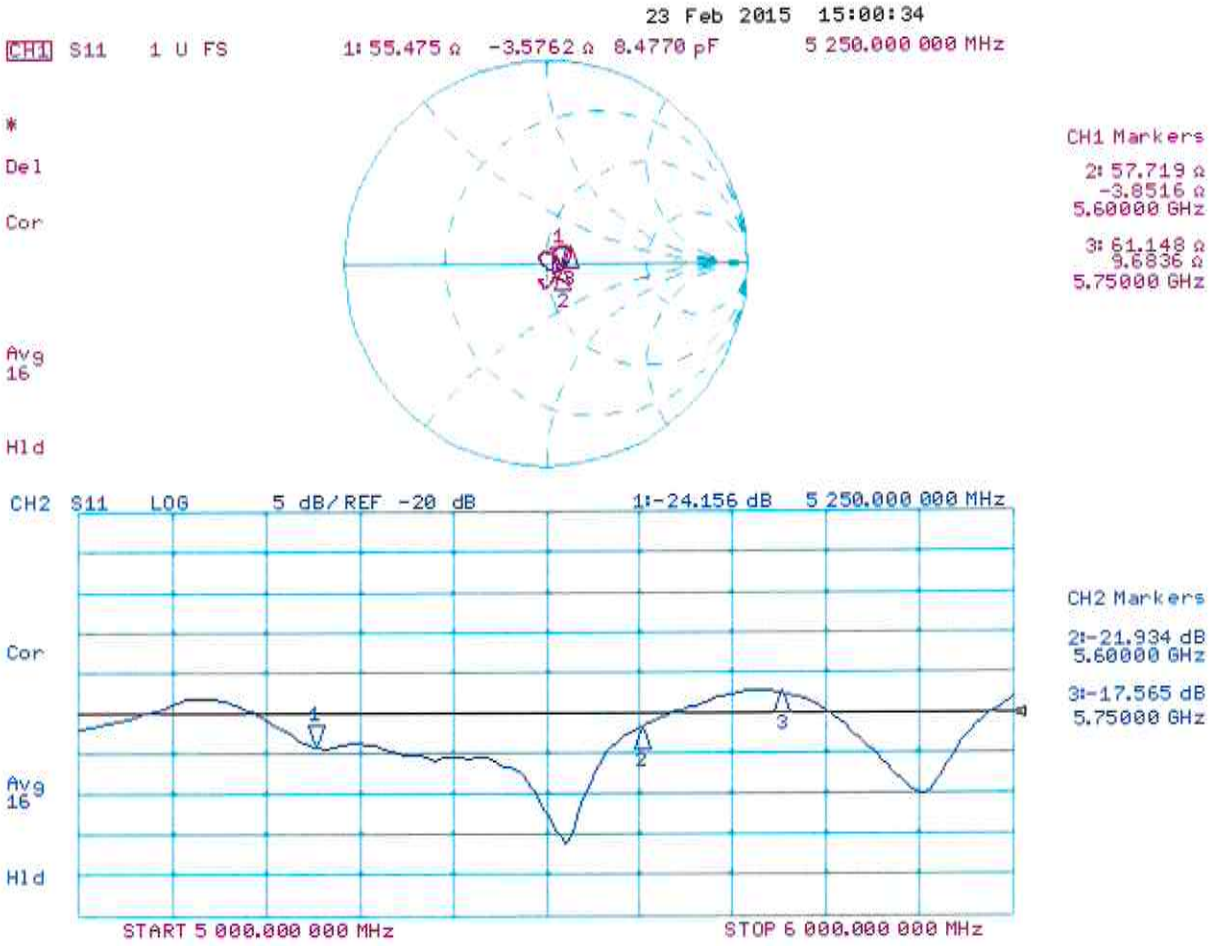
Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.02.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1016

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: f = 5250 MHz; σ = 5.51 S/m; ε_r = 48.4; ρ = 1000 kg/m^3 , Medium parameters used: f = 5600 MHz; σ = 5.99 S/m; ε_r = 47.7; ρ = 1000 kg/m^3 , Medium parameters used: f = 5750 MHz; σ = 6.22 S/m; ε_r = 47.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

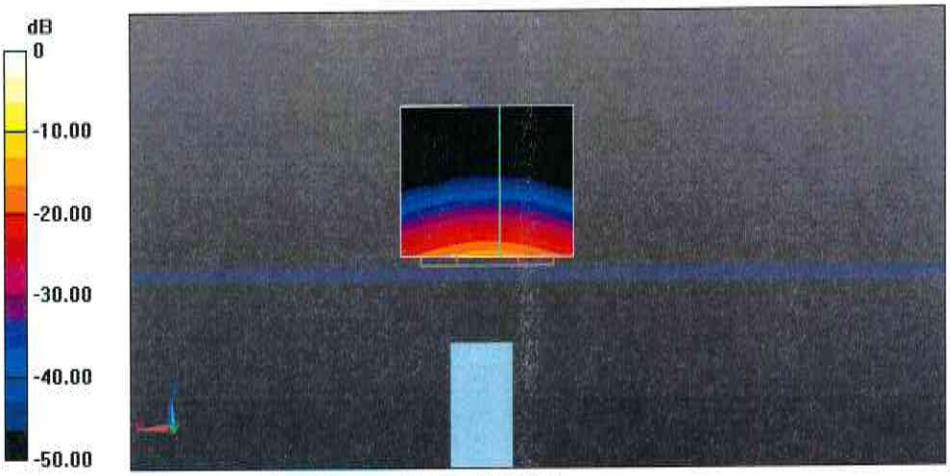
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.9, 4.9, 4.9); Calibrated: 30.12.2014, ConvF(4.35, 4.35, 4.35); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.41 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 30.2 W/kg
SAR(1 g) = 7.61 W/kg; SAR(10 g) = 2.12 W/kg
Maximum value of SAR (measured) = 17.9 W/kg

