

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 11:57:34 AM

05-0742-S_Motorola FV600_Flat_GMRS CH15_20051213_Body_headset_muscle_NI-MH

DUT: FV600; Type: Two way radio; FCC ID :K7GFV500

Communication System: GMRS; Frequency: 462.5500 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 462.5500$ MHz;

$s = 0.915$ mho/m; $\epsilon_r = 55.8$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: $dx=15$ mm, $dy=15$ mm ; Maximum value of SAR (interpolated) = 0.588 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

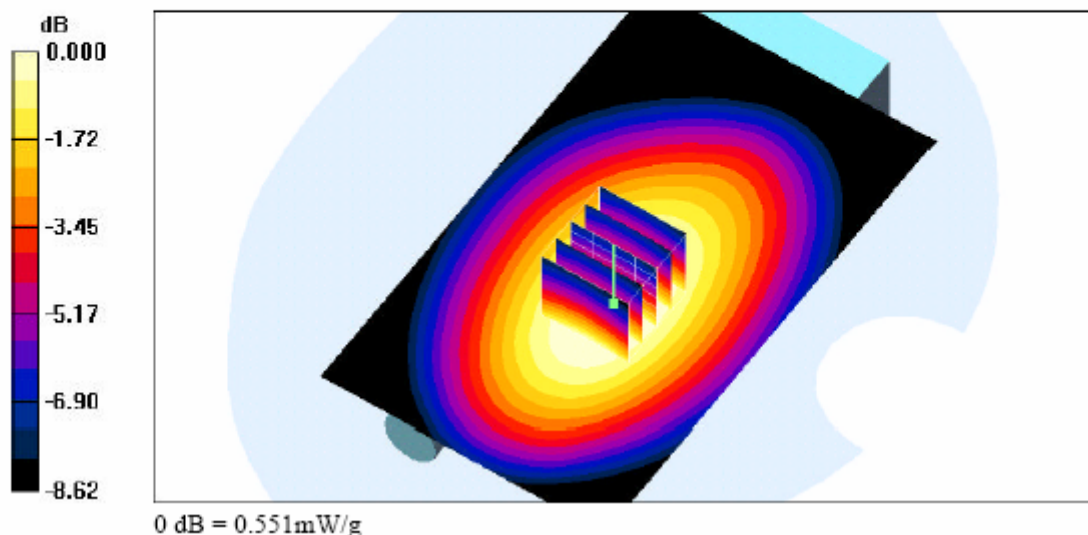
Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 24.1 V/m; Power Drift = -0.108 dB

Peak SAR (extrapolated) = 0.796 W/kg

SAR(1 g) = 0.524 mW/g; SAR(10 g) = 0.373 mW/g

Maximum value of SAR (measured) = 0.551 mW/g



SAR Test Result for GMRS Body SAR w / Belt -clip Channel 15

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 12:18:20 PM

05-0742-S_Motorola FV600_Flat_GMRS CH4_20051213_Body_headset_muscle_NI-MH**DUT: FV600; Type: Two way radio; FCC ID : K7GFV500**

Communication System: GMRS; Frequency: 462.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 462.6375$ MHz; $s = 0.915$ mho/m; $\epsilon_r = 55.8$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: dx=15mm, dy=15mm ; Maximum value of SAR (interpolated) = 0.598 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

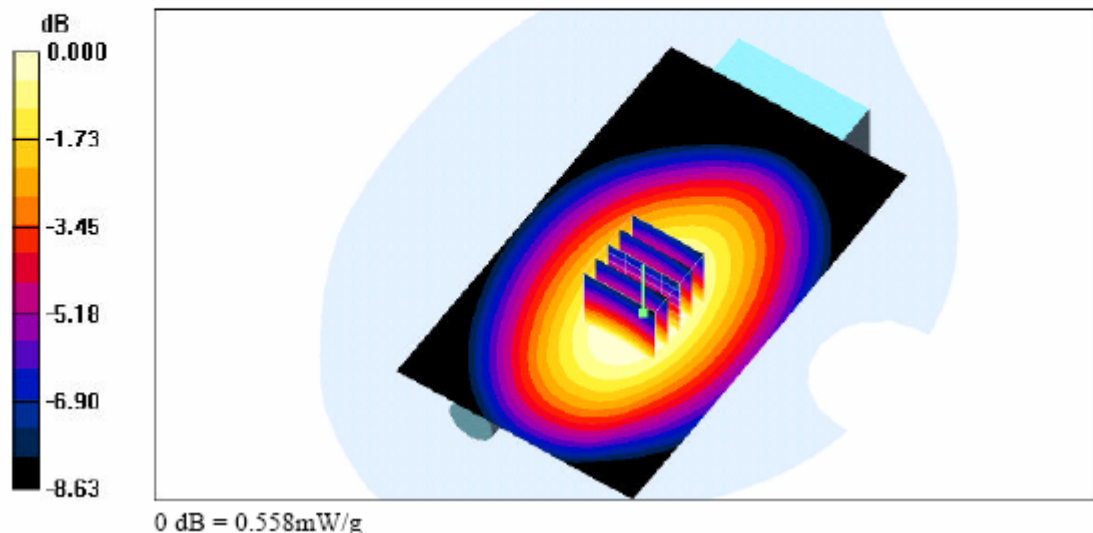
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.8 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 0.801 W/kg

