TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

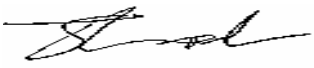
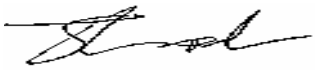
Test of: Satellite Tracking of People LLC (STOP).
BluTag.

To: OET Bulletin 65 Supplement C: (2001-01)

Measurements were performed on the DASY4 System

Test Report Serial No:
RFI/SARE1/RP46121JD27A

Supersedes Test Report Serial No:
RFI/SARE1/RP46121JD23A

This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager: 	
Tested By: Scott D'Adamo 	**Checked By: Joe Lomako** 
Report Copy No: PDF01	
Issue Date: 06 April 2005	**Test Dates: 04 April 2005**

It should be noted that the standard, OET Bulletin 65 Supplement C: (2001-01) is not listed on RFI's current UKAS schedule and is therefore "not UKAS accredited".

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields. Furthermore, the date of creation must match the issue date stated above.
This report may be copied in full.

The results in this report apply only to the sample(s) tested.

RFI Global Services Ltd
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number:2117901

This page has been left intentionally blank.

Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

Table of Contents

1. Client Information

Company Name:	Satellite Tracking of People LLC (STOP).
Address:	102 Woodmont Blvd., Suite 800 Nashville, TN 37205 USA
Contact Name:	Mr Stephen Freathy

Test Laboratory

Company Name:	RFI Global Services Ltd.
Address:	Ewhurst Park Ramsdell Basingstoke Hampshire RG26 5RQ.
Contact Name:	Mr A Brown

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification of Equipment Under Test (EUT)

Brand Name:	STOP
Model Name or Number:	Blutag
Unique type Identification:	36-0714
FCC ID Number:	S5EAA70008
Serial Number:	36-0714
Battery Serial Number:	None Stated
Country Of Manufacture:	UK
Date Of Receipt:	04 April 2005

2.2. Accessories

The following accessories were supplied with the EUT:

Description:	AC Adaptor
Brand Name:	MPW
Model Name or Number:	SA070810
Serial Number:	R00040800174
Cable Length And Type:	1.5m 2 Core
Connected to Port:	DC Input

Description:	Strap
Brand Name:	None Sated
Model Name or Number:	None Sated
Serial Number:	None Sated
Cable Length And Type:	0.27m Fibre Optic Strap
Connected to Port:	EUT Enclosure

2.3. Description of EUT

The equipment under test is a personal tracking device exercised using 1900 MHz GPRS transmit.

2.4. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

2.5. Additional Information Related to the EUT

Equipment Class:	GPRS 1900 MHz		
FCC Rule Part(s):	OET Bulletin 65 Supplement C		
Device Category:	Portable		
Application Type:	Certification		
Maximum Power Output:	30 dBm		
Transmitter Frequency Range:	1850 MHz to 1910 MHz		
Transmit Frequency Allocation Of EUT When Under Test (Channels):	**Channel Number**	**Channel Description**	**Frequency (MHz)**
	512	Low	1850.2
	660	Middle	1879.8
	810	High	1909.8
Modulation(s):	217 Hz		
Modulation Scheme (Crest Factor):	8.3		
Antenna Length and Type:	Integral		
Number Of Antenna Positions:	1 Fixed		
Intended Operating Environment:	Within network coverage		
Weight:	~ 335.50g (with AC Adaptor and Strap)		
Dimensions (without Antenna) mm:	115 (L) x 90 (W) x 45 (H) mm		
Power Supply Requirement:			
DC Supply (Volts/Amps)	Not Applicable		
AC Supply (Volts/Amps)	240 V 50 Hz / 115 V 60 Hz		
Internal Battery Supply:	4.2 V 1500 mA/h Li-ion		

2.6. Port Identification

Port	Description	Type	Applicable
1	Enclosure	-	Y

2.7. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Radio Communications Analyser
Brand Name:	Anritsu
Model Name or Number:	MT8820A
Serial Number:	6K00000633
Cable Length And Type:	1m Rosenberger
Connected to Port:	RF In / Out (Antenna)

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	OET Bulletin 65 Supplement C: (2001-01)
Title:	Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

EN 50361: 2001
Title: Basic standard for the measurement of specific absorption rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz).

ANSI/IEEE C95.1: 1999
IEEE standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz.

Federal Communications Commission, “Evaluating compliance with FCC Guidelines for human exposure to radio frequency electromagnetic fields”, OET Bulletin 65 Supplement C, FCC, Washington, D.C, 20554, 2001.

Thomas Schmid, Oliver Egger and Neils Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on microwave theory and techniques,
Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

3.3. Definition Of Measurement Equipment

The measurement equipment used complied with the requirements as detailed in OET Bulletin 65 Supplement C, Appendix D.

4. Deviations from the Test Specification

None.

5. Operation of the EUT During Testing

5.1. Operating Modes

At the client's request the EUT was tested in the following operating mode(s):

GPRS 1900 MHz transmit mode only.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

Standalone without Strap*
Standalone with Strap*
*EUT with AC Adaptor (240V 50Hz) in worst-case configuration.

6. Summary of Test Results

6.1. Summary Of Tests

Test Name	Specification Reference	Compliancy Status
Specific Absorption Rate (SAR)	OET Bulletin 65 Supplement C	Complied

6.2. Location of Tests

All the measurements described in this report were performed at the premises of
RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ.

6.3. Test Results For Specific Absorption Rate – 1900 MHz

Test Summary:

Maximum Level (W/kg):	0.172
Limit (W/kg):	4.000
Margin (W/kg):	3.828

Environmental Conditions:

Temperature Variation in Lab (°C):	24.0 to 24.0
Temperature Variation in Liquid (°C):	23.0 to 23.0

E.I.R.P Before Test:	Refer to Section 6.4

Results:

Position	Section	Channel Number	Level 10g (W/kg)	Limit 10g (W/kg)	Margin 10g (W/kg)	Note(s)	Result
Rear of EUT Facing Phantom without Strap	Flat	660	0.014	4.000	3.986	-	Complied
Front of EUT Facing Phantom without Strap	Flat	660	0.104	4.000	3.896	-	Complied
Rear of EUT Facing Phantom with Strap	Flat	660	0.000	4.000	4.000	-	Complied
Front of EUT Facing Phantom with Strap	Flat	660	0.133	4.000	3.867	-	Complied
Front of EUT Facing Phantom with Strap and AC Adaptor	Flat	660	0.105	4.000	3.895	-	Complied
Front of EUT Facing Phantom with Strap	Flat	512	0.172	4.000	3.828	-	Complied
Front of EUT Facing Phantom with Strap	Flat	810	0.143	4.000	3.857	-	Complied

6.4. E.I.R.P Measurement

The E.I.R.P output of the EUT is as follows:

Date: 04 April 2005

Channel	Frequency	TX Power Before Test / dBm
Bottom	1850.2	30.1
Middle	1879.8	29.0
Top	1909.8	28.6

Note(s):

1. E.I.R.P measurements are performed before testing only.

7. SAR Measurement System

RFI Global Services Ltd SAR measurement facility utilises the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, and the SAM phantom containing brain or muscle equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller; teach pendant (Joystick), and remote control. This is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. The data acquisition electronics (DAE) performs signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection etc. The DAE is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilises a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching mulitplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

8. SAR Safety Limits

Exposure Limits (General populations/Uncontrolled Exposure Environment)	**SAR (W/Kg)**
Spatial Peak (averaged over any 10 g of tissue)	4.0 (Limb)

Note(s):

1. *OET Bulletin 65 Supplement C SAR safety limits specified in the table above apply to devices operated in the General Population / Uncontrolled Exposure Environment.*
2. *Uncontrolled environments are defined as locations where there is exposure of individuals who have no knowledge or control of their exposure.*

9. Details of SAR Evaluation

The equipment under test was found to be compliant for localised Specific Absorption Rate (SAR) based on the following provisions and conditions:

a) The EUT was positioned under the flat section of the SAM phantom.

b) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.

c) The device was keyed to operate continuously in the transmit mode for the duration of the test.

d) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the EUT.

e) The EUT was tested with a fully charged battery and AC Adaptor where applicable.

10. Evaluation Procedures

The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

a) (i) The evaluation was performed in an applicable area of the phantom depending on the type of device being tested. For devices worn about the ear during normal operation, both the left and right ear positions were evaluated at the centre frequency of the band at maximum power. The side, which produced the greatest SAR, determined which side of the phantom would be used for the entire evaluation. The positioning of the head worn device relative to the phantom was dictated by FCC OET bulletin 65 Supplement C.

(ii) For body worn devices or devices which can be operated within 20 cm of the body, the flat section of the phantom was used. The type of device being evaluated dictated the distance of the EUT to the outer surface of the phantom flat section.

b) The SAR was determined by a pre-defined procedure within the DASY4 software. The exposed region of the phantom was scanned near the inner surface with a grid spacing of 20mm x 20mm or appropriate resolution.

c) A 7x7x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.

d) If the EUT had any appreciable drift over the course of the evaluation, then the EUT was re-evaluated. Any unusual anomalies over the course of the test also warranted a re-evaluation.

11. System Validation

Prior to the assessment, the system was verified in the flat region of the phantom.
An 1800 MHz dipole was used to perform 1900 MHz Body system validation. A forward power of 250 mW was applied to the dipole and system was verified to a tolerance of ±5% for the 1800 MHz dipole. The applicable verification (normalised to 1 Watt) is as follows:

Dipole Validation Kit	Target SAR 1g (W/kg)	Measured SAR 1g (W/kg)
D1800V2 / 264	37.00	36.72

12. Simulated Tissues

The body mixture consists of water and glycol. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient	Frequency
	1800 MHz Body
De-Ionised Water	69.79%
DGMBE	30.00%
Salt	0.20%

13. Tissue Parameters

The dielectric parameters of the fluids were verified prior to the SAR evaluation using a 58070C Dielectric Probe Kit and an 8753E Network Analyser. The dielectric parameters of the fluid are as follows:

Frequency (MHz)	Equivalent Tissue	Dielectric Constant ε_r	Conductivity σ (mho/m)
1900	Body	51.59	1.49

14. DASY4 Systems Specifications

Robot System

Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of axis:	6
Serial Number:	F00/SD89A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+

Data Acquisition Electronic (DAE) System

Cell Controller

PC:	Dell Precision 340
Operating System:	Windows NT
Data Card:	DASY4 Measurement Server
Serial Number:	1080

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converter and control logic.
Software:	DASY4 Software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.

PC Interface Card

Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16 nit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.

E-Field Probe

Model:	ET3DV6
Serial No:	1529
Construction:	Triangular core fibre optic detection system
Frequency:	10 MHz to 3 GHz
Linearity:	±0.2 dB (30 MHz to 3 GHz)
Probe Length (mm):	337
Probe Diameter (mm):	12
Tip Length (mm):	10
Tip Diameter (mm):	6.8
Sensor X Offset (mm):	2.7
Sensor Y Offset (mm):	2.7
Sensor Z Offset (mm):	2.7

Phantom

Phantom:	SAM Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm

15. Validation Results – 1800 MHz Band (Body)

Date: 04 April 2005

15.1. System Validation

Validation of the system test configuration was carried out prior to testing.

Validation Dipole Type and Serial No.	Calibrated Value of SAR in 1g volume (W/kg) at 1800 MHz	Measured Value of SAR in 1g volume (W/kg) at 1800 MHz	Percentage Difference (≤5%)
D1800 V2 / 264	37.00	36.72	(-0.80%) Yes

An 1800 MHz dipole was used to perform 1900 MHz Body system validation. This was possible as the device centre frequency is within ± 100 MHz of the verification frequency.

15.2 Liquid Properties

Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (1800 MHz)	Measured/Calculated Value (1800 MHz)	Percentage Difference (≤5%)
Relative Permittivity	53.30	51.59	(-3.20%) Yes
Conductivity	1.52	1.49	(-2.08%) Yes

15.3Temperature Variation

The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15.0 ºC to +30.0 ºC.

The actual temperature measured at the beginning and end of each test was recorded and the maximum range is shown below:

Measurement	Maximum Temperature	Minimum Temperature
Laboratory	24.0	24.0
Tissue Simulating Liquid	23.0	23.0

16. Measurement Uncertainty

16.1. No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

16.2. The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

16.3. The uncertainty of the result may need to be taken into account when interpreting the measurement results.

16.4. The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Specific Absorption Rate	1900 MHz	95%	± 17.12%

16.5. The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

16.6. Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environment. However, the estimated measurement uncertainties in SAR are less than 30%.

16.7. According to ANSI/IEEE C95.3, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy’s of ±1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ±2 dB can be expected.

16.8. According to CENELEC, typical worst-case uncertainty of field measurements is ±5 dB. For well-defined modulation characteristics the uncertainty can be reduced to ±3 dB.

