

Test of: **Panasonic Mobile Comms Dev of Europe Ltd.  
VS70A**

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

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## **Appendix 2. Measurement Methods**

### **A.2.1. Evaluation Procedure**

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 the test specification identified in section 3.1 of this report.  
  
(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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#### **A.2.2. Specific Absorption Rate (SAR) Measurements to OET Bulletin 65 Supplement C: 2001**

Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields

SAR measurements were performed in accordance with Appendix D of the standard FCC OET Bulletin 65 Supplement C: 2001, against appropriate limits for each measurement position in accordance with the standard.

The test was performed in a shielded enclosure with the temperature controlled to remain between +18.0°C and +25.0°C. The tissue equivalent material fluid temperature was controlled to give a maximum variation of  $\pm 2.0^\circ\text{C}$

Prior to any SAR measurements on the EUT, system validation and material dielectric property measurements were conducted. In the absence of a detailed procedure within the specification, system validation and material dielectric property measurements were performed in accordance with Appendix C and Appendix D of FCC OET Bulletin 65 Supplement C: 2001.

Following the successful system validation and material dielectric property measurements, a SAR versus time sweep shall be performed within 10 mm of the phantom inner surface. If the EUT power output is stable after three minutes then the measurement probe will perform a coarse surface level scan at each test position in order to ascertain the location of the maximum local SAR level. Once this area had been established, a 7x7x7 cube of 343 points (5 mm spacing in each axis  $\approx 27\text{g}$ ) will be centred at the area of concern. Extrapolation and interpolation will then be carried out on the 27g of tissue and the highest averaged SAR over a 10g cube determined.

Once the maximum interpolated SAR measurement is complete; the coarse scan is visually assessed to check for secondary peaks within 50% of the maximum SAR level. If there are any further SAR measurements required, extra 7x7x7 cubes shall be centred on each of these extra local SAR maxima.

At the end of each position test case a second time sweep shall be performed to check whether the EUT has remained stable throughout the test.

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

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### **Appendix 3. SAR Distribution Scans**

This appendix contains SAR distribution scans which are not included in the total number of pages for this report.

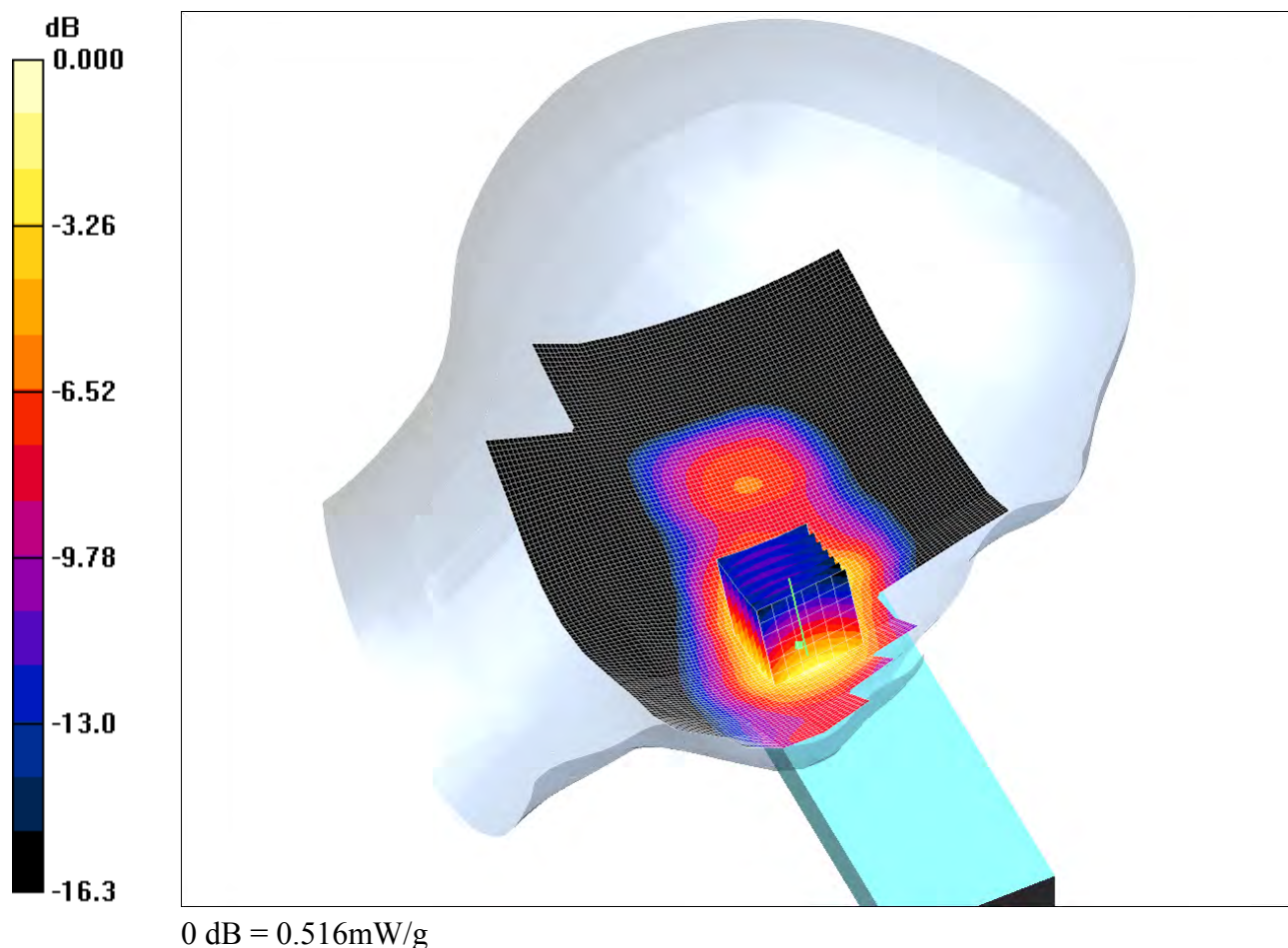
Scan Reference Number	Title
SCN/72327JD02/001	Touch Left CH660
SCN/72327JD02/002	Tilt Left CH660
SCN/72327JD02/003	Touch Right H660
SCN/72327JD02/004	Tilt Right CH660
SCN/72327JD02/005	Touch Right CH512
SCN/72327JD02/006	Touch Right CH810
SCN/72327JD02/007	Rear of EUT Facing Phantom Open with PHF CH660 GSM
SCN/72327JD02/008	Rear of EUT Facing Phantom Open with PHF CH660 GPRS
SCN/72327JD02/009	Display of EUT Facing Phantom Open with PHF CH660 GPRS
SCN/72327JD02/010	Rear of EUT Facing Phantom Closed with PHF CH660 GPRS
SCN/72327JD02/011	Display of EUT Facing Phantom Closed with PHF CH660 GPRS
SCN/72327JD02/012	Rear of EUT Facing Phantom Closed with PHF CH512 GPRS
SCN/72327JD02/013	Rear of EUT Facing Phantom Closed with PHF CH810 GPRS
SCN/72327JD02/014	Validation 001
SCN/72327JD02/015	Validation 002

