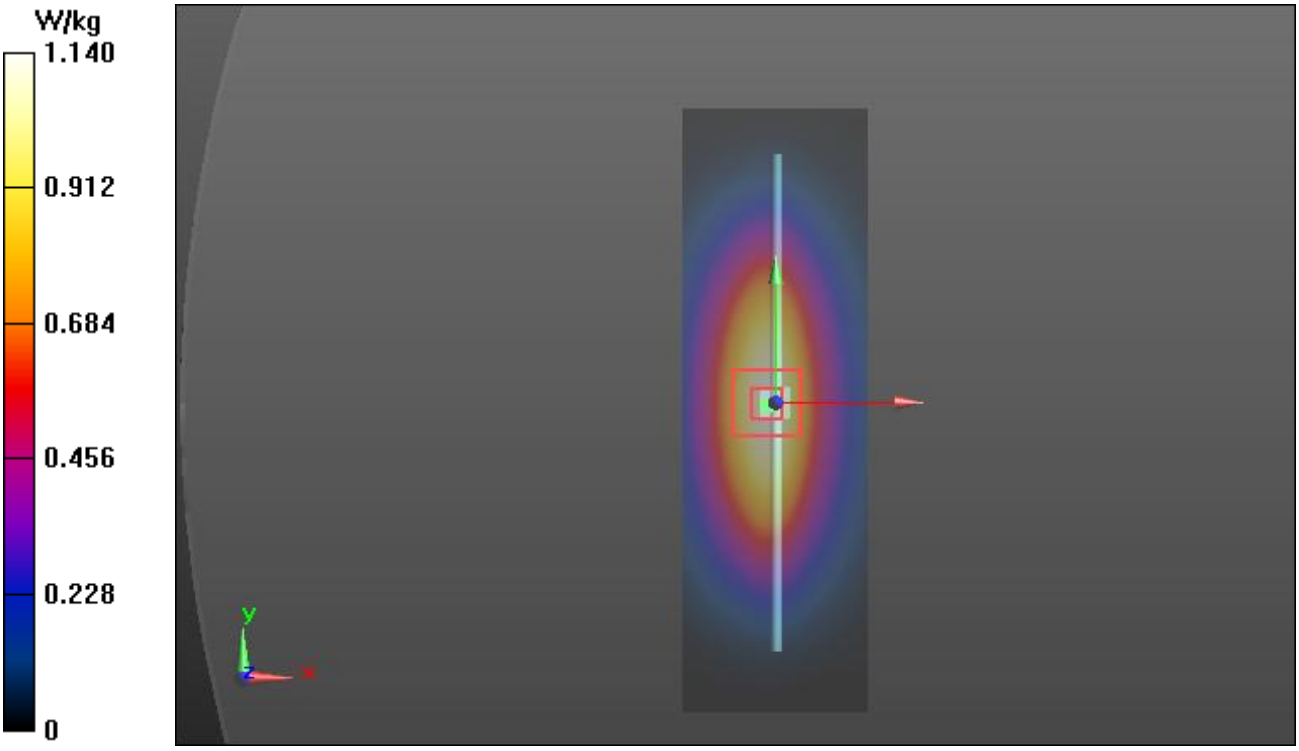
Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.956 S/m; ε_r = 52.221; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

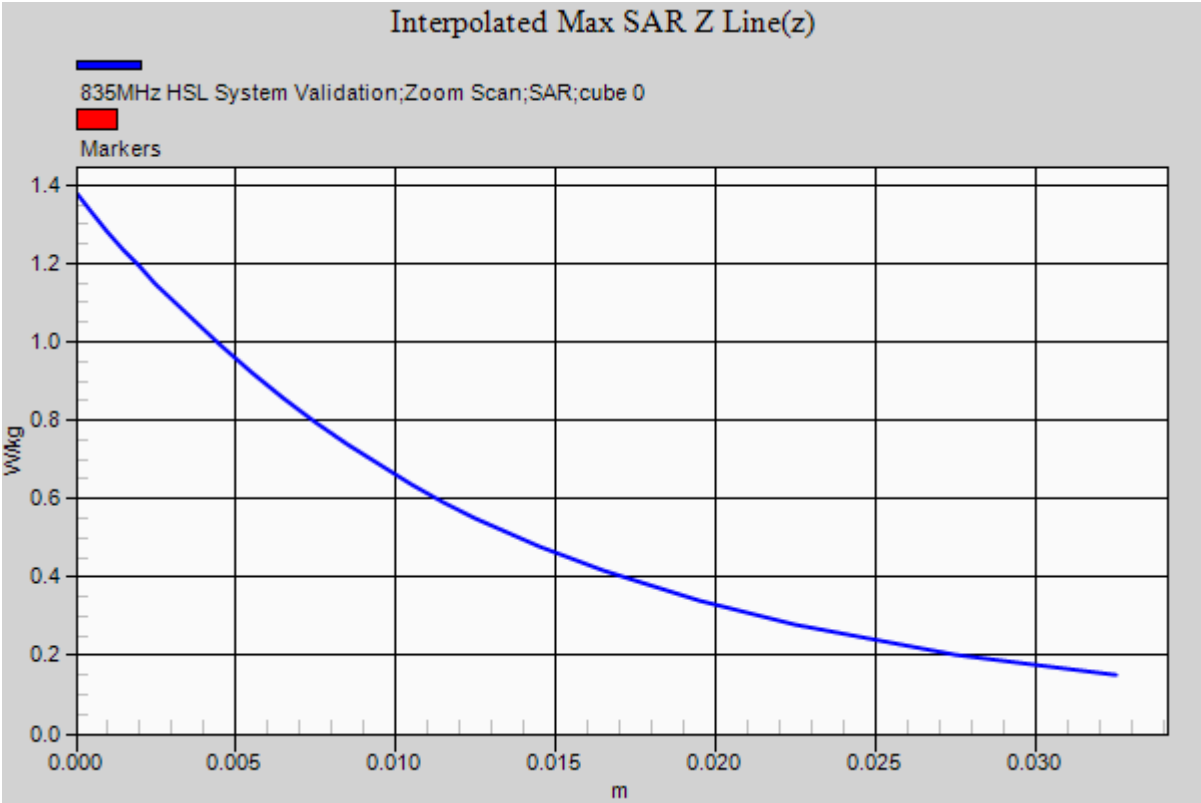
DASY Configuration:

- 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 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.14 W/kg

Configuration/835MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.91 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.962 W/kg; SAR(10 g) = 0.638 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.15 W/kg


W/kg
1.140
0.912
0.684
0.456
0.228
0
y
x


Interpolated Max SAR Z Line(z)
835MHz HSL System Validation;Zoom Scan;SAR;cube 0
Markers
W/kg
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

System Check Plot 3

Date/Time: 2/6/2015 7:12:58 AM

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

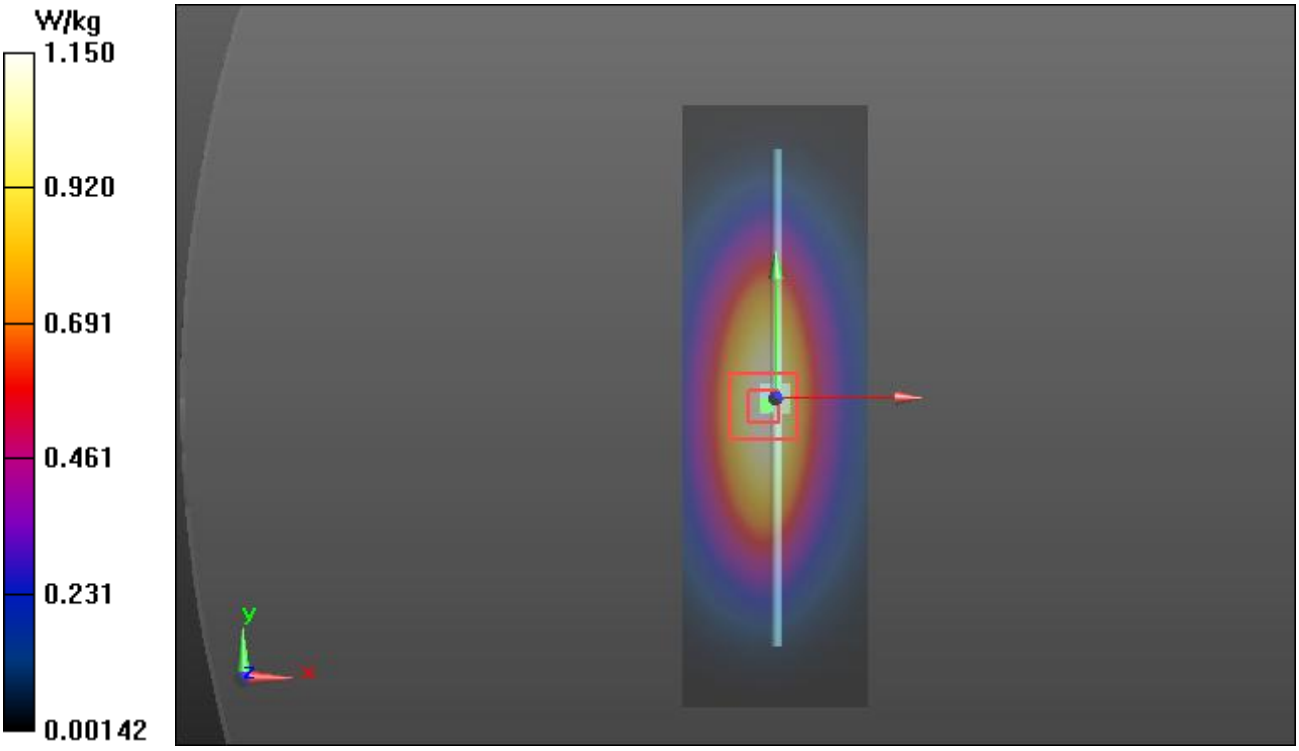
Communication System: UID 0, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.957 S/m; ε_r = 52.014; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

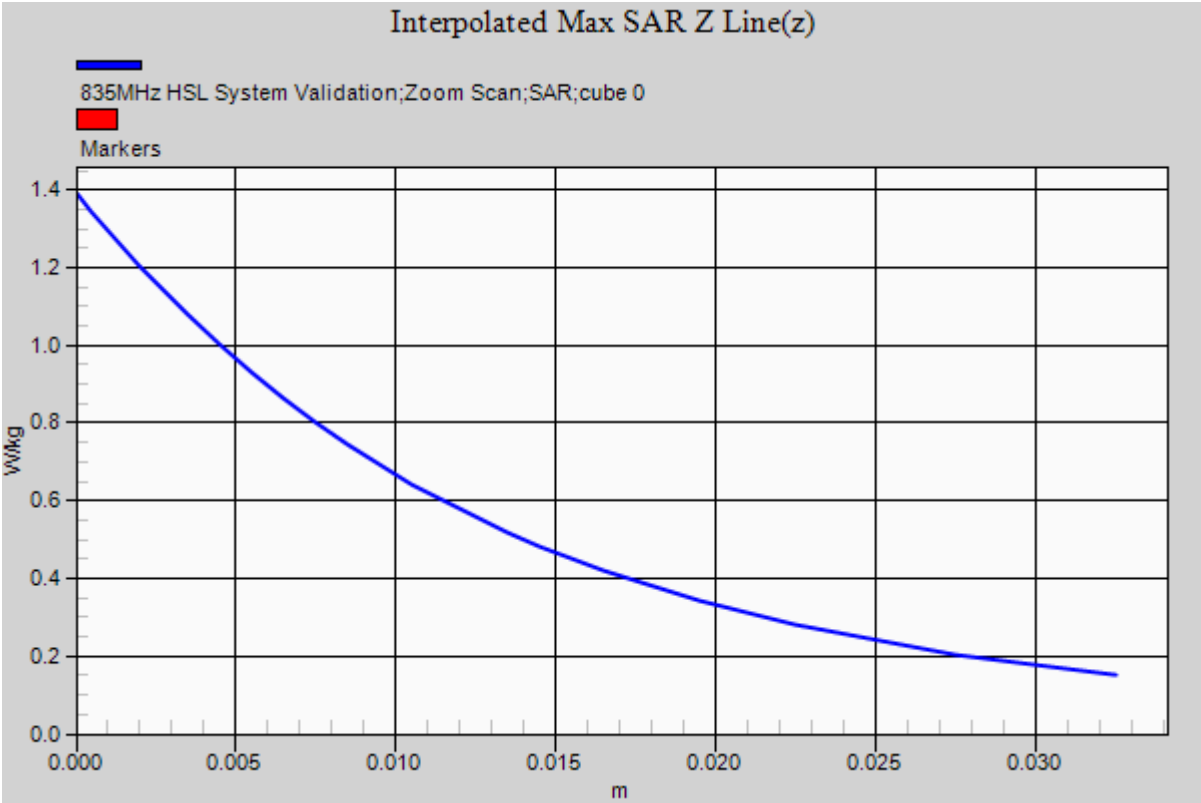
DASY Configuration:

