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SAR Test Report

Report Number: M080927_R

Test Sample: THURAYA Satellite/GSM Phone

Model Number: XT Pro
FCC ID: TZ5XTPRO
Tested For: Asia Pacific Satellite Industries Co., Ltd.

Date of Issue: 8th January 2009

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SAR EVALUATION
THURAYA Satellite/GSM Phone, **Model:** XT Pro
Report Number: M080927_R

1.0 GENERAL INFORMATION

Test Sample:	THURAYA Satellite Phone
Model Number:	XT Pro
IMEI Number:	35697902-010084-3
Manufacturer:	Asia Pacific Satellite Industries
FCC ID:	TZ5XTPRO
Device Category:	Portable Transmitter
Test Device:	Production Unit / Prototype Sample
RF exposure Category:	General Public/Unaware user

Tested for:	Asia Pacific Satellite Industries Co., Ltd.
Address:	9FL, IT Castle 2-Dong, #550-1, Gasan-Dong, GeumCheon-Gu, Seoul, Korea
Contact:	Sung-Hee, Lee
Phone:	+82-2-2026-7893
Email:	shlee@apsat.co.kr

Test Standard/s:	Evaluating Compliance with FCC Guidelines For Human Exposure to Radiofrequency Electromagnetic Fields Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) RSS-102 Issue 2 November 2005
Statement Of Compliance:	The THURAYA Satellite/GSM Phone, model XT Pro with Bluetooth module BTEZ1702SA or UGNZ9-F03A Complied with the FCC General public/uncontrolled RF exposure limits of 1.6mW/g per requirements of 47CFR2.1093(d).
Test Dates:	30th September to 3rd October 2008
Test Officer:	Peter Jakubiec Assoc Dip Electronics Eng
Authorised Signature:	Peter Jakubiec

2.0 DESCRIPTION OF DEVICE

2.1 Description of Test Sample

The device tested was a THURAYA Satellite/GSM Phone, Model: XT Pro operating in 1626.5 MHz to 1660.5 MHz Satellite, and Cellular Phone PCS frequency bands. Device also contains Bluetooth Module one of the two types can be fitted inside the phone, Model: BTEZ1702SA or UGNZ9-F03A both operating in 2402 MHz to 2480 MHz band. The test device was tested in the Touch and Tilted Positions with the antenna retracted and extended (applicable to satellite band only).

Table: EUT Parameters

Operating Mode during Testing	: See Clause 2.3
Operating Mode production sample	: Continuous Transmission - Standard GSM and Satellite
Modulation:	: Standard TDMA and π/4-CQPSK
Device Power Rating for test sample and identical production unit	: Max 2W (Typical 1.8W) in Satellite mode, 1W in GSM mode, and 4dBm Max for Bluetooth BTEZ1702SA or UGNZ9-F03A,
Device Dimensions (LxWxH)	: 229mm x 54mm x 27mm (including extended antenna)
Antenna type	: Extendable
Applicable Head Configurations	: Touch and Tilted
Applicable Body Worn-Configurations	: Body Worn for GSM/GPRS mode only
Battery Options	: One Battery Type

2.2 Test sample Accessories

2.2.1 Battery Types

A 3.7V 2520 mAh Rechargeable Li-Polymer Battery Pack is used to power the DUT. SAR measurements were performed with a standard 3.7 V battery.

2.3 Test Signal, Frequency and Output Power

The test was performed on DUT, for this evaluation. The test sample operates in 1626.5 MHz to 1660.5 MHz Satellite, Cellular 1850.2 MHz to 1909.8 MHz, and Bluetooth 2402 MHz to 2480 MHz frequency bands. The test sample was configured into a test mode and was put into maximum continuous transmit mode for the duration of each SAR scan. The channels utilised in the measurements were the traffic channels shown in the table below.

Table: Test Frequencies

Frequency Range	Traffic Channels	Band Power Class	Nominal Power (dBm)
1626.5 – 1660.5 MHz	0001, 0544, and 1087	N/A	32.5
1850.2 – 1909.8 MHz	512, 661 and 810	1	30
2402 – 2480 MHz	01, 40, and 79	N/A	4 (Max)

2.4 Conducted Power Measurements

The conducted power of the EUT was measured in the Satellite and GSM Bands with a calibrated Power Meter. The results of this measurement are listed in table below. Please note that measurement of Bluetooth conducted power was not possible because the phone is not equipped with the Bluetooth RF test port.

Table: Frequency and Output Power Satellite Band

Channel	Channel Frequency MHz	Maximum Conducted Output Power dBm
0001	1626.5	32.65
0544	1643.0	32.82
1087	1660.5	32.62

Note: The loses due to cabling and attenuation has been taken into account.

Table: Frequency and Output Power GSM Band

Channel	Channel Frequency MHz	Maximum Conducted Output Power dBm
512	1850.2	28.75
661	1880	29.02
810	1784.8	29.35

Note: The loses due to cabling and attenuation has been taken into account.

2.5 Battery Status

The device battery was fully charged prior to commencement of measurement. Each SAR test was completed within 30 minutes. The battery condition was monitored by measuring the RF power at a defined position inside the phantom before the commencement of each test and again after the completion of the test.

Table: Battery Details

Battery #1:	3.7 Vdc , 2520mAh	**Battery #2:**	3.7 Vdc , 2520mAh
Model No.:	Li18S	**Model No.:**	Li18S

2.5 Details of Test Laboratory

2.5.1 Location

EMC Technologies Pty Ltd
176 Harrick Road
Keilor Park, (Melbourne) Victoria
Australia 3042

Telephone: +61 3 9365 1000
Facsimile: +61 3 9331 7455
email: melb@emctech.com.au
website: www.emctech.com.au

2.5.2 Accreditations

EMC Technologies Pty. Ltd. is accredited by the National Association of Testing Authorities, Australia (NATA). **NATA Accredited Laboratory Number: 5292**

EMC Technologies Pty Ltd is NATA accredited for the following standards:

AS/NZS 2772.1:	RF and microwave radiation hazard measurement
ACA:	Radio communications (Electromagnetic Radiation - Human Exposure) Standard 2003
FCC:	Guidelines for Human Exposure to RF Electromagnetic Field OET65C 01/01
CENELEC:	ES59005: 1998
EN 50360: 2001	Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)
EN 50361: 2001	Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300MHz – 3GHz)
IEEE 1528: 2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head Due to Wireless Communications Devices: Measurement Techniques.

Refer to NATA website www.nata.asn.au for the full scope of accreditation.

2.5.3 Environmental Factors

The measurements were performed in a shielded room with no background network signals. The temperature in the laboratory was controlled to within 21 ± 1 °C, the humidity was 33 to 46 %. The liquid parameters were measured prior to the commencement of the tests. Tests were performed to check that reflections within the environment did not influence the SAR measurements. The noise floor of the DASY4 SAR measurement system using the SN1380 probe is less than 5μV in both air and liquid mediums.

3.0 DESCRIPTION OF SAR MEASUREMENT SYSTEM

3.1 Probe Positioning System

The measurements were performed with the state of the art automated near-field scanning system **DASY4 Version V4.7 Build 53** from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision 6-axis robot (working range greater that 1.1m), which positions the SAR measurement probes with a positional repeatability of better than ±0.02 mm. The DASY4 fully complies with the OET65 C (01-01), IEEE 1528 and EN50361SAR measurement requirements.

3.2 E-Field Probe Type and Performance

The SAR measurements were conducted with the dosimetric probe ET3DV6 Serial: 1380 (manufactured by SPEAG) designed in the classical triangular configuration and optimised for dosimetric evaluation. The probe has been calibrated and found to be accurate to better than ±0.25 dB. The probe is suitable for measurements close to material discontinuity at the surface of the phantom. The sensors of the probe are directly loaded with Schottky diodes and connected via highly resistive lines (length = 300 mm) to the data acquisition unit.

3.3 Data Acquisition Electronics

The data acquisition electronics (DAE3) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. The input impedance of the DAE3 box is 200 MΩ; the inputs are symmetrical and floating. Common mode rejection is above 80dB.Transmission to the PC-card is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The mechanical probe-mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

3.4 Calibration and Validation Procedures and Data

Prior to the SAR assessment, the system validation kit was used to verify that the DASY4 was operating within its specifications. The validation was performed at 1640 MHz with the SPEAG D1640V2 calibrated dipole, at 1800 MHz with the SPEAG calibrated dipole DV1800V2, and at 2450 MHz with the SPEAG calibrated dipole DV2450V2.

The validation dipoles are highly symmetric and matched at the centre frequency for the specified liquid and distance to the phantom. The accurate distance between the liquid surface and the dipole centre is achieved with a distance holder that snaps onto the dipole.

System validation is performed by feeding a known power level into a reference dipole, set at a know distance from the phantom. The measured SAR is compared to the theoretically derived level.

3.4.1 Validation Results

The following table lists the dielectric properties of the tissue simulating liquid measured prior to each SAR validation. The results of the validation for each day are listed in columns 5 and 6. The forward power into the reference dipole for each SAR validation was adjusted to 250 mW.

Table: Validation Results (SPEAG calibrated dipoles)

1 Validation Date	2 Frequency (MHz)	3 ϵr (measured)	4 σ (mho/m) (measured)	5 Measured SAR 1g	6 Measured SAR 10g
30th Sept. 2008	1640	40.3	1.28	7.70	4.28
1st Oct. 2008	1800	40.0	1.39	9.10	4.82
2nd Oct. 2008	2450	40.2	1.80	13.9	6.51

3.4.2 Deviation from reference validation values

The SPEAG calibration reference SAR value is the SAR validation result obtained in a specific dielectric liquid using the validation dipole during calibration. The measured one-gram SAR should be within 10% of the expected target reference values shown in table below.

Table: Deviation from reference validation values

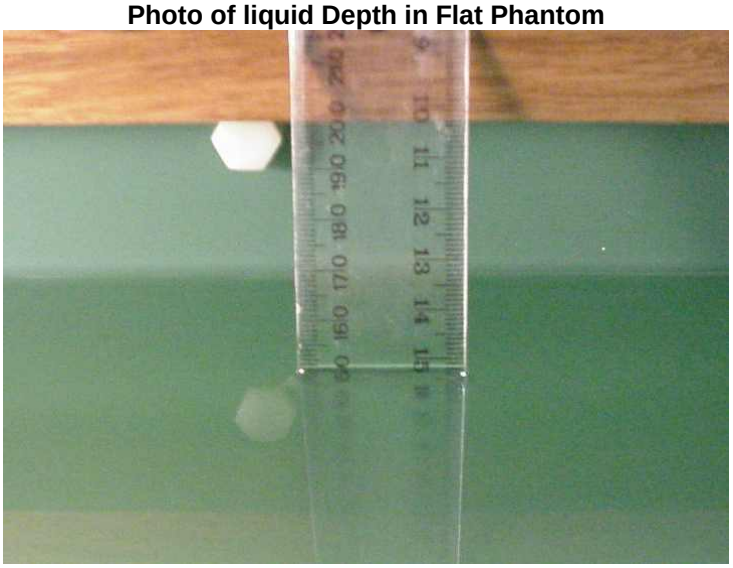
Validation Frequency & Date	Measured SAR 1g (input power = 250mW)	Measured SAR 1g (Normalized to 1W)	SPEAG CALIBRATION REFERENCE SAR VALUE 1G (MW/G)	Deviation From SPEAG 1g (%)	IEEE STD 1528 REFERENCE SAR VALUE 1G (MW/G)	Deviation From IEEE 1g (%)
1640MHz 30th Sept 08	7.7	30.80	33	-6.67	N/A	-
1800MHz 1st Oct. 08	9.1	36.40	38.2	-4.71	38.1	-4.46
2450MHz 2nd Oct. 08	13.9	55.60	53.3	4.32	52.4	6.11

Note: All reference validation values are referenced to 1W input power.

3.4.3 Liquid Depth 15cm

During the SAR measurement process the liquid level was maintained to a level of 15cm with a tolerance of ±0.5cm. The following photo shows the depth of the liquid maintained during the testing.

Photo of liquid Depth in Flat Phantom



3.5 Phantom Properties (Size, Shape, Shell Thickness)

The phantom used during the SAR testing in Touch, Tilted positions and the validation was the “SAM” phantom from SPEAG. The phantom thickness is 2.0mm+/-0.2 mm and was filled with the required tissue simulating liquid.

