

**Test Date: 29<sup>th</sup> March 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [M030330 - Intertek - Face Frontal Position 29-03-03.da4](#)**DUT: Intertek 450MHz; Type: Portable Transceiver; Serial: GMRS/FRS, Model 21 - 1903**  
**Program: Face Frontal Position**Communication System: CW 450 MHz; Frequency: 462.637 MHz; Duty Cycle: 1:1  
Medium: FCC 450MHz Head; ( $\sigma = 0.899666$  mho/m,  $\epsilon_r = 43.1631$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: SAM 12; Serial: 1060

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

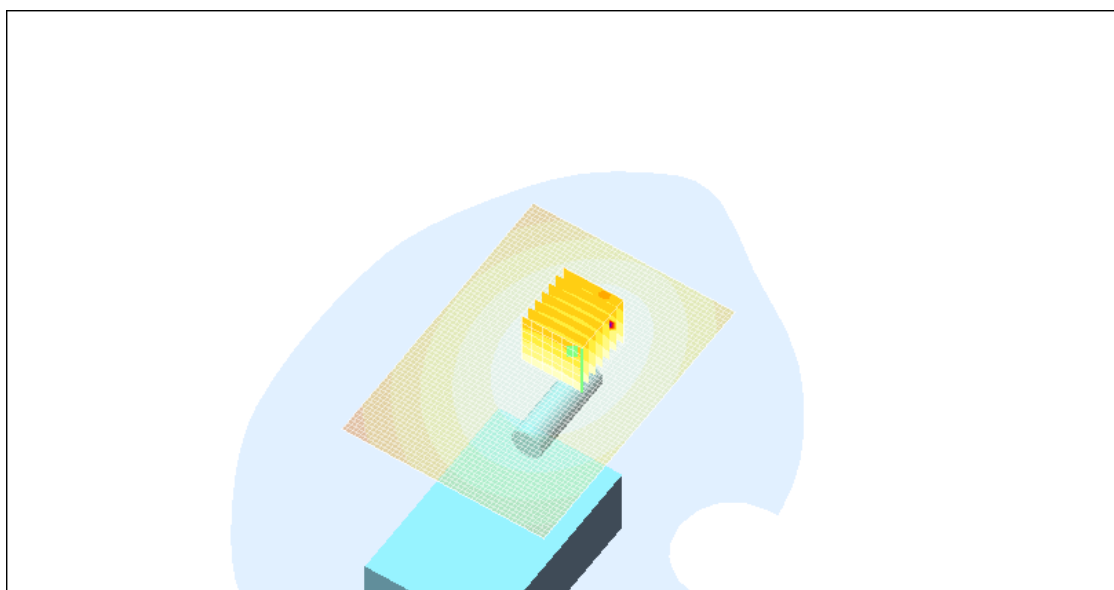
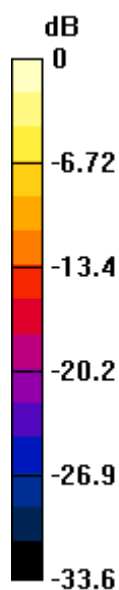
**Channel 4 Test 1 (1.5V)/Area Scan (51x71x1):** Measurement grid: dx=20mm, dy=20mm**Channel 4 Test 1 (1.5V)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.4 V/m

Peak SAR = 1.96 W/kg

SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.906 mW/g

Power Drift = -0.2 dB



SAR MEASUREMENT PLOT 1

**Ambient Temperature**  
**Liquid Temperature**  
**Humidity****21.9°C**  
**22.1°C**  
**62%**

**Test Date: 29<sup>th</sup> March 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [M030330 - Intertek - Face Frontal Position 29-03-03.da4](#)**DUT: Intertek 450MHz; Type: Portable Transceiver; Serial: GMRS/FRS, Model 21 - 1903**  
**Program: Face Frontal Position**Communication System: CW 450 MHz; Frequency: 467.637 MHz; Duty Cycle: 1:1  
Medium: FCC 450MHz Head; ( $\sigma = 0.906865$  mho/m,  $\epsilon_r = 43.0348$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: SAM 12; Serial: 1060

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

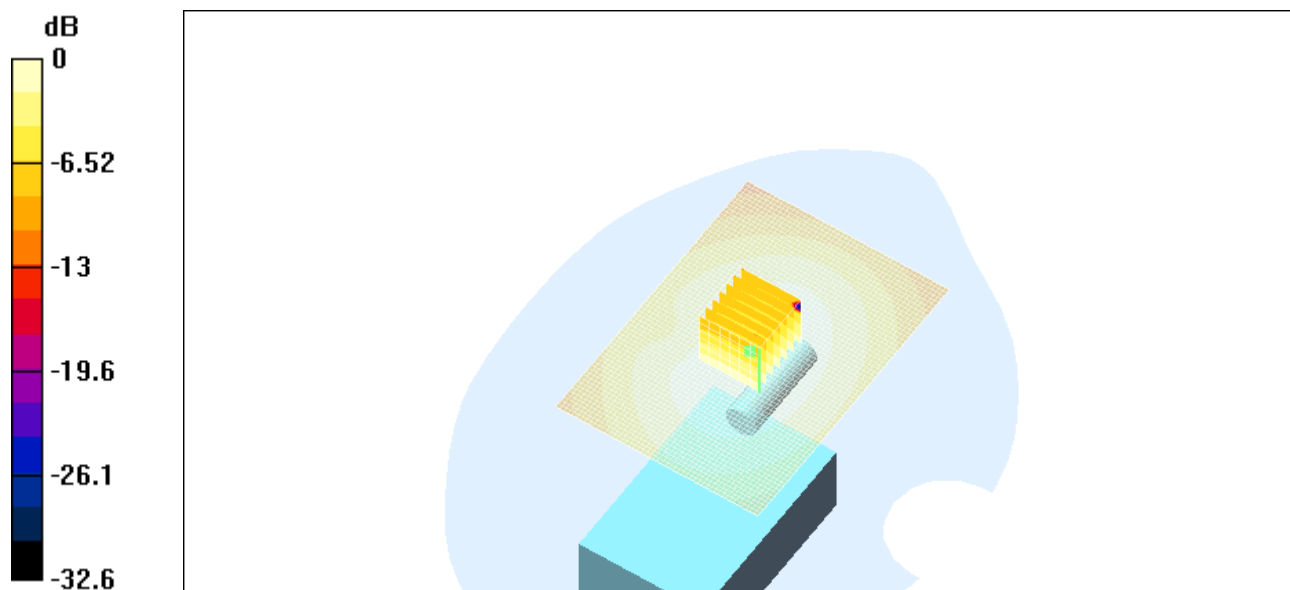
**Channel 11 Test 1 (1.5V Batt)/Area Scan (51x71x1):** Measurement grid: dx=20mm, dy=20mm**Channel 11 Test 1 (1.5V Batt)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.3 V/m

Peak SAR = 0.914 W/kg

SAR(1 g) = 0.614 mW/g; SAR(10 g) = 0.423 mW/g

Power Drift = -0.1 dB

**SAR MEASUREMENT PLOT 2****Ambient Temperature****21.9°C****Liquid Temperature****22.1°C****Humidity****62%**

This document shall not be copied or reproduced, except in full without the written permission of the Technical Director, EMC Technologies Pty. Ltd.

