



# TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.




Test of: IP Wireless UK Ltd.  
2600 MHz PCMCIA Modem

(Body Measurements Only)

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

Measurements were performed on the DASY4 System

**Test Report Serial No:**  
RFI/SARB1/RP45219JD02A

<b>This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director:</b> 	<b>Checked By: Joe Lomako</b> 
<b>Tested By: Scott D Adamo</b> 	<b>Release Version No: PDF001</b>
<b>Issue Date: 02 April 2004</b>	<b>Test Dates: 17 March 2004 to 19 March 2004</b>

**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".**

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**RADIO FREQUENCY INVESTIGATION LTD.**

**TEST REPORT**

**S.No. RFI/SARB1/RP45219JD02A**

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**Issue Date: 02 April 2004**

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**2600 MHz PCMCIA Modem**

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## 1. Client Information

### 1.1. Client Details

<b>Company Name:</b>	IP Wireless UK Ltd.
<b>Address:</b>	3-6 Charlton Business Park Crudwell Road Malmesbury Wiltshire SN16 9RU
<b>Contact Name:</b>	Mr P Warburg

### 1.2. Test Laboratory

<b>Company Name:</b>	Radio Frequency Investigation Ltd.
<b>Address:</b>	Ewhurst Park Ramsdell Basingstoke Hampshire RG26 5RQ.
<b>Contact Name:</b>	Mr J Lomako

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## **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)**

<b>Brand Name</b>	IP Wireless Broadband Modem
<b>Model Name or Number</b>	FD
<b>Unique type Identification:</b>	None Stated
<b>FCC Identification</b>	PKTPCMCIAFD1
<b>Serial Number</b>	FD5D34100F213
<b>Battery Serial Number</b>	Not Applicable
<b>Country Of Manufacture</b>	UK
<b>Date Of Receipt</b>	17 March 2004

### **2.2. Modifications Incorporated In EUT**

During the course of testing the EUT was not modified.

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### 2.3. Additional Information Related to the EUT

Equipment Class:	PCMCIA Modem
FCC Rule Part(s):	OET Bulletin 65 Supplement C
Device Category:	Portable
Application Type	Not Applicable
Maximum Power Output:	2600 MHz – 24 dBm
Transmit Frequency Allocation Of EUT When Under Test (Channels):	<p><b>2600 MHz Band:</b></p> <p><b>3.84Mcps / 6MHz Channel</b> 0 – Bottom Channel – 2503 MHz 1 – Middle channel – 2596 MHz 2 – Top channel – 2683 MHz</p> <p><b>7.68Mcps / 12MHz Channel</b> 0 – Bottom channel – 2506 MHz 1 – Middle – 2596 MHz 2 – Top channel – 2680 MHz</p> <p><b>Note:</b> - Channel numbers are for indication only.</p>
Modulation(s):	100 Hz
Modulation Scheme (Crest Factor)	3 (TDCDMA)
Battery Type(s):	Not Applicable
Antenna Length and Type:	Internal
Number Of Antenna Positions	1
Intended Operating Environment:	Commercial
Weight:	Approx 56.59g
Dimensions (without Antenna) mm:	Approx 116 (L) x 54 (W) x 22 (H) mm
Power Supply Requirement:	
DC Supply (Volts/Amps)	3.3V /1A supplied by host laptop
AC Supply (Volts/Amps)	230V / 1A supplied to host laptop via AC mains adapter
Internal Battery Supply:	Not Applicable
Port(s):	SIM PCMCIA Conducted RF test connector

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**2.4. Support Equipment**

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

<b>Description</b>	Laptop (270 Series Travel Mate)
<b>Brand Name</b>	ACer
<b>Model Name or Number</b>	BY25
<b>Serial Number</b>	00045 – 156 – 974 - 599
<b>Cable Length And Type</b>	1.5m 2 Core Cable
<b>Connected to Port</b>	DC Input

<b>Description</b>	AC Adapter
<b>Brand Name</b>	ASTECC
<b>Model Name or Number</b>	SA80-3115
<b>Serial Number</b>	B386490 60H01B
<b>Cable Length And Type</b>	1m AC Mains Cable
<b>Connected to Port</b>	AC Input

<b>Description</b>	Laptop (Notebook Computer)
<b>Brand Name</b>	SONY
<b>Model Name or Number</b>	PCG - 5201
<b>Serial Number</b>	28308530 3101633
<b>Cable Length And Type</b>	1.5m 2 Core Cable
<b>Connected to Port</b>	DC Input

<b>Description</b>	AC Adapter
<b>Brand Name</b>	SONY
<b>Model Name or Number</b>	PCGA - AC19V1
<b>Serial Number</b>	0031 D 0005652
<b>Cable Length And Type</b>	1.5m mains cable
<b>Connected to Port</b>	AC Input

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**Support Equipment (Continued)**

<b>Description</b>	Laptop (Action Book 345T)
<b>Brand Name</b>	UMAX
<b>Model Name or Number</b>	2000
<b>Serial Number</b>	PD0402096
<b>Cable Length And Type</b>	1.5m 2 Core Cable
<b>Connected to Port</b>	DC Input

<b>Description</b>	AC Adapter
<b>Brand Name</b>	Lien Electronics Inc.
<b>Model Name or Number</b>	LE - 9702A - 05
<b>Serial Number</b>	None Stated
<b>Cable Length And Type</b>	1.0m AC Mains Cable
<b>Connected to Port</b>	AC Input



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### **3. Test Specification, Methods And Procedures**

#### **3.1. Test Specification**

<b>Reference:</b>	OET Bulletin 65 Supplement C: (2001-01)
<b>Title:</b>	Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
<b>Purpose of Test:</b>	To determine whether the equipment complied with the requirements of the specification.

#### **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.

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#### **4. Deviations From The Test Specification**

At the clients request the EUT was exercised and tested at 2600 MHz Tranceive (5 TX and 10 RX) mode only in a body worn configuration. The 2450 MHz dipole verification system was used with 2450 MHz muscle simulating liquid. Measurements were performed with an E-field probe with conversion factors correlating to 2600 MHz band.

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## **5. Operation Of The EUT During Testing**

### **5.1. Operating Modes**

The EUT was tested using the following operated mode:

Tranceive Mode (5 TX and 10 RX) with PCMCIA modem exercised at 3.84Mcps / 6MHz channel and 7.68Mcps / 12MHz channel data rates consecutively.

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## **6. Summary Of Test Results**

### **6.1. Summary Of Tests**

<b>Test Name</b>	<b>Specification Reference</b>	<b>Compliance Status</b>
Specific Absorption Rate (SAR)	OET Bulletin 65 Supplement C	Complied

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**6.2. Test Results For Specific Absorption Rate – 2600 MHz ACer Host:-  
3.84Mcps / 6MHz Channel****Environmental Conditions**

Temperature Variation in Lab (°C):	25.0 to 25.0
Temperature Variation in Liquid (°C):	24.0 to 24.0

Conducted Power Measurement Before Test:	Refer to Section 6.8
--	----------------------

Position	Section	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
0 Degrees to Phantom	Flat	2596 MHz	15	0.132	1.6	1.468	Complied
90 Degrees to Phantom	Flat	2596 MHz	15	0.611	1.6	0.989	Complied
90 Degrees to Phantom	Flat	2503 MHz	15	0.408	1.6	1.192	Complied
90 Degrees to Phantom	Flat	2683 MHz	15	0.616	1.6	0.984	Complied

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**6.3. Test Results For Specific Absorption Rate – 2600 MHz ACer Host:-  
7.68Mcps / 6MHz Channel**

**Environmental Conditions**

Temperature Variation in Lab (°C):	25.0 to 25.0
Temperature Variation in Liquid (°C):	24.0 to 24.0

Conducted Power Measurement Before Test:	Refer to Section 6.8
--	----------------------

Position	Section	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
0 Degrees to Phantom	Flat	2596 MHz	15	0.204	1.6	1.396	Complied
90 Degrees to Phantom	Flat	2596 MHz	15	0.610	1.6	0.990	Complied
90 Degrees to Phantom	Flat	2506 MHz	15	0.403	1.6	1.197	Complied
90 Degrees to Phantom	Flat	2680 MHz	15	0.582	1.6	1.018	Complied

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**6.4. Test Results For Specific Absorption Rate – 2600 MHz SONY Host:-  
3.84Mcps / 6MHz Channel****Environmental Conditions**

Temperature Variation in Lab (°C):	24.0 to 24.0
Temperature Variation in Liquid (°C):	24.0 to 23.9

Conducted Power Measurement Before Test:	Refer to Section 6.8
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Position	Section	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
90 Degrees to Phantom	Flat	2596 MHz	15	0.521	1.6	1.079	Complied
0 Degrees to Phantom	Flat	2596 MHz	15	0.215	1.6	1.385	Complied
90 Degrees to Phantom	Flat	2503 MHz	15	0.433	1.6	1.167	Complied
90 Degrees to Phantom	Flat	2683 MHz	15	0.468	1.6	1.132	Complied

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**6.5. Test Results For Specific Absorption Rate – 2600 MHz SONY Host:-  
 7.68Mcps / 12MHz Channel**

**Environmental Conditions**

Temperature Variation in Lab (°C):	24.0 to 24.0
Temperature Variation in Liquid (°C):	24.0 to 23.9

Conducted Power Measurement Before Test:	Refer to Section 6.8
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Position	Section	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
0 Degrees to Phantom	Flat	2596 MHz	15	0.229	1.6	1.371	Complied
90 Degrees to Phantom	Flat	2596 MHz	15	0.570	1.6	1.030	Complied
90 Degrees to Phantom	Flat	2506 MHz	15	0.440	1.6	1.160	Complied
90 Degrees to Phantom	Flat	2680 MHz	15	0.516	1.6	1.084	Complied



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**6.6. Test Results For Specific Absorption Rate – 2600 MHz UMAX Host:-  
3.84Mcps / 6MHz Channel****Environmental Conditions**

Temperature Variation in Lab (°C):	24.0 to 25.0
Temperature Variation in Liquid (°C):	24.5 to 24.5

Field Strength Measurement Before Test:	Refer to Section 6.8
---	----------------------

Position	Section	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
0 Degrees to Phantom	Flat	2596 MHz	15	0.318	1.6	1.282	Complied
90 Degrees to Phantom	Flat	2596 MHz	15	0.562	1.6	1.038	Complied
90 Degrees to Phantom	Flat	2503 MHz	15	0.423	1.6	1.177	Complied
90 Degrees to Phantom	Flat	2683 MHz	15	0.523	1.6	1.077	Complied

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**6.7. Test Results For Specific Absorption Rate – 2600 MHz UMAX Host:-  
7.68Mcps / 12MHz Channel**

**Environmental Conditions**

Temperature Variation in Lab (°C):	24.0 to 24.0
Temperature Variation in Liquid (°C):	24.0 to 23.9

Conducted Power Measurement Before Test:	Refer to Section 6.8
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Position	Section	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
0 Degrees to Phantom	Flat	2596 MHz	15	0.308	1.6	1.292	Complied
90 Degrees to Phantom	Flat	2596 MHz	15	0.473	1.6	1.127	Complied
90 Degrees to Phantom	Flat	2506 MHz	15	0.390	1.6	1.210	Complied
90 Degrees to Phantom	Flat	2680 MHz	15	0.478	1.6	1.122	Complied

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### **6.8. Conducted Power Measurement**

#### **ACer Host:- 3.84 Mcps / 6 MHz:- 17 March 2004**

Channel	Frequency	dBm
Bottom	2503 MHz	23.9
Middle	2596 MHz	24.6
Top	2683 MHz	24.1

#### **ACer Host:- 7.68 Mcps / 12 MHz:- 17 March 2004**

Channel	Freq uency	dBm
Bottom	2506 MHz	24.0
Middle	2596 MHz	25.0
Top	2680 MHz	24.1

#### **SONY Host:- 3.84 Mcps / 6 MHz:-18 March 2004**

Channel	Frequency	dBm
Bottom	2503 MHz	23.7
Middle	2596 MHz	24.5
Top	2683 MHz	23.9

#### **SONY Host:-7.68 Mcps / 12 MHz:-18 March 2004**

Channel	Frequency	dBm
Bottom	2506 MHz	23.7
Middle	2596 MHz	24.5
Top	2680 MHz	23.9

#### **UMAX Host:-3.84 Mcps / 6 MHz:-18 March 2004**

Channel	Frequency	dBm
Bottom	2503 MHz	23.5
Middle	2596 MHz	24.5
Top	2683 MHz	23.9

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**Conducted Power Measurement (Continued)****UMAX Host:-7.68 Mcps / 12 MHz:-18 March 2004**

Channel	Frequency	dBm
Bottom	2506 MHz	23.6
Middle	2596 MHz	24.5
Top	2680 MHz	23.9

**UMAX Host:-3.84 Mcps / 6 MHz:-19 March 2004**

Channel	Frequency	dBm
Bottom	2503 MHz	23.7
Middle	2596 MHz	24.7
Top	2683 MHz	24.0

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## **7. SAR Measurement System**

7.1. Radio Frequency Investigation 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, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. 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 multiplexer, 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.

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## 8. SAR Safety Limits

<b>Exposure Limits</b> (General populations/Uncontrolled Exposure Environment)	<b>SAR</b> (W/Kg)
Spatial Peak (averaged over any 1 g of tissue)	1.6

### Notes:

1. The 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.

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## **9. Details of SAR Evaluation**

9.1. The equipment under test was found to be compliant for localised specific absorption rate (SAR) based on the following provisions and conditions:

- a) The PCMCIA Modem was exercised via a host laptop and positioned under the flat section of the phantom.
- b) Measurements were performed with the EUT, 0 degrees to the phantom and 90 degrees to the phantom consecutively.
- c) 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.
- d) The device was keyed to operate continuously in the transmit mode for the duration of the test.
- e) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.
- f) The EUT was tested via a host laptop, powered by AC mains adapter. The host laptop supplied a 3.3V / 1A supply to the PCMCIA Modem.

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## **10. Evaluation Procedures**

10.1. 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.



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## **11. System Validation**

11.1. Prior to the assessment, the system was verified in the flat region of the phantom. A 2450 MHz dipole was used. A forward power of 250 mW was applied to the dipole and system was verified to a tolerance of  $\pm 5\%$  for the 2450MHz dipole. The applicable verification (normalised to 1 Watt) is as follows:

<b>Dipole Validation Kit</b>	<b>Target SAR 1g (W/kg)</b>	<b>Measured SAR 1g (W/kg)</b>
D2450V2 / 750 (17/04/04)	52.1	54.0
D2450V2 / 750 (18/04/04)	52.1	54.4
D2450V2 / 750 (19/04/04)	52.1	52.8

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## **12. Simulated Tissues**

12.1. 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.

	<b>Frequency</b>
	<b>2450 MHz Muscle</b>
Water	68.64%
DGMBE	31.37%

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### **13. Tissue Parameters**

13.1. 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 $\epsilon_r$	Conductivity $\sigma$ (mho/m)
2450 (17/03/04)	Muscle	54.67	1.97
2450 (18/03/04)	Muscle	54.67	1.97
2450 (19/03/04)	Muscle	54.67	1.97

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## 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 bit 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:  $\pm 0.2$  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:  $2.0 \pm 0.1$  mm

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## **15. Validation results – 2450 MHz MSL Body**

### **15.1. System Validation – 17 March 2004**

15.1.1. 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 2450 MHz	Measured Value of SAR in 1g volume (W/kg) at 2450 MHz	Percentage Difference ( $\leq 5\%$ )
D2450V2 / 725	52.1	54.0	Yes

### **15.1.2. Liquid Properties**

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

Property	Target Value (2450 MHz)	Measured/Calculated Value (2450 MHz)	Percentage Difference ( $\leq 5\%$ )
Relative Permittivity	52.70	54.67	Yes
Conductivity	1.95	1.97	Yes

## **15.2. Temperature Variation**

15.2.1. The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15°C to +30°C.

15.2.2. 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	25.0	25.0
Tissue Simulating Liquid	24.0	24.0

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## **16. Validation results – 2450 MHz MSL Body**

### **16.1. System Validation – 18 March 2004**

16.1.1. 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 2450 MHz	Measured Value of SAR in 1g volume (W/kg) at 2450 MHz	Percentage Difference ( $\leq 5\%$ )
D2450V2 / 725	52.1	54.4	Yes

### **16.1.2. Liquid Properties**

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

Property	Target Value (2450 MHz)	Measured/Calculated Value (2450 MHz)	Percentage Difference ( $\leq 5\%$ )
Relative Permittivity	52.70	54.67	Yes
Conductivity	1.95	1.97	Yes

### **16.2. Temperature Variation**

16.2.1. The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15°C to +30°C.

16.2.2. 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	24.0	23.9

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## **17. Validation results – 2450 MHz MSL Body**

### **17.1. System Validation – 19 March 2004**

17.1.1. 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 2450 MHz	Measured Value of SAR in 1g volume (W/kg) at 2450 MHz	Percentage Difference ( $\leq 5\%$ )
D2450V2 / 725	52.1	52.8	Yes

### **17.1.2. Liquid Properties**

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

Property	Target Value (2450 MHz)	Measured/Calculated Value (2450 MHz)	Percentage Difference ( $\leq 5\%$ )
Relative Permittivity	52.70	54.67	Yes
Conductivity	1.95	1.97	Yes

## **17.2. Temperature Variation**

17.2.1. The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15°C to +30°C.

17.2.2. 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	25.0	24.0
Tissue Simulating Liquid	24.5	24.5

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## **18. Measurement Uncertainty**

18.1. 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.

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

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

18.4. 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".

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level</b>	<b>Calculated Uncertainty</b>
Specific Absorption Rate	2600 MHz	95%	$\pm 17.70\%$

18.5. 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.

18.6. 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%.

18.7. 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  $\pm 1$  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  $\pm 2$  dB can be expected.

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



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2600 MHz PCMCIA Modem

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**Measurement Uncertainty (Continued)**

**Specific Absorption Rate Uncertainty at 2600 MHz, TDCDMA Modulation Scheme calculated in accordance with IEEE 1528-200X**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	c <sub>i</sub>	Standard Uncertainty		u <sub>i</sub> OR u <sub>eff</sub>	Note
							+ u (%)	- u (%)		
B	Probe calibration	10.000	10.000	normal (k=2)	2.0000	1.0000	5.000	5.000	∞	
B	Axial 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	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞	
B	RF Ambient 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			9.03	9.03	>500	
	Expanded uncertainty			k = 1.96			17.70	17.70	>500	

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**1 Appendix 1. Test Equipment Used**

RFI No.	Instrument	Manufacturer	Model Number
A1094	Sony MVC FD-81	Sony	MVC - FD81
A1097	SMA Directional Coupler	MiDISCO	MDC6223-30
A1174	Dielectric Probe Kit	Agilent Technologies	85070C
A1184	Data Acquisition Electronics	Schmid & Partners	DAE3
A1184	Data Acquisition Electronics	Schmid & Partners	DAE3
A1184	Data Acquisition Electronics	Schmid & Partners	DAE3
A1184	Data Acquisition Electronics	Schmid & Partners	DAE3
A1184	Data Acquisition Electronics	Schmid & Partners	DAE3
A1186	Probe	Schmid & Partners	ET3 DV6
A1225	Low noise Amplifier	Mini Circuits	ZHL-42
A1238	SAM Phantom	Schmid & Partners	001
A1322	Schmid & Partner Engineering AG	Schmid & Partner Engineering AG	D2450V2
A215	20 dB Attenuator	Narda	766-20
C1052	Cable	Utiflex	FA210A0030M3030
C1053	Cable	Utiflex	FA210A0003M3030
C1054	Cable	Utiflex	FA210A0001M3050A
G046	Signal Generator	Gigatronics	7100/.01-20
G088	PSU	Thurlby Thandar	CPX200
M011	NRV-Z1 Power Sensor	Rohde & Schwarz	NRV-Z1
M094	URY Power Meter	Rohde & Schwarz	URY
M1001	Spectrum Analyser 8594A	Hewlett Packard	8594A
M1015	Network Analyser	Agilent Technologies	8753ES
M103	URY Power Meter	Rohde & Schwarz	URY
M1047	Robot Arm	Staubli	RX908 L
M1123	Boonton	Boonton	4531
M1130	Rohde & Schwarz	Rohde & Schwarz	URY-Z2
M136	Temperature/Humidity/Pressure Meter	RS Components	None
M509	Thermometer	Testo	110
S256	Site 56	RFI	N/A

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

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2600 MHz PCMCIA Modem

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**Appendix 2. SAR Distribution Scans**

This appendix contains SAR Distribution Scans.

Scan Reference Number	Title
SCN/45219JD02/001	Flat Section 2600MHz 6MHz Channel 0 Degrees to Phantom ACer Host
SCN/45219JD02/002	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom ACer Host
SCN/45219JD02/003	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom ACer Host
SCN/45219JD02/004	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom ACer Host
SCN/45219JD02/005	Flat Section 2600MHz 12MHz Channel 0 Degrees to Phantom ACer Host
SCN/45219JD02/006	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom ACer Host
SCN/45219JD02/007	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom ACer Host
SCN/45219JD02/008	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom ACer Host
SCN/45219JD02/009	Flat Section 2600MHz 6MHz Channel 0 Degrees to Phantom SONY Host
SCN/45219JD02/010	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom SONY Host
SCN/45219JD02/011	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom SONY Host
SCN/45219JD02/012	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom SONY Host
SCN/45219JD02/013	Flat Section 2600MHz 12MHz Channel 0 Degrees to Phantom SONY Host
SCN/45219JD02/014	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom SONY Host
SCN/45219JD02/015	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom SONY Host
SCN/45219JD02/016	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom SONY Host
SCN/45219JD02/017	Flat Section 2600MHz 12MHz Channel 0 Degrees to Phantom UMAX Host
SCN/45219JD02/018	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom UMAX Host

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**SAR Distribution Scans (Continued)**

Scan Reference Number	Title
SCN/45219JD02/019	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom UMAX Host
SCN/45219JD02/020	Flat Section 2600MHz 12MHz Channel 90 Degrees to Phantom UMAX Host
SCN/45219JD02/021	Flat Section 2600MHz 6MHz Channel 0 Degrees to Phantom UMAX Host
SCN/45219JD02/022	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom UMAX Host
SCN/45219JD02/023	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom UMAX Host
SCN/45219JD02/024	Flat Section 2600MHz 6MHz Channel 90 Degrees to Phantom UMAX Host
SCN/45219JD02/025	VALIDATION 001
SCN/45219JD02/026	VALIDATION 002
SCN/45219JD02/027	VALIDATION 003

**RADIO FREQUENCY INVESTIGATION LTD.**

**TEST REPORT**

**S.No. RFI/SARB1/RP45219JD02A**

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**Issue Date: 02 April 2004**

**Test Of: IP Wireless UK Ltd.**

**2600 MHz PCMCIA Modem**

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

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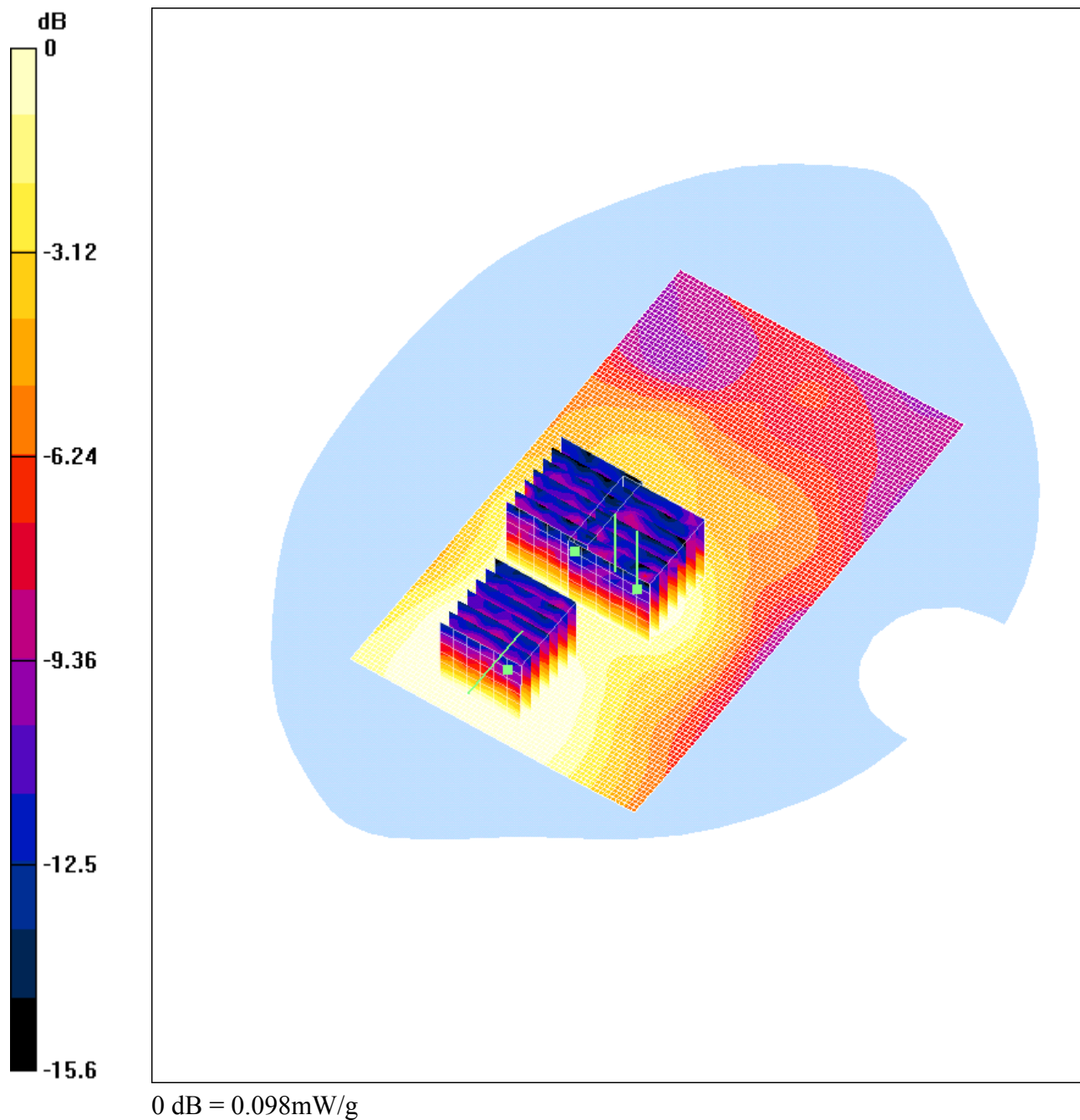
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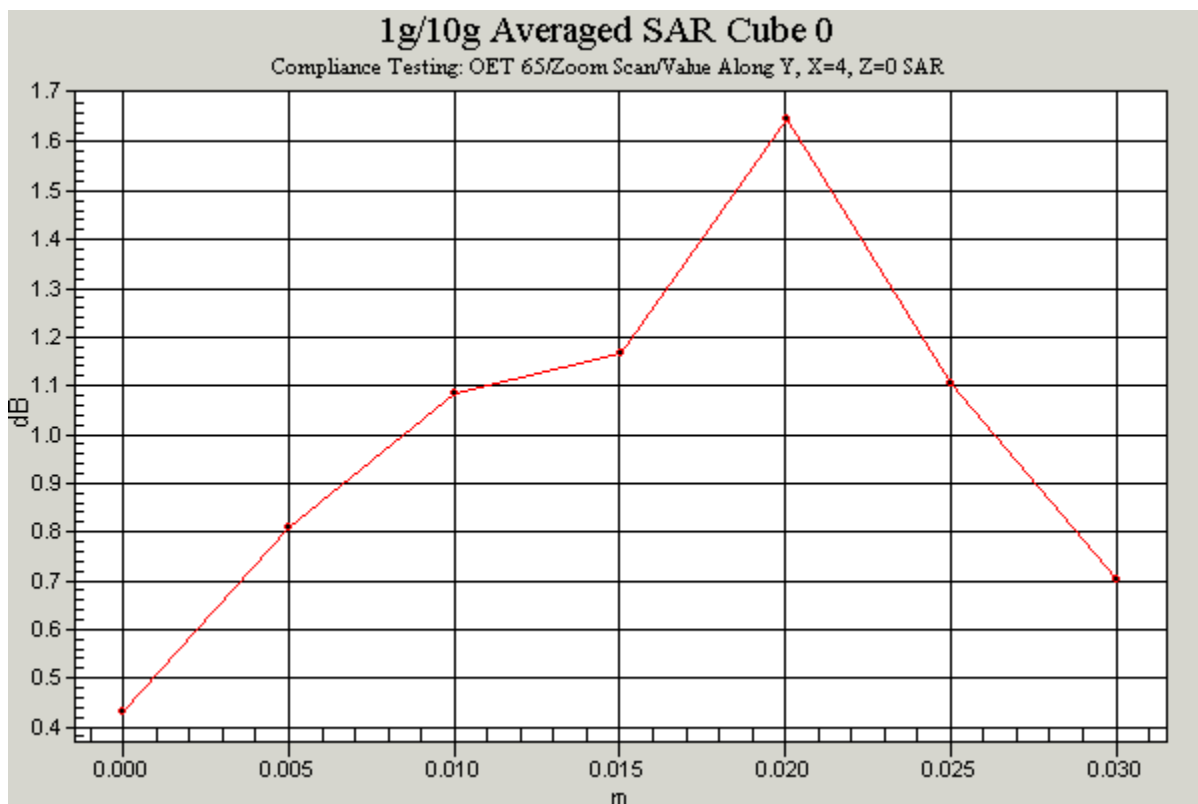
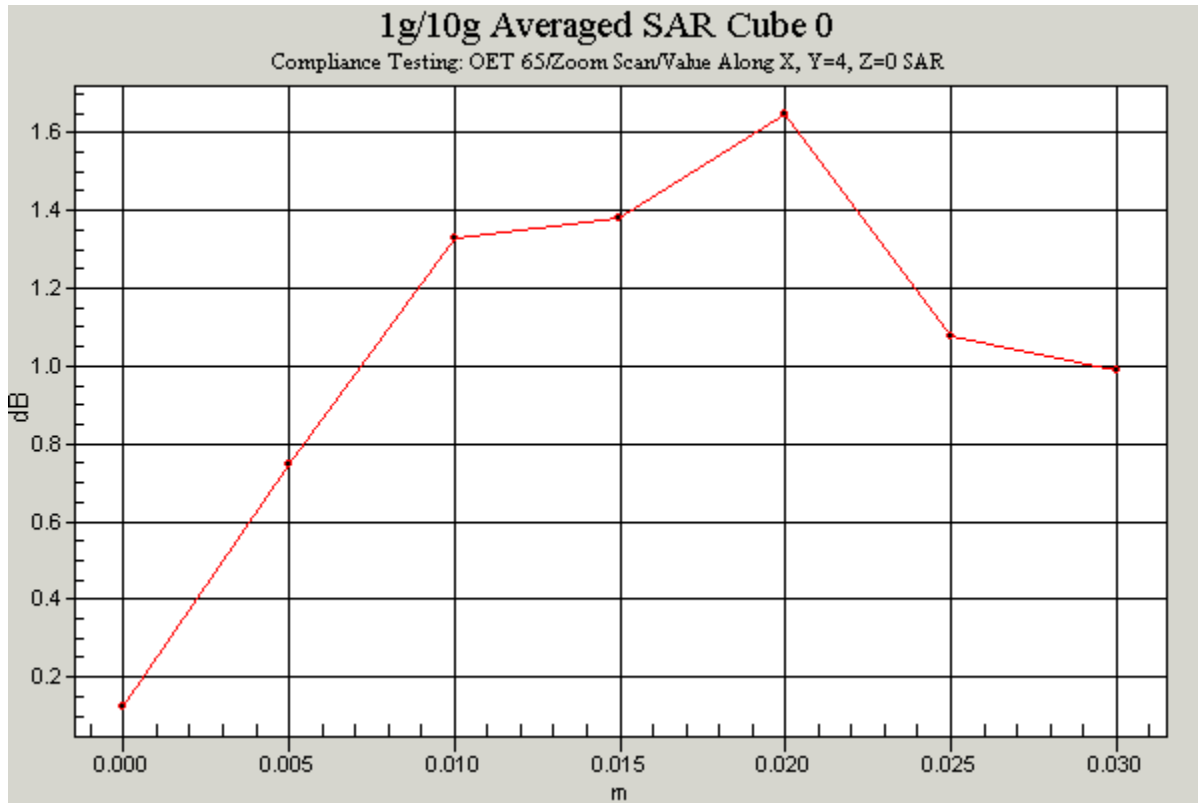
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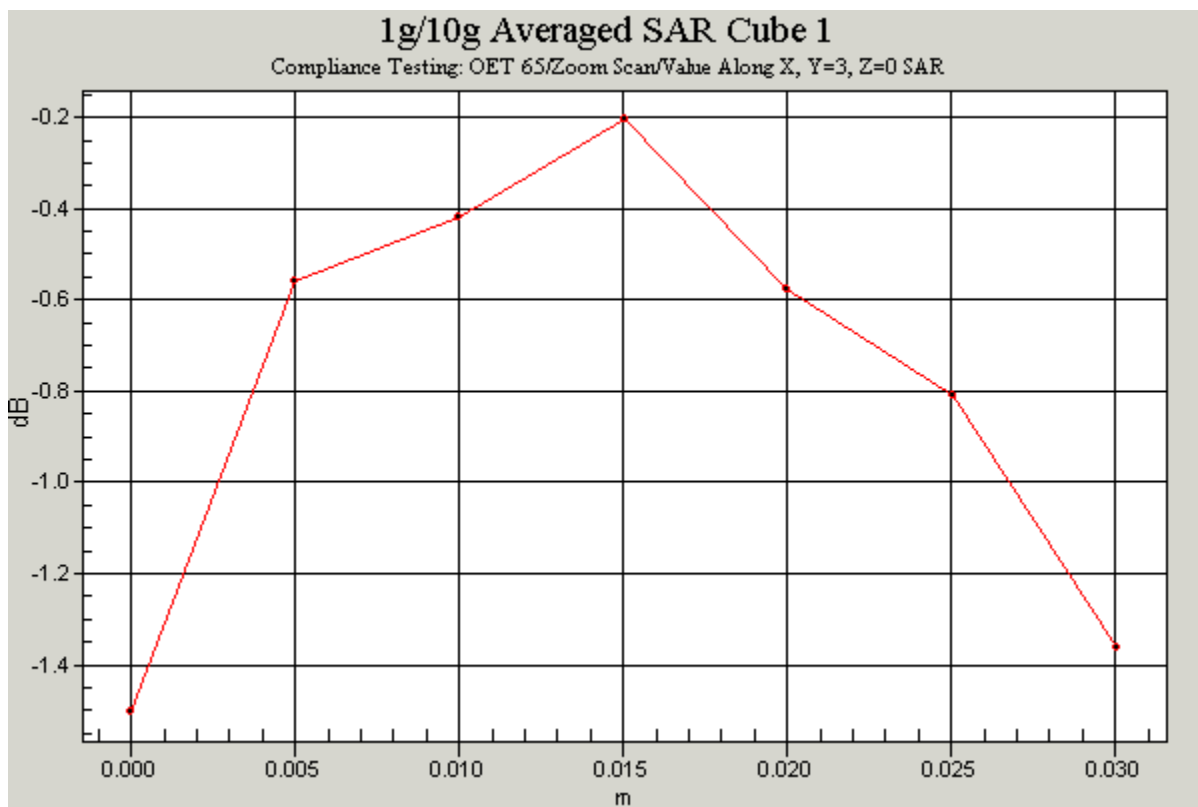
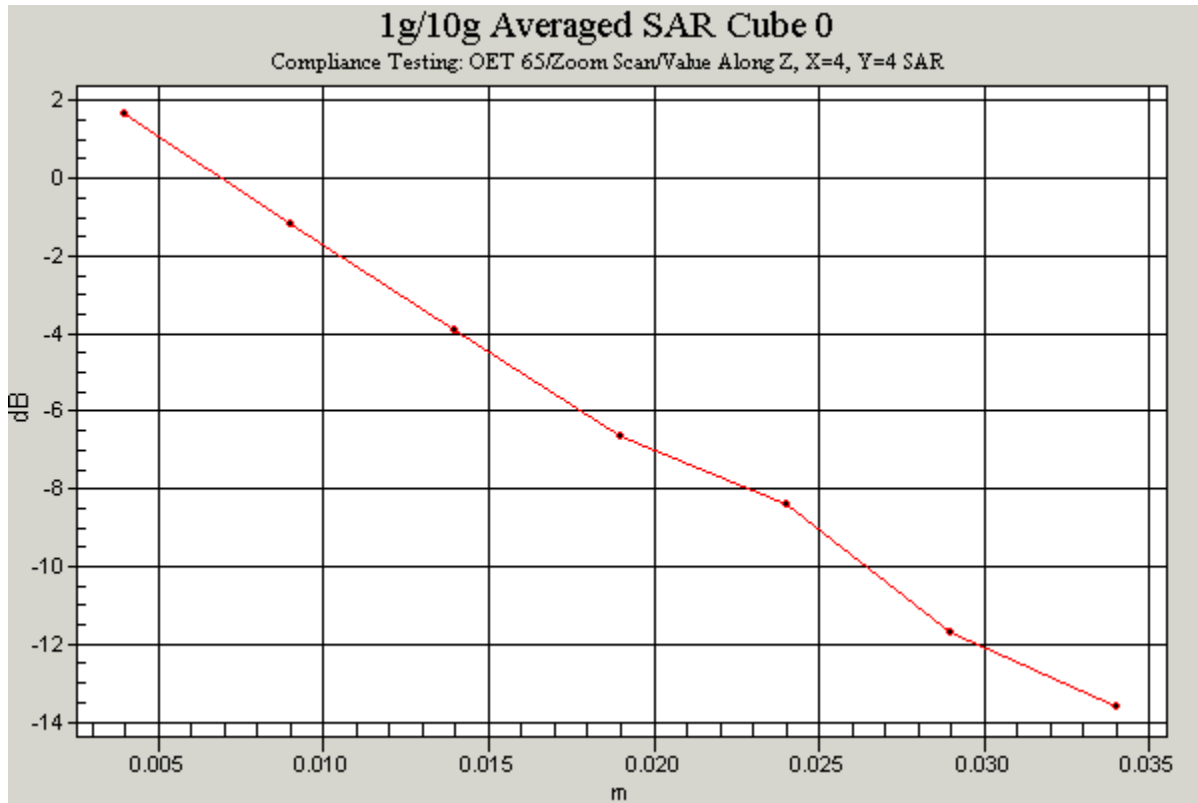
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_0 Degrees to Phantom\_ACer Host**

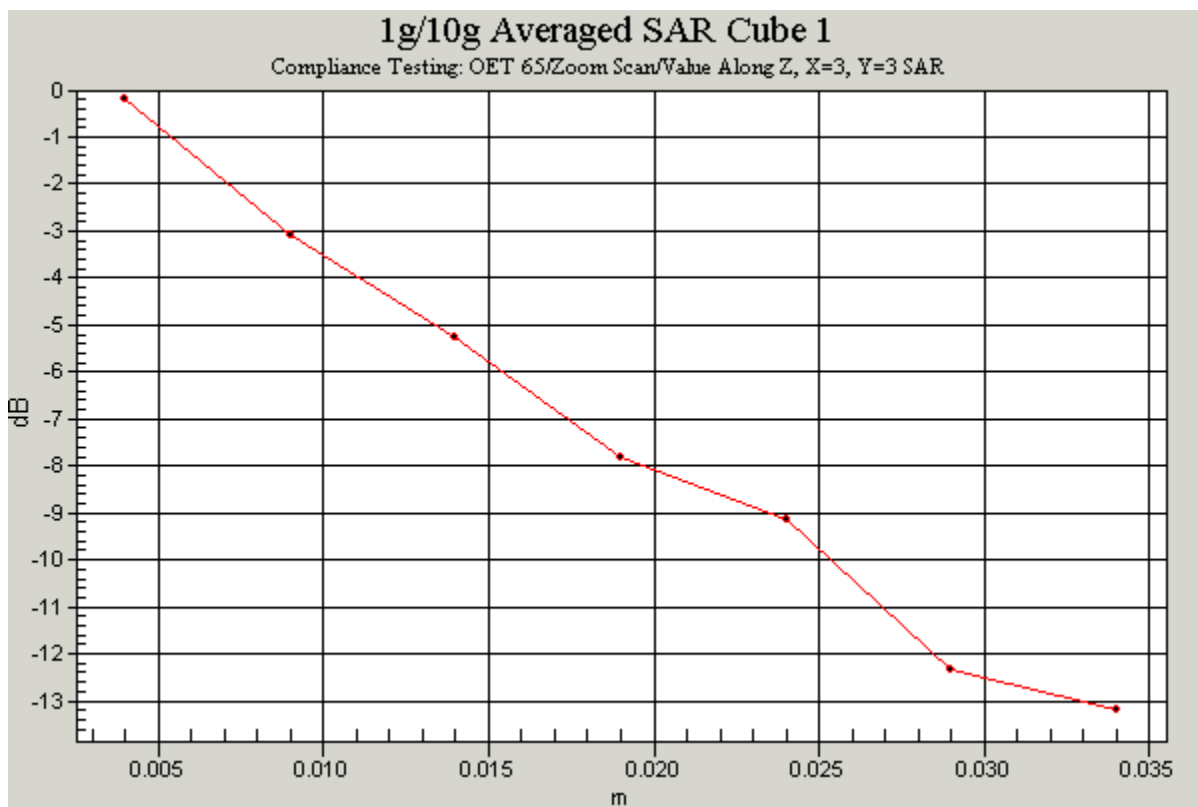
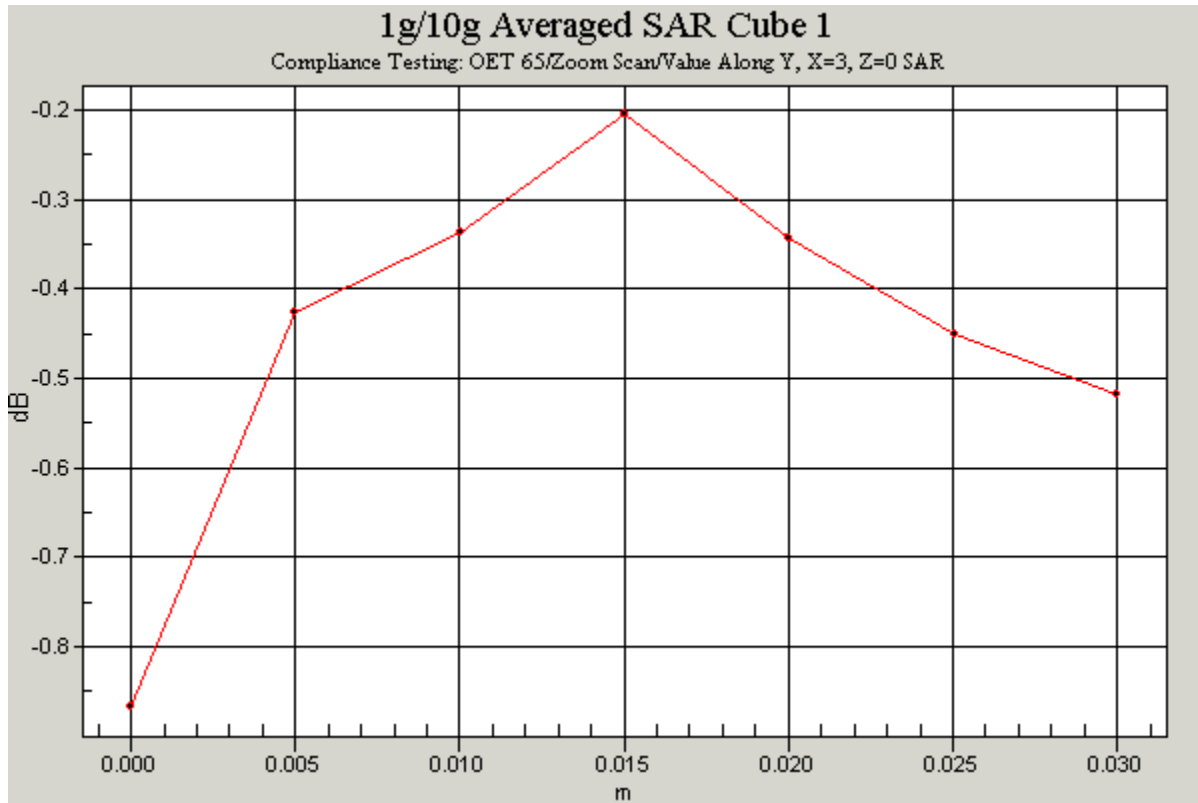
**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**

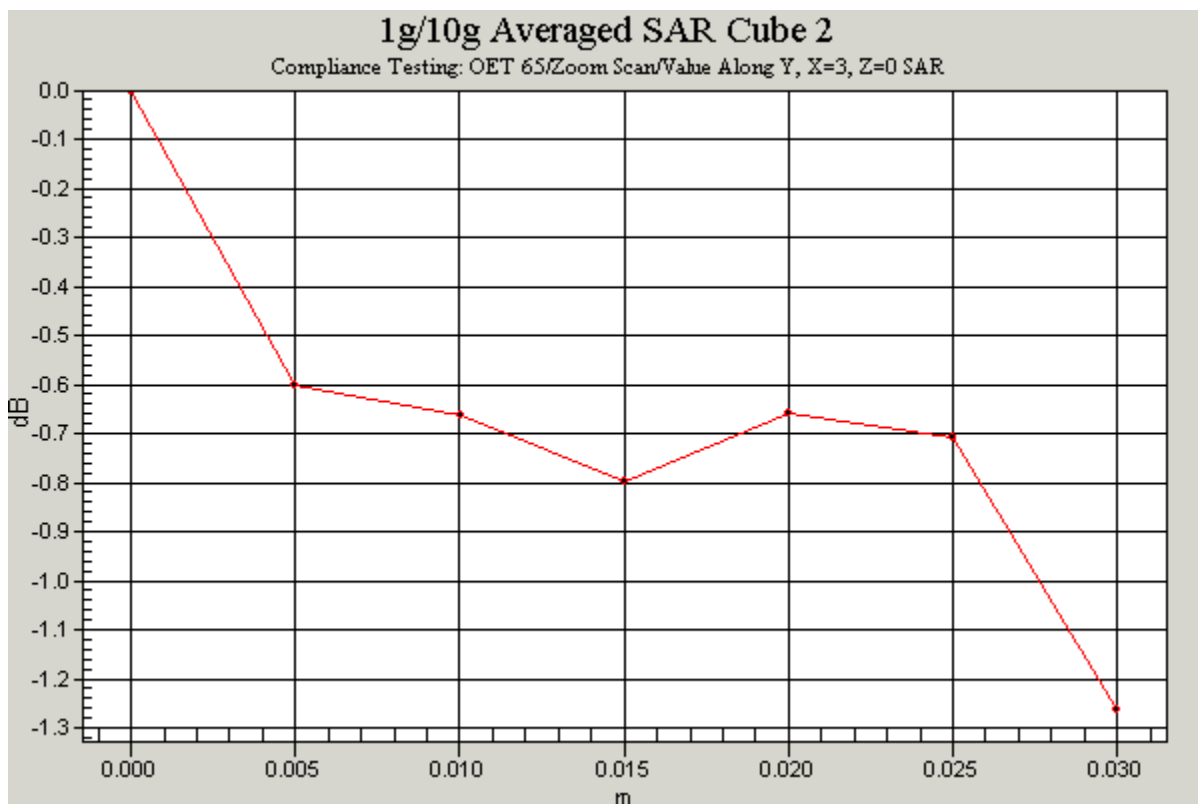
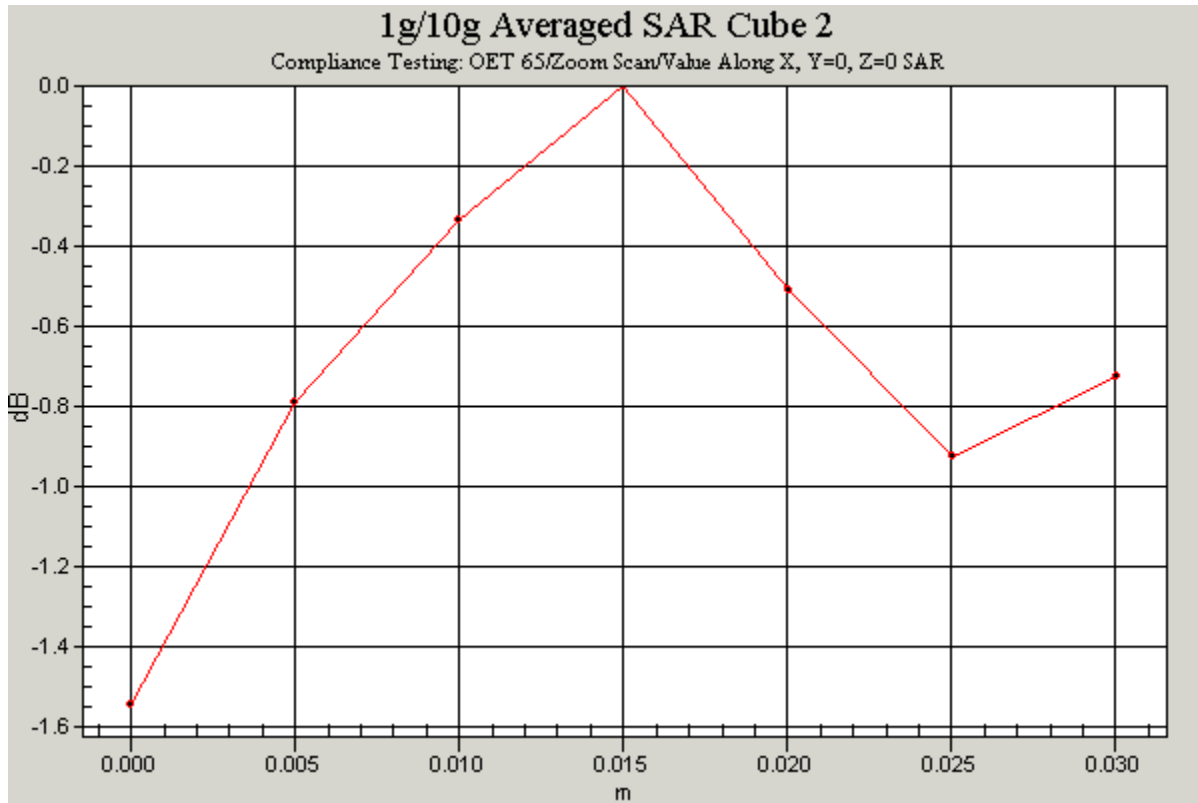