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Date: 01/11/2006

72327\_JD02\_001

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_001\_Touch\_Left\_CH660****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1879.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1879.8$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r =$ 39.9;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.03, 5.03, 5.03); Calibrated: 13/07/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1207
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Touch Left - Middle/Area Scan (91x181x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.509 mW/g

**Touch Left - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.16 V/m; Power Drift = -0.348 dB

Peak SAR (extrapolated) = 0.726 W/kg

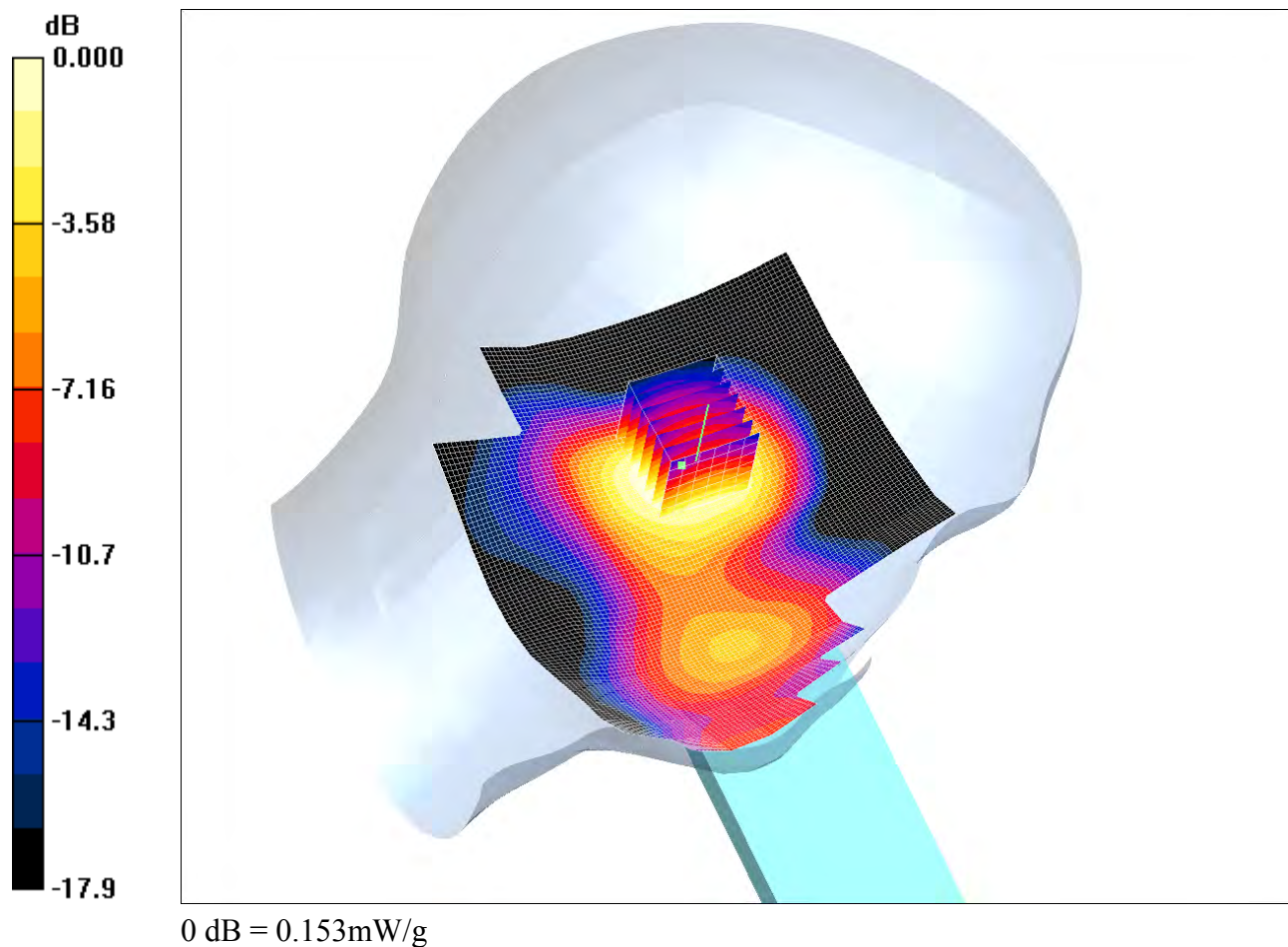
**SAR(1 g) = 0.473 mW/g; SAR(10 g) = 0.267 mW/g**

