BMS-2V 1.48 mW/g
BMS-4 1.49 mW/g

All other modes were far below the limit of 1.6 mW/g

> ---
>
> Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX -Reply
> Date: Thu, 25 Mar 1999 15:32:43 -0500
> From: Kwok Chan <kchan@fcc.gov>
> To: general@mflom.com
> CC: FCOPERIC@fcc.gov, kchan@fcc.gov
>
> To Bill Graff:
>
> 1. Please provide information on conducted output power levels for the
> data included in the attached e-mail (3 operating modes) to associate
> with those reported in the SAR report to determine RF exposure
> compliance and what output ratings to grant.
>
> 2. Please provide answer to question #4 (battery issues) on one of
> attached e-mail.
>
> (Frank: you will need to verify questions #1 & #2 in the 2nd e-mail,
> thanks)
>
> Kwok Chan
>
> >>> "M. Flom Associates, Inc" <general@mflom.com> 03/25/99 02:33pm
> >>>
> EAS #92700,
> Nokia Mobile Phones Inc,
> FCC ID: GMLNSD-3AX,
> Model 6185
>
> Attached, please find the requested page furhter to the vist of William
> ("Bill") Graff.
>
> --
> M. Flom Associates, Inc.
> general@mflom.com
> ---
> Confidential - The information in this message is only intended for
> the person(s) or organization(s) to whom it is addressed. If you are
> not that person, please contact the sender, and destroy this copy.
>
> ---
>
> Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX
> Date: Thu, 25 Mar 1999 14:33:20 -0500
> From: "M. Flom Associates, Inc" <general@mflom.com>
> Organization: M. Flom Associates, Inc, Global Complaince Center

From: [redacted] William Graff <wgraff@mflom.com>
To: G1.G1(kchan)
Date: 3/26/99 11:34am
Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX -Reply

Kwok,

As we discussed yesterday in our meeting with you in Maryland, the conducted power outputs used in the SAR report of November 16, 1998 in Section 5.5 were used for all conducted and radiated emissions testing.

AMPS-FM	+25.5 dBm
AMPS-CDMA	+24 dBm
PCS-CDMA	+22.5 dBm

These resulted in the following maximum radiated power output values,

AMPS-FM	+26.5 dBm ERP
AMPS-CDMA	+24.2 dBm ERP
PCS-CDMA	+23.6 dBm EIRP

And the following maximum SAR values.

AMPS-FM	1.53 mW/g
AMPS-CDMA	1.07 mW/g
PCS-CDMA	1.20 mW/g

In answer to your question about battery configurations, please refer to the letter with attached spreadsheet of Mr. Erkka Sointula of NMP. There are now only four battery options which will fit the Model 6185 phone. The maximum SAR values across each battery for the ~~worst~~ case emission mode (AMPS-FM) extrapolated to maximum power ~~(+25 dBm)~~ 24.0 dBm are listed below. Note there was not a large change across battery styles.

See Supp. Report.

BL2-S	1.52 mW/g
BMS-2S	1.47 mW/g
BMS-2V	1.48 mW/g
BMS-4	1.49 mW/g

All other modes were far below the limit of 1.6 mW/g

> ---
>
> Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX -Reply
> Date: Thu, 25 Mar 1999 15:32:43 -0500
> From: Kwok Chan <kchan@fcc.gov>
> To: general@mflom.com
> CC: FCOPERIC@fcc.gov, kchan@fcc.gov
>

> To Bill Graff:
>
> 1. Please provide information on conducted output power levels for the
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> 2. Please provide answer to question #4 (battery issues) on one of
> attached e-mail.
>
> (Frank: you will need to verify questions #1 & #2 in the 2nd e-mail,
> thanks)
>
> Kwok Chan
>
> >>> "M. Flom Associates, Inc" <general@mflom.com> 03/25/99 02:33pm
> >>>
> EAS #92700,
> Nokia Mobile Phones Inc,
> FCC ID: GMLNSD-3AX,
> Model 6185
>
> Attached, please find the requested page furhter to the vist of William
> ("Bill") Graff.
>
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> M. Flom Associates, Inc.
> general@mflom.com
> ---
> Confidential - The information in this message is only intended for
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> not that person, please contact the sender, and destroy this copy.
>
> ---
>
> Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX
> Date: Thu, 25 Mar 1999 14:33:20 -0500
> From: "M. Flom Associates, Inc" <general@mflom.com>
> Organization: M. Flom Associates, Inc, Global Complaince Center
> To: kchan@fcc.gov
>
> EAS #92700,
> Nokia Mobile Phones Inc,
> FCC ID: GMLNSD-3AX,
> Model 6185
>
> Attached, please find the requested page furhter to the vist of William
> ("Bill") Graff.
>
> --
> M. Flom Associates, Inc.
> general@mflom.com
> ---
> Confidential - The information in this message is only intended for

M. Flom Associates, Inc.
Global Compliance Center

3356 North San Marcos Place, Suite 107
Chandler, Arizona 85224-1571
(602) 926-3100, FAX: 926-3598
www.goodnet.com/~mflom

** NEW electronic addresses: www.mflom.com general@mflom.com

March 23, 1999

Federal Communications Commission,
Office of Eng'g & Technology,
7435 Oakland Mills Road,
Columbia, Maryland 21046.

Attention: Kwok Chan
Applicant: NOKIA MOBILE PHONES, INC.
Equipment: FCC ID: GMLNSD-3AX (Model 6185)
Reference: EA92700. Correspondence 6588 (Frank Coperich)
Subject: EAS 92700 March 16, 1999 e-mail

Kwok:

The above e-mail is acknowledged and the following are replies to each of the items listed, i.e.

1. CONFIDENTIALITY: The Applicant has accepted FCC's ruling that no confidentiality will be forthcoming for SAR only.

2. You are correct - the unit is a dual mode, dual band operation and the amended Page 2 of Form 731 has been delivered to Frank Coperich.

3/4. The Applicant has addressed both of these items and the attached pages should satisfy the requirements of the Commission.

This packet is being hand-carried by Bill Graff, our Director of Regulatory Engineering and he is accompanied by Erkka Sointula of NMP who is responsible for the SAR measurements.

As we have advised Frank Coperich, certification of this application is now critical. It was filed early December 1998 and any further delays will generate severe problems for the Applicant. Your cooperation is urgently requested.

Best personal regards,

MORTON FLOM, P. Eng.

mf;mgf
encs.
cc: **Applicant c-o S.D. office**
Attention: Marko Pistemaa

NOKIA MOBILE PHONES 3-Mar-99

To: Mr Frank Coperich
FCC Application Processing Branch

Subject: Nokia FCC ID: GMLNSD-3AX – EAS 92700

In reply to: your letter to M. Flom concerning radiated output power levels (section) and SAR values with different battery options.

3. Output power levels
We apology that there were some misstuning in the phones delivered to M. Flom, which lead to some wrong results. All the alignments, including power level settings, has been tested to guarantee the right settings. The new measurement values measured by M. Flom are now in line with the measurements we have made in testing our production process for the mass production.

The power levels used in the report are measured at the antenna output connector, and represent the maximum possible power levels.

4. SAR with different battery options.
The different battery options have very similar SAR values. Results are all within 5%. We have also limited the battery options now to 3 in our user manual. Nokia is using an additional compatible battery option in some other products on the US market. We have tested that option too and again the results are as above.

Battery options according the final User guide are:

BLS-2 (900mAh LiIon), BMS-2S (900mAh NiMH) and BLS-4 (1500mAh LiIon).

Nokia has at the moment five Schmit & Partner SAR measurement systems.These are under regular calibration routine offered by the manufacturer, including one in San Diego to support our US R&D activities. The SAR system in Finland is used for official measurements. Other are for R&D measurements and results are compared with Salo regularly.

We made one additional SAR measurement with different battery options using our San Diego SAR facilities. Again, the results are in very good agreement with our previous results.
The conducted power levels of this early production unit where on average 1 decibel below the max. 25.5dBm for AMPS, and maximum measured SAR was 1.32 mW/g. The worst to the max. 25.5dBm extrapolated (by calculation) SAR was 1.52 mW/g (i.e. in very good agreement with the official SAR report in the FCC filing).

for the attached meas. report

For 800MHz CDMA the power levels are 1.5 dB less (i.e. SAR values does not exceed the AMPS values).
In the same test for PCS we used 800MHz fluid, so the values are relative only. Again the measurement confirms, that the difference between the battery options is marginal (within 5%). In PCS band the phone has typically 25% margin to the limit.

We would like add that Nokia has tightened both power level and SAR follow-up of it's products and is, due to our on site SAR measurement capabilities, following continuously their product critical parameters.

Sincerely,

Erkka Sointula
Head of RF Technology Group
R&D San Diego
Nokia Mobile Phones

office +1 619 587 5589
cellular 992 1277

NMP San Diego R&D

3-19-99/Larry Fossett

Phone	Battery Type	Channel #	Measured SAR [mW/g]	Conducted power (dBm)	Desired max.output power (dBm)	Extrapol. SAR(25.5) (mW/g)	
6185/4903 - amps	BLS-2	799	1.22	24.77	25.50	1.44	
		485	1.27	24.72	25.50	1.52	
		991	1.10	24.99	25.50	1.24	
	BMS-2S	799	1.20	24.86	25.50	1.39	
		485	1.26	24.82	25.50	1.47	
		991	1.08	24.99	25.50	1.21	
Note! Not in sales package	BMS-2V	799	1.19	24.86	25.50	1.38	
		485	1.27	24.83	25.50	1.48	
		991	1.12	24.99	25.50	1.26	
	BLS-4	799	1.22	24.85	25.50	1.42	
		485	1.28	24.83	25.50	1.49	
		991	1.11	24.98	25.50	1.25	
6185/4903 - pcs	BLS-2	675	0.55	22.10	22.50	0.60	Relative only
	BMS-2S	675	0.54	22.16	22.50	0.58	Relative only
Note! Not in sales package	BMS-2V	675	0.57	22.18	22.50	0.61	Relative only
	BLS-4	675	0.54	22.10	22.50	0.59	Relative only

BLS-2 = 900 mAh Li Ion
BMS-2S = 900 mAh NiMH
BLS-4 = 1500 mAh Li Ion
BMS-2V = 900 mAh NiMH Note: Not sold with this phone, but compatible with 6185 and available for some other phones.

Battery options on page 84

Nokia 6185

User Guide

Draft v8.0

Final review

Note: This User Guide describes functionality planned for the HD983 final product, and may vary from the HD983 prototype provided with this User Guide.

Inclusion of items in this User Guide does not imply or guarantee inclusion in the HD983 final product. Nokia Mobile Phones reserves the right to make changes and improvements to HD983 and this User Guide without prior notice.

more information.

Charging Times

Battery Option	ACP-7U Charger	ACP-9U Charger
BLS-2 Extended Battery Li-Ion 900 mAh	4 hrs	2 hrs
BMS-2S Extended Battery NiMH 900 mAh	4 hrs	1 hr 30 min
BLS-4 Ultra Extended Battery Li-Ion 1500 mAh	5 hrs	3 hrs 30 min

Note: The times displayed above are approximate and will allow your battery to obtain approximately 80% of its capacity. At this time, the battery scroll bars on your phone's display will stop scrolling. If you wish to obtain 100% battery capacity, please allow another two hours to "trickle" or "maintenance" charge.

Standby and Talk Times

Battery Option	Digital Talk Time	Analog Talk Time	Standby Time
BLS-2 Extended Battery Li-Ion 900 mAh	2 hrs to 2 hrs 55 min	40 min to 1 hr 25 min	70 to 110 hrs (dig) 12 to 25 hrs (ana)
BMS-2S Extended Battery NiMH 900 mAh	2 hrs to 2 hrs 55 min	40 min to 1 hr 25 min	70 to 110 hrs (dig) 20 to 25 hrs (ana)
BLS-4 Ultra Extended Battery Li-Ion 1500 mAh	3 hrs 20 min to 4 hrs 50 min	1 hr 10 min to 2 hrs 25 min	115 to 180 hrs (dig) 20 to 40 hrs (ana)

Note: The times shown are approximate. Battery operation times vary according to signal conditions, network parameters set by the service provider, and how you use your phone.

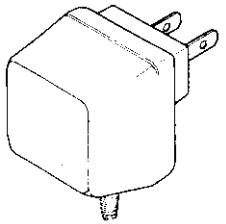
Note: Dispose of used batteries in accordance with any local regulations

Chargers & Other Accessories

The following chargers and other accessories are available

for your phone; please see your dealer for details. Also, refer to the accessories brochure that was included in your sales package for the entire line of Nokia Original Accessories.

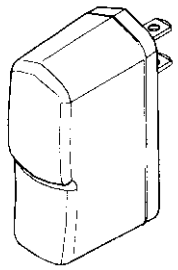
Standard Travel Charger (ACP-7U)



This lightweight (187g) and durable AC charger can be used with all battery options.

To use the Standard Travel Charger, plug it into a wall outlet and connect the lead from the charger to the base of your phone. The charger can also be used together with the Compact Desktop Charging Stand (DCH-8).

Rapid Travel Charger (ACP-9U)



This lightweight (100g) AC charger can be used with all battery options. Calls can be made during charging, even with a fully discharged battery.

To use the Rapid Travel Charger (ACP-9U), plug it into a standard 120V AC wall outlet, and connect the lead from the charger to the base of your phone.

The charger can also be used together with the optional Compact Desktop Charging Stand (DCH-8). Approximate charging times for discharged batteries are shown at the beginning of this section.

NOKIA

Fax

Nokia Mobile Phones Inc., San Diego

Date: 16 Mar 1999
Pages: 1+21

From: Marko Pistemaa, Test Engineer, Nokia Mobile Phones Inc.
Address: 9605 Scranton Road Suite 150, San Diego, CA 92121
Fax: (619) 450 3168
Phone: (619) 587 5674 (direct) or (619) 851 9809 (cellular)
E-mail: Marko.Pistemaa@nmp.nokia.com

To: **Bill Graff**
Company: M.Flom Associates, Inc.
Fax: (602) 926 3598
Cc to:

Hi Bill,

I got your fax and talked with Mort also. Mort wanted SAR report for 6185 and you can find it attached to this fax.

These are my comments on page 3 of your fax:

1. It's OK if they do not accept confidentiality for SAR report. We can not do anything to change that.
2. Nokia 6185 is a tri-mode dual band phone (800MHz AMPS, 800MHz CDMA & 1900MHz CDMA)
3. If there is a conflict between measured results and SAR report values it may be caused f.ex. by performing TA measurements before receiving SAR results (and SAR test determines final power level tuning). All phones made will be tuned according SAR results anyways.
4. I start a process to address this question. I'll contact you as soon as we have made any actions.

If you have any questions/comments, please let me know. Fastest way to contact me is through e-mail.

Best Regards,

Marko Pistemaa

NOKIA MOBILE PHONES

November 16th, 1998

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 Nokia 6185

Gentlemen,

Please find attached SAR test report of FCC ID: GMLNSD-3AX

For and on behalf of Nokia Mobile Phones Ltd.

Respectfully,

Jari Talkara
Engineering Manager, Antennas

NOKIA MOBILE PHONES

Contents

NOKIA MOBILE PHONES

1. Description of the measurement

This measurement was done by E-field scanning system for dosimetric assessments. It is robot-based system which allows automated E-field scanning in tissue simulating solutions. The measurements are based on the induced specific absorption rate (SAR) definition of relevant ANSI / IEEE standards. The dosimetric assessment system of Nokia Mobile Phones is manufactured by Prof. Niels Kuster at ETH (Schmid & Partner Engineering AG) in Switzerland, Europe.

The method used to determine the 1 gram average value of SAR is:

Initially a coarse scan is performed over the whole area on a 20 x 20 mm grid. From this coarse scan, the location at which the maximum value is measured is used as the centre for a second, more detailed scan. This second scan is based on a 3 dimensional grid of 4 x 4 x 7 points on a grid of 10 mm for 900 MHz band and grid of 5 x 5 x 7 points on a grid of 8 mm for 1800 MHz band . The average SAR values are computed using the 3D spline inter-polation algorithm. The 3D spline is composed on three one-dimensional splines with the "Not a knot" condition in the x, y and z directions (1), (2). The volume is integrated with the trapezoidal algorithm. 1000 points (10x10x10) are interpolated to calculate the average. All neighbouring volumes are evaluated until no neighbouring volume with a higher average is found.

