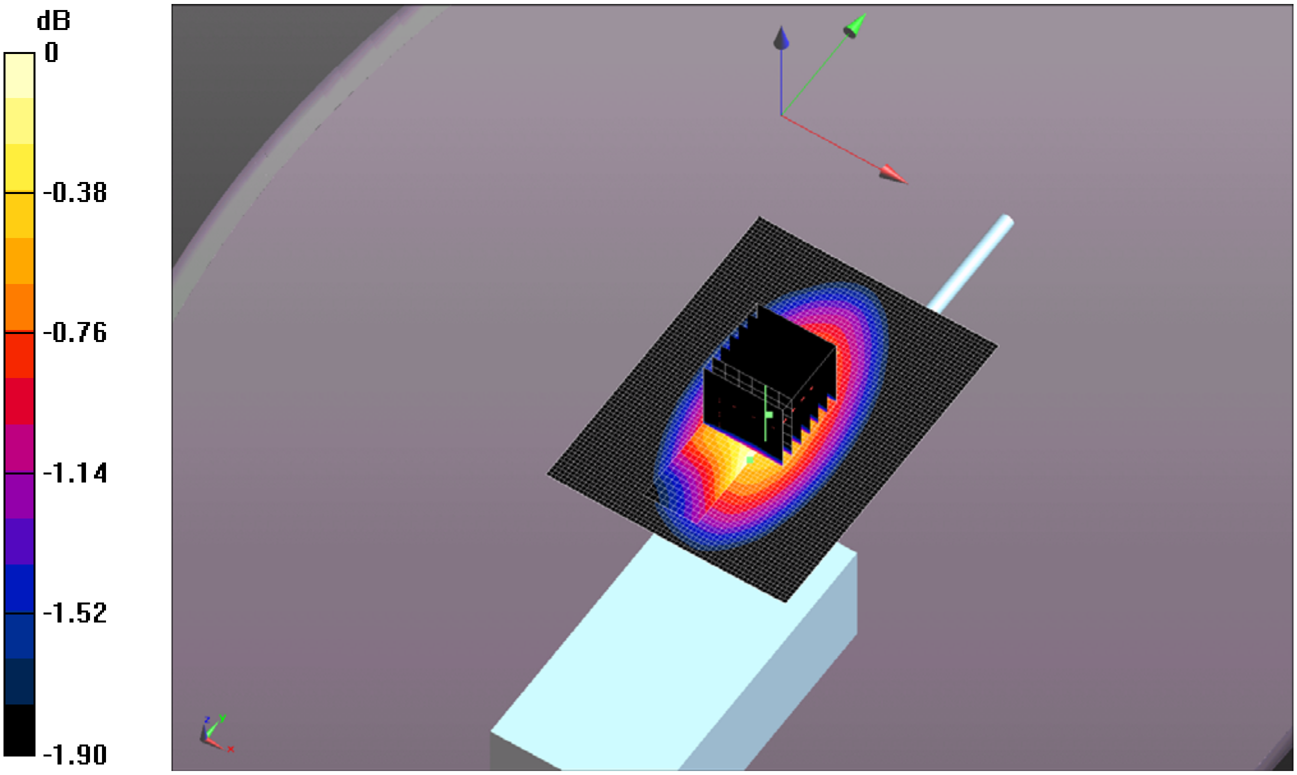
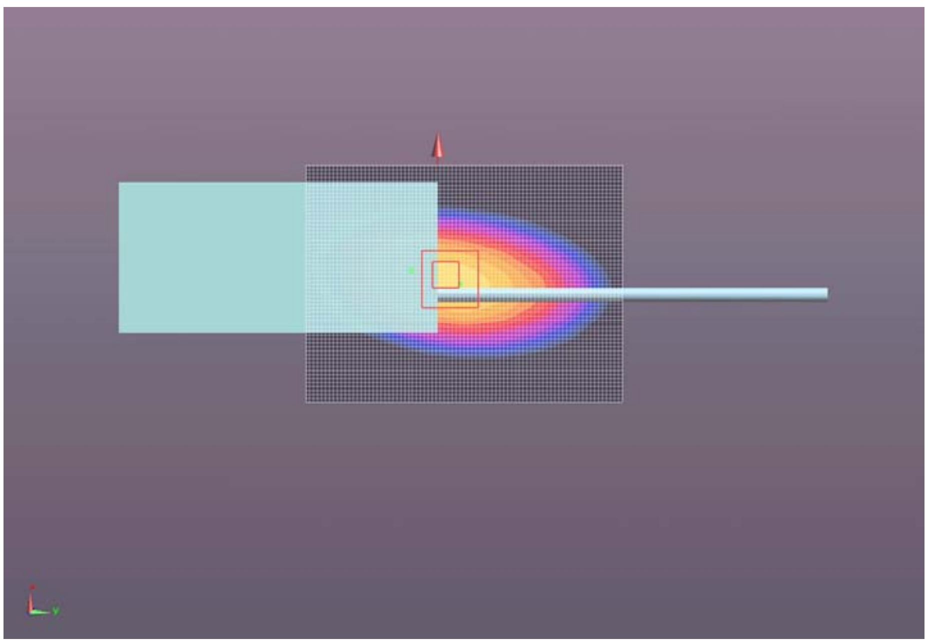
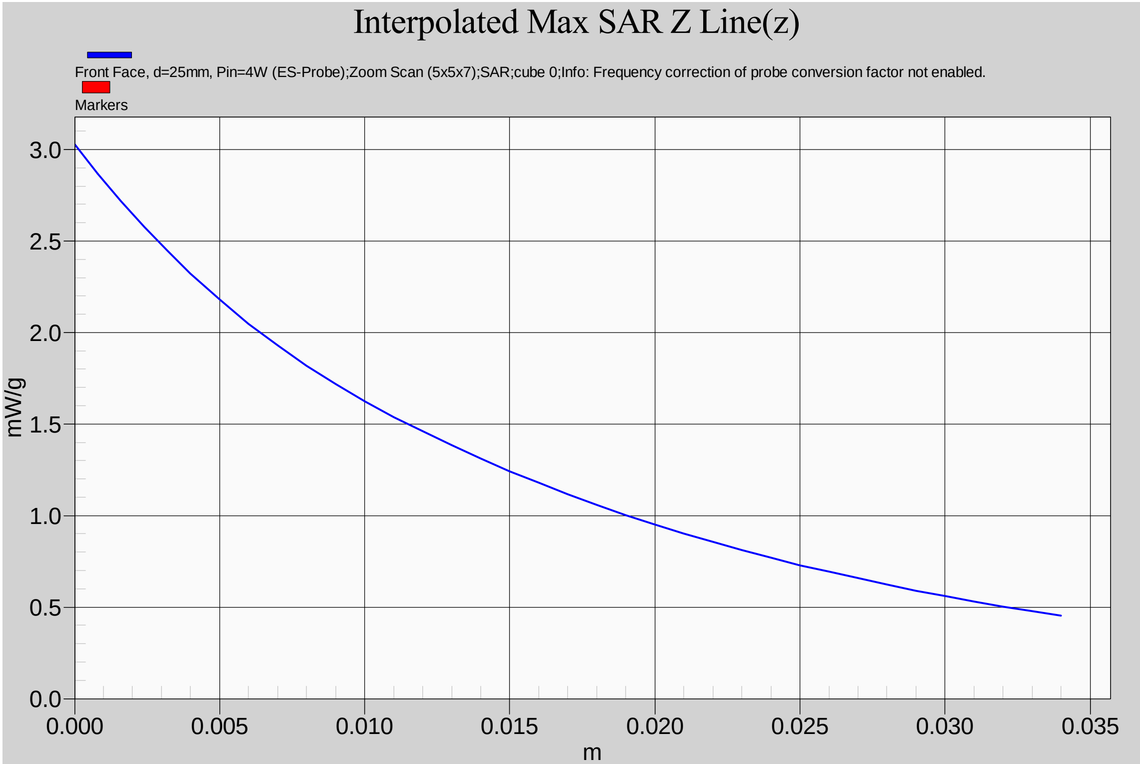


0 dB = 2.780mW/g = 8.88 dB mW/g




Interpolated Max SAR Z Line(z)
Front Face, d=25mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.2.10. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=142mm; 406.1 MHz; #17

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=142mm_Head_406.1MHz(Lf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

Communication System: CW; Frequency: 406.1 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406.1 MHz; σ = 0.833 mho/m; ε_r = 44.368; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7.1, 7.1, 7.1); Calibrated: 3/15/2011
- Sensor-Surface: 3.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Configuration_Head_FA-SC61UC=142mm_LF/Front Face, d=25mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm

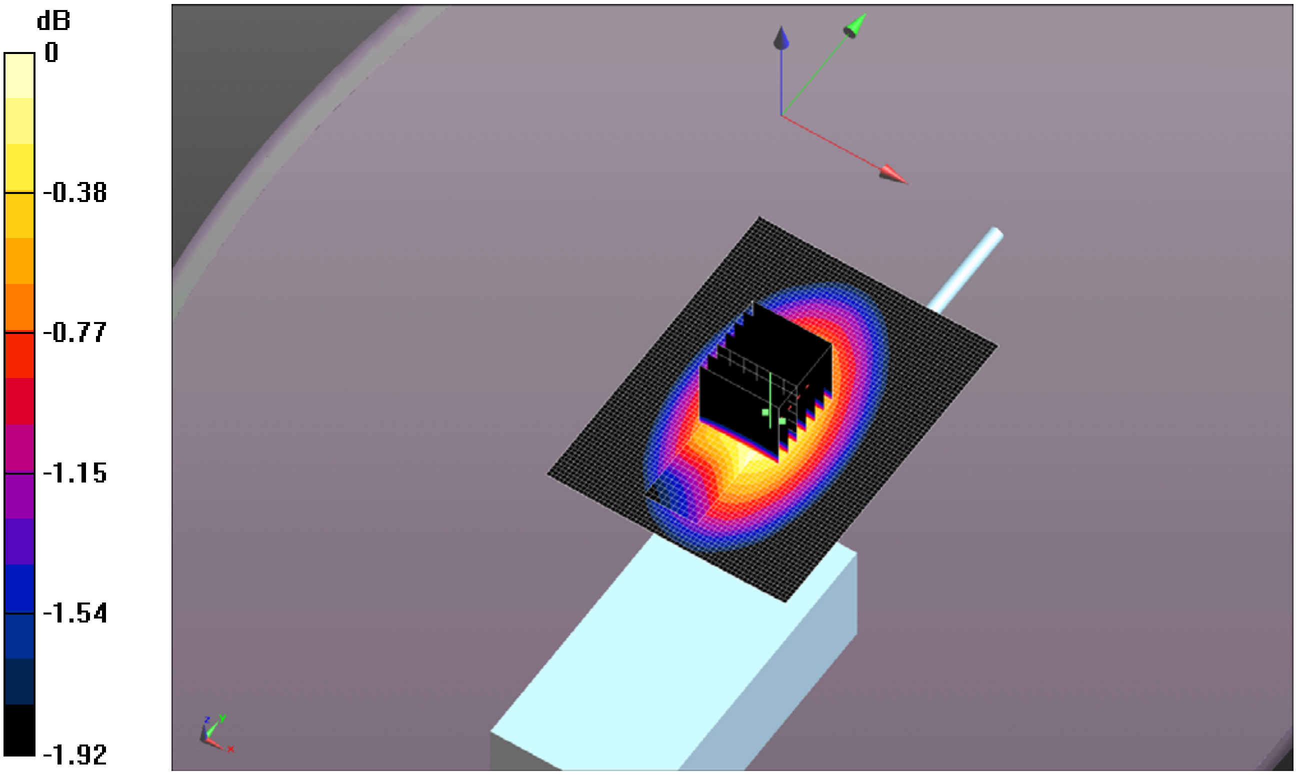
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 3.317 mW/g

Configuration_Head_FA-SC61UC=142mm_LF/Front Face, d=25mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.136 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 3.9160
SAR(1 g) = 3.04 mW/g; SAR(10 g) = 2.29 mW/g (SAR corrected for target medium)

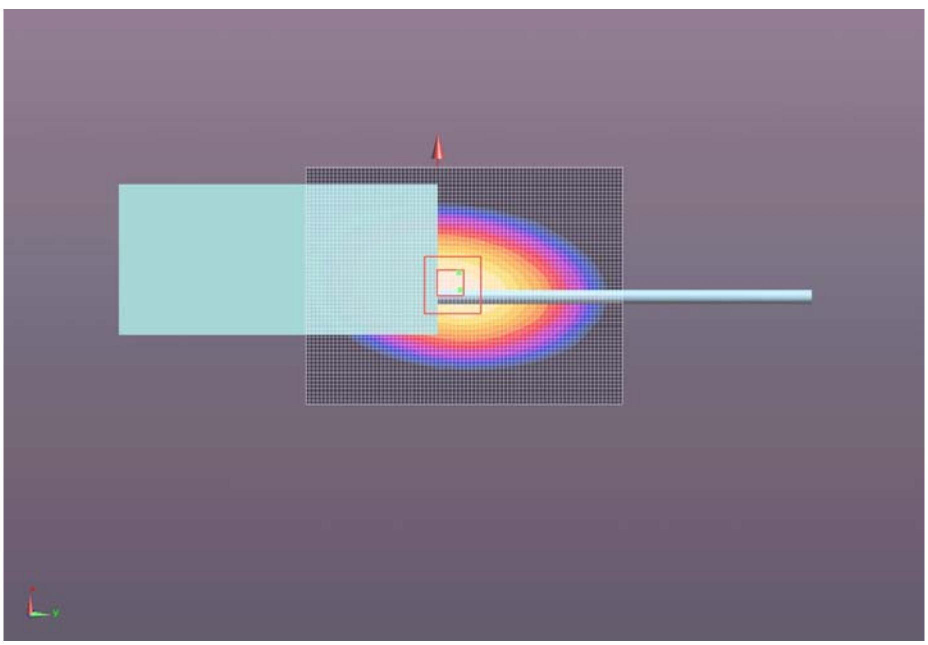
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.053 mW/g

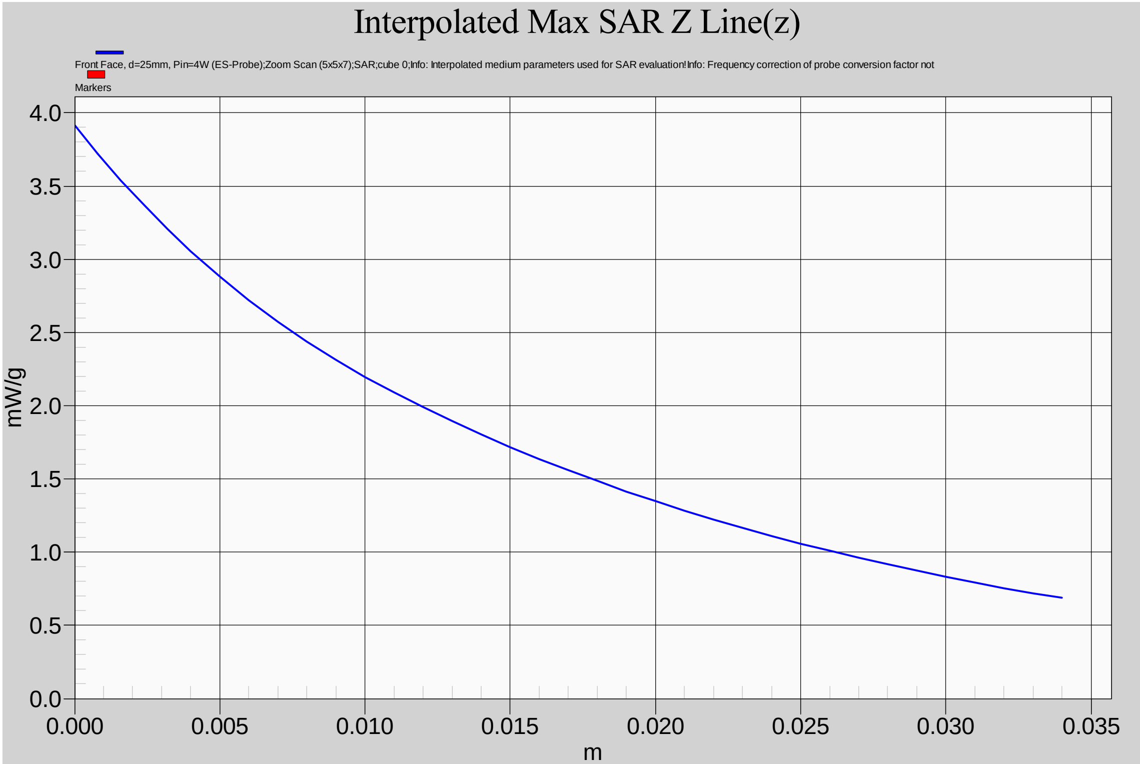
Configuration_Head_FA-SC61UC=142mm_LF/Front Face, d=25mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 3.353 mW/g



0 dB = 3.350mW/g = 10.50 dB mW/g




Interpolated Max SAR Z Line(z)
Front Face, d=25mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Interpolated medium parameters used for SAR evaluation!Info: Frequency correction of probe conversion factor not
Markers
mW/g
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.2.11. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=142mm; 430 MHz; #18

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=142mm_Head_430MHz(Mf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

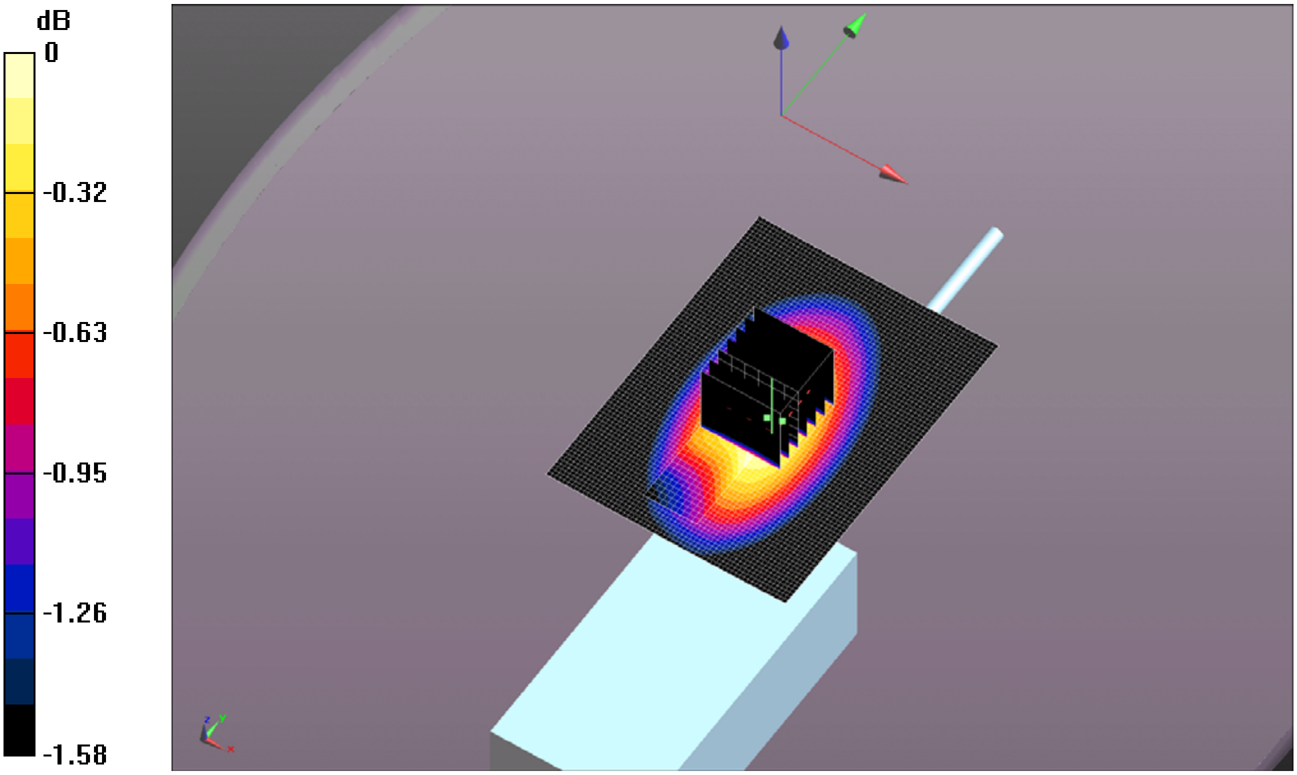
Communication System: CW; Frequency: 430 MHz; Duty Cycle: 1:1
Medium parameters used: f = 430 MHz; σ = 0.856 mho/m; ε_r = 43.777; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7.1, 7.1, 7.1); Calibrated: 3/15/2011
- Sensor-Surface: 3.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

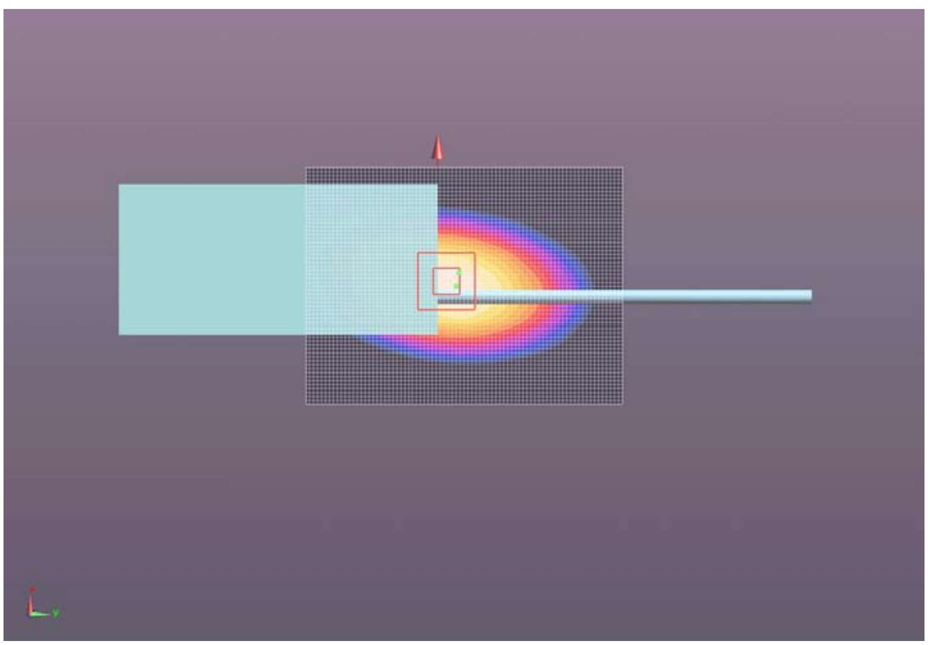
Configuration_Head_FA-SC61UC=142mm_MF/Front Face, d=25mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.732 mW/g

Configuration_Head_FA-SC61UC=142mm_MF/Front Face, d=25mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 74.073 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 5.3380
SAR(1 g) = 4.03 mW/g; SAR(10 g) = 3.03 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.157 mW/g

