## WCDMA BNAD II towards ground mid with earophone

Date/Time: 22/07/2014 13:20:34

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 2; Frequency: 1880 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 1880 MHz; $\sigma$ = 1.477 S/m; $\varepsilon_r$ = 52.425; $\rho$ = 1000 kg/$m^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(5.18, 5.18, 5.18); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards ground mid with earphone/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.852 W/kg

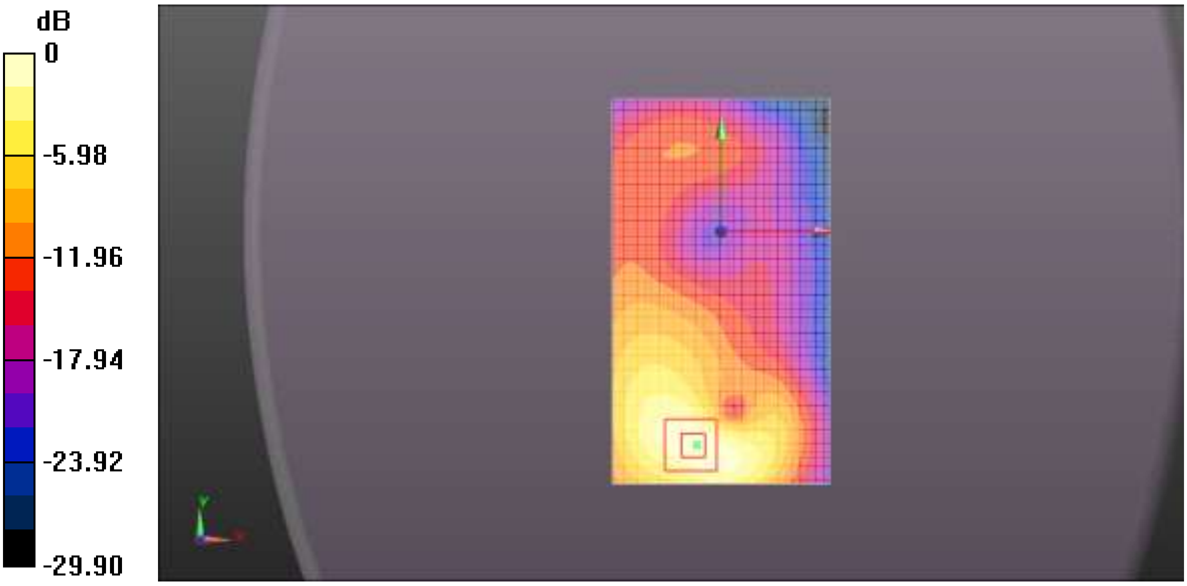
**body/towards ground mid with earphone/Zoom Scan (8x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.248 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.07 W/kg