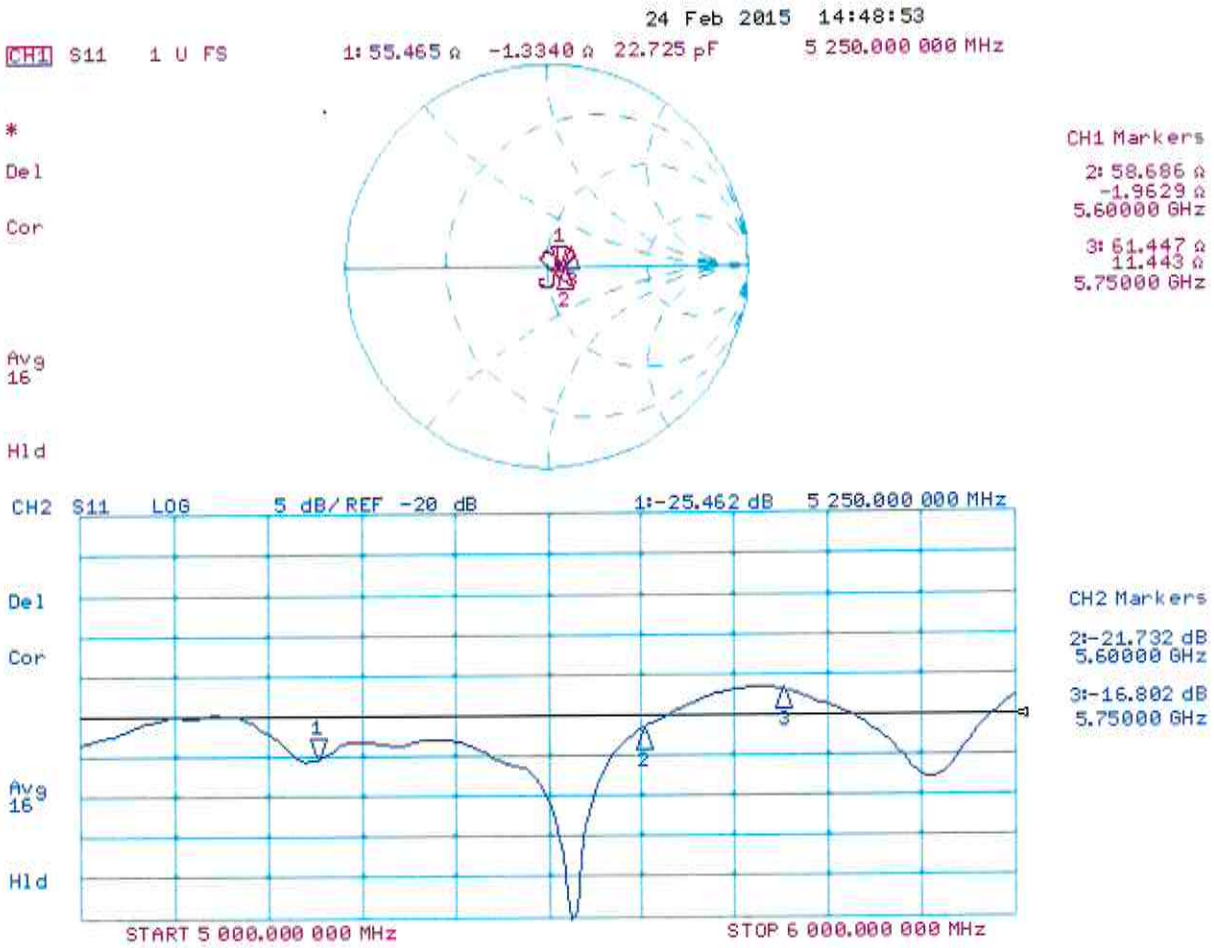
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 57.26 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 34.3 W/kg
SAR(1 g) = 7.78 W/kg; SAR(10 g) = 2.15 W/kg
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 54.77 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 7.45 W/kg; SAR(10 g) = 2.06 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 17.9 W/kg = 12.53 dBW/kg

Impedance Measurement Plot for Body TSL



12.6. Tissues-Equivalent Media Recipes

The body mixture consists of water, Polysorbate (Tween 20) and salt. 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 (% by weight)	Frequency 750/835/850/900 MHz	
	Head	Body
De-Ionized Water	52.87	71.30
Polysorbate 20	46.10	28.00
Salt	1.03	0.70

Ingredient (% by weight)	Frequency 1700/1800/1900 MHz	
	Head	Body
De-Ionized Water	55.40	71.50
Polysorbate 20	44.22	28.00
Salt	0.38	0.50

Ingredient (% by weight)	Frequency 2300/2450/2600 MHz	
	Head	Body
De-Ionized Water	55.75[(1)]	71.70
Polysorbate 20	45.25[(1)]	28.00
Salt	0.00	0.30

Stimulating Liquid for 3700 MHz to 5800 MHz are supplied and manufactured by SPEAG

Ingredient (% by weight)	Frequency
	3700 - 5800 MHz Head / Body
De-Ionized Water	~78.00
Mineral Oil	~11.00
Emulsifiers	~9.00
Additives and Salt	~2.00

Note(s):

1. As per the recipe provided by National Physical Laboratory, the 2450 MHz Head Fluid recipe is mixed to the total percentage of weight is by 101.0 %.