SAR(1 g) = 0.531 mW/g; SAR(10 g) = 0.379 mW/g

Maximum value of SAR (measured) = 0.558 mW/g

**SAR Test Result for GMRS Body SAR w / Belt -clip Channel 4**

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 3:04:48 PM

05-0742-S_Motorola FV600_Flat_GMRS CH4_20051213_Body_headset_muscle_ALKALINE**DUT: FV600; Type: Two way radio; FCC ID : K7GFV500**

Communication System: GMRS; Frequency: 462.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 462.6375$ MHz; $s = 0.915$ mho/m; $\epsilon_r = 55.8$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: dx=15mm, dy=15mm ; Maximum value of SAR (interpolated) = 0.716 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

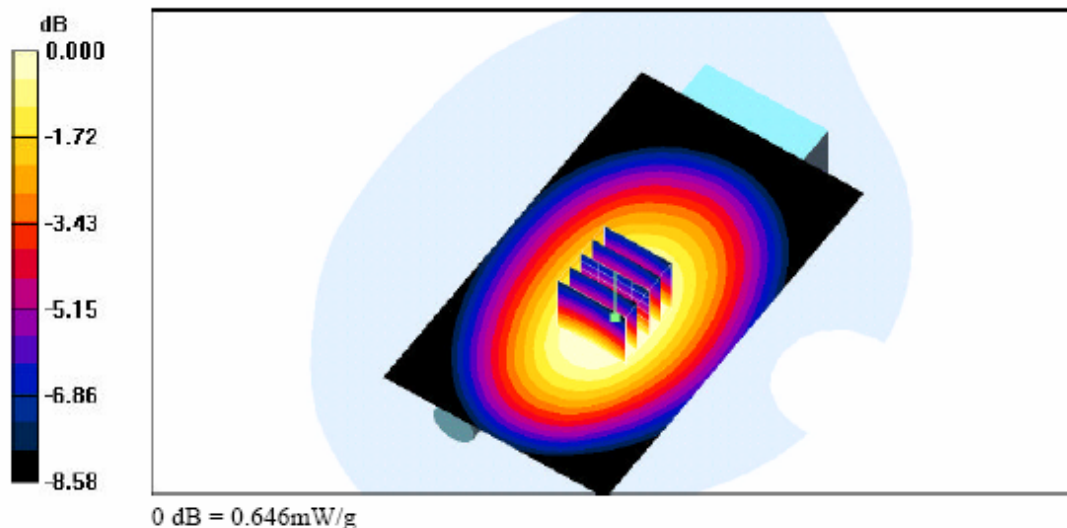
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.6 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.930 W/kg

SAR(1 g) = 0.616 mW/g; SAR(10 g) = 0.440 mW/g

Maximum value of SAR (measured) = 0.646 mW/g

**SAR Test Result for GMRS Body SAR w / Belt -clip Channel 4_ALKALINE**

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 1:49:51 PM

05-0742-S_Motorola FV600_Flat_GMRS CH22_20051213_Body_headset_muscle_NI-MH

DUT: FV600; Type: Two way radio; FCC ID : K7GFV500

Communication System: GMRS; Frequency: 462.7250 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 462.7250$ MHz;

$s = 0.915$ mho/m; $\epsilon_r = 55.8$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: dx=15mm, dy=15mm ; Maximum value of SAR (interpolated) = 0.646 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