For SAR testing in the Body Worn positions an AndreT Flat Phantom V10.1 was used. The phantom thickness is 2.0mm +/-0.2 mm and the phantom was filled with the required tissue simulating liquid. Table 4 provides a summary of the measured phantom properties

Table: Phantom Properties (300MHz-2500MHz)

Phantom Properties	Requirement for specific EUT	Measured
Depth of Phantom	N/A	200mm
Width of flat section	N/A	540mm
Length of flat section	N/A	620mm
Thickness of flat section	2.0mm +/-0.2mm (flat section)	2.08 – 2.20mm
Dielectric Constant	<5.0	4.603 @ 300MHz (worst-case frequency)
Loss Tangent	<0.05	0.0379 @ 2500MHz (worst-case frequency)

Photo 1: Flat Phantom V10.1 2mm

3.6 Tissue Material Properties

The dielectric parameters of the tissue simulating liquid were measured prior to SAR assessment using the HP85070A dielectric probe kit and HP8714B Network Analyser. The actual dielectric parameters are shown in the following table.

Table: Measured Brain Simulating Liquid Dielectric Values

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
1626.5 MHz Brain	40.4	40.3 ±5% (38.3 to 42.3)	1.27	1.29 ±5% (1.23 to 1.35)	1000
1643.0 MHz Brain	40.3	40.3 ±5% (38.3 to 42.3)	1.28	1.29 ±5% (1.23 to 1.35)	1000
1660.5 MHz Brain	40.3	40.3 ±5% (38.3 to 42.3)	1.29	1.29 ±5% (1.23 to 1.35)	1000

Note: The brain and muscle liquid parameters were within the required tolerances of ±5%.

Table: Measured Brain Simulating Liquid Dielectric Values at 1800MHz

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
1850.2 MHz Brain	39.8	40 ±5% (38 to 42)	1.42	1.40 ±5% (1.33 to 1.47)	1000
1880 MHz Brain	39.7	40 ±5% (38 to 42)	1.44	1.40 ±5% (1.33 to 1.47)	1000
1909.8 MHz Brain	39.6	40 ±5% (38 to 42)	1.45	1.40 ±5% (1.33 to 1.47)	1000

NOTE: The brain liquid parameters were within the required tolerances of ±5%.

Table: Measured Body Simulating Liquid Dielectric Values at 1800MHz

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
1850.2 MHz Body	51.9	53.3 ±5% (50.6 to 56.0)	1.50	1.52 ±5% (1.44 to 1.60)	1000
1880 MHz Body	51.7	53.3 ±5% (50.6 to 56.0)	1.51	1.52 ±5% (1.44 to 1.60)	1000
1909.8 MHz Body	51.7	53.3 ±5% (50.6 to 56.0)	1.53	1.52 ±5% (1.44 to 1.60)	1000

Note: The body liquid parameters were within the required tolerances of ±5%.

Table: Measured Brain Simulating Liquid Dielectric Values for Validations

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
2450 MHz Brain	40.2	39.2 ±5% (37.2 to 41.2)	1.79	1.80 ±5% (1.71 to 1.89)	1000

NOTE: The brain liquid parameters were within the required tolerances of ±5%.

3.6.1 Liquid Temperature and Humidity

The humidity and dielectric/ambient temperatures are recorded during the assessment of the tissue material dielectric parameters. The difference between the ambient temperature of the liquid during the dielectric measurement and the temperature during tests was less than |2|°C.

Table: Temperature and Humidity recorded for each day

Date	Ambient Temperature (°C)	Liquid Temperature (°C)	Humidity (%)
30th Sept. 2008	20.4	20.1	37
1st Oct. 2008	20.7	20.5	33
2nd Oct. 2008	20.2	20.0	46.0

3.7 Simulated Tissue Composition Used for SAR Test

The tissue simulating liquids are created prior to the SAR evaluation and often require slight modification each day to obtain the correct dielectric parameters.

Table: Tissue Type: Brain @ 1600MHz
Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	61.17
Salt	0.31
Bactericide	0.29
Triton X-100	38.23

Table: Tissue Type: Brain @ 1900MHz
Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	61.17
Salt	0.31
Bactericide	0.29
Triton X-100	38.23

Table: Tissue Type: Body @ 1900MHz
Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	40.4
Salt	0.5
Sugar	58
HEC	1
Bactericide	0.1

Table: Tissue Type: Brain @ 2450MHz
Volume of Liquid: 60 Litres

Approximate Composition	% By Weight
Distilled Water	62.7
Salt	0.5
Triton X-100	36.8

Table: Tissue Type: Muscle @ 2450MHz
Volume of Liquid: 60 Litres

Approximate Composition	% By Weight
Distilled Water	73.2
Salt	0.04
DGBE	26.7

*Refer "OET Bulletin 65 97/01 P38"

3.8 Device Holder for DASY4

The DASY4 device holder supplied by SPEAG 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 rotation centres for both scales is the ear opening. Thus the device needs no repositioning when changing the angles.

The DASY4 device holder is made of low-loss material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, to reduce the influence on the clamp on the test results.

Refer to Appendix A for photographs of device positioning

4.0 SAR MEASUREMENT PROCEDURE USING DASY4

The SAR evaluation was performed with the SPEAG DASY4 System (**VERSION V4.7 BUILD 53**). A summary of the procedure follows:

a) A measurement of the conducted power value at the antenna port is used as a reference value for assessing the power drop of the EUT. Also a measurement of the SAR value at a fixed location is used. The power is measured at the start of the test and then again at the end of the test.

b) The SAR distribution at the exposed side of the head or the flat section of the flat phantom is measured at a distance of 3.9 mm from the inner surface of the shell. The area covers the entire dimension of the head and the horizontal grid spacing is 15 mm x 15 mm. The actual Area Scan has dimensions of 210 mm x 105 mm surrounding the test device. Based on this data, the area of the maximum absorption is determined by Spline interpolation.

c) Around this point, a volume of 30 mm x 30 mm x 30 mm is assessed by measuring 7 x 7 x 7 points. On the basis of this data set, the spatial peak SAR value is evaluated with the following procedure:

   (i) The data at the surface are extrapolated, since the centre of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation is based on a least square algorithm. A polynomial of the fourth order is calculated through the points in z-axes. This polynomial is then used to evaluate the points between the surface and the probe tip.

   (ii) The maximum interpolated value is searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g and 10 g) are computed using the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot”- condition (in x, y and z-direction). The volume is integrated with the trapezoidal – algorithm. One thousand points (10 x 10 x 10) are interpolated to calculate the averages.

   (iii) All neighbouring volumes are evaluated until no neighbouring volume with a higher average value is found.

   (iv) The SAR value at the same location as in Step (a) is again measured

5.0 MEASUREMENT UNCERTAINTY

The uncertainty analysis is based on the template listed in the IEEE Std 1528-2003 for both Handset SAR tests and Validation uncertainty. The measurement uncertainty of a specific device is evaluated independently and the total uncertainty for both evaluations (95% confidence level) must be less than 30%.

Table: Uncertainty Budget for DASY4 Version V4.7 Build 53 – EUT SAR test

a	b	c	d	e= f(d,k)	f	g	h=cxf/e	i=cxg/e	k
Uncertainty Component	Sec.	Tol. (%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i (%)	10g u_i (%)	v_i
Measurement System									
Probe Calibration (k=1) (standard calibration)	E.2.1	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1	N	1	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1	1	1.5	1.5	∞
RF Ambient Conditions	E.6.1	0.05	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	1	R	1.73	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	1.61	N	1	1	1	1.6	1.6	11
Device Holder Uncertainty	E.4.1	3.34	N	1	1	1	3.3	3.3	7
Output Power Variation – SAR Drift Measurement	6.6.2	4.23	R	1.73	1	1	2.4	2.4	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity – Deviation from target values	E.3.2	5	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity – Measurement uncertainty	E.3.3	4.3	N	1	0.64	0.43	2.8	1.8	5
Liquid Permittivity – Deviation from target values	E.3.2	5	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity – Measurement uncertainty	E.3.3	4.3	N	1	0.6	0.49	2.6	2.1	5
Combined standard Uncertainty			RSS				10.1	9.7	154
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				20.2	19.31	

Estimated total measurement uncertainty for the DASY4 measurement system was ± 10.1. The extended uncertainty (K = 2) was assessed to be ±20.2 based on 95% confidence level. The uncertainty is not added to the measurement result.

Table: Uncertainty Budget for DASY4 Version V4.7 Build 53 - Validation

a	b	c	d	e= f(d,k)	f	g	h=cxf/e	i=cxg/e	k
Uncertainty Component	Sec.	Tol. (%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i (%)	10g u_i (%)	v_i
Measurement System									
Probe Calibration (k=1) (standard calibration)	E.2.1	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Hemispherical Isotropy	E.2.2	0	R	1.73	1	1	0.0	0.0	∞
Boundary Effect	E.2.3	1	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1	N	1	1	1	1.0	1.0	∞
Response Time	E.2.7	0	R	1.73	1	1	0.0	0.0	∞
Integration Time	E.2.8	0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions	E.6.1	0.05	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	1	R	1.73	1	1	0.6	0.6	∞
Test Sample Related									
Dipole Axis to Liquid Surface		2	R	1.73	1	1	1.2	1.2	∞
Power Drift		4.7	R	1.73	1	1	2.7	2.7	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity – Deviation from target values	E.3.2	5	R	1.73	0.6	0.43	1.7	1.2	∞
Liquid Conductivity – Measurement uncertainty	E.3.3	2.5	N	1.73	0.6	0.43	0.9	0.6	5
Liquid Permittivity – Deviation from target values	E.3.2	5	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity – Measurement uncertainty	E.3.3	2.5	N	1.73	0.6	0.49	0.9	0.7	5
Combined standard Uncertainty			RSS				8.0	7.8	154
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				16.0	15.63	

Estimated total measurement uncertainty for the DASY4 measurement system was ±8.0%. The extended uncertainty (K = 2) was assessed to be ±16.0% based on 95% confidence level. The uncertainty is not added to the Validation measurement result.

6.0 Equipment List and Calibration Details

Table: SPEAG DASY4 Version V4.7 Build 53

Equipment Type	Manufacturer	Model Number	Serial Number	Calibration Due	Used For this Test?
Robot - Six Axes	Staubli	RX90BL	N/A	Not applicable	✓
Robot Remote Control	SPEAG	CS7MB	RX90B	Not applicable	✓
SAM Phantom	SPEAG	N/A	1260	Not applicable	✓
SAM Phantom	SPEAG	N/A	1060	Not applicable	
Flat Phantom	AndreT	10.1	P 10.1	Not Applicable	
Flat Phantom	AndreT	9.1	P 9.1	Not Applicable	
Flat Phantom	SPEAG	PO1A 6mm	1003	Not Applicable	
Data Acquisition Electronics	SPEAG	DAE3 V1	359	11-July-2009	
Data Acquisition Electronics	SPEAG	DAE3 V1	442	24-July-2009	✓
Probe E-Field - Dummy	SPEAG	DP1	N/A	Not applicable	
Probe E-Field	SPEAG	ET3DV6	1380	18-Dec-2008	✓
Probe E-Field	SPEAG	ET3DV6	1377	14-July-2009	
Probe E-Field	SPEAG	ES3DV6	3029	Not Used	
Probe E-Field	SPEAG	EX3DV4	3563	14-July-2009	
Antenna Dipole 300 MHz	SPEAG	D300V2	1005	14-Dec-2009	
Antenna Dipole 450 MHz	SPEAG	D450V2	1009	14-Dec-2008	
Antenna Dipole 900 MHz	SPEAG	D900V2	047	7-July-2010	
Antenna Dipole 1640 MHz	SPEAG	D1640V2	314	16-July-2010	✓
Antenna Dipole 1800 MHz	SPEAG	D1800V2	242	8-July-2010	
Antenna Dipole 1950 MHz	SPEAG	D1950V3	1113	5-March-2009	
Antenna Dipole 3500 MHz	SPEAG	D3500V2	1002	06-July-2009	
Antenna Dipole 2450 MHz	SPEAG	D2450V2	724	13-Dec-2008	
Antenna Dipole 5600 MHz	SPEAG	D5GHzV2	1008	07-Dec-2009	
RF Amplifier	EIN	603L	N/A	*In test	
RF Amplifier	Mini-Circuits	ZHL-42	N/A	*In test	✓
RF Amplifier	Mini-Circuits	ZVE-8G	N/A	*In test	
Synthesized signal generator	Hewlett Packard	ESG-D3000A	GB37420238	*In test	✓
RF Power Meter Dual	Hewlett Packard	437B	3125012786	07-July-2009	✓
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481H	1545A01634	09-July-2009	✓
RF Power Meter Dual	Gigatronics	8542B	1830125	24-June-2009	
RF Power Sensor	Gigatronics	80301A	1828805	24-June-2009	
RF Power Meter Dual	Hewlett Packard	435A	1733A05847	*In test	✓
RF Power Sensor	Hewlett Packard	8482A	2349A10114	*In test	✓
Network Analyser	Hewlett Packard	8714B	GB3510035	18-Sept-2009	✓
Network Analyser	Hewlett Packard	8753ES	JP39240130	02 Oct-2008	

* Calibrated during the test for the relevant parameters.

