

Evaluation of SAR in Body Worn Configurations GMLNSD-3AW.

Introduction

SAR was measured when phone was placed with body worn accessory against the Flat Phantom. Body worn accessory BCH-12U (Picture 1) was tested. The measurement test equipment and setup was the same as used and referred in SAR TEST REPORT of NOKIA GMLNSD-3AW.



Picture 1. Belt Clip BCH-12U.

Test method

Measurements were done with the Dasy 2 dosimetric assessment system DAE V2, SN: 213 and with the generic Twin Phantom version 3 from Schmid & Partner Engineering Ag. The phone was positioned in body worn accessory against Flat Phantom. Both antenna positions were tested (whip in and whip up). Separation distance for BCH-12U is presented in picture 1. The point of maximum SAR was searched. Then the SAR was measured with a 3-dimensional cube measurement.



Picture 2. Separation distance with Belt Clip BCH-12U

The maximum output power level in lowest, middle and highest channel was used (824, 836 and 849 MHz on AMPS mode and 1850, 1880 and 1910 MHz on CDMA PCS mode). Brain equivalent liquid was used.

On PCS band the used conductivity is about 20% higher than FCC recommendation.

On Cellular band the used conductivity is about 16% lower than FCC recommendation. The SAR results have such big margin that meeting the FCC limit is evident.

Results

Graphical presentations of test positions with SAR values are presented in the end of this report.

Analog mode AMPS, Body worn, Whip in

meas. nr:	Phone position	Frequency MHz / channel	Power dBm	SAR (1g) [mW/g]
1	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	824 / 991	26.5	0.77
2	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	836 / 383	26.5	0.99
3	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	849 / 799	26.5	0.85
FCC ID: GMLNSD-3AW MEASURED: 2000-8-2/NMP		FCC limit		1.60[mW/g] (ANSI/IEEE)

Analog mode AMPS, Body worn, Whip up

meas. nr:	Phone position	Frequency MHz / channel	Power dBm	SAR (1g) [mW/g]
4	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	824 / 991	26.5	0.90
5	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	836 / 383	26.5	1.10
6	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	849 / 799	26.5	0.98
FCC ID: GMLNSD-3AW MEASURED: 2000-8-2/NMP		FCC limit		1.60[mW/g] (ANSI/IEEE)

Digital mode CDMA PCS, Body worn, Whip in

meas. nr:	Phone position	Frequency MHz / channel	Power DBm	SAR (1g) [mW/g]
7	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	1850 / 25	22.5	1.07
8	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	1880 / 600	22.5	1.34
9	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	1910 / 1175	22.5	0.97
FCC ID: GMLNSD-3AW MEASURED: 2000-8-2/NMP		FCC limit		1.60[mW/g] (ANSI/IEEE)

Digital mode CDMA PCS, Body worn, Whip up

meas. nr:	Phone position	Frequency MHz / channel	Power DBm	SAR (1g) [mW/g]
10	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	1850 / 25	22.5	0.88
11	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	1880 / 600	22.5	1.10
12	Body Worn, Belt Clip (BCH-12U) against Flat Phantom	1910 / 1175	22.5	1.01
FCC ID: GMLNSD-3AW MEASURED: 2000-8-2/NMP		FCC limit		1.60[mW/g] (ANSI/IEEE)

Summary

The SAR values found for the portable cellular phone (FCC ID: GMLNSD-3AW) are below the maximum recommended levels of 1.6 mW/g.