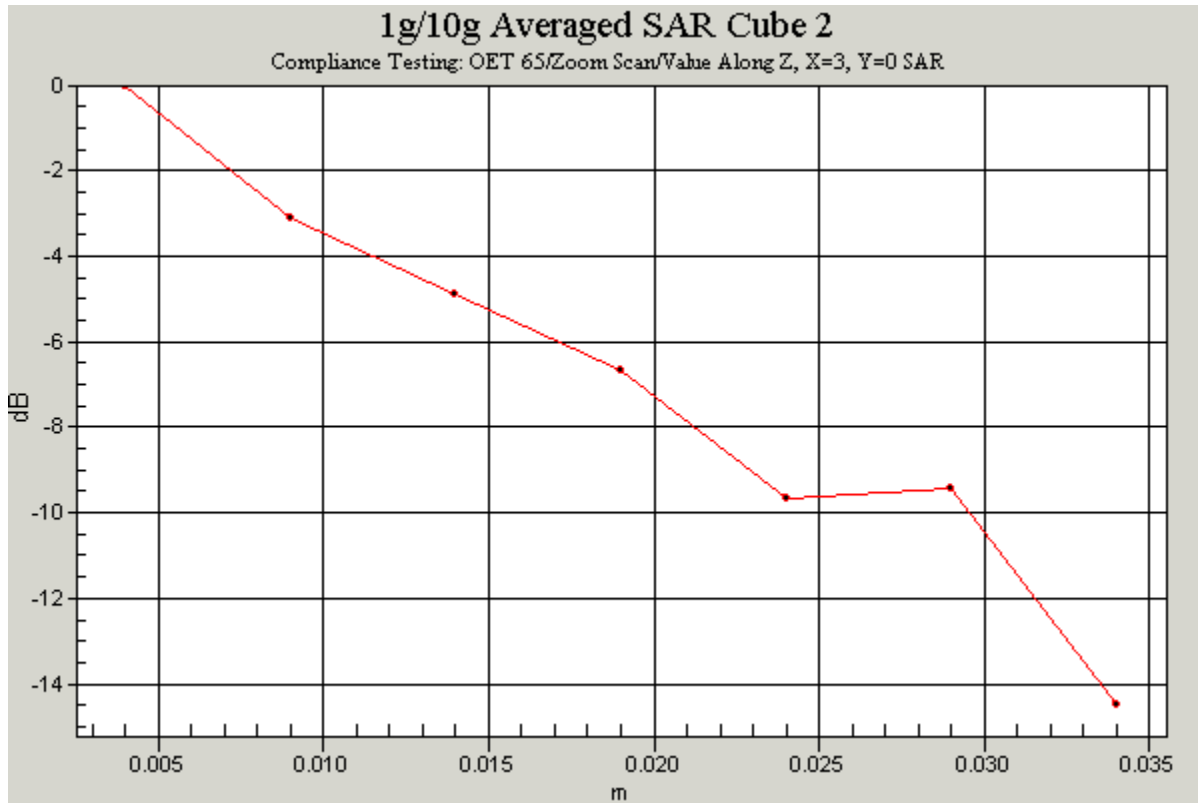












Communication System: TDCDMA - 6MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**0 Degrees to Phantom/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 4.73 V/m; Power Drift = 0.1 dB  
 Maximum value of SAR (interpolated) = 0.138 mW/g

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 4.73 V/m; Power Drift = 0.1 dB  
 Maximum value of SAR (measured) = 0.143 mW/g  
 Peak SAR (extrapolated) = 0.292 W/kg  
**SAR(1 g) = 0.132 mW/g; SAR(10 g) = 0.075 mW/g**

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.73 V/m; Power Drift = 0.1 dB  
Maximum value of SAR (measured) = 0.093 mW/g  
Peak SAR (extrapolated) = 0.193 W/kg  
**SAR(1 g) = 0.089 mW/g; SAR(10 g) = 0.053 mW/g**

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 2:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.73 V/m; Power Drift = 0.1 dB  
Maximum value of SAR (measured) = 0.098 mW/g  
Peak SAR (extrapolated) = 0.212 W/kg  
**SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.051 mW/g**

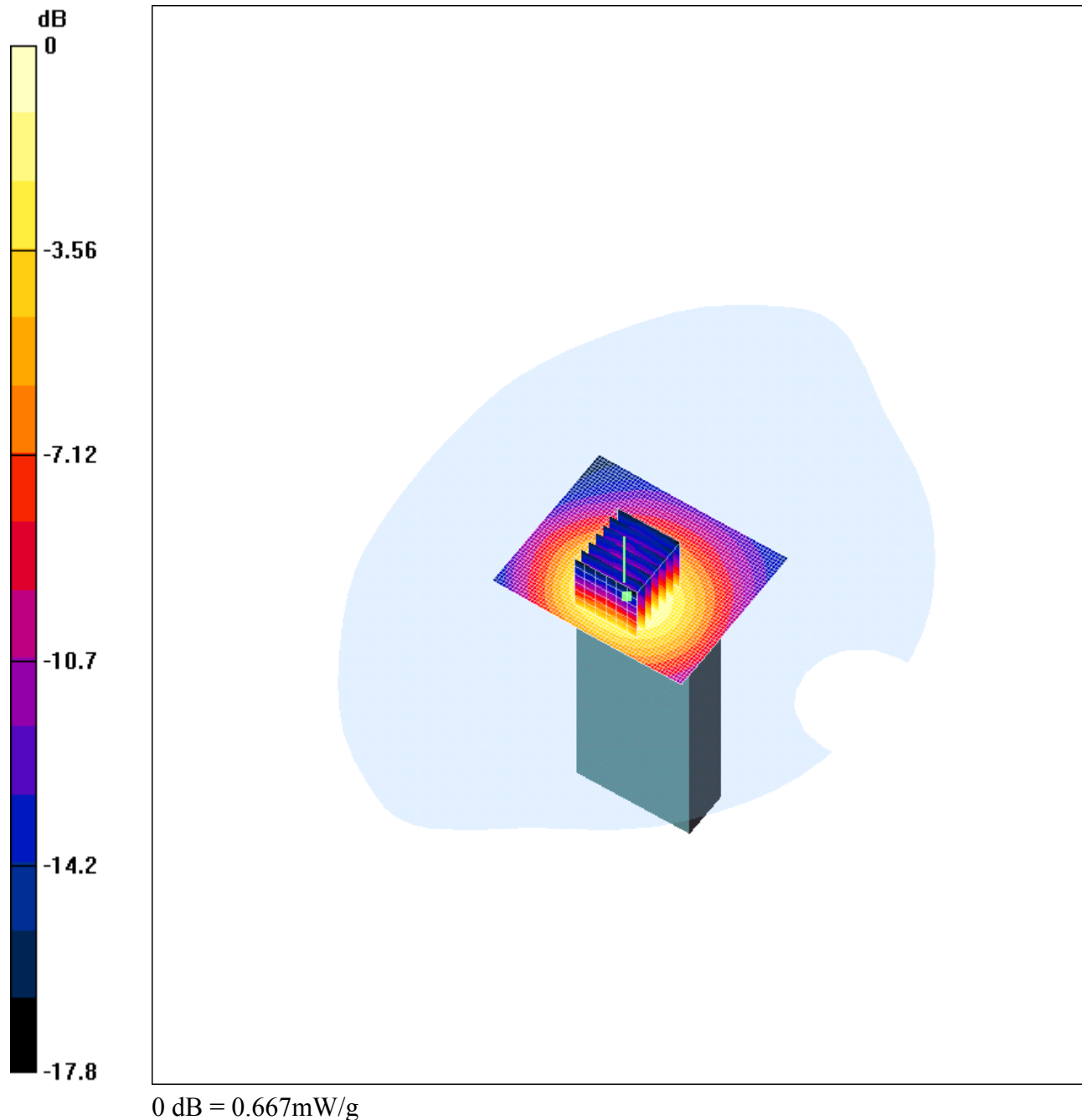
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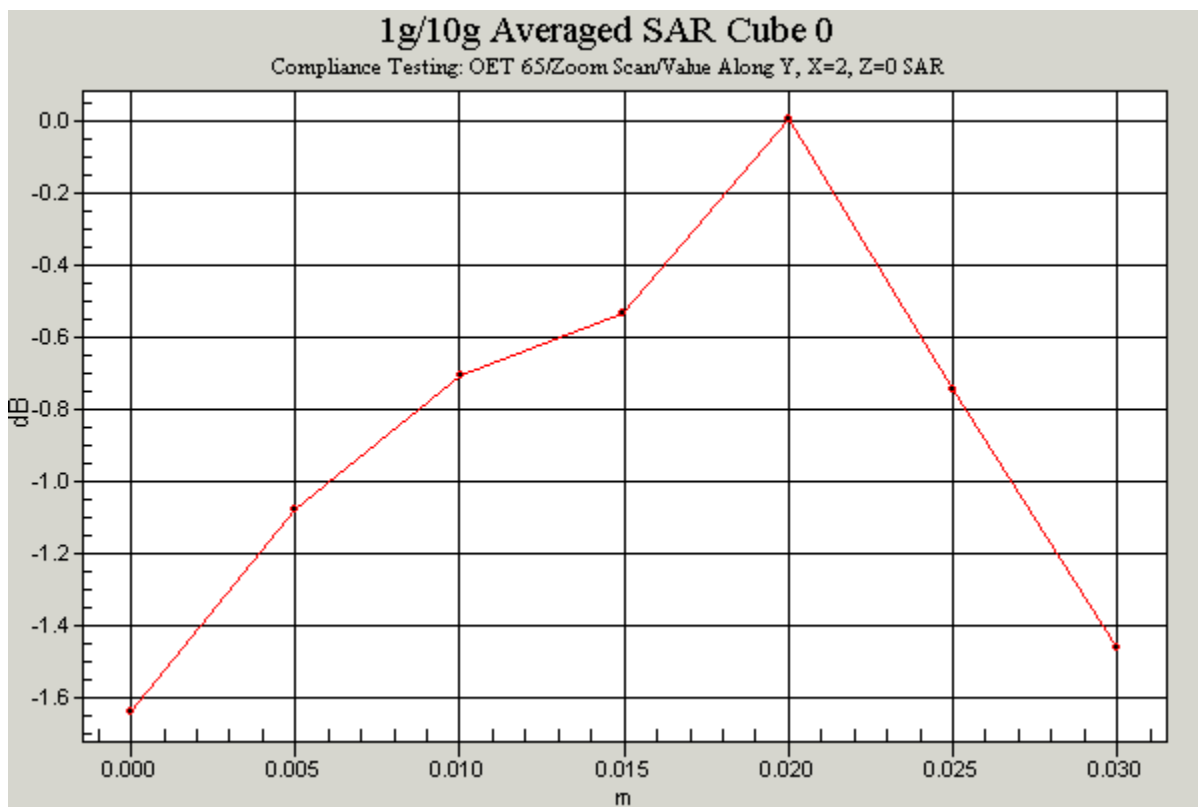
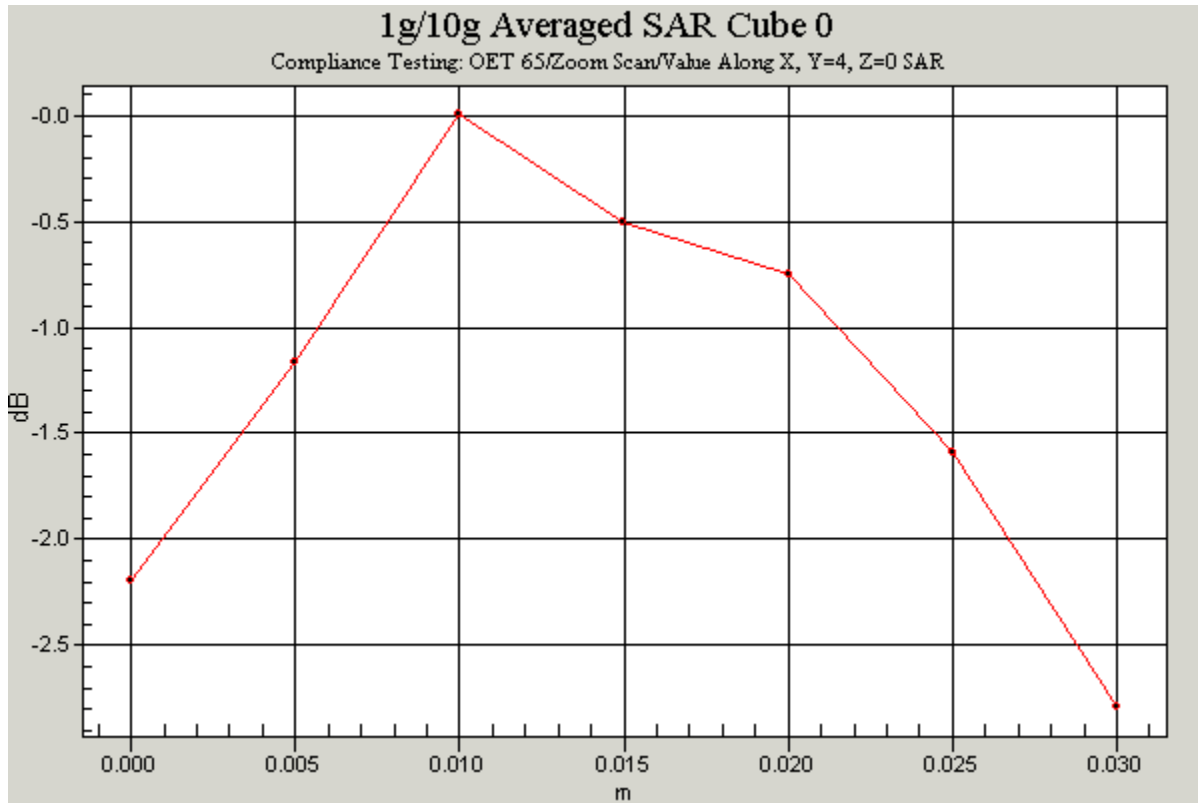
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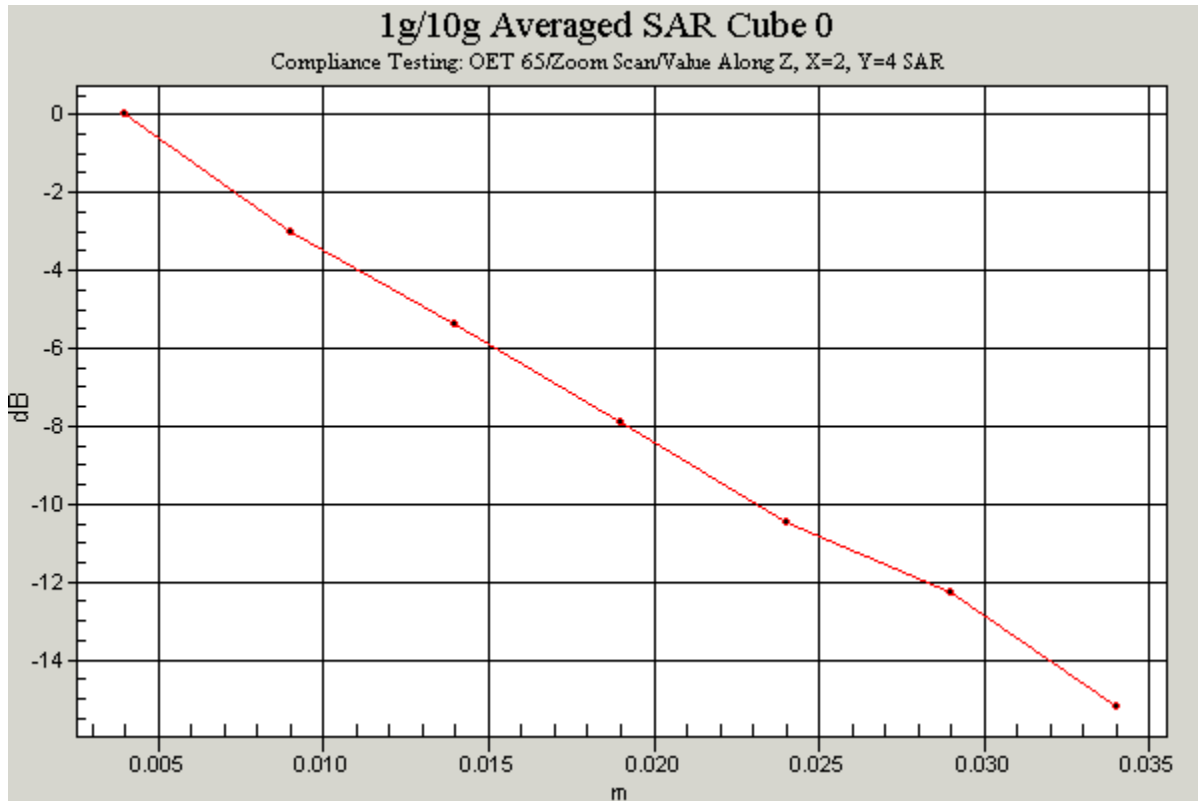
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**







Communication System: TDCDMA - 6MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.7 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.641 mW/g

**90 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.7 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.667 mW/g

Peak SAR (extrapolated) = 1.39 W/kg

**SAR(1 g) = 0.611 mW/g; SAR(10 g) = 0.332 mW/g**

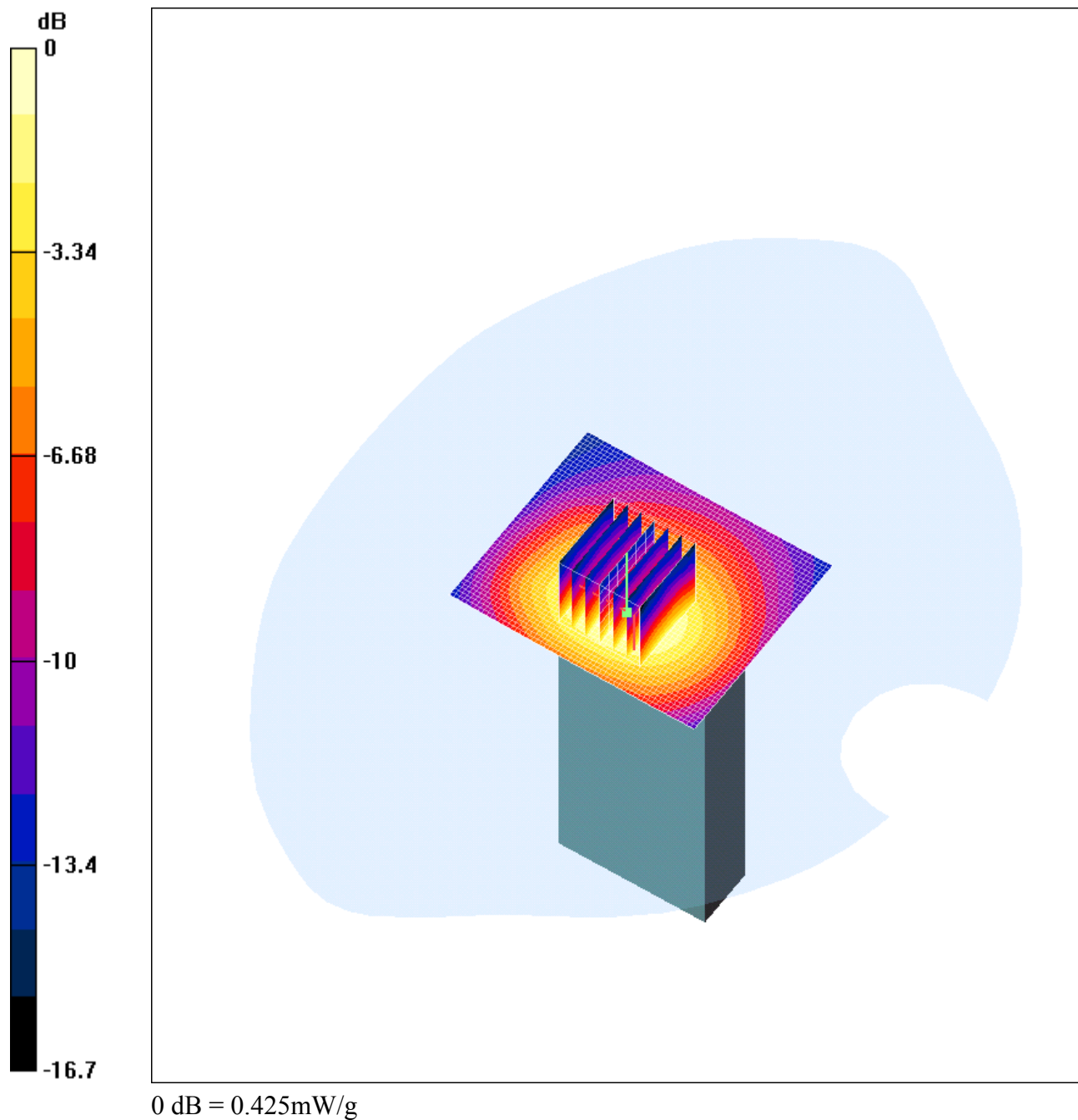
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45219/JD02/003

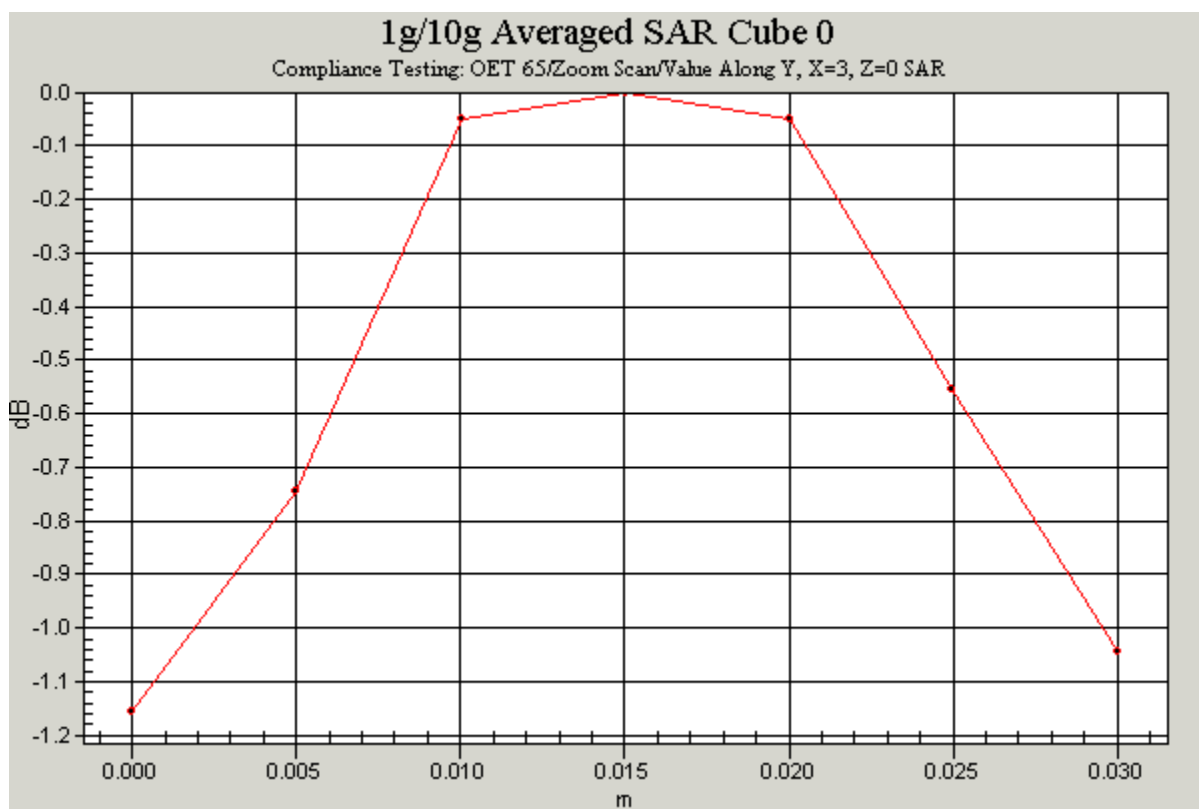
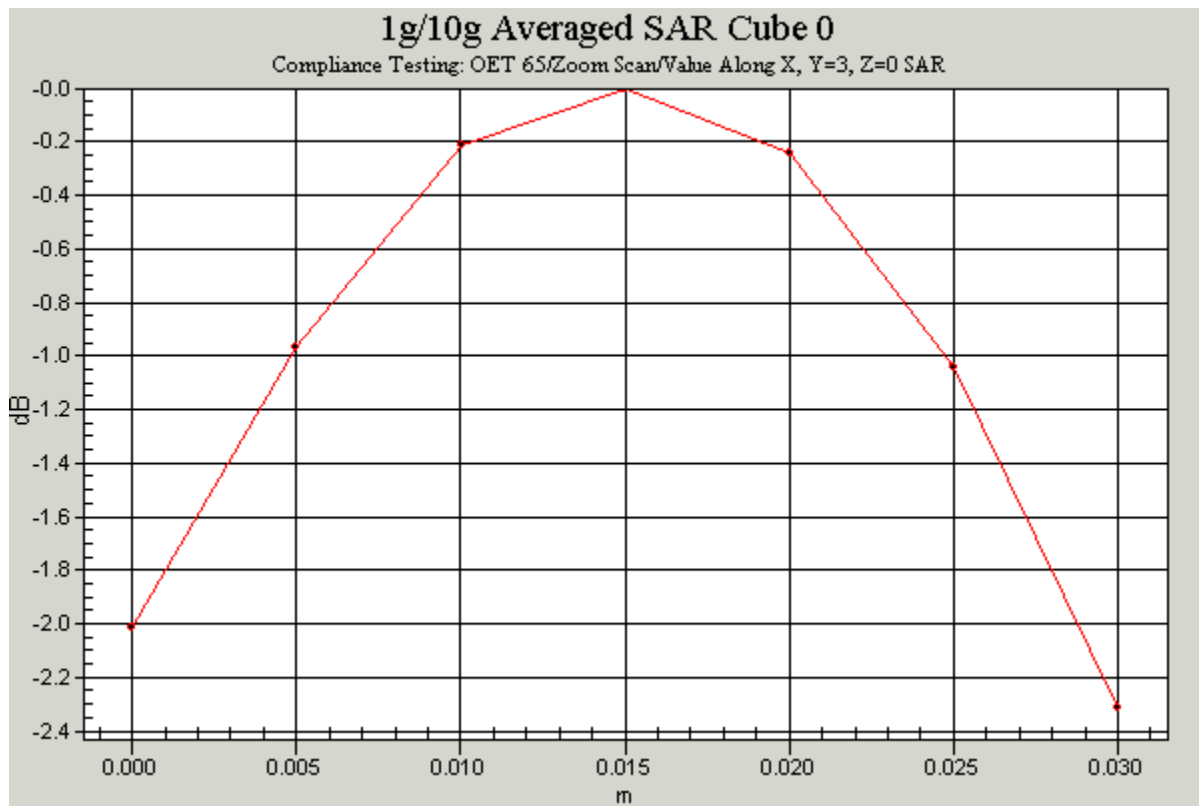
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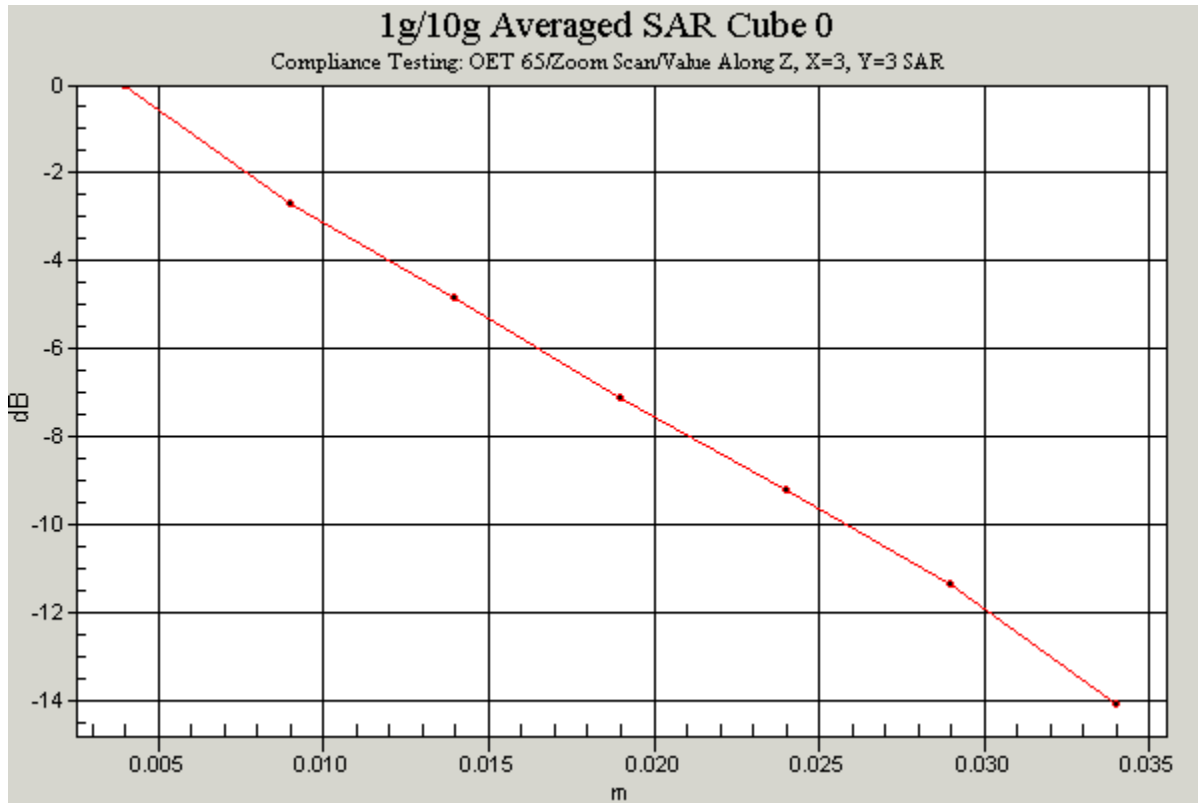
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**









Communication System: TDCDMA - 6MHz Channel; Frequency: 2503 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2503$  MHz;  $\sigma = 2.05$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(4.3, 4.3, 4.3); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Bottom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 13.5 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (interpolated) = 0.415 mW/g

**90 Degrees to Phantom - Bottom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 13.5 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (measured) = 0.425 mW/g  
 Peak SAR (extrapolated) = 0.870 W/kg  
**SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.227 mW/g**

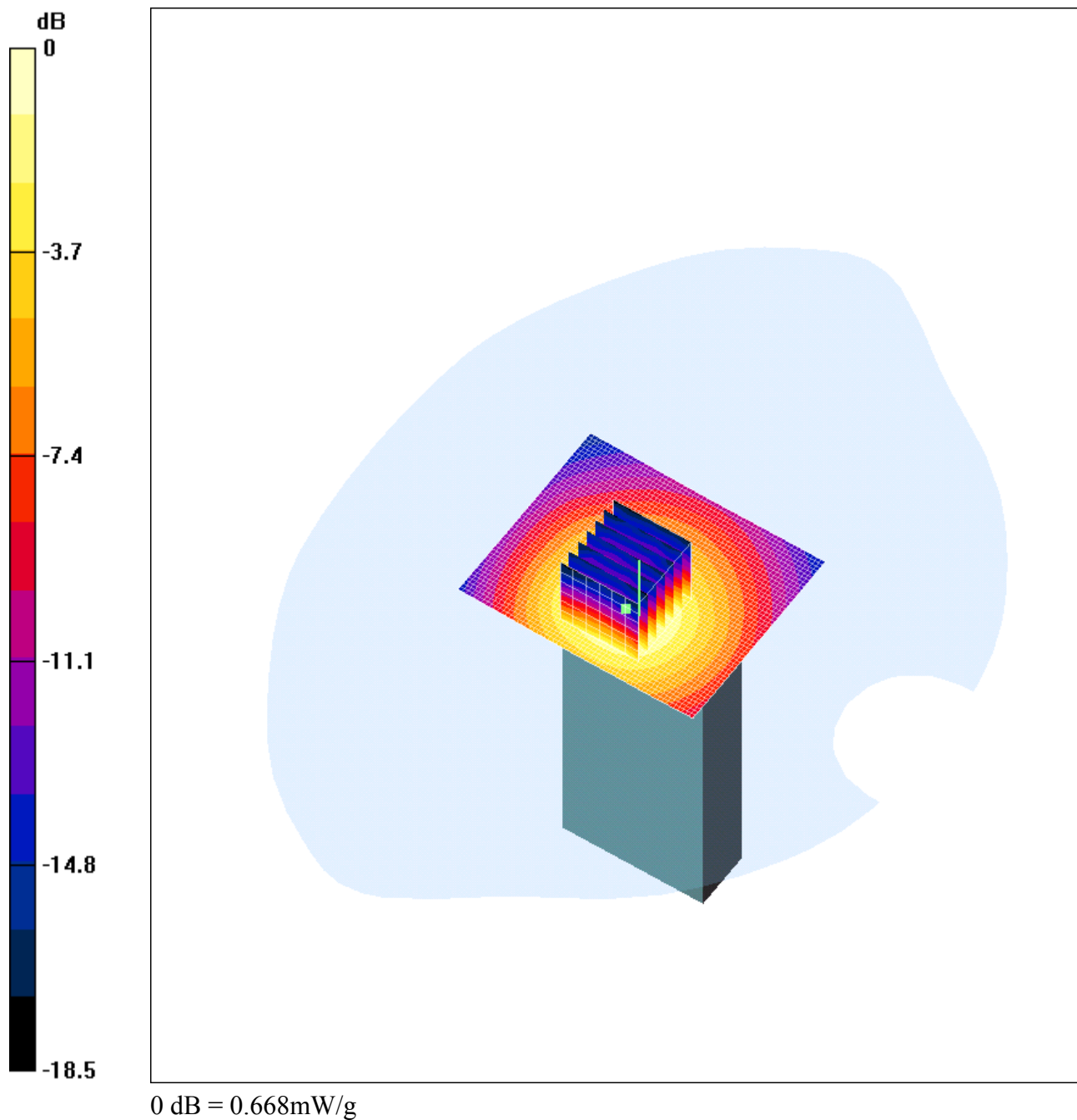
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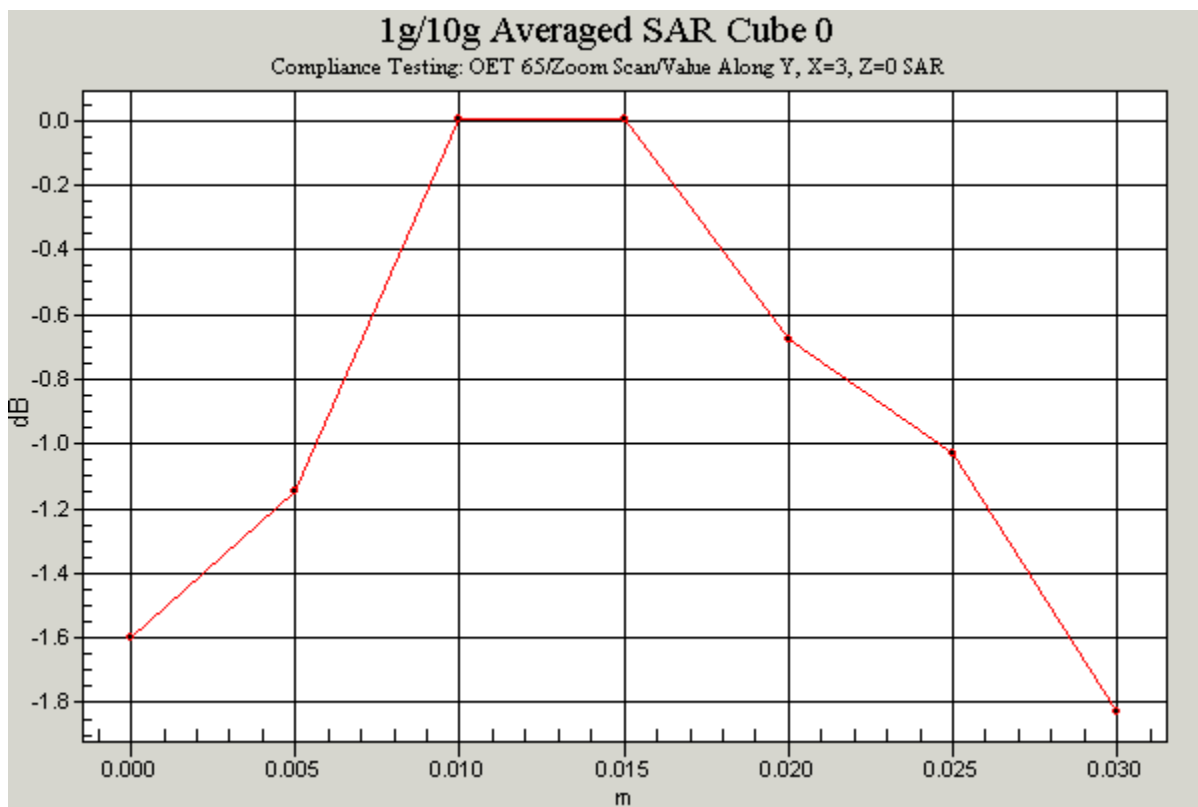
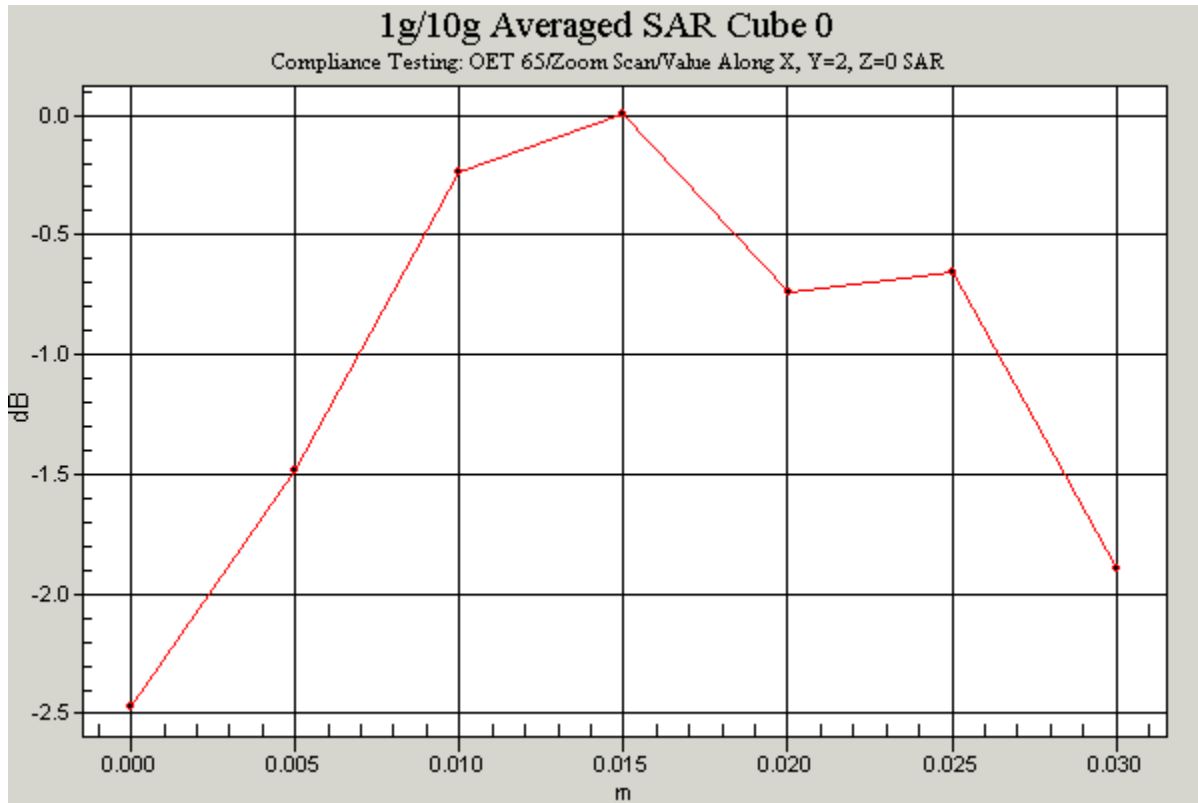
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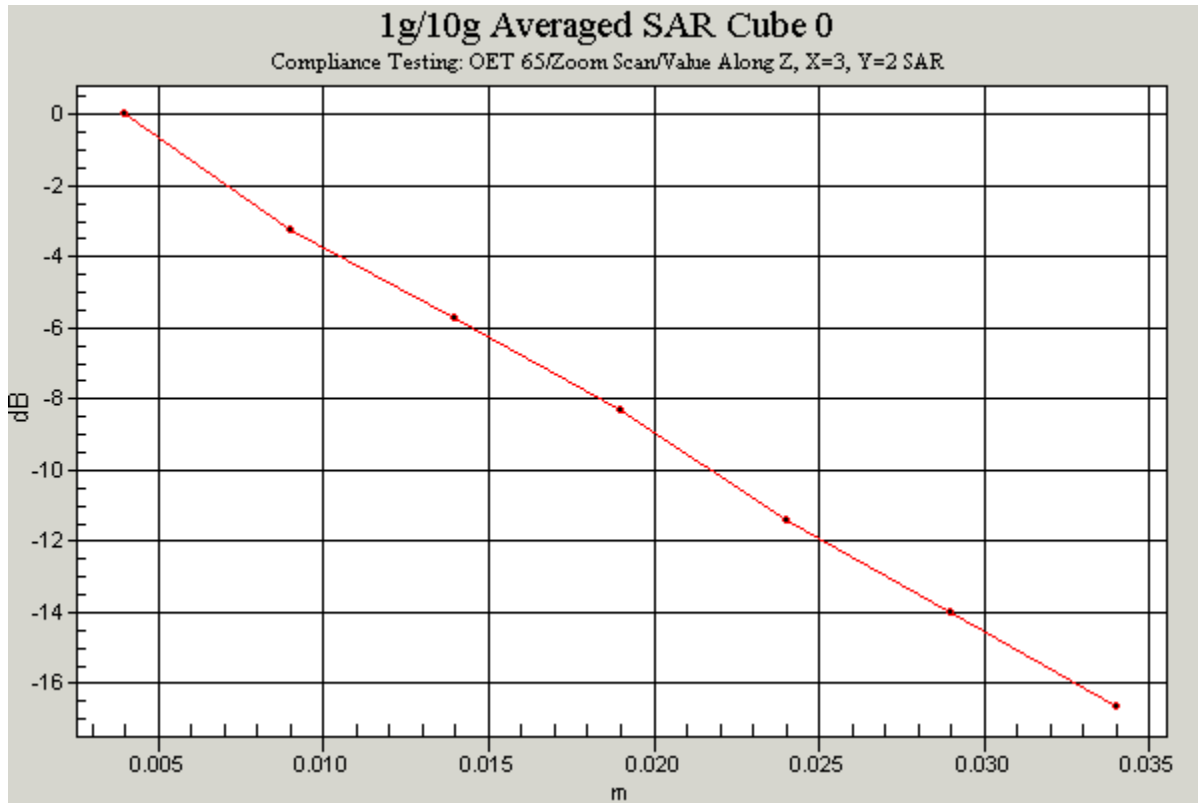
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**







Communication System: TDCDMA - 6MHz Channel; Frequency: 2683 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2683$  MHz;  $\sigma = 2.31$  mho/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Top/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 15.5 V/m; Power Drift = -0.4 dB  
 Maximum value of SAR (interpolated) = 0.594 mW/g

**90 Degrees to Phantom - Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 15.5 V/m; Power Drift = -0.4 dB  
 Maximum value of SAR (measured) = 0.668 mW/g  
 Peak SAR (extrapolated) = 1.59 W/kg  
**SAR(1 g) = 0.616 mW/g; SAR(10 g) = 0.322 mW/g**

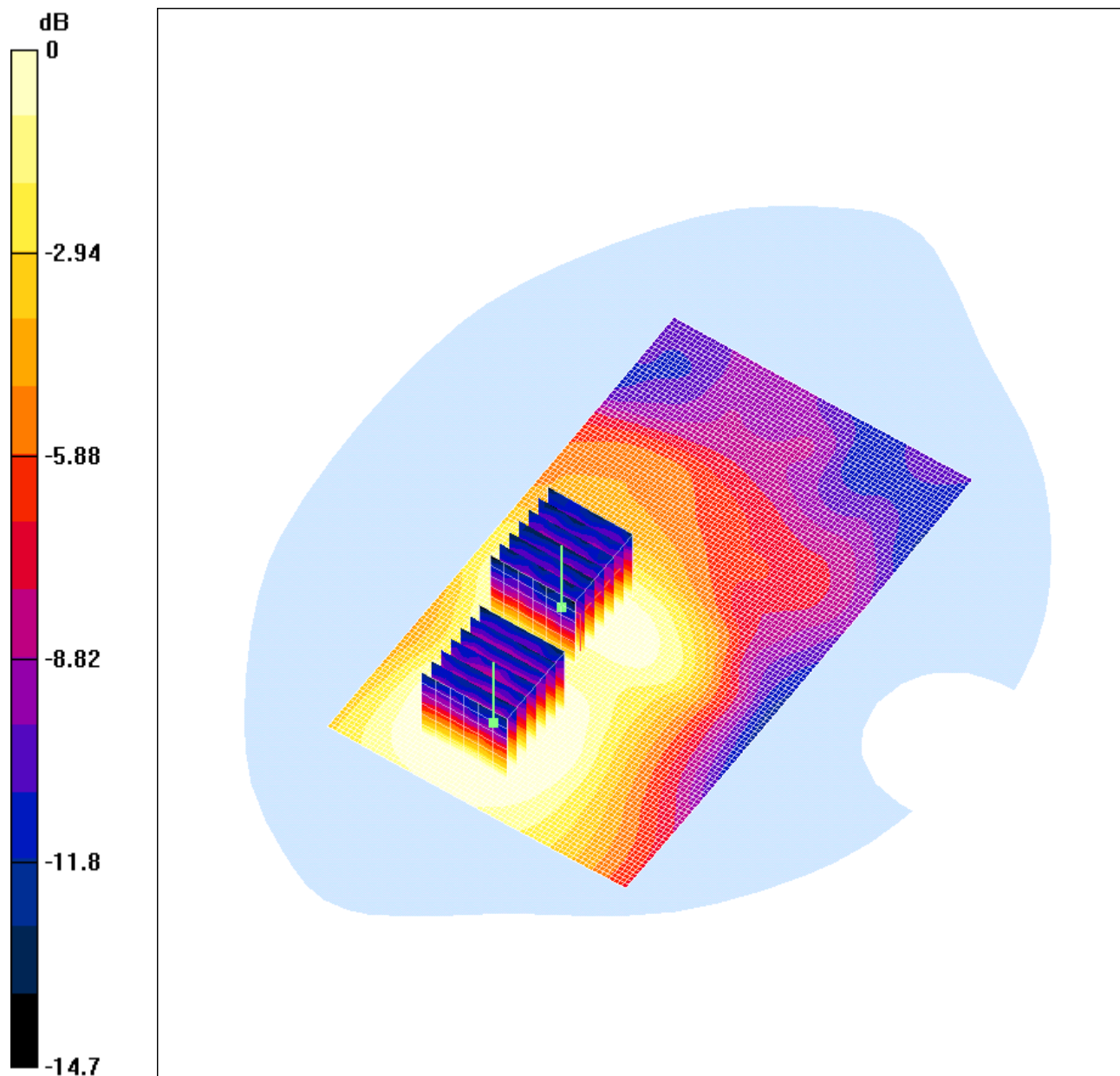
Date: 17/03/04

45219/JD02/005

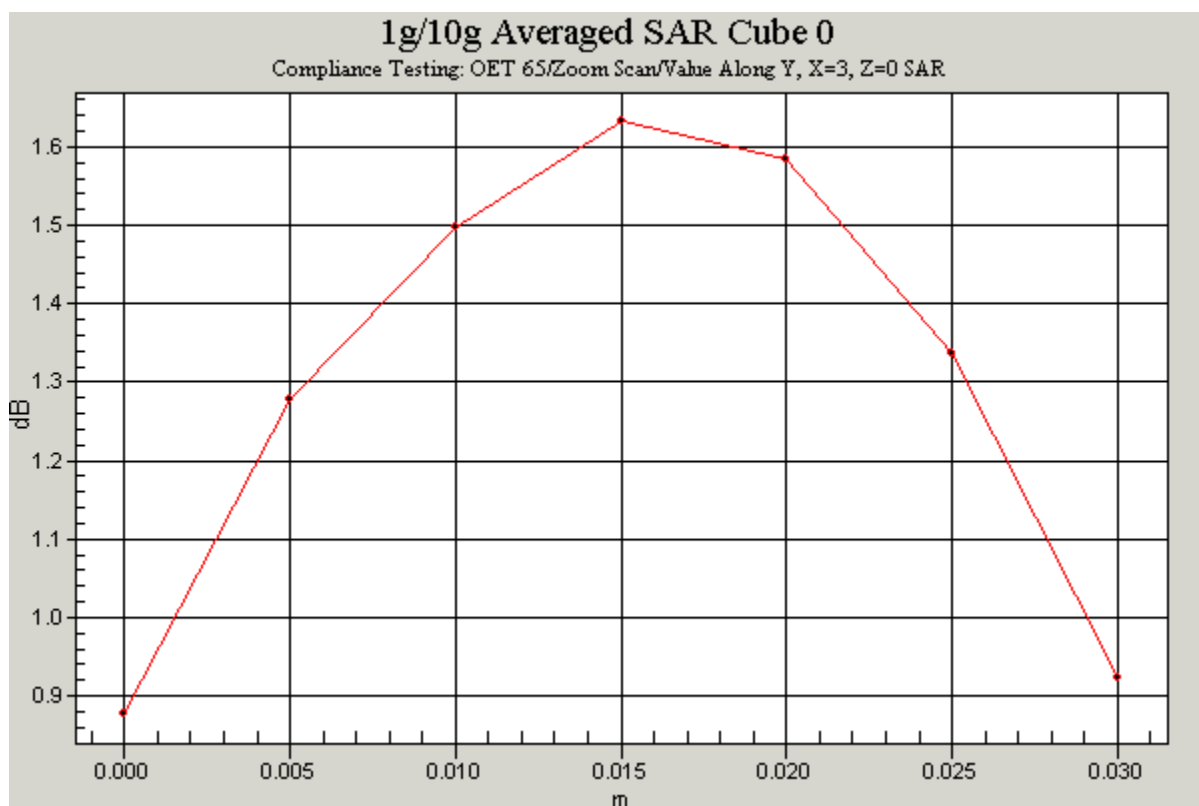
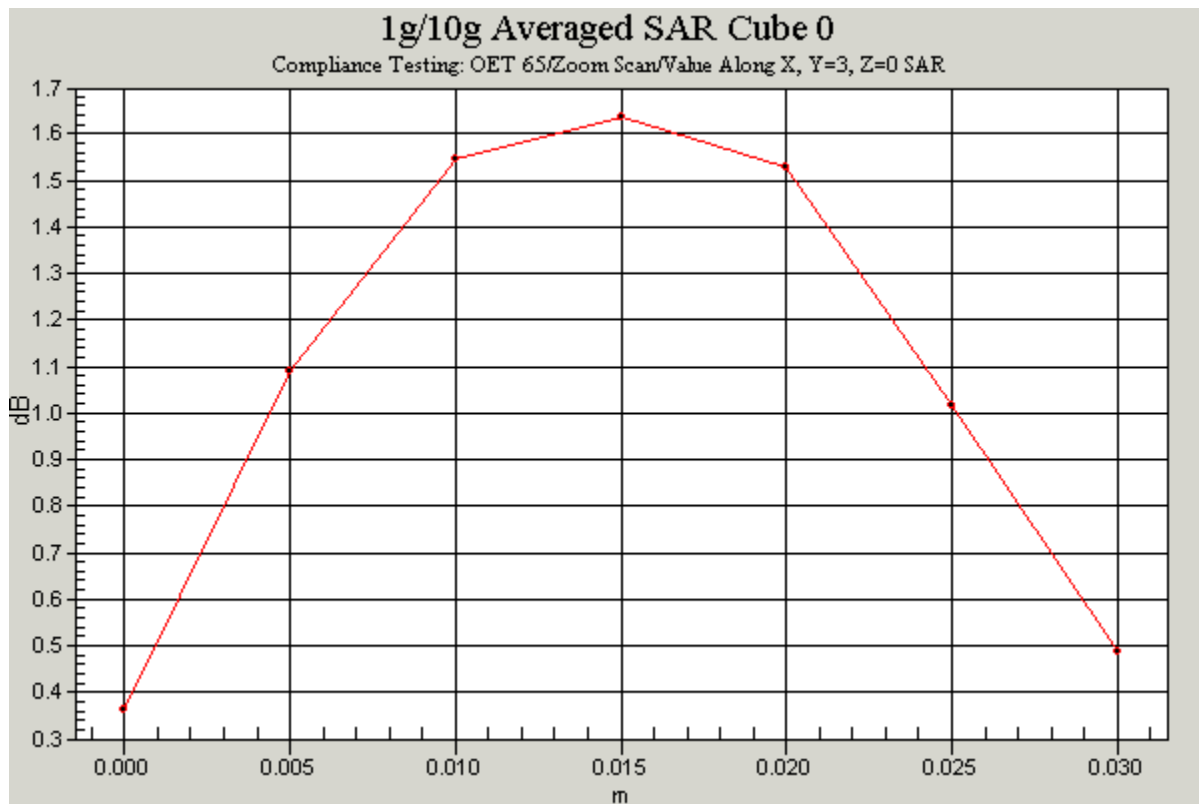
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