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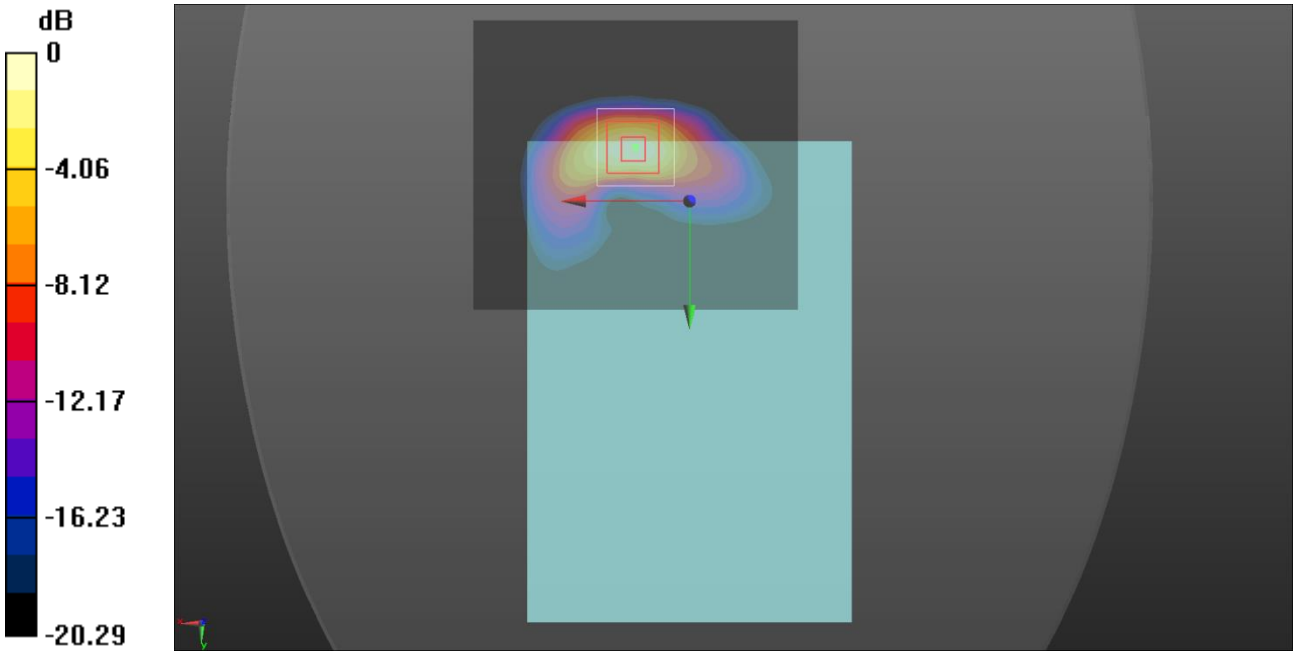
12.7. Baseline Plots

Back of EUT WCDMA Band 4 CH1513 UL VS Ltd

Date: 04/02/2015
DUT Model: A1490



0 dB = 0.647 W/kg = -1.89 dBW/kg

Communication System: UID 0, UMTS FDD (0); Frequency: 1732.6 MHz;Duty Cycle: 1:1
Medium: 1800MHz MSL Medium parameters used (interpolated): f = 1732.6 MHz; σ = 1.459 S/m; ε_r = 52.277; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: EX3DV4 - SN3994; ConvF(8.18, 8.18, 8.18); Calibrated: 07/05/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn450; Calibrated: 16/09/2014
- Phantom: ELI v5.0; Type: QDOVA002AA;
- ; SEMCAD X Version 14.6.10 (7164)

Configuration/Back - Middle 2/Area Scan (91x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.669 W/kg

Configuration/Back - Middle 2/Zoom Scan (5x5x7) 2 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.504 V/m; Power Drift = 0.36 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.581 W/kg; SAR(10 g) = 0.256 W/kg

Maximum value of SAR (measured) = 0.647 W/kg

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Back of EUT WCDMA Band 4 CH1513 – Extract from Original Report

Test Laboratory: UL Verification Services Inc. SAR Lab E Date: 8/22/2013

W-CDMA Band 4

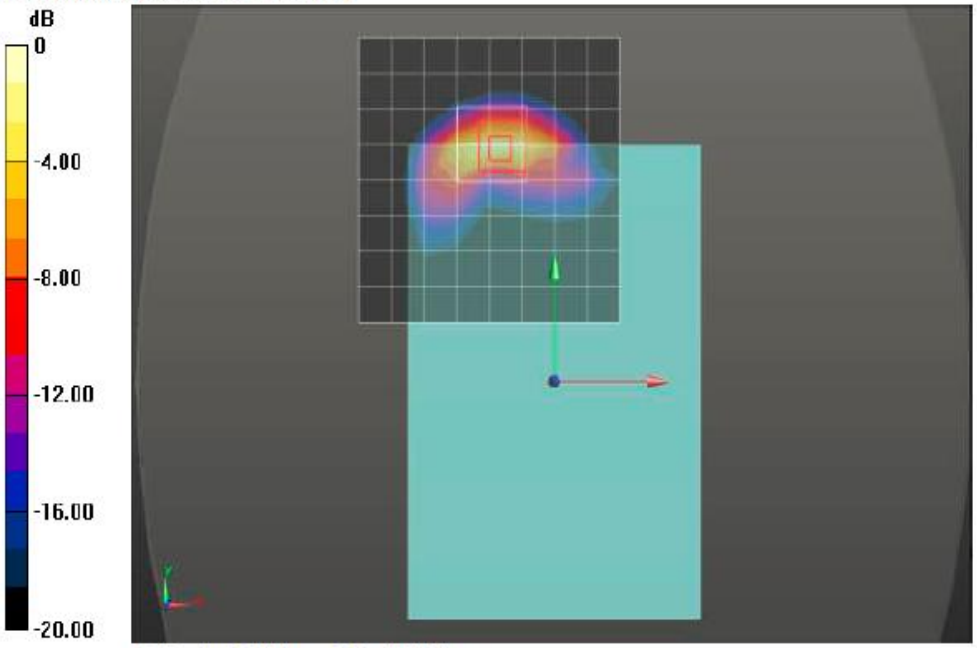
Frequency: 1752.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 1752.6 MHz; σ = 1.491 mho/m; ε_r = 51.654; ρ = 1000 kg/m^3
DASY5 Configuration:
- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1357; Calibrated: 2/5/2013
- Probe: EX3DV4 - SN3901; ConvF(8, 8, 8); Calibrated: 2/13/2013;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 A; Type: QDOVA002AA; Serial: 1180