Maximum value of SAR (measured) = 0.516 mW/g

Date: 01/11/2006

72327\_JD02\_002

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_002\_Tilt\_Left\_CH660****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1879.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1879.8$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r =$ 39.9;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.03, 5.03, 5.03); Calibrated: 13/07/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1207
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Tilt Left - Middle/Area Scan (91x181x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.169 mW/g

**Tilt Left - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.73 V/m; Power Drift = -0.165 dB

Peak SAR (extrapolated) = 0.202 W/kg

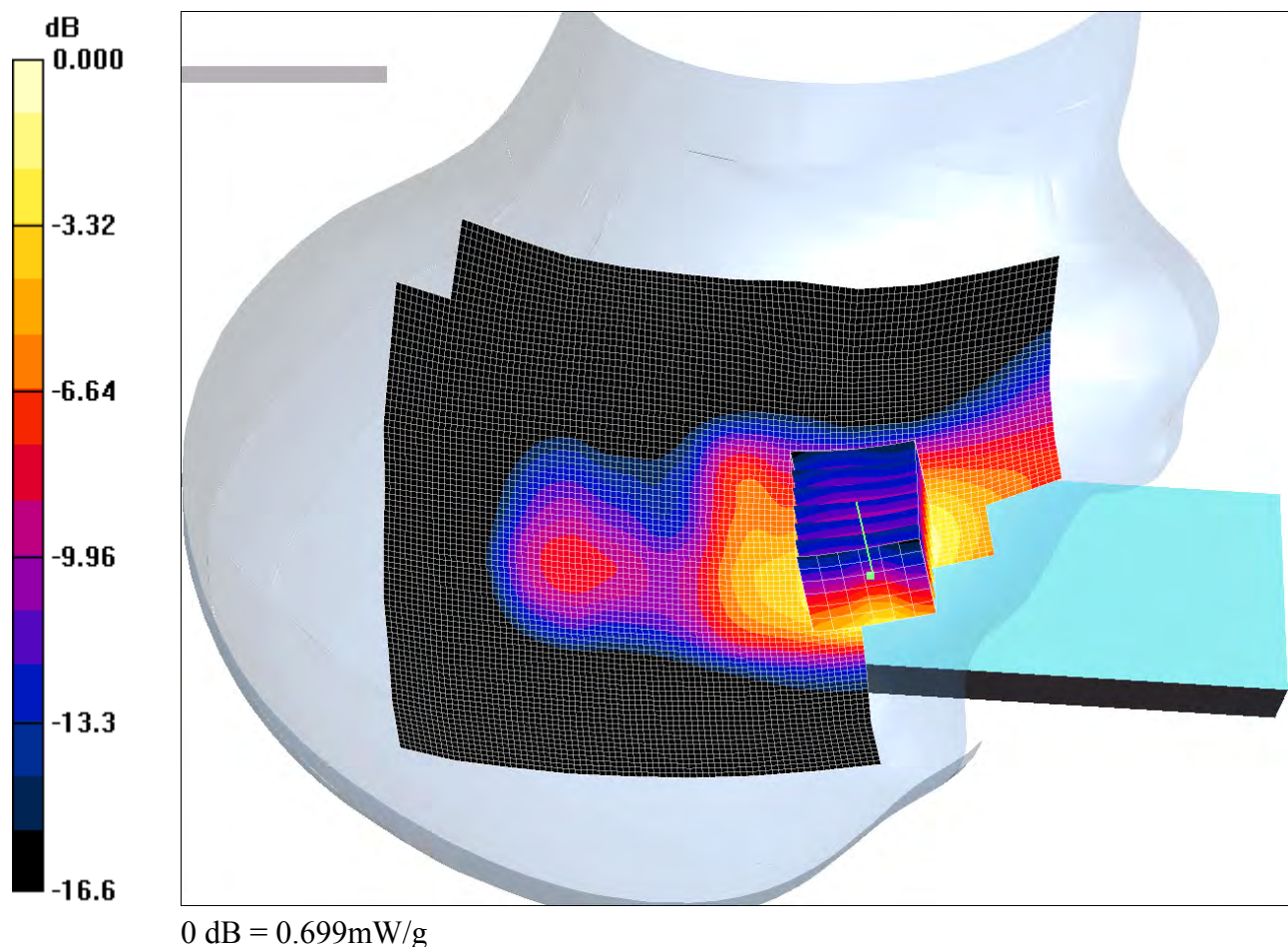
**SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.089 mW/g**

