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SAR Test Report for FCC and IC

Report Number: M040920-2

Test Sample:	Celestica Iridium Satellite Phone FCC ID: Q639505A IC: 4629A 9505A
Model Number:	9505A
Tested For:	TRL Compliance Services
Date of Issue:	8th October 2004

NATA Accredited Laboratory
Number: 5292

CONTENTS

SAR TEST REPORT FOR FCC AND IC
Iridium Satellite Phone, Model: SUG0088MBR
Report Number: M040920-2

1.0 GENERAL INFORMATION

Test Sample:	Iridium Satellite Phone
Model Number:	9505A (labelled as SUG0088MBR)
Serial Number:	600026
Manufacturer:	Celestica FCC ID: Q639505A IC:4629A 9505A
Device Category:	Portable Transmitter
Test Device:	Production Unit
RF exposure Category:	General Public/Unaware user
Tested for:	TRL Compliance Services
Address:	Nipe Lane, Up Holland Lancashire WN8 9PY United Kingdom
Contact:	John Charters
Phone:	+44 0 1695 556 666
Fax:	+44 0 1695 557 077
Email:	john.charters@trlcompliance.com
Test Standard/s:	OET 65C Evaluating Compliance with FCC Guidelines For Human Exposure to Radiofrequency Electromagnetic Fields Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields
SAR References:	**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.
Statement Of Compliance:	The sample of Iridium Satellite Phone, model 9505A complied with the Industry Canada and FCC General public/uncontrolled RF exposure limits of 1.6mW/g per requirements of 47CFR2.1093(d).
Test Dates:	24th September 2004
Test Officer:	**Peter Jakubiec** **Assoc Dip Elec Eng**
Authorised Signature:	**Chris Zombolas** **Technical Director** **EMC Technologies Pty Ltd**

2.0 DESCRIPTION OF DEVICE

2.1 Description of Test Sample

The device tested was labelled Iridium Satellite Phone, Model: SUG0088MBR operating in 1610 MHz to 1626.5 MHz frequency band. The manufacturer will market this device as the model 9505A. It will be referred to as the model number SUG0088MBR throughout this report. It has an external integral antenna and test sample was tested in the Touch and Tilted Positions.

Operating Mode during Testing	: Continuous Transmission
Modulation:	: 25k symbols/sec
Antenna type	: Extendable
Applicable Head Configurations	: Touch and Tilted
Applicable Body Worn-Configurations	: Not applicable, refer to Section 2.2.2
Battery Options	: One Battery Type

2.2 Test sample Accessories

2.2.1 Battery Types

One type of battery can be used with Iridium Satellite Phone. SAR measurements were performed with the standard 3.7V battery.

2.2.2 Body Worn Position

Based on the information supplied by the customer the Iridium Satellite Phone, Model: SUG0088MBR can only be worn on the belt clip, and it is not possible for the Iridium Satellite Phone to transmit while in the body worn position, and the manufacturer does not recommended use of the phone in this position.

2.3 Test Signal, Frequency and Output Power

The SAR test was performed on the Iridium Satellite Phone. The test sample operates in the 1610 MHz to 1626 MHz frequency band. The test sample was configured into a test mode that 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 1: Test Frequencies

Frequency Range	Traffic Channels	Band Power Class	Nominal Power (dBm)
1610 – 1625 MHz	000, 120, and 240	N/A	38.3

The conducted power of the device was measured with a calibrated Power Meter. The results of this measurement are listed in table 2:

Table 2: Frequency and Output Power

Channel	Channel Frequency MHz	Maximum Measured Conducted Output Power dBm
000	1610.0	38.94
120	1618.25	38.16
240	1626.5	38.22

Please note that the conducted power could not be measured before and after each SAR measurement. It requires disconnecting the antenna.

2.4 Battery Status

The device battery was fully charged prior to commencement of each 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 3: Battery Details

Battery #1:	**3.7V 2200 mAh Li-ion Monaco Battery Pack**
Model Number	Prototype Rev 1
Serial Number:	0046
Manufacturer:	Mpower Solutions Ltd
Battery #2:	**3.7V 2200 mAh Li-ion Monaco Battery Pack**
Model Number	Prototype Rev 1
Serial Number:	0048
Manufacturer:	Mpower Solutions Ltd
Battery #3:	**3.7V 2200 mAh Li-ion Monaco Battery Pack**
Model Number	Prototype Rev 1
Serial Number:	0010
Manufacturer:	Mpower Solutions Ltd

2.5 Details of Test Laboratory

2.5.1 Location

EMC Technologies Pty Ltd - ACN/ABN: 82057105549
57 Assembly Drive
Tullamarine, (Melbourne) Victoria
Australia 3043

Telephone: +61 3 9335 3333
Facsimile: +61 3 9338 9260
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 20± 1 °C, the humidity was 48%. 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 V4.2 Build 37** 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.