Rear_Second Stage Prox. On_0 mm/Rel. 99_ch 1513/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.44 W/kg

Rear_Second Stage Prox. On_0 mm/Rel. 99_ch 1513/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.298 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.406 mW/g
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.526 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.53 W/kg



0 dB = 1.53 W/kg = 3.69 dB W/kg

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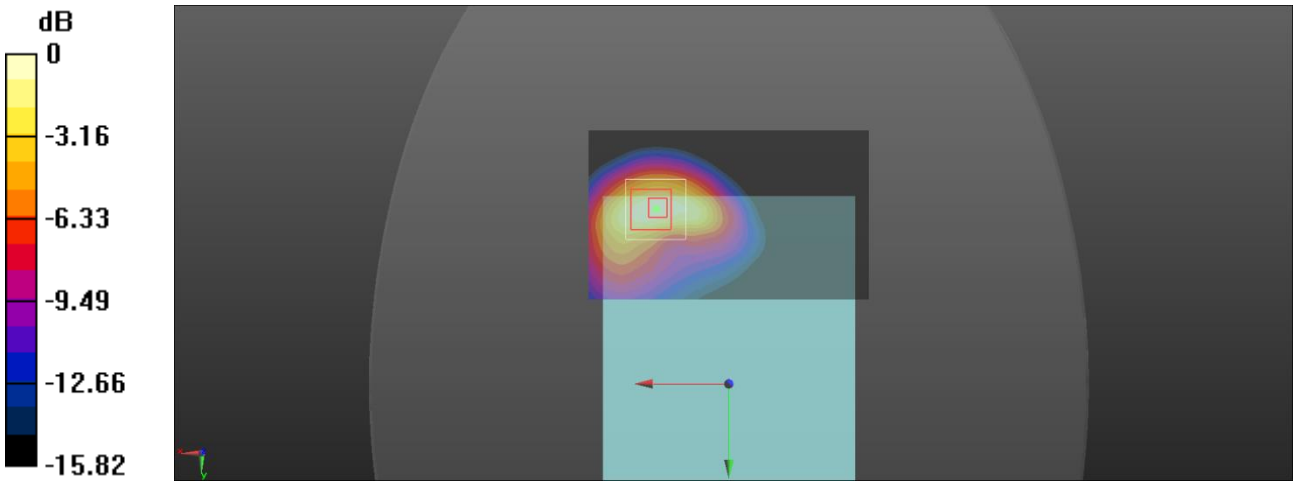
Back of EUT CDMA BC10 CH476 UL VS Ltd
Date: 04/12/2014
DUT Model: A1490



0 dB = 1.03 W/kg = 0.13 dBW/kg

Communication System: UID 0, CDMA2000 (0); Frequency: 817.9 MHz;Duty Cycle: 1:1
Medium: 900 MHz MSL Medium parameters used (interpolated): f = 817.9 MHz; σ = 0.993 S/m; ε_r = 53.527; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ES3DV3 - SN3335; ConvF(6.21, 6.21, 6.21); Calibrated: 29/08/2014;

- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/05/2014
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA;
- ; SEMCAD X Version 14.6.10 (7164)

Configuration/Front - High/Area Scan (101x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.997 W/kg
Configuration/Front - High/Zoom Scan (5x5x7) 2 2 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.523 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 0.881 W/kg; SAR(10 g) = 0.461 W/kg
Maximum value of SAR (measured) = 1.03 W/kg

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Back of EUT CDMA BC10 CH476 – Extract from Original Report

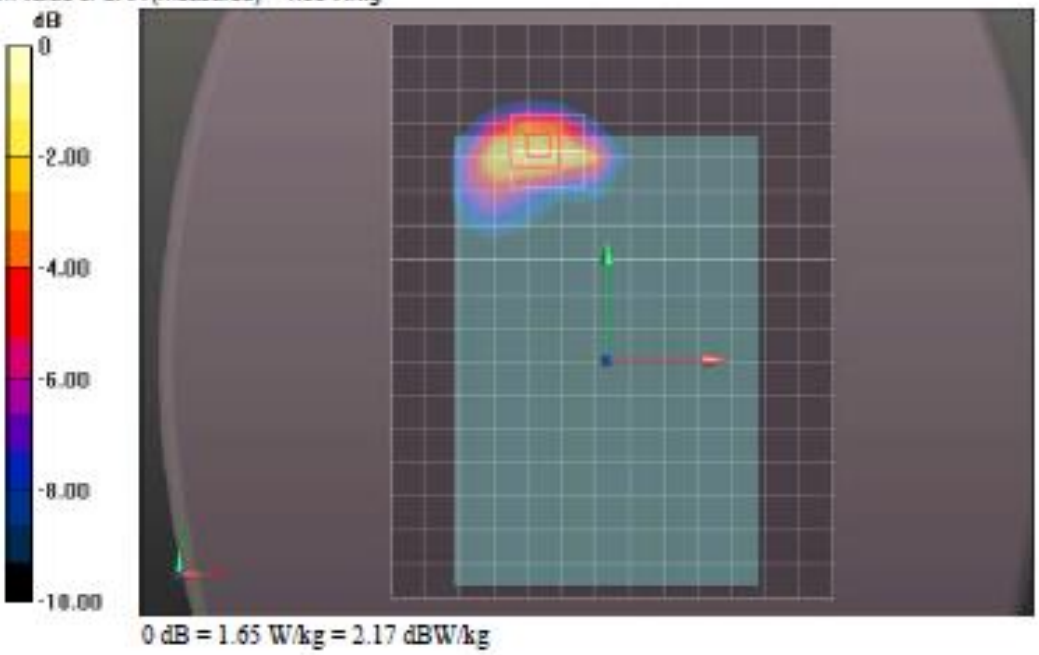
Test Laboratory: UL Verification Services Inc. SAR Lab B Date: 8/27/2013

