CERTIFICATE OF COMPLIANCE
SAR EVALUATION

Test Lab:	**Applicant:**
CELLTECH RESEARCH INC. Testing and Engineering Lab 1955 Moss Court Kelowna, B.C. Canada V1Y 9L3 Phone: 250 - 860-3130 Fax: 250 - 860-3110 Toll Free: 1-877-545-6287 e-mail: celltech@globuswireless.com web site: www.globuswireless.com	**HANWHA CORPORATION** **Telecommunication Division** Hanwha Bldg., 111-5, Sokong-Dong Chung-Ku, Seoul, Korea 100-070 Attn: Hyoung Sok Roh Senior Manager, Research Lab

FCC ID:	**OCCHWT-5000**
Model(s):	**HWT-5000**
Equipment Type:	**Dual-Band Tri-Mode PCS/Cellular Phone**
FCC Classification:	**Part 24 Licensed Portable Transmitter Held to Ear (PCE)**
FCC Rule Part(s):	**2.1093; ET Docket 96.326**
Tx Frequency Range:	**824.04 - 848.97 MHz (AMPS)** **824.70 - 848.31 MHz (CDMA)** **1851.25 - 1908.75 MHz (PCS CDMA)**
Rx Frequency Range:	**869.04 - 893.97 MHz (AMPS)** **869.70 - 893.31 MHz (CDMA)** **1931.25 – 1988.75 MHz (PCS CDMA)**
Max. RF Output Power:	**0.232 Watts ERP (AMPS)** **0.150 Watts ERP (CDMA)** **0.272 Watts EIRP (PCS CDMA)**

This wireless mobile and/or portable device has been shown to be compliant for localized specific absorption rate (SAR) for uncontrolled environment/general exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in ANSI/IEEE Std. C95.3-1999. (See test report).

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Celltech Research Inc. certifies that no party to this application has been denied FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

Shawn McMillen
General Manager
Celltech Research Inc.

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1.0 INTRODUCTION

This measurement report shows compliance of the HANWHA CORPORATION Model: HWT-5000 Dual-Band Tri-Mode PCS/Cellular Phone FCC ID: OCCHWT-5000 with FCC Part 2.1093, ET Docket 96-326 Rules for mobile and portable devices. The test procedures, as described in American National Standards Institute C95.1 - 1992 (1), FCC OET Bulletin 65–1997 were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

2.0 DESCRIPTION of Equipment Under Test (EUT)

EUT Type	Dual-Band Tri-Mode PCS/Cellular Phone	**FCC ID**	OCCHWT-5000
Equipment Class	Part 24 Licensed Portable Transmitter Held to Ear (PCE)	**Model No.(s)**	HWT-5000
FCC Rule Part(s)	§ 2.1093, Docket 96-326	**Application Type**	Parts 24 & 22 Certification
Tx Frequency Range (MHz)	824.04 – 848.97 (AMPS) 824.70 - 848.31 (CDMA) 1851.25 - 1908.75 (PCS CDMA)	**S/N No.**	Pre-production
Rx Frequency Range (MHz)	869.04 - 893.97 (AMPS) 869.70 - 893.31 (CDMA) 1931.25 - 1988.75 (PCS CDMA)	**Max. RF Output Power**	0.232W ERP (AMPS) 0.150W ERP (CDMA) 0.272W EIRP (PCS CDMA)
Modulation(s)	AMPS/CDMA/PCS CDMA	**Battery Type(s)**	Standard (1000mAh) Extended (1400mAh)
Antenna Type	Retractable Whip	**Antenna Length**	81 mm


Fig. 1. EUT Front


Fig. 2. EUT Rear


Fig. 3. EUT Left Side


Fig. 4. EUT Right Side


Fig. 5. EUT with Belt-Holster

3.0 SAR MEASUREMENT SYSTEM

Celltech Research SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, and the generic twin phantom containing brain or muscle equivalent material (see Figure 6). 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 utilizes 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.

Fig 6. DASY3 SAR Measurement System

4.0 MEASUREMENT SUMMARY

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the EUT are reported in Appendix A.

HEAD SAR MEASUREMENTS - AMPS MODE

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Battery Type	Antenna Position	SAR (w/kg)
824.04	991	Unmodulated Carrier	27.0	Standard	Retracted	1.08
824.04	991	Unmodulated Carrier	27.0	Standard	Extended	0.681
836.49	383	Unmodulated Carrier	27.0	Standard	Retracted	1.01
836.49	383	Unmodulated Carrier	27.0	Standard	Extended	1.07
848.97	799	Unmodulated Carrier	27.0	Standard	Retracted	0.546
848.97	799	Unmodulated Carrier	27.0	Standard	Extended	0.580
836.49	383	Unmodulated Carrier	27.0	Extended	Retracted	0.986
836.49	383	Unmodulated Carrier	27.0	Extended	Extended	1.04
Mixture Type: BRAIN Dielectric Constant: 44.2 Conductivity: 0.80			**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**			

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found are below the maximum limit of 1.6 w/kg.
3. The worst-case head SAR value found was 1.08 w/kg.

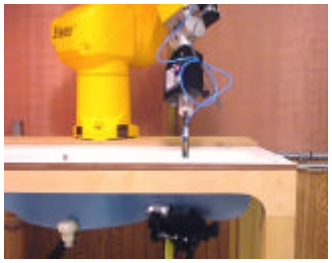


Figure 7. Head SAR Test Setup

MEASUREMENT SUMMARY (CONT.)

HEAD SAR MEASUREMENTS - 800MHz CDMA MODE

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Battery Type	Antenna Position	SAR (w/kg)
824.70	1013	CDMA	25.0	Standard	Retracted	0.663
824.70	1013	CDMA	25.0	Standard	Extended	0.451
835.89	363	CDMA	25.0	Standard	Retracted	0.712
835.89	363	CDMA	25.0	Standard	Extended	0.754
848.31	777	CDMA	25.0	Standard	Retracted	0.308
848.31	777	CDMA	25.0	Standard	Extended	0.295
835.89	363	CDMA	25.0	Extended	Retracted	0.698
835.89	363	CDMA	25.0	Extended	Extended	0.745
Mixture Type: BRAIN Dielectric Constant: 44.2 Conductivity: 0.80			**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**			

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found were below the maximum limit of 1.6 w/kg.
3. The worst-case head SAR value found was 0.754 w/kg.

Figure 8. Head SAR Test Setup

MEASUREMENT SUMMARY (CONT.)

HEAD SAR MEASUREMENTS - PCS CDMA MODE

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Battery Type	Antenna Position	SAR (w/kg)
1851.25	25	PCS CDMA	24.5	Standard	Retracted	1.39
1851.25	25	PCS CDMA	24.5	Standard	Extended	1.07
1880.00	600	PCS CDMA	24.5	Standard	Retracted	1.22
1880.00	600	PCS CDMA	24.5	Standard	Extended	1.02
1908.75	1175	PCS CDMA	24.5	Standard	Retracted	0.826
1908.75	1175	PCS CDMA	24.5	Standard	Extended	0.715
1851.25	25	PCS CDMA	24.5	Extended	Retracted	1.37
1851.25	25	PCS CDMA	24.5	Extended	Extended	1.05
Mixture Type: BRAIN Dielectric Constant: 41.2 Conductivity: 1.68		**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**				

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found were below the maximum limit of 1.6 w/kg.
3. The worst-case head SAR value found was 1.39 w/kg.

Figure 9. Head SAR Test Setup

MEASUREMENT SUMMARY (CONT.)

BODY SAR MEASUREMENTS - AMPS MODE

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Separation Distance (cm)	Antenna Position	SAR (w/kg)
824.04	991	Unmodulated Carrier	27.0	1.0	Retracted	0.550
824.04	991	Unmodulated Carrier	27.0	1.0	Extended	0.414
836.49	383	Unmodulated Carrier	27.0	1.0	Retracted	0.483
836.49	383	Unmodulated Carrier	27.0	1.0	Extended	0.775
848.97	799	Unmodulated Carrier	27.0	1.0	Retracted	0.296
848.97	799	Unmodulated Carrier	27.0	1.0	Extended	0.352
836.49	383	Unmodulated Carrier	27.0	1.0	Retracted	0.468*
836.49	383	Unmodulated Carrier	27.0	1.0	Extended	0.750*
Mixture Type: Muscle Dielectric Constant: 56.1 Conductivity: 0.95		**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population BODY: 1.6 W/kg (averaged over 1 gram)**				

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found were below the maximum limit of 1.6 w/kg.
3. The worst-case body SAR value found was 0.775 w/kg.
4. The EUT was tested for body SAR using Hanwha leather holster providing a separation distance of 1.0cm between the back of the phone and the outer surface of the phantom.
5. The EUT was tested for body SAR using the standard battery, except * using extended battery).