NOKIA MOBILE PHONES
Kari Nyyssönen

2000-8-3

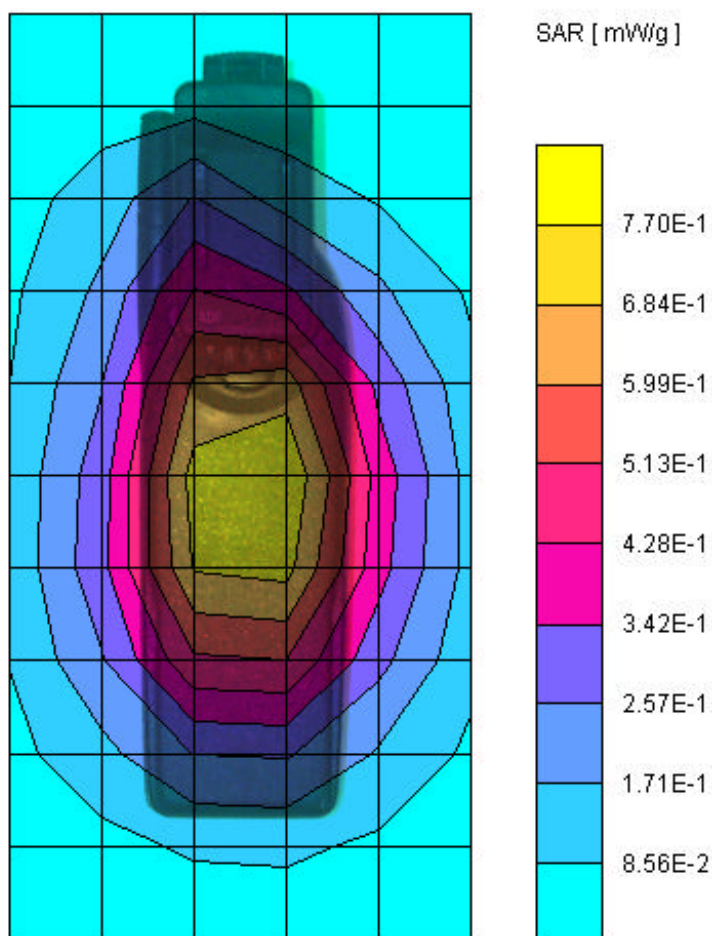
Meas 1

$\sigma = 0.79$ [mho/m] $\epsilon_r = 44.8$ $\rho = 1.00$ [g/cm³]

Coarse Grid Dx = 20.0 Dy = 20.0 Dz = 5.0 [mm]

SAR [mW/g] Max: 0.77

SAR (1g): 0.769 [mW/g] SAR (10g): 0.559 [mW/g]



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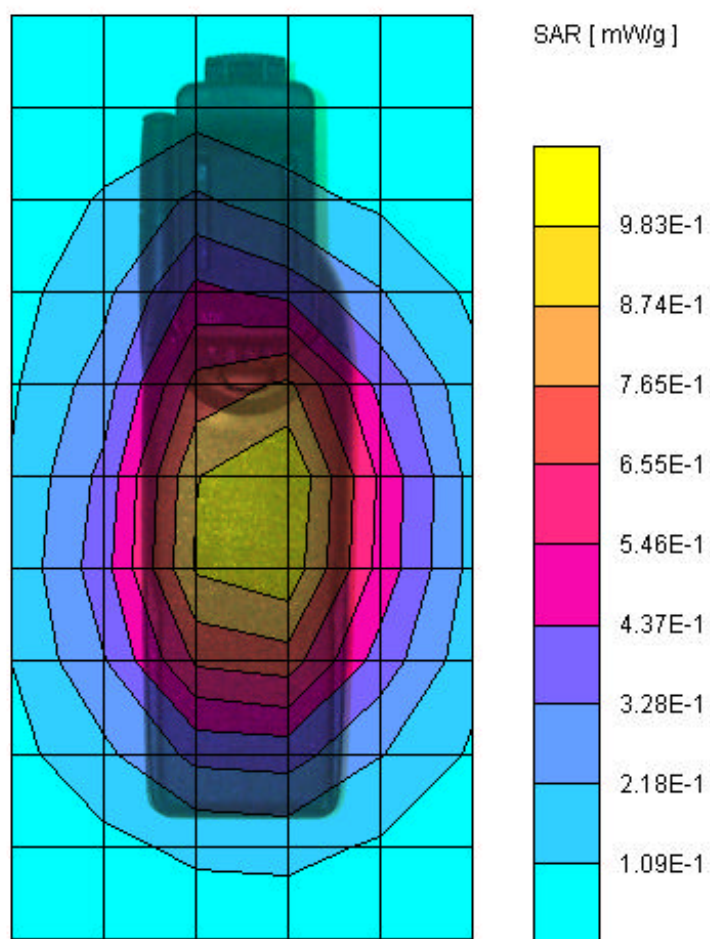
Meas 2

$\sigma = 0.80$ [mho/m] $\epsilon_r = 44.6$ $\rho = 1.00$ [g/cm³]

Coarse Grid $Dx = 20.0$ $Dy = 20.0$ $Dz = 5.0$ [mm]

