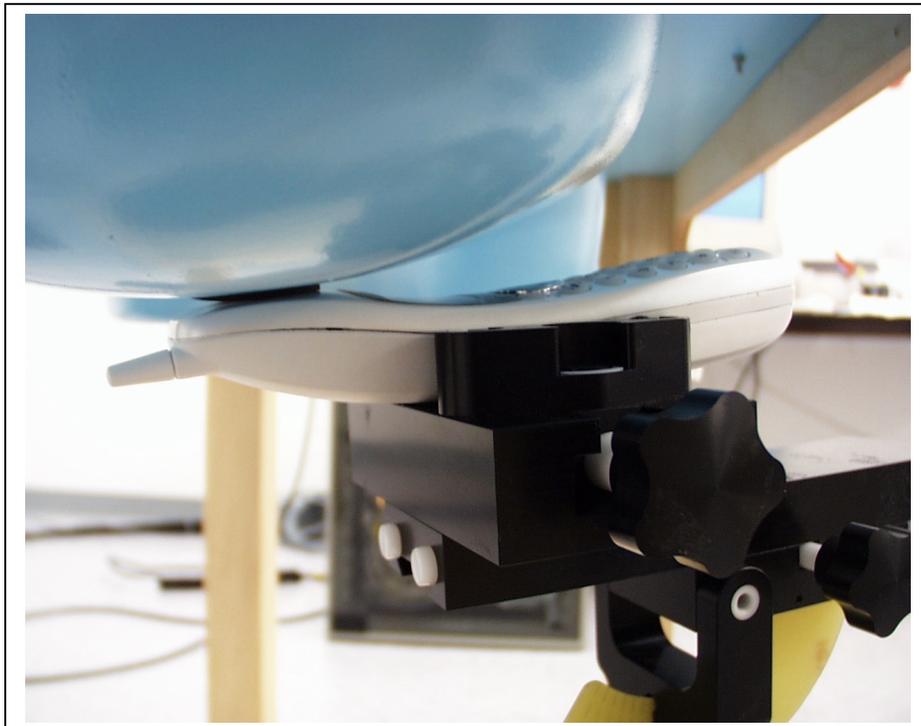




Right Cheek



Right Tilt

- BODY-WORN TEST SETUP -

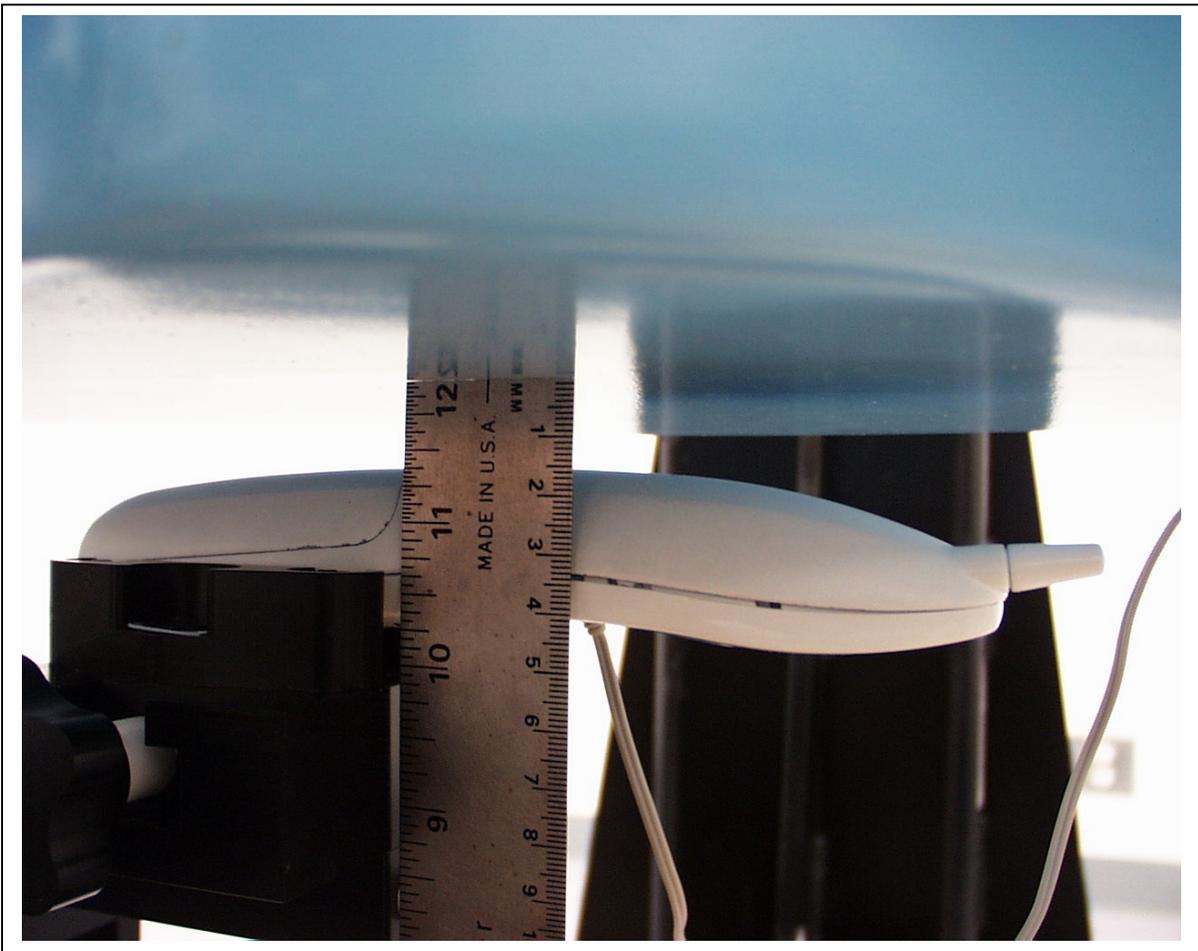
Body-Worn Configuration

The body-worn configuration is used for the devices that have a body worn accessory. Typically, a holster, belt clip or carrying case is provided or available as an accessory item for supporting the headset and body-worn operations. SAR may vary depending on the body separation distance provided by the type of holster and the batteries supplied for a phone. Generally, the design of the holster allows the phone to be positioned only with the keypad facing away from the phantom. Proper usage of the body worn accessory restricts the antenna to a specified distance away from the surface of the body. For this test,

- The EUT is placed into the holster/belt clip and the holster is positioned against the surface of the phantom in a normal operating position.
- Since this EUT doesn't supply any body-worn accessory to the end user, a distance of 15 mm was tested to confirm the necessary "minimum SAR separation distance".

The Ear-Microphone wire is then connected to the phone to simulate hands-free operation in a body-worn configuration.

Body Holster Configuration



Measurement Uncertainty

The uncertainty budget has been determined for the DASY3 measurement system according to the NIS81 [13] and the NIST1297 [14] documents and is given in the following Table.

Uncertainty Description	Error	Distrib.	Weight	Std. Dev.	Offset
Probe Uncertainty					
Axial isotropy	± 0.2 dB	U-shape	0.5	±2.4 %	
Spherical isotropy	±0.4 dB	U-shape	0.5	±4.8 %	
Isotropy from gradient	±0.5 dB	U-shape	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					
Extrapol boundary effect	±3%	Normal	1	±3%	± 5%
Probe positioning error	±0.1 mm	Normal	1	± 1%	
Integrat. and cube orient	±3%	Normal	1	±3%	
Cube shape inaccuracies	±2%	Rectangle	1	±1.2 %	
Device positioning	±6%	Normal	1	± 6%	
Combined Uncertainties			1	±11.7 %	± 5%
Extended uncertainty (K = 2)				± 23.5 %.	

4. EUT TUNE-UP PROCEDURE

The following procedures had been used to prepare the EUT for the SAR test.

Please refer to “Operating Procedure for the Diagnostics Mode (Test Mode) for Handset”. EUT was tested with 50% Duty Cycle.

50% Duty Cycle is regulated by Chip Set. Manufactured by Conexant, Model No: CX80705-13.

