

TEST REPORT



Your Ref:

Date: 6 Oct 2003

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COMPLIANCE REPORT ON TESTING IN ACCORDANCE WITH SAR (SPECIFIC ABSORPTION RATE) REQUIREMENTS

Supplement C (Edition 01-01) FCC OET Bulletin 65 (Edition 97-01)

OF A

**Mobile Phone comes with CDMA_2000 1x (800MHz) & Amps
[Model: K112]**

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JOB NUMBER 56S030874

TEST PERIOD 30 Sept 2003 - 3 Oct 2003

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LA-2001-0212-A
LA-2001-0213-F
LA-2001-0214-E
LA-2001-0215-B
LA-2001-0216-G
LA-2001-0217-G
The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme

TEST SUMMARY

PRODUCT DESCRIPTION

TEST RESULTS

ANNEX A	-	TEST INSTRUMENTATION & GENERAL PROCEDURES
ANNEX B	-	EUT PHOTOGRAPHS / DIAGRAMS Test Setup EUT Photographs
ANNEX C	-	TISSUE SIMULANT DATA SHEETS
ANNEX D	-	SAR VALIDATION RESULTS
ANNEX E	-	MEASUREMENT UNCERTAINTY
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TEST SUMMARY

The product was tested in accordance with the following standards.

Test Results Summary

Test Standards	Description	Pass / Fail
- Supplement C (Edition 01-01) to FCC OET Bulletin 65 (Edition 97-01) - ANSI/IEEE Standard C95.1-1993	SAR Measurement (AMPS Mode) Device at head phantom	Pass *
	SAR Measurement (CDMA Mode) Device at head phantom	Pass *
	SAR Measurement (AMPS Mode) Body Worn Configuration Only	Pass *
	SAR Measurement (CDMA Mode) Body Worn Configuration Only	Pass *

Note:

- The worst-case SAR value was found to be **1.45W/kg** which is lower than the maximum limit of 1.60 W/kg, over 1g of tissue.
- * Based on spatial peak uncontrolled exposure / general population level:
 Head: 1.60 W/kg, over 1g of tissue.
 Body: 1.60 W/kg, over 1g of tissue.

Modifications

No modifications were made.

DEVICE DESCRIPTION

DEVICE DESCRIPTION

Description	Mobile Phone comes with CDMA_2000 1x (800MHz) & Amps
Device Category	Portable Device
Exposure Environment	General Population/Uncontrolled exposure
Test Device Type	Production Unit
Model	K112
Brand Name	Kyocera
Serial Numbers	9D373100178
FCC ID	Q3OKWC - K112 (Class II Permissive Change)

DEVICE OPERATING CONFIGURATION

Operating Frequencies	AMPS Mode Channel 991 (824.04Mhz) Channel 384 (836.52Mhz) Channel 799 (848.97Mhz)	CDMA Mode Channel 1013 (824.70Mhz) Channel 384 (836.52Mhz) Channel 777 (848.31Mhz)
Operating Temperature Tolerance	(-30 ~ +60) Degree Celsius	
Operating Voltage Tolerance	(3.6 ~ 4.2) Volt DC	
Continuous Transmission Tolerance	The EUT shall cause no problem after transmitting for 110 minutes under maximum transmitting power rate.	
Rated Output Power	25.0 dBm $\pm$ 0.5dBm, Maximum (AMPS Phone) 23.8 dBm $\pm$ 0.2dBm, Maximum (CDMA Phone)	
Antenna Type	Integrated Antenna	
EUT Crest Factor	1.0	
Input Power	Lithium Ion Integrated Battery, 3.7V 900mAh (Model: LP063048AH)	
Accessories	1) Charger 2) Belt Clip 3) Headset with Mic. and Speaker	

MANUFACTURER

Manufacturer Address	Rod. Sen. Jose Ermirio De de Moraes, KM11 Vila Aparecidinha-Sorocaba 18087-090-Sao Paulo Brasil
DID	55-15-235 6284
Fax	55-15-3325 1351

DEVICE OPERATING CONDITION

The EUT was put into operation by a radio test set. Communication between the EUT and the radio test set was established by air link. For every SAR measurement, the EUT was set to maximum output power level using fully charged battery.

TEMPERATURE AND HUMIDITY
AMPS Mode (Head)

Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

CDMA Mode (Head)

Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

AMPS Mode (Body)

Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

CDMA Mode (Body)

Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

TEST RESULTS

The measurement results were obtained with the EUT tested in the conditions described in this report (Annex A).

Table 1 - SAR Test Results (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 991 824.04MHz	Channel: 384 836.52MHz	Channel: 799 848.97MHz
Left Side of Head	Cheek / Touch	fixed	1.060	1.220	1.190
	Ear / Tilt	fixed	0.863	0.989	0.917
Right Side of Head	Cheek / Touch	fixed	1.130	1.290	1.210
	Ear / Tilt	fixed	0.911	1.090	1.040
Output Power (dBm) Before Test			25.3	25.4	25.6
Output Power (dBm) After Test			25.2	25.2	25.4

Table 2 - SAR Test Results (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 1013 824.70MHz	Channel: 384 836.52MHz	Channel: 777 848.31MHz
Left Side of Head	Cheek / Touch	fixed	0.725	0.787	0.743
	Ear / Tilt	fixed	0.560	0.637	0.558
Right Side of Head	Cheek / Touch	fixed	0.798	0.884	0.771
	Ear / Tilt	fixed	0.670	0.754	0.627
Output Power (dBm) Before Test			23.8	23.7	23.9
Output Power (dBm) After Test			23.6	23.6	23.8

Remarks:

- All modes of operations were investigated and the worst-case SAR levels are reported.
- A fully charged Lithium Ion Integrated Battery, 3.7V 900mAh (Model: LP063048AH), was used for each mode of operation.
- For the **AMPS Mode**, the worst-case SAR value was found to be **1.29W/Kg** (over a 1g tissue) at **Channel 384** which is lower than the maximum limit of 1.60 W/Kg, please refer to the above table.
- For the **CDMA Mode**, the worst-case SAR value was found to be **0.884W/Kg** (over a 1g tissue) at **Channel 384** which is lower than the maximum limit of 1.60 W/Kg, please refer to the above table.
- The SAR limit of 1.60W/Kg (Spatial Peak level for Uncontrolled Exposure / General Population) is based on the Test Standards:
 - Supplement C (Edition 01-01) to FCC OET Bulletin 65 (Edition 97-01)
 - ANSI/IEEE Standard C95.1-1993

TEST RESULTS

The measurement results were obtained with the EUT tested in the conditions described in this report (Annex A).

Table 3 – Body Worn Position SAR Test Results (AMPS Mode), device with belt clip(26mm spacing).

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 991 824.04MHz	Channel: 384 836.52MHz	Channel: 799 848.97MHz
Flat Phantom	EUT Rear To Phantom	fixed	0.480	0.410	0.512
Output Power (dBm) Before Test			25.3	25.4	25.6
Output Power (dBm) After Test			25.2	25.2	25.4

Table 4 – Body Worn Position SAR Test Results (AMPS Mode), device Front Touching.

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 991 824.04MHz	Channel: 384 836.52MHz	Channel: 799 848.97MHz
Flat Phantom	EUT Front Touched Phantom	fixed	0.695	0.780	0.900
Output Power (dBm) Before Test			25.3	25.4	25.6
Output Power (dBm) After Test			25.2	25.2	25.4

Remarks:

1. All modes of operations were investigated and the worst-case SAR levels are reported.
2. A fully charged Lithium Ion Integrated Battery, 3.7V 900mAh (Model: LP063048AH), was used for each mode of operation.
3. For the **AMPS Mode**, the worst-case SAR value was found to be **0.900W/Kg** (over a 1g tissue) at **Channel 799** which is lower than the maximum limit of 1.60 W/Kg, please refer to the above table.
4. The SAR limit of 1.60W/Kg (Spatial Peak level for Uncontrolled Exposure / General Population) is based on the Test Standards:
 - a) Supplement C (Edition 01-01) to FCC OET Bulletin 65 (Edition 97-01)
 - b) ANSI/IEEE Standard C95.1-1993

TEST RESULTS

The measurement results were obtained with the EUT tested in the conditions described in this report (Annex A).

Table 5 – Body Worn Position SAR Test Results (CDMA Mode), device with belt clip(26mm spacing).

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 1013 824.70MHz	Channel: 384 836.52MHz	Channel: 777 848.31MHz
Flat Phantom	EUT Rear To Phantom	fixed	0.217	0.240	0.234
Output Power (dBm) Before Test			23.8	23.7	23.9
Output Power (dBm) After Test			23.6	23.6	23.8

Table 6 – Body Worn Position SAR Test Results (CDMA Mode), device Front Touching.

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 1013 824.70MHz	Channel: 384 836.52MHz	Channel: 777 848.31MHz
Flat Phantom	EUT Front Touched Phantom	fixed	0.423	0.519	0.440
Output Power (dBm) Before Test			23.8	23.7	23.9
Output Power (dBm) After Test			23.6	23.6	23.8

Remarks:

1. All modes of operations were investigated and the worst-case SAR levels are reported.
2. A fully charged Lithium Ion Integrated Battery, 3.7V 900mAh (Model: LP063048AH), was used for each mode of operation.
3. For the **CDMA Mode**, the worst-case SAR value was found to be **0.519W/Kg** (over a 1g tissue) at **Channel 384** which is lower than the maximum limit of 1.60 W/Kg, please refer to the above table.
4. The SAR limit of 1.60W/Kg (Spatial Peak level for Uncontrolled Exposure / General Population) is based on the Test Standards:
 - a) Supplement C (Edition 01-01) to FCC OET Bulletin 65 (Edition 97-01)
 - b) ANSI/IEEE Standard C95.1-1993

TEST RESULTS

The measurement results were obtained with the EUT tested in the conditions described in this report (Annex A).

Table 7 – Body Worn Position SAR Test Results (AMPS Mode), device with belt clip(11mm spacing).

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 991 824.04MHz	Channel: 384 836.52MHz	Channel: 799 848.97MHz
Flat Phantom	EUT Rear To Phantom	fixed	1.18	1.34	1.45

Table 8 – Body Worn Position SAR Test Results (CDMA Mode), device with belt clip(11mm spacing).

Phantom Configuration	Device Test Positions	Antenna Position	SAR (W/kg), over 1g Tissue Device Test Channel & Frequency		
			Channel: 1013 824.70MHz	Channel: 384 836.52MHz	Channel: 777 848.31MHz
Flat Phantom	EUT Rear To Phantom	fixed	0.901	0.922	1.11

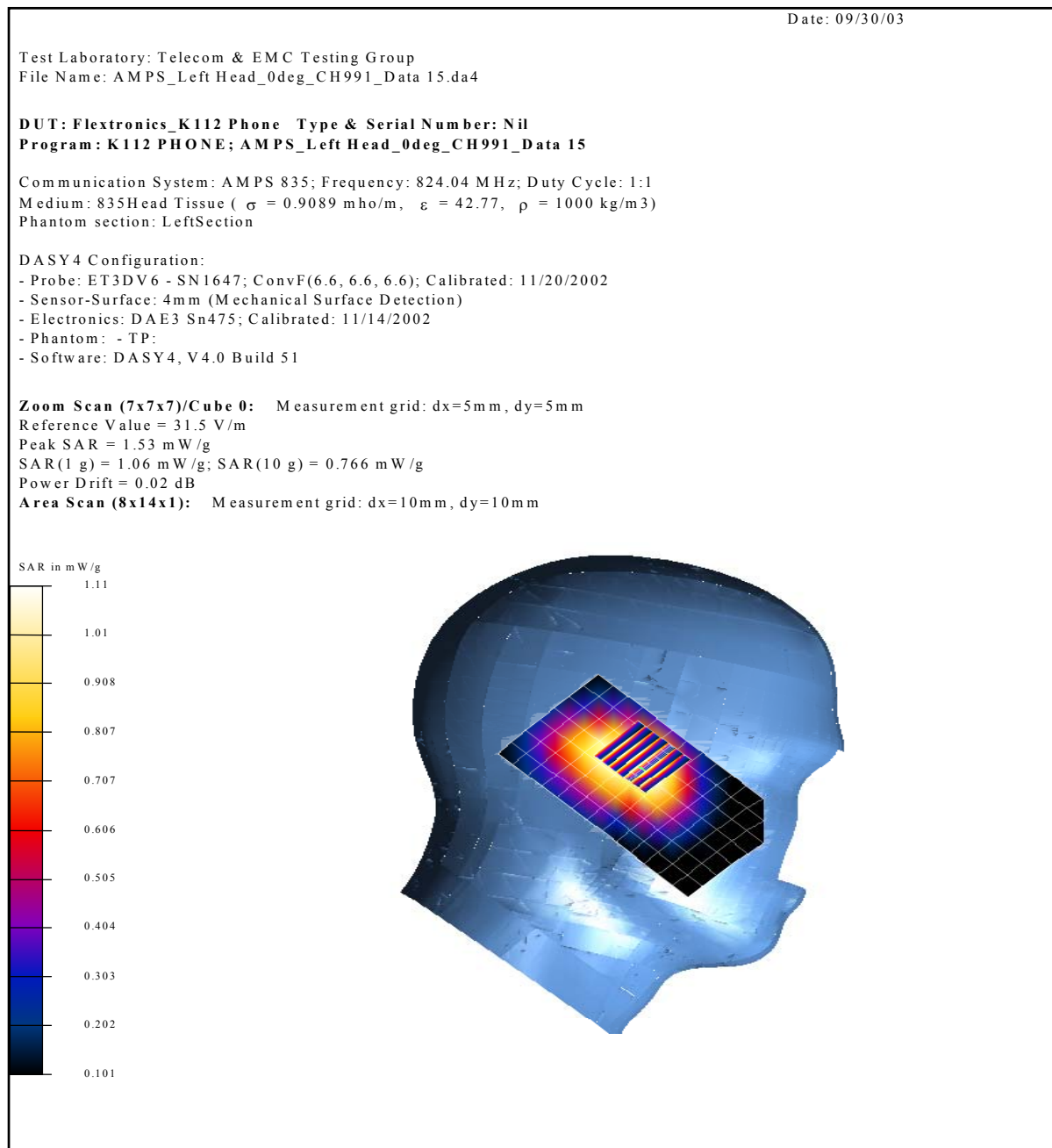
Remarks:

- All modes of operations were investigated and the worst-case SAR levels are reported.
- A fully charged Lithium Ion Integrated Battery, 3.7V 900mAh (Model: LP063048AH), was used for each mode of operation.
- For the **AMPS Mode**, the worst-case SAR value was found to be **1.45W/Kg** (over a 1g tissue) at **Channel 799** which is lower than the maximum limit of 1.60 W/Kg, please refer to the above table.
- For the **CDMA Mode**, the worst-case SAR value was found to be **1.11W/Kg** (over a 1g tissue) at **Channel 777** which is lower than the maximum limit of 1.60 W/Kg, please refer to the above table
- The SAR limit of 1.60W/Kg (Spatial Peak level for Uncontrolled Exposure / General Population) is based on the Test Standards:
 - Supplement C (Edition 01-01) to FCC OET Bulletin 65 (Edition 97-01)
 - ANSI/IEEE Standard C95.1-1993

Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 1: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

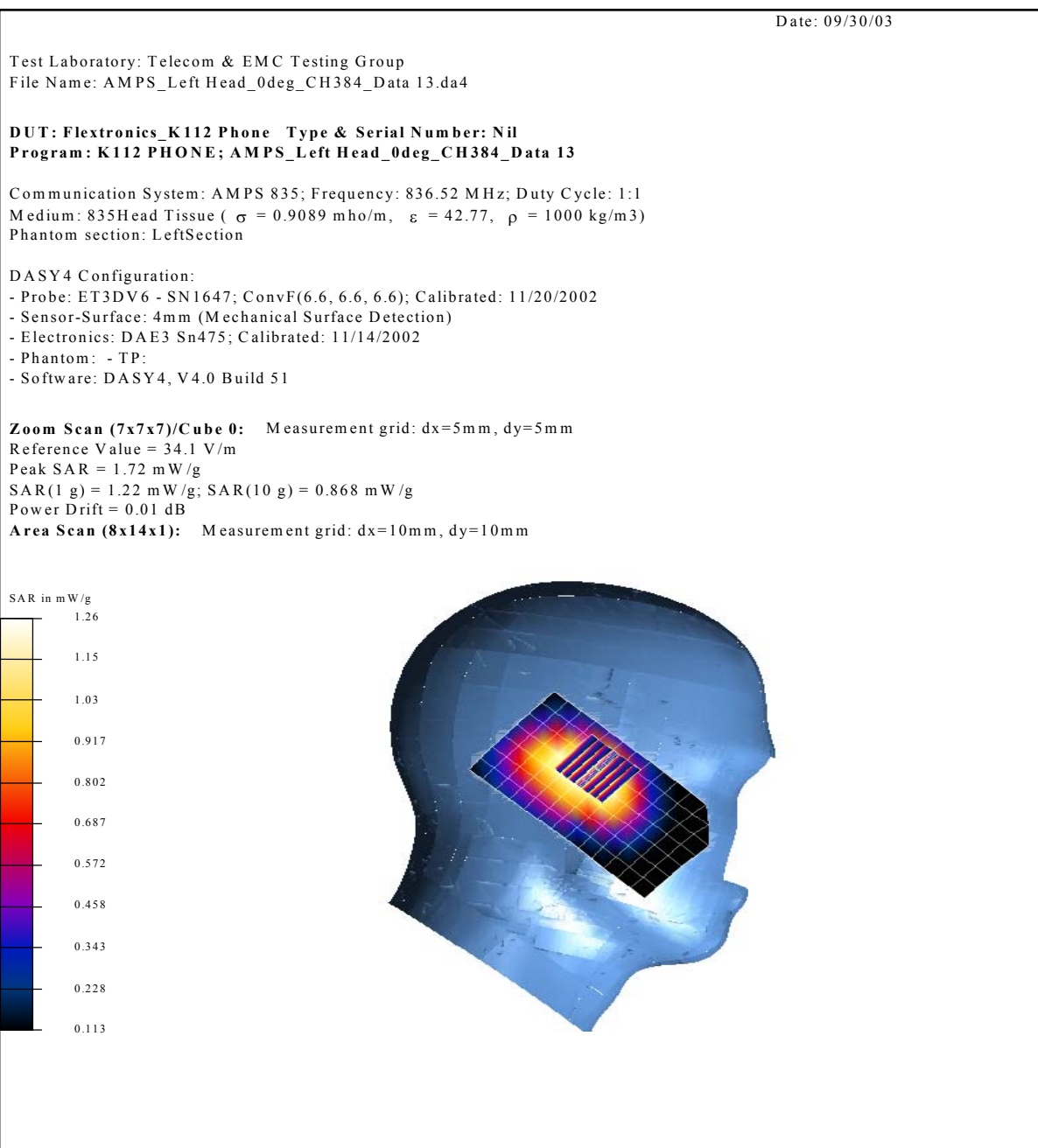
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Cheek / Touch	Fixed	Channel: 991 824.04MHz	1.060



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 2: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Cheek / Touch	Fixed	Channel: 384 836.52MHz	1.220



Ambient Temperature: $25 \pm 1^{\circ} \text{C}$
 Tissue Temperature: $24 \pm 1^{\circ} \text{C}$
 Humidity: 54% to 58%

Figure 3: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Cheek / Touch	Fixed	Channel: 799 848.97MHz	1.190

Date: 09/30/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: AMPS_Left Head_0deg_CH799_Data 17.da4

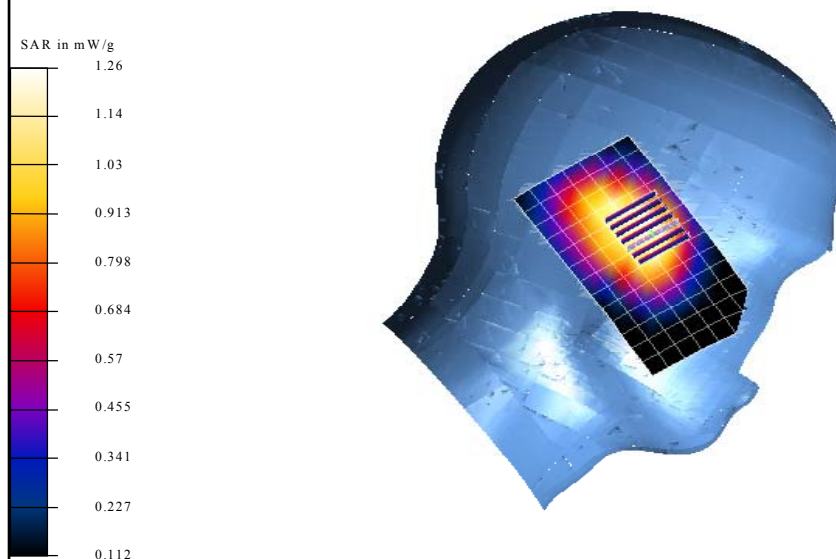
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; AMPS_Left Head_0deg_CH799_Data 17

Communication System: AMPS 835; Frequency: 848.97 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089 \text{ mho/m}$, $\epsilon = 42.77$, $\rho = 1000 \text{ kg/m}^3$)
 Phantom section: LeftSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

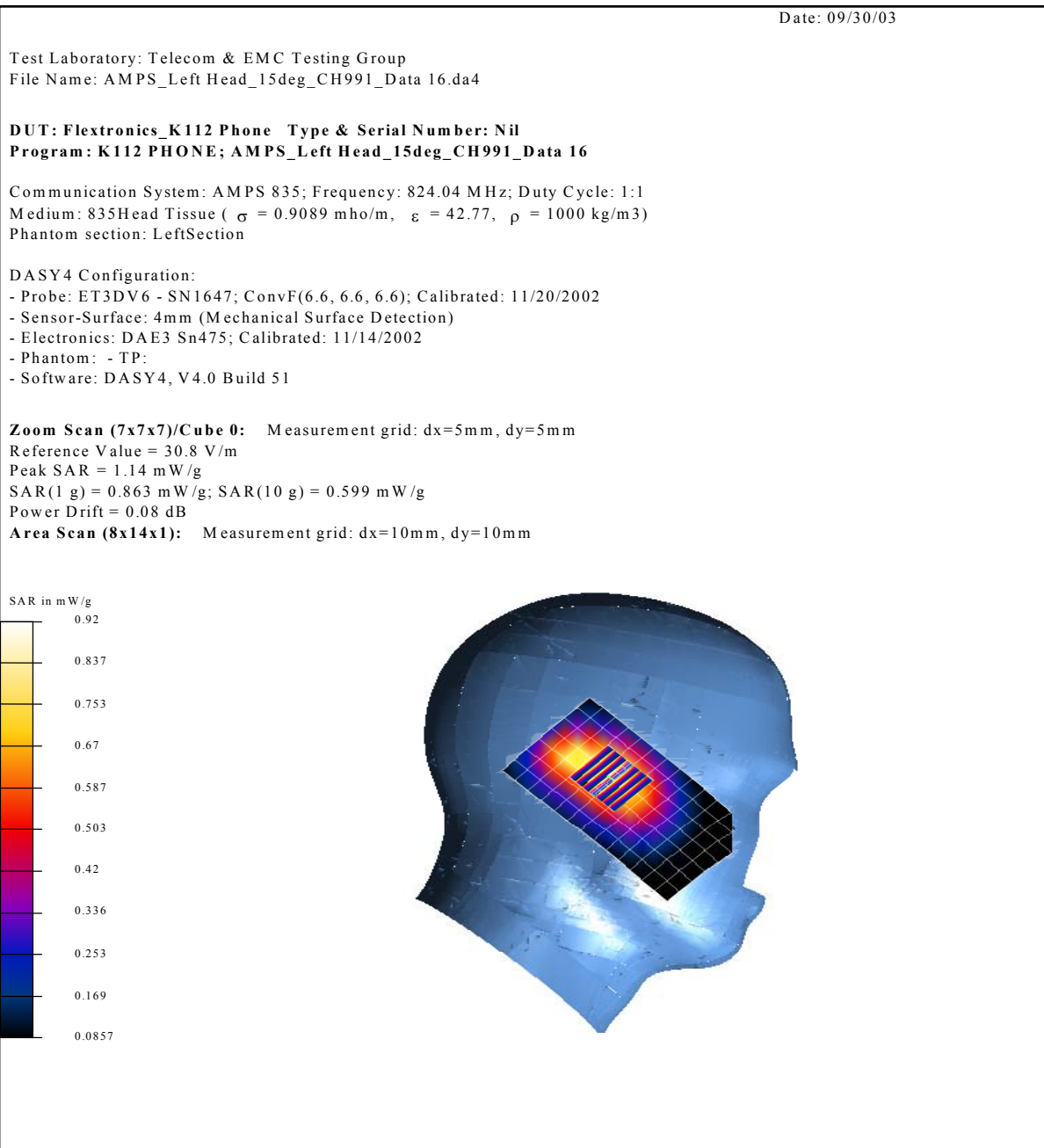
Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 34.2 V/m
 Peak SAR = 1.73 mW/g
 SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.831 mW/g
 Power Drift = 0.09 dB



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 4: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

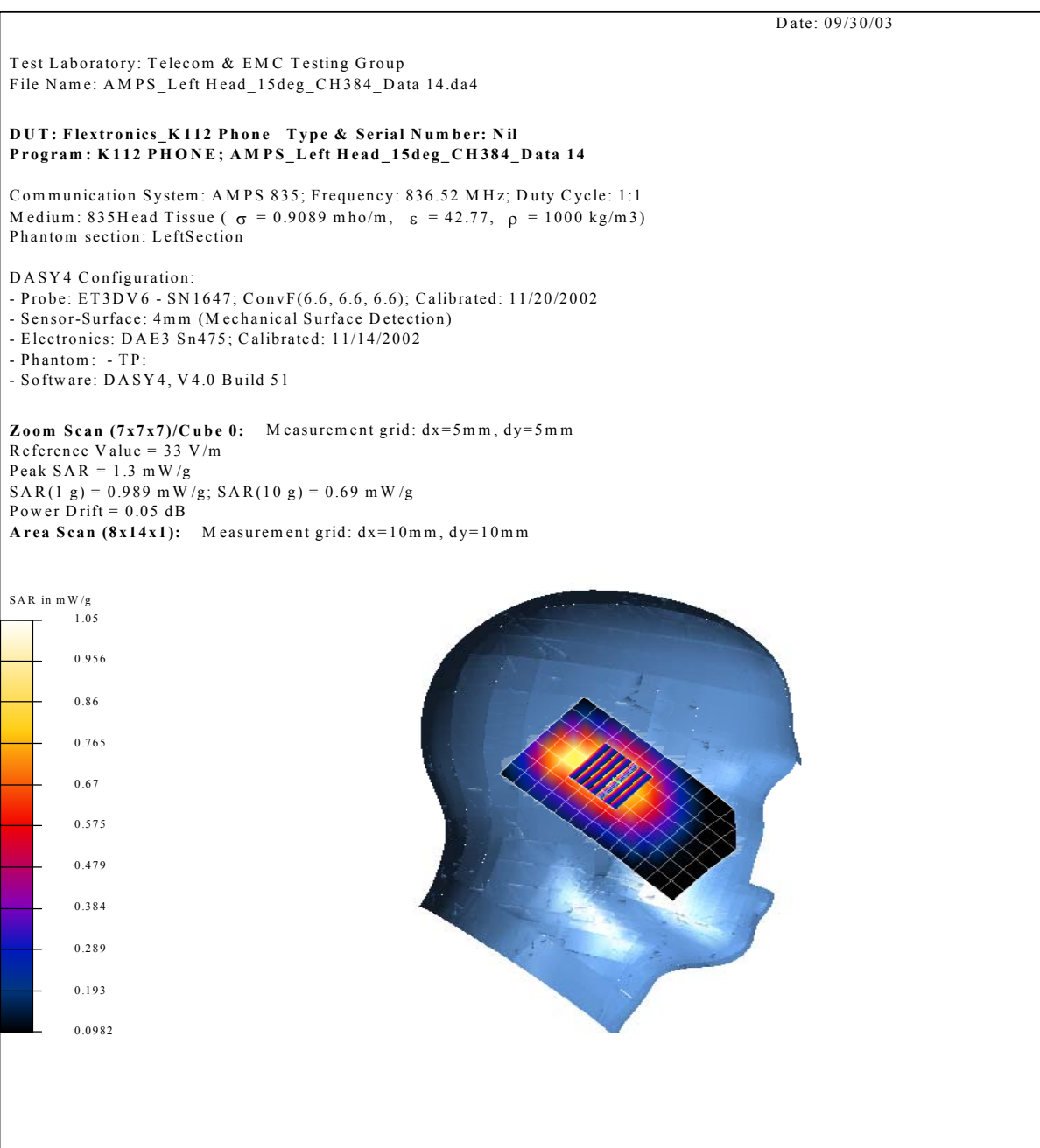
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Ear / Tilt	Fixed	Channel: 991 824.04MHz	0.863



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 5: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Ear / Tilt	Fixed	Channel: 384 836.52MHz	0.989



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 6: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Ear / Tilt	Fixed	Channel: 799 848.97MHz	0.917

Date: 09/30/03

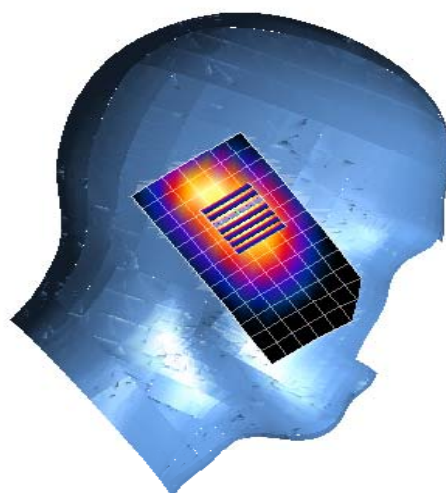
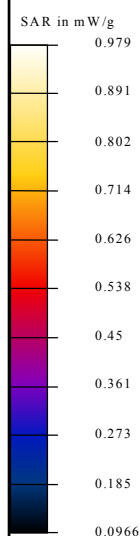
Test Laboratory: Telecom & EMC Testing Group
 File Name: AMPS_Left Head_15deg_CH799_Data 18.da4

DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; AMPS_Left Head_15deg_CH799_Data 18

Communication System: AMPS 835; Frequency: 848.97 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: LeftSection

DASY4 Configuration:
 - Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn475; Calibrated: 11/14/2002
 - Phantom: - TP:
 - Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 32.1 V/m
 Peak SAR = 1.2 mW/g
 SAR(1 g) = 0.917 mW/g; SAR(10 g) = 0.646 mW/g
 Power Drift = 0.03 dB



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 7: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Cheek / Touch	Fixed	Channel: 991 824.04MHz	1.130

Date: 09/30/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: AMPS_Right Head_0deg_CH991_Data 3.da4

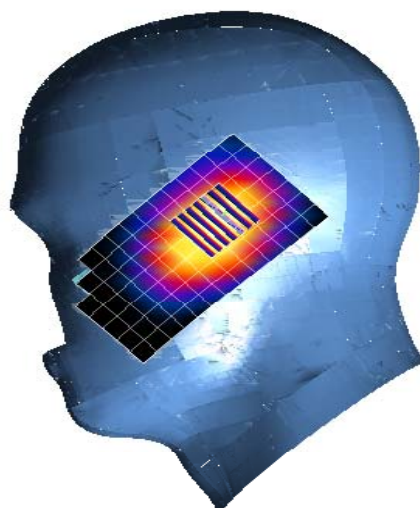
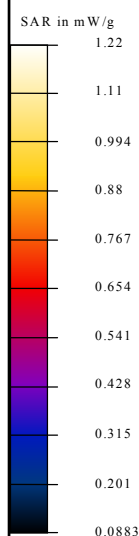
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; AMPS_Right Head_0deg_CH991_Data 3

Communication System: AMPS 835; Frequency: 824.04 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: RightSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 34.2 V/m
 Peak SAR = 1.6 mW/g
 SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.794 mW/g
 Power Drift = -0.04 dB



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 8: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Cheek / Touch	Fixed	Channel: 384 836.52MHz	1.290

Date: 09/30/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: AMPS_Right Head_0deg_CH384_Data 1.da4

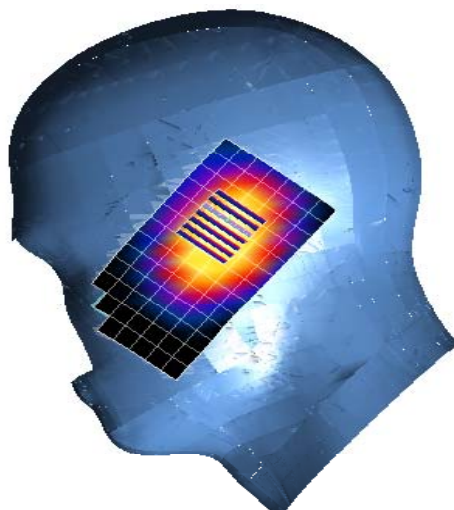
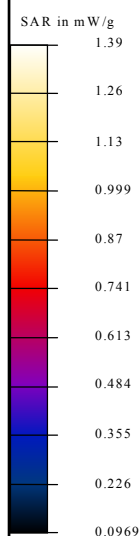
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; AMPS_Right Head_0deg_CH384_Data 1

Communication System: AMPS 835; Frequency: 836.52 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: RightSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 36.9 V/m
 Peak SAR = 1.86 mW/g
 SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.909 mW/g
 Power Drift = 0.04 dB



Ambient Temperature: $25 \pm 1^{\circ} \text{C}$
 Tissue Temperature: $24 \pm 1^{\circ} \text{C}$
 Humidity: 54% to 58%

Figure 9: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Cheek / Touch	Fixed	Channel: 799 848.97MHz	1.210

Date: 09/30/03

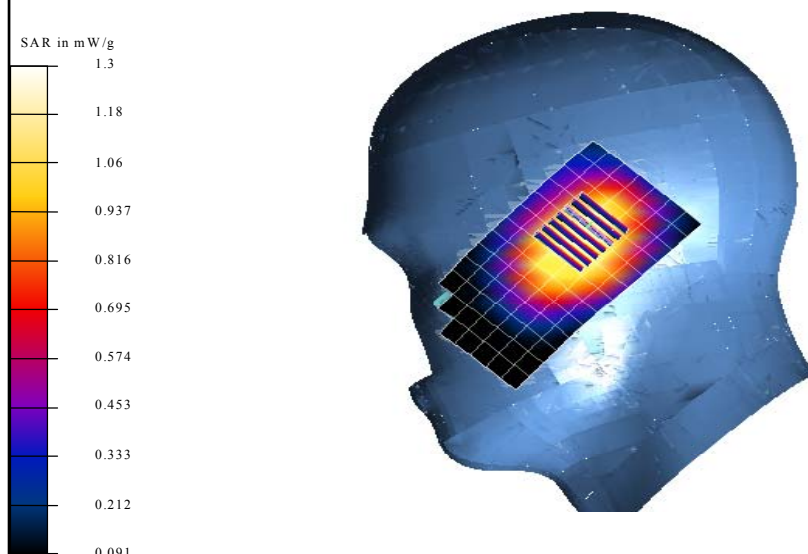
Test Laboratory: Telecom & EMC Testing Group
 File Name: AMPS_Right Head_0deg_CH799_Data 5.da4

DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; AMPS_Right Head_0deg_CH799_Data 5

Communication System: AMPS 835; Frequency: 848.97 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089 \text{ mho/m}$, $\epsilon = 42.77$, $\rho = 1000 \text{ kg/m}^3$)
 Phantom section: RightSection

DASY4 Configuration:
 - Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn475; Calibrated: 11/14/2002
 - Phantom: - TP:
 - Software: DASY4, V4.0 Build 51

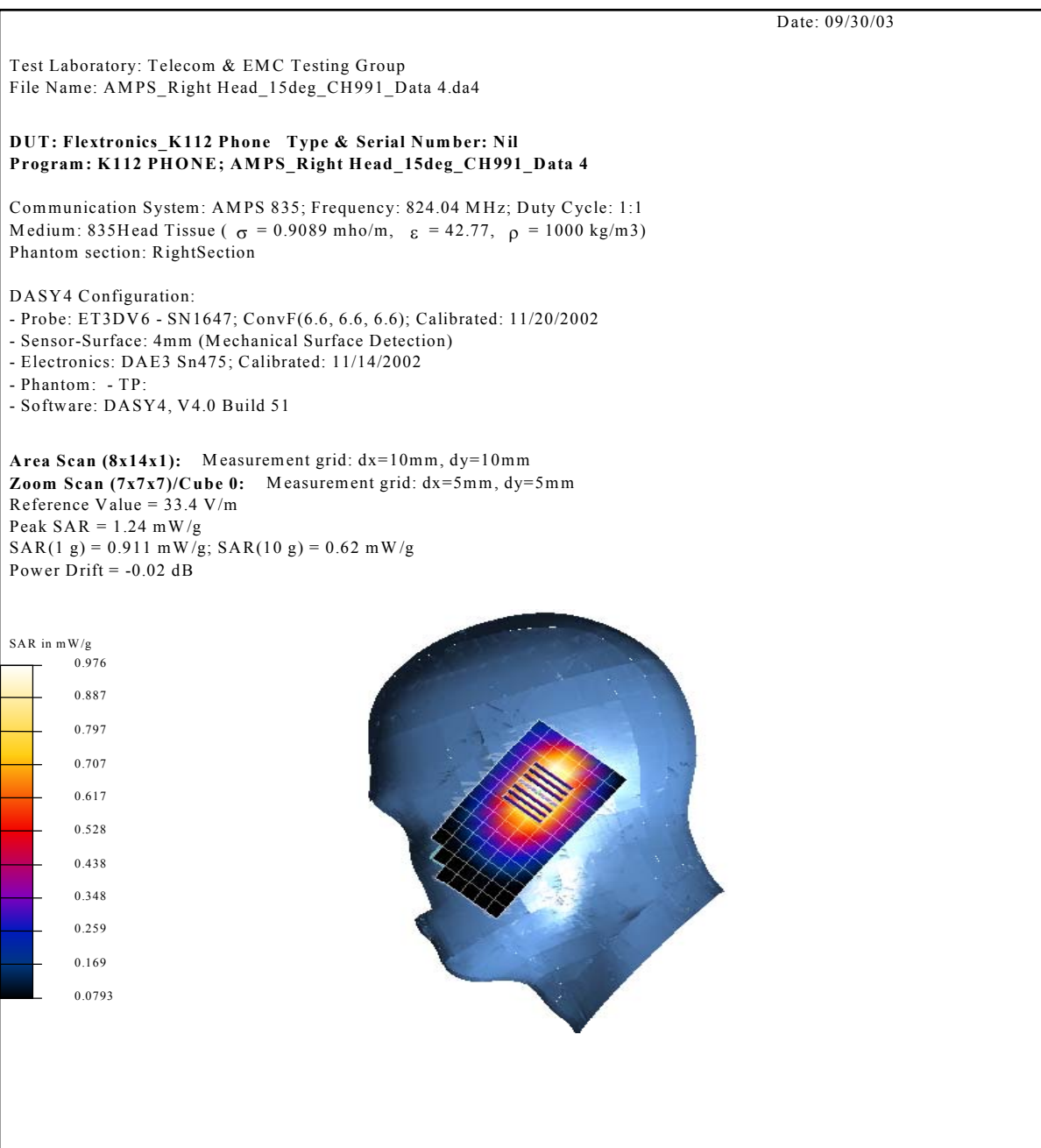
Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 35.5 V/m
 Peak SAR = 1.8 mW/g
 SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.849 mW/g
 Power Drift = 0.08 dB



Ambient Temperature: $25 \pm 1^{\circ} \text{C}$
 Tissue Temperature: $24 \pm 1^{\circ} \text{C}$
 Humidity: 54% to 58%

Figure 10: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Ear / Tilt	Fixed	Channel: 991 824.04MHz	0.911



Ambient Temperature: $25 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 54% to 58%

Figure 11: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Ear / Tilt	Fixed	Channel: 384 836.52MHz	1.090

Date: 09/30/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: AMPS_Right Head_15deg_CH384_Data 2.da4

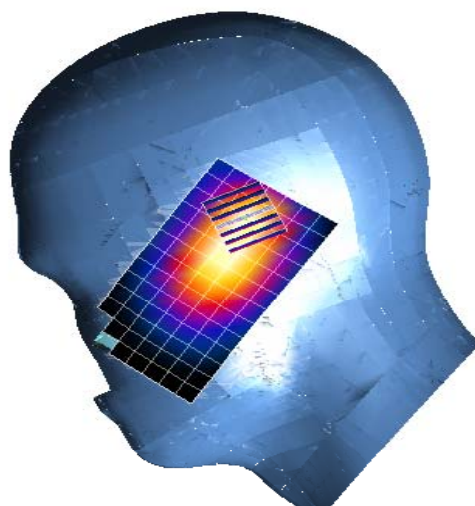
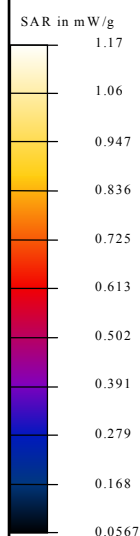
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; AMPS_Right Head_15deg_CH384_Data 2

Communication System: AMPS 835; Frequency: 836.52 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: RightSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

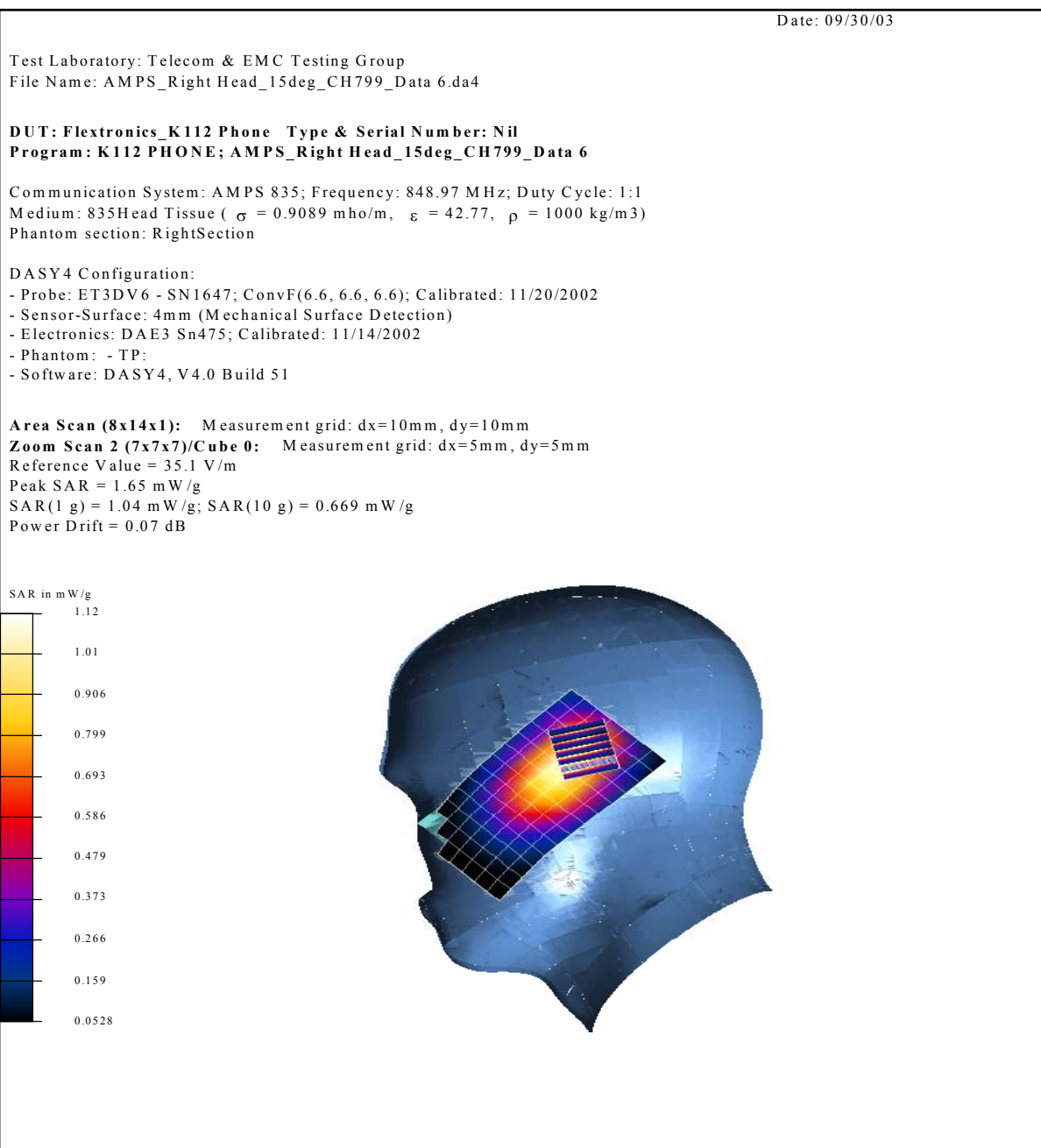
Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 36 V/m
 Peak SAR = 1.76 mW/g
 SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.694 mW/g
 Power Drift = 0.06 dB



Ambient Temperature: $25 \pm 1^{\circ} \text{C}$
 Tissue Temperature: $24 \pm 1^{\circ} \text{C}$
 Humidity: 54% to 58%

Figure 12: SAR Test Distribution Plot (AMPS Mode) – Device at head phantom

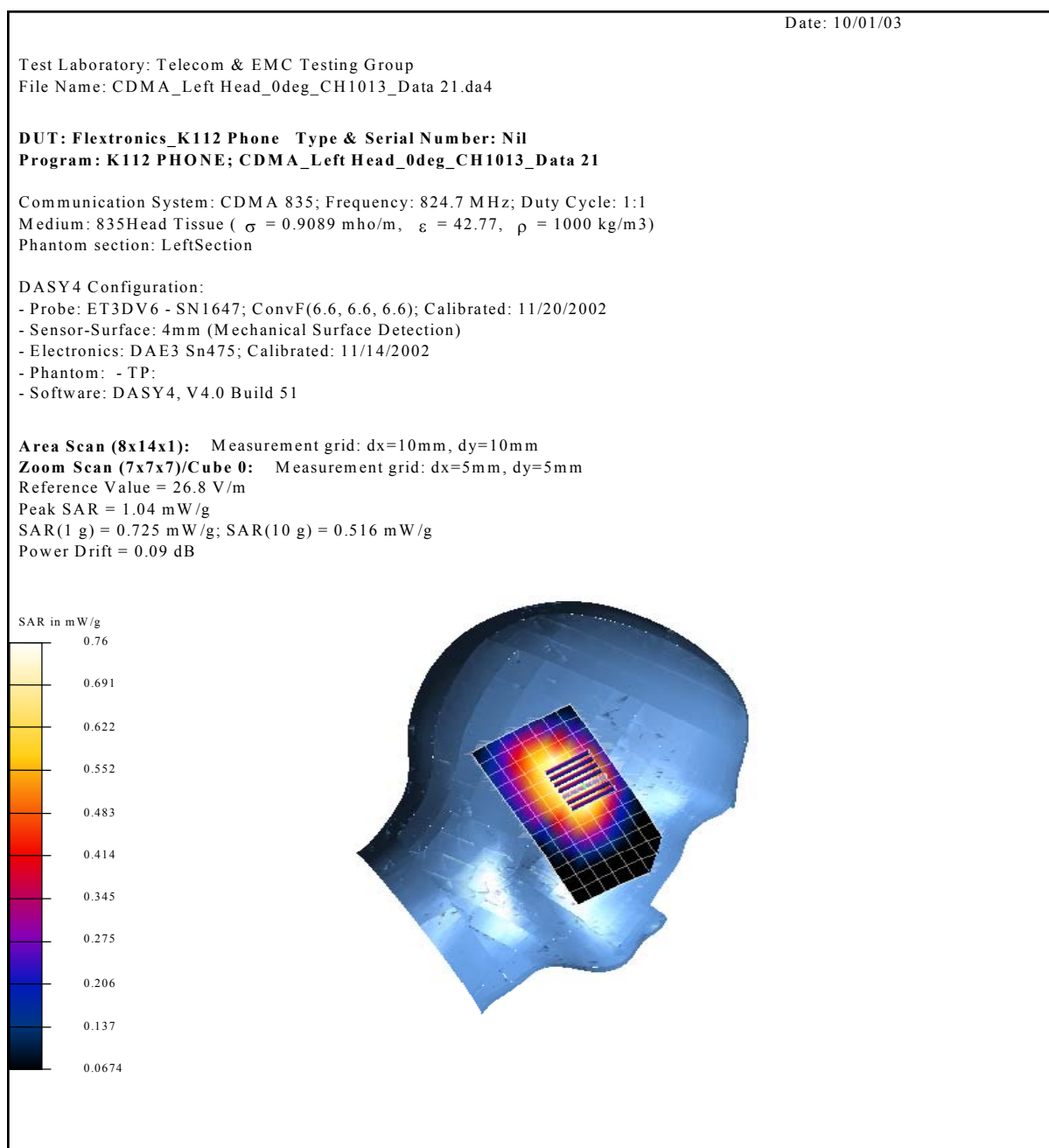
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Ear / Tilt	Fixed	Channel: 799 848.97MHz	1.040



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 13: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Cheek / Touch	Fixed	Channel: 1013 824.70MHz	0.725



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 14: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Cheek / Touch	Fixed	Channel: 384 836.52MHz	0.787

Date: 10/01/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: CDMA_Left Head_0deg_CH384_Data 19.da4

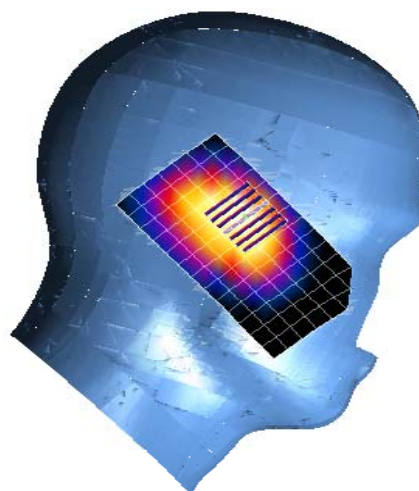
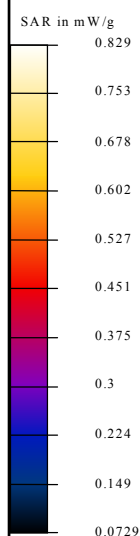
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; CDMA_Left Head_0deg_CH384_Data 19

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: LeftSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 28 V/m
 Peak SAR = 1.14 mW/g
 SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.555 mW/g
 Power Drift = 0.02 dB



Ambient Temperature: $24 \pm 1^{\circ} \text{C}$
Tissue Temperature: $24 \pm 1^{\circ} \text{C}$
Humidity: 52% to 55%

Figure 15: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Cheek / Touch	Fixed	Channel: 777 848.31MHz	0.743

Date: 10/01/03

Test Laboratory: Telecom & EMC Testing Group
File Name: CDMA_Left Head_0deg_CH777_Data 23.da4

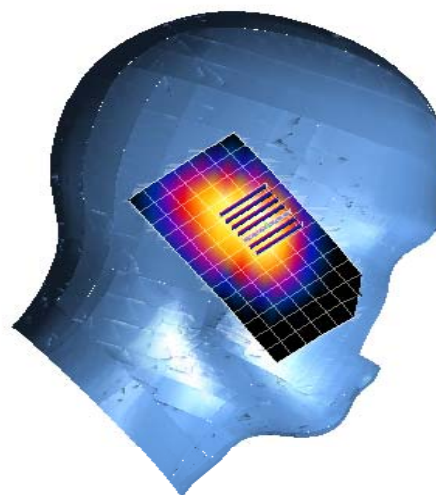
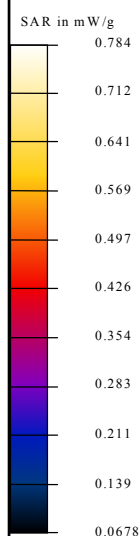
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
Program: K112 PHONE; CDMA_Left Head_0deg_CH777_Data 23

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: 835Head Tissue ($\sigma = 0.9089 \text{ mho/m}$, $\epsilon = 42.77$, $\rho = 1000 \text{ kg/m}^3$)
Phantom section: LeftSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
Reference Value = 26.3 V/m
Peak SAR = 1.12 mW/g
SAR(1 g) = 0.743 mW/g; SAR(10 g) = 0.515 mW/g
Power Drift = 0.01 dB



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 16: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Ear / Tilt	Fixed	Channel: 1013 824.70MHz	0.560

Date: 10/01/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: CDMA_Left Head_15deg_CH1013_Data 22.da4

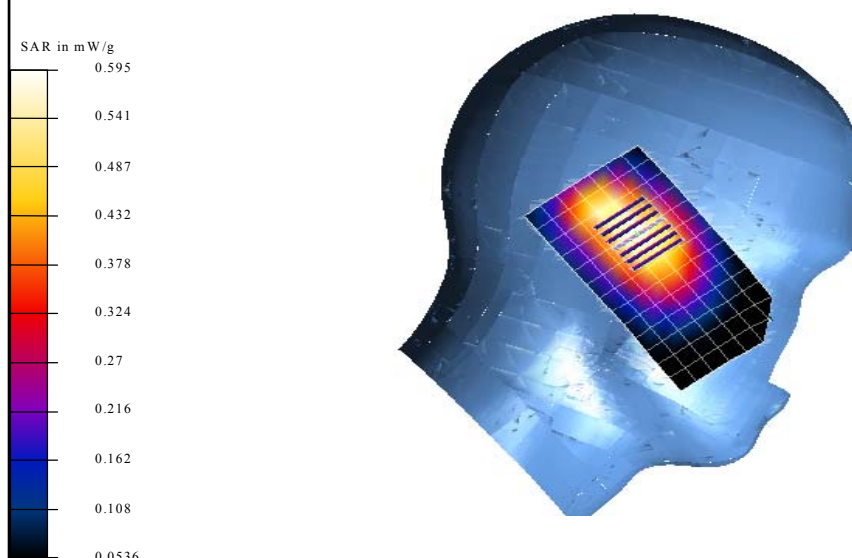
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; CDMA_Left Head_15deg_CH1013_Data 22

Communication System: CDMA 835; Frequency: 824.7 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: LeftSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 25.8 V/m
 Peak SAR = 0.719 mW/g
 SAR(1 g) = 0.56 mW/g; SAR(10 g) = 0.393 mW/g
 Power Drift = -0.01 dB



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 17: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Ear / Tilt	Fixed	Channel: 384 836.52MHz	0.637

Date: 10/01/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: CDMA_Left Head_15deg_CH384_Data 20.da4

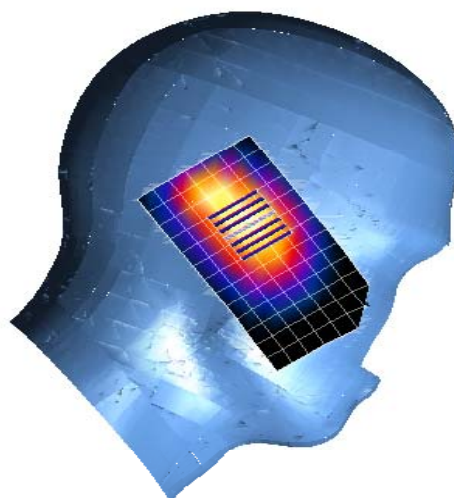
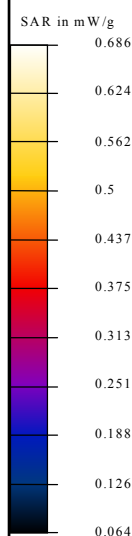
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; CDMA_Left Head_15deg_CH384_Data 20

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: LeftSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 26.7 V/m
 Peak SAR = 0.848 mW/g
 SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.445 mW/g
 Power Drift = 0.04 dB



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 18: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Left Side of Head	Ear / Tilt	Fixed	Channel: 777 848.31MHz	0.558

Date: 10/01/03

Test Laboratory: Telecom & EMC Testing Group
 File Name: CDMA_Left Head_15deg_CH777_Data 24.da4

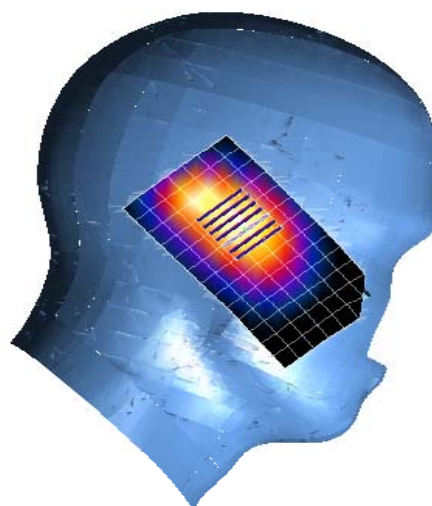
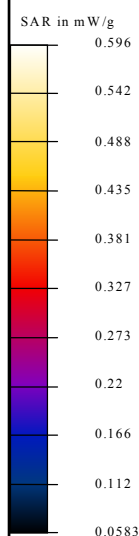
DUT: Flextronics_K112 Phone Type & Serial Number: Nil
 Program: K112 PHONE; CDMA_Left Head_15deg_CH777_Data 24

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1
 Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
 Phantom section: LeftSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

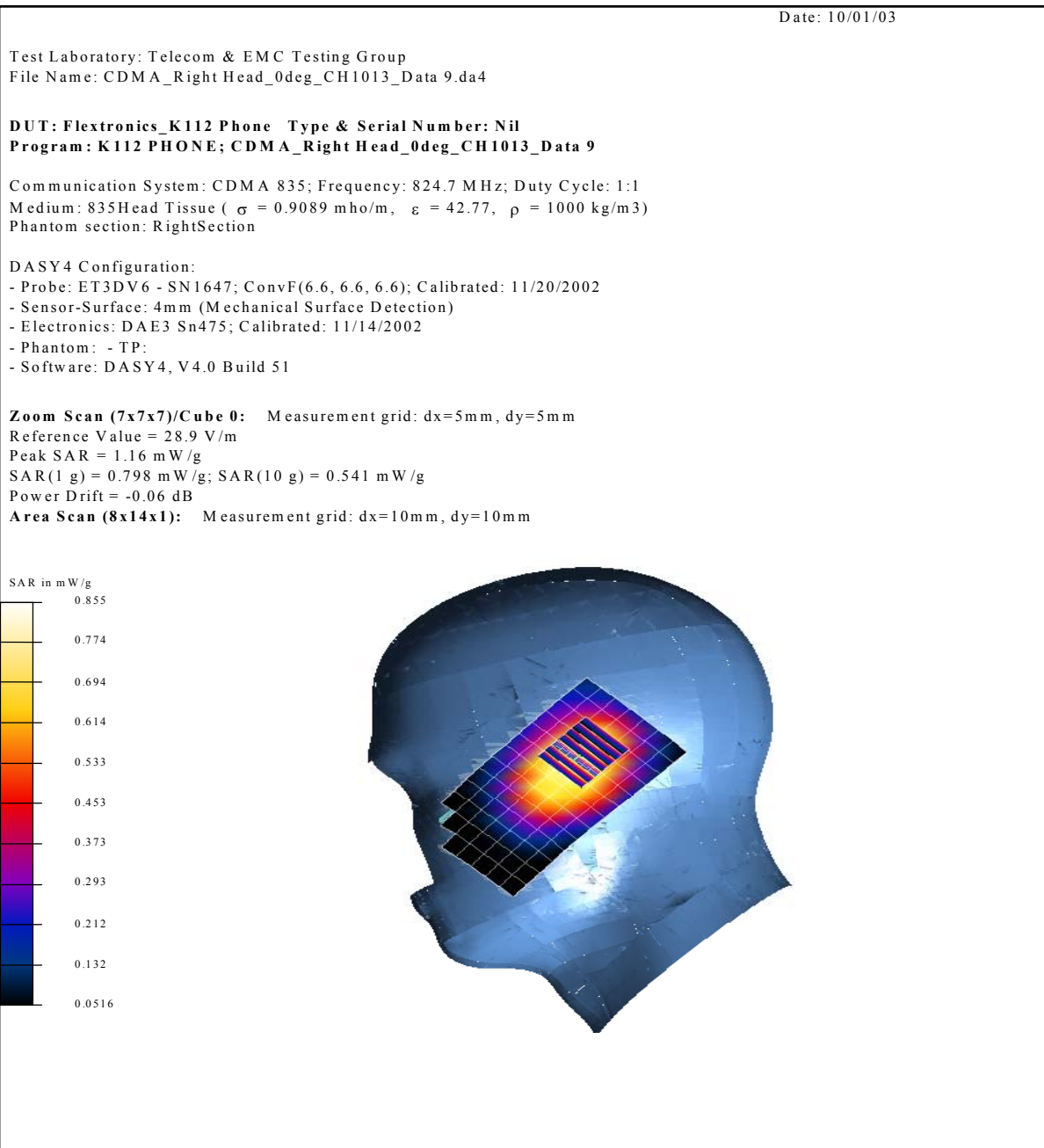
Area Scan (8x14x1): Measurement grid: dx=10mm, dy=10mm
 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
 Reference Value = 25.1 V/m
 Peak SAR = 0.727 mW/g
 SAR(1 g) = 0.558 mW/g; SAR(10 g) = 0.392 mW/g
 Power Drift = 0.02 dB