7.0 SAR TEST METHOD

7.1 Description of the Test Positions

The SAR measurements are performed on the left and right sides of the head in the Touch/Tilted positions using the centre frequency of each operating band. The configuration giving the maximum mass-averaged SAR is used to test the low-end and high-end frequencies of the transmitting band. All SAR measurements were performed in the SAM phantom.
See Appendix A for photos of test positions.

7.1.1 "Touch Position"

The devices was positioned with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, the vertical centre line was aligned with the reference plane containing the three ear and mouth reference points. (Left Ear, Right Ear and Mouth). The centre of the earpiece was then aligned with the Right Ear and Left Ear.

The phone was then moved towards the phantom with the earpiece aligned with the line between the Left Ear and the Right Ear, until the phone just touched the ear. With the device maintained in the reference plane, and the phone in contact with the ear, the bottom of the phone was moved until the front side of the phone was in contact with the cheek of the phantom, or until contact with the ear was lost.

7.1.2 "Tilted Position"

The device was positioned in the "Touch" position described above. While maintaining the device in the reference plane describe above, and pivoting against the ear, the device was moved away from the mouth by an angle of 15 degrees or until contact with the ear was lost

7.1.3 "Body Worn Position" (applicable only to GSM mode)

The body-worn operating configuration was tested with a headset connected to the device and positioned against a flat phantom in normal use configuration. The position chosen for testing was the "Body Worn Position", this position simulated the EUT placed against the body of a user. For the Body Worn Back configuration spacing used between the Back of Phone and the flat phantom was 15mm. For the Body Worn Front configuration spacing used between the Back of Phone and the flat phantom was 0mm.

7.2 List of All Test Cases (Antenna In/Out, Test Frequencies, User Modes)

The SAR was measured at three test channels for each band of operation with the test sample operating at maximum power, as specified in section 2.2. The satellite mode antenna was extended and adjusted as per user's manual.

7.3 FCC RF Exposure Limits for Occupational/ Controlled Exposure

SPATIAL PEAK SAR LIMITS FOR:	
Partial-Body:	8.0 mW/g (averaged over any 1g cube of tissue)
Hands, Wrists, Feet and Ankles:	20.0 mW/g (averaged over 10g cube of tissue)

7.4 FCC RF Exposure Limits for Un-controlled/Non–occupational

SPATIAL PEAK SAR LIMITS FOR:	
Partial-Body:	1.6 mW/g (averaged over any 1g cube of tissue)
Hands, Wrists, Feet and Ankles:	4.0 mW/g (averaged over 10g cube of tissue)

8.0 SAR MEASUREMENT RESULTS

The SAR values averaged over 1 g tissue masses were determined for the sample device for the Left and Right ear, and also for the Body Worn configurations of the phantom. The results are given in table below.

The plots with the corresponding SAR distributions, which reveal information about the location of the maximum SAR with respect to the devices, are contained in Appendix B of this report.

Table: SAR Measurement Results 1640 MHz

Test Position	Antenna	Plot Number	Test Channel	Test Freq. (MHz)	SAR Level for (1g) mW/g	DASY4 Measured Drift (dB)
Tilted Right	Retracted	1	0544	1643	0.512	-0.02
	Extended	2	0544	1643	0.144	-0.05
Touch Right	Retracted	3	0544	1643	0.494	-0.07
	Extended	4	0544	1643	0.047	-0.02
Tilted Left	Retracted	5	0001	1626.5	0.500	-0.06
		6	0544	1643	0.645	-0.04
		7	1087	1660.5	0.539	-0.05
	Extended	8	0544	1643	0.318	-0.03
Touch Left	Retracted	9	0544	1643	0.518	-0.14
	Extended	10	0544	1643	0.069	-0.07

Note: The uncertainty of the system (± 20.2 %) has not been added to the results.

Table: SAR Measurement Results – 1900 MHz

Test Position	Plot Number	Test Channel	Test Freq. (MHz)	SAR Level for (1g) mW/g	DASY4 Measured Drift (dB)
Tilted Left	11	661	1880 MHz	0.267	-0.02
Touch Left	12	661	1880 MHz	0.244	-0.17
Tilted Right	13	661	1880 MHz	0.262	-0.06
Touch Right	14	512	1850.2 MHz	0.328	-0.06
	15	661	1880 MHz	0.271	-0.09
	16	810	1909.8 MHz	0.209	-0.18
Body Worn Position Back 15mm Spacing	17	512	1850.2 MHz	0.526	-0.06
	18	661	1880 MHz	0.465	-0.03
	19	810	1909.8 MHz	0.455	-0.04
Body Worn Position Front	20	661	1880 MHz	0.613	-0.07

Note: The uncertainty of the system (±20.2%) has not been added to the result.

Table: SAR Measurement Results – 2450 MHz Bluetooth Model: BTEZ1702SA

Test Position	Plot Number	Test Channel	Test Freq. (MHz)	SAR Level for (1g) mW/g	DASY4 Measured Drift (dB)
Touch Left	21	040	2441 MHz	Noise Floor	N/A
Touch Right	22	040	2441 MHz	Noise Floor	N/A

Note: The uncertainty of the system (±20.2%) has not been added to the result.

Table: SAR Measurement Results – 2450 MHz Bluetooth Model: UGNZ9-F03A

Test Position	Plot Number	Test Channel	Test Freq. (MHz)	SAR Level for (1g) mW/g	DASY4 Measured Drift (dB)
Touch Left	23	040	2441 MHz	Noise Floor	N/A
Touch Right	24	040	2441 MHz	Noise Floor	N/A

Note: The uncertainty of the system (±20.2%) has not been added to the result.

9.0 COMPLIANCE STATEMENT

The THURAYA Satellite/GSM Phone, model XT Pro with Bluetooth module BTEZ1702SA or UGNZ9-F03A was tested on behalf of Asia Pacific Satellite Industries Co., Ltd.. It complied with the FCC SAR requirements, however compliance for the Body Worn Back position is conditional on a spacing of 15 mm from the body of the user.

The highest SAR level recorded was in the 1600 MHz Satellite band, it was 0.645 mW/g, this value was measured in the Tilted Left position with Antenna Retracted at a frequency of 1643 MHz (Channel 0544), and it was below the uncontrolled limit of 1.6 mW/g, even taking into account the measurement uncertainty of 20.2 %.

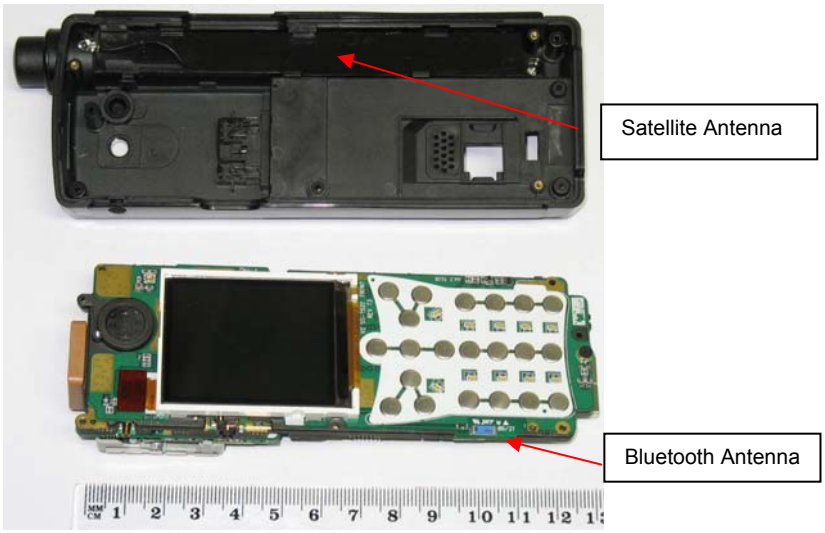
APPENDIX A MULTIBAND EVALUATION CONSIDERATIONS

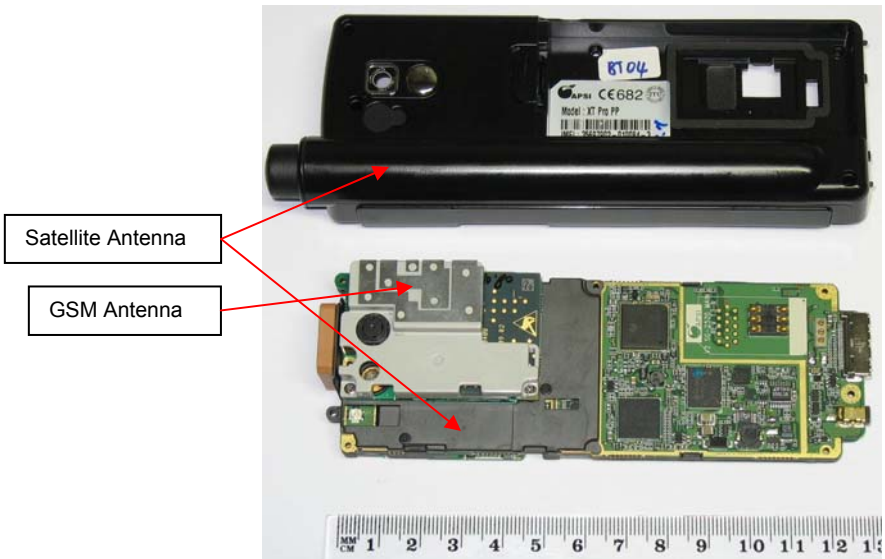
According to the SAR standards, when the sum of SAR results (simultaneously transmitting antennas Satellite and Bluetooth) is < 1.6mW/g and the distance between the antennas is 5cm or less, or the ratio of above sum to the distance between antennas < 0.3, simultaneous transmission SAR evaluation is NOT required.

The spacing between the Retracted Satellite antenna and the Bluetooth antenna was less then 5cm but more than 2.5cm; however the SAR results for both the types of Bluetooth transmitter used, were below the SAR measurement system noise floor. Spacing between the Bluetooth antenna and the GSM antenna was greater than 5cm. According to the customer the use of the phone in both the Satellite and GSM (GPRS) modes is not possible.

Conclusions: No Multiband evaluation was required for the Test Sample Satellite Phone Thuraya XT Pro.