Maximum value of SAR (measured) = 0.153 mW/g

Date: 01/11/2006

72327\_JD02\_003

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_003\_Touch\_Right\_CH660****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1879.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1879.8$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r =$ 39.9;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.03, 5.03, 5.03); Calibrated: 13/07/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1207
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171



**Touch Right - Middle/Area Scan (91x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.724 mW/g

**Touch Right - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.95 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 1.03 W/kg

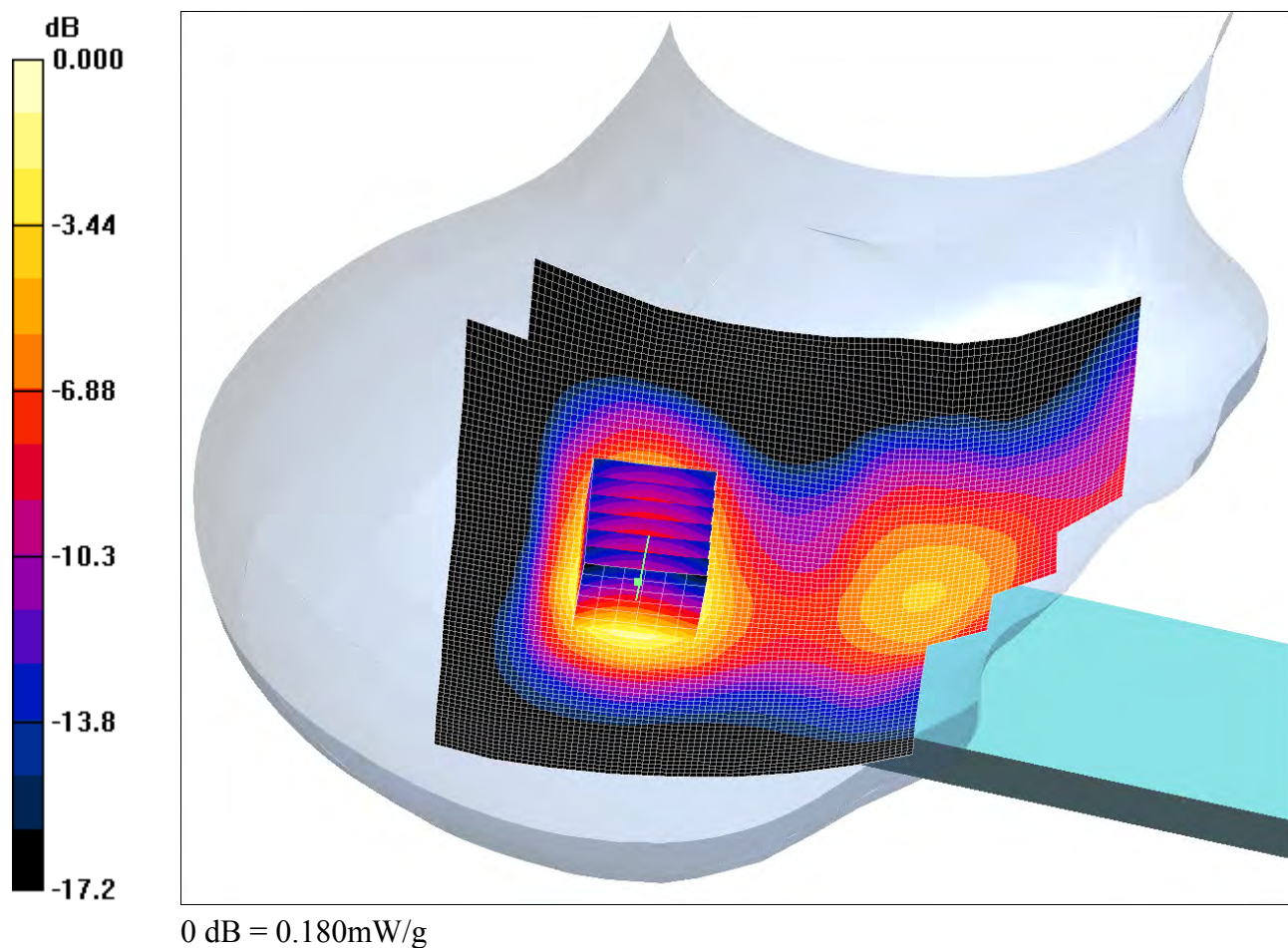
**SAR(1 g) = 0.625 mW/g; SAR(10 g) = 0.346 mW/g**