SAR [mW/g] Max: 0.98

SAR (1g): 0.989 [mW/g] SAR (10g): 0.718 [mW/g]



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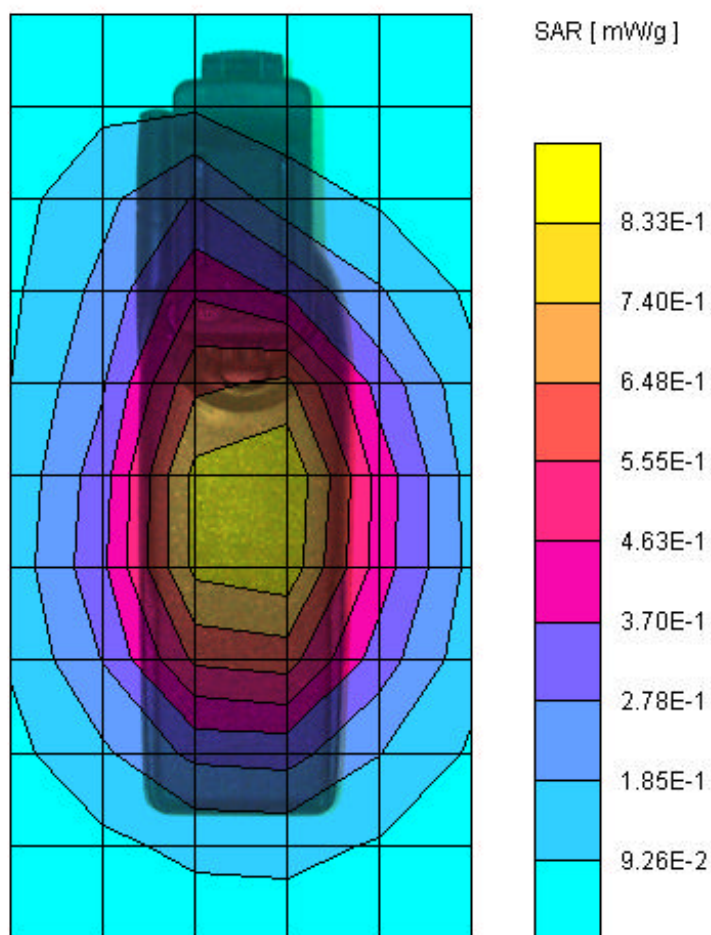
Meas 3

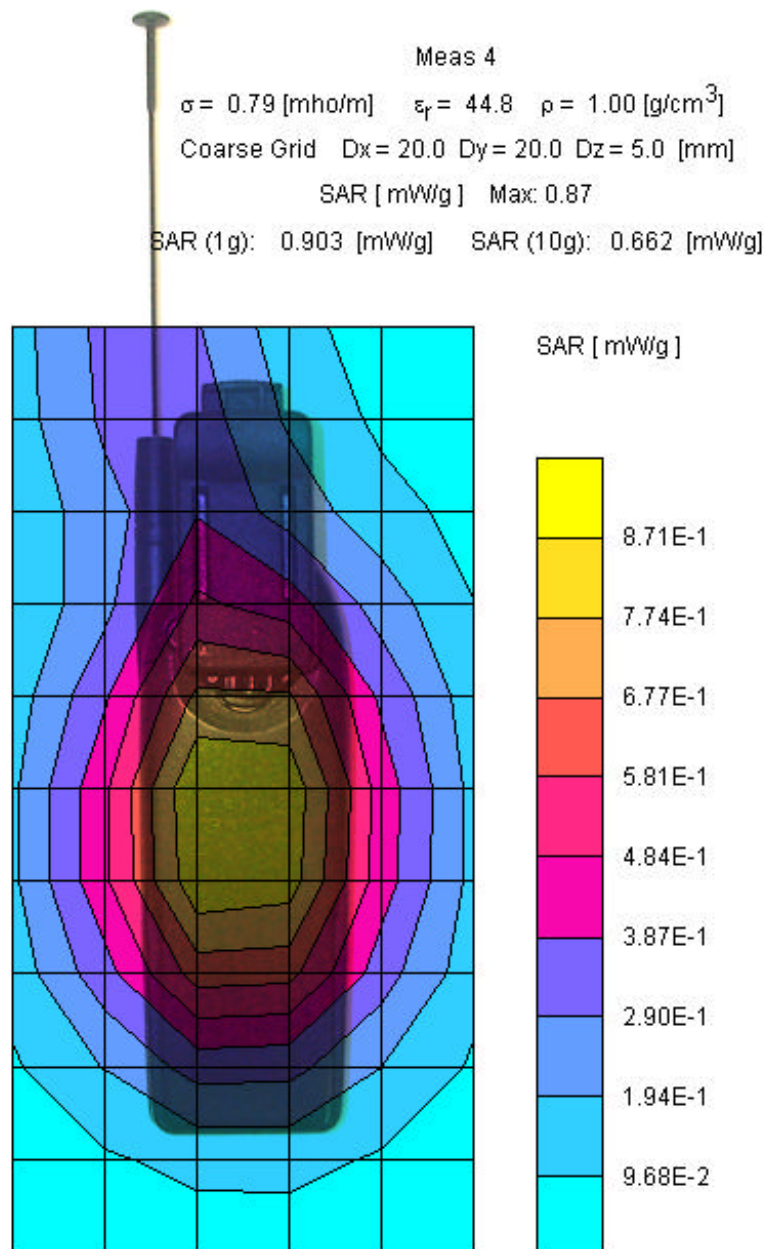
$\sigma = 0.82$ [mho/m] $\epsilon_r = 44.5$ $\rho = 1.00$ [g/cm³]