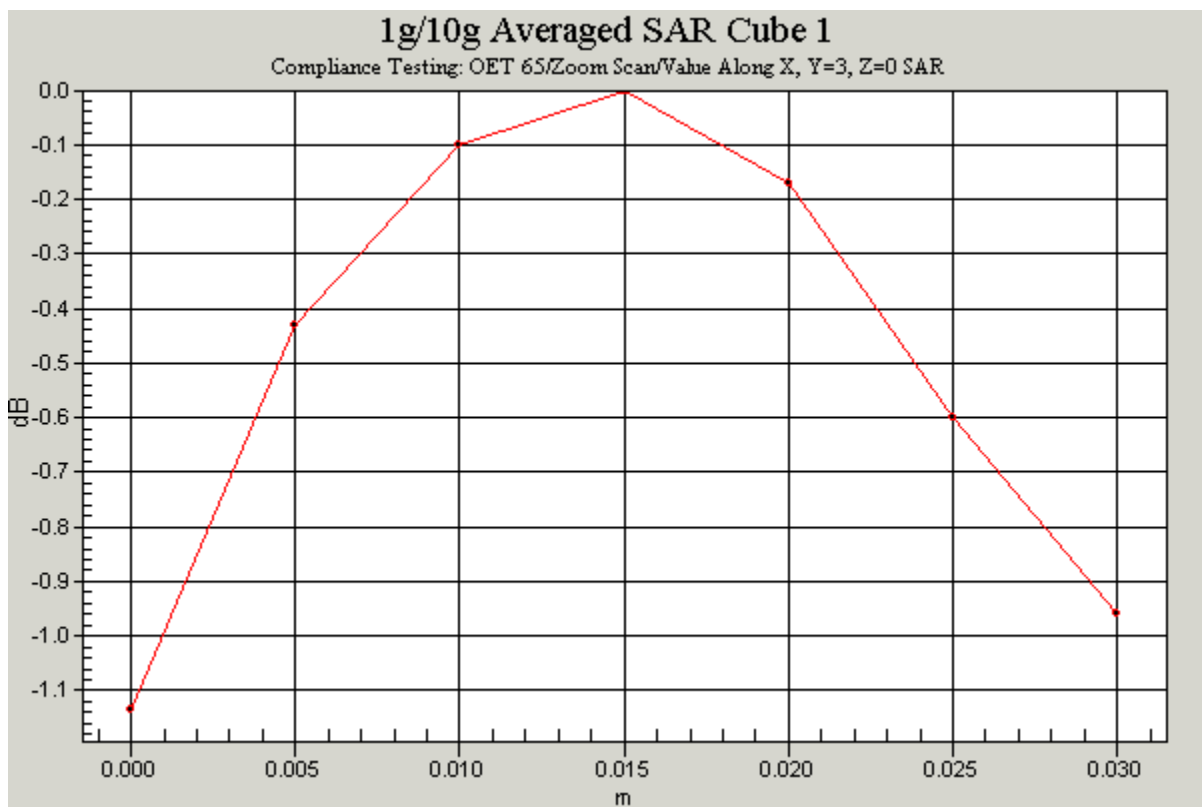
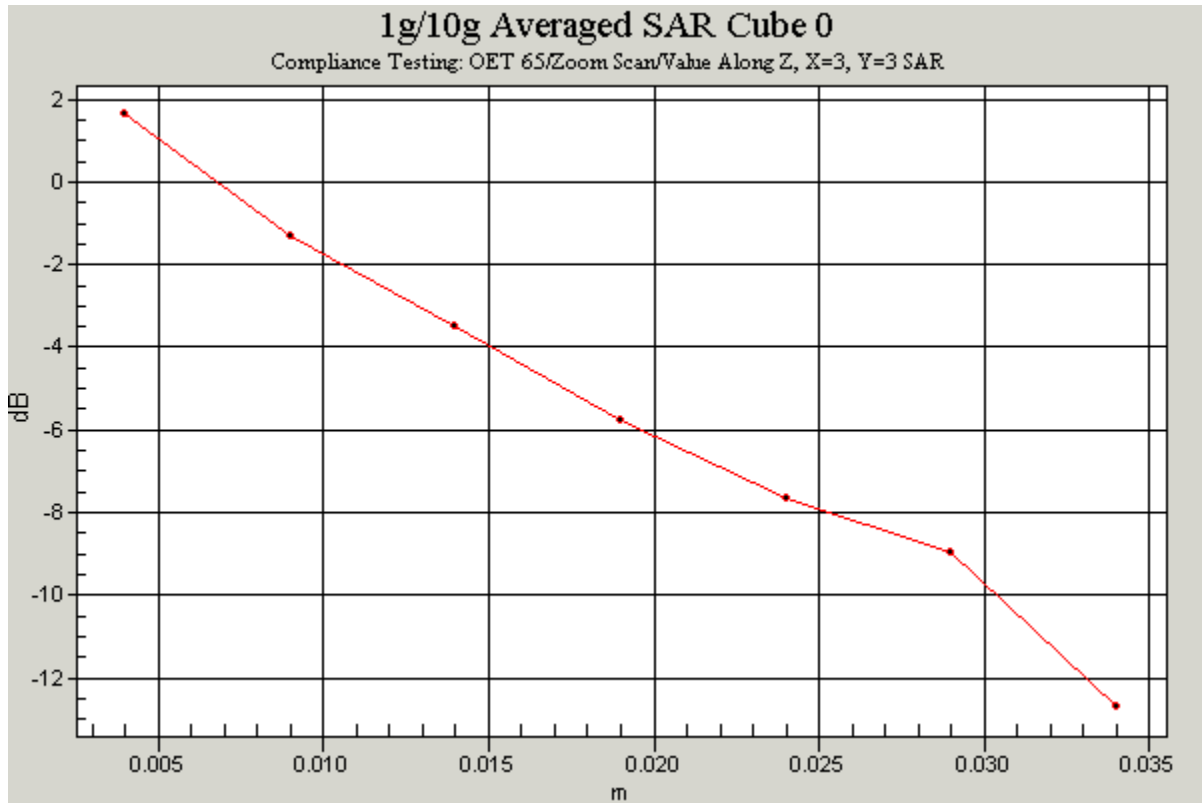
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_0 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**

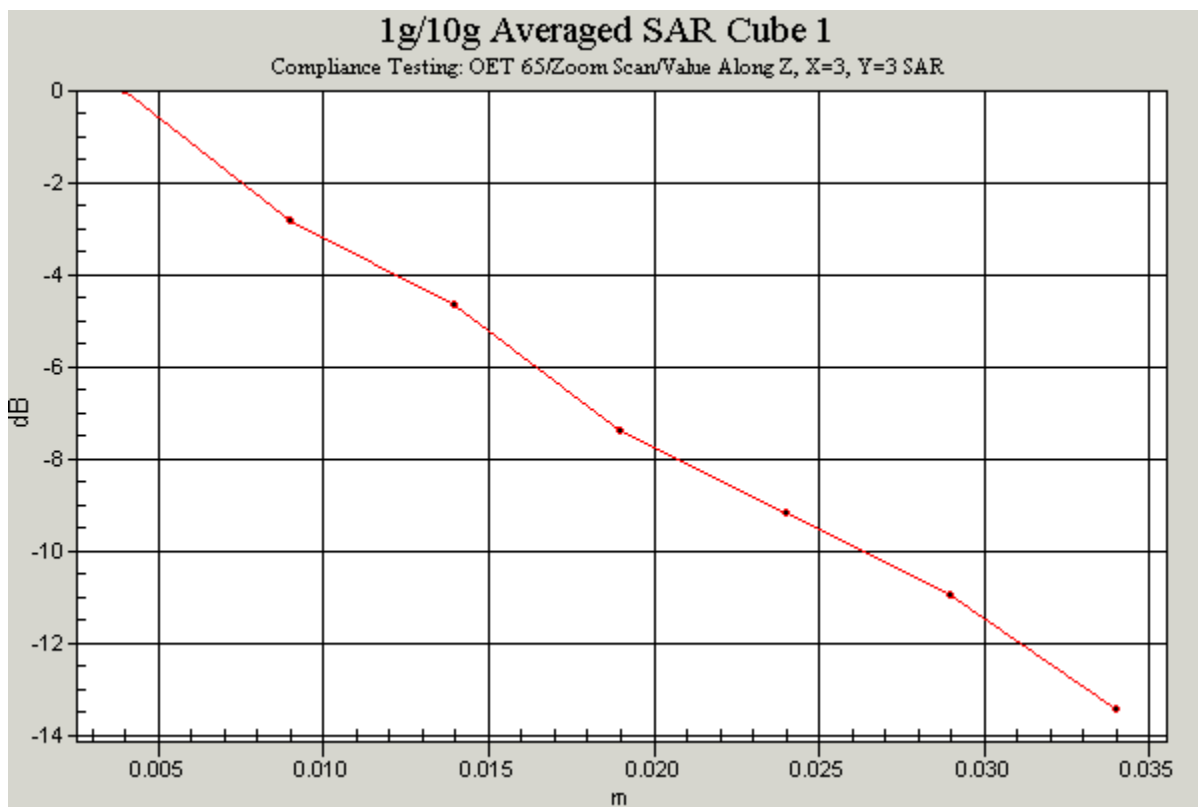
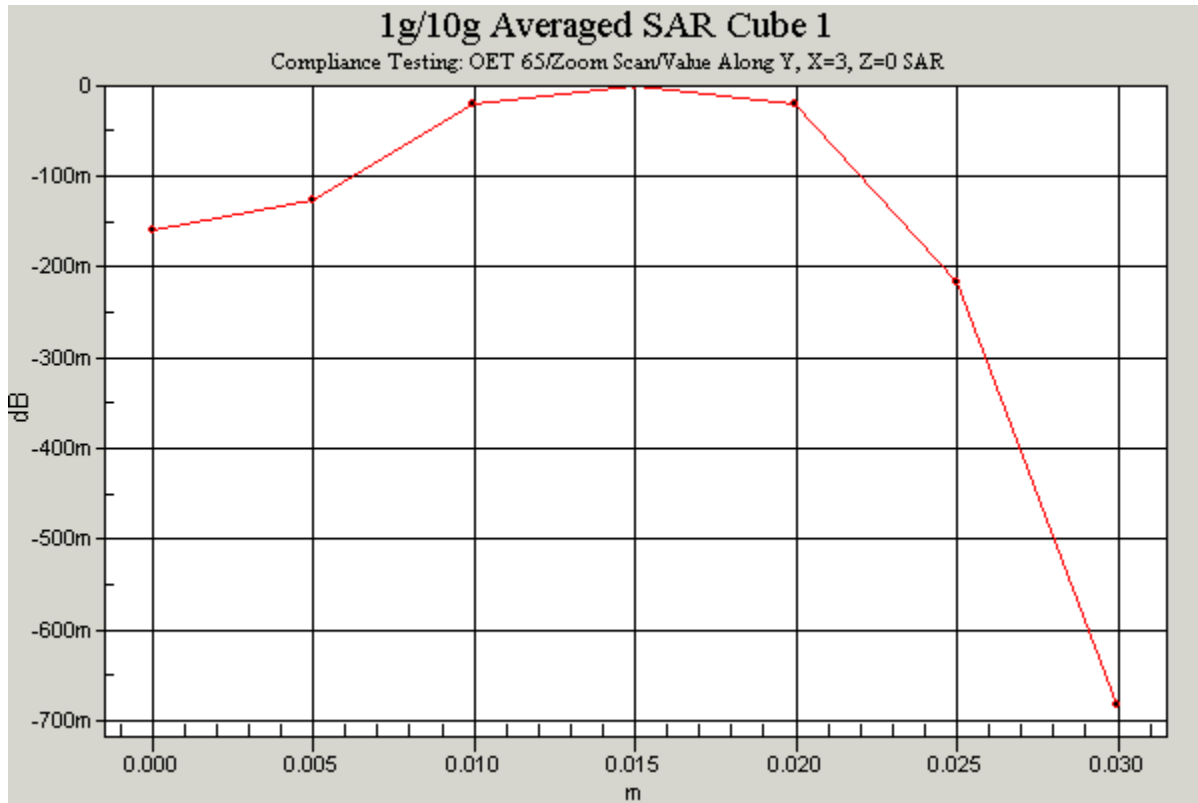


0 dB = 0.144mW/g









Communication System: TDCDMA - 12MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r =$

54.2;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**0 Degrees to Phantom/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.9 V/m; Power Drift = 0.2 dB

Maximum value of SAR (interpolated) = 0.216 mW/g

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.9 V/m; Power Drift = 0.2 dB

Maximum value of SAR (measured) = 0.210 mW/g

Peak SAR (extrapolated) = 0.445 W/kg

**SAR(1 g) = 0.204 mW/g; SAR(10 g) = 0.117 mW/g**

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.9 V/m; Power Drift = 0.2 dB

Maximum value of SAR (measured) = 0.144 mW/g

Peak SAR (extrapolated) = 0.290 W/kg

**SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.083 mW/g**

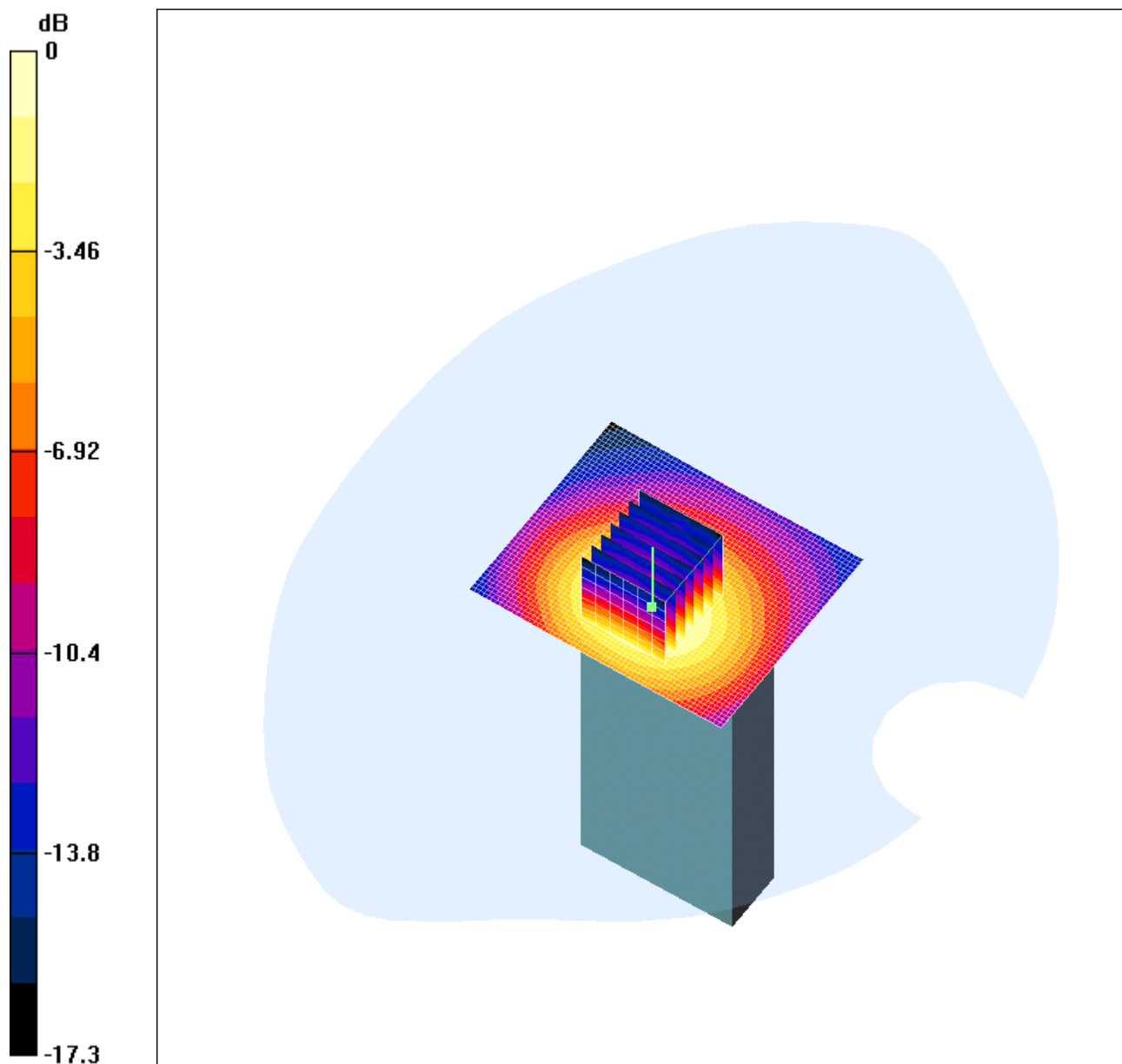
Date: 17/03/04

45219/JD02/006

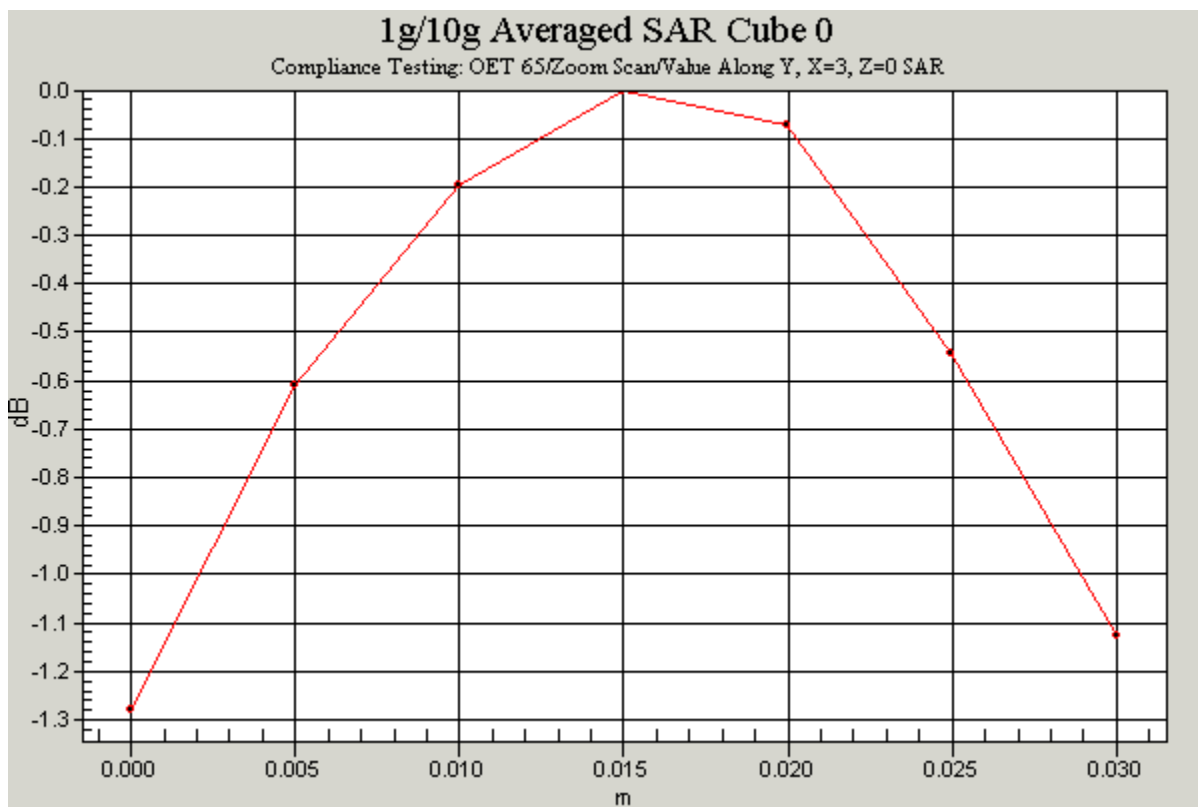
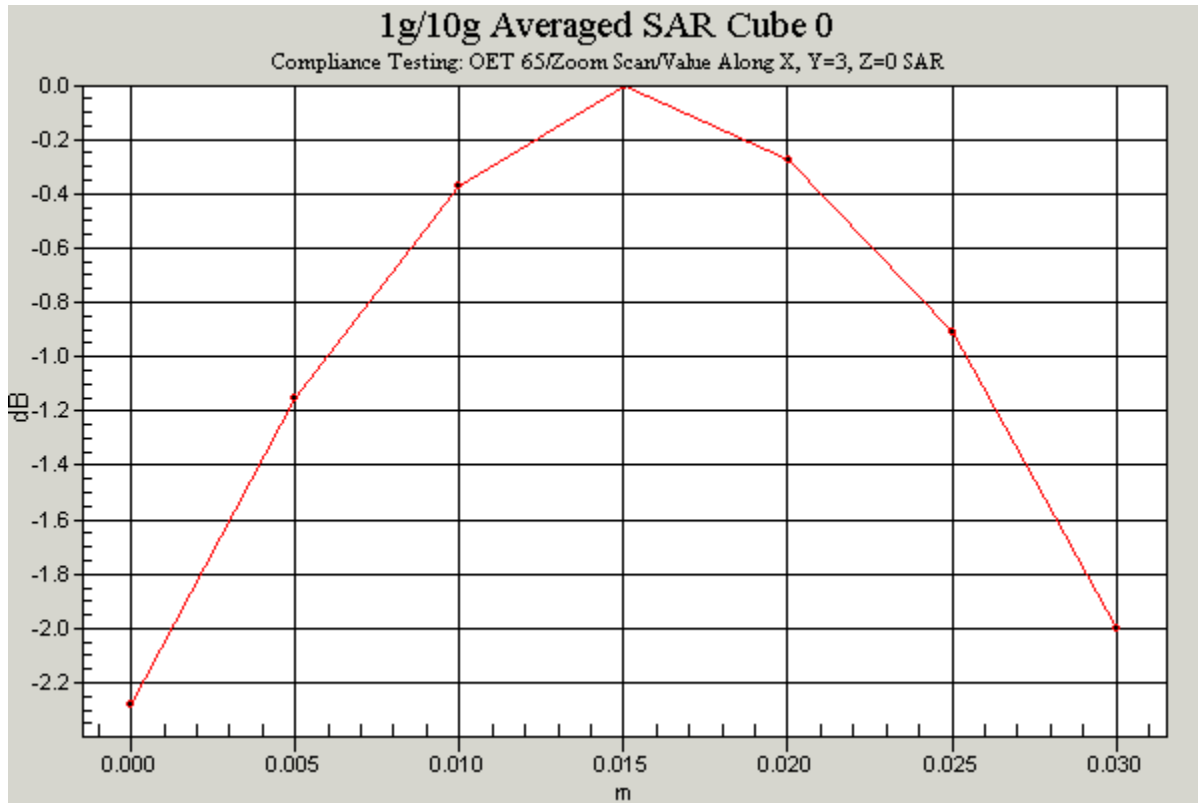
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

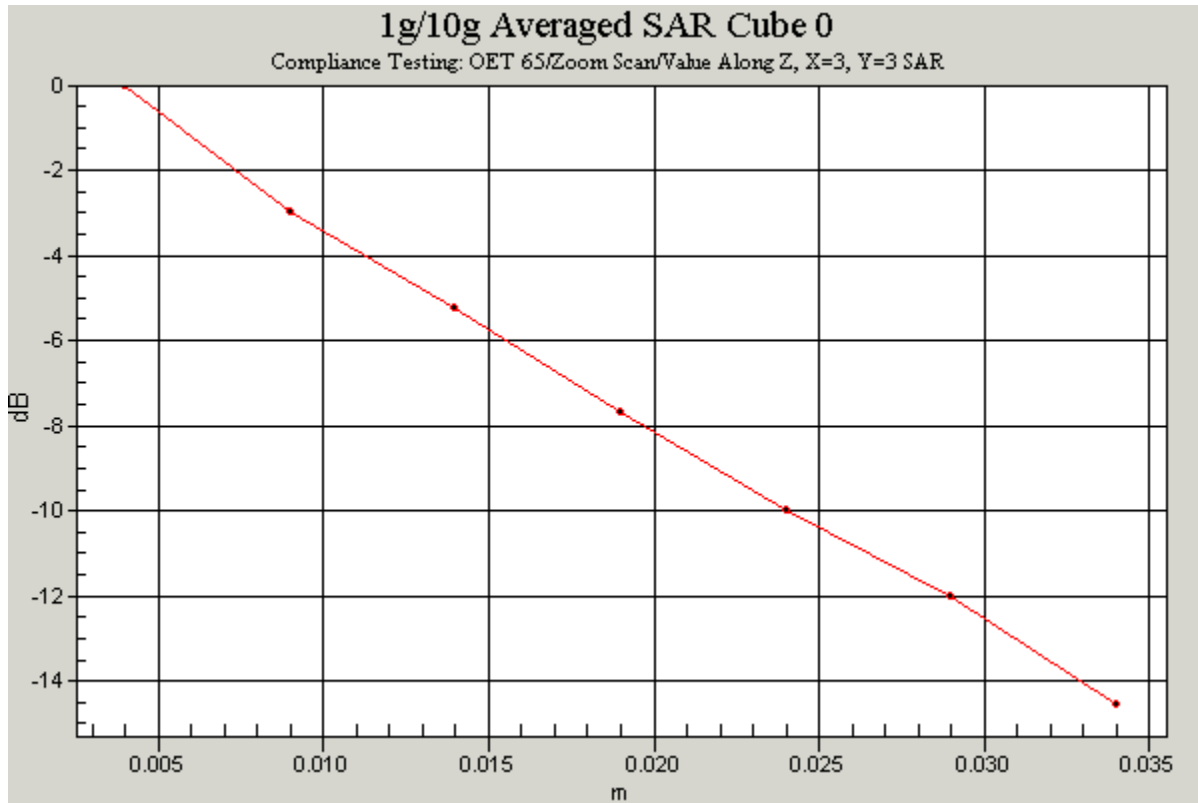
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.644mW/g





Communication System: TDCDMA - 12MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 15.8 V/m; Power Drift = -0.0 dB  
 Maximum value of SAR (interpolated) = 0.625 mW/g

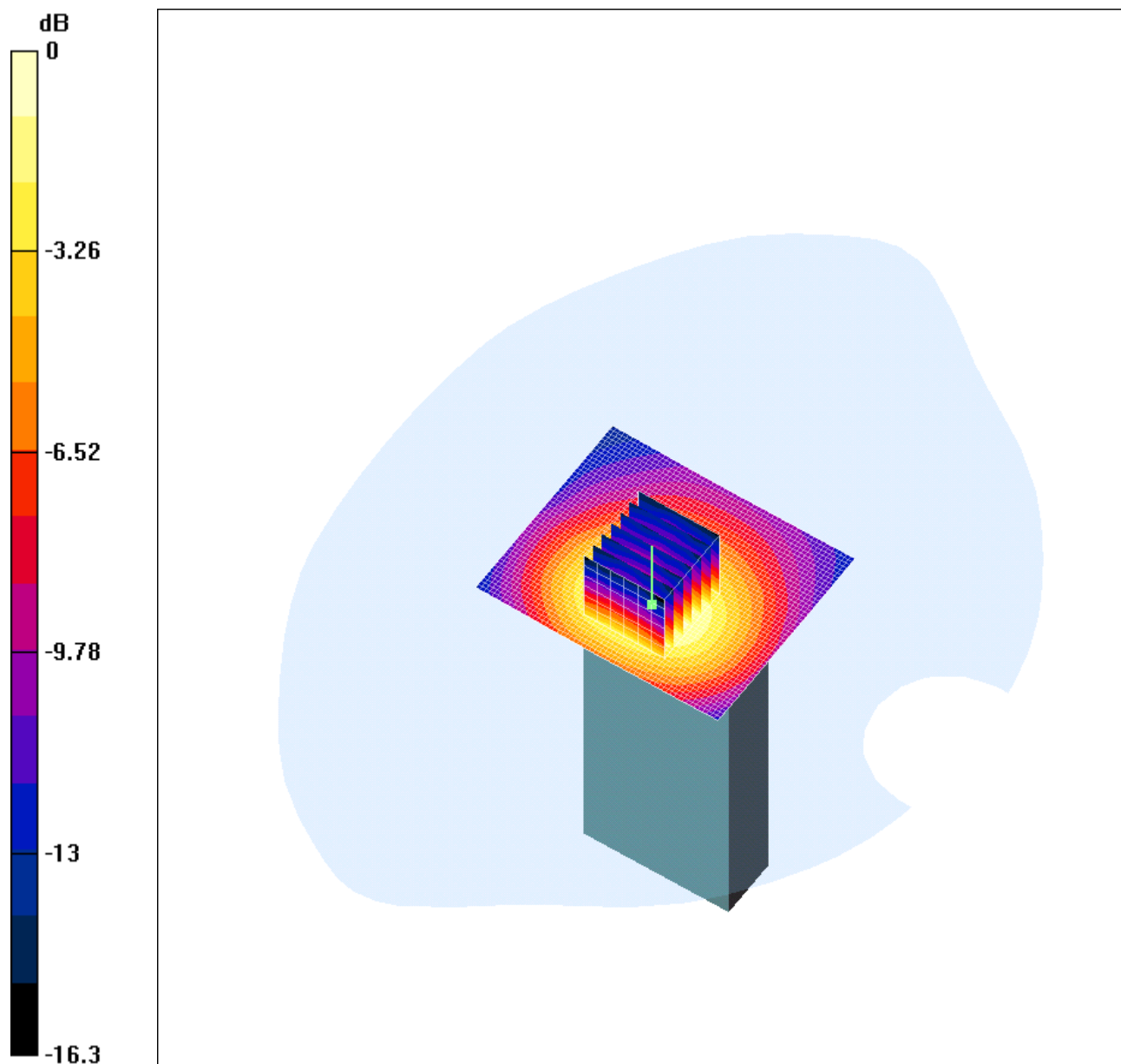
**90 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 15.8 V/m; Power Drift = -0.0 dB  
 Maximum value of SAR (measured) = 0.644 mW/g  
 Peak SAR (extrapolated) = 1.35 W/kg  
**SAR(1 g) = 0.610 mW/g; SAR(10 g) = 0.335 mW/g**

Date: 17/03/04

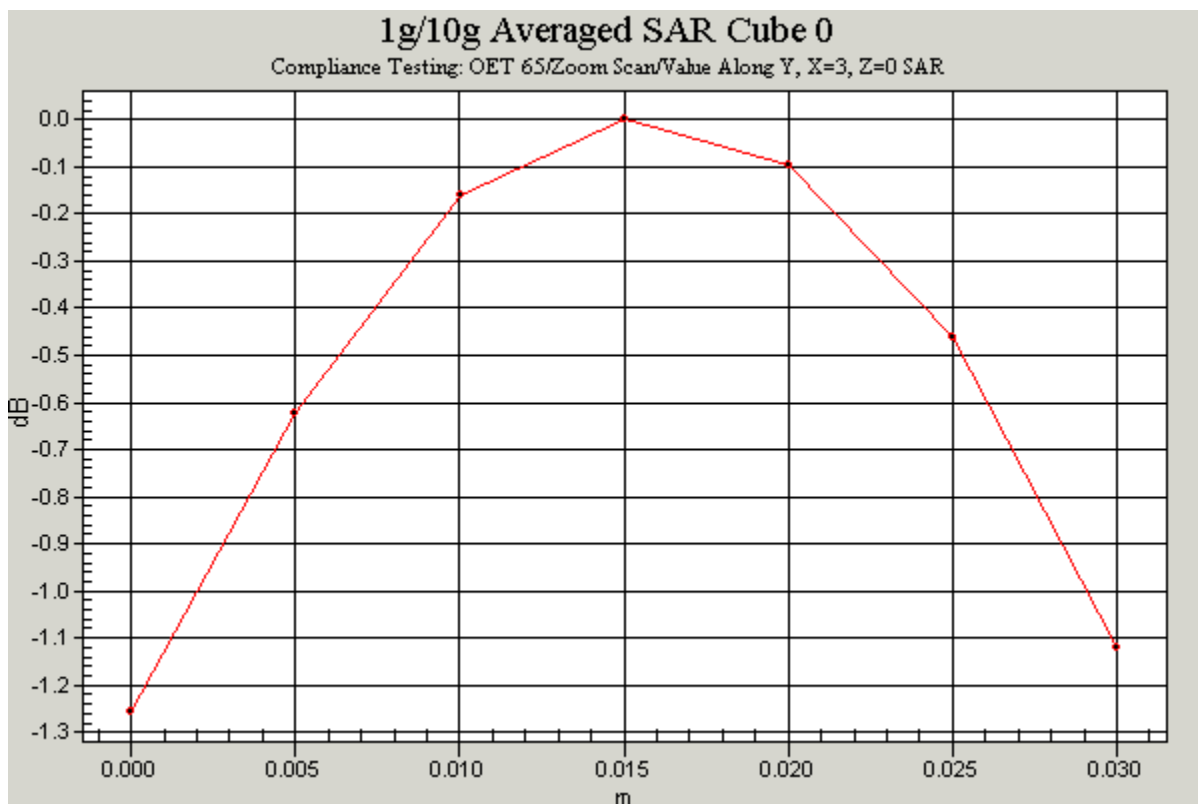
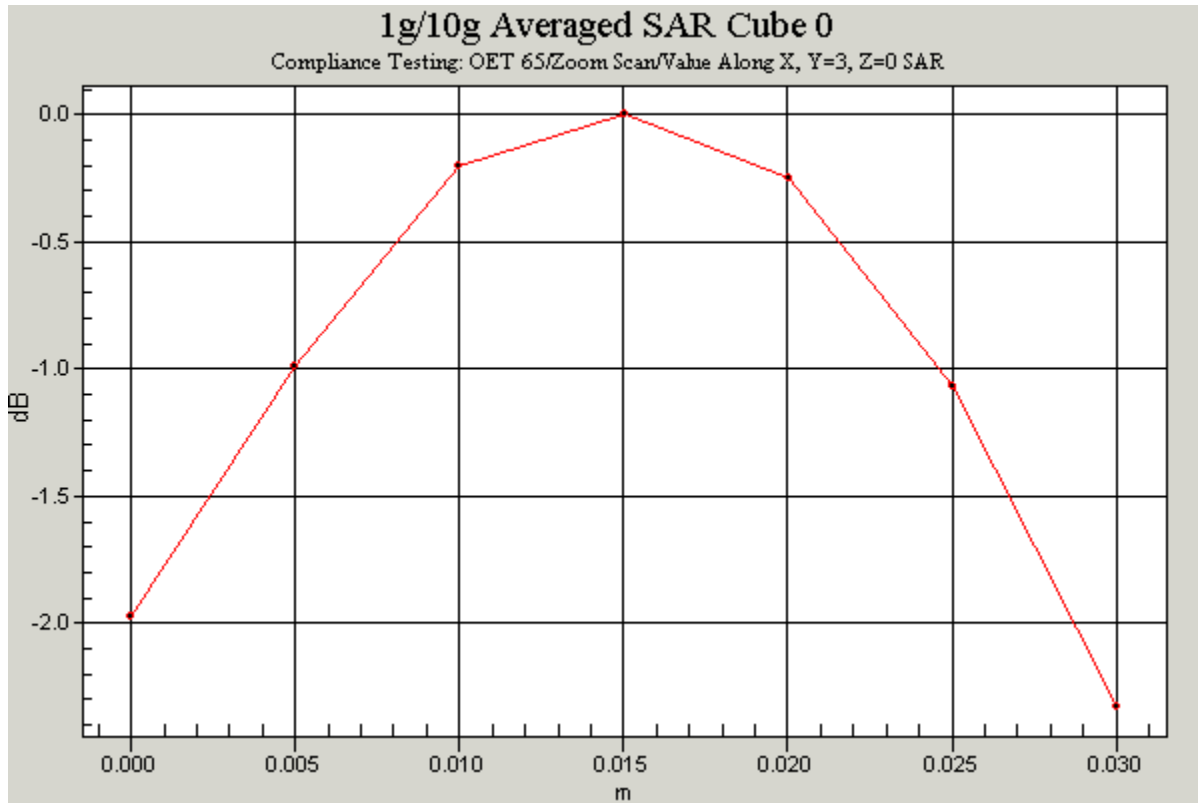
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

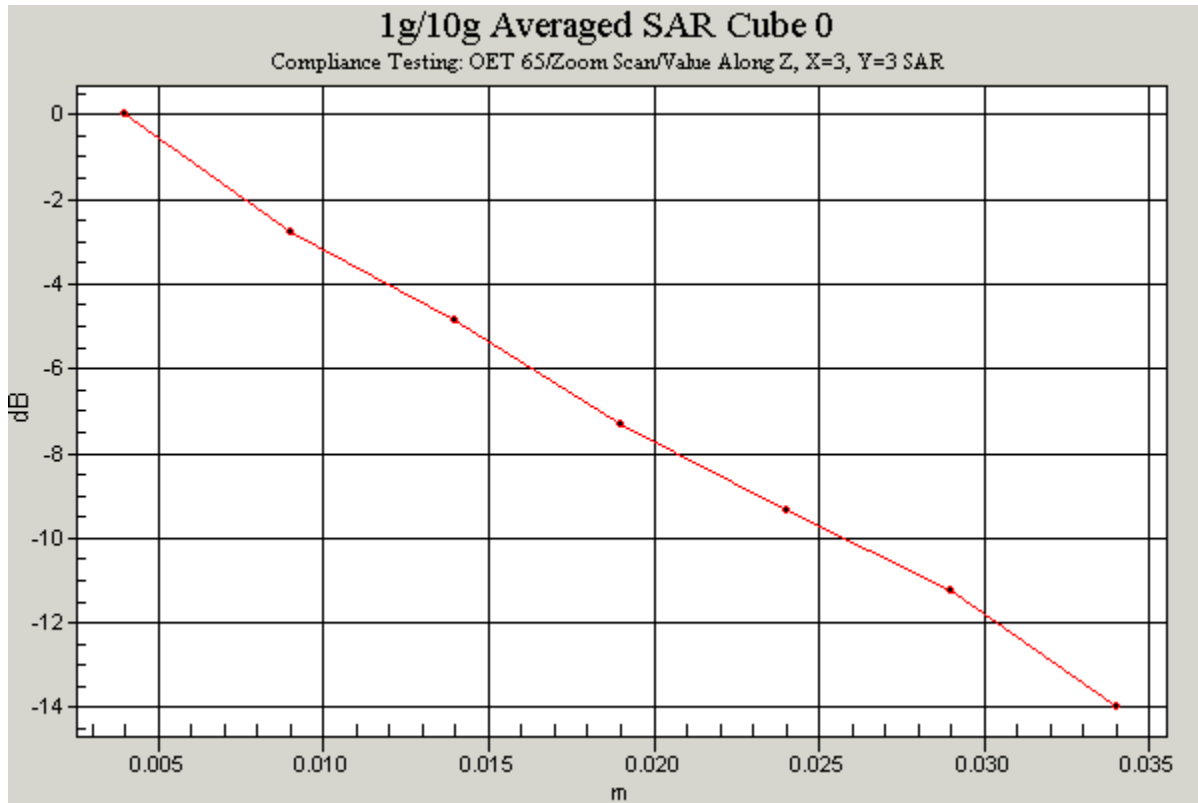
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_ 90 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.422mW/g





Communication System: TDCDMA - 12MHz Channel; Frequency: 2506 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2506$  MHz;  $\sigma = 2.05$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Bottom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 13.4 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (interpolated) = 0.421 mW/g

**90 Degrees to Phantom - Bottom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 13.4 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (measured) = 0.422 mW/g  
 Peak SAR (extrapolated) = 0.863 W/kg  
**SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.225 mW/g**



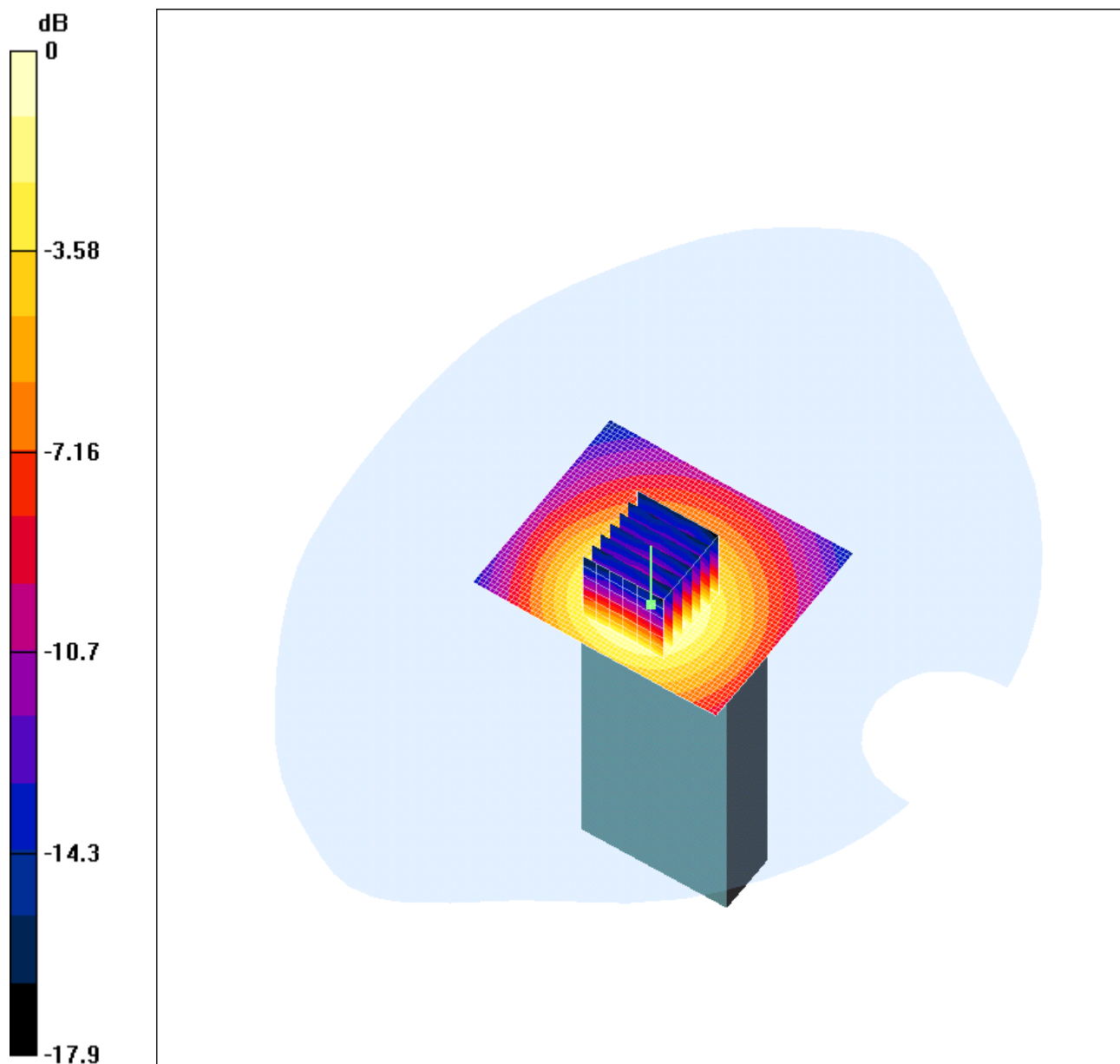
Date: 17/03/04

45219/JD02/008

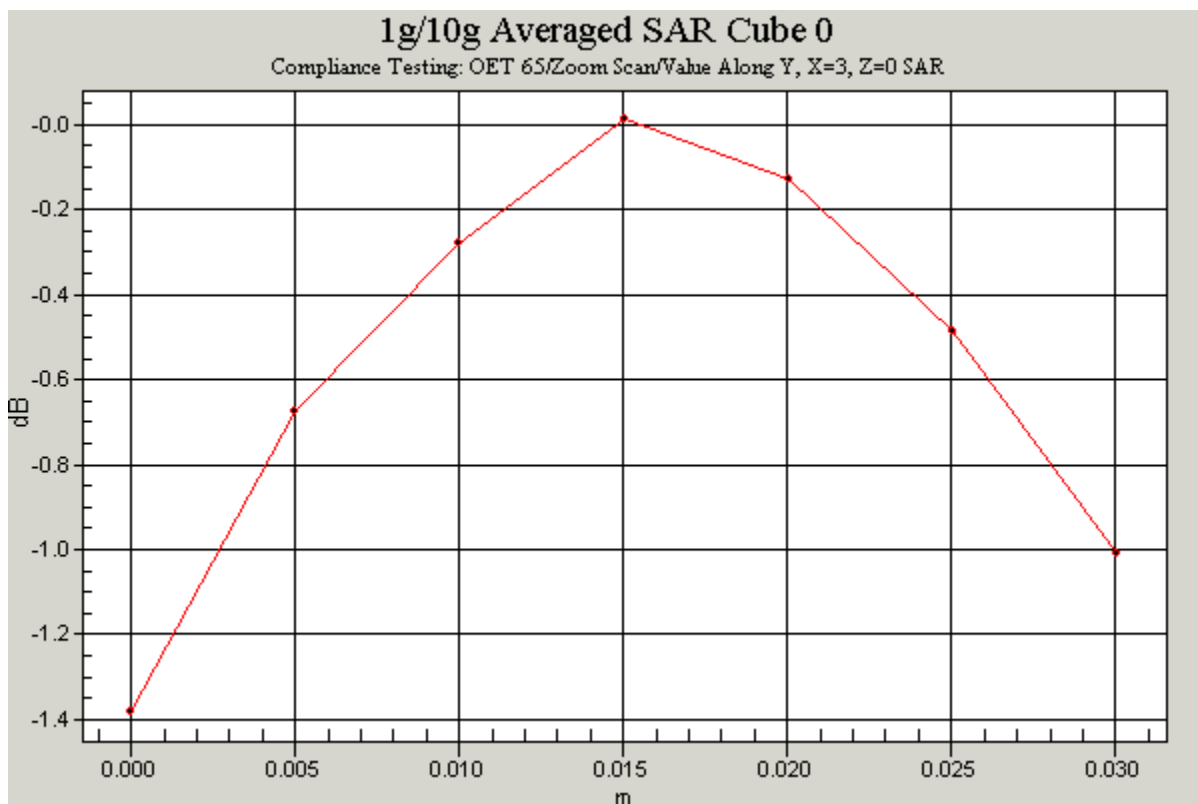
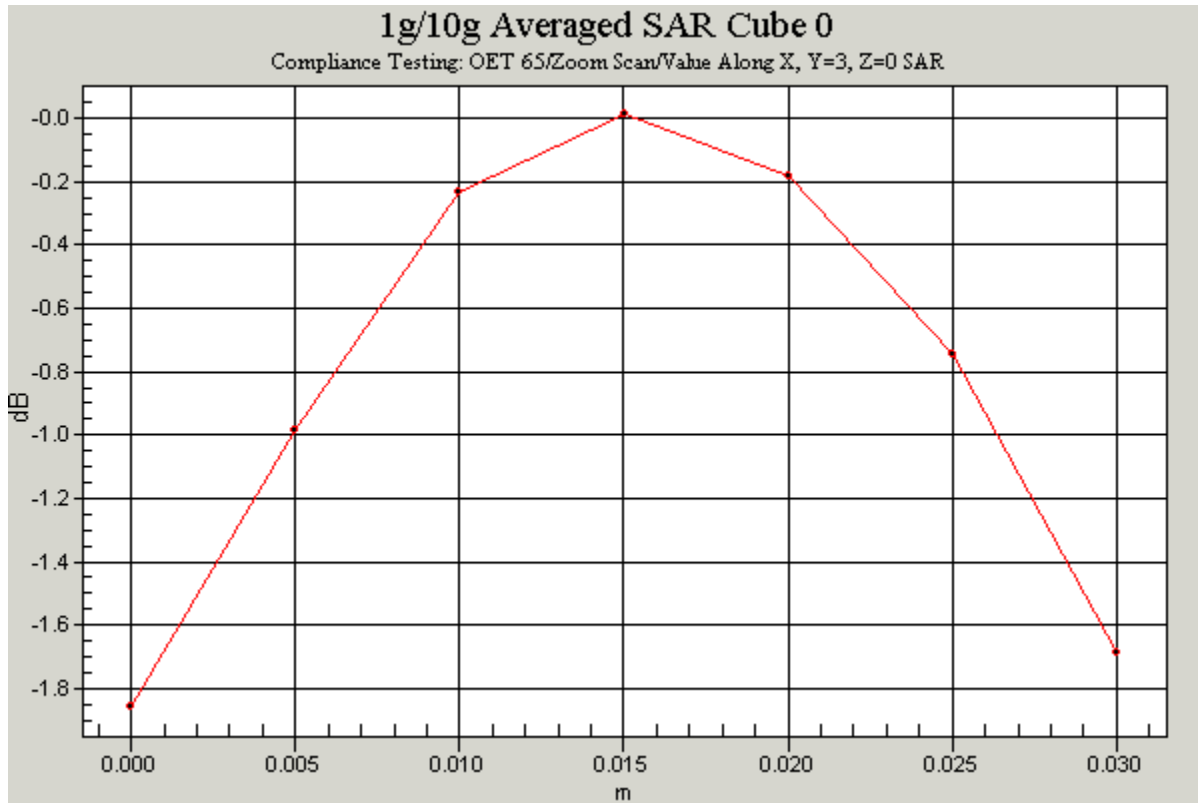
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