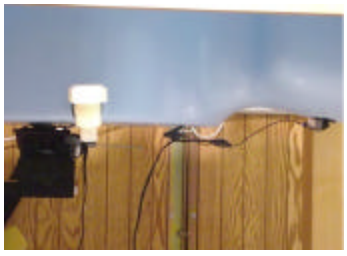


Figure 10. Body SAR Test Setup

MEASUREMENT SUMMARY (CONT.)

BODY SAR MEASUREMENTS – 800MHz CDMA MODE

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Separation Distance (cm)	Antenna Position	SAR (w/kg)
824.70	1013	CDMA	25.0	1.0	Retracted	0.314
824.70	1013	CDMA	25.0	1.0	Extended	0.263
835.89	363	CDMA	25.0	1.0	Retracted	0.310
835.89	363	CDMA	25.0	1.0	Extended	0.605
848.31	777	CDMA	25.0	1.0	Retracted	0.155
848.31	777	CDMA	25.0	1.0	Extended	0.173
835.89	363	CDMA	25.0	1.0	Retracted	0.303*
835.89	363	CDMA	25.0	1.0	Extended	0.599*
Mixture Type: Muscle Dielectric Constant: 56.1 Conductivity: 0.95			**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population BODY: 1.6 W/kg (averaged over 1 gram)**			

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found were below the maximum limit of 1.6 w/kg.
3. The worst-case body SAR value found was 0.605 w/kg.
4. The EUT was tested for body SAR using Hanwha leather holster providing a separation distance of 1.0cm between the back of the phone and the outer surface of the phantom.
5. The EUT was tested for body SAR using the standard battery, except * using extended battery).

Figure 11. Body SAR Test Setup

MEASUREMENT SUMMARY (CONT.)

BODY SAR MEASUREMENTS - PCS CDMA MODE

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Separation Distance (cm)	Antenna Position	SAR (w/kg)
1851.25	25	PCS CDMA	24.5	1.0	Retracted	0.435
1851.25	25	PCS CDMA	24.5	1.0	Extended	0.352
1880.00	600	PCS CDMA	24.5	1.0	Retracted	0.606
1880.00	600	PCS CDMA	24.5	1.0	Extended	0.413
1908.75	1175	PCS CDMA	24.5	1.0	Retracted	0.317
1908.75	1175	PCS CDMA	24.5	1.0	Extended	0.298
1880.00	600	PCS CDMA	24.5	1.0	Retracted	0.598*
1880.00	600	PCS CDMA	24.5	1.0	Extended	0.404*
Mixture Type: Muscle Dielectric Constant: 54.0 Conductivity: 1.45			**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population BODY: 1.6 W/kg (averaged over 1 gram)**			

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found were below the maximum limit of 1.6 w/kg.
3. The worst-case body SAR value found was 0.606 w/kg.
4. The EUT was tested for body SAR using Hanwha leather holster providing a separation distance of 1.0cm between the back of the phone and the outer surface of the phantom.
5. The EUT was tested for body SAR using the standard battery, except * using extended battery).

Figure 12. Body SAR Test Setup

MEASUREMENT SUMMARY (CONT.)

HAND SAR MEASUREMENTS

Frequency (MHz)	Channel	Modulation	Conducted Power (dBm)	Separation Distance (cm)	Antenna Position	SAR (w/kg)
836.49	383	Unmodulated Carrier	27.0	0.0	Retracted	1.23
836.49	383	Unmodulated Carrier	27.0	0.0	Extended	1.33
835.89	363	800MHz CDMA	25.0	0.0	Retracted	0.763
835.89	363	800MHz CDMA	25.0	0.0	Extended	1.11
1880.00	600	PCS CDMA	24.5	0.0	Retracted	0.823
1880.00	600	PCS CDMA	24.5	0.0	Extended	0.869
800-850 MHz Dielectric Constant: 56.1 Conductivity: 0.95			**Mixture Type: Muscle ANSI / IEEE C95. 1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population HAND: 4.0 W/kg (averaged over 10 grams)**			
1850-1910 MHz Dielectric Constant: 54.0 Conductivity: 1.45						

Notes:

1. All modes of operation were investigated and the worst-case SAR levels are reported.
2. The SAR values found were below the maximum limit of 1.6 w/kg.
3. The EUT was tested for hand SAR with the back of the phone touching the outer surface of the planar phantom.
4. The EUT was tested for hand SAR using the standard battery.

Figure 13. Hand SAR Test Setup

5.0 SAR SAFETY LIMITS

EXPOSURE LIMITS (General populations/Uncontrolled Exposure Environment)	**SAR** (W/Kg)
Spatial Average (averaged over the whole body)	0.08
Spatial Peak (averaged over any 1g of tissue)	1.60
Spatial Peak (hands/wrists/feet/ankles averaged over 10g)	4.00

Notes: 1. The FCC 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.

6.0 DETAILS OF SAR EVALUATION

The HANWHA CORPORATION HWT-5000 Dual-Band Tri-Mode PCS/Cellular Phone FCC ID: OCCHWT-5000 was found to be compliant for localized specific absorption rate (SAR) based on the following test provisions and conditions:

1) The handset was placed in a normal operating position with the center of the ear-piece aligned with the ear canal on the phantom.
2) With the ear-piece touching the phantom the center line of the handset was aligned with an imaginary plane (X and Y axis) consisting of three lines connecting both ears and the mouth.
3) The handset was gradually moved towards the cheek until any point of the mouth-piece or keypad touched the cheek.
4) The EUT was tested in a body-worn configuration with the handset placed in the Hanwha belt holster which was placed on the device holder with the back of the phone facing parallel to, and the belt-clip touching, the outer surface of the planar phantom. The belt holster provided a 1.0cm spacing between the back of the phone and the outer surface of the planar phantom.
5) The EUT was tested for hand SAR with the back of the handset touching the surface of the planar phantom.
6) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimize drift.
7) The device was keyed to operate continuously in the transmit mode for the duration of the test.
8) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.
9) The EUT was tested with a fully charged battery.

7.0 EVALUATION PROCEDURES

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 center 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 Supp., C.

(ii) For body worn devices or devices which can be operated within 20 cm of the body, the planar section of the phantom was used. The type of device being evaluated dictated the distance of the EUT to the outer surface of the planar phantom.

(iii) The probe was positioned relative to the phantom head in order to have the angle no greater than $\pm 30^0$ to the normal.

b. The SAR was determined by a pre-defined procedure within the DASY3 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 20mm x 20mm.

c. A 5x5x7 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.

8.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in the planar region of the phantom. For devices operating below 1GHz, an 835MHz dipole or 900MHz was used, depending on the operating frequency of the EUT. For devices operating above 1GHz, an 1800MHz dipole was used. A forward power of 250mW was applied to the dipole and system was verified to a tolerance of $\pm$5% for 835MHz and 900MHz dipoles, and $\pm$10% tolerance for 1800MHz dipole. The applicable verification(s) is/are as follows (see Appendix B for validation test plots):

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)
D835V2	2.06	2.04
D1800V2	9.32	9.61

9.0 SIMULATED TISSUES

The brain and muscle mixtures consist of a viscous gel using hydroxethylcellullose (HEC) gelling agent and saline solution. Preservation with a bacteriacide is added and 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.