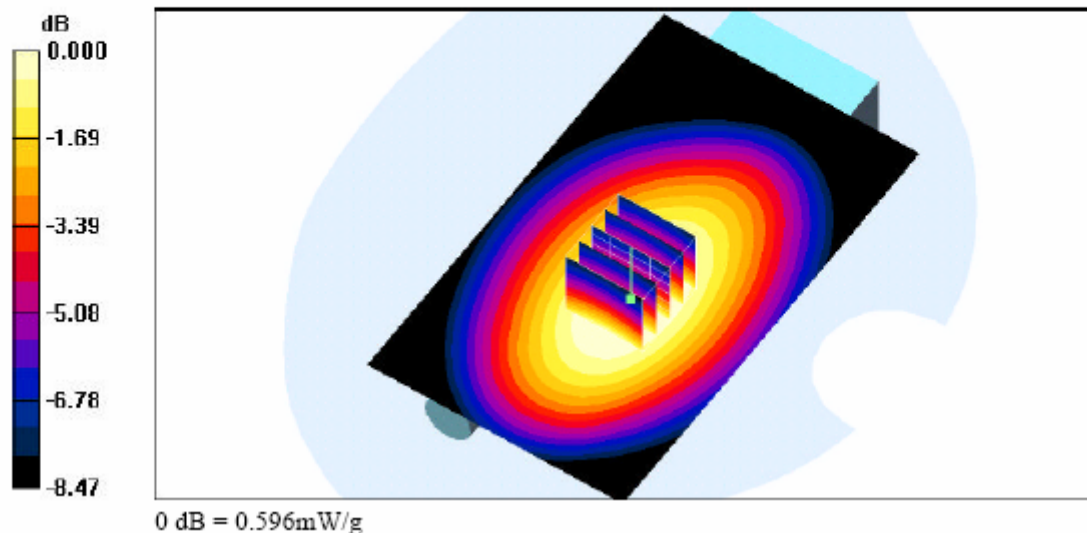
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.3 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 0.858 W/kg

SAR(1 g) = 0.569 mW/g; SAR(10 g) = 0.407 mW/g

Maximum value of SAR (measured) = 0.596 mW/g



SAR Test Result for GMRS Body SAR w / Belt -clip Channel 22

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 10:48:56 AM

05-0742-S_Motorola FV600_Flat_FRS CH8_20051213_Body_headset_muscle_NI-MH**DUT: FV600; Type: Two way radio; FCC ID :K7GFV500**

Communication System: FRS; Frequency: 467.5625 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 467.5625$ MHz; $s = 0.921$ mho/m; $\epsilon_r = 55.7$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: dx=15mm, dy=15mm ; Maximum value of SAR (interpolated) = 0.422 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

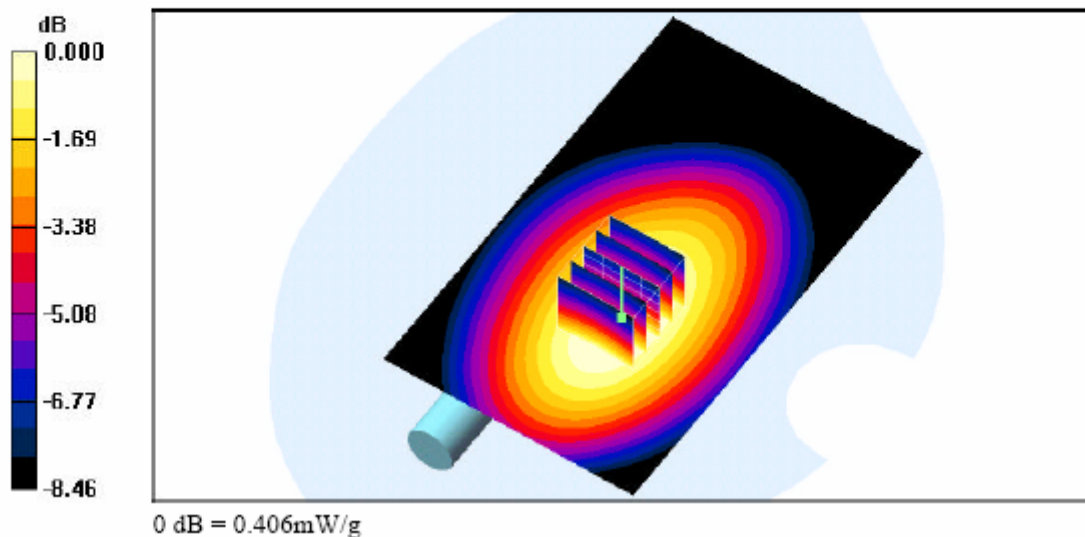
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.7 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 0.582 W/kg

SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.279 mW/g

Maximum value of SAR (measured) = 0.406 mW/g

**SAR Test Result for FRS Body SAR w / Belt -clip Channel 8**

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 11:13:27 AM

05-0742-S_Motorola FV600_Flat_FRS CH11_20051213_Body_headset_muscle_NI-MH**DUT: FV600; Type: Two way radio; FCC ID:K7GFV500**

Communication System: FRS; Frequency: 467.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 467.6375$ MHz; $s = 0.921$ mho/m; $\epsilon_r = 55.7$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: dx=15mm, dy=15mm ; Maximum value of SAR (interpolated) = 0.473 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

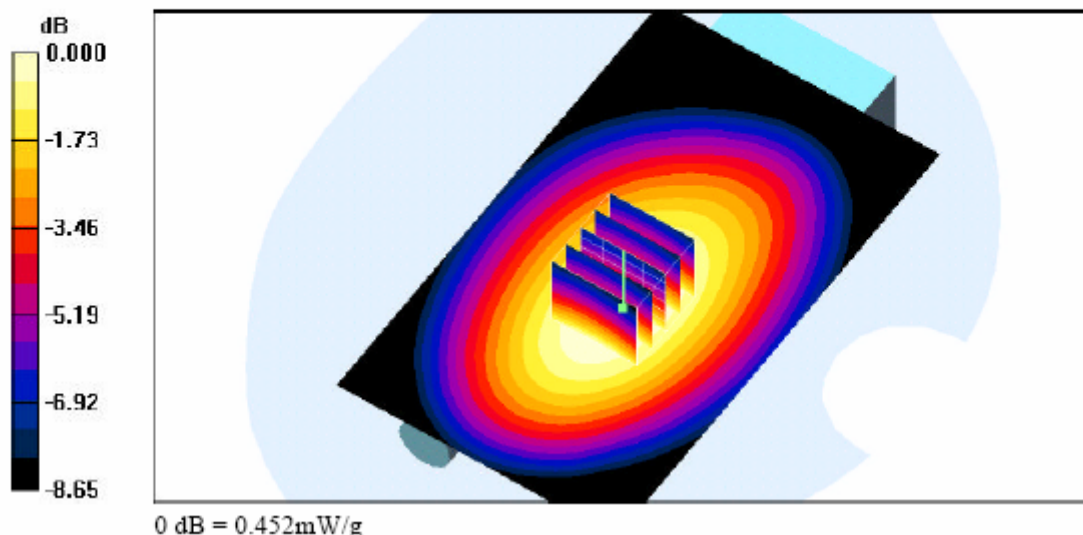
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.6 V/m; Power Drift = -0.188 dB

Peak SAR (extrapolated) = 0.646 W/kg

SAR(1 g) = 0.432 mW/g; SAR(10 g) = 0.309 mW/g

Maximum value of SAR (measured) = 0.452 mW/g

**SAR Test Result for FRS Body SAR w / Belt -clip Channel 11**

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 2:17:14 PM

05-0742-S_Motorola FV600_Flat_FRS CH11_20051213_Body_headset_muscle_ALKALINE

DUT: FV600; Type: Two way radio; FCC ID:K7GFV500

Communication System: FRS; Frequency: 467.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 467.6375 \text{ MHz}$;

$s = 0.921 \text{ mho/m}$; $\epsilon_r = 55.7$; density = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.578 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