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 19: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

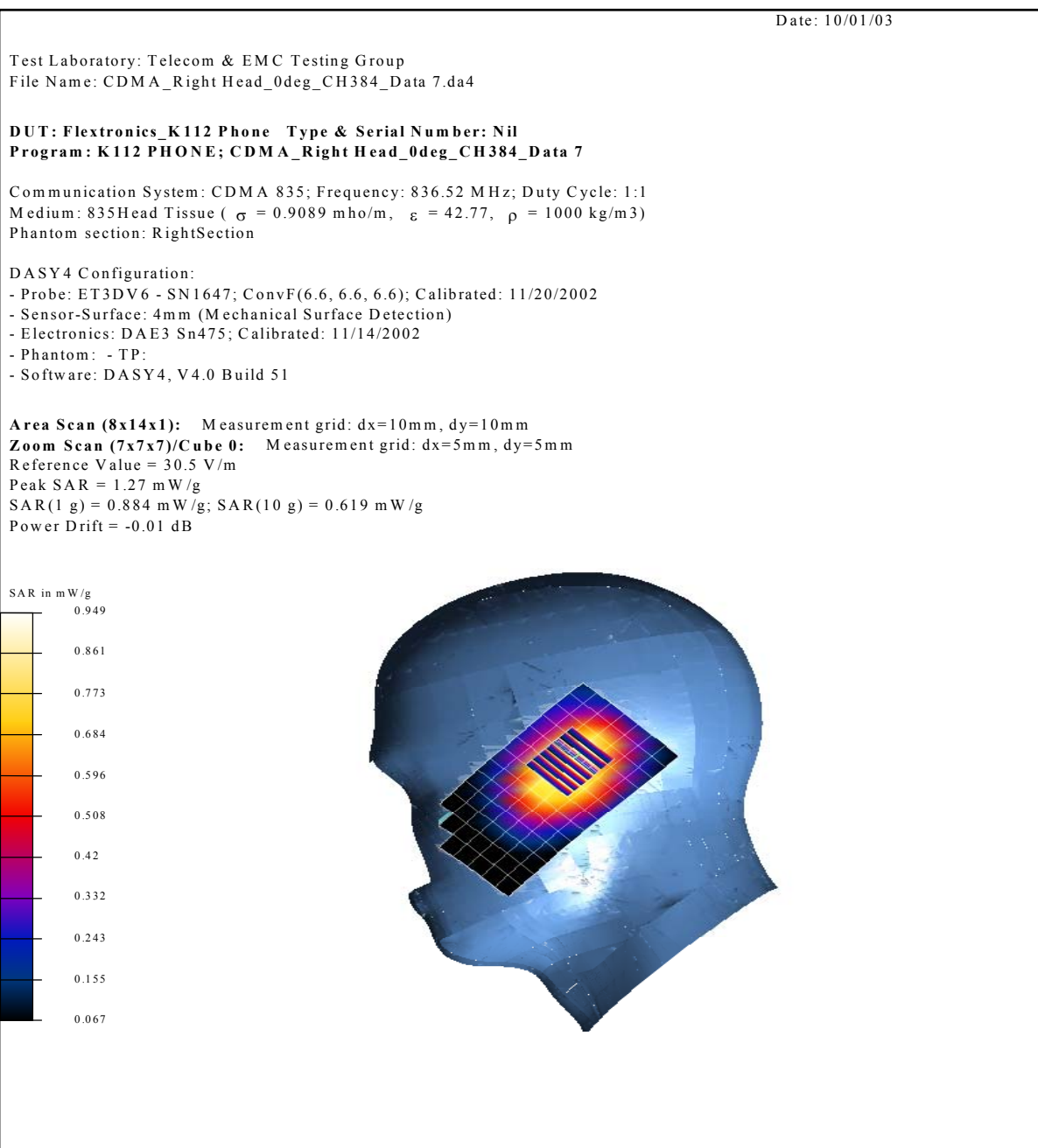
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Cheek / Touch	Fixed	Channel: 1013 824.70MHz	0.798



Ambient Temperature: $24 \pm 1^{\circ} \text{C}$
Tissue Temperature: $24 \pm 1^{\circ} \text{C}$
Humidity: 52% to 55%

Figure 20: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

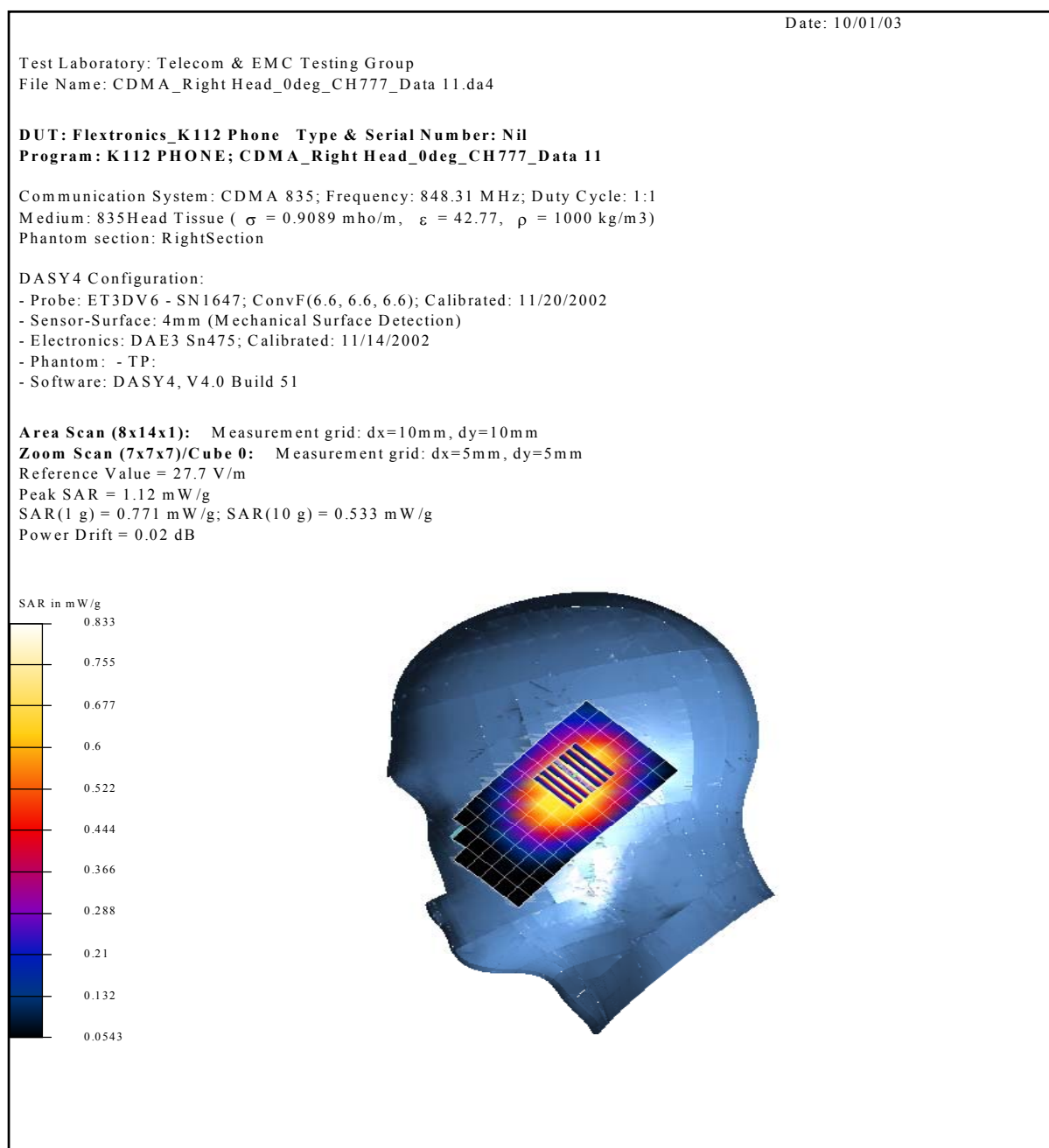
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Cheek / Touch	Fixed	Channel: 384 836.52MHz	0.884



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 21: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

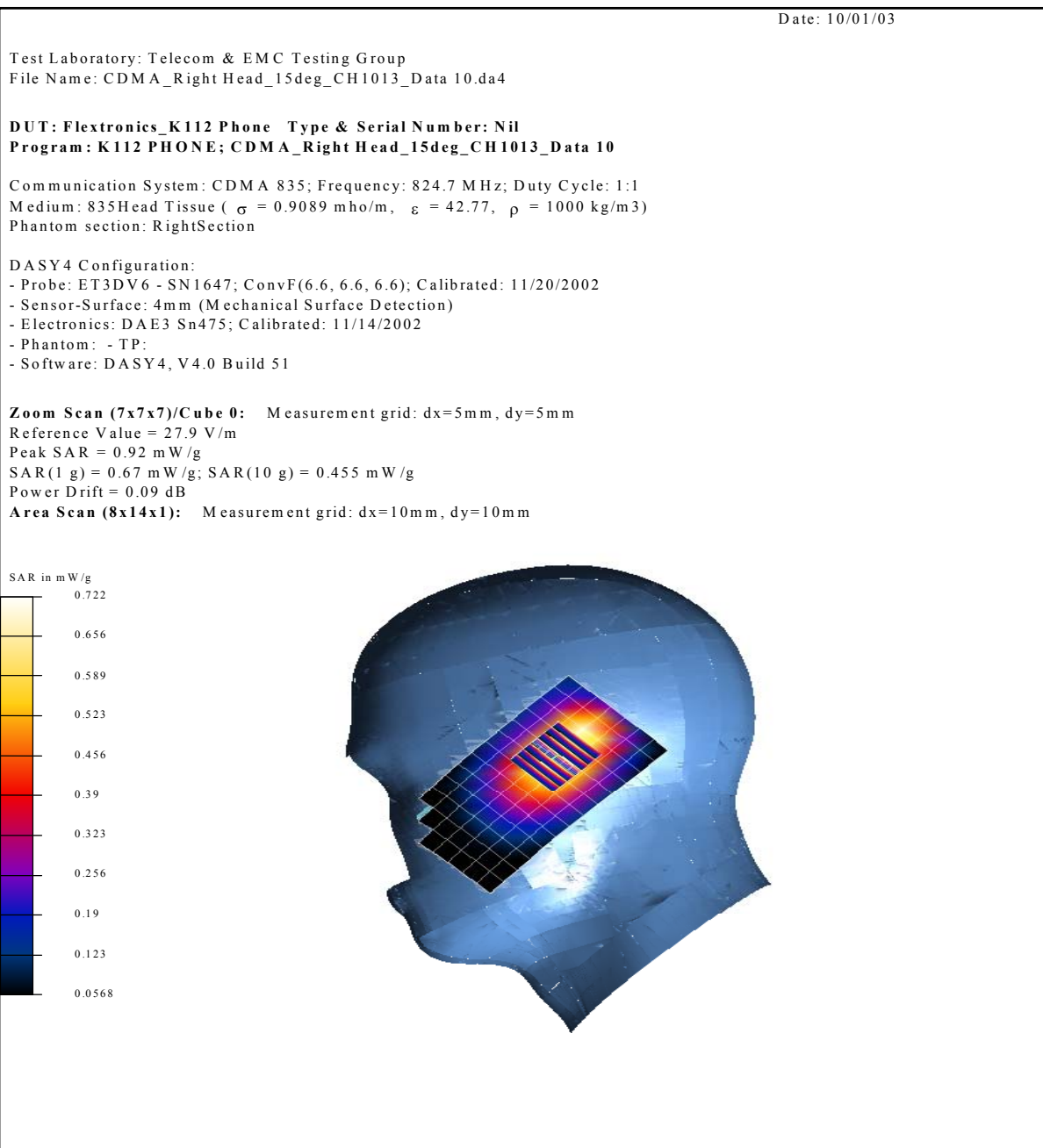
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Cheek / Touch	Fixed	Channel: 777 848.31MHz	0.771



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 22: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

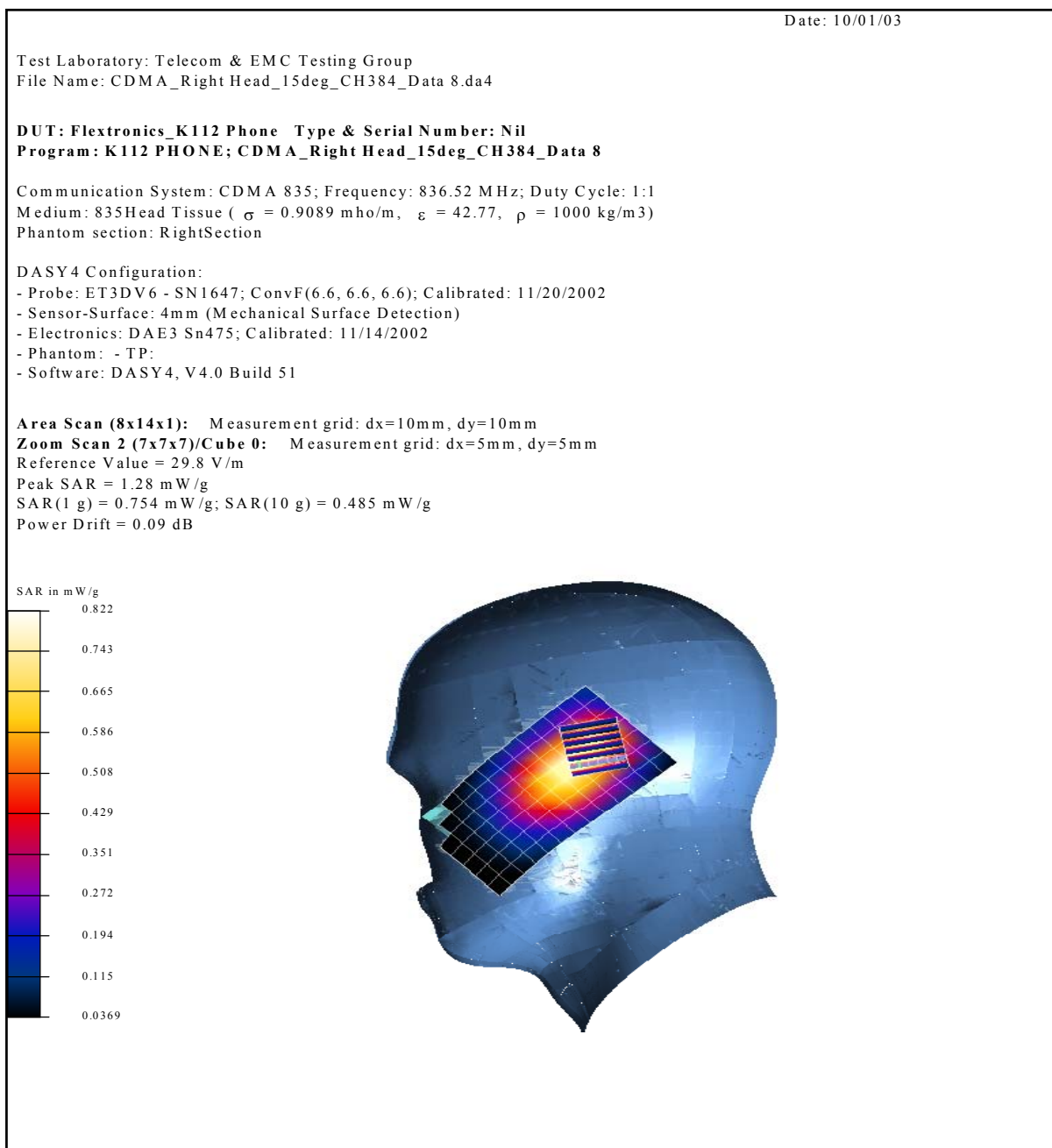
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Ear / Tilt	Fixed	Channel: 1013 824.70MHz	0.670



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
Humidity: 52% to 55%

Figure 23: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

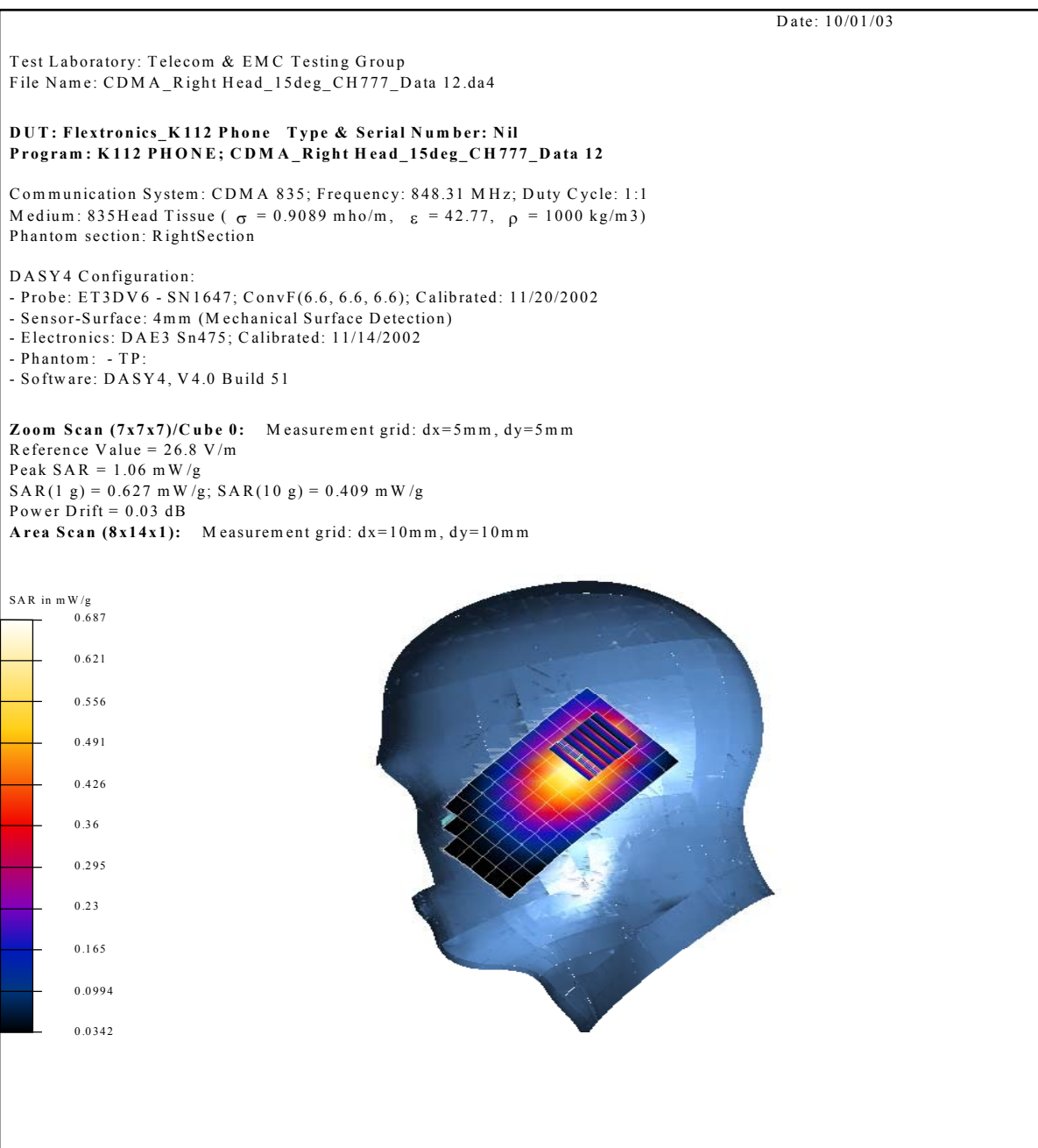
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Ear / Tilt	Fixed	Channel: 384 836.52MHz	0.754



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $24 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 55%

Figure 24: SAR Test Distribution Plot (CDMA Mode) – Device at head phantom

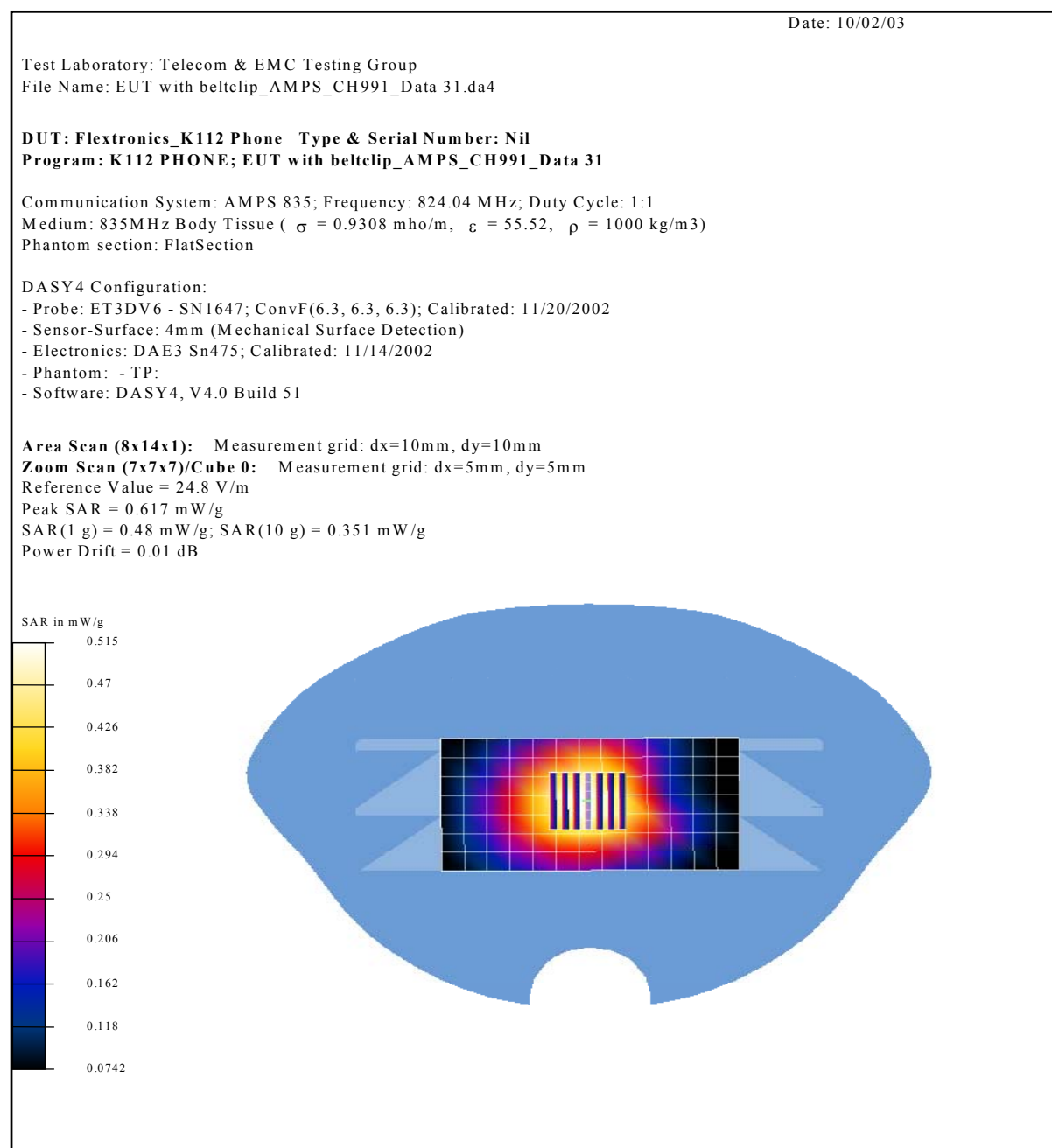
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Right Side of Head	Ear / Tilt	Fixed	Channel: 777 848.31MHz	0.627



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 25: SAR Test Distribution Plot (AMPS Mode) – Device with belt clip (26mm spacing).

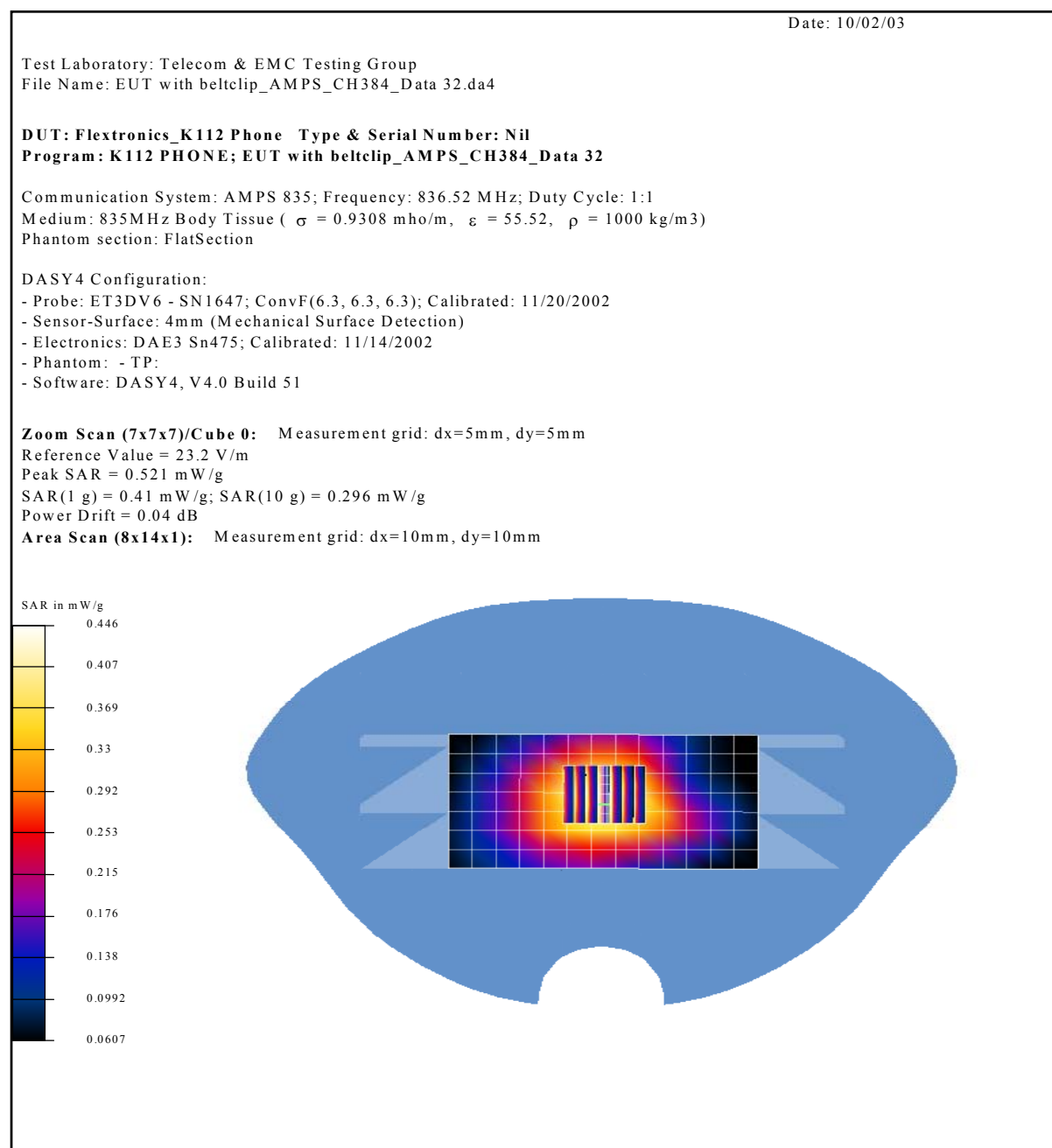
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 991 824.04MHz	0.480



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 26: SAR Test Distribution Plot (AMPS Mode) – Device with belt clip (26mm spacing).