INGREDIENT	FREQUENCY			
	800-850MHz Brain %	**800-850MHz Muscle %**	**1850-1910MHz Brain %**	**1850-1910MHz Muscle %**
Water	40.4	52.4	45.0	40.4
Sugar	56.0	45.0	53.9	58.0
Salt	2.5	1.4	0.0	0.5
HEC	0.1	1.0	0.1	0.1
Bactericide	1.0	0.2	1.0	1.0

10.0 TISSUE PARAMETERS

The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer. The dielectric parameters of the fluid are as follows:

Frequency (MHz)	**Equivalent Tissue**	**Dielectric Constant ε_r**	**Conductivity ó (mho/m)**	**ñ (Kg/m^3)**
800-850	Brain	44.2 ± 5%	0.80 ± 5%	1000
800-850	Muscle	56.1 ± 5%	0.95 ± 5%	1000
1850-1910	Brain	41.2 ± 10%	1.68 ± 10%	1000
1850-1910	Muscle	54.0 ± 10%	1.45± 10%	1000

11.0 ROBOT SYSTEM SPECIFICATIONS

Specifications

POSITIONER:	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability:	0.02 mm
No. of axis:	6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor:	Pentium III
Clock Speed:	450 MHz
Operating System:	Windows NT
Data Card:	DASY3 PC-Board

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converter, and control logic
Software:	DASY3 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.:	1387
Construction:	Triangular core fiber optic detection system
Frequency:	10 MHz to 6 GHz
Linearity:	± 0.2 dB (30 MHz to 3 GHz)

Phantom

Phantom:	Generic Twin
Shell Material:	Fiberglass
Thickness:	2.0 ± 0.1 mm

12.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	***S/N #***	***CALIB. DATE***
DASY3 System -Robot -ET3DV6 E-Field Probe -DAE -835MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -Generic Twin Phantom V3.0	 599396-01 1387 383 411 054 247 N/A	 N/A Sept 1999 Sept 1999 Aug 1999 Aug 1999 Aug 1999 N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Oct 1999 Oct 1999 Oct 1999
E4408B Spectrum Analyzer	US39240170	Nov 1999
8594E Spectrum Analyzer	3543A02721	Mar 2000
8753E Network Analyzer	US38433013	Nov 1999
8648D Signal Generator	3847A00611	N/A
5S1G4 Amplifier Research Power Amplifier	26235	N/A

13.0 MEASUREMENT UNCERTAINTIES

Uncertainty Description	Error	Distribution	Weight	Standard Deviation	Offset
Probe Uncertainty					
Axial isotropy	±0.2 dB	U-Shaped	0.5	±2.4 %	
Spherical isotropy	±0.4 dB	U-Shaped	0.5	±4.8 %	
Isotropy from gradient	±0.5 dB	U-Shaped	0	±	
Spatial resolution	±0.5 %	Normal	1	±0.5 %	
Linearity error	±0.2 dB	Rectangle	1	±2.7 %	
Calibration error	±3.3 %	Normal	1	±3.3 %	
SAR Evaluation Uncertainty					
Data acquisition error	±1 %	Rectangle	1	±0.6 %	
ELF and RF disturbances	±0.25 %	Normal	1	±0.25 %	
Conductivity assessment	±10 %	Rectangle	1	±5.8 %	
Spatial Peak SAR Evaluation Uncertainty					
Extrapolated boundary effect	±3 %	Normal	1	±3 %	±5 %
Probe positioning error	±0.1 mm	Normal	1	±1 %	
Integrated and cube orientation	±3 %	Normal	1	±3 %	
Cube Shape inaccuracies	±2 %	Rectangle	1	±1.2 %	
Device positioning	±6 %	Normal	1	±6 %	
Combined Uncertainties				±11.7 %	±5 %

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, the estimated measurement uncertainties in SAR are less than 15-25 %.

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 ± 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 ± 2dB can be expected.

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

14.0 REFERENCES

(1) ANSI, *ANSI/IEEE C95.1: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 Ghz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992;*

(2) Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997;

(3) 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.

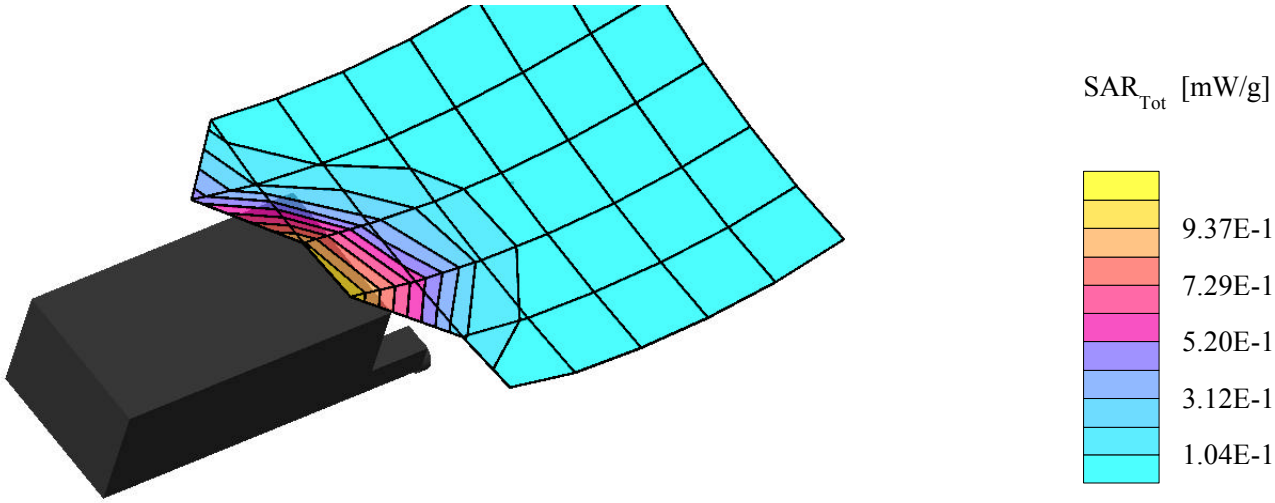
(4) Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645 – 652, May 1997.

APPENDIX A - SAR MEASUREMENT DATA

HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Hand Section; Position: (80°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7 (Test Date: Oct. 18, 2000)
SAR (1g): 1.07 mW/g * , SAR (10g): 0.667 mW/g * Max outside

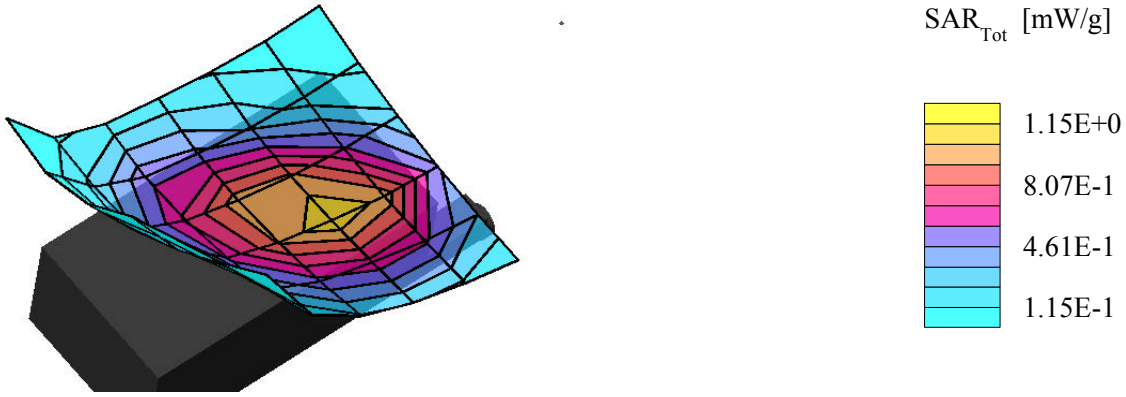
Large area scan to show hot spot occured in cheek/mouth area.
The following SAR plots have the probe tilted to within +-30
degrees normal to the curved surface of the cheek/mouth.