Diagram Showing Antenna Positions





APPENDIX B1 Test Sample Photographs

Battery 1

Battery 2

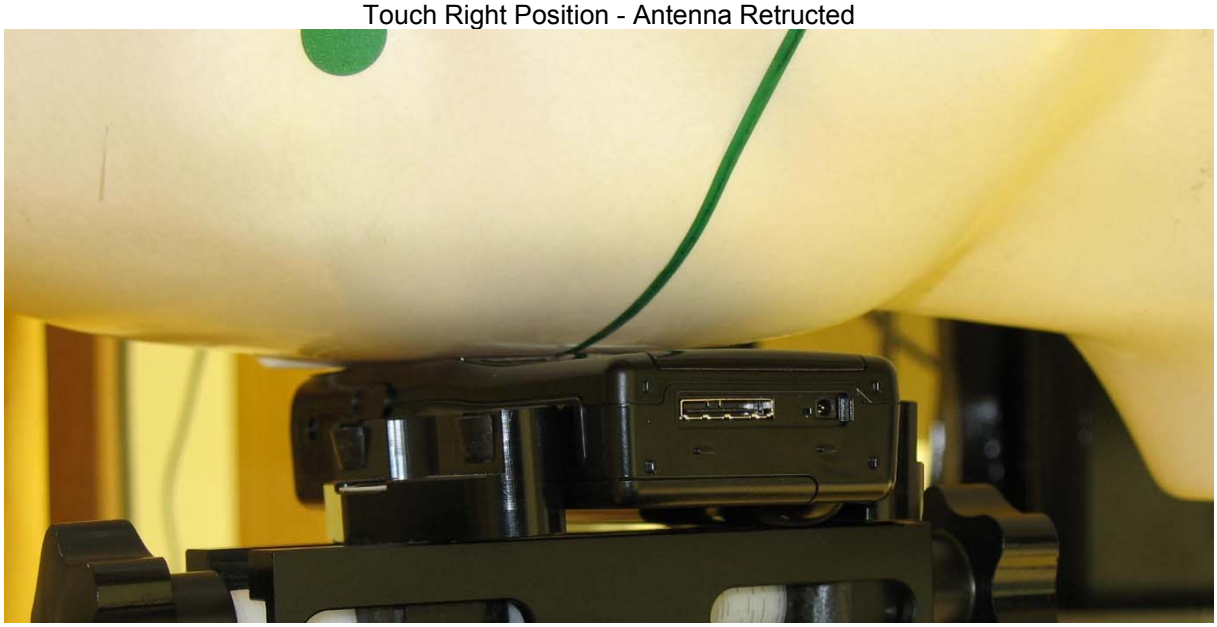
DUT

DUT

Appendix B2 Test Setup Photographs

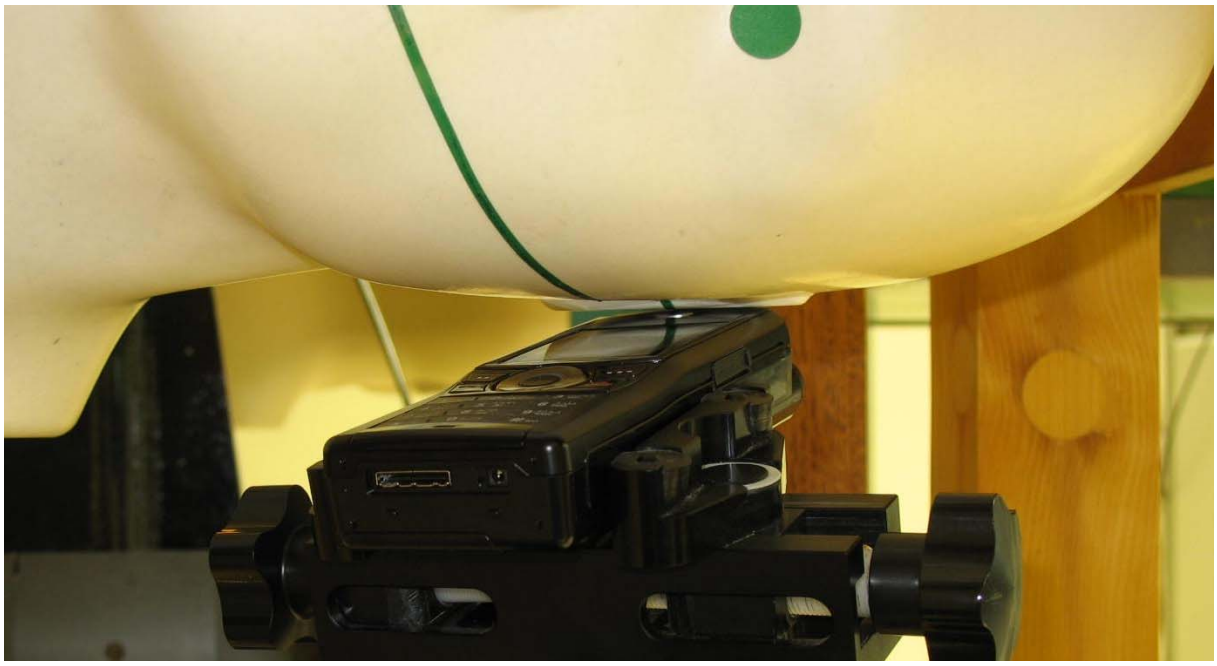
Touch Left Position - Antenna Extended

Touch Right Position - Antenna Retructed



Appendix B3 Test Setup Photographs

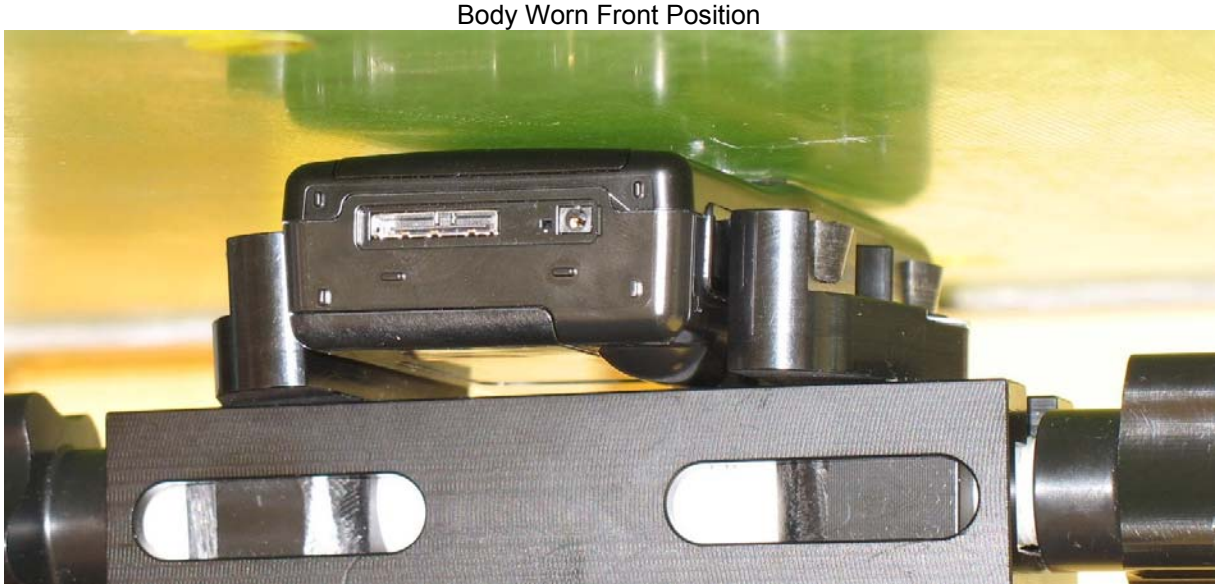
Tilted Left Position - Antenna Retructed



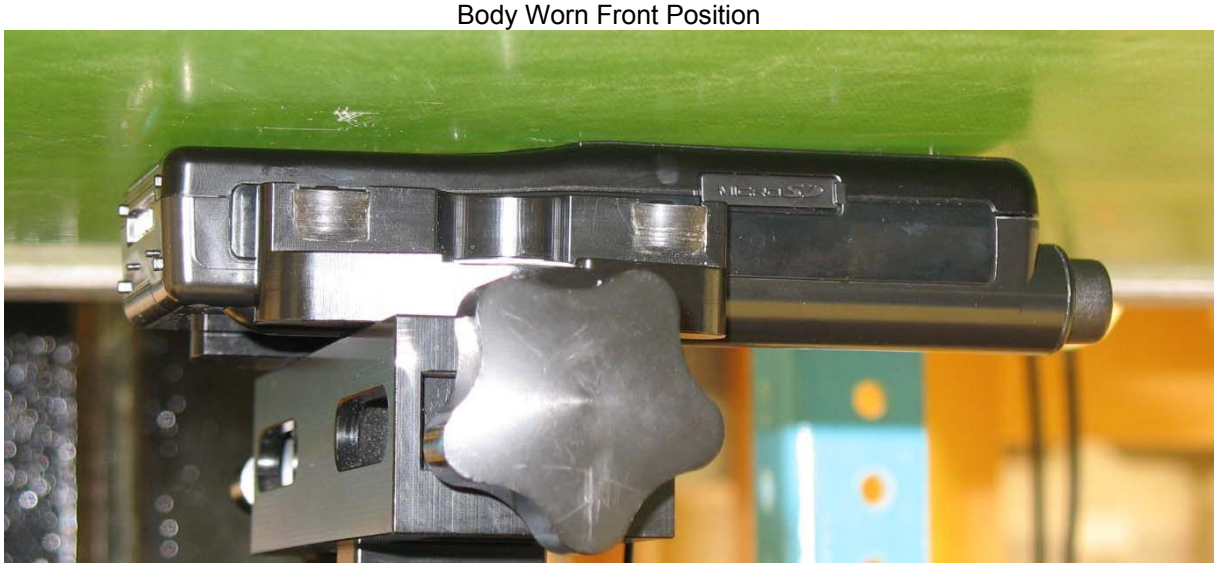
Tilted Right Position - Antenna Extended

Appendix B4 Test Setup Photographs

Body Worn Front Position

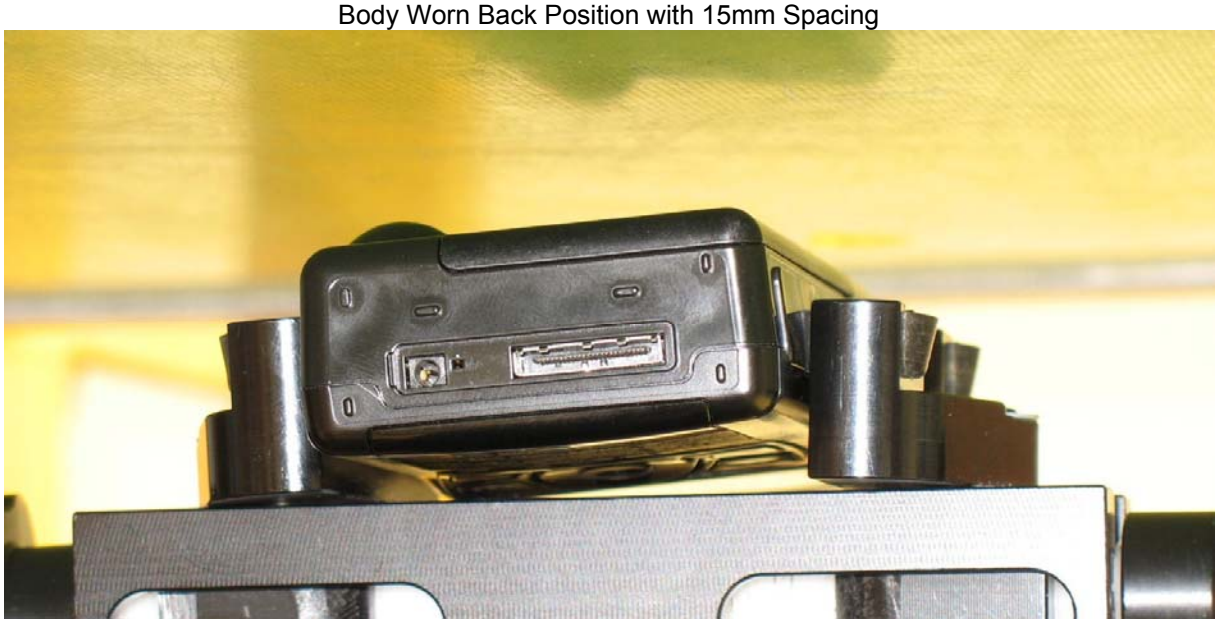


Body Worn Front Position

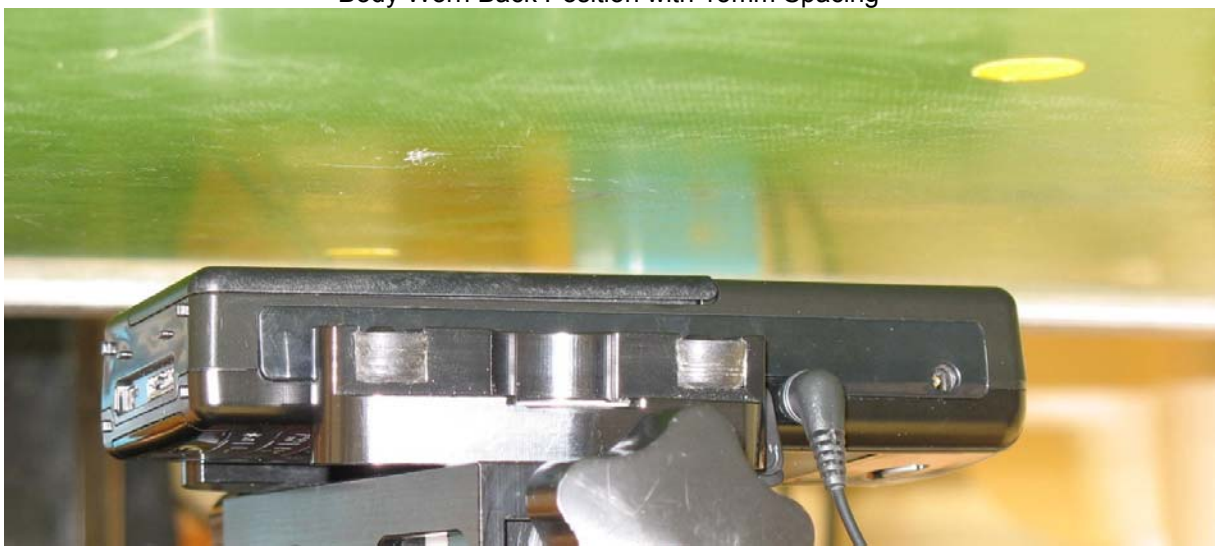


Appendix B5 Test Setup Photographs

Body Worn Back Position with 15mm Spacing



Body Worn Back Position with 15mm Spacing



APPENDIX C PLOTS OF THE SAR MEASUREMENTS

Plots of the measured SAR distributions inside the phantom are given in this Appendix for all tested configurations. The spatial peak SAR values were assessed with the procedure described in this report.