(1) W. Gander, Computermathematik, Birkhauser, Basel, 1992

(2) W. H. Press, S. A Teukolsky, W. T. Vettering and B. P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, second edition, Cambridge University Press, 1992

2. Description of calibration by manufacturer

The calibration of data acquisition electronics and probe was done by the manufacturer. (Appendix 3 and 7)

- the data acquisition unit is calibrated and tested using a FLUKE 702 Process Calibrator
- measurement uncertainty is less than ± 20% for various tissues simulating solutions and frequencies:
  - these calibration parameters were measured using a temperature probe developed by manufacturer
  - description of the probe calibration and examples of the evaluation are enclosed in Appendix 7

3. List of standards

ANSI/IEEE Std C95.1-1992
IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

ANSI/IEEE Std C95.3-1992
IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields-RF and Microwave

4. Device list:

Automated E-field scanning system for dosimetric assessments System. Calibration due August 1999. Technical data (Appendix 1)

Probe ET3DV4, SN: 1105, Recalibrated due August 1999
Technical data (Appendix 2)

DASY-dosimetric assessment system, DAE V2, SN: 213, Calibration due August 1999 (Appendix 3)

Industrial robot and Control unit, type STÄUBLI CS7 RX 90(CR) NO:595148-01, Technical data (Appendix 4)

Generic Twin Phantom Version 3 (Appendix 6).

PC COMPAQ 466
laser printer QMS magicolor plus

Devices for preparation of the brain tissue simulating liquids
-General laboratory equipment for preparation of liquids
-Magnetic stirrer with heating plate IKA RET CV, SN:792708
-Scale Mettler Doleto, SN: 2114177678

HP 85070A Dielectric probe system
- network analyzer HP 8753B, SN:2716U00762, Calibration due March 1999
- cables
- probe stand
- dielectric probe kit NO: US33020242
- PC AST PREMMIA 4/66 d
- HP-IB 82335B (interface and software)

Dipole Validation kit for 900 MHz band, Schmid & Partner Engineering AG, Typ: D900V2, SN: 003, Recalibrated/Verification due August 1999 and Dipole Validation kit for 1800 MHz band, Schmid & Partner Engineering AG, Typ: D1800V2, SN: 207, Recalibrated/Verification due August 1999
- signal generator ROHDE & SCHWARZ, 1038.6002.03 , Calibration due July 2000
- power meter, ROHDE & SCHWARZ, 857.8008.02, Calibration due November 1999
- amplifier ZHL-42 (SMA), 022488-RM:4152

5. Equipment under test

Unit: **NOKIA 6185**
FCC-ID: **GMLNSD-3AX**

5.1 Verification and results

Validation of the measurement system was made before measurement using the Validation kit. Appendix: 8 and 9

This validation measurement makes sure that the repeatability of SAR measurement value with careful positioning is better than 10 %.

On 900 MHz band error was < 3 % compared to the parameter of manufacturer SAR results (0.25W): 2.34 mW/g (1g) and 2.39 mW/g (1g).
On 1800 MHz band error was < 13 % compared to the parameter of manufacturer SAR results (0.25W): 9.28 mW/g (1g) and 10.5 mW/g (1g).
Appendix: 8 and 9

5.2 Specification of Liquid

The liquids were done using the "Recipe 900MHz " and "Recipe 1800MHz" for liquid of brain tissue at 900 MHz and 1800 MHz, respectively, and preparation bases on brochure. Appendix 5

900 MHz liquid was used with the 900 MHz validation kit measurement and 1800 MHz liquid was used with the 1800 MHz validation kit measurement.

The parameters was measured by liquid testing of HP85070A Dielectric probe system. The amounts of used liquids were 20 litres.

Liquid parameters εr *(Relative permittivity) and* σ *(Conductivity)* were measured by HP 85070A Dielectric probe system.

900 MHz:	εr = 41.3	σ = 0.86
824 MHz:	εr = 42.1	σ = 0.79
836 MHz:	εr = 41.9	σ = 0.80
849 MHz:	εr = 41.8	σ = 0.81
1800 MHz:	εr = 40.3	σ = 1.73
1850 MHz:	εr = 40.1	σ = 1.75
1880 MHz:	εr = 40.0	σ = 1.78
1910 MHz:	εr = 39.8	σ = 1.81

5.3 Specification of position with phone against generic twin phantom

The position of the phone relative to the head phantom is shown on page 8. The centre of the phone's earpiece is aligned such that it is co-axial with a mark on the phantom which represents the centre of the ear on the left side of the head.

Measurement was done with a Left-Hand (L.H.) side because the helix phone antenna is situated in the top right corner of the phone (viewed from the earpiece side). Therefore, the antenna is closer to the head in the measurement position using a L.H. side rather than a R.H. side. It is concluded that the L.H. side is worst case measurement position.

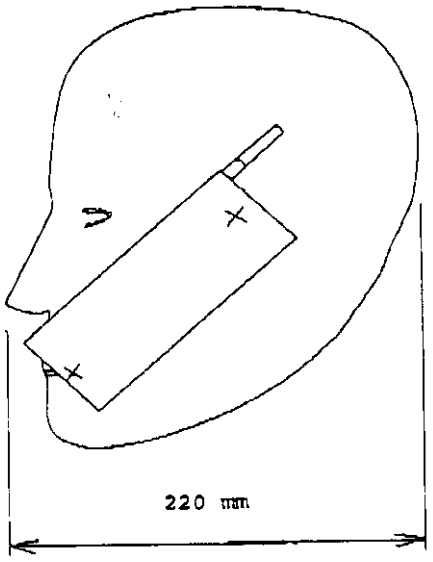
The test signal for SAR measurement was analog AMPS and a pulsed mode (TDMA)

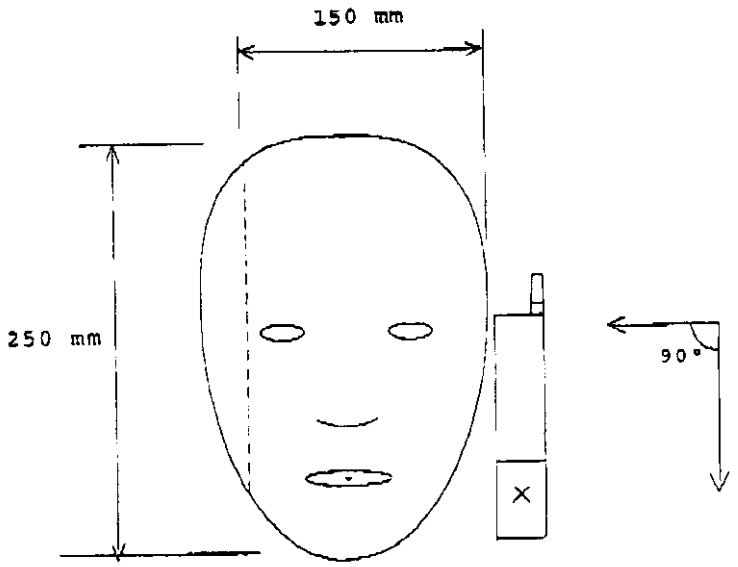
The phone position against the head was in Normal phone position (for the IEEE Std C95.1-1991 (ANSI / IEEE) and FCC measurement). The angle between the reference line of the phone and the line connecting both auditory canal opening was 90°. The distance between the handset and the ear area of phantom head is 4 mm (page 8).

The used radio channels on 900 MHz band were: 991, 383 and 799.
The used radio channels on 1800 MHz band were: 25, 600 and 1175.
Peak TX power of analog AMPS and CDMA test signal ("Power" in the table of the paragraph 5.5) was measured from external antenna connector of the transceiver using power level 2. During the tests the battery was fully charged.

Ambient and "brain tissue" liquid temperature was 23 °C ± 1 °C.

5.4 The phone position against generic twin phantom





5.5 Results of SAR for 1g.

Appendix: 10

The plots in Appendix 10 are a graphical representation of the SAR values over the whole area being scanned.

Appendix 10, page 10 (nr:10), has sketch of the phone added on the plot for clarifying the position of the phone with respect to the measured SAR values.

The size of the area being scanned is sufficiently large to ensure that all possible regions of peak SAR are measured. This is indicated by the fact that the position of peak SAR is in the measured area, and the value of SAR reduces asymptotically in the x- and y- directions as the probe is moved towards the border of the measured area.

Analog mode AMPS

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
1	90°	824 / 991	25.5	1.24
2	90°	836 / 383	25.5	1.49
3	90°	849 / 799	25.5	1.53
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

CDMA Cellular

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
4	90°	824 / 991	24.0	0.92
5	90°	836 / 383	24.0	1.02
6	90°	849 / 799	24.0	1.07
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

NOKIA MOBILE PHONES

CDMA PCS

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
7	90°	1850 / 2	22.5	1.14
8	90°	1880 / 1000	22.5	1.20
9	90°	1909 / 1998	22.5	1.00
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

Jari Tolu
1998-11-16

Appendix 10

pages 1 - 10

SAR MEASUREMENT RESULTS

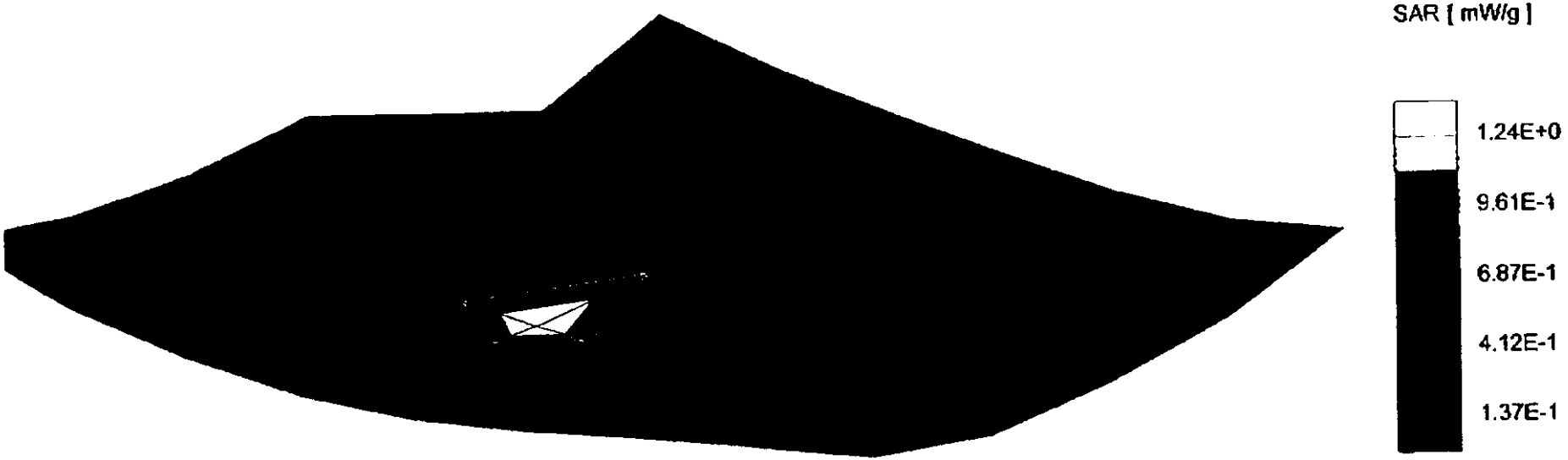
Nr 1, Type: NSD-3AX, Amps mode, Channel 991 (824MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90l.mea

σ = 0.79 [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: 1.24

SAR (1g): 1.24 [mW/g] SAR (10g): 0.820 [mW/g]



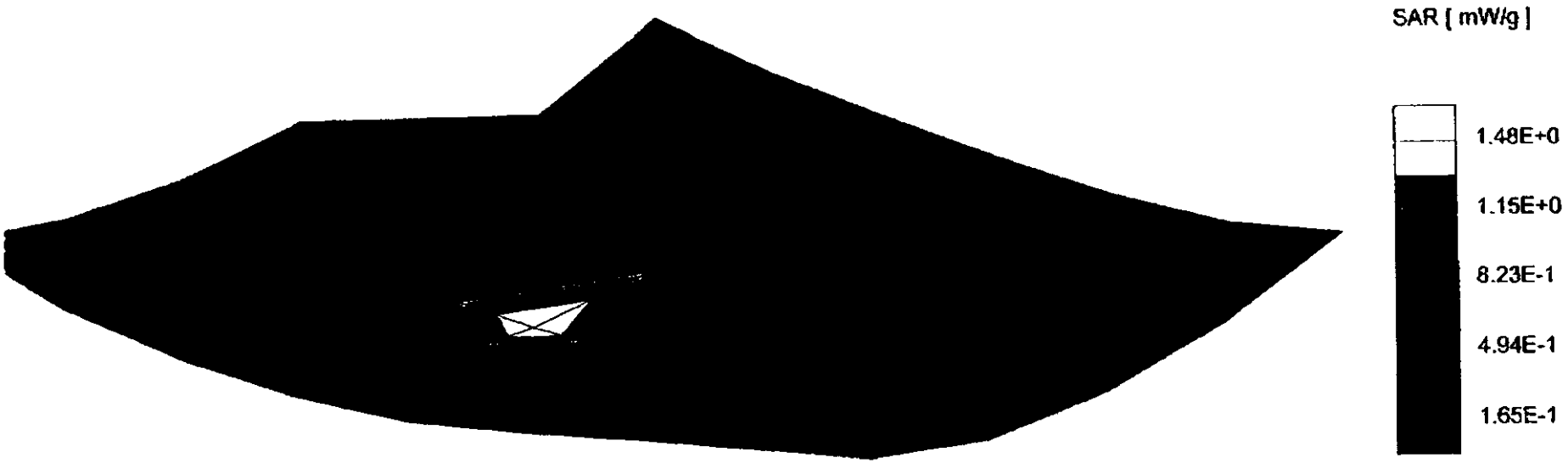
Nr 2, Type: NSD-3AX, Amps mode, Channel 384 (836MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90m.mea

σ = 0.80 [mho/m] ϵ_T = 41.9 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.48

SAR (1g): 1.44 [mW/g] SAR (10g): 0.954 [mW/g]



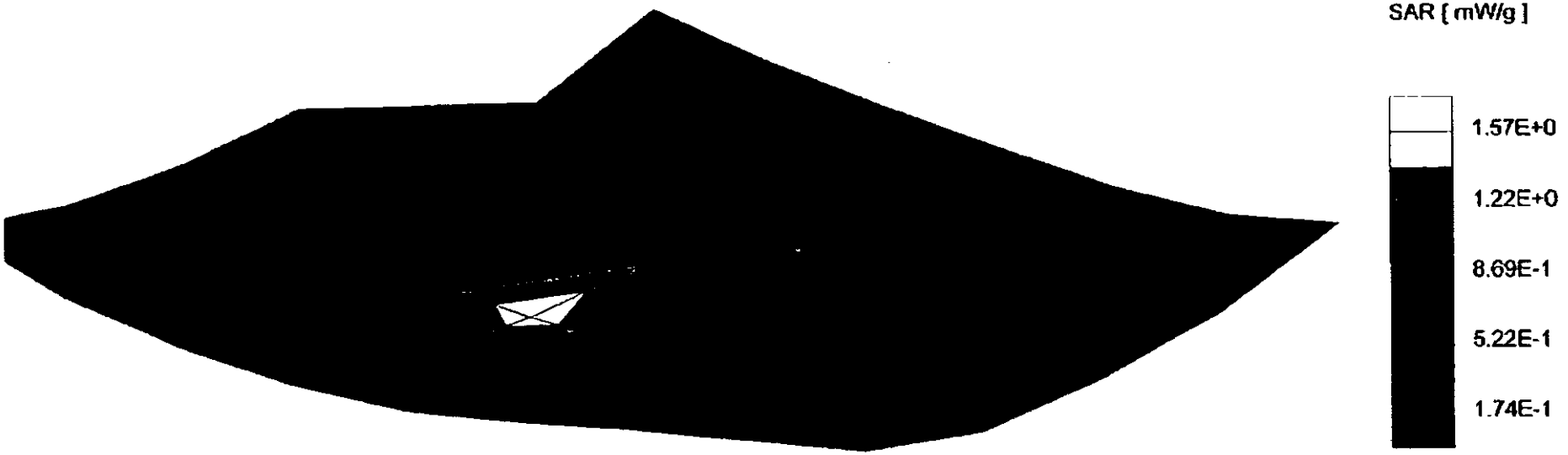
Nr 3, Type: NSD-3AX, Amps mode, Channel 799 (849MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90h.mea

σ = 0.81 [mho/m] ε_r = 41.8 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.57

SAR (1g): 1.53 [mW/g] SAR (10g): 1.00 [mW/g]