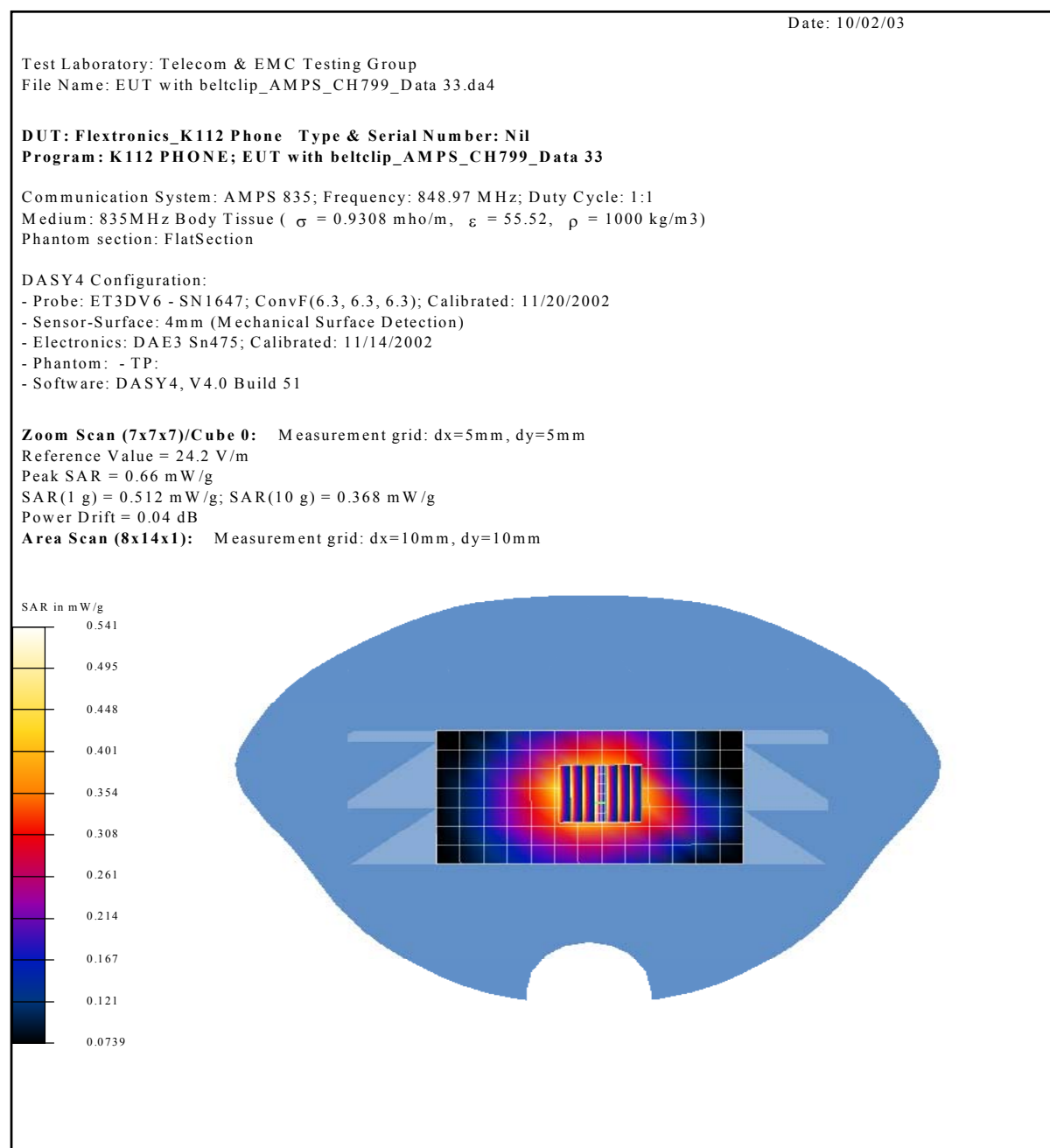
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 384 836.52MHz	0.410



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 27: SAR Test Distribution Plot (AMPS Mode) – Device with belt clip (26mm spacing).

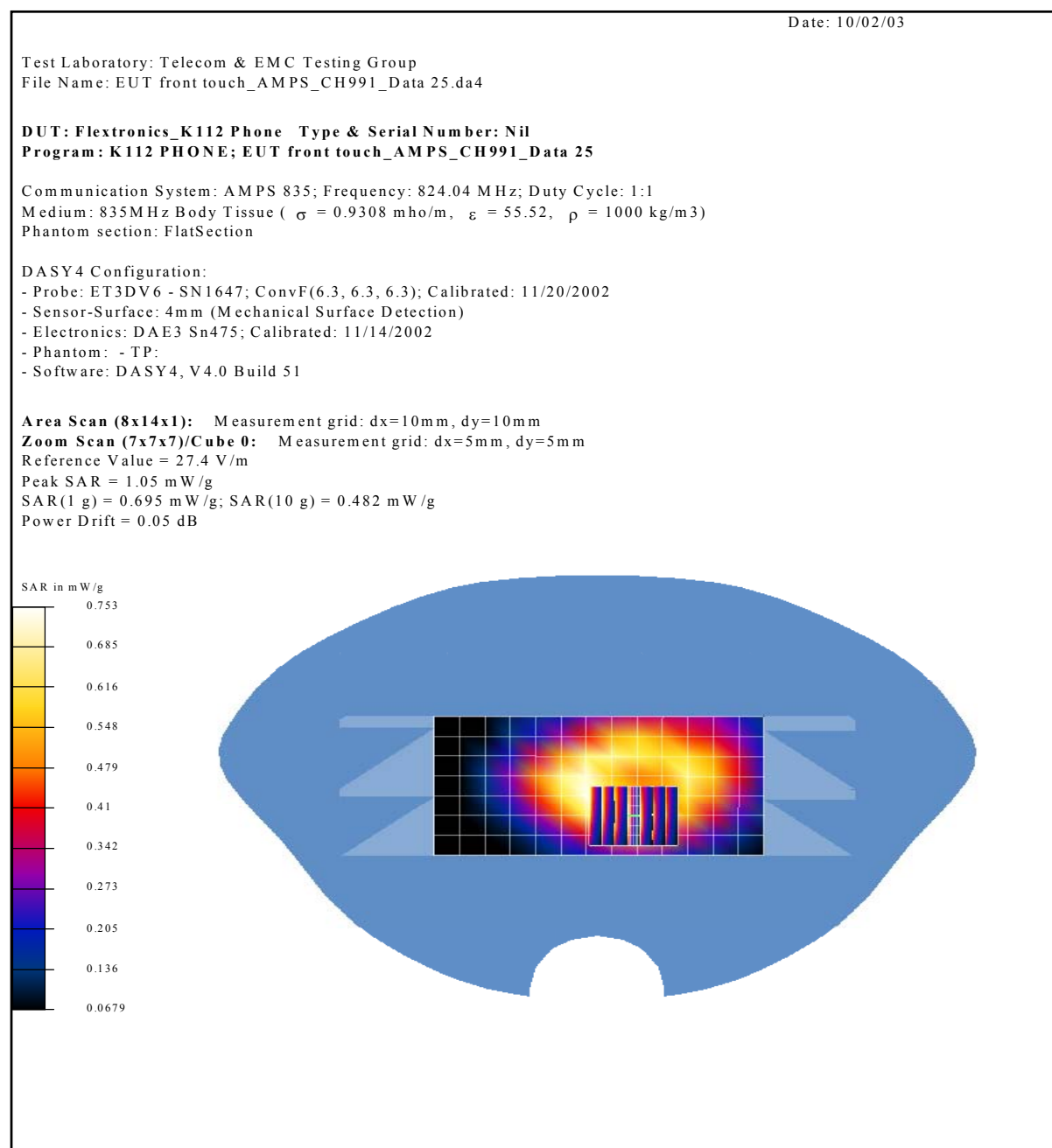
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 799 848.97MHz	0.512



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 28: SAR Test Distribution Plot (AMPS Mode) – Device Front Touching.

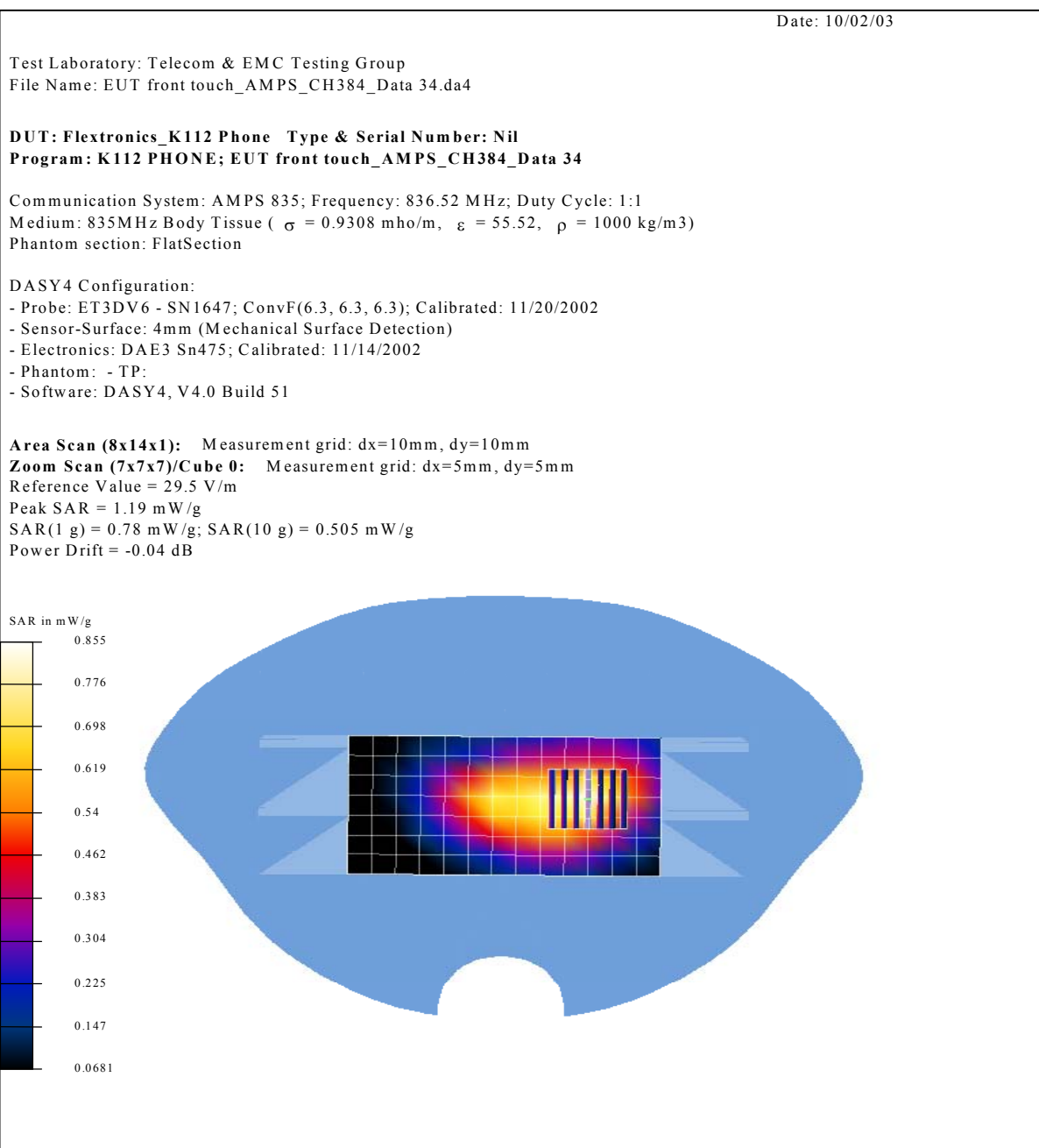
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Front Touched Phantom	Fixed	Channel: 991 824.04MHz	0.695



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
Humidity: 52% to 57%

Figure 29: SAR Test Distribution Plot (AMPS Mode) – Device Front Touching.

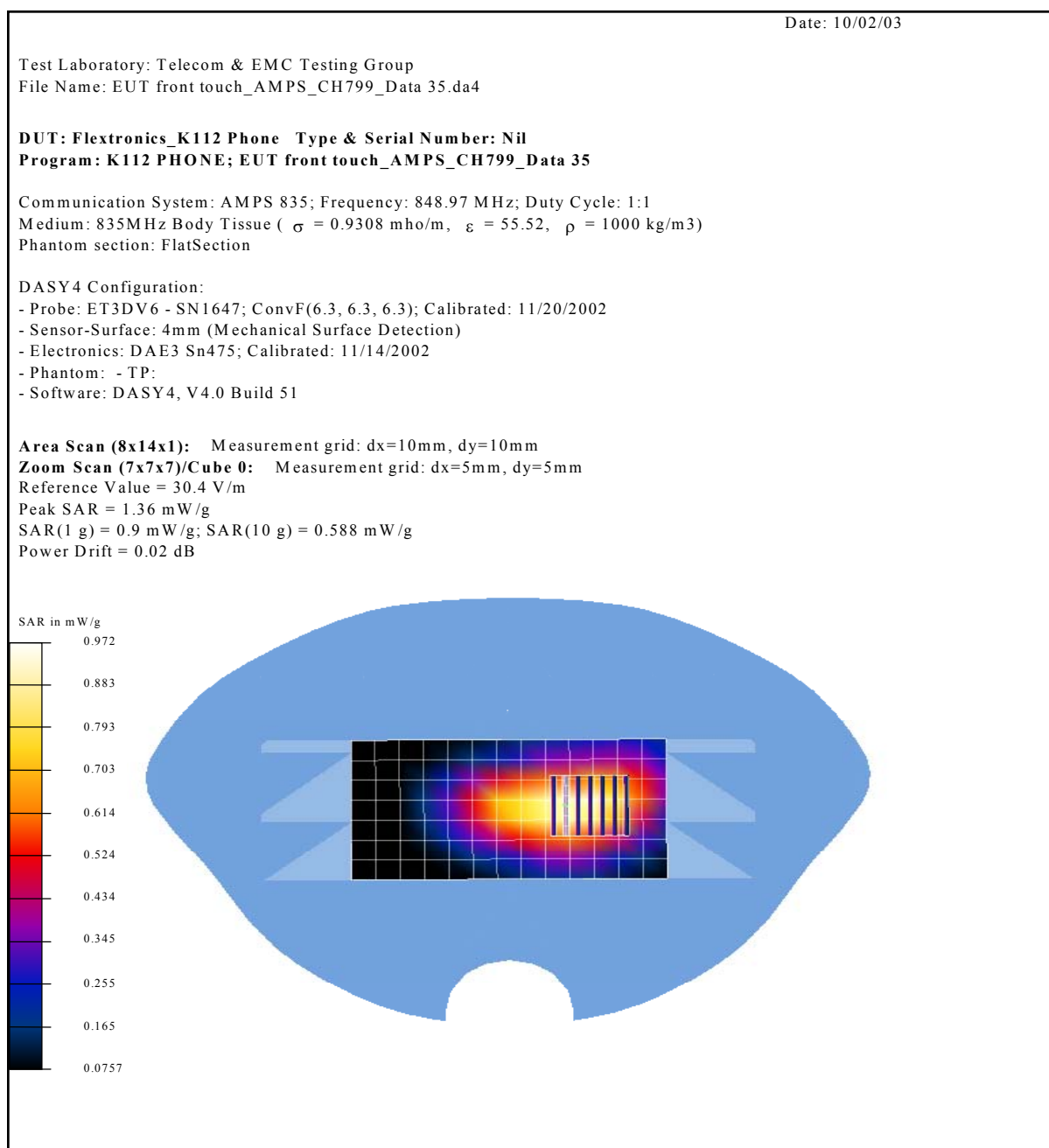
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Front Touched Phantom	Fixed	Channel: 384 836.52MHz	0.780



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 30: SAR Test Distribution Plot (AMPS Mode) – Device Front Touching.

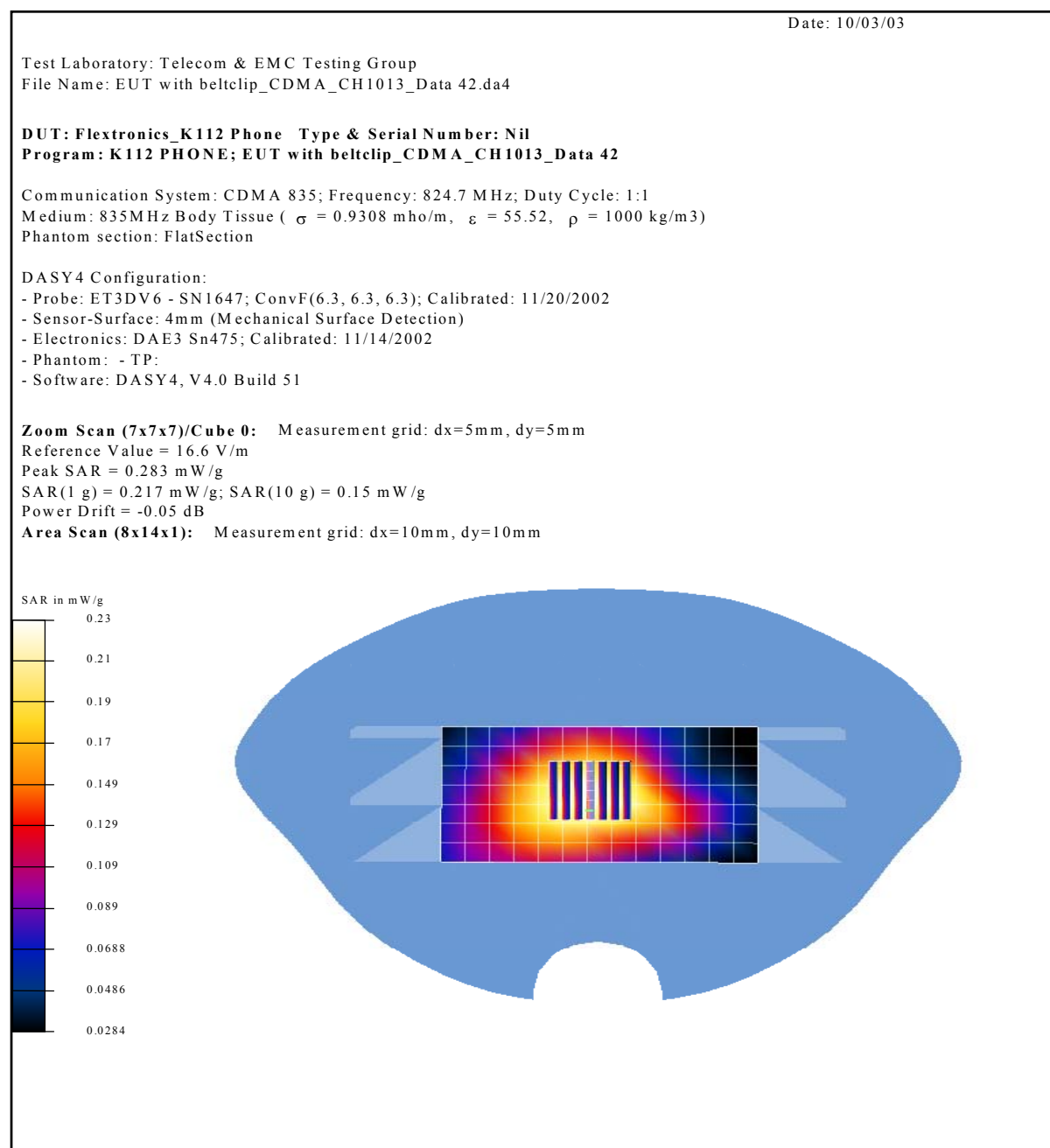
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Front Touched Phantom	Fixed	Channel: 799 848.97MHz	0.900



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 31: SAR Test Distribution Plot (CDMA Mode) – Device with belt clip (26mm spacing).

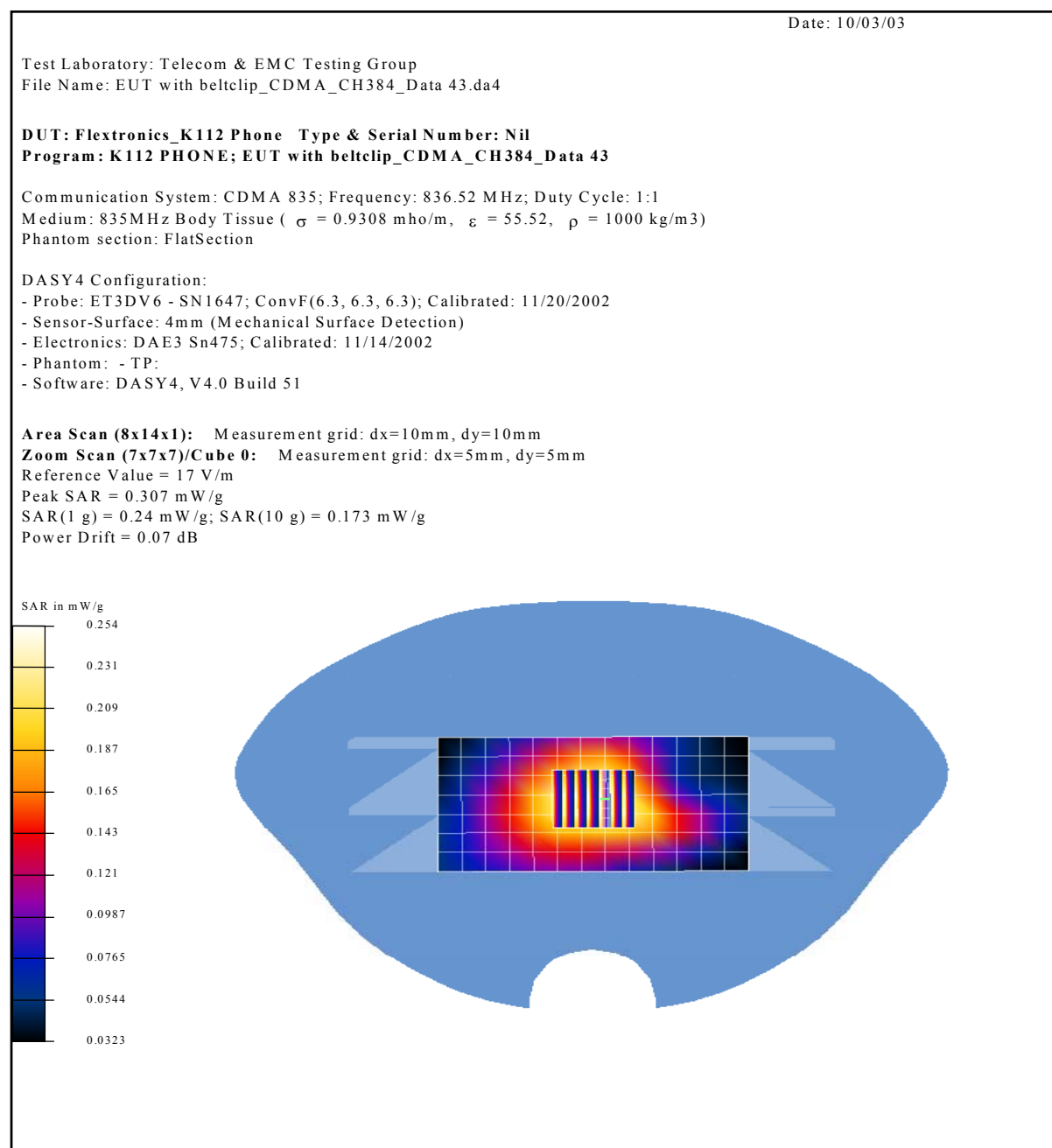
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 1013 824.70MHz	0.217



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 32: SAR Test Distribution Plot (CDMA Mode) – Device with belt clip (26mm spacing).

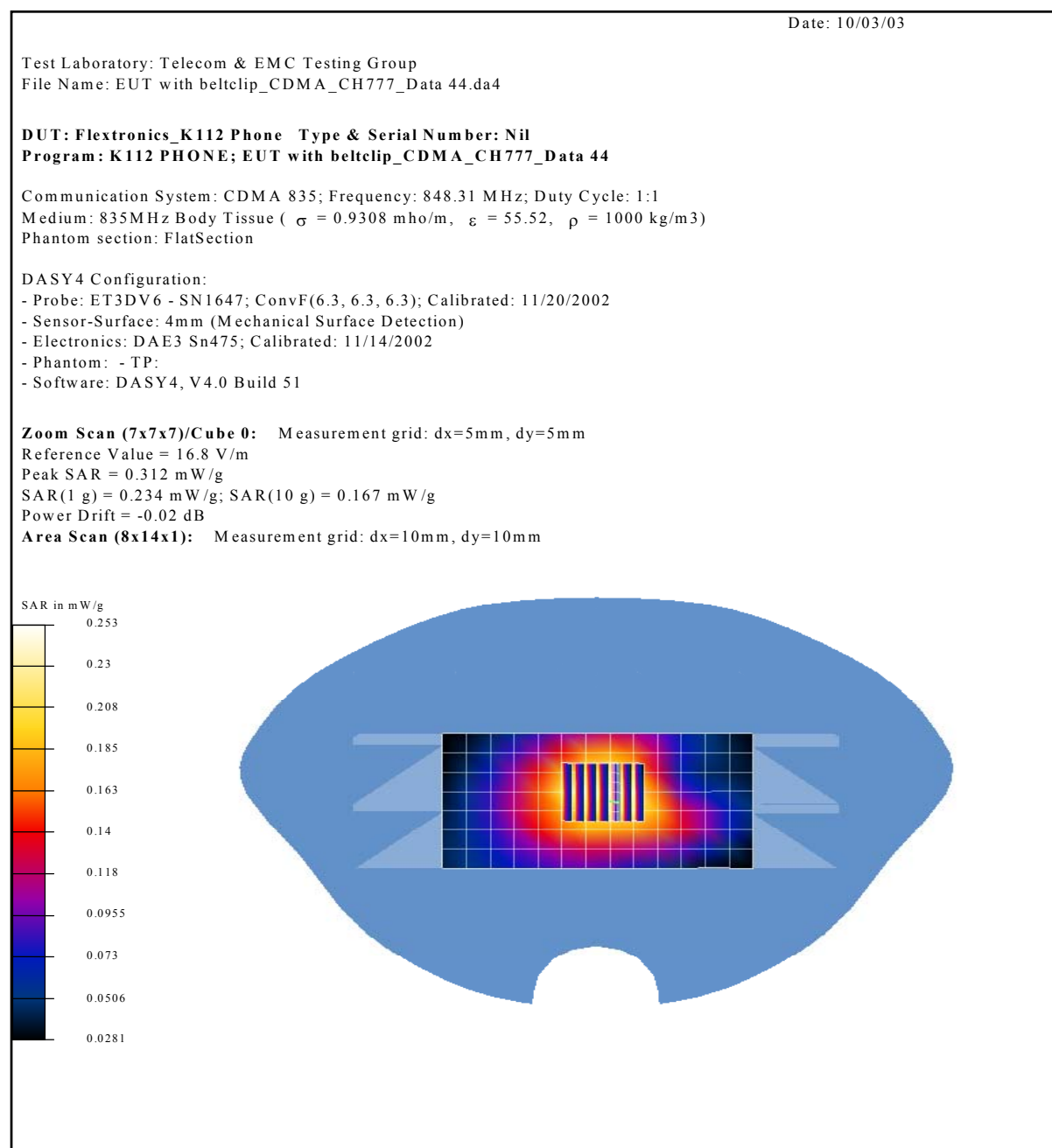
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 384 836.52MHz	0.240



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 33: SAR Test Distribution Plot (CDMA Mode) – Device with belt clip (26mm spacing).

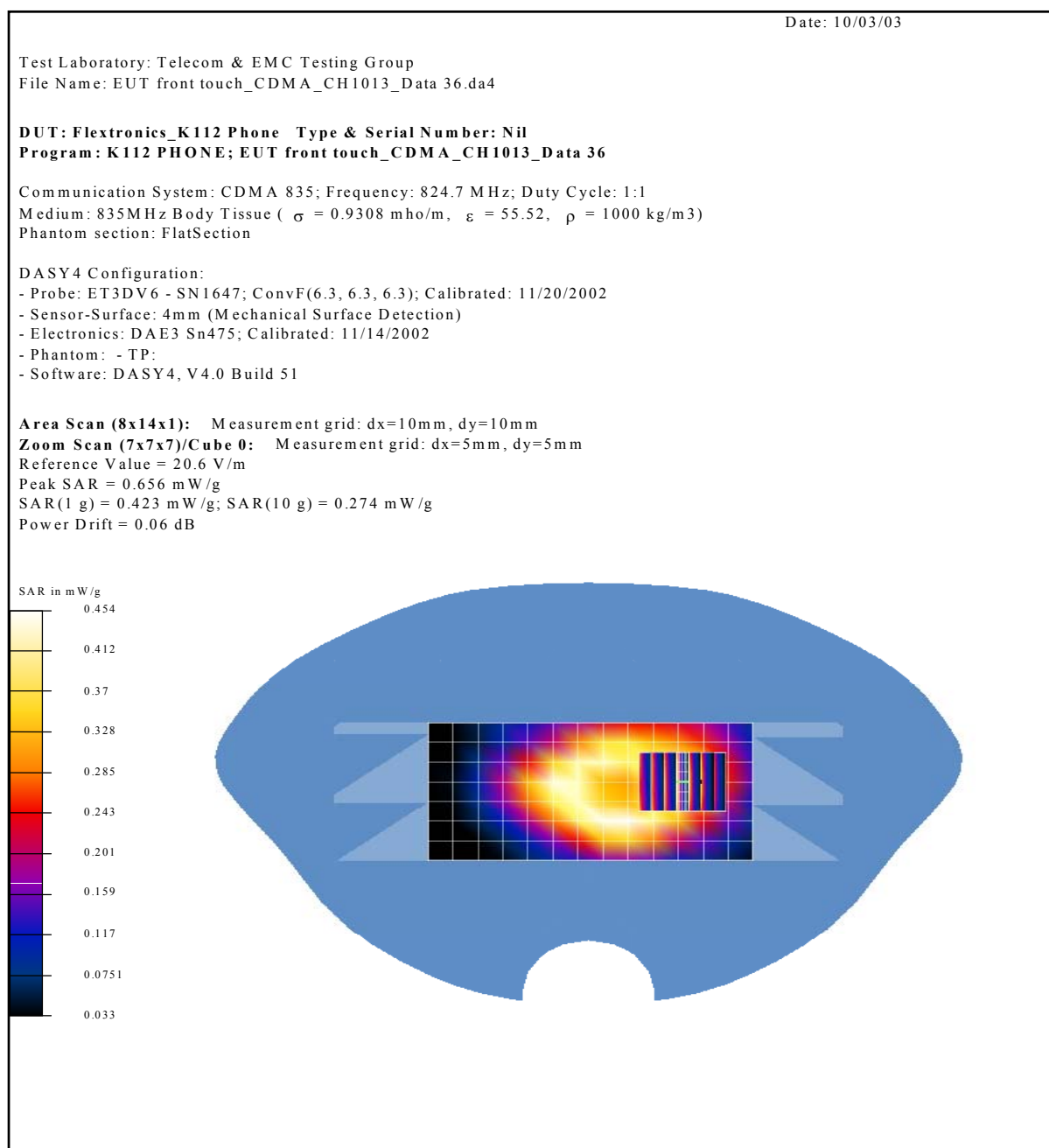
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 777 848.31MHz	0.234



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 34: SAR Test Distribution Plot (CDMA Mode) – Device Front Touching.