Table: 1600 MHz SAR Plots

Test Position	Antenna	Plot Number	Test Channel
Test Position	**Antenna**	**Plot Number**	**Test Channel**
Tilted Right	Retracted	1	0544
Tilted Right	Extended	2	0544
Touch Right	Retracted	3	0544
Touch Right	Extended	4	0544
Tilted Left	Retracted	5	0001
		6	0544
		7	1087
	Extended	8	0544
Touch Left	Retracted	9	0544
Touch Left	Extended	10	0544

Table: 1900 MHz SAR Plots

Test Position	Plot Number	Test Channel
Tilted Left	11	661
Touch Left	12	661
Tilted Right	13	661
Touch Right	14	512
	15	661
	16	810
Body Worn Position Back 15mm Spacing	17	512
	18	661
	19	810
Body Worn Position Front	20	661

Table: 2450 MHz Bluetooth Model: BTEZ1702SA

Test Position	Plot Number	Test Channel
Touch Left	21	040
Touch Right	22	040

Table: 2450 MHz Bluetooth Model: UGNZ9-F03A

Test Position	Plot Number	Test Channel
Touch Left	23	040
Touch Right	24	040

Table: SAR Validation Plots

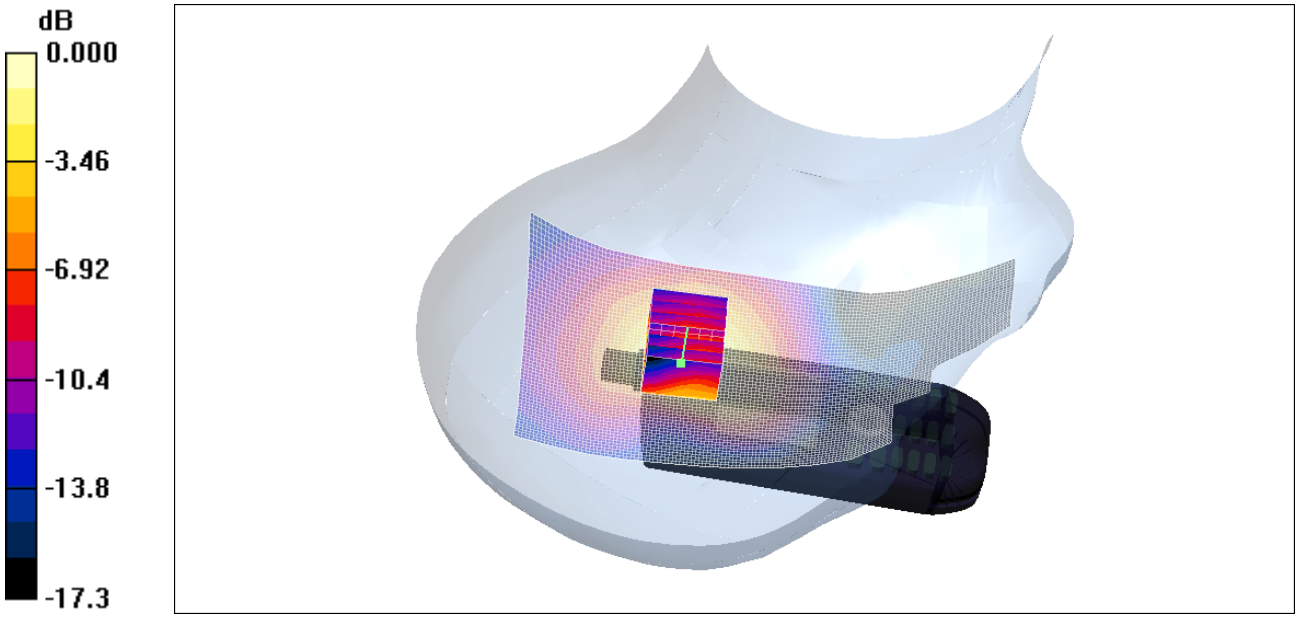
Date	Plot Number	Frequency
30th September 2008	25	1640 MHz
1st October 2008	26	1900 MHz
2nd October 2008	27	2450 MHz

Test Date: 30 September 2008
File Name: Tilted Right 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1643 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1642 MHz; σ = 1.28 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Right Section

Channel 0544 Test/Area Scan (131x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.586 mW/g

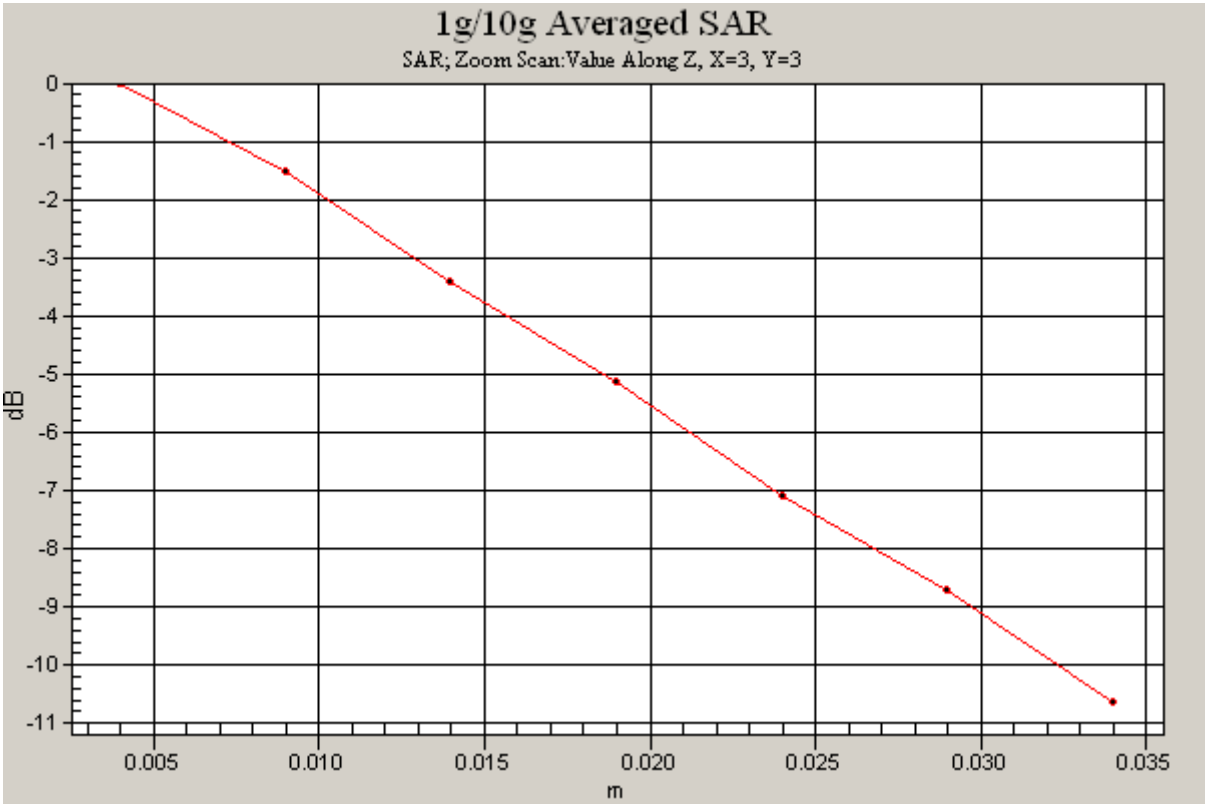
Channel 0544 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.746 W/kg
SAR(1 g) = 0.512 mW/g; SAR(10 g) = 0.308 mW/g
Maximum value of SAR (measured) = 0.569 mW/g



0 dB = 0.569mW/g

SAR MEASUREMENT PLOT 1

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

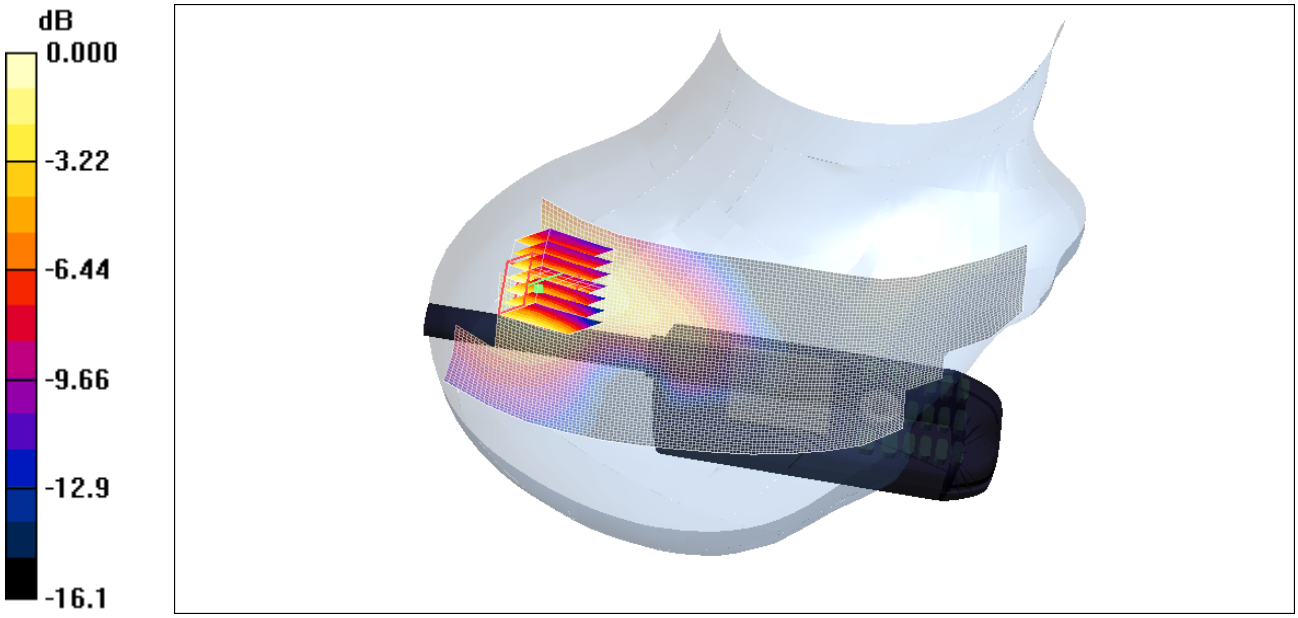


Test Date: 30 September 2008
File Name: Tilted Right Extended Antenna 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1643 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1642 MHz; σ = 1.28 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Right Section

Channel 0544 Test/Area Scan (171x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.153 mW/g