CDMA BC10

Frequency: 817.9 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 23.0°C; Liquid Temperature: 22.0°C
Medium parameters used (interpolated): f = 817.9 MHz; σ = 1 S/m; ε_r = 53.009; ρ = 1000 kg/m^3
DASY5 Configuration:
- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/9/2013
- Probe: EX3DV4 - SN3751; ConvF(8.58, 8.58, 8.58); Calibrated: 11/15/2012;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Rear_Second Stage Prox. On_0 mm/1xRTT_RC3 SO32_ch 476/Area Scan (14x18x1):
Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.30 W/kg

Rear_Second Stage Prox. On_0 mm/1xRTT_RC3 SO32_ch 476/Zoom Scan (5x5x7)/Cube
0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 40.916 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 1.17 W/kg; SAR(10 g) = 0.601 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.65 W/kg



0 dB = 1.65 W/kg = 2.17 dBW/kg

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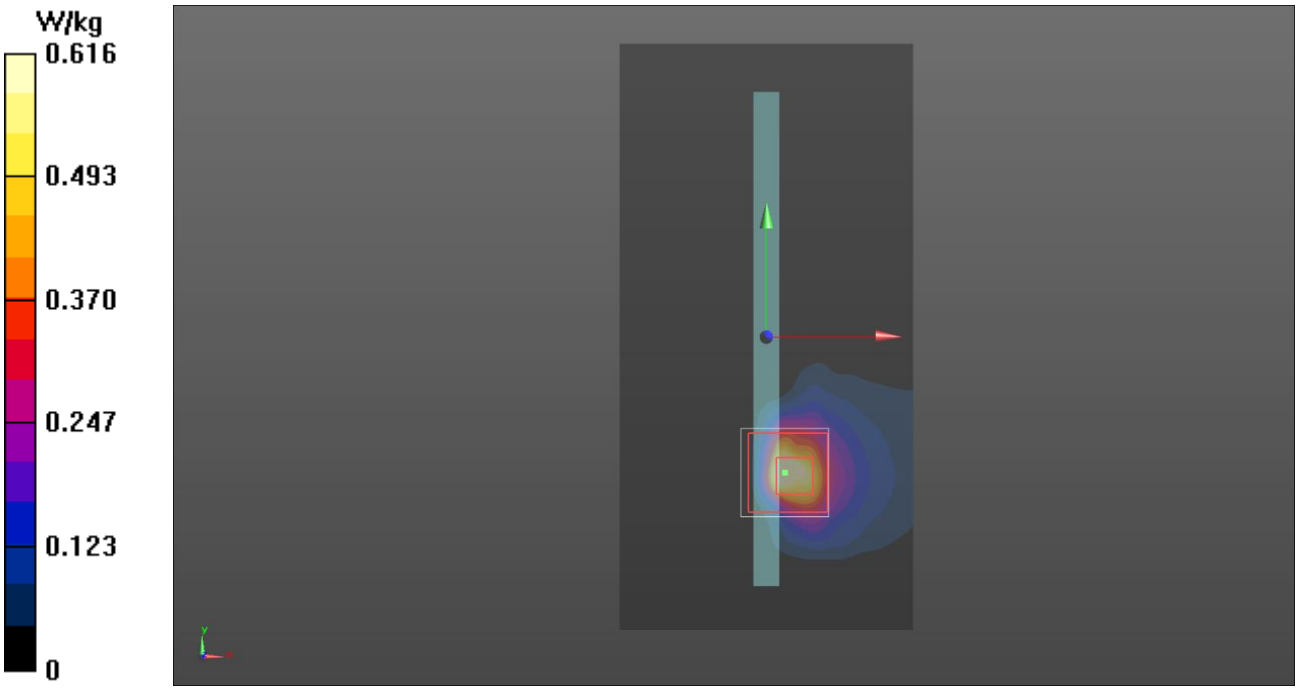
Bottom of EUT Wi-Fi 5.2GHz CH46 UL VS Ltd

Date: 31/03/2015
DUT Model: A1490



Communication System: UID 0, WLAN 802.11 (0); Frequency: 5230 MHz;Duty Cycle: 1:1
Medium: 5GHz MSL Medium parameters used (interpolated): f = 5230 MHz; σ = 5.365 S/m; ε_r = 47.852; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3814; ConvF(4.38, 4.38, 4.38); Calibrated: 18/09/2014;

- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 15/04/2014
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA;
- ; SEMCAD X Version 14.6.10 (7164)

Configuration/31-03-15 Ant 2 Cmd Bottom of EUT Facing Phantom 2 2 2/Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.727 W/kg
Configuration/31-03-15 Ant 2 Cmd Bottom of EUT Facing Phantom 2 2 2/Zoom Scan (7x7x12) (7x7x12)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.334 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.509 W/kg; SAR(10 g) = 0.147 W/kg
Maximum value of SAR (measured) = 0.616 W/kg

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Bottom of EUT Wi-Fi 5.2GHz CH46 – Extract from Original Report