Maximum value of SAR (measured) = 0.699 mW/g

Date: 01/11/2006

72327\_JD02\_004

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_004\_Tilt\_Right\_CH660****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1879.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1879.8$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r =$ 39.9;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.03, 5.03, 5.03); Calibrated: 13/07/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1207
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Tilt Right - Middle/Area Scan (91x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.197 mW/g

**Tilt Right - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.4 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 0.249 W/kg

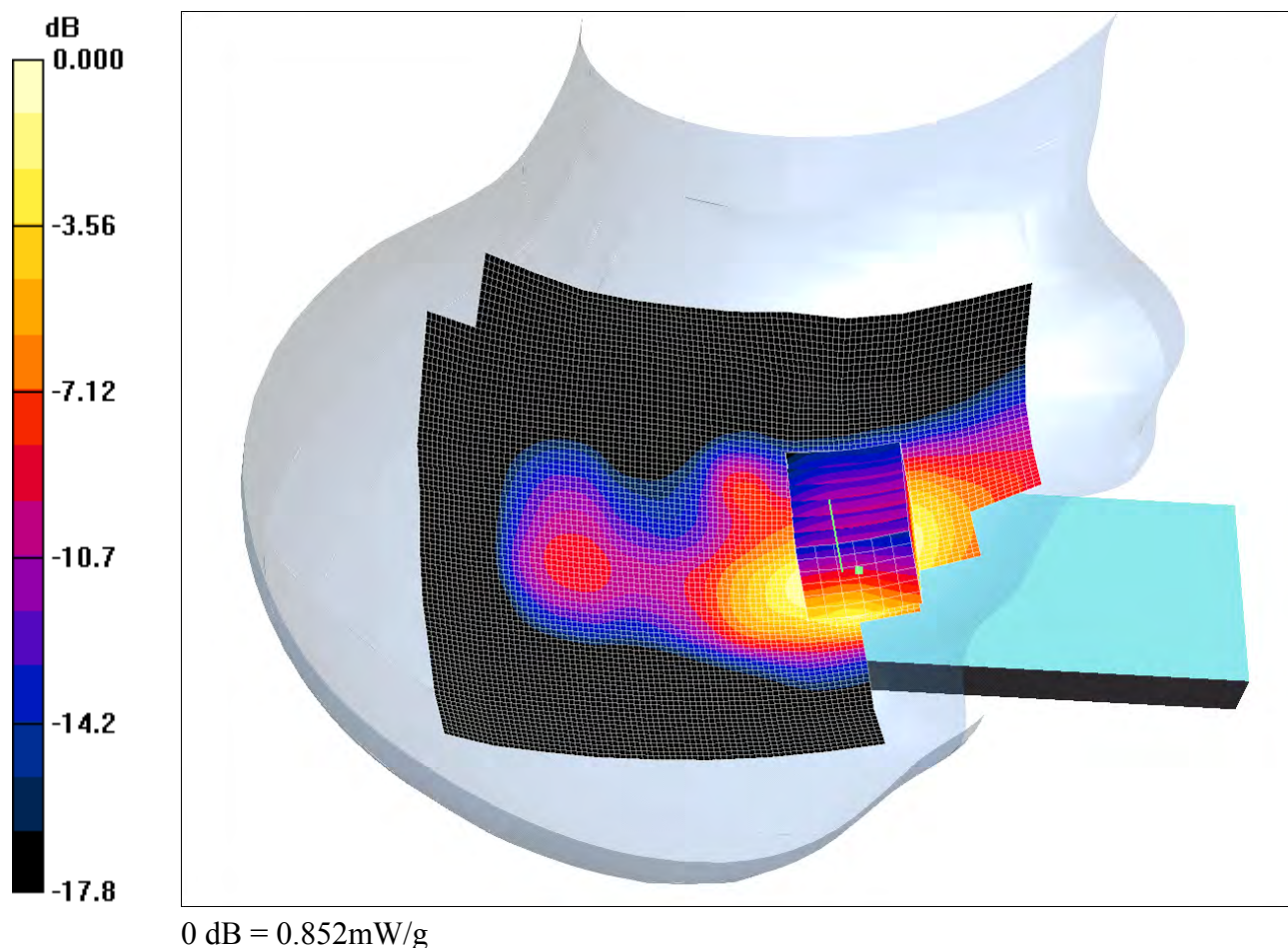
**SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.098 mW/g**

Maximum value of SAR (measured) = 0.180 mW/g

Date: 01/11/2006

72327\_JD02\_005

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_005\_Touch\_Right\_CH512****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40$ ; $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.03, 5.03, 5.03); Calibrated: 13/07/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1207
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Touch Right - Low/Area Scan (91x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.843 mW/g