**Test Date: 29<sup>th</sup> March 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [M030330 - Intertek - Face Frontal Position 29-03-03.da4](#)**DUT: Intertek 450MHz; Type: Portable Transceiver; Serial: GMRS/FRS, Model 21 - 1903**  
**Program: Face Frontal Position**Communication System: CW 450 MHz; Frequency: 462.637 MHz; Duty Cycle: 1:1  
Medium: FCC 450MHz Head; ( $\sigma = 0.899666$  mho/m,  $\epsilon_r = 43.1631$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: SAM 12; Serial: 1060

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

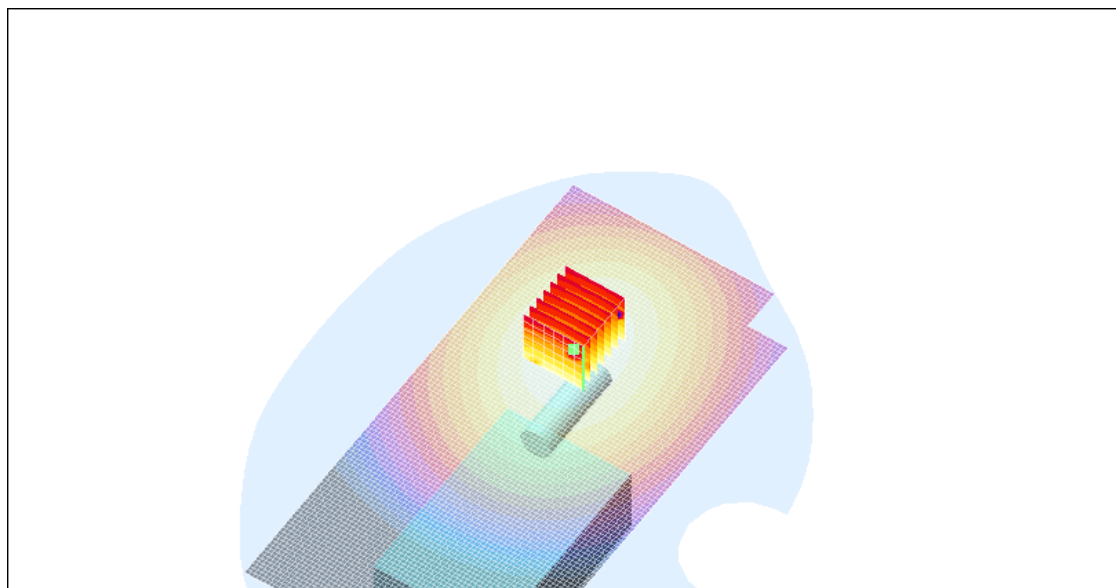
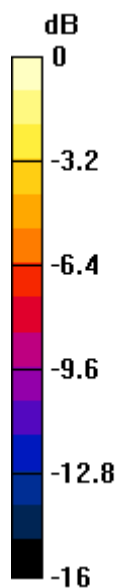
**Channel 4 Test 1 (1.2V Batt)/Area Scan (61x121x1):** Measurement grid: dx=20mm, dy=20mm**Channel 4 Test 1 (1.2V Batt)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22 V/m

Peak SAR = 1.5 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.75 mW/g

Power Drift = -0.1 dB



SAR MEASUREMENT PLOT 3

**Ambient Temperature**  
**Liquid Temperature**  
**Humidity****21.9°C**  
**22.1°C**  
**62%**

---

This document shall not be copied or reproduced, except in full without the written permission of the Technical Director, EMC Technologies Pty. Ltd.

**Test Date: 1<sup>st</sup> April 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [M030330 - Intertek - Belt Clip Position 01-04-03.da4](#)**DUT: Intertek 450MHz; Type: Portable Transceiver; Serial: GMRS/FRS, Model 21 - 1903**  
**Program: Belt Clip Position**Communication System: CW 450 MHz; Frequency: 462.637 MHz; Duty Cycle: 1:1  
Medium: FCC 450MHz Head; ( $\sigma = 0.940812$  mho/m,  $\epsilon_r = 55.0165$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: SAM 12; Serial: 1060

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

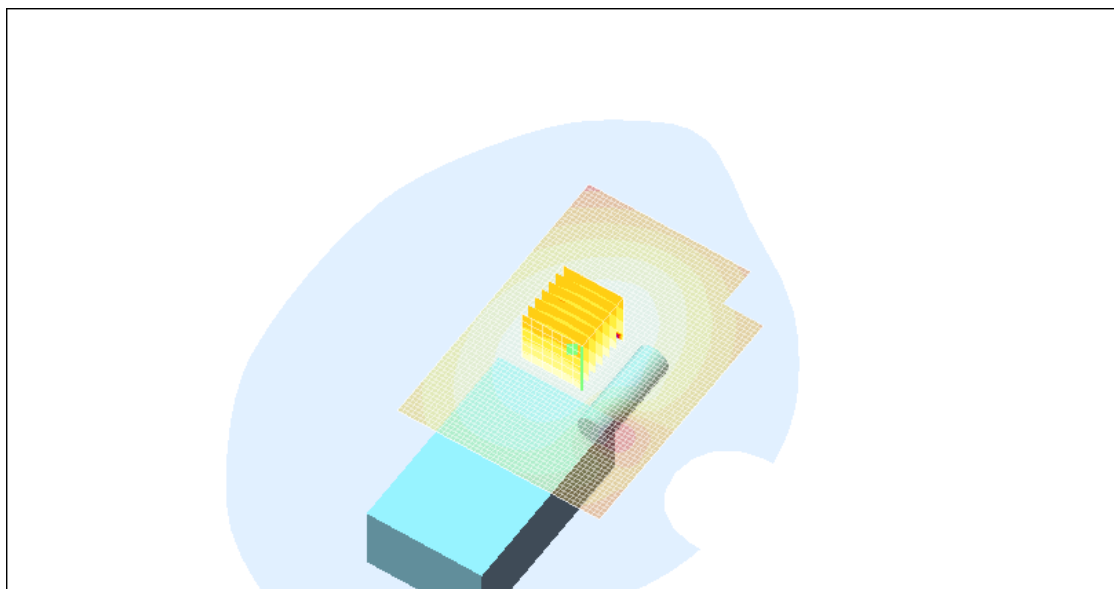
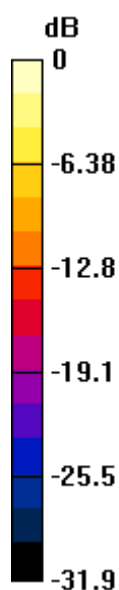
**Channel 4 Test/Area Scan (51x71x1):** Measurement grid: dx=20mm, dy=20mm**Channel 4 Test/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.8 V/m

Peak SAR = 2.31 W/kg

SAR(1 g) = 1.41 mW/g; SAR(10 g) = 0.968 mW/g

Power Drift = -0.4 dB



SAR MEASUREMENT PLOT 4

**Ambient Temperature****21.6°C****Liquid Temperature****21.1°C****Humidity****59%**

**Test Date: 2<sup>nd</sup> April 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [M030330 - Intertek - Belt Clip Position 02-04-03.da4](#)**DUT: Intertek 450MHz; Type: Portable Transceiver; Serial: GMRS/FRS, Model 21 - 1903**  
**Program: Belt Clip Position**Communication System: CW 450 MHz; Frequency: 467.637 MHz; Duty Cycle: 1:1  
Medium: FCC 450MHz Head; ( $\sigma = 0.972234$  mho/m,  $\epsilon_r = 55.2429$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: SAM 12; Serial: 1060

-Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

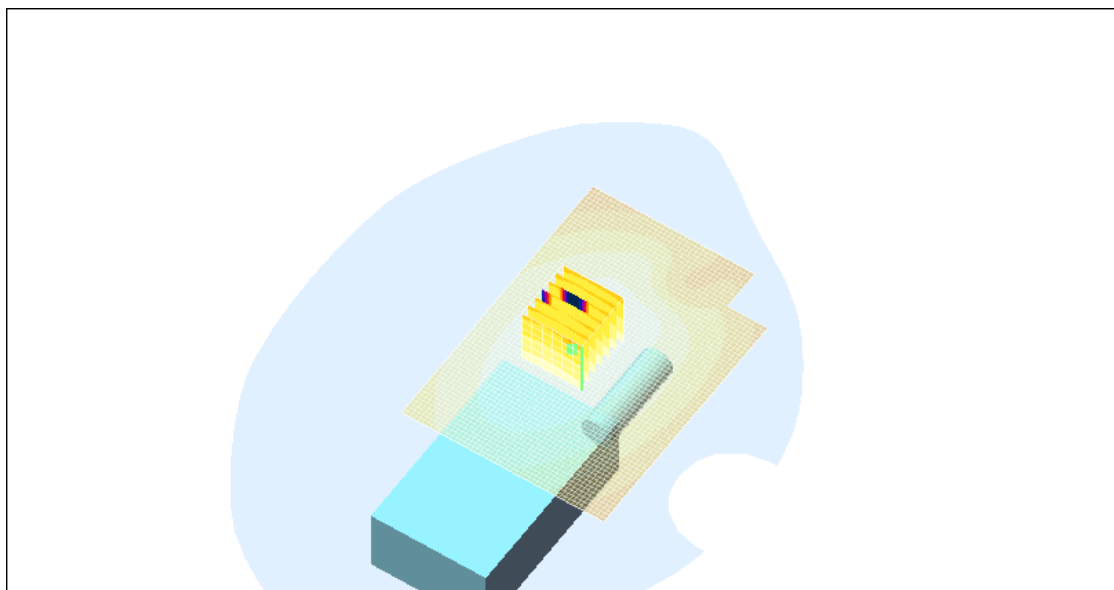
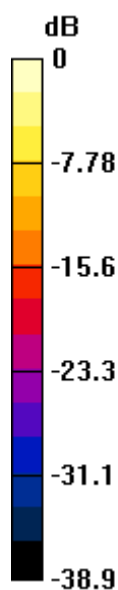
**Channel 11 Test (1.5V)/Area Scan (51x71x1):** Measurement grid: dx=20mm, dy=20mm**Channel 11 Test (1.5V)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.3 V/m

Peak SAR = 70.7 W/kg

SAR(1 g) = 1.49 mW/g; SAR(10 g) = 0.628 mW/g

Power Drift = -0.2 dB



SAR MEASUREMENT PLOT 5

**Ambient Temperature****21.9°C****Liquid Temperature****21.5°C****Humidity****65%**

This document shall not be copied or reproduced, except in full without the written permission of the Technical Director, EMC Technologies Pty. Ltd.

**Test Date: 2<sup>nd</sup> April 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [M030330 - Intertek - Belt Clip Position 02-04-03.da4](#)**DUT: Intertek 450MHz; Type: Portable Transceiver; Serial: GMRS/FRS, Model 21 - 1903**  
**Program: Belt Clip Position**Communication System: CW 450 MHz; Frequency: 462.637 MHz; Duty Cycle: 1:1  
Medium: FCC 450MHz Head; ( $\sigma = 0.96636$  mho/m,  $\epsilon_r = 55.3765$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: SAM 12; Serial: 1060

-Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

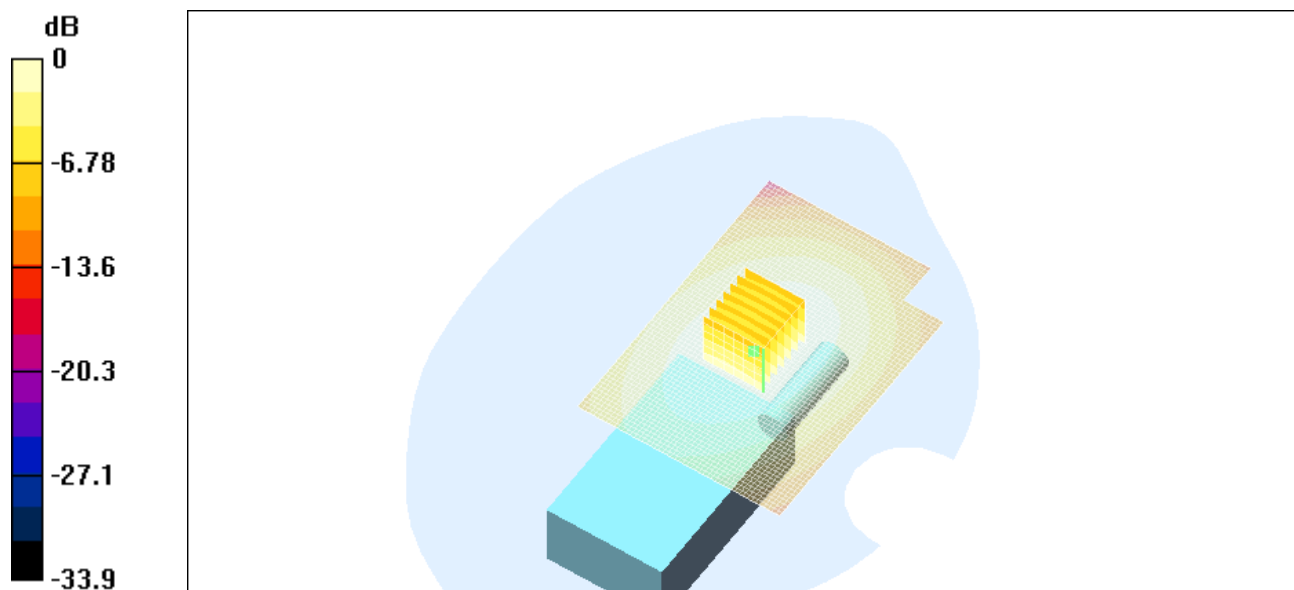
**Channel 4 Test 2 (1.2V)/Area Scan (51x71x1):** Measurement grid: dx=20mm, dy=20mm**Channel 4 Test 2 (1.2V)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.4 V/m

Peak SAR = 2.58 W/kg

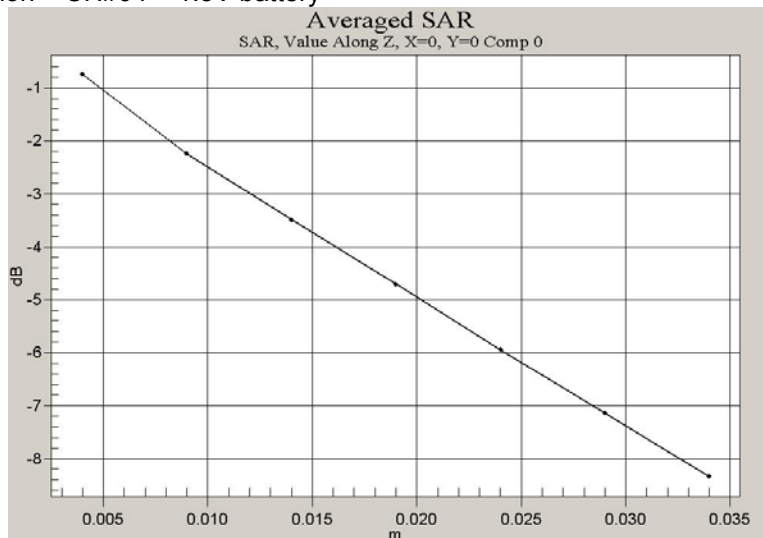
SAR(1 g) = 1.62 mW/g; SAR(10 g) = 1.14 mW/g