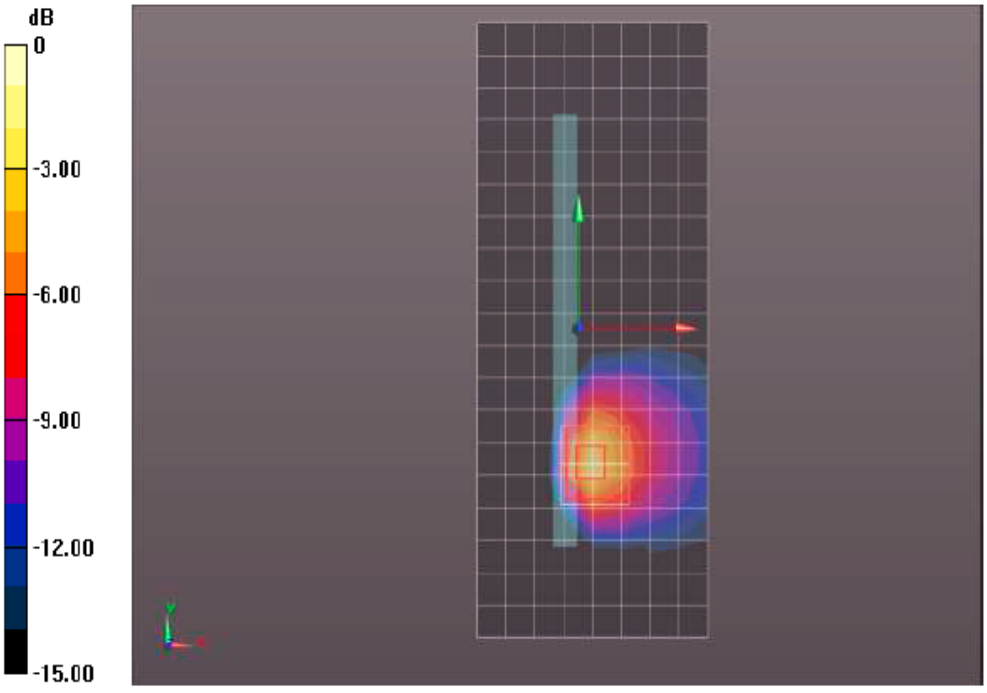
Test Laboratory: Lab A Date: 8/23/2013

WiFi 5.2GHz (WiFi 2)

Frequency: 5230 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: f = 5230 MHz; σ = 5.277 mho/m; ε_r = 47.769; ρ = 1000 kg/m^3
DASY5 Configuration:
- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1263; Calibrated: 1/14/2013
- Probe: EX3DV4 - SN3778; ConvF(4.14, 4.14, 4.14); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1134

Edge 3/802.11n_HT40_Ch 46/Area Scan (9x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.480 mW/g

Edge 3/802.11n_HT40_Ch 46/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 16.263 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 3.6420
SAR(1 g) = 0.866 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 1.742 mW/g



0 dB = 1.740mW/g = 4.81 dB mW/g

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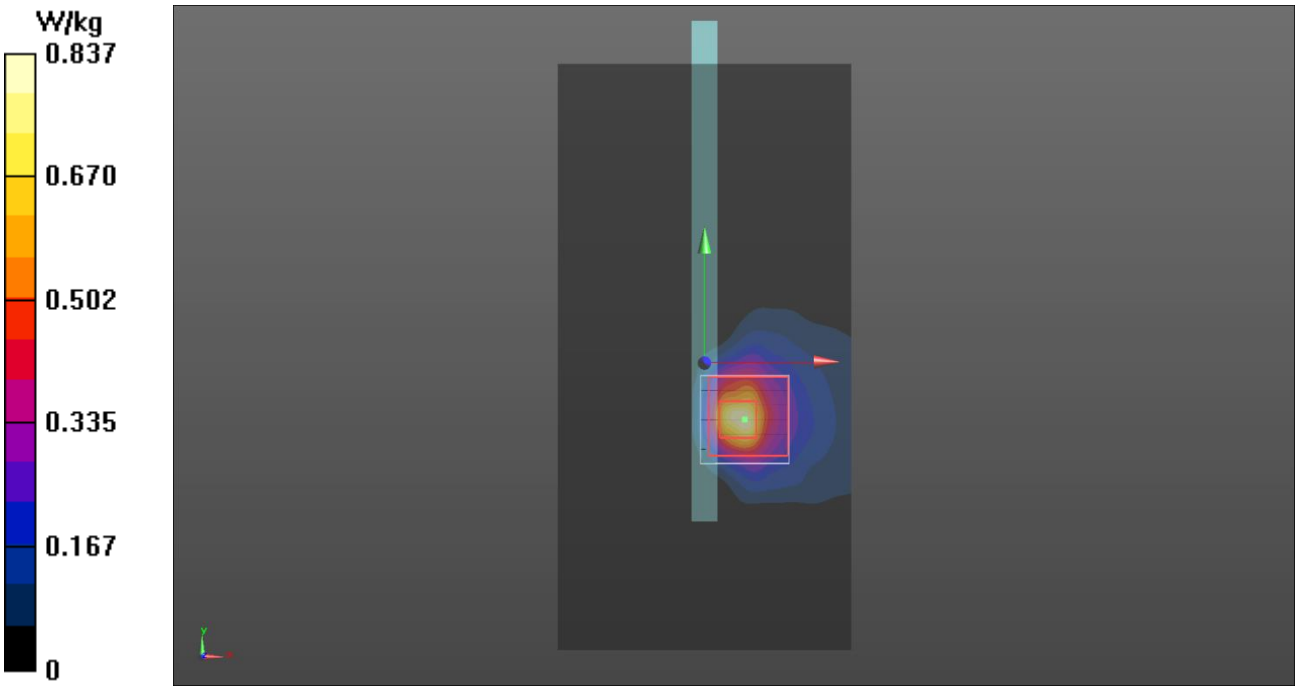
Bottom of EUT Wi-Fi 5.3GHz CH60 UL VS Ltd

