This document was generated in response to a request for additional technical information by Stan Lyles in regards to the type approval of the KX444. The information included in related to the 2 specific topics discussed in the following email received by Lin Lu on Jan 14, 2004:

At 12:44 PM 1/14/04 -0500, Stanley Lyles wrote:

> Hello Lin,
>
> I e-mail the technical review on January 5, 2004 in the Equipment Authorization System (EAS). Correspondence reference number 26163.
>
> 1) Please provide secondary SAR peak values consistent with Supplement C and Public Notice DA 02-1438.
>
> 2) Please provide AMPS left cheek SAR at middle and high channel with thin battery and backpack clip.
>
> Stan Lyles
> FCC/OET/EAB

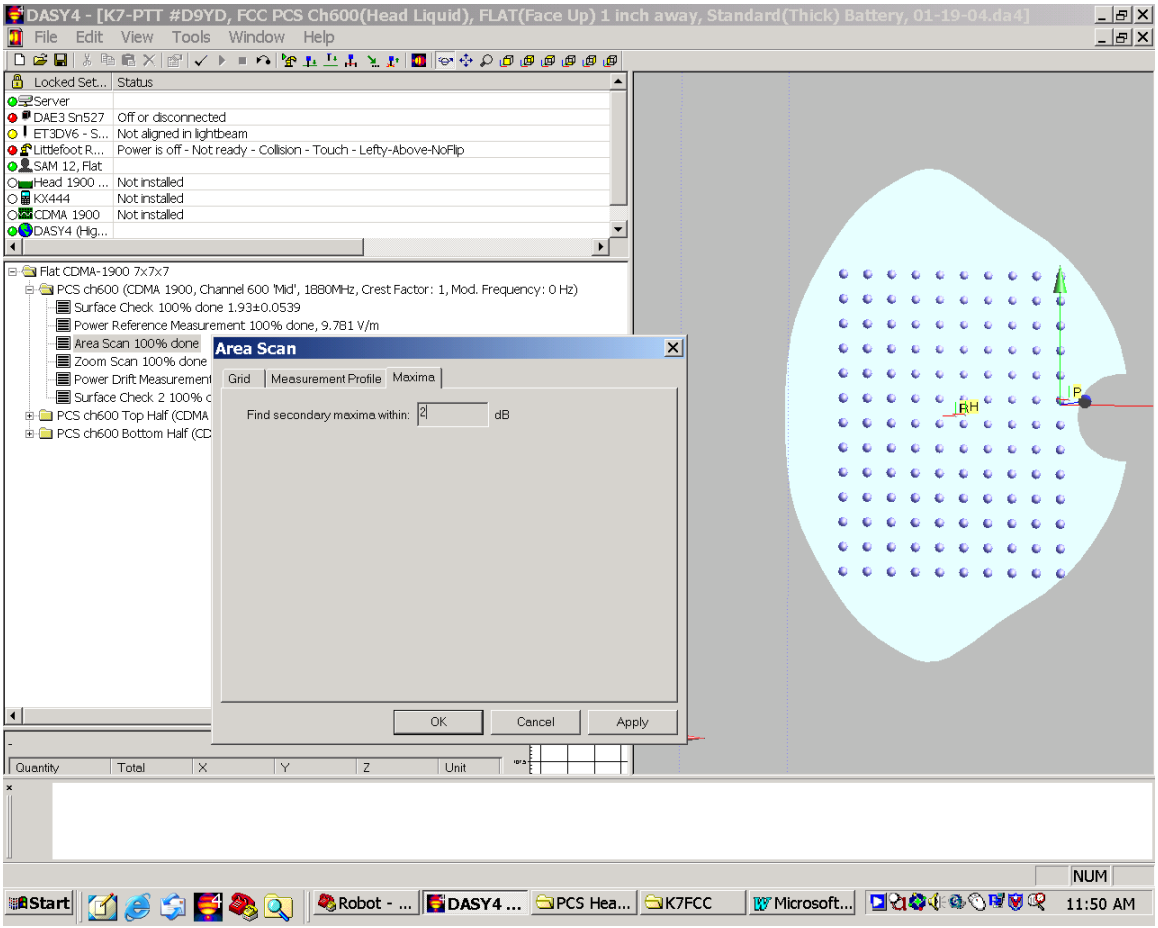
Note this request refers to,

FCC ID: OVFKWC-KX444
Applicant: Kyocera Wireless Corp
Correspondence Reference Number: 26163
731 Confirmation Number: EA862074