- 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 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.15 W/kg

Configuration/835MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.70 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.970 W/kg; SAR(10 g) = 0.643 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.16 W/kg


W/kg
1.150
0.920
0.691
0.461
0.231
0.00142
y
x


Interpolated Max SAR Z Line(z)
835MHz HSL System Validation;Zoom Scan;SAR;cube 0
Markers
W/kg
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

System Check Plot 4

Date/Time: 2/10/2015 10:05:50 AM

DUT: Dipole1900 MHz; Type: D1900V2; Serial: 5d144

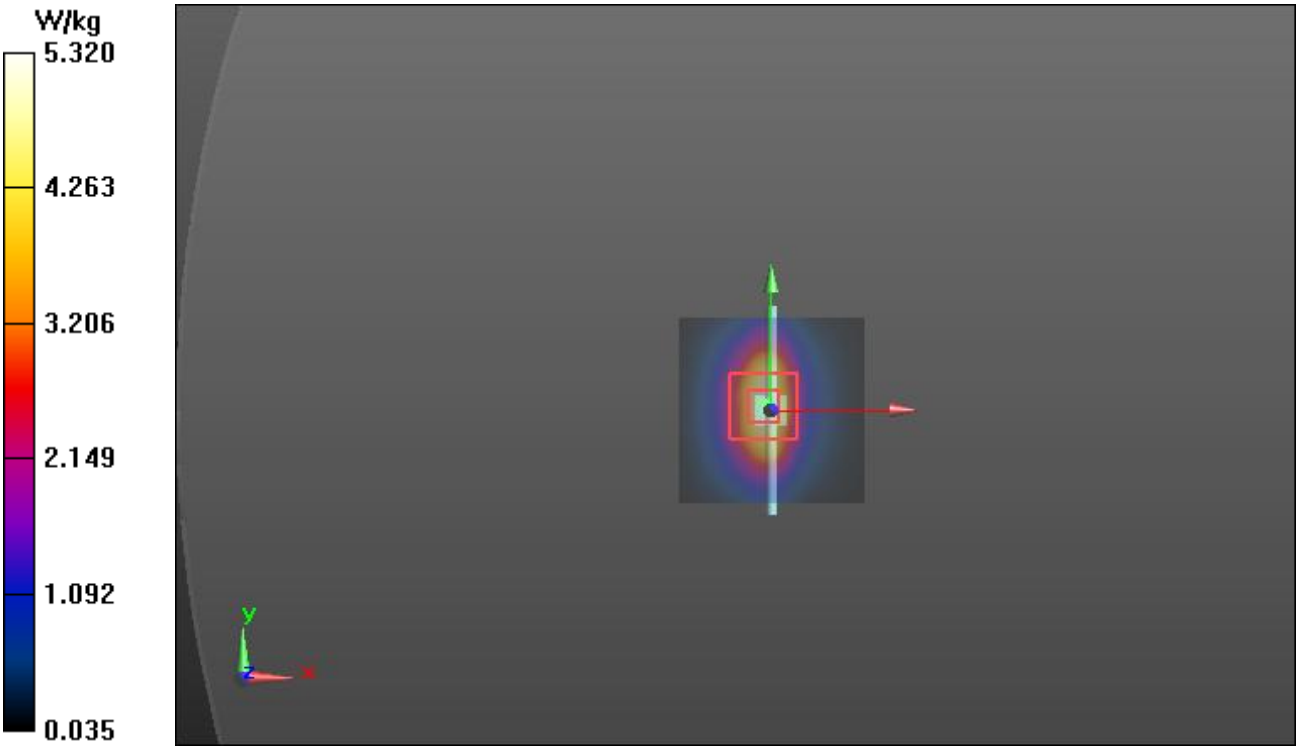
Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz);
Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.511 S/m; ε_r = 51.789; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

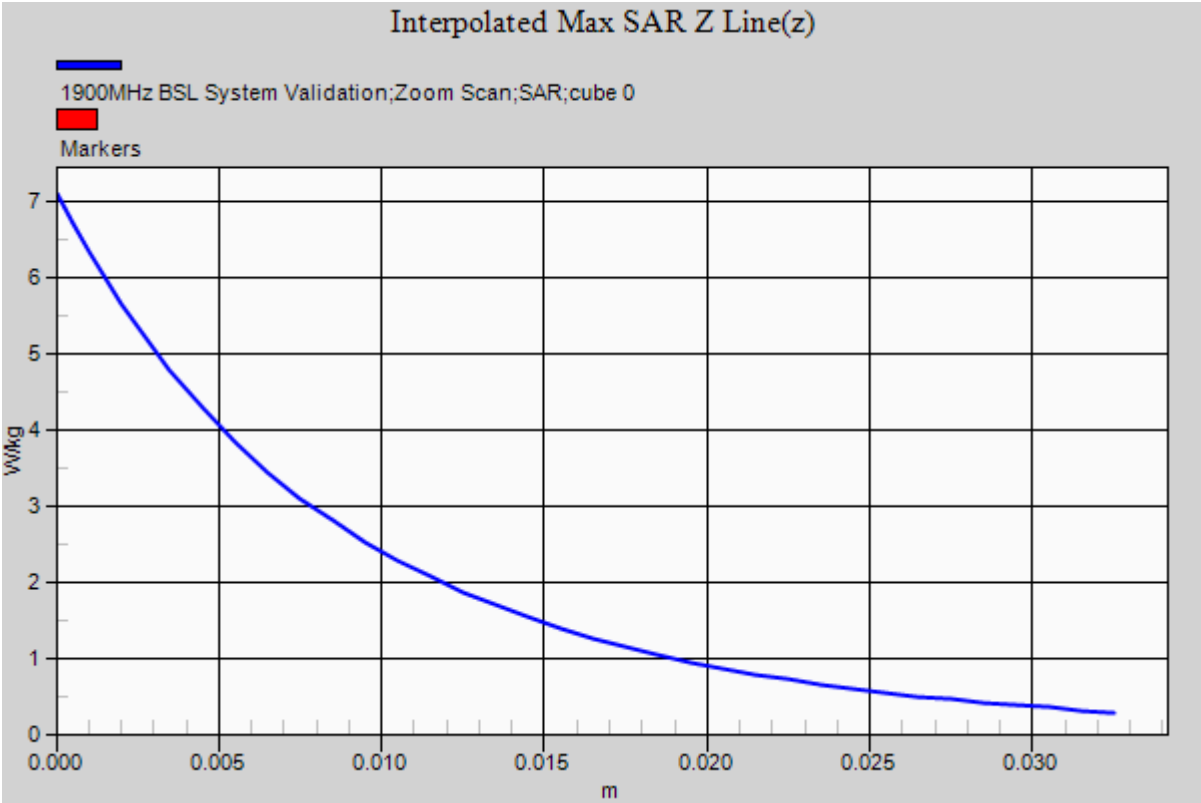
DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); 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/1900MHz BSL System Validation/Area Scan (41x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 5.32 W/kg

Configuration/1900MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.95 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 7.11 W/kg
SAR(1 g) = 3.99 W/kg; SAR(10 g) = 2.12 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 5.36 W/kg


W/kg
5.320
4.263
3.206
2.149
1.092
0.035
y
x


Interpolated Max SAR Z Line(z)
1900MHz BSL System Validation;Zoom Scan;SAR;cube 0
Markers
W/kg
0
1
2
3
4
5
6
7
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

System Check Plot 5

Date/Time: 2/11/2015 9:08:53 AM

DUT: Dipole1900 MHz; Type: D1900V2; Serial: 5d144

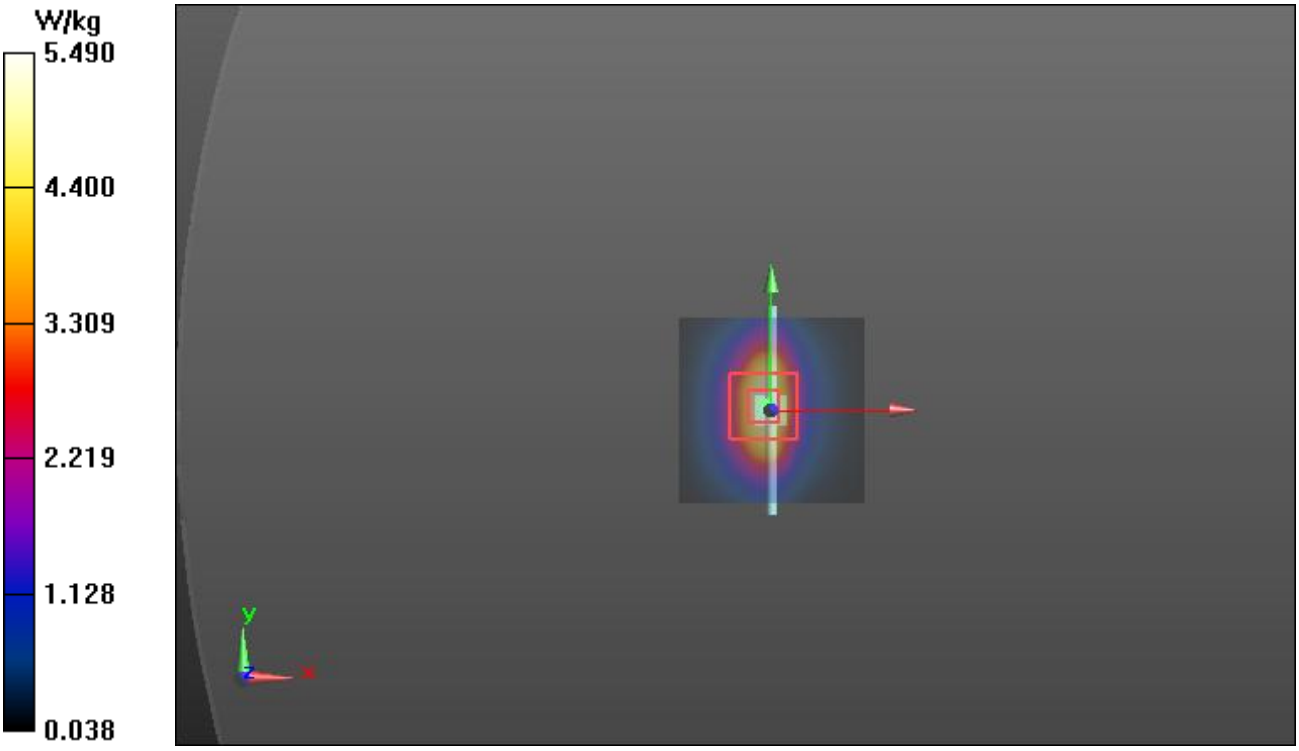
Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz);
Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.542 S/m; ε_r = 52.687; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