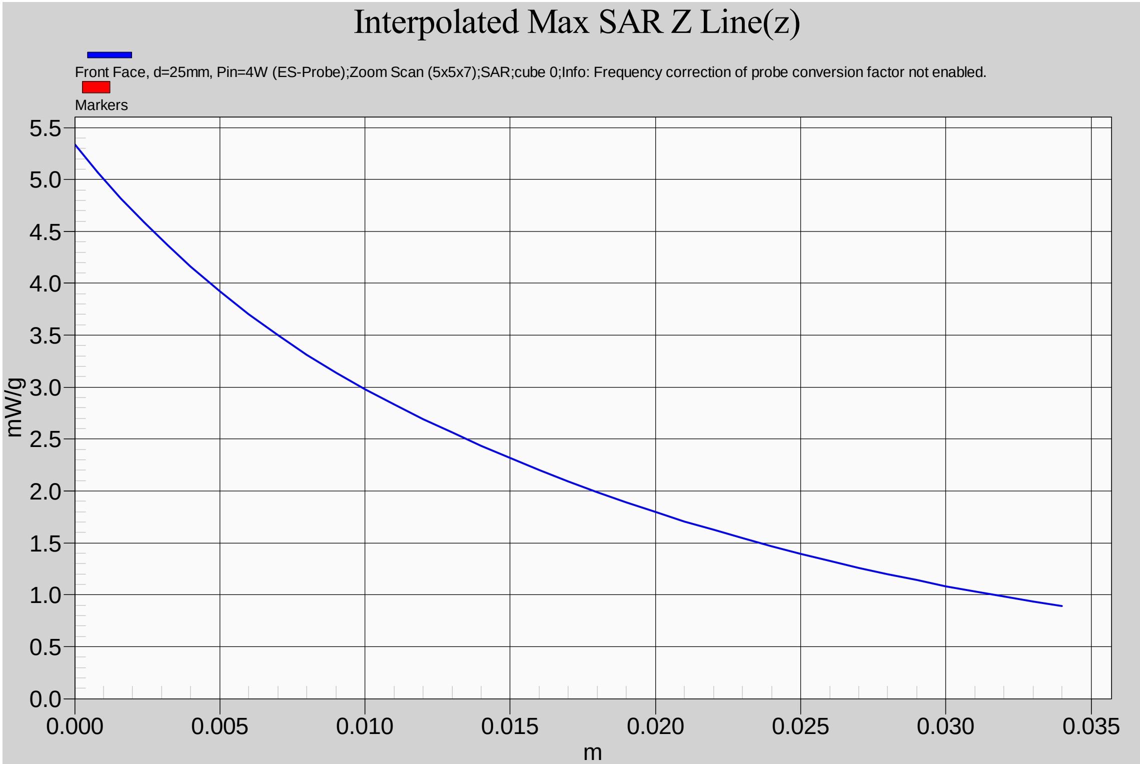
Configuration_Head_FA-SC61UC=142mm_MF/Front Face, d=25mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 4.755 mW/g



0 dB = 4.750mW/g = 13.53 dB mW/g



- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*


Interpolated Max SAR Z Line(z)
Front Face, d=25mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.2.12. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=142mm; 460 MHz; #19

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=142mm_Head_460MHz(Hf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

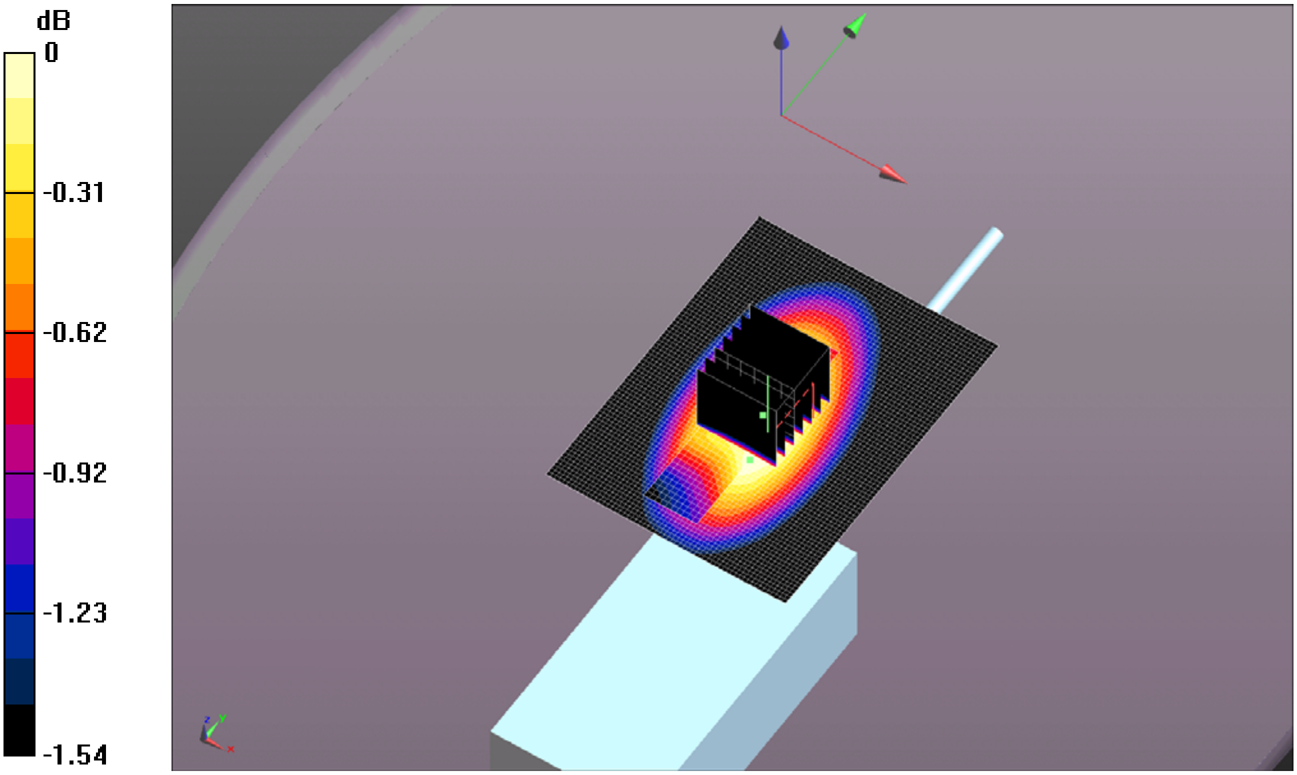
Communication System: CW; Frequency: 460 MHz; Duty Cycle: 1:1
Medium parameters used: f = 460 MHz; σ = 0.882 mho/m; ε_r = 43.174; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7.1, 7.1, 7.1); Calibrated: 3/15/2011
- Sensor-Surface: 3.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

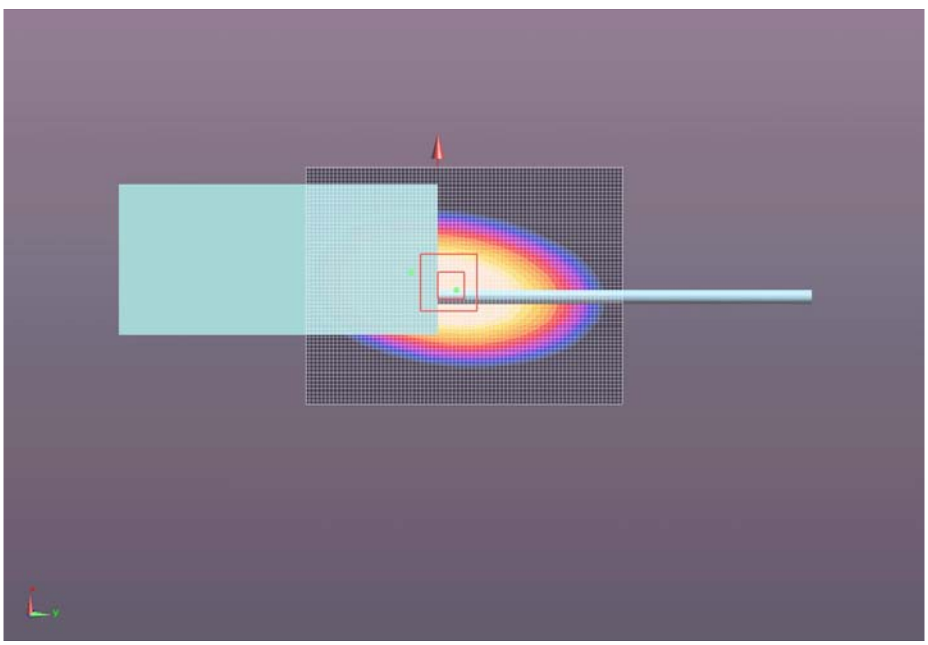
Configuration_Head_FA-SC61UC=142mm_HF/Front Face, d=25mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.646 mW/g

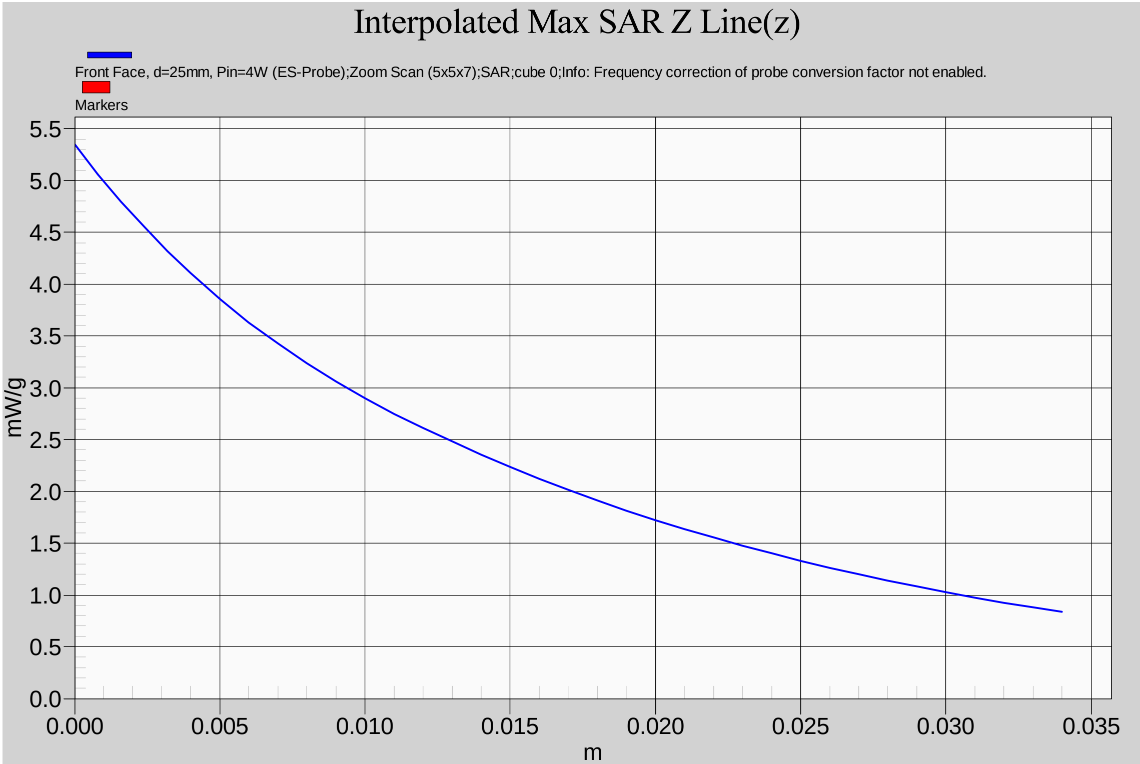
Configuration_Head_FA-SC61UC=142mm_HF/Front Face, d=25mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 70.878 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 5.3480
SAR(1 g) = 3.87 mW/g; SAR(10 g) = 2.9 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.102 mW/g

Configuration_Head_FA-SC61UC=142mm_HF/Front Face, d=25mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 4.441 mW/g



0 dB = 4.440mW/g = 12.95 dB mW/g




Interpolated Max SAR Z Line(z)
Front Face, d=25mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3. Body Configuration Result* for Cut Antenna (FA-SC61UC)

#	Configuration	Antenna Position	Frequency [MHz]	Channel	MAX SAR_{1g} [W/Kg]
*	Occupational/Controlled Exposure Category Limit				8.0
20	¼ helical whip cut antenna (M/N: FA-SC61UC, 360~520 MHz, white ring) 50% duty cycle for PTT; Antenna Length=165mm MB-94 Clip, HM-159LA Speaker Microphone	FIX	406.1	Low	4.71
21		FIX	435	Middle	2.11
22		FIX	469.9	High	0.88
23	¼ helical whip antenna (M/N: FA-SC61UC, 360~520 MHz, white ring) 50% duty cycle for PTT; Antenna Length=156mm MB-94 Clip, HM-159LA Speaker Microphone	FIX	406.1	Low	**4.78**
24		FIX	420	Middle	4.12
25		FIX	469.9	High	1.38
26		FIX	445	Option	2.64
27	¼ helical whip antenna (M/N: FA-SC61UC, 360~520 MHz, white ring) 50% duty cycle for PTT; Antenna Length=148mm MB-94 Clip, HM-159LA Speaker Microphone	FIX	406.1	Low	3.57
28		FIX	440	Middle	3.61
29		FIX	469.9	High	2.07
30		FIX	420	Option	-
31	¼ helical whip antenna (M/N: FA-SC61UC, 360~520 MHz, white ring) 50% duty cycle for PTT; Antenna Length=142mm MB-94 Clip, HM-159LA Speaker Microphone	FIX	406.1	Low	2.79
32		FIX	430	Middle	3.38
33		FIX	460	High	3.35

*

6.5.3.1. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=165mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 406.1 MHz; #20

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=165mm_Body_406.1MHz(Lf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

Communication System: CW; Frequency: 406.1 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406.1 MHz; $\sigma = 0.899$ mho/m; $\varepsilon_r = 56.941$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Configuration_Body_FA-SC61UC=165mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm

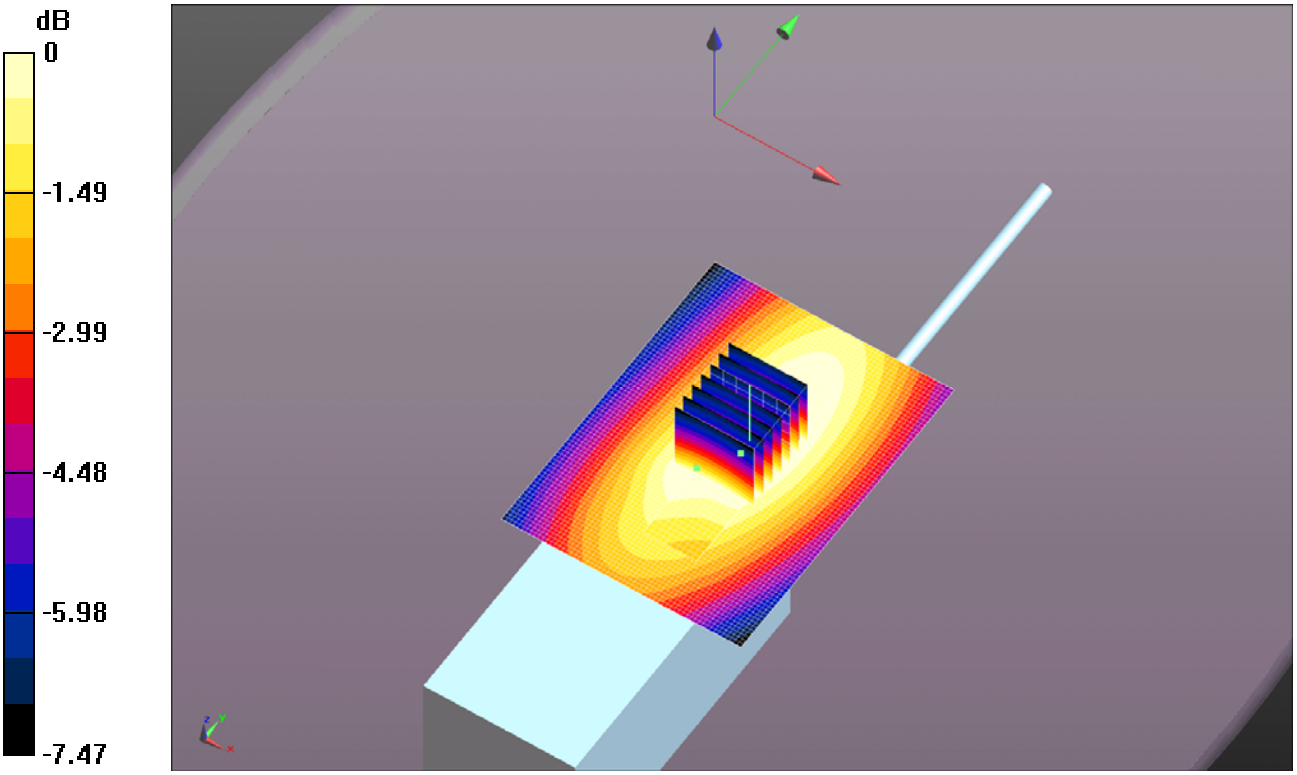
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 9.959 mW/g

Configuration_Body_FA-SC61UC=165mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm

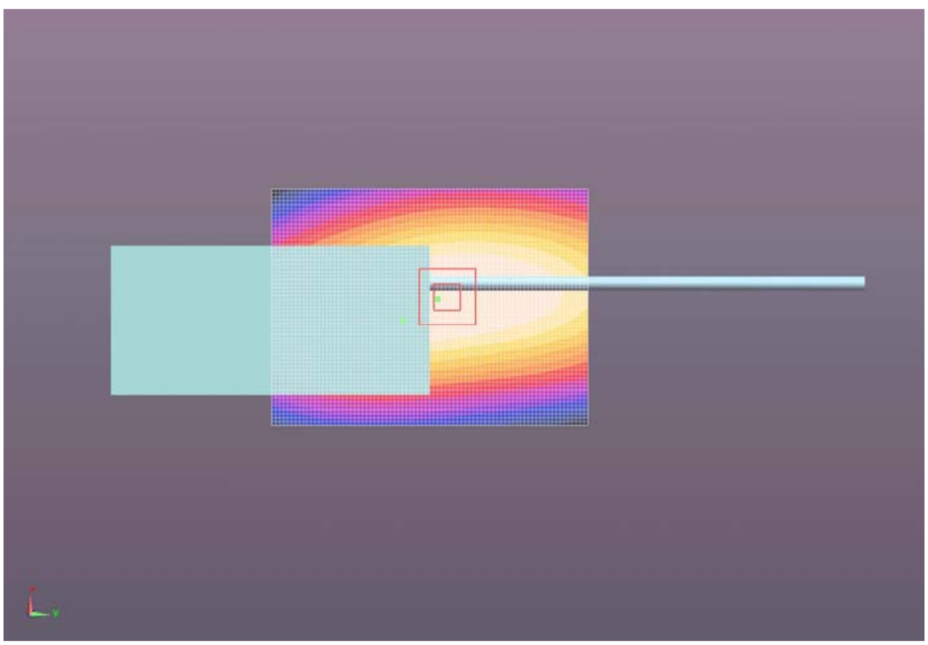
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 10.416 mW/g

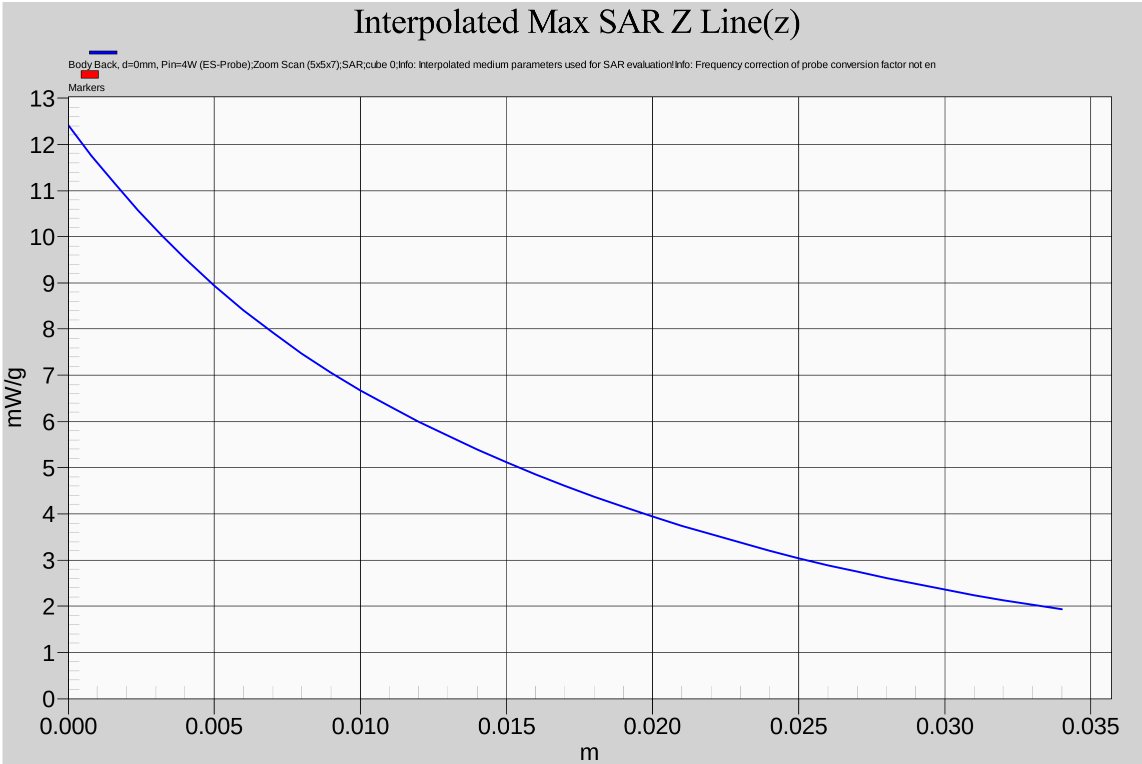
Configuration_Body_FA-SC61UC=165mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.2 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 12.4180
SAR(1 g) = 9.41 mW/g; SAR(10 g) = 6.93 mW/g (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 9.521 mW/g



0 dB = 9.520mW/g = 19.57 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Interpolated medium parameters used for SAR evaluation!Info: Frequency correction of probe conversion factor not en
Markers
mW/g
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.2. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=165mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 435 MHz; #21

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=165mm_Body_435MHz(Mf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