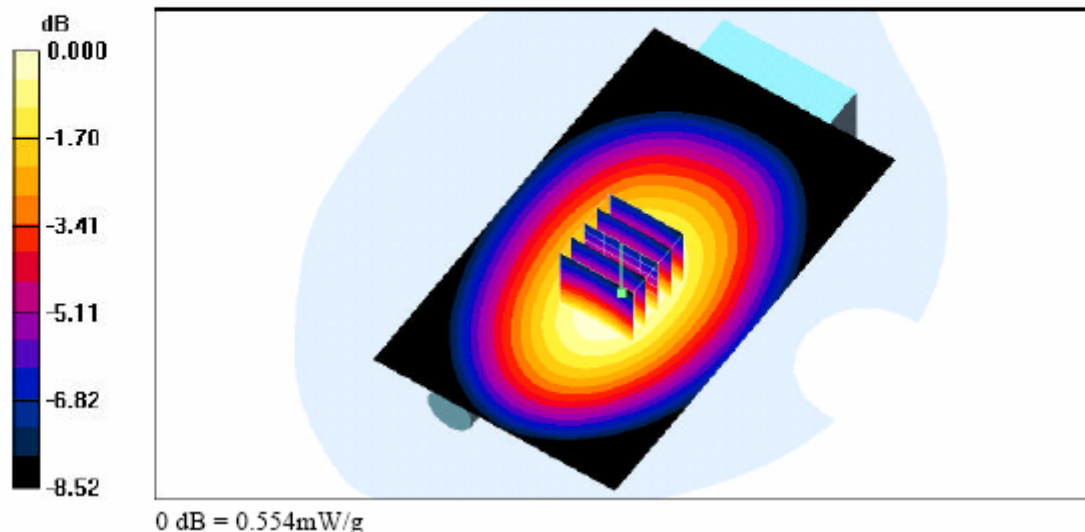
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.7 V/m ; Power Drift = -0.118 dB

Peak SAR (extrapolated) = 0.798 W/kg

SAR(1 g) = 0.529 mW/g ; SAR(10 g) = 0.377 mW/g

Maximum value of SAR (measured) = 0.554 mW/g



SAR Test Result for FRS Body SAR w / Belt -clip Channel 11_ALKALINE

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 11:34:13 AM

05-0742-S_Motorola FV600_Flat_FRS CH14_20051213_Body_headset_muscle_NI-MH**DUT: FV600; Type: Two way radio; FCC ID:K7GFV500**

Communication System: FRS; Frequency: 467.7125 MHz; Duty Cycle: 1:1

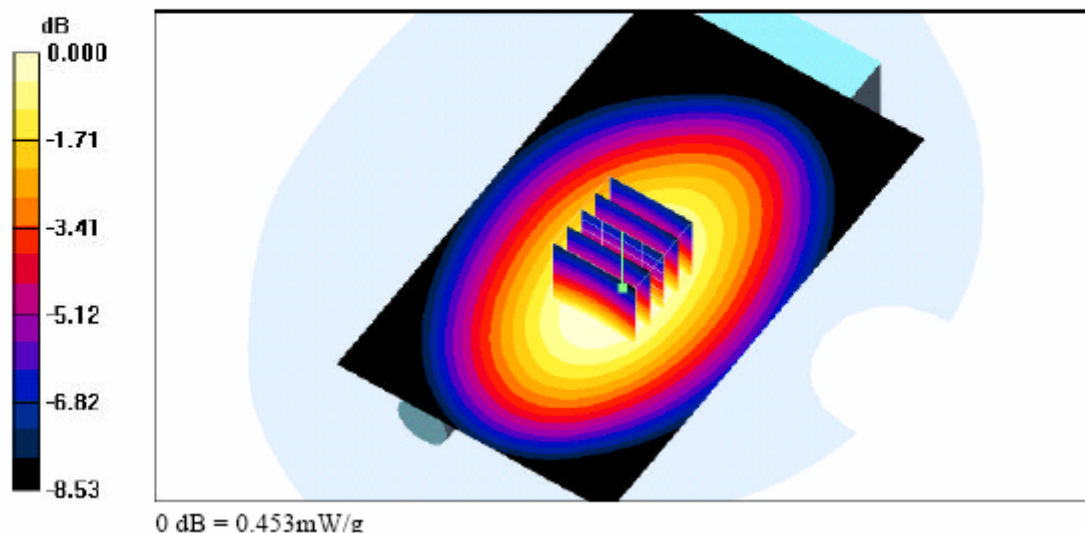
Medium: Body 450MHz Medium parameters used: $f = 467.7125$ MHz; $s = 0.921$ mho/m; $\epsilon_r = 55.7$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):Measurement grid: $dx=15$ mm, $dy=15$ mm ; Maximum value of SAR (interpolated) = 0.486 mW/g**Flat/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mmReference Value = 21.2 V/m; Power Drift = -0.108 dBPeak SAR (extrapolated) = 0.646 W/kgSAR(1 g) = 0.433 mW/g; SAR(10 g) = 0.311 mW/gMaximum value of SAR (measured) = 0.453 mW/g**SAR Test Result for FRS Body SAR w / Belt -clip Channel 14**