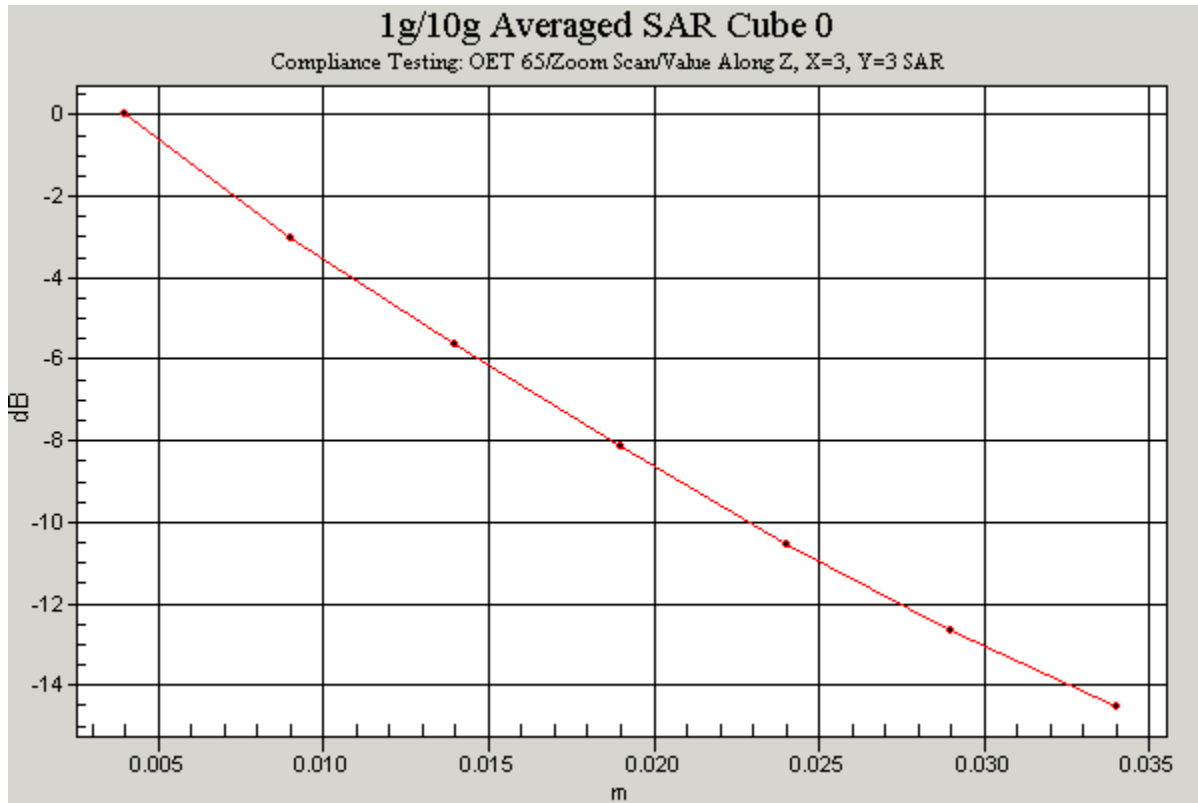
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_ACer Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.611mW/g





Communication System: TDCDMA - 12MHz Channel; Frequency: 2680 MHz; Duty Cycle: 1:3  
Medium: 2450MHz MSL Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.3$  mho/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Top/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 14.9 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.608 mW/g

**90 Degrees to Phantom - Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.9 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.611 mW/g

Peak SAR (extrapolated) = 1.3 W/kg

**SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.318 mW/g**

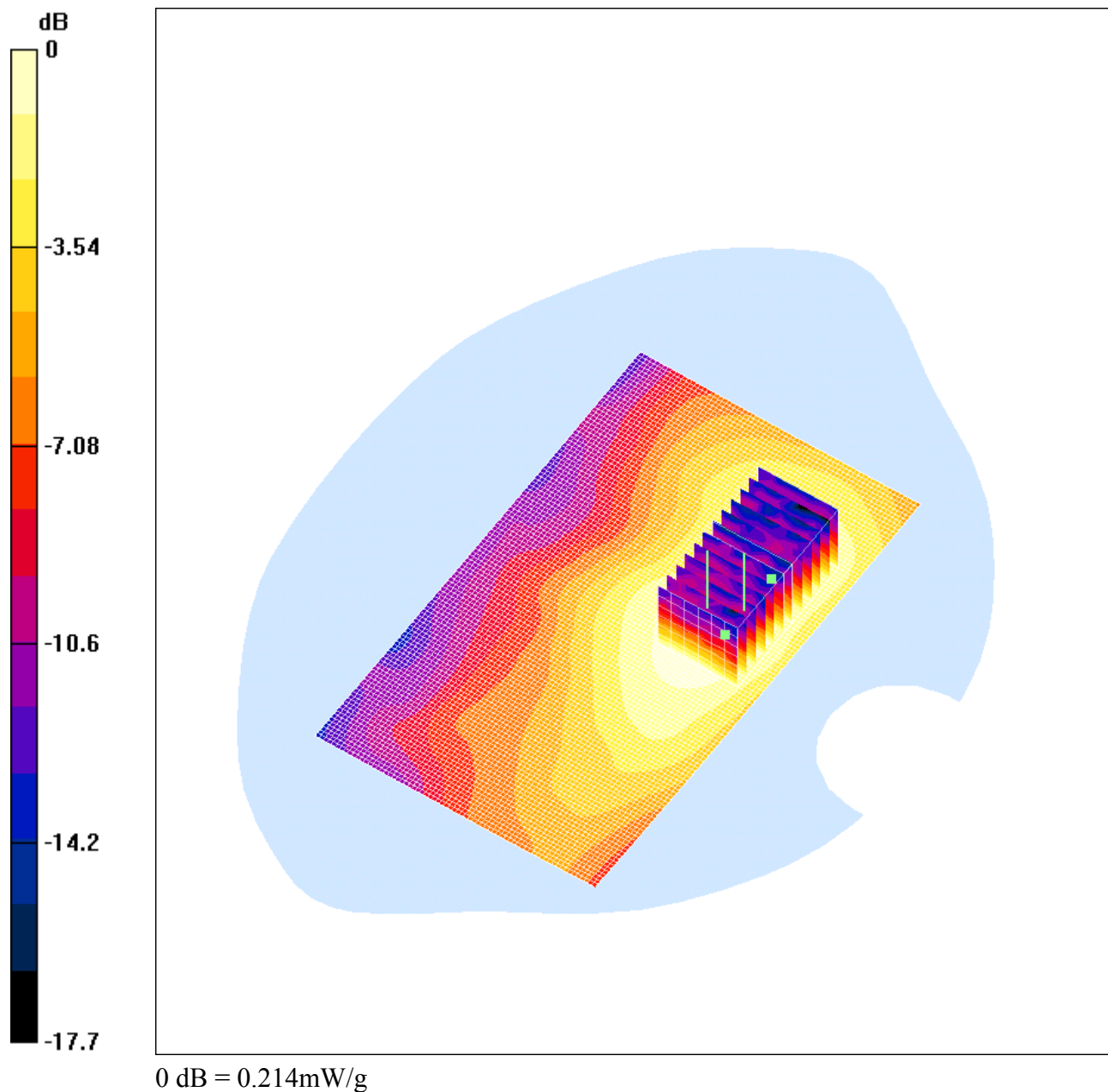
Date:18/03/04

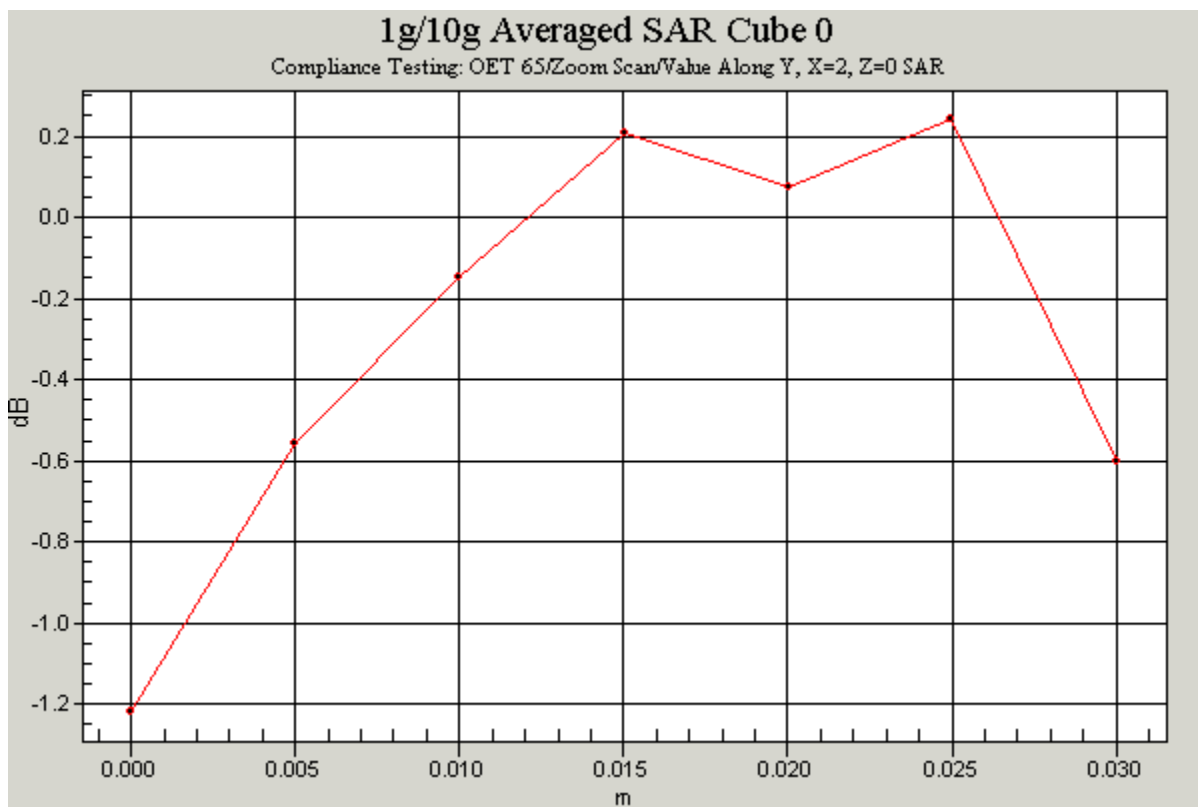
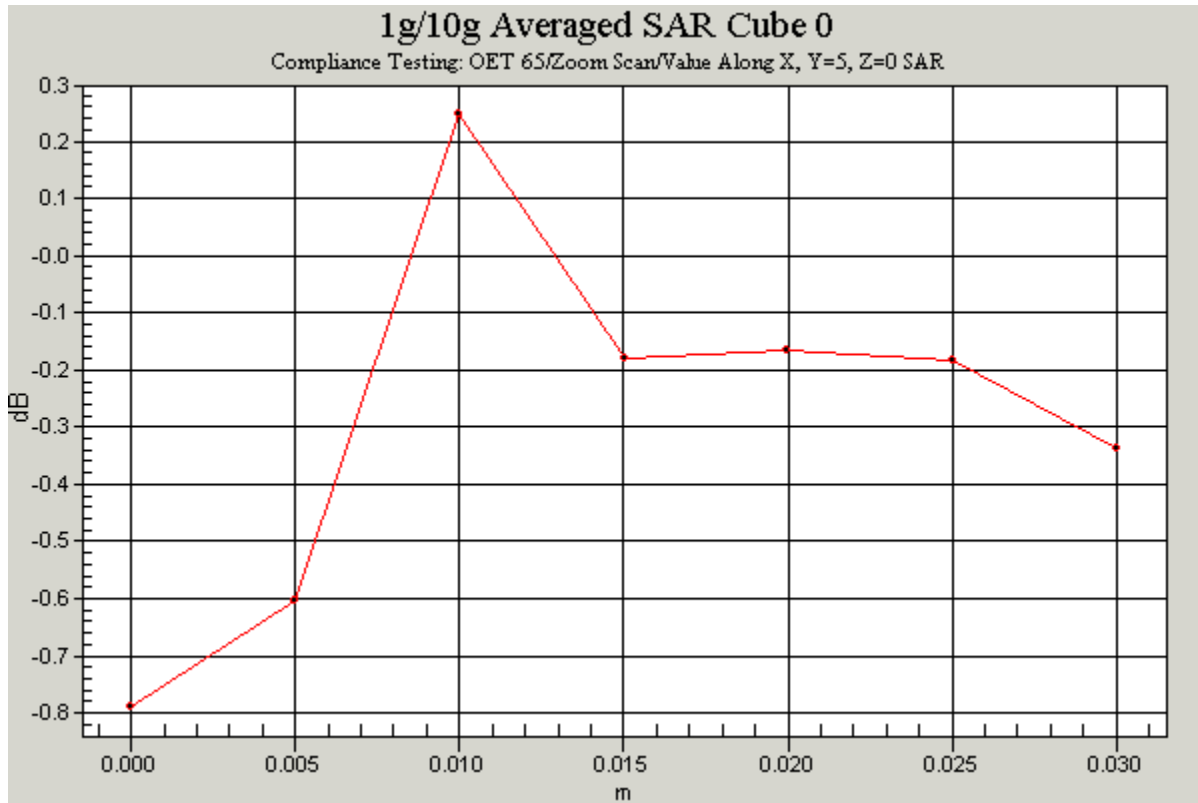
45219/JD02/009

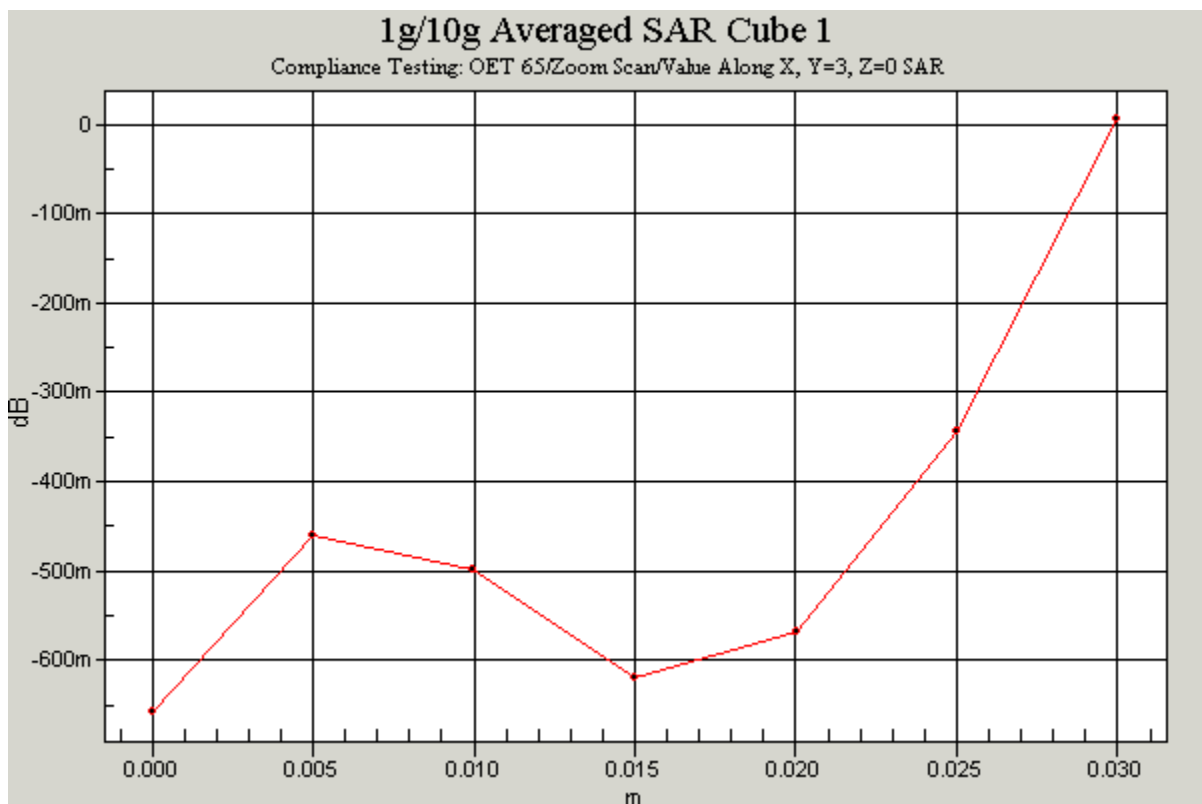
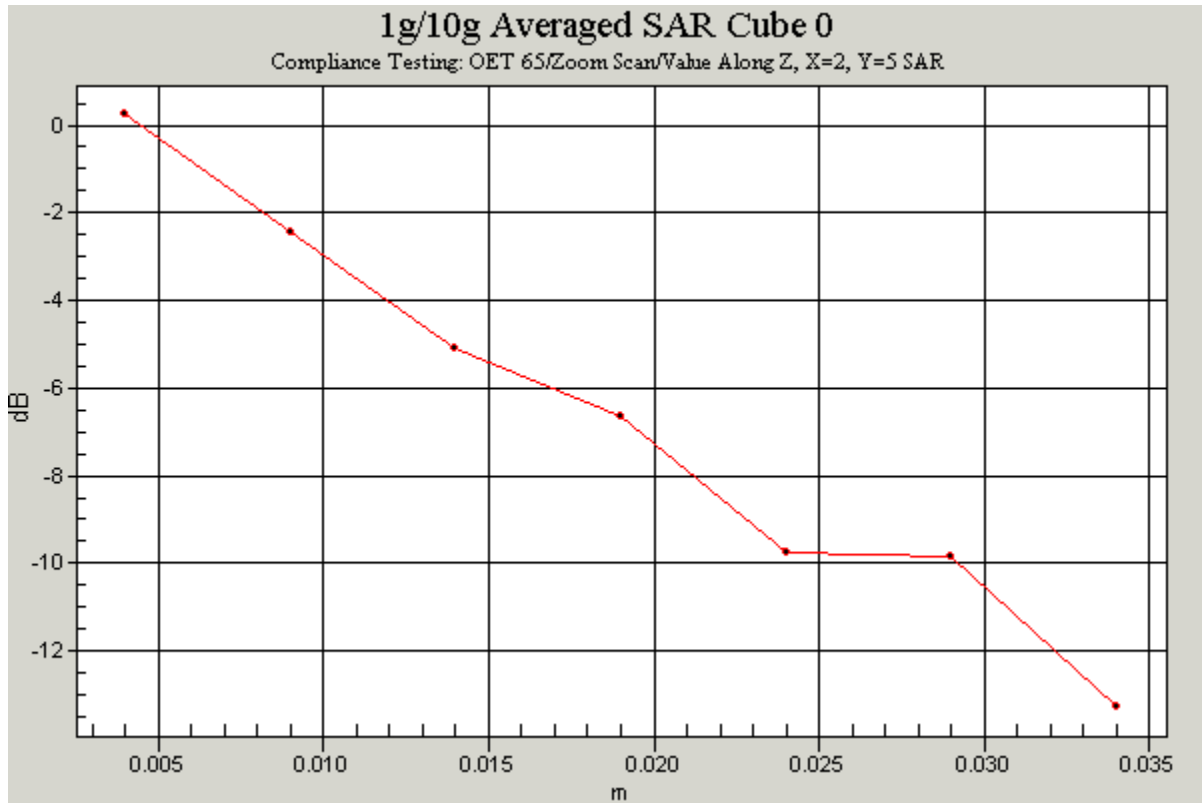
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

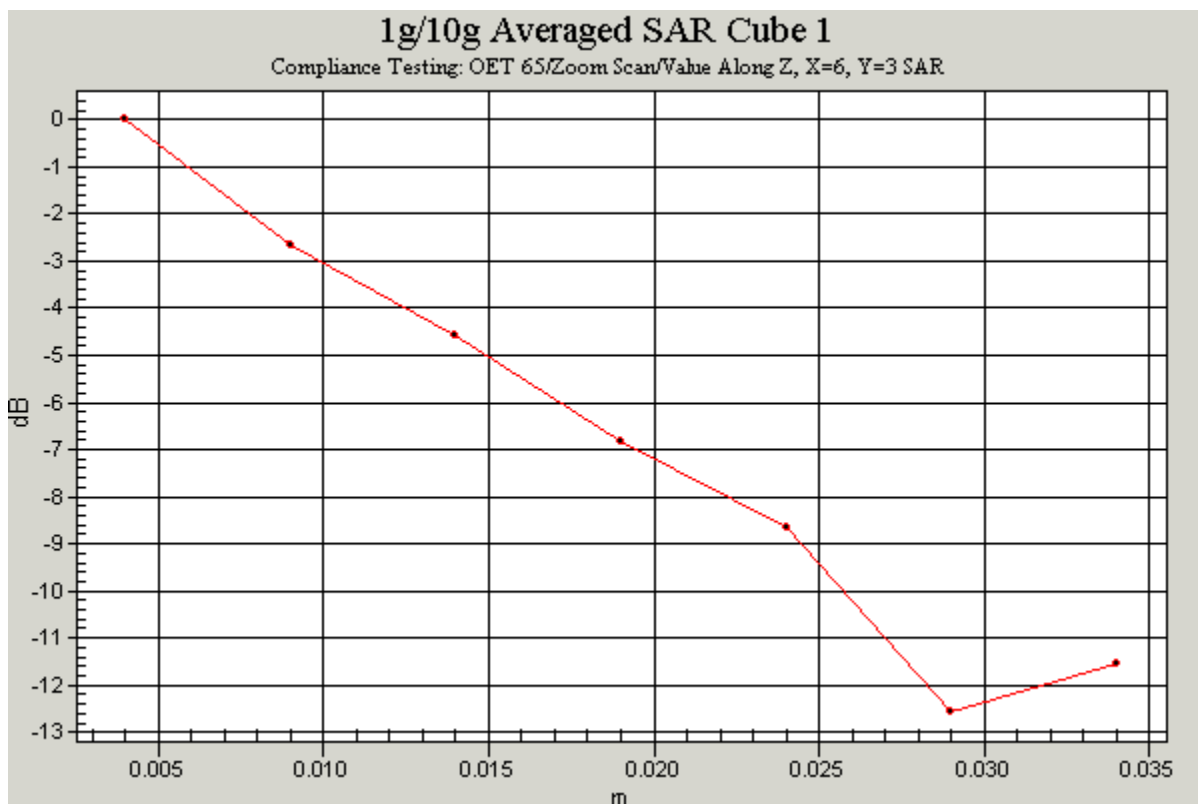
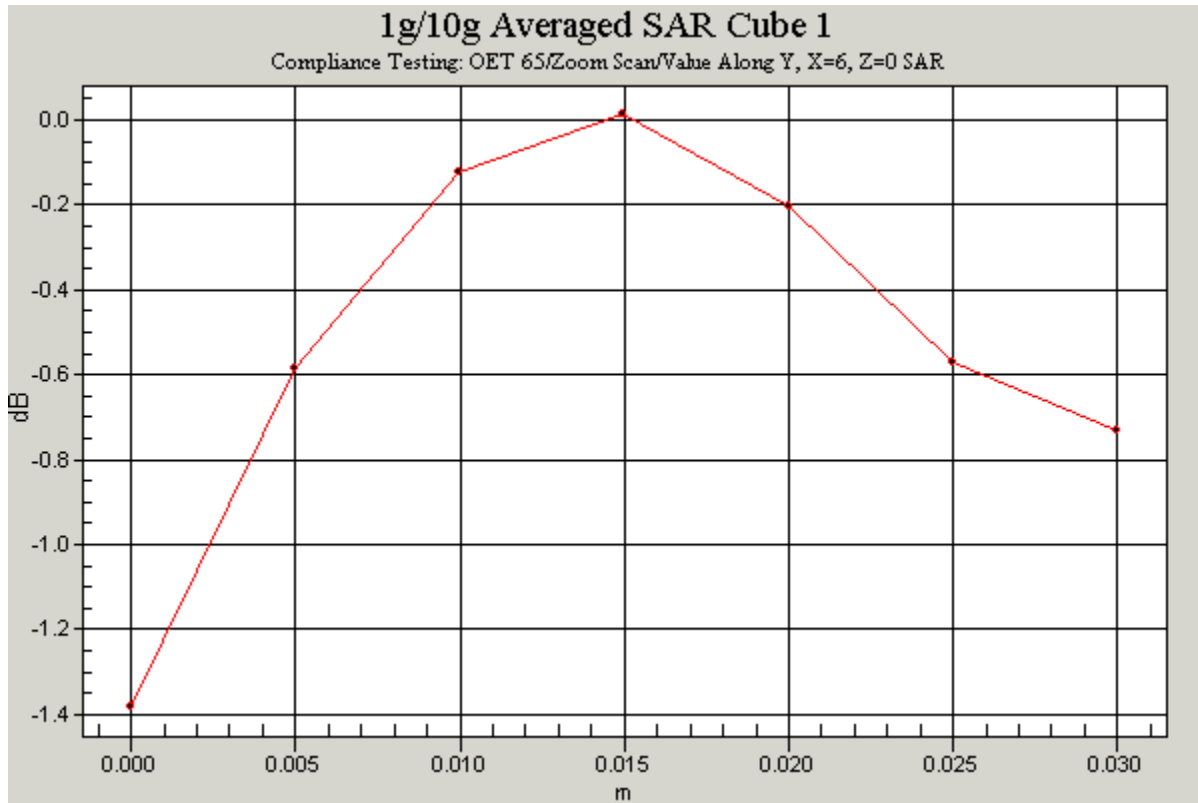
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_0 Degrees to Phantom\_Sony Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**









Communication System: TDCDMA - 6MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r =$

54.2;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**0 Degrees to Phantom/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 7.65 V/m; Power Drift = 0.2 dB

Maximum value of SAR (interpolated) = 0.221 mW/g

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.65 V/m; Power Drift = 0.2 dB

Maximum value of SAR (measured) = 0.226 mW/g

Peak SAR (extrapolated) = 0.455 W/kg

**SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.127 mW/g**

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.65 V/m; Power Drift = 0.2 dB

Maximum value of SAR (measured) = 0.214 mW/g

Peak SAR (extrapolated) = 0.430 W/kg

**SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.114 mW/g**



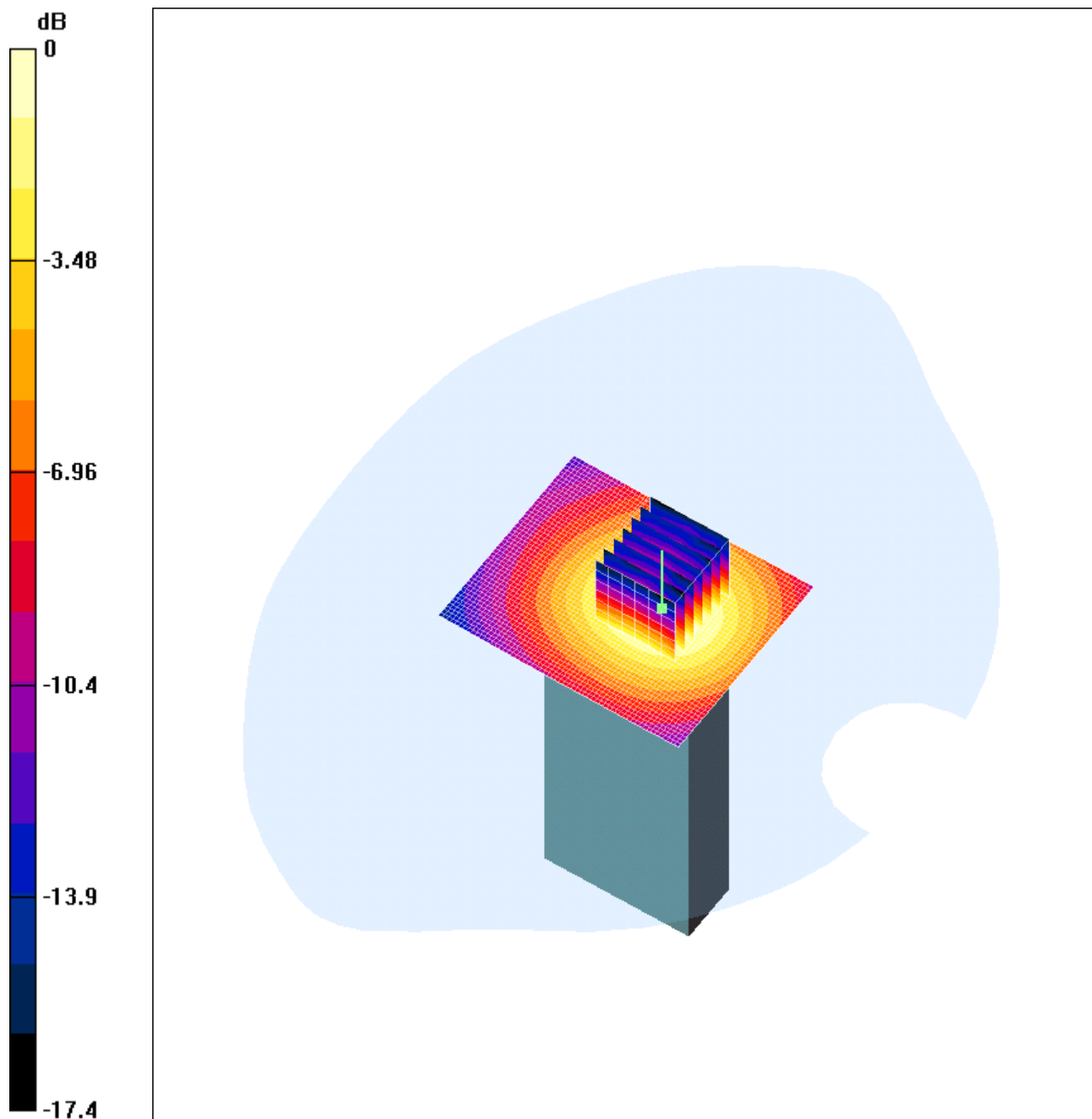
Date: 18/03/04

45219/JD02/010

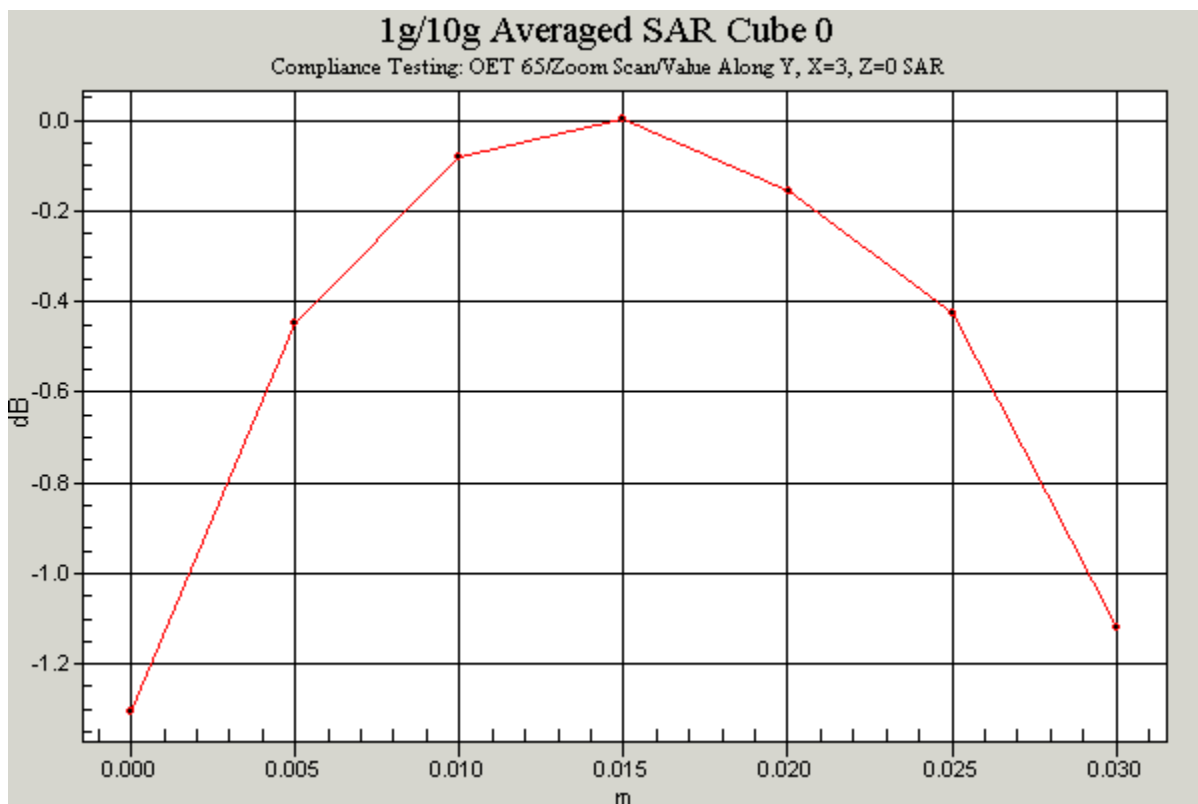
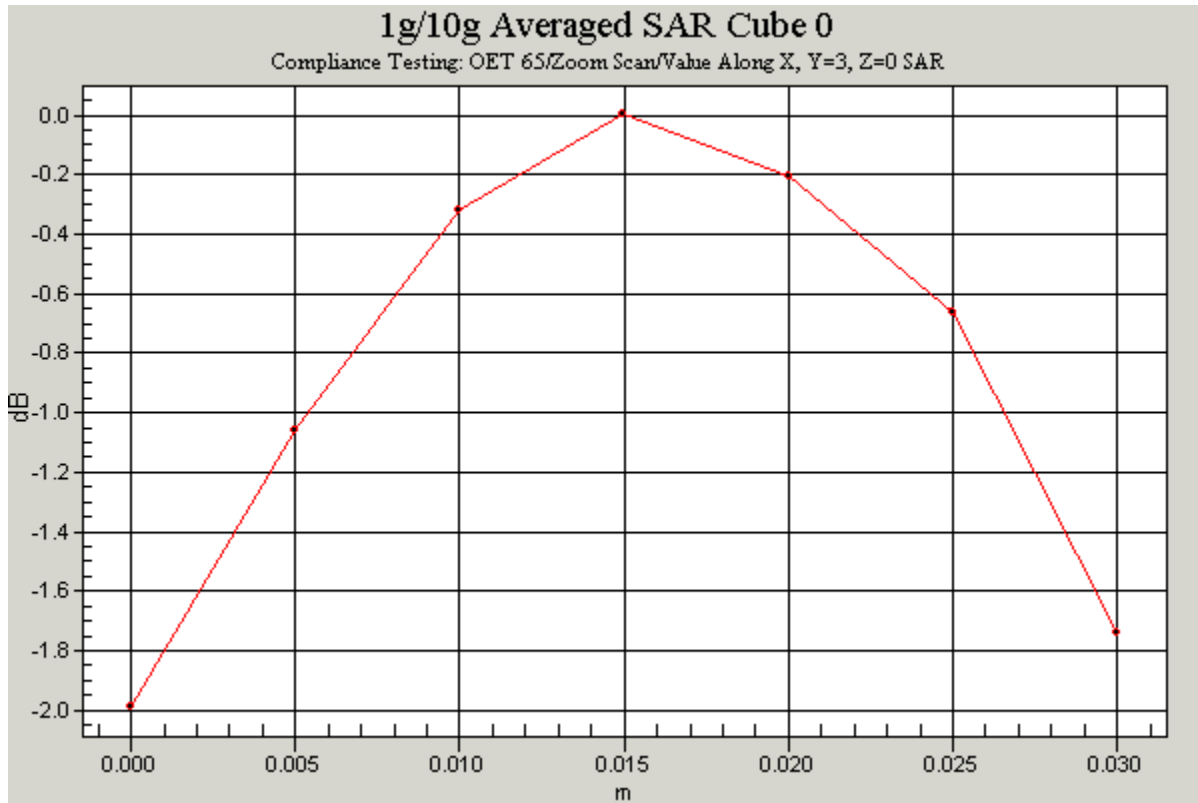
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

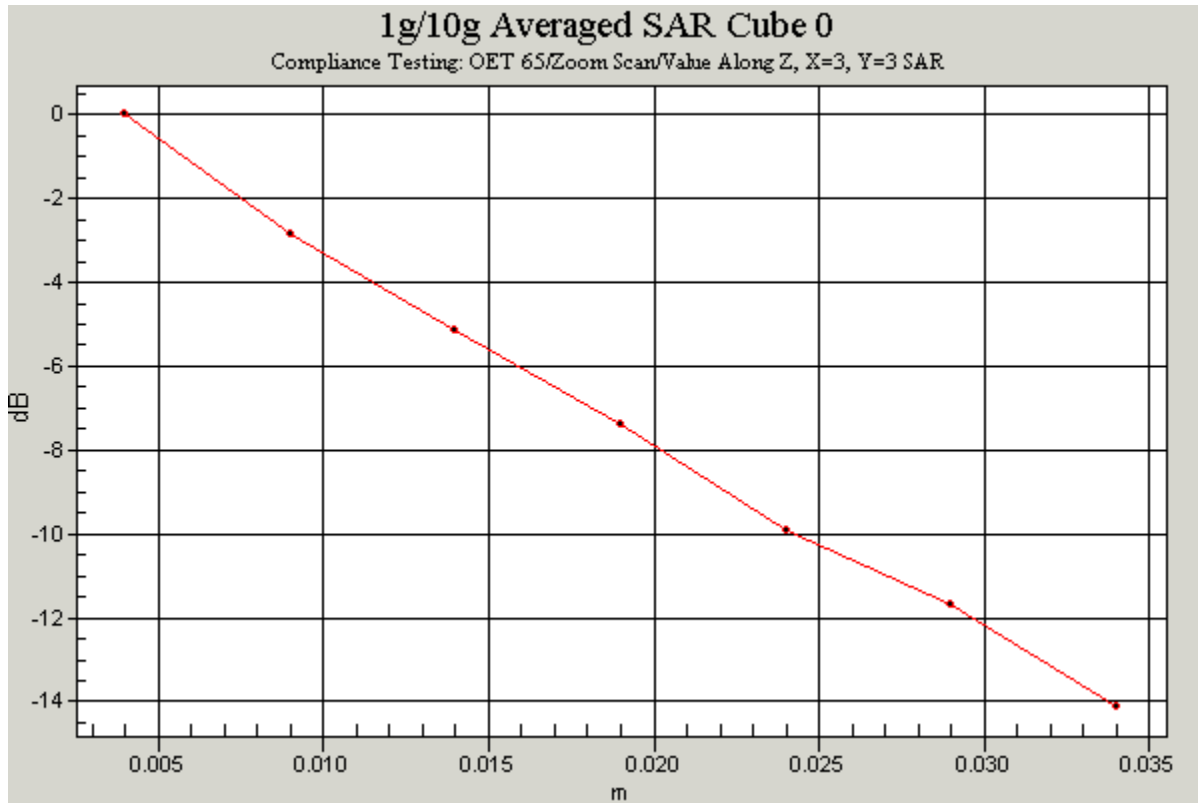
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_Sony Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.545mW/g





Communication System: TDCDMA - 6MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 15.4 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (interpolated) = 0.550 mW/g

**90 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 15.4 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (measured) = 0.545 mW/g  
 Peak SAR (extrapolated) = 1.14 W/kg  
**SAR(1 g) = 0.521 mW/g; SAR(10 g) = 0.291 mW/g**

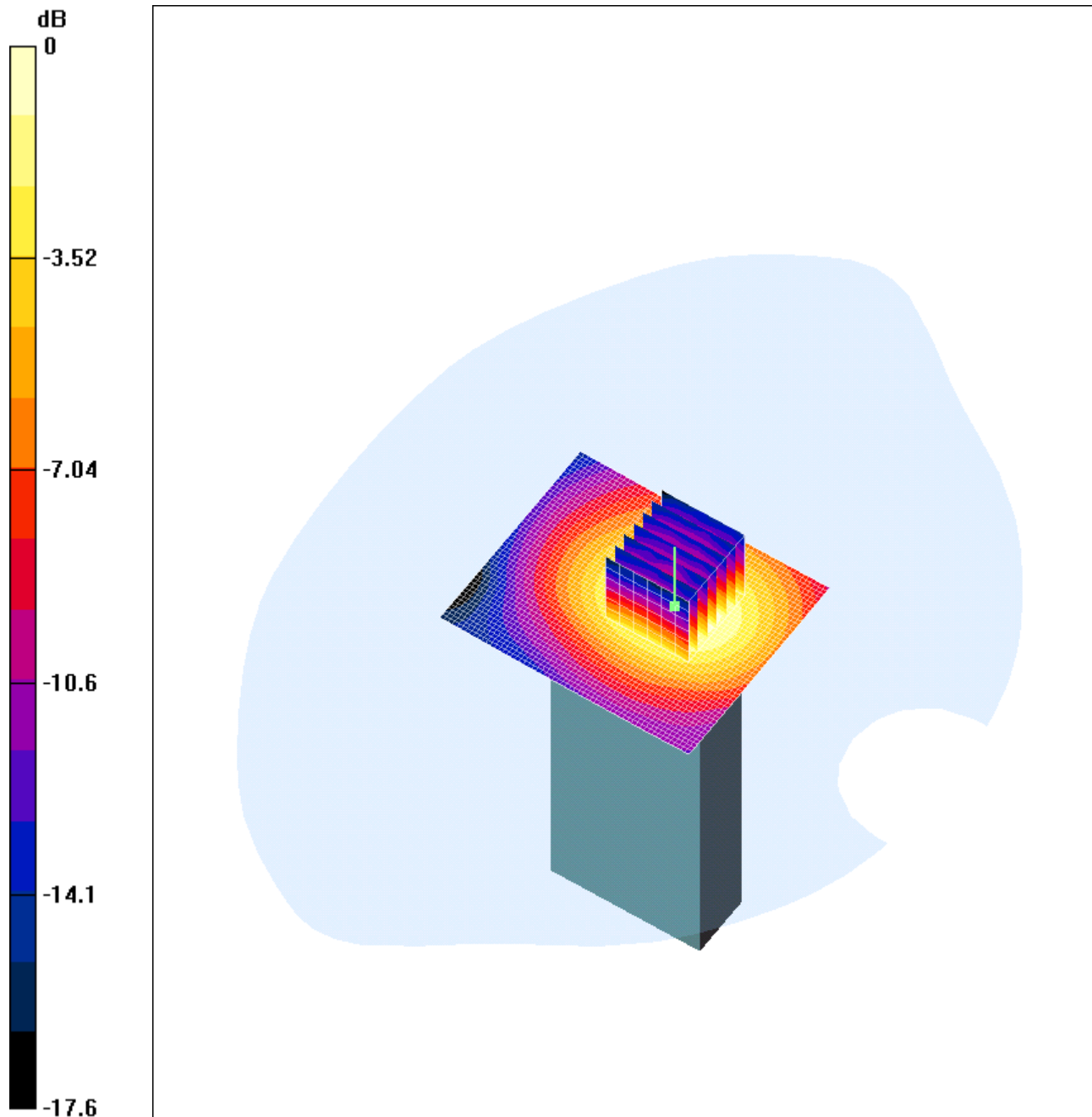
Date: 18/03/04

45219/JD02/011

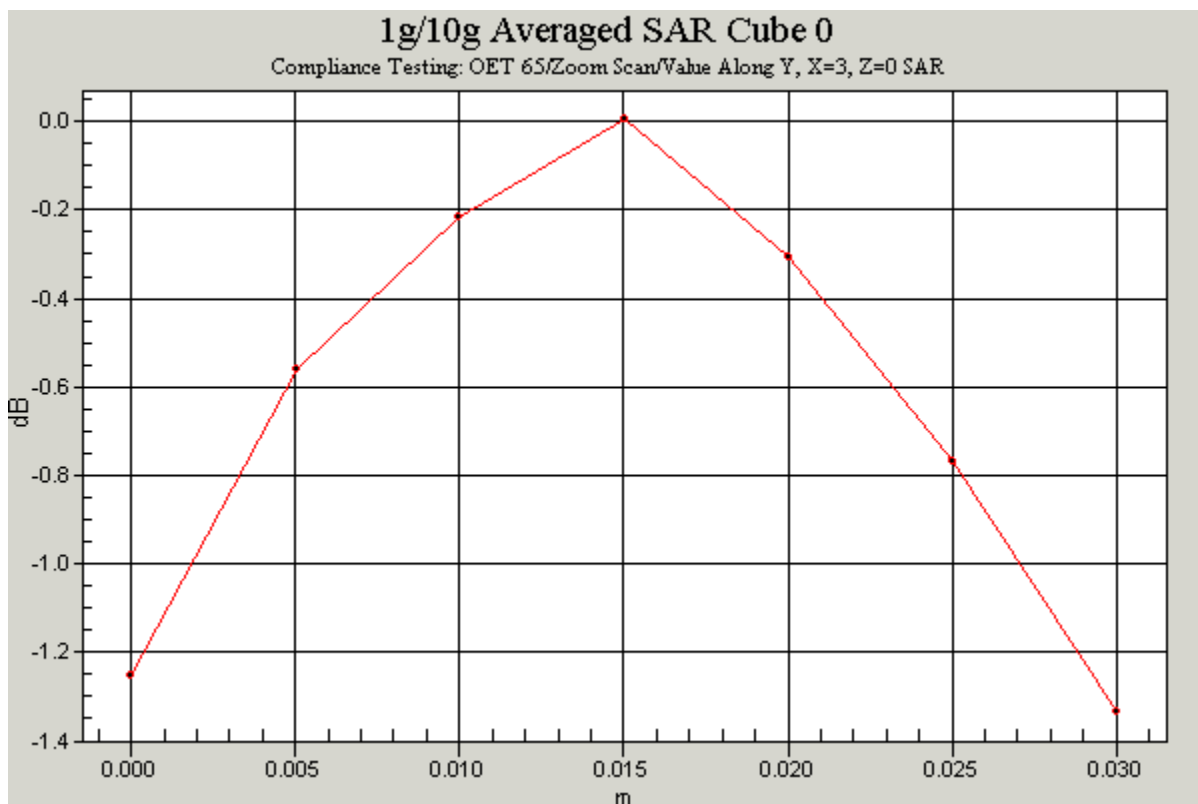
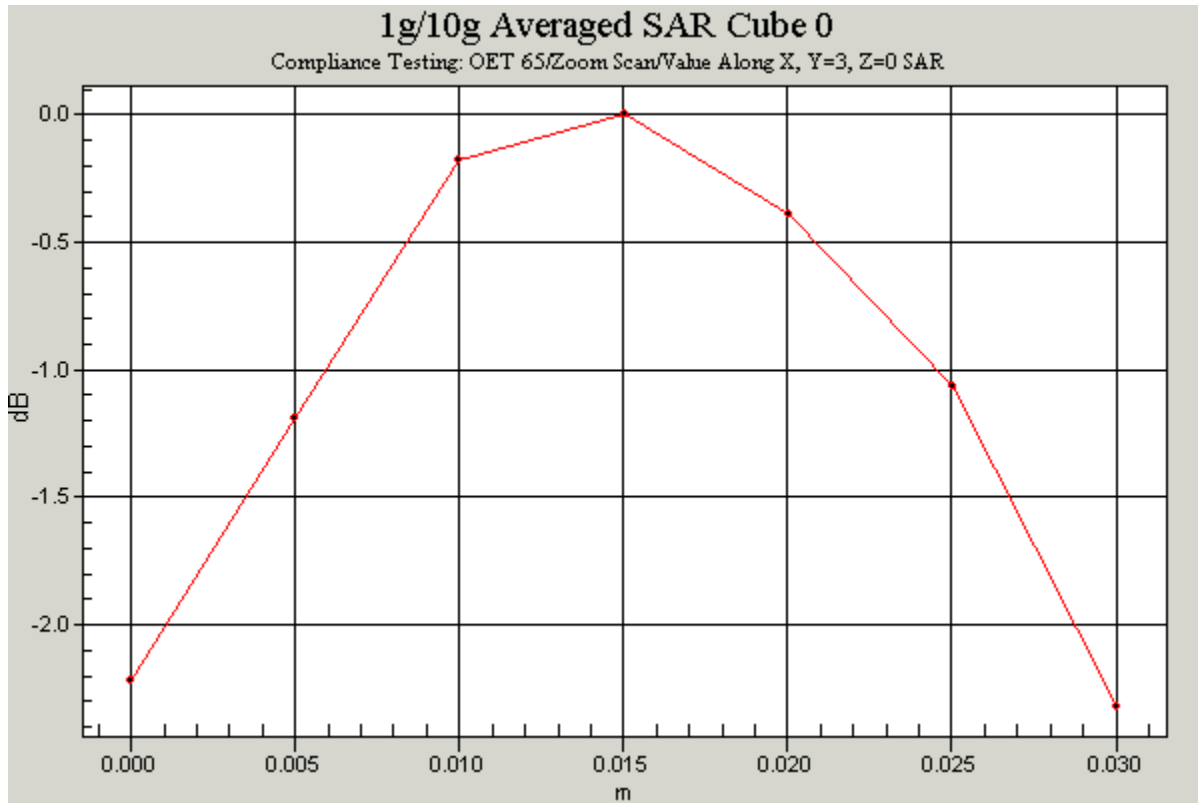
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