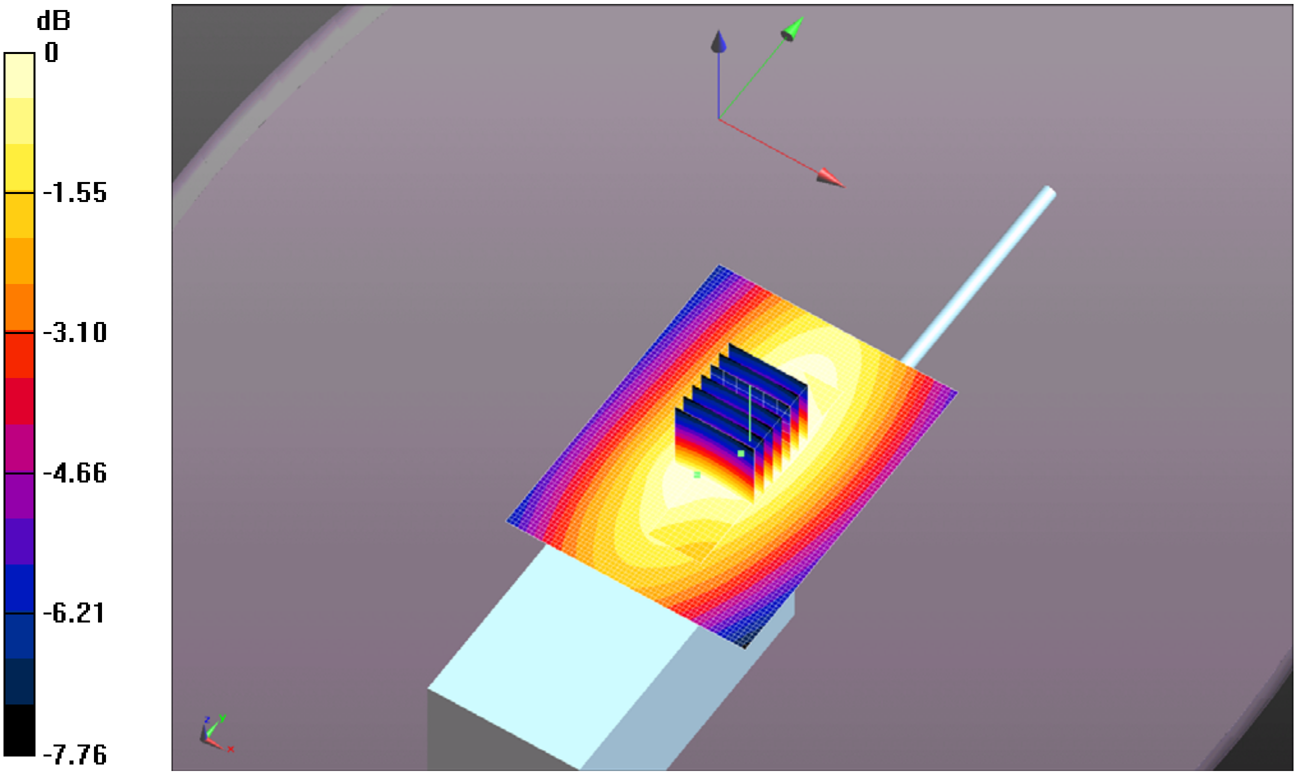
Communication System: CW; Frequency: 435 MHz; Duty Cycle: 1:1
Medium parameters used: f = 435 MHz; σ = 0.927 mho/m; ε_r = 56.417; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

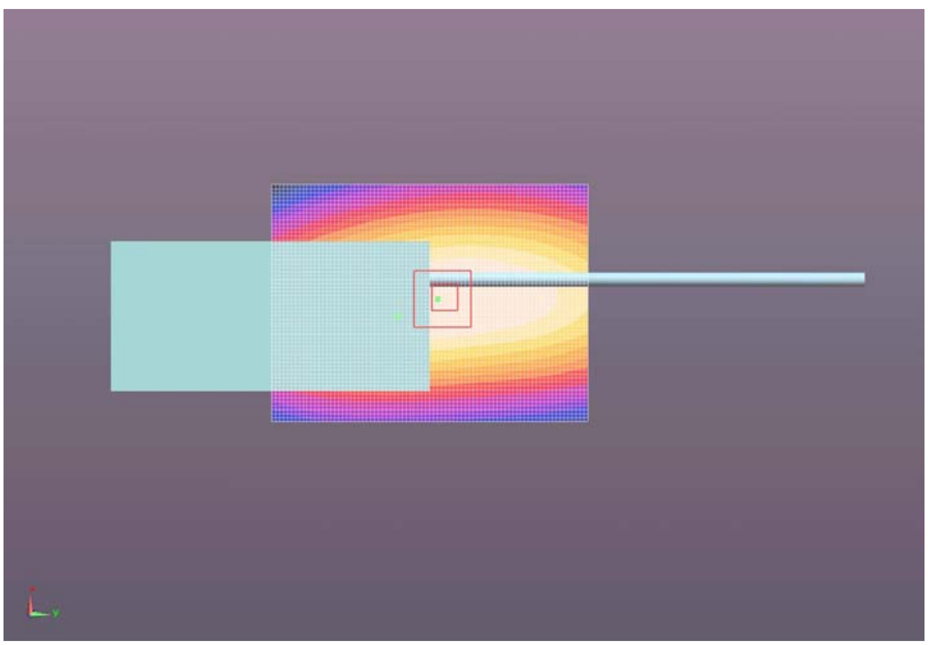
Configuration_Body_FA-SC61UC=165mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 4.617 mW/g

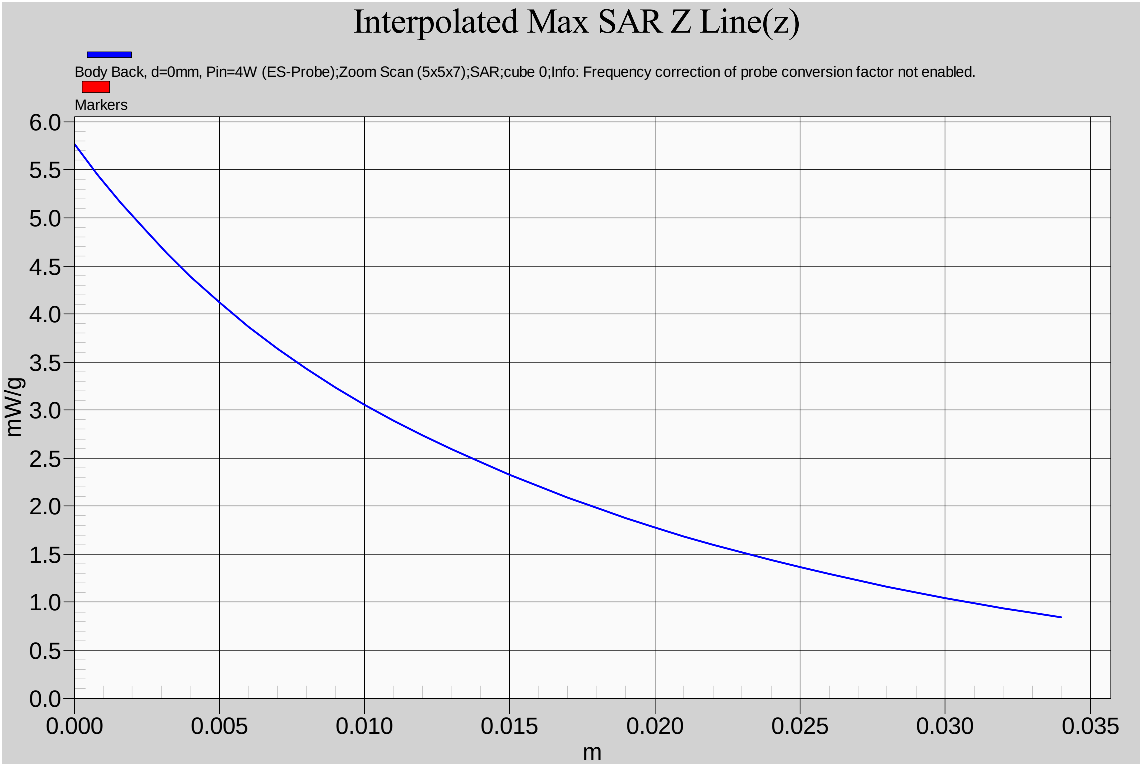
Configuration_Body_FA-SC61UC=165mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.655 mW/g

Configuration_Body_FA-SC61UC=165mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 70.551 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 5.7670
SAR(1 g) = 4.22 mW/g; SAR(10 g) = 3.1 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.391 mW/g



0 dB = 4.390mW/g = 12.85 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.3. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=165mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 469.9MHz; #22

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=165mm_Body_469.9MHz(Hf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

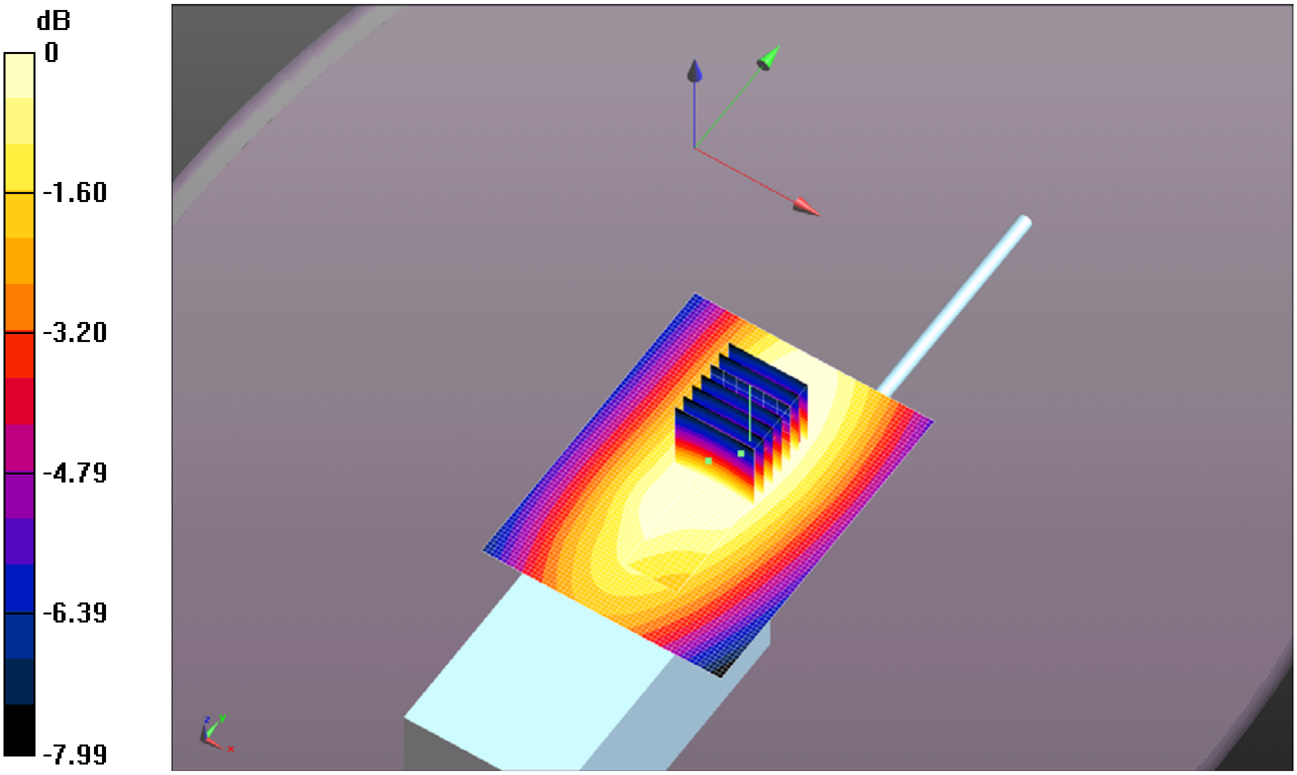
Communication System: CW; Frequency: 469.9 MHz; Duty Cycle: 1:1
Medium parameters used: f = 470 MHz; σ = 0.954 mho/m; ε_r = 55.983; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

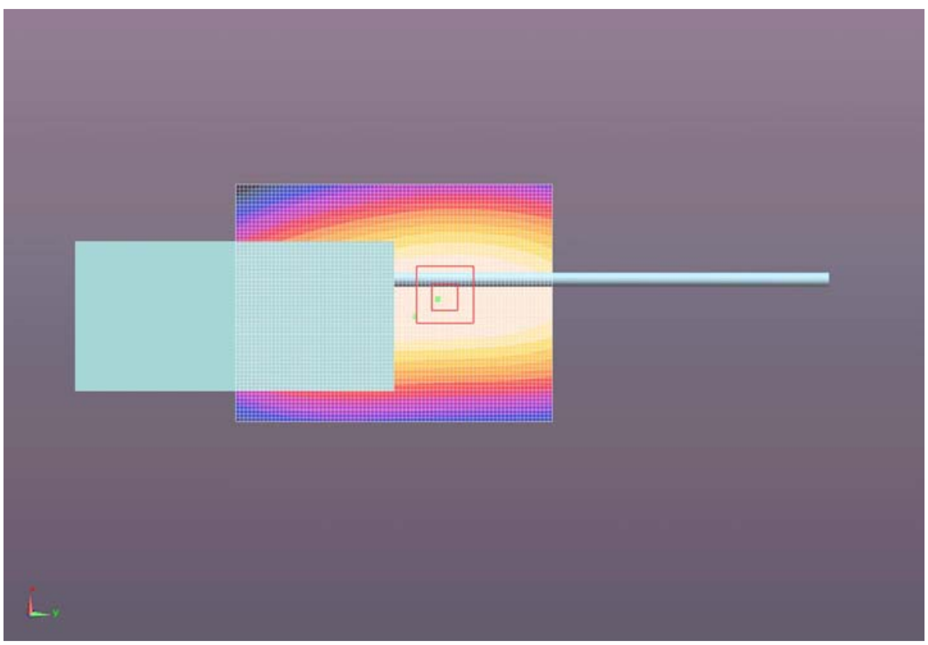
Configuration_Body_FA-SC61UC=165mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 2.059 mW/g

Configuration_Body_FA-SC61UC=165mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.083 mW/g

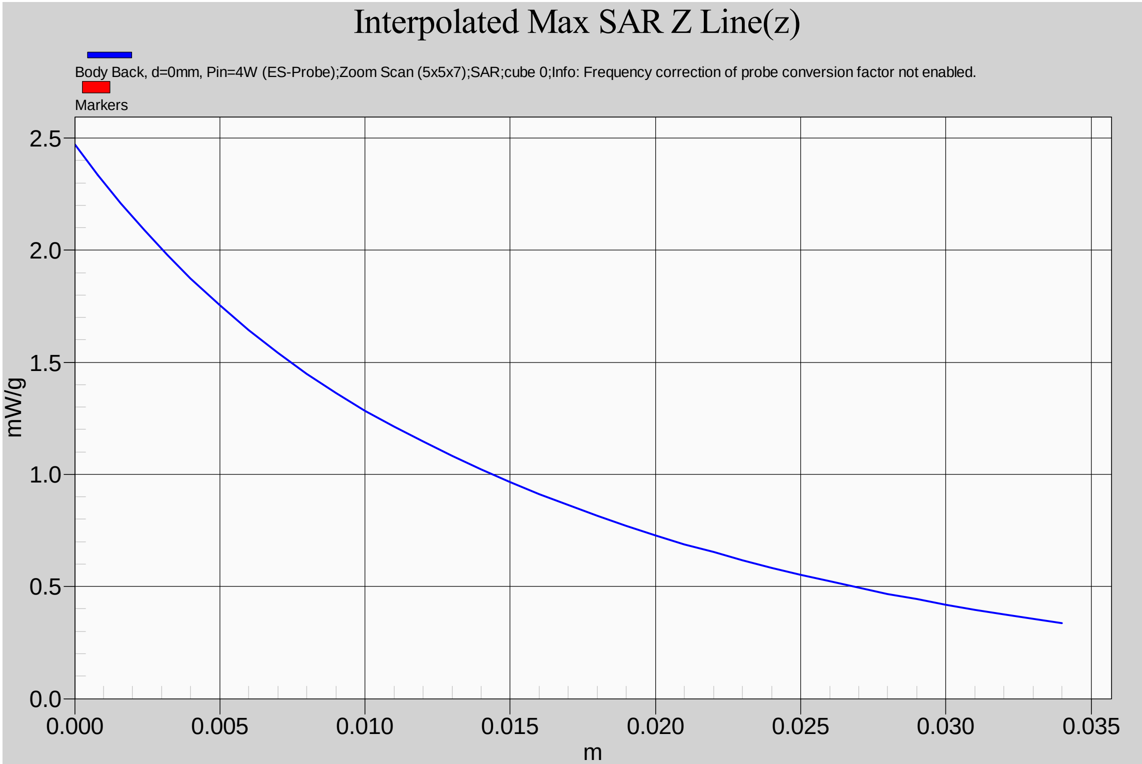
Configuration_Body_FA-SC61UC=165mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.545 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.4720
SAR(1 g) = 1.76 mW/g; SAR(10 g) = 1.28 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.873 mW/g



0 dB = 1.870mW/g = 5.44 dB mW/g



- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*


Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.4. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=156mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 406.1MHz; #23

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=156mm_Body_406.1MHz(Lf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

Communication System: CW; Frequency: 406.1 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406.1 MHz; σ = 0.899 mho/m; ε_r = 56.941; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Configuration_Body_FA-SC61UC=156mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm

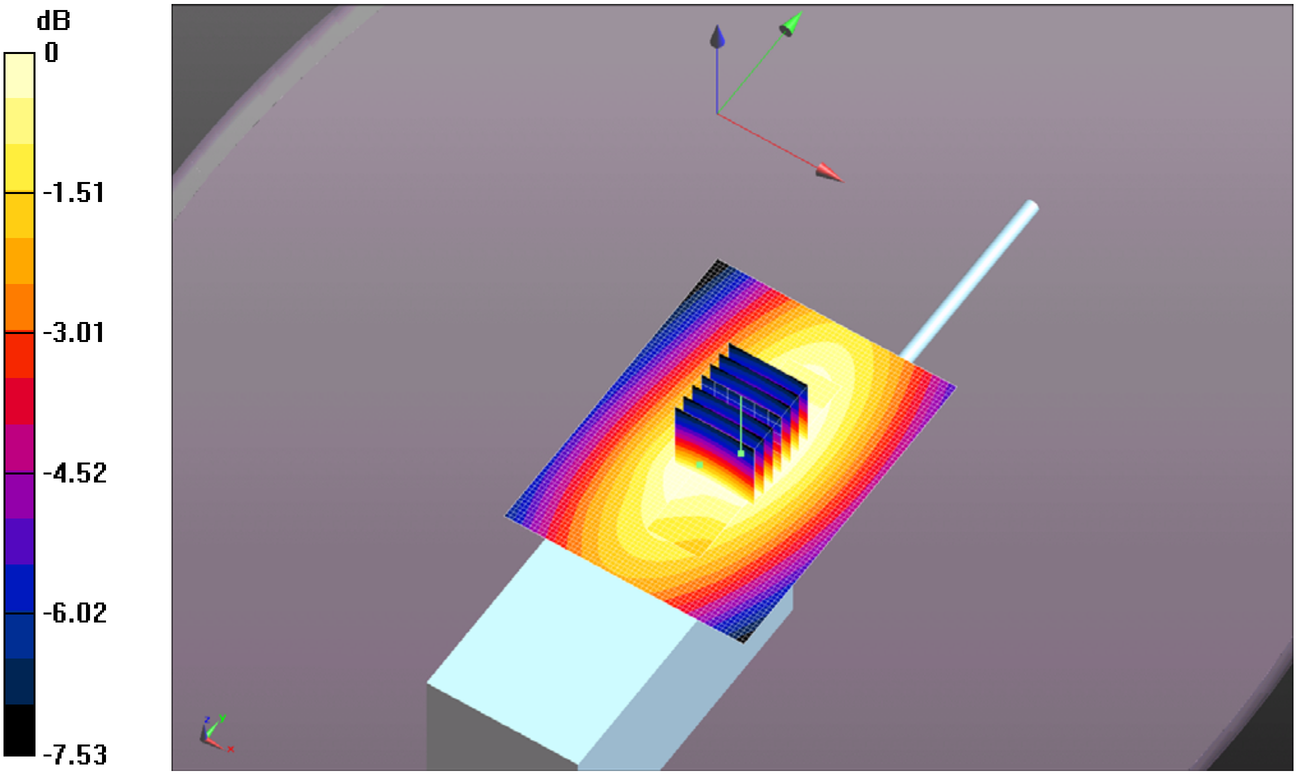
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 10.121 mW/g

Configuration_Body_FA-SC61UC=156mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm

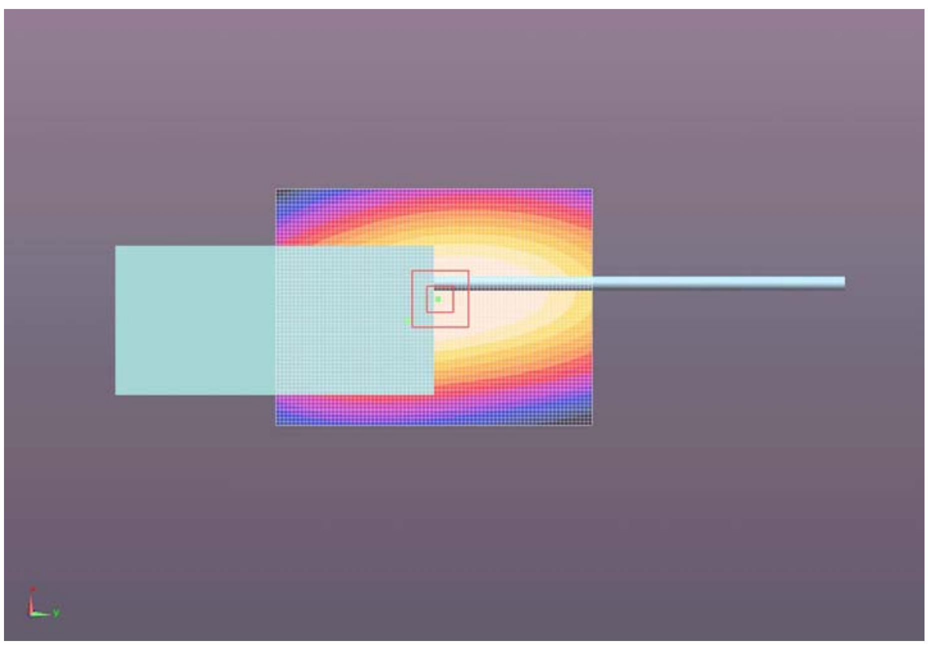
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 10.585 mW/g

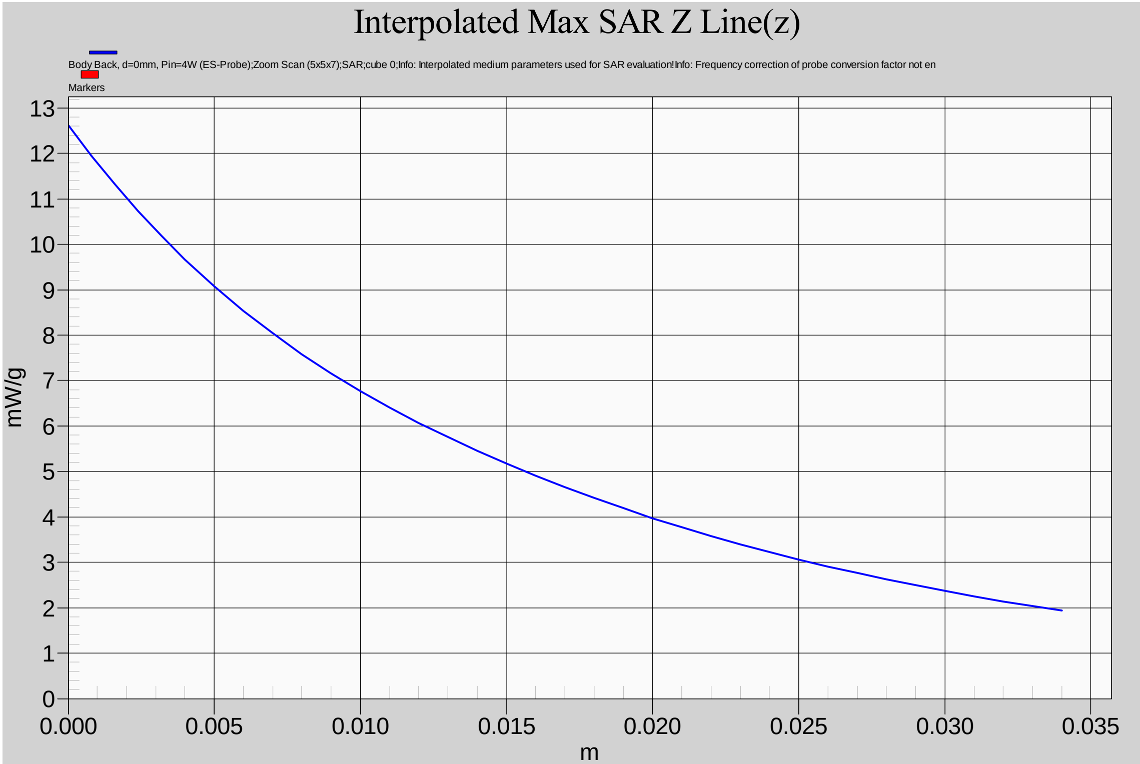
Configuration_Body_FA-SC61UC=156mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.9 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 12.6260
SAR(1 g) = 9.55 mW/g; SAR(10 g) = 7.01 mW/g (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 9.675 mW/g