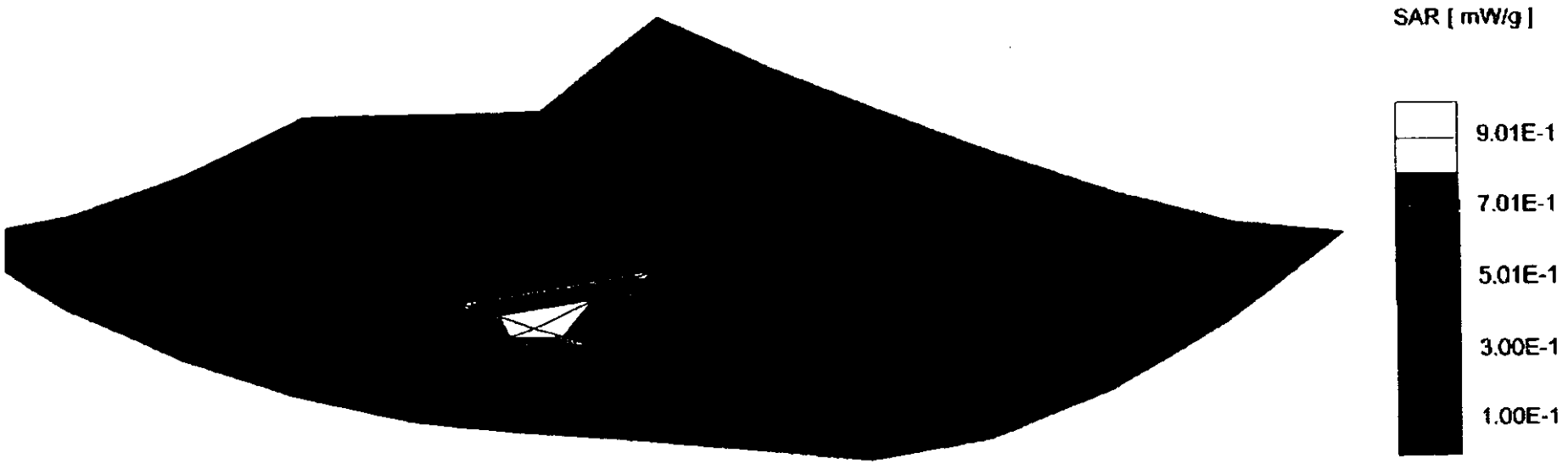
Nr 4, Type: NSD-3AX, CDMA Cellular, Ch. 991 (824MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: ccf90l.mea

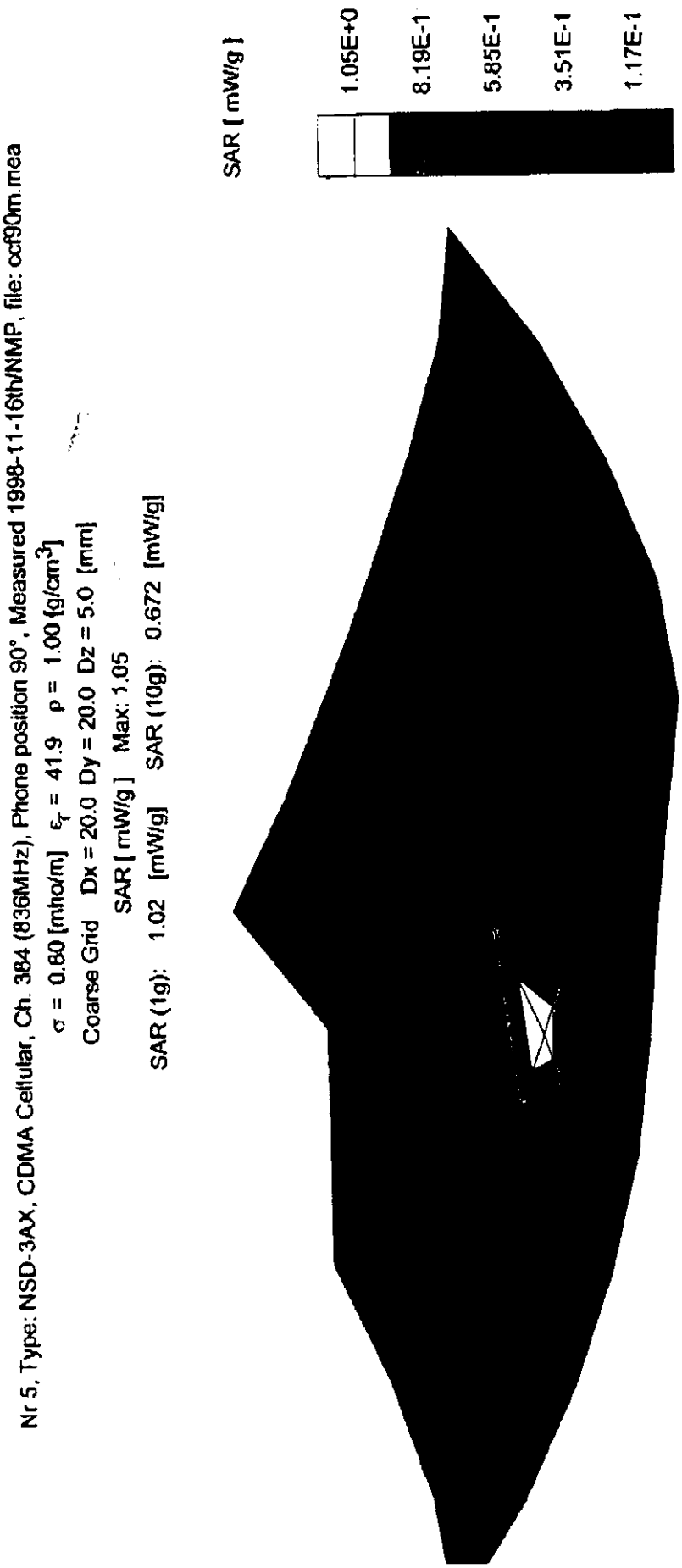
σ = 0.79 [mho/m] ε_r = 42.1 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 0.90

SAR (1g): 0.924 [mW/g] SAR (10g): 0.618 [mW/g]




Nr 5, Type: NSD-3AX, CDMA Cellular, Ch. 384 (836MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: ccf90m.mea
σ = 0.80 [mho/m] εr = 41.9 ρ = 1.00 [g/cm³]
Coarse Grid Dx = 20.0 Dy = 20.0 Dz = 5.0 [mm]
SAR [mW/g] Max: 1.05
SAR (1g): 1.02 [mW/g] SAR (10g): 0.672 [mW/g]
SAR [mW/g]
1.05E+0
8.19E-1
5.85E-1
3.51E-1
1.17E-1

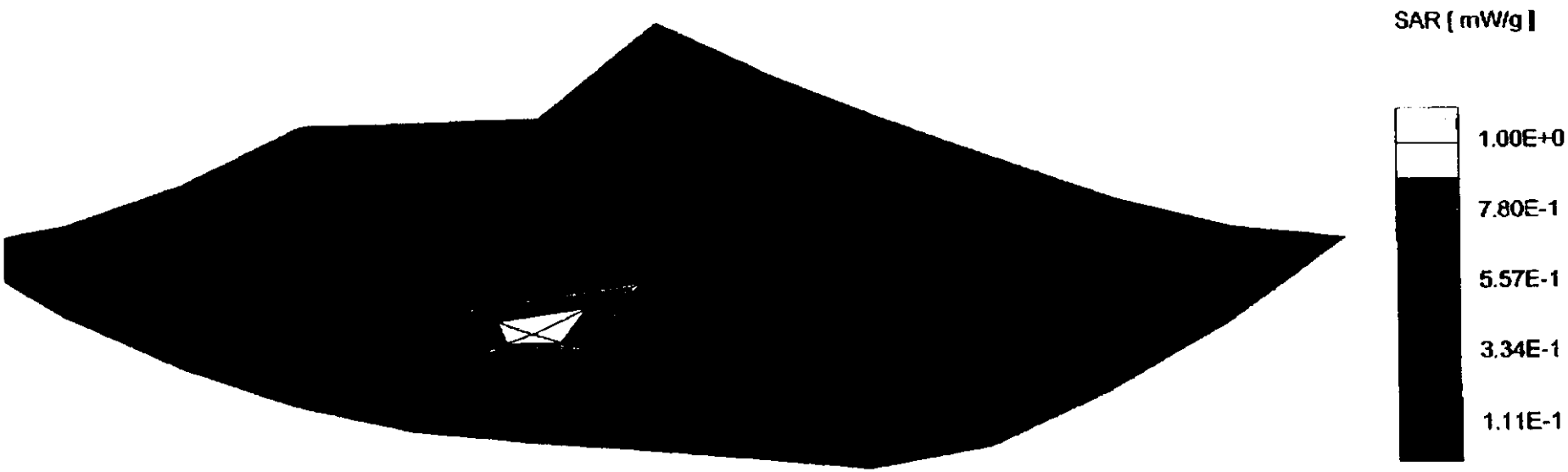
Nr 6, Type: NSD-3AX, CDMA Cellular, Ch. 799 (849MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: ccf90h.mea

σ = 0.81 [mho/m] ε_r = 41.8 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.00

SAR (1g): 1.07 [mW/g] SAR (10g): 0.698 [mW/g]



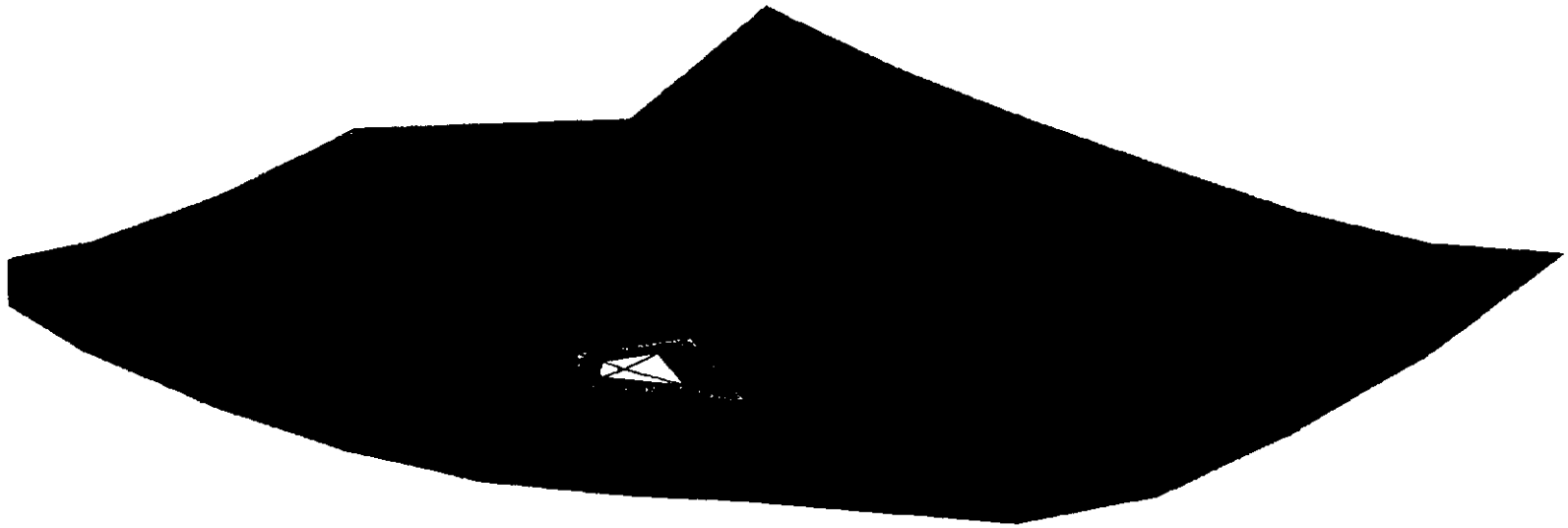
Nr 7, Type: NSD-3AX, CDMA Pcs, Channel 25 (1850MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fcp90l.mea

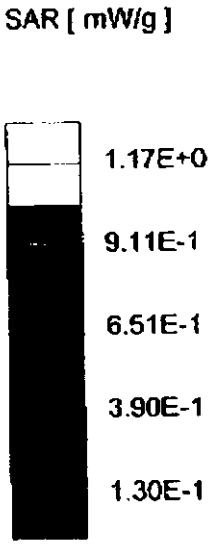
σ = 1.75 [mho/m]$_f$ = 40.1 ρ = 1.00 [g/cm^3]

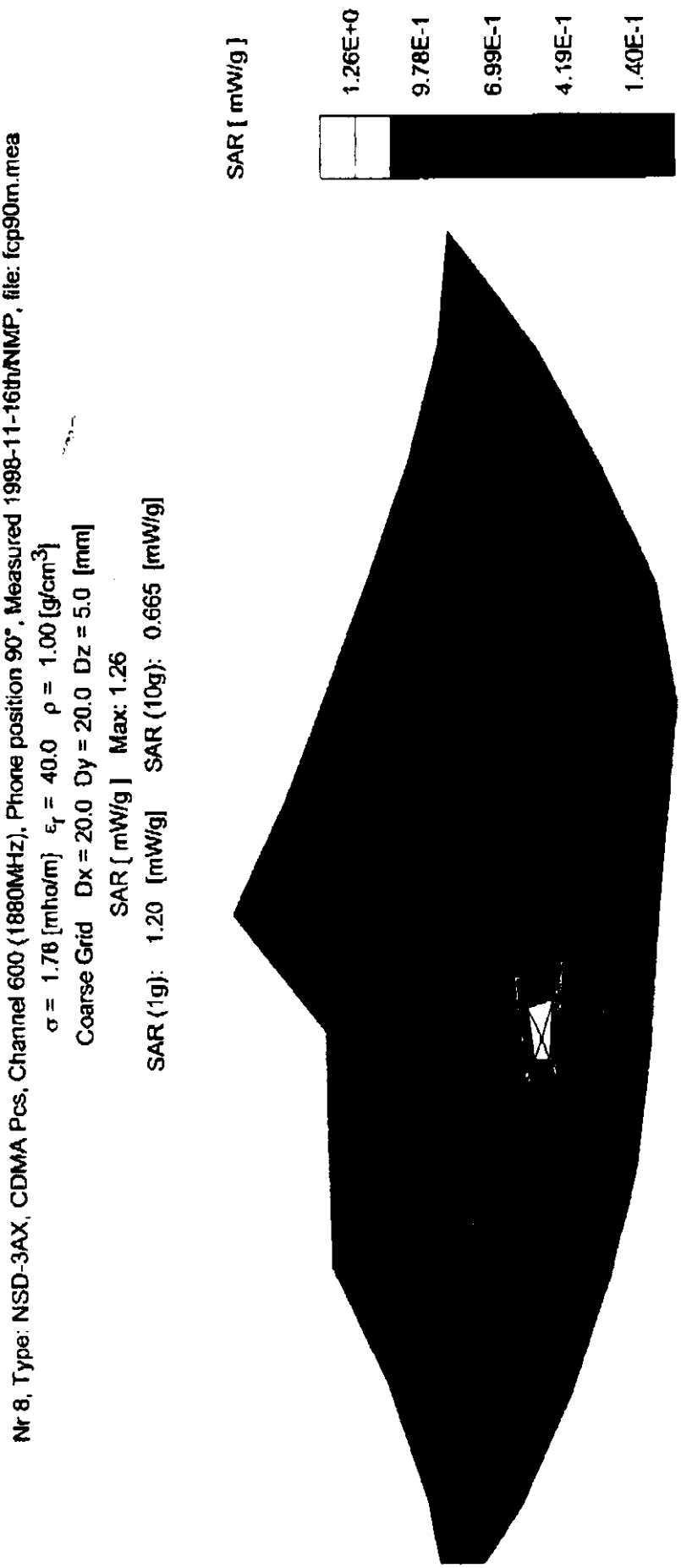
Coarse Grid Dx = 20.0 Dy = 20.0 Dz = 5.0 [mm]

SAR [mW/g] Max: 1.17

SAR (1g): 1.14 [mW/g] SAR (10g): 0.639 [mW/g]






Nr 8, Type: NSD-3AX, CDMA Pcs, Channel 600 (1880MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fcp90m.mea
σ = 1.78 [mho/m] εr = 40.0 ρ = 1.00 [g/cm3]
Coarse Grid Dx = 20.0 Dy = 20.0 Dz = 5.0 [mm]
SAR [mW/g] Max: 1.26
SAR (1g): 1.20 [mW/g] SAR (10g): 0.665 [mW/g]
SAR [mW/g]
1.26E+0
9.78E-1
6.99E-1
4.19E-1
1.40E-1

