PCTEST ENGINEERING LABORATORY, INC.

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CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

APPLICANT NAME & ADDRESS:
SAMSUNG ELECTRONICS CO., LTD.
416 Maetan-3 Dong, Paldal-Ku
Suwon City Kyungki-Do 441-742, KOREA
Attn: Wallace Oh, Engineering Manager
Samsung Electronics America (QA Lab)

DATE & LOCATION OF TESTING:
Dates of Tests: March 25-28, 2002
Test Report S/N: 22/24.220325126.A3L
Test Site: PCTEST Lab, Columbia MD

FCC ID:	**A3LSPHI330**
APPLICANT:	**SAMSUNG ELECTRONICS CO., LTD.**

EUT Type:	**Tri-Mode Dual-Band Analog/PCS Phone (AMPS/CDMA)**
Tx Frequency:	**824.04 – 848.97 MHz (AMPS) / 824.70 – 848.31 MHz (CDMA)** **1851.25 – 1908.75 MHz (PCS CDMA)**
Rx Frequency:	**869.04 – 893.97 MHz (AMPS) / 869.70 – 893.31 MHz (CDMA)** **1931.25 – 1988.75 MHz (PCS CDMA)**
Max. RF Output Power:	**0.535 W ERP AMPS (27.283 dBm) / 26.5 dBm Conducted** **0.477 W ERP CDMA (26.783 dBm) / 26.0 dBm Conducted** **0.452 W EIRP PCS CDMA (26.551 dBm)/ 24.5 dBm Conducted**
Max. SAR Measurement:	**1.400W/kg AMPS Head SAR; 0.989W/kg AMPS Body SAR;** **1.090W/kg CDMA Head SAR; 0.788W/kg CDMA Body SAR;** **1.370W/kg PCS CDMA Head SAR; 0.714W/kg PCS CDMA Body SAR**
Trade Name/Model(s):	***SPH-i330***
FCC Classification:	**Licensed Portable Transmitter Held to Ear (PCE)**
FCC Rule Part(s):	**§2.1093; FCC/OET Bulletin 65 Supplement C [July 2001]**
Application Type:	**Certification**
Test Device Serial No.:	***identical* prototype**

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in FCC/OET Bulletin 65 Supplement C (2001) and IEEE Std. 1528-200X (Draft 6.4, July 2001).

I attest to the accuracy of data. All measurements reported herein 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.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Alfred Cirwithian
Vice President Engineering

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12. SYSTEM VERIFICATION

Tissue Verification

Table 12.1 Simulated Tissue Verification [5]

MEASURED TISSUE PARAMETERS									
Date(s)	03/18/02	835MHz Brain		835MHz Muscle		1900MHz Brain		1900MHz Muscle	
Liquid Temperature (°C)	22.6	Target	Measured	Target	Measured	Target	Measured	Target	Measured
Dielectric Constant: ε		41.50	43.40	55.20	55.50	40.00	40.30	53.30	54.00
Conductivity: σ		0.900	0.870	0.970	0.990	1.400	1.440	1.520	1.560

Test System Validation

Prior to assessment, the system is verified to the ±10% of the specifications at 835MHz and 1900MHz by using the system validation kit(s). (Graphic Plots Attached)

Table 12.2 System Validation [5]

SYSTEM DIPOLE VALIDATION TARGET & MEASURED				
System Validation Kit: D-835V2, S/N: 406	835MHz Brain	Targeted SAR_{1g} (mW/g) 2.375	Measured SAR_{1g} (mW/g) **2.45**	Deviation (%) **+ 3.2**
System Validation Kit: D-1900V2, S/N: 502	1900MHz Brain	Targeted SAR_{1g} (mW/g) 9.925	Measured SAR_{1g} (mW/g) **10.1**	Deviation (%) **+ 1.8**

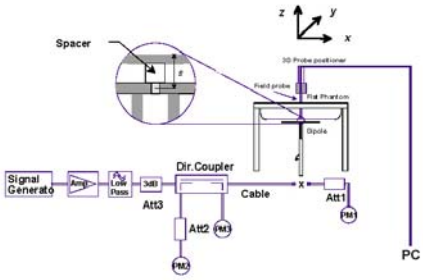

Figure 12.1 Dipole Validation Test Setup

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13. SAR TEST DATA SUMMARY

See Measurement Result Data Pages

Procedures Used To Establish Test Signal

The handset was placed into simulated call mode (AMPS, Cellular CDMA & PCS CDMA modes) using manufacturers test codes. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR [4]. When test modes are not available or inappropriate for testing a handset, the actual transmission is activated through a base station simulator or similar equipment. See data pages for actual procedure used in measurement.

Device Test Conditions

The handset is battery operated. Each SAR measurement was taken with a fully charged battery. In order to verify that the device was tested at full power, conducted output power measurements were performed before and after each SAR measurement to confirm the output power. If a conducted power deviation of more than 5% occurred, the test was repeated.

EUT Handset Reference Points

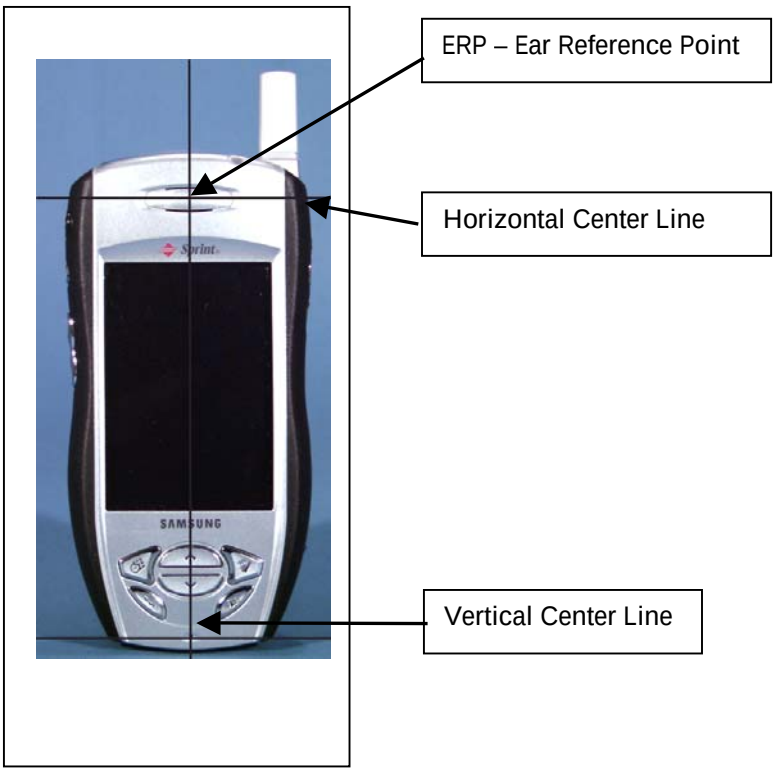

Figure 13.1 Handset Reference Points

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SAR DATA SUMMARY

Mixture Type: 835MHz Brain

14.1 MEASUREMENT RESULTS (AMPS Right Head SAR – Touch)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
824.04	0991	AMPS	26.5	26.5	Standard	Cheek / Touch	Fixed	**0.959**
836.49	0383	AMPS	26.5	26.5	Standard	Cheek / Touch	Fixed	**1.120**
848.97	0799	AMPS	26.5	26.5	Standard	Cheek / Touch	Fixed	**1.160**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g) averaged over 1 gram**		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☐ Flat Phantom	☒ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

Alfred Cirwithian
Vice President Engineering

Figure 14.1 Right Head SAR Test Setup
-- Cheek / Touch Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.2 MEASUREMENT RESULTS (AMPS Right Head SAR – Tilt)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
824.04	0991	AMPS	26.5	26.5	Standard	Ear / 15° Tilt	Fixed	**0.776**
836.49	0383	AMPS	26.5	26.5	Standard	Ear / 15° Tilt	Fixed	**0.928**
848.97	0799	AMPS	26.5	26.5	Standard	Ear / 15° Tilt	Fixed	**0.871**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☐ Flat Phantom	☒ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

Alfred Cirwithian
Vice President Engineering

Figure 14.2 Right Head SAR Test Setup
-- Ear / 15° Tilt Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.3 MEASUREMENT RESULTS (AMPS Left Head SAR - Touch)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
824.04	0991	AMPS	26.5	26.5	Standard	Cheek / Touch	Fixed	**1.360**
836.49	0383	AMPS	26.5	26.5	Standard	Cheek / Touch	Fixed	**1.290**
848.97	0799	AMPS	26.5	26.5	Standard	Cheek / Touch	Fixed	**1.400**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☒ Left Head	☐ Flat Phantom	☐ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.3 Left Head SAR Test Setup -- Cheek / Touch Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.4 MEASUREMENT RESULTS (AMPS Left Head SAR – Tilt)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
824.04	0991	AMPS	26.5	26.5	Standard	Ear / 15° Tilt	Fixed	**1.150**
836.49	0383	AMPS	26.5	26.5	Standard	Ear / 15° Tilt	Fixed	**1.170**
848.97	0799	AMPS	26.5	26.5	Standard	Ear / 15° Tilt	Fixed	**1.180**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☒ Left Head	☐ Flat Phantom	☐ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.4 Left Head SAR Test Setup
-- Ear / 15° Tilt Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.5 MEASUREMENT RESULTS (CELLULAR CDMA Right Head SAR – Touch)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
848.31	0777	CDMA	26.0	26.0	Standard	Cheek / Touch	Fixed	**1.010**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☐ Flat Phantom	☒ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1
9. Justification for reduced test configurations: Per FCC P1528 Power Rule (Jan. 31, 2002), SAR measurements were taken on only one channel because the peak SAR value is less than 85% of the maximum SAR value in AMPS mode.