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.08 mW/g, SAR (10g): 0.724 mW/g

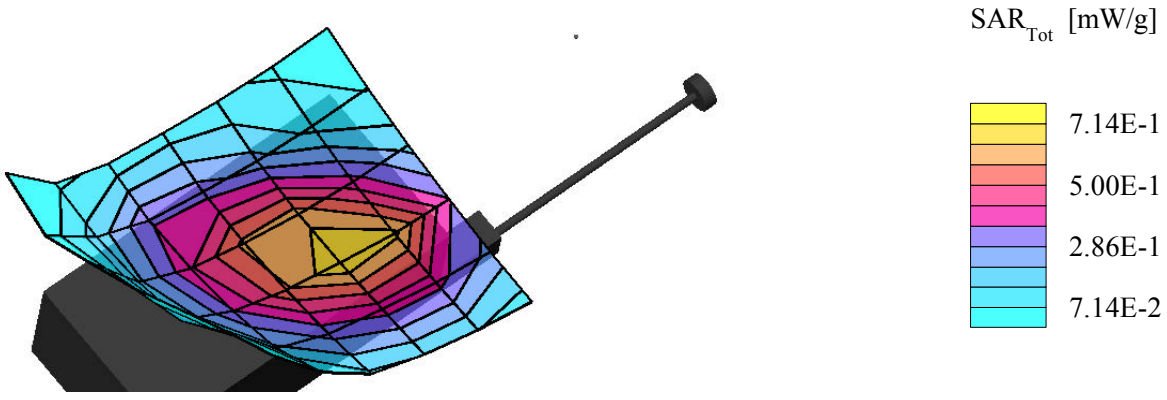
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna In
Channel 991 [824.04MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.681 mW/g, SAR (10g): 0.459 mW/g

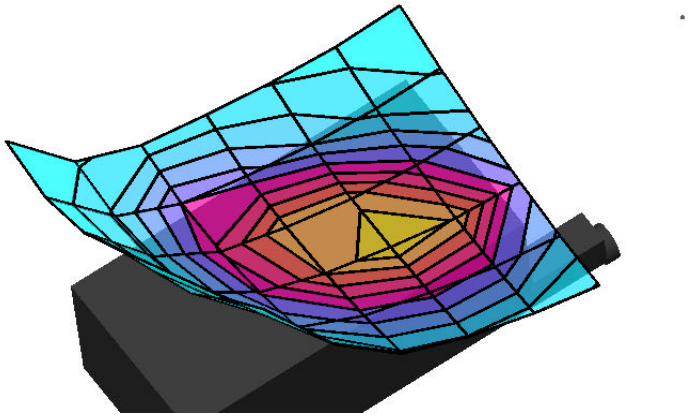
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna Out
Channel 991 [824.04MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.01 mW/g, SAR (10g): 0.685 mW/g

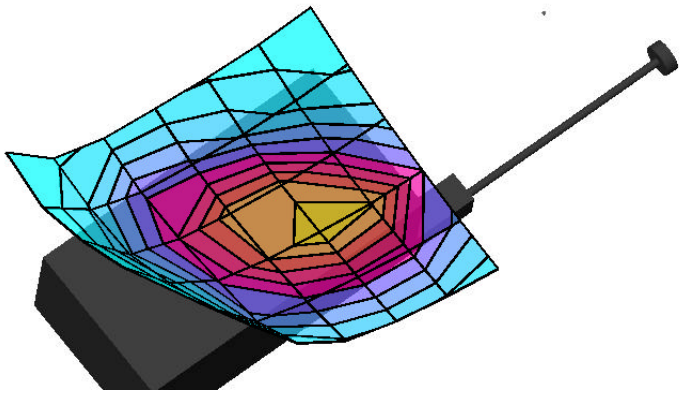
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna In
Channel 383 [836.49MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.07 mW/g, SAR (10g): 0.720 mW/g

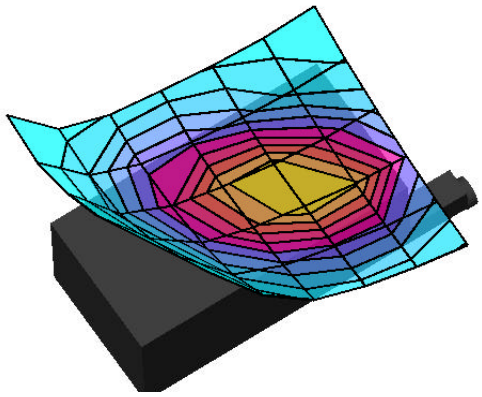
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna Out
Channel 383 [836.49MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000

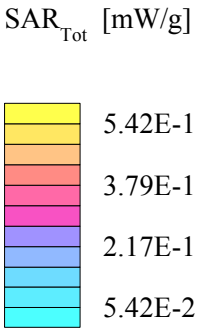


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.546 mW/g, SAR (10g): 0.365 mW/g

Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna In
Channel 799 [848.97MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000

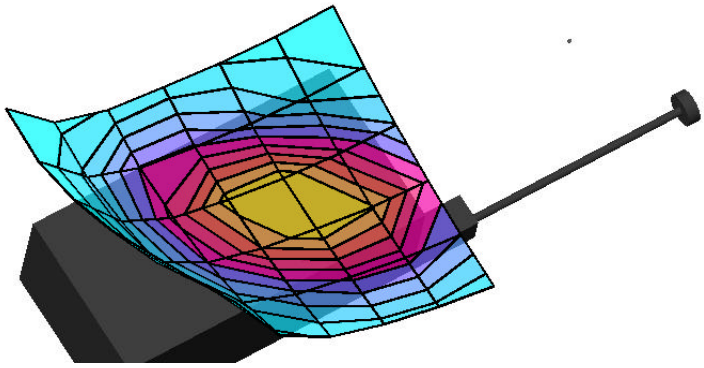




HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.580 mW/g, SAR (10g): 0.387 mW/g

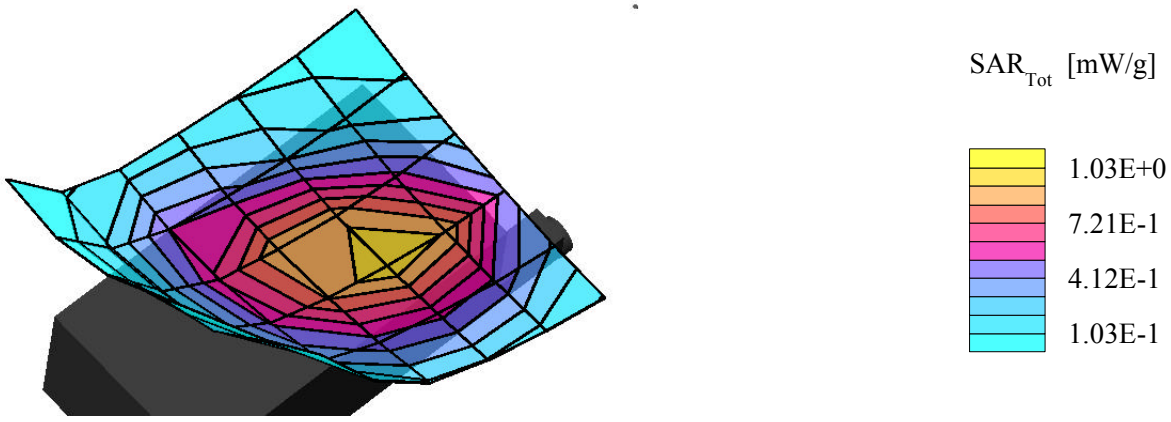
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna Out
Channel 799 [848.97MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.986 mW/g, SAR (10g): 0.668 mW/g

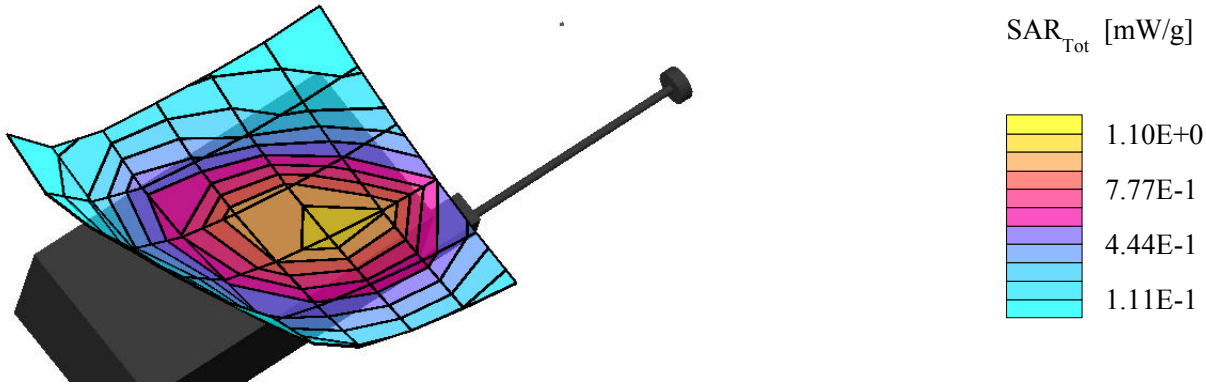
Extended Battery
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna In
Channel 383 [836.49MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.04 mW/g, SAR (10g): 0.702 mW/g