5. EVALUATION PROCEDURE

5.1. SIMULATED TISSUE LIQUID PARAMETER CONFIRMATION

The dielectric parameters were checked prior to assessment using the HP85070A dielectric probe kit. The dielectric parameters measured are reported in each correspondent section:

5.2. SYSTEM ACCURACY VERIFICATION

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

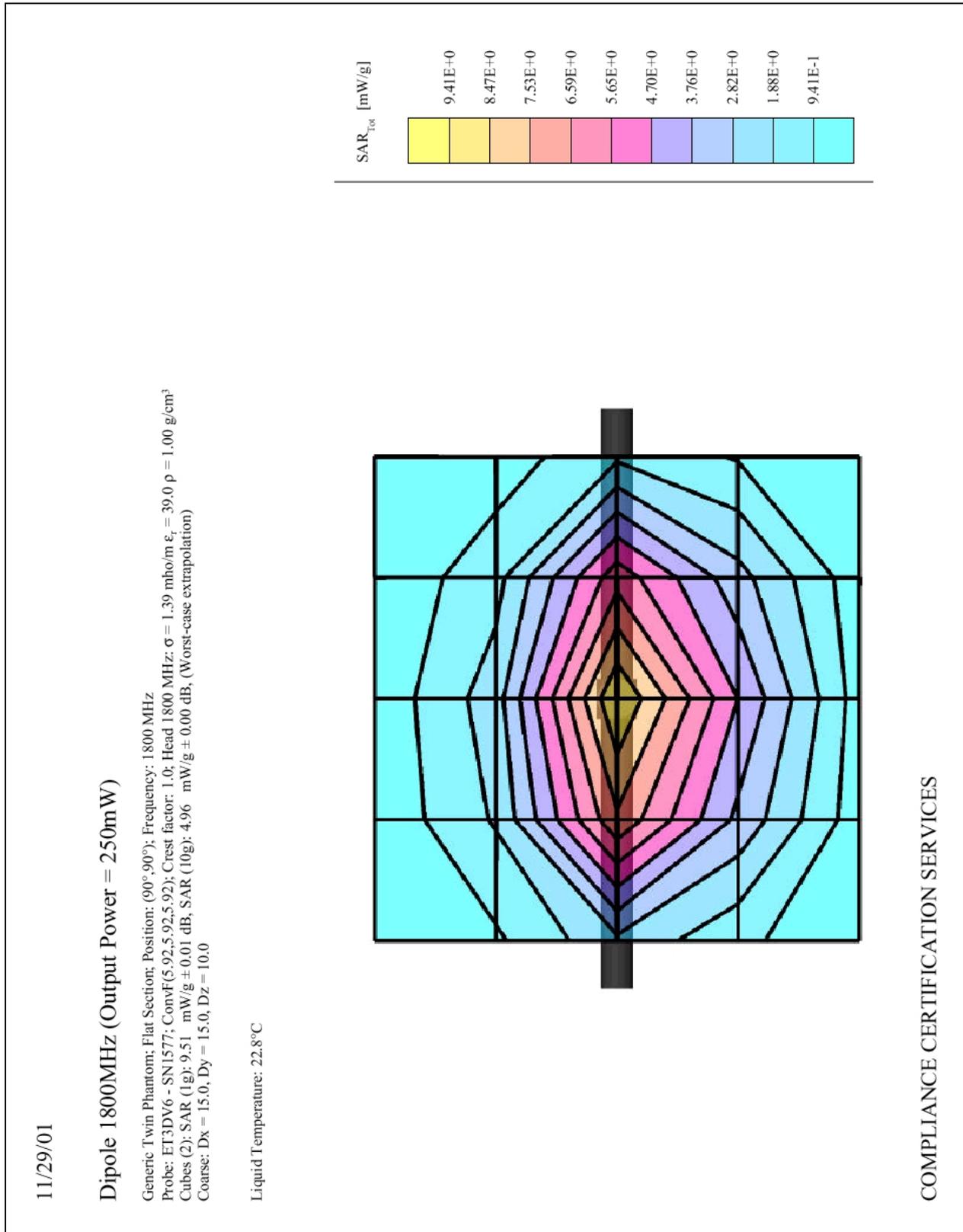
IEEE P1528 recommended reference value

Frequency (MHz)	1 g SAR	10 g SAR	local SAR at surface (above feedpoint)	local SAR at surface (y=2cm offset from feedpoint)
300	3.0	2.0	4.4	2.1
450	4.9	3.3	7.2	3.2
835	9.5	6.2	14.1	4.9
900	10.8	6.9	16.4	5.4
1450	29.0	16.0	50.2	6.5
1800	38.1	19.8	69.5	6.8
1900	39.7	20.5	72.1	6.6
2000	41.1	21.1	74.6	6.5
2450	52.4	24.0	104.2	7.7
3000	63.8	25.7	140.2	9.5

System validation result

Simulant	Freq [MHz]	Parameters	Liquid Temp [°C]	Target Value	Measured Value	Deviation [%]	Limit [%]
Head	1800	ϵ	22.8	40.0	39.0	-2.5	± 5
		σ	22.8	1.40	1.39	-0.7143	± 5
		1 g SAR	22.8	38.1	38.04	-1.5748	± 10

System Validation Plot



5.3. SAR EVALUATION PROCEDURE

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head or EUT and the horizontal grid spacing was 20 mm x 20 mm. Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point, a volume of 32 mm x 32 mm x 34 mm was assessed by measuring 5 x 5 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm [11]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

2. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x, y and z-directions) [11], [12]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

3. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

5.4. EXPOSURE LIMIT

(A) Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

(B) Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE 1: **Whole-Body SAR** is averaged over the entire body, **partial-body SAR** is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. **SAR for hands, wrists, feet and ankles** is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