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 and must be within ±10%.

3.4.1 Validation Results (1640 MHz)

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 4: Validation Results (SPEAG calibrated dipoles)

1 Validation Date	2 Frequency (MHz)	3 ∈r (measured)	4 σ (mho/m) (measured)	5 Measured SAR 1g	6 Measured SAR 10g
24th Sep 2004	1640	38.4	1.28	8.89	4.39

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 (DV1640V2) during calibration. The measured one-gram SAR should be within 10% of the expected target reference values shown in table 5 below.

Table 5: Deviation from reference validation values

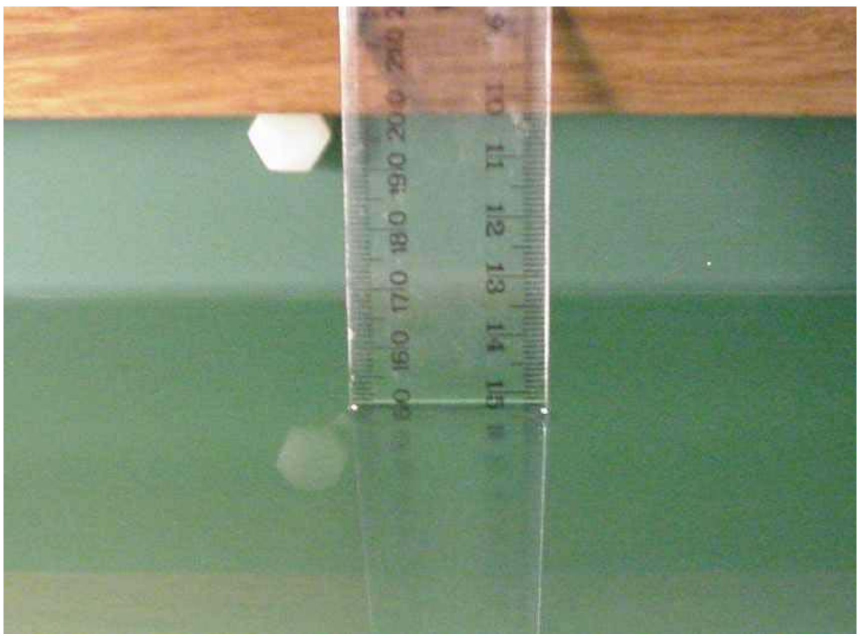
Validation Frequency	Measured SAR 10g (input power = 250mW)	Measured SAR 10g (Normalized to 1W)	SPEAG Calibration reference SAR Value 1g (mW/g)	Deviation From SPEAG 1g (%)
1640 MHz	8.89	35.56	33.0	+7.76

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.

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 6: Measured Brain Simulating Liquid Dielectric Values

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
1610.73 MHz Brain	38.6	40.3 ±5% (38.3 to 42.3)	1.25	1.29 ±5% (1.23 to 1.35)	1000
1618.11 MHz Brain	38.5	40.3 ±5% (38.3 to 42.3)	1.27	1.29 ±5% (1.23 to 1.35)	1000
1625.49 MHz Brain	38.5	40.3 ±5% (38.3 to 42.3)	1.27	1.29 ±5% (1.23 to 1.35)	1000

Note: The brain and muscle 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 7: Temperature and Humidity recorded for each day

Date	Ambient Temperature (°C)	Liquid Temperature (°C)	Humidity (%)
24th September 2004	20.5	20.0	48.0

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 8: 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

*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. 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 20 mm x 20 mm. The actual Area Scan has dimensions of 121 mm x 51 mm for head configuration, surrounding the test device hot spot location. Based on this data, the area of the maximum absorption is determined by Spline interpolation. A pre-scan is performed for each phantom configuration to ensure that entire hot spot is identified.