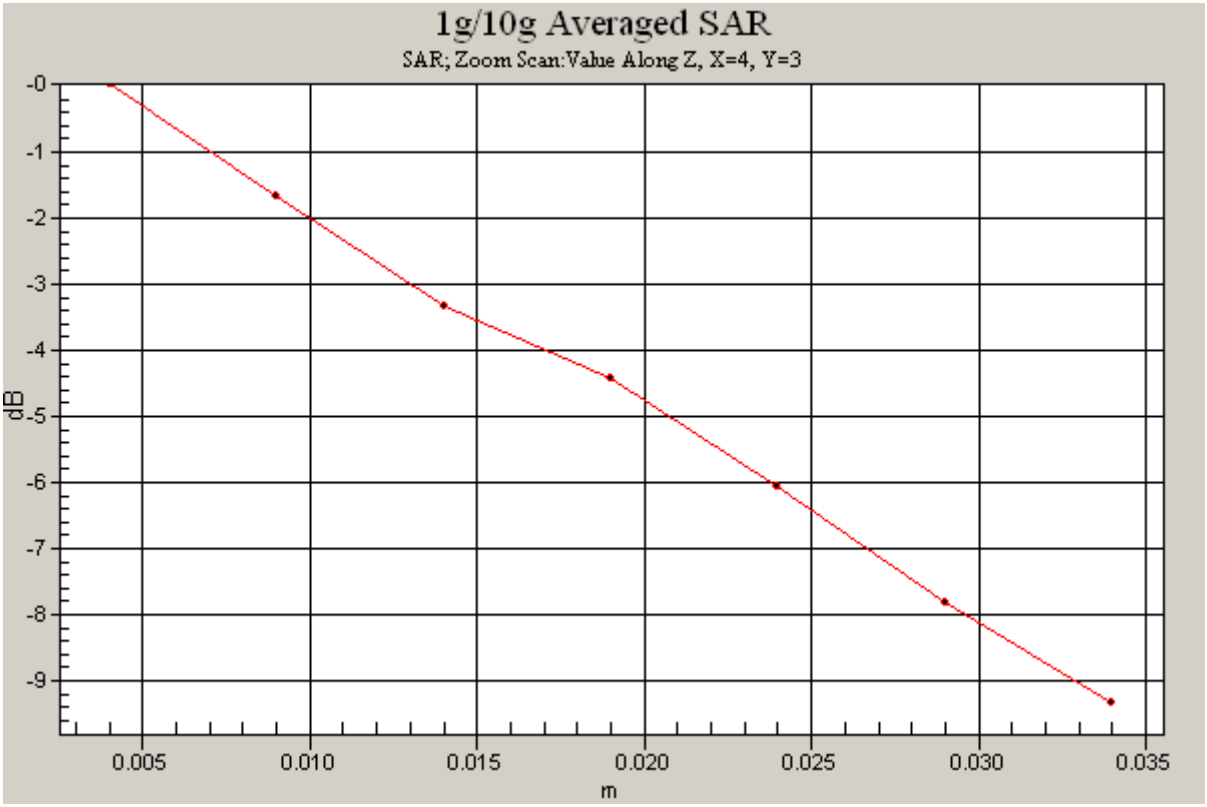
Channel 0544 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.66 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 0.216 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.095 mW/g
Maximum value of SAR (measured) = 0.157 mW/g



0 dB = 0.157mW/g

SAR MEASUREMENT PLOT 2

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

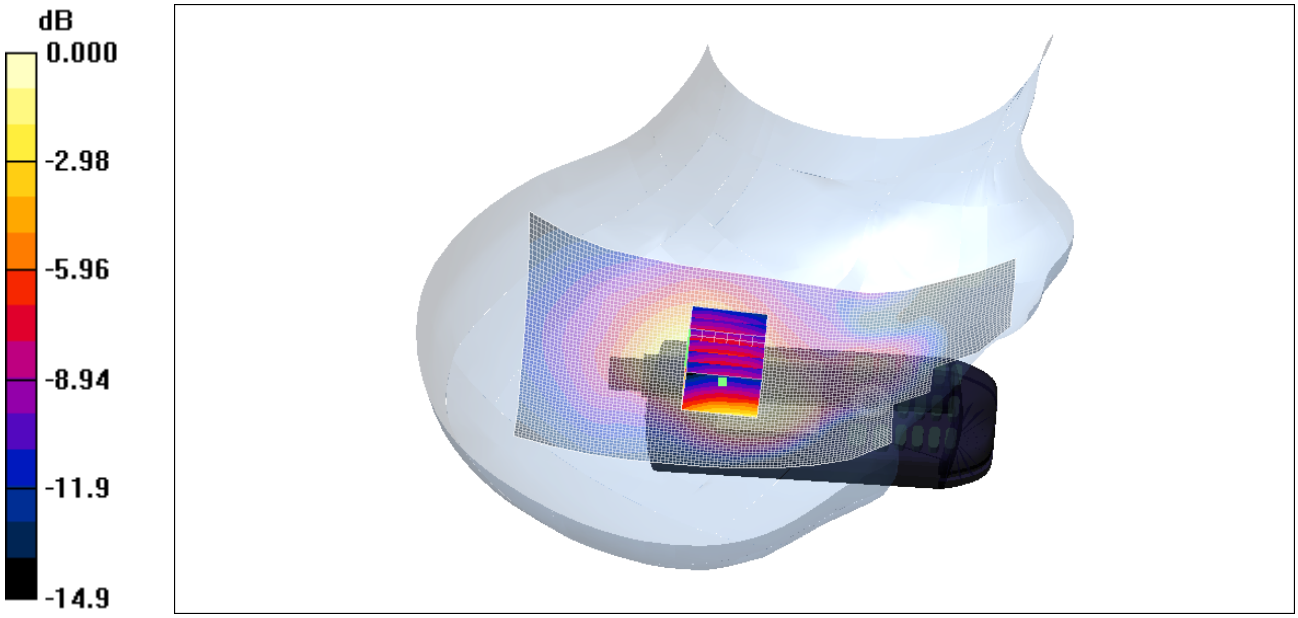


Test Date: 30 September 2008
File Name: Touch Right 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1643 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1642 MHz; σ = 1.28 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Right Section

Channel 0544 Test/Area Scan (131x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.566 mW/g

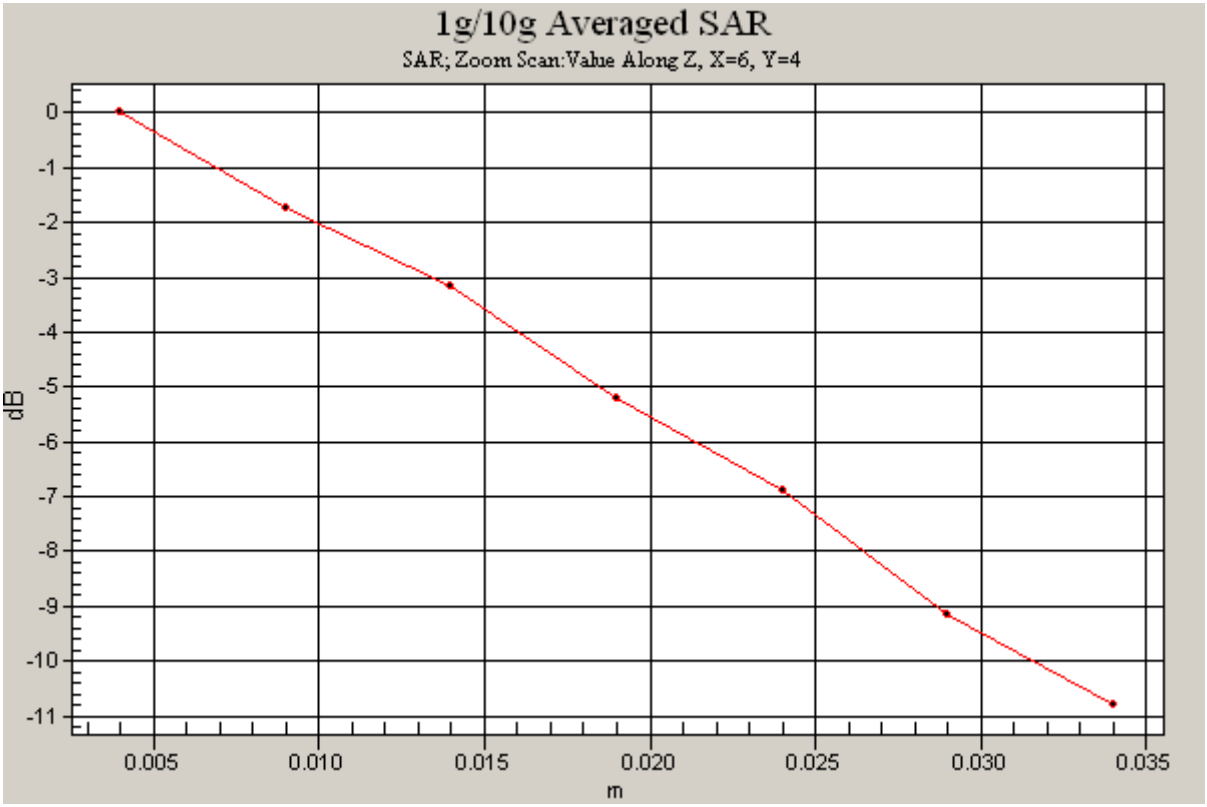
Channel 0544 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.57 V/m; Power Drift = -0.010 dB
Peak SAR (extrapolated) = 0.641 W/kg
SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.538 mW/g



0 dB = 0.538mW/g

SAR MEASUREMENT PLOT 3

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

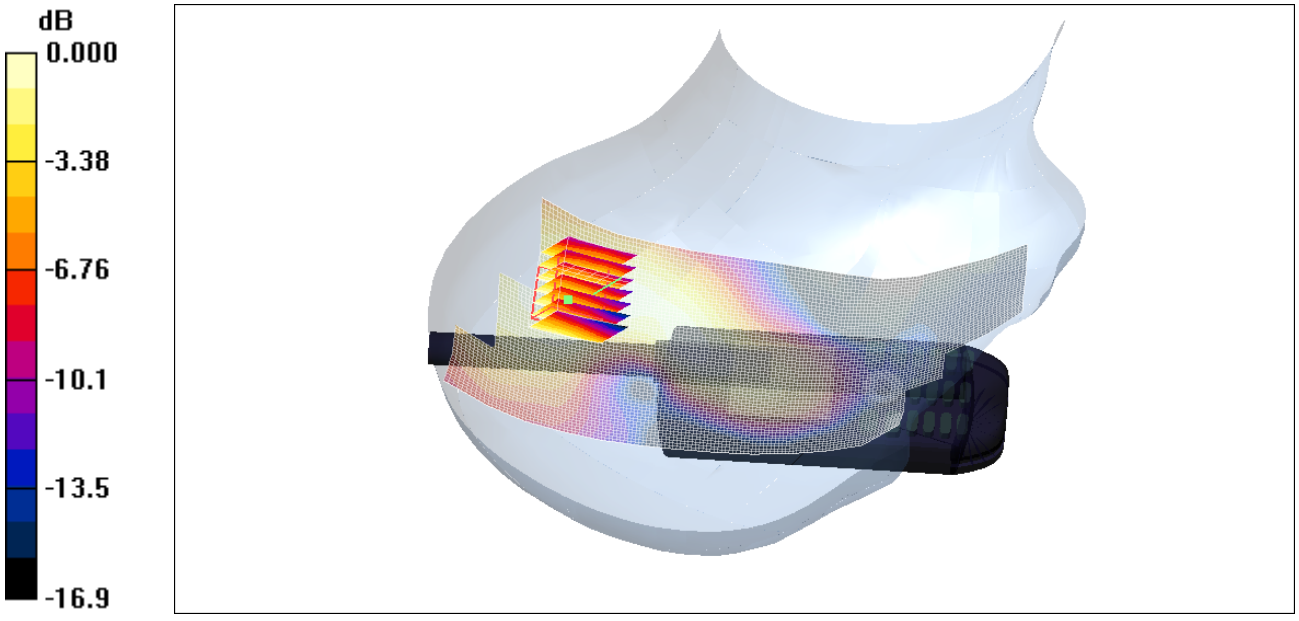


Test Date: 30 September 2008
File Name: Touch Right Extended Antenna 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1643 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1642 MHz; σ = 1.28 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Right Section

Channel 0544 Test/Area Scan (171x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.053 mW/g