Power Drift = -0.2 dB

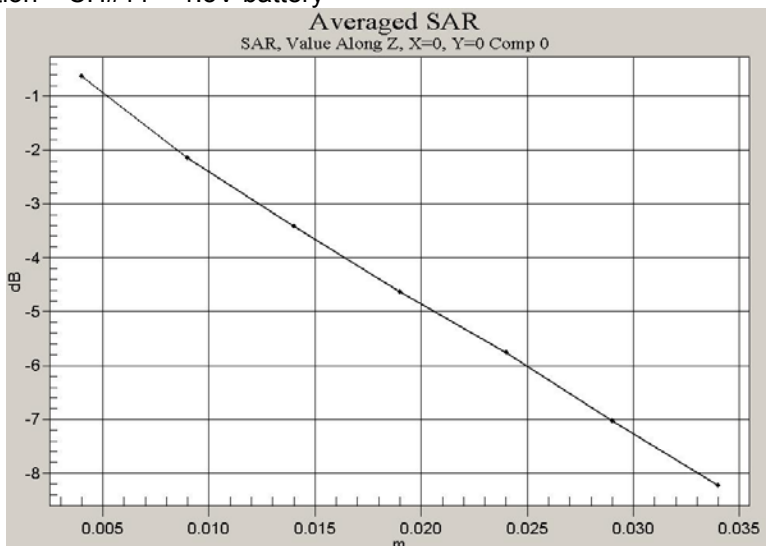
**SAR MEASUREMENT PLOT 6****Ambient Temperature****21.9°C****Liquid Temperature****21.5°C****Humidity****65%**

## Z-Axis Scans of the SAR Measurements – Face Position

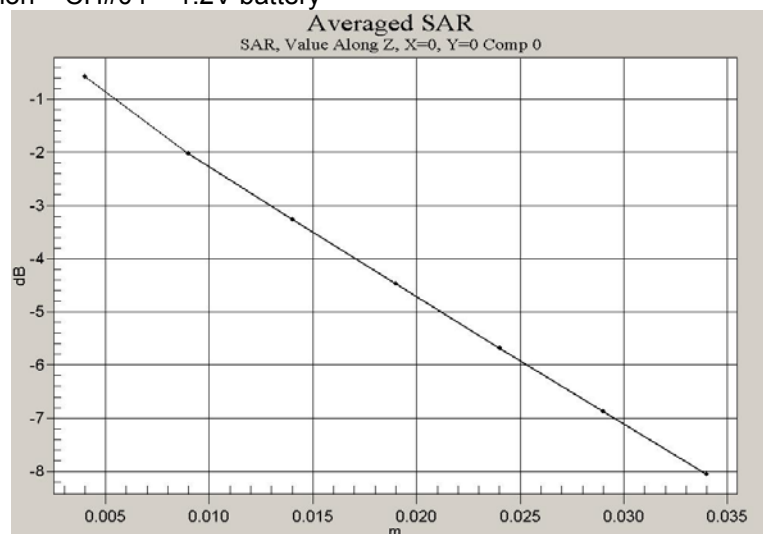
Plot 1: Face Position – CH#04 – 1.5V battery



Plot 2: Face Position – CH#11 – 1.5V battery

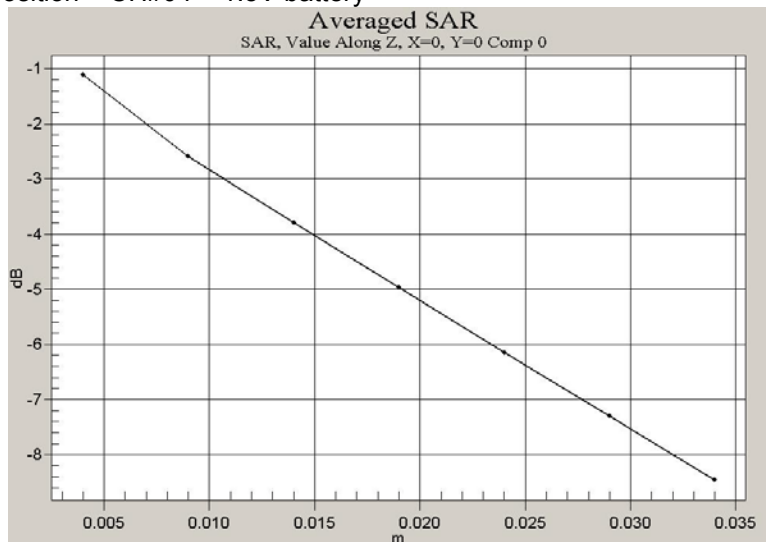


Plot 3: Face Position – CH#04 – 1.2V battery

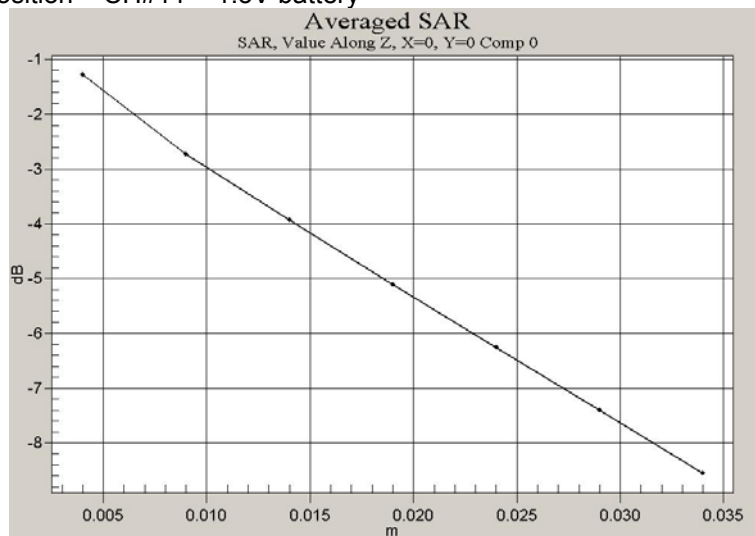


## Z-Axis Scans of the SAR Measurements – Belt-Clip Position

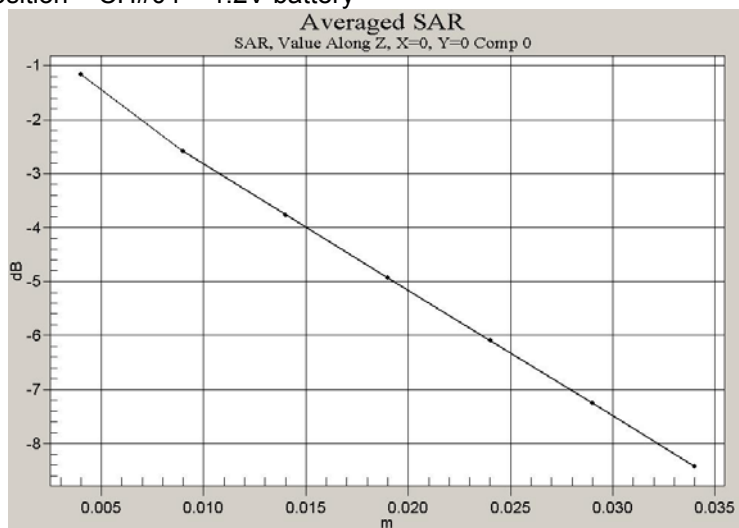
Plot 4: Belt-Clip Position – CH#04 – 1.5V battery