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 9: Uncertainty Budget for DASY4 Version V4.2 Build 37 – 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	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									
Test Sample Positioning	E.4.2	2.9	N	1	1	1	2.9	2.9	11
Device Holder Uncertainty	E.4.1	3.6	N	1	1	1	3.6	3.6	7
Output Power Variation – SAR Drift Measurement	6.6.2	12.2	R	1.73	1	1	7.0	7.0	∞
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	10	N	1	0.64	0.43	6.4	4.3	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	5	N	1	0.6	0.49	3.0	2.5	5
Combined standard Uncertainty			RSS				13.6	12.5	154
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				27.3	25.10	

Estimated total measurement uncertainty for the DASY4 measurement system was ±13.6%. The extended uncertainty (K = 2) was assessed to be ±27.3% based on 95% confidence level. The uncertainty is not added to the measurement result.

Table 10: Uncertainty Budget for DASY4 Version V4.2 Build 37 - Validation

a	b	c	d	e= f(d,k)	f	g	h=cxf/e	i=cxg/e	k
Uncertainty Component	Sec.	Tol. (6%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i (6%)	10g u_i (6%)	v_i
Measurement System									
Probe Calibration (k=1) (standard calibration)	E.2.1	4.4	N	1	1	1	4.4	4.4	∞
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	8.3	R	1.73	1	1	4.8	4.8	∞
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	3.9	R	1.73	1	1	2.3	2.3	∞
Test Sample Related									
Dipole axis to liquid		1	R	1.73	1	1	0.6	0.6	∞
Input power and SAR drift measurement		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	10	N	1.73	0.6	0.43	3.5	2.5	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	5	N	1.73	0.6	0.49	1.7	1.4	5
Combined standard Uncertainty			RSS				±10.0	±9.5	154
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				±20.0	±19.1	

Estimated total measurement uncertainty for the DASY4 measurement system was ±10.0%. The extended uncertainty (K = 2) was assessed to be ±20.0% based on 95% confidence level. The uncertainty is not added to the Validation measurement result.

6.0 EQUIPMENT LIST AND CALIBRATION DETAILS

Table 11: SPEAG DASY4 Version V4.2 Build 37

Equipment Type	Manufacturer	Model Number	Serial Number	Calibration Due	Used For this Test?
Robot - Six Axes	Staubli	RX90BL	N/A	Not applicable	Yes
Robot Remote Control	SPEAG	CS7MB	RX90B	Not applicable	Yes
SAM Phantom	SPEAG	N/A	1260	Not applicable	Yes
SAM Phantom	SPEAG	N/A	1060	Not applicable	Yes
Flat Phantom	SPEAG	V4.4 Combination 6.00/2.00mm	1001	Not Applicable	No
Flat Phantom	SPEAG	PO1A V4.4e 6mm	1003	Not Applicable	No
Data Acquisition Electronics	SPEAG	DAE3 V1	359	16-July-2004	Yes
Data Acquisition Electronics	SPEAG	DAE3 V1	442	9-Sept-2004	No
Probe E-Field - Dummy	SPEAG	DP1	N/A	Not applicable	No
Probe E-Field	SPEAG	ET3DV6	1380	14-July -05	Yes
Probe E-Field	SPEAG	ET3DV6	1377	19–Sept-2004	No
Probe E-Field	SPEAG	ES3DV6	3029	23-Sept - 04	No
Antenna Dipole 450 MHz	SPEAG	D450V2	1009	24-Jan-2005	No
Antenna Dipole 900 MHz	SPEAG	D900V2	047	12-July-06	No
Antenna Dipole 1640 MHz	SPEAG	D1640V2	314	25-May-2006	Yes
Antenna Dipole 1800 MHz	SPEAG	D1800V2	242	13-July-06	No
Antenna Dipole 2450 MHz	SPEAG	D2450V2	724	9-Nov-2004	No
Antenna Dipole 5600 MHz	SPEAG	D5GHzV2	1008	05-Oct-2005	No
RF Amplifier	Mini-Circuits	ZHL-42	N/A	Not applicable	Yes
Synthesized signal generator	Hewlett Packard	ESG-D3000A	GB37420 238	In test	Yes
RF Power Meter Dual	Hewlett Packard	437B	3125012 786	26/5/05	Yes
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481H	1545A01 634	27-May-05	Yes
*RF Power Meter Dual	Hewlett Packard	435A	1733A05 847	*Not Required	Yes
RF Power Sensor	Hewlett Packard	8482A	2349A10 114	*Not Required	Yes
Network Analyser	Hewlett Packard	8714B	GB35100 35	10-Sept -05	Yes
Dual Directional Coupler	NARDA	3022	75453	In test	Yes
Spectrum Analyser 9 kHz - 22 GHz	Hewlett Packard	8593EM	3412A00 105	08-July-05	Yes

***Note**: Reference power meter only.

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 channel 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

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

The device has a extendable antenna. The SAR was measured at three test channels with the test sample operating at maximum power, as specified in section 2.3. The SAR was measured with the antenna retracted and then with it extended.