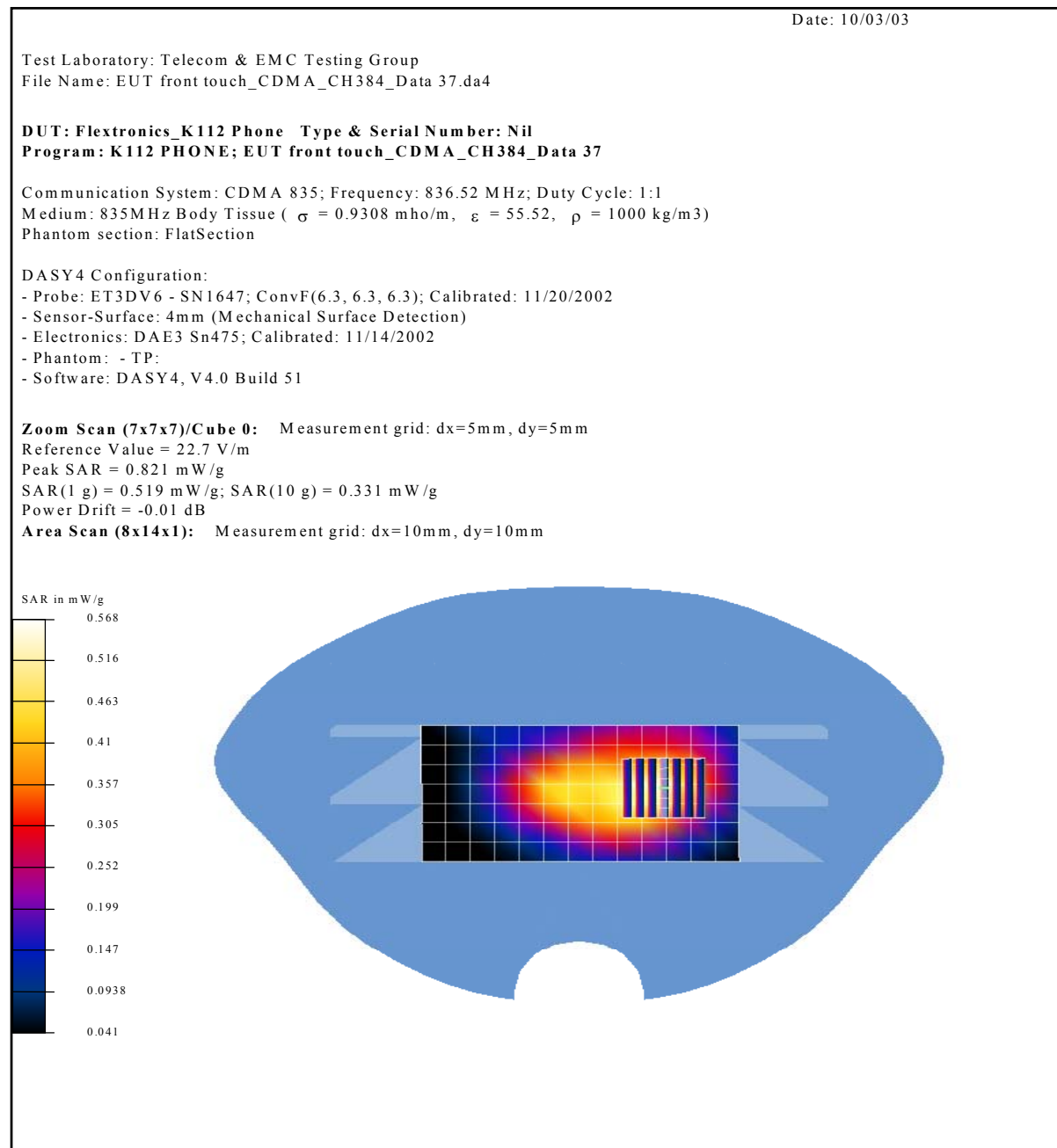
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Front Touched Phantom	Fixed	Channel: 1013 824.70MHz	0.423



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 35: SAR Test Distribution Plot (CDMA Mode) – Device Front Touching.

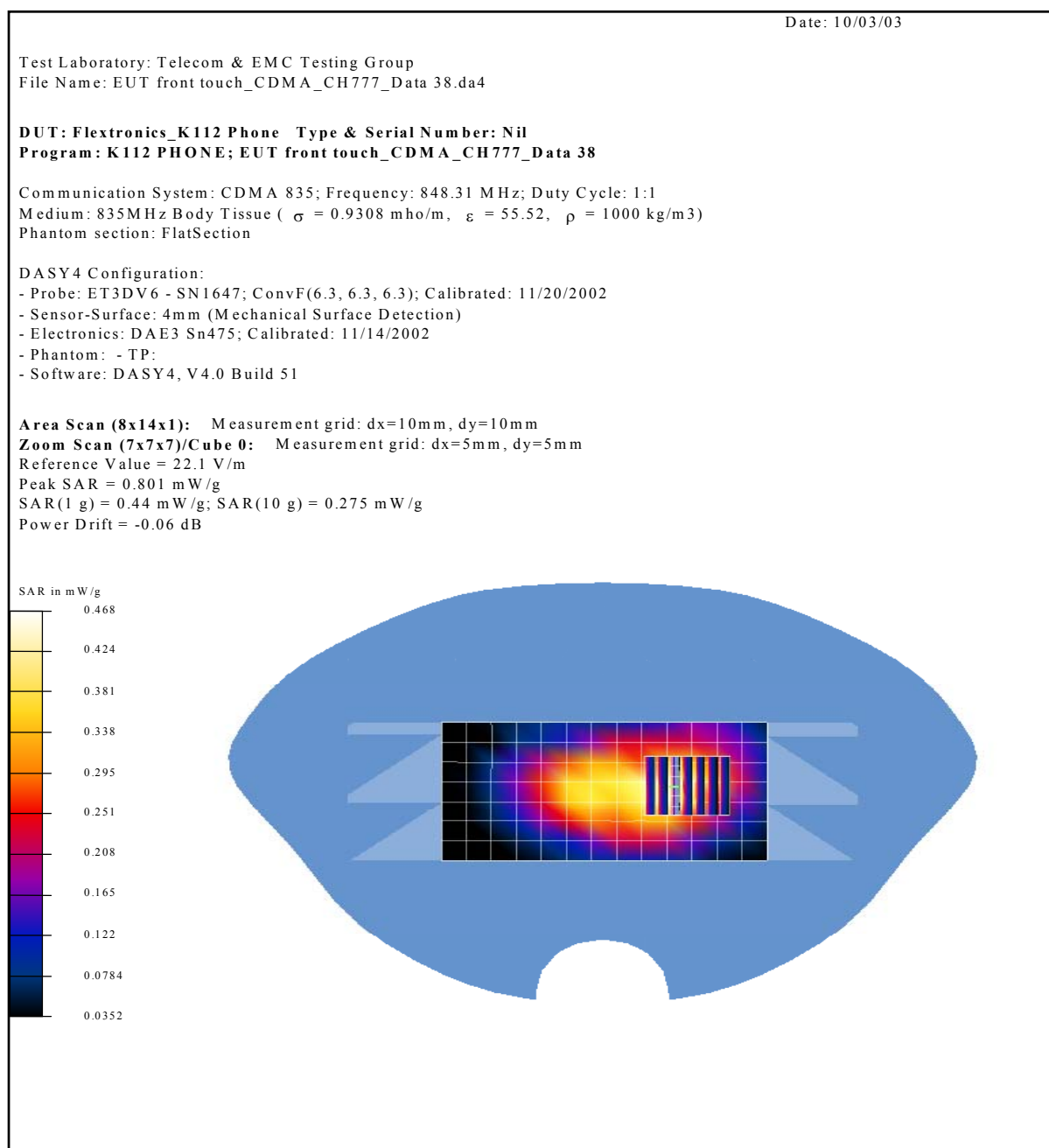
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Front Touched Phantom	Fixed	Channel: 384 836.52MHz	0.519



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 36: SAR Test Distribution Plot (CDMA Mode) – Device Front Touching.

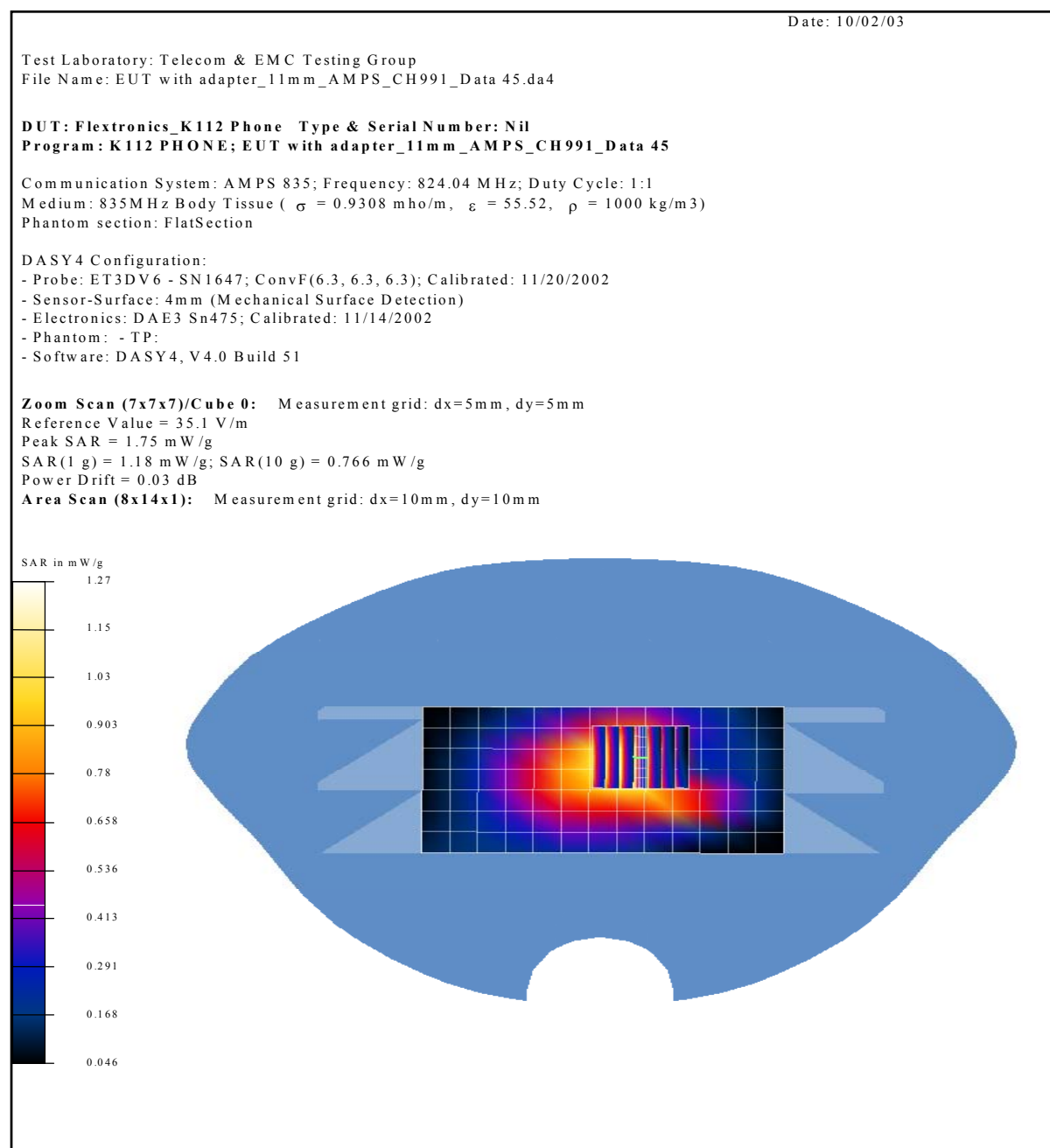
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Front Touched Phantom	Fixed	Channel: 777 848.31MHz	0.440



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 37: SAR Test Distribution Plot (AMPS Mode) – Device with belt clip (11mm spacing).

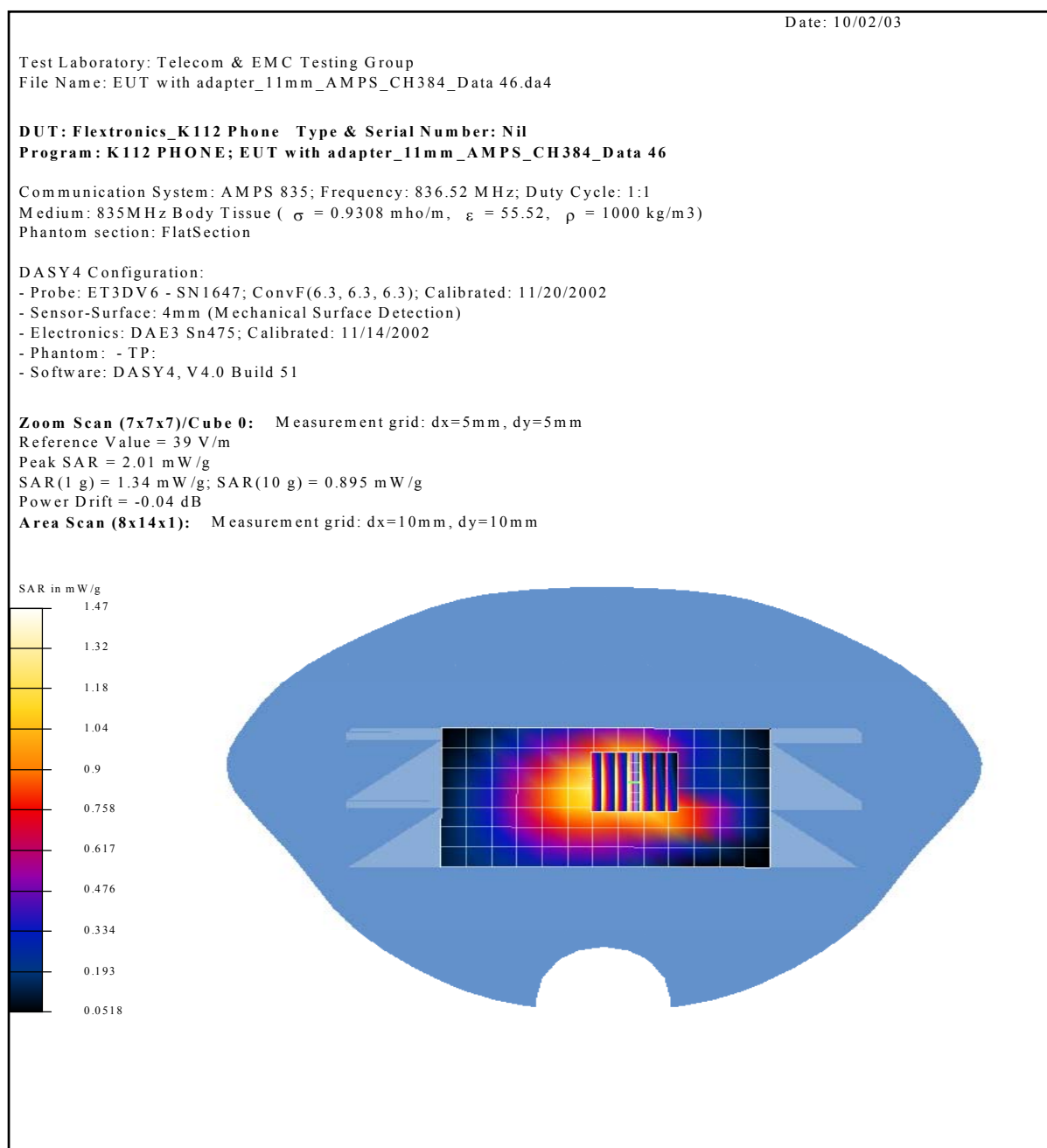
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 991 824.04MHz	1.18



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 38: SAR Test Distribution Plot (AMPS Mode) – Device with belt clip (11mm spacing).

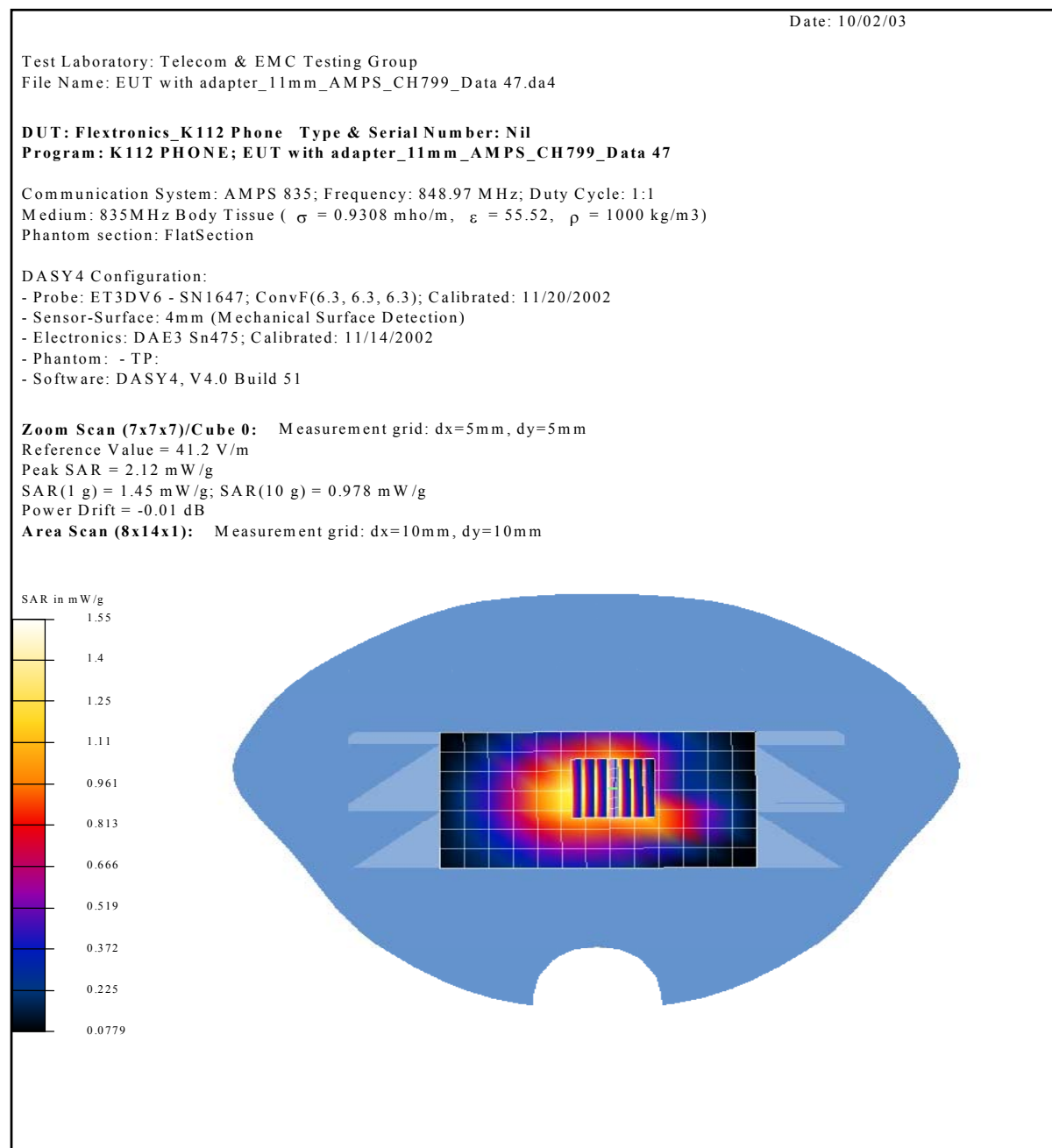
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 384 836.52MHz	1.34



Ambient Temperature: $23 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 52% to 57%

Figure 39: SAR Test Distribution Plot (AMPS Mode) – Device with belt clip (11mm spacing).

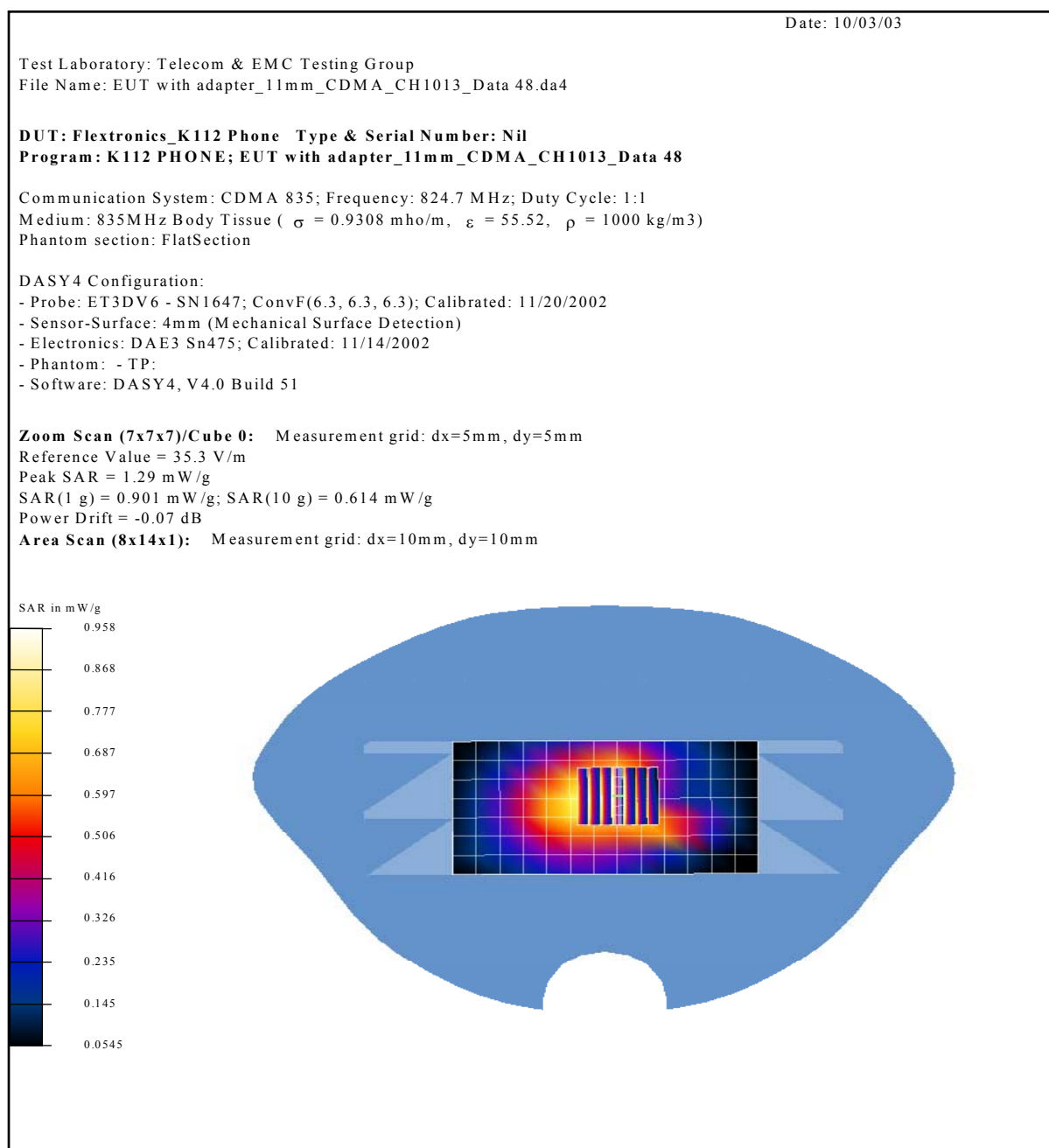
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 799 848.97MHz	1.45



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 40: SAR Test Distribution Plot (CDMA Mode) – Device with belt clip (11mm spacing).

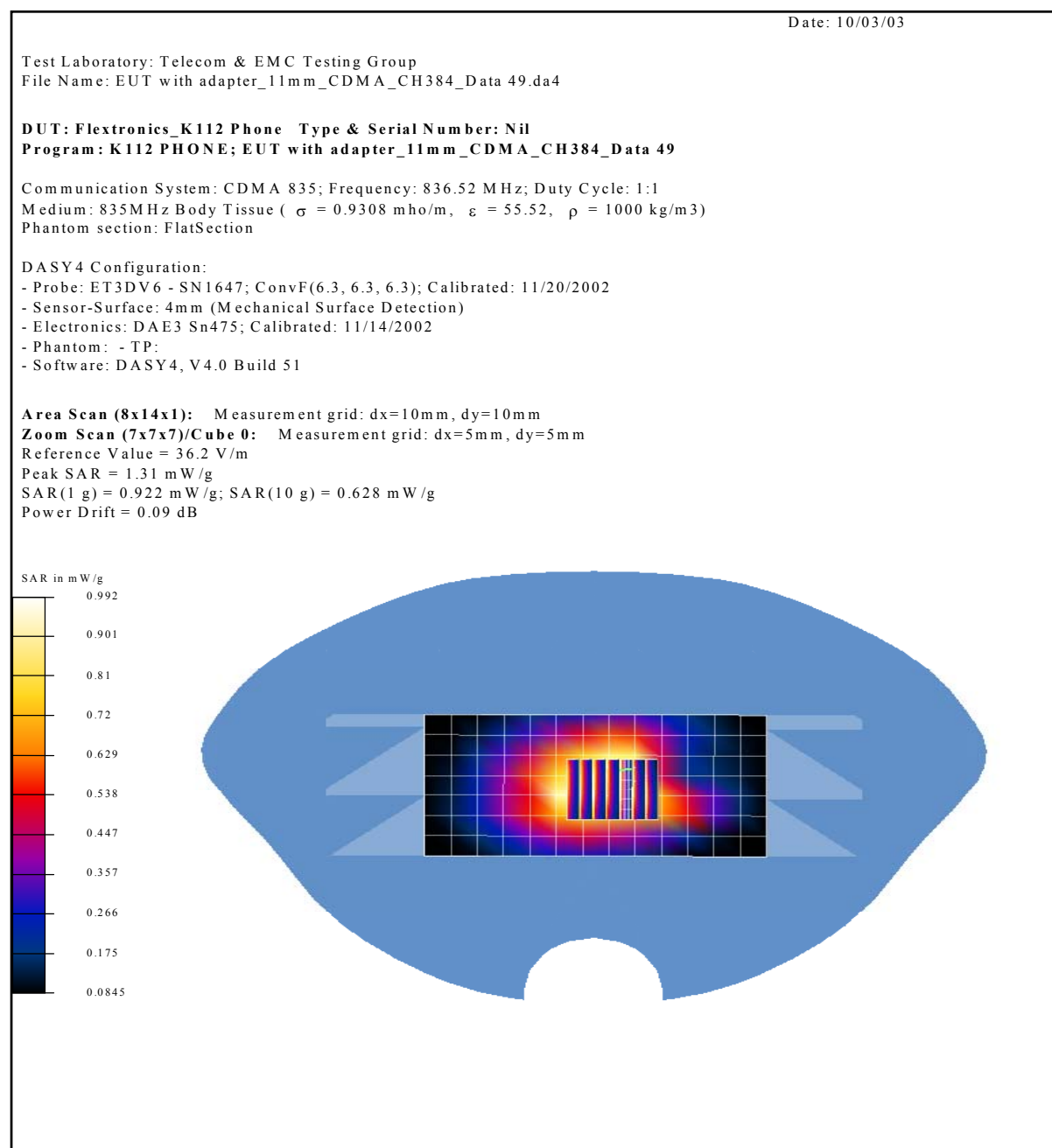
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 1013 824.70MHz	0.901



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

Figure 41: SAR Test Distribution Plot (CDMA Mode) – Device with belt clip (11mm spacing).

