October12th, 2000

P.O. Box 86
Joensuunkatu 7E
FIN-24101 SALO
Finland

FEDERAL COMMUNICATIONS COMMISSION
Equipment Authorization Branch
7435 Oaklands Mills Road
Columbia, MD 21046

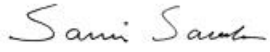
SAR TEST REPORT of Body Worn Accessories for LJPNSB-7

Gentlemen,

Please find attached SAR test report of FCC ID: LJPNSB-7

For and on behalf of Nokia Mobile Phones Ltd.

Respectfully,



Sami Savela
Senior RF Design Engineer
Responsible for NMP SAR measurements

NOKIA MOBILE PHONES
Sami Savela

2000-10-12

Evaluation of SAR in Body Worn Configurations LJPNSB-7.

Introduction

The tests described in this report have been performed in order to demonstrate that the equipment under test complies with the FCC requirements of the SAR specifications. Since the date of the original grant, a new carrying case CSL-10 is designed and a material change was made on carrying case CSH-3. The FCC approval for their RF exposure compliance is needed.

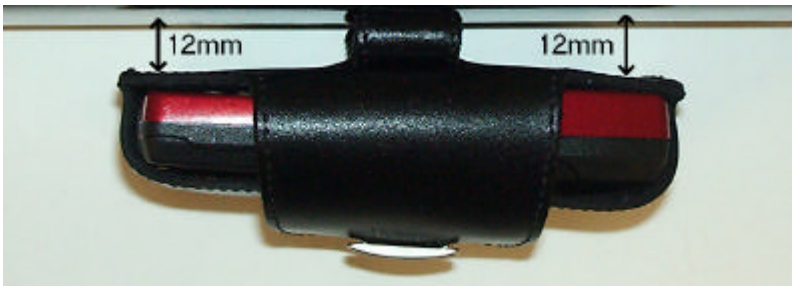
SAR was measured when phone was placed with body worn accessory against the Flat Phantom. Body worn accessories CSL-10 and CSH-3 (Picture 1) were tested. The measurement test equipment and setup were the same as used and referred in SAR TEST REPORT of NOKIA 8290.

Picture 1. Carrying Cases CSL-10 and CSH-3

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. Separation distance for CSL-10 is presented in picture 2 and for CSH-3 in picture 3. The point of maximum SAR was searched. Then the SAR was measured with a 3-dimensional cube measurement.

Picture 2. Separation distance with Carry Case CSL-10



Picture 3. Separation distance with Carry Case CSH-3

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

Permittivity and conductivity of muscle tissue simulating liquids at 1880 MHz is shown in table 1. FCC recommendation is from http://www.fcc.gov/fcc-bin-dielec.sh

	Permittivity	Conductivity
FCC recommendation	54.332108	1.436068
Used brain tissue	41.9	1.74

Table 1. Properties of liquids simulating muscle tissue @ 1880 MHz

The used brain tissue has higher conductivity and lower permittivity than the liquid FCC recommends to be used. Thus all SAR values are overestimated.

Results

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

Digital mode GSM PCS, Body worn, Carry Case CSL-10

meas. nr:	Phone position	Frequency MHz / channel	Power EIRP*) dBm	SAR (1g)[mW/g]
1	Body Worn, against Flat Phantom	1850 / 512	31.4	0.43
2	Body Worn, against Flat Phantom	1880 / 661	29.9	0.39
3	Body Worn, against Flat Phantom	1910 / 810	29.4	0.33
FCC ID: LJPNSB-7 MEASURED: 2000-10-12/NMP		FCC limit		1.60[mW/g] (ANSI/IEEE)

***) Radiated power was measured by FCC accredited test lab**

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Digital mode GSM PCS, Body worn, Carry Case CSH-3

meas. nr:	Phone position	Frequency MHz / channel	Power EIRP*) dBm	SAR (1g)[mW/g]
4	Body Worn, against Flat Phantom	1850 / 512	31.4	0.19
5	Body Worn, against Flat Phantom	1880 / 661	29.9	0.17
6	Body Worn, against Flat Phantom	1910 / 810	29.4	0.16
FCC ID: LJPNSB-7 MEASURED: 2000-10-12/NMP		FCC limit		1.60[mW/g] (ANSI/IEEE)

***) Radiated power was measured by FCC accredited test lab**

Summary

The SAR values found for the portable cellular phone (FCC ID: LJPNSB-7) are below the maximum recommended levels of 1.6 mW/g.