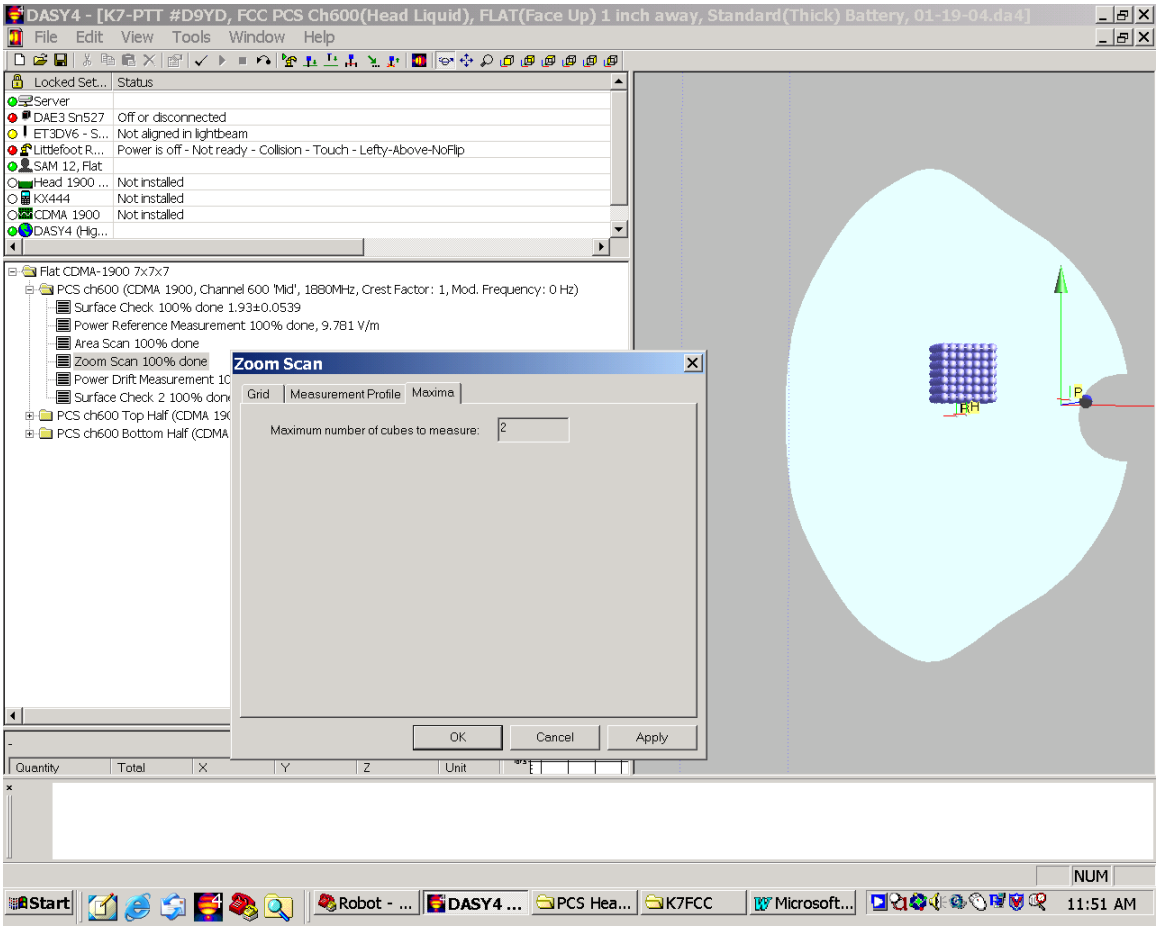
1) Please provide secondary SAR peak values consistent with Supplement C and Public Notice DA 02-1438

Based on supplement C, all peaks within 2.0 dB (58.5%) of the highest peak identified by the interpolated data should be evaluated with a fine resolution volume scan to determine the hightest one-gram average SAR. Therefore, the DASY 4 program was configured in the way that all peaks within 2.0 dB of the highest peak, if there was, could automatically evaluated. The configuration of DASY 4 program is shown below.

⇒ **Area scan job** - when an area scan measured all reachable points, it computed all of the field maxima found in the scan area, within a range of 2dB specified in IEEE P1528, (see below for the config.). For the cases that multiple maximums were detected, the number of zoom scan could be increased accordingly.



⇒ **Zoom scan –** in a zoom scan, the maxim number of cubes to measure was set to 2 due to two peaks appearance on the preceding area scans in this application, (see below for the config.). If two peaks were within 2dB of the highest one, two zoom scans could perform to provide the evaluations with a fine resolution volume scan to determine the one-gram average SAR for both peaks.



Per the request, all of the SAR tests included in the original submittal were checked. The tests were re-conducted for these plots containing multiple hot spots. In all of tests, the secondary peak was less than the primary peak by more than 2 dB, and the software only did one cube scan for the primary peak evaluation.

To prove that the secondary peak was in deed lower by more than 2 dB, we manually reduced the range of the area scan to focus on the secondary peak evaluation for the two cases as examples. The results are listed in the table below. The SAR plots are shown in the following pages. The relevant equipment validations are attached in the appendix.

Note the dipole and probe used in the measurement were the same as what were used for the original submittal, therefore all of the manufactory info has been included in the original files.

CDMA 1900 HEAD		**Channel:**	1175	
		Frequency (MHz):	1908.75	
		Power before Test (dBm):	23.12	
		Power after Test (dBm):	23.16	
Configuration	**Test Position**	**Antenna Position**	**SAR, 1g (W/kg)**	
			Primary peak	**Secondary peak**
standard batt & batt cover w/ backpack clip	**Left** Cheek/Touch	Fixed	**0.983**	**0.495**

CDMA 1900 BODY		**Channel:**	600	
		Frequency (MHz):	1880	
		Power before Test (dBm):	23.13	
		Power after Test (dBm):	23.05	
Configuration	**Test Position**	**Phone Configuration**	**SAR, 1g (W/kg)**	
			Primary peak	**Secondary peak**
Kyocera Universal Belt Clip: (CE90-B1795-01)	Flat	Face Down	**0.284**	**0.120**

Since all secondary peaks are lower than the primary peaks by more than 2 dB in this application, the rest of secondary peak values are not reported in the response.

Date/Time: 01/15/04 13:16:57

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC PCS Ch1175 LC only, Standard(Thick) battery, Backpack Clip, 01-15-04.da4