Plot 5: Belt-Clip Position – CH#11 – 1.5V battery



Plot 6: Belt-Clip Position – CH#04 – 1.2V battery



## **APPENDIX C**

### **PLOTS OF THE SAR MEASUREMENTS**

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

**Table 14: List of Validation Plots**

| <b>Page</b> | <b>Plot Number</b>   | <b>SAR Plot Title</b>                  |
|-------------|----------------------|----------------------------------------|
| <b>31</b>   | SAR Validation 1     | Validation 29 <sup>th</sup> March 2003 |
| <b>32</b>   | SAR Validation 2     | Validation 31 <sup>st</sup> March 2003 |
| <b>33</b>   | SAR Validation 3     | Validation 1 <sup>st</sup> April 2003  |
| <b>34</b>   | SAR Validation 4     | Validation 2 <sup>nd</sup> April 2003  |
| <b>35</b>   | Z-Axis Plots 1 and 2 | Z-Axis Scans 1 and 2                   |
| <b>36</b>   | Z-Axis Plots 3 and 3 | Z-Axis Scans 3 and 4                   |

**Validation Date: 29<sup>th</sup> March 2003**

**Test Laboratory: EMC Technologies Pty Ltd**

File Name: [Validation 450 MHz \(DAE442 Probe1377\)29-03-03.da4](#)

**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2, S/N:1009**

**Program: Validation 450 MHz**

Communication System: CW 450 MHz; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: FCC 450MHz Head; ( $\sigma = 0.96$  mho/m,  $\epsilon_r = 55.9$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: Flat Phantom 4.4; Serial: P 4.4

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

**Channel 1Test/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm

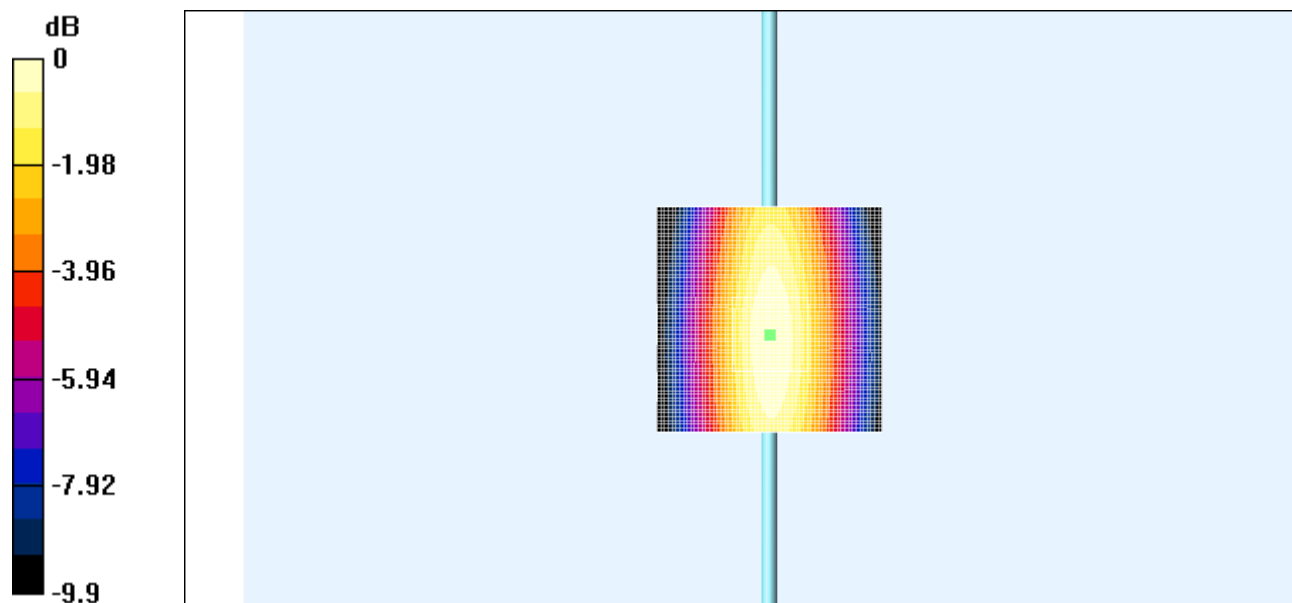
**Channel 1Test/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.5 V/m

Peak SAR = 2.14 W/kg

SAR(1 g) = 1.33 mW/g; SAR(10 g) = 0.864 mW/g

Power Drift = -0.01 dB



SAR VALIDATION NUMBER 1

**Ambient Temperature**

**21.9°C**

**Liquid Temperature**

**22.1°C**

**Humidity**

**62%**

This document shall not be copied or reproduced, except in full without the written permission of the Technical Director, EMC Technologies Pty. Ltd.

[www.emctech.com.au](http://www.emctech.com.au)

**Validation Date: 31<sup>st</sup> March 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [Validation 450 MHz \(DAE442 Probe1377\)31-03-03.da4](#)**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2, S/N:1009****Program: Validation 450 MHz**

Communication System: CW 450 MHz; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: FCC 450MHz Body; ( $\sigma = 0.94$  mho/m,  $\epsilon_r = 56.0$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: Flat Phantom 4.4; Serial: P 4.4

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

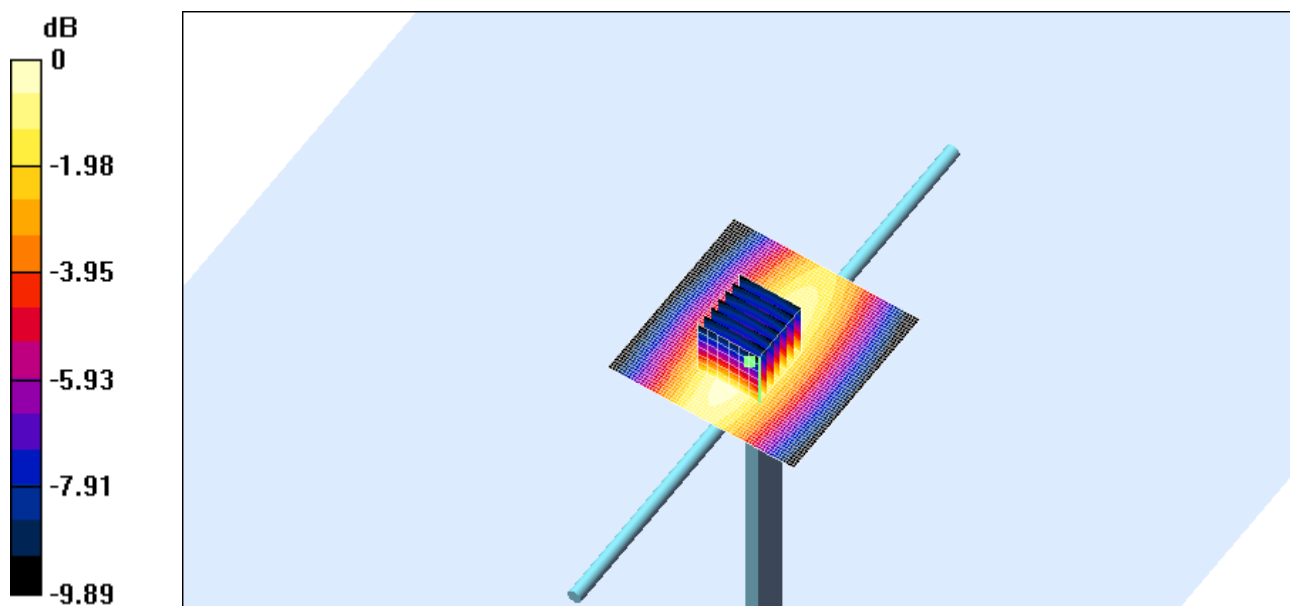
**Channel 1 Test/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm**Channel 1 Test/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.1 V/m