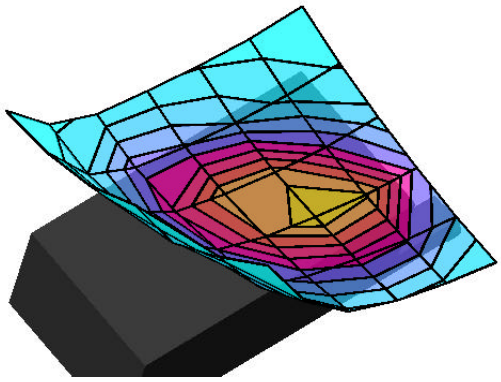
Extended Battery
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
Unmodulated Carrier - Antenna Out
Channel 383 [836.49MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000

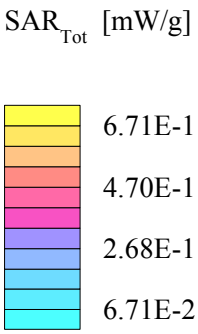


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.663 mW/g, SAR (10g): 0.447 mW/g * Max outside

Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna In
Channel 1013 [824.70MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

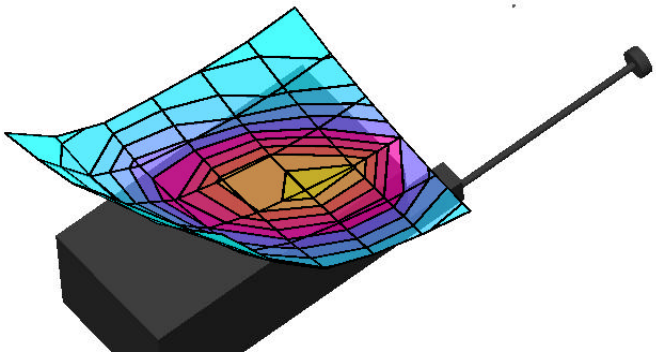


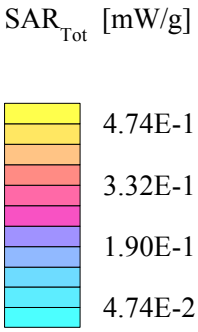


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.451 mW/g, SAR (10g): 0.303 mW/g * Max outside

Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna Out
Channel 1013 [824.70MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

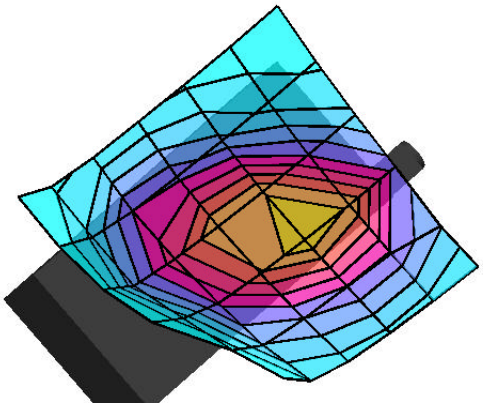


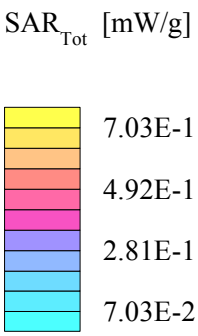


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.712 mW/g, SAR (10g): 0.480 mW/g

Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna In
Channel 363 [835.89MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

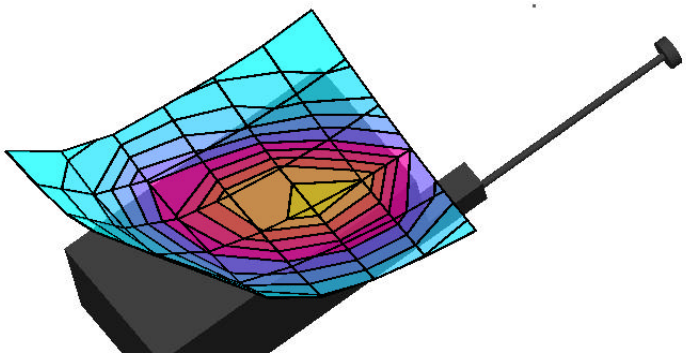




HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.754 mW/g, SAR (10g): 0.507 mW/g * Max outside

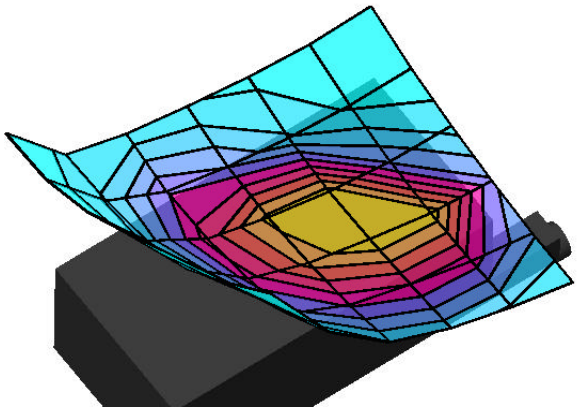
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna Out
Channel 363 [835.89MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

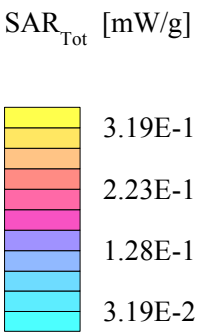


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.308 mW/g, SAR (10g): 0.208 mW/g

Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna In
Channel 777 [848.31MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

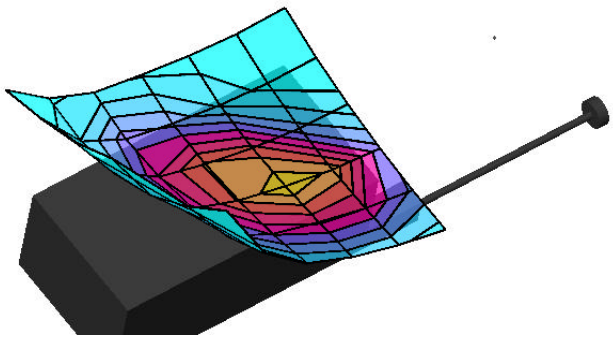


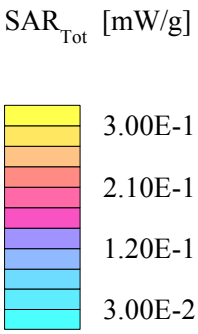


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.295 mW/g, SAR (10g): 0.196 mW/g * Max outside

Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna Out
Channel 777 [848.31MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

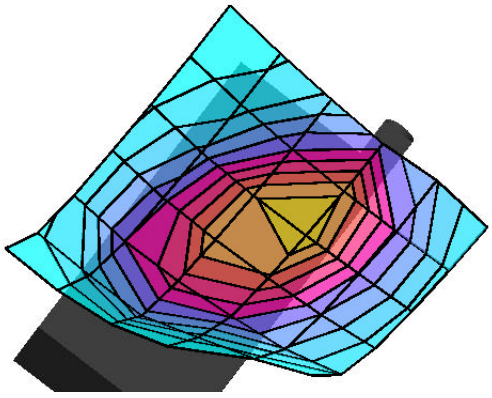


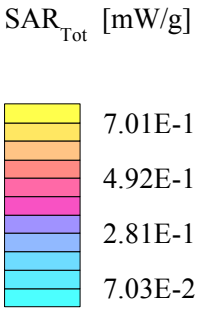


HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.698 mW/g, SAR (10g): 0.471 mW/g

Extended Battery
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna In
Channel 363 [835.89MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000