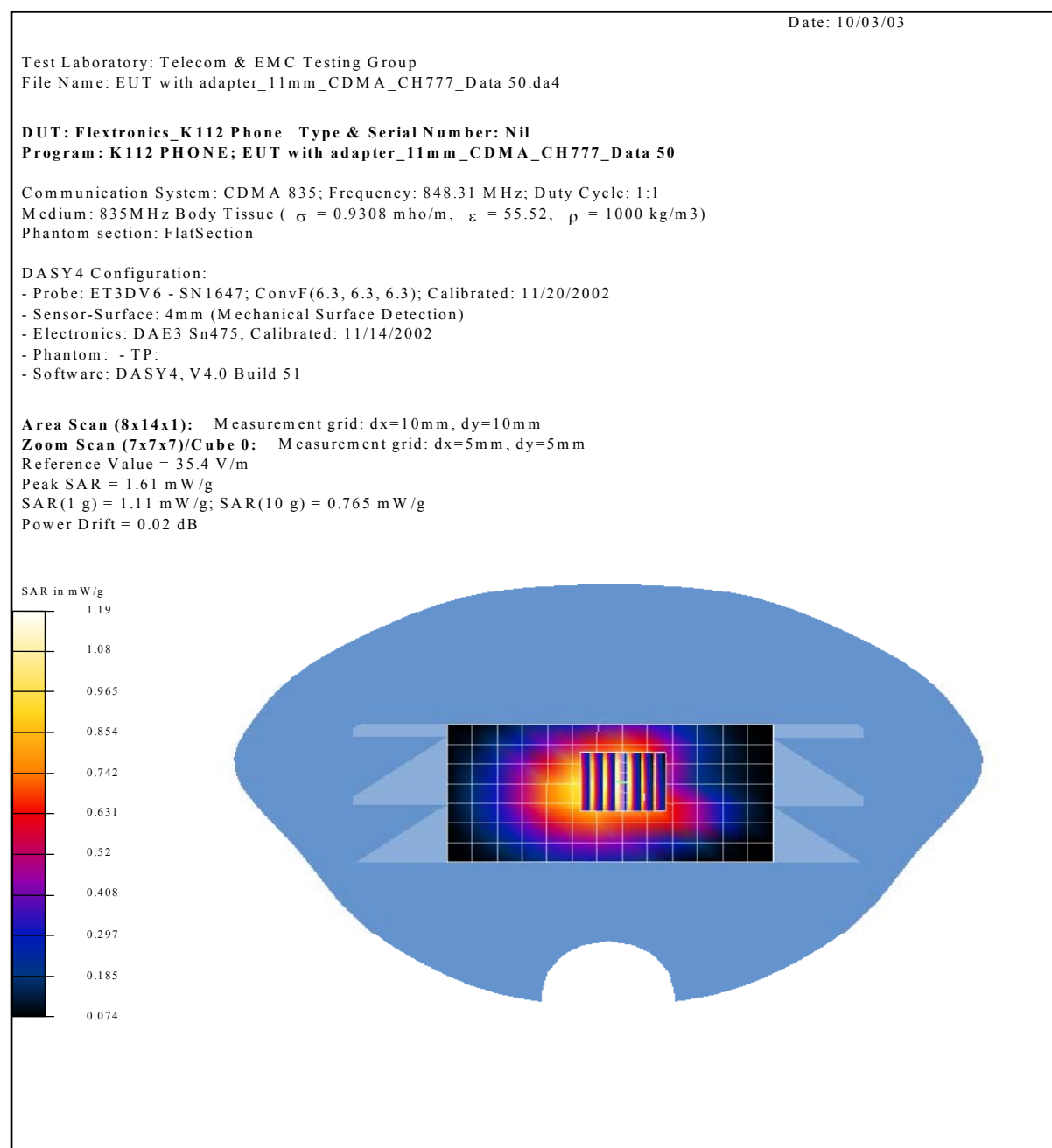
Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 384 836.52MHz	0.922



Ambient Temperature: $24 \pm 1^{\circ}\text{C}$
 Tissue Temperature: $23 \pm 1^{\circ}\text{C}$
 Humidity: 57% to 61%

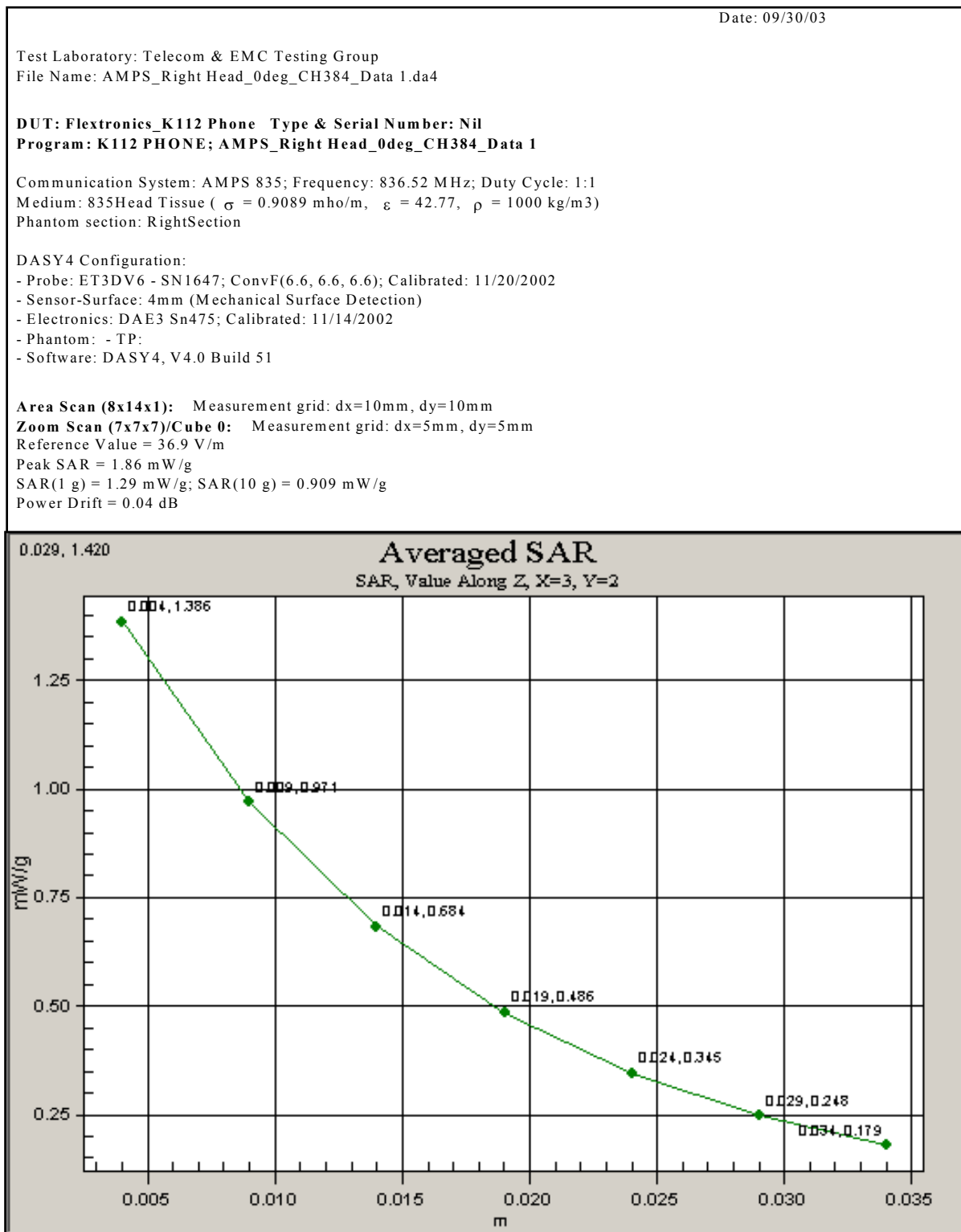
Figure 42: SAR Test Distribution Plot (CDMA Mode) – Device with belt clip (11mm spacing).

Phantom Configuration	Device Test Positions	Antenna Position	Channel	SAR (W/kg), over 1g Tissue
Flat Phantom	EUT Rear To Phantom	Fixed	Channel: 777 848.31MHz	1.11



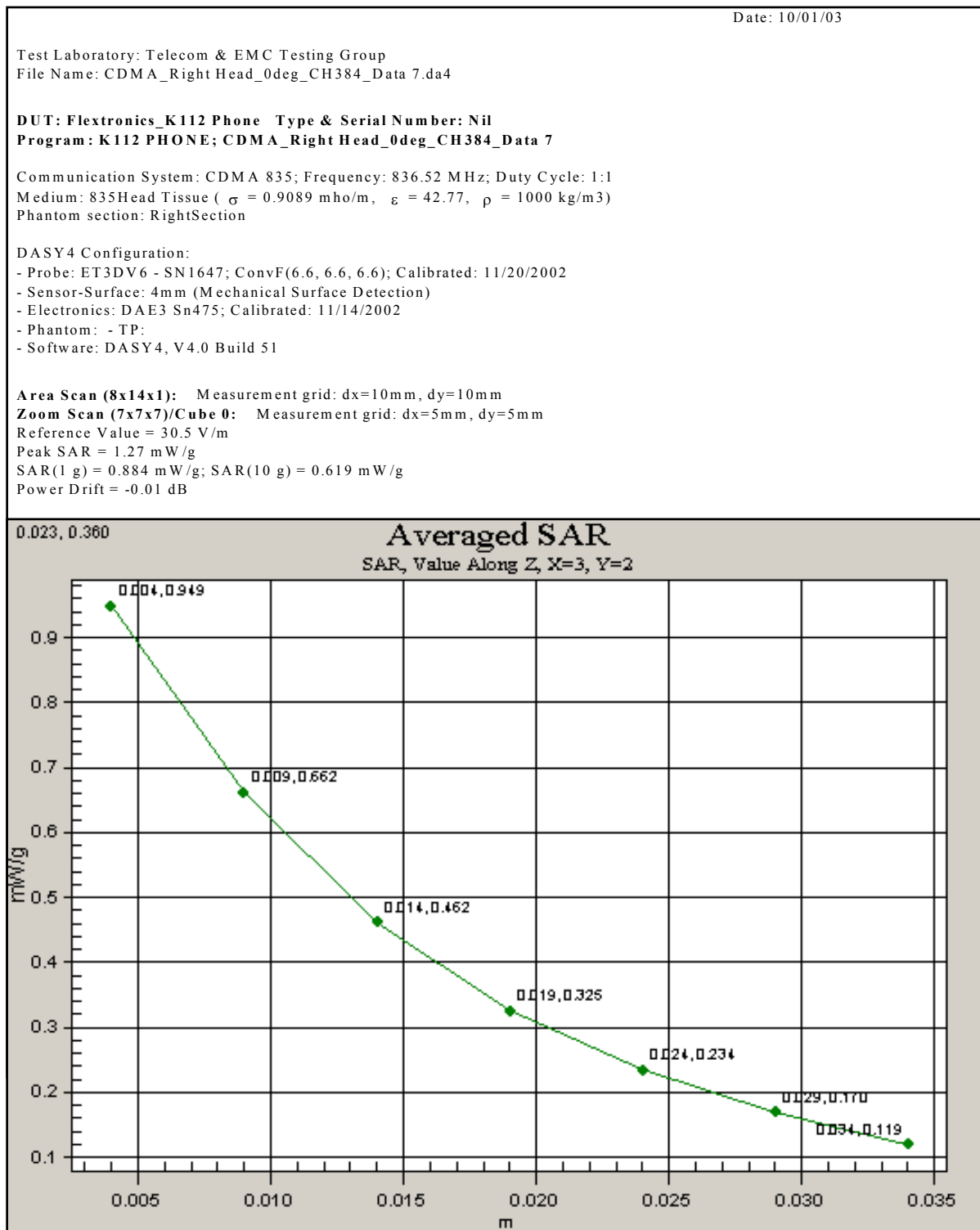
Z-PLOT for highest SAR measured value (AMPS Mode / Device at head phantom).

For the **AMPS Mode (Device at head phantom)**, the worst-case SAR value was found to be **1.29W/Kg** (over a 1g tissue) at **Channel 384** which is lower than the maximum limit of 1.60 W/Kg.



Z-PLOT for highest SAR measured value (CDMA Mode / Device at head phantom).

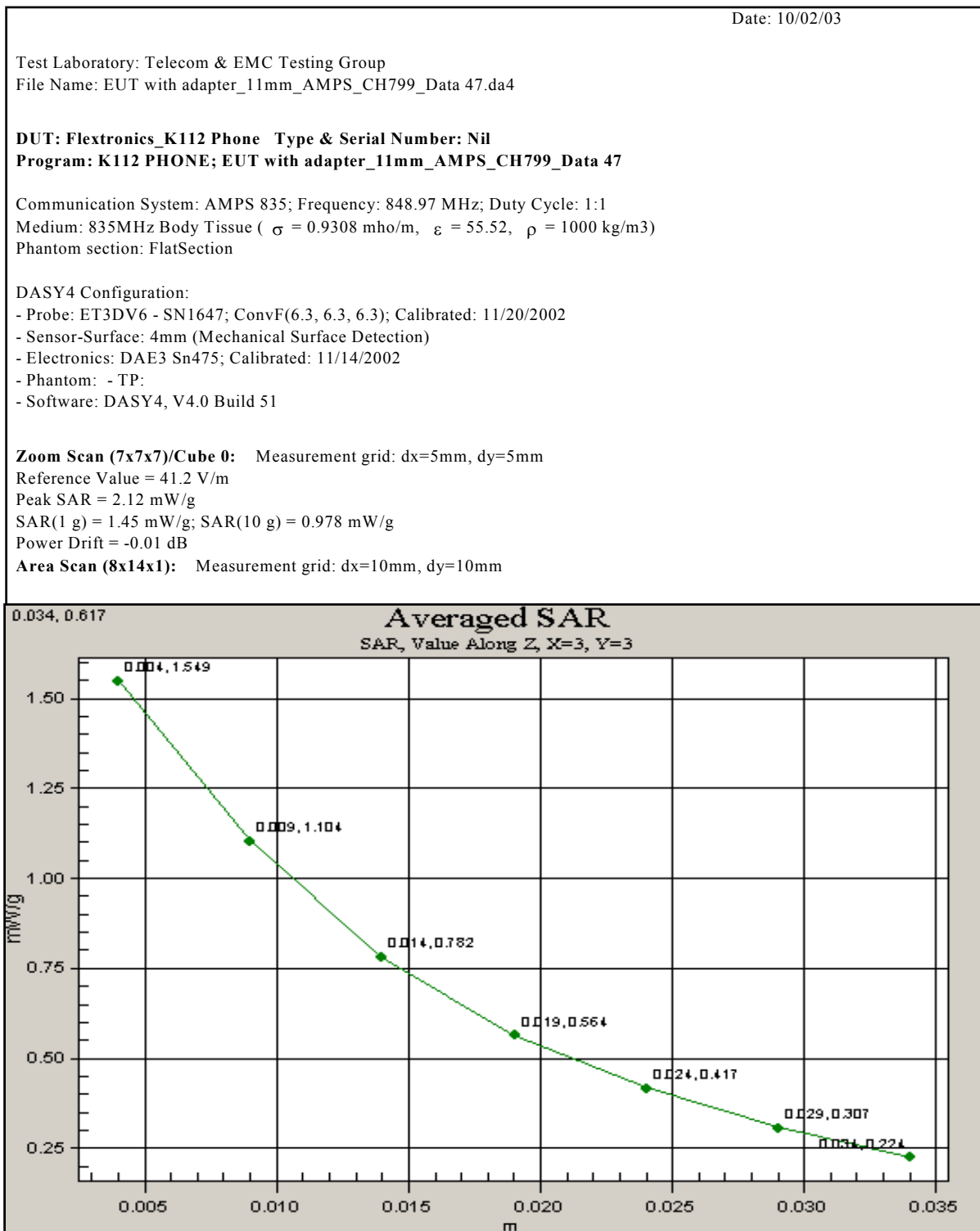
For the **CDMA Mode (Device at head phantom)**, the worst-case SAR value was found to be **0.884W/Kg** (over a 1g tissue) at **Channel 384** which is lower than the maximum limit of 1.60 W/Kg.



TEST RESULTS

Z-PLOT for highest SAR measured value (AMPS Mode / Body Worn Configuration).

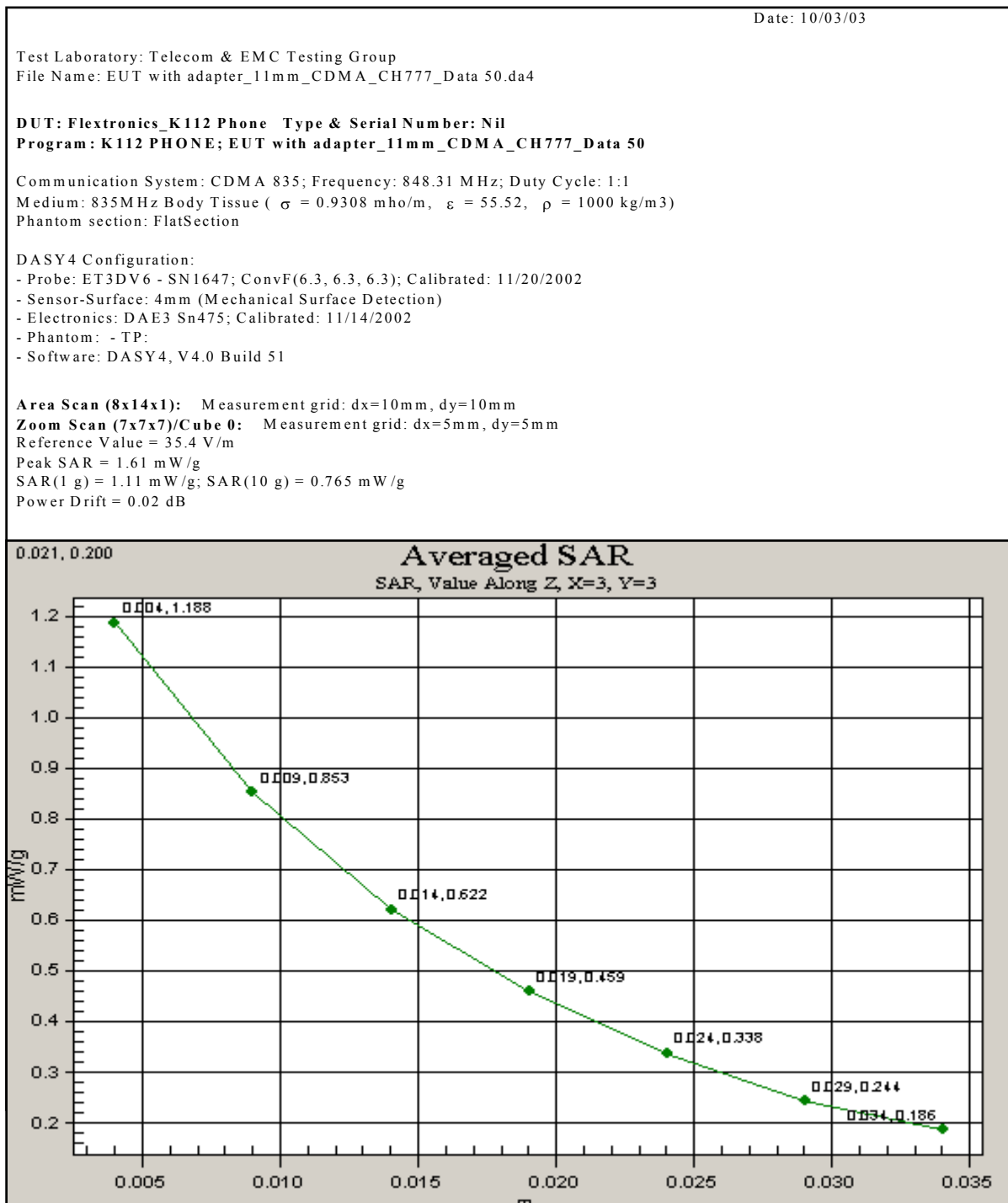
For the **AMPS Mode (Body Worn Configuration)**, the worst-case SAR value was found to be **1.45W/Kg** (over a 1g tissue) at **Channel 799** which is lower than the maximum limit of 1.60 W/Kg.



TEST RESULTS

Z-PLOT for highest SAR measured value (CDMA Mode / Body Worn Configuration).

For the **CDMA Mode (Body Worn Configuration)**, the worst-case SAR value was found to be **1.11W/Kg** (over a 1g tissue) at **Channel 777** which is lower than the maximum limit of 1.60 W/Kg.



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1. Results of the testing/calibration in the form of a report will be issued immediately after the service has been completed or terminated.
2. Unless otherwise requested, a report shall contain only technical results. Analysis and interpretation of the results and professional opinion and recommendations expressed thereupon, if required, shall be clearly indicated and additional fee paid for, by the Client.
3. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that PSB Corporation approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that PSB Corporation in any way "guarantees" the later performance of the product/equipment.
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August 2003

ANNEX A

**TEST INSTRUMENTATION
&
GENERAL PROCEDURE**

A.1 General Test Procedure

In the SAR measurement, the positioning of the probes must be performed with sufficient accuracy to obtain repeatable measurements in the presence of rapid spatial attenuation phenomena. The accurate positioning of the E-field probe is accomplished by using a high precision robot. The robot can be taught to position the probe sensor following a specific pattern of points. In a first sweep, the sensor is positioned as close as possible to the interface, with the sensor enclosure touching the inside of the fiberglass shell. The SAR is measured on a grid of points, which covers the curved surface of the phantom in an area larger than the size of the DUT. After the initial scan, a high- resolution grid is used to locate the absolute maximum measured energy point. At this location, attenuation versus depth scan will be accomplished by the measurement system to calculate the SAR value.

A.2 SAR Test Instrumentation**SAR Measurement System****• Positioning Equipment**

Type: High Precision Industrial Robot, RX90.
Precision: High precision (repeatability 0.02mm)
Reliability: High reliability (industrial design)

• Compaq Computer

Type: 2.4GHz Pentium
Memory: 512MB SDRAM
Operating System: Windows 2000
Dell Monitor: 17" LCD

• Dosimetric E-Field Probe

Type: ET3DV6
Isotropy Error ($\varnothing$): $\pm 0.25\text{dB}$
Dynamic Range: 0.01 – 100 W/kg

• Phantom & Tissue

Phantom: "SAM v4.0 Phantom", manufactured by SPEAG
Tissue: Simulated Tissue with electrical characteristics similar to those of the human at normal body temperature ($23 \pm 1^\circ\text{C}$)
Shell: Fiberglass shell phantom with 2mm thickness
Dimension: A100cm x 50cm x 85cm (L x W x H)

A.3 Test Setup**Phantom**

The “SAM v4.0 Phantom”, manufactured by SPEAG is a fiberglass shell phantom with 2 mm shell thickness. It has three measurement areas:

- Left hand
- Right hand
- Flat phantom

The phantom table comes in the sizes: A 100x50x85 cm (LxWxH) table for use with free standing robots.

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. Only one device holder is necessary if two phantoms are used (e.g., for different solutions).

Simulated tissue

Simulated Tissue: Suggested in a paper by George Hartsgrrove and colleagues in University of Ottawa Ref.: Bioelectromagnetics 8:29-36 (1987)

This simulated tissue is mainly composed of water, sugar and salt. At higher frequencies, in order to achieve the proper conductivity, the solution does not contain salt. Also, at these frequencies, D.I. water and alcohol is preferred.

Tissue Density : Approximately 1.25 g/cm^3

- **Preparation**

The ingredients (i.e. water, sugar, salt, etc) required to prepare the simulated tissue are carefully weighed and poured into a clean container for mixing. A stirring paddle, that is attached to a hand drill is used to stir the solution for a duration of about 30 minutes or more. When the ingredients are completely dissolved, the solution is left in the container for the air bubbles to disappear.

- **Measurement of Electrical Characteristics of Simulated Tissue**

- 1) S-PARAMETER Network Analyzer, Agilent 8753ES (30kHz – 6GHz)
- 2) Agilent 85070D Dielectric Probe Kit

ELECTRICAL CHARACTERISTIC MEASUREMENT SETUP



- **Description of the Agilent 85070D Dielectric Probe Kit**

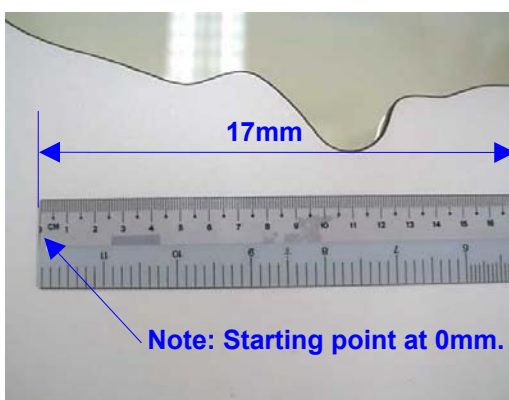
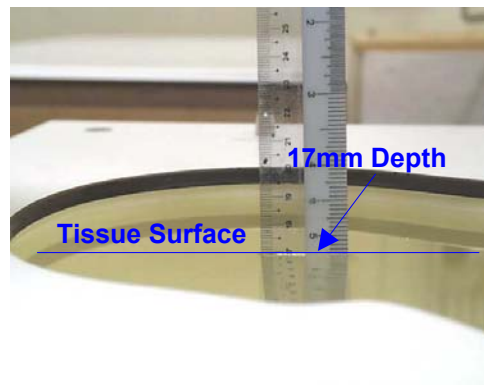
The 85070D is a dielectric probe that is used to measure the intrinsic electrical properties of materials in the RF and microwave frequency bands. The 85070D software allows you to measure the complex dielectric constant (also called permittivity) of liquids and semi-solids, including the dielectric loss factor or loss tangent.

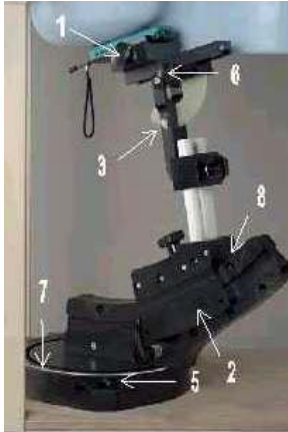
To obtain data at hundreds of frequencies in seconds, simply immerse the probe into liquids or semi-solids - no special fixtures or containers are required. The 85070D must be used in conjunction with an Agilent network analyzer. The network analyzer provides the high frequency stimulus, and measures the reflected response.

The probe transmits a signal into the material under test (MUT). The measured reflected response from the materials is then related to its dielectric properties. A computer controls the system, and runs software that guides the user through a measurement sequence. An effort is made to keep the results dielectric constant and conductivity within 5 % of published data.

Liquid Depth

The liquid depth at the head of the SAM v4.0 Phantom is approximately 17mm.



Positioning of EUT

The **DASY4 holder** is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65° . The intended use position in the CENELEC document is has a rotation angle of 65° and an inclination angle of 80° . The rotation centers for both scales is the ear opening. Thus the device needs no repositioning when changing the angles. The device rotation around the device axis is not changed in the holder. In the CENELEC standard it is always 0° . If the standard changes, a support will be provided with the new angle.

1. **“Cheek/Touch Position”** – the device is brought toward the mouth of the head phantom by pivoting against the “ear reference point” or along the “N-F” line for the SCC-34/SC-2 head phantom. This test position is established:
 - i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
 - ii) (Or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

2. **“Ear/Tilt Position”** – With the handset aligned in the “Cheek/Touch Position”:
 - i) If the earpiece of the handset is not in full contact with the phantom’s ear spacer (in the “Cheek/Touch position”) and the peak SAR location for the “Cheek/Touch” position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the “initial ear position” by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.
 - ii) (Otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both “ear reference points” (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the handset is tilted away from the mouth with respect to the “test device reference point” by 15° . After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both “ear reference points” until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

3. **Body Worn Configuration**

All body worn accessories are tested for the FCC RF exposure compliance. The phone is positioned into carrying case (if available) and placed below of the flat phantom. Headset or ear piece (if available) is connected during measurements.