**Touch Right - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.28 V/m; Power Drift = -0.208 dB

Peak SAR (extrapolated) = 1.25 W/kg

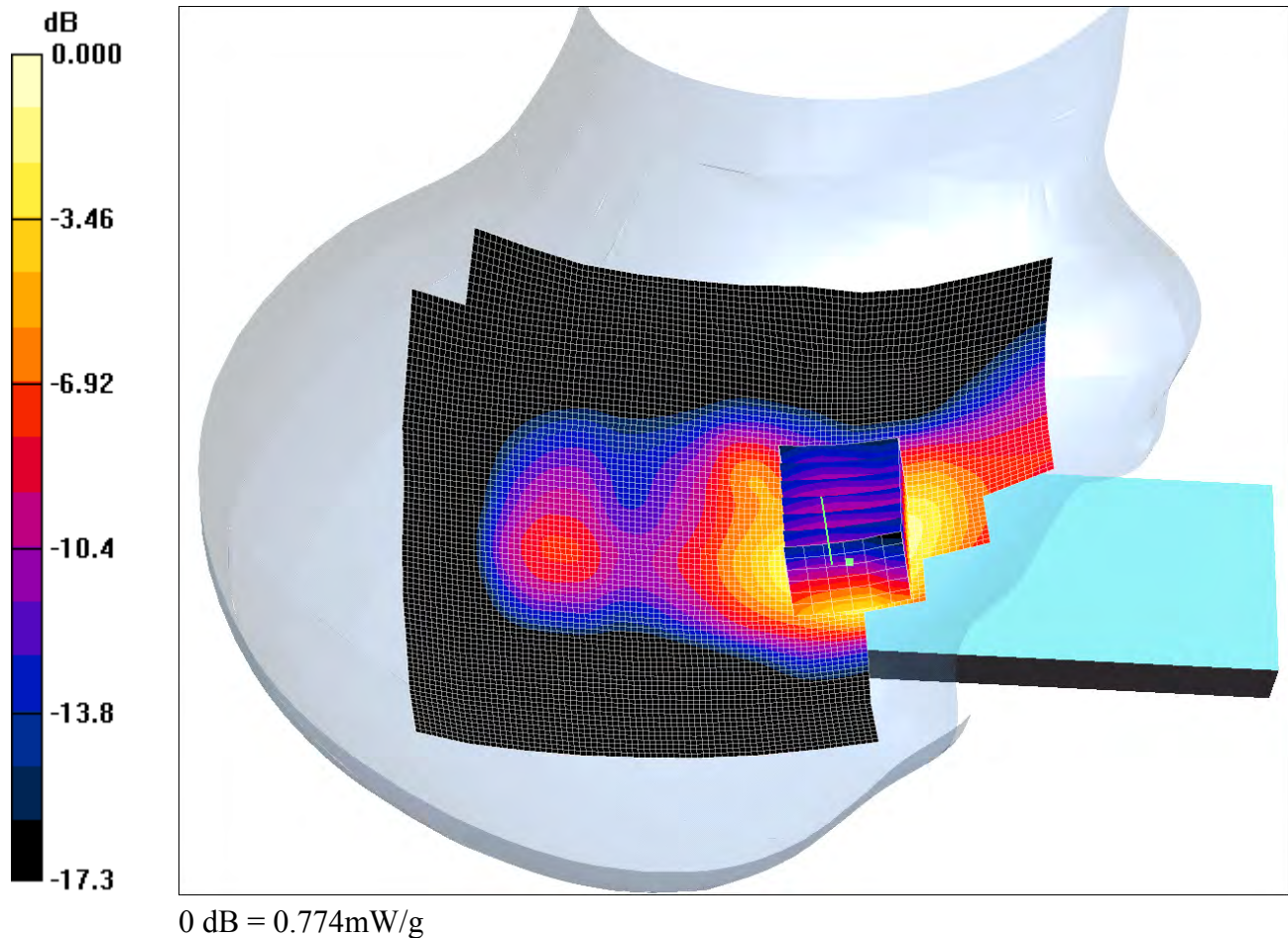
**SAR(1 g) = 0.768 mW/g; SAR(10 g) = 0.439 mW/g**

Maximum value of SAR (measured) = 0.852 mW/g

Date: 01/11/2006

72327\_JD02\_006

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_006\_Touch\_Right\_CH810****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1909.8$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r =$ 39.8;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.03, 5.03, 5.03); Calibrated: 13/07/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1207
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Touch Right - High/Area Scan (91x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.735 mW/g

**Touch Right - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.93 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 1.13 W/kg