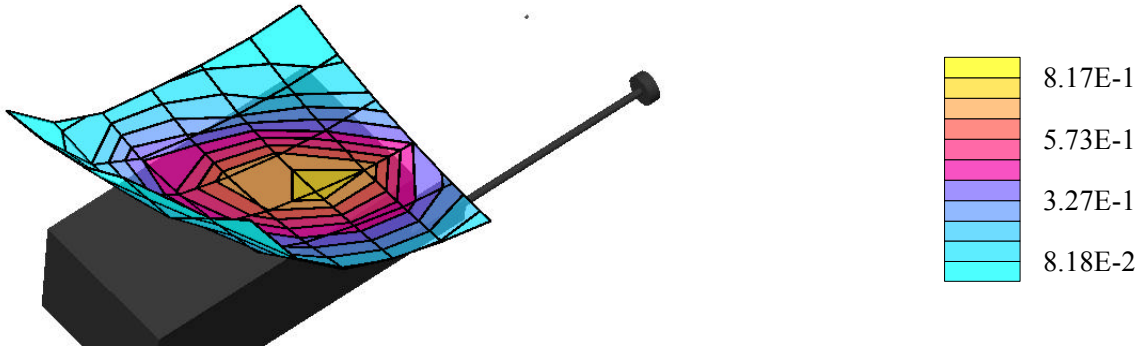




HANWHA CORPORATION FCC ID: OCCHWT-5000

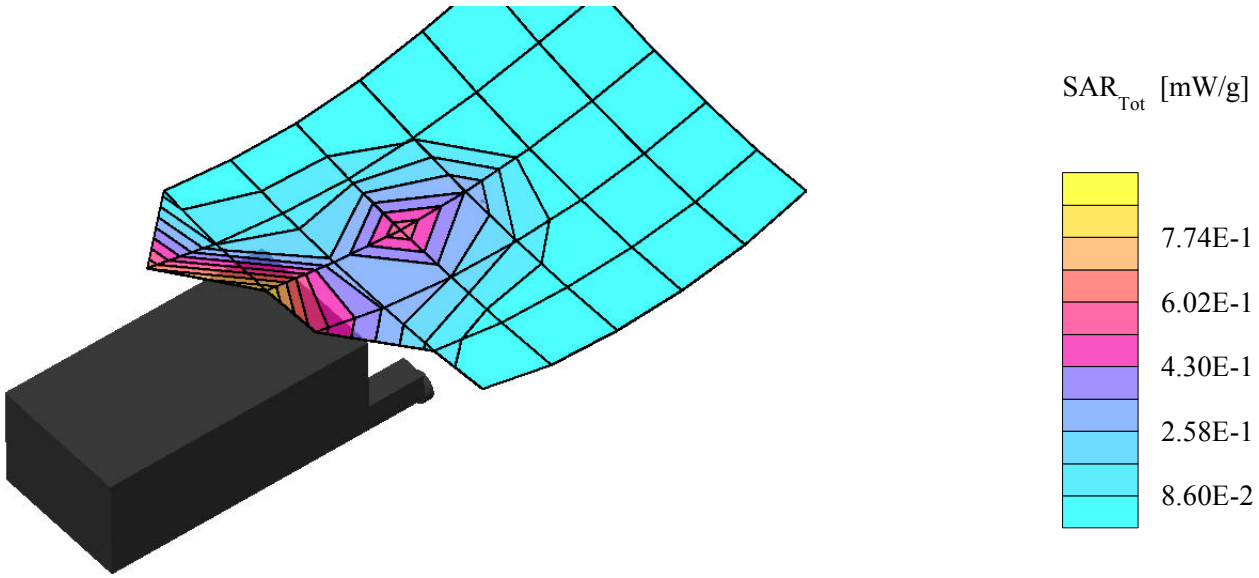
Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\varepsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.745 mW/g, SAR (10g): 0.500 mW/g * Max outside

Head SAR - Extended Battery
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
CDMA Mode - Antenna Out
Channel 363 [835.89MHz]
Conducted Power 25.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

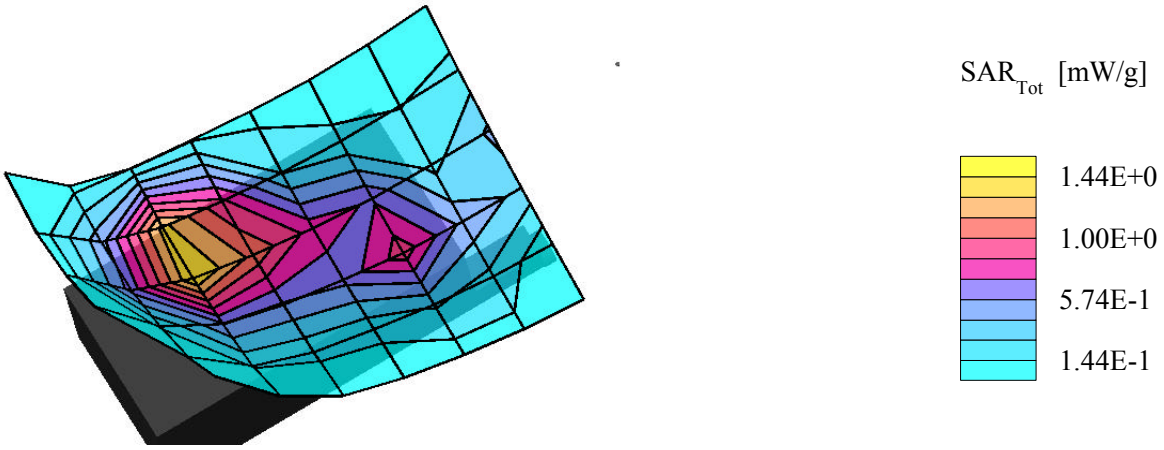
Generic Twin Phantom; Left Hand Section; Position: (80°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7 (Test Date: Oct. 18, 2000)
Large area scan to show hot spot occured in cheek/mouth area.
The following SAR plots have the probe tilted to within +-30
degrees normal to the curved surface of the cheek/mouth.



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.39 mW/g, SAR (10g): 0.767 mW/g

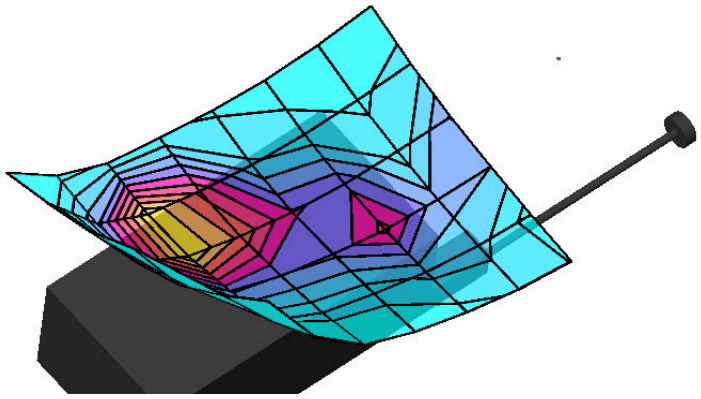
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna In
Channel 25 [1851.25MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.07 mW/g, SAR (10g): 0.593 mW/g

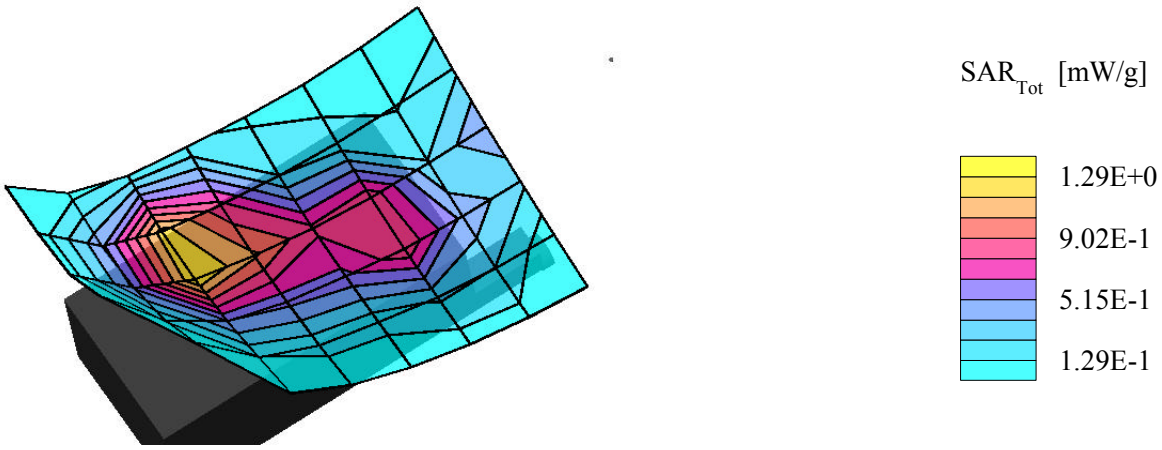
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna Out
Channel 25 [1851.25MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.22 mW/g, SAR (10g): 0.676 mW/g