Date: 01/04/2015
DUT Model: A1490



Communication System: UID 0, WLAN 802.11 (0); Frequency: 5300 MHz;Duty Cycle: 1:1
Medium: 5GHz MSL Medium parameters used: f = 5300 MHz; σ = 5.444 S/m; ε_r = 47.53; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3814; ConvF(4.18, 4.18, 4.18); Calibrated: 18/09/2014;

- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 15/04/2014
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA;
- ; SEMCAD X Version 14.6.10 (7164)

Configuration/31-03-15 Ant 2 Cmd Bottom of EUT Facing Phantom 2 2 2 2/Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.837 W/kg
Configuration/31-03-15 Ant 2 Cmd Bottom of EUT Facing Phantom 2 2 2 2/Zoom Scan (7x7x12) (7x7x12)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 12.007 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 2.05 W/kg
SAR(1 g) = 0.614 W/kg; SAR(10 g) = 0.196 W/kg
Maximum value of SAR (measured) = 0.766 W/kg

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Bottom of EUT Wi-Fi 5.3GHz CH60 – Extract from Original Report

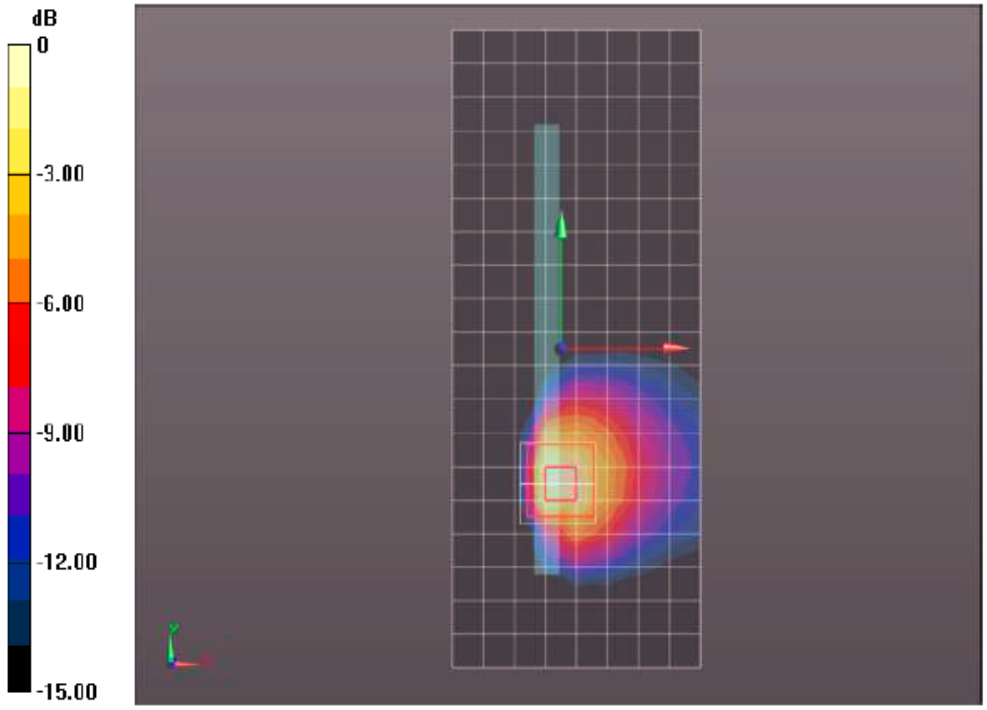
Test Laboratory: Lab B Date: 8/29/2013

WiFi 5.3GHz (WiFi 2)

Frequency: 5300 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: f = 5300 MHz; σ = 5.365 mho/m; ε_r = 47.803; ρ = 1000 kg/m^3
DASY5 Configuration:
- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1264; Calibrated: 1/14/2013
- Probe: EX3DV4 - SN3720; ConvF(3.98, 3.98, 3.98); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Edge 3/802.11a_Ch 60/Area Scan (9x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.852 mW/g

Edge 3/802.11a_Ch 60/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 19.201 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 4.1040
SAR(1 g) = 0.970 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 2.024 mW/g



0 dB = 2.020mW/g = 6.11 dB mW/g

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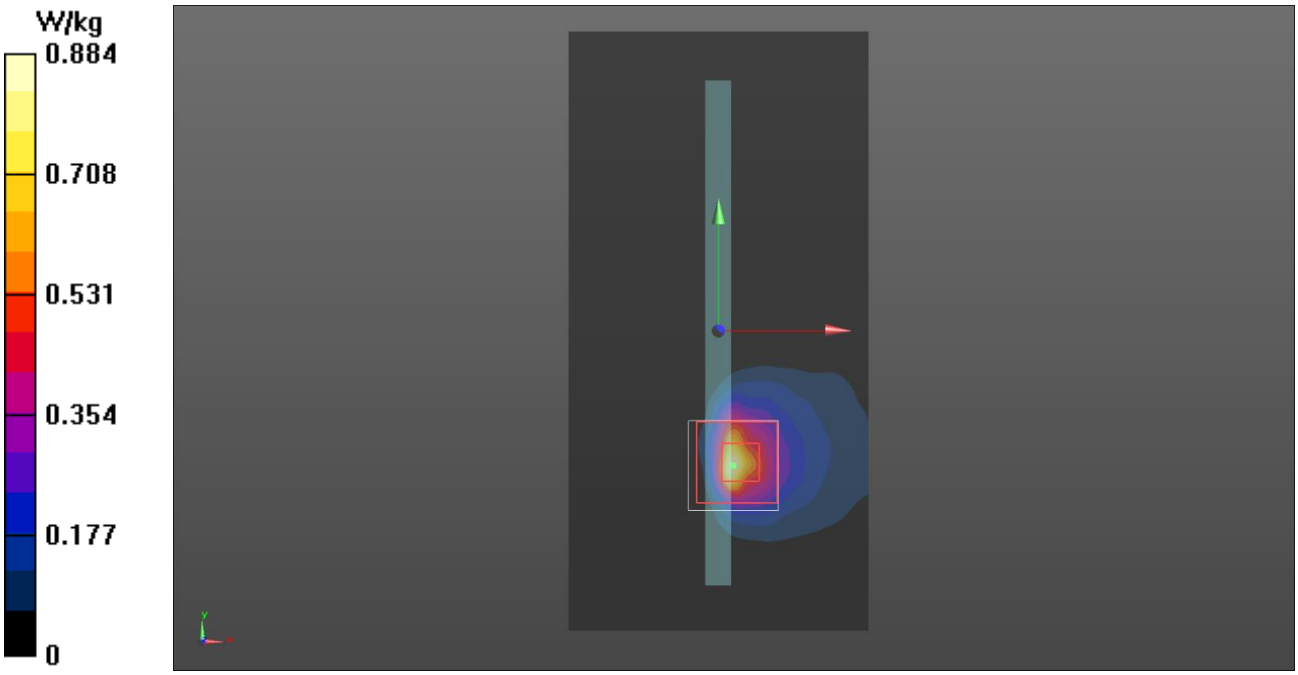
Bottom of EUT Wi-Fi 5.8GHz CH157 UL VS Ltd