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Vice President Engineering

Figure 14.5 Right Head SAR Test Setup -- Cheek / Touch Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.6 MEASUREMENT RESULTS (CELLULAR CDMA Right Head SAR – Tilt)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
848.31	0777	CDMA	26.0	26.0	Standard	Ear / 15° Tilt	Fixed	**0.866**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☐ Flat Phantom	☒ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1
9. Justification for reduced test configurations: Per FCC P1528 Power Rule (Jan. 31, 2002), SAR measurements were taken on only one channel because the peak SAR value is less than 85% of the maximum SAR value in AMPS mode.

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Vice President Engineering

Figure 14.6 Right Head SAR Test Setup
-- Ear / 15° Tilt Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.7 MEASUREMENT RESULTS (CELLULAR CDMA Left Head SAR – Touch)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
848.31	0777	CDMA	26.0	26.0	Standard	Cheek / Touch	Fixed	**1.090**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☒ Left Head	☐ Flat Phantom	☐ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1
9. Justification for reduced test configurations: Per FCC P1528 Power Rule (Jan. 31, 2002), SAR measurements were taken on only one channel because the peak SAR value is less than 85% of the maximum SAR value in AMPS mode.

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Figure 14.7 Left Head SAR Test Setup -- Cheek / Touch Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.8 MEASUREMENT RESULTS (CELLULAR CDMA Left Head SAR – Tilt)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
848.31	0777	CDMA	26.0	26.0	Standard	Ear / 15° Tilt	Fixed	**1.070**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☒ Left Head	☐ Flat Phantom	☐ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1
9. Justification for reduced test configurations: Per FCC P1528 Power Rule (Jan. 31, 2002), SAR measurements were taken on only one channel because the peak SAR value is less than 85% of the maximum SAR value in AMPS mode.

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Vice President Engineering

Figure 14.8 Left Head SAR Test Setup -- Ear / 15° Tilt Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 1900MHz Brain

14.9 MEASUREMENT RESULTS (PCS CDMA Right Head SAR – Touch)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
1851.25	0025	CDMA	24.5	24.5	Standard	Cheek / Touch	Fixed	**0.915**
1880.00	0600	CDMA	24.5	24.5	Standard	Cheek / Touch	Fixed	**1.200**
1908.75	1175	CDMA	24.5	24.5	Standard	Cheek / Touch	Fixed	**1.060**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☐ Flat Phantom	☒ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.9 Right Head SAR Test Setup
-- Cheek / Touch Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 1900MHz Brain

14.10 MEASUREMENT RESULTS (PCS CDMA Right Head SAR – Tilt)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
1851.25	0025	CDMA	24.5	24.5	Standard	Ear / 15° Tilt	Fixed	**0.966**
1880.00	0600	CDMA	24.5	24.5	Standard	Ear / 15° Tilt	Fixed	**1.200**
1908.75	1175	CDMA	24.5	24.5	Standard	Ear / 15° Tilt	Fixed	**1.130**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☐ Flat Phantom	☒ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.10 Right Head SAR Test Setup
-- Ear / Tilt Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 1900MHz Brain

14.11 MEASUREMENT RESULTS (PCS CDMA Left Head SAR – Touch)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
1851.25	0025	CDMA	24.5	24.5	Standard	Cheek / Touch	Fixed	**0.902**
1880.00	0600	CDMA	24.5	24.5	Standard	Cheek / Touch	Fixed	**1.170**
1908.75	1175	CDMA	24.5	24.5	Standard	Cheek / Touch	Fixed	**1.160**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☒ Left Head	☐ Flat Phantom	☐ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.11 Left Head SAR Test Setup -- Cheek / Touch Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 1900MHz Brain

14.12 MEASUREMENT RESULTS (PCS CDMA Left Head SAR – Tilt)

FREQUENCY		Modulation	Begin / End POWER‡			Device Test Position	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
1851.25	0025	CDMA	24.5	24.5	Standard	Ear / 15° Tilt	Fixed	**1.030**
1880.00	0600	CDMA	24.5	24.5	Standard	Ear / 15° Tilt	Fixed	**1.310**
1908.75	1175	CDMA	24.5	24.5	Standard	Ear / 15° Tilt	Fixed	**1.370**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☒ Left Head	☐ Flat Phantom	☐ Right Head	
5. SAR Configuration	☒ Head	☐ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		

7. Tissue parameters and temperatures are listed on the SAR plots.
8. Liquid tissue depth is 15.1 cm. ± 0.1

Alfred Cirwithian
Vice President Engineering

Figure 14.12 Left Head SAR Test Setup
-- Ear / Tilt Position --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Muscle

14.13 MEASUREMENT RESULTS (AMPS Body SAR w/o Holster)

FREQUENCY		Modulation	Begin / End POWER‡			Separation Distance (cm) ‡‡	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
824.04	0991	AMPS	26.5	26.5	Standard	1.5 [w/o Holster]	Fixed	**0.951**
836.49	0383	AMPS	26.5	26.5	Standard	1.5 [w/o Holster]	Fixed	**0.969**
848.97	0799	AMPS	26.5	26.5	Standard	1.5 [w/o Holster]	Fixed	**0.989**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Muscle 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in atypical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☒ Flat Phantom	☐ Right Head	
5. SAR Configuration	☐ Head	☒ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		
7. ‡‡Test Configuration	☐ With Holster	☒ Without Holster		

8. Tissue parameters and temperatures are listed on the SAR plots.
9. Both sides of the phone were tested and the worst-case side is reported.
10. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.13 Body SAR Test Setup -- w/o Holster --

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SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Muscle

14.14 MEASUREMENT RESULTS (CELLULAR CDMA Body SAR w/o Holster)								
FREQUENCY		Modulation	Begin / End POWER‡			Separation Distance (cm) ‡‡	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
848.31	0777	CDMA	26.0	26.0	Standard	1.5 [w/o Holster]	Fixed	**0.788**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in atypical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☒ Flat Phantom	☐ Right Head	
5. SAR Configuration	☐ Head	☒ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		
7. ‡‡Test Configuration	☐ With Holster	☒ Without Holster		

8. Tissue parameters and temperatures are listed on the SAR plots.
9. Both sides of the phone were tested and the worst-case side is reported.
10. Liquid tissue depth is 15.1 cm. ± 0.1
11. Justification for reduced test configurations: Per FCC P1528 Power Rule (Jan. 31, 2002), SAR measurements were taken on only one channel because the peak SAR value is less than 85% of the maximum SAR value in AMPS mode.

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Vice President Engineering

Figure 14.14 Body SAR Test Setup -- w/o Holster --

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SAR DATA SUMMARY (Continued)

Mixture Type: 1900MHz Muscle

14.15 MEASUREMENT RESULTS (PCS CDMA Body SAR w/o Holster)

FREQUENCY		Modulation	Begin / End POWER‡			Separation Distance (cm) ‡‡	Antenna Position	SAR (W/kg)
MHz	Ch.		(dBm)		Battery			
1851.25	0025	CDMA	24.5	24.5	Standard	1.5 [w/o Holster]	Fixed	**0.709**
1880.00	0600	CDMA	24.5	24.5	Standard	1.5 [w/o Holster]	Fixed	**0.714**
1908.75	1175	CDMA	24.5	24.5	Standard	1.5 [w/o Holster]	Fixed	**0.707**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Muscle 1.6 W/kg (mW/g)** averaged over 1 gram		

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in atypical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒ Conducted	☐ ERP	☐ EIRP	
4. SAR Measurement System	☒ DASY3	☐ IDX		
Phantom Configuration	☐ Left Head	☒ Flat Phantom	☐ Right Head	
5. SAR Configuration	☐ Head	☒ Body	☐ Hand	
6. Test Signal Call Mode	☒ Manu. Test Codes	☐ Base Station Simulator		
7. ‡‡Test Configuration	☐ With Holster	☒ Without Holster		

8. Tissue parameters and temperatures are listed on the SAR plots.
9. Both sides of the phone were tested and the worst-case side is reported.
10. Liquid tissue depth is 15.1 cm. ± 0.1

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Vice President Engineering

Figure 14.15 Body SAR Test Setup -- w/o Holster --

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15. SAR TEST EQUIPMENT

Equipment Calibration

Table 15.1 Test Equipment Calibration

EQUIPMENT SPECIFICATIONS			
Type		**Calibration Date**	**Serial Number**
Stäubli Robot RX60L		February 2002	599131-01
Stäubli Robot Controller		February 2002	PCT592
Stäubli Teach Pendant (Joystick)		February 2002	3323-00161
Micron Computer, 450 MHz Pentium III, Windows NT		February 2002	PCT577
SPEAG EDC3		February 2002	321
SPEAG DAE3		February 2002	330
SPEAG E-Field Probe ET3DV6		February 2002	1560
SPEAG Dummy Probe		February 2002	PCT583
SPEAG SAM Twin Phantom V4.0		February 2002	PCT666
SPEAG Light Alignment Sensor		February 2002	205
SPEAG Validation Dipole D1900V2		February 2002	PCT613
Brain Equivalent Matter (835MHz)		March 2002	PCTBEM101
Brain Equivalent Matter (1900MHz)		March 2002	PCTBEM301
Muscle Equivalent Matter (835MHz)		March 2002	PCTMEM201
Muscle Equivalent Matter (1900MHz)		March 2002	PCTMEM401
Microwave Amp. Model: 5S1G4, (800MHz - 4.2GHz)		January 2002	22332
Gigatronics 8651A Power Meter		January 2002	1835299
HP-8648D (9kHz ~ 4GHz) Signal Generator		January 2002	PCT530
Amplifier Research 5S1G4 Power Amp		January 2002	PCT540
HP-8753E (30kHz ~ 3GHz) Network Analyzer		January 2002	PCT552
HP85070B Dielectric Probe Kit		January 2002	PCT501
Ambient Noise/Reflection, etc.	<12mW/kg/<3%of SAR	January 2002	Anechoic Room PCT01