7.3 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 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 configurations of the phantom. The results are given in Table 12 (1600 MHz).

Appendix B of this report contains the plots with the corresponding SAR distributions and show the location of the maximum SAR with respect to the devices.

Table 12: SAR Measurement Results

Test Position	Antenna	Plot Number	Test Channel	Test Freq. (MHz)	SAR Level for (1g) mW/g	DASY4 Measured Drift (dB)
Touch Right	Retracted	1	120	1618.25	0.223	-0.5
Touch Right	Extended	2	120	1618.25	0.0097	-0.5
Tilted Right	Extended	3	120	1618.25	0.015	+0.1
Tilted Right	Retracted	4	000	1610.0	0.326	-0.3
Tilted Right	Retracted	5	120	1618.25	0.357	-0.4
Tilted Right	Retracted	6	240	1626.5	0.177	-0.2
Touch Left	Retracted	7	120	1618.25	0.123	+0.1
Touch Left	Extended	8	120	1618.25	0.017	-0.4
Tilted Left	Retracted	9	120	1618.25	0.154	+0.5
Tilted Left	Extended	10	120	1618.25	0.029	+0.3

Note: The uncertainty of the system (±27.3%) has not been added to the results.

The maximum measured SAR in the 1600 MHz band was 0.357 mW/g for a 1 gram cube. This value was measured in the Tilted Right position with Antenna Retracted at a frequency of 1618.25 MHz (Channel 120).

The FCC SAR limit for Non-occupational exposure is 1.6 m W/g measurement in a 1g cube of tissue.

9.0 COMPLIANCE STATEMENT

The Iridium Satellite Phone, Model SUG0088MBR tested on behalf of TRL Compliance Services, complied with the FCC and Industry Canada SAR requirements.

The highest SAR level recorded was 0.357 mW/g for a 1g cube. This value was measured in the "Tiled Right" position with Antenna Retracted, and was below the uncontrolled limit of 1.6 mW/g, even taking into account the measurement uncertainty of 27.3%.