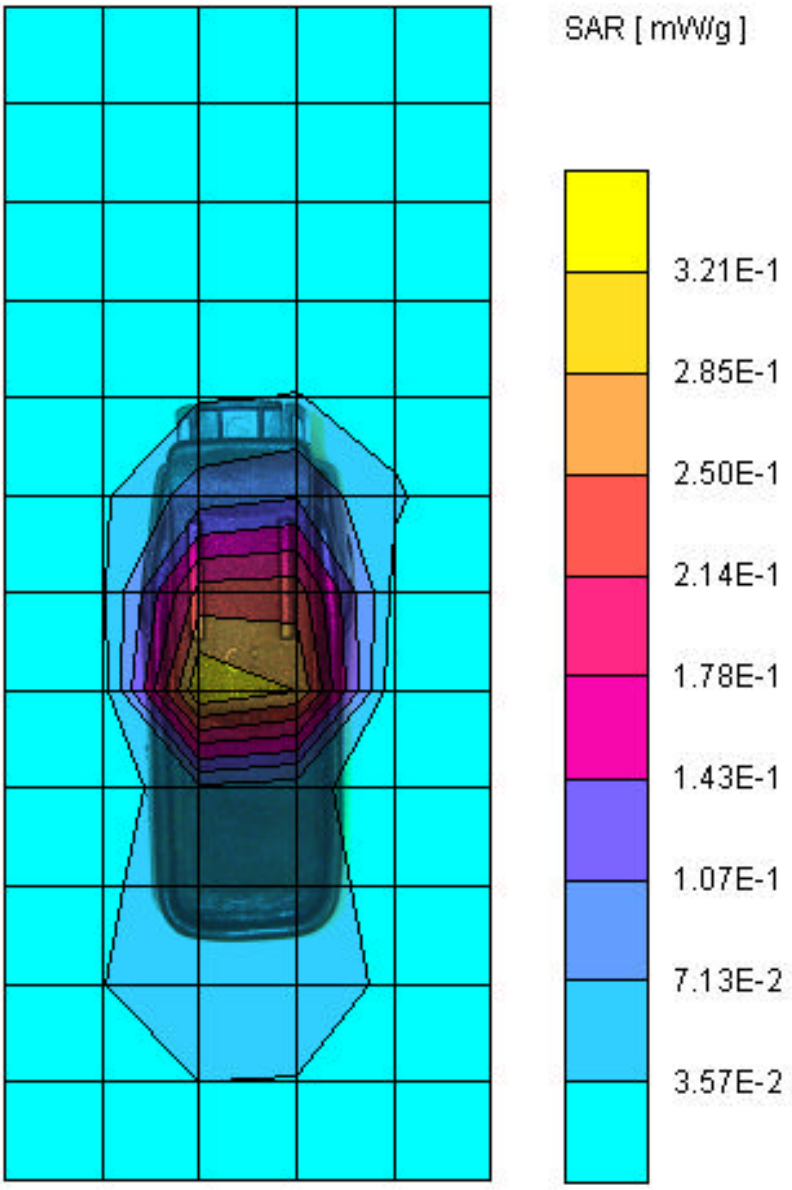
Meas 1

σ = 1.71 [mho/m] ε_r = 42.1 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.32

SAR (1g): 0.425 [mW/g] SAR (10g): 0.221 [mW/g]