Measurement Uncertainty (Continued)

Specific Absorption Rate Uncertainty at 1900 MHz, GPRS Modulation Scheme calculated in accordance with IEEE 1528-200X

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	c_i	Standard Uncertainty		υ_i or υ_{eff}	Note
							+ u (dBµV)	- u (dBµV)		
B	Probe calibration	8.900	8.900	normal (k=2)	2.0000	1.0000	4.450	4.450	∞	
B	Axail Isotropy	0.100	0.100	normal (k=2)	2.0000	1.0000	0.050	0.050	∞	
B	Hemispherical Isotropy	0.100	0.100	normal (k=2)	2.0000	1.0000	0.050	0.050	∞	
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞	
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞	
B	Linearity	2.330	2.330	Rectangular	1.7321	1.0000	1.345	1.345	∞	
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞	
B	Readout Electronics	0.650	0.650	normal (k=2)	2.0000	1.0000	0.325	0.325	∞	
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞	
B	Integration Time	0.005	0.005	Rectangular	1.7321	1.0000	0.003	0.003	∞	
B	RF Ambinet conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞	
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞	
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞	
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞	
A	Test Sample Positioning	0.584	0.584	normal (k=1)	1.0000	1.0000	0.584	0.584	10	
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10	
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞	
B	Drit of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞	
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞	
B	Liquid Conductivity (measured value)	2.440	2.440	Rectangular	1.7321	1.0000	1.409	1.409	∞	
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞	
B	Liquid Permittivity (measured value)	2.440	2.440	Rectangular	1.7321	1.0000	1.409	1.409	∞	
	Combined standard uncertainty			t-distribution			8.74	8.74	>500	
	Expanded uncertainty			k = 1.96			17.12	17.12	>500	

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
A1094	Sony MVC FD-81	Sony	MVC - FD81	125805
A1097	SMA Directional Coupler	MiDISCO	MDC6223-30	None
A1137	3dB Attenuator	Narda	779	04690
A1174	Dielectric Probe Kit	Agilent Technologies	85070C	Us99360072
A1186	Probe	Schmid & Partners	ET3 DV6	1529
A1190	1800 MHz Validation Dipole	Schmid & Partner	D1800V2	264
A1225	Low noise Amplifier	Mini Circuits	ZHL-42	E022601
A1234	Data Acquisition Electronics	Schmid & Partner	DAE3	450
A1238	SAM Phantom	Schmid & Partner	001	001
A1410	DC-4.0GHz 3dB Attenuator	Omni Spectra	FSC 16179	20510-3
A215	20 dB Attenuator	Narda	766-20	9402
A512	Wave Guide Antenna	EMCO	3115	3993
C1052	Cable	Utiflex	FA210A0030M3030	001
C1053	Cable	Utiflex	FA210A0003M3030	001
C323	Cable	Rosenberger	UFA 210A-1-0788-50x50	96A0121
G046	Signal Generator	Gigatronics	7100/.01-20	749474
G0528	Robot Power Supply	Schmid & Partner	DASY	None
G088	PSU	Thurlby Thandar	CPX200	100700
L0753	Anritsu	Anritsu	MT8820A	6K00000633
M047	Multimeter	Fluke	75	52130086
M095	URY Power Meter	Rohde & Schwarz	URY	891 491/078
M1015	Network Analyser	Agilent Technologies	8753ES	US39172406
M1129	Insertion Unit	Rohde & Schwarz	URY-Z2	890242/16
M136	Temperature/Humidity/ Pressure Meter	RS Components	None	None
M509	Thermometer	Testo	110	40378800433
S256	Site 56	RFI	N/A	N/A

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

Appendix 2. SAR Distribution Scans

This appendix contains SAR Distribution Scans.

Scan Reference Number	Title
SCN/46121_27_001	Rear of EUT Facing Phantom without Strap Flat 660
SCN/46121_27_002	Front of EUT Facing Phantom without Strap Flat 660
SCN/46121_27_003	Rear of EUT Facing Phantom with Strap Flat 660
SCN/46121_27_004	Front of EUT Facing Phantom with Strap Flat 660
SCN/46121_27_005	Front of EUT Facing Phantom with Strap and AC Adaptor Flat 660
SCN/46121_27_006	Front of EUT Facing Phantom with Strap Flat 512
SCN/46121_27_007	Front of EUT Facing Phantom with Strap Flat 810
SCN/46121_27_008	System Performance Check-D1800 04/04/05

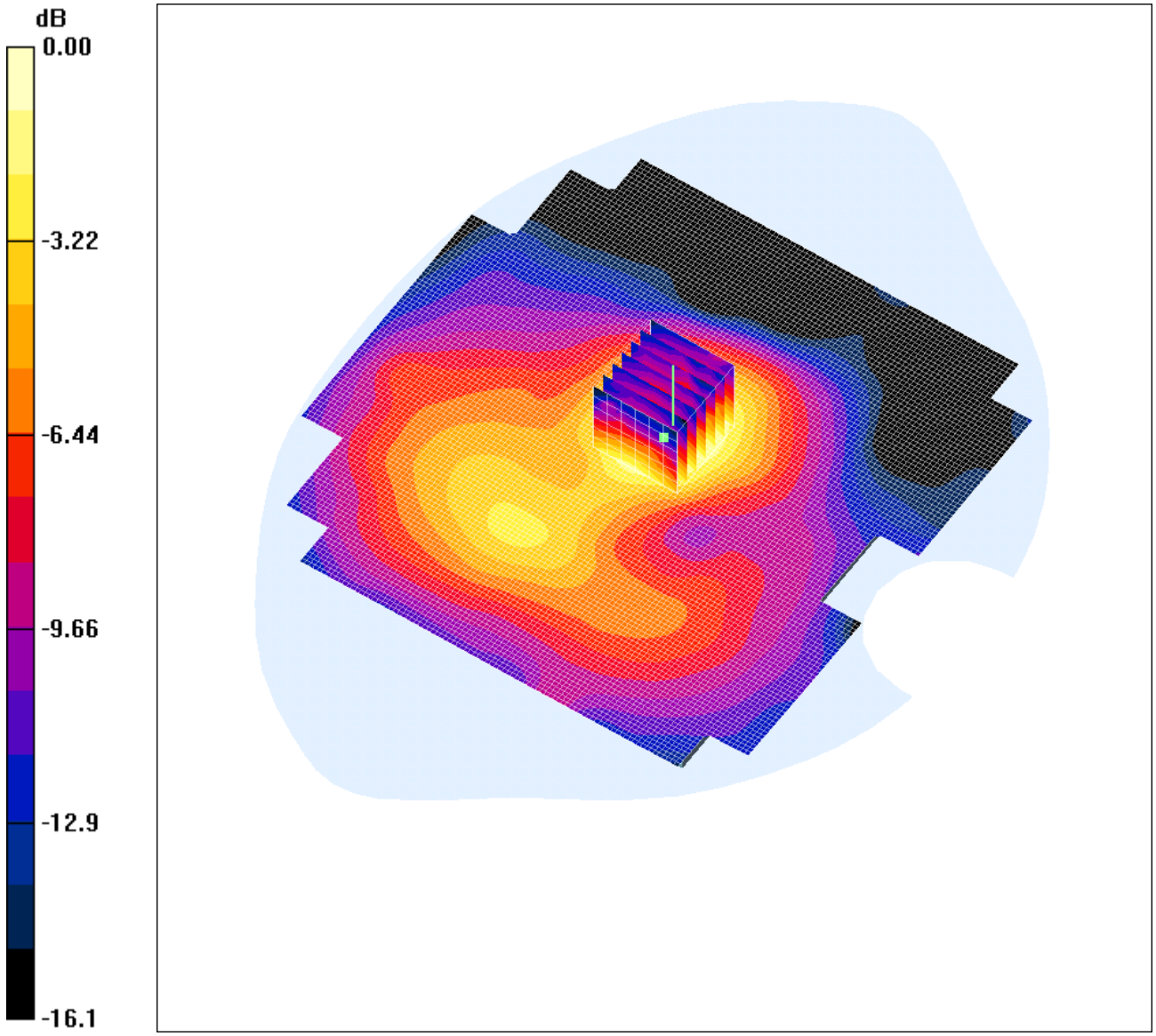
Date: 04/04/2005

46121_27_001

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_001_Rear of EUT Facing Phantom without Strap_Flat_660

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.024mW/g

Communication System: DCS 1900; Frequency: 1879.8 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1879.8 MHz; σ = 1.57 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear of EUT Facing Phantom (0mm Seperation) Without Strap- Middle/Area Scan (121x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.024 mW/g

Rear of EUT Facing Phantom (0mm Seperation) Without Strap- Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.65 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 0.034 W/kg
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.024 mW/g

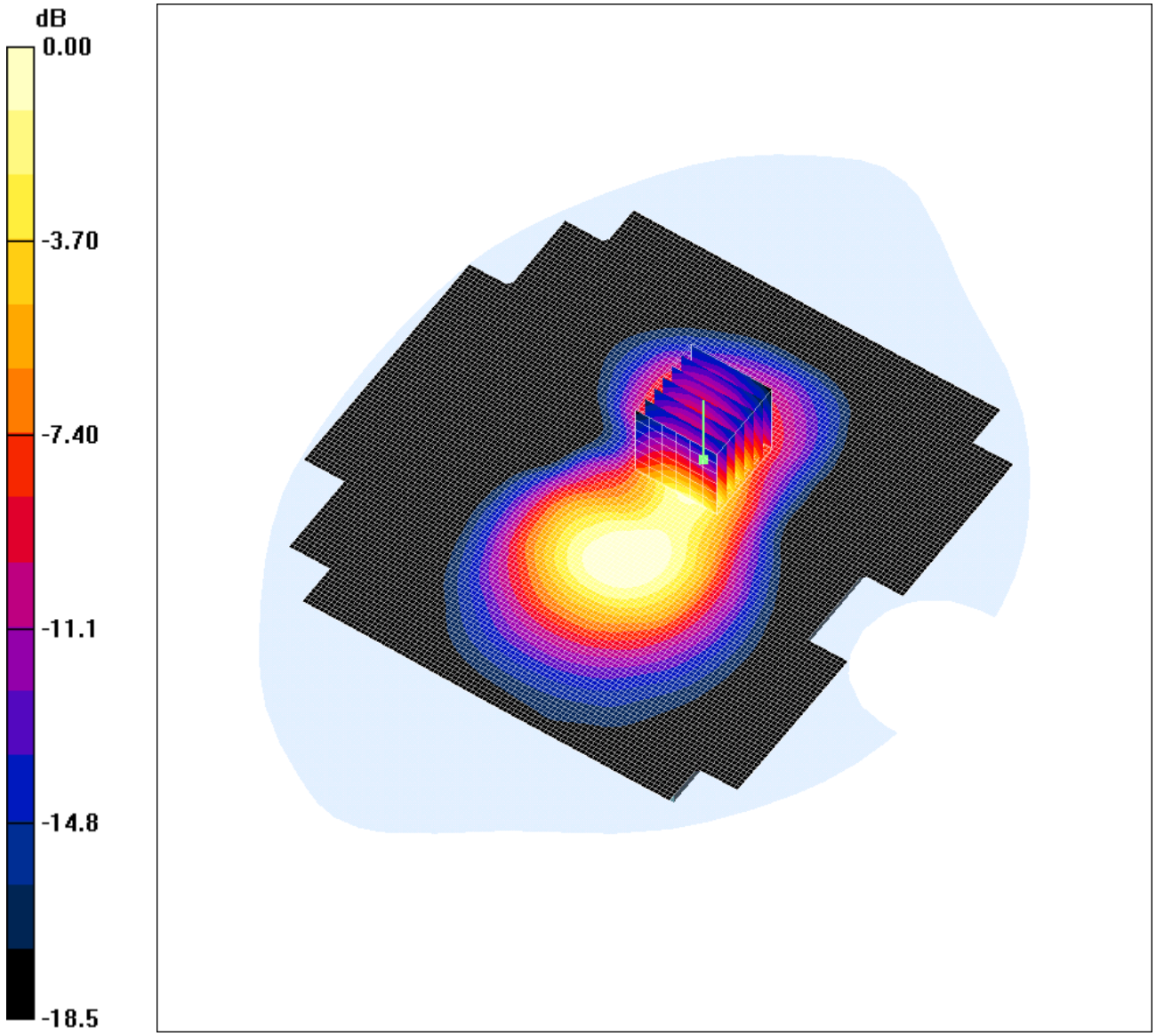
Date: 04/04/2005

46121_27_002

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_002_Front of EUT Facing Phantom without Strap_Flat_660

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.217mW/g

Communication System: DCS 1900; Frequency: 1879.8 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1879.8 MHz; σ = 1.57 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Front of EUT Facing Phantom (0mm Seperation) Without Strap- Middle/Area Scan (121x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.228 mW/g

Front of EUT Facing Phantom (0mm Seperation) Without Strap- Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.56 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 0.352 W/kg
SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.104 mW/g
Maximum value of SAR (measured) = 0.217 mW/g

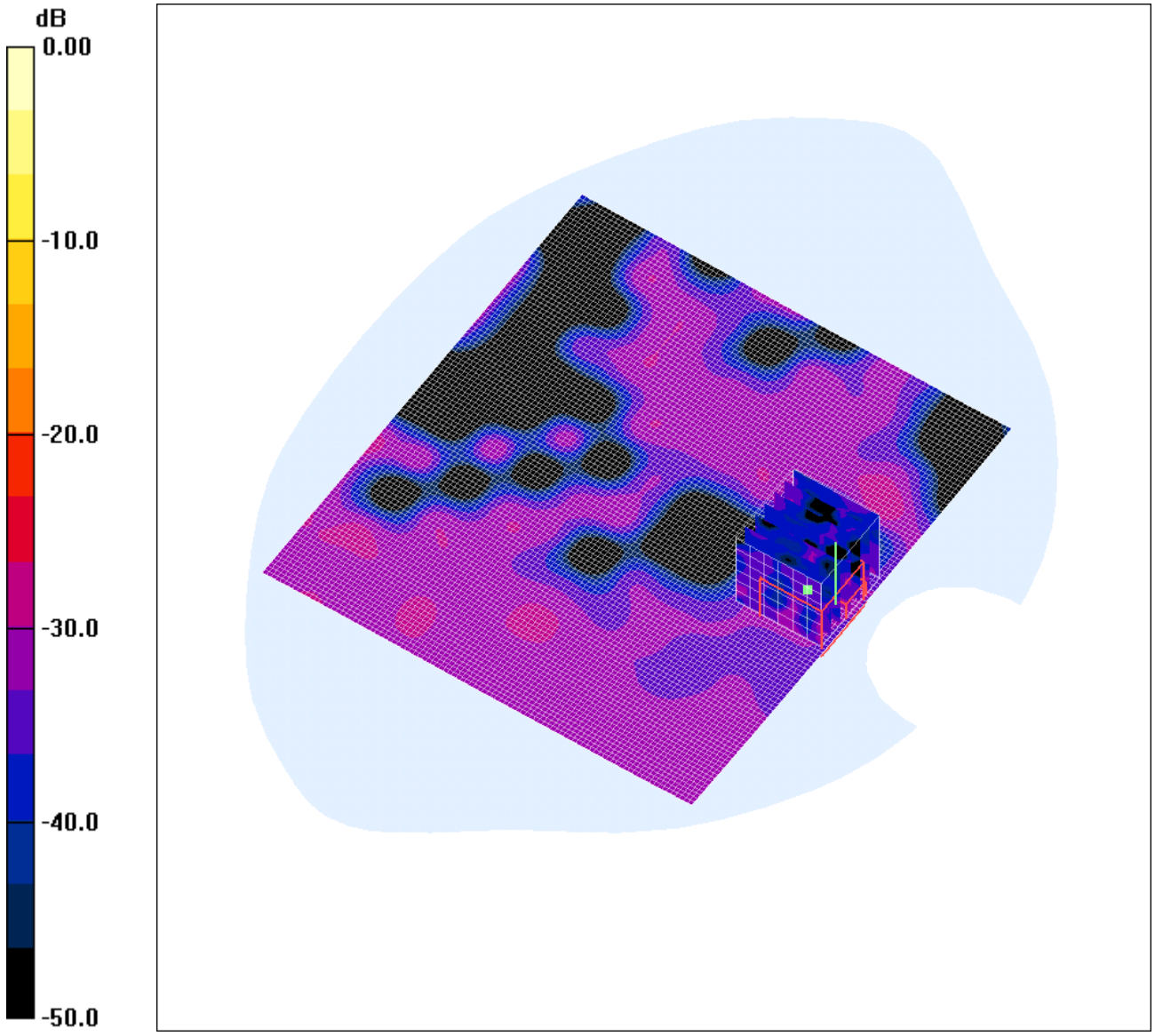
Date: 04/04/2005

46121_27_003

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_003_Rear of EUT Facing Phantom with Strap_Flat_660