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 7:13:04 PM

05-0742-S_Motorola FV600_Flat_GMRS CH4_20051213_Body_15 mm_muscle_NI-MH**DUT: FV600; Type: Two way radio; FCC ID : K7GFV500**

Communication System: GMRS; Frequency: 462.6375 MHz; Duty Cycle: 1:1

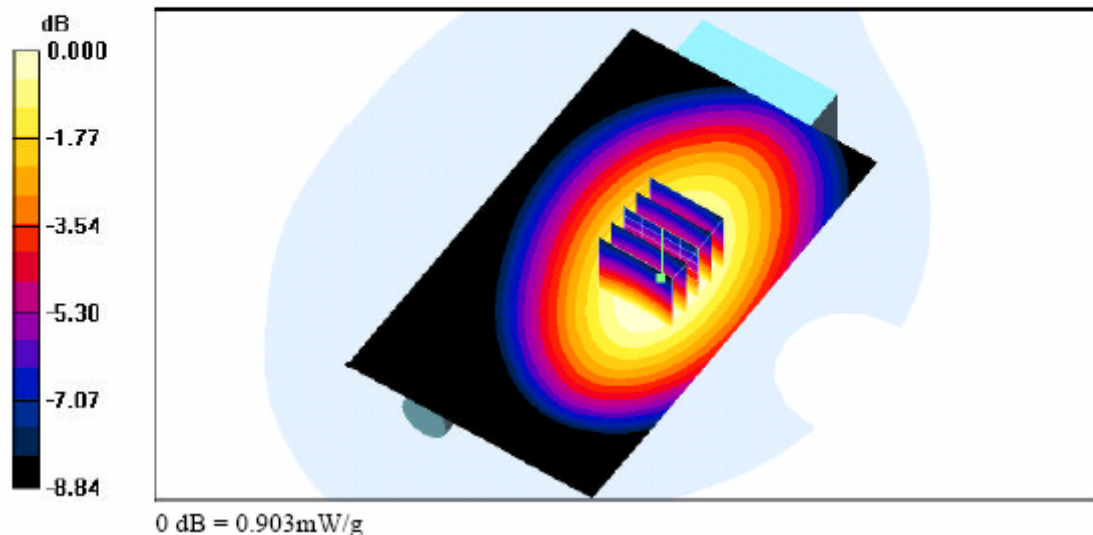
Medium: Body 450MHz Medium parameters used: $f = 462.6375 \text{ MHz}$; $s = 0.915 \text{ mho/m}$; $\epsilon_r = 55.8$; density = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.979 mW/g **Flat/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 27.9 V/m ; Power Drift = -0.159 dB Peak SAR (extrapolated) = 1.29 W/kg SAR(1 g) = 0.859 mW/g ; SAR(10 g) = 0.610 mW/g Maximum value of SAR (measured) = 0.903 mW/g **SAR Test Result for GMRS Body SAR w/o Belt -clip -1.5cm Channel 4**

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 5:40:03 PM

05-0742-S_Motorola FV600_Flat_GMRS CH4_20051213_Body_15 mm_muscle_ALKALINE

DUT: FV600; Type: Two way radio; FCC ID : K7GFV500

Communication System: GMRS; Frequency: 462.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 462.6375 \text{ MHz}$;

$s = 0.915 \text{ mho/m}$; $\epsilon_r = 55.8$; density = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.668 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