NOTE:

The E-field probe was calibrated by SPEAG, by temperature measurement procedure. Dipole Validation measurement is performed by PCTEST Lab. before each test. The brain simulating material is calibrated by PCTEST using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

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SAMSUNG FCC ID: A3LSPHI330 -- FM Head SAR

SAM Phantom; Right Hand Section; Probe:ET3DV6 - SN1560; ConvF(6.78,6.78,6.78)

Med. Parameters 835 MHz Brain: σ = 0.87 mho/m ε_r = 43.4 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

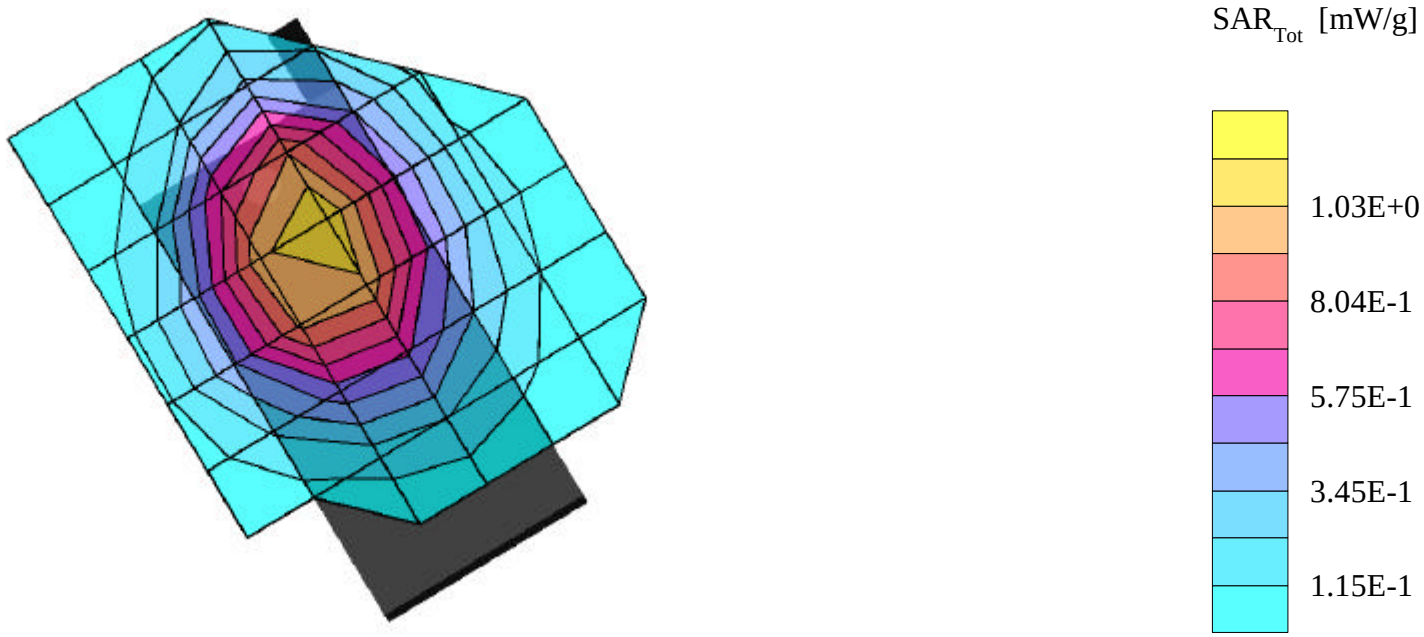
SAR (1g): 1.16 mW/g,SAR (10g): 0.841 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

FM Mode, Ch.0799 [848.97MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C

Conducted Power = 26.5dBm; Right Head SAR, Cheek/Touch position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- FM Head SAR

SAM Phantom; Right Hand Section; Probe:ET3DV6 - SN1560; ConvF(6.78,6.78,6.78)

Med. Parameters 835 MHz Brain: σ = 0.87 mho/m ε_r = 43.4 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

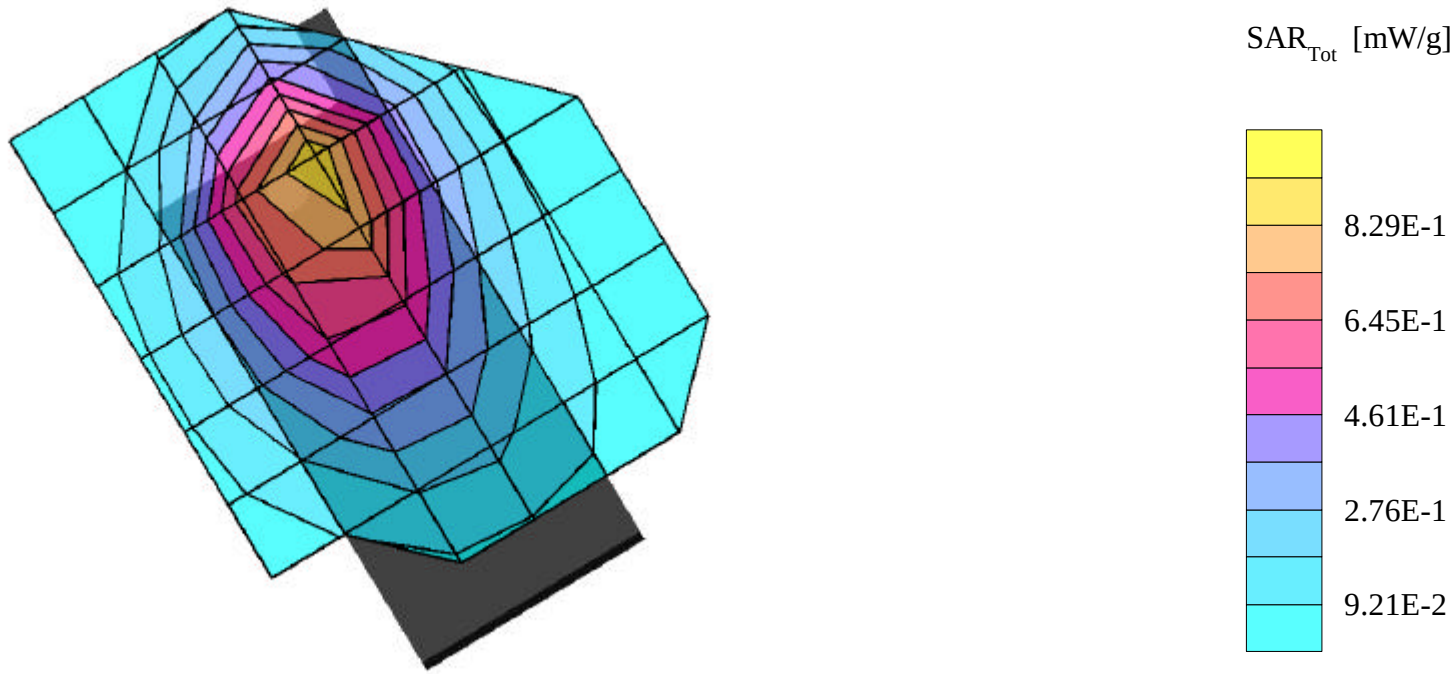
SAR (1g): 0.928 mW/g,SAR (10g): 0.631 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

FM Mode, Ch.0383 [836.49MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C

Conducted Power = 26.5dBm; Right Head SAR, Ear/15 degree Tilt position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- FM Head SAR

SAM Phantom; Left Hand Section; Probe:ET3DV6 - SN1560; ConvF(6.78,6.78,6.78)

Med. Parameters 835 MHz Brain: σ = 0.87 mho/m ε_r = 43.4 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

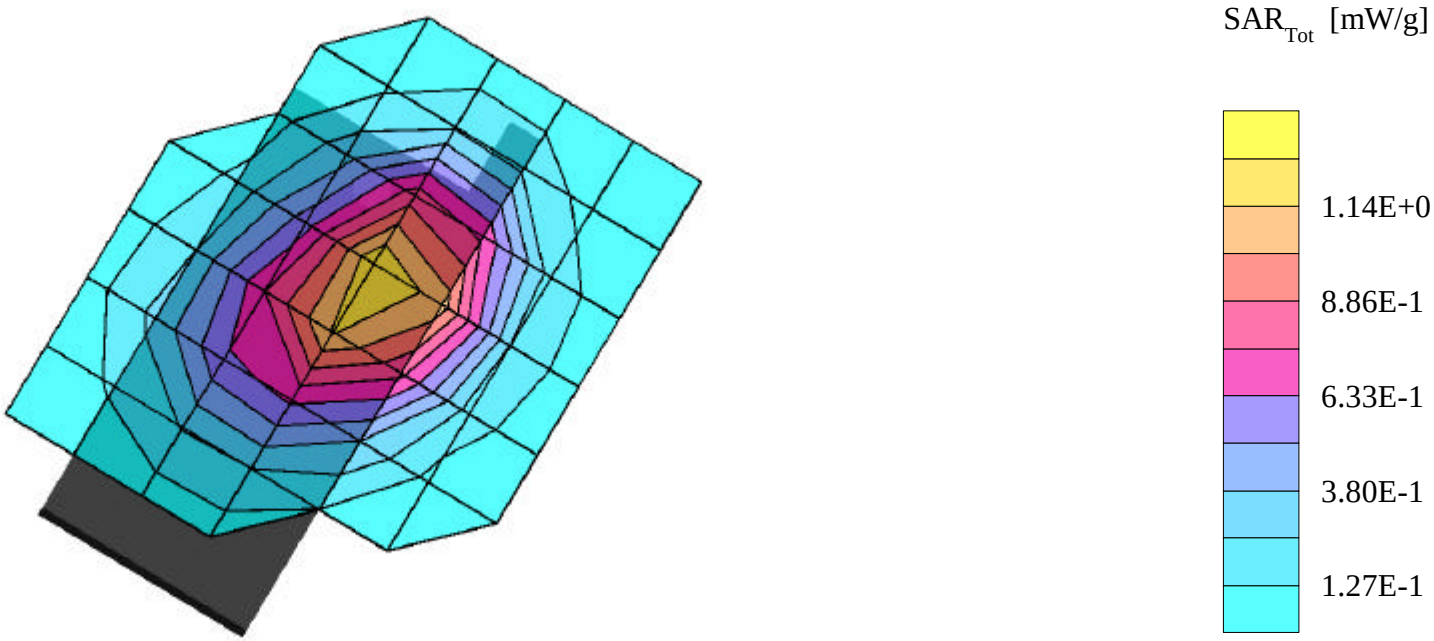
SAR (1g): 1.40 mW/g,SAR (10g): 0.911 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