Full Scan, FCC PCS Ch1175 LC, Standard battery, Backpack Clip, 01-15-04

DUT: KX444

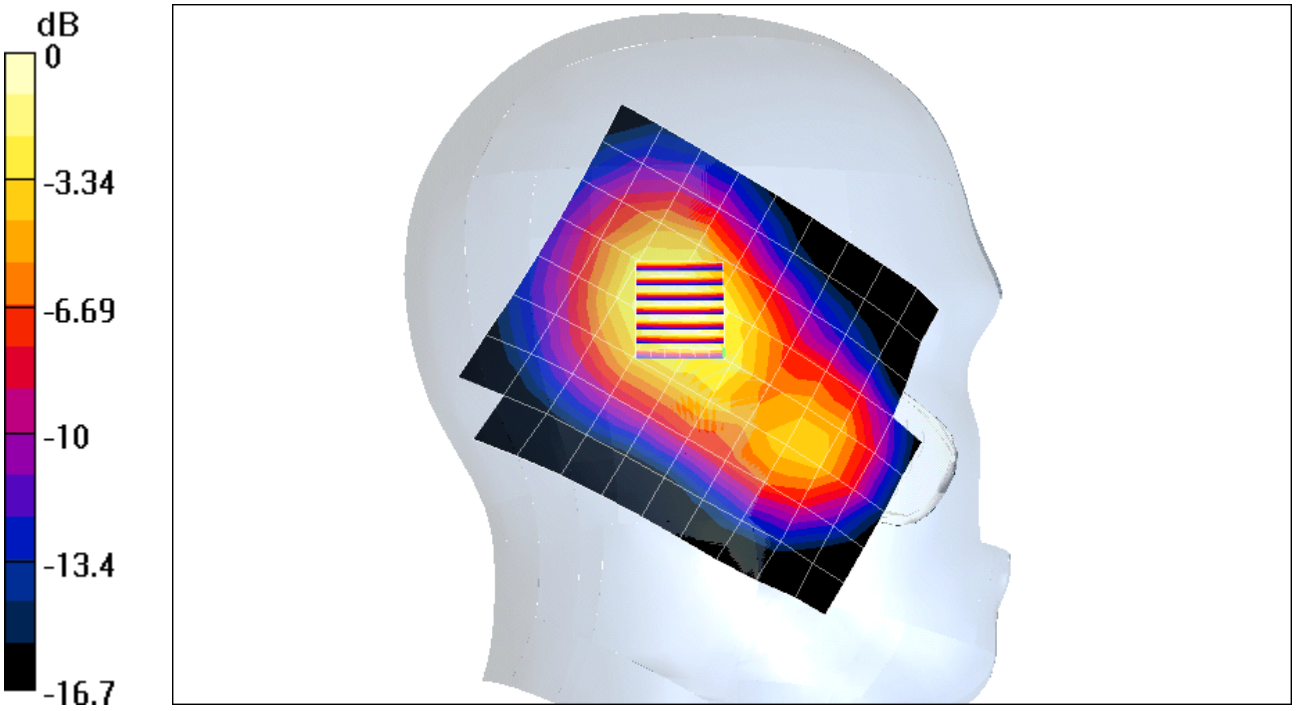
Communication System: CDMA 1900, Frequency: 1909 MHz, Duty Cycle: 1:1
Medium: Head 1900 MHz, (σ = 1.46 mho/m, ε_r = 39.92, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Left Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(5.3, 5.3, 5.3), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

PCS 1175 LC/Area Scan (11x9x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 24.2 V/m
Power Drift = 0.1 dB
Maximum value of SAR = 1 mW/g

PCS 1175 LC/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.983 mW/g; SAR(10 g) = 0.577 mW/g
Reference Value = 24.2 V/m
Power Drift = 0.1 dB
Maximum value of SAR = 1.08 mW/g



0 dB = 1.08mW/g

Date/Time: 01/15/04 13:16:57

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC PCS Ch1175 LC only, Standard(Thick) battery, Backpack Clip, 01-15-04.da4

2nd Peak Scan, FCC PCS Ch1175 LC, Standard battery, Backpack Clip, 01-15-04

DUT: KX444

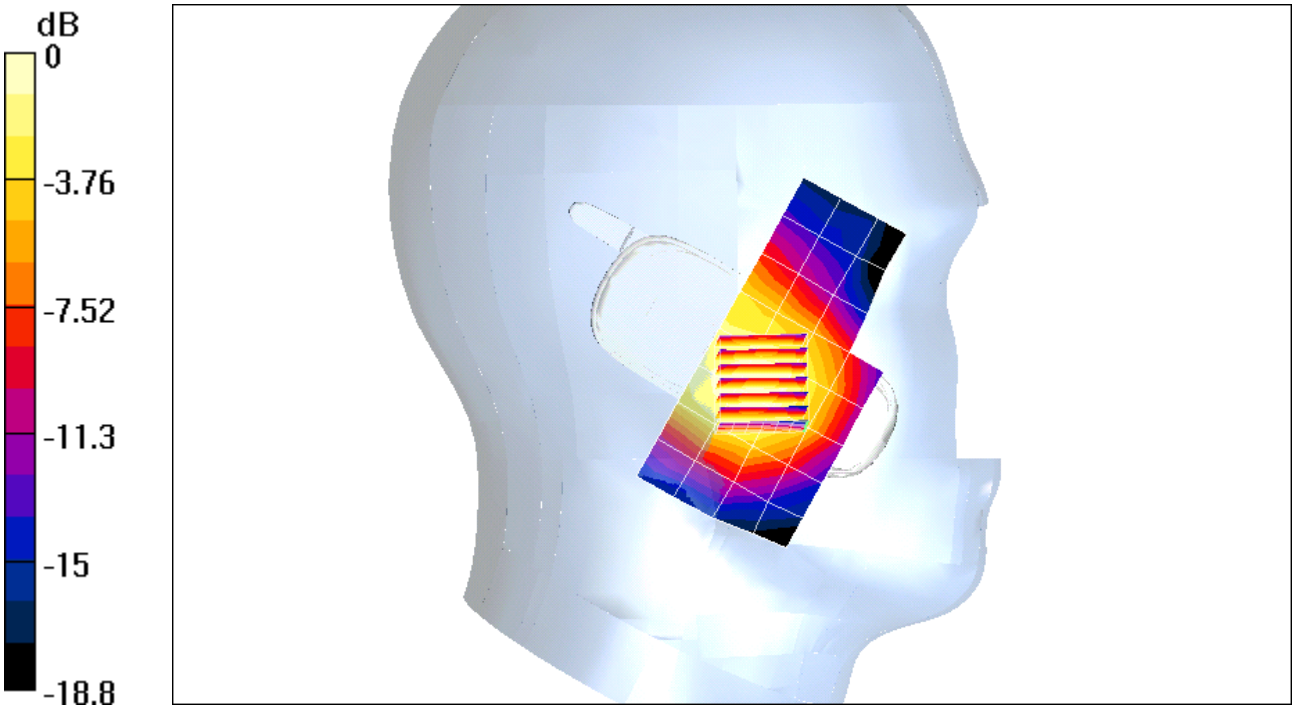
Communication System: CDMA 1900, Frequency: 1909 MHz, Duty Cycle: 1:1
Medium: Head 1900 MHz, (σ = 1.46 mho/m, ε_r = 39.92, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Left Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(5.3, 5.3, 5.3), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

PCS 1175 LC 3/Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 24.3 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.54 mW/g

PCS 1175 LC 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.764 W/kg
SAR(1 g) = 0.495 mW/g; SAR(10 g) = 0.317 mW/g
Reference Value = 24.3 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.524 mW/g



0 dB = 0.524mW/g

Date/Time: 01/15/04 21:06:17

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC PCS Ch600 FLAT only, Thin battery, Belt Clip, 01-15-04.da4