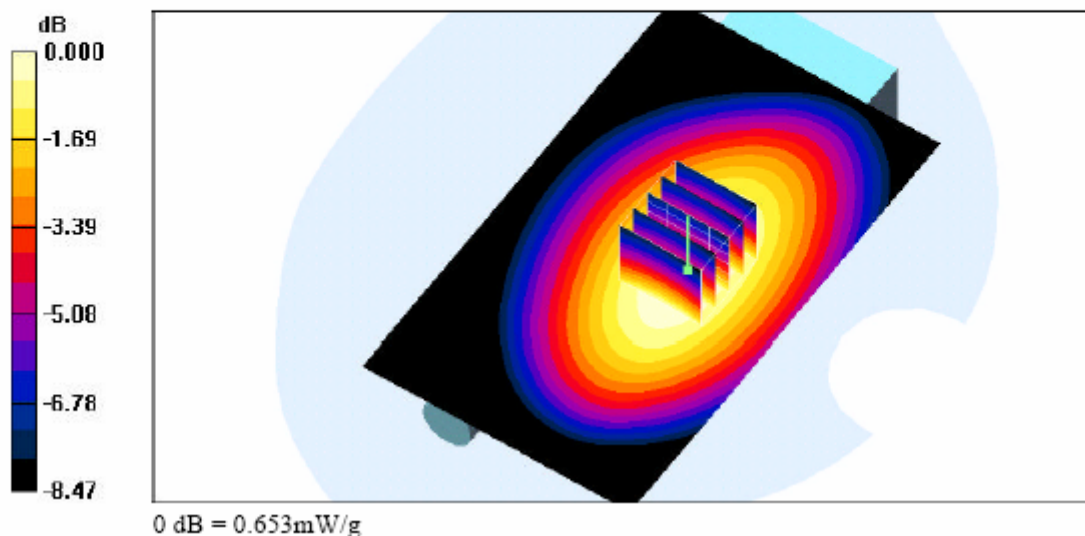
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.4 V/m ; Power Drift = -0.135 dB

Peak SAR (extrapolated) = 0.932 W/kg

SAR(1 g) = 0.624 mW/g ; SAR(10 g) = 0.446 mW/g

Maximum value of SAR (measured) = 0.653 mW/g



SAR Test Result for GMRS Body SAR w/o Belt -clip -1.5cm Channel 4_ALKALINE

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 6:26:45 PM

05-0742-S_Motorola FV600_Flat_FRS CH11_20051213_Body_15 mm_muscle_NI-MH

DUT: FV600; Type: Two way radio; FCC ID:K7GFV500

Communication System: FRS; Frequency: 467.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 467.6375$ MHz;

$s = 0.921$ mho/m; $\epsilon_r = 55.7$; density = 1000 kg/m³ ;

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: dx=15mm, dy=15mm ; Maximum value of SAR (interpolated) = 0.644 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

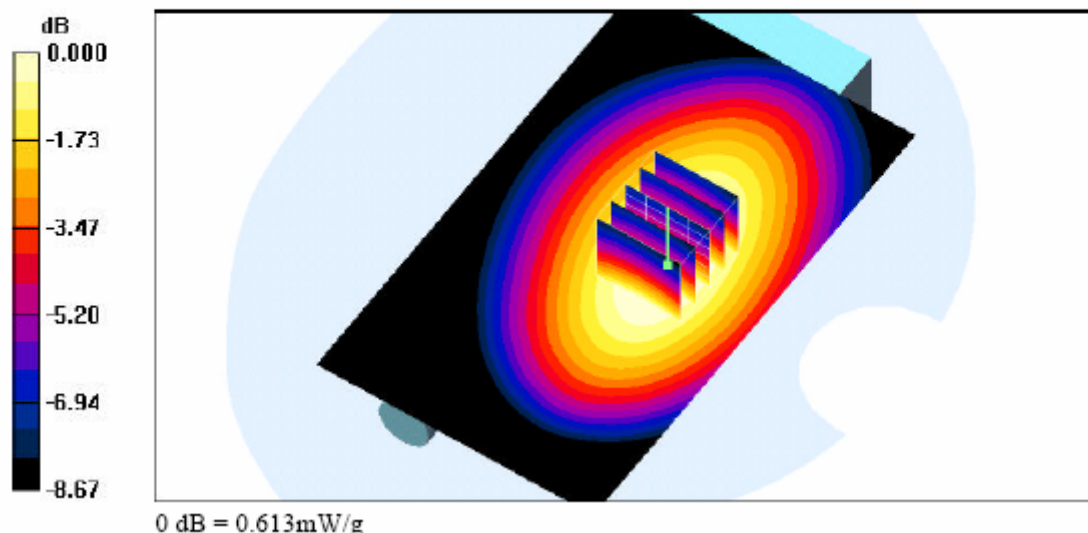
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.4 V/m; Power Drift = -0.189 dB