0 dB = 9.680mW/g = 19.72 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Interpolated medium parameters used for SAR evaluation!Info: Frequency correction of probe conversion factor not en
Markers
mW/g
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.5. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=156mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 420 MHz; #24

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=156mm_Body_420MHz(Mf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

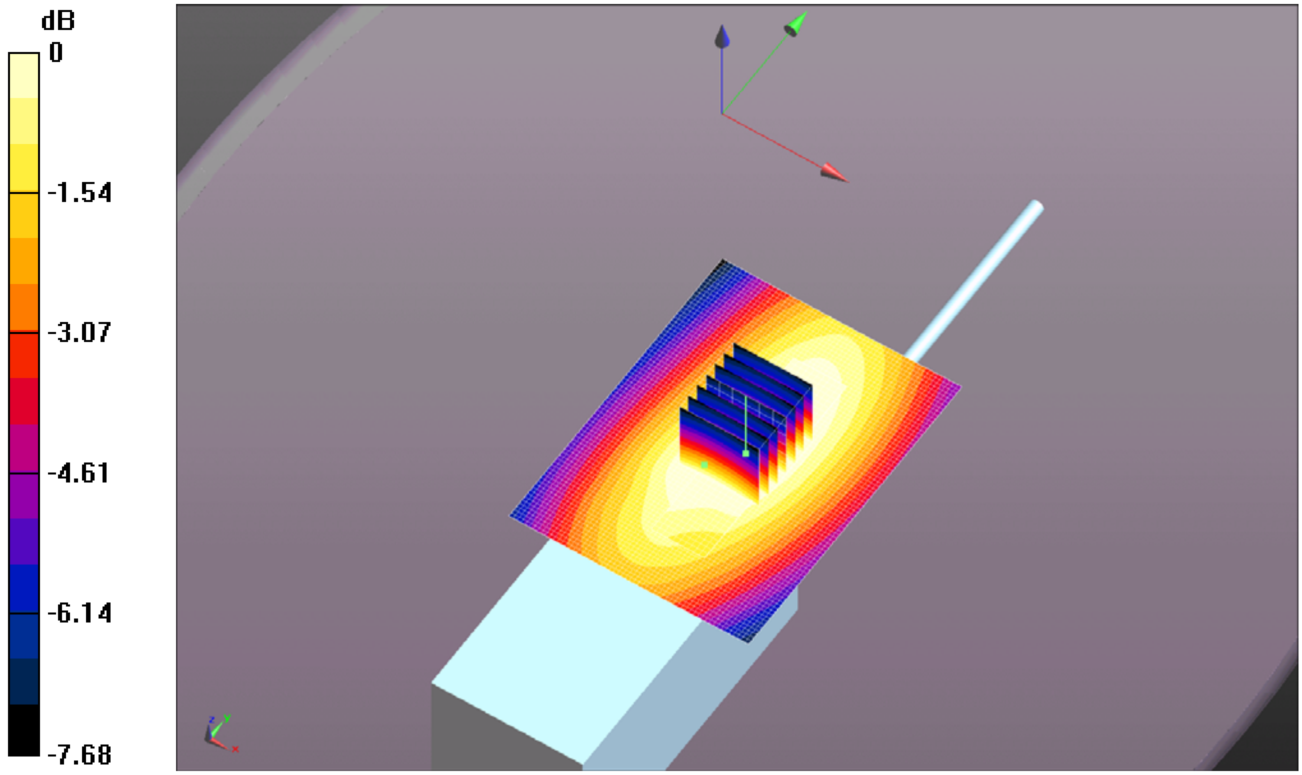
Communication System: CW; Frequency: 420 MHz; Duty Cycle: 1:1
Medium parameters used: f = 420 MHz; σ = 0.914 mho/m; ε_r = 56.729; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

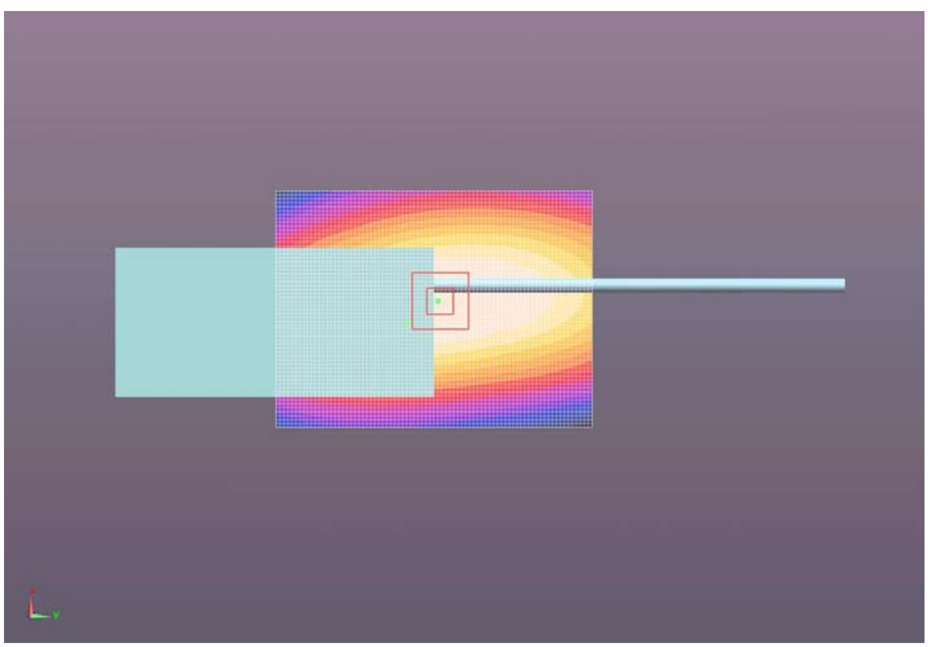
Configuration_Body_FA-SC61UC=156mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 9.421 mW/g

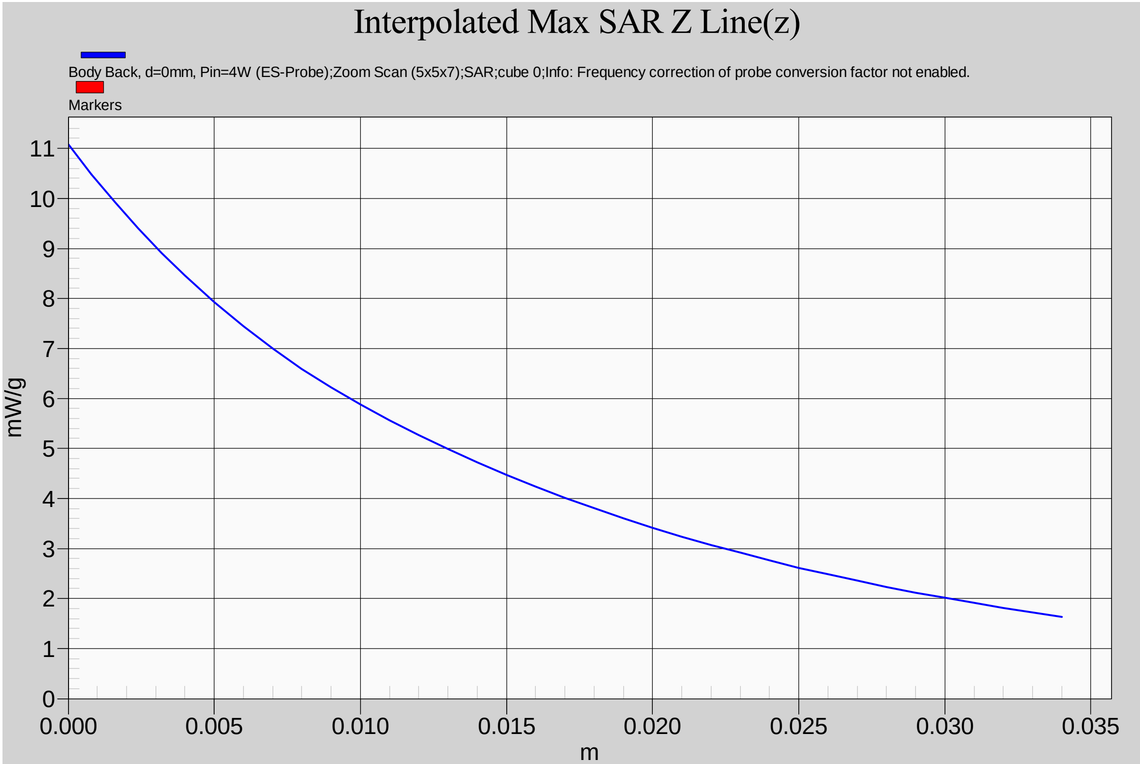
Configuration_Body_FA-SC61UC=156mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 9.289 mW/g

Configuration_Body_FA-SC61UC=156mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.5 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 11.0780
SAR(1 g) = 8.23 mW/g; SAR(10 g) = 6.03 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 8.455 mW/g



0 dB = 8.460mW/g = 18.55 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
11
10
9
8
7
6
5
4
3
2
1
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.6. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=156mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 469.9 MHz; #25

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=156mm_Body_469.9MHz(Hf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

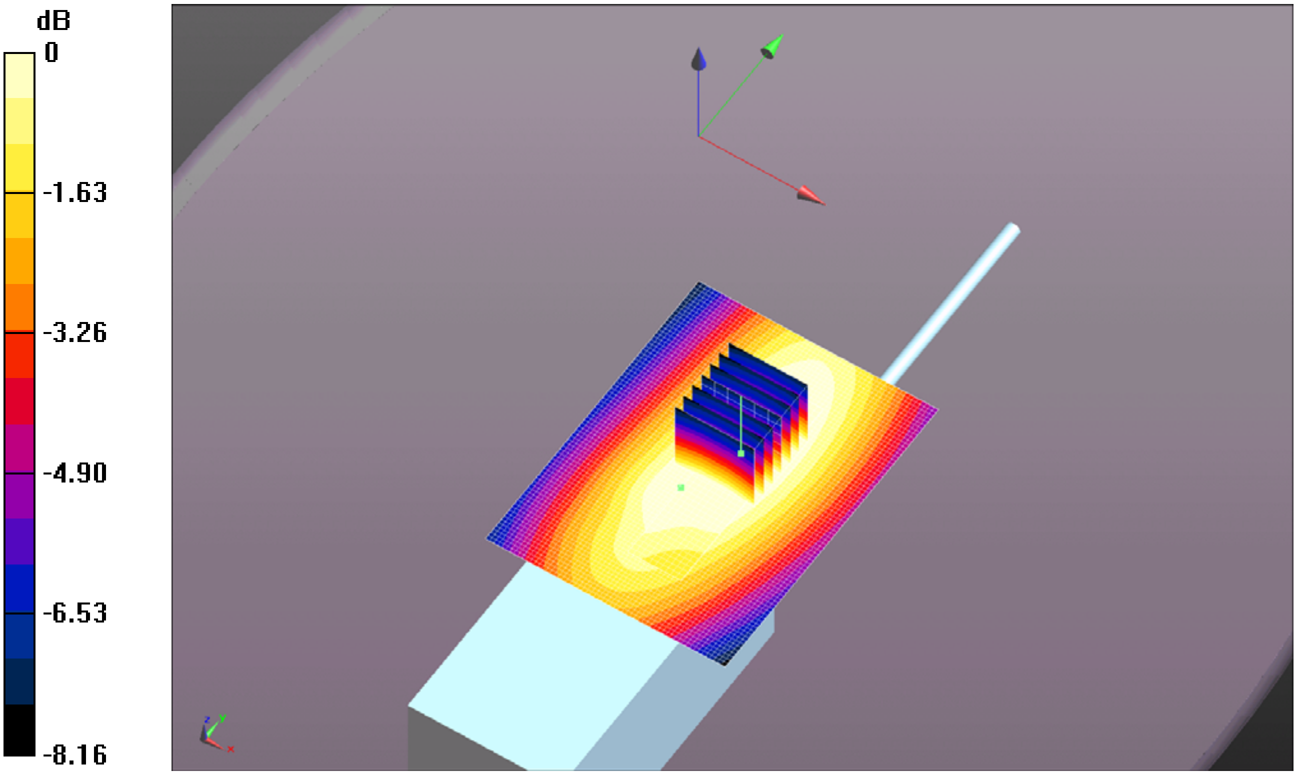
Communication System: CW; Frequency: 469.9 MHz; Duty Cycle: 1:1
Medium parameters used: f = 470 MHz; σ = 0.954 mho/m; ε_r = 55.983; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

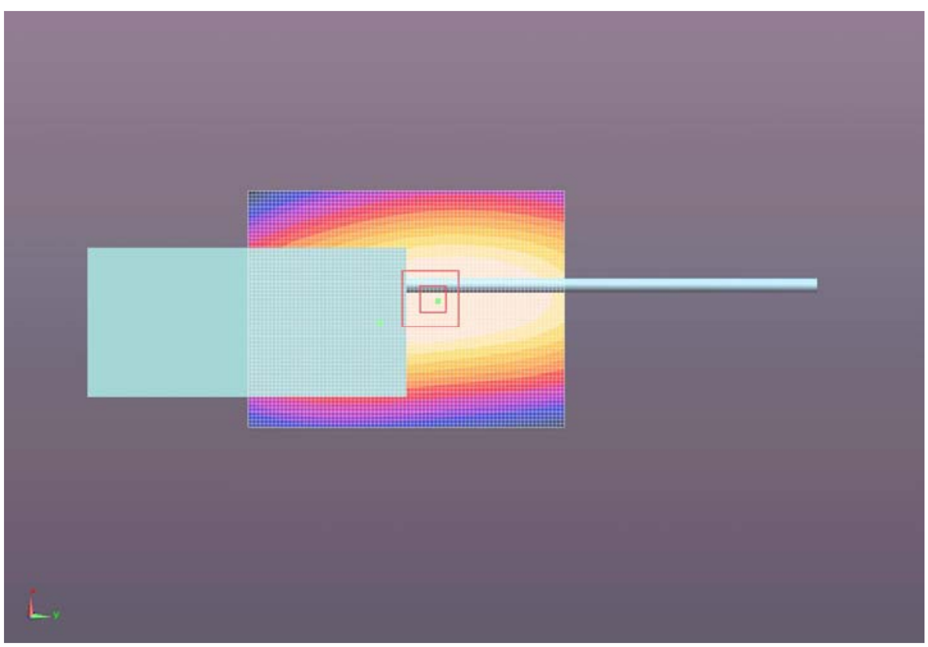
Configuration_Body_FA-SC61UC=156mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 3.233 mW/g

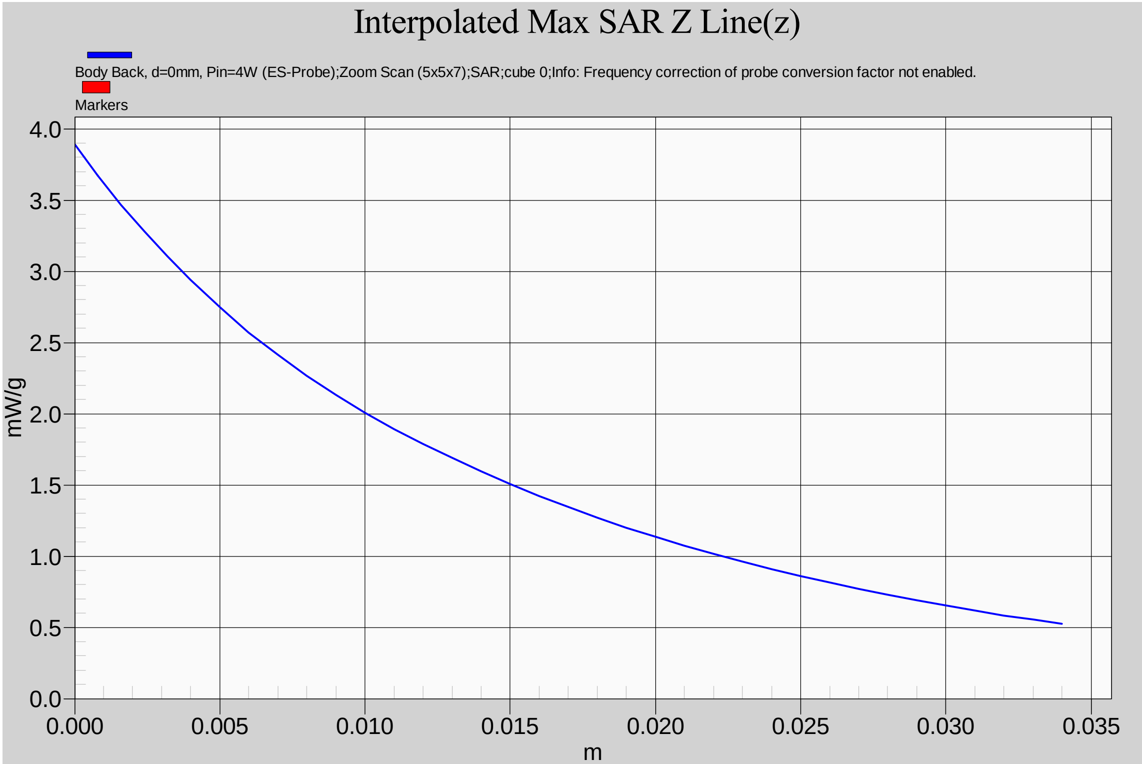
Configuration_Body_FA-SC61UC=156mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.270 mW/g

Configuration_Body_FA-SC61UC=156mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.702 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 3.8910
SAR(1 g) = 2.75 mW/g; SAR(10 g) = 2.01 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 2.936 mW/g



0 dB = 2.940mW/g = 9.37 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.7. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=156mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 445 MHz; #26

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=156mm_Body_445MHz(Of).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

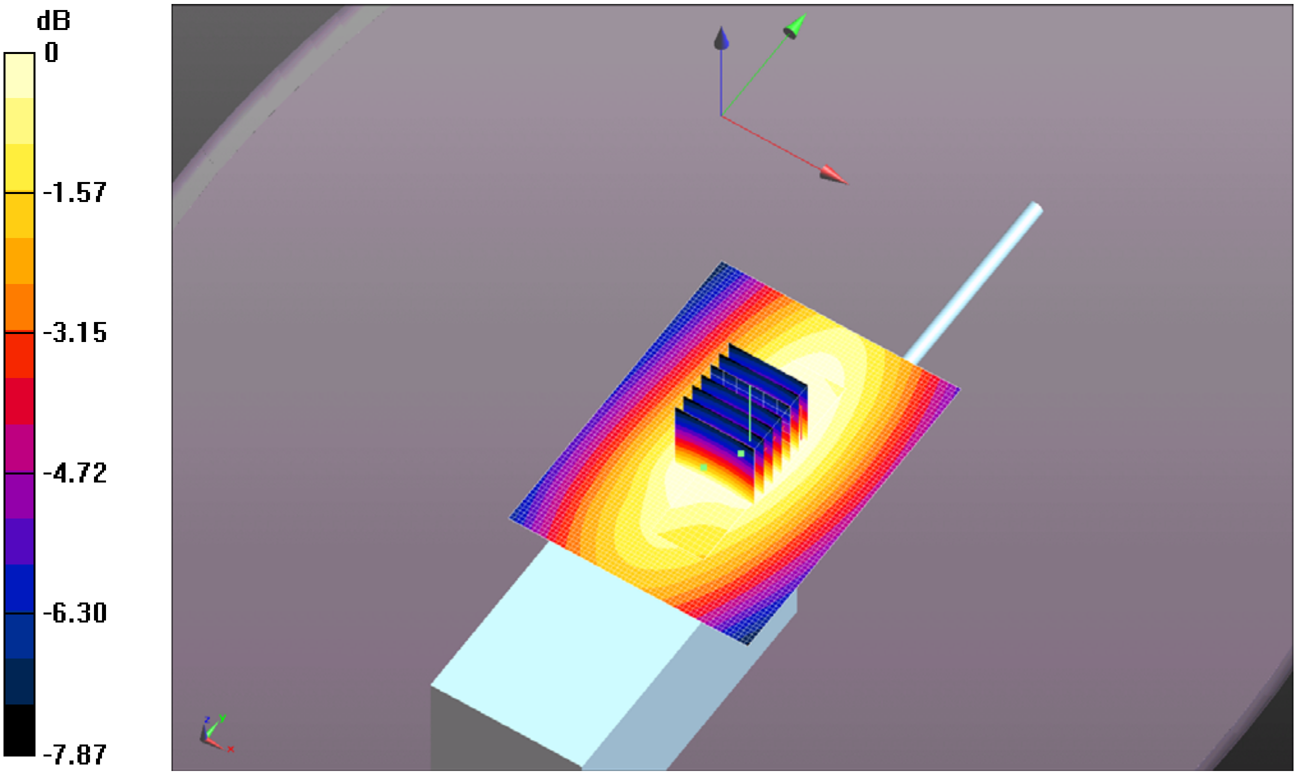
Communication System: CW; Frequency: 445 MHz; Duty Cycle: 1:1
Medium parameters used: f = 445 MHz; σ = 0.936 mho/m; ε_r = 56.283; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

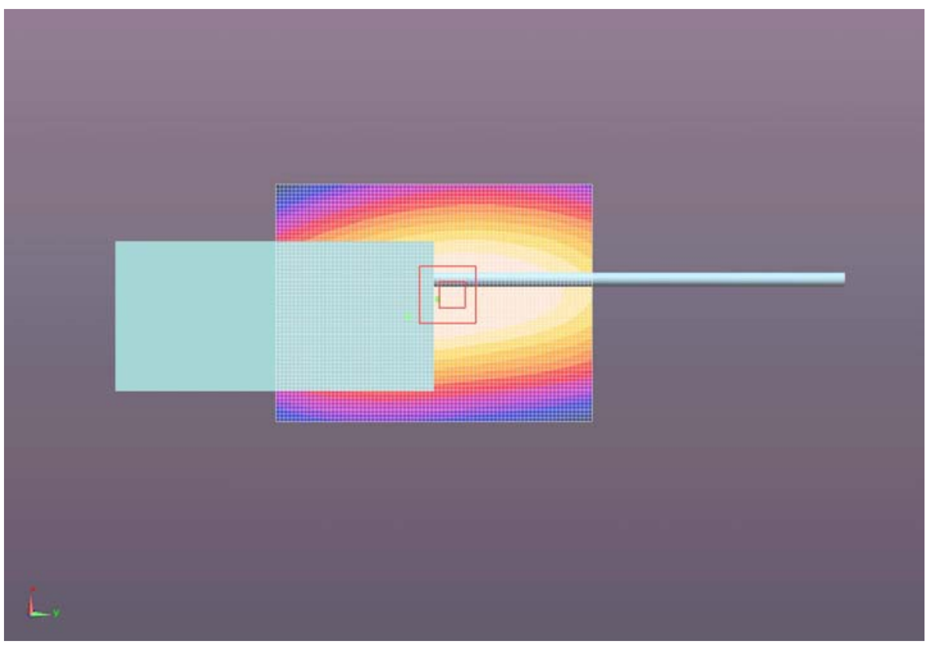
Configuration_Body_FA-SC61UC=156mm_Of/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 5.928 mW/g