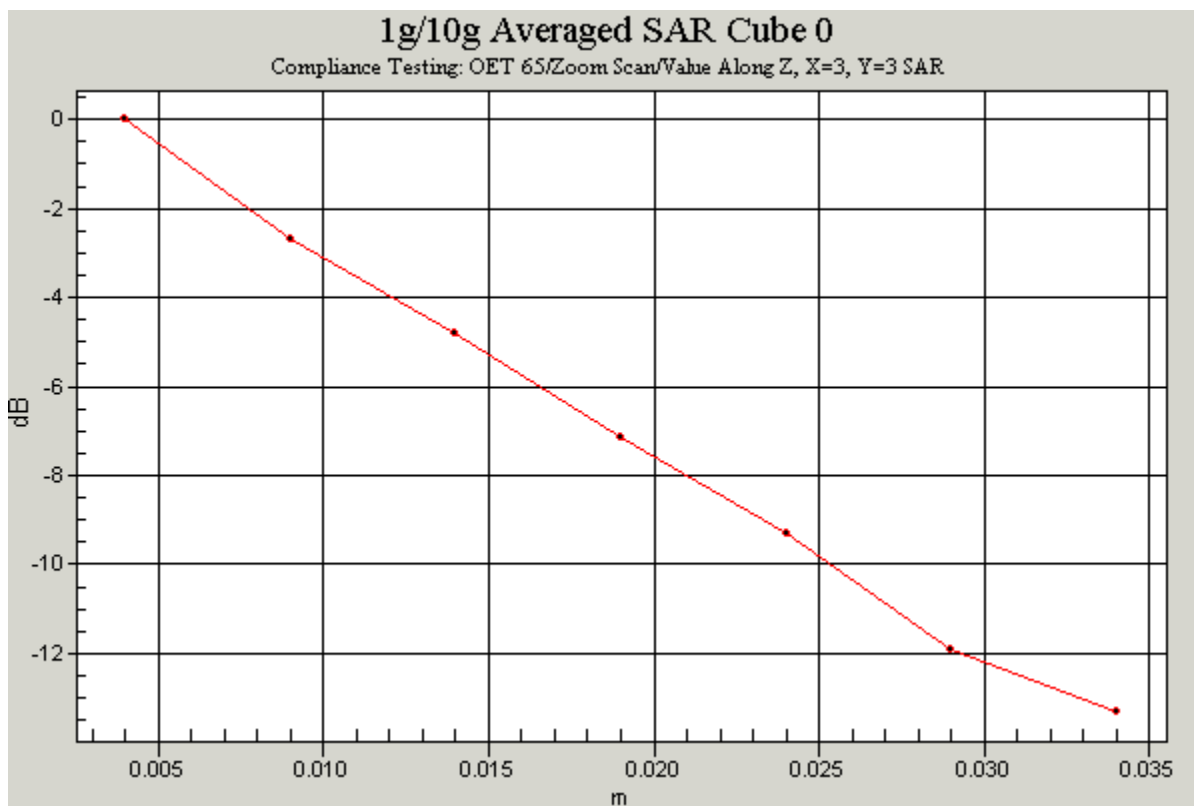
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_Sony Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.462mW/g





Communication System: TDCDMA - 6MHz Channel; Frequency: 2503 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2503$  MHz;  $\sigma = 2.05$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(4.3, 4.3, 4.3); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Bottom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 14 V/m; Power Drift = -0.1 dB  
 Maximum value of SAR (interpolated) = 0.448 mW/g

**90 Degrees to Phantom - Bottom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 14 V/m; Power Drift = -0.1 dB  
 Maximum value of SAR (measured) = 0.462 mW/g  
 Peak SAR (extrapolated) = 0.931 W/kg  
**SAR(1 g) = 0.433 mW/g; SAR(10 g) = 0.242 mW/g**

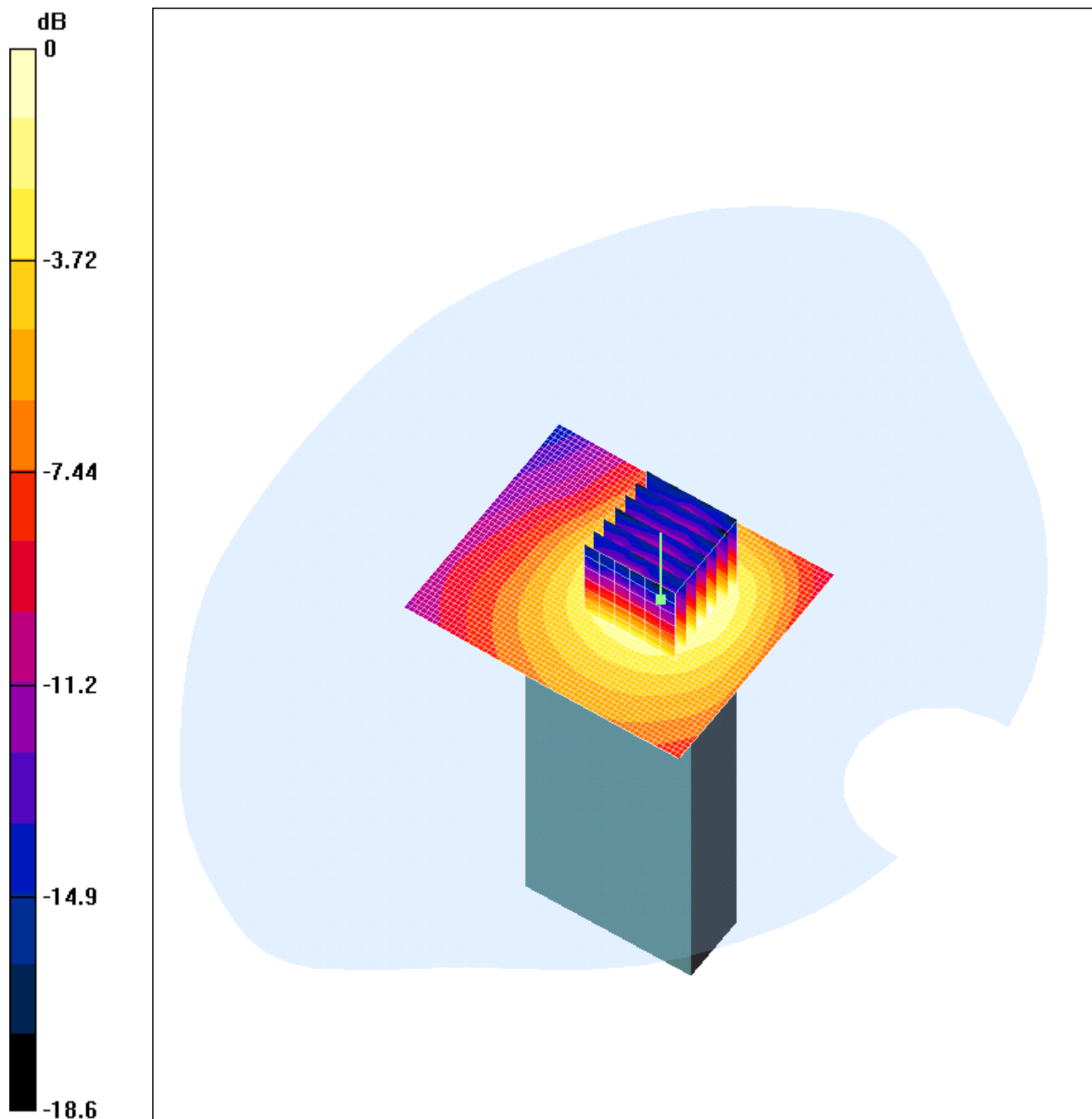
Date: 18/03/04

45219/JD02/012

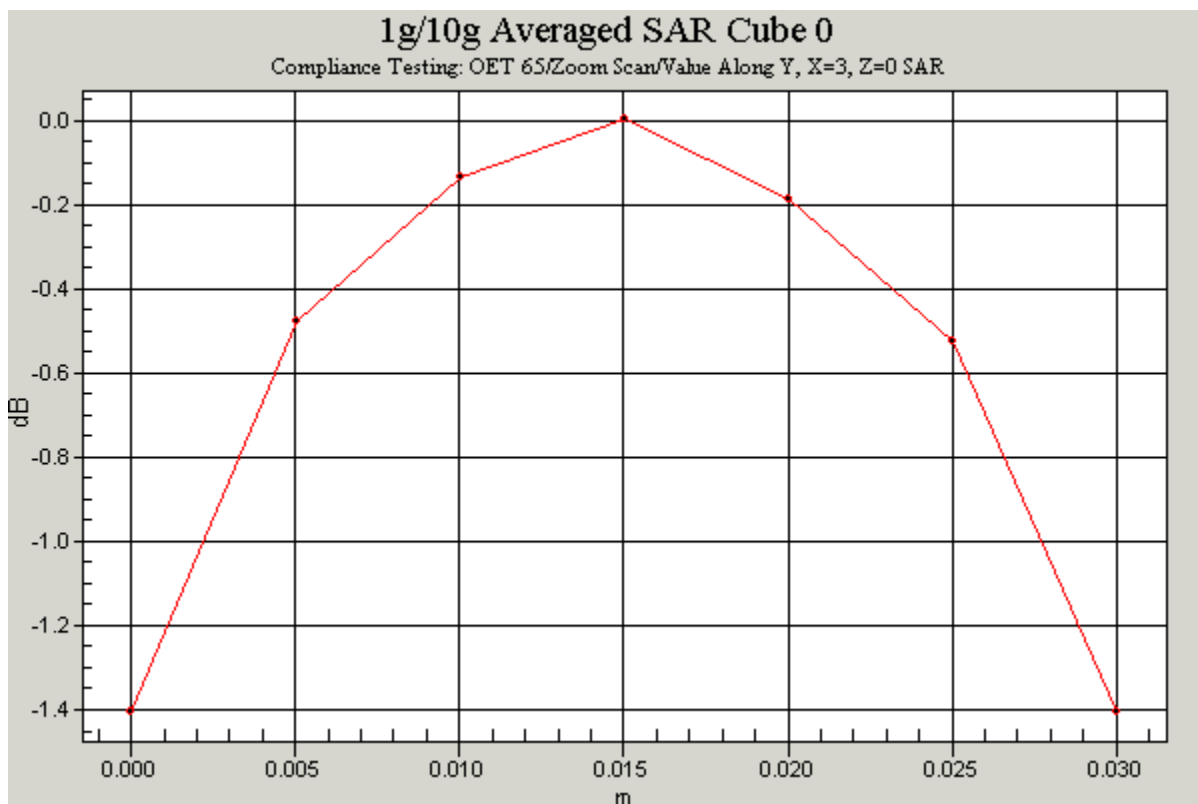
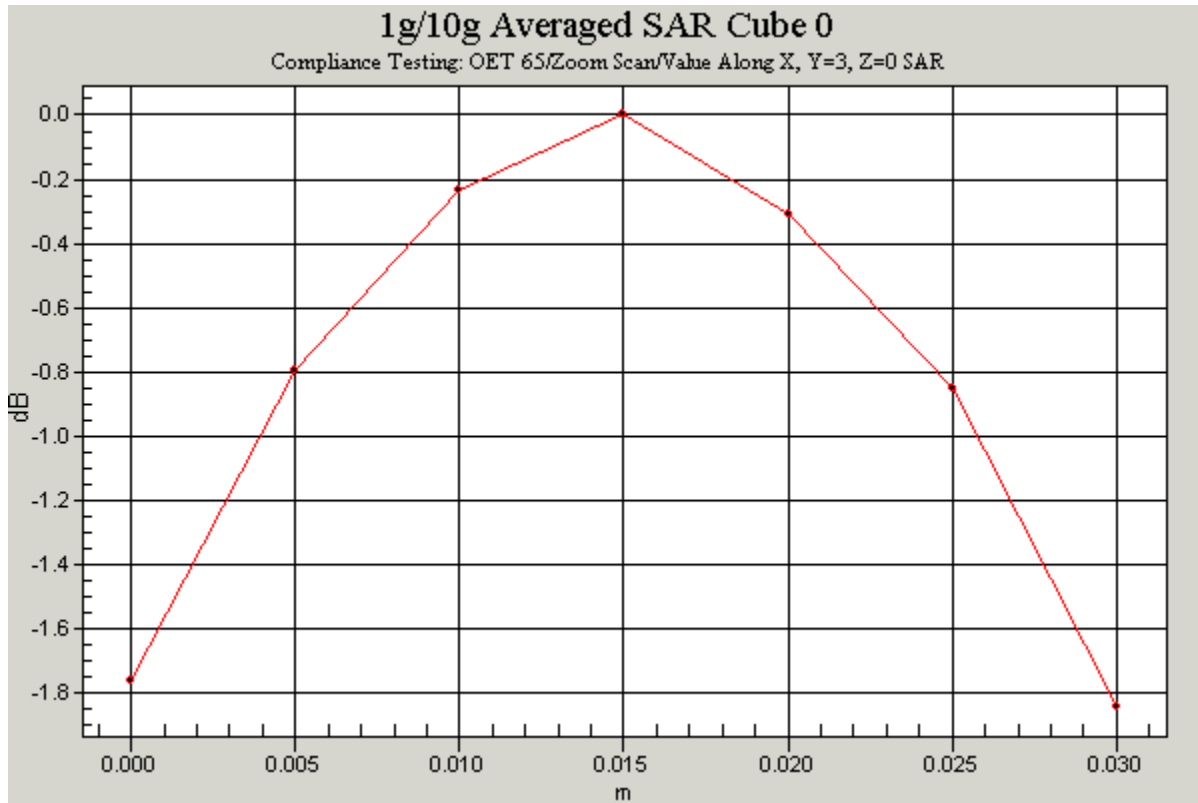
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_Sony Host**

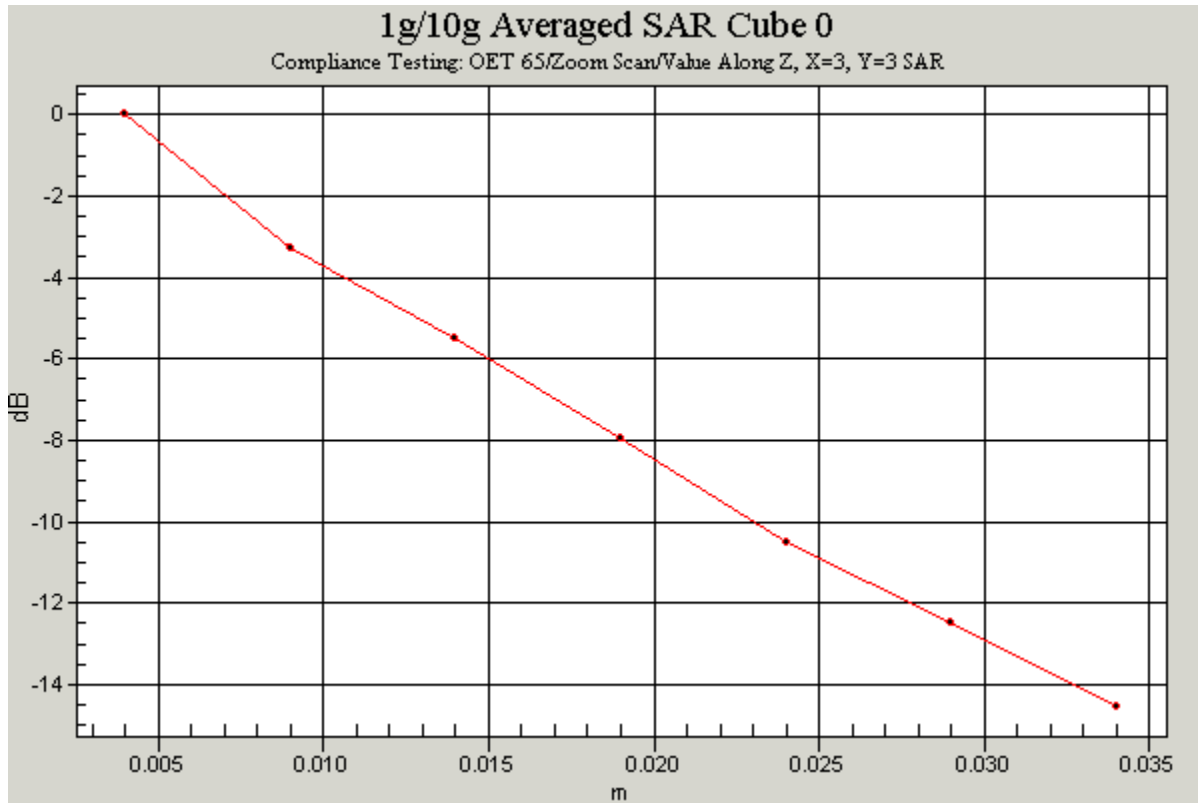
**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.484mW/g







Communication System: TDCDMA - 6MHz Channel; Frequency: 2683 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2683$  MHz;  $\sigma = 2.31$  mho/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom Top/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 13.5 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (interpolated) = 0.486 mW/g

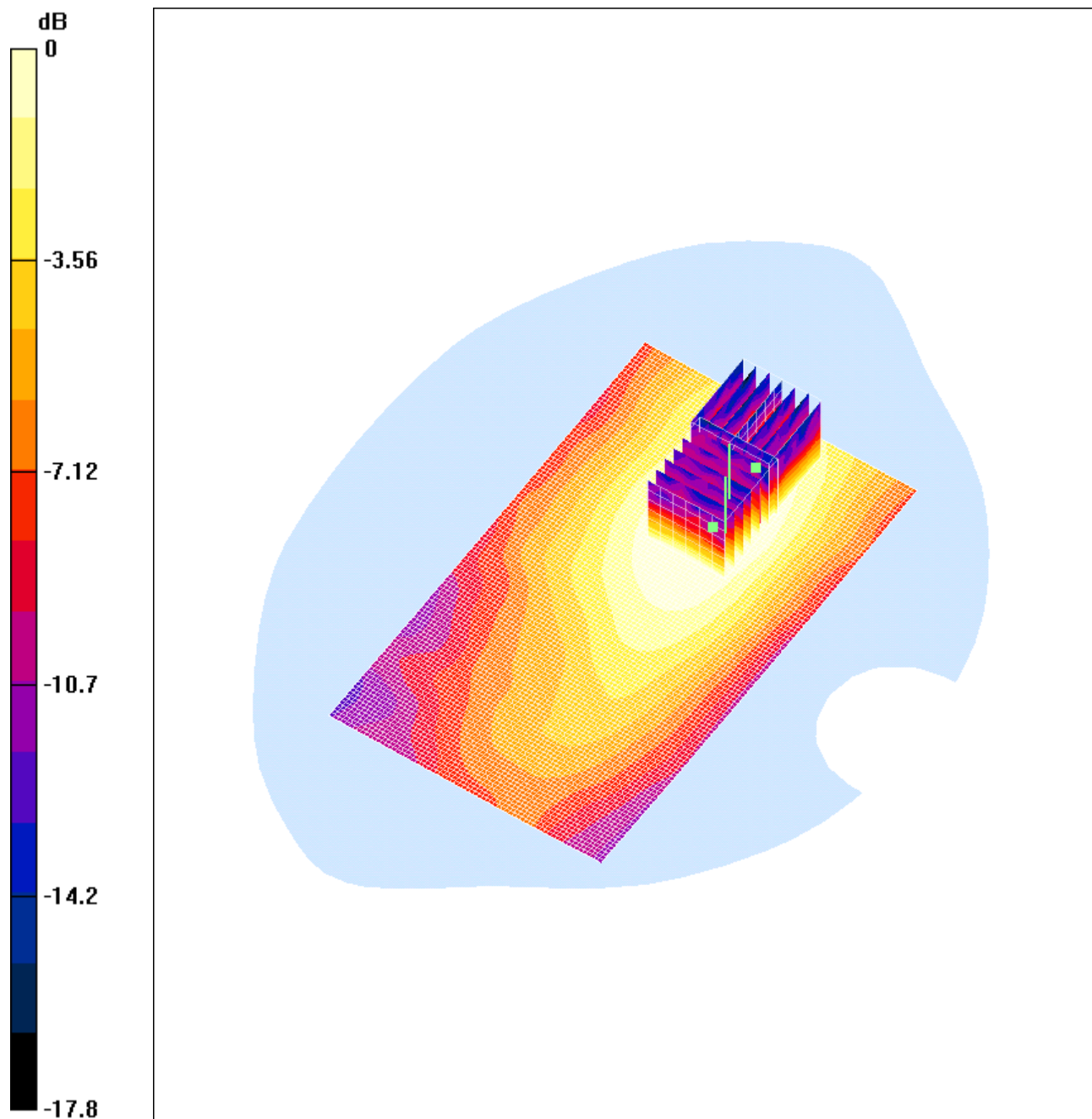
**90 Degrees to Phantom Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 13.5 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (measured) = 0.484 mW/g  
 Peak SAR (extrapolated) = 1.12 W/kg  
**SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.256 mW/g**

Date: 18/03/04

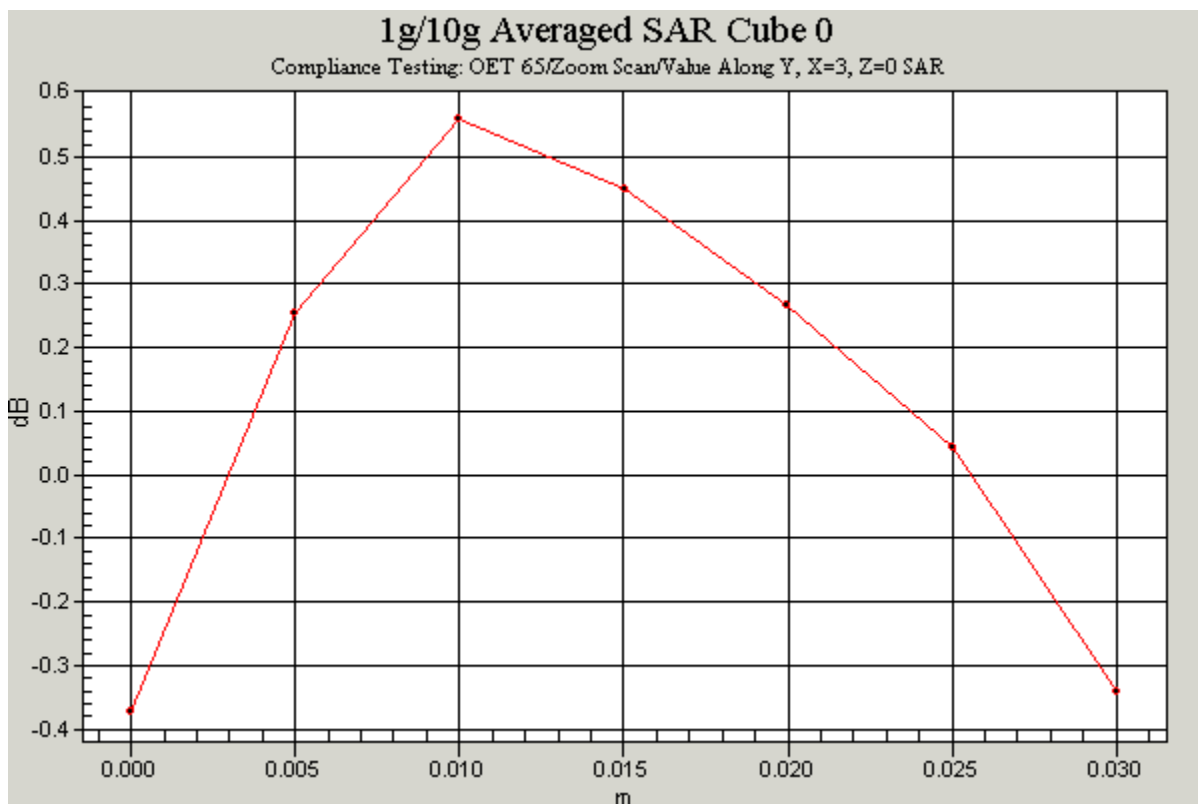
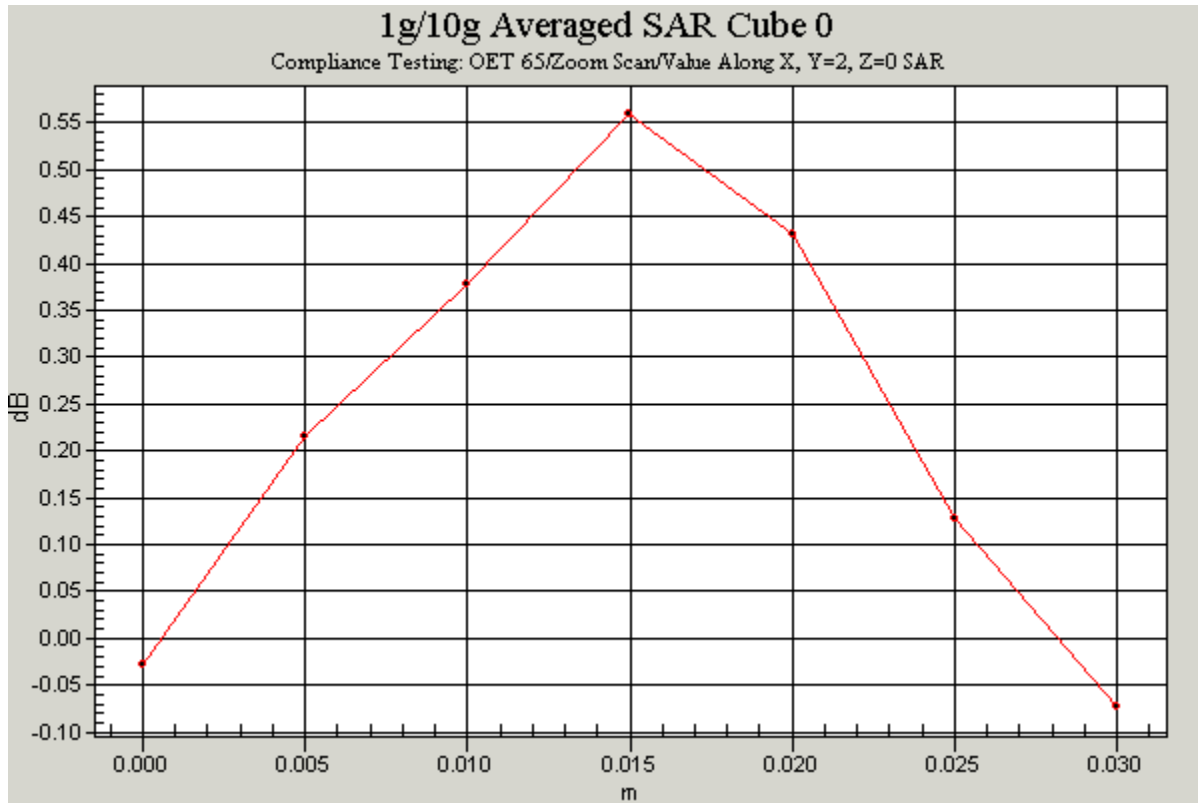
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

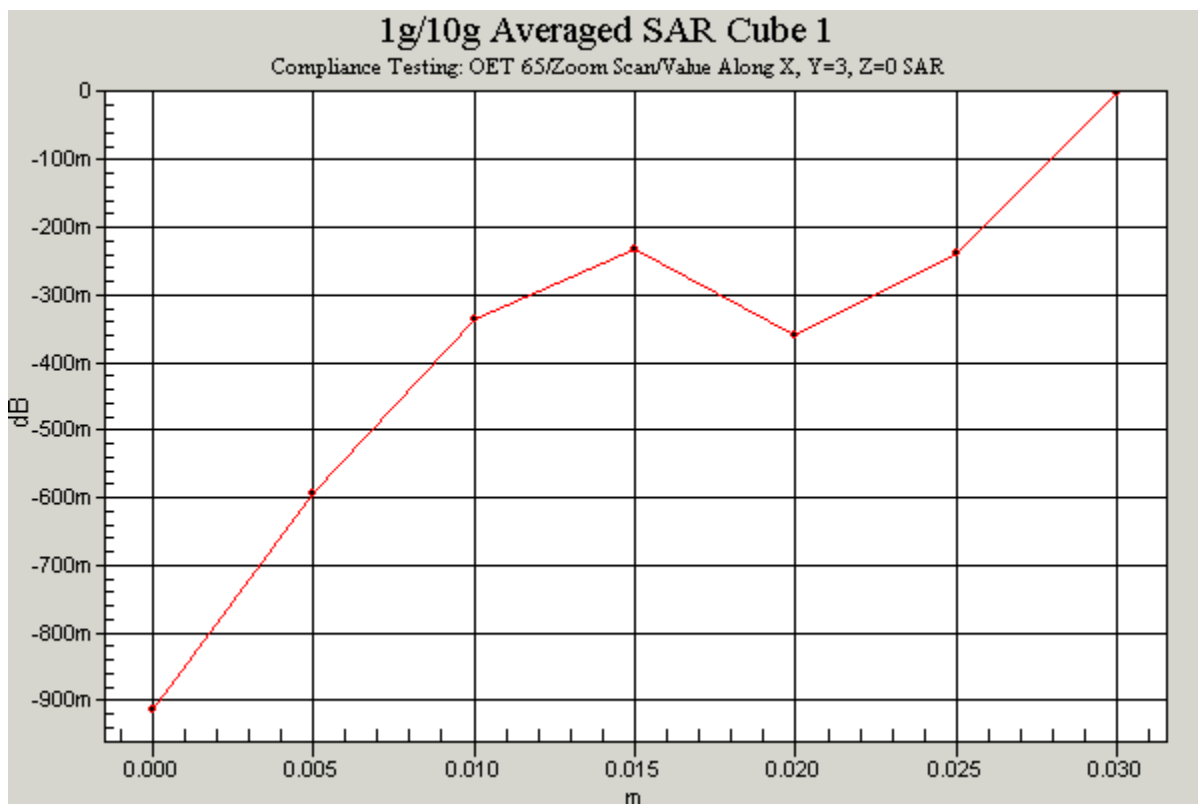
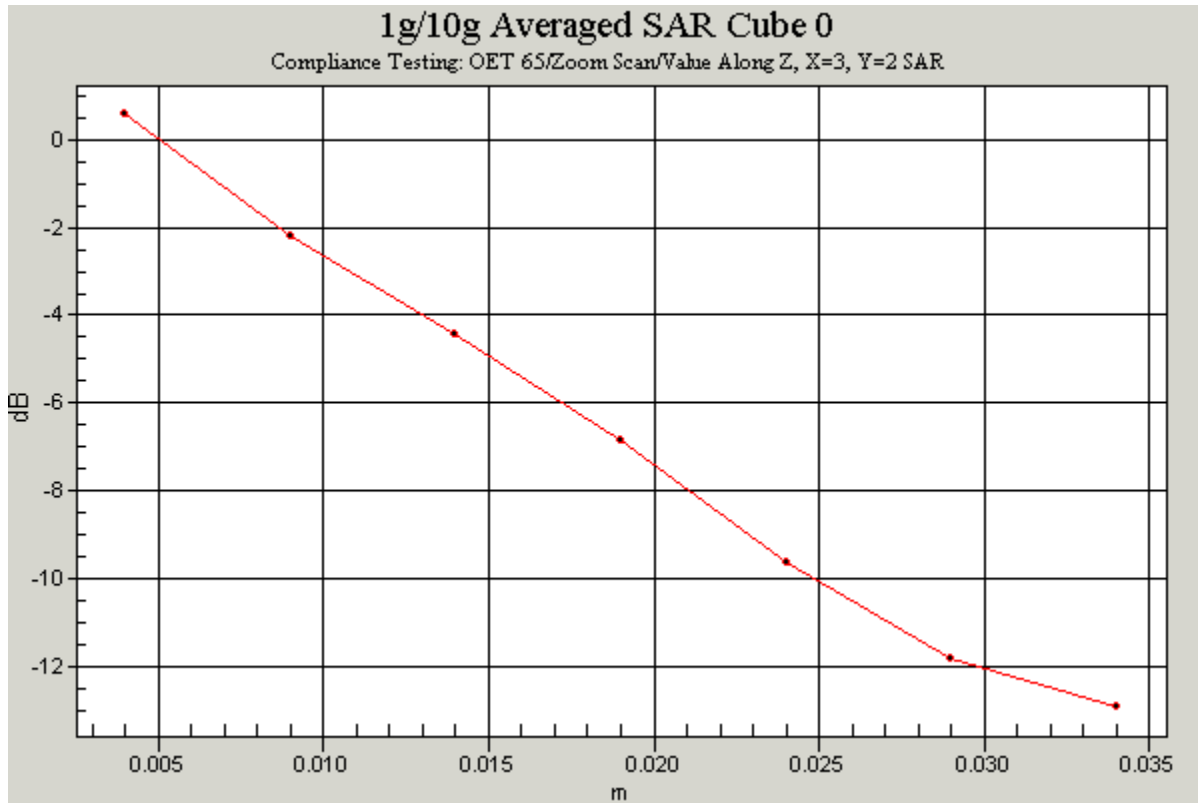
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_ 0 Degrees to Phantom\_Sony Host**

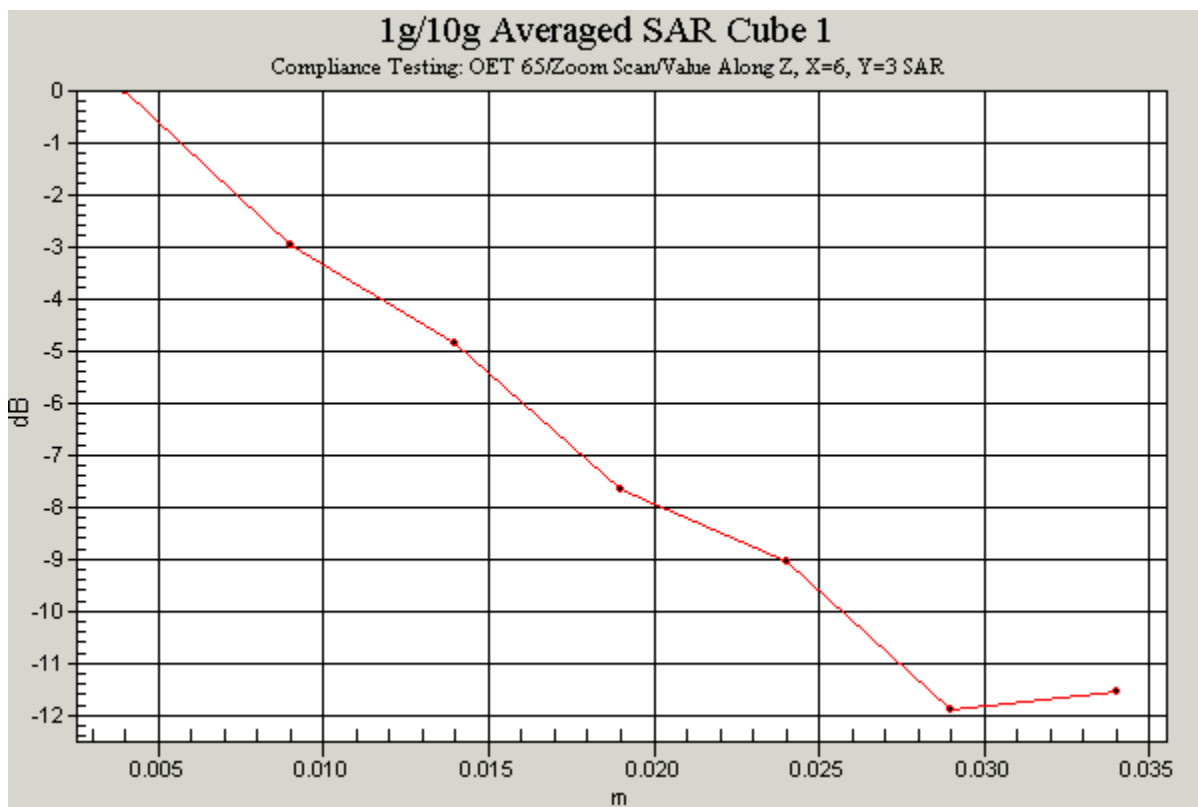
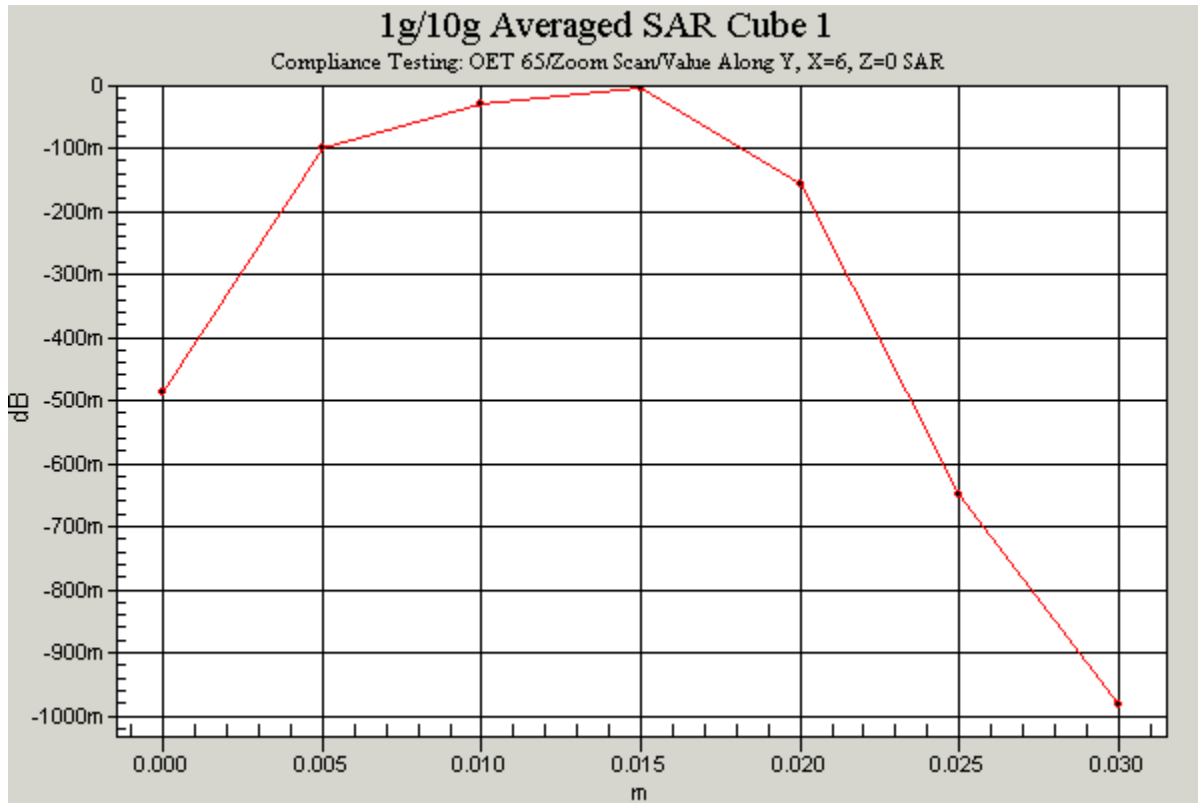
**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.212mW/g







Communication System: TDCDMA - 12MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r =$

54.2;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**0 Degrees to Phantom/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 8.7 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.232 mW/g

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.7 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.241 mW/g

Peak SAR (extrapolated) = 0.462 W/kg

**SAR(1 g) = 0.229 mW/g; SAR(10 g) = 0.135 mW/g**

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.7 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.212 mW/g

Peak SAR (extrapolated) = 0.433 W/kg

**SAR(1 g) = 0.198 mW/g; SAR(10 g) = 0.116 mW/g**

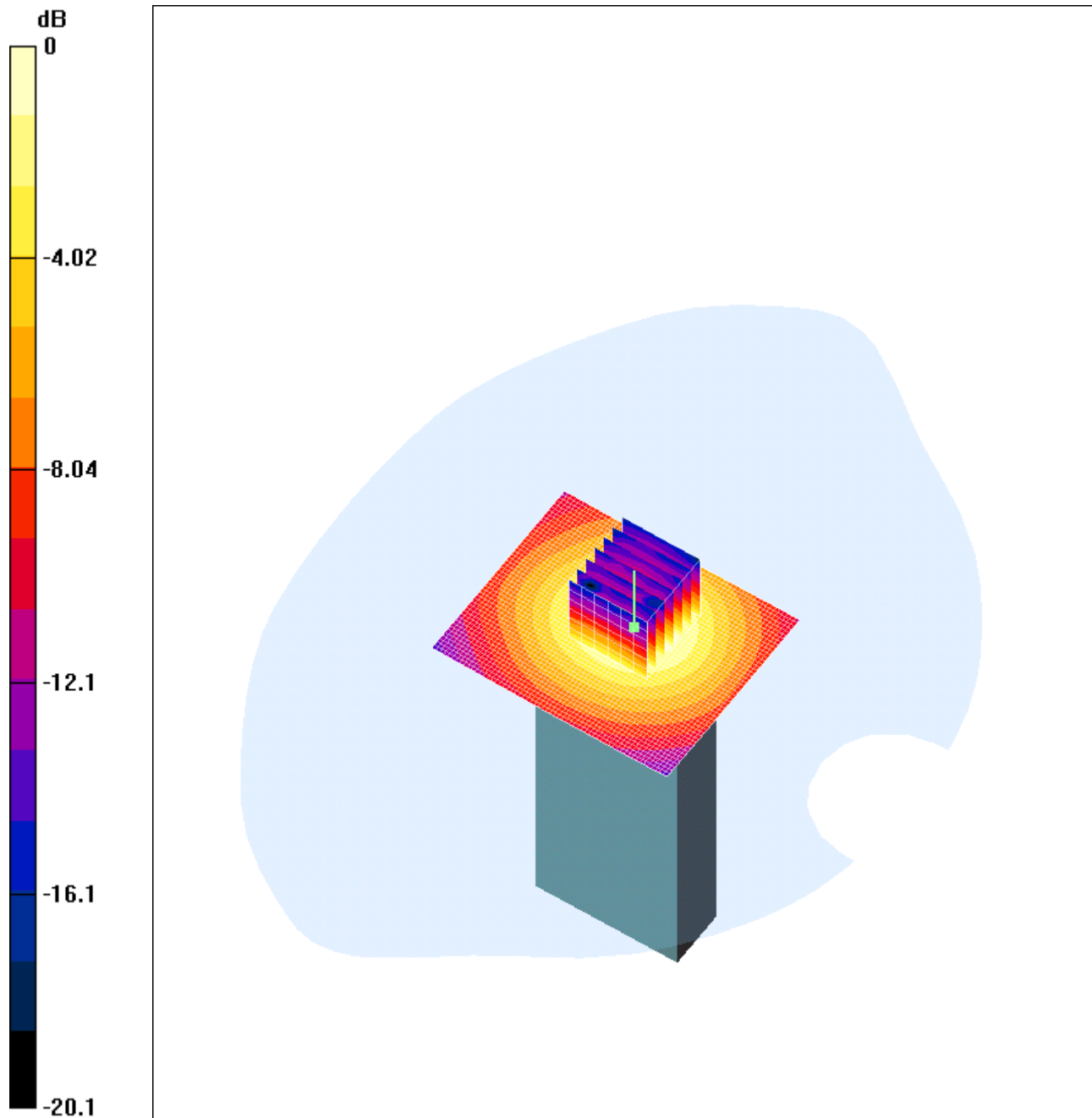
Date: 18/03/04

45219/JD02/014

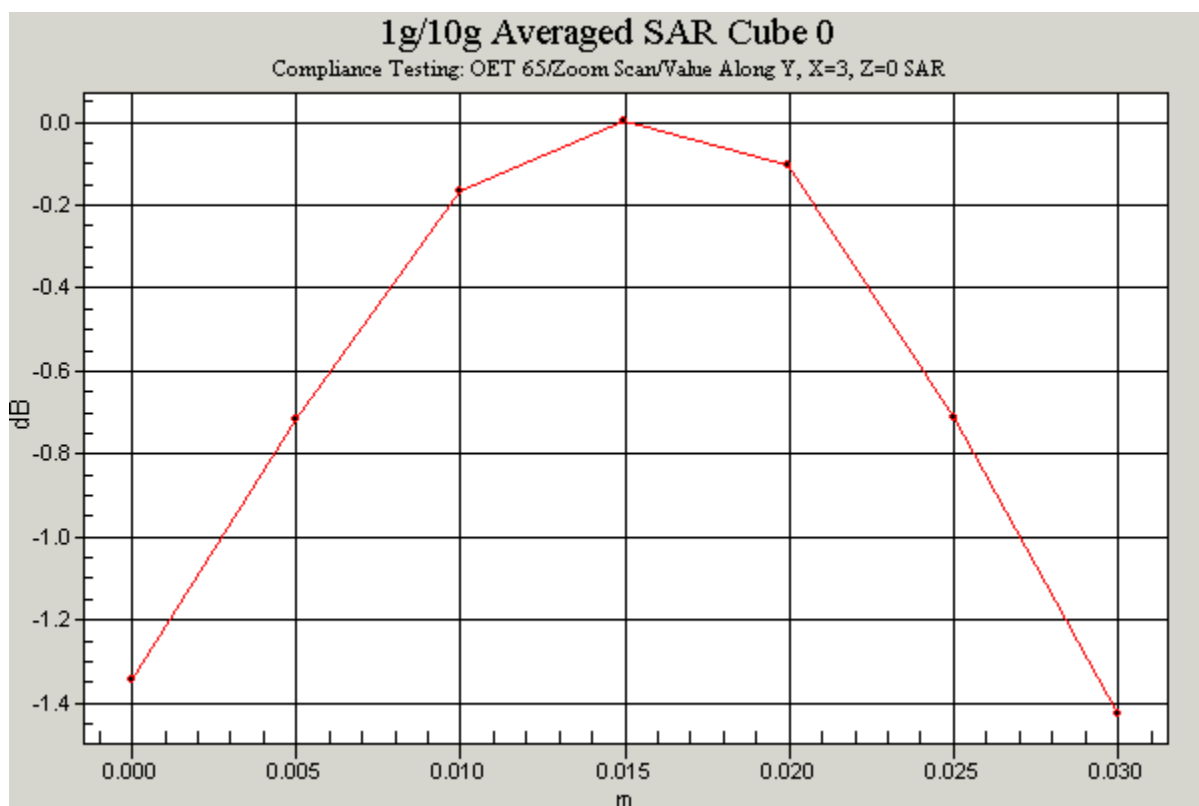
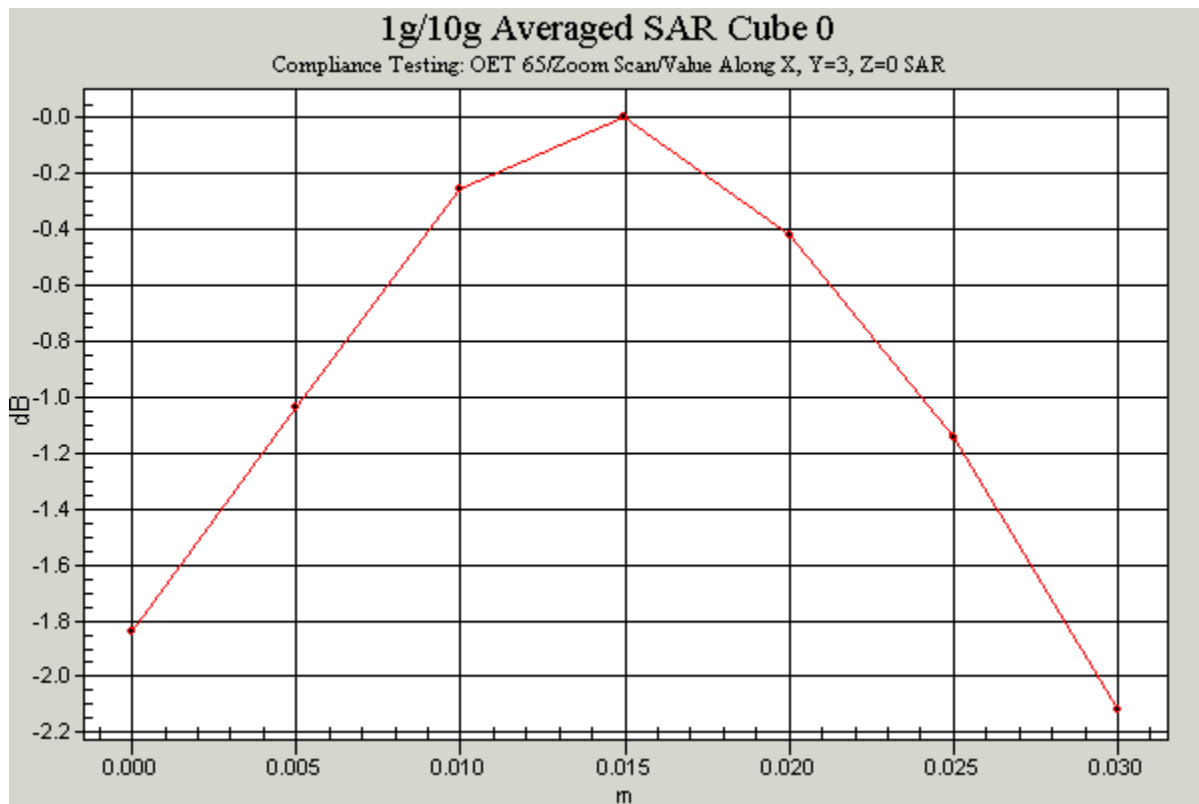
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_Sony Host**