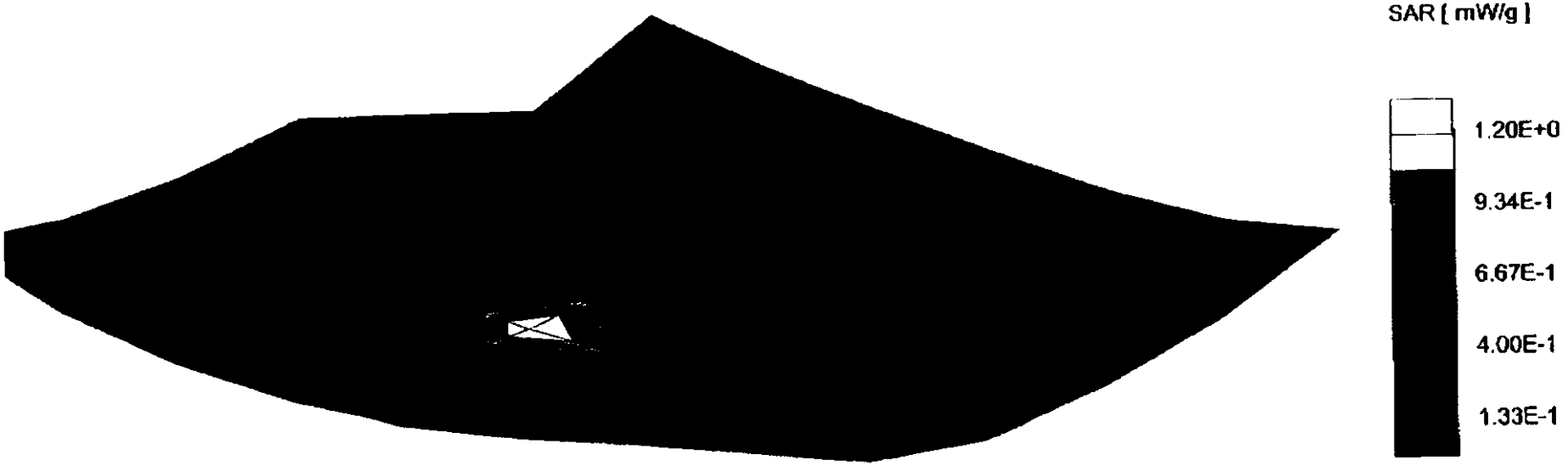
Nr 9, Type: NSD-3AX, CDMA Pcs, Channel 1175 (1909MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fcp90h.mea

σ = 1.80 [mho/m] ε_r = 39.8 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.20

SAR (1g): 0.995 [mW/g] SAR (10g): 0.554 [mW/g]



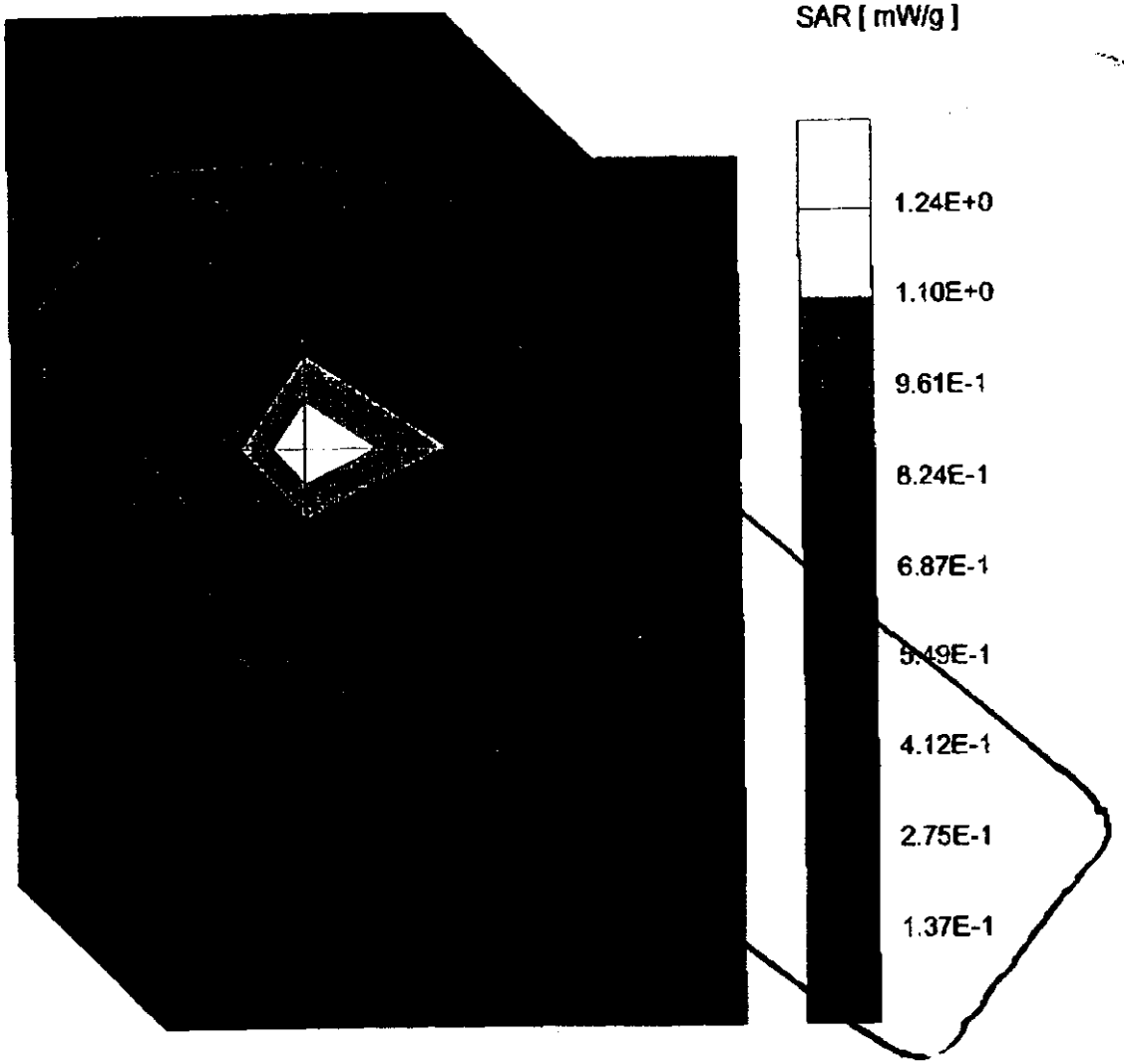
Nr 10, Type: NSD-3AX, Amps mode, Channel 991 (824MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90l.mea

σ = 0.79 [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: 1.24

SAR (1g): 1.24 [mW/g] SAR (10g): 0.820 [mW/g]



[redacted] To: kchan@fcc.gov
>
> EAS #92700,
> Nokia Mobile Phones Inc,
> FCC ID: GMLNSD-3AX,
> Model 6185
>
> Attached, please find the requested page furhter to the vist of William
> ("Bill") Graff.
>
> --
> M. Flom Associates, Inc.
> general@mflom.com
> ---
> Confidential - The information in this message is only intended for
> the person(s) or organization(s) to whom it is addressed. If you are
> not that person, please contact the sender, and destroy this copy.
>
> ---
> Name: Page7.1.pdf
> Page7.1.pdf Type: Acrobat (application/pdf)
> Encoding: base64
>
> ---
>
> Subject: Nokia - EAS 92700
> Date: Thu, 04 Mar 1999 12:51:29 -0500
> From: Kwok Chan <kchan@fcc.gov>
> To: FCOPERIC@fcc.gov
> CC: kchan@fcc.gov
>
> Frank:
>
> Dave, Bruce and George gave me an SAR list, this is one of them.
>
> This is the Nokia dual mode, dual band phone - GMLNSD-3AX, EAS
> 92700.
>
> 1. Nokia wants confidentiality for SAR. I believed you had said no and
> they accepted it for the previous 2 applications - GMLNHA-9 and
> GMLNHA-9S. We need to go through the same "No" procedure again.
> Confidentiality requested in one of those pages in the cover letter exhibit.
>
> 2. The EAS system only logged one mode in the 800 MHz band. Nokia is
> requesting dual mode, dual band operation for this phone on the 731
> form.
>
> 3. The output power levels in the test data for exhibit 6 are conducted
> measurement using a power meter. We need radiated output - ERP for
> 800 MHz band and EIRP for 1900 MHz band. They will need to provide
> these numbers. The conducted output in exhibit 6 also disagree with
> those indicated in the SAR report (conducted also), see below -
>
> Mode frequency exhibit 6 SAR SAR value

>
> AMPS 824 MHz 257 mW 355 mW 1.24 W/kg
> AMPS 836 275 mW 355 mW 1.49 W/kg
> AMPS 849 213 mW 355 mW 1.53 W/kg
>
> CDMA 824 501 mW 251 mW 0.92 W/kg
> CDMA 836 550 mW 251 mW 1.02 W/kg
> CDMA 849 467 mW 251 mW 1.07 W/kg
>
> CDMA 1880 204 mW 178 mW 1.14 W/kg
> CDMA 1850 128 mW 178 mW 1.20 W/kg
> CDMA 1910 199 mW 178 mW 1.00 W/kg
>
> The specs in exhibit 12 indicate 600 mW (probably conducted) for all
> operating modes in both frequency bands. The correct maximum output
> ratings should be determined before we can apply that information to
> evaluate SAR compliance.
>
> 4. The users manual indicates there are 6 battery options. We do not
> have sufficient information to determine if the batteries are different in
> shape, dimensions or other characteristics that can affect SAR. The
> reported SAR value for AMPS mode at 849 MHz is 1.53 W/kg, which
> does not leave much margin for certain changes in device performance
> that may affect SAR due to the different battery options. If the batteries
> are similar enough that Nokia does not expect SAR to exceeded limit with
> all the battery options, some sort of analysis (or tests results if
> necessary) should be provided to demonstrate there is sufficient SAR
> margin to cover performance variations due to different battery options.
>
> Kwok Chan

CC: FCCMAIL.SMTPNLM."erkka.sointula@nmp.nokia.com", kc...

From: [redacted] Kwok Chan
To: FCCMAIL.SMTPNLM."general@mflom.com"
Date: 3/25/99 3:23pm
Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX -Reply

To Bill Graff:

1. Please provide information on conducted output power levels for the data included in the attached e-mail (3 operating modes) to associate with those reported in the SAR report to determine RF exposure compliance and what output ratings to grant.

2. Please provide answer to question #4 (battery issues) on one of attached e-mail.

(Frank: you will need to verify questions #1 & #2 in the 2nd e-mail, thanks)

Kwok Chan

>>> "M. Flom Associates, Inc" <general@mflom.com> 03/25/99 02:33pm >>>
EAS #92700,
Nokia Mobile Phones Inc,
FCC ID: GMLNSD-3AX,
Model 6185

Attached, please find the requested page furhter to the vist of William ("Bill") Graff.

--
M. Flom Associates, Inc.
general@mflom.com

CC: kchan, FCOPERIC

From: [redacted] "M. Flom Associates, Inc" <general@mflom.com>
To: G1.G1(kchan)
Date: 3/25/99 2:33pm
Subject: EAS #92700, Nokia Mobile Phones Inc, FCC ID: GMLNSD-3AX

EAS #92700,
Nokia Mobile Phones Inc,
FCC ID: GMLNSD-3AX,
Model 6185

Attached, please find the requested page furhter to the vist of William ("Bill") Graff.

--
M. Flom Associates, Inc.
general@mflom.com

From: [redacted] Kwok Chan
To: FCOPERIC
Date: 3/4/99 12:51pm
Subject: [redacted] Nokia - EAS 92700

Frank:

Dave, Bruce and George gave me an SAR list, this is one of them.

This is the Nokia dual mode, dual band phone - GMLNSD-3AX, EAS 92700.

1. Nokia wants confidentiality for SAR. I believed you had said no and they accepted it for the previous 2 applications - GMLNHA-9 and GMLNHA-9S. We need to go through the same "No" procedure again. Confidentiality requested in one of those pages in the cover letter exhibit.

2. The EAS system only logged one mode in the 800 MHz band. Nokia is requesting dual mode, dual band operation for this phone on the 731 form.

3. The output power levels in the test data for exhibit 6 are conducted measurement using a power meter. We need radiated output - ERP for 800 MHz band and EIRP for 1900 MHz band. They will need to provide these numbers. The conducted output in exhibit 6 also disagree with those indicated in the SAR report (conducted also), see below -

Mode	frequency	exhibit 6	SAR	SAR value
AMPS	824 MHz	257 mW	355 mW	1.24 W/kg
AMPS	836	275 mW	355 mW	1.49 W/kg
AMPS	849	213 mW	355 mW	1.53 W/kg
CDMA	824	501 mW	251 mW	0.92 W/kg
CDMA	836	550 mW	251 mW	1.02 W/kg
CDMA	849	467 mW	251 mW	1.07 W/kg
CDMA	1880	204 mW	178 mW	1.14 W/kg
CDMA	1850	128 mW	178 mW	1.20 W/kg
CDMA	1910	199 mW	178 mW	1.00 W/kg

The specs in exhibit 12 indicate 600 mW (probably conducted) for all operating modes in both frequency bands. The correct maximum output ratings should be determined before we can apply that information to evaluate SAR compliance.

4. The users manual indicates there are 6 battery options. We do not have sufficient information to determine if the batteries are different in shape, dimensions or other characteristics that can affect SAR. The reported SAR value for AMPS mode at 849 MHz is 1.53 W/kg, which does not leave much margin for certain changes in device performance that may affect SAR due to the different battery options. If the batteries are similar enough that Nokia does not expect SAR to exceeded limit with all the battery options, some sort of analysis (or tests results if necessary) should be provided to demonstrate there is sufficient SAR margin to cover performance variations due to different battery options.

Kwok Chan

CC: kchan

M. Flom Associates, Inc. - Global Compliance Center
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85224-1571
www.mflom.com general@mflom.com (602/480) 926-3100, FAX:-3598

TOTAL PAGES:	2
DATE:	March 25, 1999
VIA FAX:	1 301 344 2050
TO:	FEDERAL COMMUNICATIONS COMMISSION
ATTENTION:	Frank Coperich, Electronics Engineer
APPLICANT:	NOKIA MOBILE PHONES, INC.
EQUIPMENT:	FCC ID: GMLNSD-3AX (Model 6185)
SUBJECT:	EA92700. Correspondence 6588

Good morning Frank:

Further to the FCC lab visit by Bill Graff, attached please find R. F. Power Output (Radiated) data which should be inserted as Page 7.1 of 71 of the original submission and amendments.

We trust this is the information you are seeking and that a favourable outcome will result.

Best personal regards,

MORTON FLOM, P. Eng.

mf;mgf
enc.

cc: Applicant c/o S.D. office

FCC ID: GMLNSD-3AX

PAGE NO. 7.1 of 71. Amended March 22, 1999

NAME OF TEST: R. F. Power Output (Radiated)

SPECIFICATION: 47 CFR 2.1046(a)

GUIDE: EIA/IS-19-B-1988
TIA/EIA/IS-137-A-1996

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE (RADIATED)

1. The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Equivalent loading (ERP) was calculated from the equation $P_t=((E \times R)^2/49.2)$ watts and equivalent loading (EIRP) was calculated from the equation $P_t=((E \times R)^2/30)$ watts, where R = 3m.

2. Measurement accuracy is ±1.5 dB.

MEASUREMENT RESULTS

g9930100: 1999-Mar-19 Fri 15:21:00
AMPS FM:

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	ERP, dBm	ERP, Watts
824.04000	824.040000	97.1	25.7	11393156.8	25.55	0.35
836.40000	836.400000	97.5	25.7	1445439.77	25.85	0.38
848.97000	848.970000	98.1	25.6	81557758.03	26.45	0.44

g9930122: 1999-Mar-19 Fri 15:49:00
AMPS CDMA:

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	ERP, dBm	ERP, Watts
824.76000	824.760000	95.6	25.7	1170846.6	23.95	0.24
836.40000	836.400000	95.5	25.7	1148153.62	23.85	0.24
848.19000	848.190000	95.8	25.6	81189871.33	24.15	0.26

g9930099: 1999-Mar-19 Fri 13:45:00
PCS CDMA:

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	EIRP dBm	EIRP, Watts
1851.25000	1851.250000	82	34.8	9699036.74	21.65	0.14
1880.00000	1880.000000	83.8	35.0	3877000.82	23.55	0.22
1908.75000	1908.750000	83	35.1	7810027.94	22.85	0.19

MFA M. Flom Associates, Inc.
Global Compliance Center

3356 North San Marcos Place, Suite 107
Chandler, Arizona 85224-1571
(602) 926-3100, FAX: 926-3598
www.goodnet.com/~mflom

** NEW electronic addresses: www.mflom.com general@mflom.com

March 23rd, 1999

Federal Communications Commission,
Office of Eng'g & Technology,
7435 Oakland Mills Road,
Columbia, Maryland 21046.

Attention: Frank Coperich, Electronics Engineer
Applicant: NOKIA MOBILE PHONES, INC.
Equipment: FCC ID: GMLNSD-3AX (Model 6185)
Reference: EA92700. Correspondence 6588 e-mail 03/16/99

Frank:

We will reply to your e-mail abovenoted via item numbers, i.e.

1. This has been addressed - attached revised Page 2 Form 731

   Also attached revised pages: 2 of 71, 8 of 71
   AND Occupied Bandwidth Plots 32 of 71, 33, 34, 35.1, 35.2
   36, 37, 38, 38.1, 38.2, 38.3
   42, 47, 65, 66.1 and 66.2

2. This has been addressed on Amended Page 2 of Form 731

3. SAR portion of filing is being addressed separately to the attention of Kwok Chan.

This packet is being hand-carried by Bill Graff, our Director of Regulatory Engineering accompanied by Erkka Sointula, representing the Applicant.