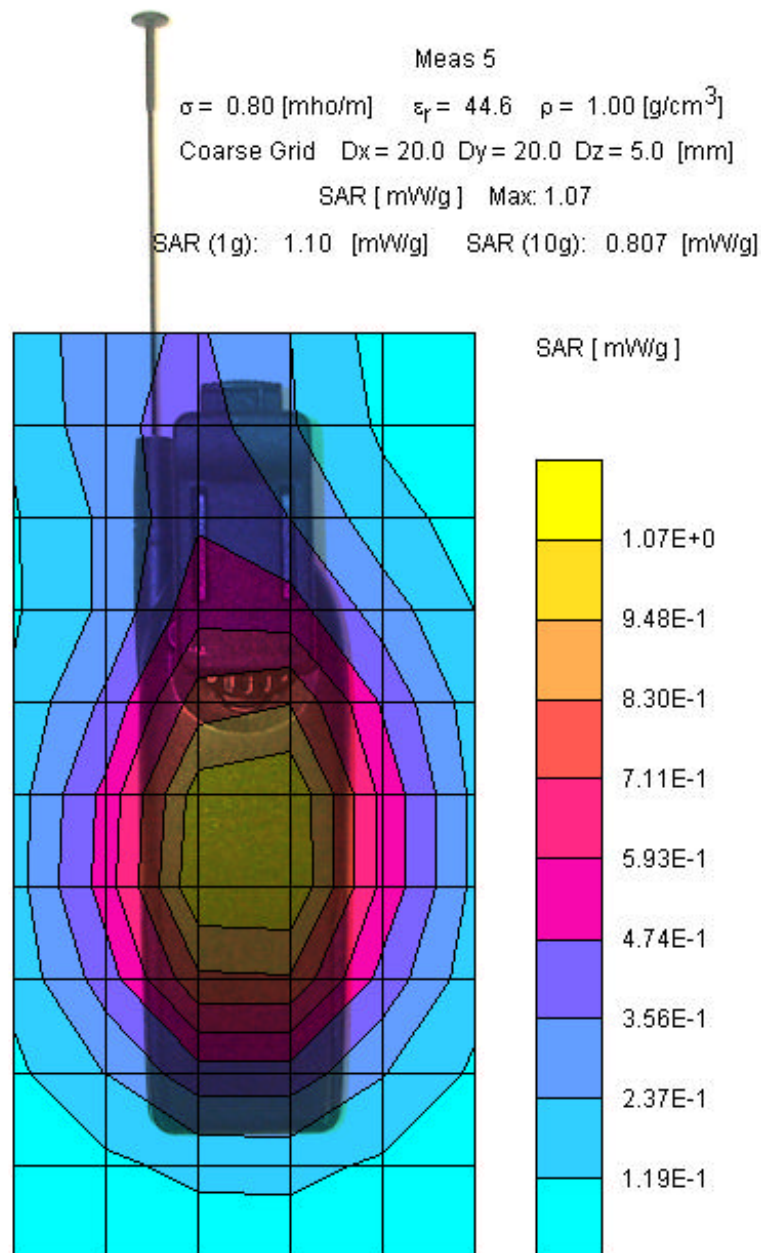
Coarse Grid Dx= 20.0 Dy= 20.0 Dz= 5.0 [mm]