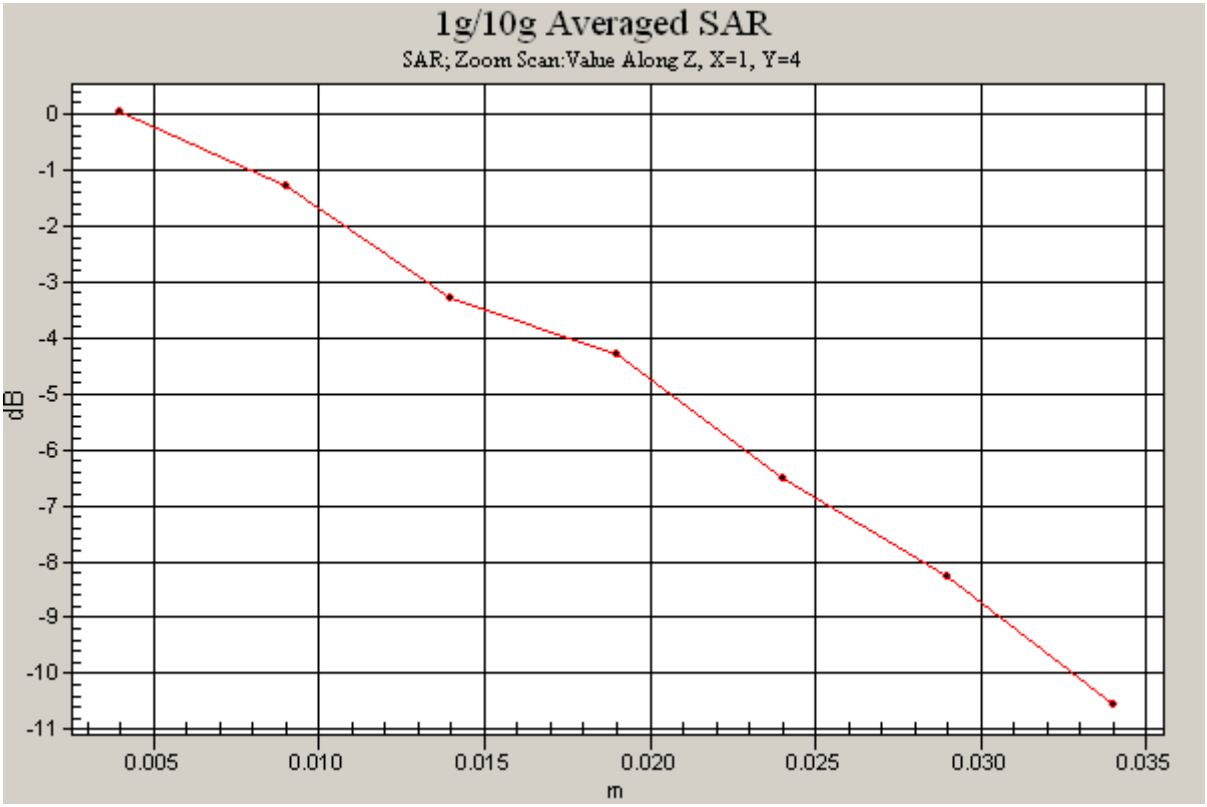
Channel 0544 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.48 V/m; Power Drift = -0.088 dB
Peak SAR (extrapolated) = 0.065 W/kg
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.033 mW/g
Maximum value of SAR (measured) = 0.051 mW/g



0 dB = 0.051mW/g

SAR MEASUREMENT PLOT 4

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

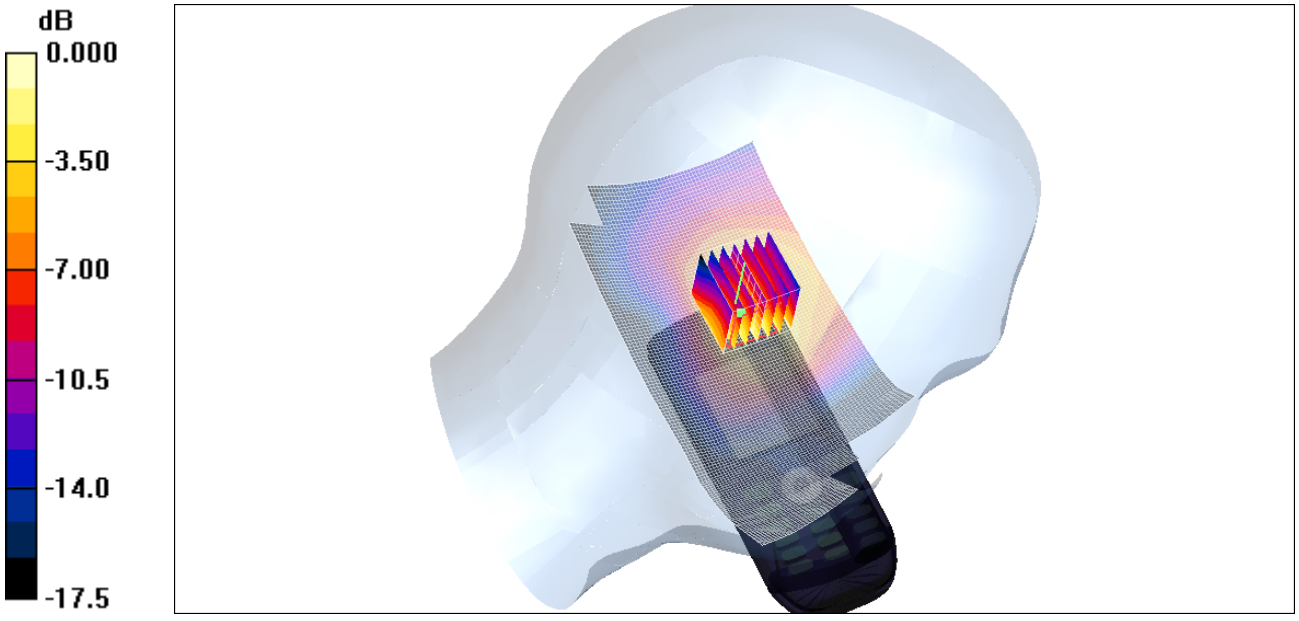


Test Date: 30 September 2008
File Name: Tilted Left 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1626 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1626 MHz; σ = 1.27 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Left Section

Channel 0001 Test/Area Scan (131x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.565 mW/g

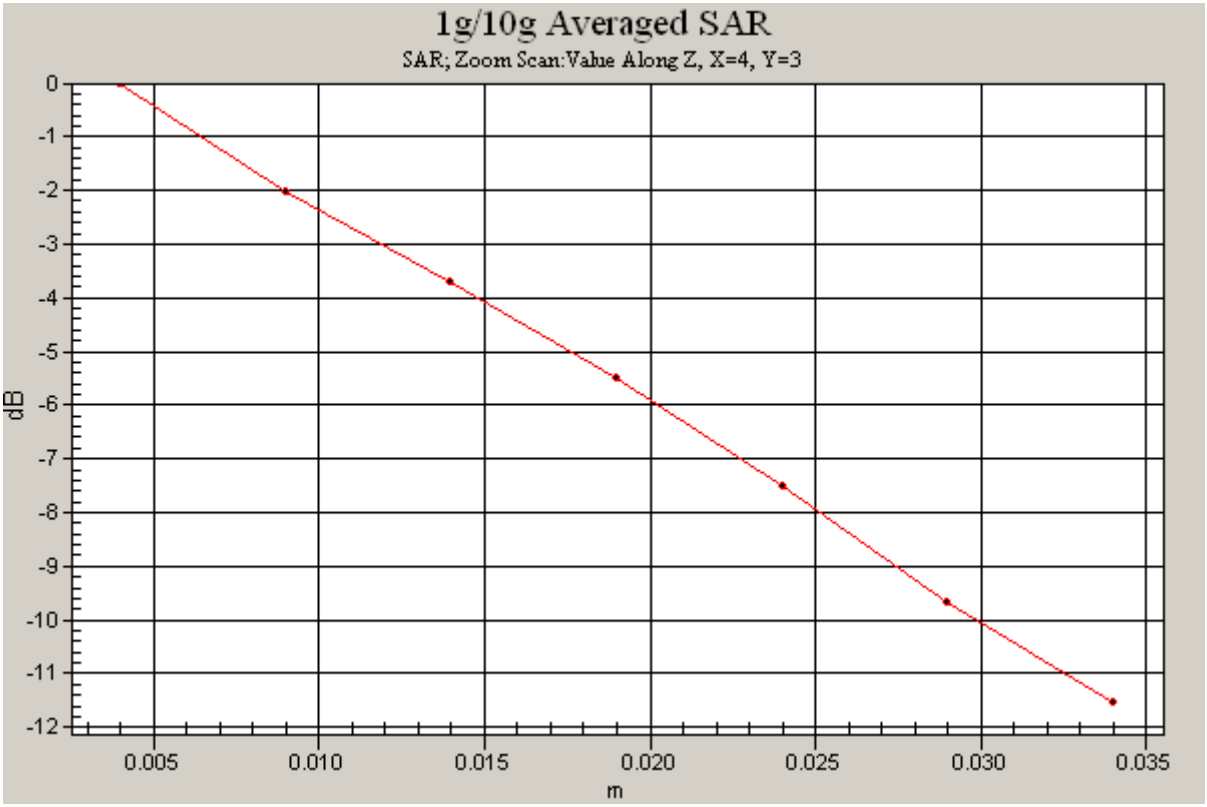
Channel 0001 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = -0.371 dB
Peak SAR (extrapolated) = 0.752 W/kg
SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.305 mW/g
Maximum value of SAR (measured) = 0.581 mW/g



0 dB = 0.581mW/g

SAR MEASUREMENT PLOT 5

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

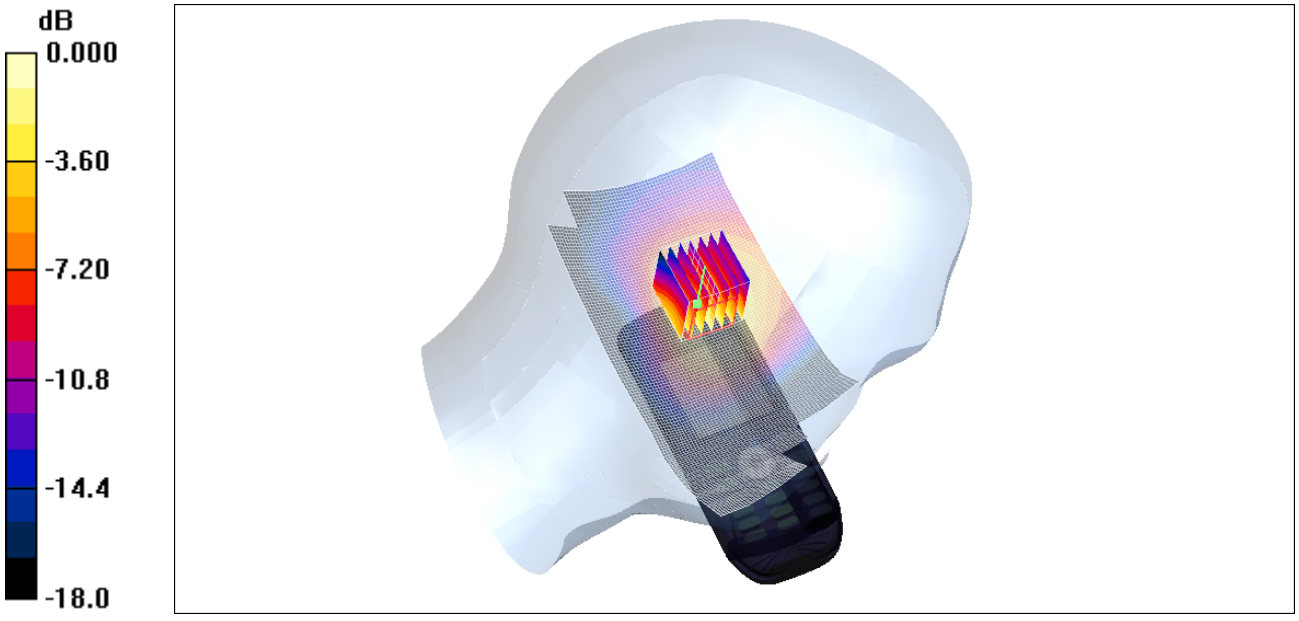


Test Date: 30 September 2008
File Name: Tilted Left 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1643 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1642 MHz; σ = 1.28 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Left Section

Channel 0544 Test/Area Scan (131x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.715 mW/g