FM Mode, Ch.0799 [848.97MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C

Conducted Power = 26.5dBm; Left Head SAR, Cheek/Touch position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- FM Head SAR

SAM Phantom; Left Hand Section; Probe:ET3DV6 - SN1560; ConvF(6.78,6.78,6.78)

Med. Parameters 835 MHz Brain: σ = 0.87 mho/m ε_r = 43.4 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

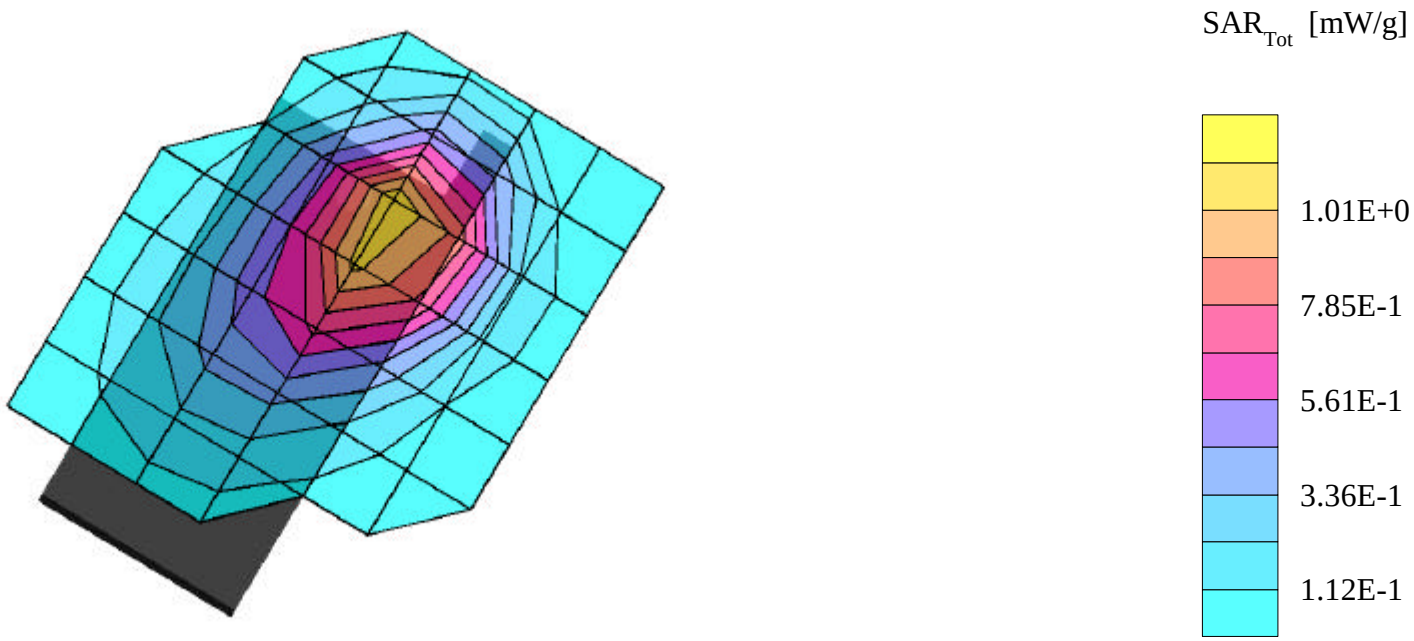
SAR (1g): 1.18 mW/g,SAR (10g): 0.781 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

FM Mode, Ch.0799 [848.97MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C

Conducted Power = 26.5dBm; Left Head SAR, Ear/15 degree Tilt position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- Cellular CDMA Head SAR

SAM Phantom; Left Hand Section; Probe:ET3DV6 - SN1560; ConvF(6.78,6.78,6.78)

Med. Parameters 835 MHz Brain: σ = 0.87 mho/m ε_r = 43.4 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

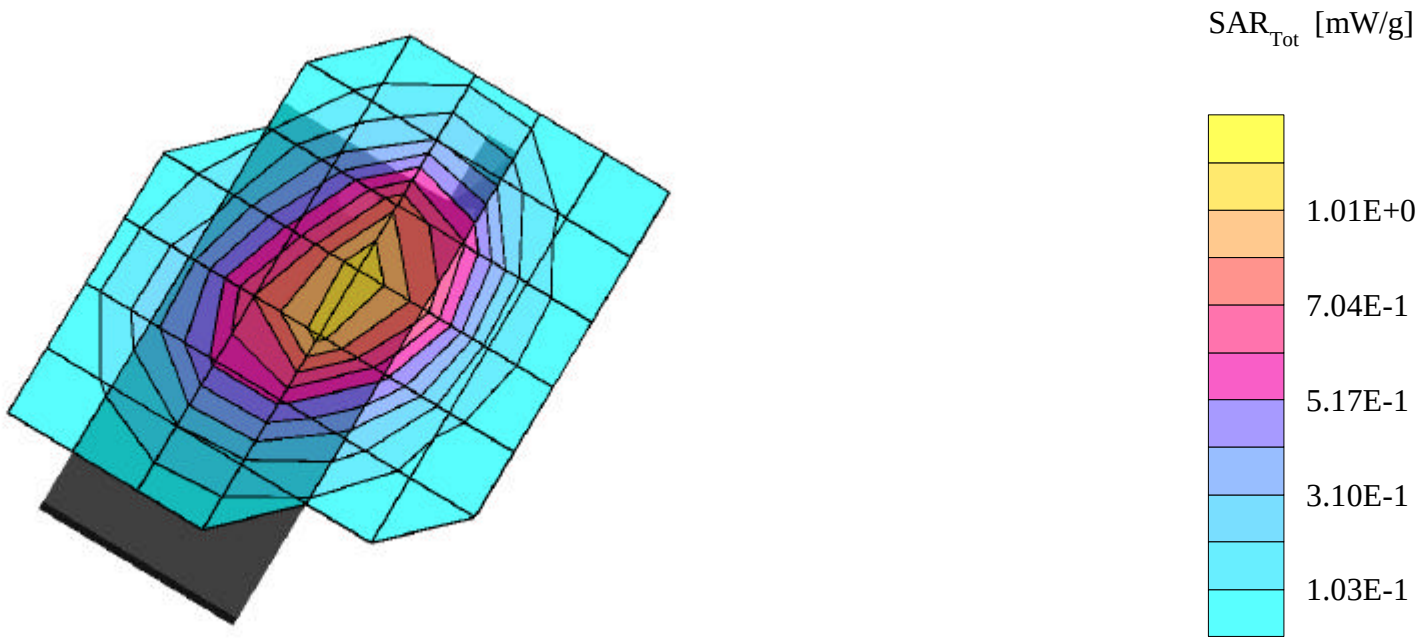
SAR (1g): 1.09 mW/g,SAR (10g): 0.743 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

Cellular CDMA Mode, Ch.0777 [848.31MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.3°C

Conducted Power = 26.0dBm; Left Head SAR, Cheek/Touch position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Head SAR

SAM Phantom; Right Hand Section; Probe:ET3DV6 - SN1560; ConvF(5.16,5.16,5.16)

Med. Parameters 1900 MHz Brain: σ = 1.44 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