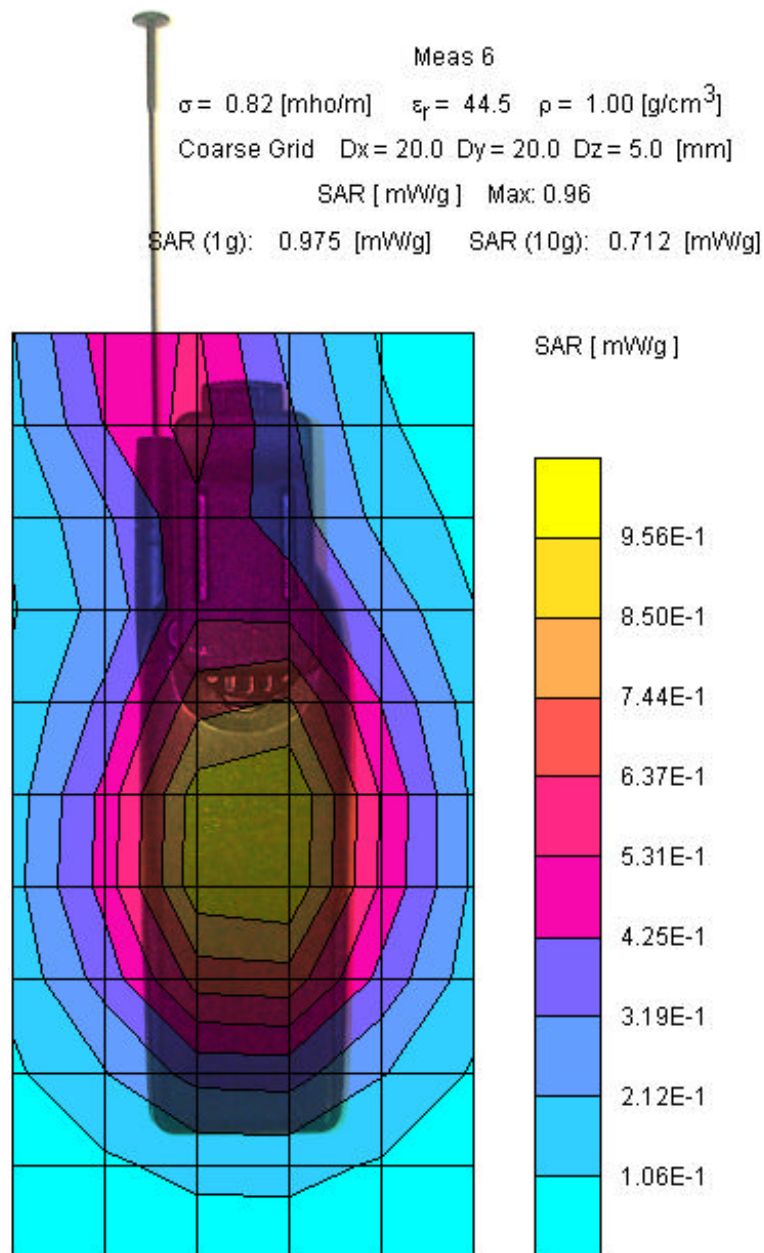
SAR [mW/g] Max: 0.83

SAR (1g): 0.851 [mW/g] SAR (10g): 0.617 [mW/g]