Full Scan, FCC PCS Ch600 FLAT only, Thin battery, Belt Clip, 01-15-04

DUT: KX444

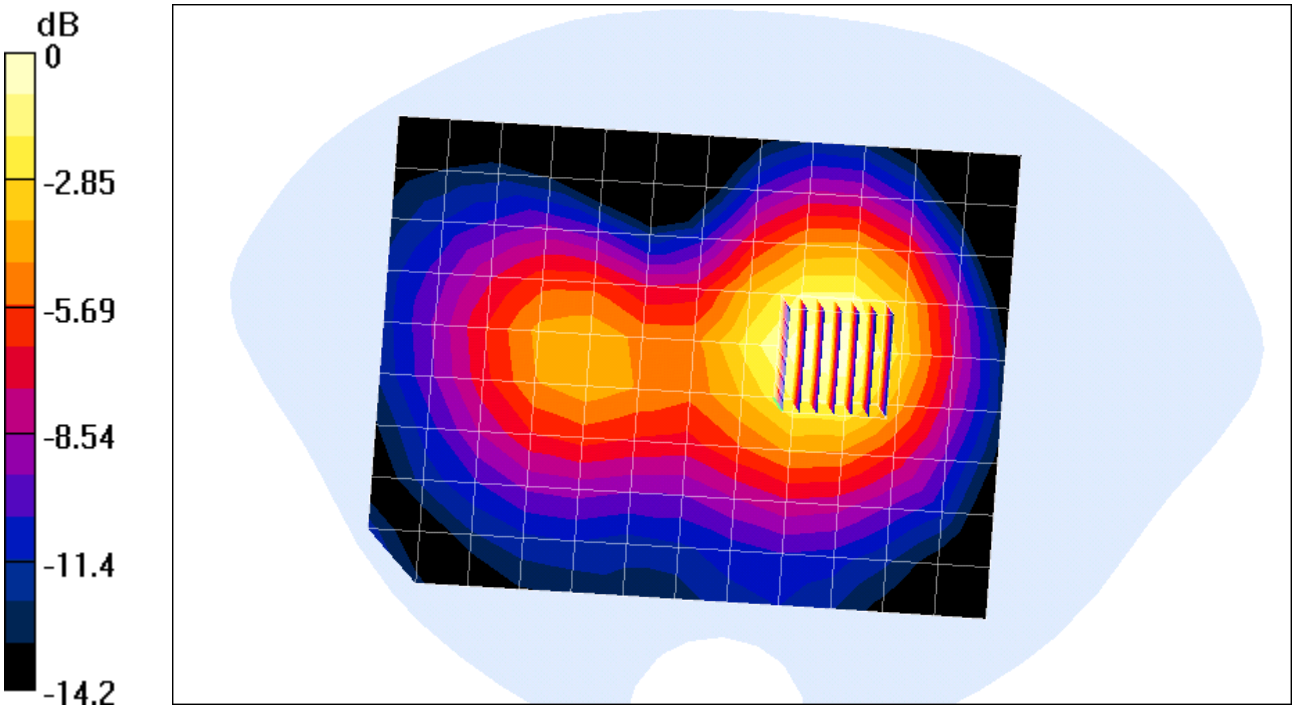
Communication System: CDMA 1900, Frequency: 1880 MHz, Duty Cycle: 1:1
Medium: Muscle 1900Mhz, (σ = 1.53 mho/m, ε_r = 52.81, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Flat Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(4.9, 4.9, 4.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

PCS ch600/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 10.6 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.289 mW/g

PCS ch600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.435 W/kg
SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.177 mW/g
Reference Value = 10.6 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.302 mW/g



0 dB = 0.302mW/g

Date/Time: 01/15/04 21:06:17

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC PCS Ch600 FLAT only, Thin battery, Belt Clip, 01-15-04.da4

2nd Peak Scan, FCC PCS Ch600 FLAT only, Thin battery, Belt Clip, 01-15-04

DUT: KX444

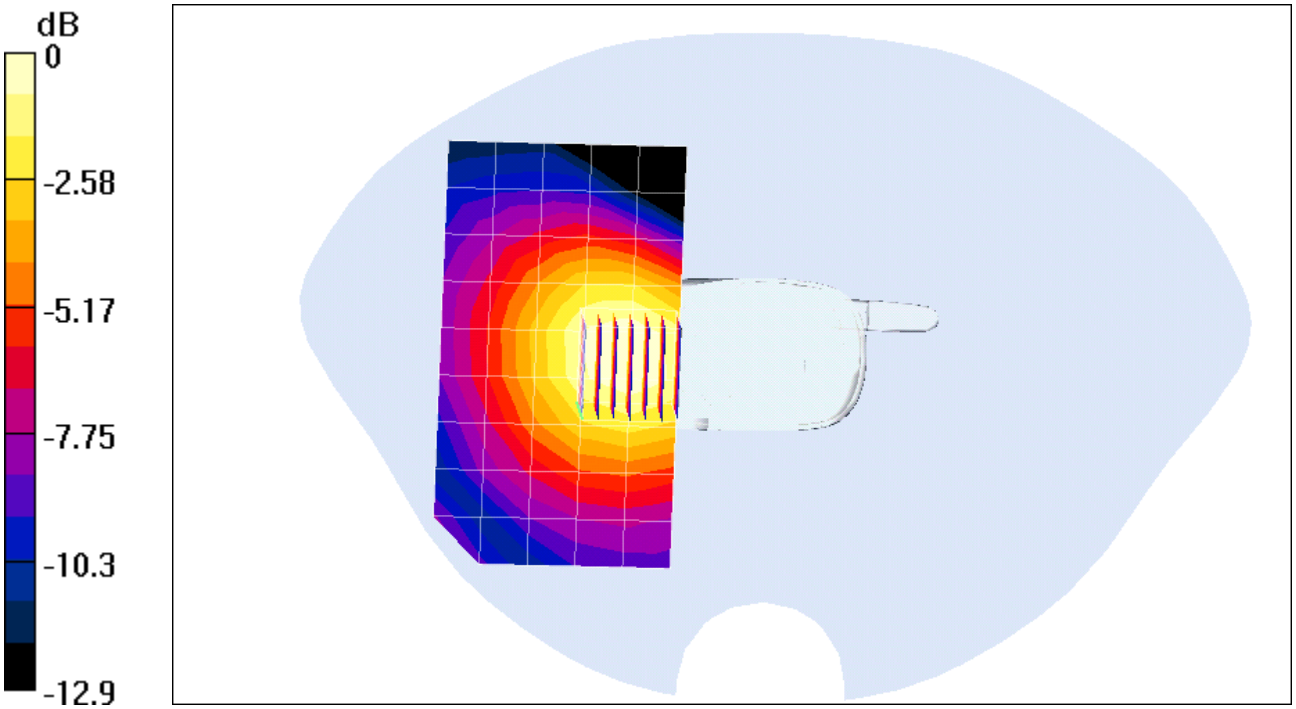
Communication System: CDMA 1900, Frequency: 1880 MHz, Duty Cycle: 1:1
Medium: Muscle 1900Mhz, (σ = 1.53 mho/m, ε_r = 52.81, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Flat Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(4.9, 4.9, 4.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