Peak SAR = 2.13 W/kg

SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.839 mW/g

Power Drift = 0.02 dB

**SAR VALIDATION NUMBER 2****Ambient Temperature****20.2°C****Liquid Temperature****20.0°C****Humidity****56%**

This document shall not be copied or reproduced, except in full without the written permission of the Technical Director , EMC Technologies Pty. Ltd.

**Validation Date: 1<sup>st</sup> April 2003****Test Laboratory: EMC Technologies Pty Ltd**File Name: [Validation 450 MHz \(DAE442 Probe1377\)01-04-03.da4](#)**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2, S/N:1009****Program: Validation 450 MHz**

Communication System: CW 450 MHz; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: FCC 450MHz Head; ( $\sigma = 0.93$  mho/m,  $\epsilon_r = 55.2$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: Flat Phantom 4.4; Serial: P 4.4

-Measurement SW: DASY4, V4.0 Build 51; Postprocessing SW: SEMCAD, V1.6 Build 109

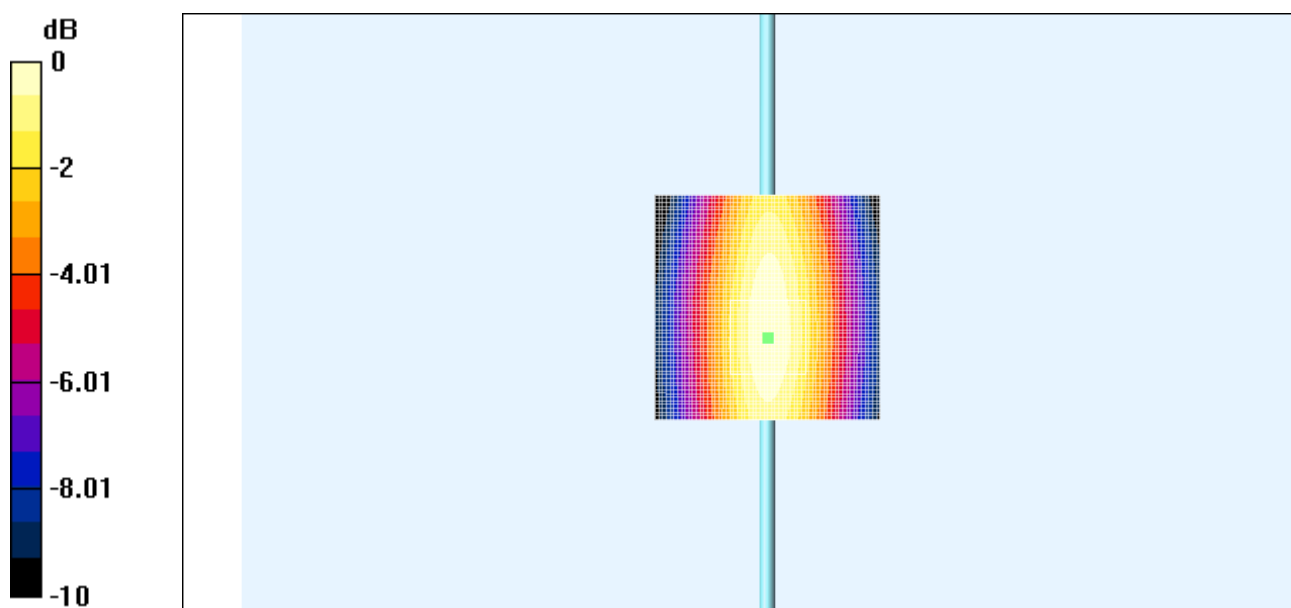
**Channel 1Test/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm**Channel 1Test/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.7 V/m

Peak SAR = 2.16 W/kg

SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.863 mW/g

Power Drift = -0.01 dB

**SAR VALIDATION NUMBER 3****Ambient Temperature****21.6°C****Liquid Temperature****21.1°C****Humidity****59%**

This document shall not be copied or reproduced, except in full without the written permission of the Technical Director , EMC Technologies Pty. Ltd.

**Validation Date: 2<sup>nd</sup> April 2003**

**Test Laboratory: EMC Technologies Pty Ltd**

File Name: [Validation 450 MHz \(DAE442 Probe1377\)02-03-03 Test\(Dasy 4.1\).da4](#)

**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2, S/N:1009**

**Program: Validation 450 MHz**

Communication System: CW 450 MHz; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: FCC 450MHz Head; ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 43.5$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Dasy Configuration:

-Probe: ET3DV6 - SN1377; ConvF(7.2, 7.2, 7.2); Calibrated: 6/09/2002

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

-Electronics: DAE3 Sn442; Calibrated: 23/10/2002

-Phantom: Flat Phantom 4.4; Serial: P 4.4

-Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

**Channel 1Test/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm

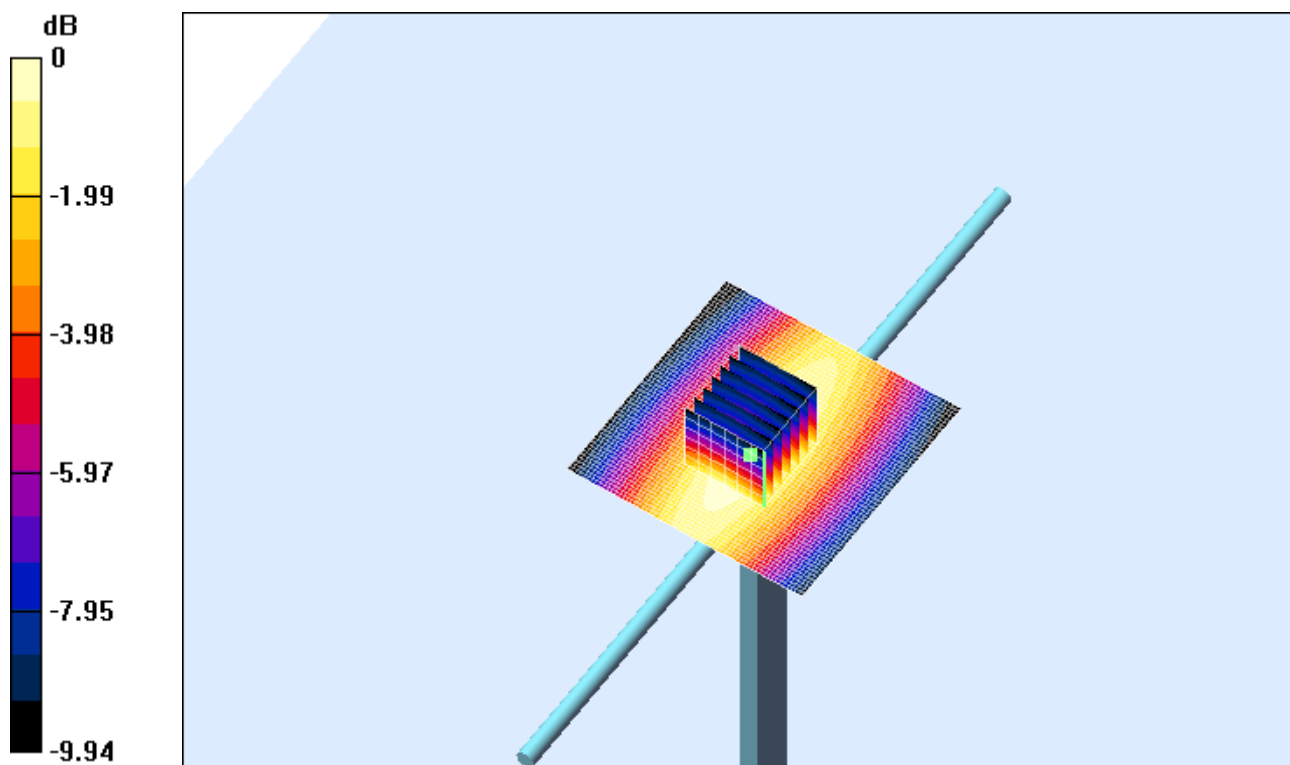
**Channel 1Test/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.2 V/m