Date: 01/04/2015
DUT Model: A1490



Communication System: UID 0, WLAN 802.11 (0); Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: 5GHz MSL Medium parameters used (interpolated): f = 5785 MHz; σ = 6.194 S/m; ε_r = 46.477; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3814; ConvF(4.06, 4.06, 4.06); Calibrated: 18/09/2014;

- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 15/04/2014
- Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA;
- ; SEMCAD X Version 14.6.10 (7164)

Configuration/31-03-15 Ant 2 Cmd Bottom of EUT Facing Phantom 2 2 2 2/Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.884 W/kg
Configuration/31-03-15 Ant 2 Cmd Bottom of EUT Facing Phantom 2 2 2 2/Zoom Scan (7x7x12) (7x7x12)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.198 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 0.522 W/kg; SAR(10 g) = 0.166 W/kg
Maximum value of SAR (measured) = 0.599 W/kg

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Bottom of EUT Wi-Fi 5.8GHz CH157 – Extract from Original Report

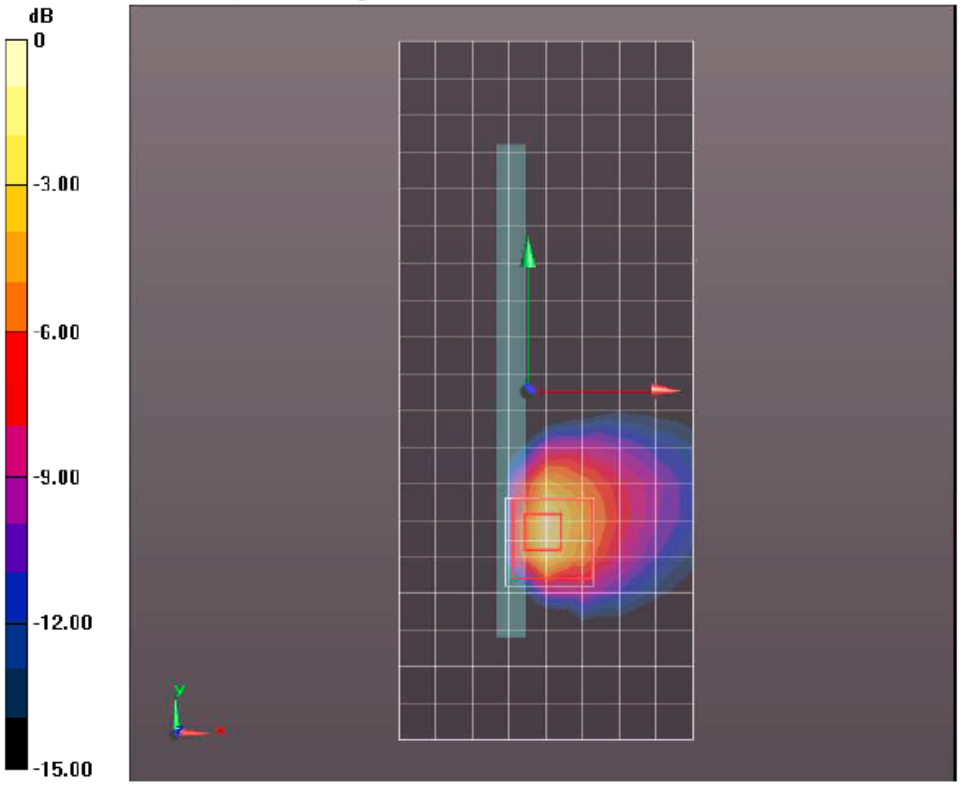
Test Laboratory: Lab D Date: 8/27/2013

WiFi 5.8GHz (WiFi 2)

Frequency: 5785 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: f = 5785 MHz; σ = 6.084 mho/m; ε_r = 46.637; ρ = 1000 kg/m^3
DASY5 Configuration:
- Area Scan Setting: Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn1278; Calibrated: 1/30/2013
- Probe: EX3DV4 - SN3676; ConvF(3.92, 3.92, 3.92); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1135

Edge 3/802.11a_Ch 157/Area Scan (9x20x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.276 mW/g

Edge 3/802.11a_Ch 157/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 14.898 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 3.0610
SAR(1 g) = 0.703 mW/g; SAR(10 g) = 0.213 mW/g
Maximum value of SAR (measured) = 1.432 mW/g



0 dB = 1.430mW/g = 3.11 dB mW/g

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