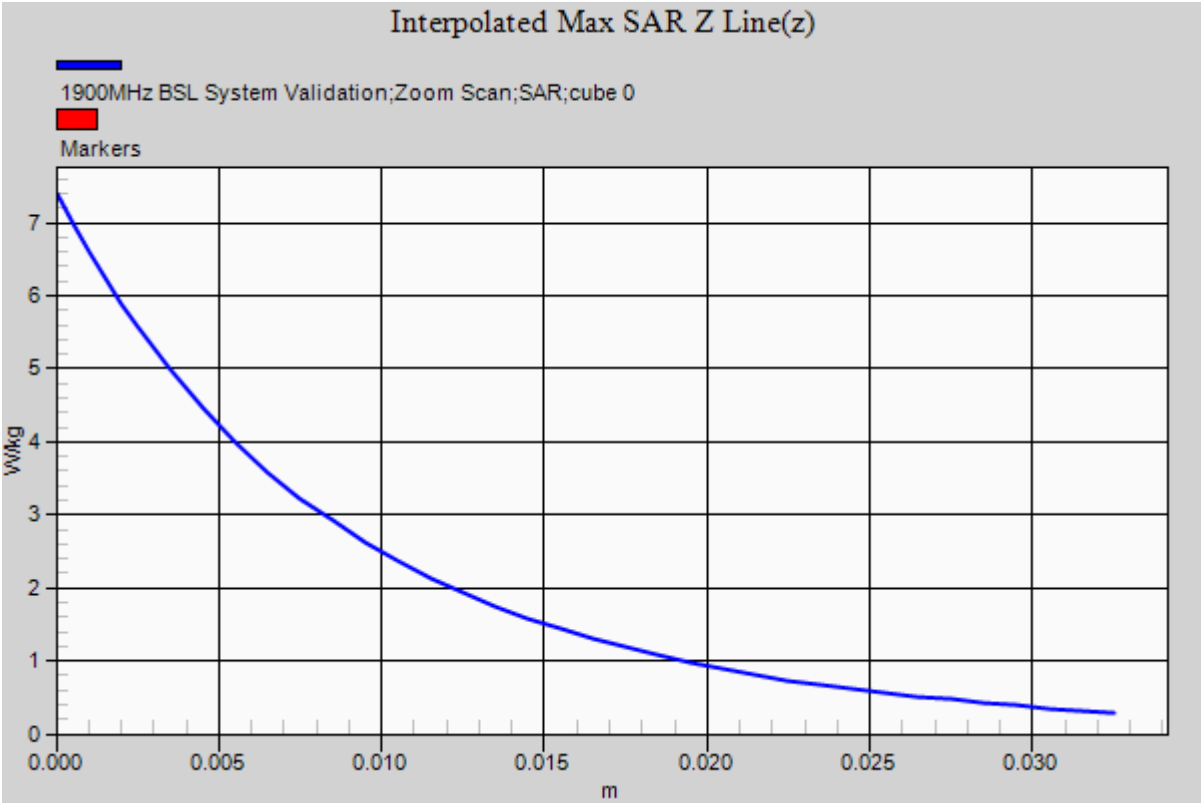
DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); 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/1900MHz BSL System Validation/Area Scan (41x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 5.49 W/kg

Configuration/1900MHz BSL System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.16 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 7.40 W/kg
SAR(1 g) = 4.11 W/kg; SAR(10 g) = 2.19 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 5.57 W/kg


W/kg
5.490
4.400
3.309
2.219
1.128
0.038
y
x


Interpolated Max SAR Z Line(z)
1900MHz BSL System Validation;Zoom Scan;SAR;cube 0
Markers
W/kg
0
1
2
3
4
5
6
7
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

12 SAR PLOTS

Scan 1

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

DUT: CrossMatch; Type: NA; Serial: NA

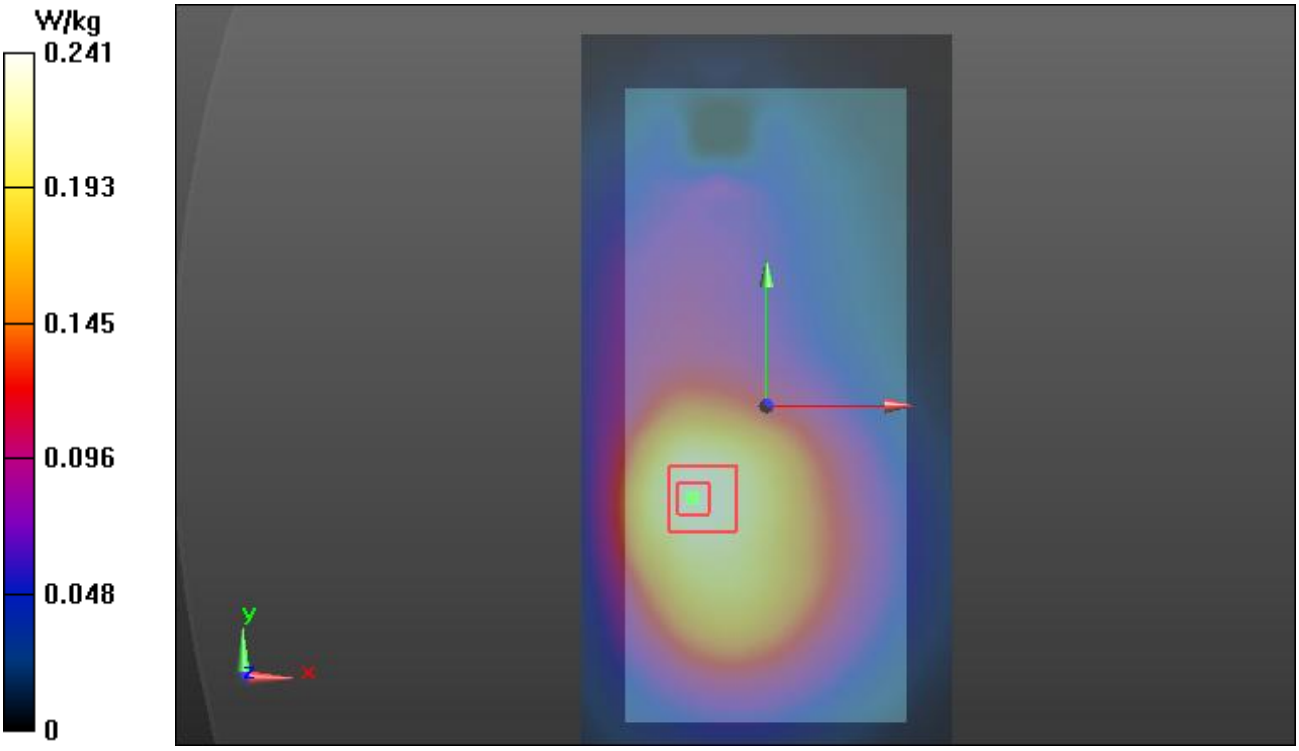
Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.0 - 849.0 MHz); Frequency: 824.2 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.953 S/m; ε_r = 52.954; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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
- 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/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 11.30 V/m; Power Drift = 0.11 dB
Fast SAR: SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.144 W/kg (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.241 W/kg


W/kg
0.241
0.193
0.145
0.096
0.048
0
y
x

Scan 2

Date/Time: 2/4/2015 5:33:33 PM

DUT: CrossMatch; Type: NA; Serial: NA

Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.0 - 849.0 MHz); Frequency: 824.2 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.953 S/m; ε_r = 52.954; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

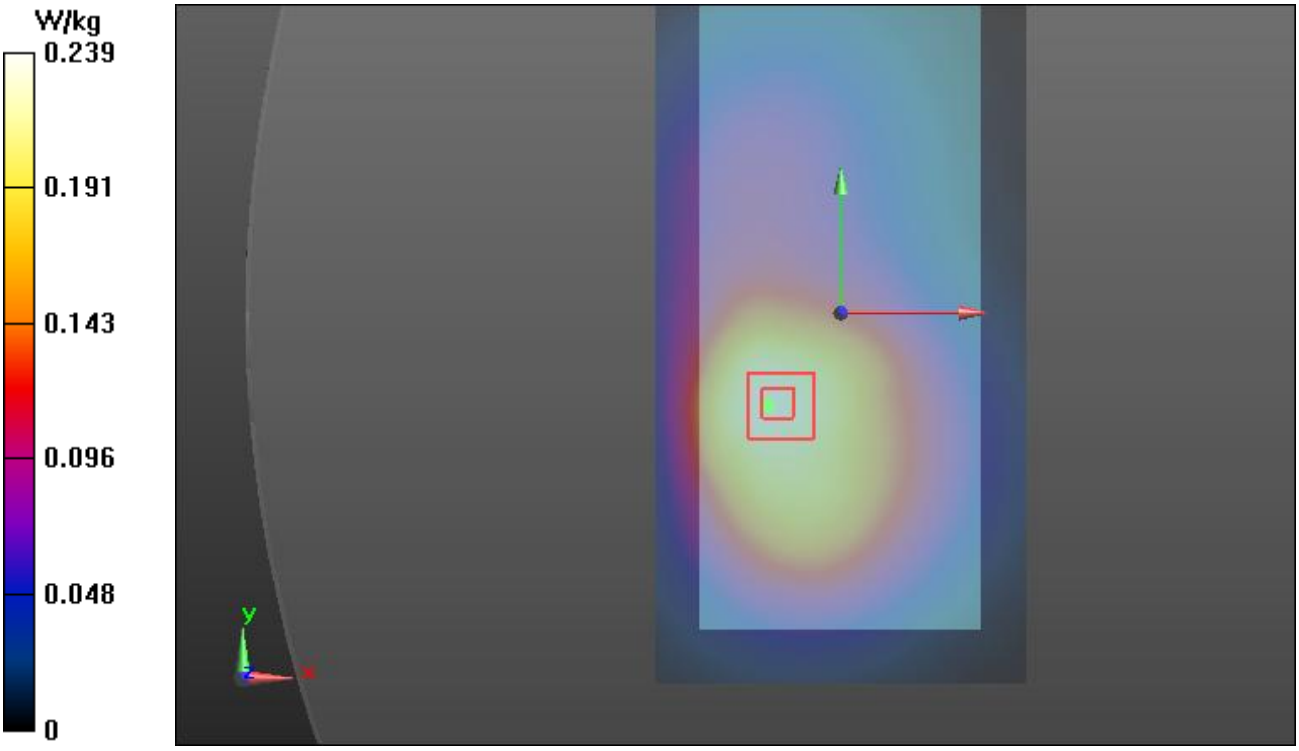
- Probe: EX3DV4 - SN3812; ConvF(8.99, 8.99, 8.99); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.239 W/kg

Configuration/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.62 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.276 W/kg
SAR(1 g) = 0.209 W/kg; SAR(10 g) = 0.152 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.239 W/kg