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.00mW/g

Communication System: DCS 1900; Frequency: 1879.8 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1879.8 MHz; σ = 1.57 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Area Scan (101x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.00 mW/g

Rear of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.621 V/m; Power Drift = 0.192 dB
Peak SAR (extrapolated) = 0.00 W/kg
SAR(1 g) = 0.000529 mW/g; SAR(10 g) = 0.000217 mW/g
Maximum value of SAR (measured) = 0.00 mW/g

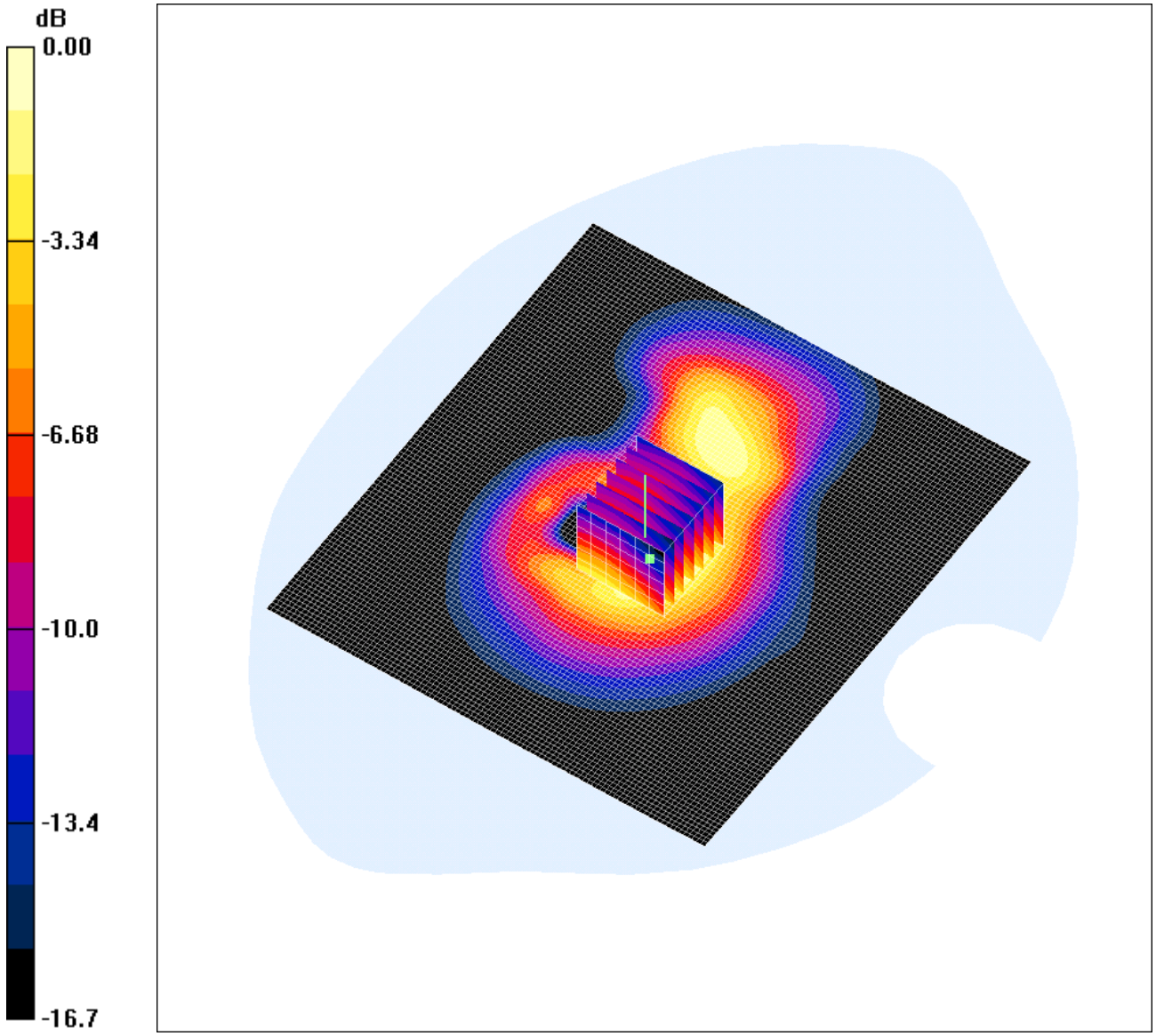
Date: 04/04/2005

46121_27_004

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_004_Front of EUT Facing Phantom with Strap_Flat_660

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.236mW/g

Communication System: DCS 1900; Frequency: 1879.8 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1879.8 MHz; σ = 1.57 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Front of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Area Scan (101x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.317 mW/g

Front of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.326 W/kg
SAR(1 g) = 0.217 mW/g; SAR(10 g) = 0.133 mW/g
Maximum value of SAR (measured) = 0.236 mW/g

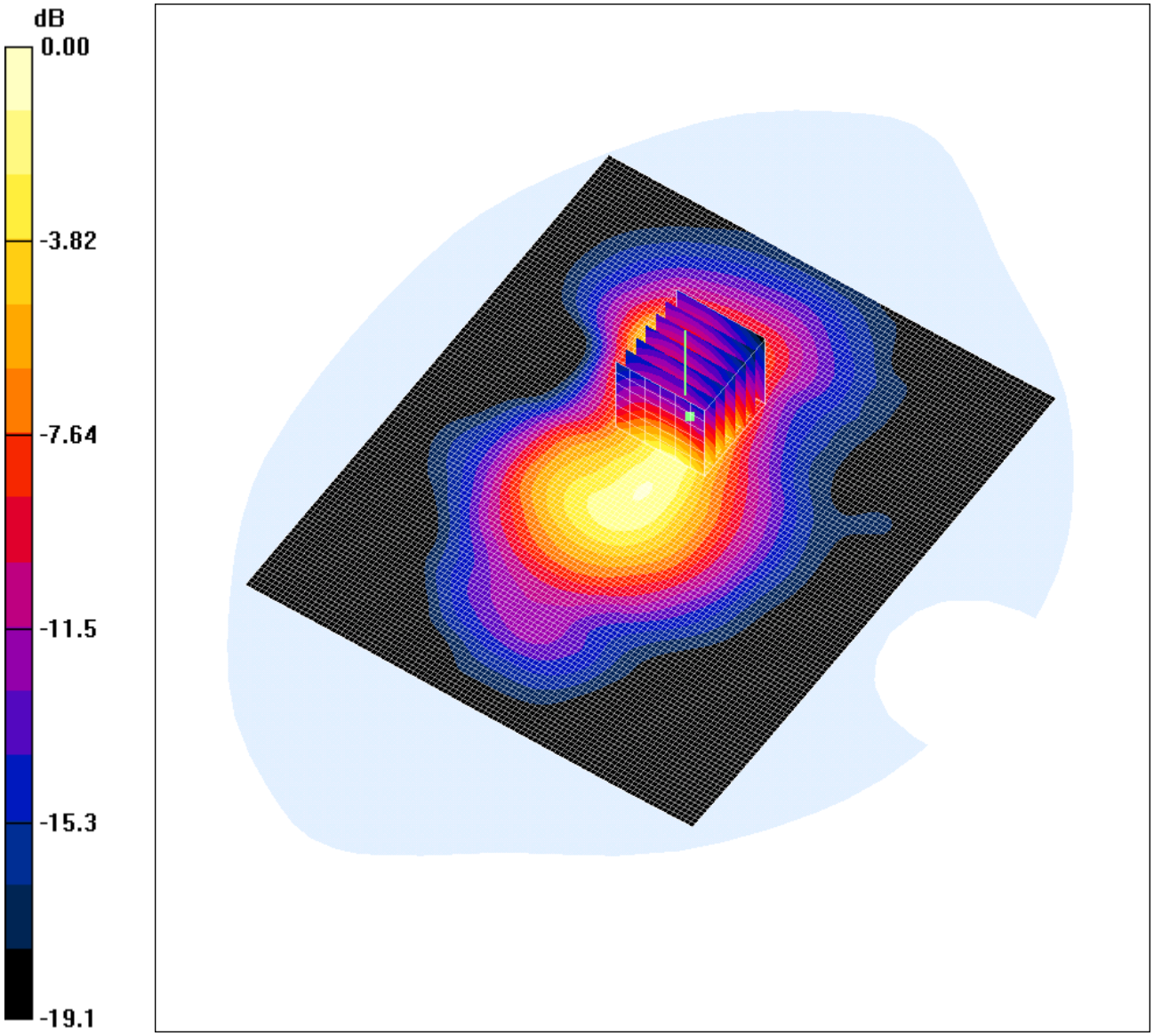
Date: 04/04/2005

46121_27_005

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_005_Front of EUT Facing Phantom with Strap and AC Adaptor_Flat_660

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.221mW/g

Communication System: DCS 1900; Frequency: 1879.8 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1879.8 MHz; σ = 1.57 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Front of EUT Facing Phantom (0mm Seperation) With Strap and AC Adaptor-Middle/Area Scan (101x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.227 mW/g

Front of EUT Facing Phantom (0mm Seperation) With Strap and AC Adaptor-Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.095 dB
Peak SAR (extrapolated) = 0.357 W/kg
SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.105 mW/g
Maximum value of SAR (measured) = 0.221 mW/g

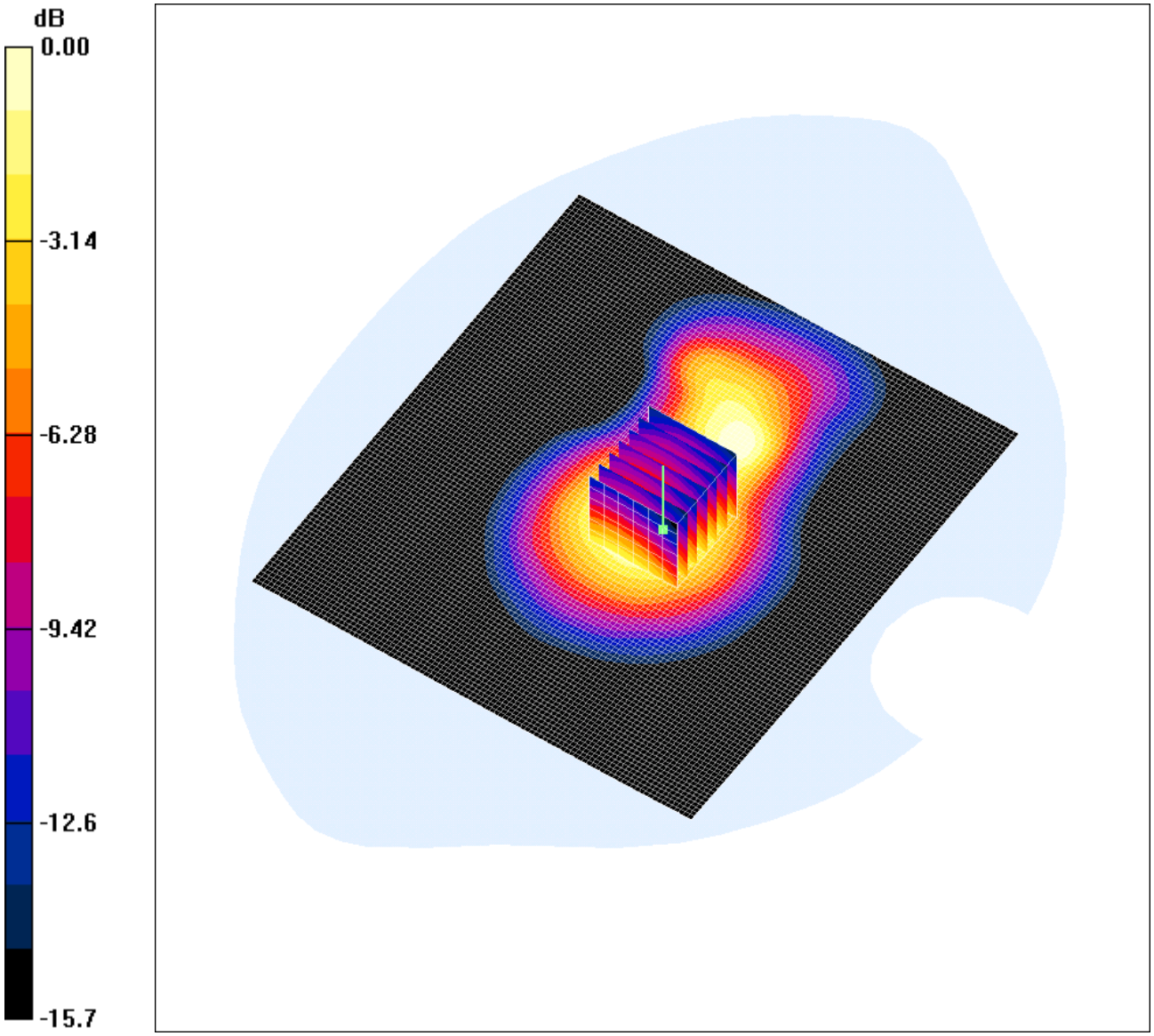
Date: 04/04/2005

46121_27_006

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_006_Front of EUT Facing Phantom with Strap_Flat_512