TEST INSTRUMENTATION & GENERAL PROCEDURES
ANNEX A

<u>Instrument</u>	<u>Model</u>	<u>S/No</u>	<u>Cal Due Date</u>	
Boonton RF Power Meter (Dual Channel)	4532	97701	25 June 2004	×
Boonton Peak Power Sensor	56218-S/1	1417	31 Aug 2003	
Boonton Power Sensor	51075	31534	-	×
Boonton Power Sensor	51075	32002	25 June 2004	×
S-Parameter Network Analyzer (30kHz – 3GHz)	HP8753ES	US37390533	17 Sept 2004	×
Agilent 85070D Dielectric Probe Kit	85075D	21356	-	×
Agilent Signal Generator (10MHz – 20GHz)	83620B	3844A01337	11 Oct 2003	×
Amplifier Research Power Amplifier (1MHz – 1000MHz)	25W1000B	27225	-	
Amplifier Research Power Amplifier (800MHz – 4.2GHz)	25S1G4A	29346	-	×
Agilent Dual Directional Coupler	HP778D	18289	-	×
Radio Test Set	2967	296501/331	-	
R&S Universal Radio Communication Tester	CMU-200	837587/068	18 Sep 2004	
450MHz System Validation Dipole	D450V2	1004	4 Apr 2003	
835MHz System Validation Dipole	D835V2	447	12 Nov 2003	×
900MHz System Validation Dipole	D900V2	134	11 Nov 2003	
1800MHz System Validation Dipole	D1800V2	2d019	11 Nov 2003	
1900MHz System Validation Dipole	D1900V2	546	25 Nov 2003	
2450MHz System Validation Dipole	D2450V2	715	25 Sep 2004	
Data Acquisition Electronics (DAE)	DAE3V1	475	11 Nov 2003	×
Dosimetric E-field Probe	ET3DV6	1645	25 Nov 2002	
Dosimetric E-field Probe	ET3DV6	1646	25 Nov 2002	
Dosimetric E-field Probe	ET3DV6	1647	20 Nov 2003	×
Isotropic H-field Probe	H3DV6	6115	6 Mar 2003	
Agilent Wireless Communication Tester	8960	US40300307	20 Jan 2004	×

ANNEX B

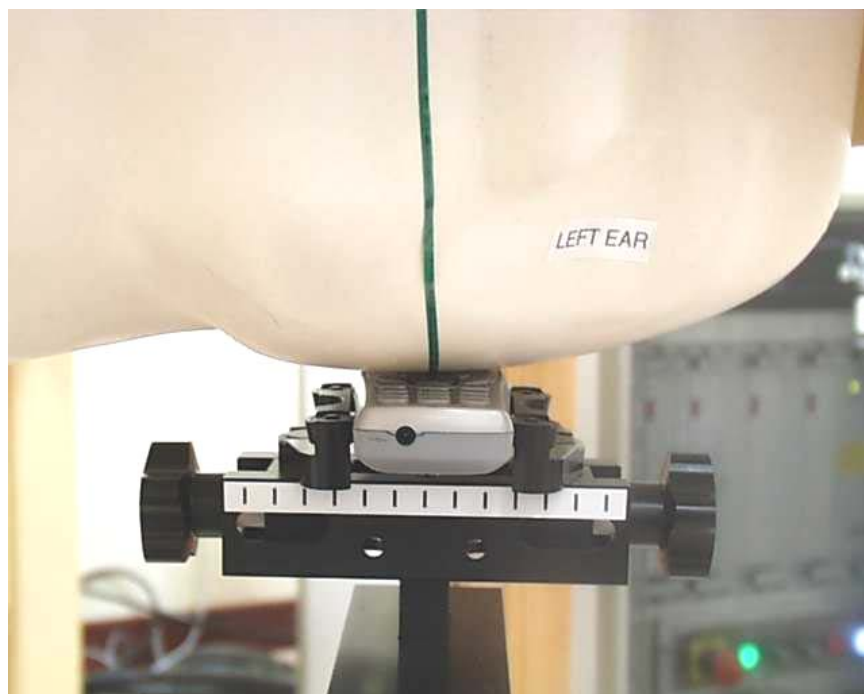
TEST SETUP PHOTOGRAPHS

SAR Test Setup Photographs



SAR Test Setup (Device at head phantom) – Far View

SAR Test Setup Photographs

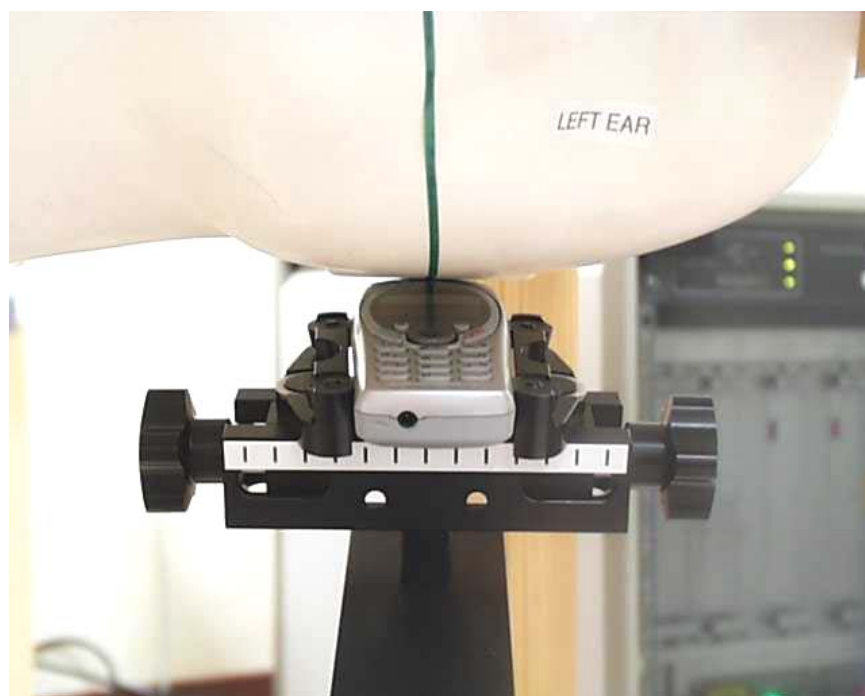


SAR Test Setup (Device at head phantom) – Closer Front View (Cheek/Touch)



SAR Test Setup (Device at head phantom) – Closer Side View (Cheek/Touch)

SAR Test Setup Photographs



SAR Test Setup (Device at head phantom) – Closer Front View (Ear/Tilt)



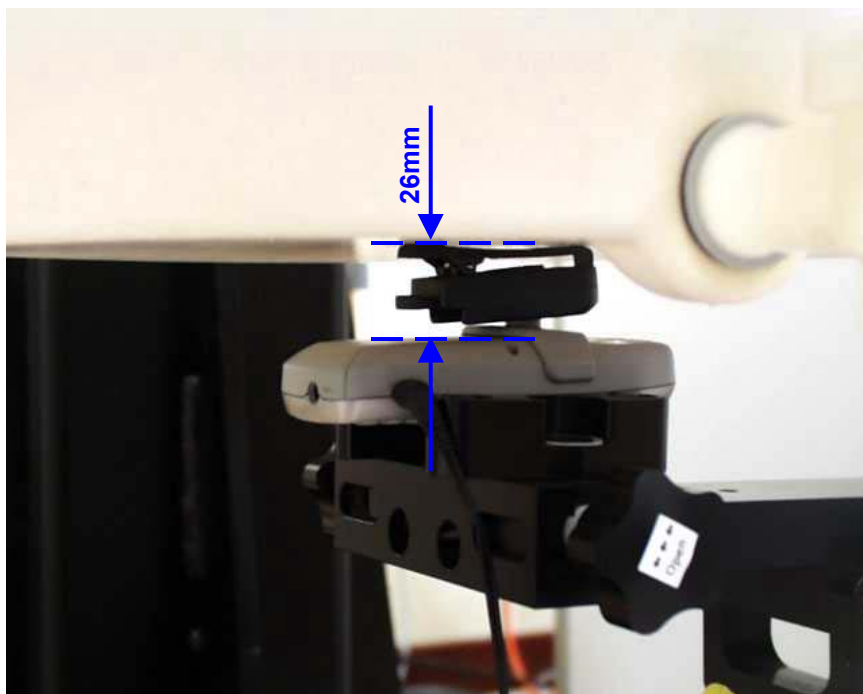
SAR Test Setup (Device at head phantom) – Closer Side View (Ear/Tilt)

SAR Test Setup Photographs



SAR Test Setup At Flat Phantom – Far View

SAR Test Setup Photographs

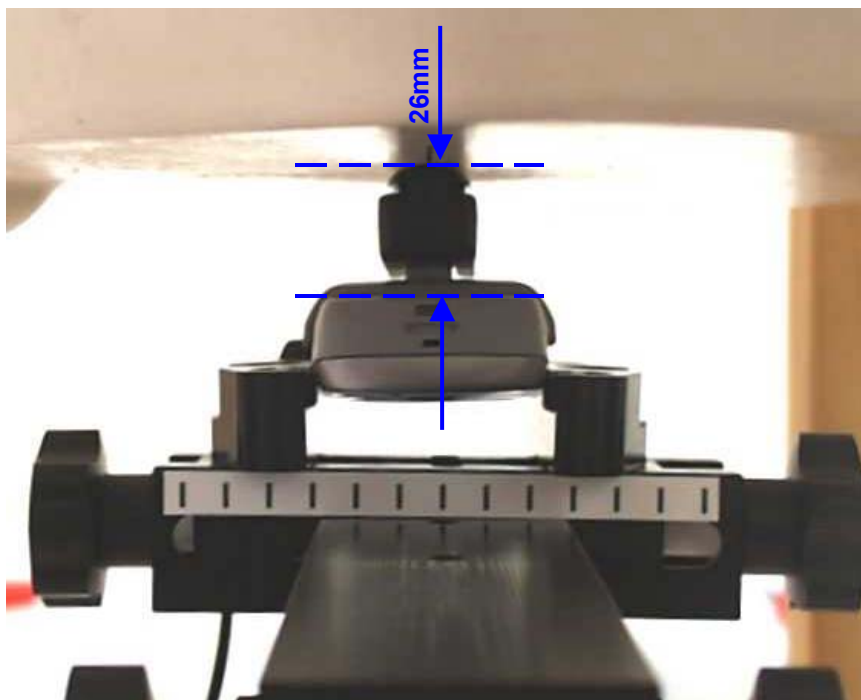


SAR Test Setup At Flat Phantom – View from Left Side(EUT Rear To Phantom, 26mm Gap Spacing)



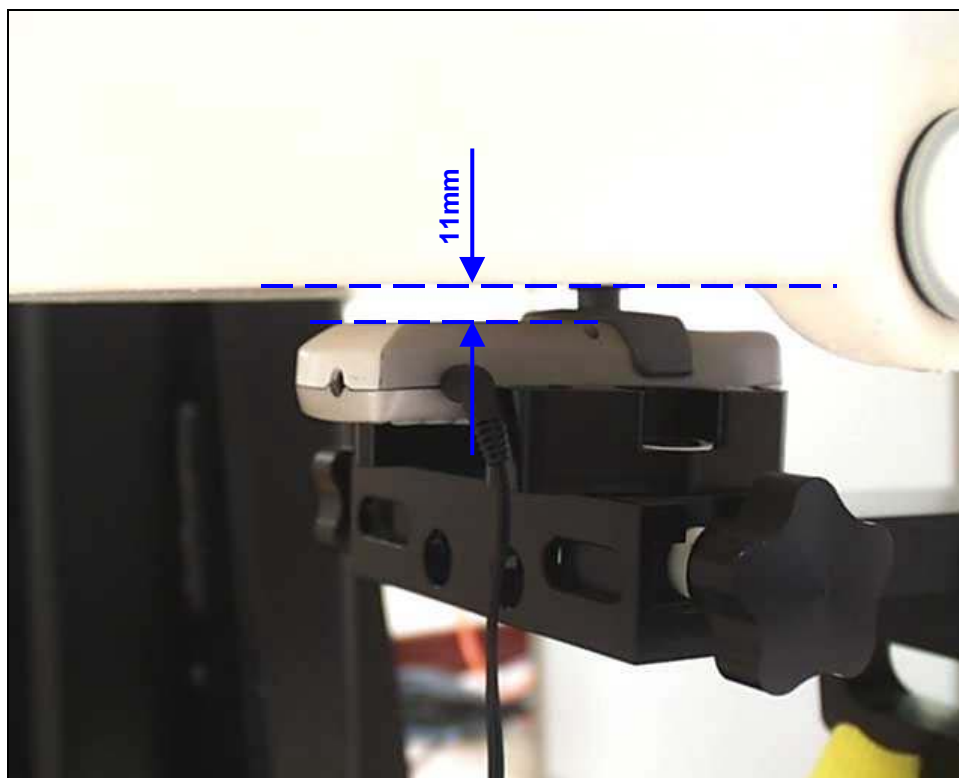
SAR Test Setup At Flat Phantom – View from Right Side(EUT Rear To Phantom, 26mm Gap Spacing)

SAR Test Setup Photographs

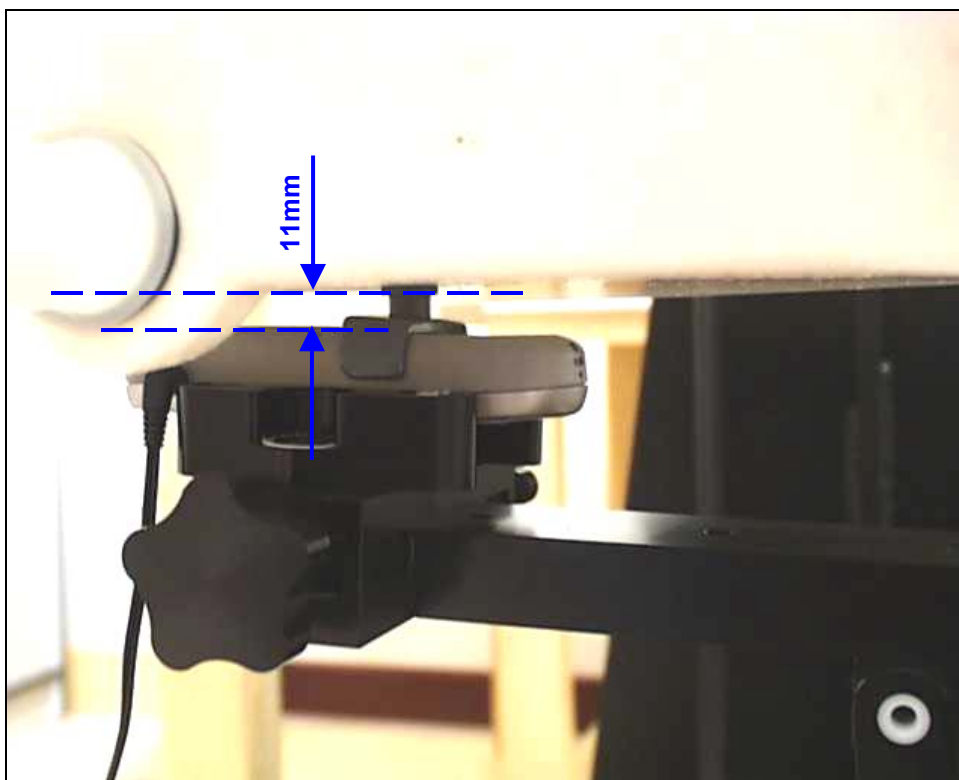


SAR Test Setup At Flat Phantom – Closer Side View (EUT Rear To Phantom, 26mm Gap Spacing)

SAR Test Setup Photographs

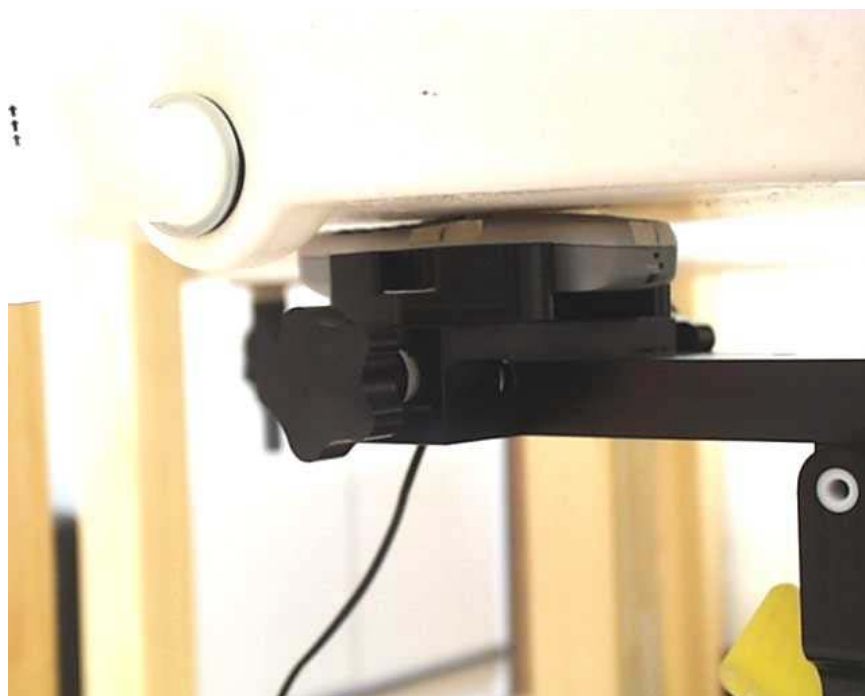


SAR Test Setup At Flat Phantom – Closer View (EUT **Rear** To Phantom)



SAR Test Setup At Flat Phantom – Closer View (EUT **Rear** To Phantom)

SAR Test Setup Photographs



SAR Test Setup At Flat Phantom – Closer View (EUT **Front** Touched Phantom)

Conducted Power Measurement Setup

Conducted Power Measurement Setup

EUT PHOTOGRAPHS

Front of EUTRear of EUT

EUT PHOTOGRAPHS

EUT with Accessories

ANNEX C

TISSUE SIMULANT DATA SHEETS

TISSUE SIMULANT DATA SHEETS
ANNEX C

Type of Tissue	Head	Body
Target Frequency (MHz)	835	835
Target Dielectric Constant	41.50	55.20
Target Conductivity (S/m)	0.90	0.97
Composition (by weight)	Water (39.5%) Ethanol (0%) Sugar (56.65%) Salt (1.48%) HEC (0%) Preventol D7 (2.37%)	Water (54.07%) Ethanol (0%) Sugar (43.03%) Salt (0.82%) HEC (0%) Preventol D7 (2.08%)
Measured Dielectric Constant	42.77	55.52
Measured Conductivity (S/m)	0.9089	0.9308

Probe Name	Dosimetric E-field Probe ET3DV6	Dosimetric E-field Probe ET3DV6
Probe Serial Number	1647	1647
Sensor Offset (mm)	2.7	2.7
Conversion Factor	6.6 ± 9.5%	6.3 ± 9.5%
Probe Calibration Due Date (DD/MM/YY)	20 Nov 2003	20 Nov 2003

TISSUE SIMULANT DATA SHEETS

ANNEX C

Head Tissue at 835MHz

Frequency	e'	e''	Conductivity
825000000	42.91	19.61	0.8986
826000000	42.89	19.60	0.8992
827000000	42.87	19.60	0.9006
828000000	42.91	19.61	0.9018
829000000	42.84	19.62	0.9036
830000000	42.84	19.58	0.9029
831000000	42.81	19.57	0.9036
832000000	42.82	19.58	0.9052
833000000	42.82	19.58	0.9060
834000000	42.81	19.56	0.9064
835000000	42.77	19.59	0.9089
836000000	42.76	19.56	0.9086
837000000	42.76	19.57	0.9101
838000000	42.75	19.57	0.9113
839000000	42.74	19.56	0.9115
840000000	42.74	19.56	0.9127
841000000	42.71	19.60	0.9156
842000000	42.70	19.56	0.9149
843000000	42.68	19.55	0.9157
844000000	42.68	19.57	0.9176
845000000	42.67	19.56	0.9184
846000000	42.63	19.51	0.9172
847000000	42.64	19.53	0.9188
848000000	42.63	19.53	0.9200
849000000	42.63	19.53	0.9211
850000000	42.60	19.51	0.9214
851000000	42.59	19.50	0.9219
852000000	42.58	19.52	0.9241
853000000	42.57	19.50	0.9242
854000000	42.57	19.48	0.9242
855000000	42.54	19.47	0.9250
856000000	42.54	19.49	0.9267
857000000	42.52	19.49	0.9278
858000000	42.51	19.45	0.9273
859000000	42.50	19.47	0.9291
860000000	42.49	19.46	0.9300
861000000	42.49	19.48	0.9318
862000000	42.43	19.45	0.9315
863000000	42.45	19.44	0.9319
864000000	42.44	19.47	0.9344
865000000	42.40	19.43	0.9336

Tested by: NAC
Date : 30th Sept 2003
Frequency: 835MHz
Mixture: Head Tissue
Tissue temp: 24°C

Composition		
Tap Water	16000.0g	39.50%
Ultra Pure Water	0.0g	0.00%
Sugar	22944.0g	56.65%
Glyco	0.0g	0.00%
Salt	600.0g	1.48%
Preventol D7	960.0g	2.37%
Total Weight	40504.0g	100.0%

Result (FCC)	Dielectric Constant	Conductivity
Measured	42.77	0.9089
Target (FCC)	41.5	0.9
Low Limit	39.425	0.855
High Limit	43.575	0.945
% Off Target	+3.07	+0.99

(e' = Dielectric Constant)
 (e'' = Loss Factor)

TISSUE SIMULANT DATA SHEETS

ANNEX C

Body Tissue at 835MHz

Frequency	e'	e''	Conductivity
825000000	55.59	20.08	0.9203
826000000	55.60	20.10	0.9226
827000000	55.58	20.06	0.9217
828000000	55.59	20.06	0.9229
829000000	55.59	20.09	0.9254
830000000	55.58	20.08	0.9259
831000000	55.55	20.05	0.9258
832000000	55.53	20.04	0.9264
833000000	55.56	20.05	0.9278
834000000	55.53	20.03	0.9282
835000000	55.52	20.06	0.9308
836000000	55.51	20.03	0.9305
837000000	55.52	20.05	0.9323
838000000	55.50	20.05	0.9337
839000000	55.49	20.04	0.9341
840000000	55.48	20.02	0.9343
841000000	55.46	20.06	0.9371
842000000	55.46	20.05	0.9379
843000000	55.45	20.03	0.9379
844000000	55.45	20.04	0.9398
845000000	55.45	20.02	0.9401
846000000	55.41	20.01	0.9404
847000000	55.40	20.00	0.9410
848000000	55.41	20.01	0.9427
849000000	55.41	20.02	0.9443
850000000	55.38	19.98	0.9437
851000000	55.37	19.98	0.9446
852000000	55.36	19.97	0.9455
853000000	55.37	19.97	0.9464
854000000	55.34	19.95	0.9465
855000000	55.34	19.98	0.9492
856000000	55.35	19.95	0.9487
857000000	55.32	19.96	0.9502
858000000	55.31	19.95	0.9508
859000000	55.30	19.96	0.9523
860000000	55.30	19.95	0.9531
861000000	55.29	19.96	0.9548
862000000	55.24	19.94	0.9549
863000000	55.28	19.93	0.9555
864000000	55.28	19.93	0.9564
865000000	55.21	19.93	0.9575

Tested by: NAC
Date : 2nd Oct 2003
Frequency: 835MHz
Mixture: Body Tissue
Tissue temp: 23°C

Composition		
Tap Water	19500.0g	54.07%
Ultra Pure Water	0.0g	0.00%
Sugar	15518.0g	43.03%
Glyco	0.0g	0.00%
Salt	296.1g	0.82%
Preventol D7	750.0g	2.08%
Total Weight	36064.1g	100.0%

Result (FCC)	Dielectric Constant	Conductivity
Measured	55.52	0.9308
Target (FCC)	55.2	0.97
Low Limit	52.44	0.9215
High Limit	57.96	1.0185
% Off Target	+0.58	-4.04

(e' = Dielectric Constant)
(e'' = Loss Factor)

ANNEX D

SAR VALIDATION RESULTS

**Schmid & Partner
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate**835 MHz System Validation Dipole**

Type:

D835V2

Serial Number:

447

Place of Calibration:

Zurich

Date of Calibration:

November 12, 2001

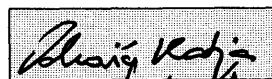
Calibration Interval:

24 months

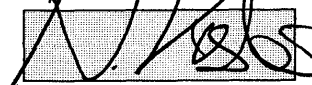
Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:



Approved by:



SAR VALIDATION RESULTS

ANNEX D

SAR Validation – AMPS Mode_Head Tissue at 835MHz (Dipole forward power = 250mW)

Date: 09/30/03

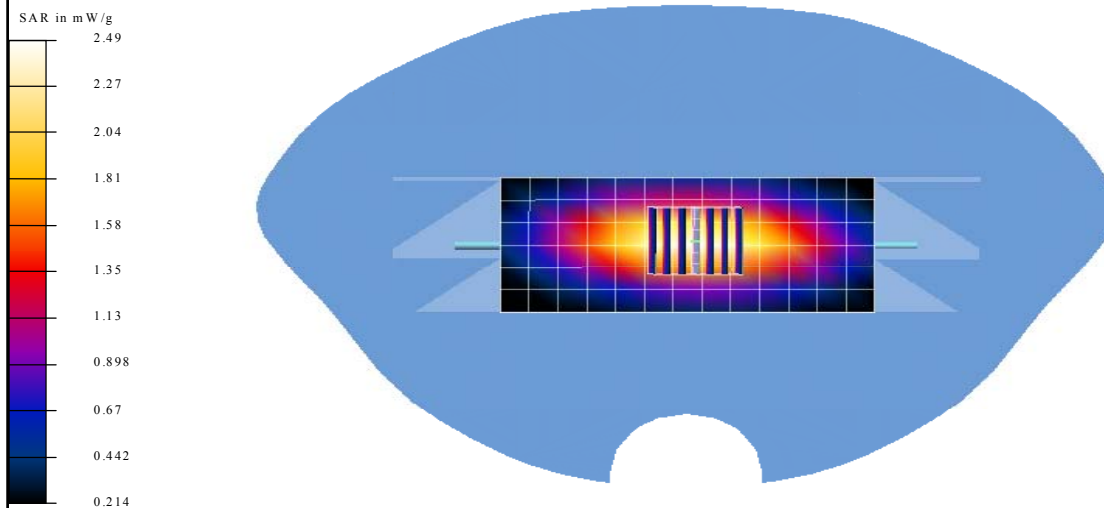
Test Laboratory: Telecom & EMC Testing Group
File Name: 835 MHz Head_Dipole Validation.da4

DUT: Dipole 835MHz Type & Serial Number: 447
Program: 835 MHz Head_Dipole Validation; 835 MHz Head_Dipole Validation

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
Phantom section: FlatSection

DASY4 Configuration:
- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (7x14x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
Reference Value = 54.8 V/m
Peak SAR = 3.41 mW/g
SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.47 mW/g
Power Drift = -0.07 dB



SAR VALIDATION RESULTS

ANNEX D

SAR Validation – CDMA Mode Head Tissue at 835MHz (Dipole forward power = 250mW)

Date: 10/01/03

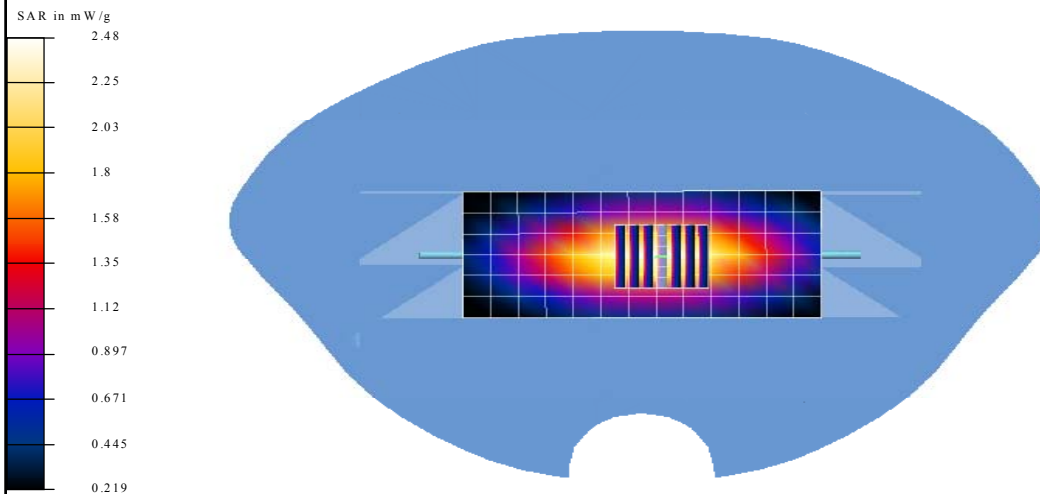
Test Laboratory: Telecom & EMC Testing Group
File Name: CDMA_835 MHz Head_Dipole Validation.da4

DUT: Dipole 835MHz Type & Serial Number: 447
Program: CDMA_835 MHz Head_Dipole Validation; CDMA_835 MHz Head_Dipole Validation

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835Head Tissue ($\sigma = 0.9089$ mho/m, $\epsilon = 42.77$, $\rho = 1000$ kg/m³)
Phantom section: FlatSection

DASY4 Configuration:
- Probe: ET3DV6 - SN1647; ConvF(6.6, 6.6, 6.6); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (7x14x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
Reference Value = 55.5 V/m
Peak SAR = 3.41 mW/g
SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.47 mW/g
Power Drift = -0.02 dB



SAR VALIDATION RESULTS

ANNEX D

SAR Validation – AMPS Mode_Body Tissue at 835MHz (Dipole forward power = 250mW)

Date: 10/02/03

Test Laboratory: Telecom & EMC Testing Group
File Name: 835 MHz Body_Dipole Validation.da4

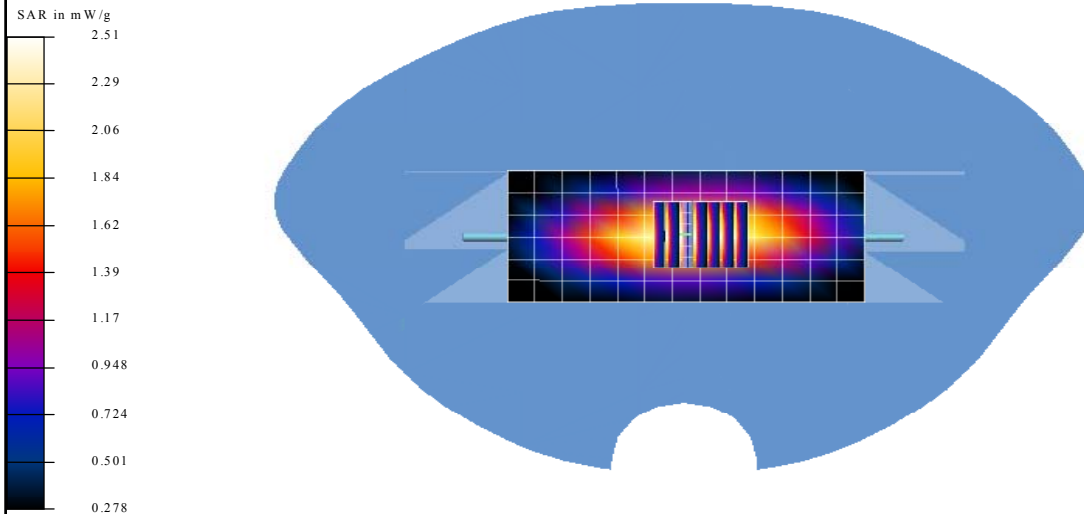
DUT: Dipole 835MHz Type & Serial Number: 447
Program: 835 MHz Body_Dipole Validation; 835 MHz Body_Dipole Validation

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835MHz Body Tissue ($\sigma = 0.9308$ mho/m, $\epsilon = 55.52$, $\rho = 1000$ kg/m³)
Phantom section: FlatSection

DASY4 Configuration:

- Probe: ET3DV6 - SN1647; ConvF(6.3, 6.3, 6.3); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (7x14x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
Reference Value = 54.1 V/m
Peak SAR = 3.3 mW/g
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.53 mW/g
Power Drift = -0.03 dB



SAR VALIDATION RESULTS

ANNEX D

SAR Validation – CDMA Mode_Body Tissue at 835MHz (Dipole forward power = 250mW)

Date: 10/03/03

Test Laboratory: Telecom & EMC Testing Group
File Name: CDMA_835 MHz Body_Dipole Validation.da4

DUT: Dipole 835MHz Type & Serial Number: 447**Program: CDMA_835 MHz Body_Dipole Validation; CDMA_835 MHz Body_Dipole Validation**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835MHz Body Tissue ($\sigma = 0.9308$ mho/m, $\epsilon = 55.52$, $\rho = 1000$ kg/m³)
Phantom section: FlatSection

DASY4 Configuration:

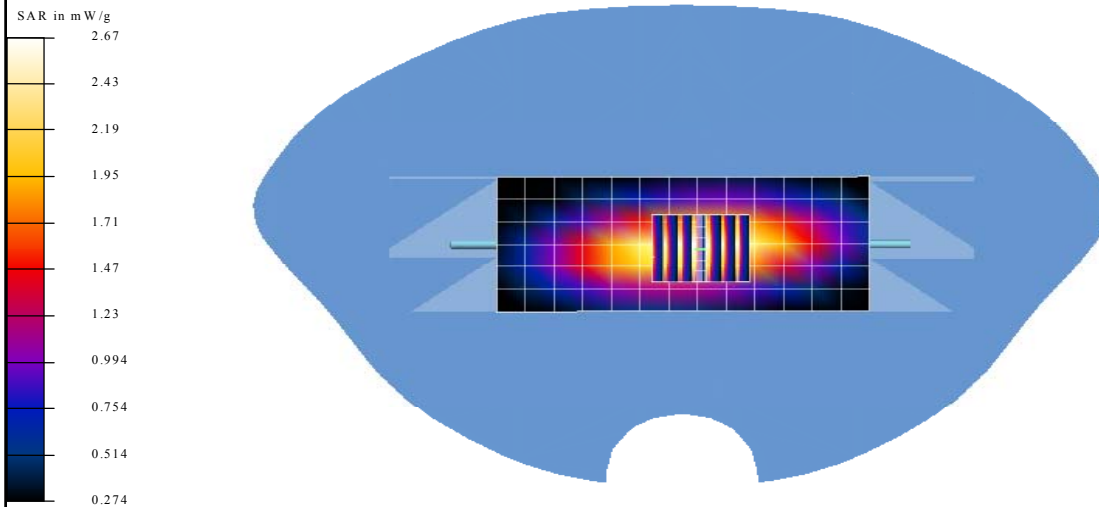
- Probe: ET3DV6 - SN1647; ConvF(6.3, 6.3, 6.3); Calibrated: 11/20/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn475; Calibrated: 11/14/2002
- Phantom: - TP:
- Software: DASY4, V4.0 Build 51

Area Scan (7x14x1): Measurement grid: dx=10mm, dy=10mm**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm
Reference Value = 54.5 V/m

Peak SAR = 3.57 mW/g

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g

Power Drift = -0.04 dB



SAR VALIDATION RESULTS

ANNEX D

Measured Tissue Parameters:

	835MHz Head		835MHz Body	
	Target	Measured	Target	Measured
Dielectric Constant	41.50	42.77	55.20	55.52
Conductivity	0.90	0.9089	0.97	0.9308

System Dipole Validation Target & Measured:

System Validation D835MHz: S/Nos.: 447	Target SAR (1g)	835MHz Head		835MHz Body	
		AMPS	CDMA	AMPS	CDMA
	2.375 ^{Note 1}	2.30 (-3.16%)	2.29 (-3.58%)	2.32 (-2.32%)	2.47 (+0.04%)

Note 1 - Dipole forward power = 250mW

ANNEX E

MEASUREMENT UNCERTAINTY

MEASUREMENT UNCERTAINTY

ANNEX E

Measurement Uncertainty

All test measurement carried out are traceable to national standards. The uncertainty of measurement at a confidence level of 95%, with a coverage of 2, is $\pm 21.1\%$.