W/kg
0.239
0.191
0.143
0.096
0.048
0
y
x

Scan 3

Date/Time: 2/5/2015 9:43:38 AM

DUT: CrossMatch; Type: NA; Serial: NA

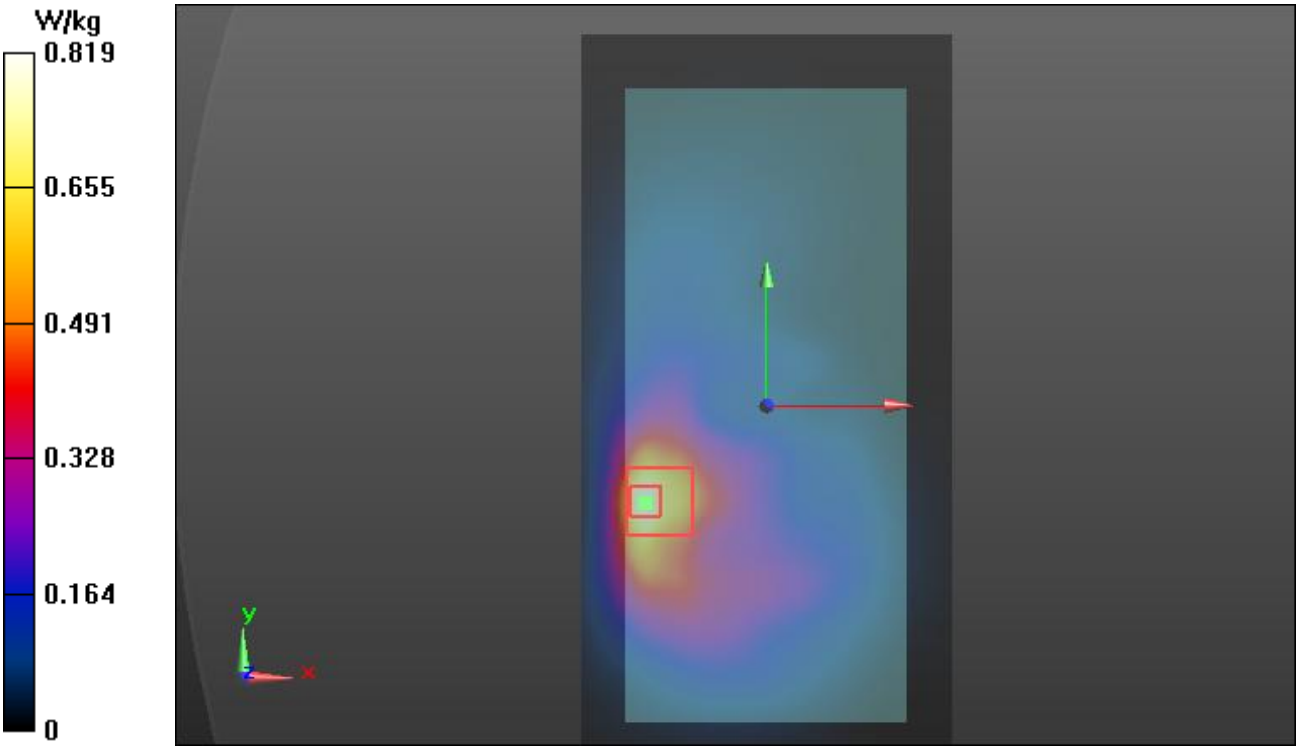
Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.0 - 849.0 MHz); Frequency: 824.2 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.946 S/m; ε_r = 52.351; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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
- 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/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 10.07 V/m; Power Drift = 0.06 dB
Fast SAR: SAR(1 g) = 0.635 W/kg; SAR(10 g) = 0.392 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 0.819 W/kg


W/kg
0.819
0.655
0.491
0.328
0.164
0
y
x

Scan 4

Date/Time: 2/5/2015 11:01:28 AM

DUT: CrossMatch; Type: NA; Serial: NA

Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.0 - 849.0 MHz); Frequency: 824.2 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.946 S/m; ε_r = 52.351; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

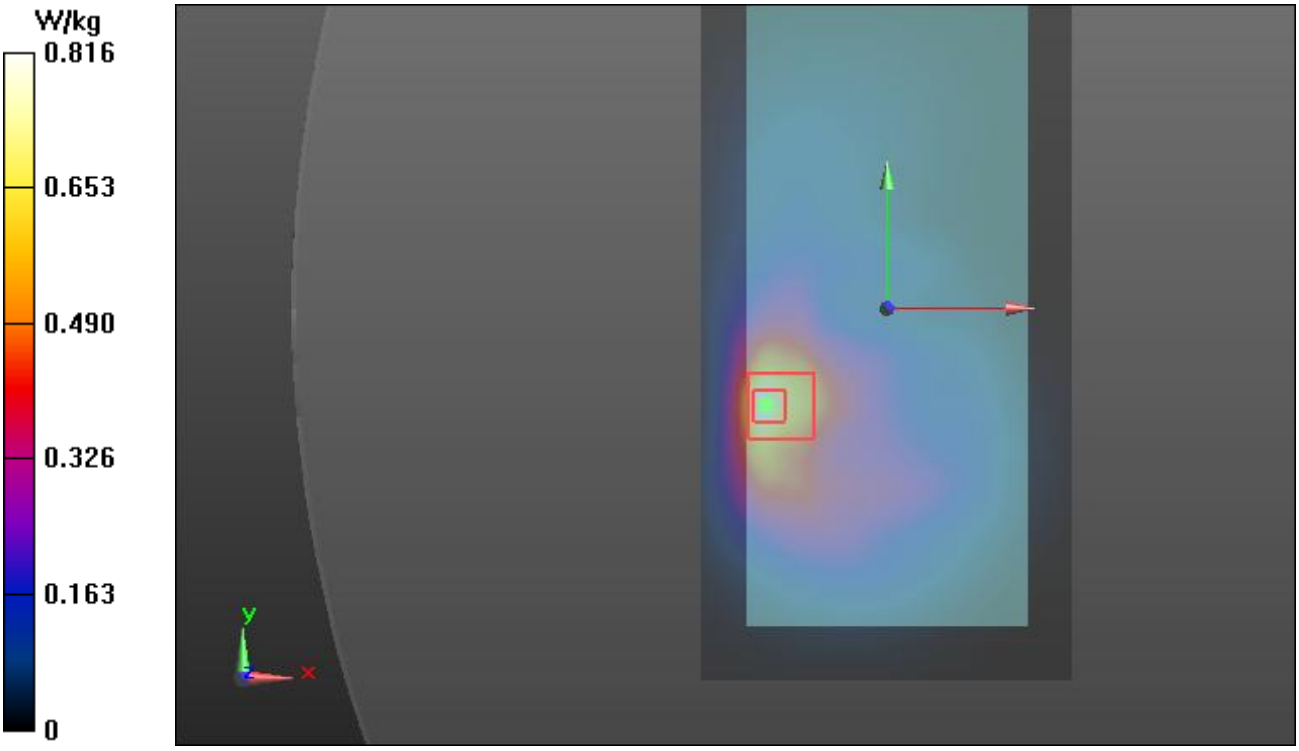
- Probe: EX3DV4 - SN3812; ConvF(8.99, 8.99, 8.99); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

Configuration/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.32 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.602 W/kg; SAR(10 g) = 0.353 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.772 W/kg


W/kg
0.816
0.653
0.490
0.326
0.163
0
y
x

Scan 5

Date/Time: 2/6/2015 5:20:03 PM

DUT: CrossMatch; Type: NA; Serial: NA

Communication System: UID 0, WCDMA; Communication System Band: Band 5 (826 - 846 MHz);
Frequency: 836.6 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used: f = 837 MHz; σ = 0.959 S/m; ε_r = 51.99; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

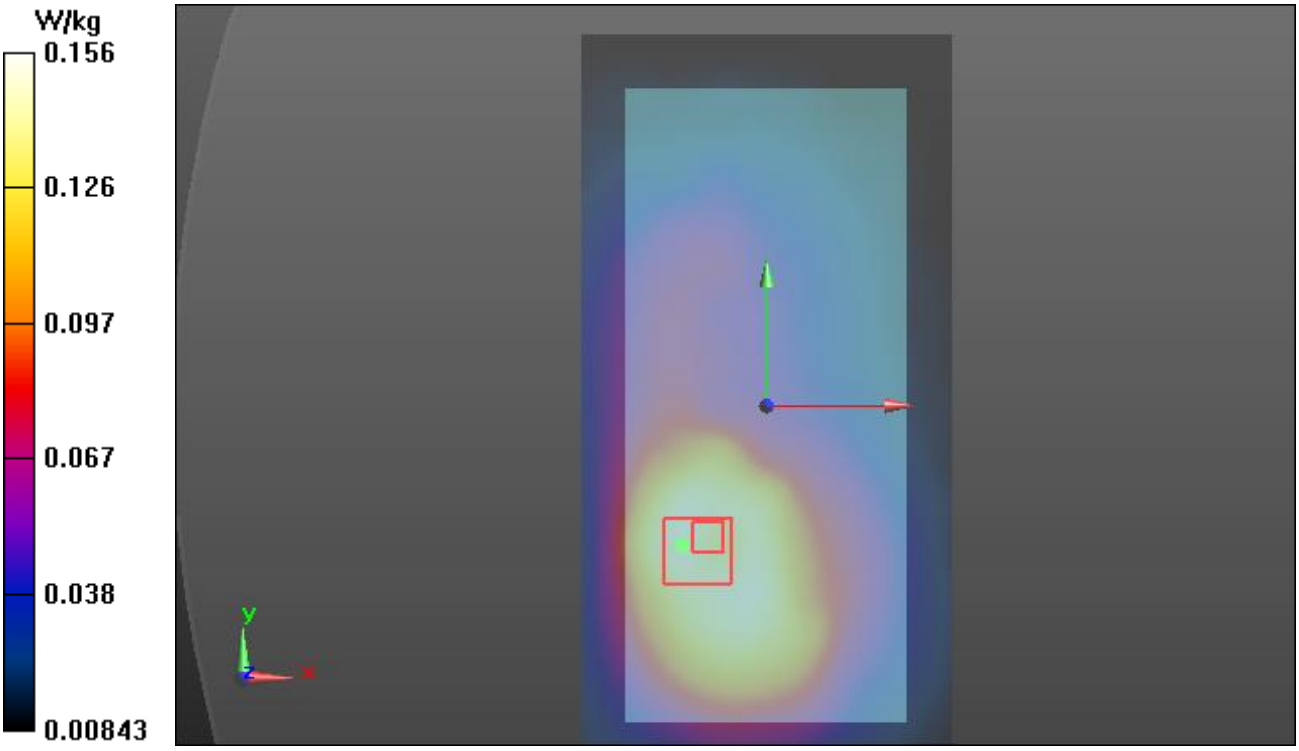
DASY Configuration:

- 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/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.458 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.181 W/kg
SAR(1 g) = 0.133 W/kg; SAR(10 g) = 0.095 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.156 W/kg

Configuration/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.147 W/kg


W/kg
0.156
0.126
0.097
0.067
0.038
0.00843
y
x

Scan 6

Date/Time: 2/6/2015 7:17:25 PM

DUT: CrossMatch; Type: NA; Serial: NA

Communication System: UID 0, WCDMA; Communication System Band: Band 5 (826 - 846 MHz); Frequency: 826.4 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.947 S/m; ε_r = 52.076; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