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2000-10-12

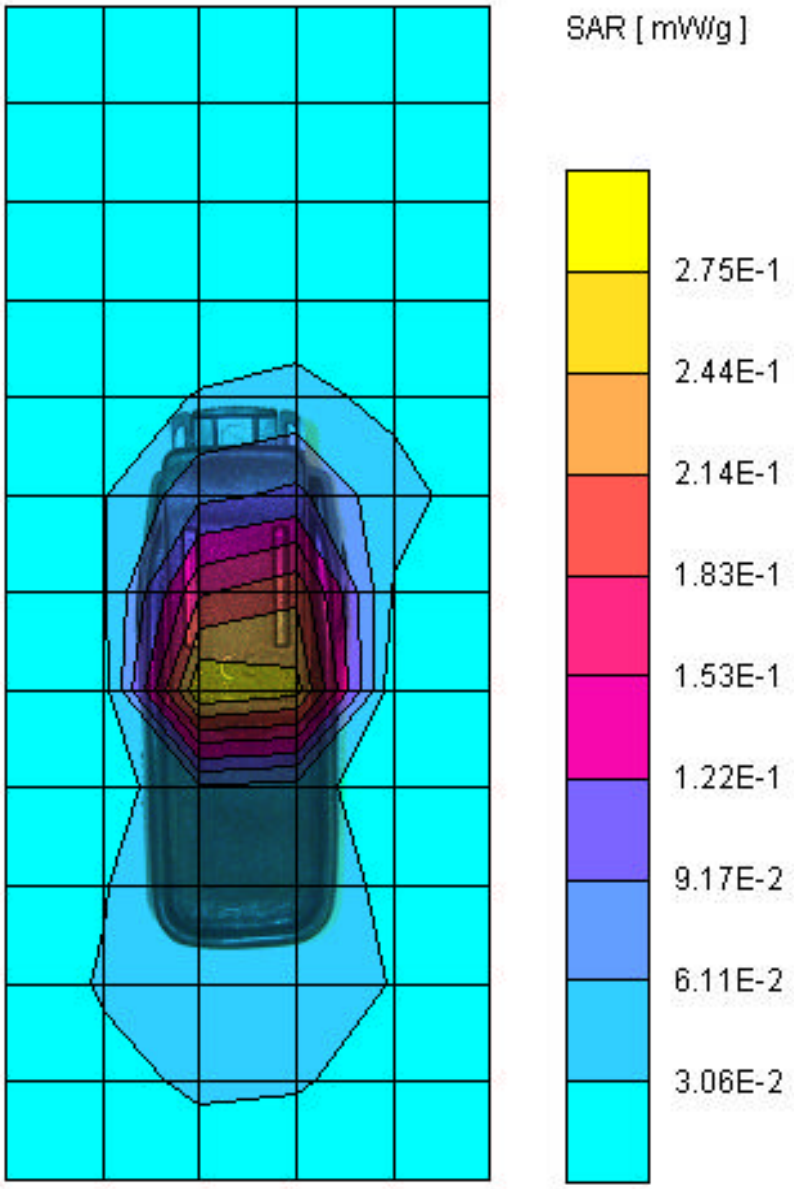
Meas 2

σ = 1.74 [mho/m] ε_r = 41.9 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.28

SAR (1g): 0.394 [mW/g] SAR (10g): 0.198 [mW/g]



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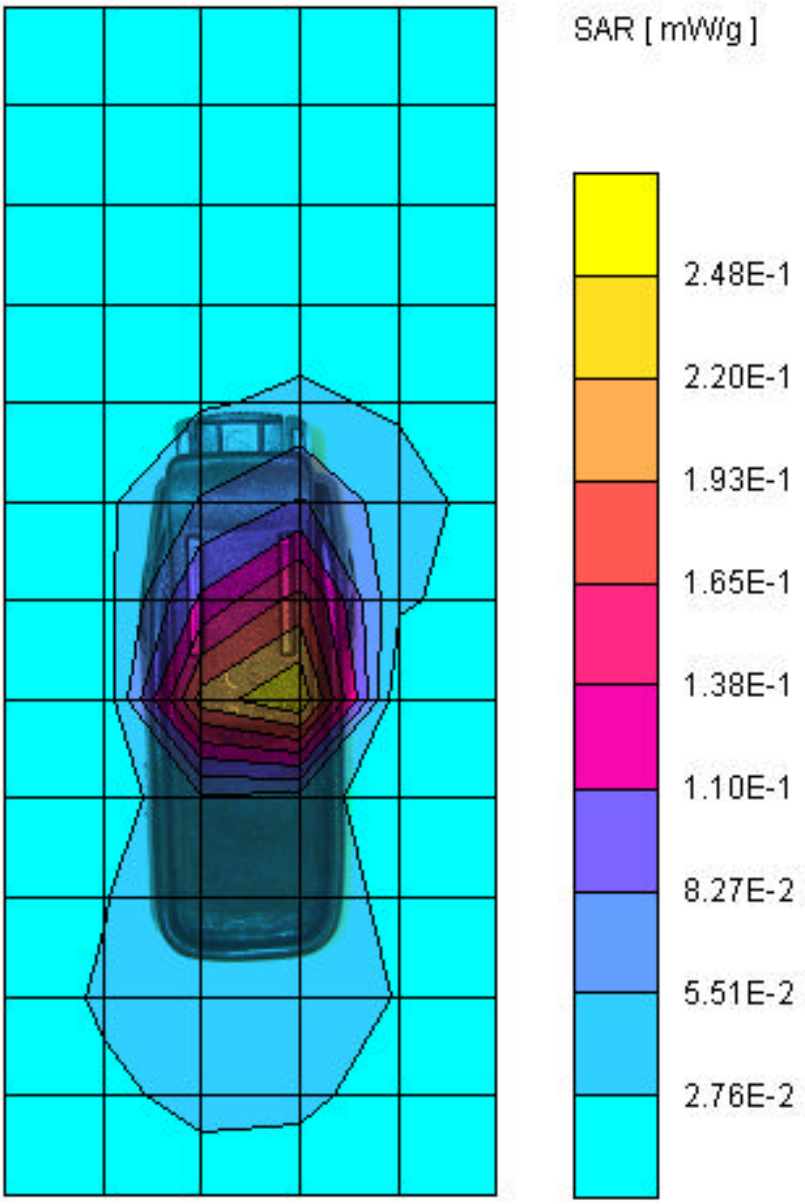
Meas 3