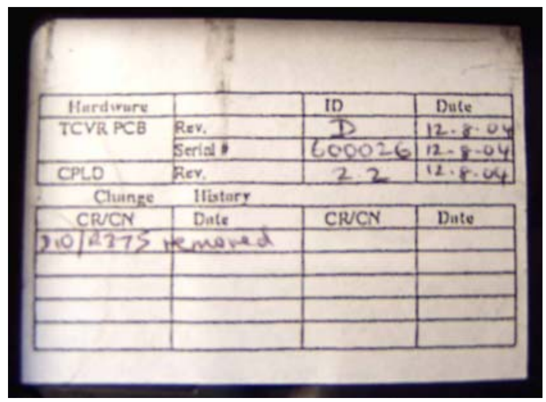
APPENDIX A1
Test Sample Photographs

Battery 1

Battery 2

Battery 3

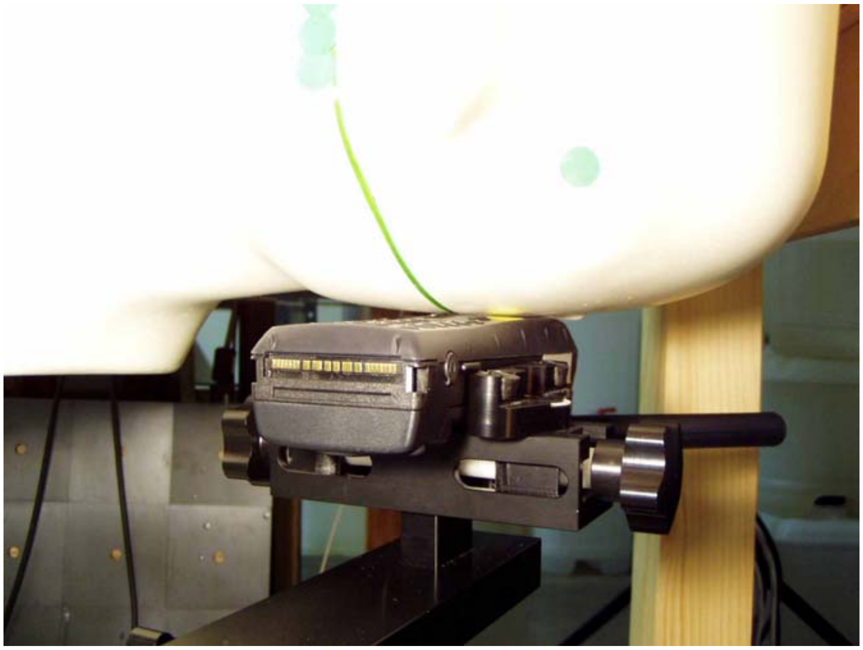
Test Sample ID



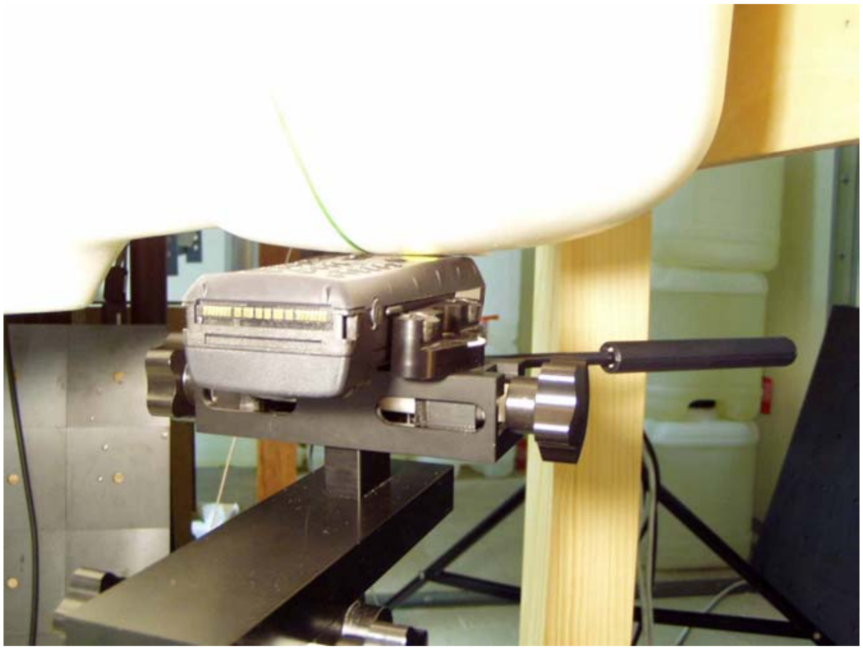
Iridium Satellite Phone – Model: SUG0088MBR