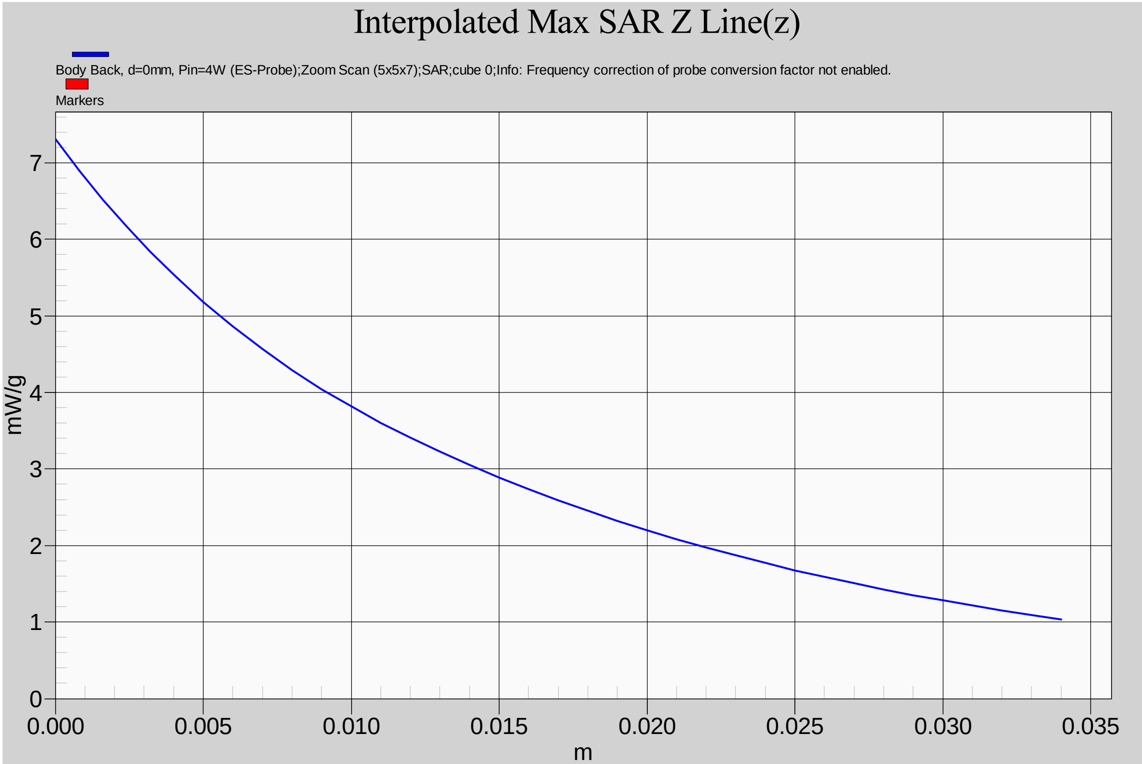
Configuration_Body_FA-SC61UC=156mm_Of/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.101 mW/g

Configuration_Body_FA-SC61UC=156mm_Of/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 79.937 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 7.3030
SAR(1 g) = 5.27 mW/g; SAR(10 g) = 3.85 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 5.525 mW/g



0 dB = 5.530mW/g = 14.85 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
0
1
2
3
4
5
6
7
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.8. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=148mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 406.1 MHz; #27

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=148mm_Body_406.1MHz(Lf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

Communication System: CW; Frequency: 406.1 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406.1 MHz; $\sigma = 0.899$ mho/m; $\varepsilon_r = 56.941$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Configuration_Body_FA-SC61UC=148mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm

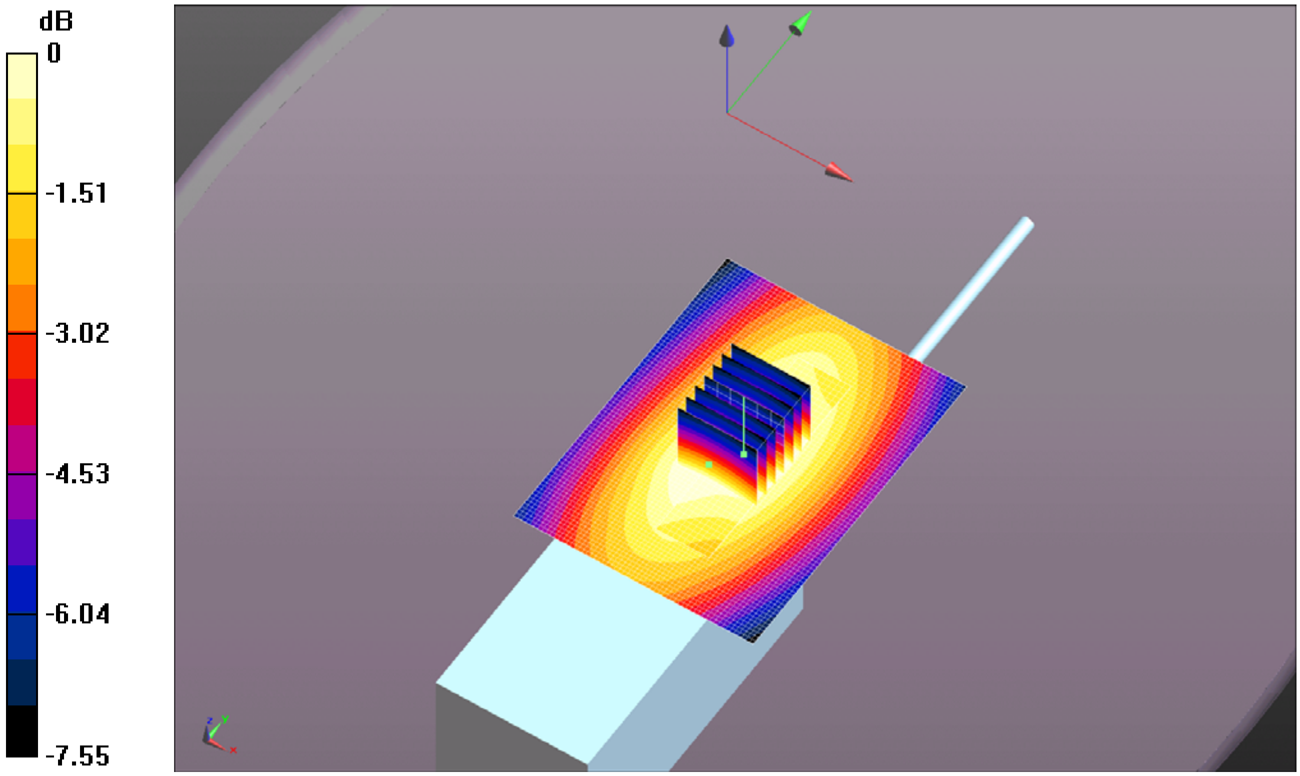
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 7.782 mW/g

Configuration_Body_FA-SC61UC=148mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm

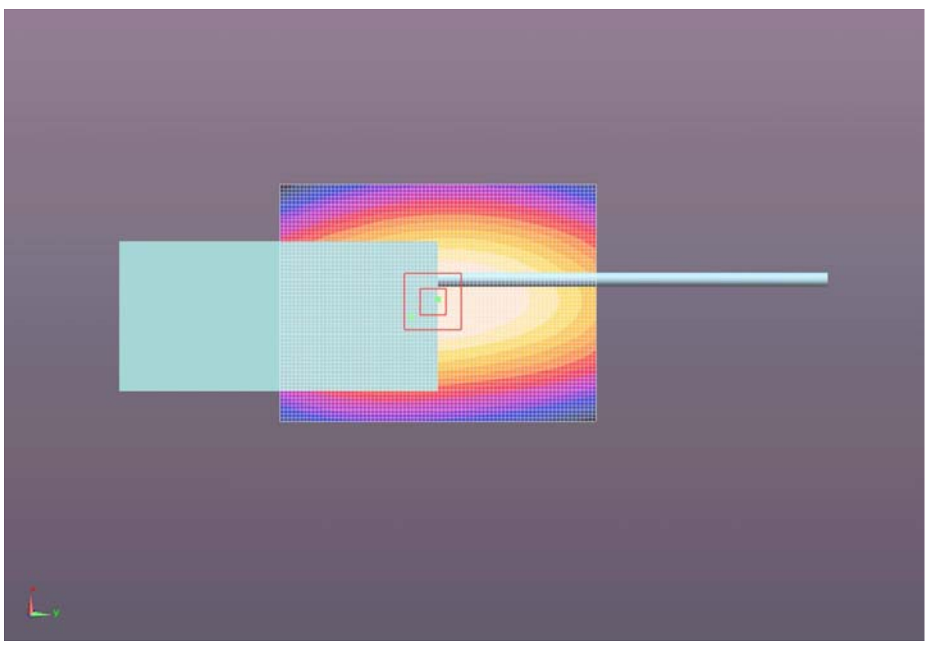
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 7.719 mW/g

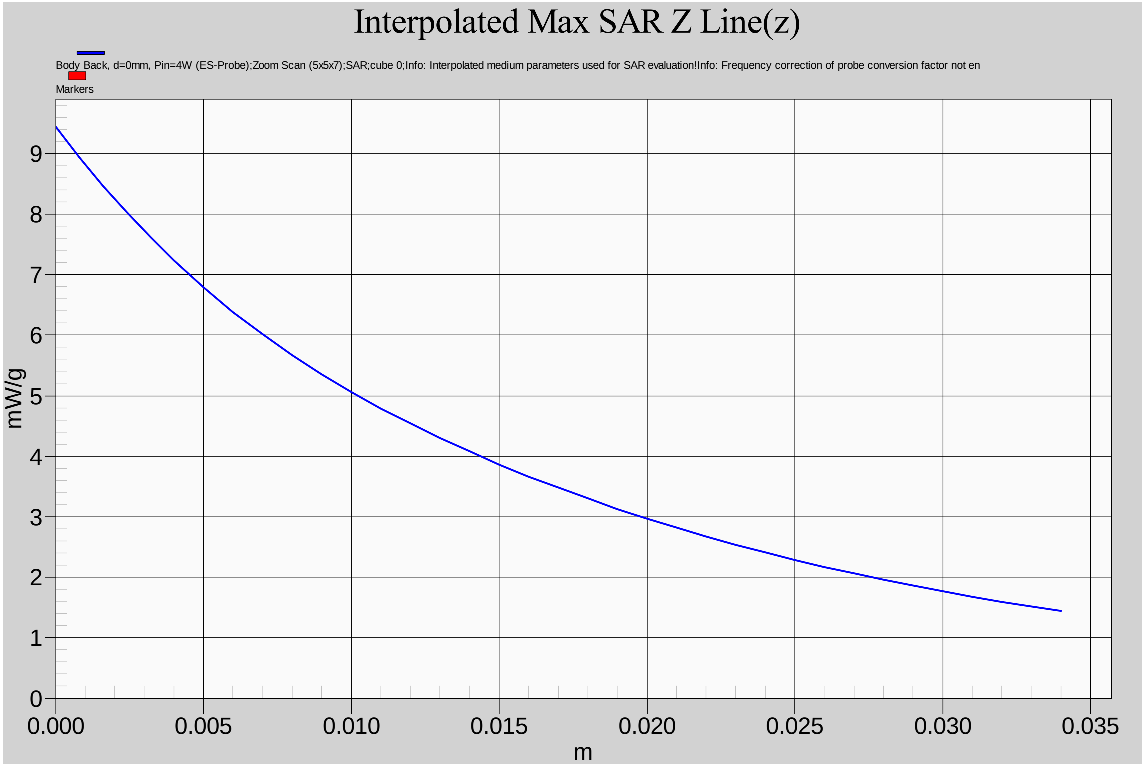
Configuration_Body_FA-SC61UC=148mm_Lf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.685 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 9.4350
SAR(1 g) = 7.14 mW/g; SAR(10 g) = 5.23 mW/g (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 7.238 mW/g



0 dB = 7.240mW/g = 17.19 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Interpolated medium parameters used for SAR evaluation!Info: Frequency correction of probe conversion factor not en
Markers
mW/g
0
1
2
3
4
5
6
7
8
9
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.9. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=148mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 440 MHz; #28

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=148mm_Body_440MHz(Mf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

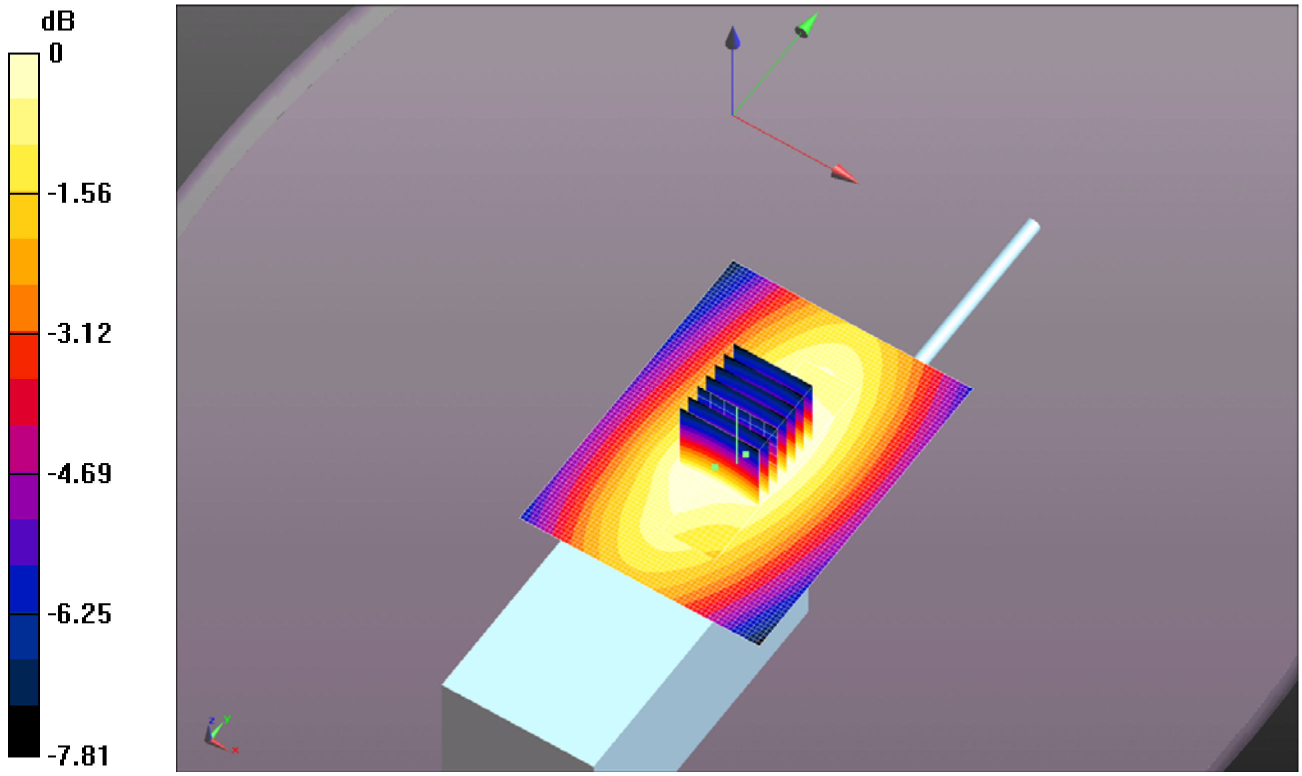
Communication System: CW; Frequency: 440 MHz; Duty Cycle: 1:1
Medium parameters used: f = 440 MHz; σ = 0.93 mho/m; ε_r = 56.404; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

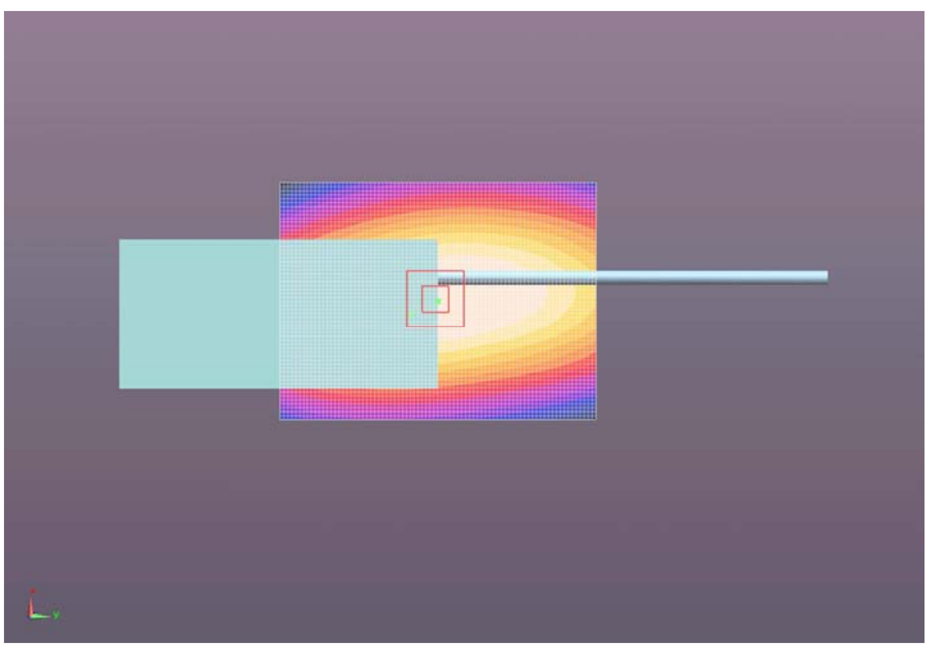
Configuration_Body_FA-SC61UC=148mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 8.335 mW/g

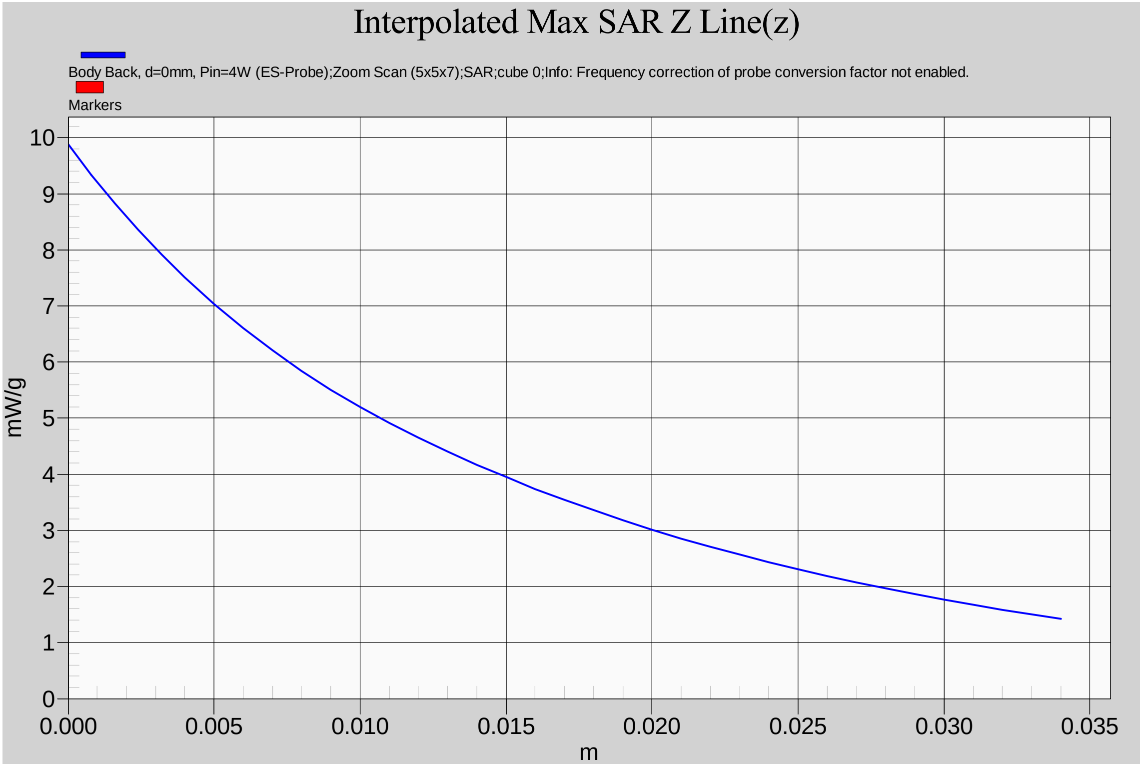
Configuration_Body_FA-SC61UC=148mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 8.255 mW/g

Configuration_Body_FA-SC61UC=148mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.313 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 9.8790
SAR(1 g) = 7.21 mW/g; SAR(10 g) = 5.29 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 7.511 mW/g



0 dB = 7.510mW/g = 17.51 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
0
1
2
3
4
5
6
7
8
9
10
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.10. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=148mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 469.9 MHz; #29

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=148mm_Body_469.9MHz(Hf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

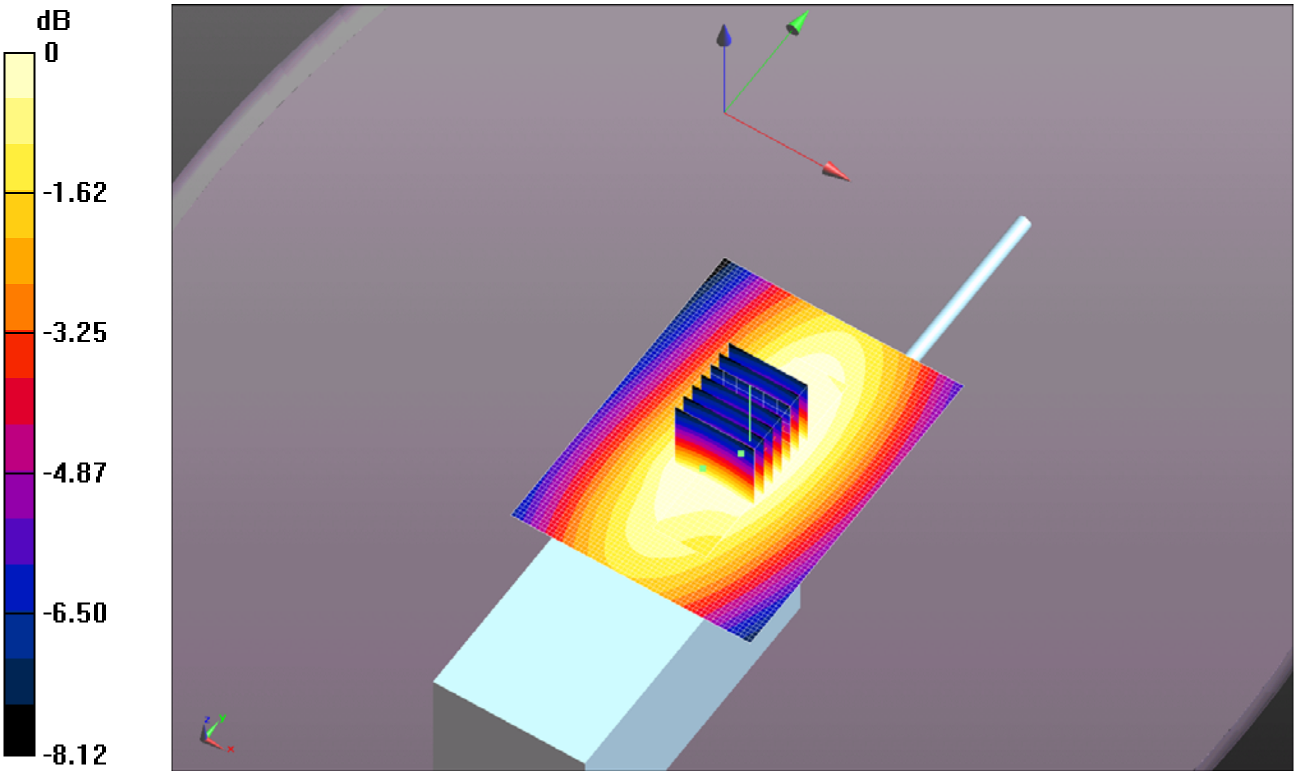
Communication System: CW; Frequency: 469.9MHz; Duty Cycle: 1:1
Medium parameters used: f = 470 MHz; σ = 0.954 mho/m; ε_r = 55.983; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