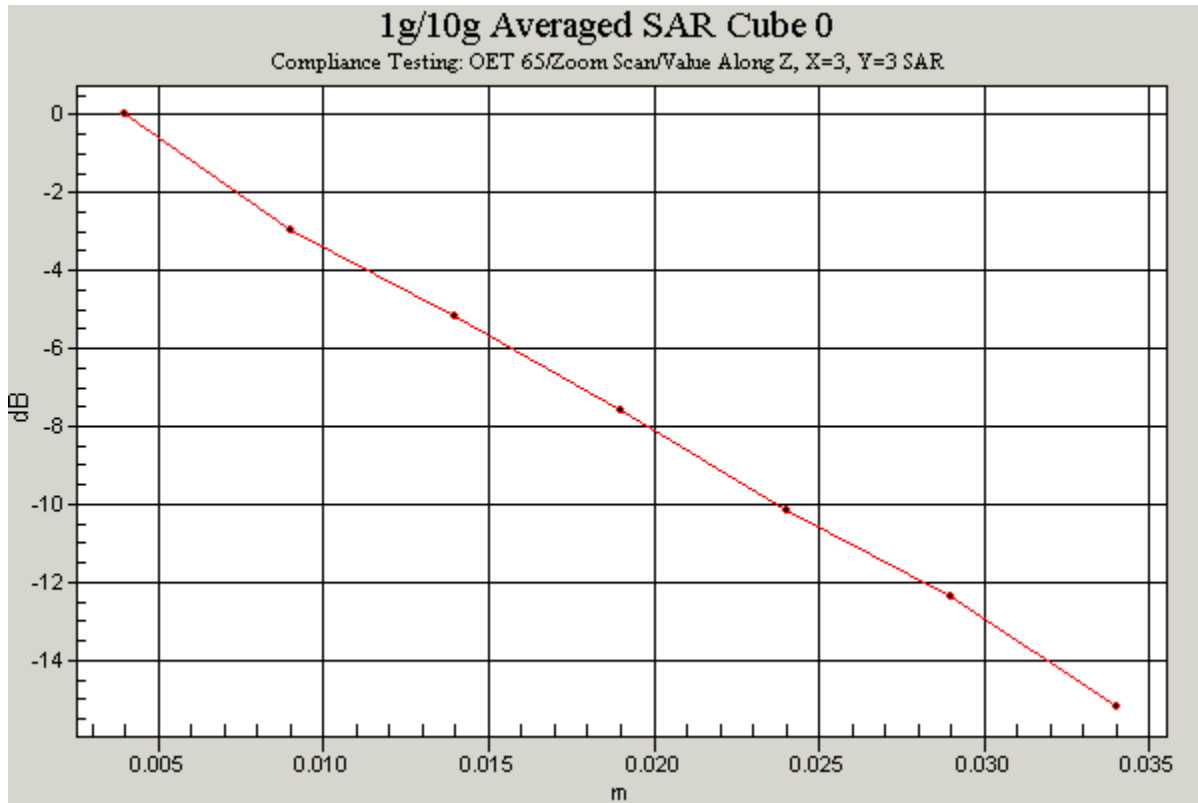
**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.602mW/g







Communication System: TDCDMA - 12MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.7 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.595 mW/g

**90 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.7 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.602 mW/g

Peak SAR (extrapolated) = 1.25 W/kg

**SAR(1 g) = 0.570 mW/g; SAR(10 g) = 0.312 mW/g**

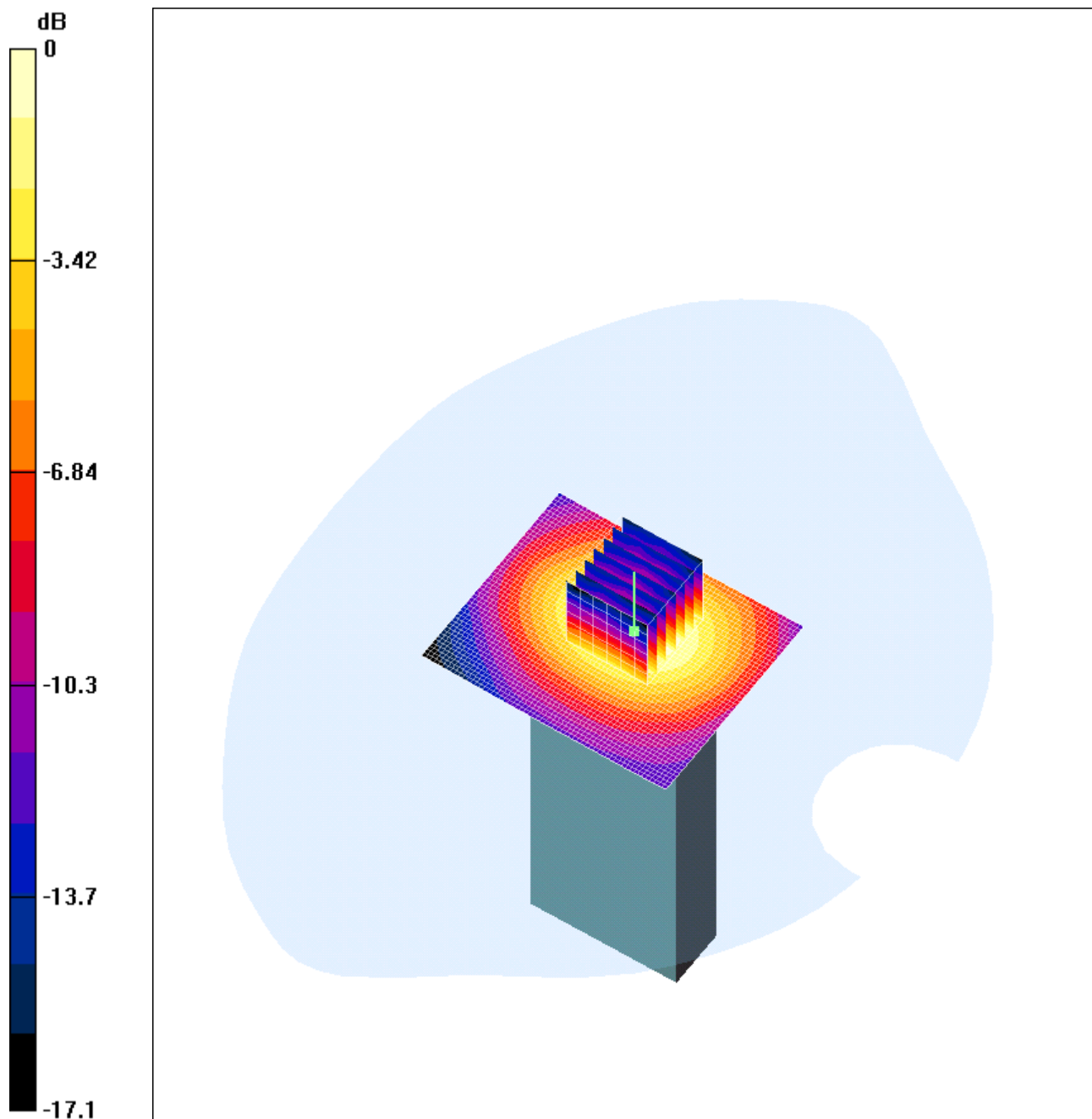
Date: 18/03/04

45219/JD02/015

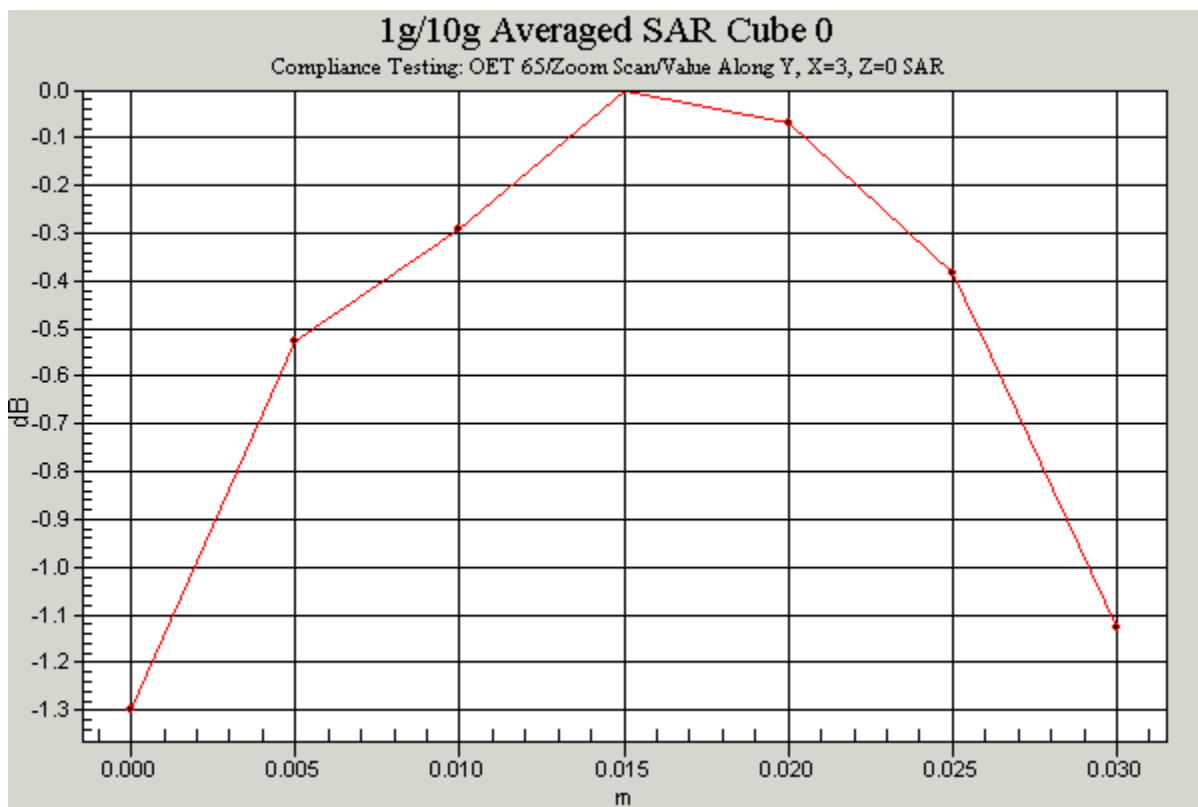
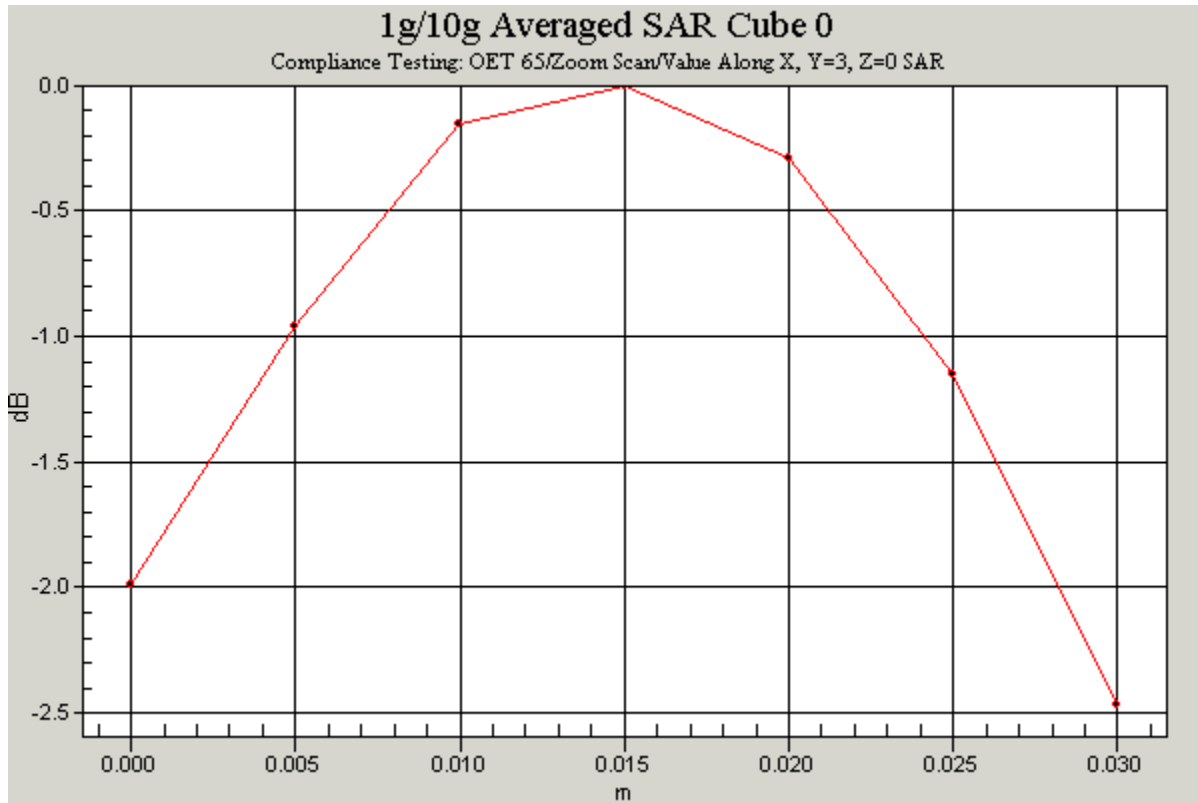
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

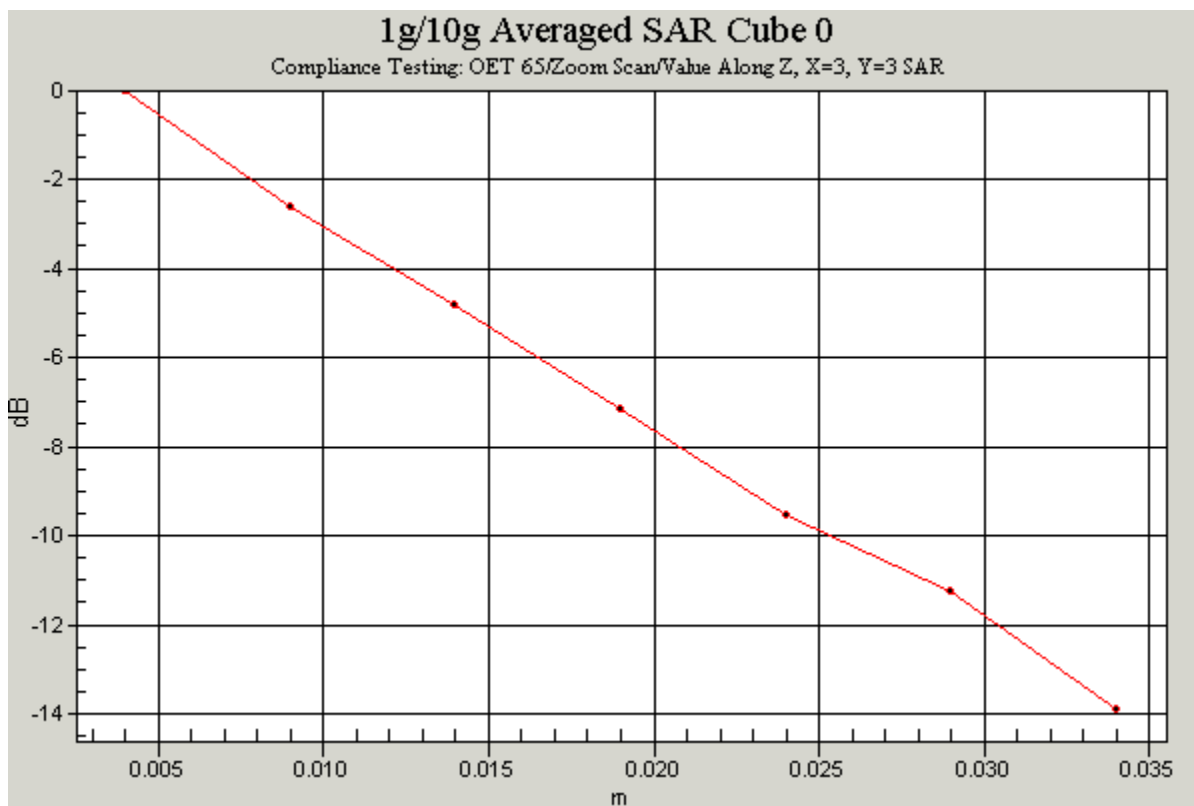
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_Sony Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.463mW/g





Communication System: TDCDMA - 12MHz Channel; Frequency: 2506 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2506$  MHz;  $\sigma = 2.05$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Bottom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 13.5 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (interpolated) = 0.457 mW/g

**90 Degrees to Phantom - Bottom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 13.5 V/m; Power Drift = 0.0 dB  
 Maximum value of SAR (measured) = 0.463 mW/g  
 Peak SAR (extrapolated) = 0.904 W/kg  
**SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.247 mW/g**

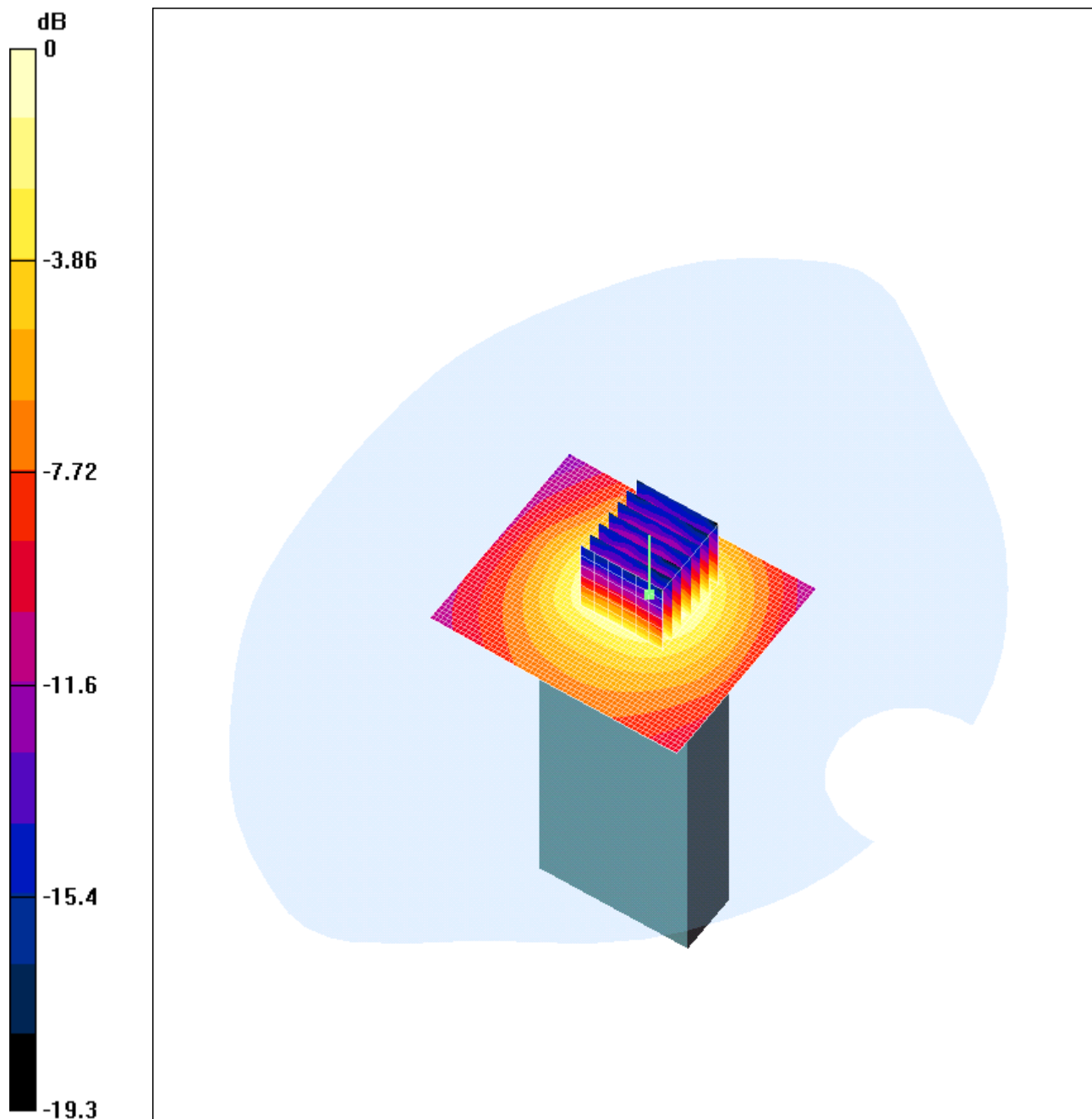
Date: 18/03/04

45219/JD02/016

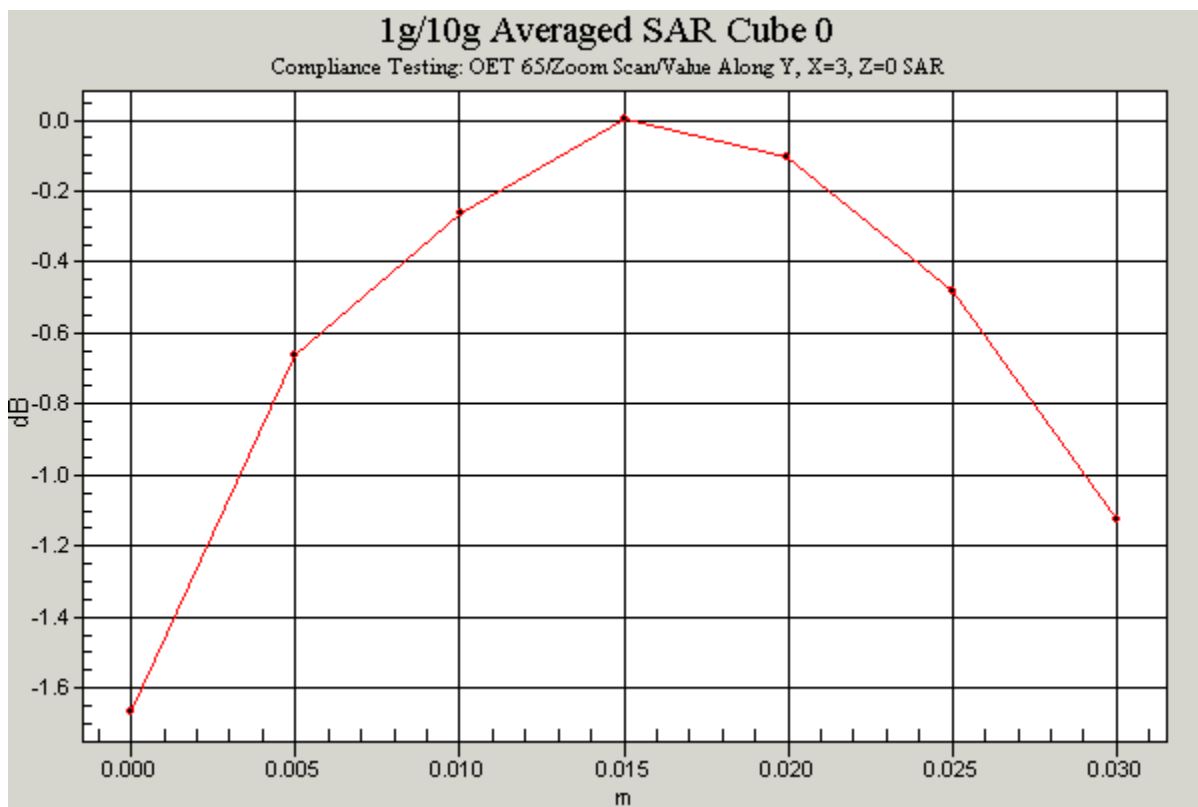
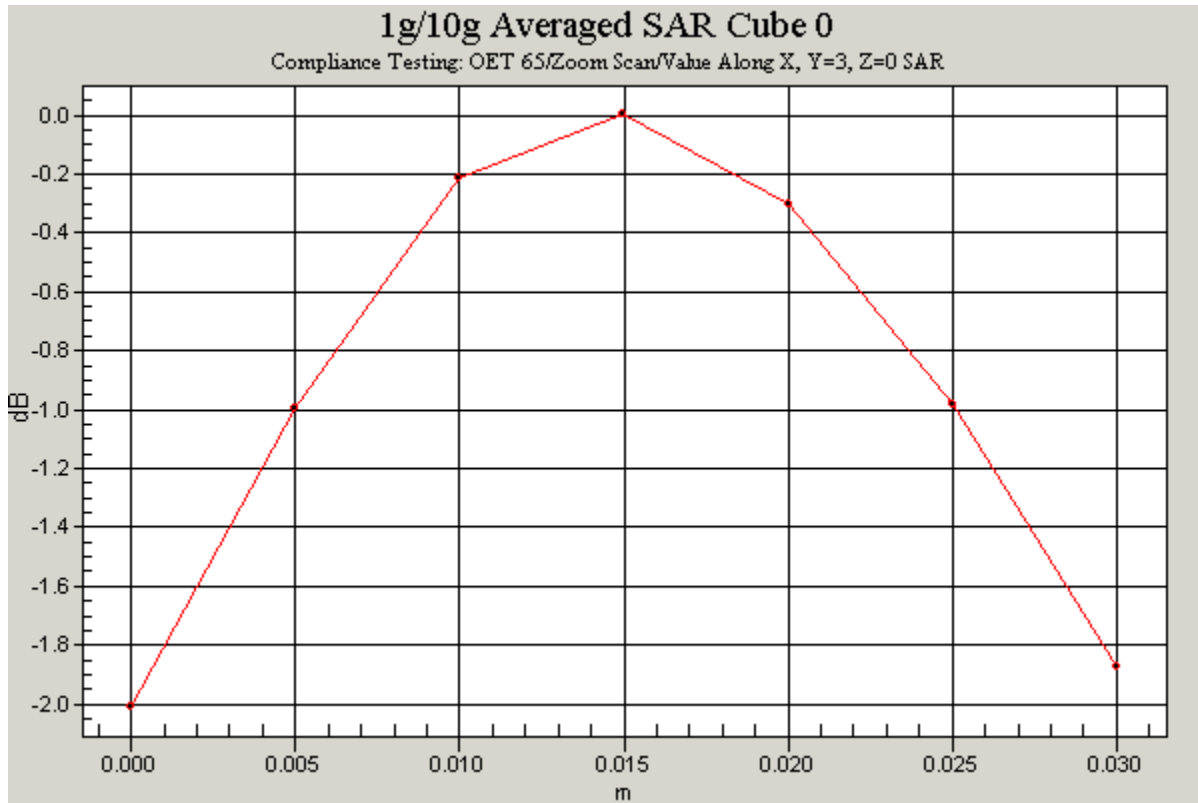
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

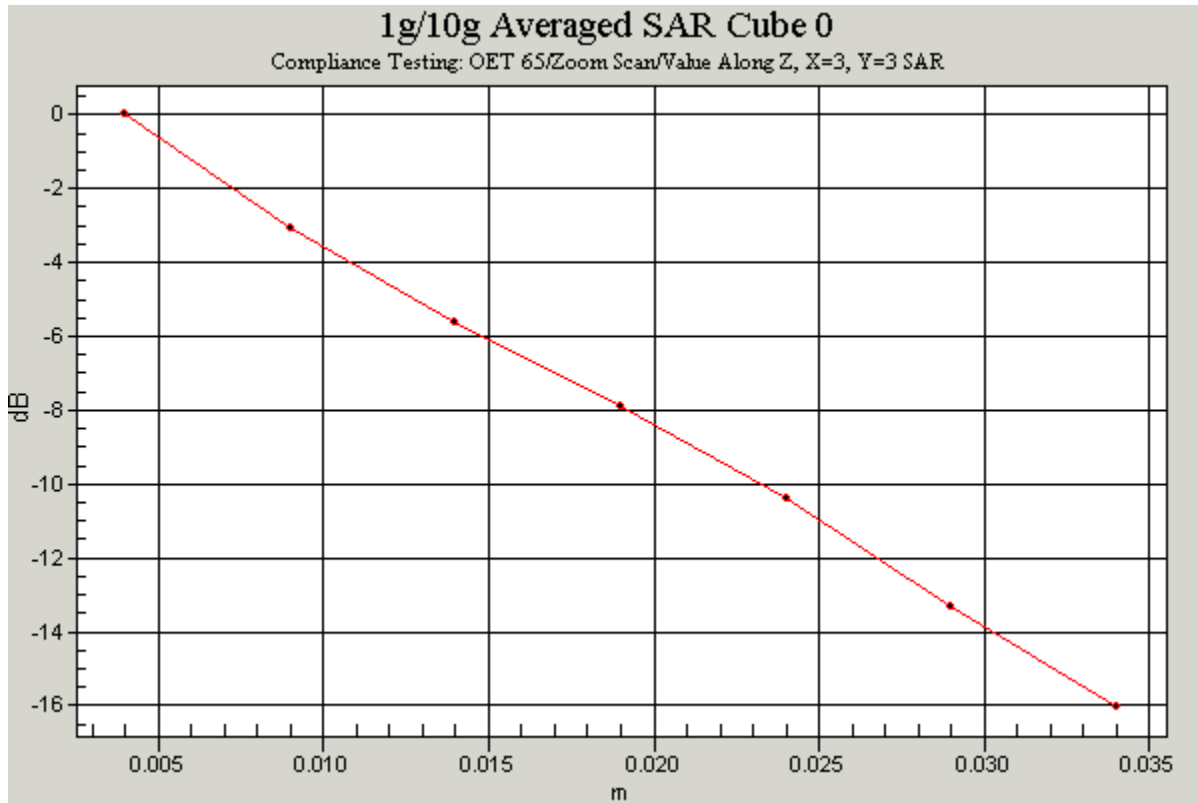
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_Sony Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.538mW/g





Communication System: TDCDMA - 12MHz Channel; Frequency: 2680 MHz; Duty Cycle: 1:3  
Medium: 2450MHz MSL Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.3$  mho/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Top/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 14.4 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.540 mW/g

**90 Degrees to Phantom - Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.538 mW/g

Peak SAR (extrapolated) = 1.17 W/kg

**SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.279 mW/g**

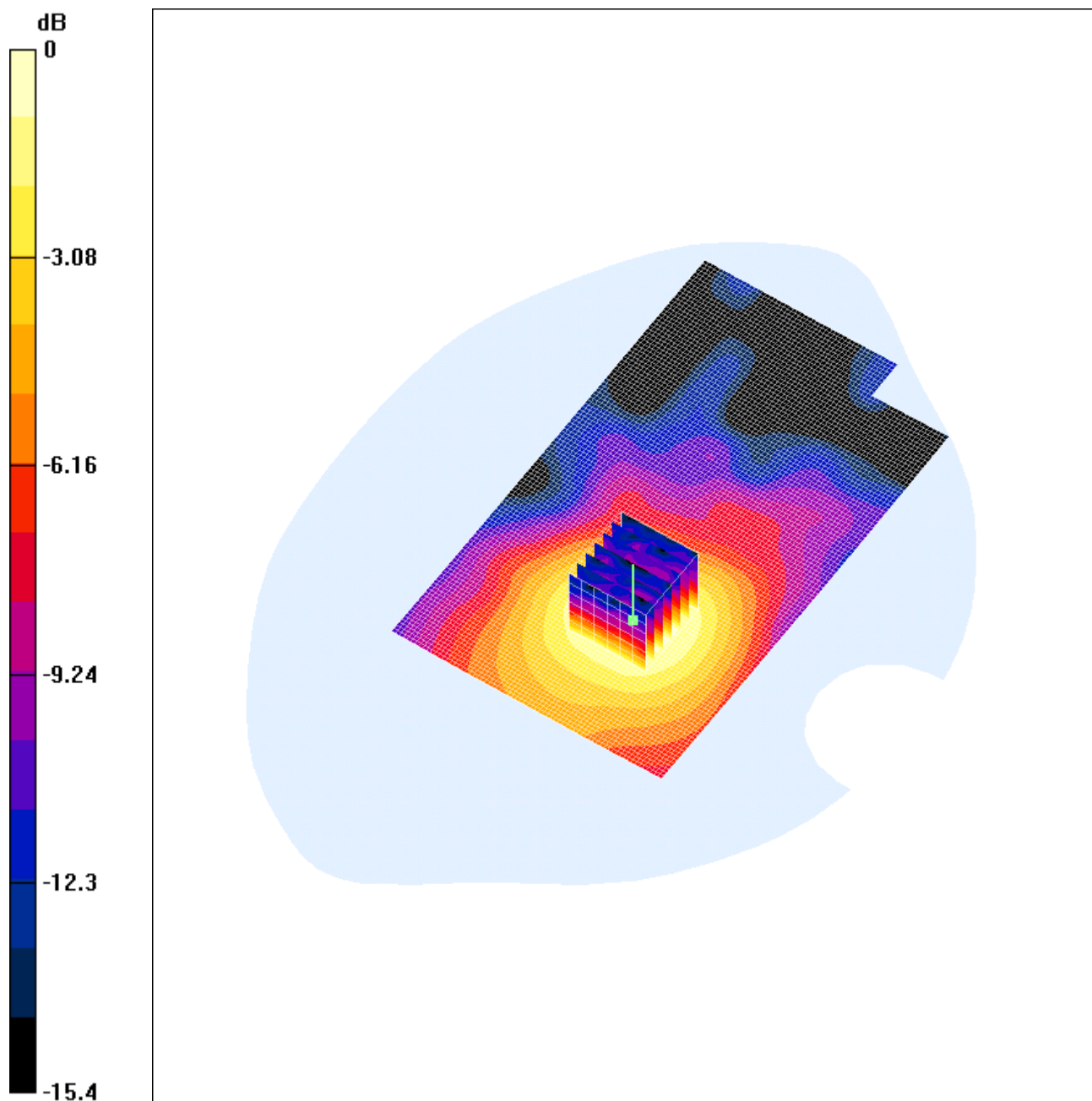
Date: 18/03/04

45219/JD02/017

Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

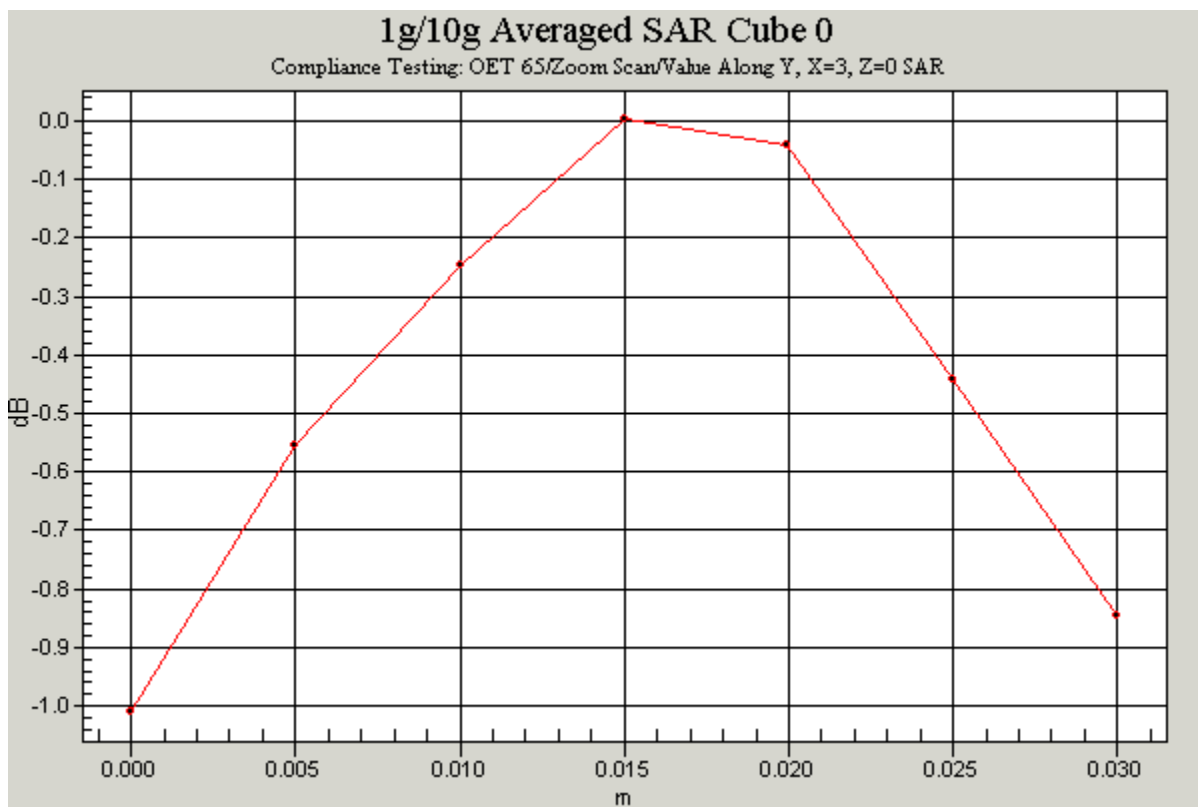
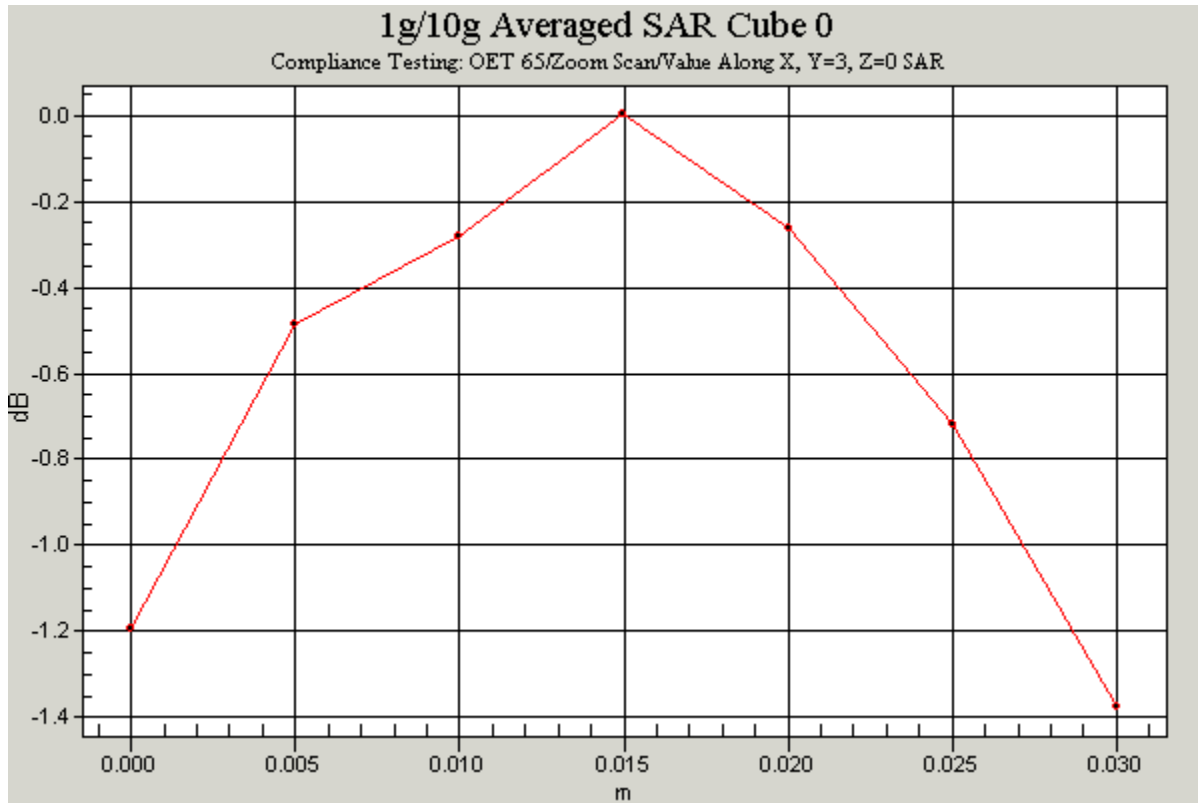
**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_0 Degrees to Phantom\_UMAX Host**

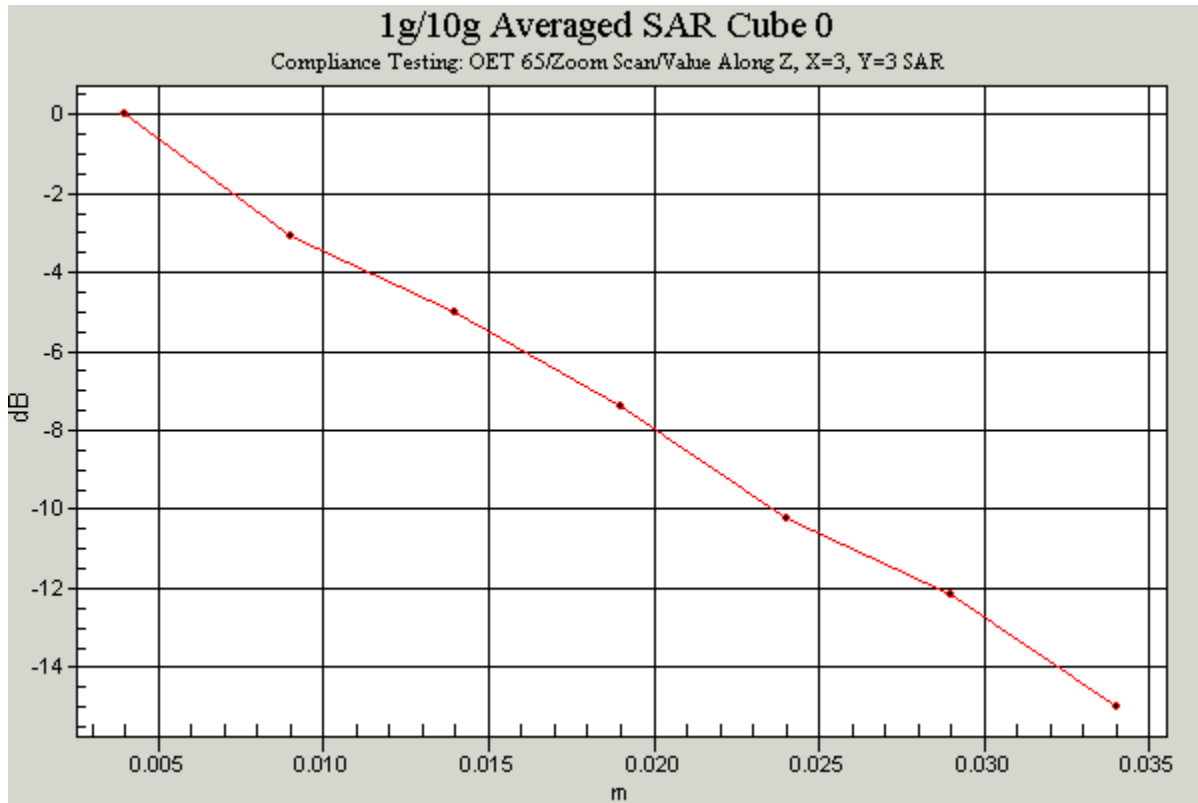
**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.322mW/g







Communication System: TDCDMA - 12MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**0 Degrees to Phantom/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 10.9 V/m; Power Drift = -0.1 dB  
 Maximum value of SAR (interpolated) = 0.311 mW/g

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 10.9 V/m; Power Drift = -0.1 dB  
 Maximum value of SAR (measured) = 0.322 mW/g  
 Peak SAR (extrapolated) = 0.708 W/kg  
**SAR(1 g) = 0.308 mW/g; SAR(10 g) = 0.177 mW/g**

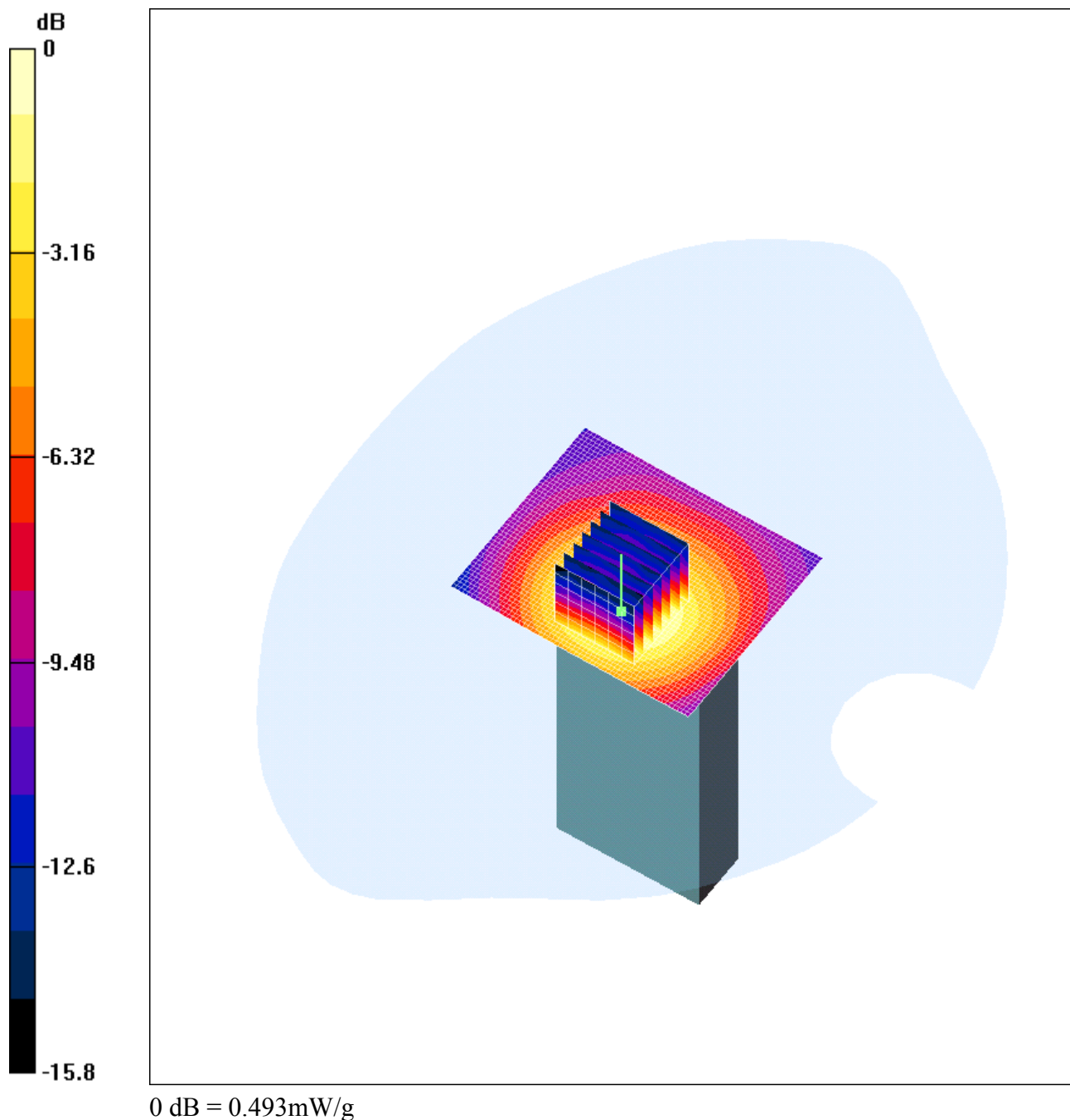
Date: 18/03/04

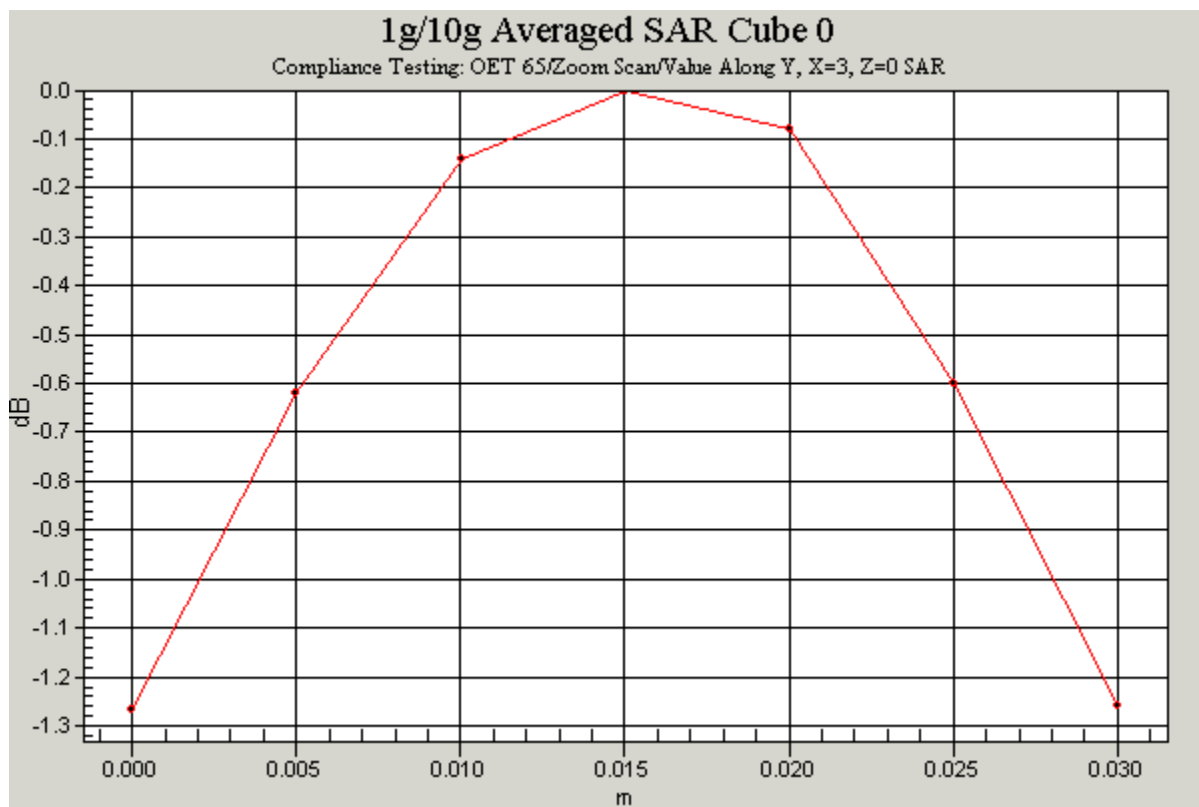
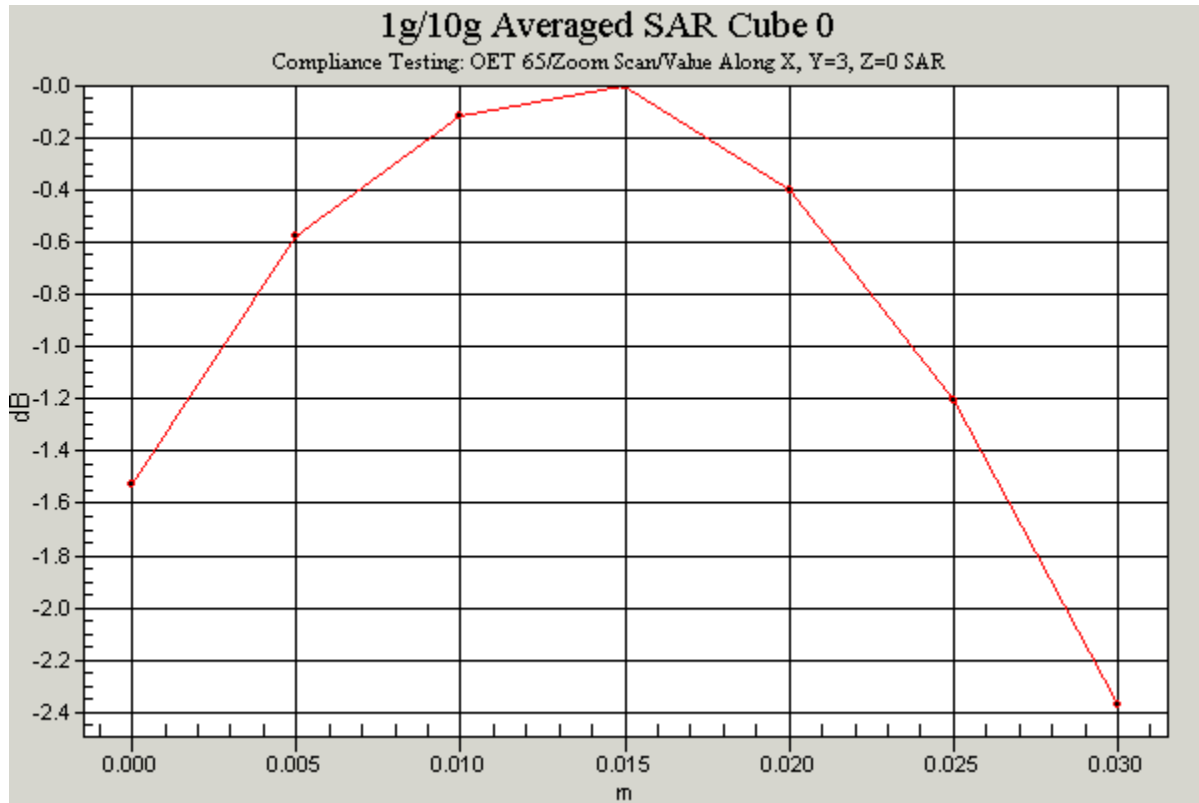
45219/JD02/18