APPENDIX A2
Test Setup Photographs

Touch Left Position – Antenna Retracted

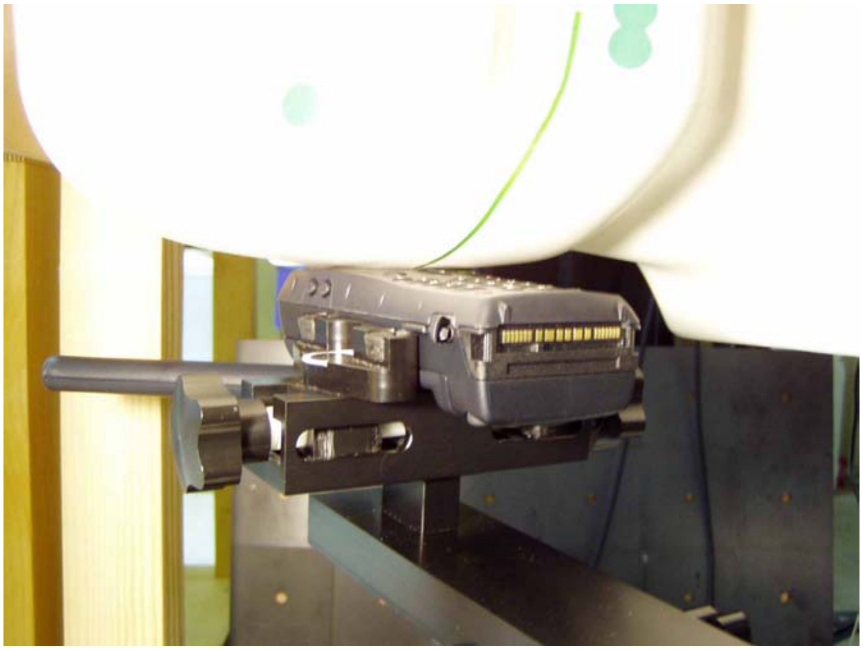


Touch Left Position – Antenna Extended

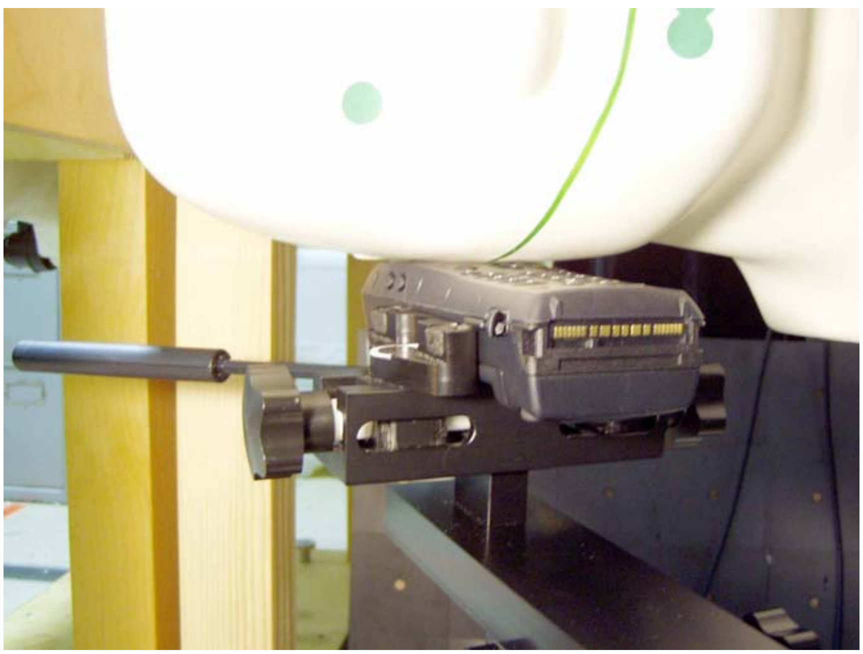


APPENDIX A3
Test Setup Photographs

Touch Right Position – Antenna Retracted



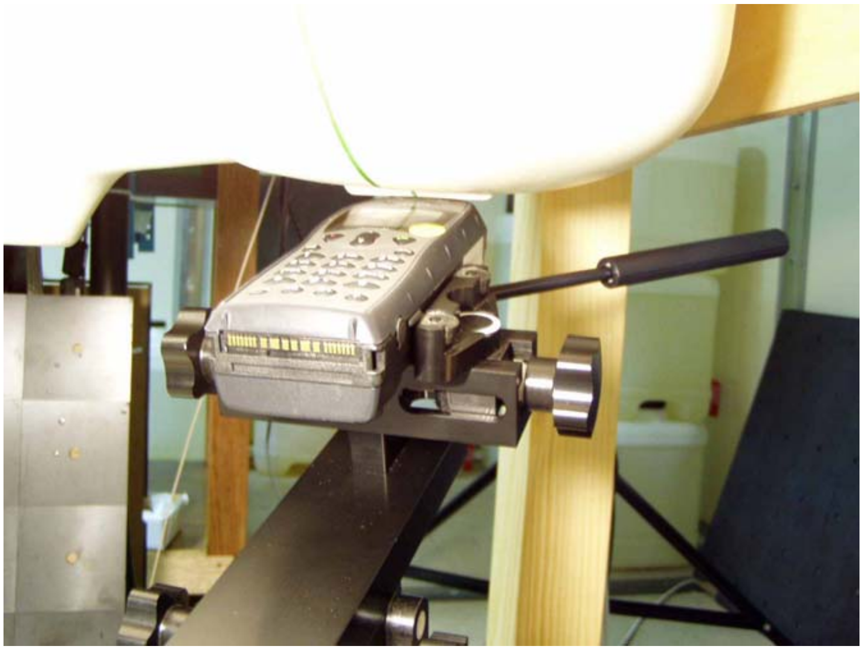
Touch Right Position – Antenna Extended



APPENDIX A4
Test Setup Photographs

Tilted Left Position – Antenna Retracted

Tilted Left Position – Antenna Extended



APPENDIX A5
Test Setup Photographs

Tilted Right Position – Antenna Retracted

Tilted Right Position – Antenna Extended