Your cooperation is urgently anticipated for this submission originally filed early December 1998 and poses a critical problem for the Applicant if there are any further delays.

Thanks and best personal regards,

MORTON FLOM, P. Eng.

mf;mgf
encs.
cc: Applicant: c-o San Diego Office
Attention: Marko Pistemaa

SECTION IV - *Enter FCC ID from Page 1, Section I* ▶ GMLNSD-3AX

1.(a) Instead of Applicant, FCC is authorized to mail original Grant to: *(See instructions)*

Firm name, number, street, City, State/Country, ZIP/Postal Code:
M. FLOM ASSOCIATES, INC.
3356 N. San Marcos Place, Suite 107
CHANDLER, ARIZONA, U.S.A.
85224-1571

(b) Name, Title and Mail Stop, if any, of person at above address to receive Grant: (If 1.(a) is completed, this Item must be completed)

MORTON FLOM, P. Eng., President

2.(a) Technical contact:
Firm name, contact person, number, street, City, State/Country, ZIP/Postal Code:
M. FLOM ASSOCIATES, INC.
MORTON FLOM, President
3356 No. San Marcos Place, #107
CHANDLER, ARIZONA,U.S.A.
85224 1571

(b) Telephone No. (Area/Country/City code, No. and Ext.): 602 926 3100

(c) FAX No. (Area/Country/City code and No.): 602 926 3598

(d) Internet e-mail address: mflom@goodnet.com

(e) Non-Technical contact:
Firm name, contact person, number, street, City, State/Country, ZIP/Postal Code:
M.FLOM ASSOCIATES, INC.
MORTON FLOM, President
3356 No. San Marcos Place, #107
CHANDLER, ARIZONA, U.S.A.
85224 1571

(f) Telephone No. (Area/Country/City code, No. and Ext.): 602 926 3100

(g) FAX No. (Area/Country/City code and No.): 602 926 3598

(h) Internet e-mail address: old: mflom@goodnet.com NEW: general@mflom.com

3. Does this application include a request for confidentiality for any portion(s) of the data contained in this application pursuant to 47 CFR §0.459 of the Commission's Rules? *If "Yes" see instructions.* ☑ Yes ☐ No

4. Does the applicant request that the Commission defer grant of this application pursuant to 47 CFR §0.457(d)(1)(ii)? *(See instructions)* ☐ Yes ☑ No

5. Type of equipment authorization requested: (check *one* box only) ☑ Certification ☐ Type Acceptance ☐ Notification

6.(a) Equipment Code and description: *(See instructions, page 4)* T N E Non-Broadcast Transmitter Held to Ear & PCE for PCS

(b) Equipment will be operated under FCC Rule Part(s): 15, 22H, 24 & CONFIDENTIALITY

7. Application is for: (Check one box only)

☑ 1. Original equipment *(See instructions)*

☐ 2. Change in identification of presently authorized equipment
ORIGINAL FCC ID | Grant date

☐ 3. Class II permissive change or modification of presently authorized equipment *(See instructions)*

8. EQUIPMENT SPECIFICATIONS: *(See instructions)*

(a) Frequency range in MHz	(b) Rated RF power output in watts	(c) Frequency tolerance %, Hz, ppm	(d) Emission designator (See 47 CFR §2.201 and §2.202)	(e) Microprocessor model number
Analogue: 824.04 to 848.97	Analogue AMPS= .5 ERP	±2.5 ppm	40K0F1D (Analogue)	
			40K0F8W (Analogue)	
AMPS, CDMA 824.75 to 848.25	AMPS, CDMA = .35 ERP		1M25F9W (CDMA)	
			1M25F9W (PCS)	
PCS CDMA 1851.25-1908.75	PCS CDMA .2 EIRP			

9. Is the equipment in this application:

(a) a composite device subject to more than one type of equipment authorization? ☐ Yes ☑ No

(b) part of a system that operates with, or is marketed with, another device that requires an equipment authorization? ☐ Yes ☑ No

If either of the above questions is answered "Yes" complete items 10.(a) and (b). *(See instructions)*

COMPLETE, SIGN and DATE Page 3

PAGE NO. 2 of 71. Amended March 22, 1999

LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

IN ACCORDANCE WITH FCC RULES AND REGULATIONS,
VOLUME II, PART 2 AND TO

22H, 24, Confidentiality

Sub-part 2.1033

(c)(1): NAME AND ADDRESS OF APPLICANT:

Nokia Mobile Phones, Inc.
6200 Courtney Campbell Causeway, Suite 900
P.O. Box 30730
Tampa, Florida 33630-3730

VENDOR:

Nokia Mobile Phones
9605 Scranton Rd., Suite 105
San Diego, CA 92121

(c)(2): FCC ID: GMLNSD-3AX

MODEL NO: 6185, Type NSD-3AX

(c)(3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: 40K0F1D (Analogue),
40K0F8W (Analogue),
1M25F9W (CDMA),
1M25F9W (PCS)

(c)(5): FREQUENCY RANGE, MHz: 824.04 to 848.97 Analogue
824.75 to 848..25 AMPS CDMA
1851.25 to 1908.75 PCS CDMA

(c)(6): POWER RATING, Watts: (i) Analogue: 0.5 ERP
(ii) CDMA AMPS: 0.35 ERP
(iii) CDMA PCS: 0.2 EIRP

x Switchable ___ Variable ___ N/A

(c)(7): MAXIMUM POWER RATING, Watts: 7

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NAME OF TEST: Carrier Output Power (Conducted)

SPECIFICATION: 47 CFR 2.1046(a)

GUIDE: EIA/IS-19-B-1988
TIA/EIA/IS-137-A-1996

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the unmodulated output power was measured by means of an R. F. Power Meter.

2. Measurement accuracy is ±3%.

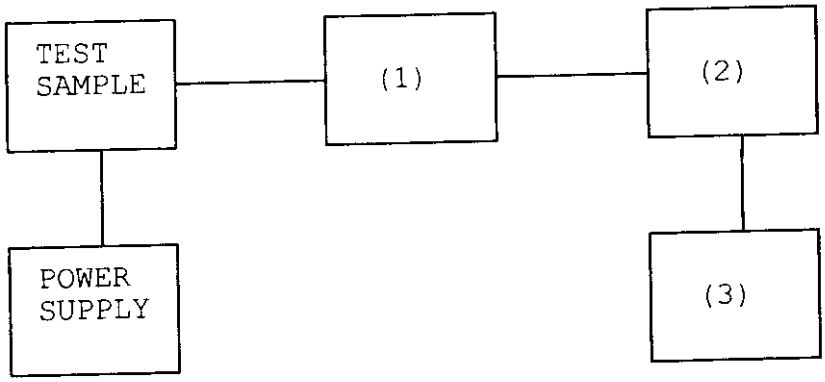
MEASUREMENT RESULTS

NOMINAL, MHz	CHANNEL	R. F. POWER, WATTS Lo	Hi
AMPS MODE:			
824.040	991	0.003	0.355
836.400	380	0.003	0.355
848.970	799	0.002	0.355
CDMA MODE:			
824.185	991	0.0003	0.252
836.400	380	0.0003	0.252
848.897	799	0.0002	0.252
CDMA MODE:			
1879.98	N/A	0.0002	0.177
1850.04	N/A	0.0002	0.177
1909.92	N/A	0.0002	0.177

SUPERVISED BY: Morton Flom, P. Eng.

TRANSMITTER POWER CONDUCTED MEASUREMENTS

TEST 1: R. F. POWER OUTPUT
TEST 2: FREQUENCY STABILITY



	Asset	Description	s/n
(1)		COAXIAL ATTENUATOR	
x	i00122	Narda 766-10	7802
	i00123	Narda 766-10	7802A
	i00069	Bird 8329 (30 dB)	1006
	i00113	Sierra 661A-3D	1059
(2)		POWER METERS	
	i00014	HP 435A	1733A05836
x	i00039	HP 436A	2709A26776
x	i00020	HP 8901A POWER MODE	2105A01087
(3)		FREQUENCY COUNTER	
	i00042	HP 5383A	1628A00959
x	i00019	HP 5334B	2704A00347
x	i00020	HP 8901A FREQUENCY MODE	2105A01087

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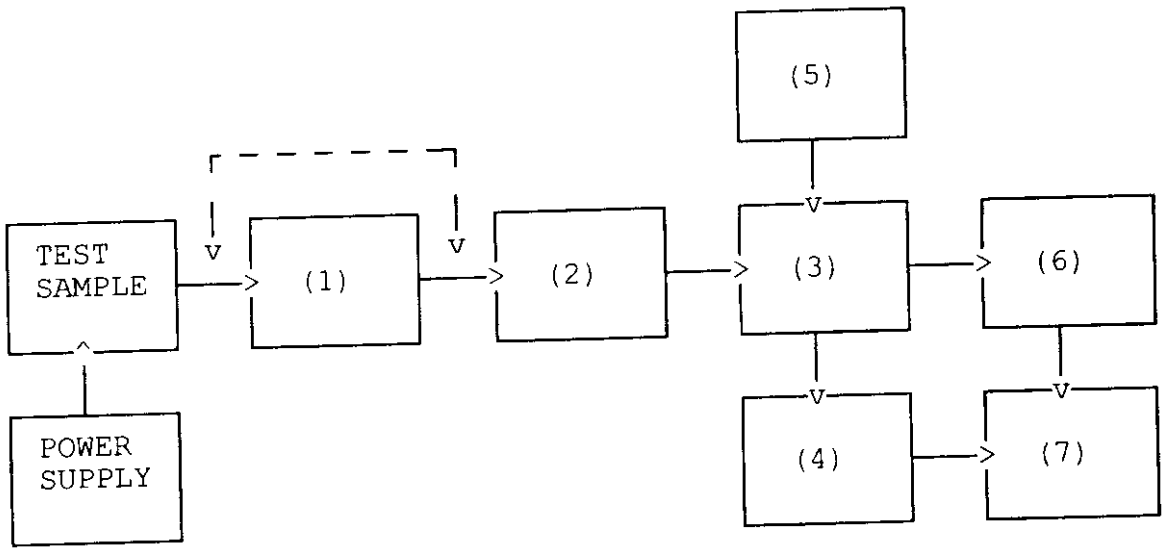
Measurement Of Maximum Deviation



	Asset	Description	s/n
(1)		AUDIO OSCILLATOR/GENERATOR	
	i00010	HP 204D	1105A04683
x	i00017	HP 8903A	2216A01753
(2)		COAXIAL ATTENUATOR	
	i00122	Narda 766-10	7802
x	i00123	Narda 766-10	7802A
	i00113	Sierra 661A-3D	1059
(3)		FILTERS; NOTCH, HP, LP, BP	
	i00126	Eagle TNF-1	100-250
	i00125	Eagle TNF-1	50-60
x	i00124	Eagle TNF-1	250-850
(4)		SPECTRUM ANALYZER	
x	i00048	HP 8566B	2511A01467
	i00029	HP 8563E	3213A00104
(5)		SCOPE	
x	i00030	HP 54502A	2927A00209

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MEASUREMENT SUMMARY: Emission Masks (Occupied Bandwidth)

MODULATION	MEASURED DEVIATION ±kHz (HP 8901A)	LIMIT ±kHz	B/W @-26 dB PLOTS, kHz
NONE	0.0	0.0	0.0
VOICE	10.8	≥ 10.8 & ≤ 13.2	-29
WIDEBAND DATA	8.8	≥ 7.2 & ≤ 8.8	-32
SAT + VOICE	13.8	N/A	-32
SAT + DTMF	7.4	N/A	-17
CDMA	N/A	N/A	-18
TDMA	N/A	N/A	N/A
NAMPS	N/A	N/A	N/A

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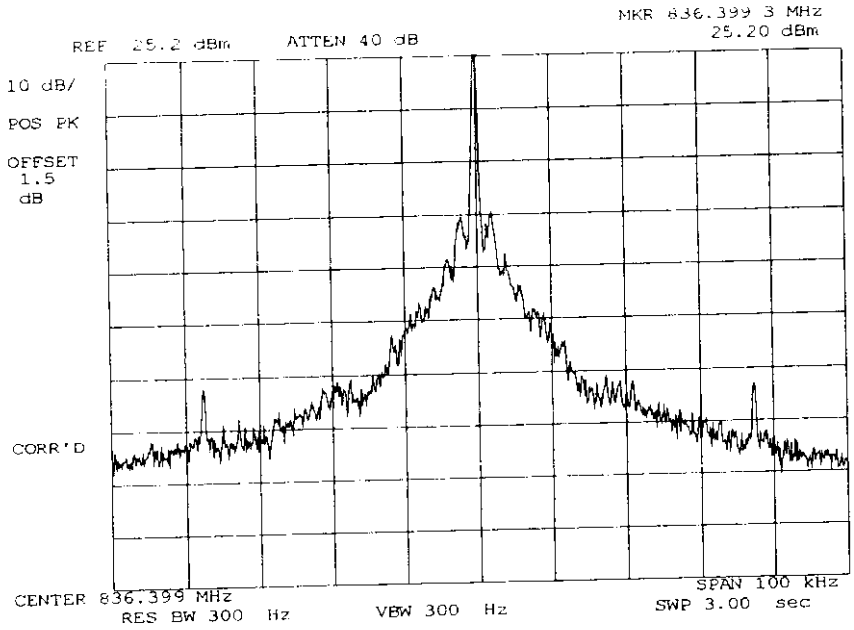
PAGE NO. 32 of 71. Amended March 22, 1999.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930107: 1999-Mar-19 Fri 11:49:00
STATE: 2:High Power



POWER: HIGH
MODULATION: NONE

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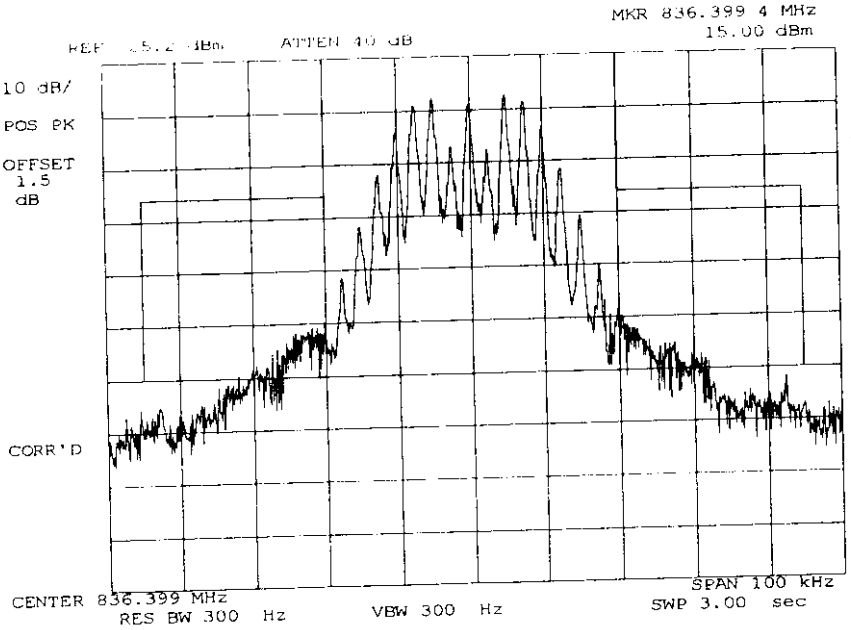
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930108: 1999-Mar-19 Fri 11:55:00
STATE: 2:High Power

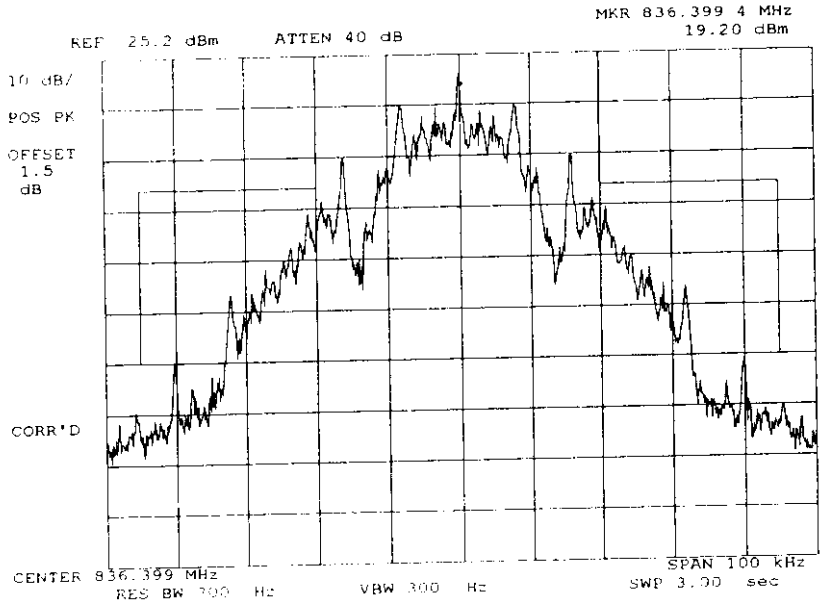


POWER: HIGH
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: AMPS CELLULAR,
F3E/F3D w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 34 of 71. Amended March 22, 1999.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930111: 1999-Mar-19 Fri 12:04:00
STATE: 2:High Power