PCS ch600 Bottom Half/Area Scan (10x6x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 10.1 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.121 mW/g

PCS ch600 Bottom Half/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.183 W/kg
SAR(1 g) = 0.12 mW/g; SAR(10 g) = 0.0772 mW/g
Reference Value = 10.1 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.127 mW/g



0 dB = 0.127mW/g

2) Please provide AMPS left cheek SAR at middle and high channel with thin battery and backpack clip

We performed the SAR testing as requested for AMPS. We also conducted the SAR testing as requested configurations for the 800MHz CDMA mode due to the higher SAR value. The results are listed below and the plots are follows.

AMPS 800 HEAD		Channel:	991	383	799
		Frequency (MHz):	824.04	836.49	848.97
		Power before Test (dBm):	25.05	25.04	25.06
		Power after Test (dBm):	25.02	25.03	25.00
Configuration	**Test Position**	**Antenna Position**	**SAR, 1g (W/kg)**		
thin battery & batt cover w/ backpack clip	**Left** Cheek/Touch	Fixed		**1.03**	**1.17**

CDMA 800 HEAD		Channel:	1013	383	777
		Frequency (MHz):	824.70	836.49	848.31
		Power before Test (dBm):	25.02	25.01	25.05
		Power after Test (dBm):	25.14	25.00	25.02
Configuration	**Test Position**	**Antenna Position**	**SAR, 1g (W/kg)**		
standard batt & batt cover w/ backpack clip	**Left** Cheek/Touch	Fixed		**1.01**	**1.18**

Date/Time: 01/14/04 15:28:35

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC AMPS ch 383-799, Left Cheek with Thin Battery and Backpack Clip, 01 -14-04da4.da4

KX444, AMPS ch383, Left Cheek, Thin Battery and Backpack Clip

DUT: KX444

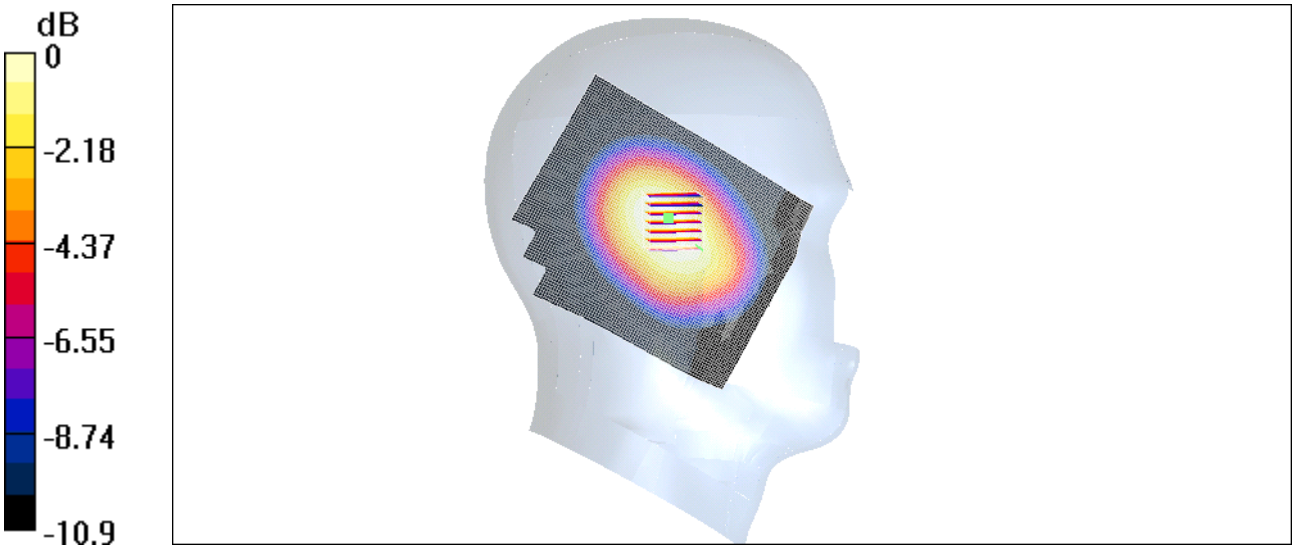
Communication System: AMPS, Frequency: 836 MHz, Duty Cycle: 1:1
Medium: Head 835 MHz, (σ = 0.86 mho/m, ε_r = 40.14, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Left Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(6.9, 6.9, 6.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

AMPS Ch383 LC/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 35.8 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 1.14 mW/g

AMPS Ch383 LC/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.745 mW/g
Reference Value = 35.8 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 1.08 mW/g



0 dB = 1.08mW/g

Date/Time: 01/14/04 15:28:35

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC AMPS ch 383-799, Left Cheek with Thin Battery and Backpack Clip, 01 -14-04da4.da4