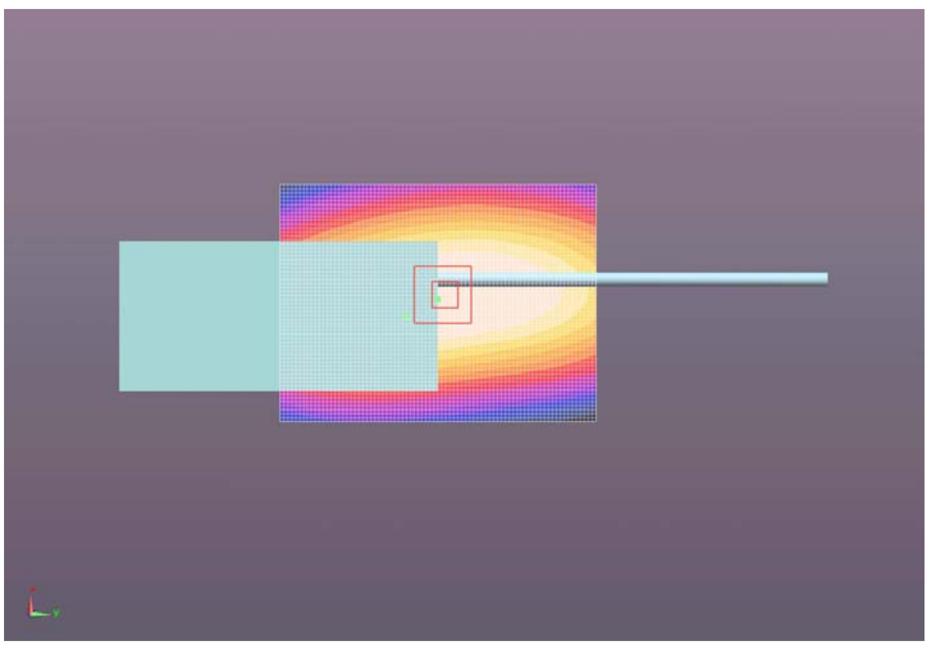
Configuration_Body_FA-SC61UC=148mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 4.968 mW/g

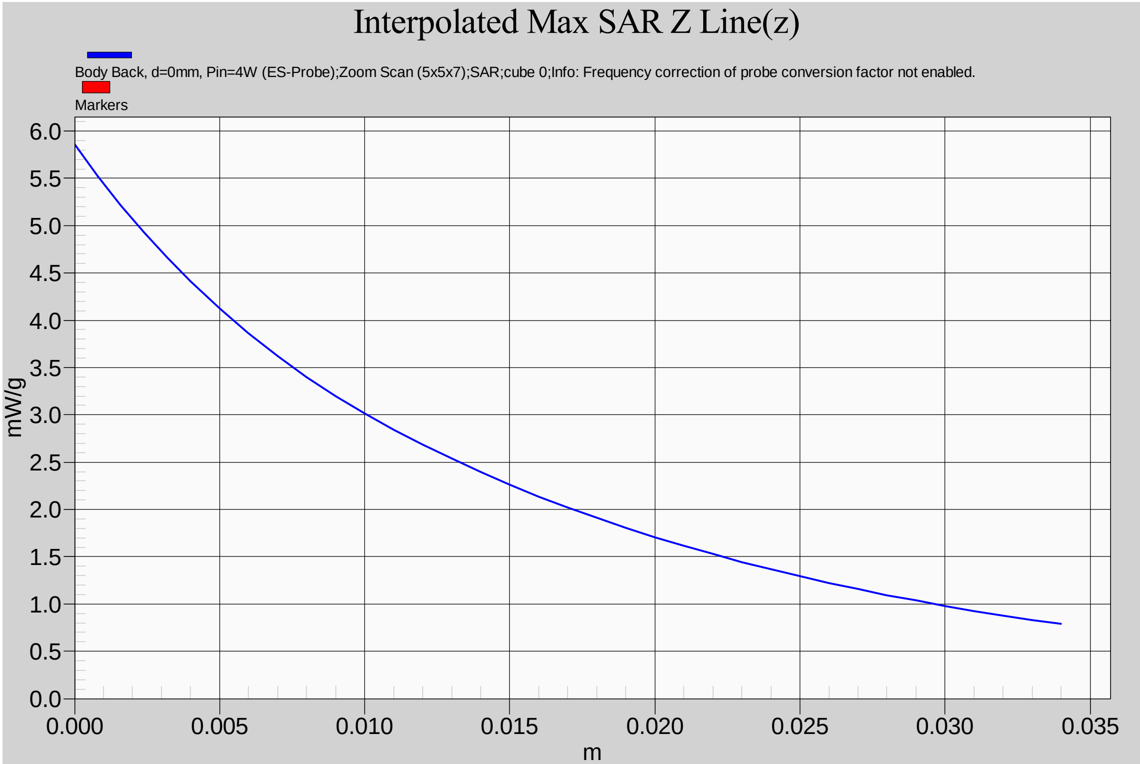
Configuration_Body_FA-SC61UC=148mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.948 mW/g

Configuration_Body_FA-SC61UC=148mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 72.381 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 5.8580
SAR(1 g) = 4.13 mW/g; SAR(10 g) = 3 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.400 mW/g



0 dB = 4.400mW/g = 12.87 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.11. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=142mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 406.1 MHz; #31

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=142mm_Body_406.1MHz(Lf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

Communication System: CW; Frequency: 406.1 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 406.1 MHz; σ = 0.899 mho/m; ε_r = 56.941; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Configuration_Body_FA-SC61UC=142mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm

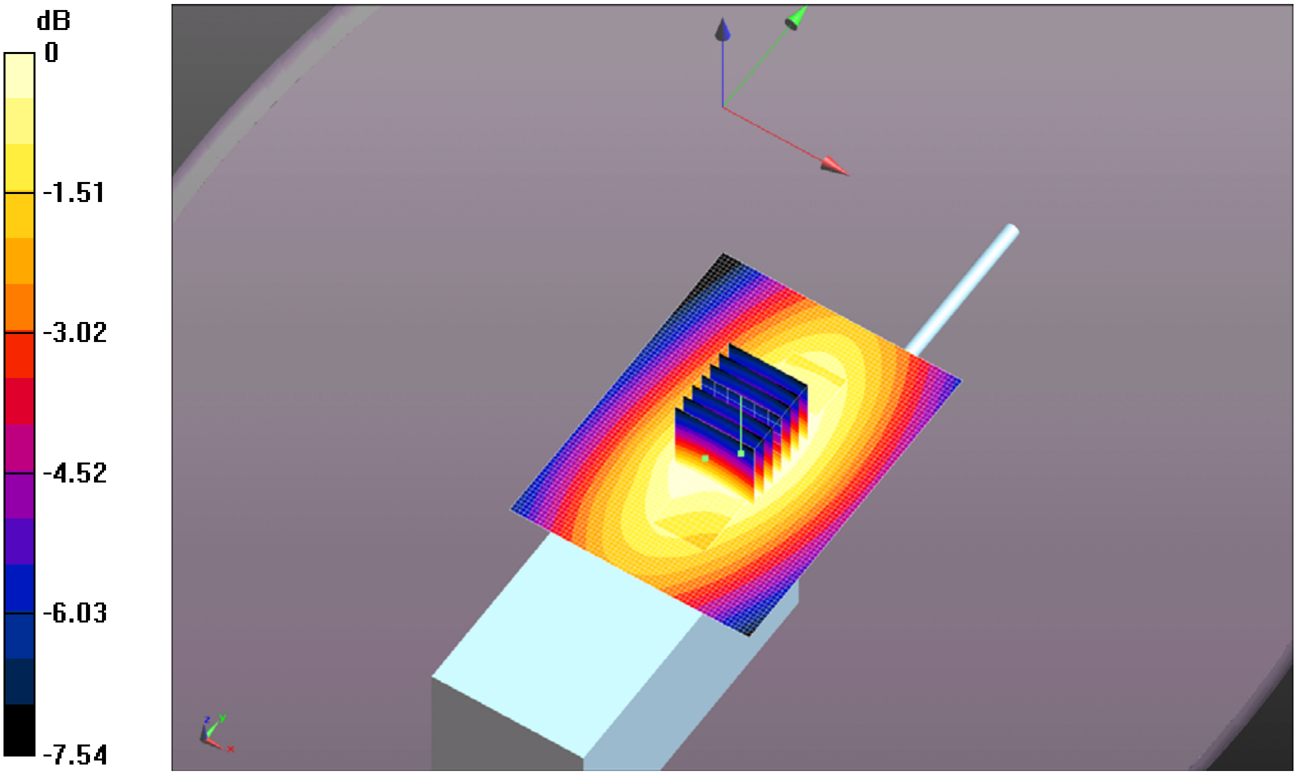
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 6.024 mW/g

Configuration_Body_FA-SC61UC=142mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm

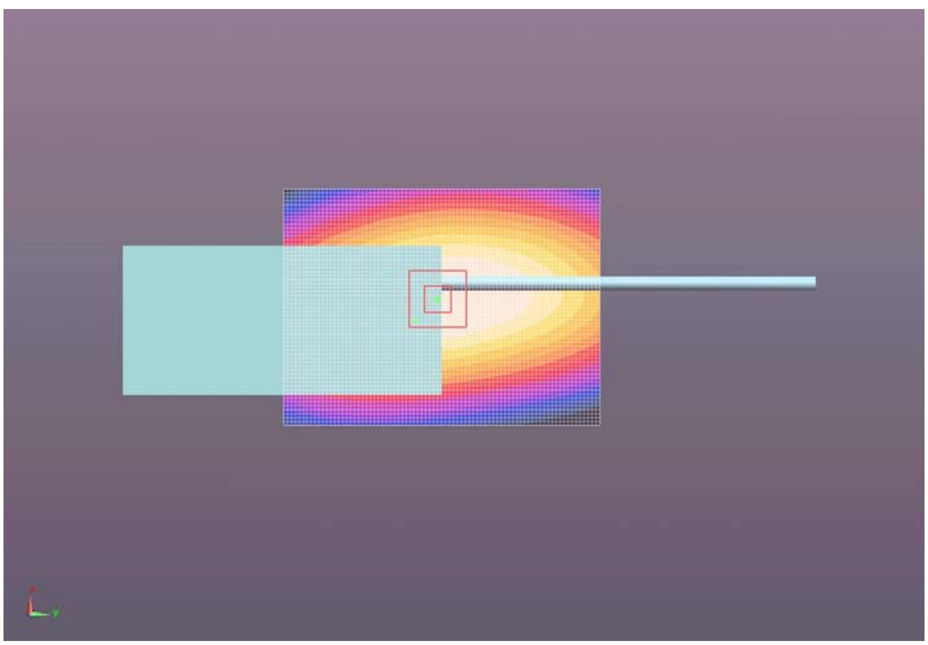
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 6.114 mW/g

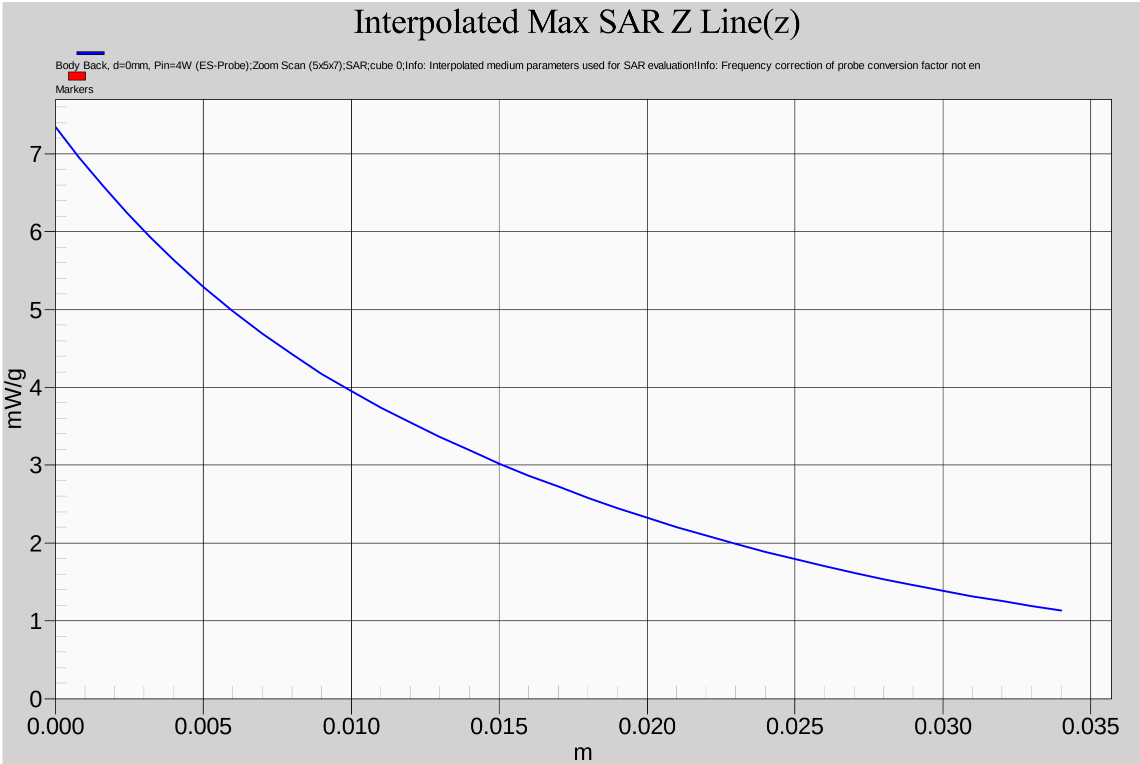
Configuration_Body_FA-SC61UC=142mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.692 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 7.3390
SAR(1 g) = 5.57 mW/g; SAR(10 g) = 4.1 mW/g (SAR corrected for target medium)

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.641 mW/g



0 dB = 5.640mW/g = 15.03 dB mW/g




Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Interpolated medium parameters used for SAR evaluation!Info: Frequency correction of probe conversion factor not en
Markers
mW/g
0
1
2
3
4
5
6
7
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

6.5.3.12. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=142mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 430 MHz; #32

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=142mm_Body_430MHz(Mf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

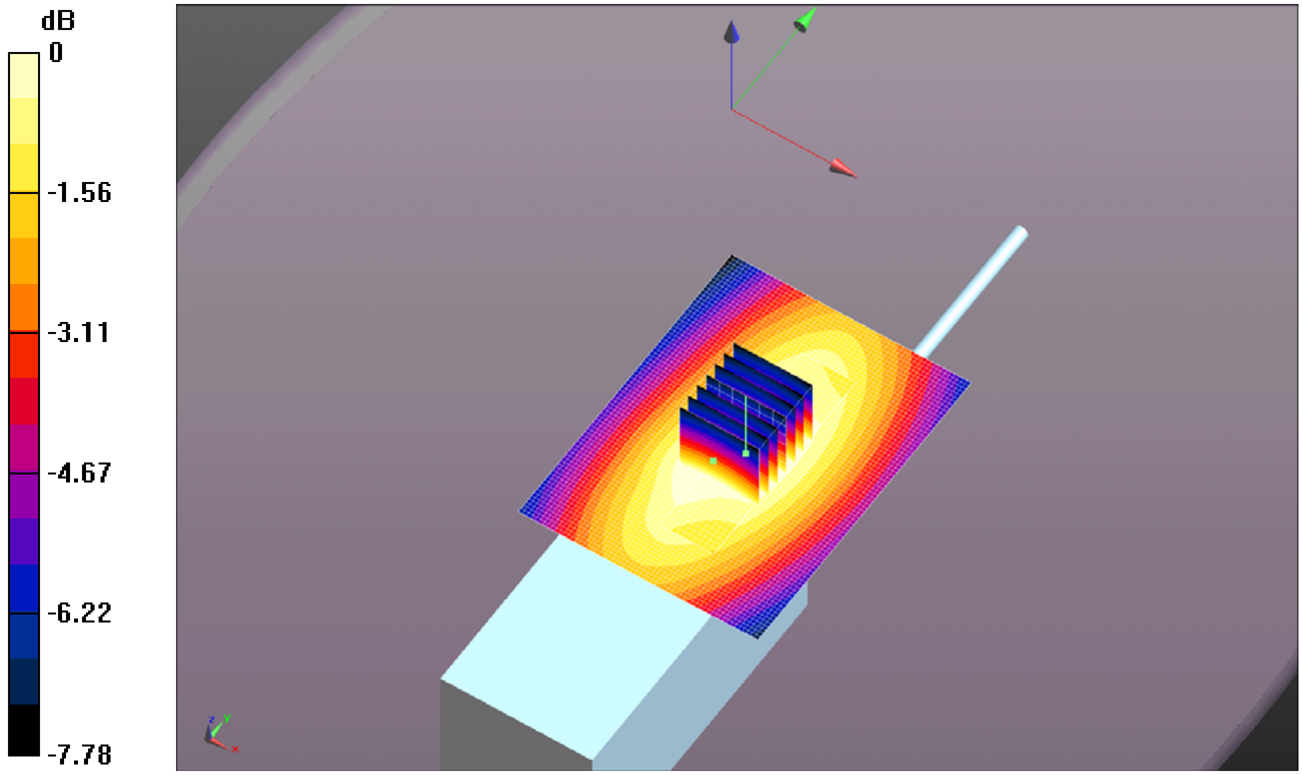
Communication System: CW; Frequency: 430 MHz; Duty Cycle: 1:1
Medium parameters used: f = 430 MHz; σ = 0.922 mho/m; ε_r = 56.524; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

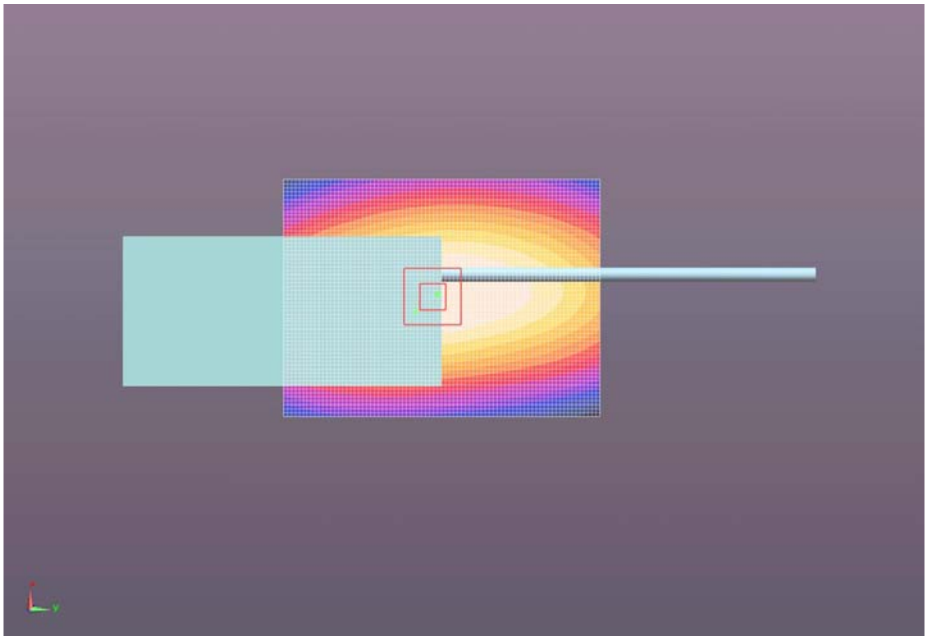
Configuration_Body_FA-SC61UC=142mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 7.670 mW/g

Configuration_Body_FA-SC61UC=142mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 7.542 mW/g

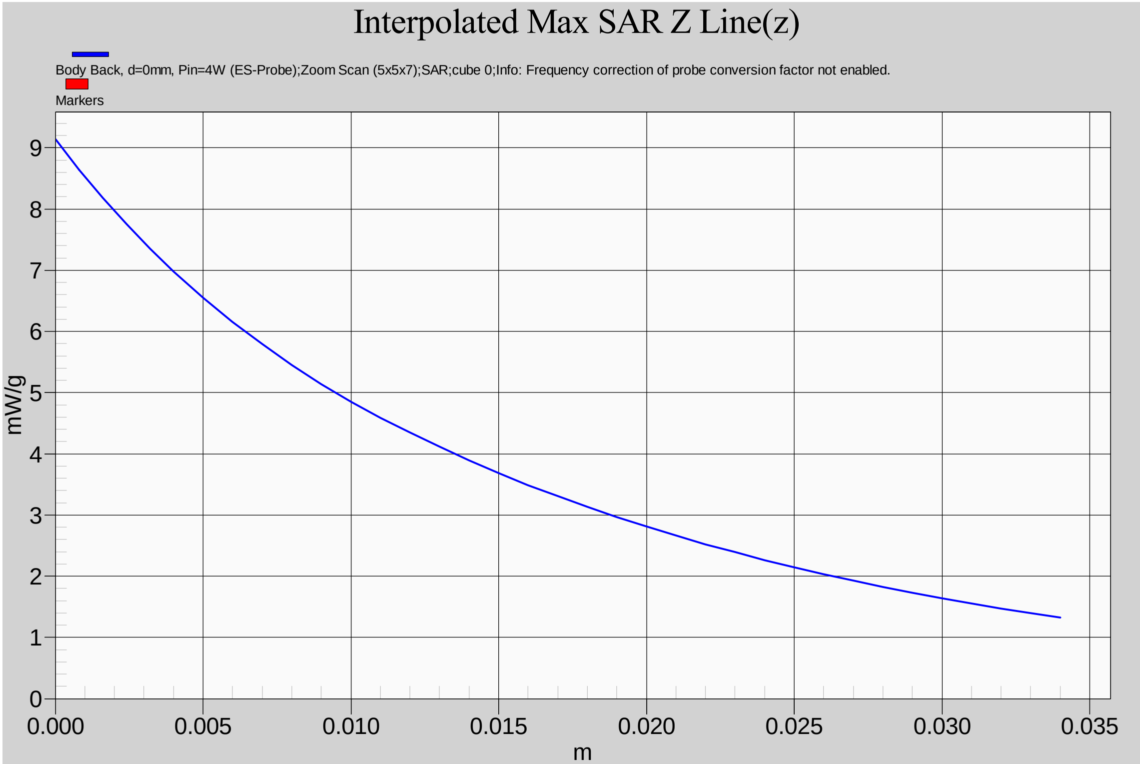
Configuration_Body_FA-SC61UC=142mm_Mf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.395 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 9.1350
SAR(1 g) = 6.75 mW/g; SAR(10 g) = 4.94 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 6.982 mW/g