<p style="text-align: center;">NOTE: POPULATION/UNCONTROLLED ENVIRONMENTS PARTIAL BODY LIMIT 1.6 mW/g APPLIED TO THIS PRODUCT</p>
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6. RESULTS

This page summarizes the results of the performed dosimetric evaluation. The plots with the corresponding SAR distributions, which reveal information about the location of the maximum SAR with respect to the device could be found in the following pages.

SAR TEST DATA SUMMARY

Ambient TEMPERATURE (°C): 22.5

Relative HUMIDITY (%): 62.8

Summary of worst case SAR reading

Left Head Position

Mode	Position	Ch	Freq [MHz]	Liquid Temp [°C]	Conducted Power [dBm]		Worst case SAR, averaged over 1g [mW/g]				
					Before	After	Set-up condition (applicable checked)			Measured	Limit
							Antenna	Cheek	Tilted		
DSSS	Head	L	2405	23.6	10.74	10.74	Fixed	X		0.0448	1.6
DSSS	Head	L	2405	23.8	10.74	10.74	Fixed		X	0.0860	1.6

Right Head Position

Mode	Position	Ch	Freq [MHz]	Liquid Temp [°C]	Conducted Power [dBm]		Worst case SAR, averaged over 1g [mW/g]				
					Before	After	Set-up condition (applicable checked)			Measured	Limit
							Antenna	Cheek	Tilted		
DSSS	Head	H	2475	23.2	11.23	11.23	Fixed	X		0.0568	1.6
DSSS	Head	H	2475	23.4	11.23	11.23	Fixed		X	0.0827	1.6

Body Position

Mode	Position	Ch	Freq [MHz]	Liquid Temp [°C]	Conducted Power [dBm]		Worst case SAR, averaged over 1g [mW/g]			
					Before	After	Set-up condition (applicable checked)		Measured	Limit
							Antenna	Separation dist (mm)		
DSSS	Muscle	H	2475	23.2	11.23	11.23	Fixed	15	0.0131	1.6

Measurement Results

Liquid Measurement date: 11/29/01

By: Thu Chan

Simulant	Freq [MHz]	Parameters	Liquid Temp [°C]	Target Value	Measured Value	Deviation [%]	Limit [%]
Head	2450	ϵ	23.6	39.2	39.46	0.663	± 5
		σ	23.6	1.80	1.876	4.222	± 5