KX444, AMPS ch799, Left Cheek, Thin Battery with Backpack Clip

DUT: KX444

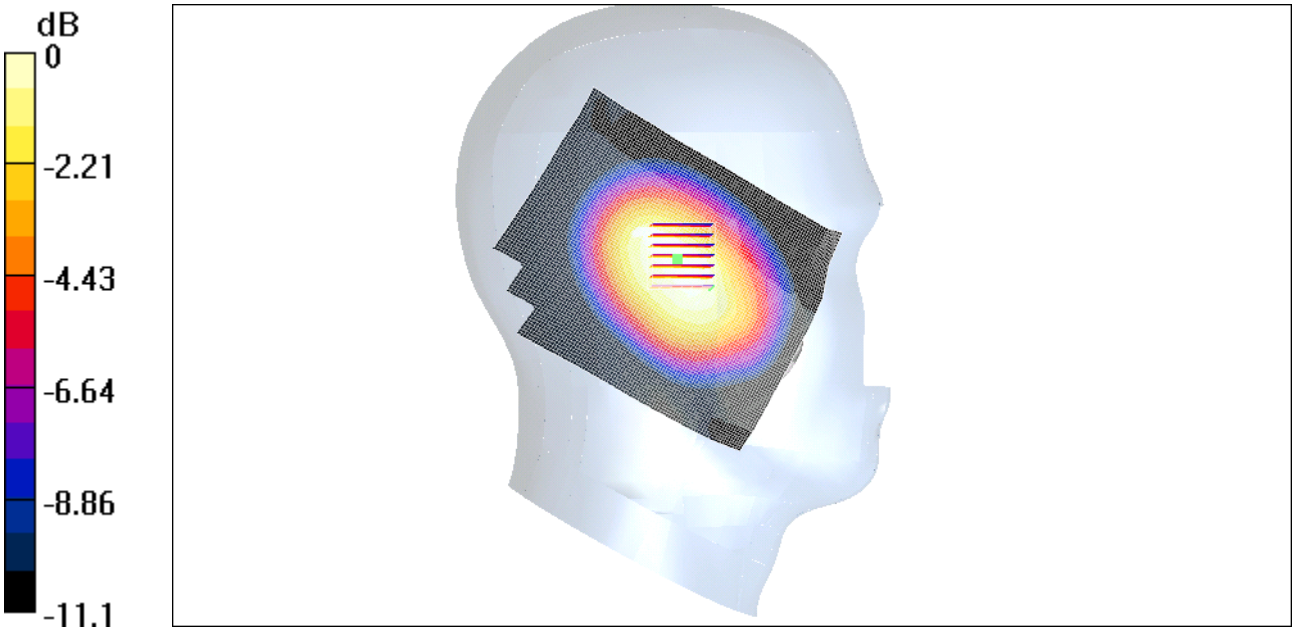
Communication System: AMPS, Frequency: 848 MHz, Duty Cycle: 1:1
Medium: Head 835 MHz, (σ = 0.86 mho/m, ε_r = 40.14, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Left Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(6.9, 6.9, 6.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

AMPS Ch799 LC/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 37.8 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 1.24 mW/g

AMPS Ch799 LC/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.857 mW/g
Reference Value = 37.8 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 1.24 mW/g



0 dB = 1.24mW/g

Date/Time: 01/14/04 17:52:25

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC CDMA-800 ch 383-777, Left Cheek with Thick Battery and Backpack Clip, 01-14-04da4.da4

KX444, CDMA-800 ch 383, Left Cheek, Standard Battery with Backpack Clip

DUT: KX444

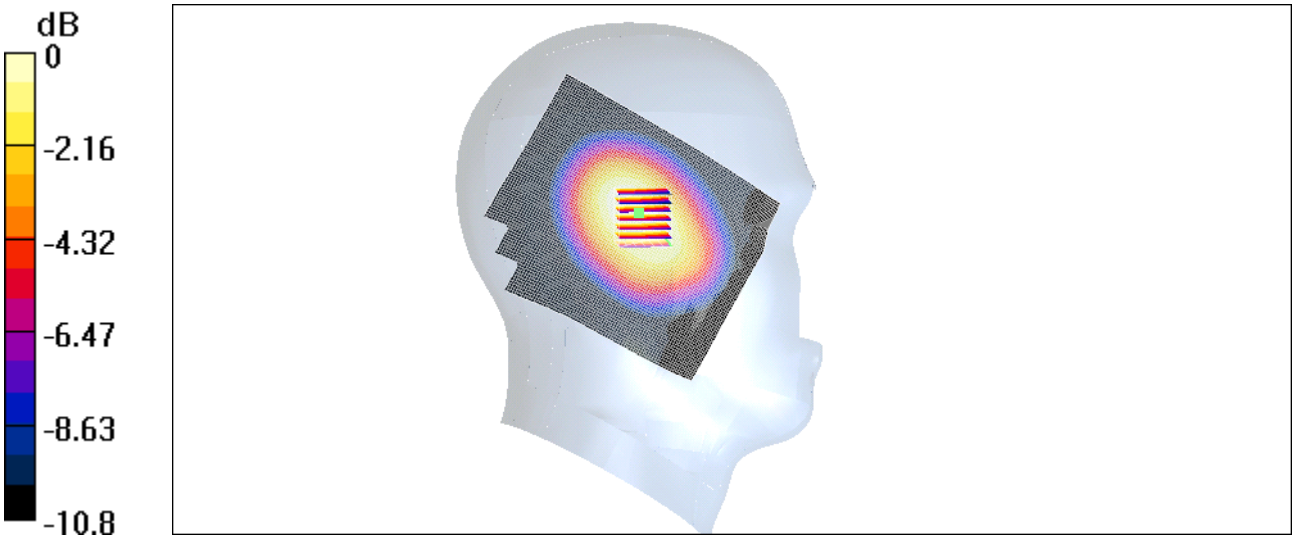
Communication System: 800-CDMA, Frequency: 837 MHz, Duty Cycle: 1:1
Medium: Head 835 MHz, (σ = 0.86 mho/m, ε_r = 40.14, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Left Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(6.9, 6.9, 6.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

CDMA-800 Ch383 LC/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 34.8 V/m
Power Drift = -0.07 dB
Maximum value of SAR = 1.14 mW/g

CDMA-800 Ch383 LC/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.734 mW/g
Reference Value = 34.8 V/m
Power Drift = -0.07 dB
Maximum value of SAR = 1.08 mW/g



0 dB = 1.08mW/g

Date/Time: 01/14/04 17:52:25

Test Laboratory: Kyocera Wireless Corporation
File Name: K7-PTT #D9YD, FCC CDMA-800 ch 383-777, Left Cheek with Thick Battery and Backpack Clip, 01-14-04da4.da4