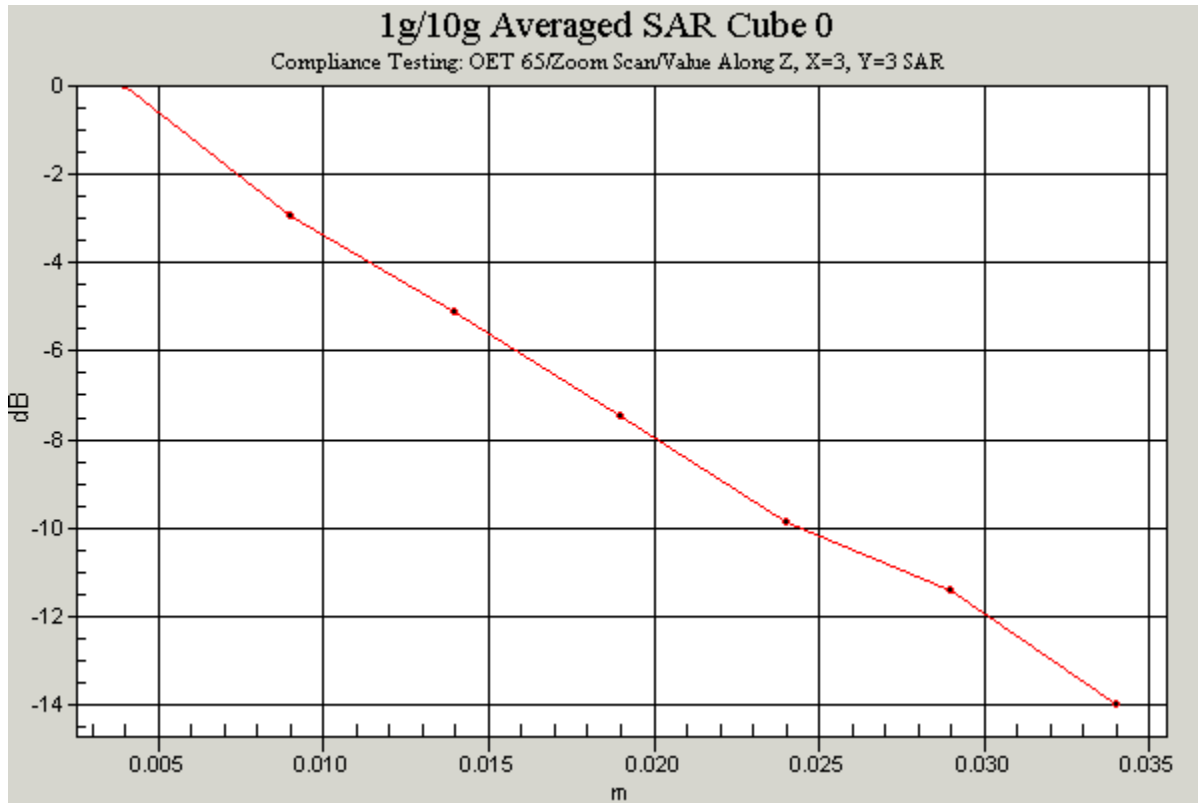
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**







Communication System: TDCDMA - 12MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 14 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.484 mW/g

**90 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.493 mW/g

Peak SAR (extrapolated) = 1.07 W/kg

**SAR(1 g) = 0.473 mW/g; SAR(10 g) = 0.262 mW/g**

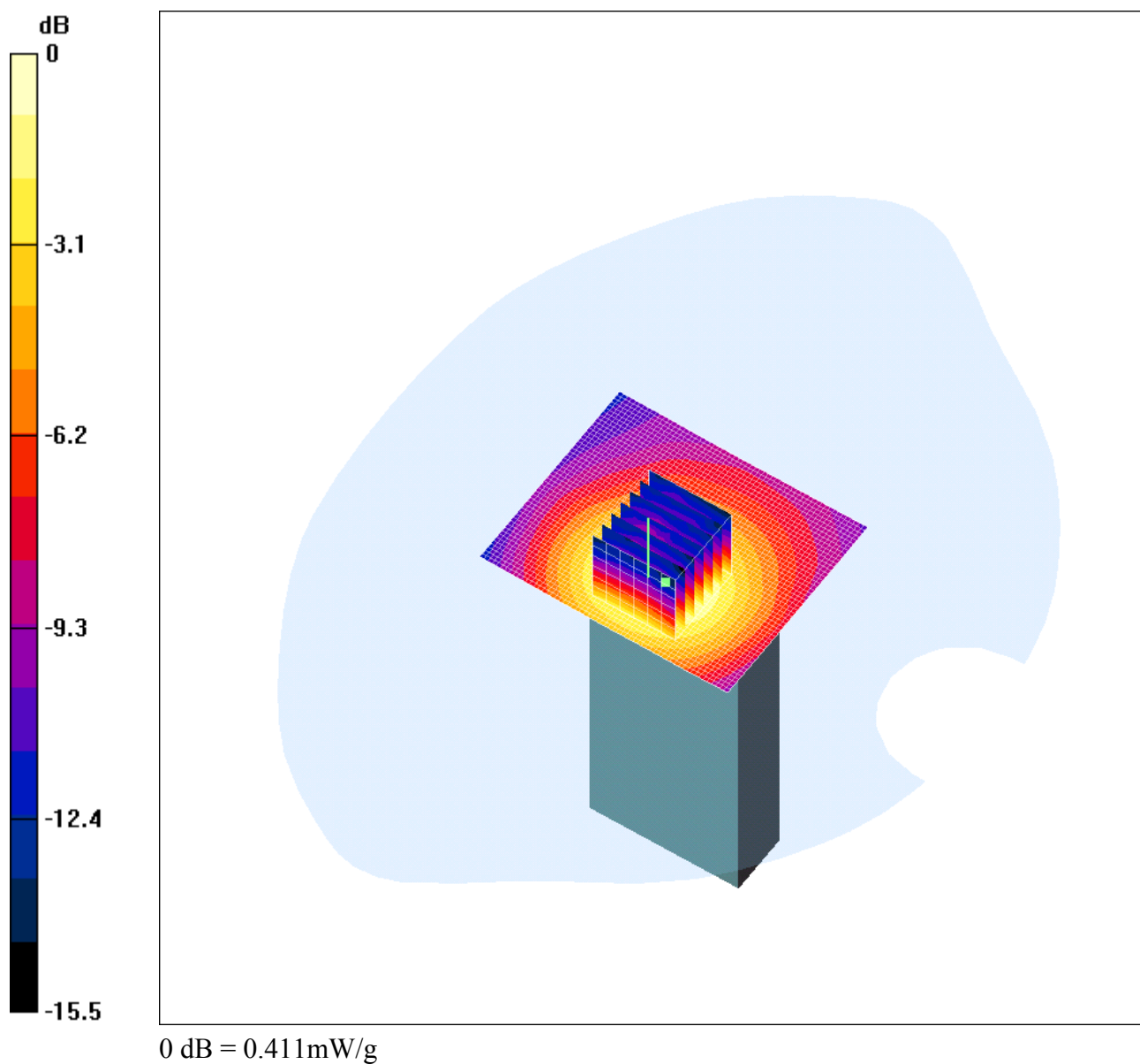
Date: 18/03/04

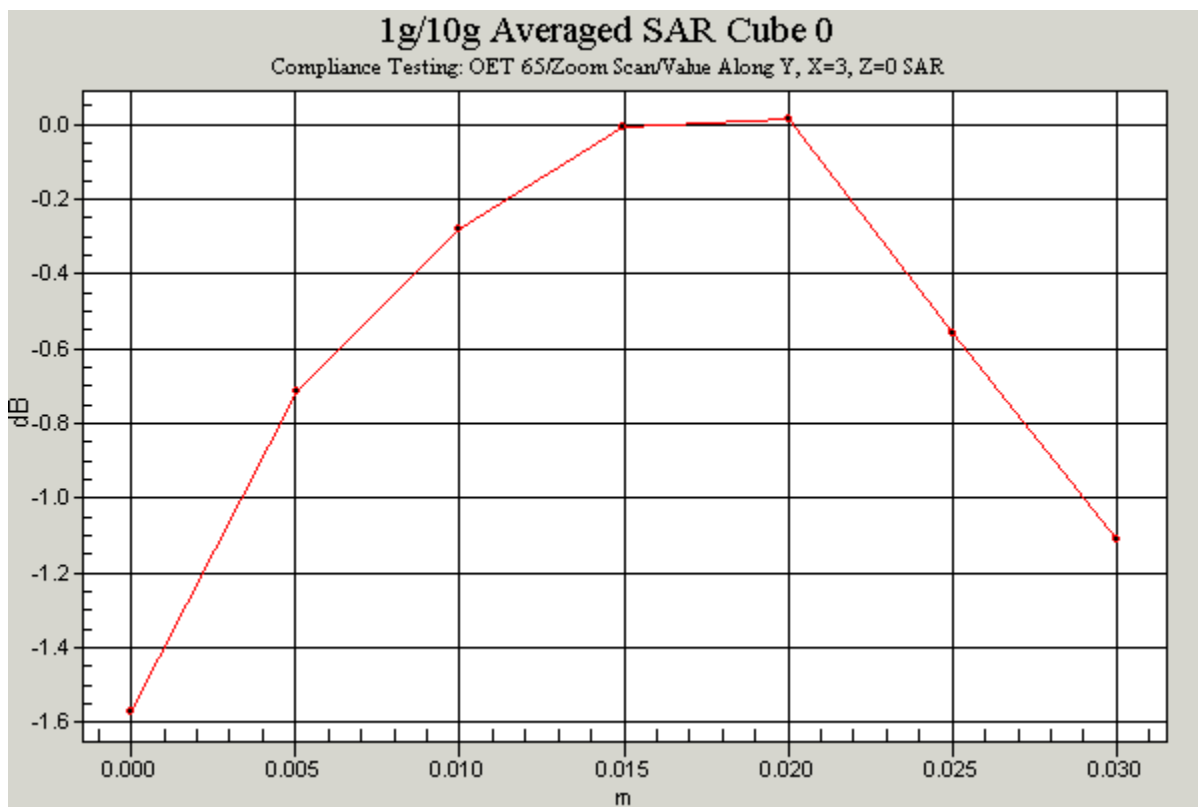
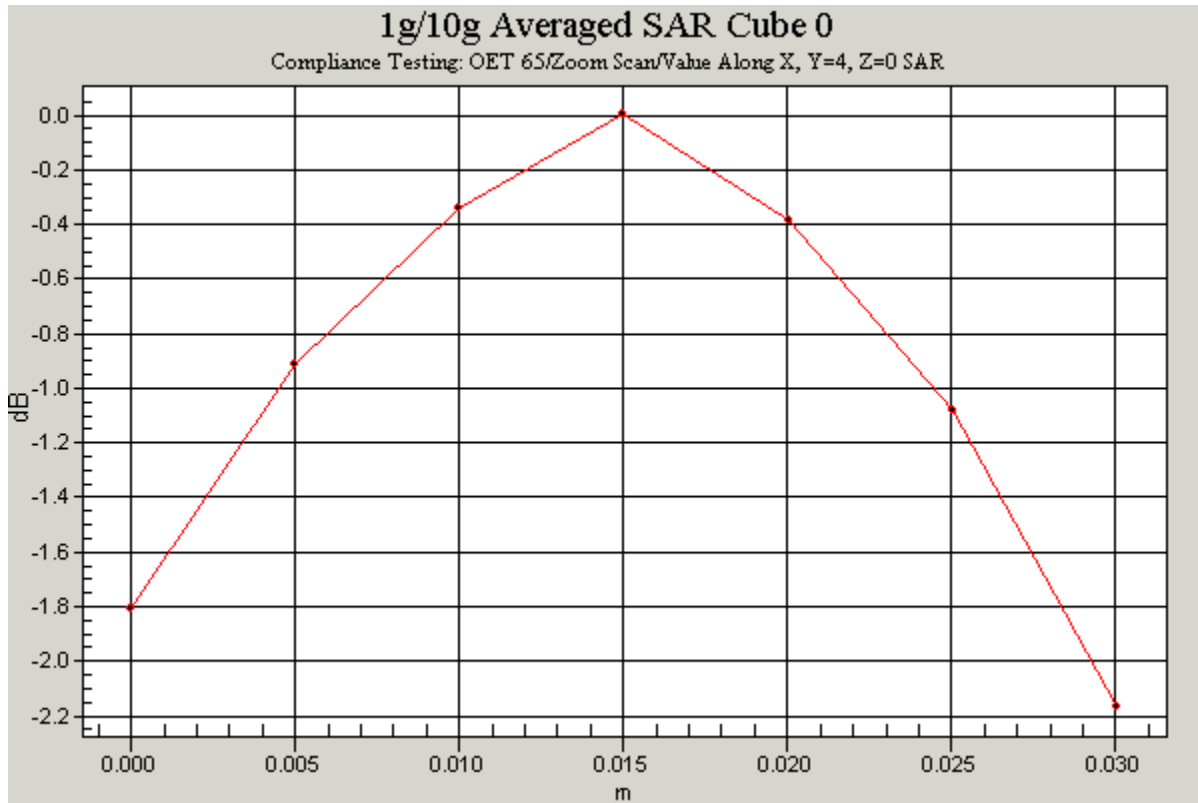
45219/JD02/019

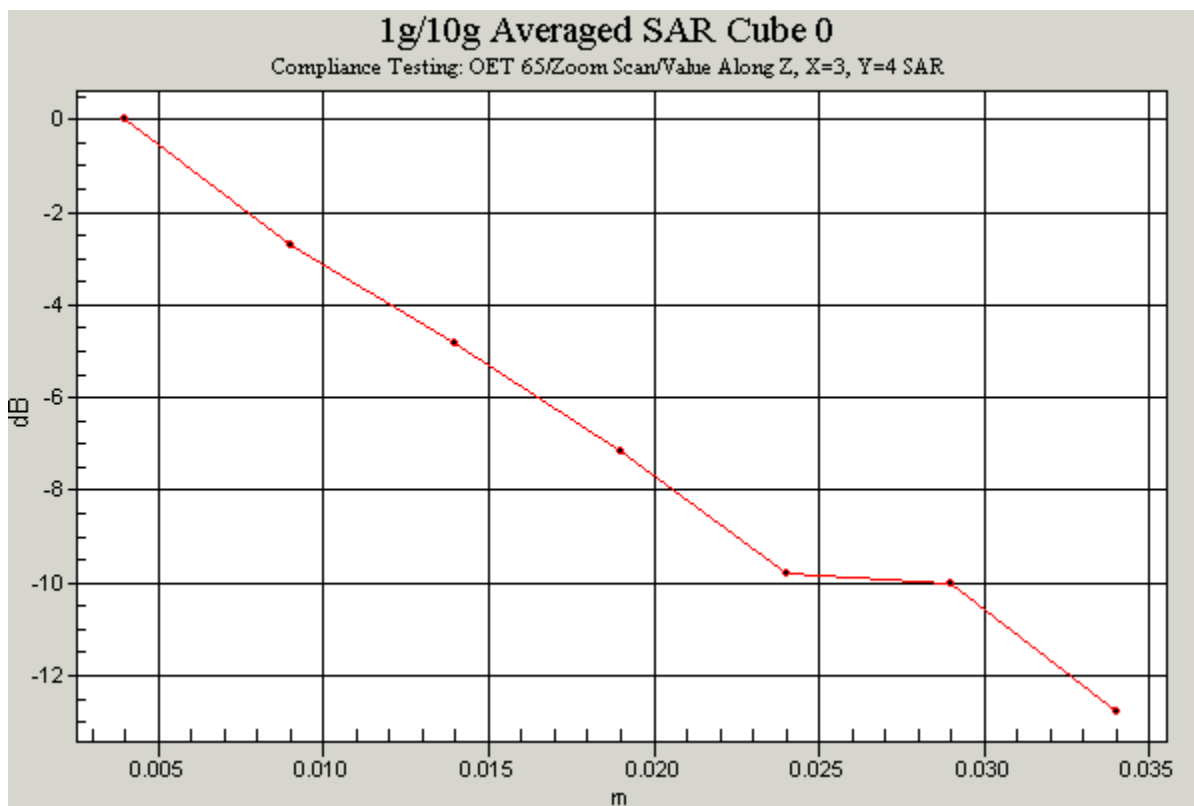
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**







Communication System: TDCDMA - 12MHz Channel; Frequency: 2506 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2506$  MHz;  $\sigma = 2.05$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 112

**90 Degrees to Phantom Bottom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 12.7 V/m; Power Drift = -0.004 dB  
 Maximum value of SAR (interpolated) = 0.408 mW/g

**90 Degrees to Phantom Bottom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 12.7 V/m; Power Drift = -0.004 dB  
 Maximum value of SAR (measured) = 0.411 mW/g  
 Peak SAR (extrapolated) = 0.833 W/kg  
**SAR(1 g) = 0.390 mW/g; SAR(10 g) = 0.220 mW/g**



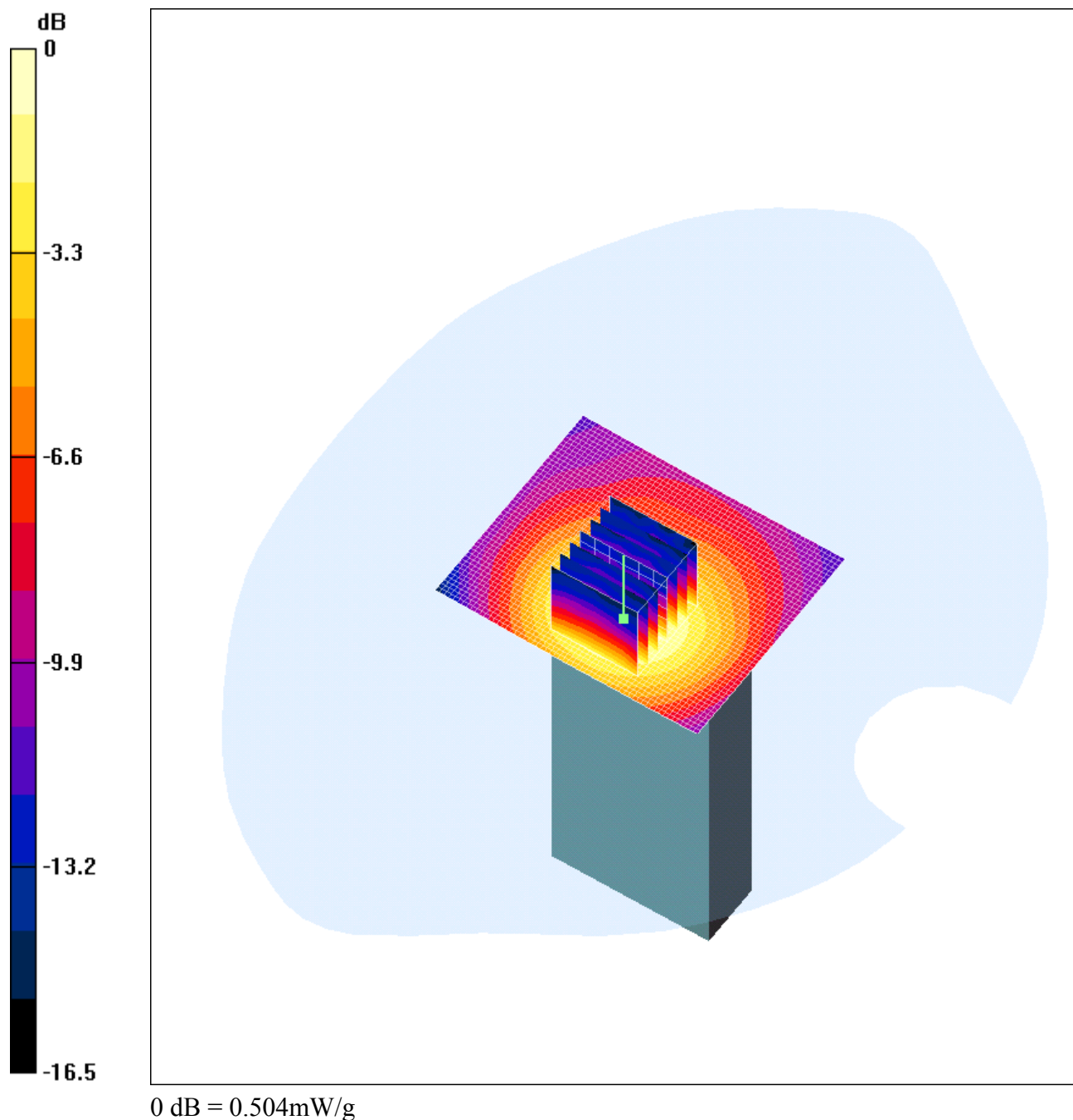
Date: 18/03/04

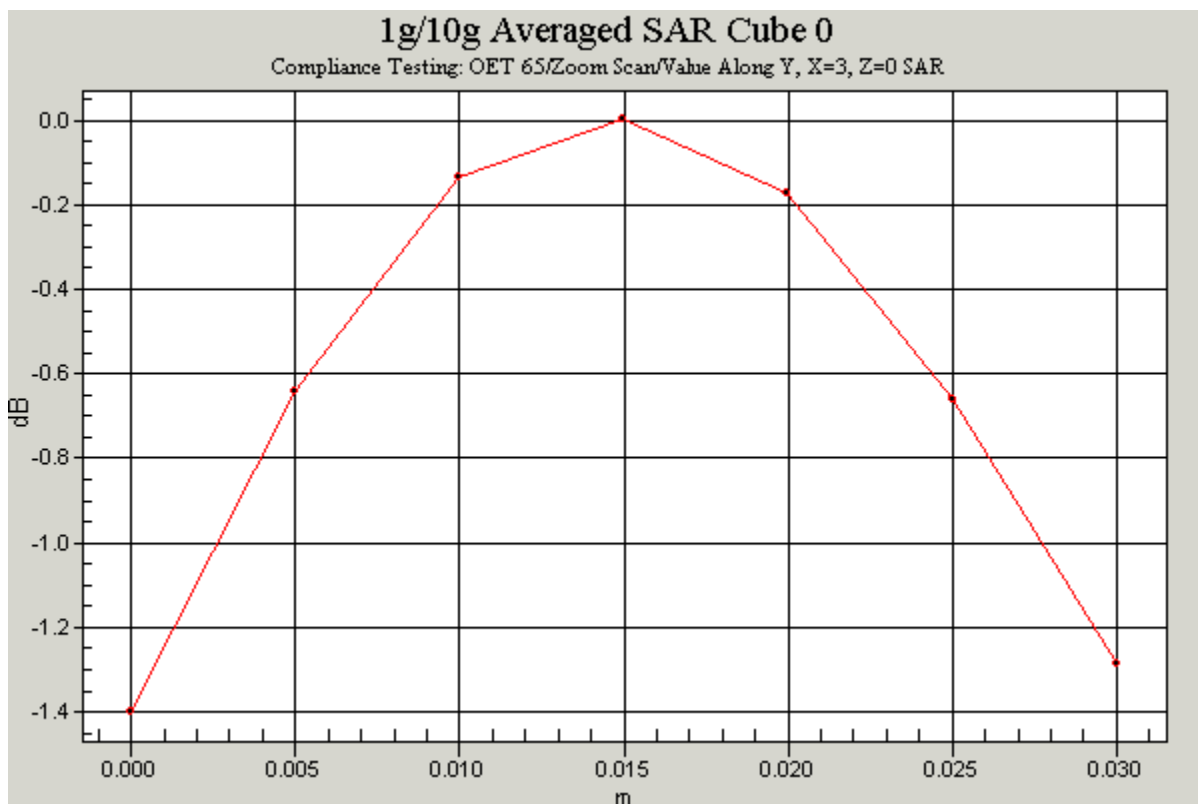
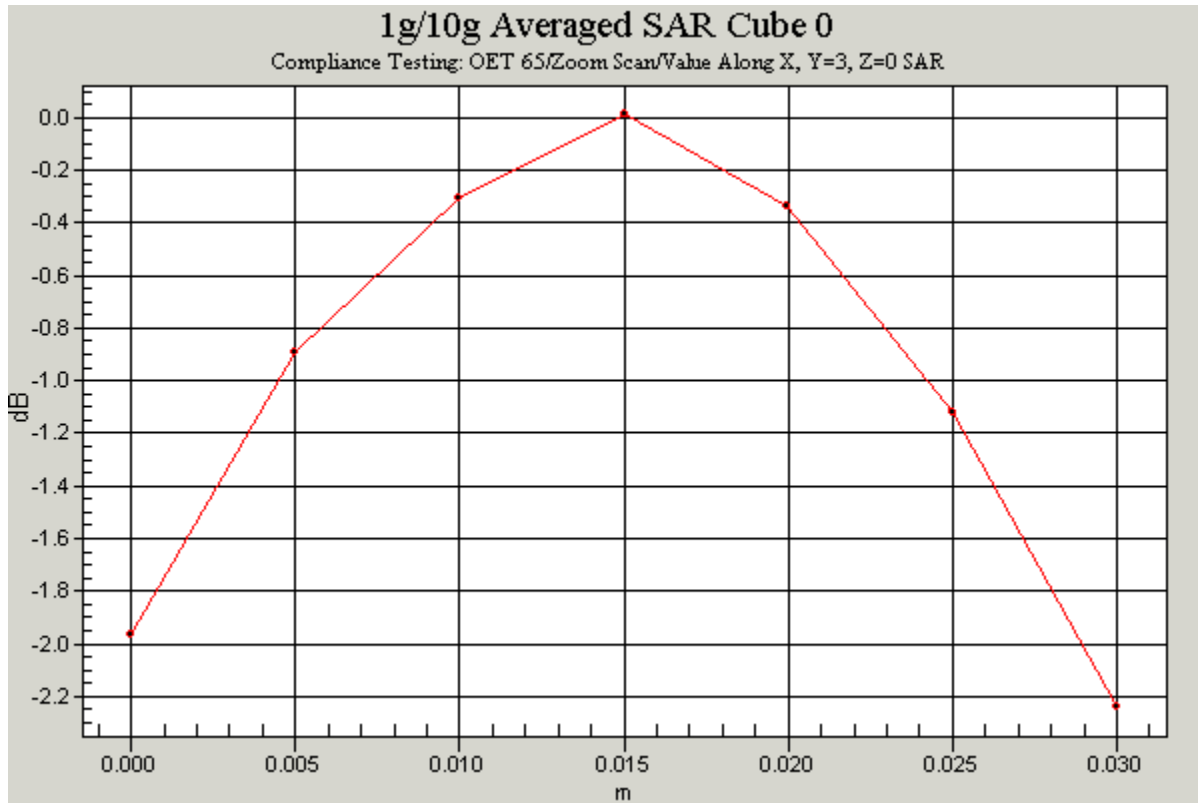
45219/JD02/020

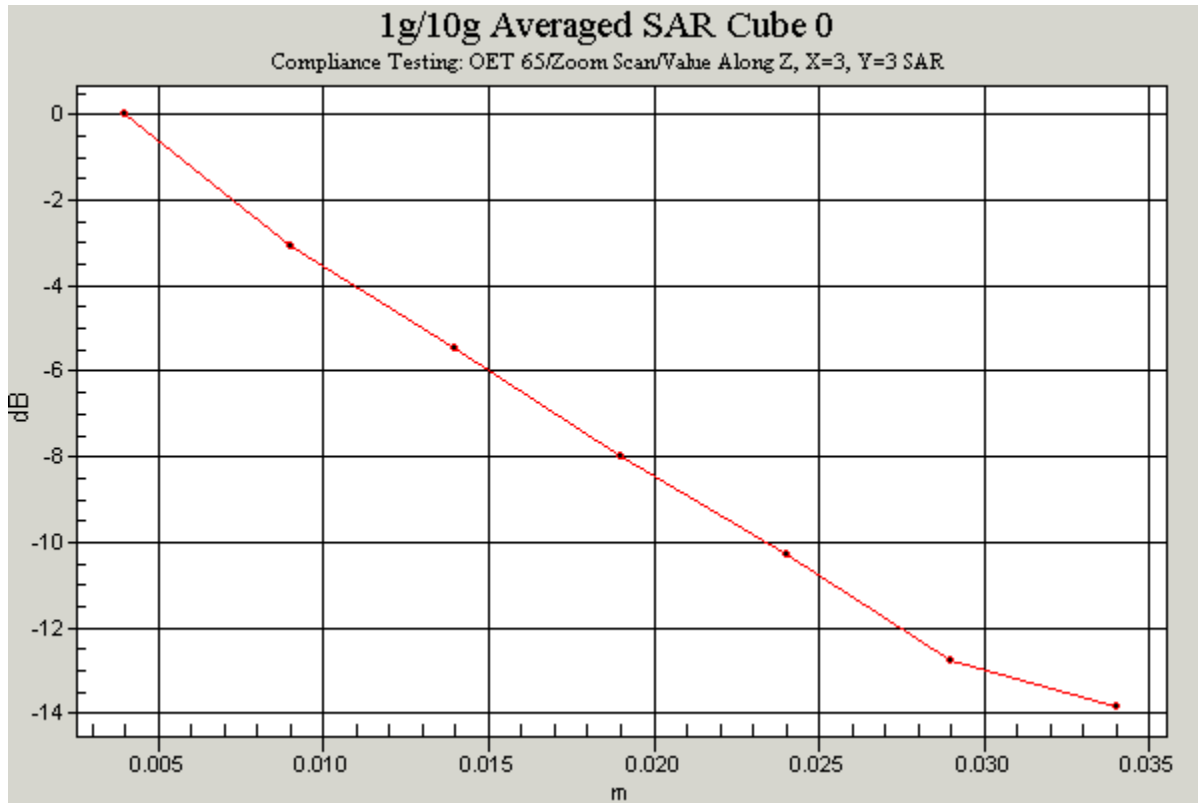
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_12MHz Channel\_90 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**







Communication System: TDCDMA - 12MHz Channel; Frequency: 2680 MHz; Duty Cycle: 1:3  
Medium: 2450MHz MSL Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.3$  mho/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom Top/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 13.2 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.498 mW/g

**90 Degrees to Phantom Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.2 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.504 mW/g

Peak SAR (extrapolated) = 1.11 W/kg

**SAR(1 g) = 0.478 mW/g; SAR(10 g) = 0.260 mW/g**

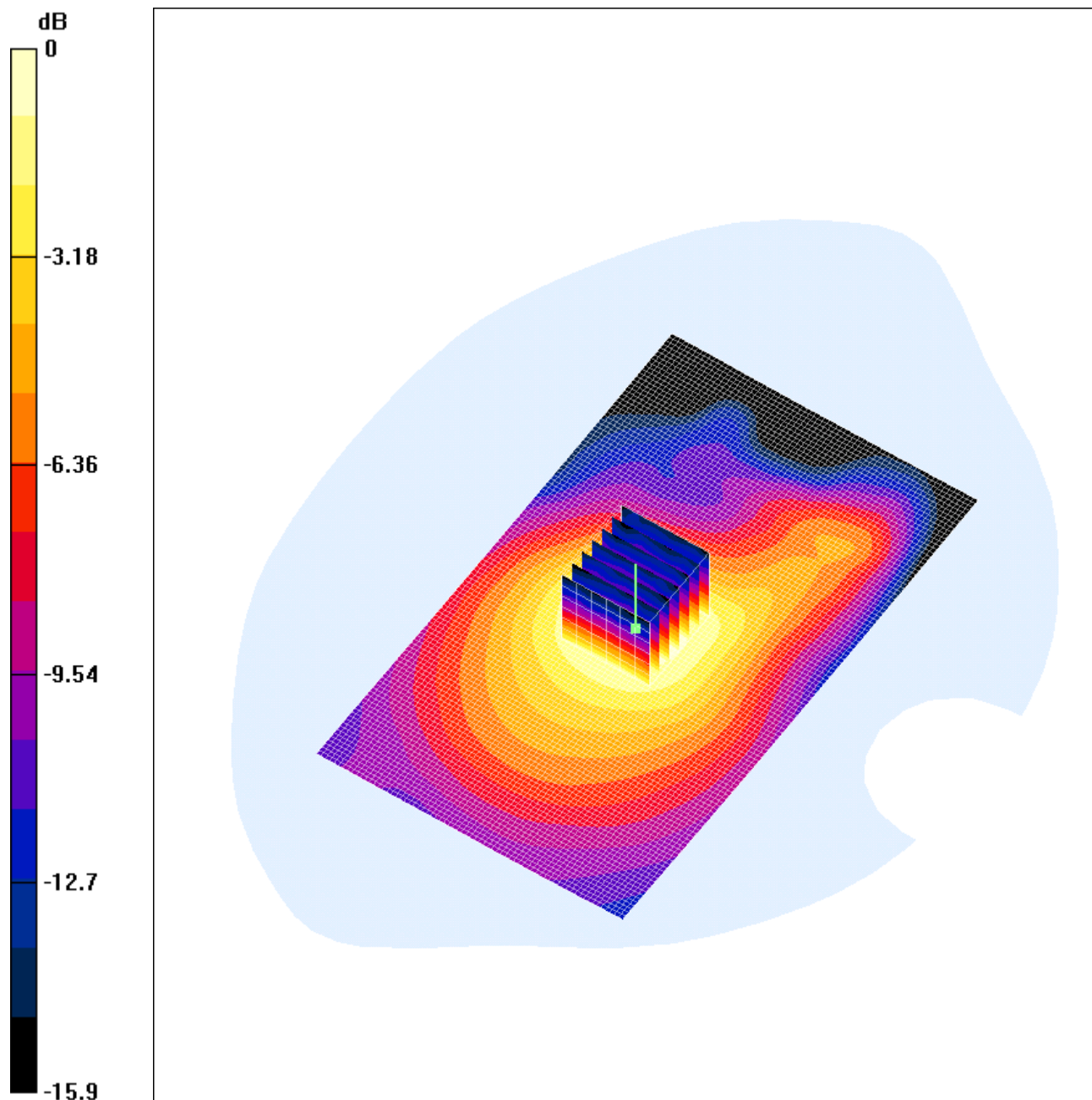
Date: 19/03/04

45219/JD02/021

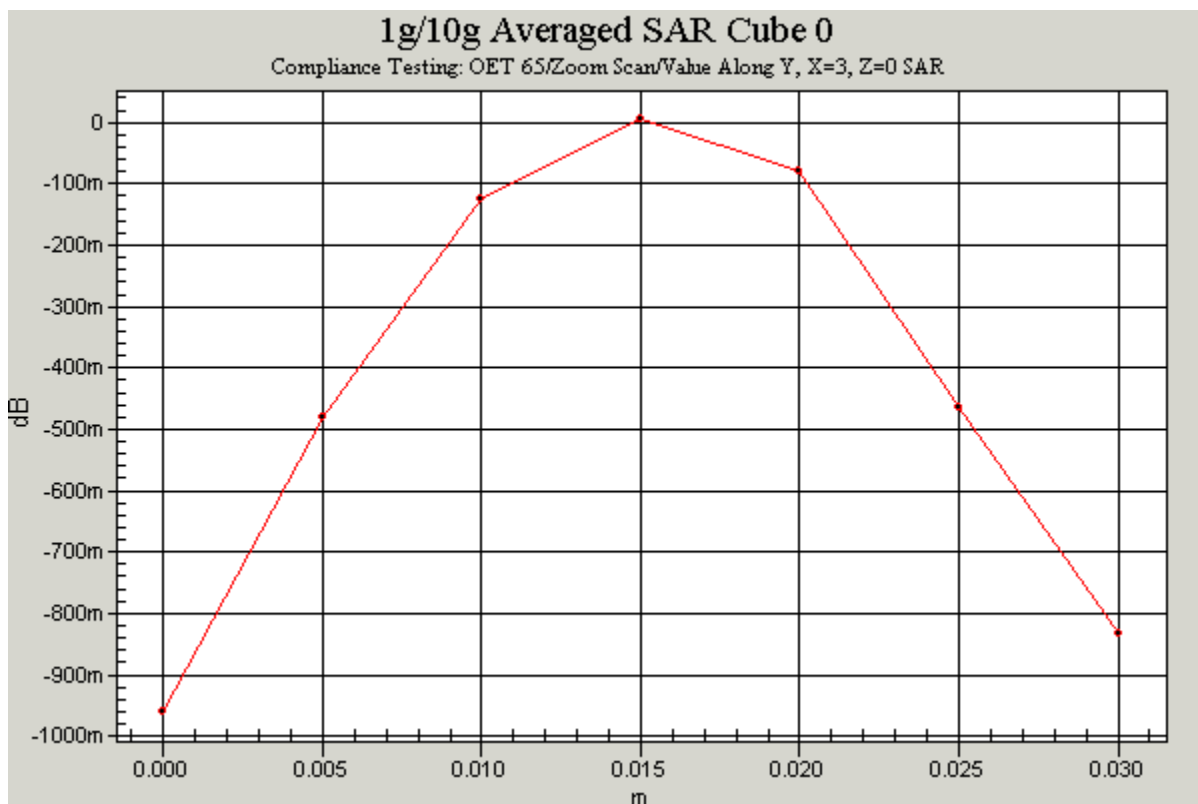
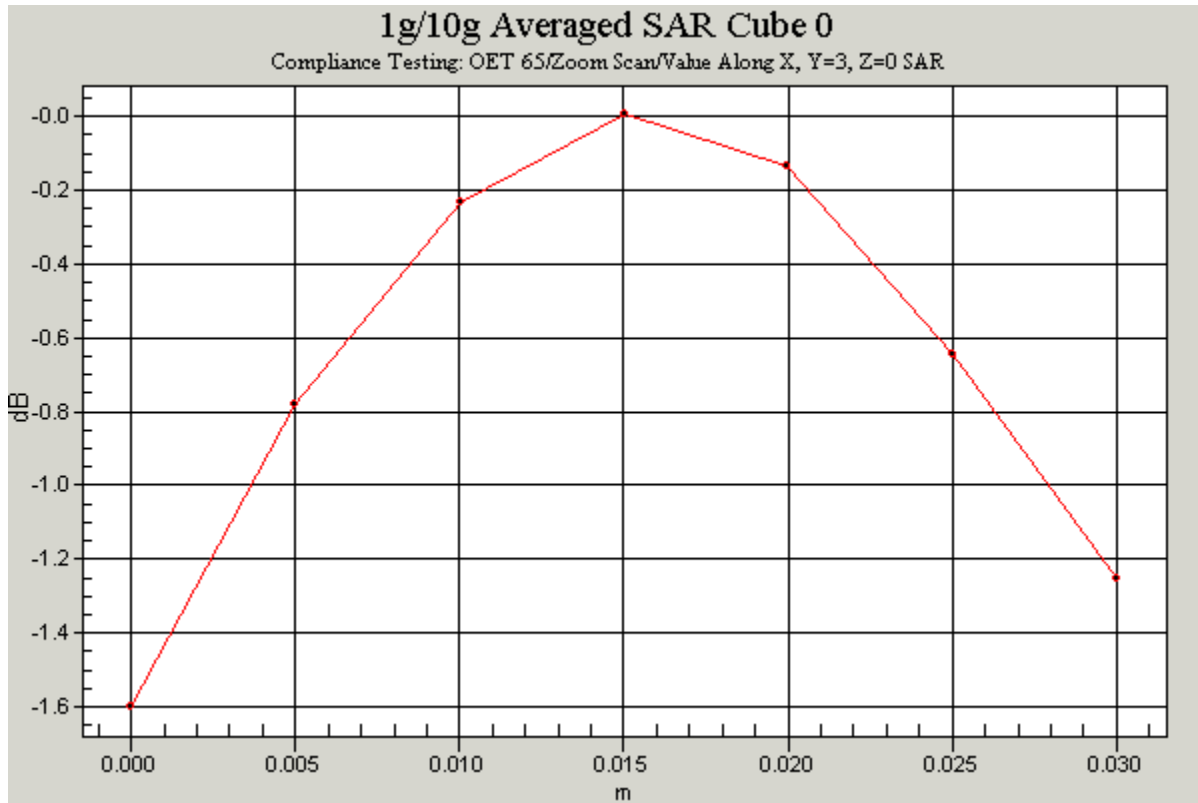
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

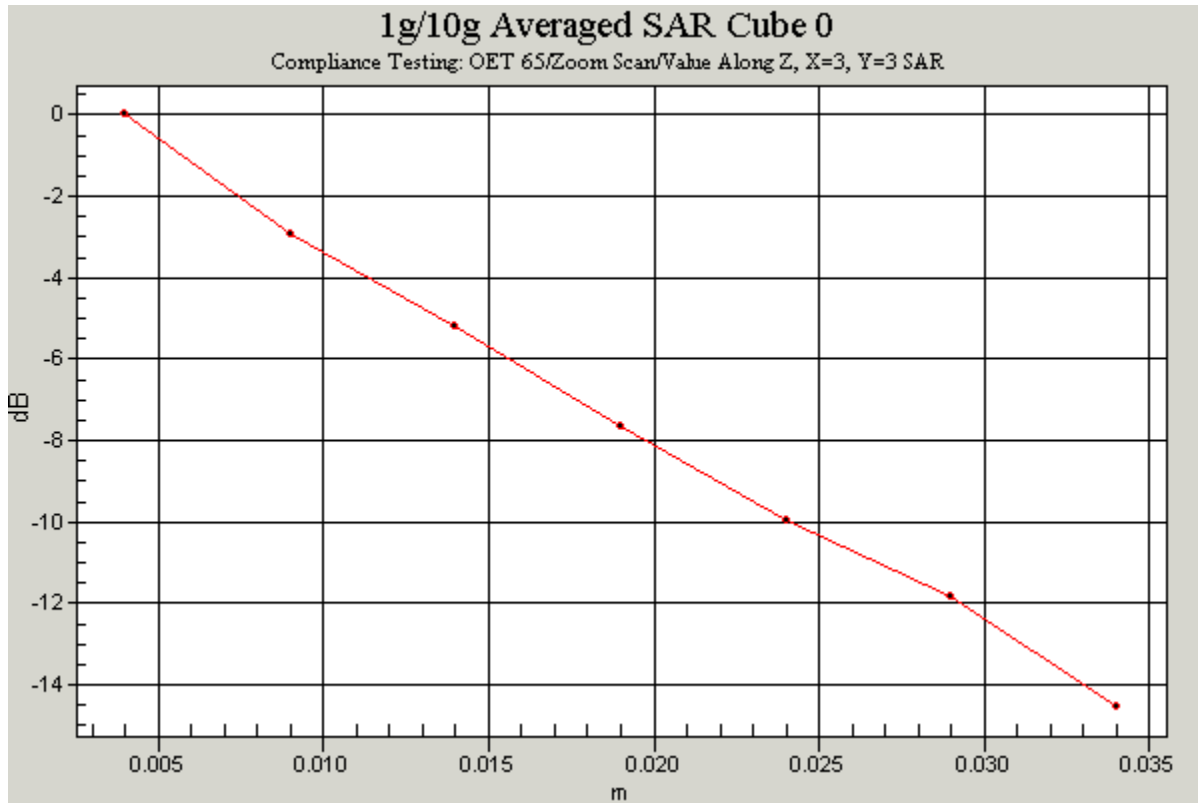
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_ 0 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.331mW/g





Communication System: TDCDMA - 6MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**0 Degrees to Phantom/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 11.4 V/m; Power Drift = -0.0 dB  
 Maximum value of SAR (interpolated) = 0.327 mW/g

**0 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 11.4 V/m; Power Drift = -0.0 dB  
 Maximum value of SAR (measured) = 0.331 mW/g  
 Peak SAR (extrapolated) = 0.687 W/kg  
**SAR(1 g) = 0.318 mW/g; SAR(10 g) = 0.180 mW/g**