0 dB = 6.980mW/g = 16.88 dB mW/g



- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*



3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: http://www.ultratech-labs.com

6.5.3.13. ¼ helical whip cut antenna (M/N: FA-SC61UC), length=142mm; Belt Belt Clip (M/N: MB-94), Speaker Microphone (M/N: HM-159LA); 460 MHz; #33

Test Laboratory: Ultratech Group of Labs
File Name: ICOM-286Q_FA-SC61UC=142mm_Body_460MHz(Hf).da52

DUT: ICOM UHF Transceiver; Type: IC-F4031S; Serial: 7200001

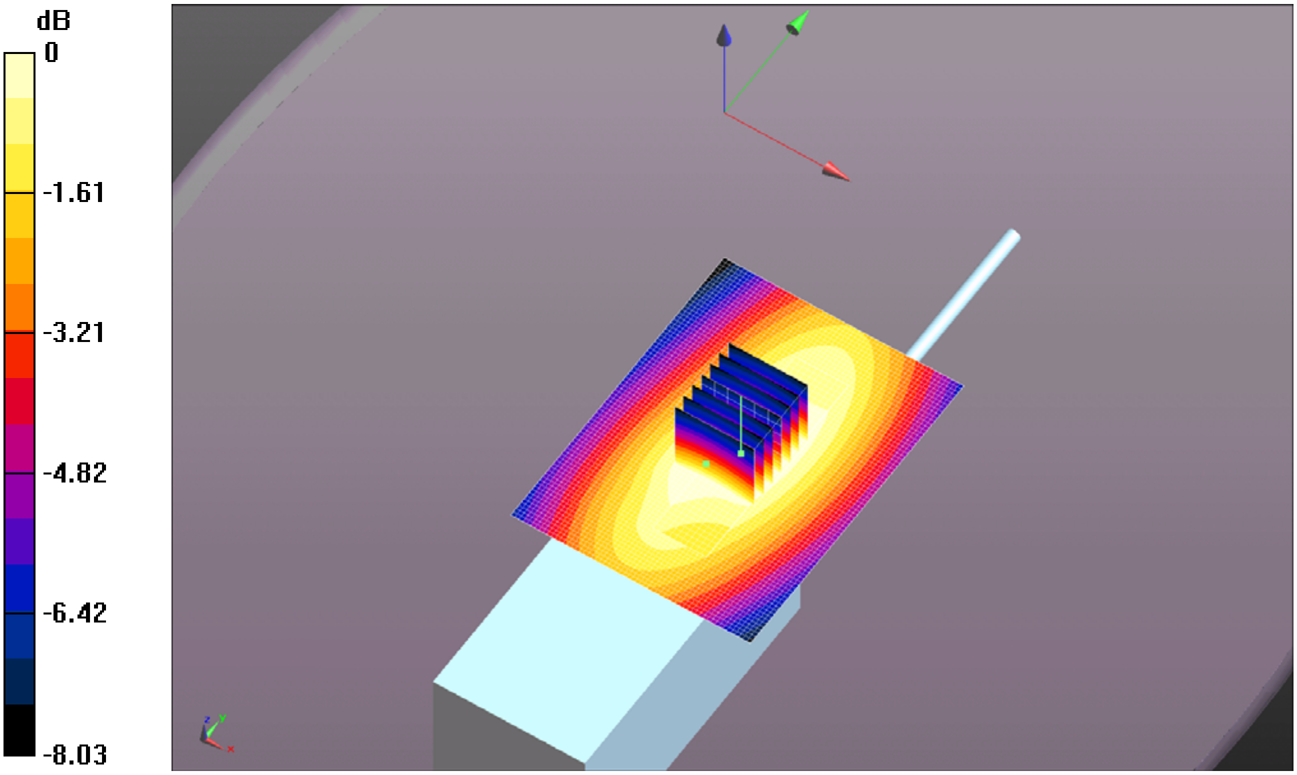
Communication System: CW; Frequency: 460 MHz; Duty Cycle: 1:1
Medium parameters used: f = 460 MHz; σ = 0.946 mho/m; ε_r = 56.164; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

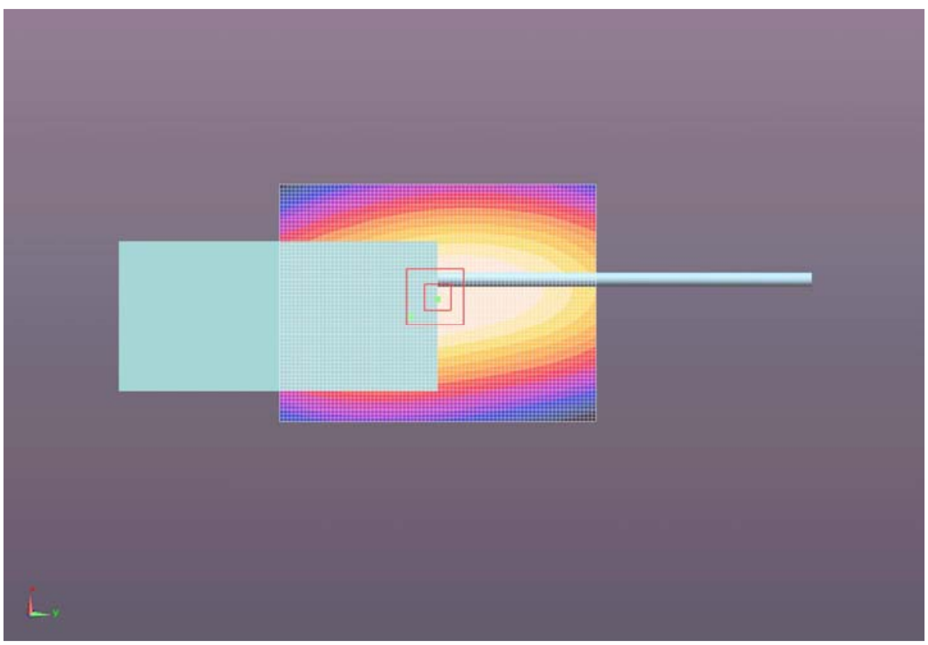
Configuration_Body_FA-SC61UC=142mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/FindMax (11x41x1):
Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 7.405 mW/g

Configuration_Body_FA-SC61UC=142mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 7.642 mW/g

Configuration_Body_FA-SC61UC=142mm_Hf/Body Back, d=0mm, Pin=4W (ES-Probe)/Zoom Scan (5x5x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.745 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 9.3760
SAR(1 g) = 6.7 mW/g; SAR(10 g) = 4.87 mW/g (SAR corrected for target medium)
Maximum value of SAR (measured) = 7.128 mW/g



0 dB = 7.130mW/g = 17.06 dB mW/g



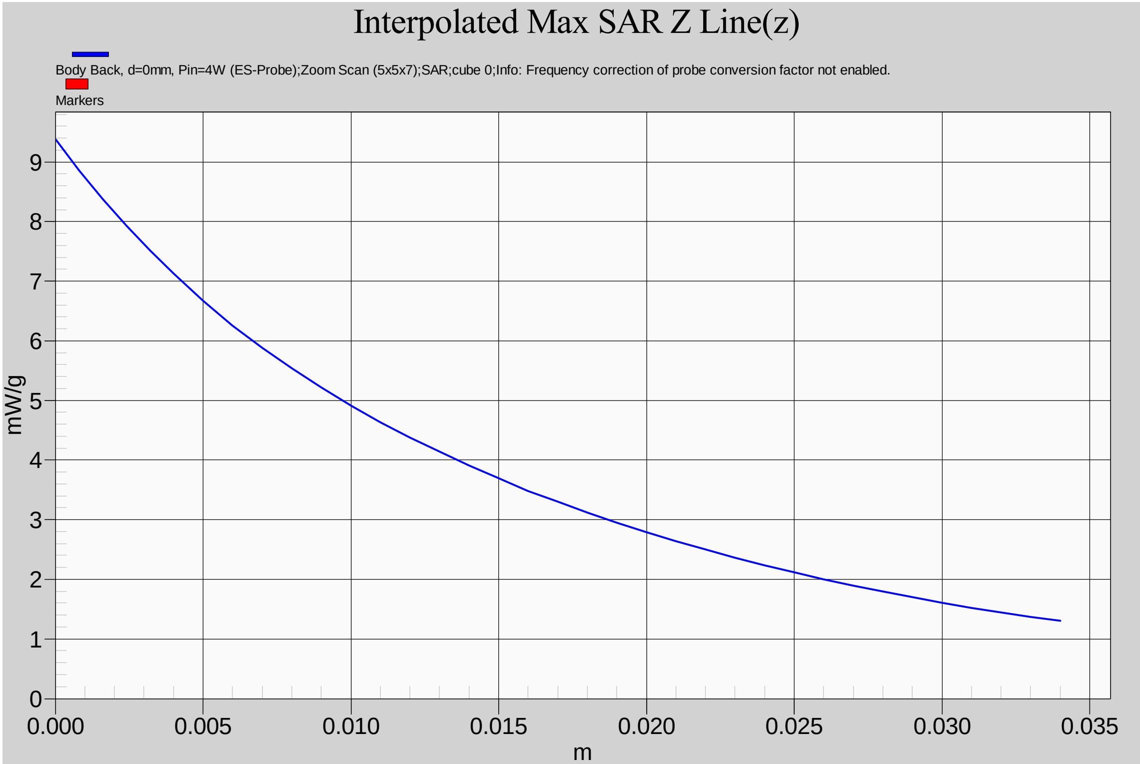
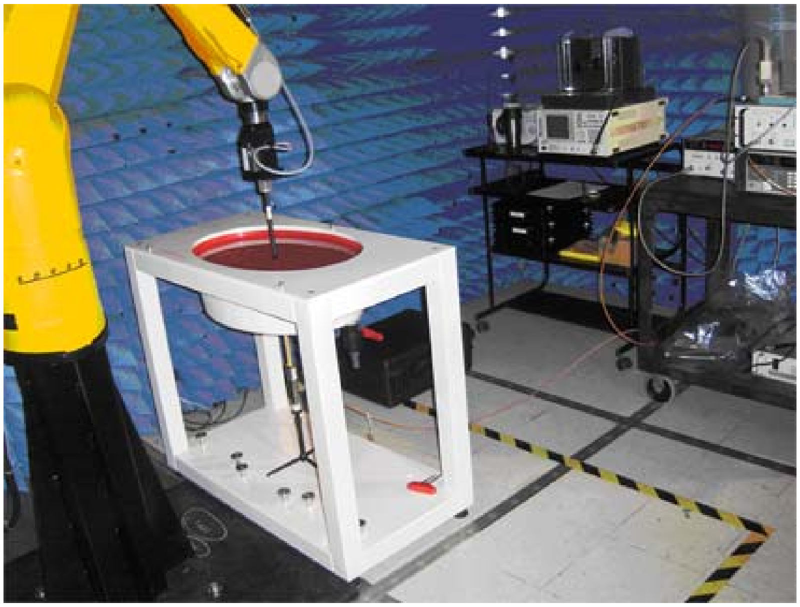
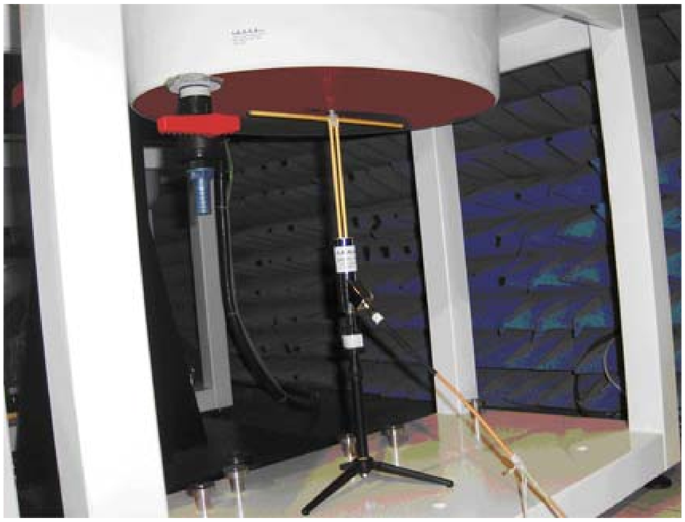

Interpolated Max SAR Z Line(z)
Body Back, d=0mm, Pin=4W (ES-Probe);Zoom Scan (5x5x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
0
1
2
3
4
5
6
7
8
9
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

EXHIBIT 7. SAR MEASUREMENT SYSTEM VERIFICATION



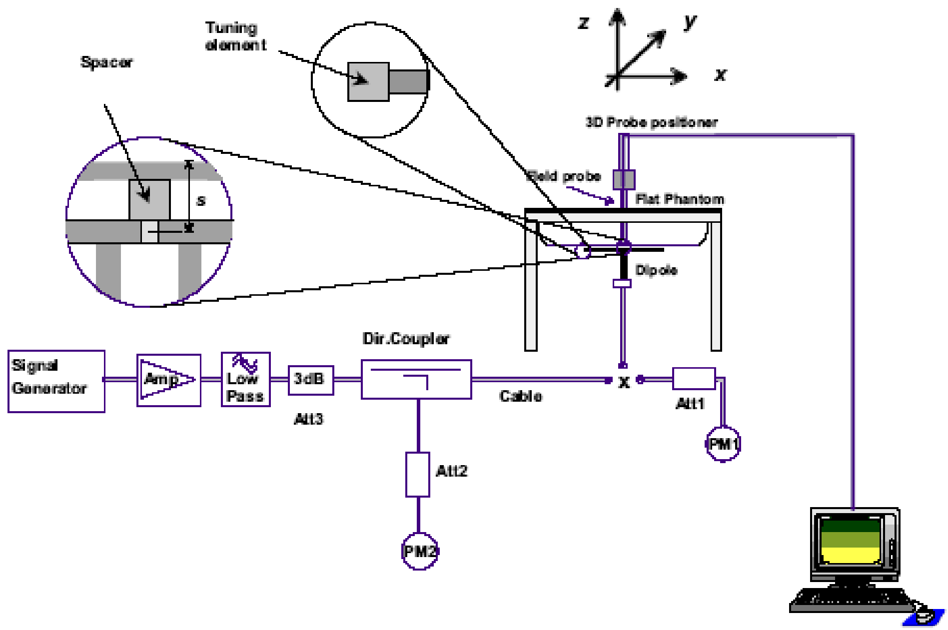
7.1. STANDARD SOURCE

A half-wave dipole is positioned below the bottom of the phantom and centered with its axis parallel to the longest side of the phantom. The distance between the liquid filled phantom bottom surface and the center of the dipole axis, *s*, is chosen as specified IEEE 1528 at the specific test frequency (i.e. 15 mm at 835 MHz). A low loss and low dielectric constant spacer is used to establish the correct distance between the top surface of the dipole and the bottom surface of the phantom.



7.2. STANDARD SOURCE INPUT POWER MEASUREMENT

The system validation is performed as shown below or in Figure 7.1 in IEEE 1528.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power was verified to be at least 20dB below the forward power.

7.3. SYSTEM VALIDATION PROCEDURE

A complete 1g-averaged SAR measurement is performed. The measured 1g-averaged SAR value is normalized to a forward power of 1W to a half-wave dipole and compared with the reference SAR value for the reference dipole and flat phantom shown in columns 2 and 3 of Table 7.1 in IEEE 1528.

7.4. VERIFICATION RESULTS

*7.4.1. Reference SAR values at 450 MHz**

	Head Tissue	Body Tissue
Reference SAR_{1g} [W/Kg]	**4.58**	**4.69**
Reference SAR_{peak} [W/Kg]	**6.75**	**6.82**
Measured SAR_{1g} [W/Kg]	4.40	4.56
Measured SAR_{peak} [W/Kg]	7.01	7.06

* SAR values in 7.4.1 are normalized to a forward power of 1 W.

7.4.2. Verification at 450 MHz

7.4.2.1. Verification for 450MHz Head Tissue:

Test Laboratory: Ultratech Group of Labs
File Name: Sys.Ver.Check-D450MHz_ICOM_Head.da52

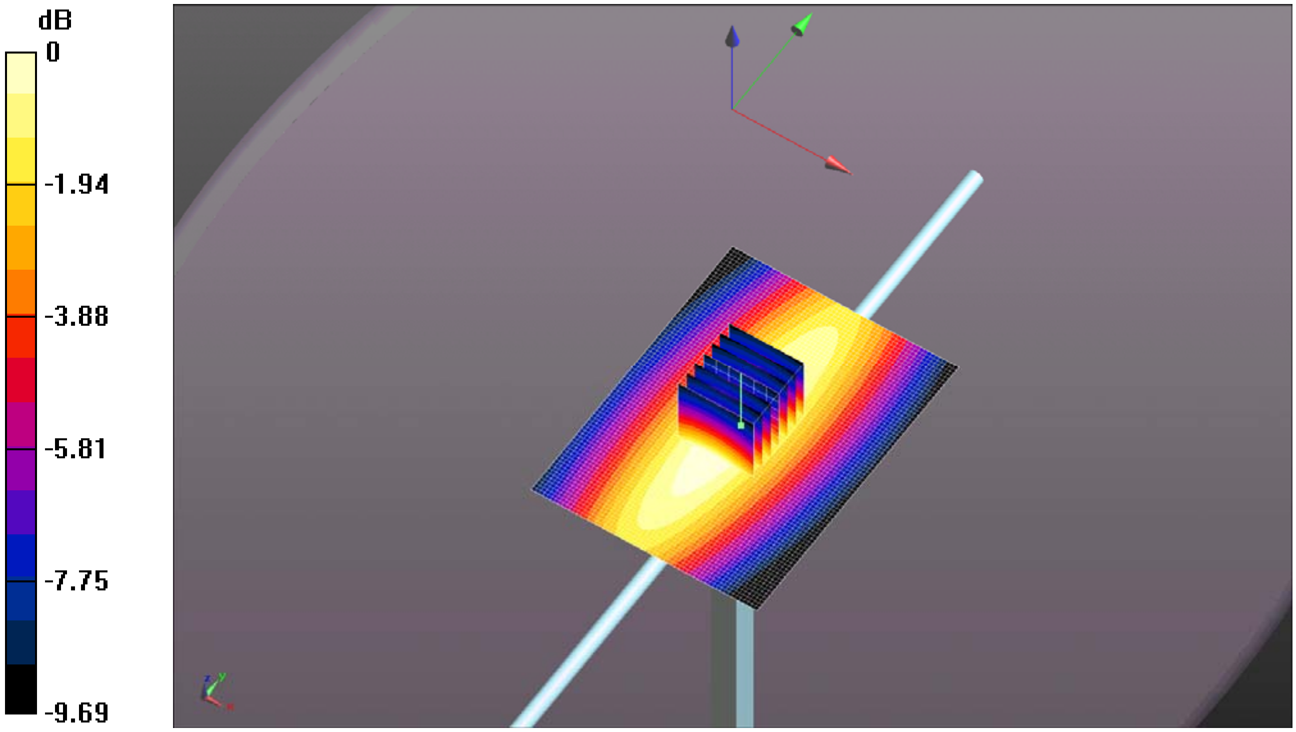
DUT: Dipole 450 MHz D450V3; Type: SA AAD 045 CA; Serial: 1063

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; $\sigma = 0.872$ mho/m; $\varepsilon_r = 43.381$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

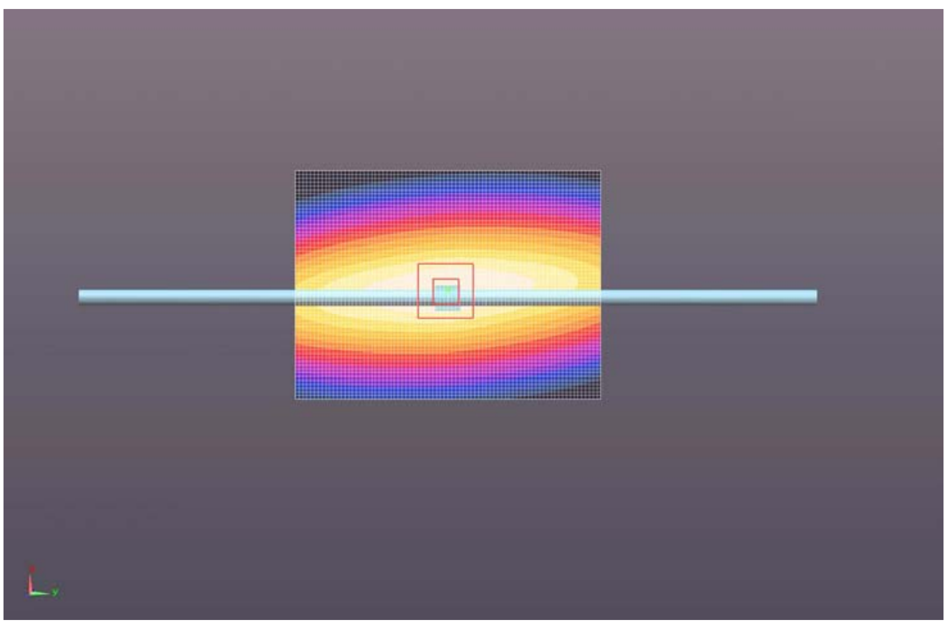
DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7.1, 7.1, 7.1); Calibrated: 3/15/2011
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

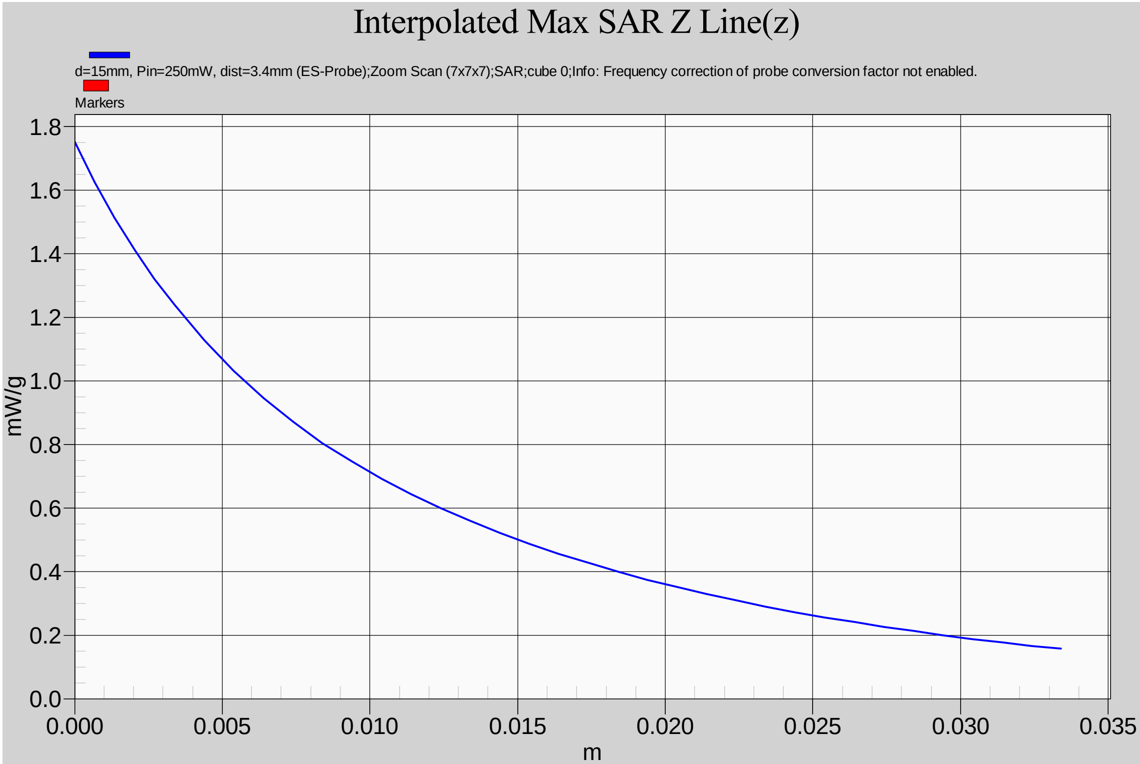
System Verification Configuration for 450MHz_Head/d=15mm, Pin=250mW, dist=3.4mm (ES-Probe)/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.262 mW/g