σ = 1.77 [mho/m] ε_r = 41.7 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.25

SAR (1g): 0.326 [mW/g] SAR (10g): 0.164 [mW/g]



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2000-10-12

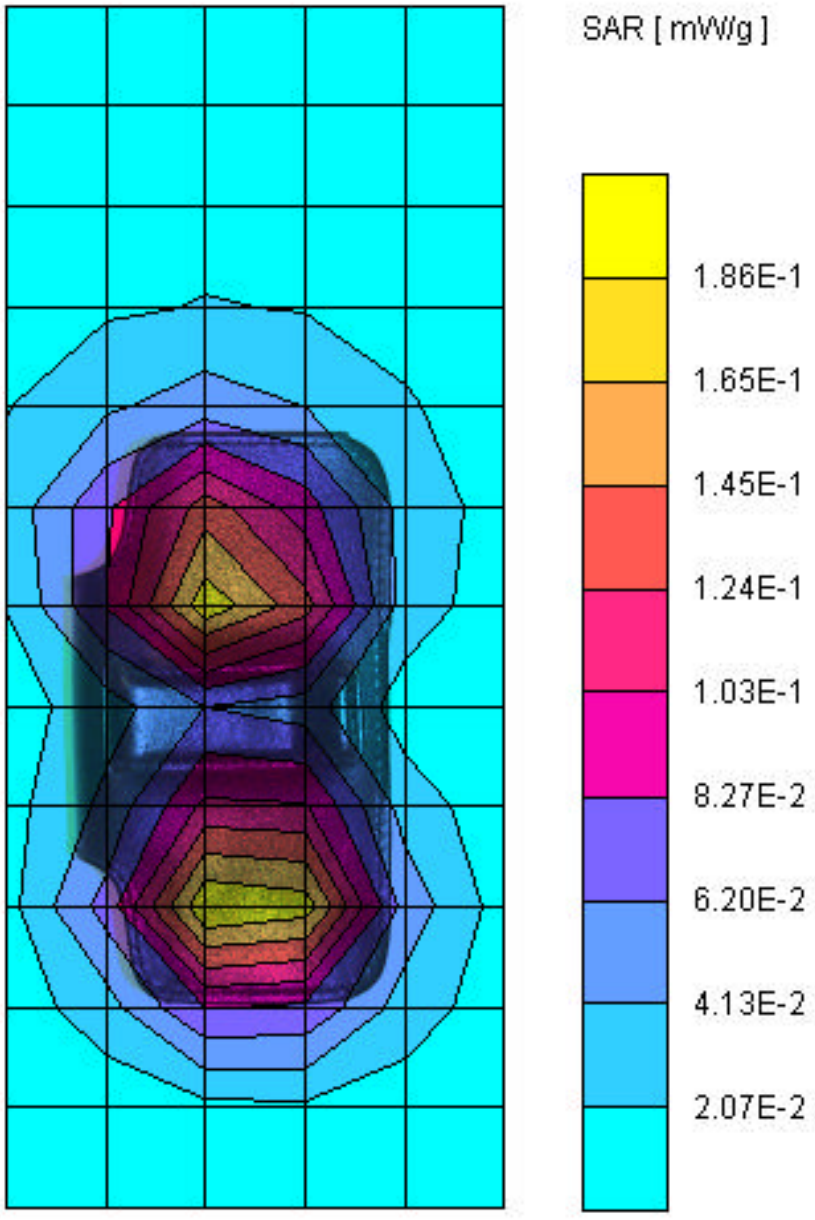
Meas 4

σ = 1.71 [mho/m] ε_r = 42.1 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.19