KX444, CDMA-800 ch777, Left Cheek, Standard Battery with Backpack Clip

DUT: KX444

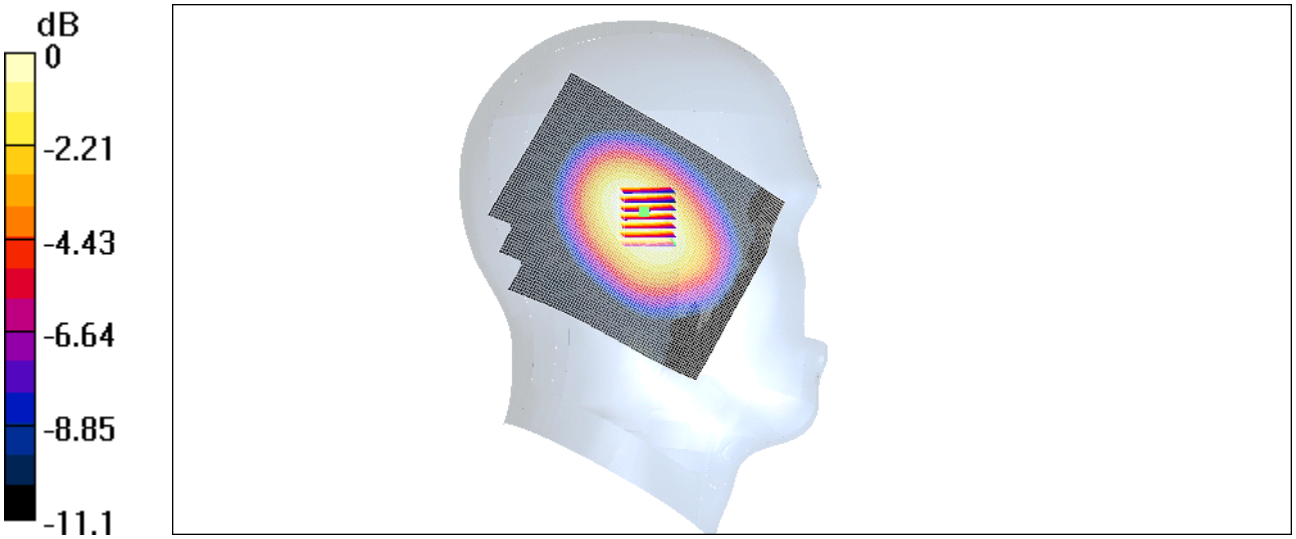
Communication System: 800-CDMA, Frequency: 848 MHz, Duty Cycle: 1:1
Medium: Head 835 MHz, (σ = 0.86 mho/m, ε_r = 40.14, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Left Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(6.9, 6.9, 6.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

CDMA-800 Ch777 LC/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 37.6 V/m
Power Drift = -0.01 dB
Maximum value of SAR = 1.3 mW/g

CDMA-800 Ch777 LC/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.6 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.856 mW/g
Reference Value = 37.6 V/m
Power Drift = -0.01 dB
Maximum value of SAR = 1.24 mW/g



0 dB = 1.24mW/g

Appendix

Validation data –

Tissue	Freq. (MHz)	Description	Validation SAR (mW/g), 1g	Dielectric Parameters		Temp. (°C)	Test date	Comments
				ε_r	σ (S/m)			Validation testing -
Head	835	Measured	1.01	40.14	0.86	22±1	01-14-04	For device testing in head liquid
		SPEAG Reference	**1.04**	**41.9**	**0.89**	**--**	**02-11-02**	
		FCC Reference*	**--**	**41.5**	**0.90**	**20-26**	**--**	
	1900	Measured	4.48	39.92	1.46	22±1	01-15-04	for device testing in head & muscle liquid
		SPEAG Reference	**4.56**	**39.1**	**1.47**	**--**	**02-20-02**	
		FCC Reference*	**--**	**40.0**	**1.40**	**20-26**	**--**	
Muscle	1900	Measured	--	52.81	1.53	22±1	01-15-04	for device testing in muscle
		FCC Reference*	**--**	**53.3**	**1.52**	**20-26**	**--**	

FCC reference values are adopted from OET Bulletin 65 (97-01) Supplement C (01-01).

Validation plots and SAR plots -

Date/Time: 01/14/04 14:45:36

Test Laboratory: Kyocera Wireless Corporation
File Name: 835MHz Validation for FCC, Probe 1618, DAE 527, Dipole #453, 01-14-04.da4

835MHz Validation for FCC, Probe 1618, Dipole #453, 01-14-04

DUT: Dipole 835 MHz

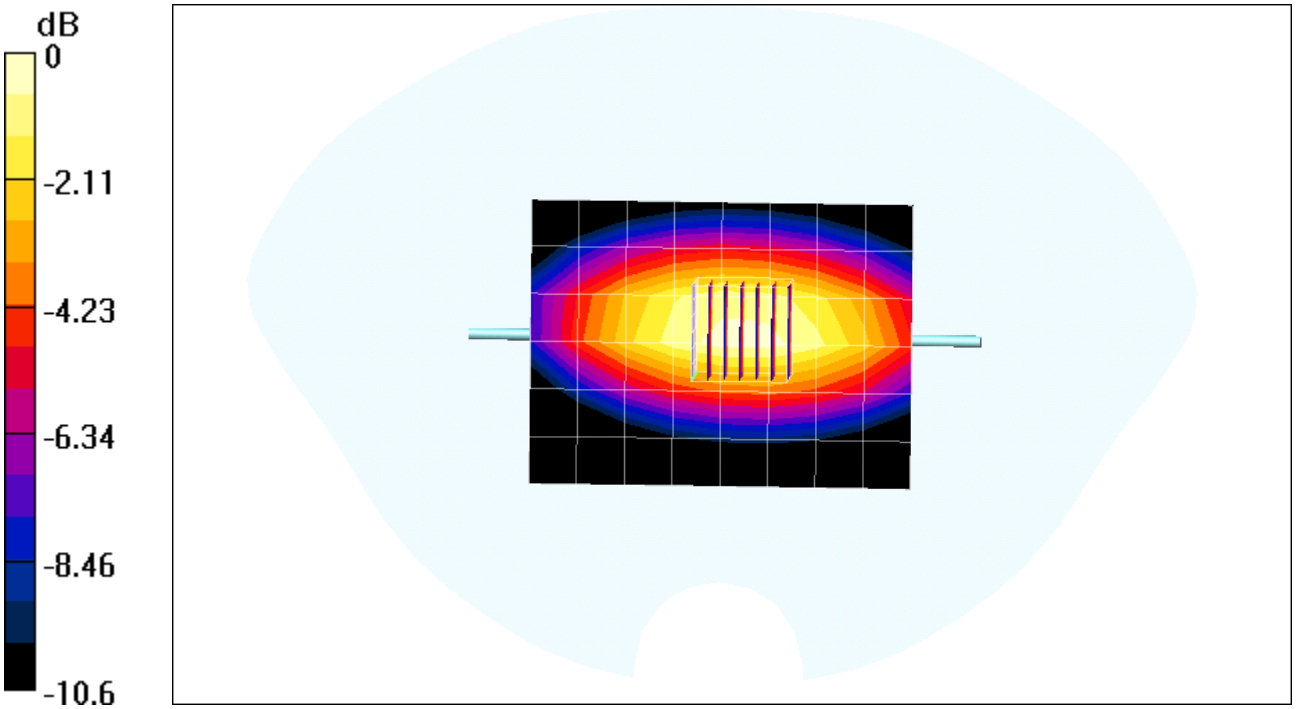
Communication System: CW, Frequency: 835 MHz, Duty Cycle: 1:1
Medium: Head 835 MHz, (σ = 0.86 mho/m, ε_r = 40.14, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Flat Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(6.9, 6.9, 6.9), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527,
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