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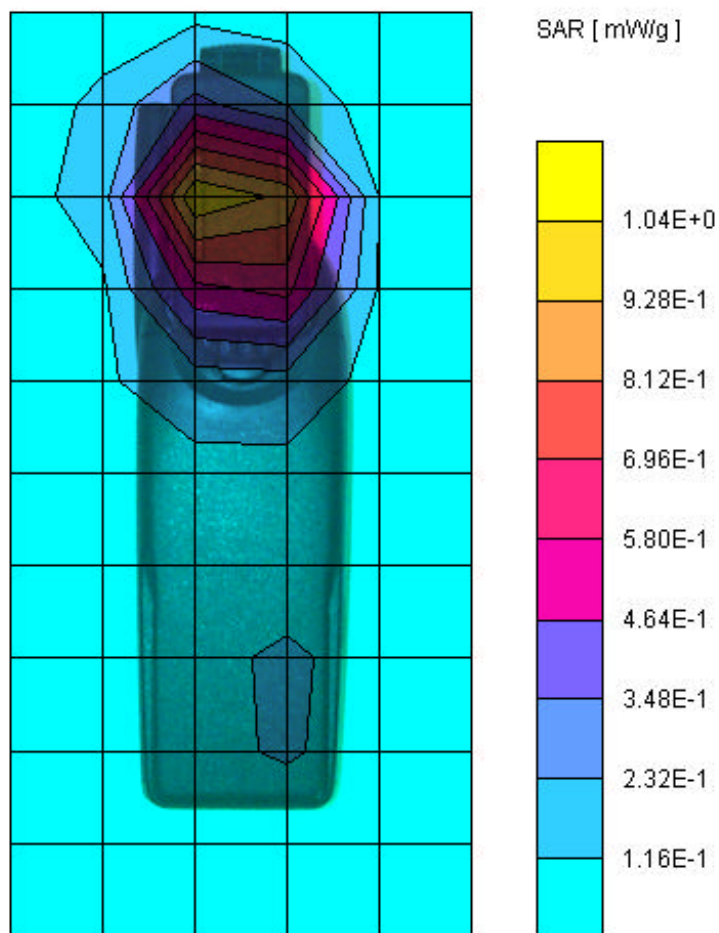
Meas 7

$\sigma = 1.71$ [mho/m] $\epsilon_r = 42.1$ $\rho = 1.00$ [g/cm³]

Coarse Grid $Dx = 20.0$ $Dy = 20.0$ $Dz = 5.0$ [mm]

SAR [mW/g] Max: 1.04

SAR (1g): 1.07 [mW/g] SAR (10g): 0.544 [mW/g]



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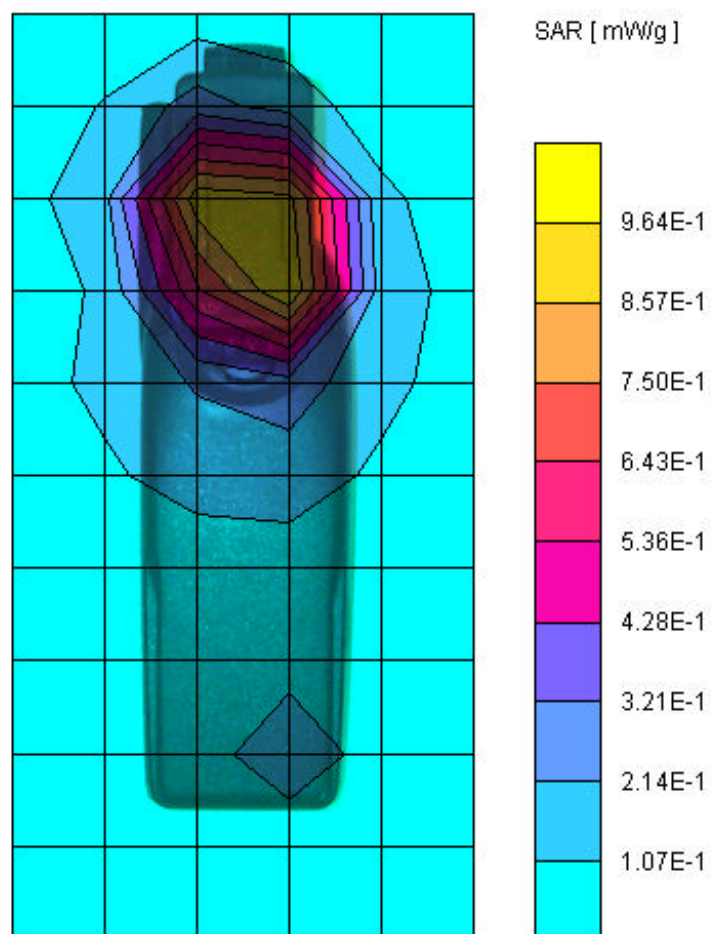
Meas 8

$\sigma = 1.74$ [mho/m] $\epsilon_r = 41.9$ $\rho = 1.00$ [g/cm³]