Peak SAR (extrapolated) = 0.886 W/kg

SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.419 mW/g

Maximum value of SAR (measured) = 0.613 mW/g



SAR Test Result for FRS Body SAR w/o Belt –clip -1.5cm Channel 11

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/13/2005 6:03:24 PM

05-0742-S_Motorola FV600_Flat_FRS CH11_20051213_Body_15 mm_muscle_ALKALINE

DUT: FV600; Type: Two way radio; FCC ID:K7GFV500

Communication System: FRS; Frequency: 467.6375 MHz; Duty Cycle: 1:1

Medium: Body 450MHz Medium parameters used: $f = 467.6375$ MHz;

$s = 0.921$ mho/m; $\epsilon_r = 55.7$; density = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1530-LF; ConvF(7.19, 7.19, 7.19); Calibrated: 9/6/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Flat/Area Scan (71x121x1):

Measurement grid: $dx=15$ mm, $dy=15$ mm ; Maximum value of SAR (interpolated) = 0.509 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

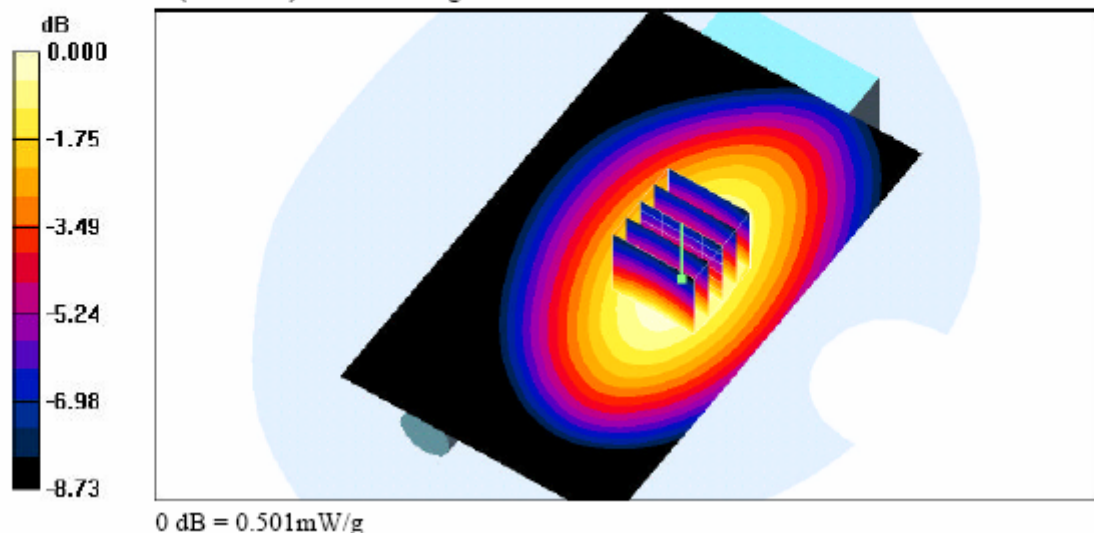
Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 19.0 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 0.730 W/kg

SAR(1 g) = 0.480 mW/g; SAR(10 g) = 0.342 mW/g

Maximum value of SAR (measured) = 0.501 mW/g



SAR Test Result for FRS Body SAR w/o Belt -clip -1.5cm Channel 11_ALKALINE

Appendix C – Dipole Calibration

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **D450V2-1021_Feb05**

CALIBRATION CERTIFICATE

Object **D450V2 - SN: 1021**

Calibration procedure(s) **QA CAL-15.v4
Calibration Procedure for dipole validation kits below 800 MHz**

Calibration date: **February 1, 2005**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN: 901	29-Jun-04 (SPEAG, No. DAE4-901_Jun04)	Jun-05
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

Calibrated by:	Name Nico Vetterli	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: February 1, 2005

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D450V2-1021_Feb05

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Calibration Laboratory of

Schmid & Partner

Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.3
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom V4.4	Shell thickness: 6 ± 0.2 mm
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	43.5	0.87 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	45.1 $\pm$ 6 %	0.87 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	398 mW input power	2.01 mW / g
SAR normalized	normalized to 1W	5.05 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	5.13 mW / g $\pm$ 18.1 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.32 mW / g
SAR normalized	normalized to 1W	3.32 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	3.36 mW / g $\pm$ 17.6 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	56.7	0.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.6 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	398 mW input power	2.14 mW / g
SAR normalized	normalized to 1W	5.38 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	5.26 mW / g ± 18.1 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	398 mW input power	1.39 mW / g
SAR normalized	normalized to 1W	3.49 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	3.43 mW / g ± 17.6 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"