POWER: HIGH
MODULATION: WBD
MASK: AMPS CELLULAR, F3E/F3D w/LPF

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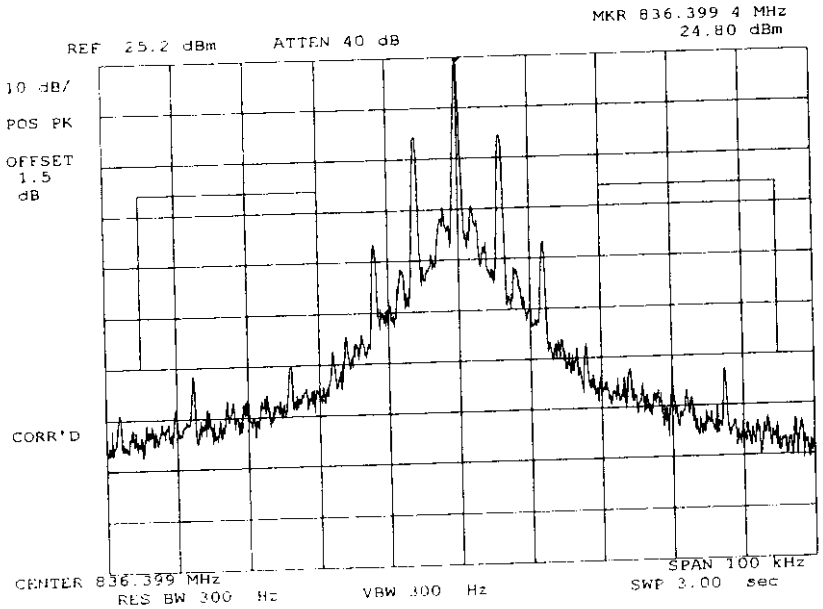
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930106: 1999-Mar-19 Fri 11:43:00
STATE: 2:High Power



POWER: HIGH
MODULATION: SAT
MASK: AMPS CELLULAR, F3E/F3D w/LPF

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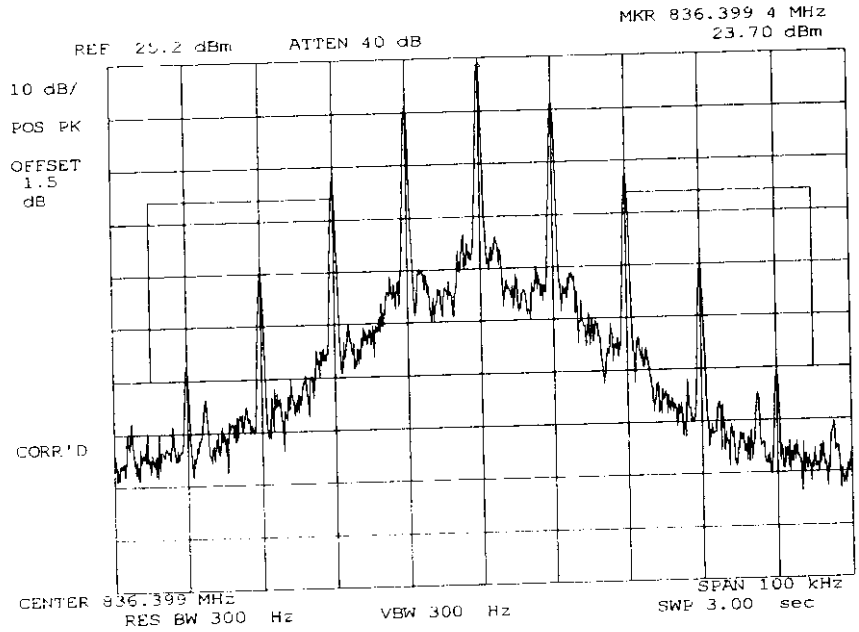
PAGE NO. 35.2 of 71. Amended March 22, 1999.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930105: 1999-Mar-19 Fri 11:39:00
STATE: 2:High Power



POWER: HIGH
MODULATION: ST
MASK: AMPS CELLULAR, F3E/F3D w/LPF

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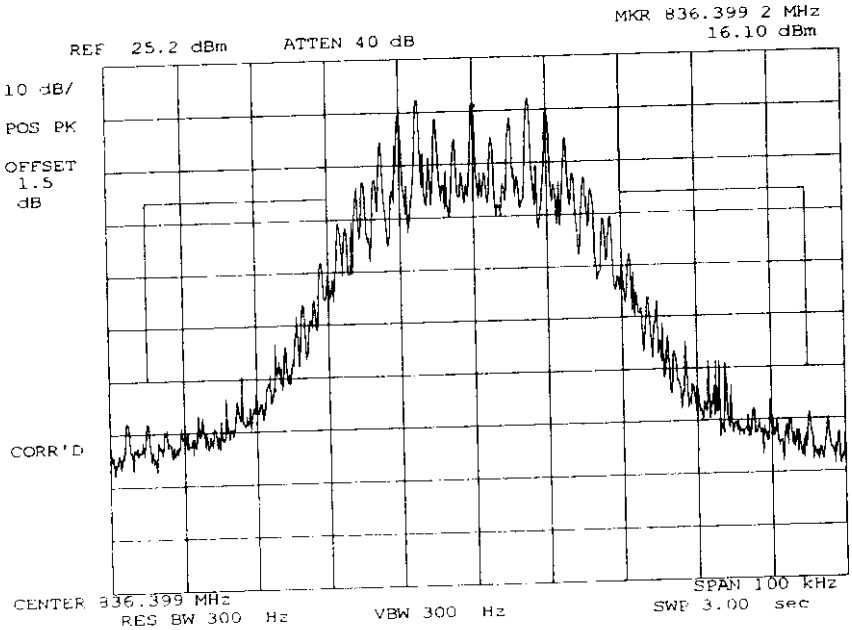
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930115: 1999-Mar-19 Fri 12:23:00
STATE: 2:High Power



POWER: HIGH
MODULATION: SAT+VOICE
MASK: AMPS CELLULAR, F3E/F3D w/LPF

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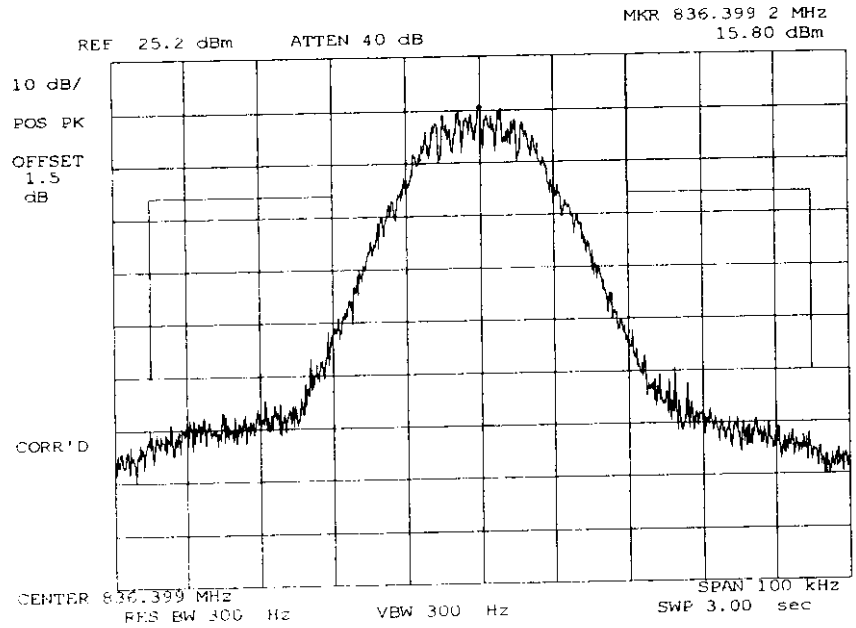
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930110: 1999-Mar-19 Fri 12:02:00
STATE: 2:High Power



POWER: HIGH
MODULATION: SAT+DTMF
MASK: AMPS CELLULAR, F3E/F3D w/LPF

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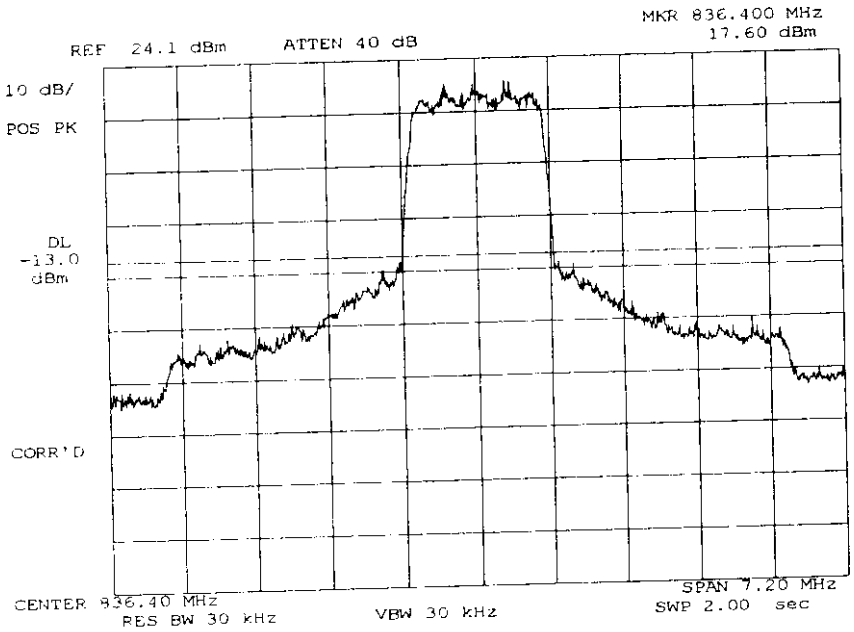
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930102: 1999-Mar-19 Fri 10:58:00
STATE: 2:High Power



POWER: HIGH
MODULATION: CDMA CH 380

SUPERVISED BY:

Morton Flom, P. Eng.

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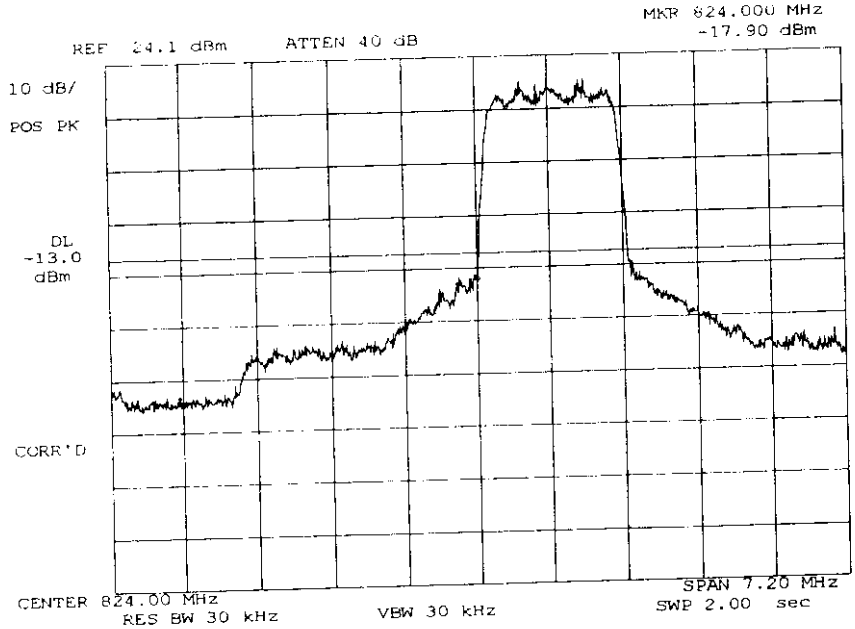
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930103: 1999-Mar-19 Fri 11:02:00
STATE: 2:High Power

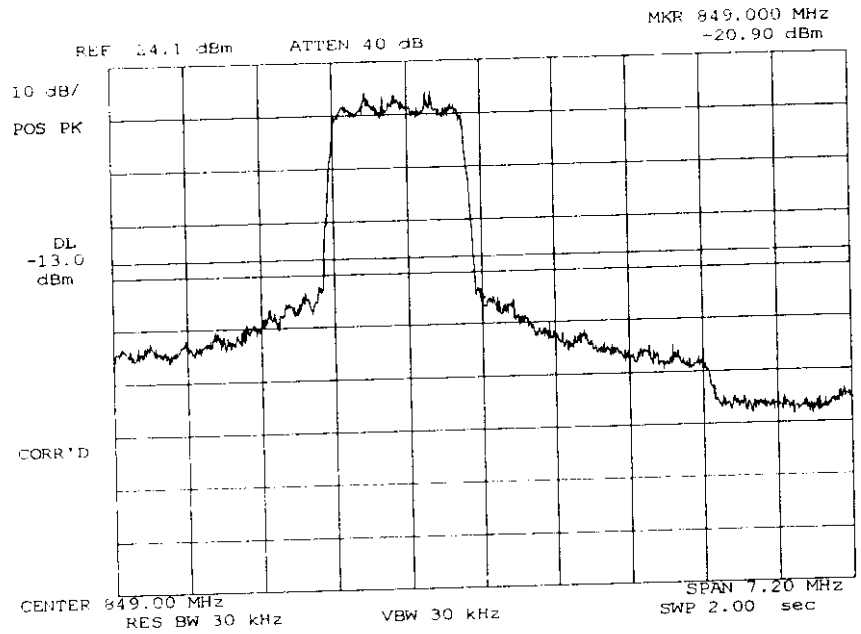


POWER: HIGH
MODULATION: CDMA (AMPS)
LOWER BANDEDGE

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 38.3 of 71. Amended March 22, 1999.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930104: 1999-Mar-19 Fri 11:04:00
STATE: 2:High Power



POWER: HIGH
MODULATION: CDMA (AMPS)
UPPER BANDEDGE

SUPERVISED BY: Morton Flom, P. Eng.

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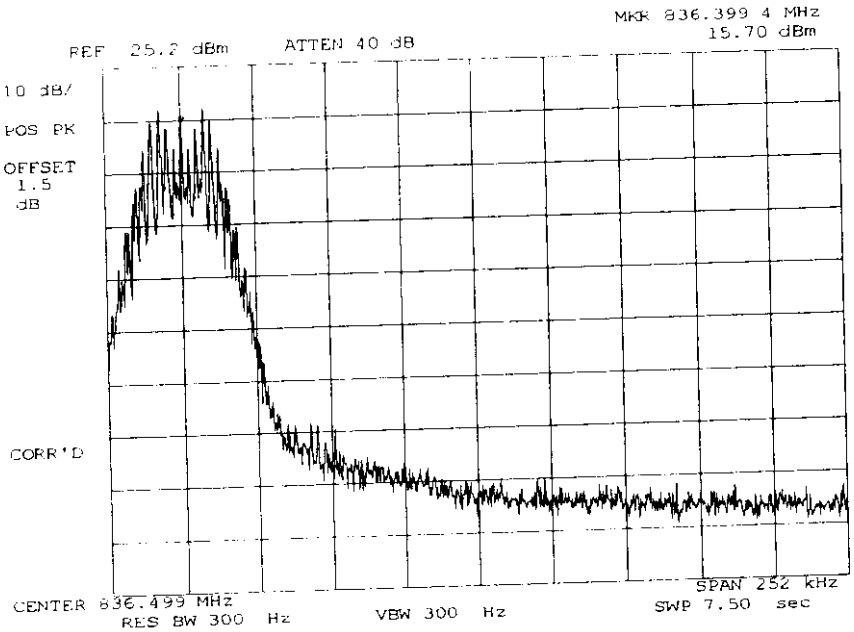
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930114: 1999-Mar-19 Fri 12:15:00
STATE: 2:High Power



POWER: HIGH
MODULATION: SAT+VOICE
OFFSET OCCUPIED BANDWIDTH

SUPERVISED BY: Morton Flom, P. Eng.