Error Description	Uncertainty Value $\pm \%$	Probability Distribution	Divisor	ci 1g	Standard Unc.(1g)	Vi or Veff
Measurement System						
Probe Calibration	± 4.8	normal	1	1	± 4.8	∞
Axial isotropy	± 4.7	rectangular	$\sqrt{3}$	$(1-cp)^{1/2}$	± 1.9	∞
Hemispherical Isotropy	± 9.6	rectangular	$\sqrt{3}$	$(cp)^{1/2}$	± 3.9	∞
Spatial resolution	± 0.0	rectangular	$\sqrt{3}$	1	± 0.0	∞
Boundary effects	± 1.0	rectangular	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	rectangular	$\sqrt{3}$	1	± 2.7	∞
System Detection limit	± 1.0	rectangular	$\sqrt{3}$	1	± 0.6	∞
Readout electronics	± 1.0	normal	1	1	± 1.0	∞
Response time	± 0.8	rectangular	$\sqrt{3}$	1	± 0.5	∞
Integration time	± 2.6	rectangular	$\sqrt{3}$	1	± 1.5	∞
RF ambient conditions	± 3.0	rectangular	$\sqrt{3}$	1	± 1.7	∞
Probe Positioning Mechanical Tolerance	± 0.4	rectangular	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning with respect to Phantom Shell	± 2.9	rectangular	$\sqrt{3}$	1	± 1.7	∞
Extrapolation, Interpolation and Integration Algorithms for Max. SAR Evaluation	± 1.0	rectangular	$\sqrt{3}$	1	± 0.6	∞
Test Sample Related						
Device positioning	± 2.9	normal	1	1	± 2.9	145
Device holder uncertainty	± 3.6	normal	1	1	± 3.6	5
Power drift	± 5.0	rectangular	$\sqrt{3}$	1	± 2.9	∞
Phantom and Tissue Parameters						
Phantom uncertainty	± 4.0	rectangular	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	rectangular	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas)	± 4.0	normal	1	0.64	± 2.6	∞
Liquid permittivity (target)	± 5.0	rectangular	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas)	± 3.1	normal	1	0.6	± 1.8	∞
Combined Standard Uncertainty						
Coverage Factor for 95%		k=2			± 10.5	330
Extended Standard Uncertainty					± 21.1	

ANNEX F

SAR PROBE CALIBRATION CERTIFICATES

**Schmid & Partner
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate**Dosimetric E-Field Probe**

Type:

ET3DV6

Serial Number:

1647

Place of Calibration:

Zurich

Date of Calibration:

November 20, 2002

Calibration Interval:

12 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:



Approved by:



**Schmid & Partner
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Telephone +41 1 245 97 00, Fax +41 1 245 97 79

Probe ET3DV6

SN:1647

Manufactured:	November 7, 2001
Last calibration:	November 26, 2001
Recalibrated:	November 20, 2002

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1647

November 20, 2002

DASY - Parameters of Probe: ET3DV6 SN:1647

Sensitivity in Free Space

Diode Compression

NormX	1.70 $\mu V/(V/m)^2$	DCP X	96	mV
NormY	1.64 $\mu V/(V/m)^2$	DCP Y	96	mV
NormZ	1.70 $\mu V/(V/m)^2$	DCP Z	96	mV

Sensitivity in Tissue Simulating Liquid

Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\% \text{ mho/m}$
ConvF X	6.6 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.6 $\pm 9.5\%$ (k=2)	Alpha	0.41
ConvF Z	6.6 $\pm 9.5\%$ (k=2)	Depth	2.40
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
ConvF X	5.4 $\pm 8.9\%$ (k=2)	Boundary effect:	
ConvF Y	5.4 $\pm 8.9\%$ (k=2)	Alpha	0.51
ConvF Z	5.4 $\pm 8.9\%$ (k=2)	Depth	2.40

Boundary Effect

Head	900 MHz	Typical SAR gradient: 5 % per mm		
	Probe Tip to Boundary		1 mm	2 mm
	SAR _{be} [%] Without Correction Algorithm		9.8	5.5
	SAR _{be} [%] With Correction Algorithm		0.3	0.5
Head	1800 MHz	Typical SAR gradient: 10 % per mm		
	Probe Tip to Boundary		1 mm	2 mm
	SAR _{be} [%] Without Correction Algorithm		12.0	7.9
	SAR _{be} [%] With Correction Algorithm		0.2	0.2

Sensor Offset

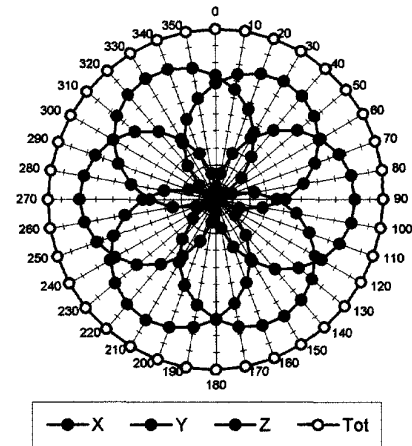
Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.2 $\pm$ 0.2	mm

ET3DV6 SN:1647

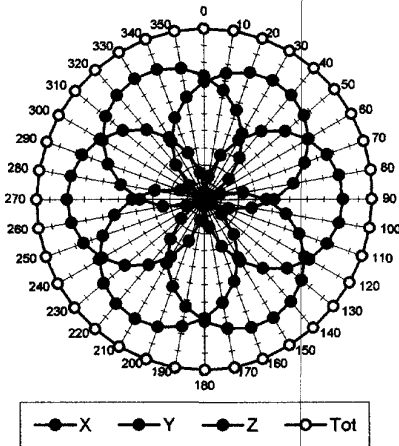
November 20, 2002

Receiving Pattern (ϕ), $\theta = 0^\circ$

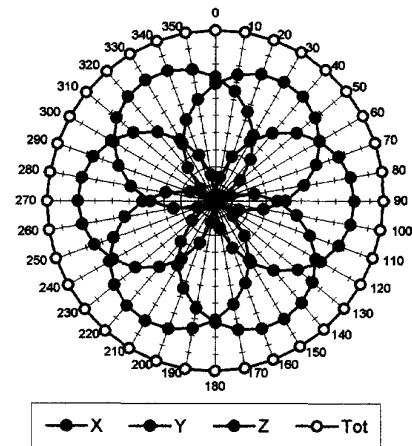
f = 30 MHz, TEM cell ifi110



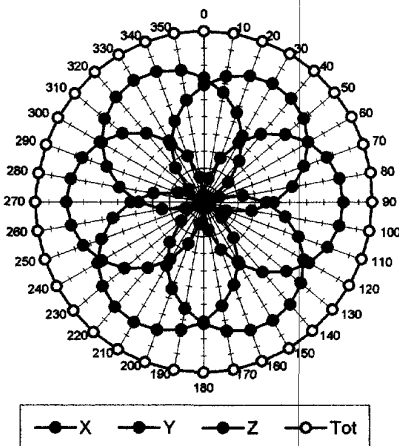
f = 100 MHz, TEM cell ifi110



f = 300 MHz, TEM cell ifi110

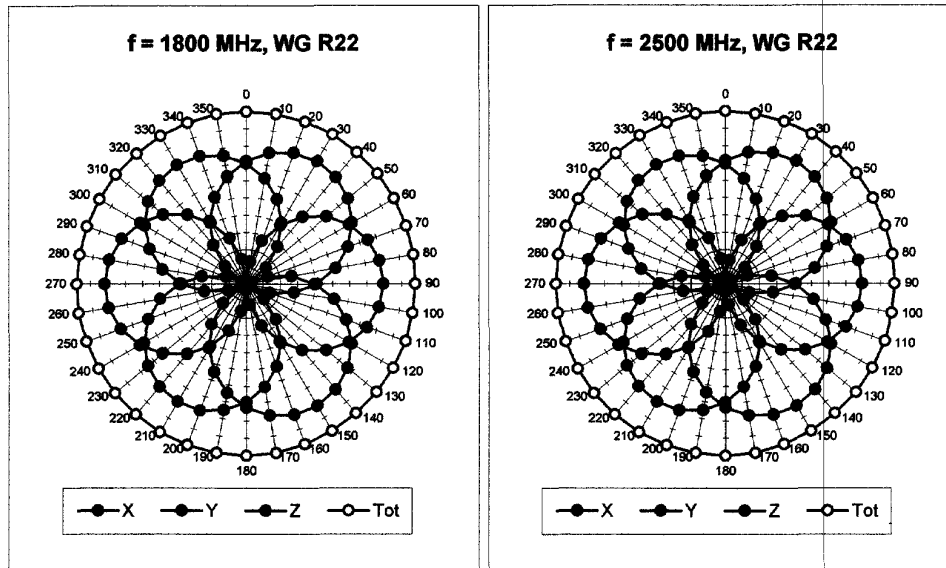


f = 900 MHz, TEM cell ifi110

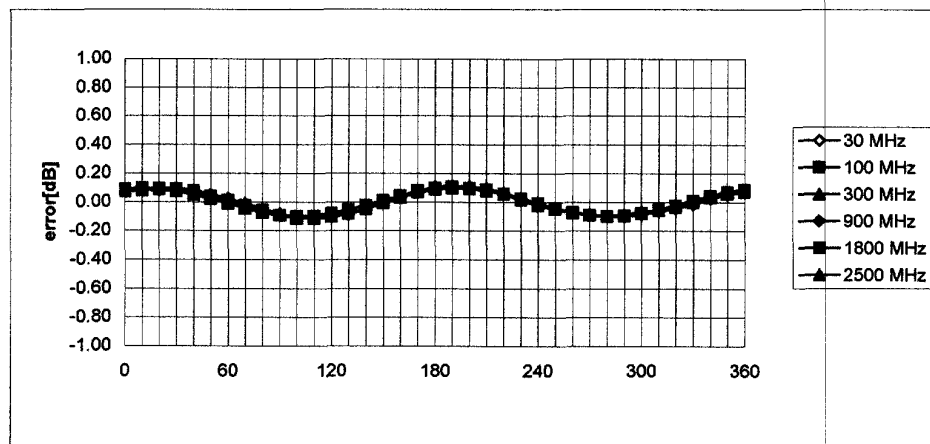


ET3DV6 SN:1647

November 20, 2002



Isotropy Error (ϕ), $\theta = 0^\circ$

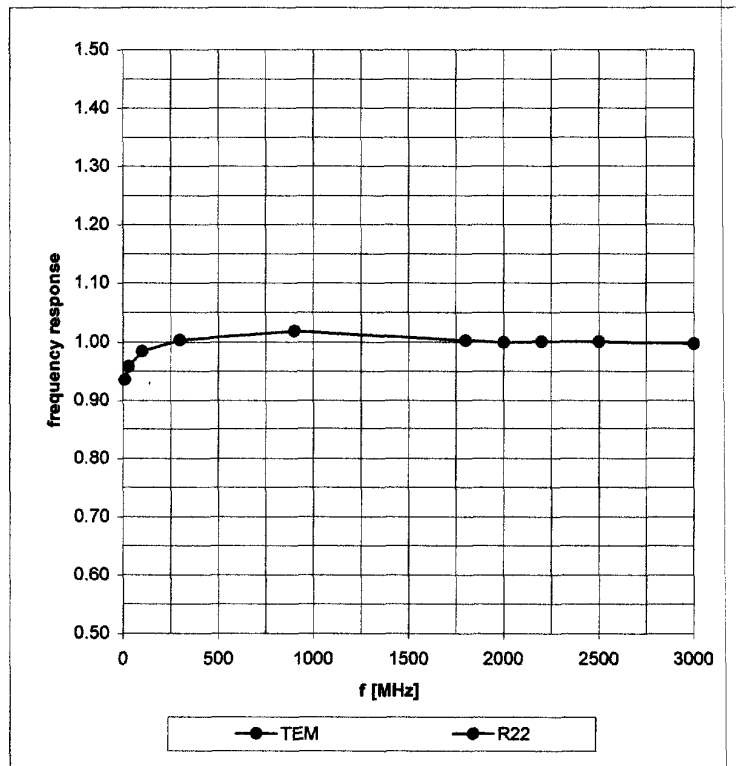


ET3DV6 SN:1647

November 20, 2002

Frequency Response of E-Field

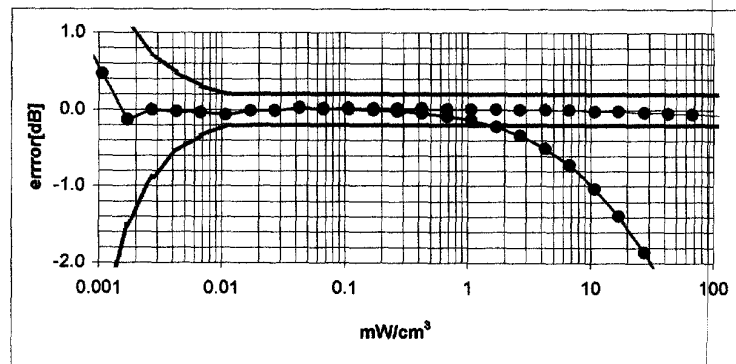
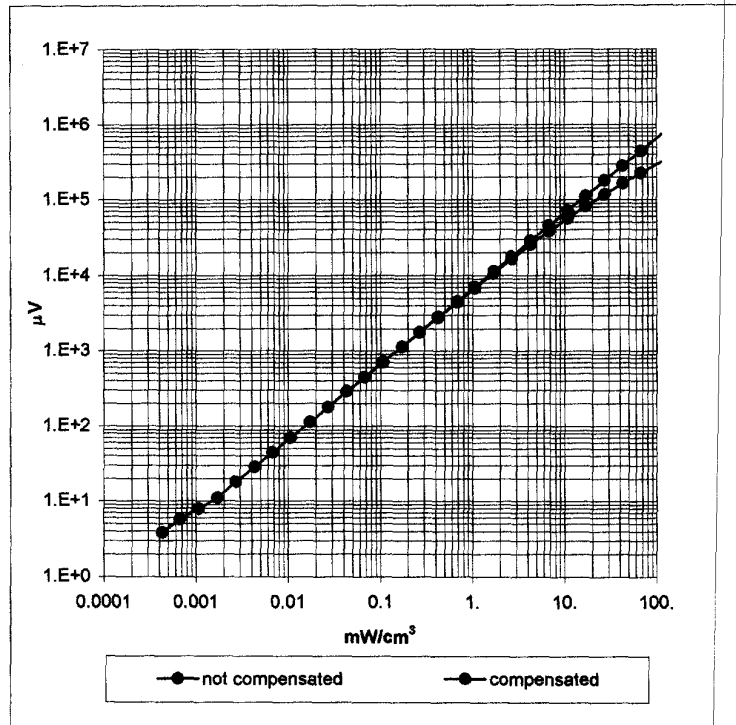
(TEM-Cell:ifi110, Waveguide R22)



ET3DV6 SN:1647

November 20, 2002

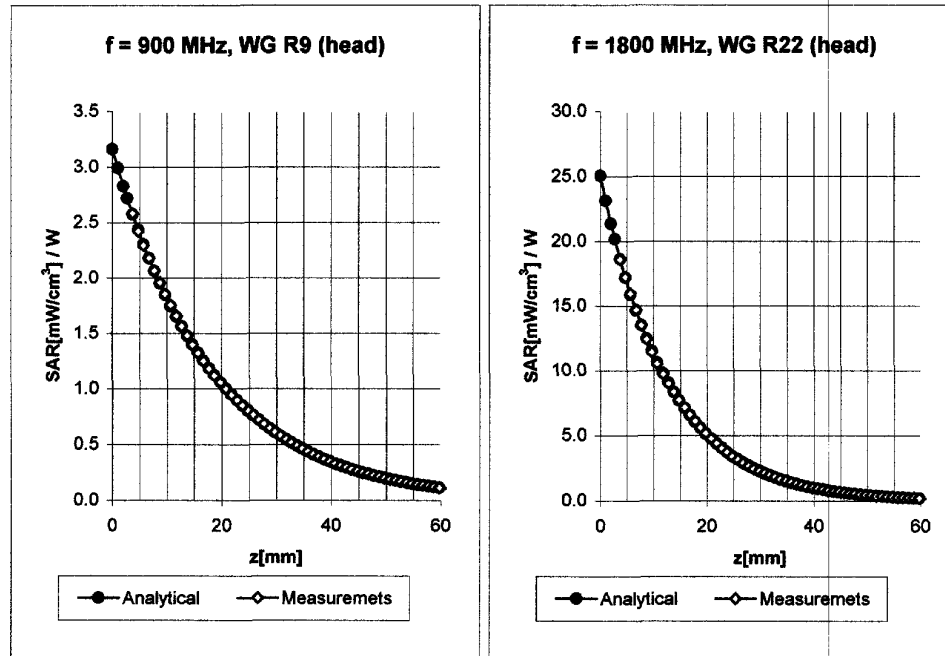
Dynamic Range $f(\text{SAR}_{\text{brain}})$
(Waveguide R22)



ET3DV6 SN:1647

November 20, 2002

Conversion Factor Assessment

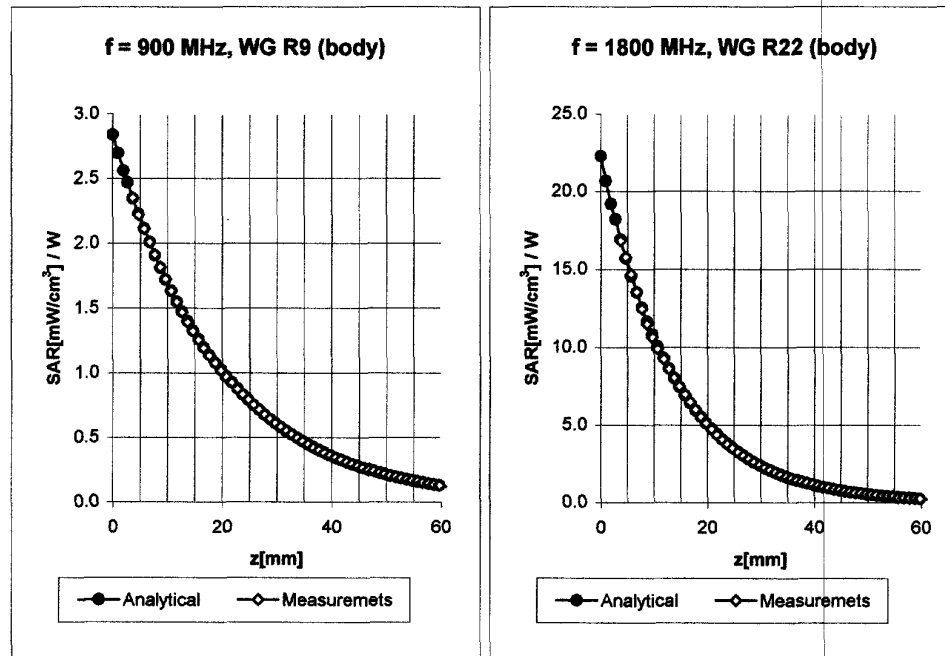


Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\% \text{ mho/m}$
	ConvF X	$6.6 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.6 \pm 9.5\% (k=2)$	Alpha 0.41
	ConvF Z	$6.6 \pm 9.5\% (k=2)$	Depth 2.40
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
	ConvF X	$5.4 \pm 8.9\% (k=2)$	Boundary effect:
	ConvF Y	$5.4 \pm 8.9\% (k=2)$	Alpha 0.51
	ConvF Z	$5.4 \pm 8.9\% (k=2)$	Depth 2.40

ET3DV6 SN:1647

November 20, 2002

Conversion Factor Assessment

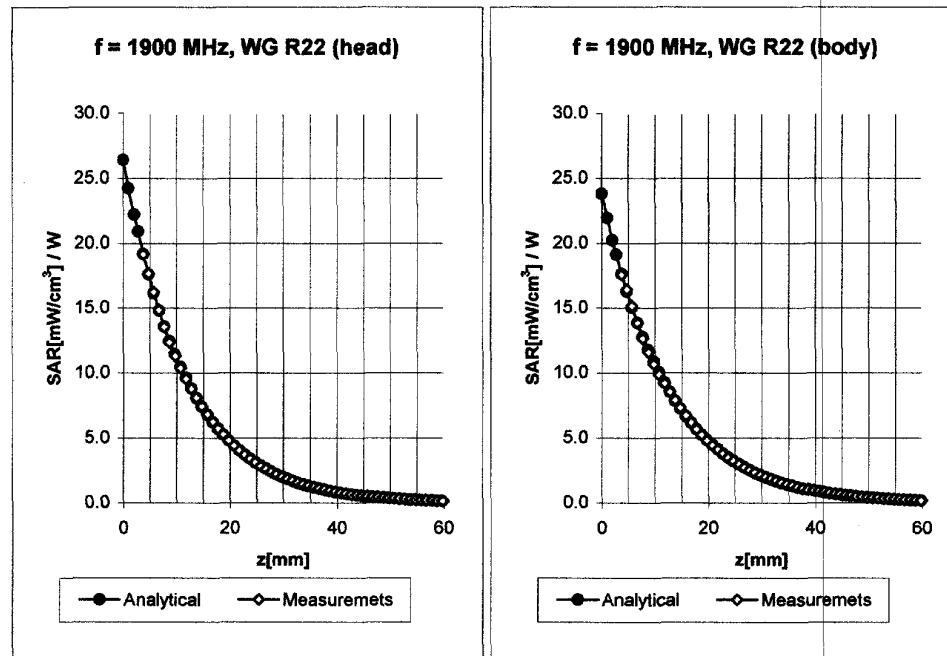


Body	900 MHz	$\epsilon_r = 55.0 \pm 5\%$	$\sigma = 1.05 \pm 5\% \text{ mho/m}$
Body	835 MHz	$\epsilon_r = 55.2 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
	ConvF X	$6.3 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.3 \pm 9.5\% (k=2)$	Alpha 0.42
	ConvF Z	$6.3 \pm 9.5\% (k=2)$	Depth 2.39
Body	1800 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\% \text{ mho/m}$
	ConvF X	$5.1 \pm 8.9\% (k=2)$	Boundary effect:
	ConvF Y	$5.1 \pm 8.9\% (k=2)$	Alpha 0.63
	ConvF Z	$5.1 \pm 8.9\% (k=2)$	Depth 2.26

ET3DV6 SN:1647

November 20, 2002

Conversion Factor Assessment



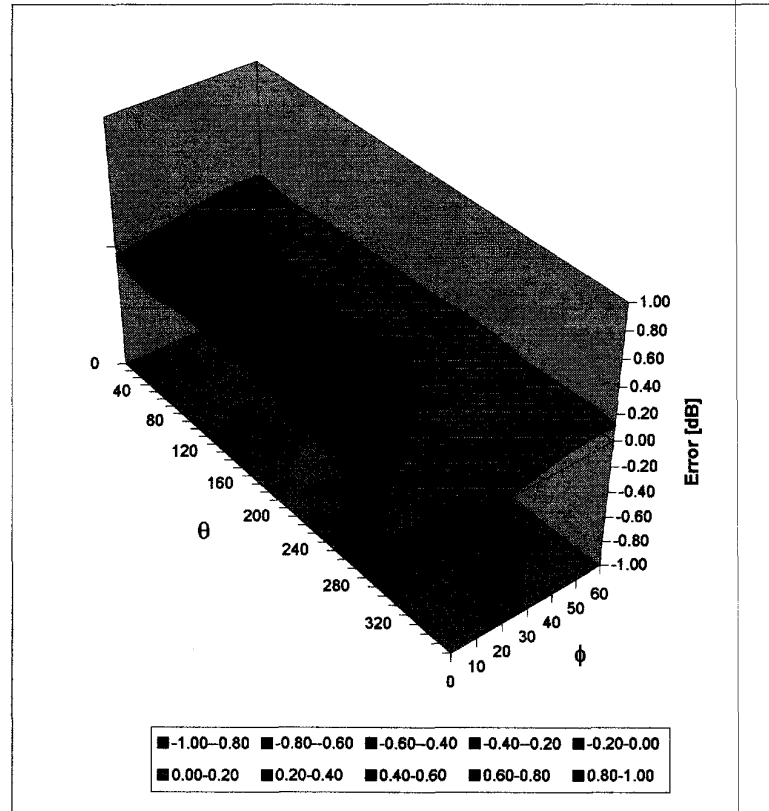
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
ConvF X	5.3 $\pm 8.9\%$ (k=2)	Boundary effect:	
ConvF Y	5.3 $\pm 8.9\%$ (k=2)	Alpha	0.55
ConvF Z	5.3 $\pm 8.9\%$ (k=2)	Depth	2.32
Body	1900 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\% \text{ mho/m}$
ConvF X	5.0 $\pm 8.9\%$ (k=2)	Boundary effect:	
ConvF Y	5.0 $\pm 8.9\%$ (k=2)	Alpha	0.76
ConvF Z	5.0 $\pm 8.9\%$ (k=2)	Depth	2.06

ET3DV6 SN:1647

November 20, 2002

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



ANNEX G

REFERENCES

The methods and procedures used for the measurements contained in this report are details in the following reference standards:

Publications	Year	Title
Supplement C (Edition 01-01) to FCC OET Bulletin 65 (Edition 97-01)	2001	"Evaluating Compliance with FCC Guidelines for Human Exposure to radio Frequency Fields"
IEEE Standard 1528-200X	2000	"Product Performance Standards Relative to the safe Use of Electromagnetic Energy"
ANSI/IEEE C95.3	1992	"Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave"
ANSI/IEEE C95.1	1992	"Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300GHz"
ACA, Radio Communications (EMR Human Exposure)	2000 (No.2)	"Radiocommunication (Electromagnetic Radiation – Human Exposure)"
EN50360	2001	Product Standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300MHz – 3GHz)
EN50361	2001	Basic Standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phone (300MHz – 3GHz)