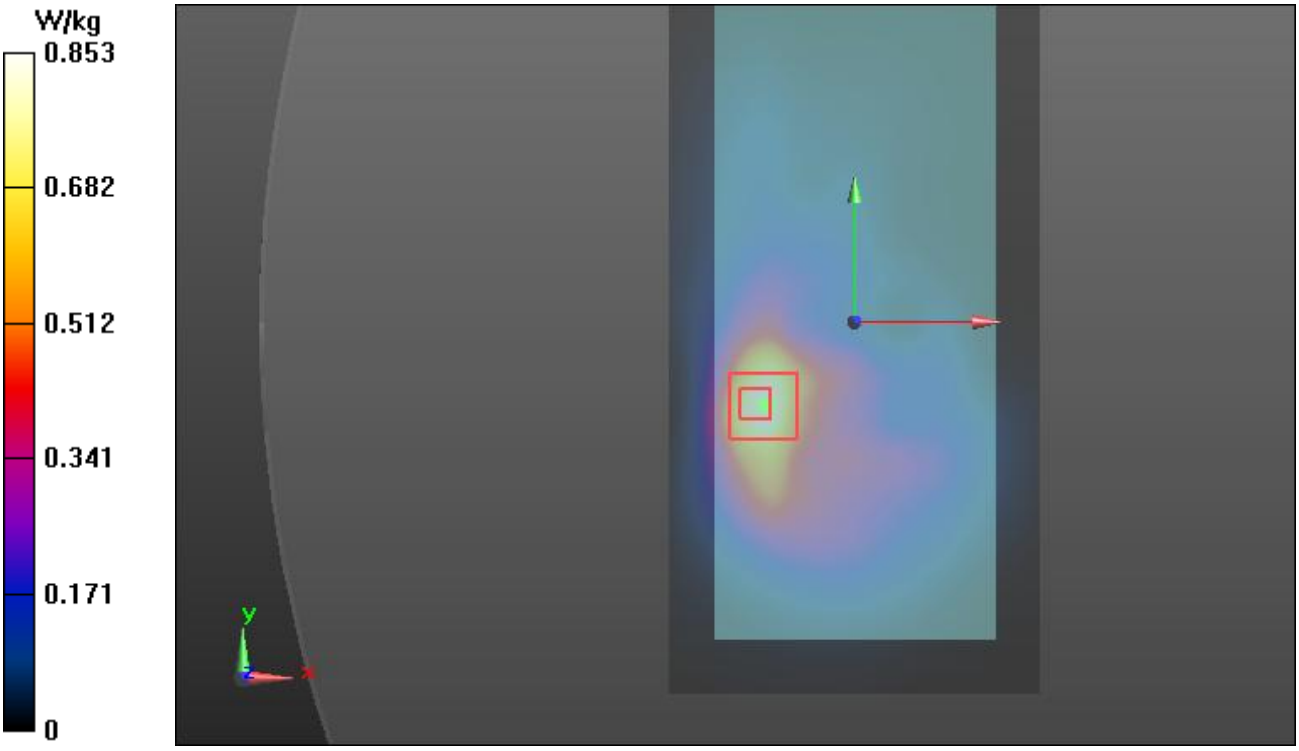
DASY Configuration:

- 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/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.853 W/kg

Configuration/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.78 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.708 W/kg; SAR(10 g) = 0.405 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.923 W/kg


W/kg
0.853
0.682
0.512
0.341
0.171
0
y
x

Scan 7

Date/Time: 2/10/2015 2:00:02 PM

DUT: CrossMatch; Type: NA; Serial: NA

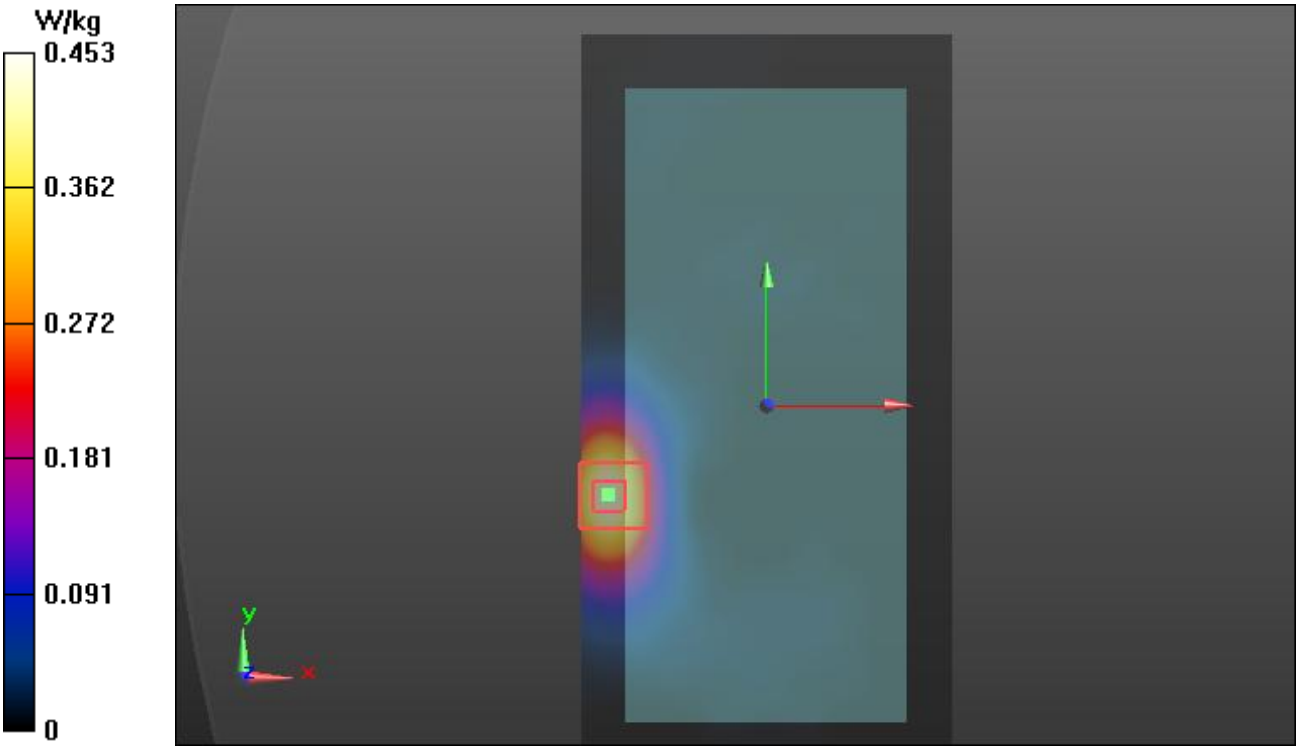
Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz); Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used: f = 1910 MHz; σ = 1.519 S/m; ε_r = 51.732; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), z = 1.0
- 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/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 1.225 V/m; Power Drift = 1.75 dB
Fast SAR: SAR(1 g) = 0.347 W/kg; SAR(10 g) = 0.191 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 0.453 W/kg


W/kg
0.453
0.362
0.272
0.181
0.091
0
y
x

Scan 8

Date/Time: 2/10/2015 2:36:08 PM

DUT: CrossMatch; Type: NA; Serial: NA

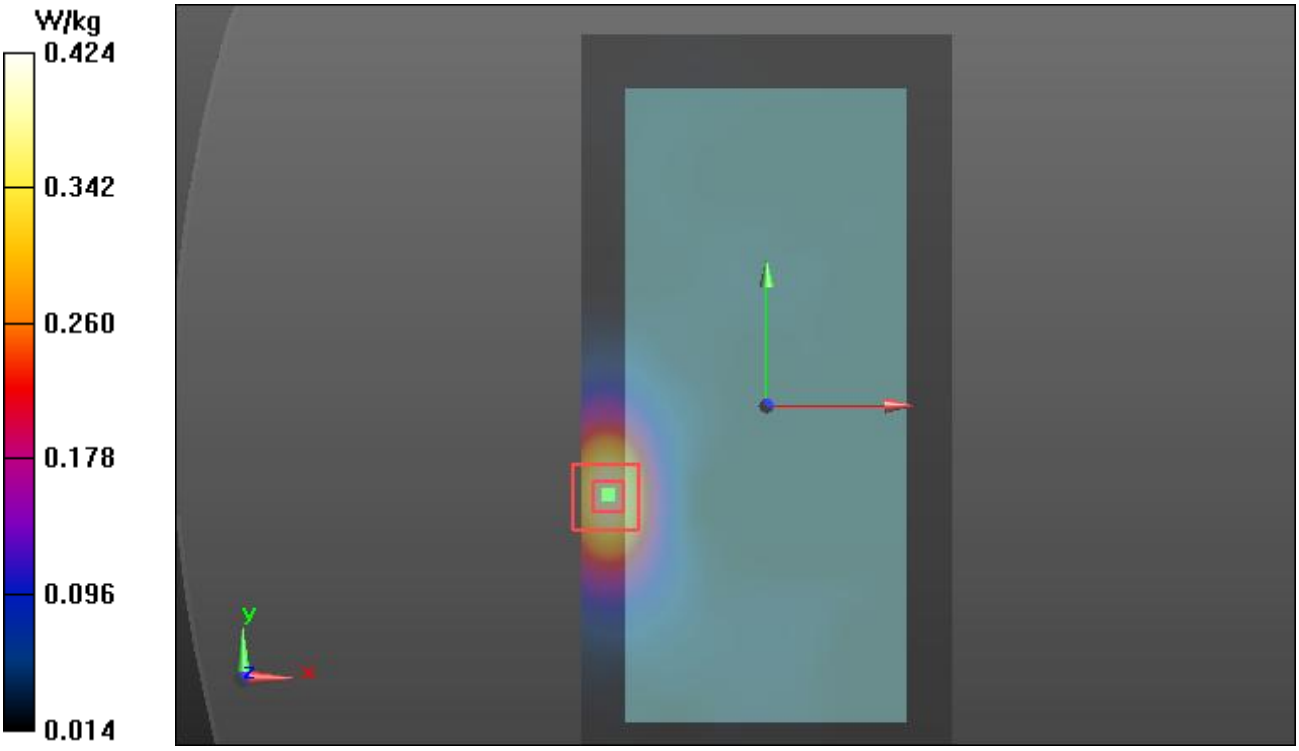
Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz); Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used: f = 1910 MHz; σ = 1.519 S/m; ε_r = 51.732; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); 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/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.385 V/m; Power Drift = 0.25 dB
Peak SAR (extrapolated) = 0.529 W/kg
SAR(1 g) = 0.340 W/kg; SAR(10 g) = 0.206 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.424 W/kg

Configuration/Area Scan (81x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.453 W/kg