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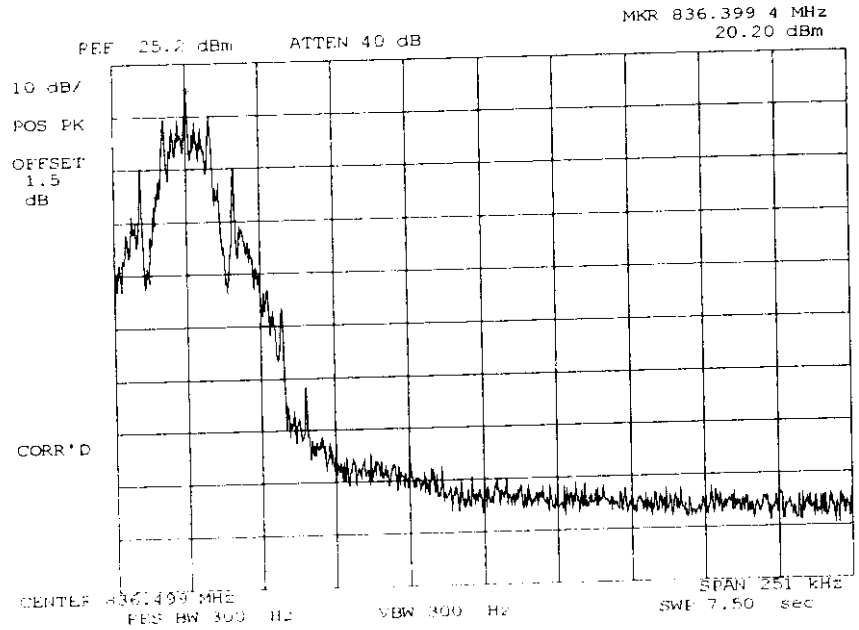
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930112: 1999-Mar-19 Fri 12:07:00
STATE: 2:High Power



POWER: HIGH
MODULATION: WBD
OFFSET OCCUPIED BANDWIDTH

SUPERVISED BY: Morton Flom, P. Eng.

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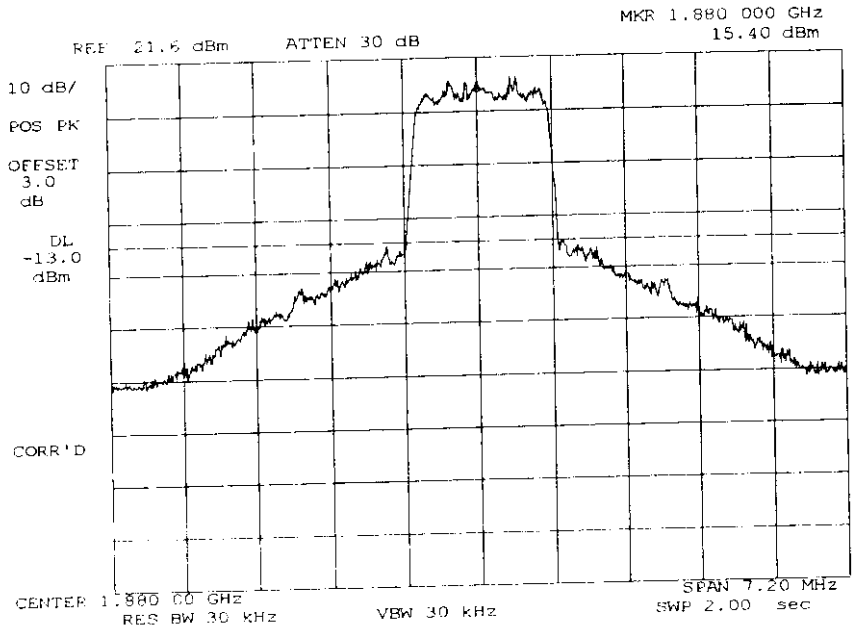
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930118: 1999-Mar-19 Fri 13:24:00
STATE: 2:High Power



POWER: HIGH
MODULATION: CDMA
CHANNEL 600

SUPERVISED BY: Morton Flom, P. Eng.

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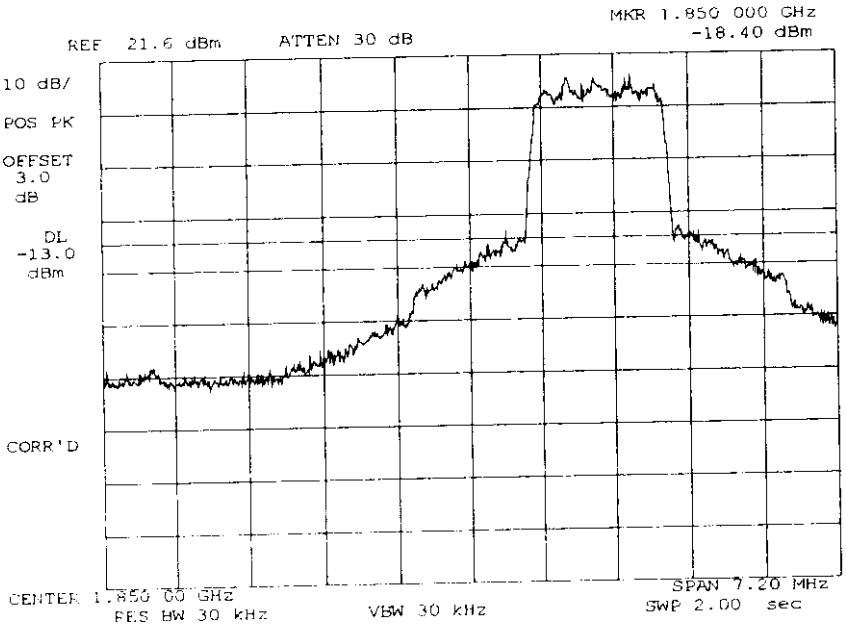
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930117: 1999-Mar-19 Fri 13:21:00
STATE: 2:High Power



POWER: HIGH
MODULATION: CDMA
LOWER PCS BAND EDGE CHANNEL 25

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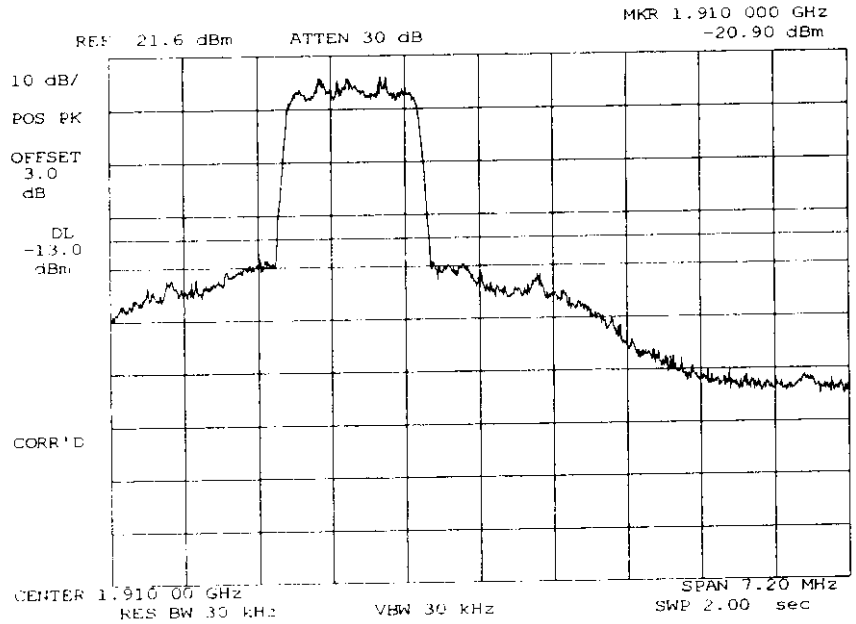
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9930119: 1999-Mar-19 Fri 13:28:00
STATE: 2:High Power



POWER: HIGH
MODULATION: CDMA
UPPER PCS BAND EDGE CHANNEL
1175

SUPERVISED BY: Morton Flom, P. Eng.

From: Frank Coperich
To: INTERNET:mflom@goodnet.com
Date: 3/16/99 10:27am
Subject: Nokia - EAS 92700 -Forwarded

SAR comments are attached.

To: Morton Flom, M. Flom Associates, Inc.
From: Frank Coperich
fcoperic@fcc.gov
FCC Application Processing Branch

Re: FCC ID GMLNSD-3AX

Applicant: Nokia Mobile Phones Inc
Correspondence Reference Number: 6588
731 Confirmation Number: EA92700
Date of Original E-Mail: 3/16/99

Subject:

1.) The measured power output levels listed on FCC Form 731, the measured values shown on Page 7 of 71 of your test report and the unmodulated carrier reference levels from the occupied bandwidth tests all are different. In addition, we have not received measured values of ERP for Cellular operation and EIRP for PCS operation. Please provide the necessary data and resolve this disparity in the values provided for power output values.

2.) Please list the lowest and highest operating channel (center frequency) for both Cellular and PCS CDMA operation.

3.) Comments regarding the SAR portion of your filing are being sent via separate E-Mail.

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days of the original e-mail date may result in application dismissal pursuant to Section 2.917(c) and forfeiture of the filing fee pursuant to Section 1.1108

DO NOT Reply to this email by using the Reply button. In order for your response to be processed expeditiously, you must upload your response via the Internet at www.fcc.gov, Electronic Filing, OET Equipment Authorization Electronic Filing. If the response is submitted through Add Attachments, a message which informs the processing staff that a new exhibit has been submitted must also be submitted via Submit Correspondence. Also, please note that partial responses increase processing time and should not be submitted.

Any questions about the content of this correspondence should be directed to the e-mail address listed below the name of the sender.

5.5 Results of SAR for 1g.

Appendix: 10

The plots in Appendix 10 are a graphical representation of the SAR values over the whole area being scanned.

Appendix 10, page 10 (nr:10), has sketch of the phone added on the plot for clarifying the position of the phone with respect to the measured SAR values.

The size of the area being scanned is sufficiently large to ensure that all possible regions of peak SAR are measured. This is indicated by the fact that the position of peak SAR is in the measured area, and the value of SAR reduces asymptotically in the x- and y- directions as the probe is moved towards the border of the measured area.

Analog mode AMPS

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
1	90°	824 / 991	25.5	1.24
2	90°	836 / 383	25.5	1.49
3	90°	849 / 799	25.5	1.53
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

CDMA Cellular

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
4	90°	824 / 991	24.0	0.92
5	90°	836 / 383	24.0	1.02
6	90°	849 / 799	24.0	1.07
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

1998-11-16

CDMA PCS

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
7	90°	1850 / 2	22.5	1.14
8	90°	1880 / 1000	22.5	1.20
9	90°	1909 / 1998	22.5	1.00
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

Jari Tele
1998-11-16

Appendix 10

pages 1 - 10

SAR MEASUREMENT RESULTS

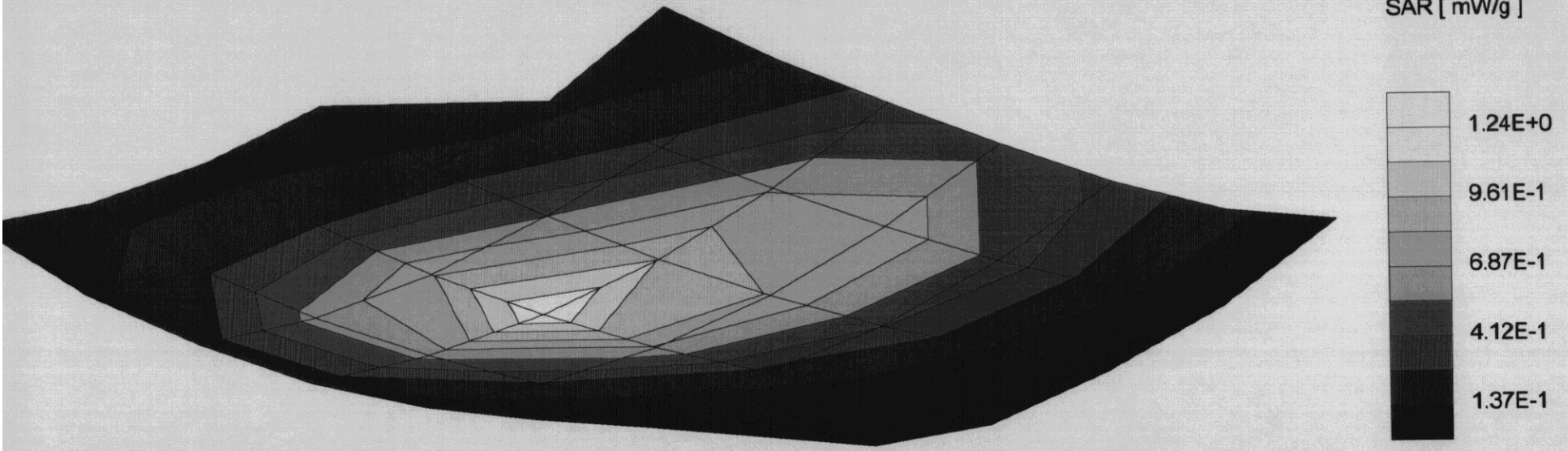
Nr 1, Type: NSD-3AX, Amps mode, Channel 991 (824MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90l.mea

σ = 0.79 [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: 1.24

SAR (1g): 1.24 [mW/g] SAR (10g): 0.820 [mW/g]



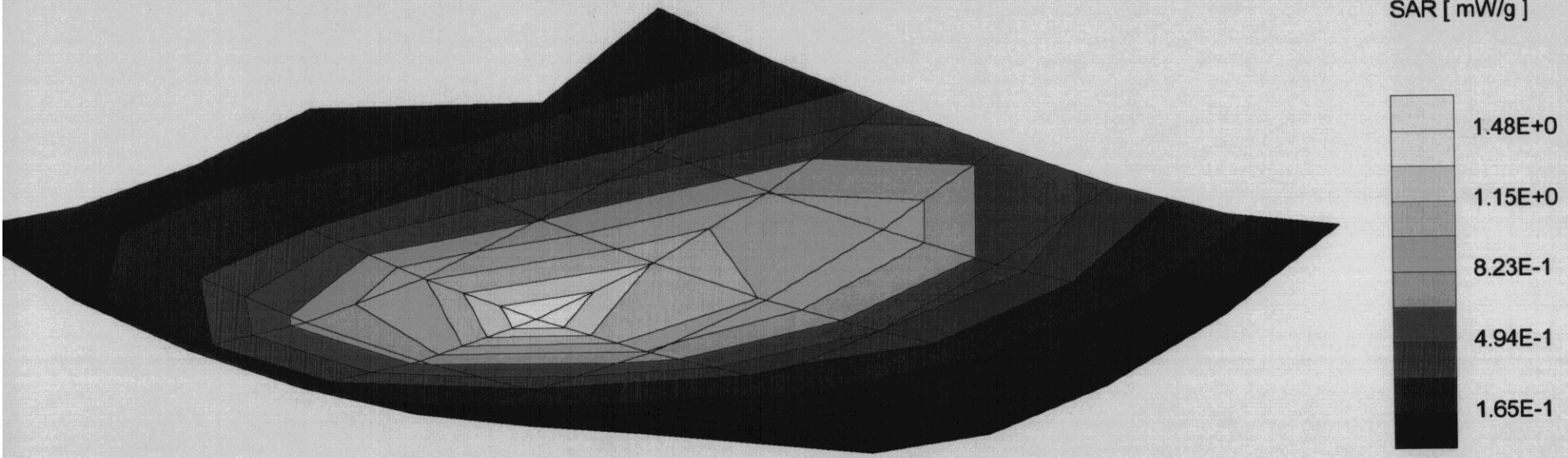
Nr 2, Type: NSD-3AX, Amps mode, Channel 384 (836MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90m.mea

σ = 0.80 [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: 1.48

SAR (1g): 1.44 [mW/g] SAR (10g): 0.954 [mW/g]



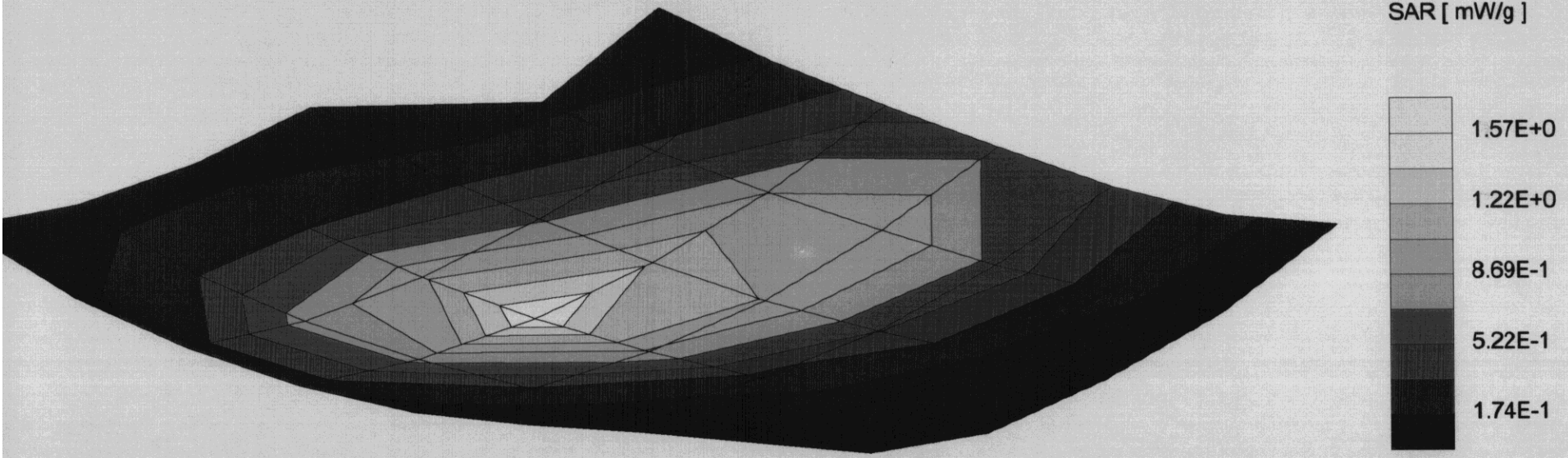
Nr 3, Type: NSD-3AX, Amps mode, Channel 799 (849MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90h.mea