Peak SAR = 2.1 W/kg

SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.841 mW/g

Power Drift = 0.2 dB



**SAR VALIDATION NUMBER 4**

**Ambient Temperature**

**21.9°C**

**Liquid Temperature**

**21.5°C**

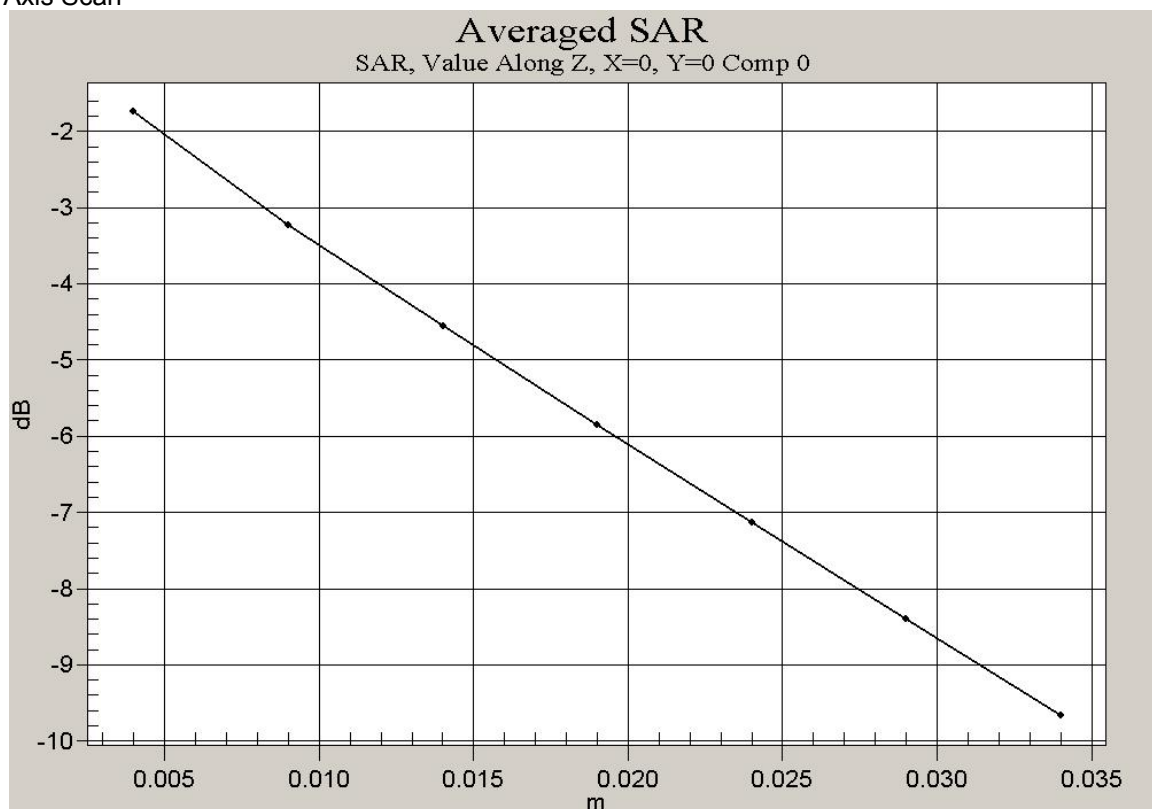
**Humidity**

**65%**

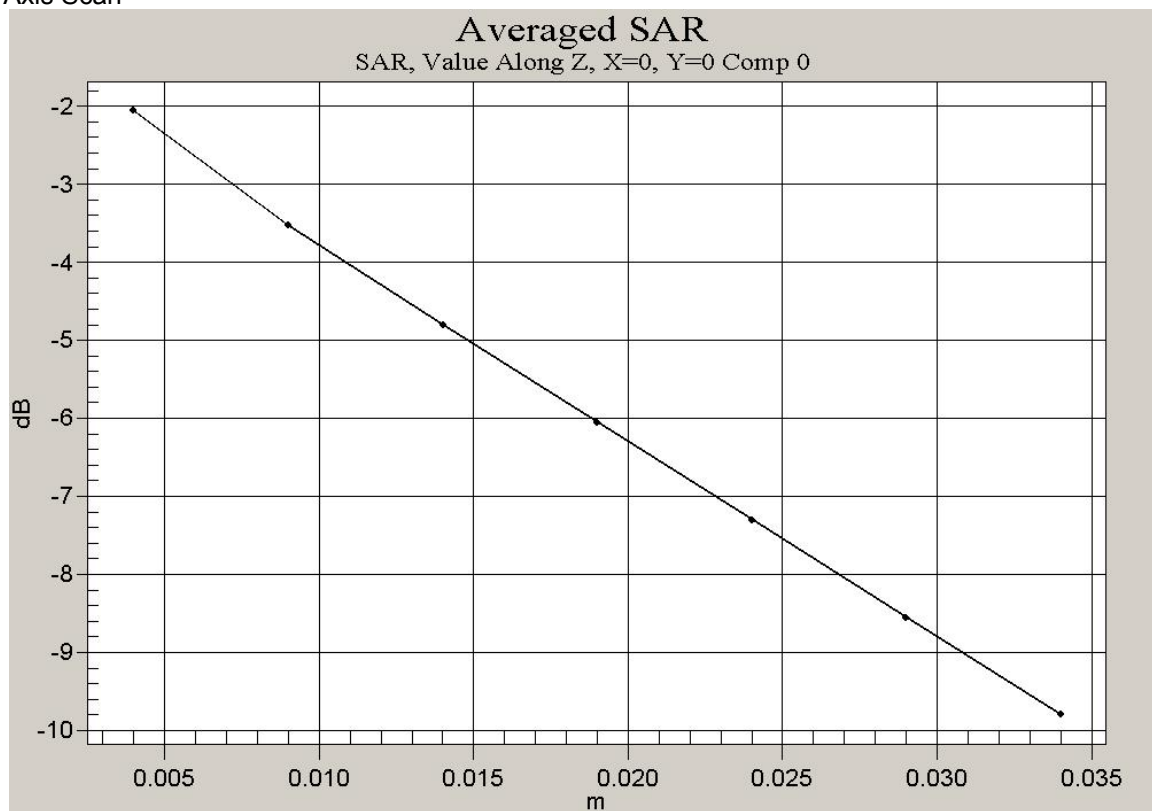
This document shall not be copied or reproduced, except in full without the written permission of the Technical Director, EMC Technologies Pty. Ltd.