W/kg
0.424
0.342
0.260
0.178
0.096
0.014
y
x

Scan 9

Date/Time: 2/10/2015 5:11:53 PM

DUT: CrossMatch; Type: NA; Serial: NA

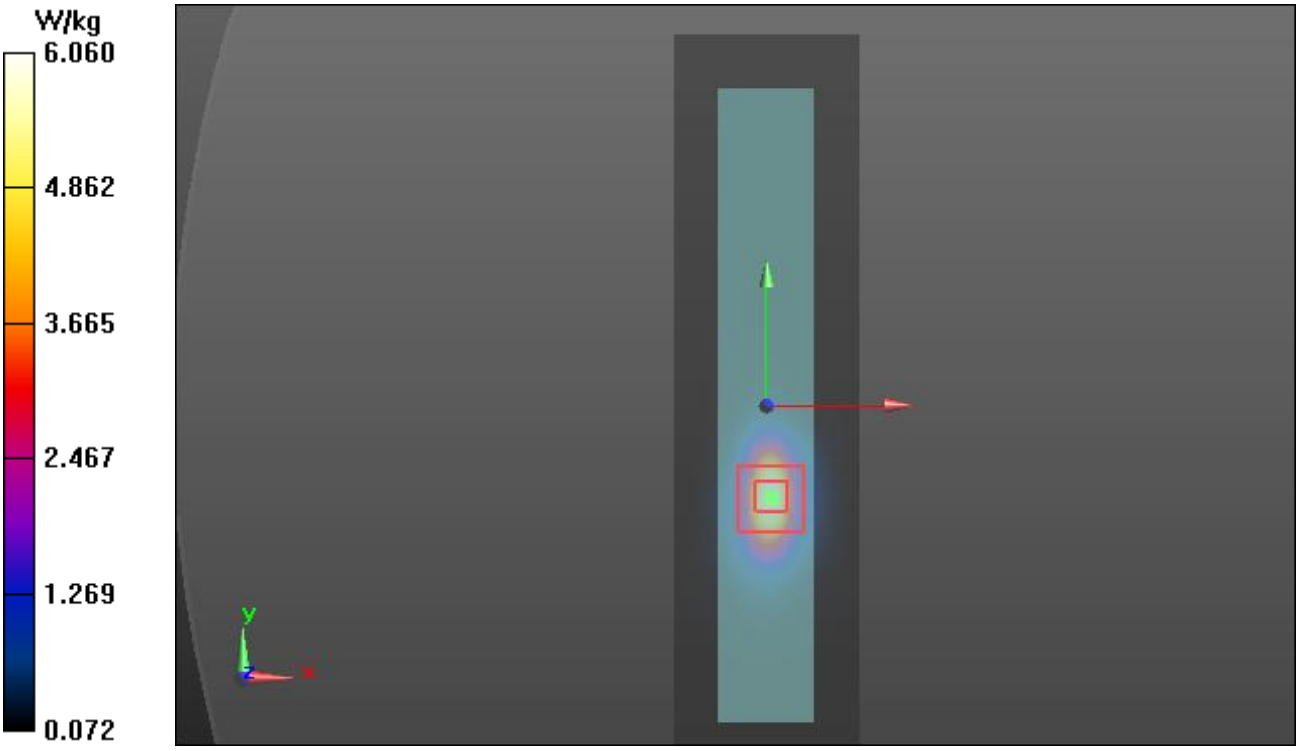
Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz); Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used: f = 1910 MHz; σ = 1.519 S/m; ε_r = 51.732; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); 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/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.53 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 8.24 W/kg
SAR(1 g) = 4.35 W/kg; SAR(10 g) = 2.05 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 6.06 W/kg

Configuration/Area Scan (41x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 6.22 W/kg


W/kg
6.060
4.862
3.665
2.467
1.269
0.072
y
x

Scan 10

Date/Time: 2/11/2015 1:47:20 PM

DUT: CrossMatch; Type: NA; Serial: NA

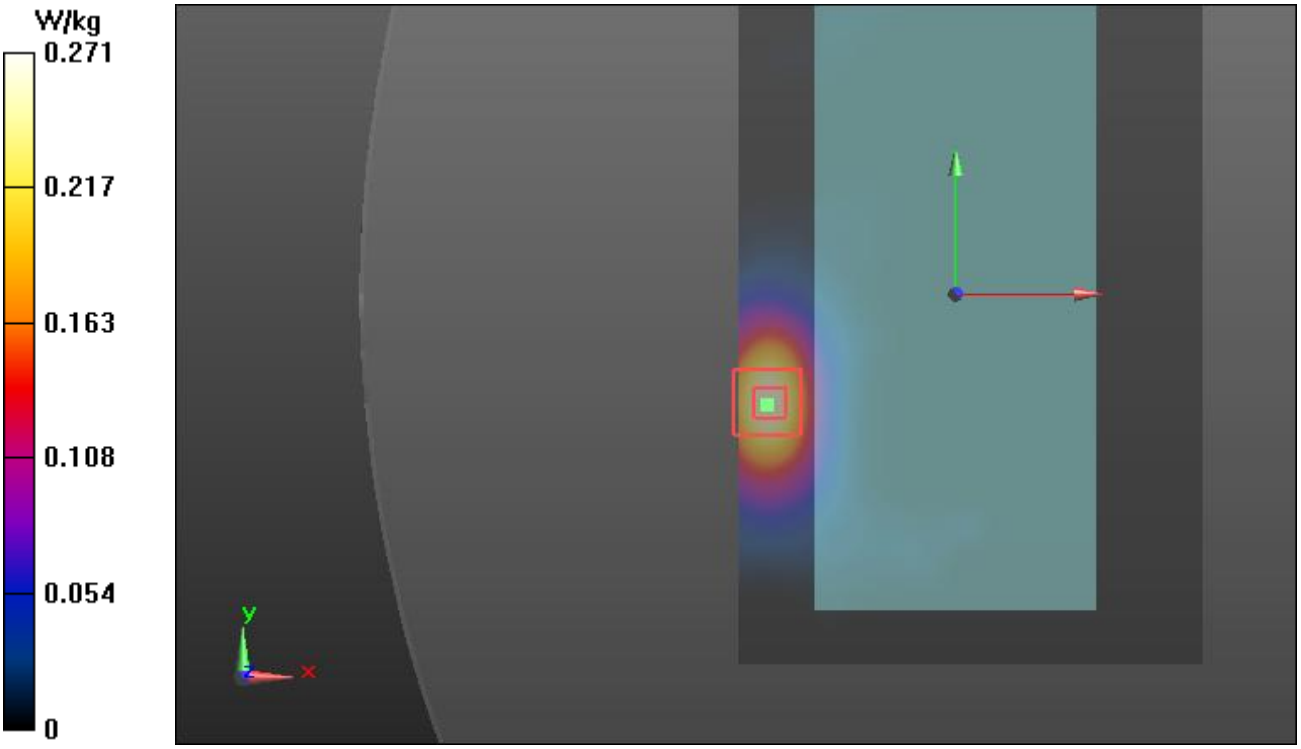
Communication System: UID 0, WCDMA; Communication System Band: Band 2 (1852 - 1908 MHz); Frequency: 1907.7 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1908 MHz; σ = 1.549 S/m; ε_r = 52.651; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); 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/Area Scan (101x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.271 W/kg

Configuration/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.8820 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.205 W/kg; SAR(10 g) = 0.125 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.254 W/kg


W/kg
0.271
0.217
0.163
0.108
0.054
0
y
x

Scan 11

Date/Time: 2/11/2015 3:46:07 PM

DUT: CrossMatch; Type: NA; Serial: NA

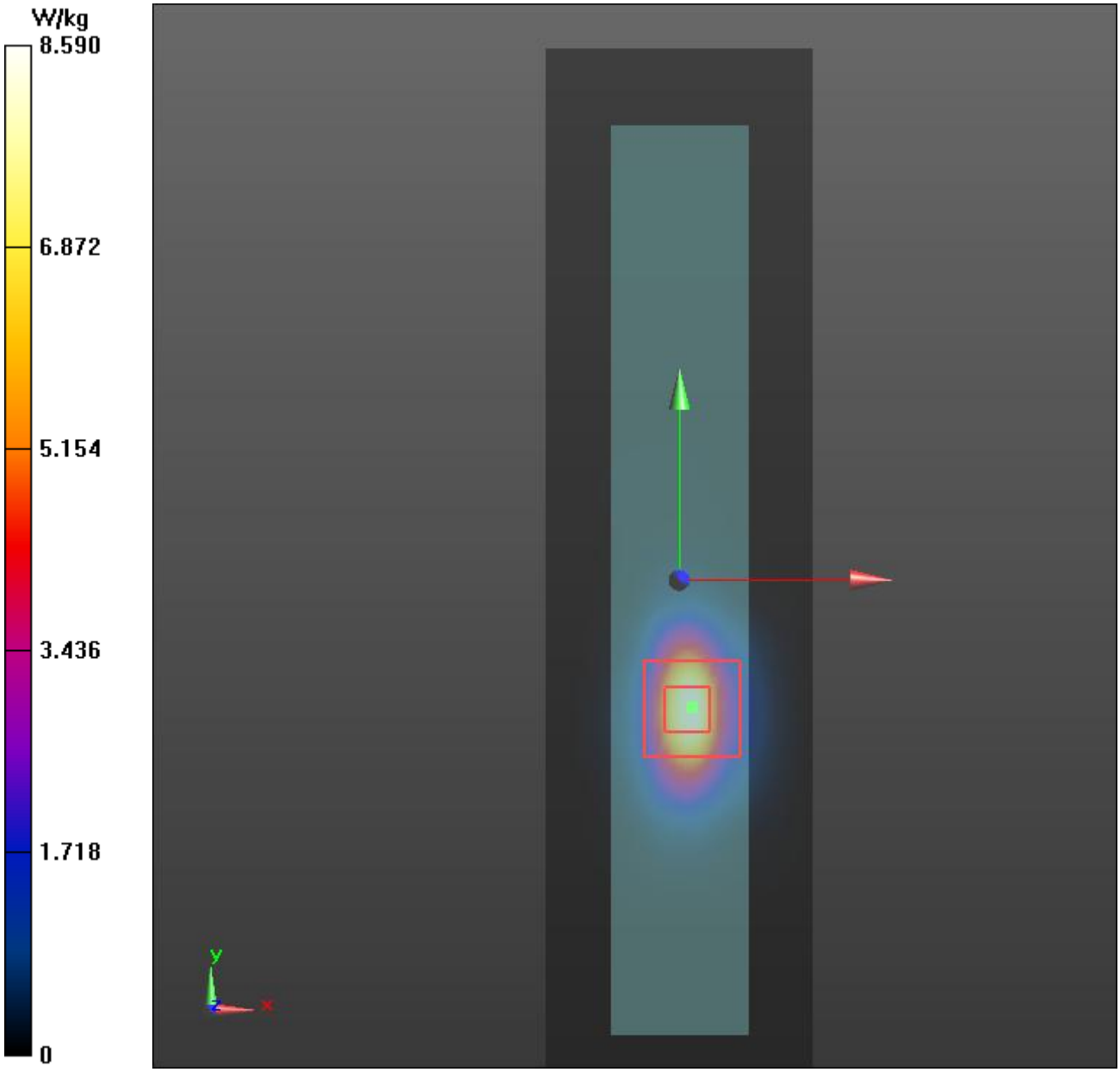
Communication System: UID 0, WCDMA; Communication System Band: Band 2 (1852 - 1908 MHz); Frequency: 1852.4 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.514 S/m; ε_r = 52.815; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), z = 1.0
- 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/Area Scan (41x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 16.50 V/m; Power Drift = 0.09 dB
Fast SAR: SAR(1 g) = 5.81 W/kg; SAR(10 g) = 2.48 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 8.59 W/kg


W/kg
8.590
6.872
5.154
3.436
1.718
0
y
x

Scan 12

Date/Time: 2/11/2015 4:32:35 PM

DUT: CrossMatch; Type: NA; Serial: NA

Communication System: UID 0, WCDMA; Communication System Band: Band 2 (1852 - 1908 MHz); Frequency: 1852.4 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.514 S/m; ε_r = 52.815; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