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.299mW/g

Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.55 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Front of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Area Scan (101x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.310 mW/g

Front of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.268 dB
Peak SAR (extrapolated) = 0.409 W/kg
SAR(1 g) = 0.278 mW/g; SAR(10 g) = 0.172 mW/g
Maximum value of SAR (measured) = 0.299 mW/g

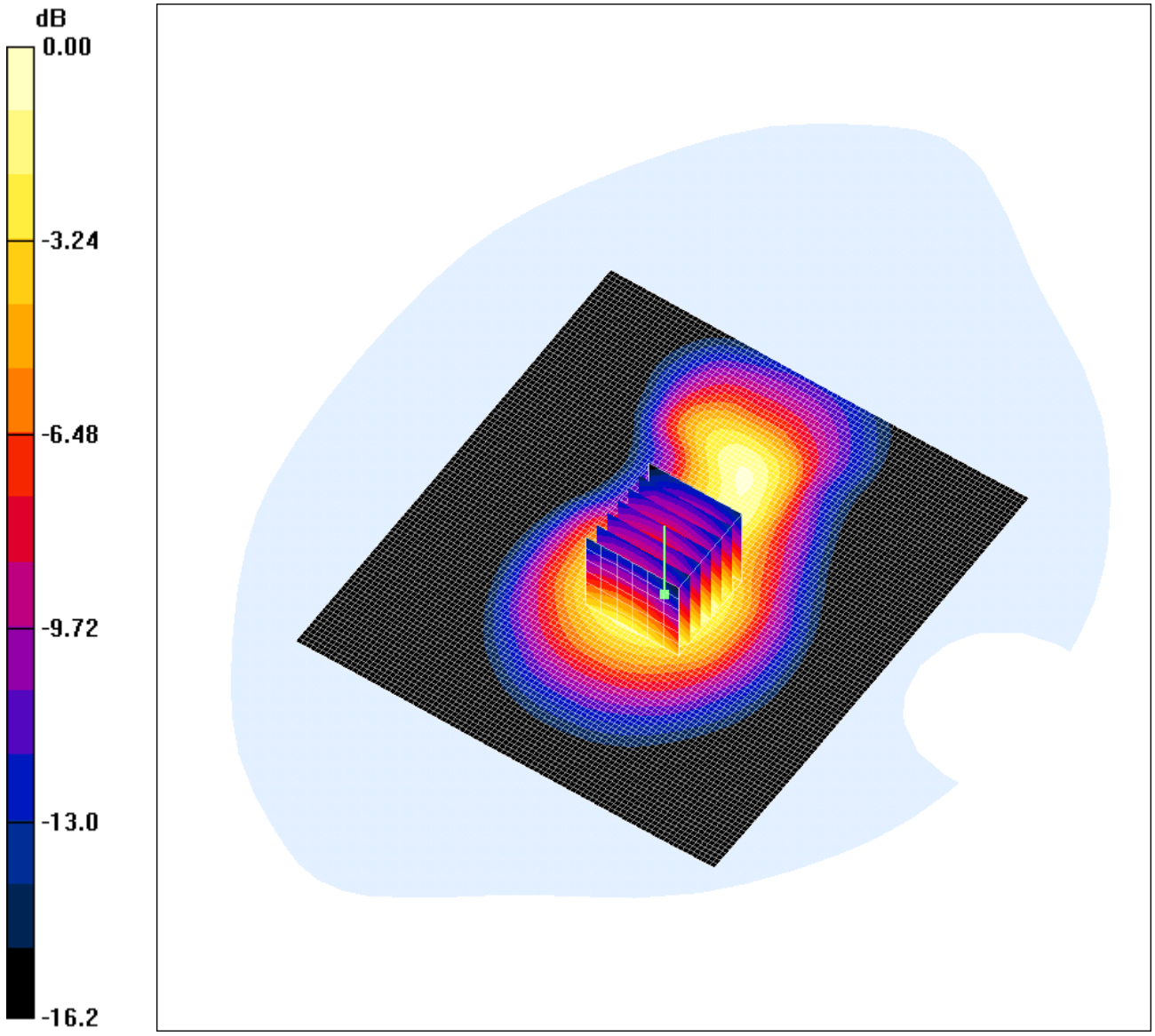
Date: 04/04/2005

46121_27_007

Test Laboratory: RFI GLOBAL SERVICES LTD.

46121_JD27_007_Front of EUT Facing Phantom with Strap_Flat_810

DUT: STOP; Type: BluTag; Serial: 36-0714



0 dB = 0.255mW/g

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: 1800 MSL Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.6 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.38, 4.38, 4.38); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Front of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Area Scan (91x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.273 mW/g

Front of EUT Facing Phantom (0mm Seperation) With Strap- Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.93 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 0.351 W/kg
SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.255 mW/g

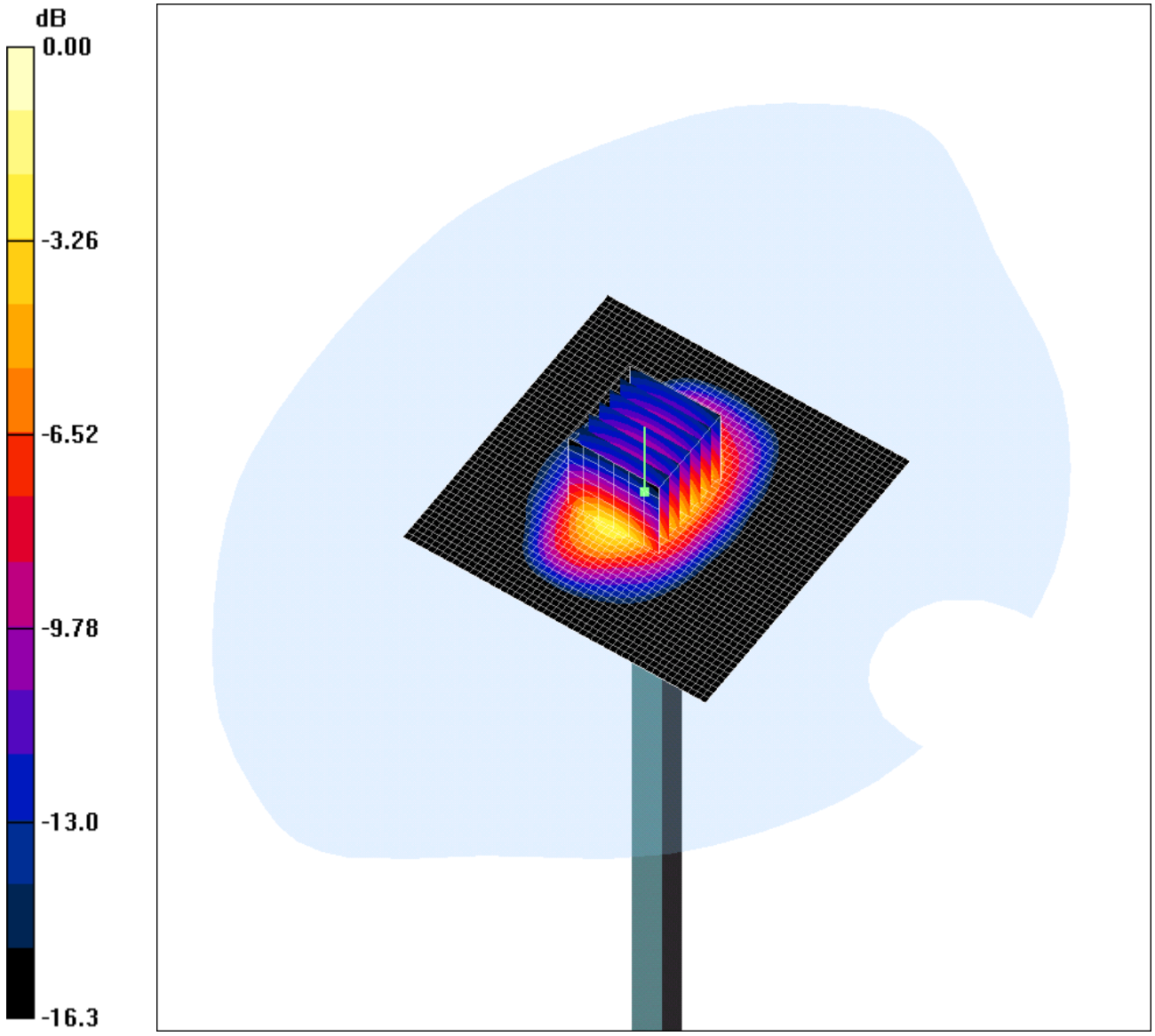
Date: 04/04/2005

46121_27_Validation 001

Test Laboratory: RFI GLOBAL SERVICES LTD.

System Performance Check-D1800 04 04 05

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: 264



0 dB = 10.5mW/g

Communication System: CW; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: 1800 MSL Medium parameters used: f = 1800 MHz; σ = 1.49 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1529; ConvF(4.58, 4.58, 4.58); Calibrated: 10/06/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/06/2004
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

d=10mm, Pin=250mW/Area Scan (51x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 12.3 mW/g

d=10mm, Pin=250mW/Zoom Scan 7x7x7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.0 V/m; Power Drift = 0.077 dB
Peak SAR (extrapolated) = 15.3 W/kg
SAR(1 g) = 9.18 mW/g; SAR(10 g) = 4.92 mW/g
Maximum value of SAR (measured) = 10.5 mW/g

Appendix 3. Test Configuration Photograph

This appendix contains the following photograph(s):

Photograph Reference Number	Title
PHT/SAR_Configuration	Test configuration for the measurement of Specific Absorption Rate (SAR)

PHT/SAR_Configuration

Appendix 4. Calibration Data

This appendix contains the calibration data and certificates.

Asset Number	Date	Title
A1190	15 April 2004	Calibration procedure for dipole validation kits
A1186	10 June 2005	Calibration procedure for domisetric E-field probes

This page has been left intentionally blank.

A1190

07/05/04.

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

Client RFI

CALIBRATION CERTIFICATE

Object(s) D1800V2 - SN:264

Calibration procedure(s) QA CAL-05.v2
Calibration procedure for dipole validation kits

Calibration date: April 15, 2004

Condition of the calibrated item In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	6-Nov-03 (METAS, No. 252-0254)	Nov-04
Power sensor HP 8481A	US37292783	6-Nov-03 (METAS, No. 252-0254)	Nov-04
Power sensor HP 8481A	MY41092317	18-Oct-02 (Agilent, No. 20021018)	Oct-04
RF generator R&S SML-03	100698	27-Mar-2002 (R&S, No. 20-92389)	In house check: Mar-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Judith Mueller	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: April 21, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Schmid & Partner Engineering AG
s p e a g
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

DASY

Dipole Validation Kit

Type: D1800V2

Serial: 264

Manufactured: March 5, 2000
Calibrated: April 15, 2004

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **head simulating solution** of the following electrical parameters at 1800 MHz:

Relative Dielectricity	**40.6**	± 5%
Conductivity	**1.36 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 5.08 at 1800 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250 mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**37.2 mW/g** ± 16.8 % (k=2)[1]
averaged over 10 cm^3 (10 g) of tissue:	**19.9 mW/g** ± 16.2 % (k=2)[1]

[1] validation uncertainty

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.201 ns**	(one direction)
Transmission factor:	**0.975**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance spacer was in place during impedance measurements.

Feedpoint impedance at 1800 MHz:	Re{Z} = **46.9 Ω**
	Im {Z} = **-5.9 Ω**
Return Loss at 1800 MHz	**-23.3 dB**

4. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **body simulating solution** of the following electrical parameters at 1800 MHz:

Relative Dielectricity	**52.6**	± 5%
Conductivity	**1.49 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 4.61 at 1800 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250 mW ± 3 %. The results are normalized to 1W input power.