SAR (1g): 0.189 [mW/g] SAR (10g): 0.109 [mW/g]



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2000-10-12

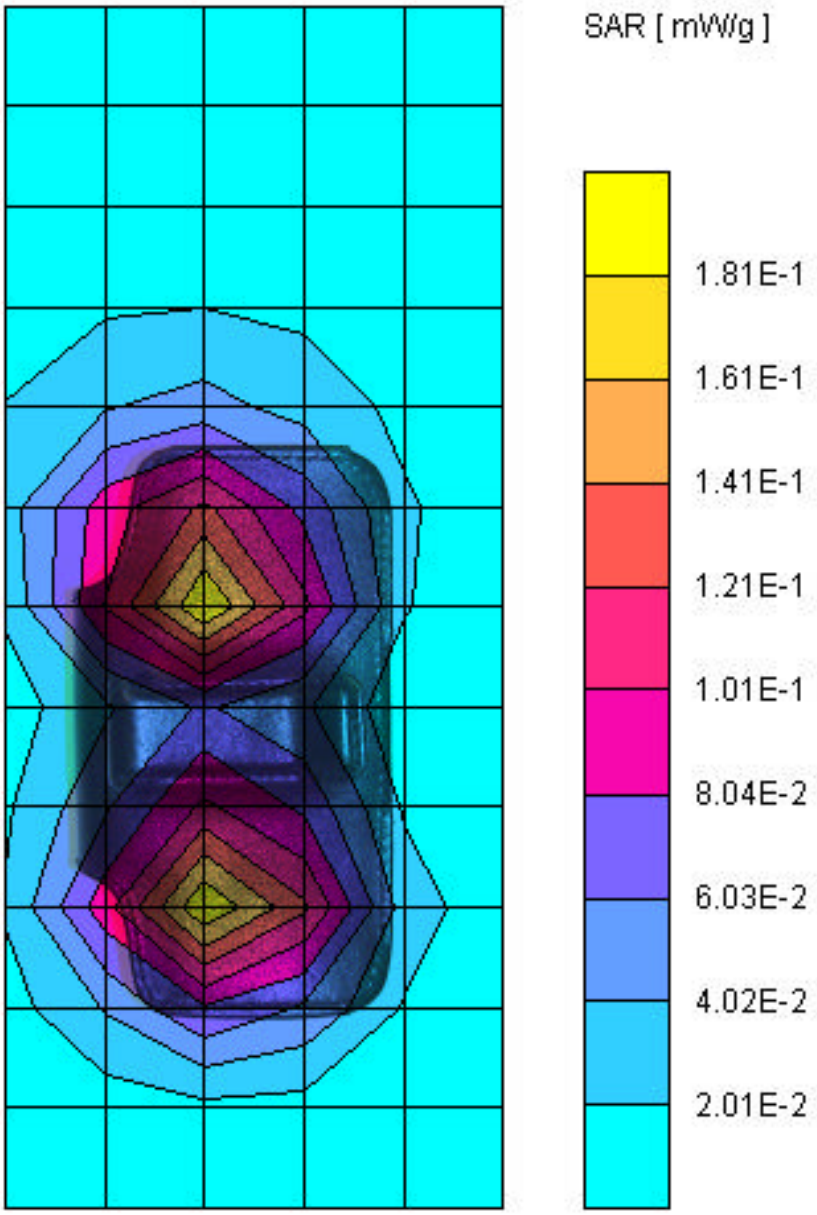
Meas 5

σ = 1.74 [mho/m] ε_r = 41.9 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.18

SAR (1g): 0.165 [mW/g] SAR (10g): 0.0945 [mW/g]



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Meas 6

σ = 1.77 [mho/m] ε_r = 41.7 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.16

SAR (1g): 0.161 [mW/g] SAR (10g): 0.0924 [mW/g]