System Verification Configuration for 450MHz_Head/d=15mm, Pin=250mW, dist=3.4mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 37.873 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.7520
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.728 mW/g
Maximum value of SAR (measured) = 1.236 mW/g



0 dB = 1.240mW/g = 1.87 dB mW/g




Interpolated Max SAR Z Line(z)
d=15mm, Pin=250mW, dist=3.4mm (ES-Probe);Zoom Scan (7x7x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

7.4.2.2. Verification for 450MHz Body Tissue:

Test Laboratory: Ultratech Group of Labs
File Name: Sys.Ver.Check-D450MHz_ICOM_Body.da52

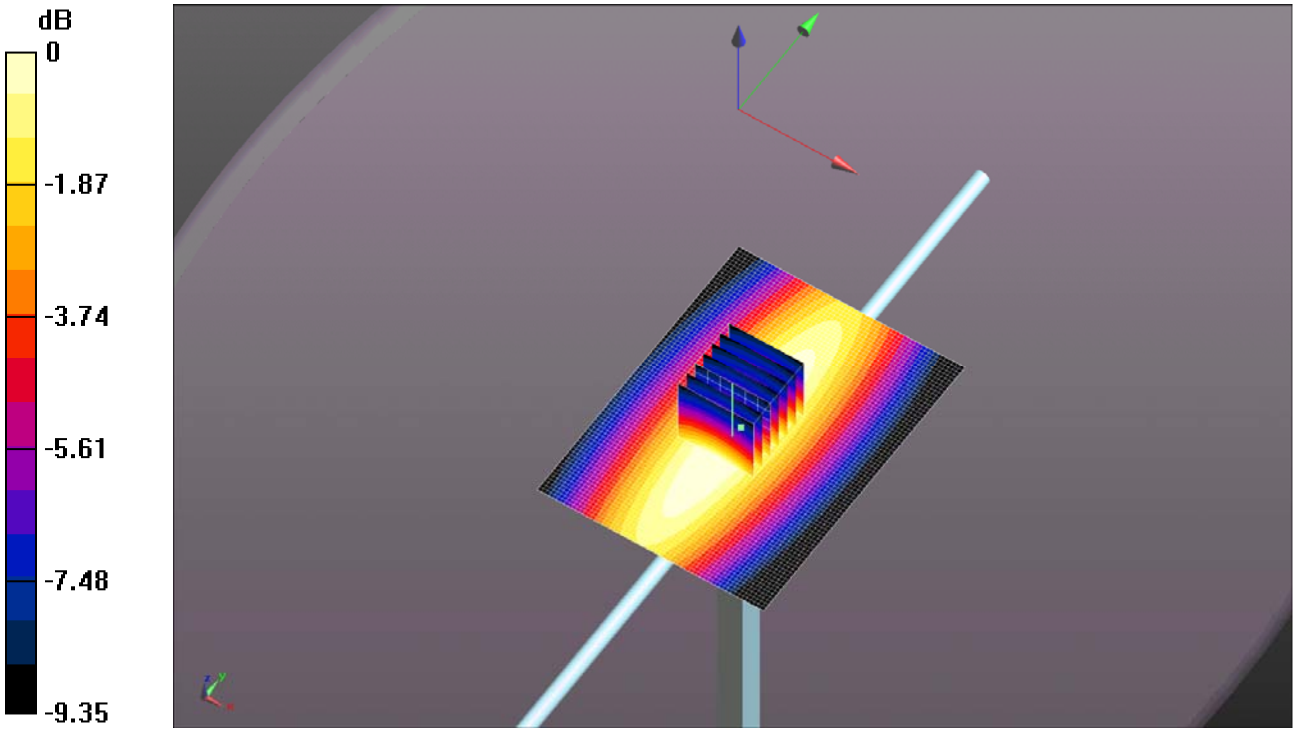
DUT: Dipole 450 MHz D450V3; Type: SA AAD 045 CA; Serial: 1063

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; σ = 0.939 mho/m; ε_r = 56.261; ρ = 1000 kg/m^3
Phantom section: Flat Section

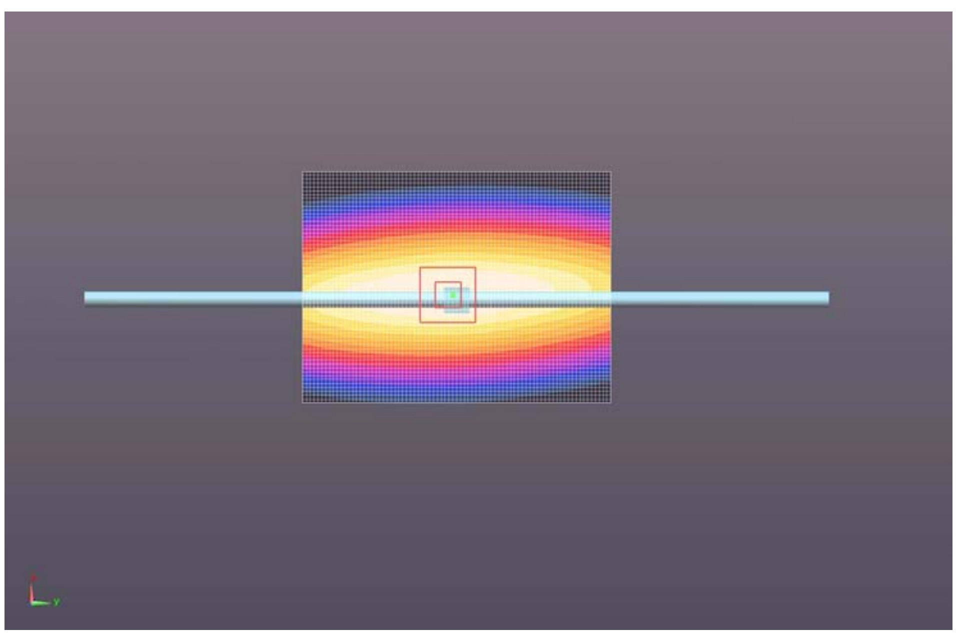
DASY5 Configuration:
- Probe: ES3DV3 - SN3208; ConvF(7, 7, 7); Calibrated: 3/15/2011
- Sensor-Surface: 3.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874;
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

System Verification Configuration for 450MHz_Body/d=15mm, Pin=250mW, dist=3.4mm (ES-Probe)/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.276 mW/g

System Verification Configuration for 450MHz_Body/d=15mm, Pin=250mW, dist=3.4mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 37.145 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.7660
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.762 mW/g
Maximum value of SAR (measured) = 1.217 mW/g



0 dB = 1.220mW/g = 1.73 dB mW/g



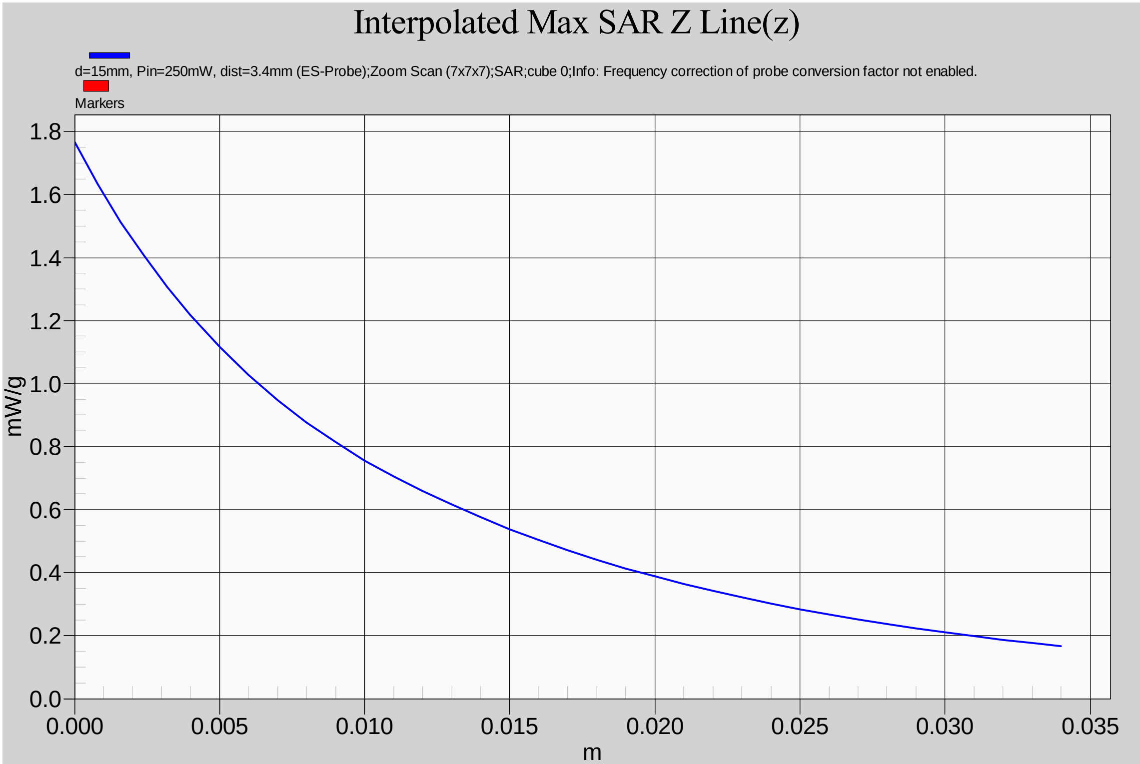
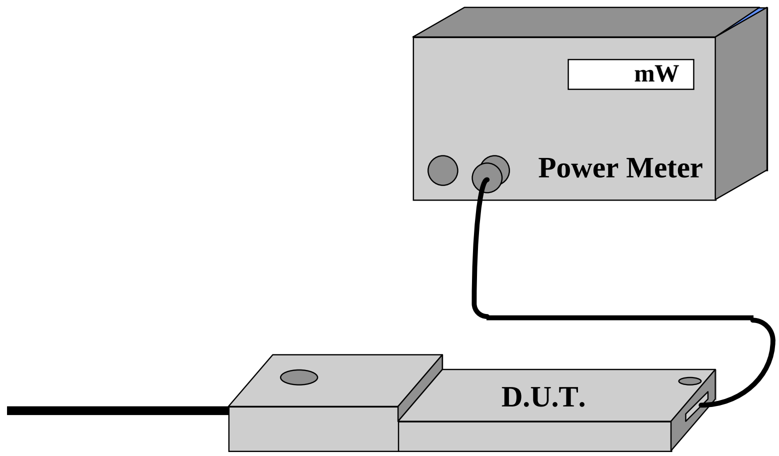

Interpolated Max SAR Z Line(z)
d=15mm, Pin=250mW, dist=3.4mm (ES-Probe);Zoom Scan (7x7x7);SAR;cube 0;Info: Frequency correction of probe conversion factor not enabled.
Markers
mW/g
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

EXHIBIT 8. D.U.T. POWER MEASUREMENT

Whenever possible, a conducted power measurement is performed. To accomplish this, we utilize a fully charged battery, a calibrated power meter and a cable adapter provided by the manufacturer. The data of the cable and related circuit losses are also provided by the manufacturer. The power measurement is then performed across the operational band and the channel with the highest output power is recorded.



Power measurement is performed before and after the SAR to verify if the battery was delivering full power at the time of testing. A difference in output power would determine a need for battery replacement and to repeat the SAR test.

8.1.1. RF conducted output power measurement

Fundamental Frequency (MHz)	Measured RF output power conducted (W)
406.1	4.40
420	4.22
430	4.25
435	4.27
440	4.29
445	4.32
460	4.01
469.9	4.56

8.1.2. SAR drift measurement

The local SAR was measured at the arbitrary location in the vicinity of the antenna fed point in the simulated tissue at 469.9 MHz during the period of 30 minute for rechargeable Li-ion battery pack.

The power (SAR) drift after 30 minutes of the continuous transmission at the maximum power level was found to be less than ± 5 %.

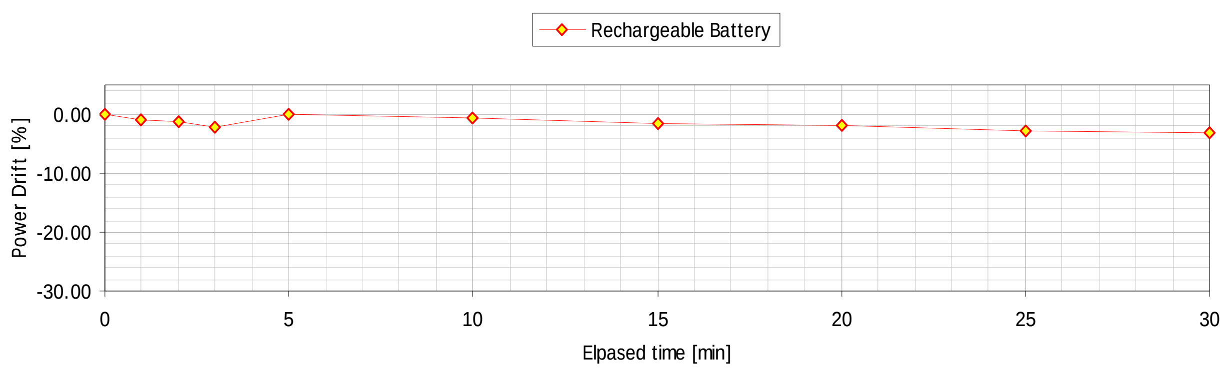


EXHIBIT 9. TISSUE DIELECTRIC PARAMETER CALIBRATION

9.1. SIMULATED TISSUE

Simulated Tissue: Suggested in a paper by George Hartsgrove and colleagues in University of Ottawa Ref.: Bioelectromagnetics 8:29-36 (1987)

Ingredient	Quantity
Water	40.4 %
Sugar	56.0 %
Salt	2.5 %
HEC	1.0 %
Bactericide	0.1 %

Table 9.1 Example of composition of simulated tissue

This simulated tissue is mainly composed of water, sugar and salt. At higher frequencies, in order to achieve the proper conductivity, the solution does not contain salt. Also, at these frequencies, D.I. water and alcohol is preferred.

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 Kg/m^{3}[*])

[*] The actual mass density of the equivalent tissue varies based on the composition of the tissue from 990 Kg/m^3 to 1,300 Kg/m^3.

9.2. MEASUREMENT OF ELECTRICAL CHARACTERISTICS OF SIMULATED TISSUE

HP Dielectric Strength Probe System (open-ended coaxial transmission-line probe/sensor) was used.

9.2.1. Equipment set-up

The equipment consists of a probe connected to one port of a vector network analyzer. The probe is an open-ended coaxial line, as shown in Figure 9.2.1.1. Cylindrical coordinates (ρ, ϕ, z) are used where ρ is the radial distance from the axis, ϕ is the angular displacement around the axis, z is the displacement along the axis, a is the inner conductor radius, and b is the outer conductor inner radius.

The sample holder is a non-metallic container that is large compared with the size of the probe immersed in it. A probe with an outer diameter b of 2 to 4 mm is suitable for the measurement of tissue-equivalent materials in the 300 MHz to 3 GHz frequency range. This probe size is commensurate with sample volumes of 50 cc or higher. Larger probes of up to 7 mm outer diameter b may be used with larger sample volumes. A flange is typically included to better represent the infinite ground-plane assumption used in admittance calculations.

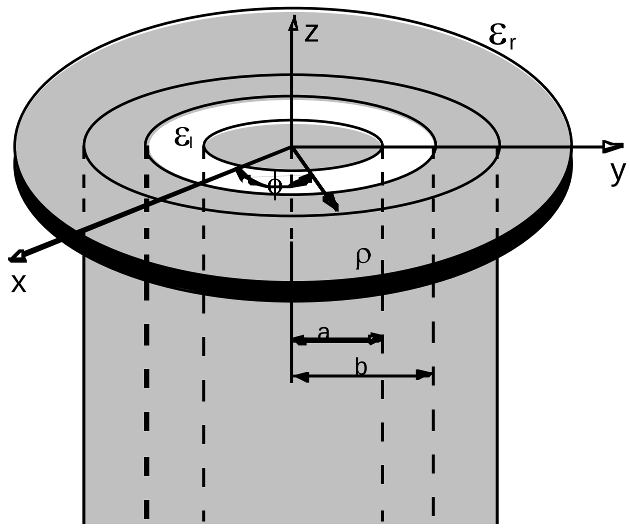


Figure 9.2.1. An open-ended coaxial probe with inner and outer radii a and b, respectively

The accuracy of the short-circuit measurement should be verified for each calibration at a number of frequencies. A short circuit can be achieved by gently pressing a piece of aluminum foil against the open end. For best electrical contact, the probe end should be flat and free of oxidation. Larger the sensors generally have better foil short-circuit repeatability. It is possible to obtain good contact with some commercial 4.6 mm probes using the metal-disk short-circuit supplied with the kit. For best repeatability, it may be necessary to press the disk by hand.

The network analyzer is configured to measure the magnitude and phase of the admittance. A one-port reflection calibration is performed at the plane of the probe by placing materials for which the reflection coefficient can be calculated in contact with the probe. Three standards are needed for the calibration, typically a short circuit, air, and de-ionized water at a well-defined temperature (other reference liquids such as methanol or ethanol may be used for calibration). The calibration is a key part of the measurement procedure, and it is therefore important to ensure that it has been performed correctly. It can be checked by re-measuring the short circuit to ensure that a reflection coefficient of Γ = -1.0 (linear units) is obtained consistently.

9.2.2. Measurement procedure

a) Configure and calibrate the network analyzer and probe system.
b) Place the sample in a non-metallic container and immerse the probe. A fixture or clamp is recommended to stabilize the probe, mounted such that the probe face is at an angle with respect to the liquid surface to minimize trapped air bubbles beneath the flange.
c) Measure the complex admittance with respect to the probe aperture.
d) Compute the complex relative permittivity $\varepsilon_r = \varepsilon_r' - j\,\sigma / \omega\varepsilon_0$.

9.3. SIMULATED TISSUE MEASUREMENT RESULTS

Tissue calibration type	HP Dielectric Strength Probe System (M/N: 85070C)	
Tissue calibration date [MM/DD/YYYY]	12/01/2011	12/01/2011
Tissue calibrated by	Steven Lu	Steven Lu
Room temperature [°C]	23.3	23.3
Room humidity [%]	40	40
Simulated tissue temperature [°C]	20.8	20.8
Tissue calibration frequency [MHz]	450	450
Tissue Type	Brain	Muscle
Target conductivity [S/m]	0.87	0.94
Target dielectric constant	43.5	56.7
Composition (by weight) [%]	DI Water (38.56 %) Sugar (56.32 %) Salt (3.95 %) HEC (0.25 %) Bactericide (0.92 %)	DI Water (51.16 %) Sugar (46.78 %) Salt (1.49 %) HEC (0.13 %) Bactericide (0.44 %)
Measured conductivity [S/m]	0.87(0.3%)	0.94(-0.1%)
Measured dielectric constant	43.4(-0.3%)	56.3(-0.8 %)
Penetration depth (plane wave excitation) [mm]	42.8	44.5

9.3.1. 450 MHz Brain Tissue

	Meas. after 5min			DI Water at 20°C			Init. Meas.		
Frequency [MHz]	ε'	ε"	σ [S/m]	ε'	ε"	σ [S/m]	ε'	ε"	σ [S/m]
415.000	44.1748	36.5529	0.84	80.1801	2.0598	0.05	43.9515	36.7574	0.85
450.000	43.3806	34.8435	0.87	80.1432	2.1755	0.05	43.1705	35.0638	0.88
485.000	42.6133	33.3978	0.90	80.0768	2.2617	0.06	42.3974	33.3631	0.90

9.3.2. 450 MHz Muscle Tissue

	Meas. after 5min			DI Water at 20°C			Init. Meas.		
Frequency [MHz]	ε'	ε"	σ [S/m]	ε'	ε"	σ [S/m]	ε'	ε"	σ [S/m]
415.000	56.7904	39.3890	0.91	80.1801	2.0598	0.05	56.7817	39.2875	0.91
450.000	56.2612	37.5228	0.94	80.1432	2.1755	0.05	56.2354	37.3939	0.94
485.000	55.7747	35.7805	0.97	80.0768	2.2617	0.06	55.7405	35.6624	0.96

EXHIBIT 10. SAR MEASUREMENT UNCERTAINTY

10.1. MEASUREMENT UNCERTAINTY EVALUATION FOR SAR TEST

Error Description	Uncertainty value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) v_{eff}
Measurement System								
Probe Calibration	±5.5 %	N	1	1	1	±5.5 %	±5.5 %	∞
Axial Isotropy	±4.7 %	R	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Readout Electronics	±0.3 %	R	$\sqrt{3}$	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	N	1	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	$\sqrt{3}$	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Phantom and Setup								
Phantom Uncertainty	±4.0 %	R	$\sqrt{3}$	1	1	±2.3 %	±2.3 %	∞
Liquid Conductivity (target)	±5.0 %	R	$\sqrt{3}$	0.64	0.43	±1.8 %	±1.2 %	∞
Liquid Conductivity (meas.)	±2.5 %	N	1	0.64	0.43	±1.6 %	±1.1 %	∞
Liquid Permittivity (target)	±5.0 %	R	$\sqrt{3}$	0.6	0.49	±1.7 %	±1.4 %	∞
Liquid Permittivity (meas.)	±2.5 %	N	1	0.6	0.49	±1.5 %	±1.2 %	∞
Combined Std. Uncertainty						±10.7 %	±10.5 %	387
Expanded STD Uncertainty						**±21.4 %**	**±21.0 %**	

EXHIBIT 11. ADDITIONAL TEST INSTRUMENTS LIST

Name	Type	Serial Number (SN)	Calibration Date (or Due Date)
Signal Generator	HP 8648C	3443U00391	Due Date: Dec. 14, 2012
Dipole Antenna	D450V3	1063	Aug. 22, 2011
Power Meter (HP)	HP 436A HP 436A	2347A17246 2709A27515	Due Date: Aug. 15, 2012 Due Date: Aug. 15, 2012
Directional Coupler (narda)	Model 3020A	35482	N/A
Spectrum Analyzer (ADVANTEST)	R3271	15050203	Due Date: Aug. 19, 2012
Network Analyzer (HP)	8753D	3410J02042	Due Date: Aug. 17, 2012
RF Amplifier (RF Bay, Inc)	MPA-12-30	21100106	Due Date: Dec. 14, 2012

EXHIBIT 12. PROBE CALIBRATION CERTIFICATE

See Appendix 1.

EXHIBIT 13. VALIDATION DIPOLE CALIBRATION CERTIFICATE

See Appendix 2.