Date/Time: 04/15/04 12:19:37

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN264

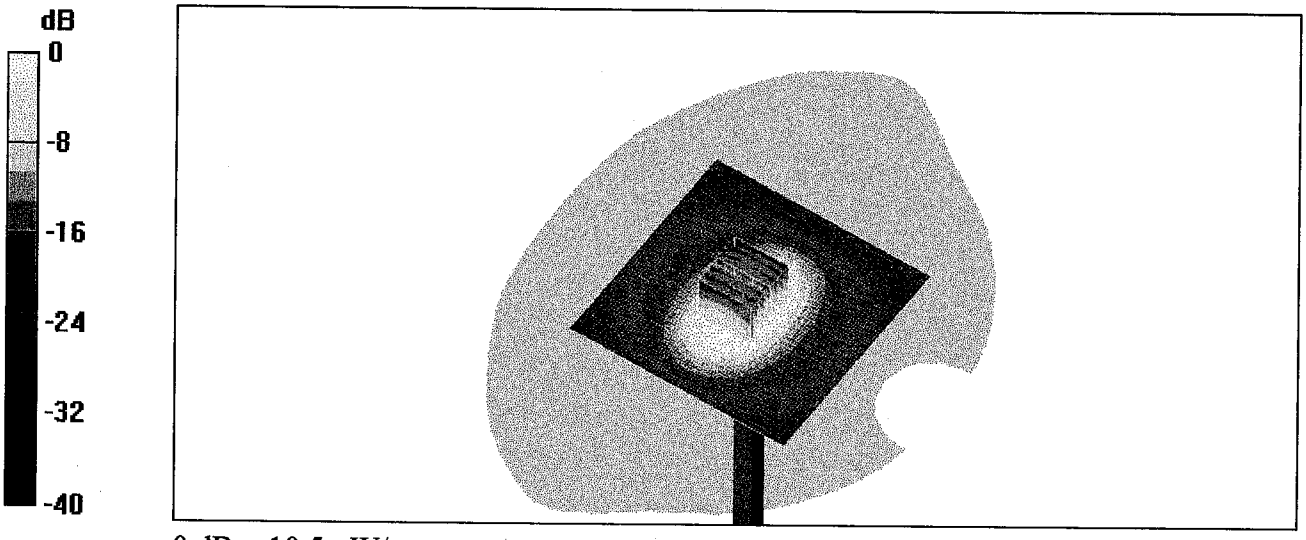
Communication System: CW-1800; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: HSL 1800 MHz;
Medium parameters used: f = 1800 MHz; σ = 1.36 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

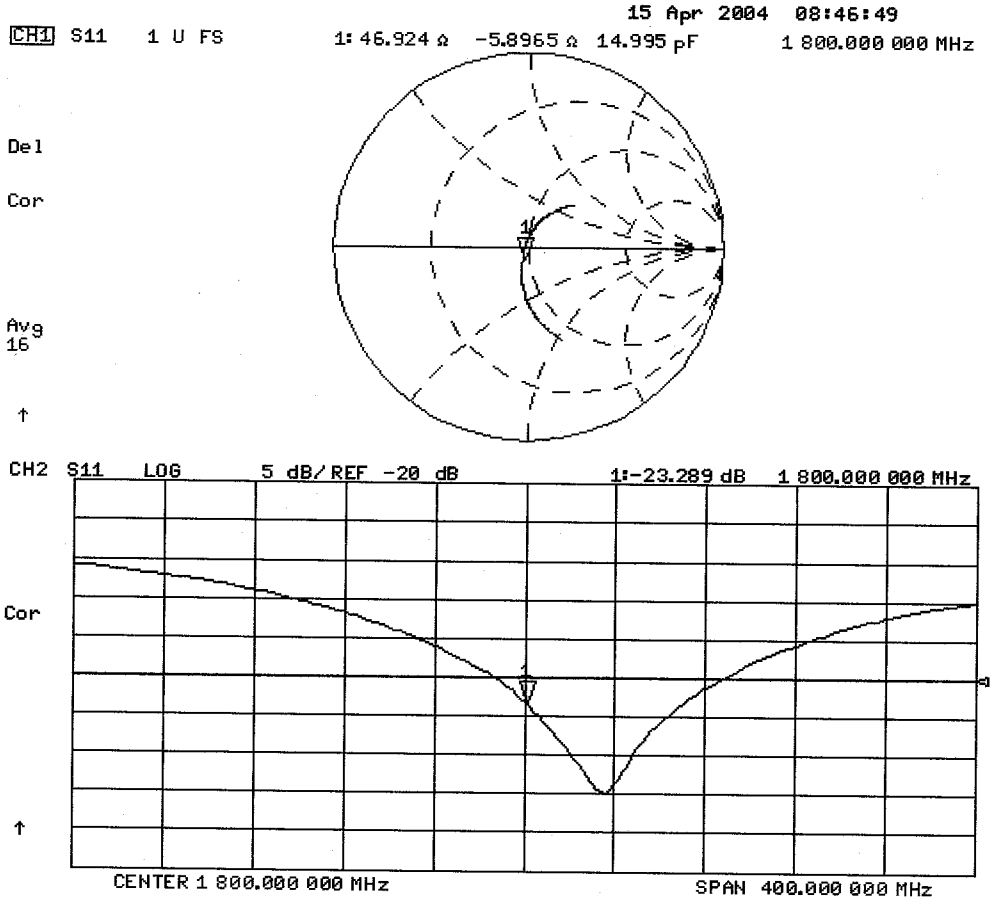
- Probe: ET3DV6 - SN1507; ConvF(5.08, 5.08, 5.08); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 90.6 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 10.6 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.6 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 10.5 mW/g
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.31 mW/g; SAR(10 g) = 4.98 mW/g



0 dB = 10.5mW/g


15 Apr 2004 08:46:49
CH1 S11 1 U FS
1: 46.924 Ω -5.8965 Ω 14.995 pF
1 800.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF -20 dB
1:-23.289 dB 1 800.000 000 MHz
Cor
CENTER 1 800.000 000 MHz
SPAN 400.000 000 MHz

5. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**37.0 mW/g** ± 16.8 % $(k=2)^2$
averaged over 10 cm^3 (10 g) of tissue:	**20.0 mW/g** ± 16.2 % $(k=2)^2$

6. Dipole Impedance and Return Loss

The dipole was positioned at the flat phantom sections according to section 4 and the distance spacer was in place during impedance measurements.

Feedpoint impedance at 1800 MHz:	Re{Z} = **44.3 Ω**
	Im {Z} = **-5.7 Ω**
Return Loss at 1800 MHz	**-21.3 dB**

7. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

8. Design

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

9. Power Test

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

---

[2] validation uncertainty

Date/Time: 04/14/04 10:24:48

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN264

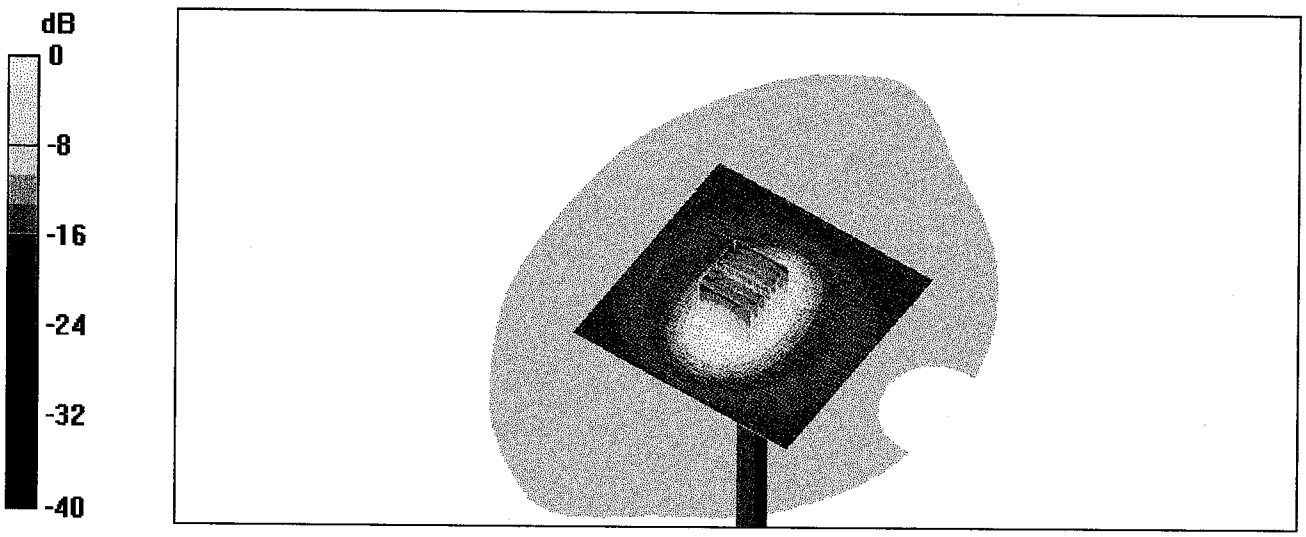
Communication System: CW-1800; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: Muscle 1800 MHz;
Medium parameters used: f = 1800 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.61, 4.61, 4.61); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

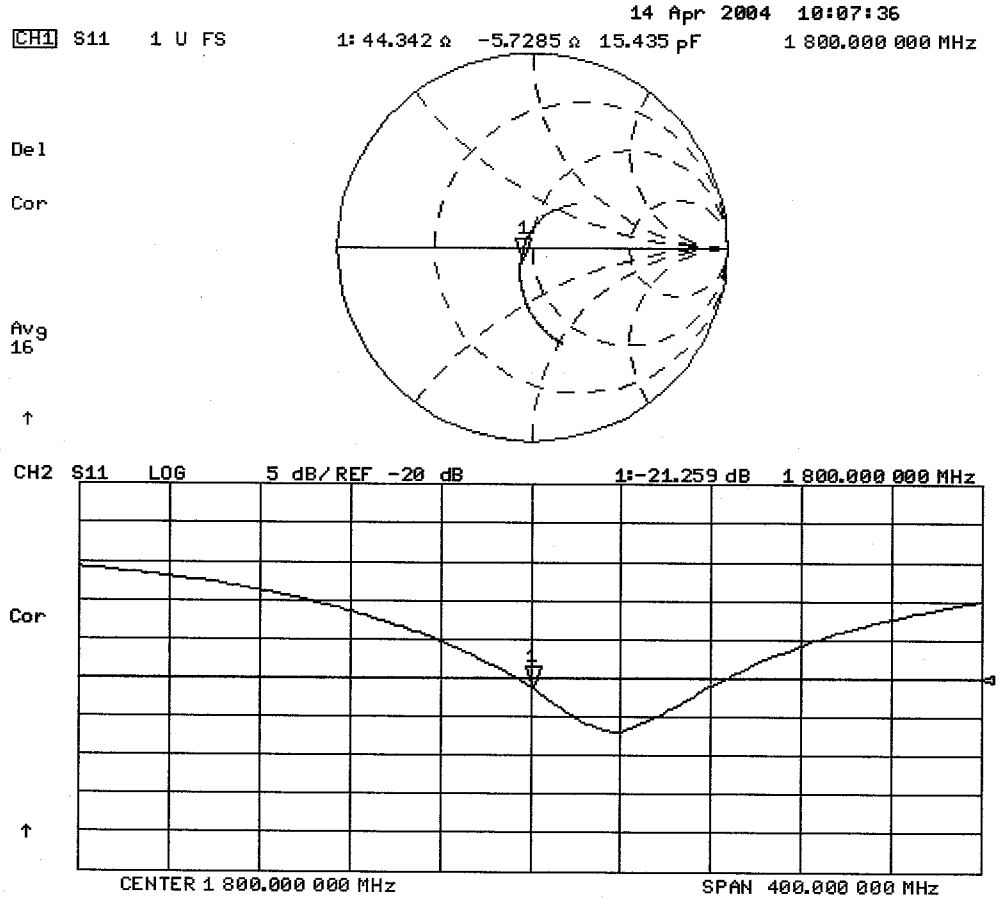
Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 87.5 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 10.5 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.5 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 10.5 mW/g
Peak SAR (extrapolated) = 15.4 W/kg
SAR(1 g) = 9.25 mW/g; SAR(10 g) = 5 mW/g



0 dB = 10.5mW/g

264
Body


14 Apr 2004 10:07:36
CH1 S11 1 U FS
1: 44.342 Ω -5.7285 Ω 15.435 pF
1 800.000 000 MHz
Del
Cor
Avg
16
↑
CH2 S11 LOG 5 dB/ REF -20 dB
1:-21.259 dB 1 800.000 000 MHz
Cor
↑
CENTER 1 800.000 000 MHz
SPAN 400.000 000 MHz

A1186

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

Client **RFI**

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1529
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	June 10, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM 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 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

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

Date issued: June 10, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Probe ET3DV6

SN:1529

Manufactured:	March 21, 2000
Last calibrated:	June 9, 2003
Recalibrated:	June 10, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1529

Sensitivity in Free Space

NormX	**1.73** $\mu V/(V/m)^2$	DCP X	**95**	mV
NormY	**2.02** $\mu V/(V/m)^2$	DCP Y	**95**	mV
NormZ	**1.77** $\mu V/(V/m)^2$	DCP Z	**95**	mV

Diode Compression[A]

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.9	5.4
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

Head **1750 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	14.5	9.9
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

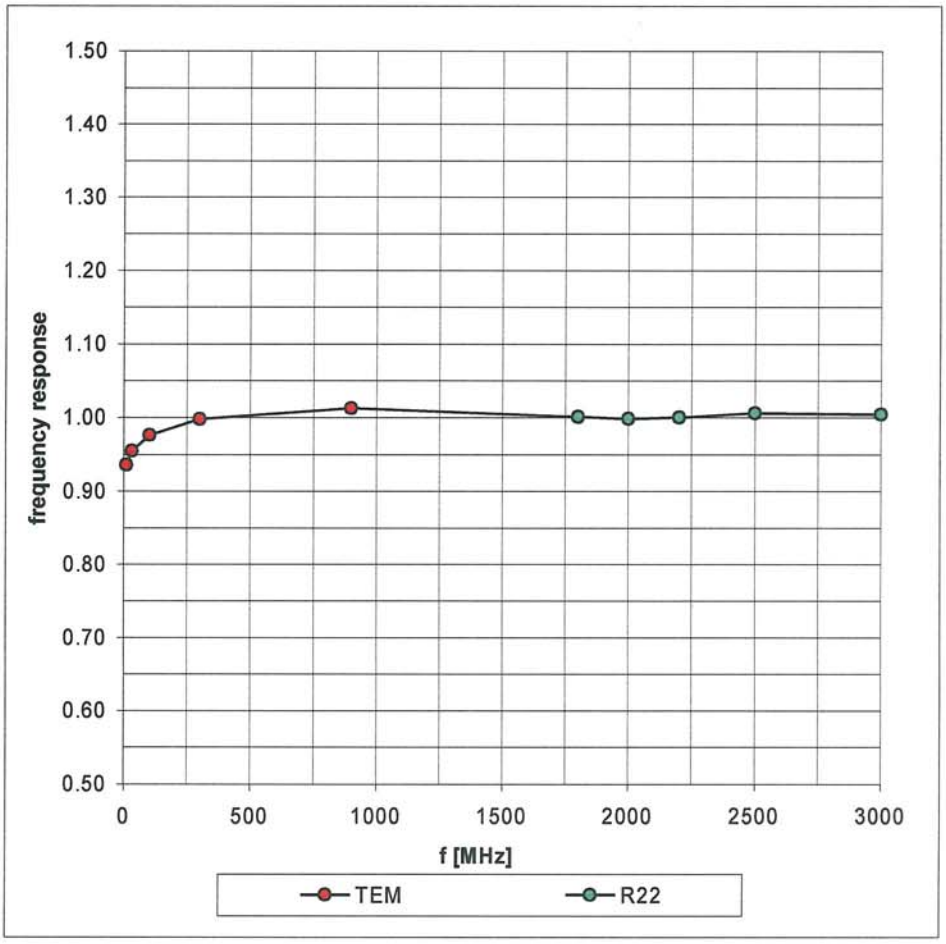
Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