Coarse Grid Dx= 20.0 Dy= 20.0 Dz= 5.0 [mm]

SAR [mW/g] Max: 0.96

SAR (1g): 1.34 [mW/g] SAR (10g): 0.677 [mW/g]



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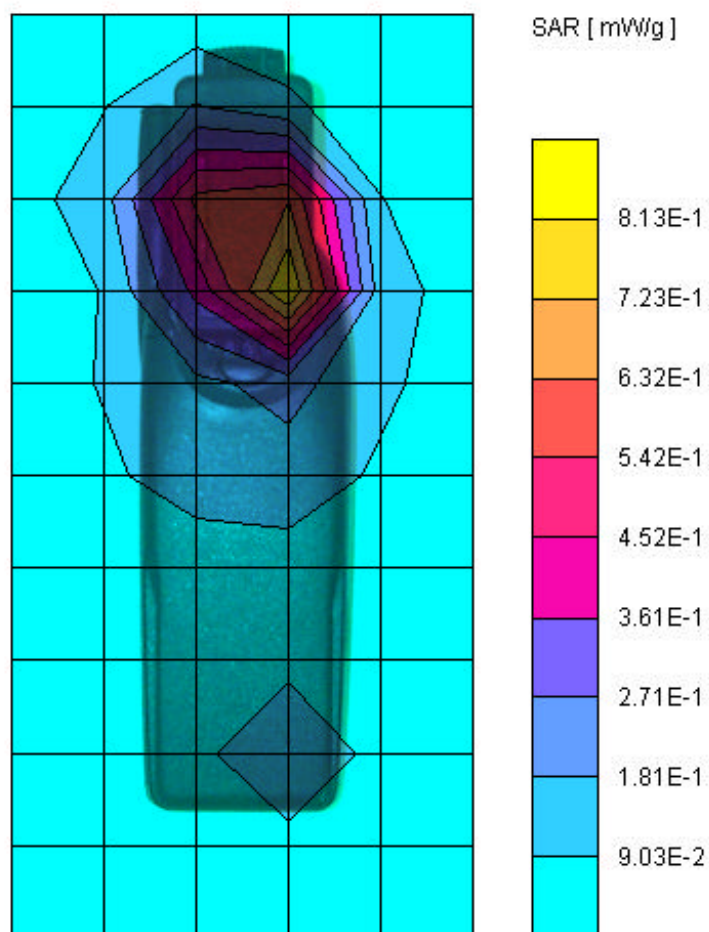
Meas 9

$\sigma = 1.77$ [mho/m] $\epsilon_r = 41.7$ $\rho = 1.00$ [g/cm³]

Coarse Grid Dx = 20.0 Dy = 20.0 Dz = 5.0 [mm]

SAR [mW/g] Max: 0.81

SAR (1g): 0.971 [mW/g] SAR (10g): 0.486 [mW/g]



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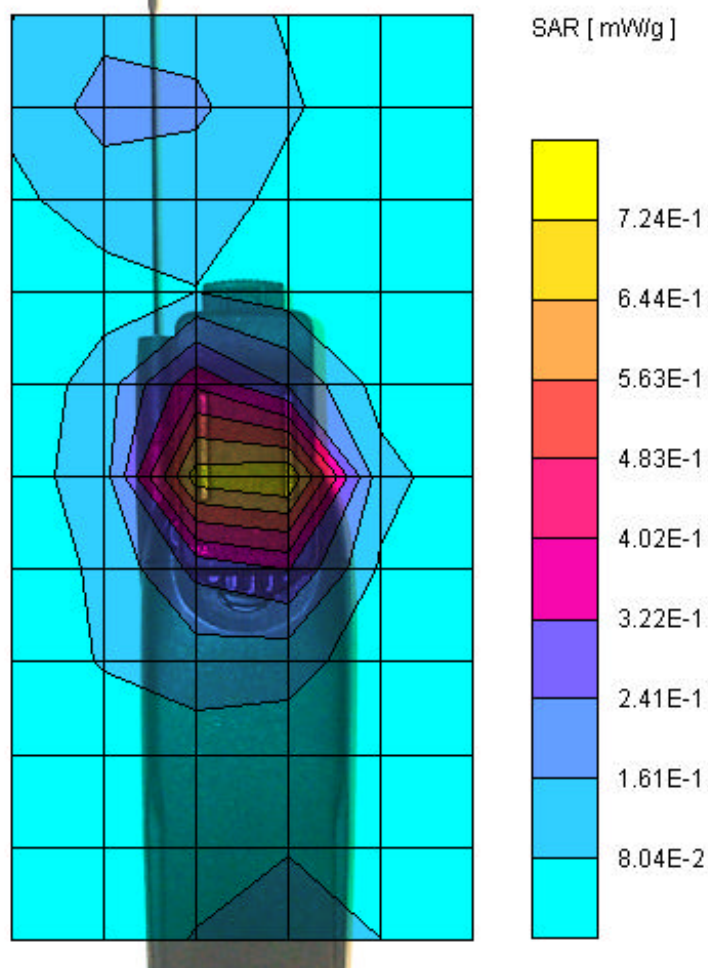
Meas 10