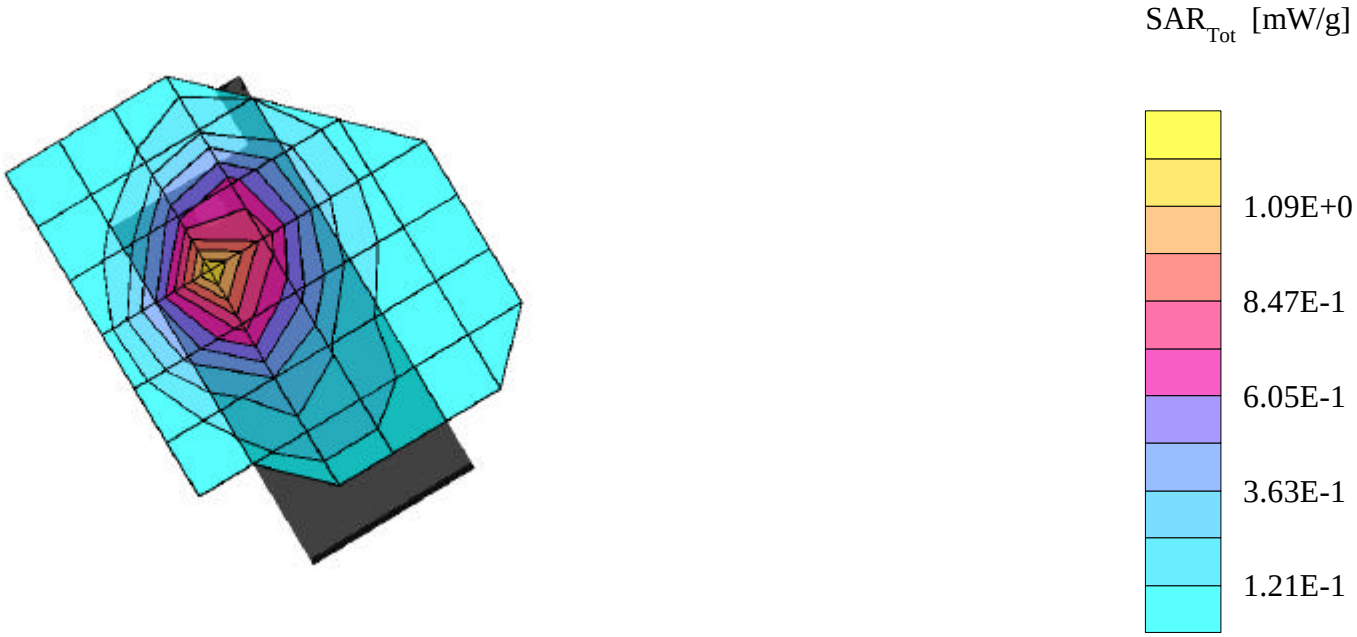
SAR (1g): 1.20 mW/g,SAR (10g): 0.755 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

PCS CDMA Mode, Ch.0600 [1880.00MHz]; Standard Battery; Ambient Temp. = 22.2°C / Meas. Tissue Temp. = 22.0°C

Conducted Power = 24.5dBm; Right Head SAR, Cheek/Touch position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Head SAR

SAM Phantom; Right Hand Section; Probe:ET3DV6 - SN1560; ConvF(5.16,5.16,5.16)

Med. Parameters 1900 MHz Brain: σ = 1.44 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

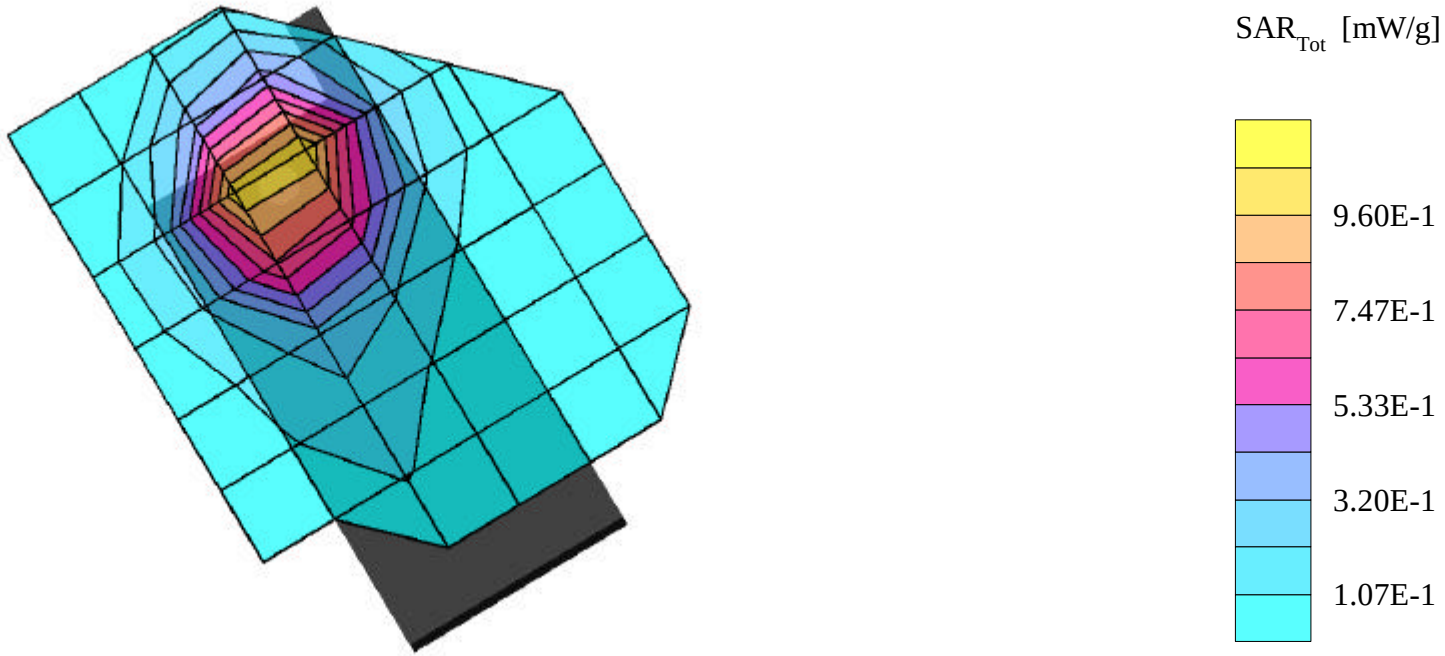
SAR (1g): 1.20 mW/g,SAR (10g): 0.741 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

PCS CDMA Mode, Ch.0600 [1880.00MHz]; Standard Battery; Ambient Temp. = 22.2°C / Meas. Tissue Temp. = 22.0°C

Conducted Power = 24.5dBm; Right Head SAR, Ear/15 degree Tilt position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Head SAR

SAM Phantom; Left Hand Section; Probe:ET3DV6 - SN1560; ConvF(5.16,5.16,5.16)

Med. Parameters 1900 MHz Brain: σ = 1.44 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

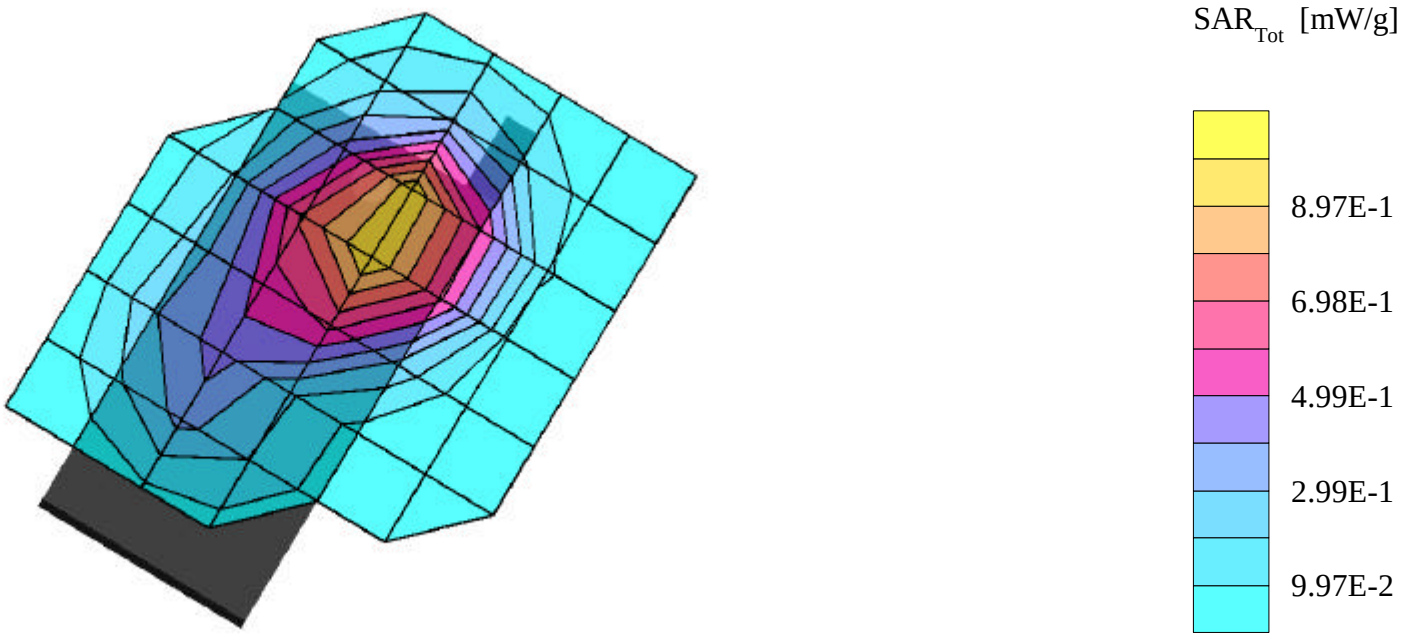
SAR (1g): 1.17 mW/g,SAR (10g): 0.690 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

PCS CDMA Mode, Ch.0600 [1880.00MHz]; Standard Battery; Ambient Temp. = 22.2°C / Meas. Tissue Temp. = 22.0°C

Conducted Power = 24.5dBm; Left Head SAR, Cheek/Touch position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Head SAR

SAM Phantom; Left Hand Section; Probe:ET3DV6 - SN1560; ConvF(5.16,5.16,5.16)

Med. Parameters 1900 MHz Brain: σ = 1.44 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