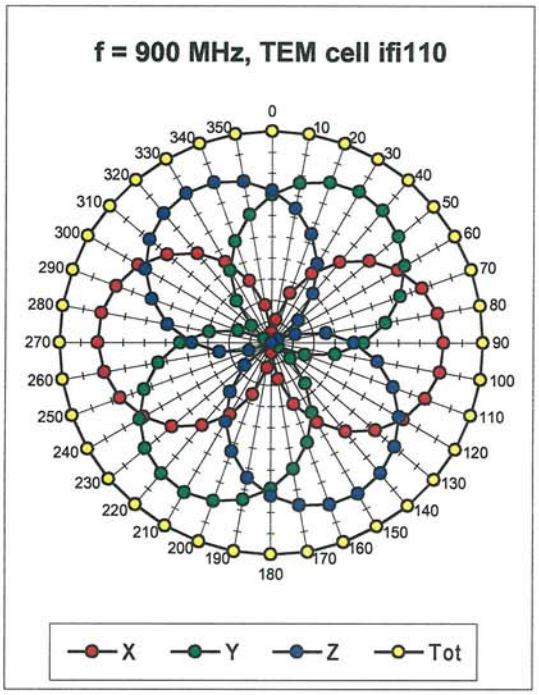
[A] numerical linearization parameter: uncertainty not required

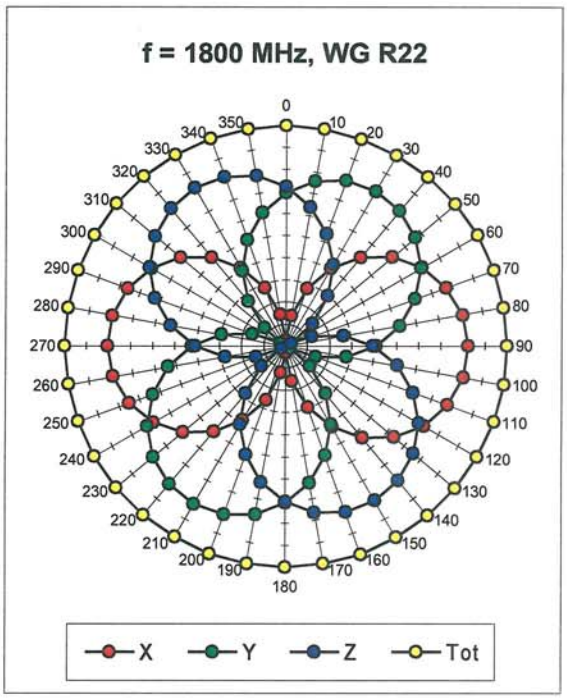
Frequency Response of E-Field

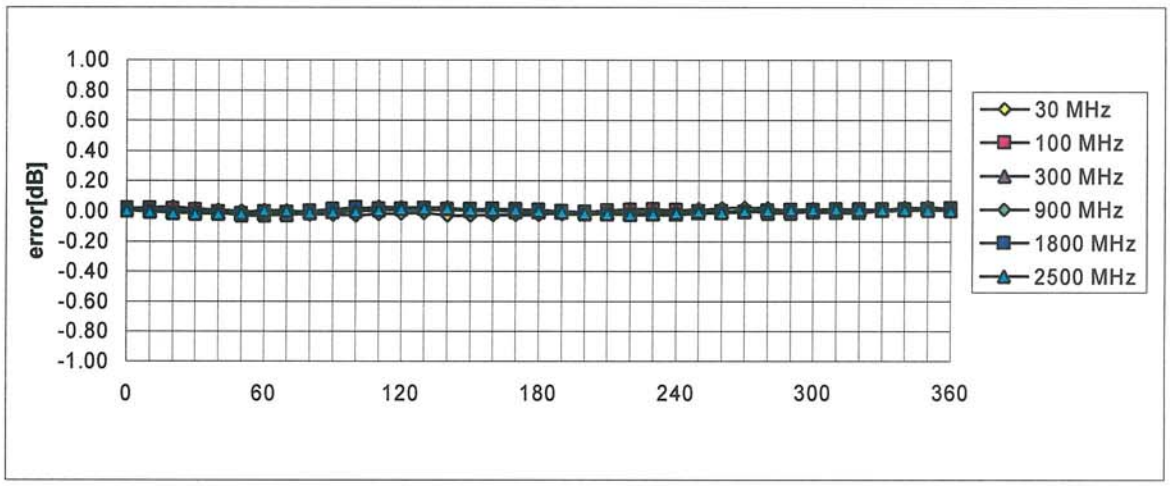
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ), θ = 0°



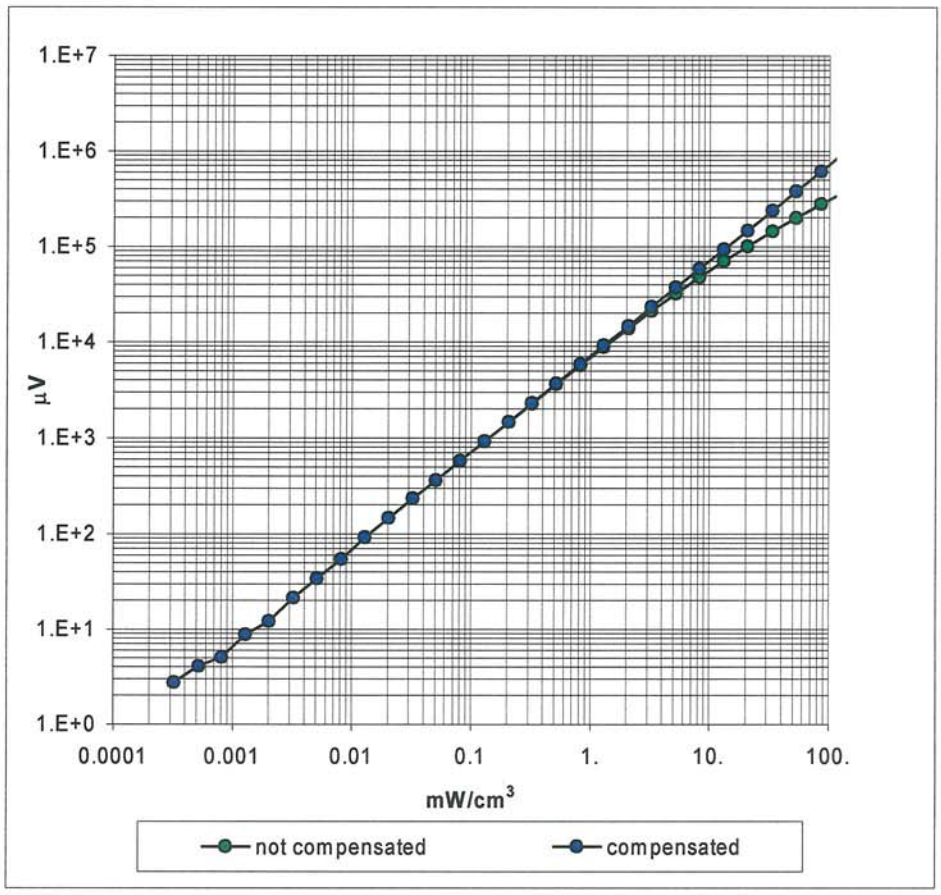


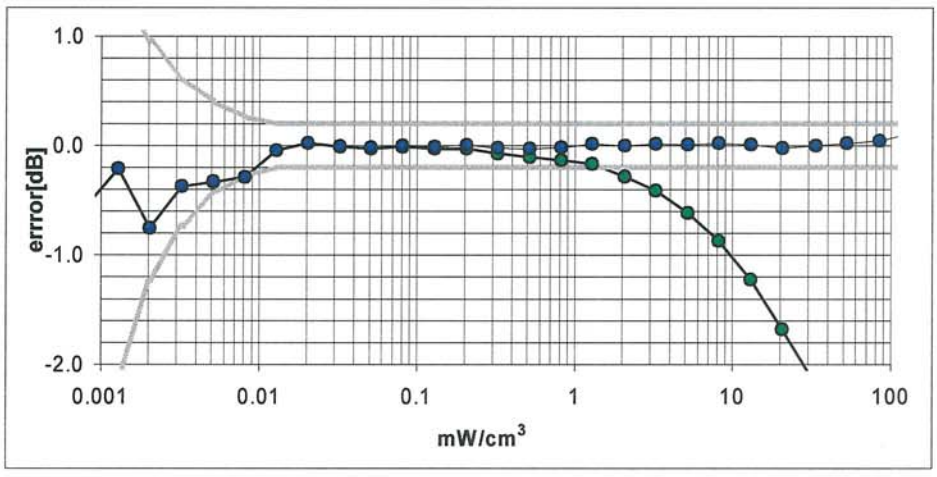


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

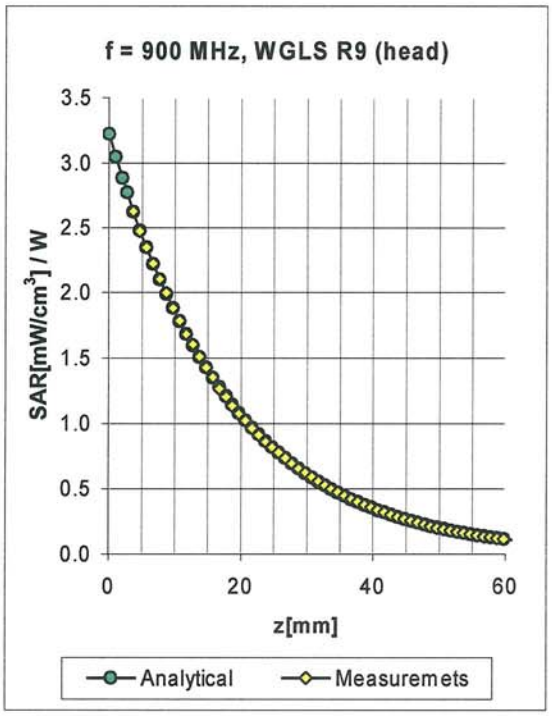
(Waveguide R22)