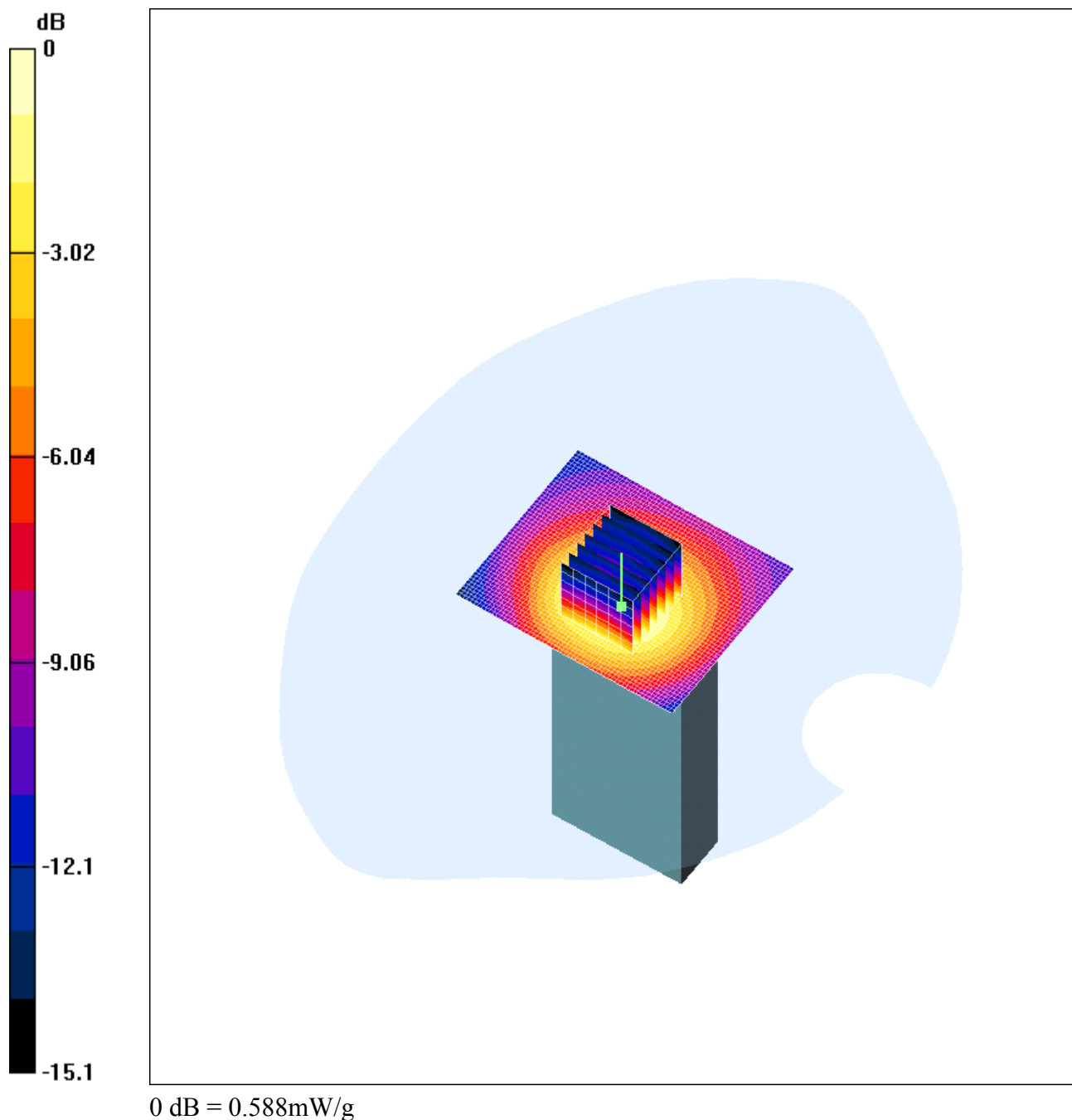
Date: 18/03/04

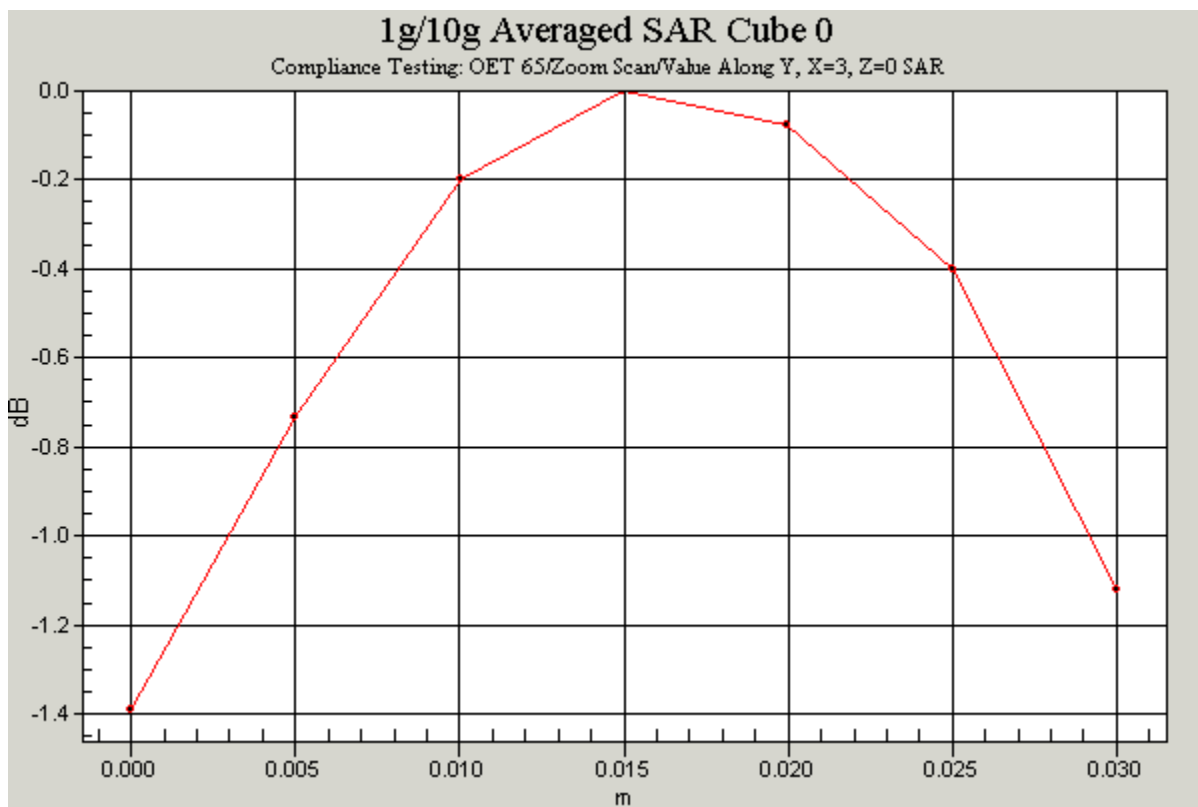
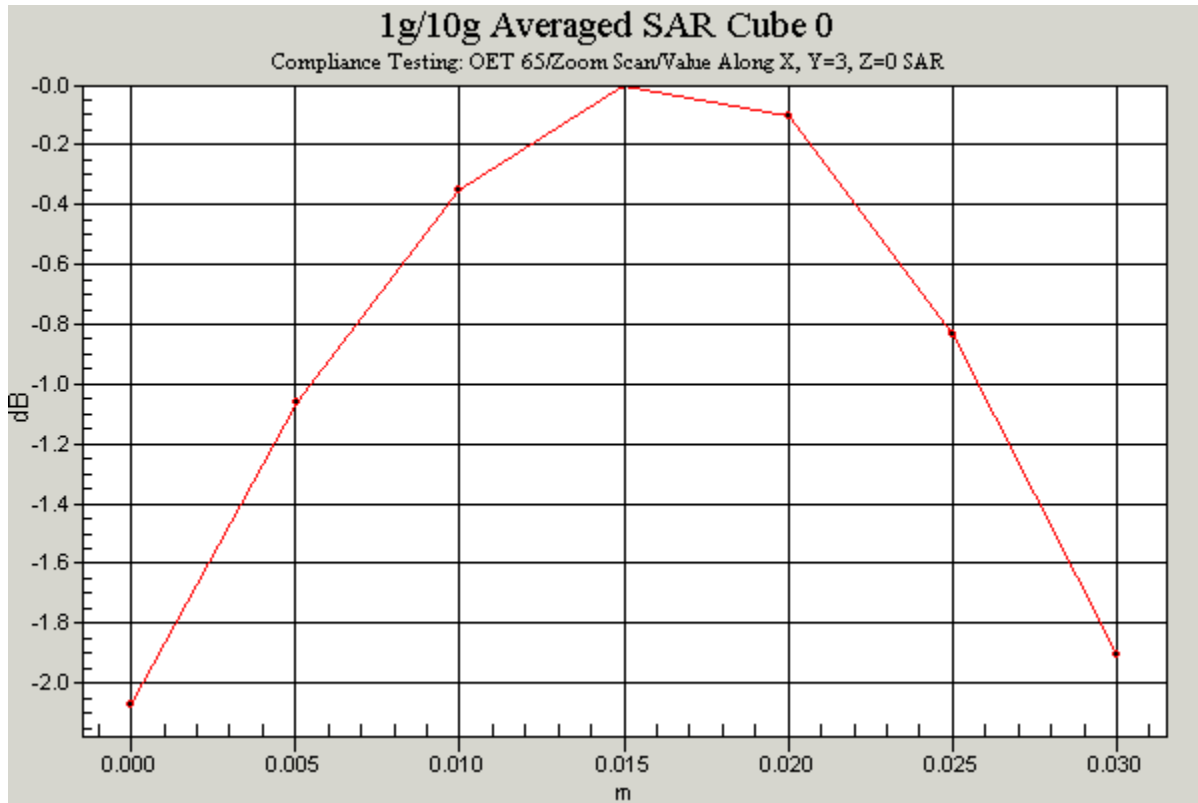
45219/JD02/022

Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

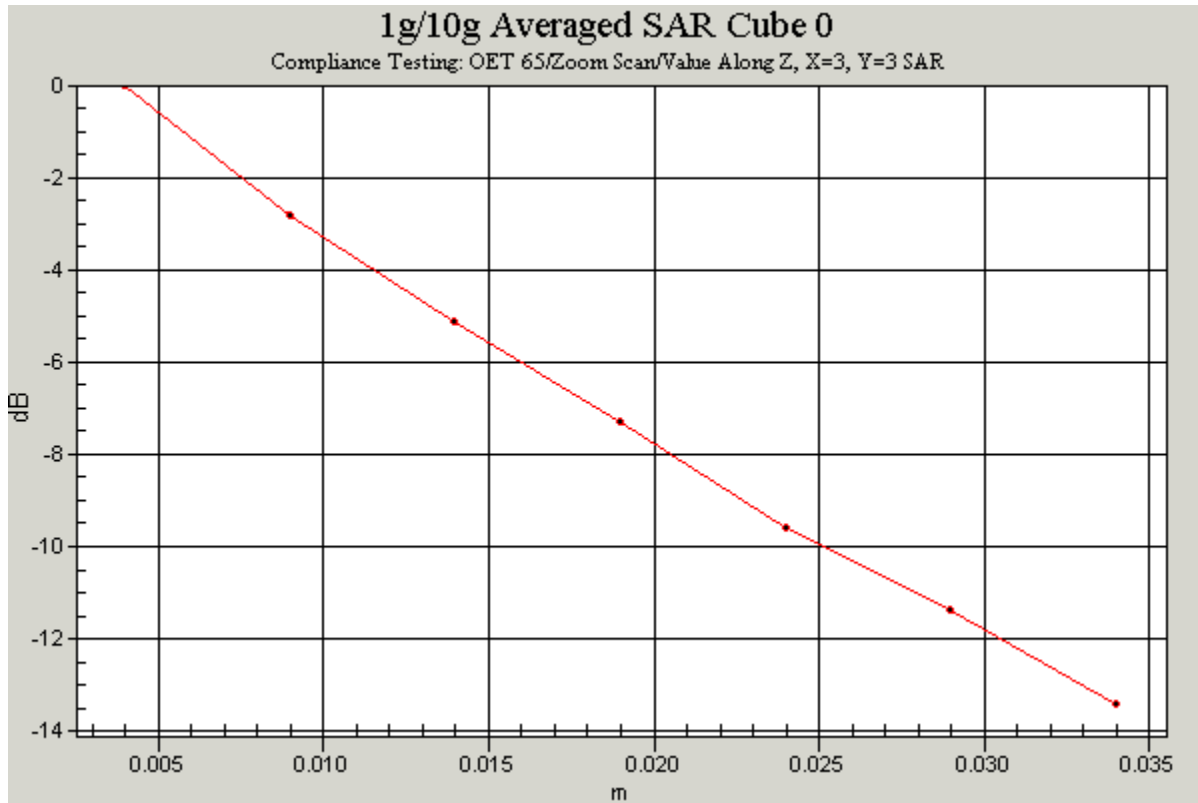
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**









Communication System: TDCDMA - 6MHz Channel; Frequency: 2596 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2596$  MHz;  $\sigma = 2.18$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 16.3 V/m; Power Drift = -0.2 dB

Maximum value of SAR (interpolated) = 0.593 mW/g

**90 Degrees to Phantom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.3 V/m; Power Drift = -0.2 dB

Maximum value of SAR (measured) = 0.588 mW/g

Peak SAR (extrapolated) = 1.21 W/kg

**SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.313 mW/g**

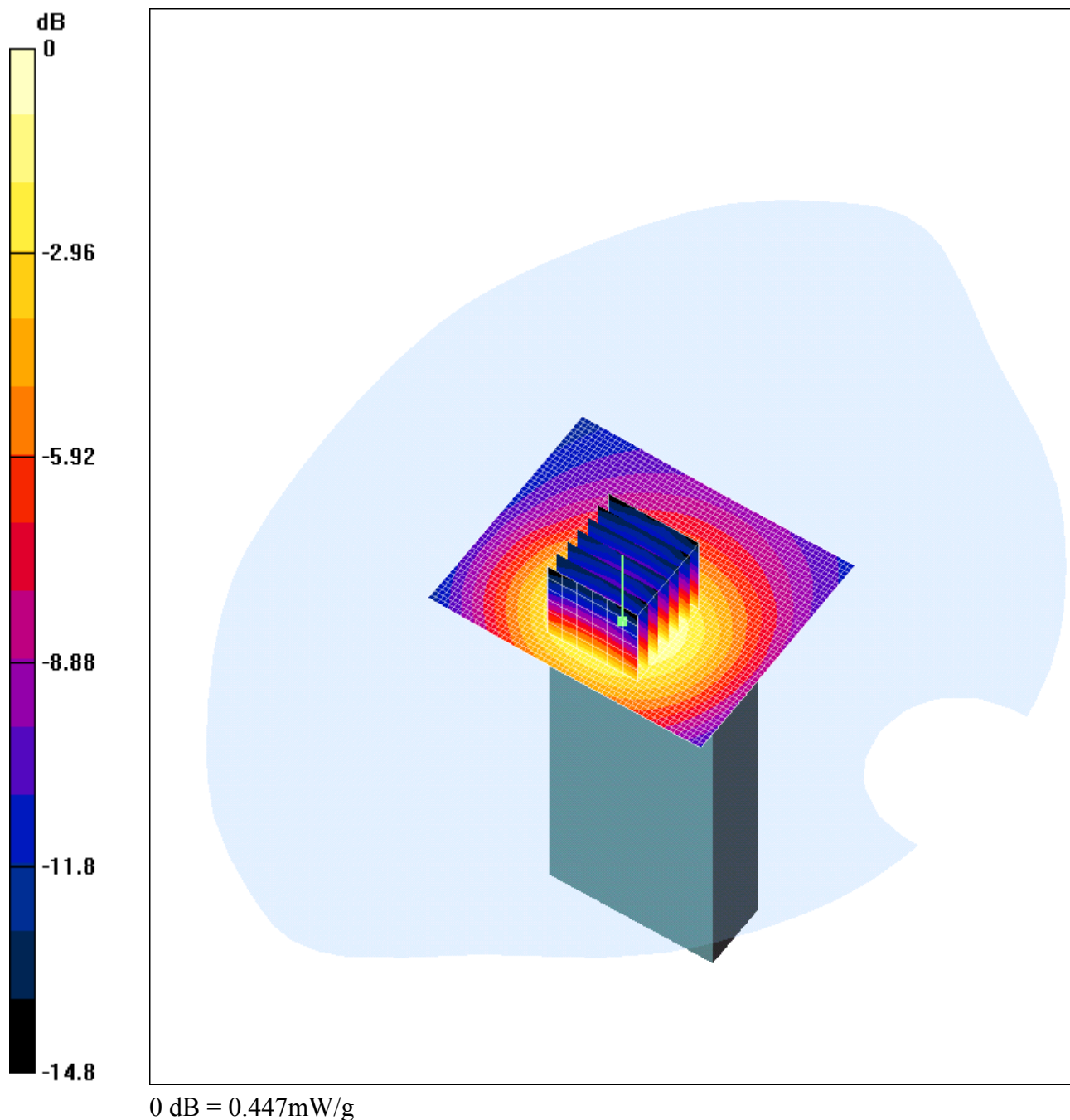
Date: 19/03/04

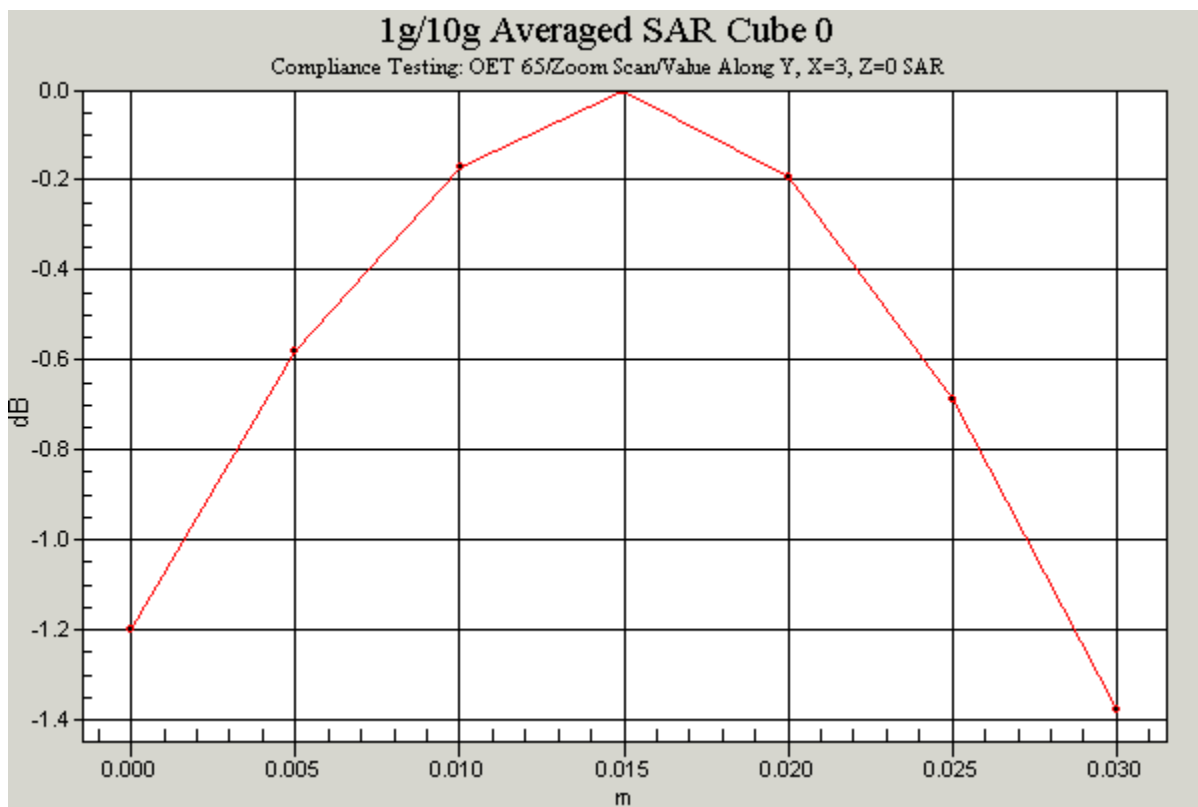
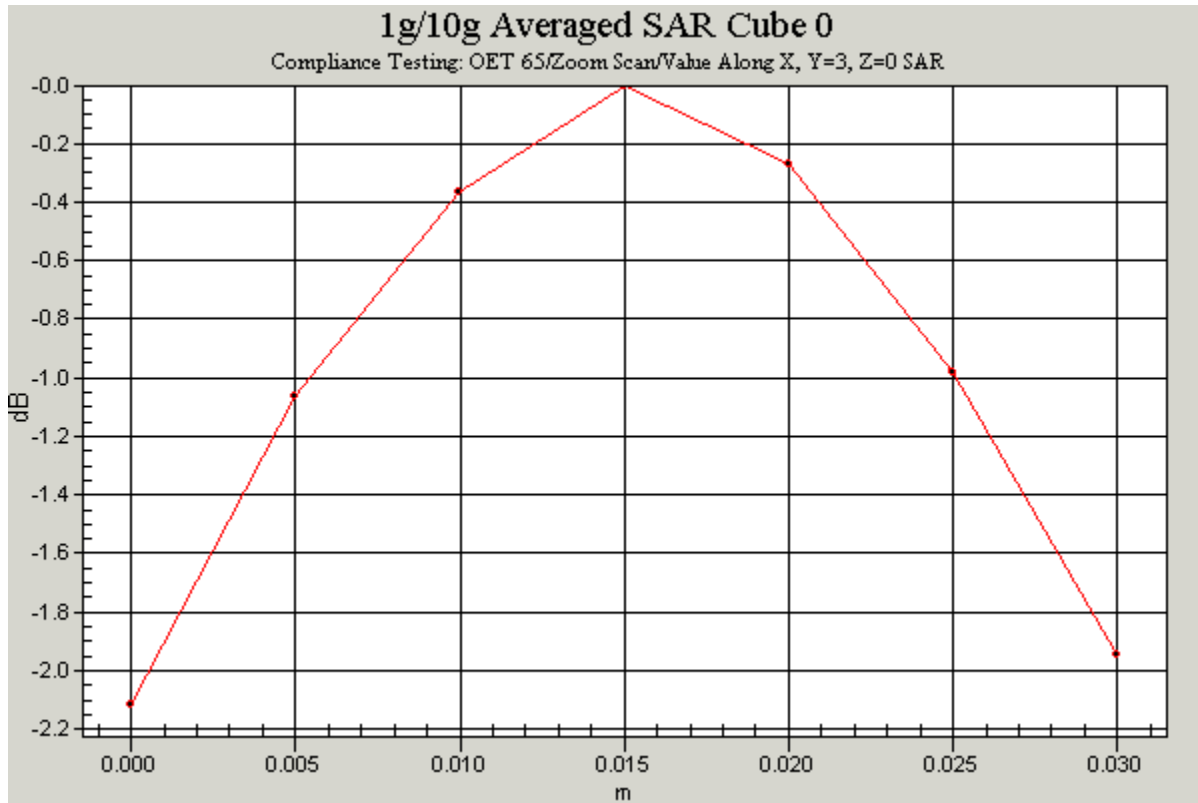
45219/JD02/023

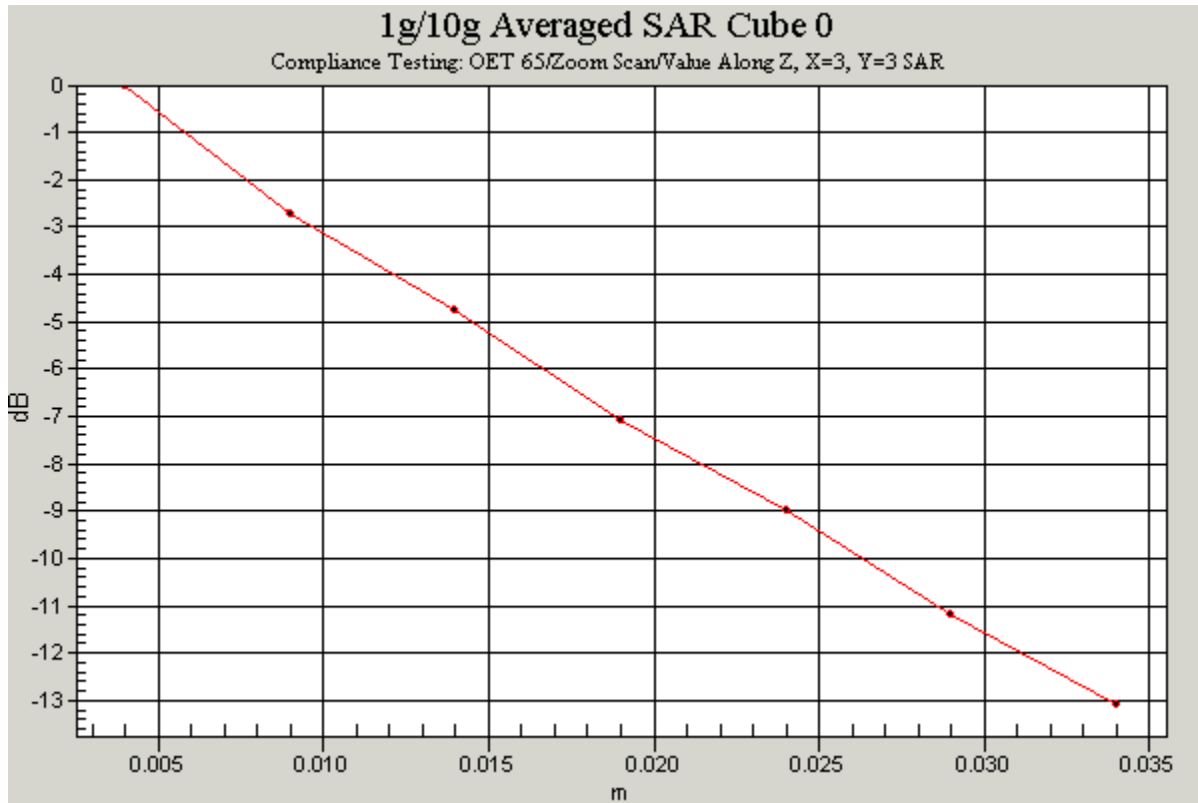
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_90 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**







Communication System: TDCDMA - 6MHz Channel; Frequency: 2503 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2503$  MHz;  $\sigma = 2.05$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(4.3, 4.3, 4.3); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**90 Degrees to Phantom - Bottom/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 13.3 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.447 mW/g

**90 Degrees to Phantom - Bottom/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.3 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.447 mW/g

Peak SAR (extrapolated) = 0.908 W/kg

**SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.238 mW/g**

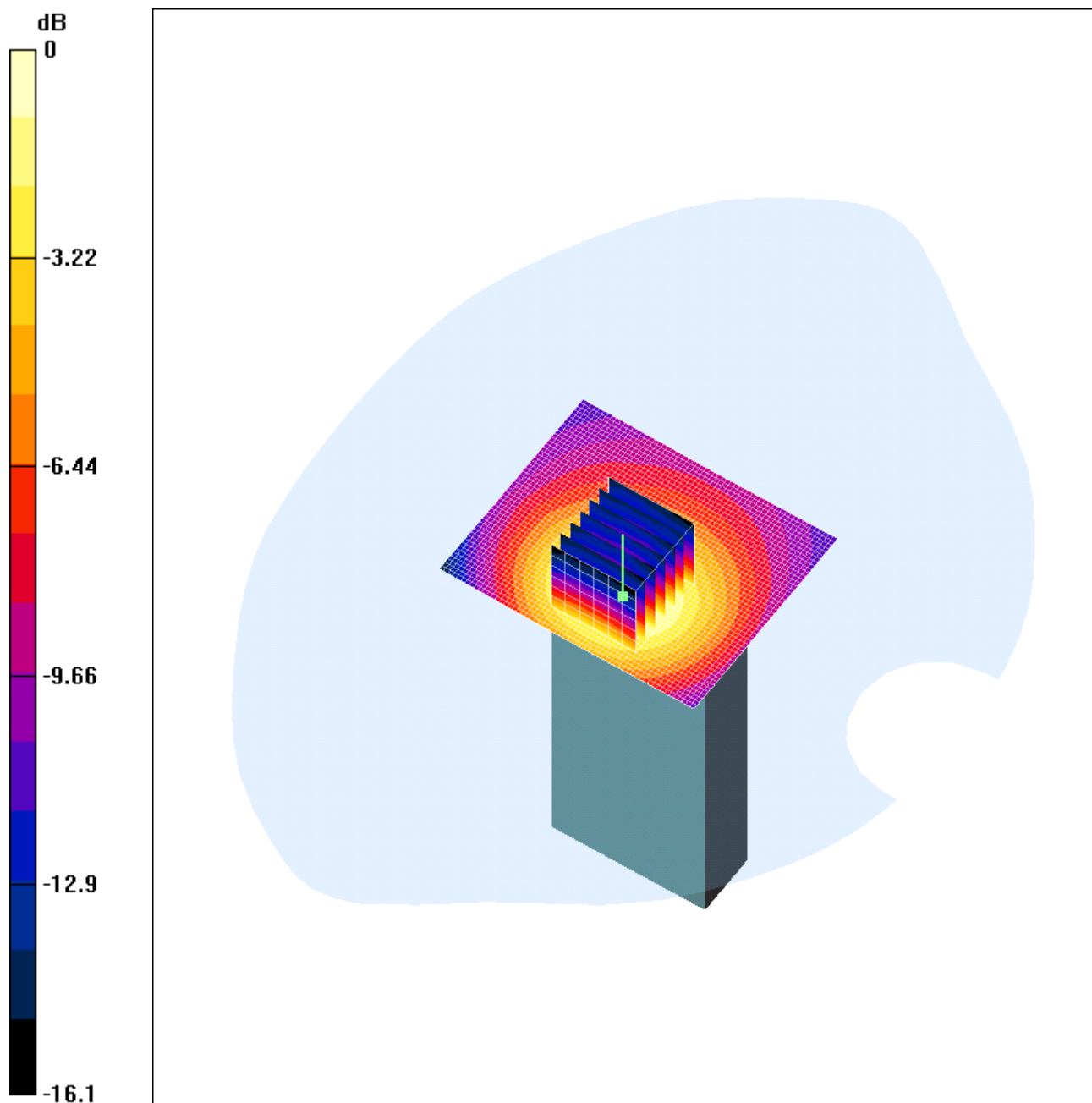
Date: 18/03/04

45219/JD02/024

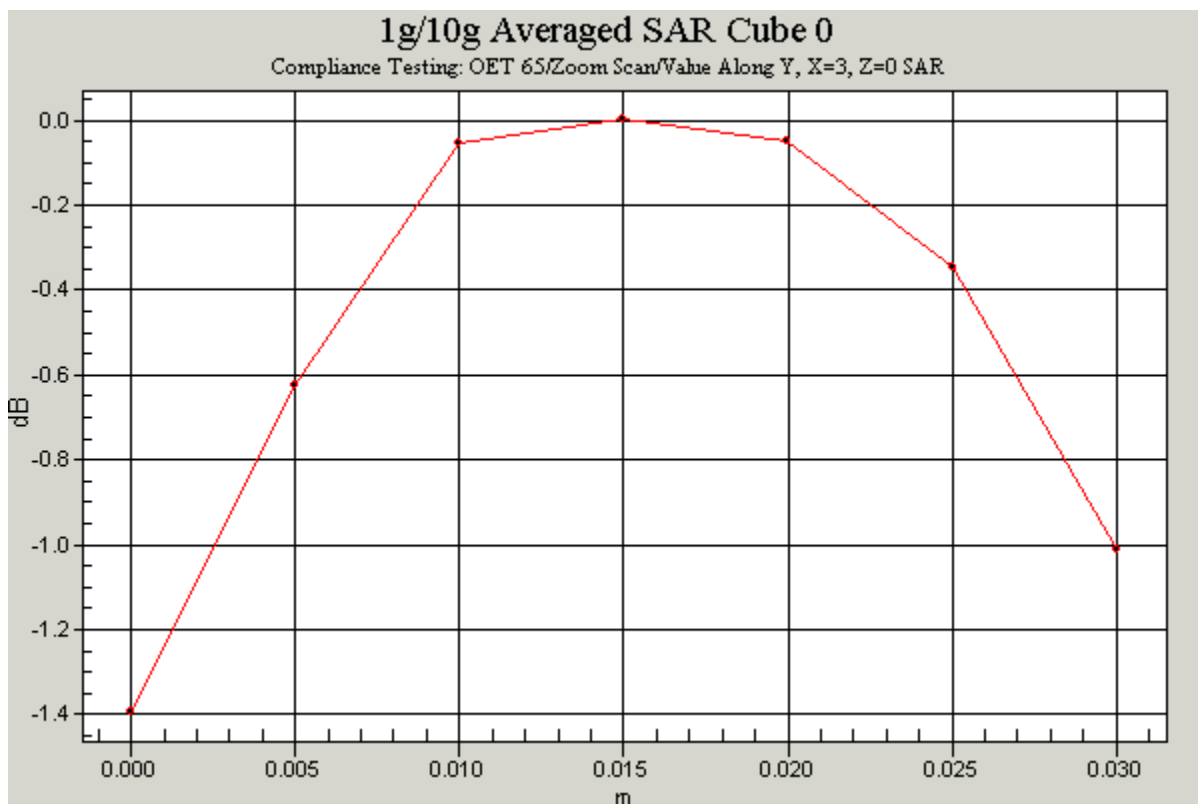
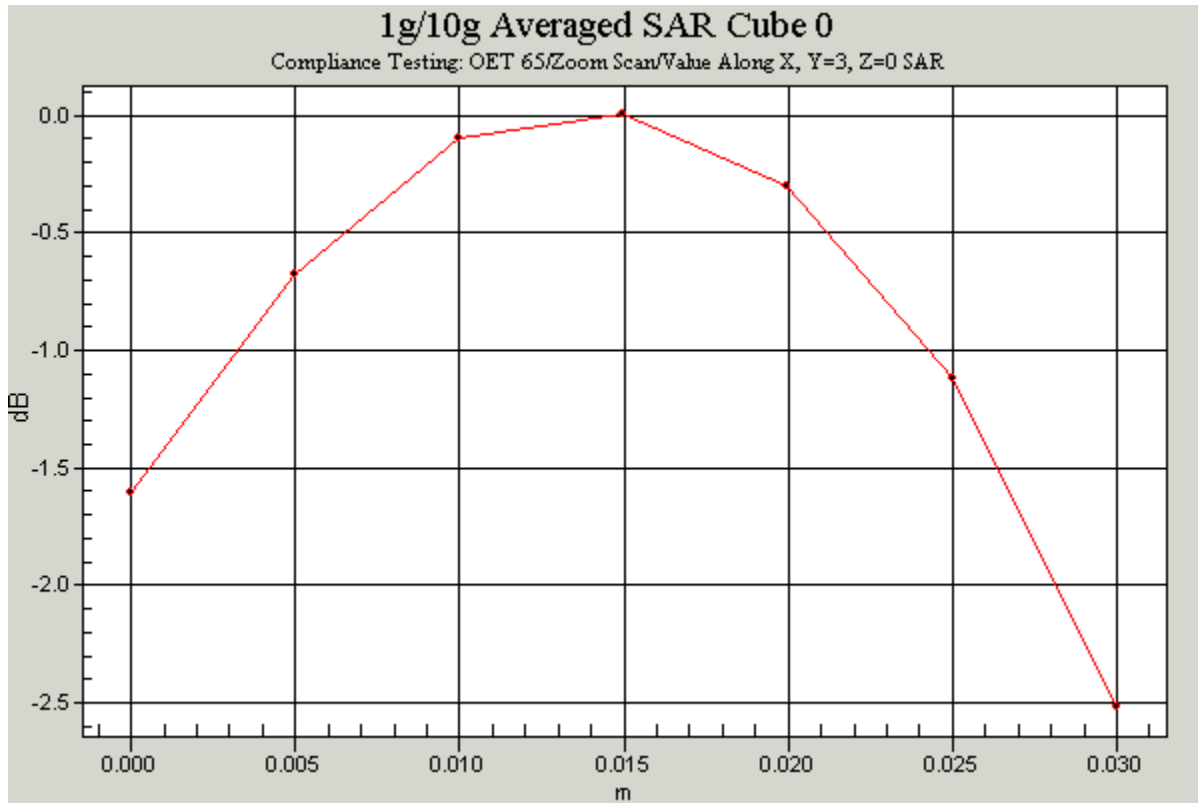
Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

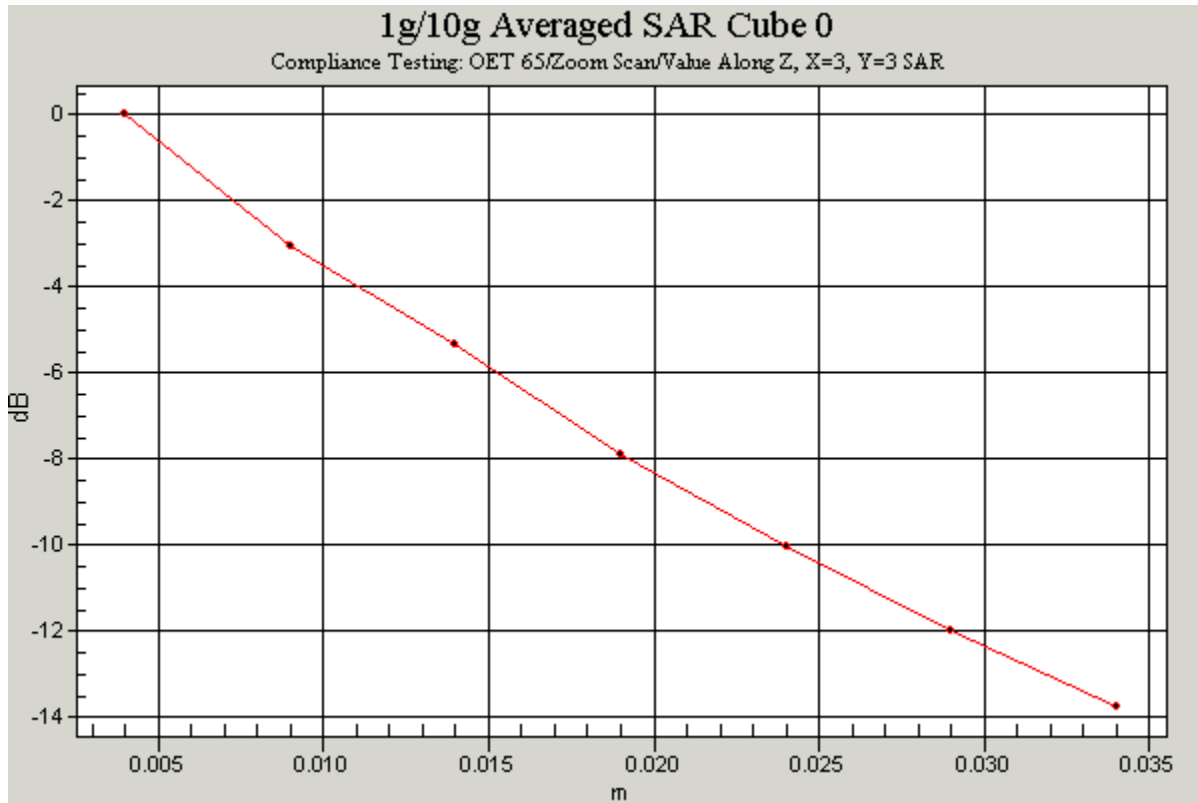
**45219\_JD02\_Flat\_Section\_2600MHz\_6MHz Channel\_ 90 Degrees to Phantom\_UMAX Host**

**DUT: IP Wireless UK Ltd.; Type: 6MHz Channel PCMCIA Modem; Serial: FD5D34100F213**



0 dB = 0.538mW/g





Communication System: TDCDMA - 6MHz Channel; Frequency: 2683 MHz; Duty Cycle: 1:3  
 Medium: 2450MHz MSL Medium parameters used (interpolated):  $f = 2683$  MHz;  $\sigma = 2.31$  mho/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(3.97, 3.97, 3.97); Calibrated: 09/06/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

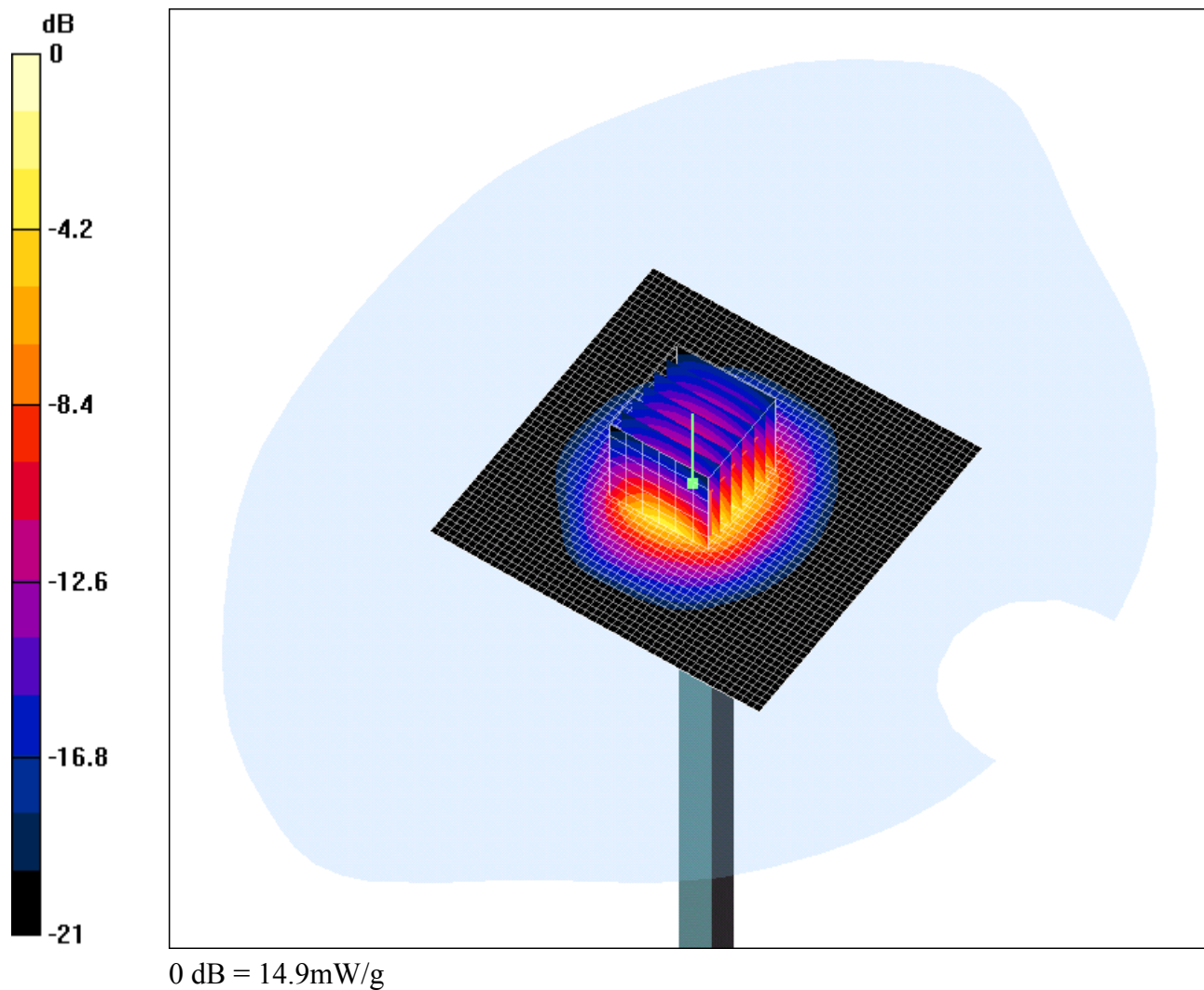
**90 Degrees to Phantom Top/Area Scan (61x51x1):** Measurement grid: dx=15mm, dy=15mm  
 Reference Value = 14 V/m; Power Drift = -0.1 dB  
 Maximum value of SAR (interpolated) = 0.541 mW/g

**90 Degrees to Phantom Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 14 V/m; Power Drift = -0.1 dB  
 Maximum value of SAR (measured) = 0.538 mW/g  
 Peak SAR (extrapolated) = 1.22 W/kg  
**SAR(1 g) = 0.523 mW/g; SAR(10 g) = 0.285 mW/g**

Date: 17/03/04

VALIDATION\_001

Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**System Performance Check-D2450 17 03 04****DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN725**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450MHz MSL Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.98$  mho/m;  $\epsilon_r = 54.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(4.3, 4.3, 4.3); Calibrated: 09/06/2003

- Sensor-Surface: 4mm (Mechanical Surface Detection)



Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

- Electronics: DAE3 Sn394; Calibrated: 22/08/2003

- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**d=10mm, Pin=250mW/Area Scan (51x51x1):** Measurement grid: dx=20mm, dy=20mm

Reference Value = 89.1 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 15.4 mW/g

**d=10mm, Pin=250mW/Zoom Scan 7x7x7 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.1 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 14.9 mW/g

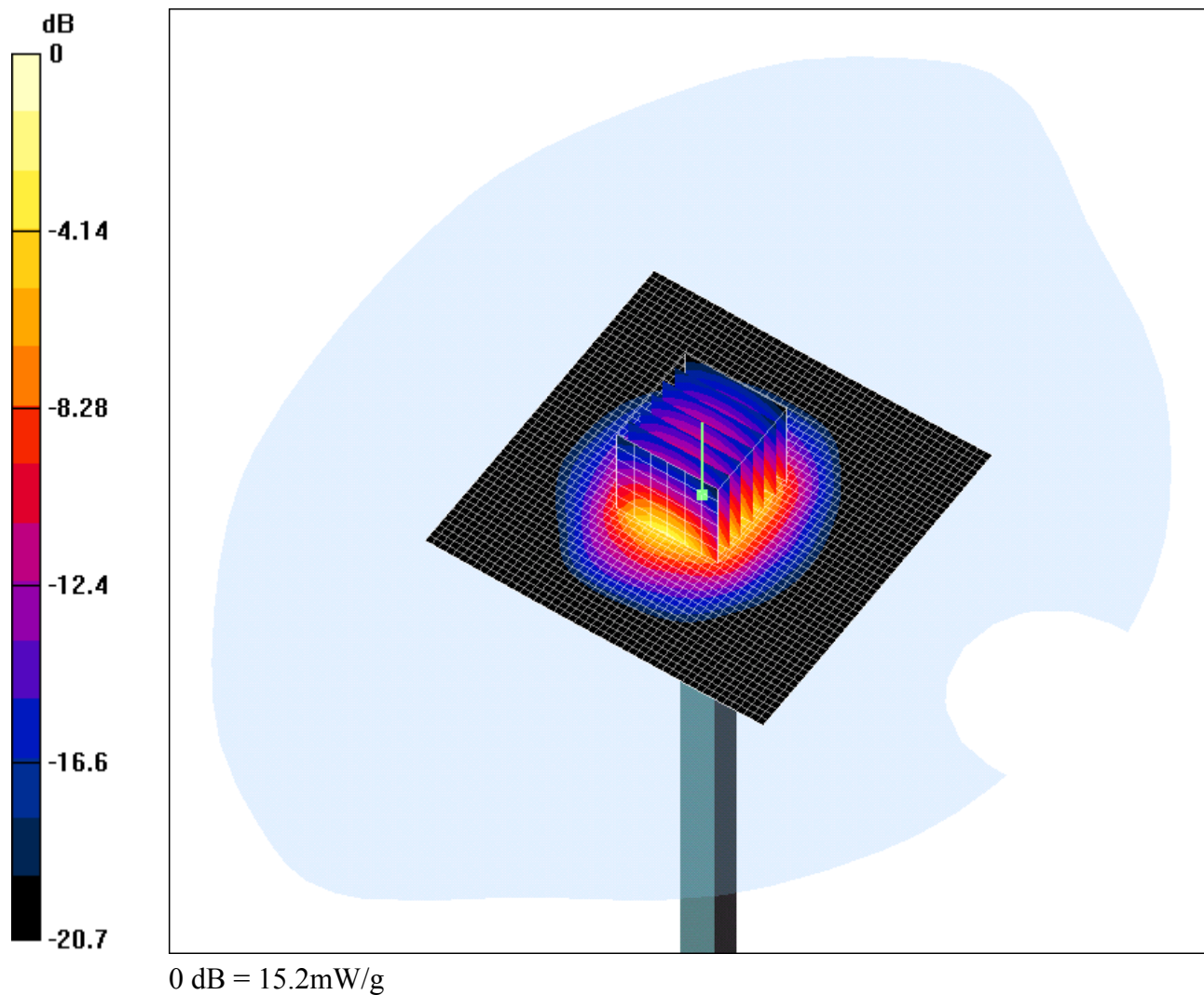
Peak SAR (extrapolated) = 31.8 W/kg

**SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.26 mW/g**

Date: 18/03/04

VALIDATION\_002

Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**System Performance Check-D2450 18 03 04****DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN725**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450MHz MSL Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.98$  mho/m;  $\epsilon_r = 54.7$ ;  $\rho = 1000$  $\text{kg/m}^3$ 

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(4.3, 4.3, 4.3); Calibrated: 09/06/2003

- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

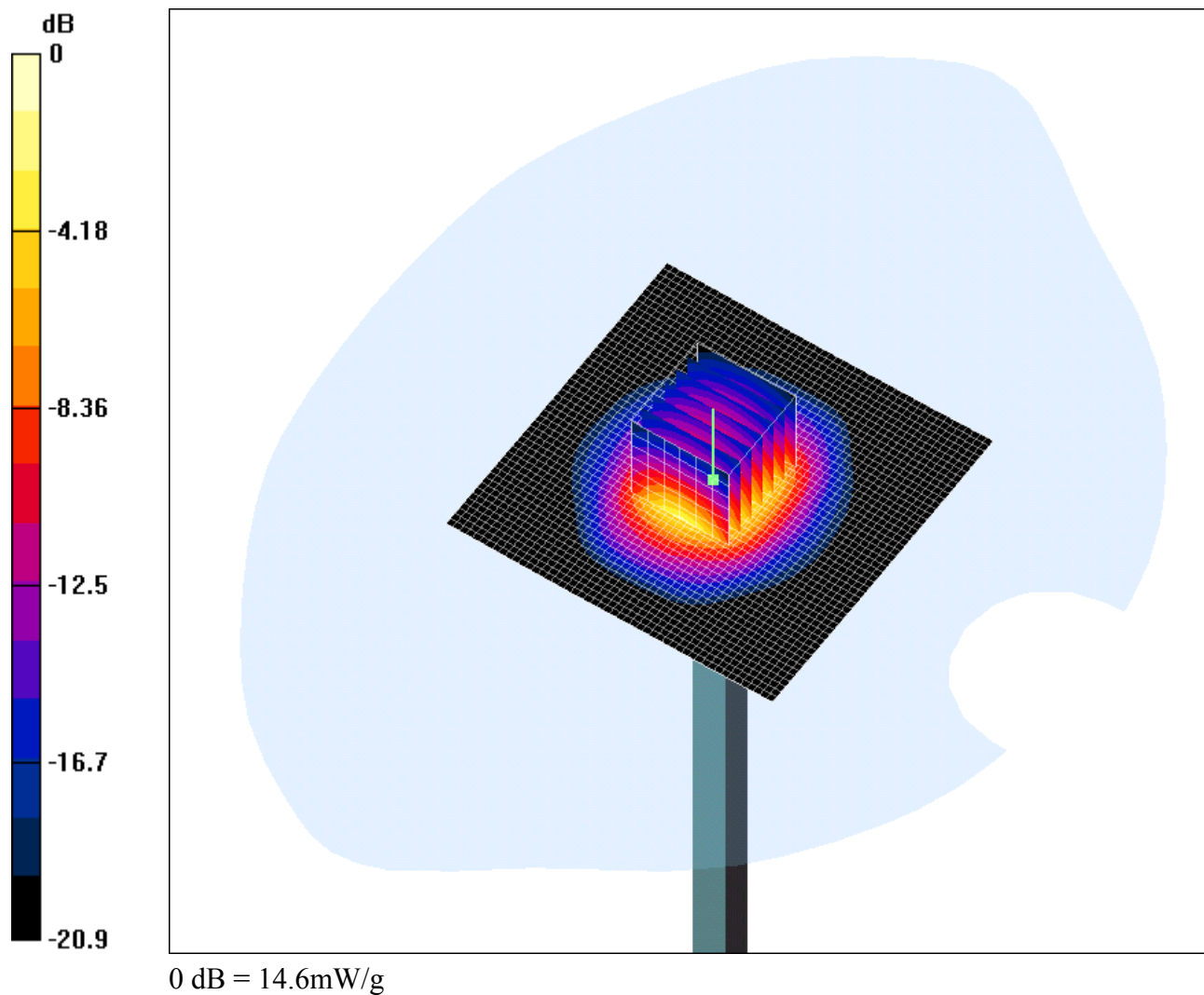
**d=10mm, Pin=250mW/Area Scan (51x51x1):** Measurement grid: dx=20mm, dy=20mm  
Reference Value = 88.6 V/m; Power Drift = 0.0 dB  
Maximum value of SAR (interpolated) = 14.8 mW/g

**d=10mm, Pin=250mW/Zoom Scan 7x7x7 (7x7x7)/Cube 0:** Measurement grid: dx=5mm,  
dy=5mm, dz=5mm  
Reference Value = 88.6 V/m; Power Drift = 0.0 dB  
Maximum value of SAR (measured) = 15.2 mW/g  
Peak SAR (extrapolated) = 31.4 W/kg  
**SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.3 mW/g**

Date: 19/03/04

VALIDATION\_003

Test Laboratory: RADIO FREQUENCY INVESTIGATION LTD.

**System Performance Check-D2450 19 03 04****DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN725**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450MHz MSL Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.98$  mho/m;  $\epsilon_r = 54.7$ ;  $\rho = 1000$  $\text{kg/m}^3$ 

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1529; ConvF(4.3, 4.3, 4.3); Calibrated: 09/06/2003

- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 22/08/2003
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

**d=10mm, Pin=250mW/Area Scan (51x51x1):** Measurement grid: dx=20mm, dy=20mm  
Reference Value = 88.7 V/m; Power Drift = -0.0 dB  
Maximum value of SAR (interpolated) = 14.8 mW/g

**d=10mm, Pin=250mW/Zoom Scan 7x7x7 (7x7x7)/Cube 0:** Measurement grid: dx=5mm,  
dy=5mm, dz=5mm  
Reference Value = 88.7 V/m; Power Drift = -0.0 dB  
Maximum value of SAR (measured) = 14.6 mW/g  
Peak SAR (extrapolated) = 30.5 W/kg  
**SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.13 mW/g**