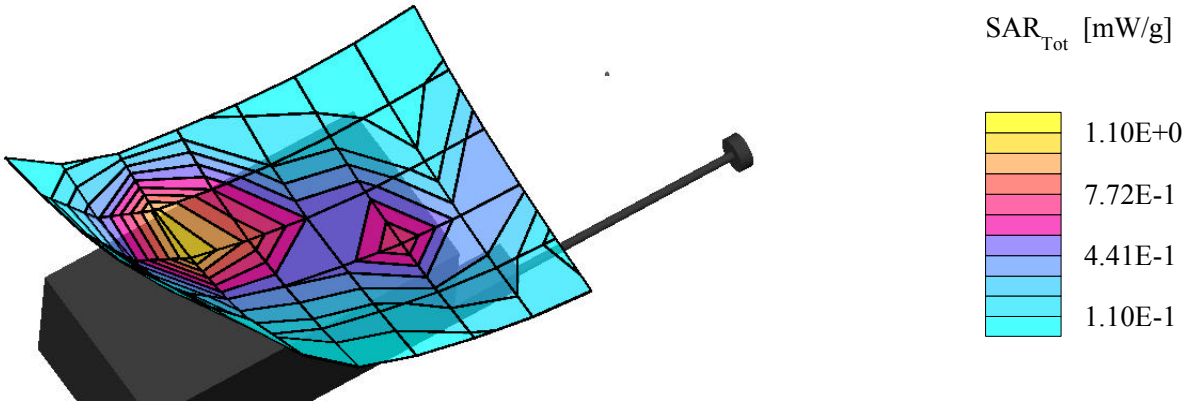
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna In
Channel 600 [1880.00MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.02 mW/g, SAR (10g): 0.563 mW/g

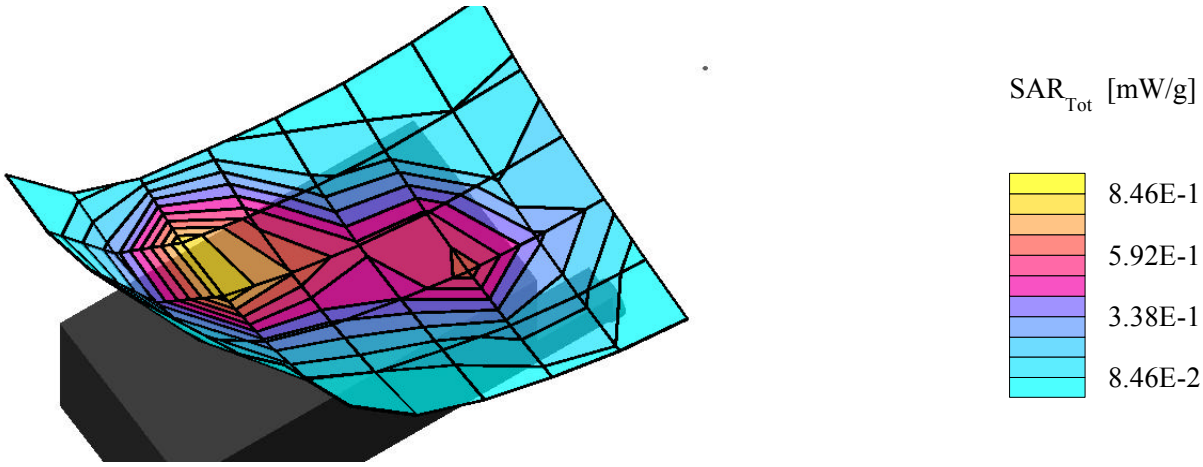
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna Out
Channel 600 [1880.00MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.826 mW/g, SAR (10g): 0.448 mW/g

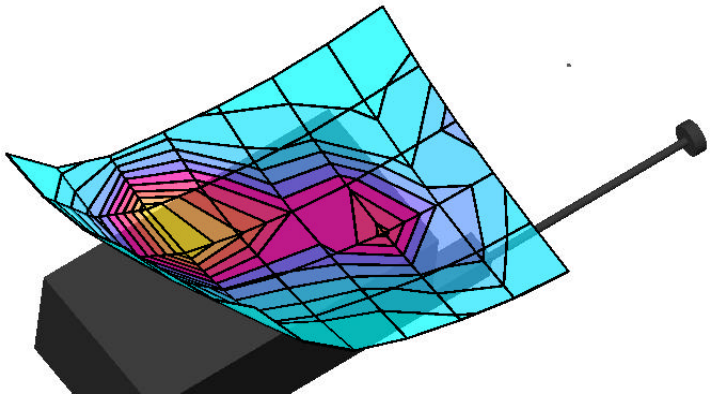
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna In
Channel 1175 [1908.75MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.715 mW/g, SAR (10g): 0.385 mW/g

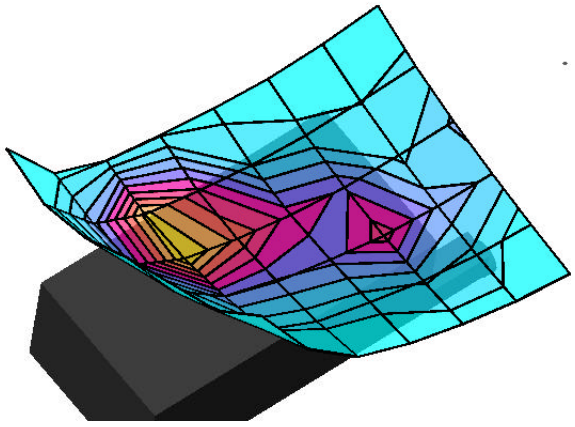
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode-Antenna Out
Channel 1175 [1908.75MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
1800MHz Brain: $\sigma = 1.68$ mho/m $\varepsilon_r = 41.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.37 mW/g, SAR (10g): 0.756 mW/g

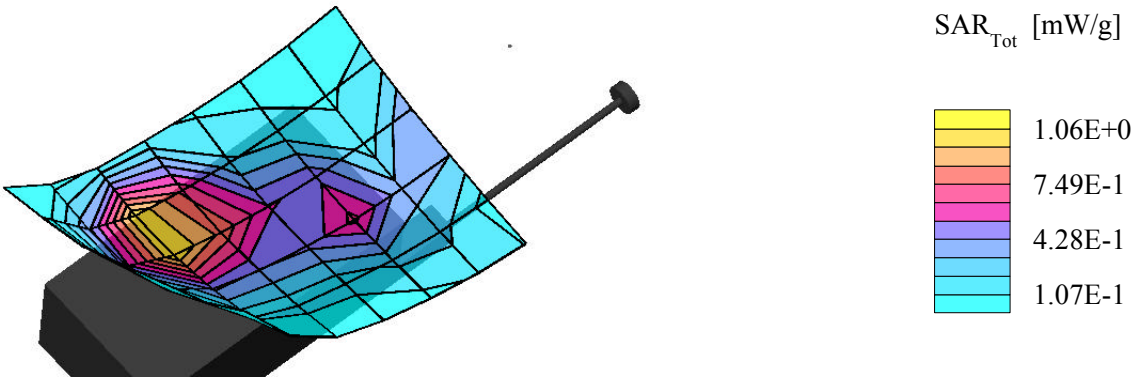
Extended Battery
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna In
Channel 25 [1851.25MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Left Cheek Section; Position: (72°,65°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
1800MHz Brain: $\sigma = 1.68$ mho/m $\varepsilon_r = 41.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.05 mW/g, SAR (10g): 0.582 mW/g