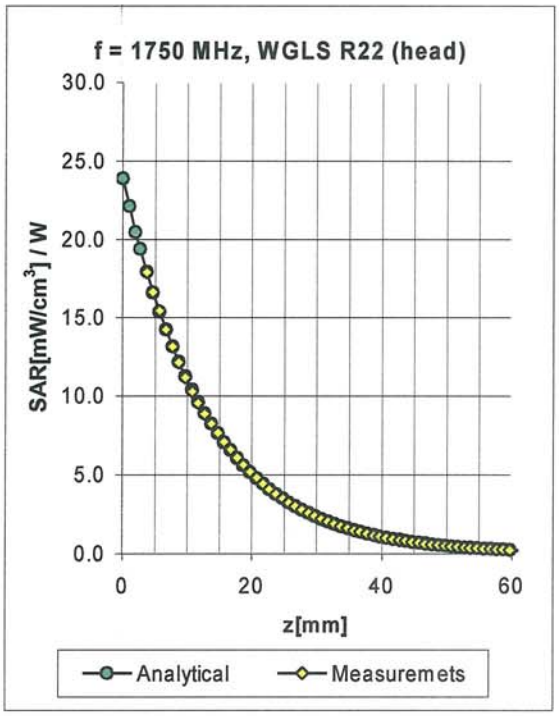




Probe Linearity Error < ± 0.2 dB

Conversion Factor Assessment



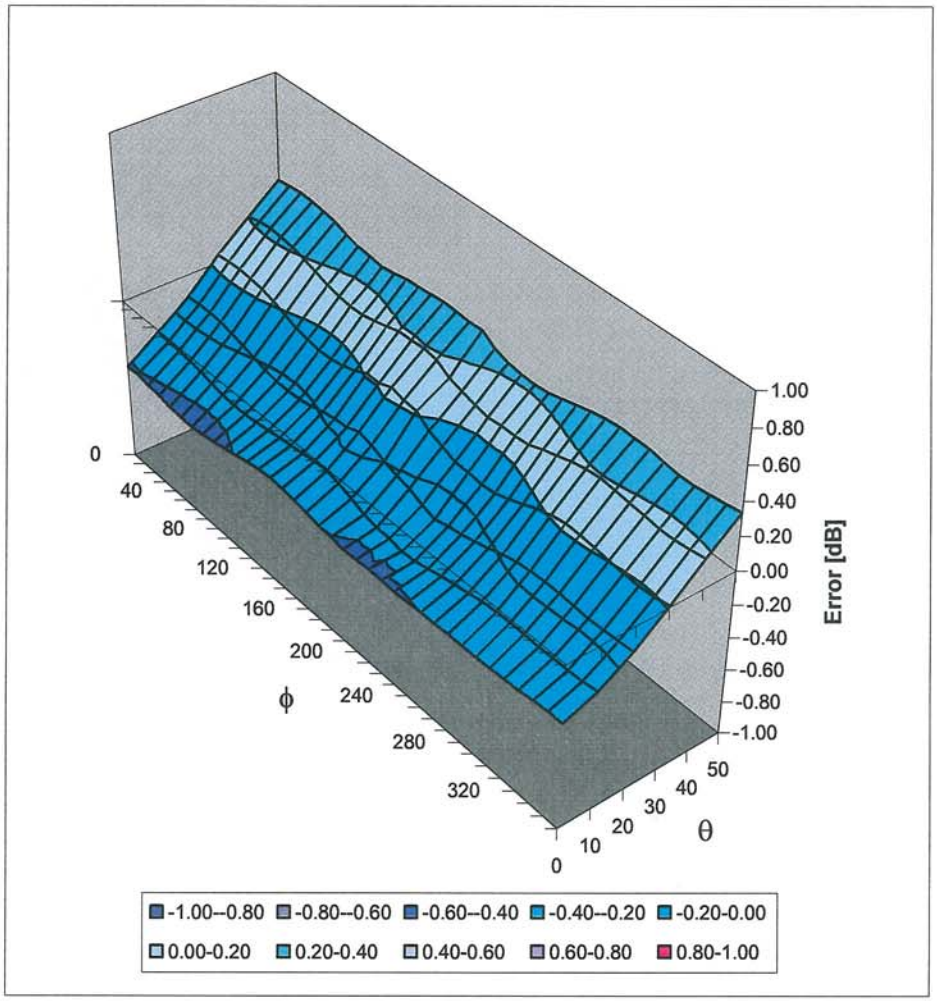


f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	785-885	Head	41.5 ± 5%	0.90 ± 5%	0.45	2.29	6.31 ± 9.7% (k=2)
900	850-950	Head	41.5 ± 5%	0.97 ± 5%	0.57	1.99	6.14 ± 9.7% (k=2)
1750	1700-1800	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.43	5.07 ± 9.7% (k=2)
1900	1850-1950	Head	40.0 ± 5%	1.40 ± 5%	0.59	2.61	4.90 ± 9.7% (k=2)
2450	2400-2500	Head	39.2 ± 5%	1.80 ± 5%	1.03	1.88	4.31 ± 9.7% (k=2)
835	785-885	Body	55.2 ± 5%	0.97 ± 5%	0.65	1.91	6.09 ± 9.7% (k=2)
900	850-950	Body	55.0 ± 5%	1.05 ± 5%	0.47	2.25	5.94 ± 9.7% (k=2)
1750	1700-1800	Body	53.3 ± 5%	1.52 ± 5%	0.59	2.75	4.58 ± 9.7% (k=2)
1900	1850-1950	Body	53.3 ± 5%	1.52 ± 5%	0.63	2.70	4.38 ± 9.7% (k=2)
2450	2400-2500	Body	52.7 ± 5%	1.95 ± 5%	1.42	1.50	4.16 ± 9.7% (k=2)

[B] The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

Deviation from Isotropy in HSL

Error (θ, ϕ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

Appendix 5. Photographs of EUT

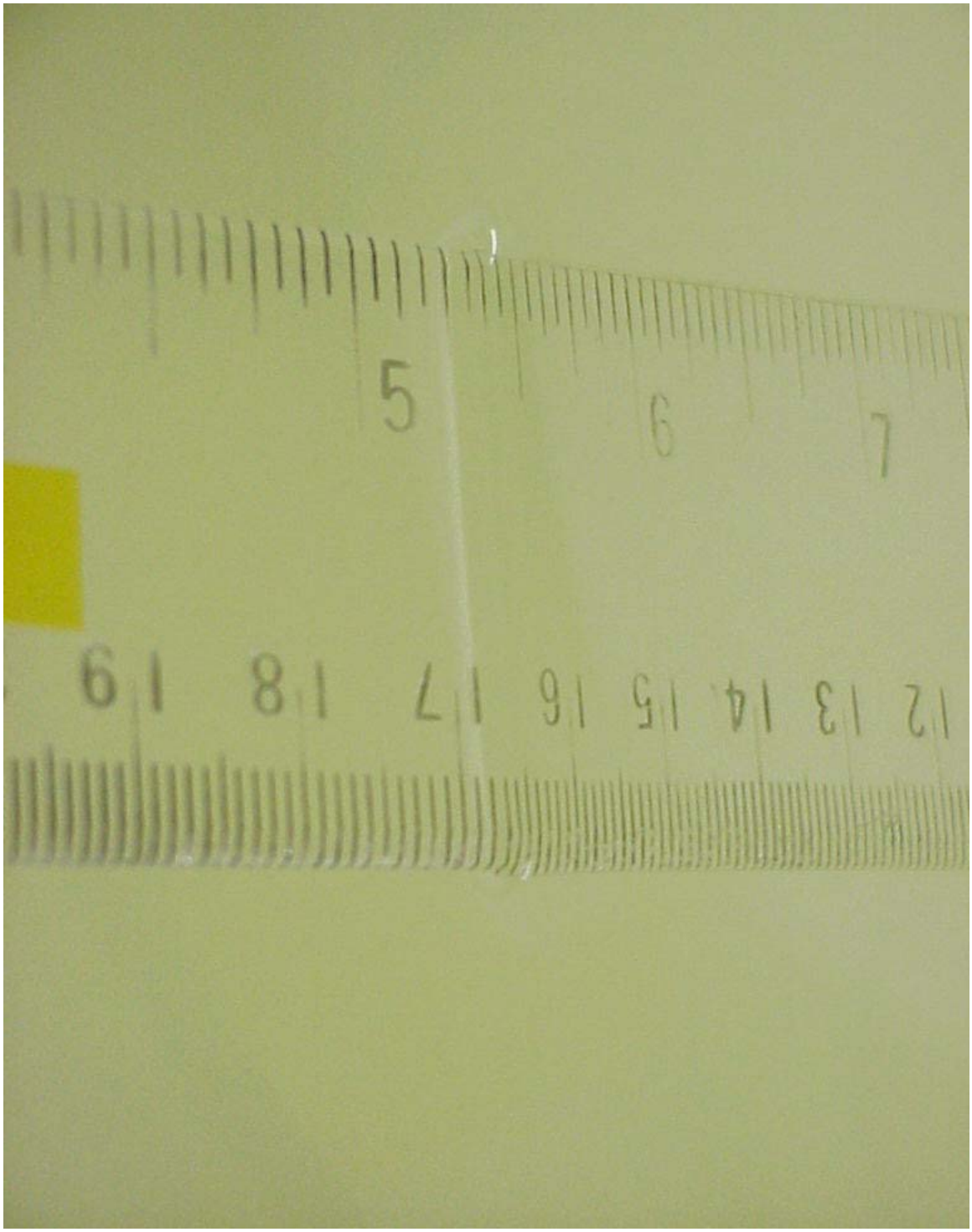
This appendix contains the following photographs:

Photo Reference Number	Title
PHT/46121/001	1800 MHz MSL Fluid Level
PHT/46121/002	AC Adapter Identification 1
PHT/46121/003	AC Adapter Identification 2
PHT/46121/004	AC Adapter Identification 3
PHT/46121/005	AC Adapter View 1
PHT/46121/006	AC Adapter View 2
PHT/46121/007	EUT Identification 1
PHT/46121/008	Front of EUT
PHT/46121/009	Front of EUT Facing Phantom with Strap
PHT/46121/010	Front of EUT Facing Phantom with Strap and AC Adapter
PHT/46121/011	Front of EUT Facing Phantom without Strap
PHT/46121/012	Rear of EUT
PHT/46121/013	Rear of EUT Facing Phantom with Strap
PHT/46121/014	Rear of EUT Facing Phantom without Strap
PHT/46121/015	Strap View 1
PHT/46121/016	Strap View 2

This page has been left intentionally blank.

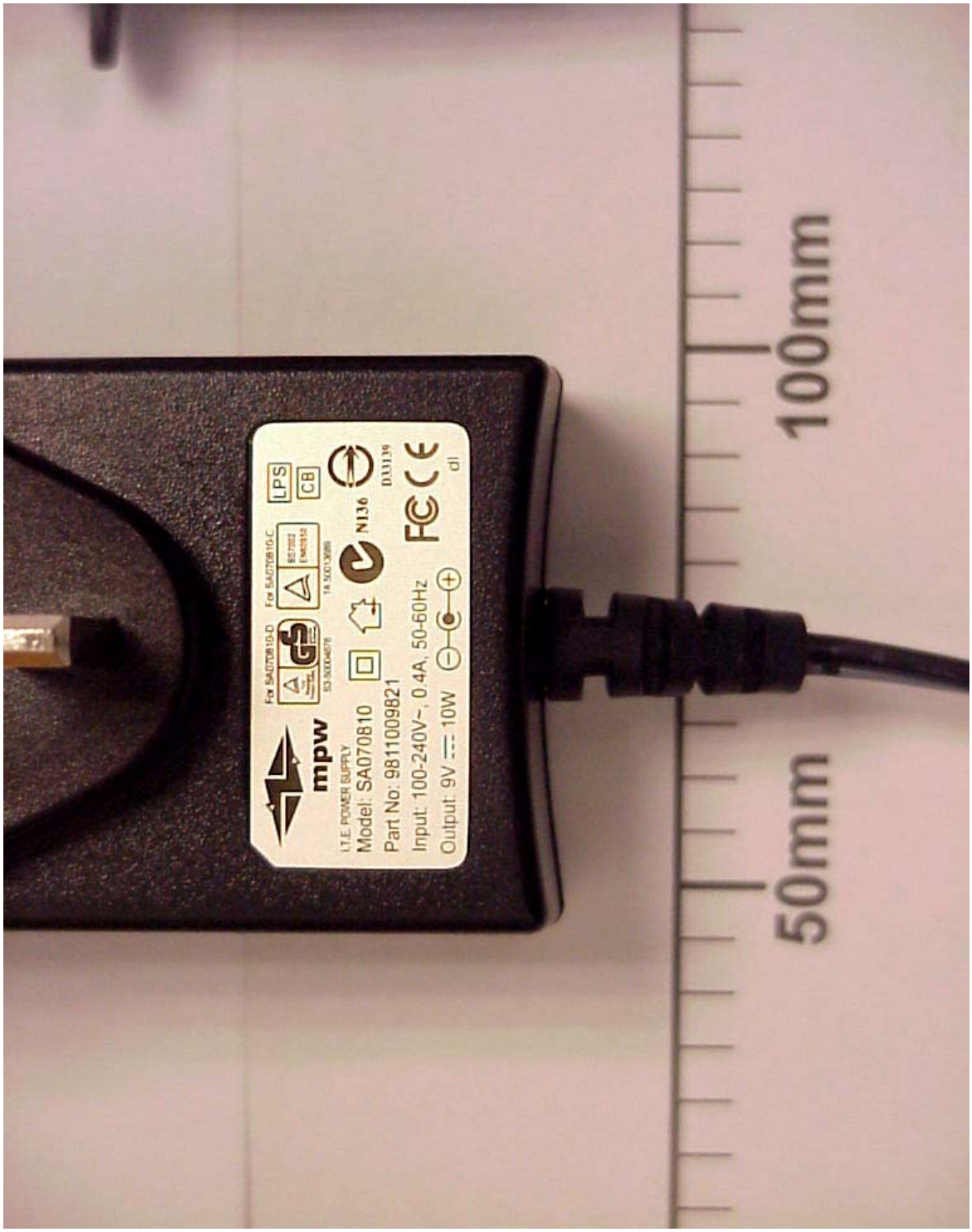
Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/001 1800 MHz MSL Fluid Level



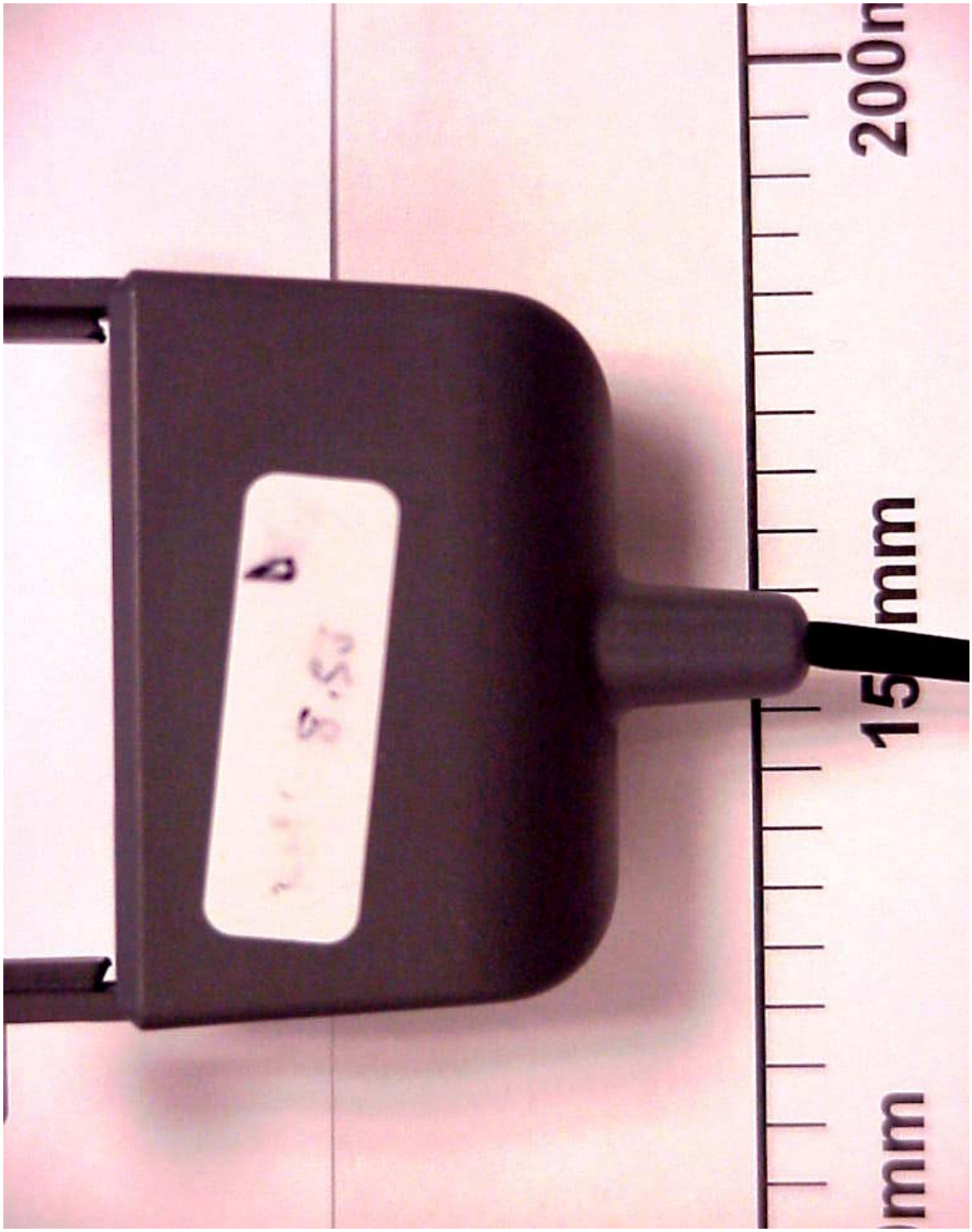
Test Of: **Satellite Tracking of People LLC (STOP). BluTag.**
To: **OET Bulletin 65 Supplement C: (2001-01)**

