



TTI-P-G 158



Appendix for the report:

Dosimetric Assessment of the Portable Device
Panasonic X70U
(FCC ID: NWJ22B002A)
According to the FCC Requirements

Bluetooth measurements for head position

February 25, 2004
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The test results only relate to the items tested.
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Subject of Investigation

This report includes SAR measurements with activated Bluetooth transmitter for the worst case head position for the X70U from Panasonic and is an appendix for the test report: DASY Test-Report, Panasonic_6575_368a. The SAR is measured without and with activated Bluetooth transmitter on GSM 850 and PCS 1900 for the check position on the left side of the SAM phantom.

The Tables below contain the measured SAR values averaged over a mass of 1 g:

Phantom Configuration (Liquid depth = 15.6 cm)	Test Position	SAR _{Ig} [W/kg] (Drift[dB])			Temperature	
		Channel 128 824.2 MHz 26.9 dBm	Channel 190 836.6 MHz 28.7 dBm	Channel 251 848.8 MHz 29.3 dBm	Ambient [°C]	Liquid [°C]
		Left Side	Cheek without Bluetooth		0.398 (0.08)	
	Cheek with Bluetooth		0.375 (-0.04)		21.2	20.3

Table 1: Measured head phantom results for GSM 850 for the Panasonic X70U.

Phantom Configuration (Liquid depth = 16.4 cm)	Test Position	SAR _{Ig} [W/kg] (Drift[dB])			Temperature	
		Channel 512 1850.2 MHz 30.9 dBm	Channel 661 1880.0 MHz 31.6 dBm	Channel 810 1909.8 MHz 31.0 dBm	Ambient [°C]	Liquid [°C]
		Left Side	Cheek without Bluetooth		0.682 (0.04)	
	Cheek with Bluetooth		0.665 (0.05)		21.0	20.5

Table 2: Measured head phantom results for PCS 1900 for the Panasonic X70U.

The above mentioned power values are ERP (GSM 850) and EIRP (PCS 1900) values, and were delivered from Panasonic, UK.

Appendix

Administrative Data

Date of validation: 850 MHz, Head: November 18, 2003
1900 MHz, Head: November 14, 2003
Date of measurement: 850 MHz, Head: November 18, 2003
1900 MHz, Head: November 14, 2003
Data stored: Panasonic_6575_368

Device under Test and Test Conditions

MTE: Panasonic X70U, Production Line Unit
Date of receipt: November 14, 2003
IMEI: 004400622871885
FCC ID: NWJ22B002A
Equipment class: Portable device
Power Class: GSM 850: 5, tested with power level 7
PCS 1900: 1, tested with power level 0
RF exposure environment: General Population/Uncontrolled
Power supply: Internal Battery (Other batteries not available)
Antenna: Antenna Typ: Helix
Measured Standards: GSM 850, PCS 1900
Method to establish a call: GSM 850, PCS 1900: Basestation simulator, using the air interface
Modulation: GMSK
Crest Factor: Talk Mode: 8
TX range: GSM 850 : 824.2 MHz – 848.8 MHz
PCS 1900 : 1850.2 MHz – 1909.8 MHz
RX range: GSM 850 : 869.2 MHz – 893.8 MHz
PCS 1900 : 1930.2 MHz – 1989.8 MHz
Used TX Channels: GSM 850: ch. 190
PCS 1900: ch. 661
Used Phantom: SAM Twin Phantom V4.0, as defined by the IEEE SCC-34/SC2 group and delivered by Schmid & Partner Engineering AG

The material parameters and the results from the simplified performance check are included in the main test report: DASY Test-Report, Panasonic_6575_368a.

Test Laboratory: IMST; File Name: [70uglm_1.da4](#)

DUT: Panasonic ; Type: X70 U; Serial: 004400622871885

Program: Measurement

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

Medium: Head 835 MHz ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.4$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(6.8, 6.8, 6.8); Calibrated: 21.03.2003

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

- Electronics: DAE3 Sn335; Calibrated: 05.05.2003

- Phantom: SAM TP:1059;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.02 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.382 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.571 W/kg

SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.265 mW/g

Reference Value = 5.02 V/m

Power Drift = 0.08 dB

Maximum value of SAR = 0.42 mW/g

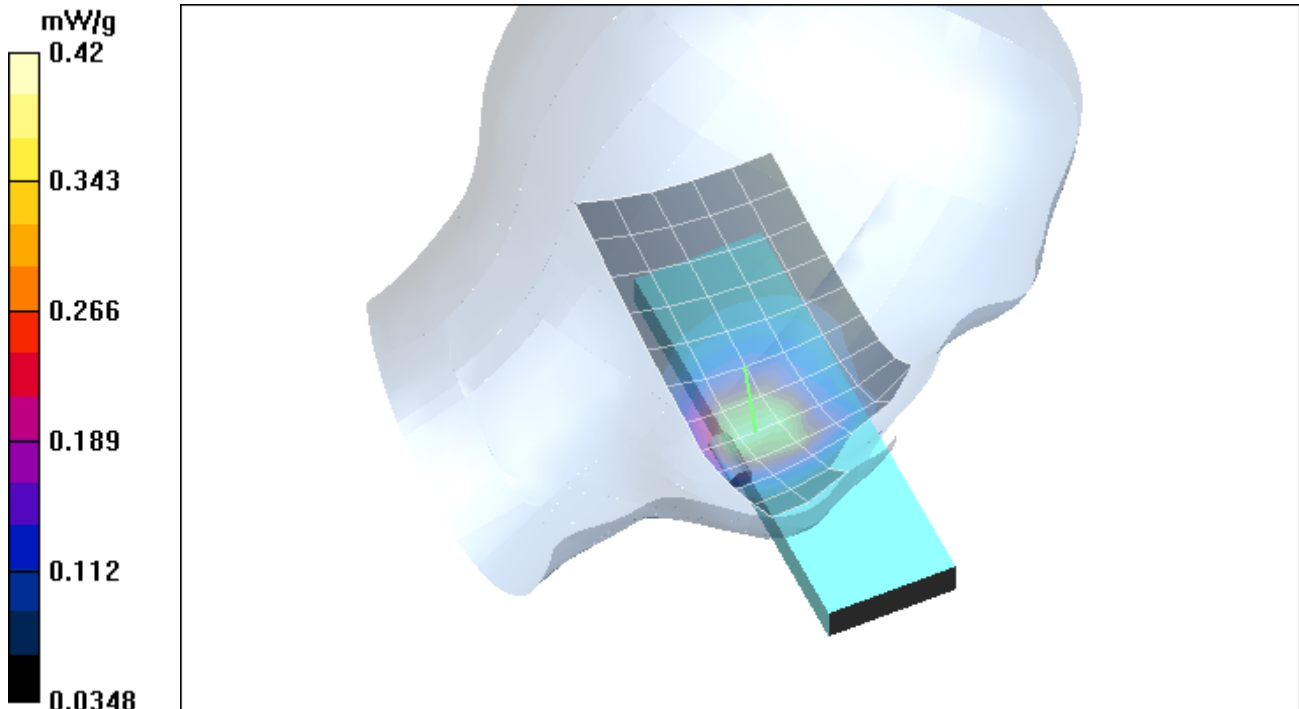


Fig. 1: SAR distribution for GSM 850, channel 190, cheek position, left side of head without Bluetooth. (November 18, 2003; Ambient Temperature: 21.0 C; Liquid Temperature: 20.2 °C).

Test Laboratory: IMST; File Name: [70uglm_1_bt.da4](#)

DUT: Panasonic ; Type: X70 U; Serial: 0044006228719760

Program: Measurement

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

Medium: Head 835 MHz ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.4$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(6.8, 6.8, 6.8); Calibrated: 21.03.2003

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

- Electronics: DAE3 Sn335; Calibrated: 05.05.2003

- Phantom: SAM TP:1059;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x14x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 5.22 V/m

Power Drift = -0.04 dB

Maximum value of SAR = 0.415 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 0.53 W/kg