σ = 0.81 [mho/m] ε_r = 41.8 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.57

SAR (1g): 1.53 [mW/g] SAR (10g): 1.00 [mW/g]



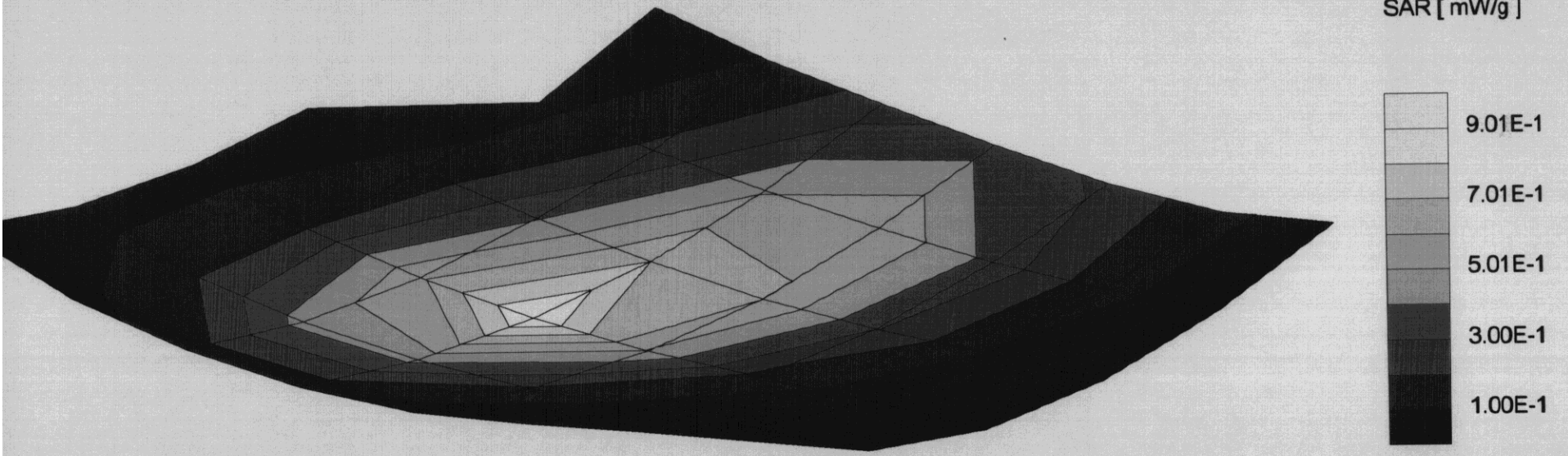
Nr 4, Type: NSD-3AX, CDMA Cellular, Ch. 991 (824MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: ccf90l.mea

σ = 0.79 [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: 0.90

SAR (1g): 0.924 [mW/g] SAR (10g): 0.618 [mW/g]



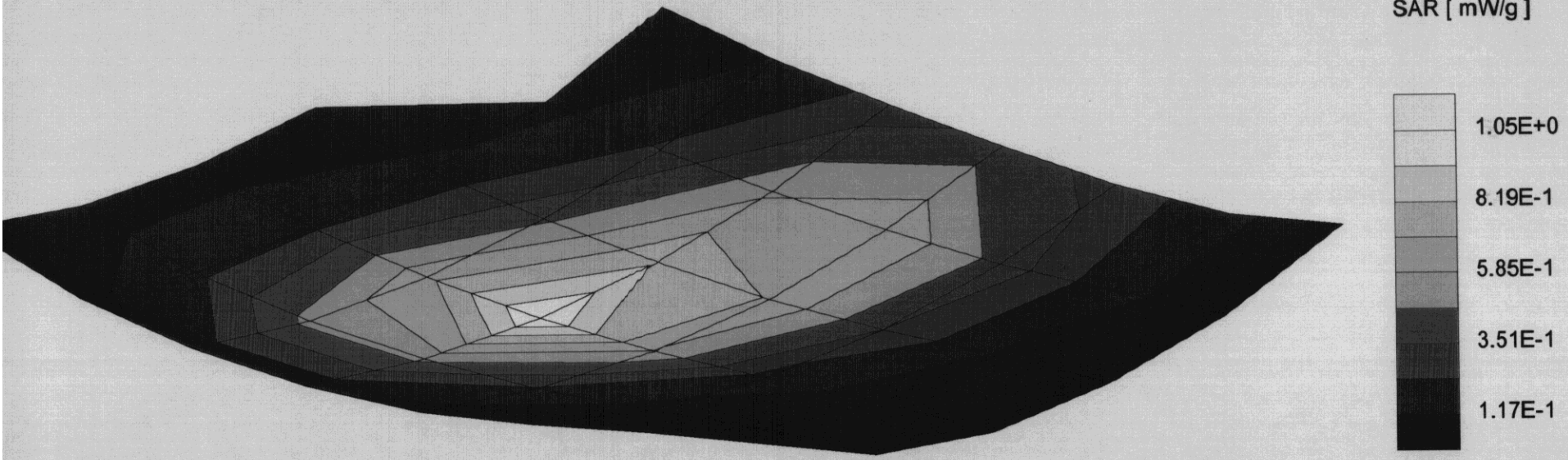
Nr 5, Type: NSD-3AX, CDMA Cellular, Ch. 384 (836MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: ccf90m.mea

σ = 0.80 [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: 1.05

SAR (1g): 1.02 [mW/g] SAR (10g): 0.672 [mW/g]



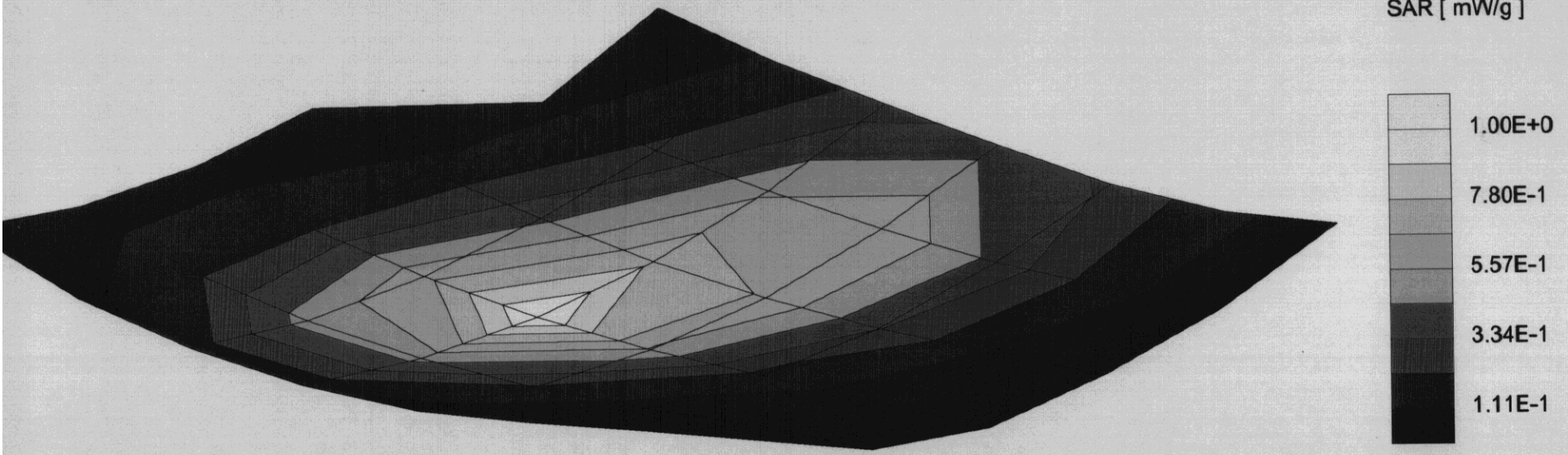
Nr 6, Type: NSD-3AX, CDMA Cellular, Ch. 799 (849MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: ccf90h.mea

σ = 0.81 [mho/m] ε_r = 41.8 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.00

SAR (1g): 1.07 [mW/g] SAR (10g): 0.698 [mW/g]



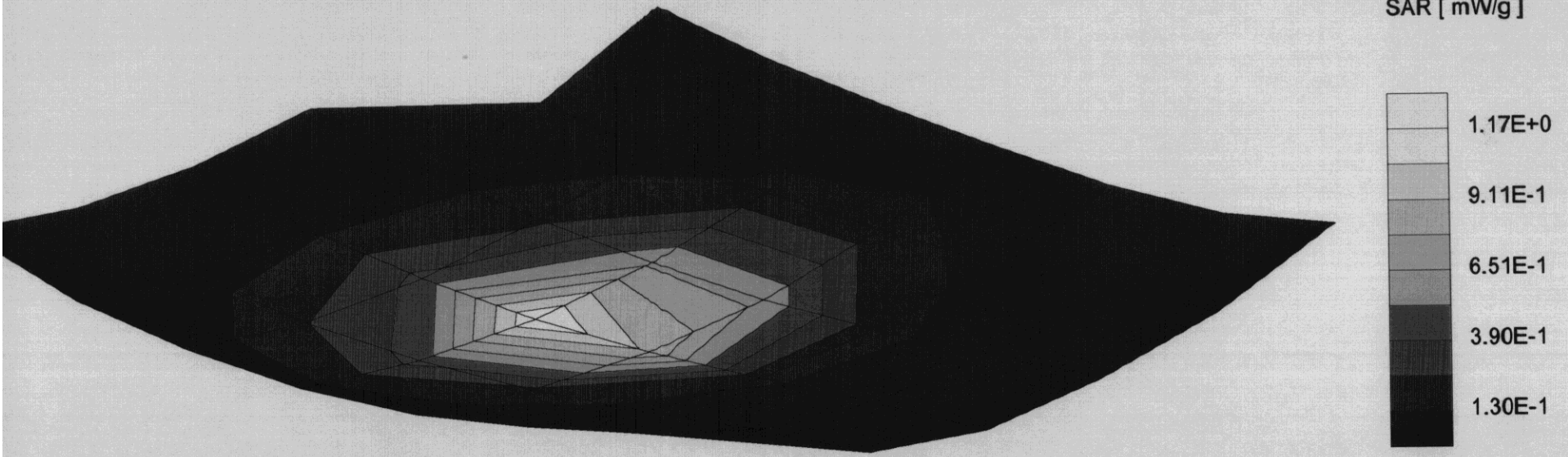
Nr 7, Type: NSD-3AX, CDMA Pcs, Channel 25 (1850MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fcp90l.mea

σ = 1.75 [mho/m] ε_r = 40.1 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.17

SAR (1g): 1.14 [mW/g] SAR (10g): 0.639 [mW/g]



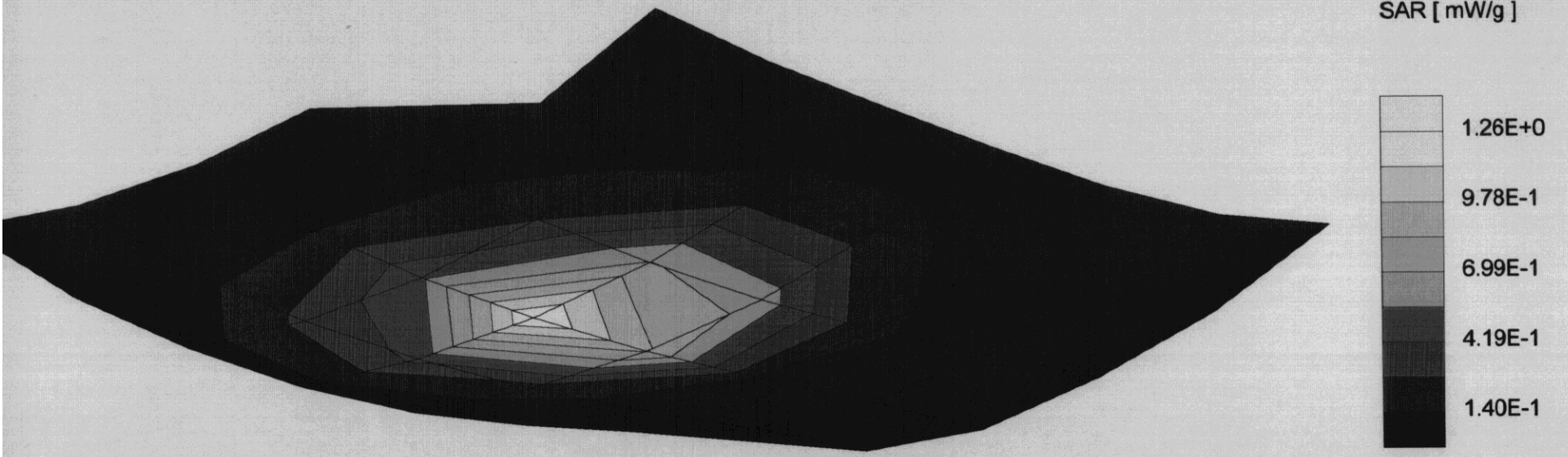
Nr 8, Type: NSD-3AX, CDMA Pcs, Channel 600 (1880MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fcp90m.mea

σ = 1.78 [mho/m] ε_r = 40.0 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.26

SAR (1g): 1.20 [mW/g] SAR (10g): 0.665 [mW/g]



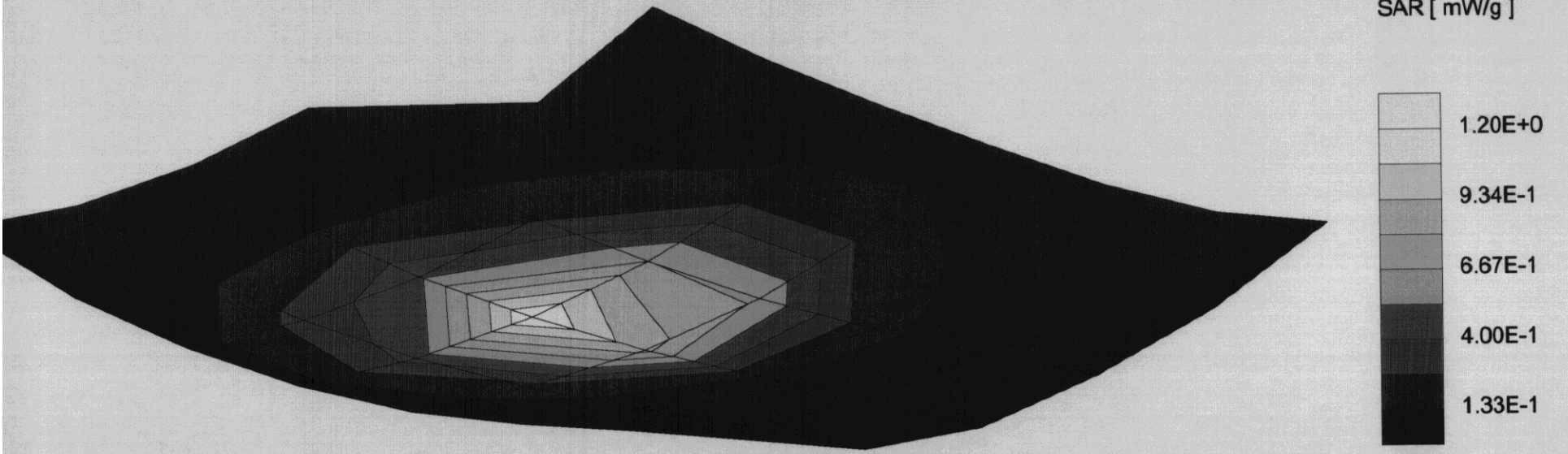
Nr 9, Type: NSD-3AX, CDMA Pcs, Channel 1175 (1909MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fcp90h.mea

σ = 1.80 [mho/m] ε_r = 39.8 ρ = 1.00 [g/cm^3]

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

SAR [mW/g] Max: 1.20

SAR (1g): 0.995 [mW/g] SAR (10g): 0.554 [mW/g]



Nr 10, Type: NSD-3AX, Amps mode, Channel 991 (824MHz), Phone position 90°, Measured 1998-11-16th/NMP, file: fca90l.mea

σ = 0.79 [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: 1.24

SAR (1g): 1.24 [mW/g] SAR (10g): 0.820 [mW/g]