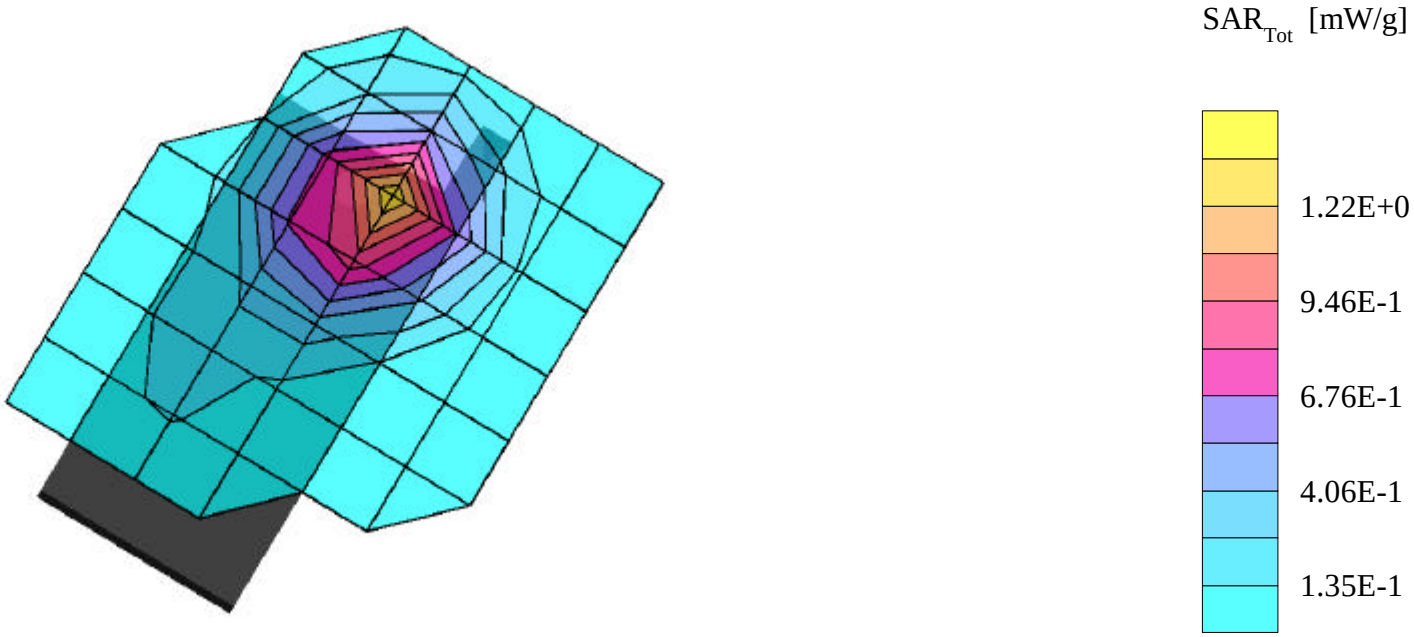
SAR (1g): 1.37 mW/g,SAR (10g): 0.803 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

PCS CDMA Mode, Ch.1175 [1908.75MHz]; Standard Battery; Ambient Temp. = 22.2°C / Meas. Tissue Temp. = 22.0°C

Conducted Power = 24.5dBm; Left Head SAR, Ear/15 degree Tilt position

Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- FM Body SAR

SAM Phantom; Flat Section; Probe:ET3DV6 - SN1560; ConvF(6.52,6.52,6.52)

Med. Parameters 835 MHz Muscle: σ = 0.99 mho/m ε_r = 55.5 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

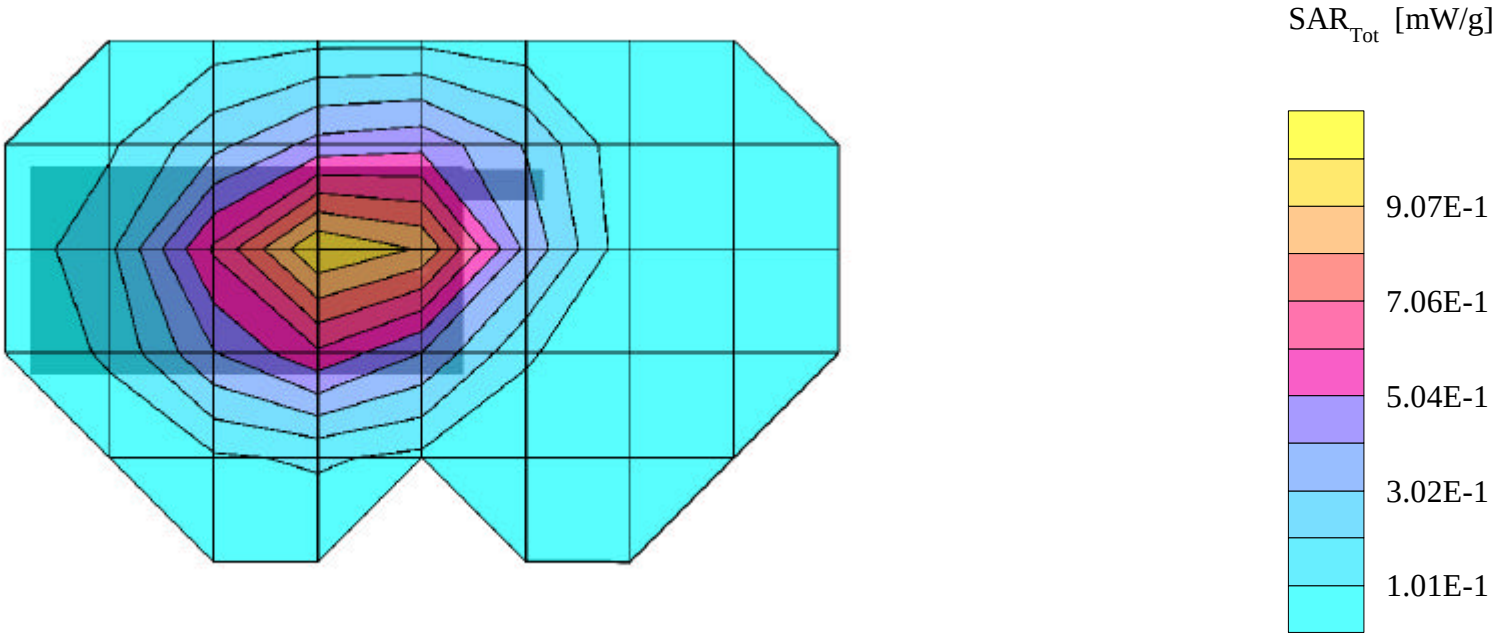
SAR (1g): 0.989 mW/g,SAR (10g): 0.734 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

FM Mode, Ch.0799 [848.97MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.3°C

Conducted Power = 26.5dBm; Spacing = 1.5cm from EUT (antenna side) to flat phantom, No BeltClip/No Holster

Test Date -- 03/27/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- Cellular CDMA Body SAR

SAM Phantom; Flat Section; Probe:ET3DV6 - SN1560; ConvF(6.52,6.52,6.52)

Med. Parameters 835 MHz Muscle: σ = 0.99 mho/m ε_r = 55.5 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

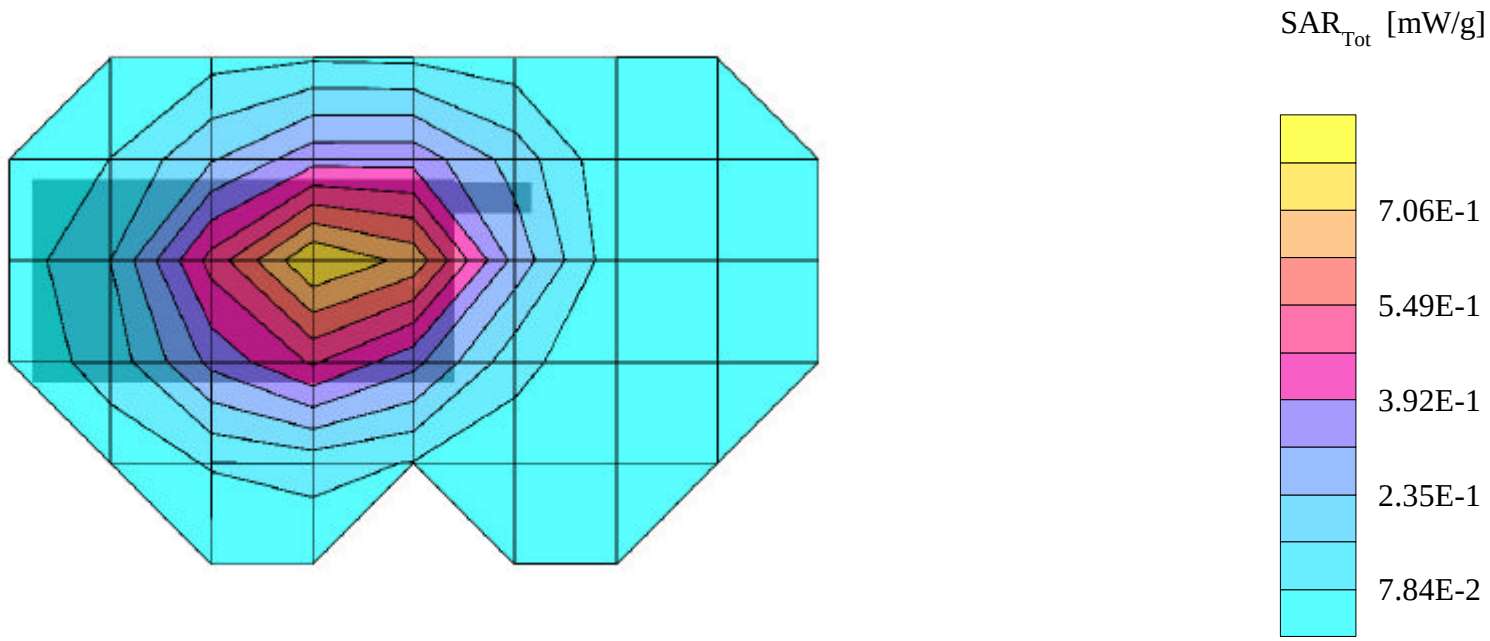
SAR (1g): 0.788 mW/g,SAR (10g): 0.585 mW/g