Liquid Measurement date: 11/30/01

By: Thu Chan

Simulant	Freq [MHz]	Parameters	Liquid Temp [°C]	Target Value	Measured Value	Deviation [%]	Limit [%]
Head	2450	ϵ	23.2	39.2	39.45	0.639	± 5
		σ	23.2	1.80	1.878	4.333	± 5
Body	2450	ϵ	23.2	52.7	51.52	-2.239	± 5
		σ	23.2	1.95	2.02	3.590	± 5

Left Head Position

Mode	Position	Ch	Freq [MHz]	Liquid Temp [°C]	Conducted Power [dBm]		Worst case SAR, averaged over 1g [mW/g]				
					Before	After	Set-up condition (applicable checked)			Measured	Limit
							Antenna	Cheek	Tilted		
DSSS	Head	H	2475	23.6	11.23	11.23	Fixed	X		0.0441	1.6
DSSS	Head	M	2439	23.6	10.73	10.73	Fixed	X		0.0215	1.6
DSSS	Head	L	2405	23.6	10.74	10.74	Fixed	X		0.0448	1.6
DSSS	Head	H	2475	23.8	11.23	11.23	Fixed		X	0.0713	1.6
DSSS	Head	M	2439	23.8	10.73	10.73	Fixed		X	0.0628	1.6
DSSS	Head	L	2405	23.8	10.74	10.74	Fixed		X	0.0860	1.6