**SAR(1 g) = 0.696 mW/g; SAR(10 g) = 0.388 mW/g**

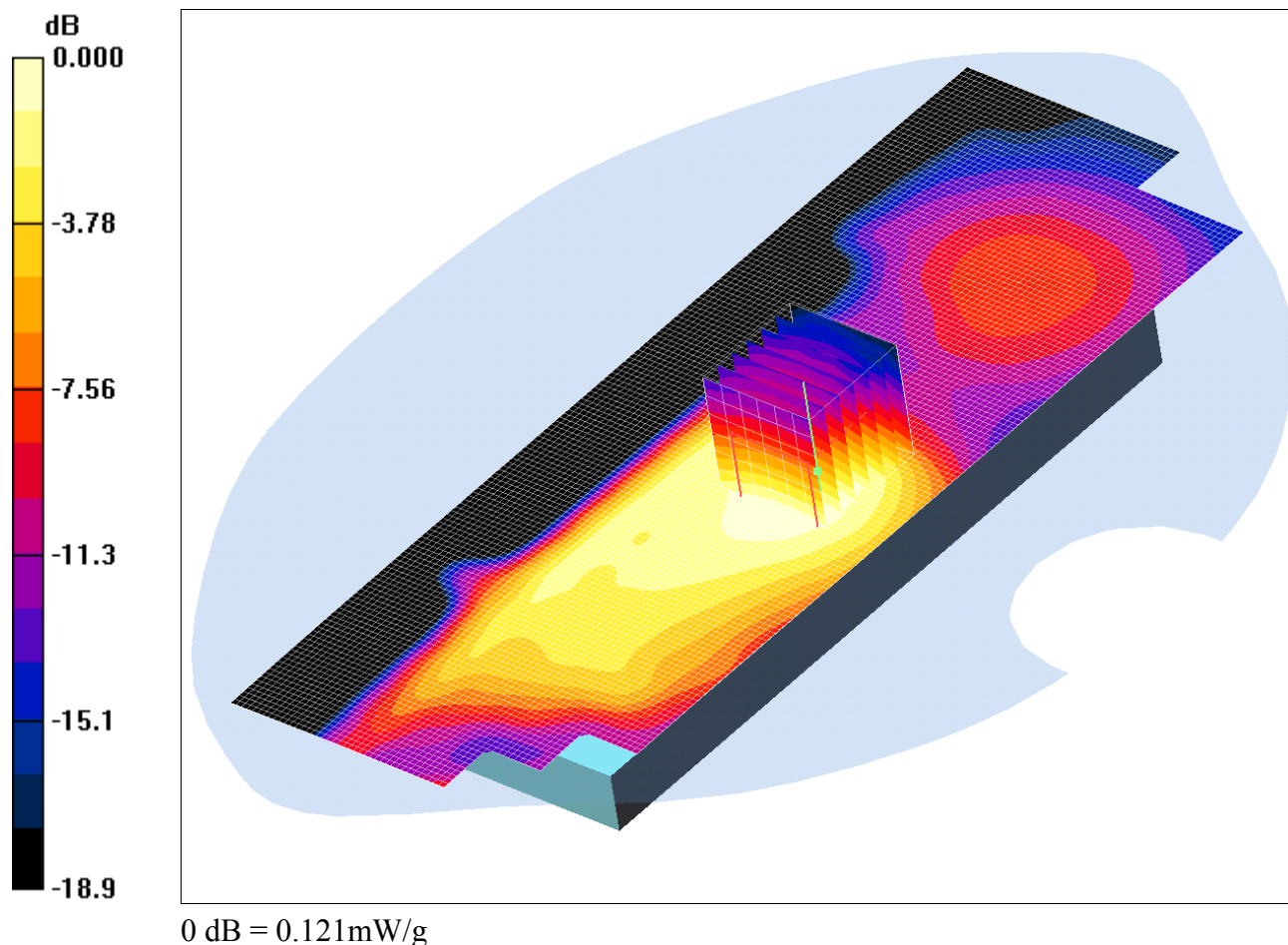
Maximum value of SAR (measured) = 0.774 mW/g



Date: 01/11/2006

72327\_JD02\_007

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_007\_Rear\_of\_EUT\_Facing\_Phantom\_Open\_with\_PHF\_CH660\_GSM****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: PCS 1900; Frequency: 1879.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1879.8$  MHz;  $\sigma = 1.58$  mho/m;  $\epsilon_r =$ 51.7;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.55, 4.55, 4.55); Calibrated: 12/07/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12a; Type: SAM 4.0; Serial: TP:1193
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171



**Rear of EUT Facing Phantom Open with PHF - Middle/Area Scan (61x171x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.122\text{ mW/g}$