$\sigma = 1.71$ [mho/m] $\epsilon_r = 42.1$ $\rho = 1.00$ [g/cm³]

Coarse Grid Dx = 20.0 Dy = 20.0 Dz = 5.0 [mm]

SAR [mW/g] Max: 0.72

SAR (1g): 0.884 [mW/g] SAR (10g): 0.455 [mW/g]



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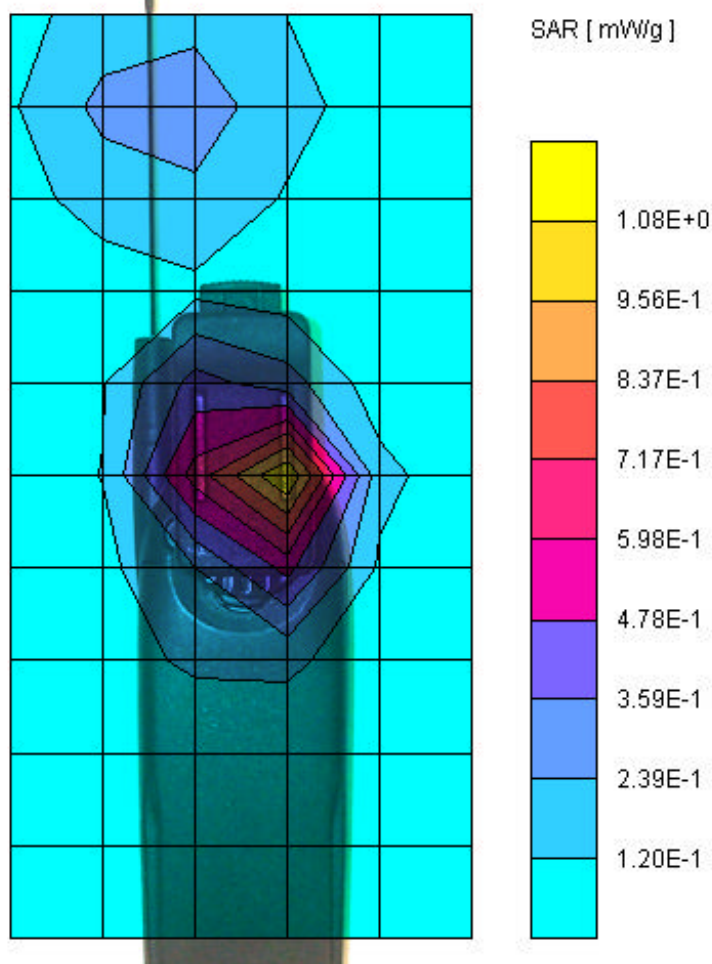
Meas 11

$\sigma = 1.74$ [mho/m] $\epsilon_r = 41.9$ $\rho = 1.00$ [g/cm³]

Coarse Grid $Dx = 20.0$ $Dy = 20.0$ $Dz = 5.0$ [mm]

SAR [mW/g] Max: 1.08

SAR (1g): 1.10 [mW/g] SAR (10g): 0.556 [mW/g]



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Meas 12

$\sigma = 1.77$ [mho/m] $\epsilon_r = 41.7$ $\rho = 1.00$ [g/cm³]

Coarse Grid $Dx = 20.0$ $Dy = 20.0$ $Dz = 5.0$ [mm]

SAR [mW/g] Max: 0.80

SAR (1g): 1.01 [mW/g] SAR (10g): 0.513 [mW/g]