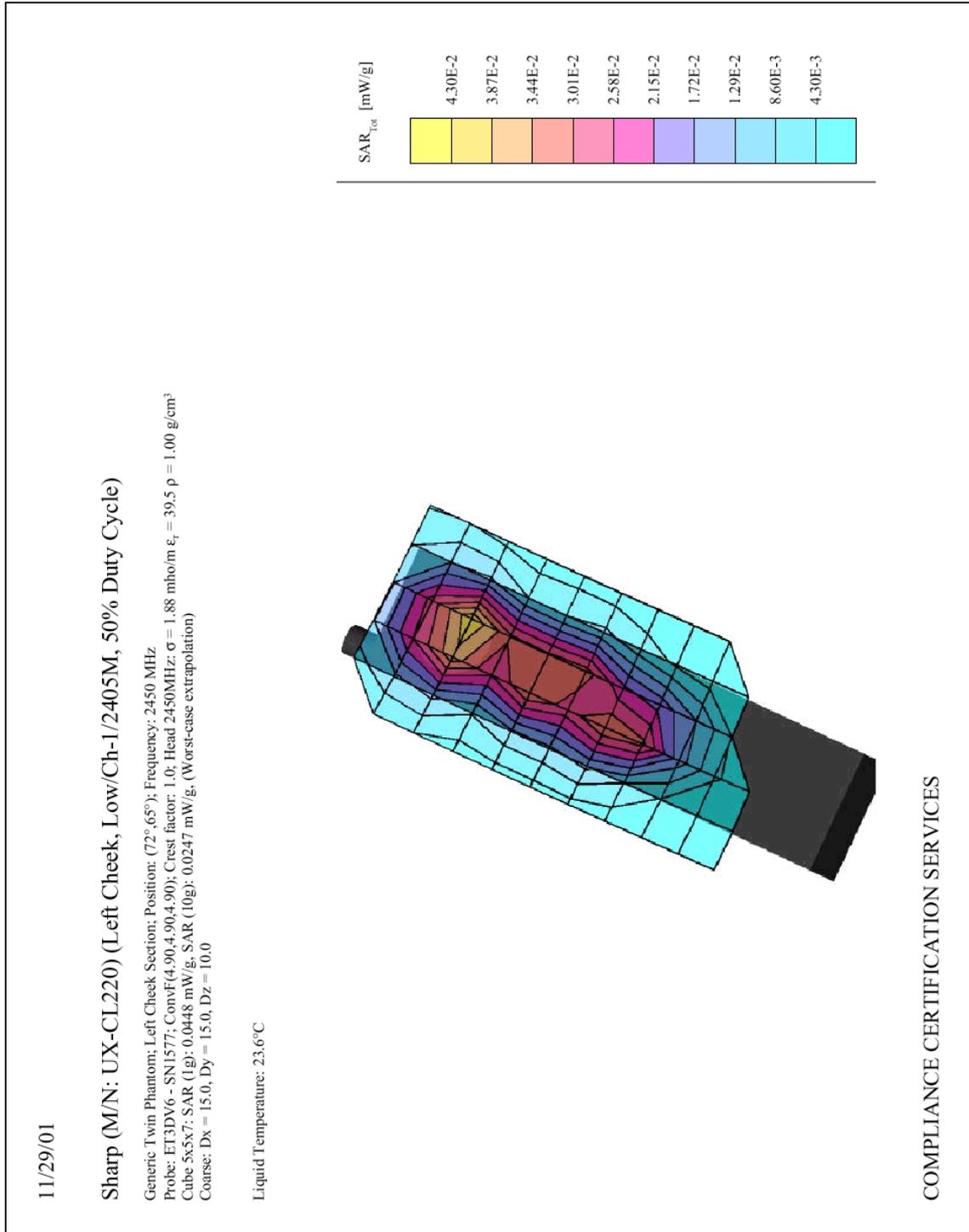
Right Head Position

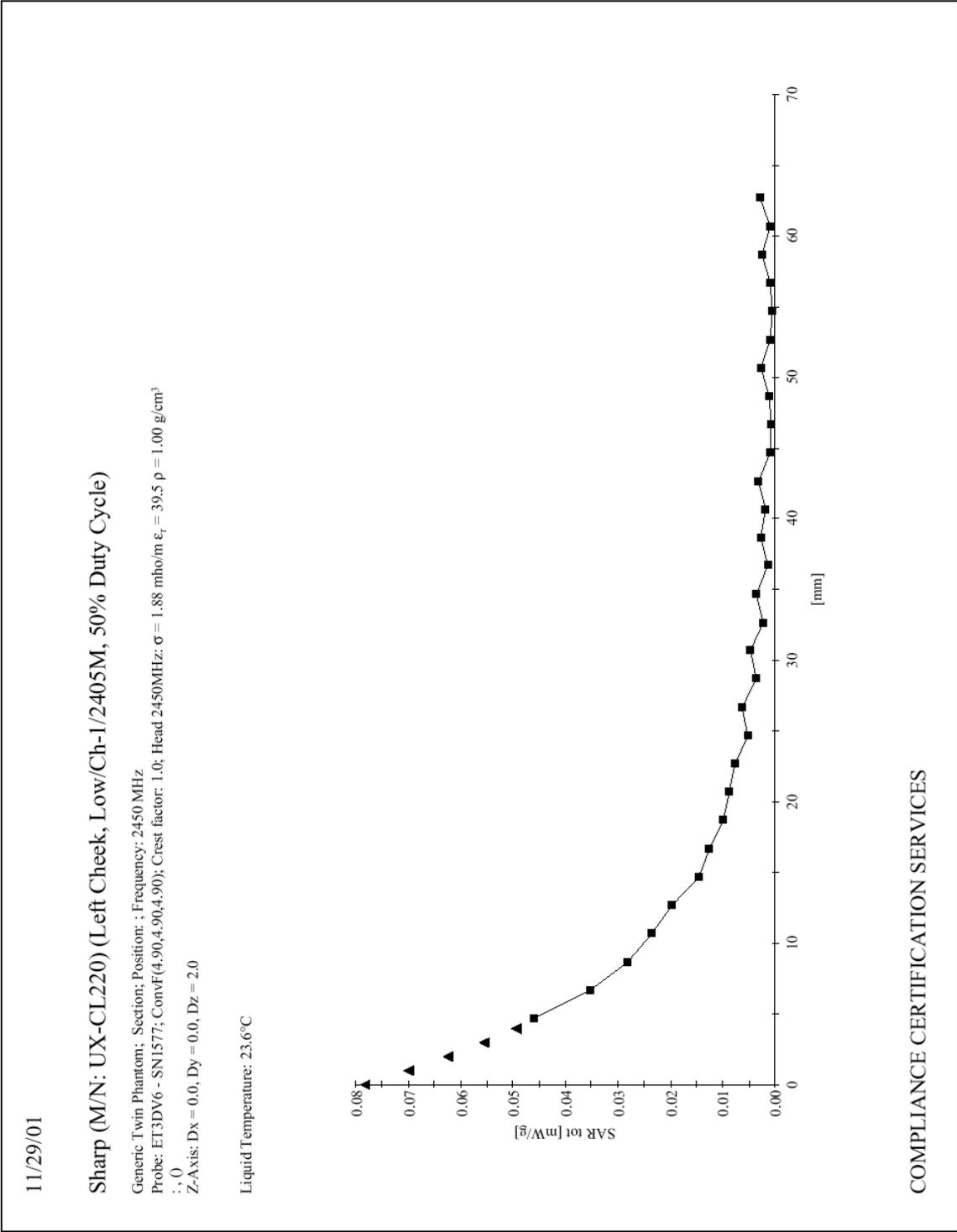
Mode	Position	Ch	Freq [MHz]	Liquid Temp [°C]	Conducted Power [dBm]		Worst case SAR, averaged over 1g [mW/g]				
					Before	After	Set-up condition (applicable checked)			Measured	Limit
							Antenna	Cheek	Tilted		
DSSS	Head	H	2475	23.2	11.23	11.23	Fixed	X		0.0568	1.6
DSSS	Head	M	2439	23.2	10.73	10.73	Fixed	X		0.0232	1.6
DSSS	Head	L	2405	23.2	10.74	10.74	Fixed	X		0.0237	1.6
DSSS	Head	H	2475	23.4	11.23	11.23	Fixed		X	0.0827	1.6
DSSS	Head	M	2439	23.4	10.73	10.73	Fixed		X	0.0691	1.6
DSSS	Head	L	2405	23.4	10.74	10.74	Fixed		X	0.0675	1.6