**Rear of EUT Facing Phantom Open with PHF - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube**

**0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $7.39\text{ V/m}$ ; Power Drift =  $0.247\text{ dB}$

Peak SAR (extrapolated) =  $0.190\text{ W/kg}$

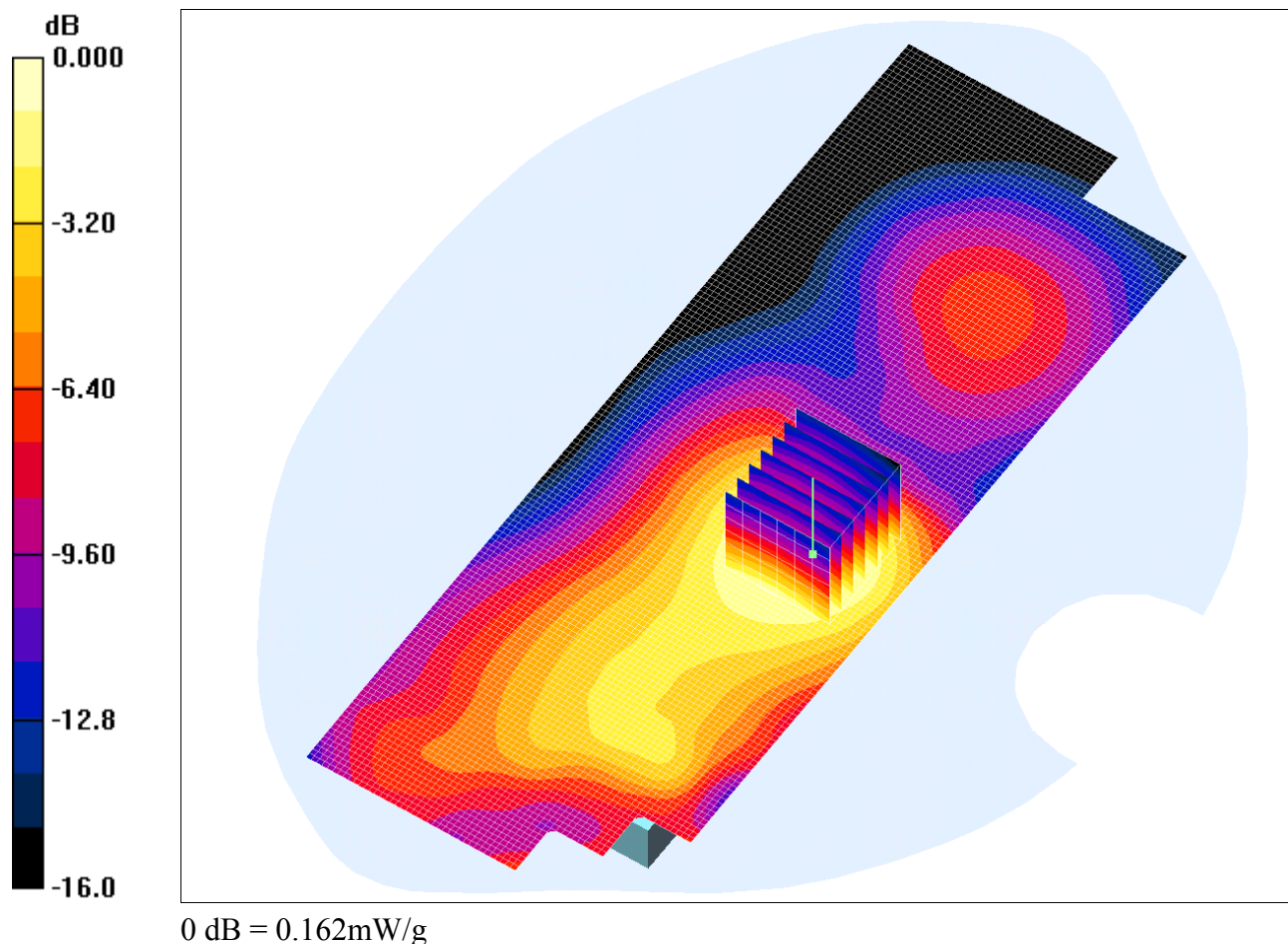
**SAR(1 g) =  $0.114\text{ mW/g}$ ; SAR(10 g) =  $0.069\text{ mW/g}$**

Maximum value of SAR (measured) =  $0.121\text{ mW/g}$

Date: 01/11/2006

72327\_JD02\_008

Test Laboratory: RFI GLOBAL SERVICES LTD.

**72327\_JD02\_008\_Rear\_of\_EUT\_Facing\_Phantom\_Open\_with\_PHF\_CH660\_GPRS****DUT: Panasonic; Type: VS70A (Sample C3); IMEI: 0044010220170043**

Communication System: GPRS 1900; Frequency: 1879.8 MHz; Duty Cycle: 1:4

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1879.8$  MHz;  $\sigma = 1.58$  mho/m;  $\epsilon_r =$ 51.7;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.55, 4.55, 4.55); Calibrated: 12/07/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn394; Calibrated: 19/05/2006
- Phantom: SAM 12a; Type: SAM 4.0; Serial: TP:1193
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Rear of EUT Facing Phantom Open with PHF - Middle/Area Scan (61x171x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.170\text{ mW/g}$

**Rear of EUT Facing Phantom Open with PHF - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube**

**0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $7.94\text{ V/m}$ ; Power Drift =  $-0.021\text{ dB}$

Peak SAR (extrapolated) =  $0.251\text{ W/kg}$

**SAR(1 g) =  $0.152\text{ mW/g}$ ; SAR(10 g) =  $0.093\text{ mW/g}$**

Maximum value of SAR (measured) =  $0.162\text{ mW/g}$