PHT/46121/002 AC Adapter Identification 1



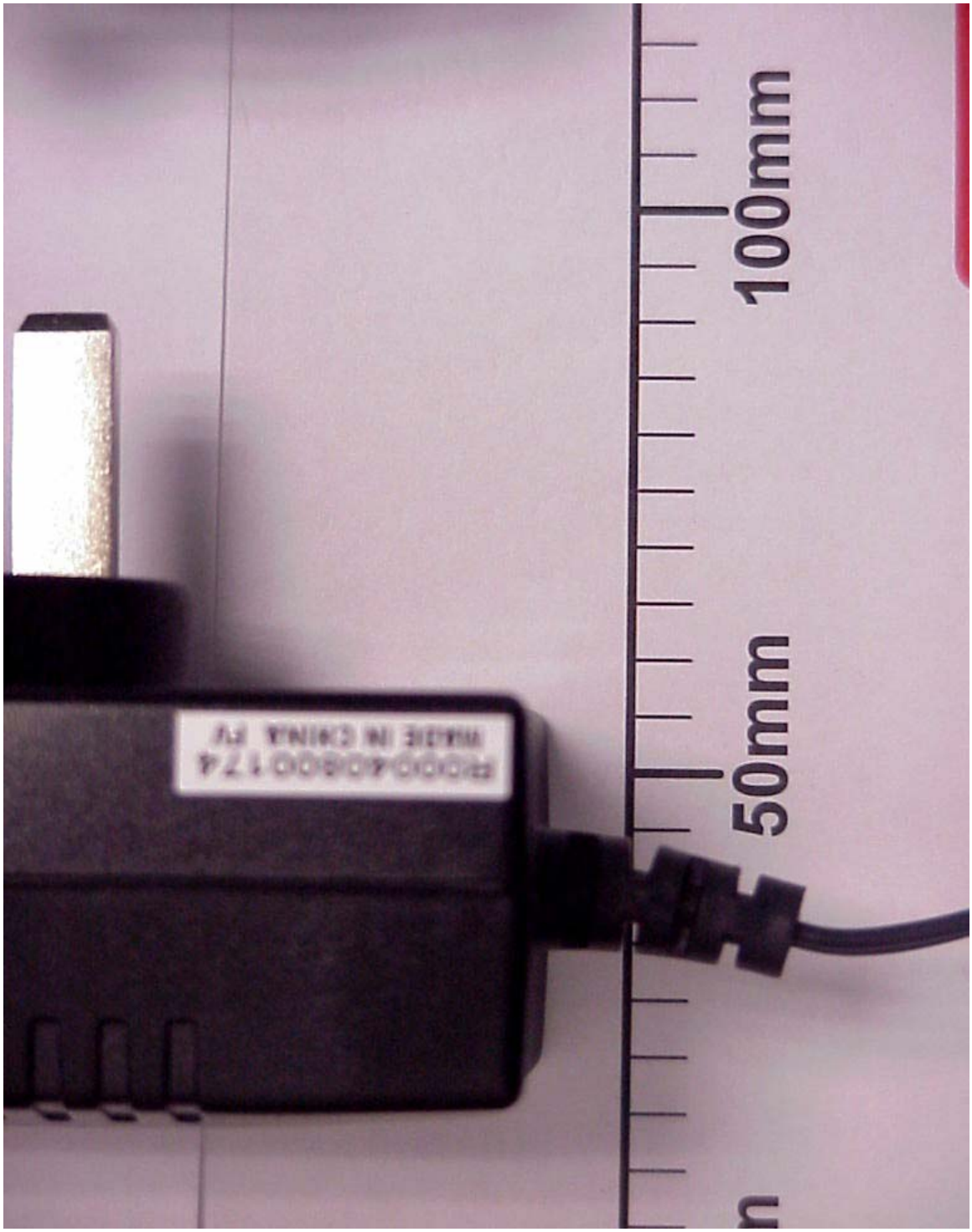
Test Of: Satellite Tracking of People LLC (STOP). BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/003 AC Adapter Identification 2



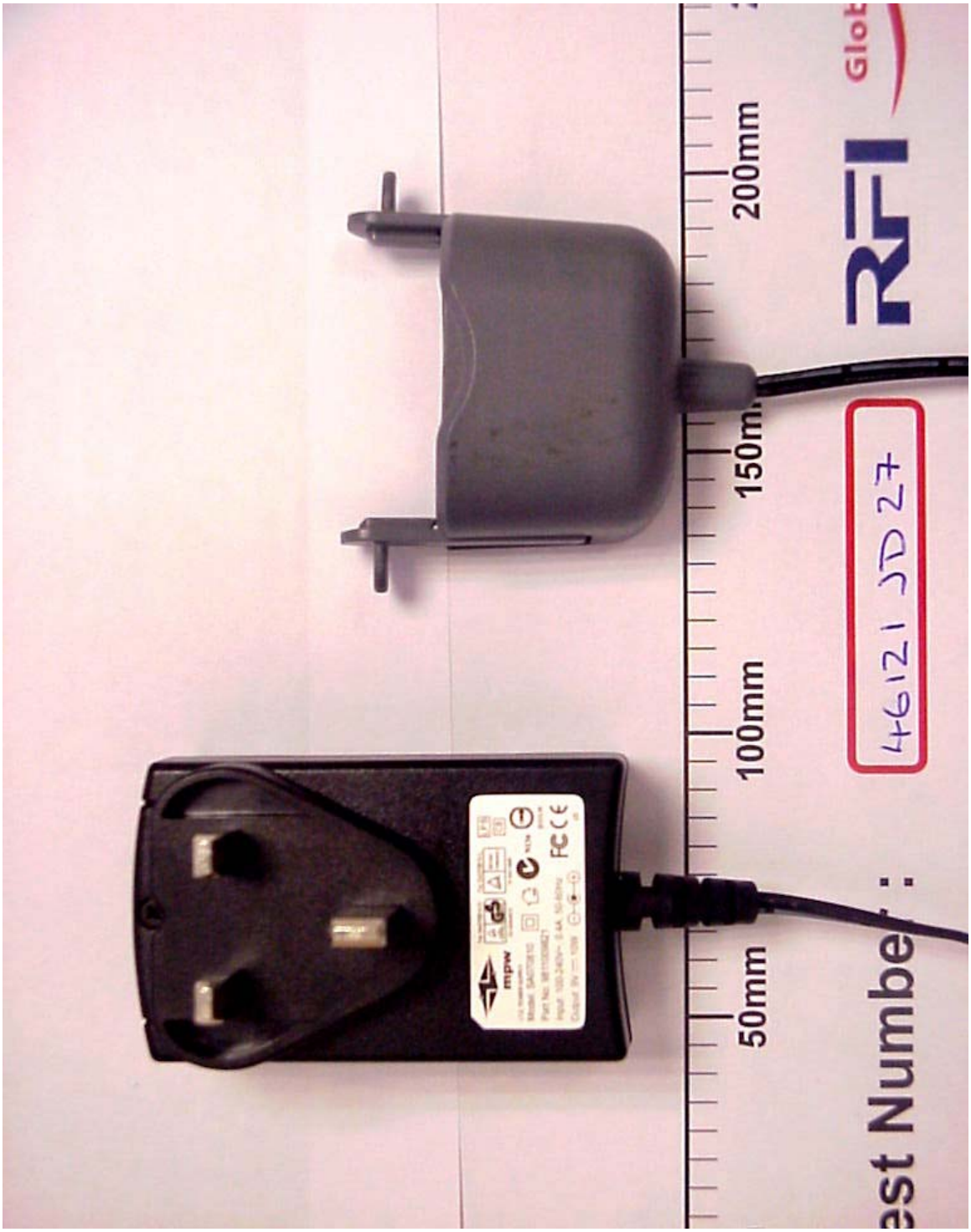
Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/004 AC Adapter Identification 3



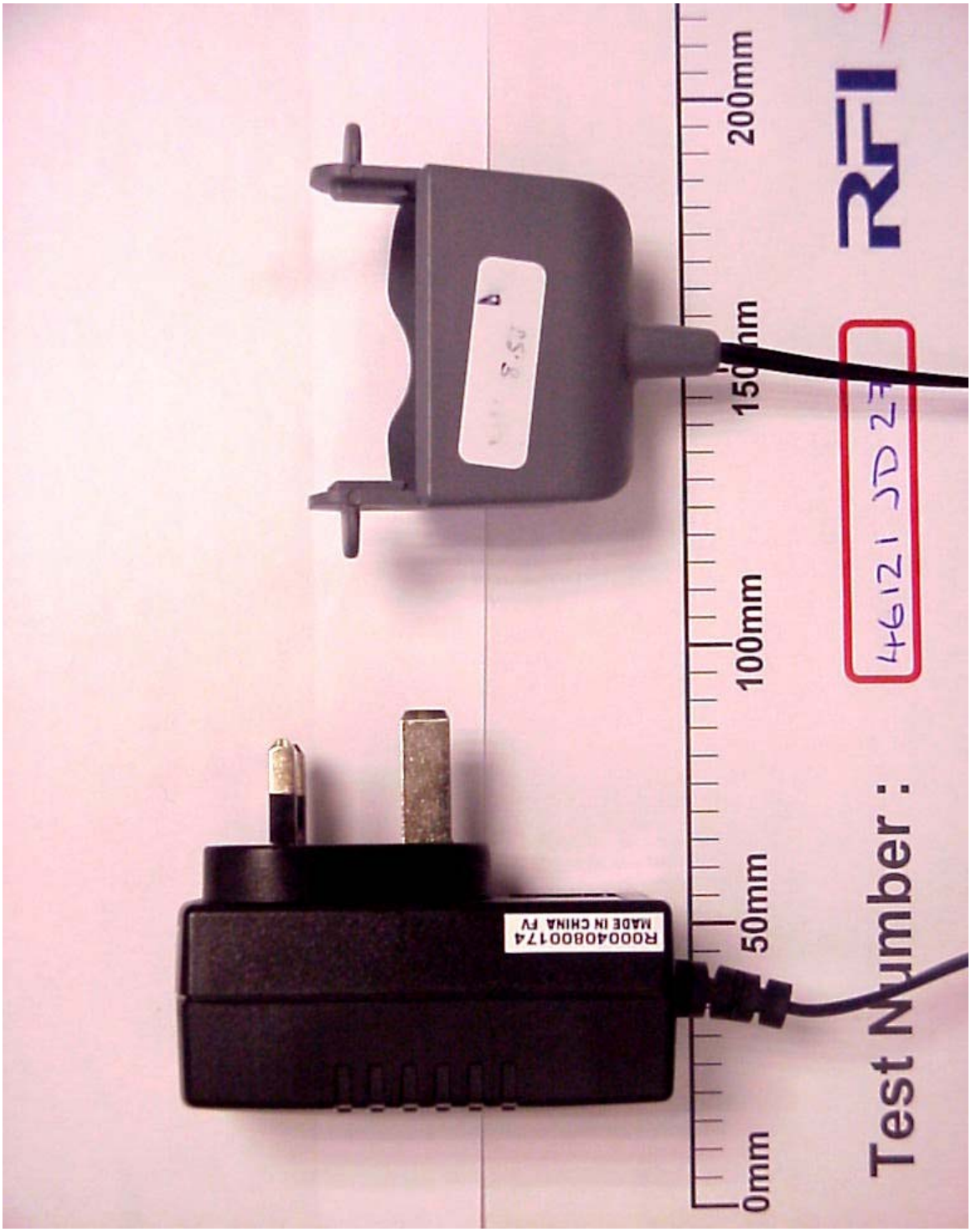
Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/005 AC Adapter View 1



Test Of: Satellite Tracking of People LLC (STOP). BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/006 AC Adapter View 2



Test Of: Satellite Tracking of People LLC (STOP). BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/007 EUT Identification 1

Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/008 Front of EUT

Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/009 Front of EUT Facing Phantom with Strap

Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/010 Front of EUT Facing Phantom with Strap and AC Adapter

Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/011 Front of EUT Facing Phantom without Strap

Test Of: Satellite Tracking of People LLC (STOP). BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/012 Rear of EUT

PHT/46121/013 Rear of EUT Facing Phantom with Strap

Test Of: Satellite Tracking of People LLC (STOP).
BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/014 Rear of EUT Facing Phantom without Strap

Test Of: Satellite Tracking of People LLC (STOP). BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/015 Strap View 1

Test Of: Satellite Tracking of People LLC (STOP). BluTag.
To: OET Bulletin 65 Supplement C: (2001-01)

PHT/46121/016 Strap View 2