Body Position

Mode	Position	Ch	Freq [MHz]	Liquid Temp [°C]	Conducted Power [dBm]		Worst case SAR, averaged over 1g [mW/g]			
					Before	After	Set-up condition (applicable checked)		Measured	Limit
							Antenna	Separation dist (mm)		
DSSS	Muscle	H	2475	23.2	11.23	11.23	Fixed	15	0.0131	1.6
DSSS	Muscle	M	2439	23.2	10.73	10.73	Fixed	15	0.0049	1.6
DSSS	Muscle	L	2405	23.2	10.74	10.74	Fixed	15	0.0108	1.6

Test Plots



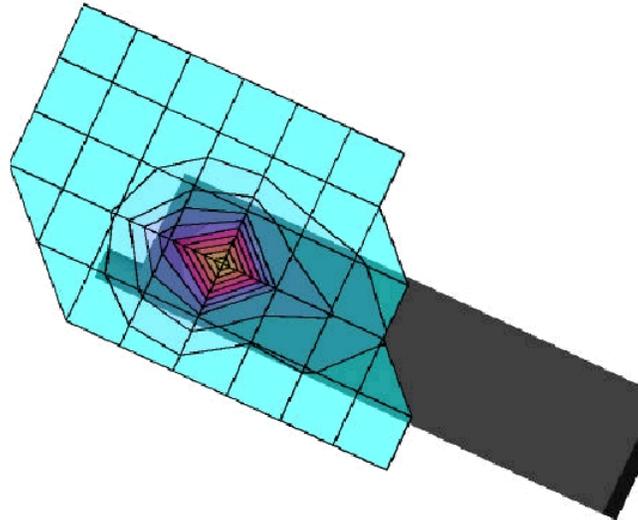


11/29/01

Sharp (M/N: UX-CL220) (Left Tilt, Low/Ch-1/2405M, 50% Duty Cycle)

Generic Twin Phantom; Left Hand Section; Position: (80°, 65°); Frequency: 2450 MHz
 Probe: ET3DV6 - SN1577; ConvF(4,90,4,90,4,90); Crest factor: 1.0; Head 2450MHz: $\sigma = 1.88$ mho/m $\epsilon_r = 39.5$ $\rho = 1.00$ g/cm³
 Cube 5x5x7: SAR (1g): 0.0860 mW/g; SAR (10g): 0.0444 mW/g, (Worst-case extrapolation)
 Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

Liquid Temperature: 23.8°C



COMPLIANCE CERTIFICATION SERVICES