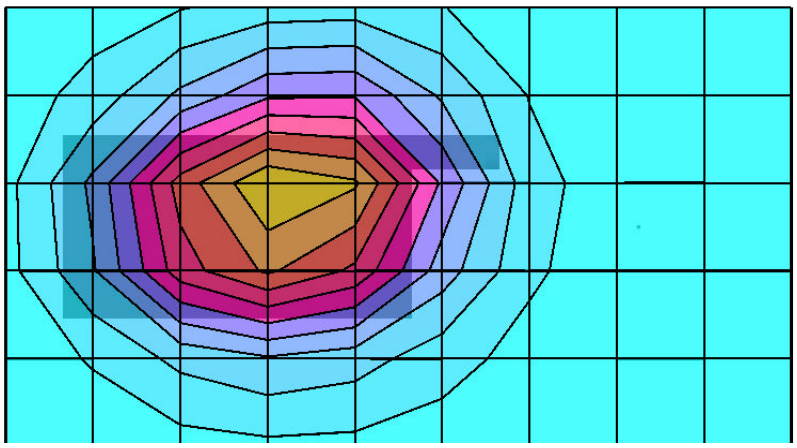
Extended Battery
Head SAR
HANWHA CORPORATION Dual Band Tri-mode
Model HWT-5000
PCS Mode - Antenna Out
Channel 25 [1851.25MHz]
Conducted Power 24.5dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Muscle 835 MHz: σ = 0.95 mho/m ε_r = 56.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.550 mW/g, SAR (10g): 0.372 mW/g

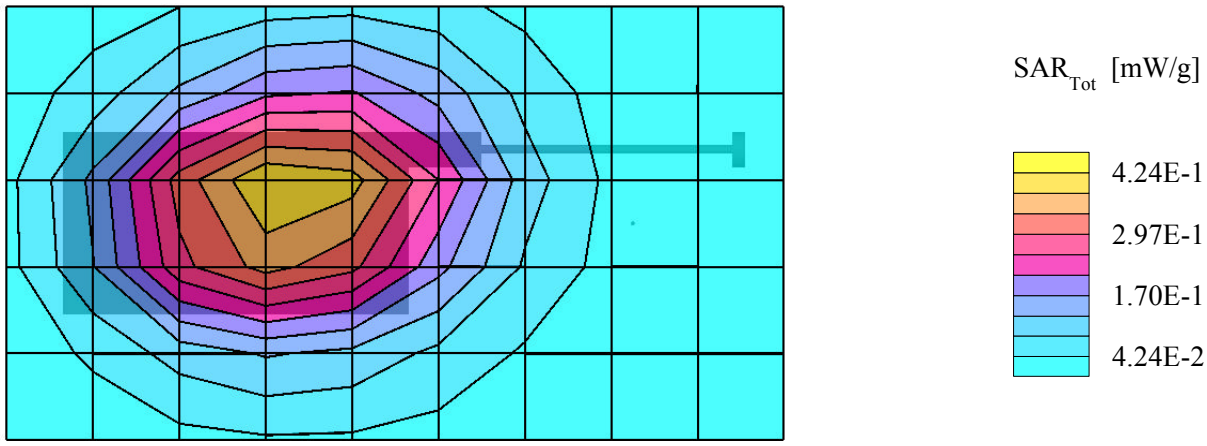
Body Worn Using 1.0cm Holster
HANWHA CORPORATION Dual Band Tri-Mode
Model HWT-5000
Unmodulated Carrier
Channel 991 [824.04MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Muscle 835 MHz: σ = 0.95 mho/m ε_r = 56.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.414 mW/g, SAR (10g): 0.280 mW/g

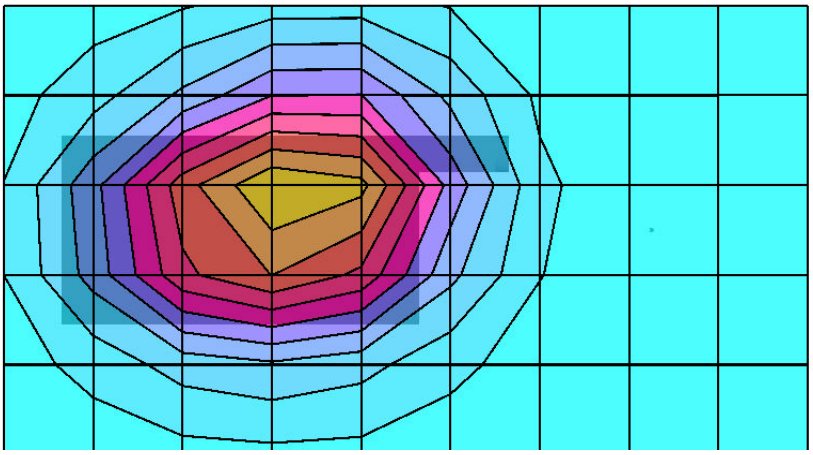
Body Worn Using 1.0cm Holster
HANWHA CORPORATION Dual Band Tri-Mode
Model HWT-5000
Unmodulated Carrier
Channel 991 [824.04MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Muscle 835 MHz: σ = 0.95 mho/m ε_r = 56.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.483 mW/g, SAR (10g): 0.326 mW/g

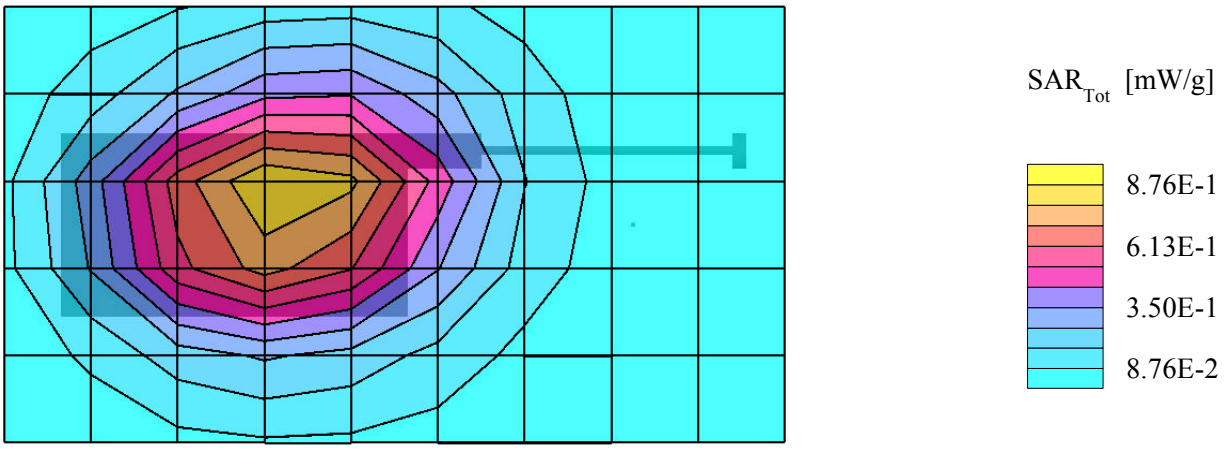
Body Worn Using 1.0cm Holster
HANWHA CORPORATION Dual Band Tri-Mode
Model HWT-5000
Unmodulated Carrier
Channel 383 [836.49MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Muscle 835 MHz: σ = 0.95 mho/m ε_r = 56.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.775 mW/g, SAR (10g): 0.527 mW/g

Body Worn Using 1.0cm Holster
HANWHA CORPORATION Dual Band Tri-Mode
Model HWT-5000
Unmodulated Carrier
Channel 383 [836.49MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000



HANWHA CORPORATION FCC ID: OCCHWT-5000

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Muscle 835 MHz: σ = 0.95 mho/m ε_r = 56.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.296 mW/g, SAR (10g): 0.198 mW/g

Body Worn Using 1.0cm Holster
HANWHA CORPORATION Dual Band Tri-Mode
Model HWT-5000
Unmodulated Carrier
Channel 799 [848.97MHz]
Conducted Power 27.0dBm
Date Tested: Oct 18, 2000