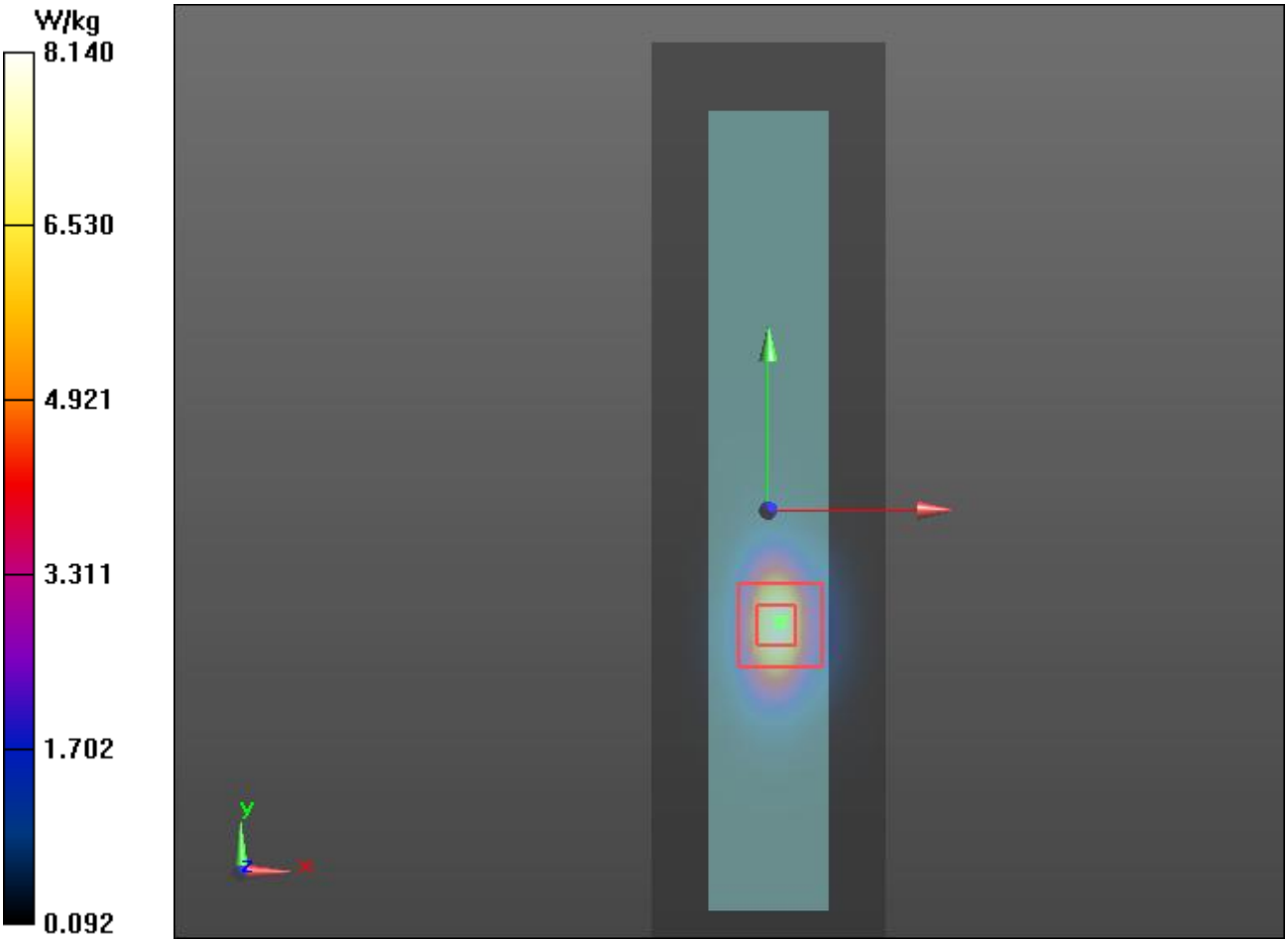
- Probe: EX3DV4 - SN3812; ConvF(7.45, 7.45, 7.45); Calibrated: 1/26/2015;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), z = 31.0
- Electronics: DAE4 Sn1287; Calibrated: 1/20/2015
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: 1146
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.86 V/m; Power Drift = 0.26 dB
Peak SAR (extrapolated) = 11.1 W/kg
SAR(1 g) = 5.79 W/kg; SAR(10 g) = 2.72 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 8.14 W/kg

Configuration/Area Scan (41x161x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

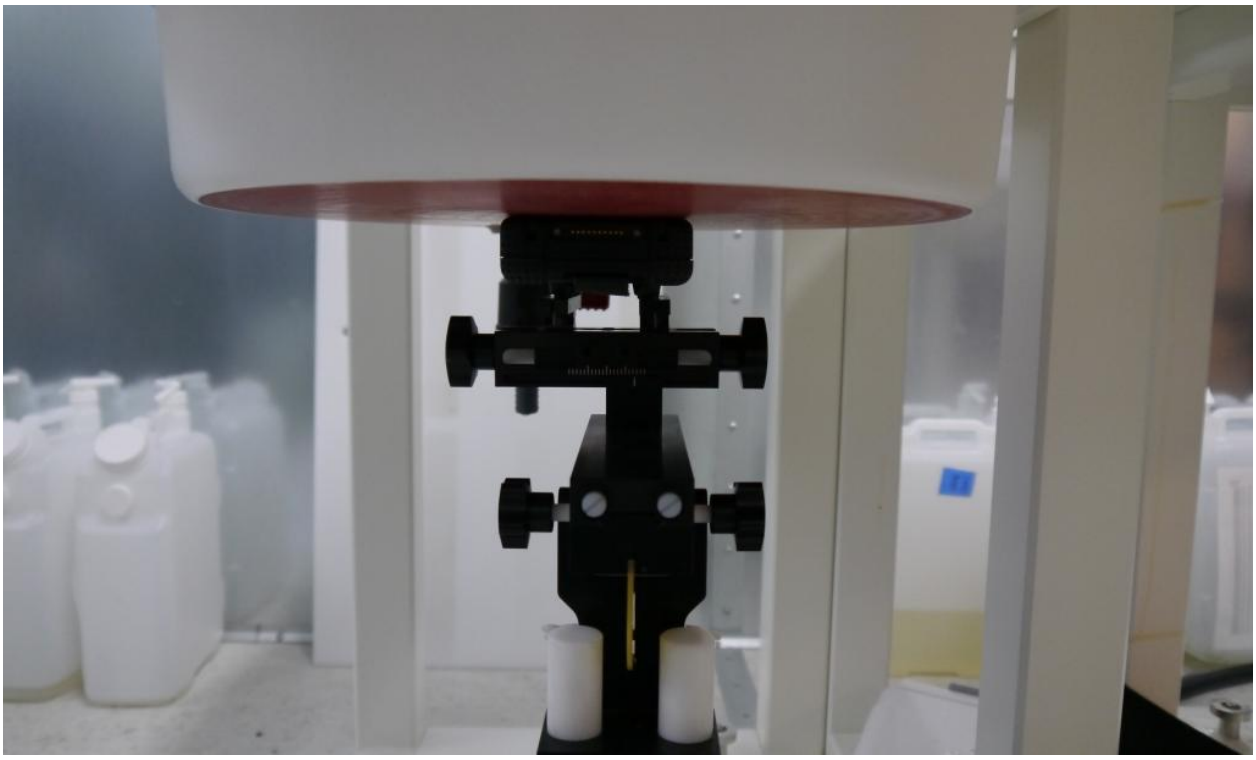
Maximum value of SAR (interpolated) = 8.18 W/kg