**Validation Date: 29<sup>th</sup> March 2003**

Z-Axis Scan

**Validation Date: 31<sup>st</sup> March 2003**

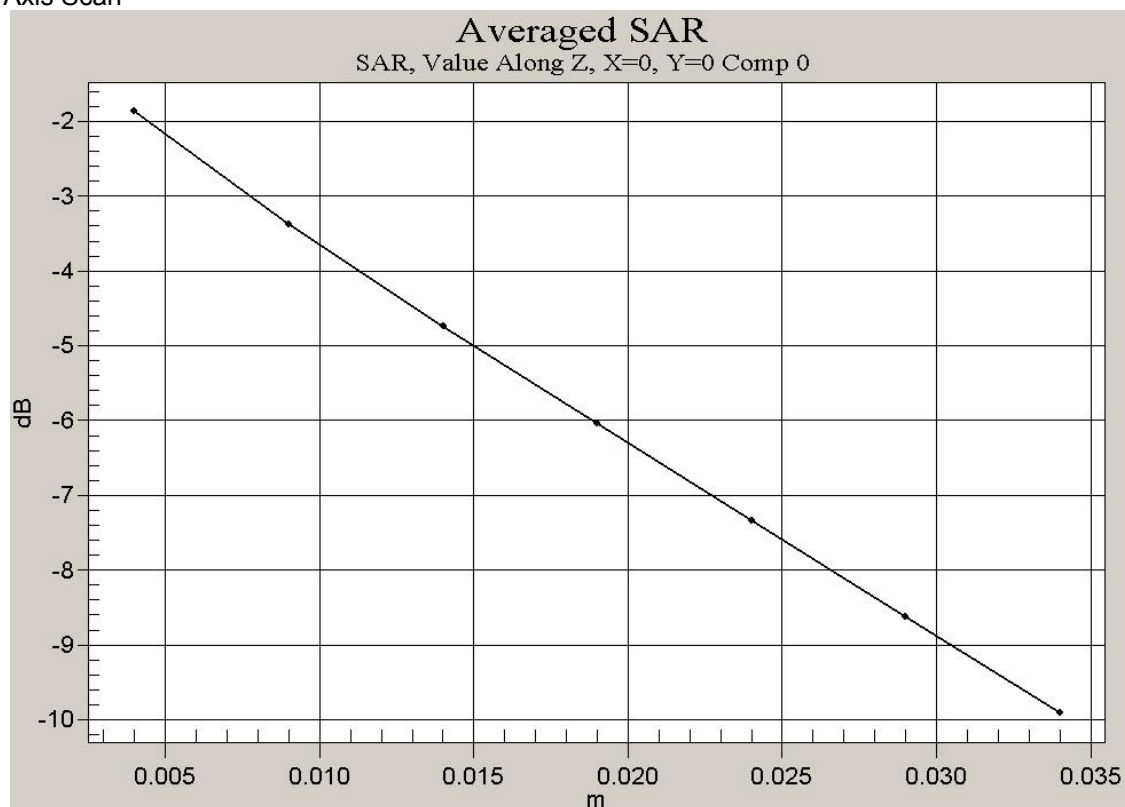
Z-Axis Scan



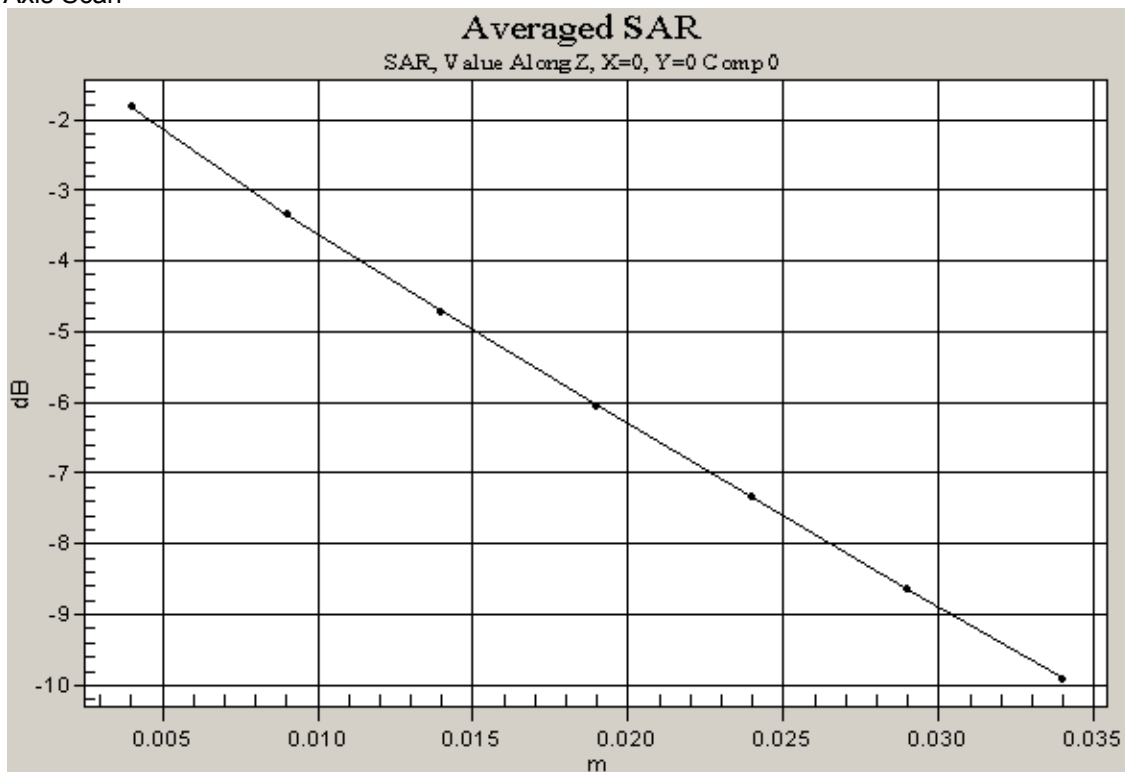
This document shall not be copied or reproduced, except in full without the written permission of the Technical Director, EMC Technologies Pty. Ltd.

**Validation Date: 1<sup>st</sup> April 2003**

Z-Axis Scan

**Validation Date: 2<sup>nd</sup> April 2003**

Z-Axis Scan



## **APPENDIX D**

### **SAR TESTING EQUIPMENT CALIBRATION CERTIFICATE ATTACHMENTS**

#### **Calibration Certificate Attachments**

|                                               |          |
|-----------------------------------------------|----------|
| 1. 450 MHz Dipole Calibration Sheet           | 6 pages  |
| 2. E-Field Probe Calibration Sheet            | 11 Pages |
| 3. 450MHz Conversion Factor Calibration Sheet | 3 Pages  |
| 4. Thickness Details of SAM 1060 Phantom      | 1 Page   |