SAR(1 g) = 0.375 mW/g; SAR(10 g) = 0.252 mW/g

Reference Value = 5.22 V/m

Power Drift = -0.04 dB

Maximum value of SAR = 0.401 mW/g

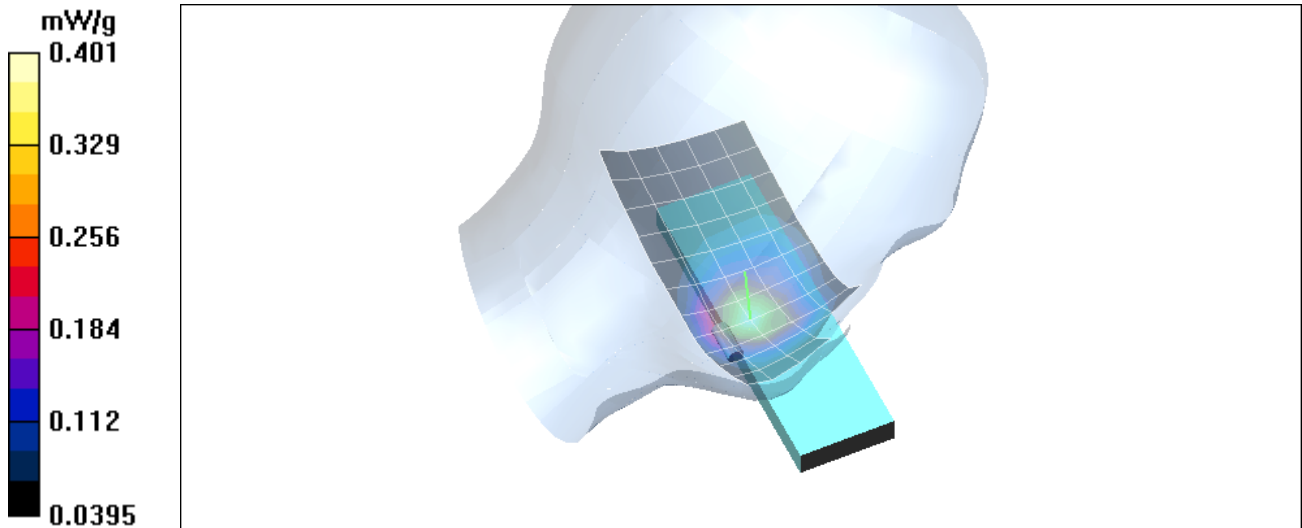


Fig. 2: SAR distribution for GSM 850, channel 190, cheek position, left side of head with Bluetooth. (November 18, 2003; Ambient Temperature: 21.2 C; Liquid Temperature: 20.3 °C).

Test Laboratory: IMST; File Name: [X70uplm_1.da4](#)

DUT: Panasonic ; Type: X70 U; Serial: 004400622871885

Program: Measurement

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.39$ mho/m, $\epsilon_r = 39.5$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003

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

- Electronics: DAE3 Sn335; Calibrated: 05.05.2003

- Phantom: SAM TP:1176;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 4.12 V/m

Power Drift = 0.04 dB

Maximum value of SAR = 0.626 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.682 mW/g; SAR(10 g) = 0.369 mW/g