835MHz/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 35.2 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 0.983 mW/g

835MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.657 mW/g
Reference Value = 35.2 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 1.08 mW/g



0 dB = 1.08mW/g

Date/Time: 01/15/04 11:16:10

Test Laboratory: Kyocera Wireless Corporation
File Name: 1900MHz Validation for FCC@20dbm, Probe 1618, DAE 527, Dipole #5d005, 01-15-04.da4

1900MHz Validation for FCC@20dbm, Probe 1618, Dipole #5d005, 01-15-04

DUT: Dipole 1900 MHz

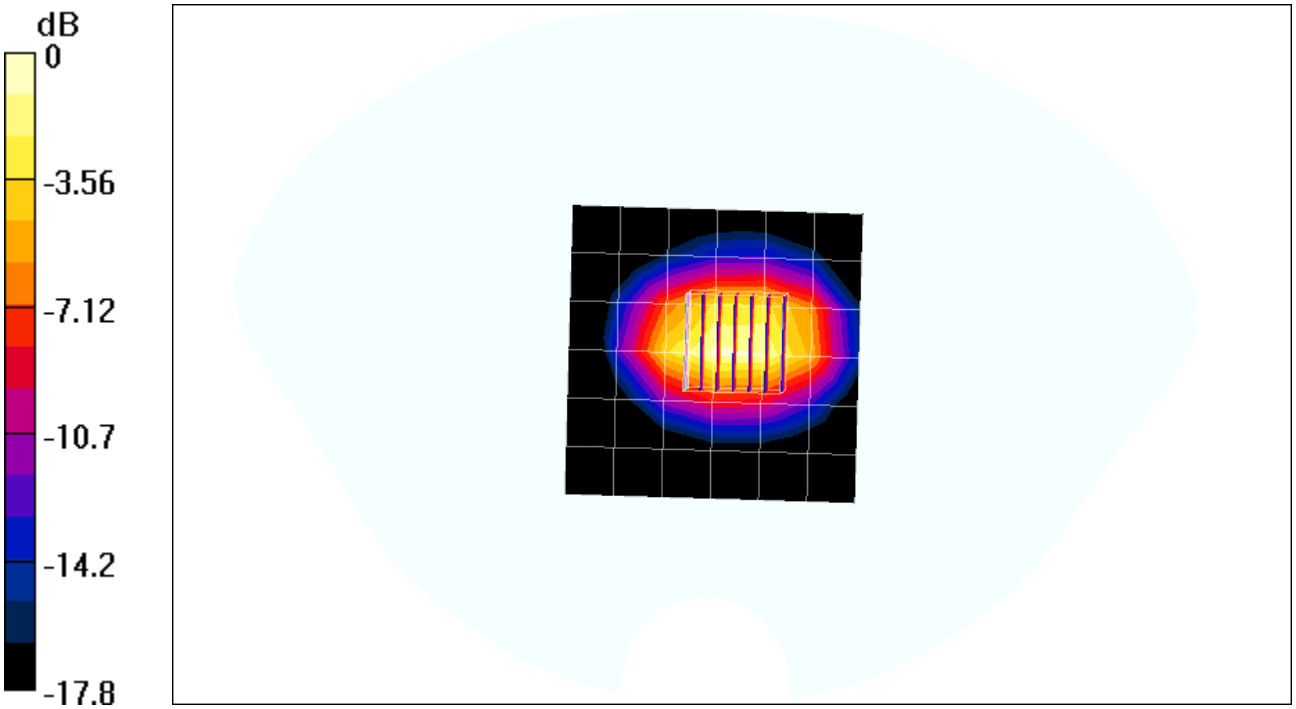
Communication System: CW, Frequency: 1900 MHz, Duty Cycle: 1:1
Medium: Head 1900 MHz, (σ = 1.46 mho/m, ε_r = 39.92, ρ = 1000 kg/m^3)
Phantom: SAM 12,Phantom section: Flat Section

DASY4 Configuration:
Probe: ET3DV6 - SN1618, ConvF(5.3, 5.3, 5.3), Calibrated: 10/10/2003
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection),
Electronics: DAE3 Sn527
Measurement SW: DASY4, V4.1 Build 47
Postprocessing SW: SEMCAD, V1.6 Build 115

Temperature:
Room T = 21.8 +/– 1 deg C, Liquid T = 22.0 +/– 1 deg C

1900MHz/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 57.1 V/m
Power Drift = 0.01 dB
Maximum value of SAR = 4.25 mW/g

1900MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 7.95 W/kg
SAR(1 g) = 4.48 mW/g; SAR(10 g) = 2.31 mW/g
Reference Value = 57.1 V/m
Power Drift = 0.01 dB
Maximum value of SAR = 5.07 mW/g



0 dB = 5.07mW/g