W/kg
8.140
6.530
4.921
3.311
1.702
0.092
y
x

13 SETUP PHOTOGRAPHS

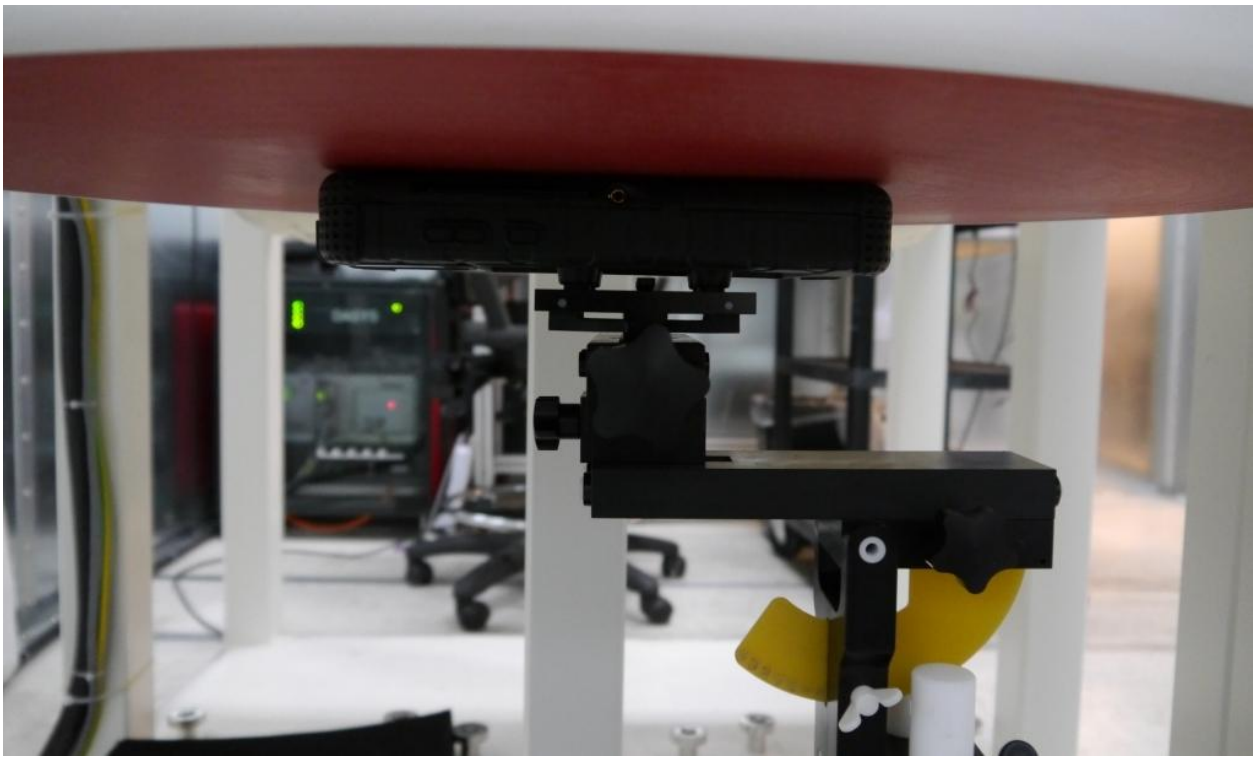
Postion P1

EUT screen facing towards phantom



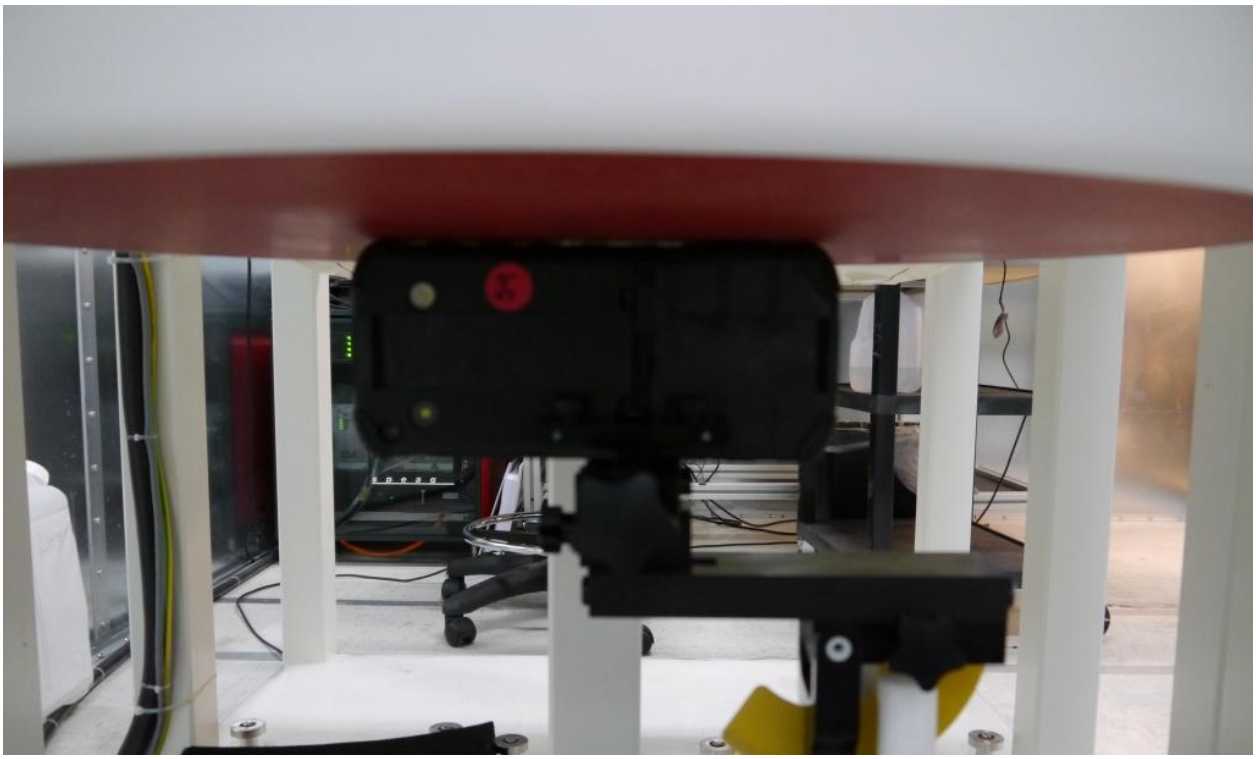
Position P2

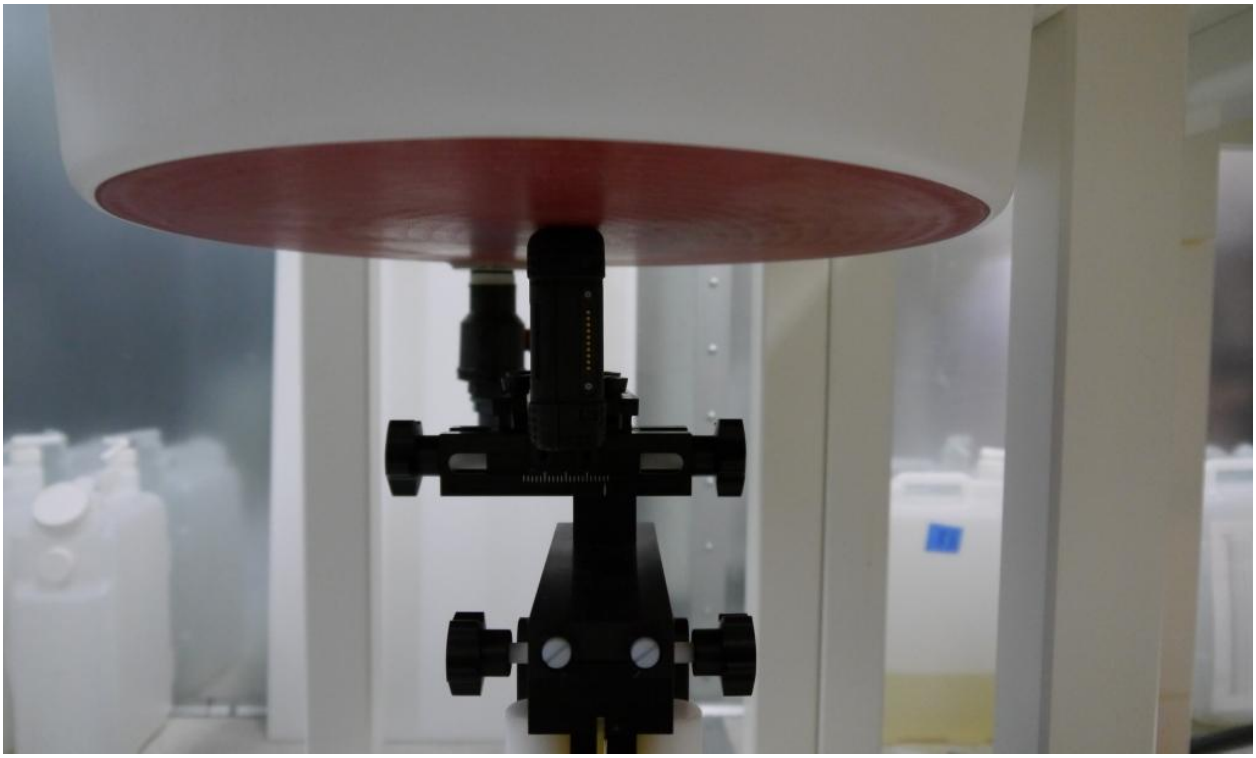
EUT screen facing away from phantom



Postion P3

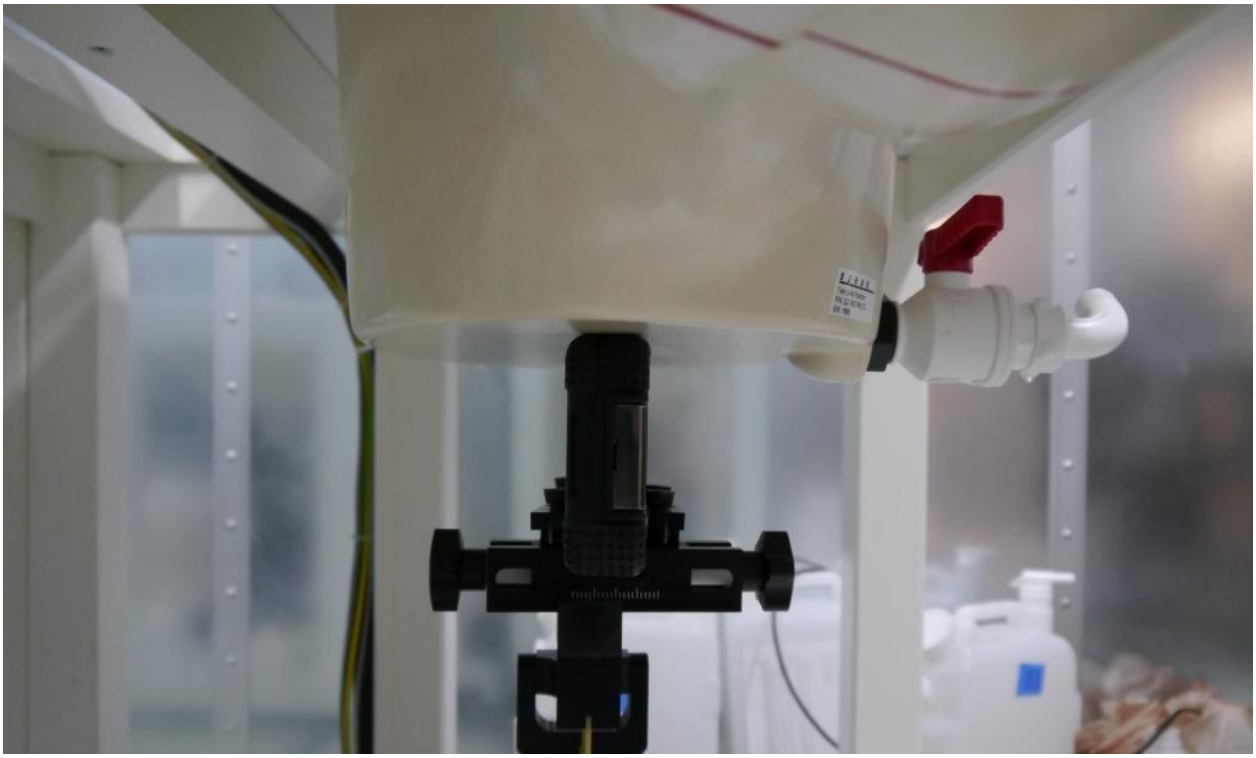
EUT left side towards phantom



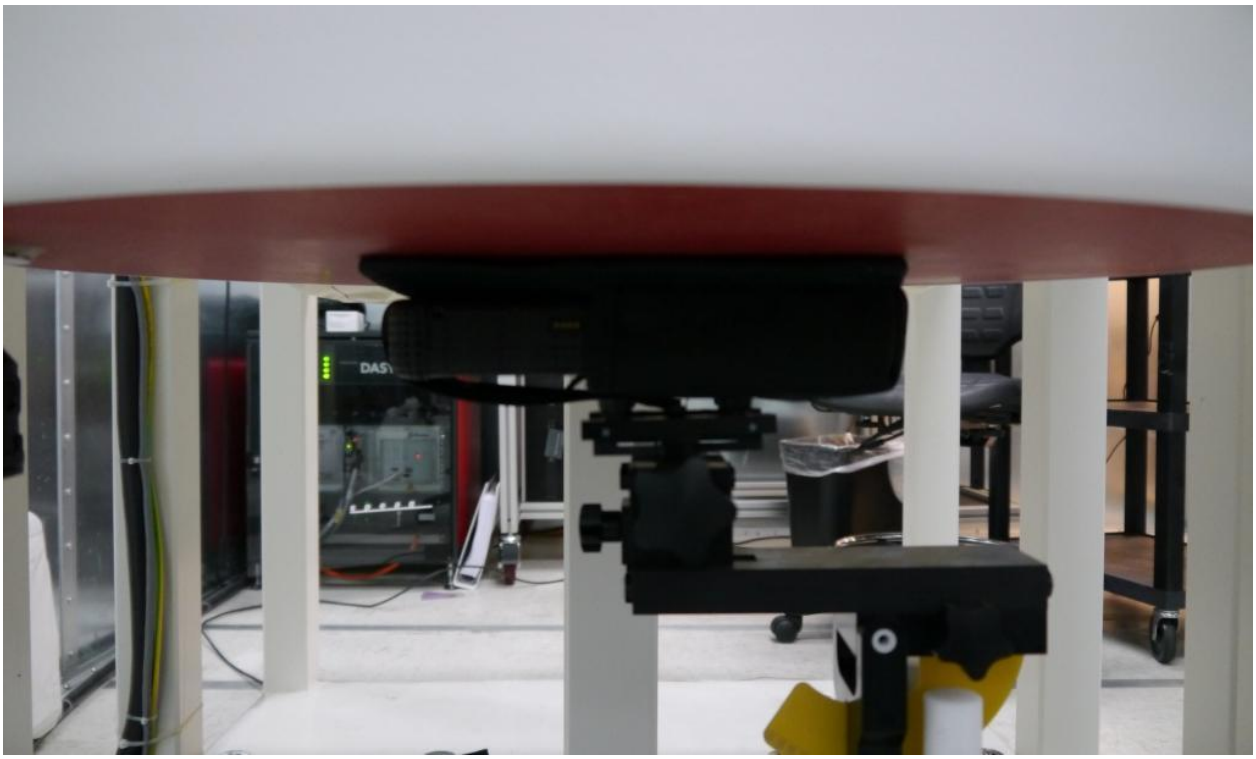


Position P4

EUT right side towards phantom



Postion P1 or P2 with case



14 REVISION HISTORY

Revision Level	Description of changes	Revision Date
0	Initial release	6 March 2015
1	Page 6: Removed reference to OET 65 Suplement C. Updated reference to KDB 648474 D04 Handset SAR v01r02	31 March 2015