SAMSUNG TriMode Phone Model: SPH-i330

Cellular CDMA Mode, Ch.0777 [848.31MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.3°C

Conducted Power = 26.0dBm; Spacing = 1.5cm from EUT (antenna side) to flat phantom, No BeltClip/No Holster

Test Date -- 03/27/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Body SAR

SAM Phantom; Flat Section; Probe:ET3DV6 - SN1560; ConvF(4.70,4.70,4.70)

Med. Parameters 1900 MHz Muscle: σ = 1.56 mho/m ε_r = 54.0 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

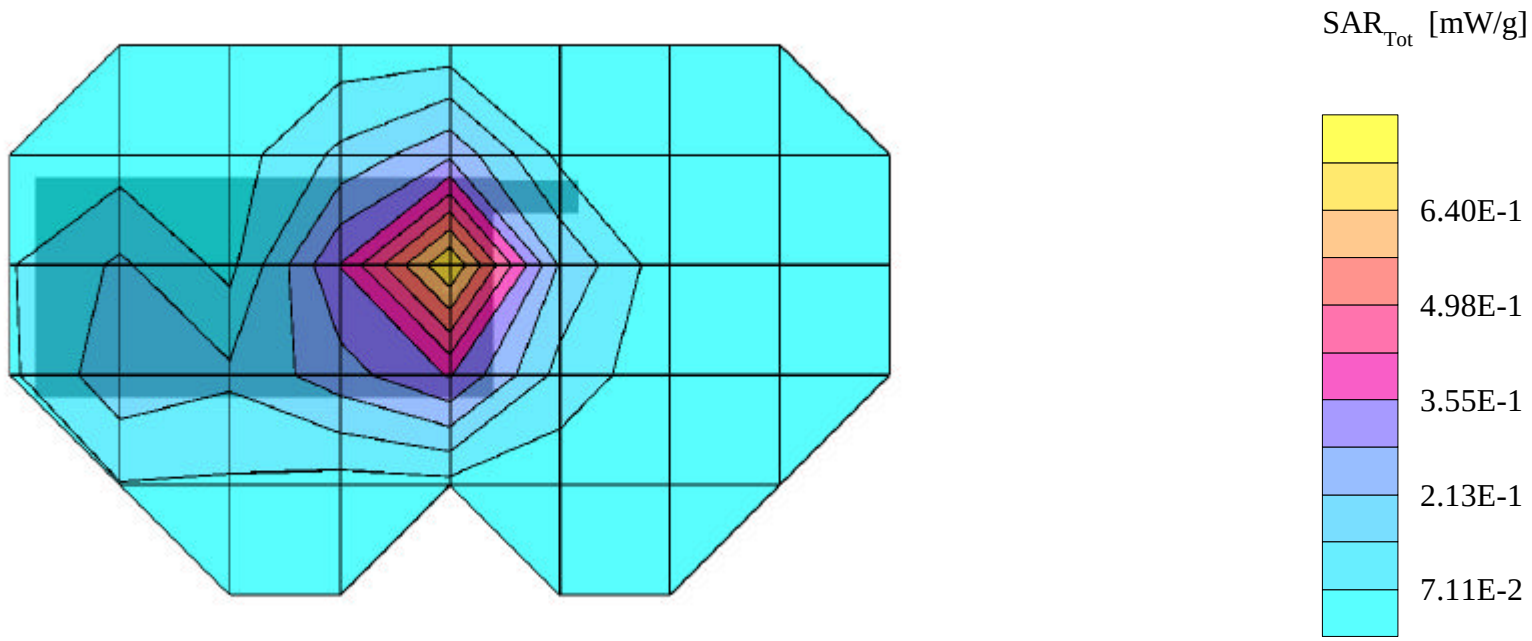
SAR (1g): 0.714 mW/g,SAR (10g): 0.405 mW/g

SAMSUNG TriMode Phone Model: SPH-i330

PCS CDMA Mode, Ch.0600 [1880.00MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C

Conducted Power = 24.5dBm; Spacing = 1.5cm from EUT (antenna side) to flat phantom, No BeltClip/No Holster

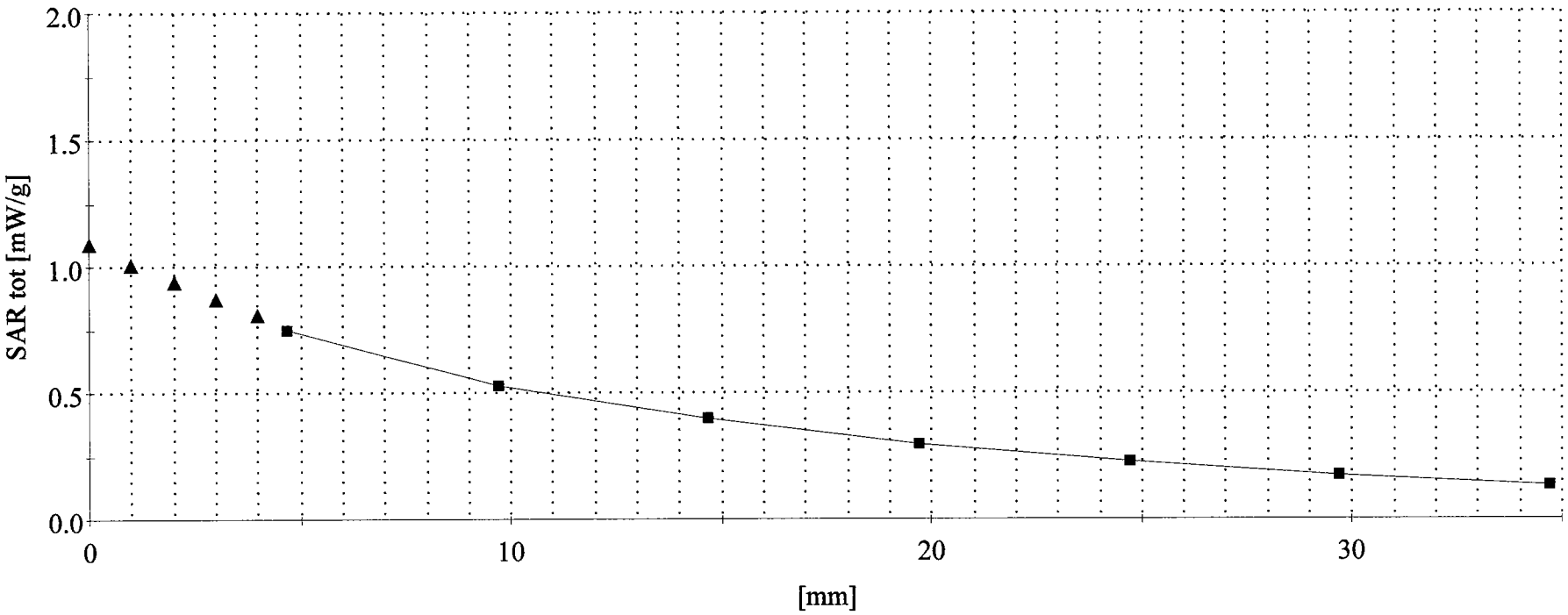
Test Date -- 03/27/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- FM Head SAR

SAM Phantom; Left Hand Section; Probe: ET3DV6 - SN1560; ConvF(6.78,6.78,6.78)
Med. Parameters 835 MHz Brain: $\sigma = 0.87$ mho/m $\varepsilon_r = 43.4$ $\rho = 1.00$ g/cm^3; Antenna Position -- In; Crest Factor 1.0
SAR (1g): 1.40 mW/g, SAR (10g): 0.911 mW/g

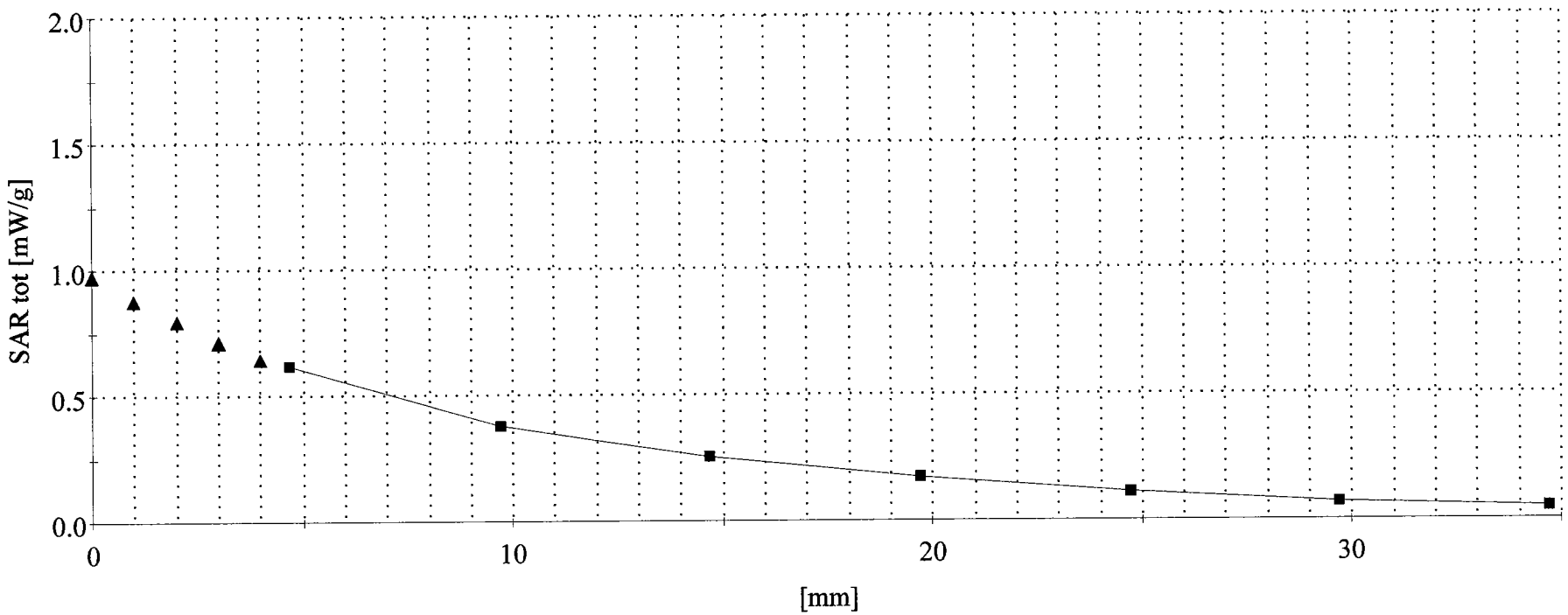
SAMSUNG TriMode Phone Model: SPH-I330
FM Mode, Ch.0799 [848.97MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C
Conducted Power = 26.5dBm; Left Head SAR, Cheek/Touch position
Test Date -- 03/26/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Head SAR