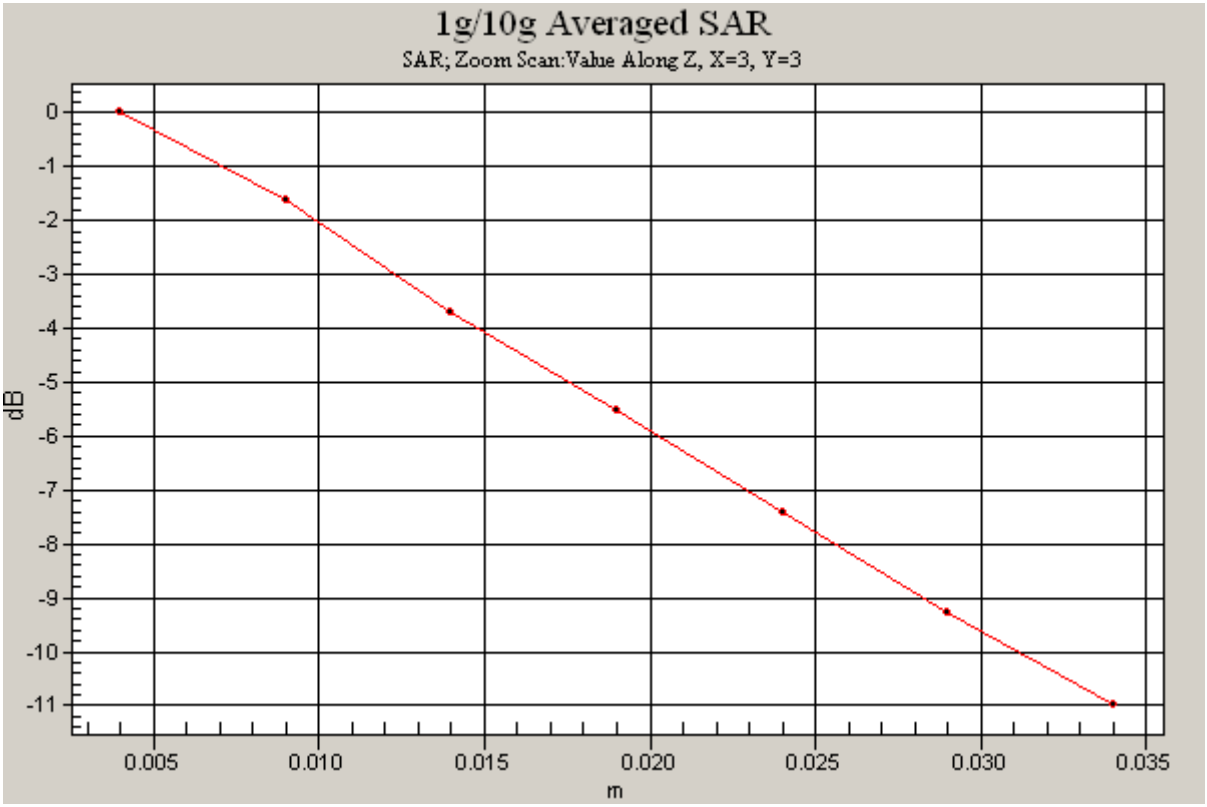
Channel 0544 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = -0.381 dB
Peak SAR (extrapolated) = 0.920 W/kg
SAR(1 g) = 0.645 mW/g; SAR(10 g) = 0.390 mW/g
Maximum value of SAR (measured) = 0.745 mW/g



0 dB = 0.745mW/g

SAR MEASUREMENT PLOT 6

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

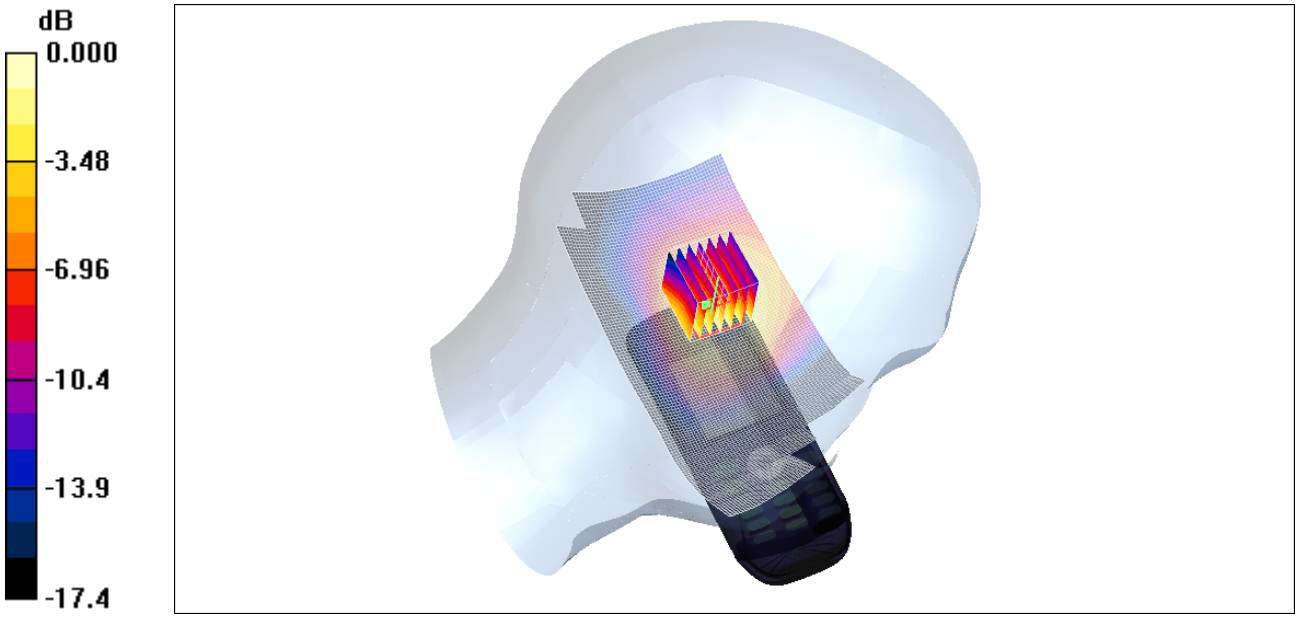


Test Date: 30 September 2008
File Name: Tilted Left 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1660 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1660 MHz; σ = 1.29 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Left Section

Channel 1087 Test/Area Scan (131x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.645 mW/g

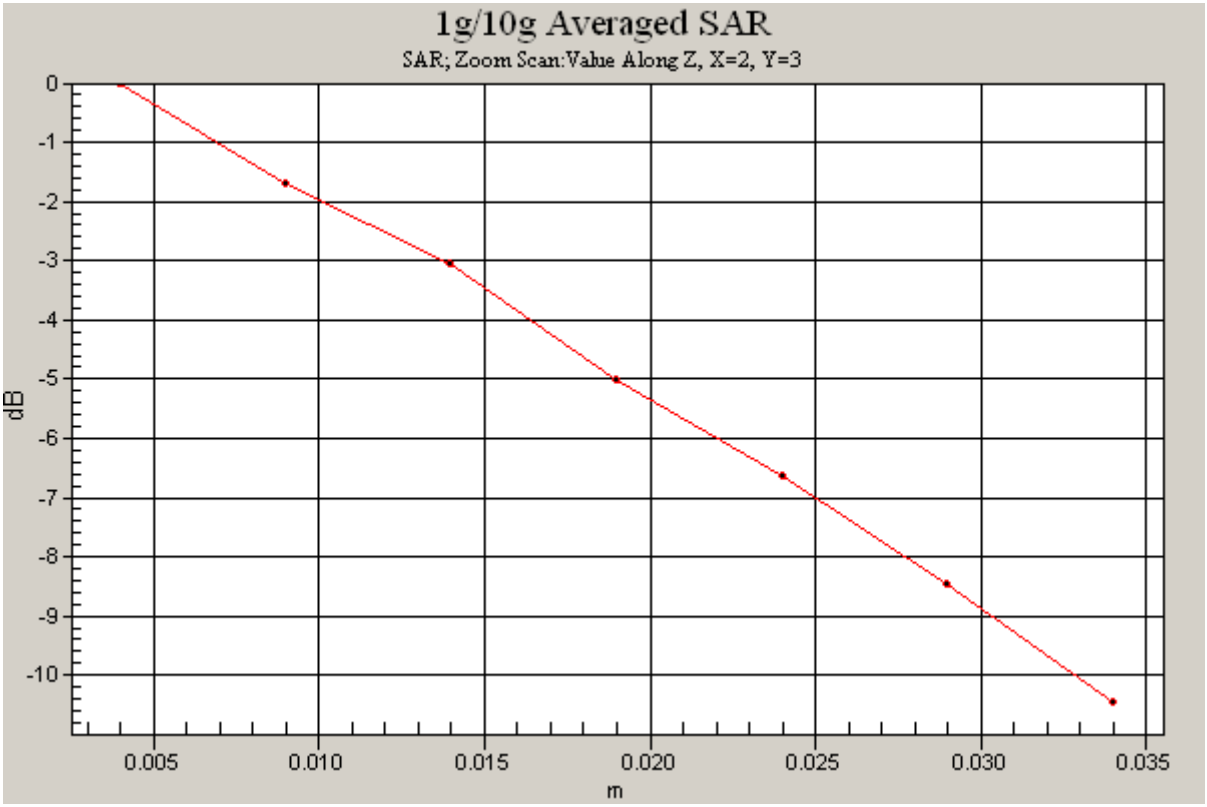
Channel 1087 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.267 dB
Peak SAR (extrapolated) = 0.708 W/kg
SAR(1 g) = 0.539 mW/g; SAR(10 g) = 0.340 mW/g
Maximum value of SAR (measured) = 0.611 mW/g



0 dB = 0.611mW/g

SAR MEASUREMENT PLOT 7

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**

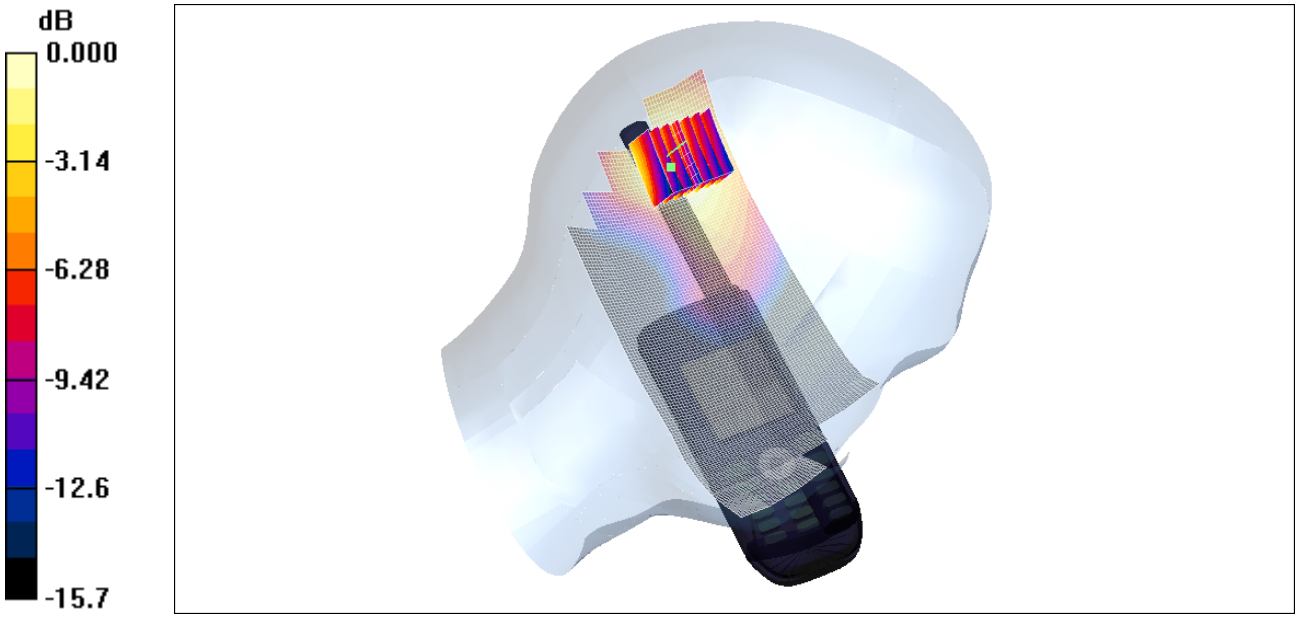


Test Date: 30 September 2008
File Name: Tilted Left Extended Antenna 1600 MHz (DAE442 Probe1380) 30-09-08.da4
DUT: Thuraya Satelite Phone; Type: XT Pro; Serial: IMEI:35697902-010084-3

* Communication System: 1640 MHz Satelite; Frequency: 1643 MHz; Duty Cycle: 1:8
* Medium parameters used: f = 1642 MHz; σ = 1.28 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
- Electronics: DAE3 Sn442; Probe: ET3DV6 - SN1380; ConvF(5.6, 5.6, 5.6)
- Phantom: SAM 22; Serial: 1260; Phantom section: Left Section

Channel 0544 Test/Area Scan (171x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.363 mW/g

Channel 0544 Test/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = -0.429 dB
Peak SAR (extrapolated) = 0.457 W/kg
SAR(1 g) = 0.318 mW/g; SAR(10 g) = 0.205 mW/g
Maximum value of SAR (measured) = 0.348 mW/g



0 dB = 0.348mW/g

SAR MEASUREMENT PLOT 8

Ambient Temperature	**20.4 Degrees Celsius**
Liquid Temperature	**20.1 Degrees Celsius**
Humidity	**37.0 %**