Reference Value = 4.12 V/m

Power Drift = 0.04 dB

Maximum value of SAR = 0.755 mW/g

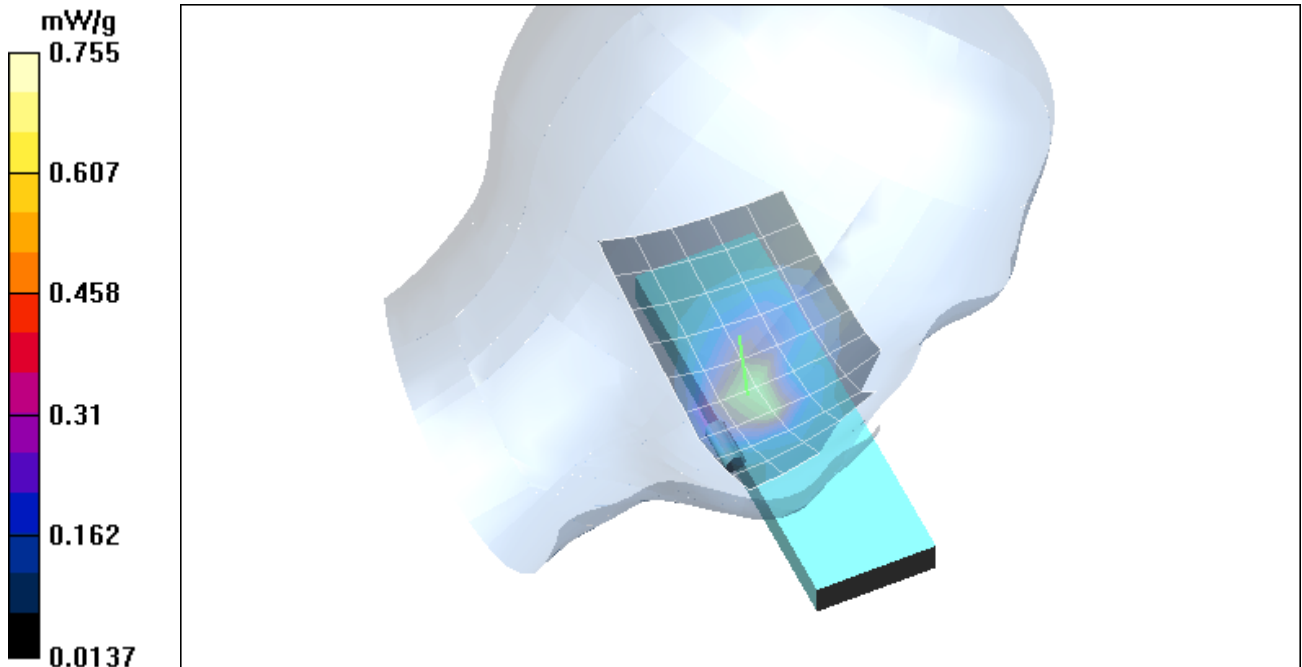


Fig. 3: SAR distribution for PCS 1900, channel 661, cheek position, left side of head without Bluetooth. (November 14, 2003; Ambient Temperature: 21.0° C; Liquid Temperature : 20.6° C).

Test Laboratory: IMST; File Name: [X70uplm_1blue.da4](#)

DUT: Panasonic ; Type: X70 U; Serial: 0044006228718800

Program: Measurement

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Head 1900 MHz ($\sigma = 1.39$ mho/m, $\epsilon_r = 39.5$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1669; ConvF(5.2, 5.2, 5.2); Calibrated: 21.03.2003

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

- Electronics: DAE3 Sn335; Calibrated: 05.05.2003

- Phantom: SAM TP:1176;

- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

cheek left/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 3.88 V/m

Power Drift = 0.05 dB

Maximum value of SAR = 0.58 mW/g

cheek left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.357 mW/g

Reference Value = 3.88 V/m

Power Drift = 0.05 dB

Maximum value of SAR = 0.735 mW/g

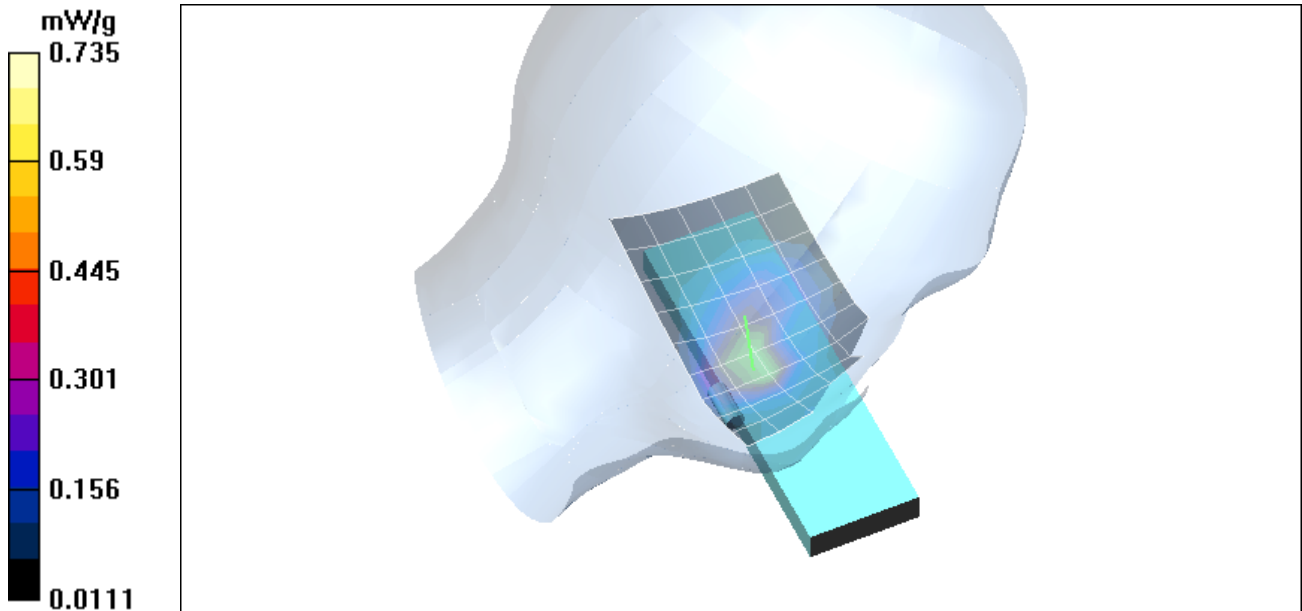


Fig. 4: SAR distribution plot for GSM 1900 for the Panasonic X70U with Bluetooth, channel 661, cheek position, left side of head. (Ambient Temperature: 21.0° C, Liquid Temperature: 20.5° C).

Environment

To comply with the required noise level (less than 12 mW/kg) periodically measurements without a DUT were conducted.

Humidity: $45\% \pm 5\%$

Test Equipment

Test Equipment	Model	Serial Number	Last Calibration	Next Calibration
DASY4 System				
Software Version	V4.0	N/A	N/A	N/A
Dosimetric E-Field Probe	ET3DV6	1669	03/2003	03/2004
Data Acquisition Electronics	DAE3 V1	335	05/2003	05/2004
Phantom	SAM	1176	N/A	N/A
Performance Checking				
System Validation Dipole, Head	D835V2	437	11/2002	11/2004
System Validation Dipole, Body	D835V2	437	11/2002	11/2004
System Validation Dipole, Head	D1900V2	535	11/2002	11/2004
System Validation Dipole, Body	D1900V2	535	11/2002	11/2004
Power Meter, Agilent	E4416A	GB41050414	11/2002	11/2003
Power Sensor, Agilent	E9301H	US40010212	12/2002	12/2003
RF Source (Network Analyzer)	HP8753D	3410A06555	11/2002	11/2003
RF Amplifier, Mini-Circuits	ZHL-42	D012296	N/A	N/A
Material Measurement				
Network Analyzer	HP8753D	3410A06555	11/2002	12/2003
Dielectric Probe Kit	HP85070B	US33020263	N/A	N/A
General				
Radio Tester, Rohde & Schwarz	CMU200	835305/050	12/2002	12/2003

Table 3: Test equipment.

Pictures to demonstrate the required liquid depth

Fig. 5 – 6 show the liquid depth in the used SAM phantoms.

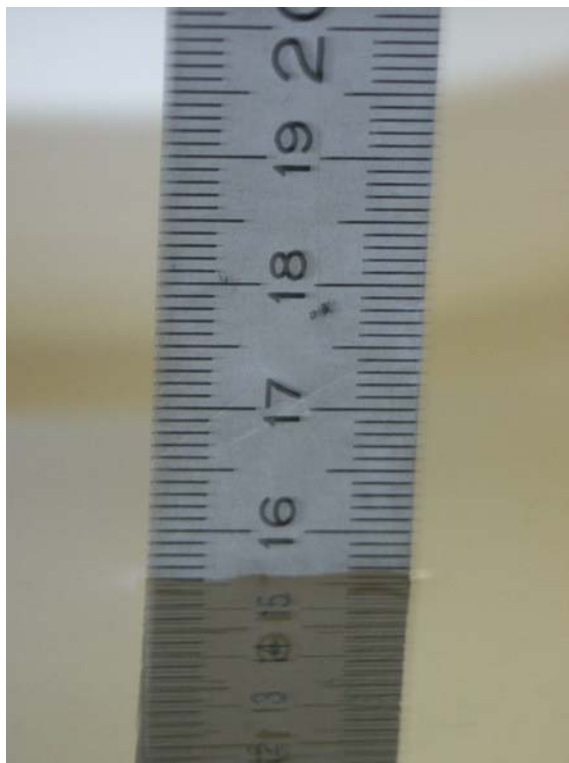


Fig. 5: Liquid depth for GSM 850 Head.



Fig. 6: Liquid depth for PCS 1900 Head.