SAM Phantom; Left Hand Section; Probe: ET3DV6 - SN1560; ConvF(5.16,5.16,5.16)
Med. Parameters 1900 MHz Brain: σ = 1.44 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0
SAR (1g): 1.37 mW/g, SAR (10g): 0.803 mW/g

SAMSUNG TriMode Phone Model: SPH-I330
PCS CDMA Mode, Ch.1175 [1908.75MHz]; Standard Battery; Ambient Temp. = 22.2°C / Meas. Tissue Temp. = 22.0°C
Conducted Power = 24.5dBm; Left Head SAR, Ear/15 degree Tilt position
Test Date -- 03/27/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- FM Body SAR

SAM Phantom; Flat Section; Probe: ET3DV6 - SN1560; ConvF(6.52,6.52,6.52)

Med. Parameters 835 MHz Muscle: $\sigma = 0.99$ mho/m $\varepsilon_r = 55.5$ $\rho = 1.00$ g/cm^3; Antenna Position -- In; Crest Factor 1.0

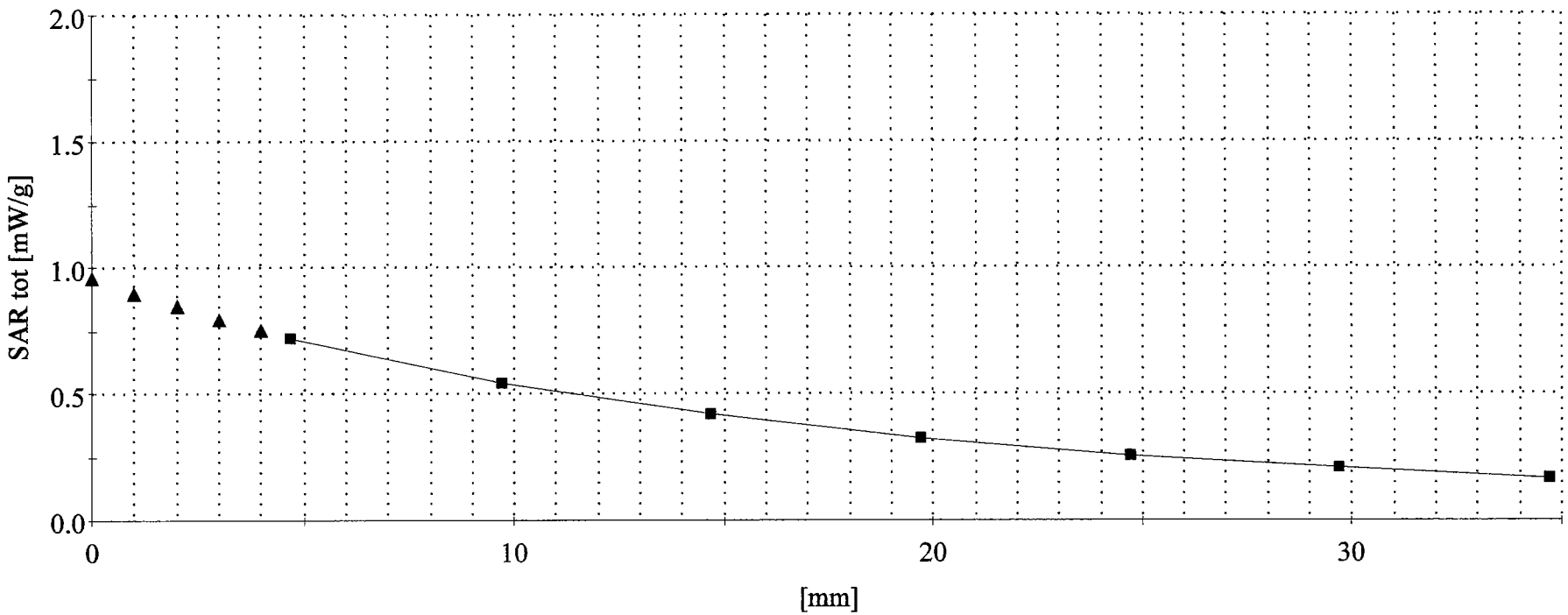
SAR (1g): 0.989 mW/g, SAR (10g): 0.734 mW/g

SAMSUNG TriMode Phone Model: SPH-I330

FM Mode, Ch.0799 [848.97MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.3°C

Conducted Power = 26.5dBm; Spacing = 1.5cm from EUT (antenna side) to flat phantom, No BeltClip/No Holster

Test Date -- 03/27/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]



SAMSUNG FCC ID: A3LSPHI330 -- PCS CDMA Body SAR

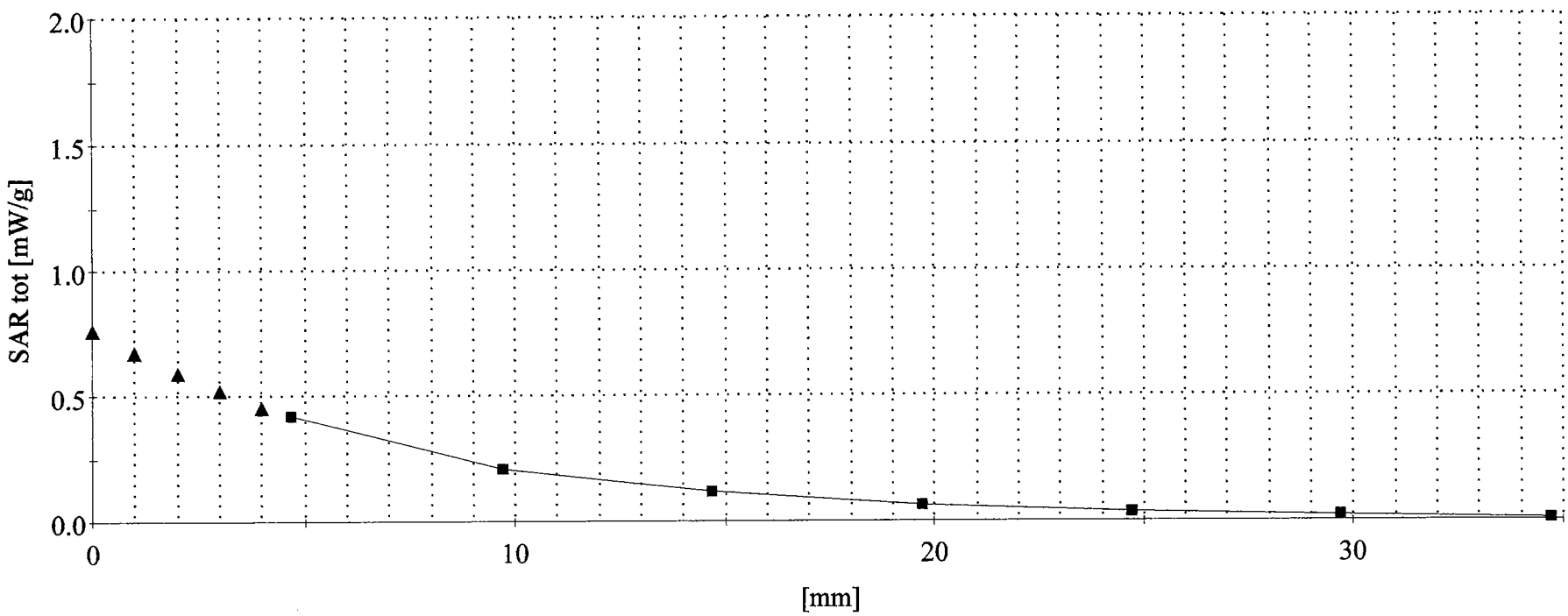
SAM Phantom; Flat Section; Probe: ET3DV6 - SN1560; ConvF(4.70,4.70,4.70)

Med. Parameters 1900 MHz Muscle: σ = 1.56 mho/m ε_r = 54.0 ρ = 1.00 g/cm^3; Antenna Position -- In; Crest Factor 1.0

SAR (1g): 0.714 mW/g, SAR (10g): 0.405 mW/g

SAMSUNG TriMode Phone Model: SPH-i330

PCS CDMA Mode, Ch.0600 [1880.00MHz]; Standard Battery; Ambient Temp. = 22.4°C / Meas. Tissue Temp. = 22.2°C

Conducted Power = 24.5dBm; Spacing = 1.5cm from EUT (antenna side) to flat phantom, No BeltClip/No Holster

Test Date -- 03/27/2002 [FCC/OET Bulletin 65 - Supplement C, July 2001]