**SAR(1 g) = 0.671 W/kg; SAR(10 g) = 0.368 W/kg**

Maximum value of SAR (measured) = 0.828 W/kg



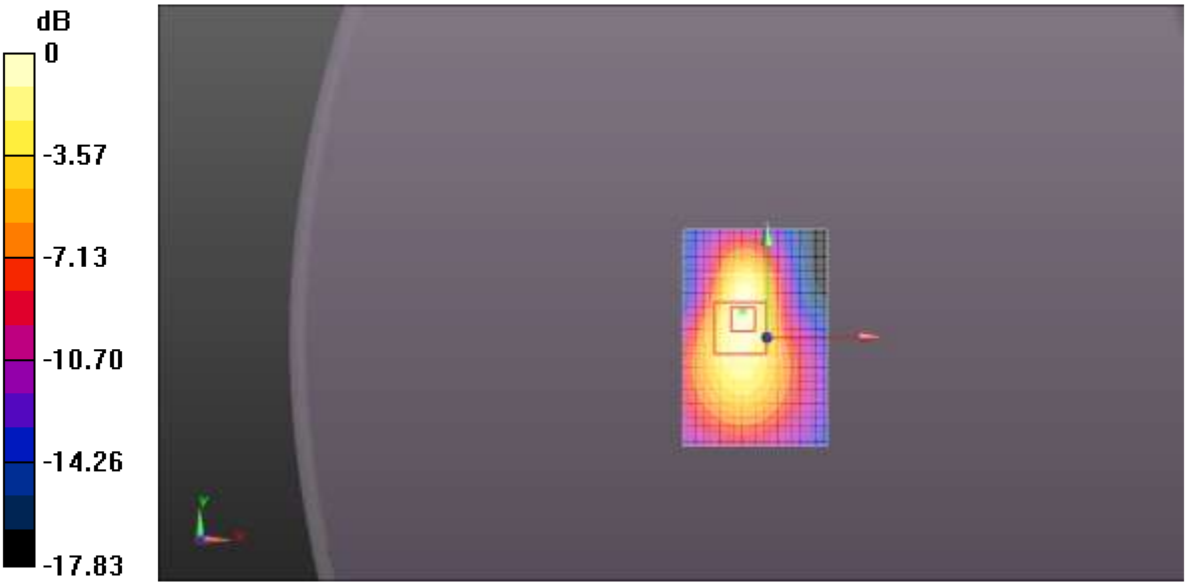

0 dB = 0.852 W/kg = -0.70 dBW/kg

**WCDMA BNAD II front high repeat**
Date/Time: 22/07/2014 12:46:07
Communication System: UID 0, WCDMA (0); Communication System Band: BAND 2; Frequency: 1907.6 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1908 MHz; $\sigma$ = 1.502 S/m; $\varepsilon_r$ = 52.332; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE1528-2013)
DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(5.18, 5.18, 5.18); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/front high repeat/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.16 W/kg

**body/front high repeat/Zoom Scan (7x8x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.802 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.49 W/kg
**SAR(1 g) = 0.870 W/kg; SAR(10 g) = 0.468 W/kg**
Maximum value of SAR (measured) = 1.10 W/kg




0 dB = 1.16 W/kg = 0.65 dBW/kg

**WCDMA BNAD V left touch mid**

Date/Time: 17/07/2014 14:07:21

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.883 S/m; $\varepsilon_r$ = 41.292; ρ = 1000 kg/$m^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.43, 6.43, 6.43); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: SAM 1; Type: SAM; Serial: TP:1702
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**left/touch mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.315 W/kg

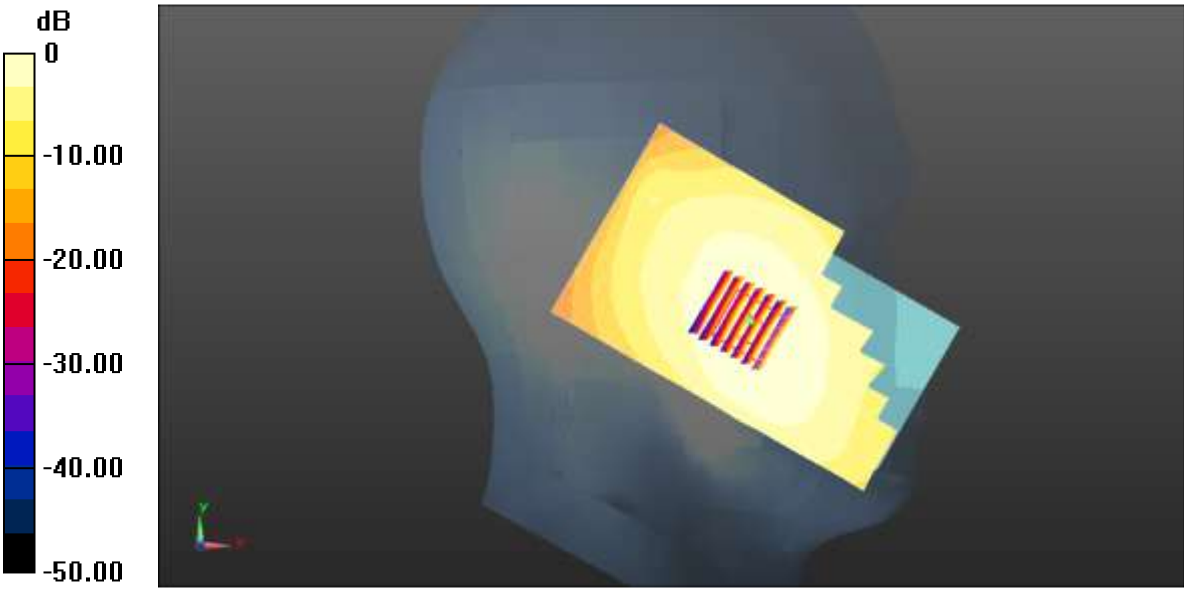
**left/touch mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.533 V/m; Power Drift = -0.01 dB

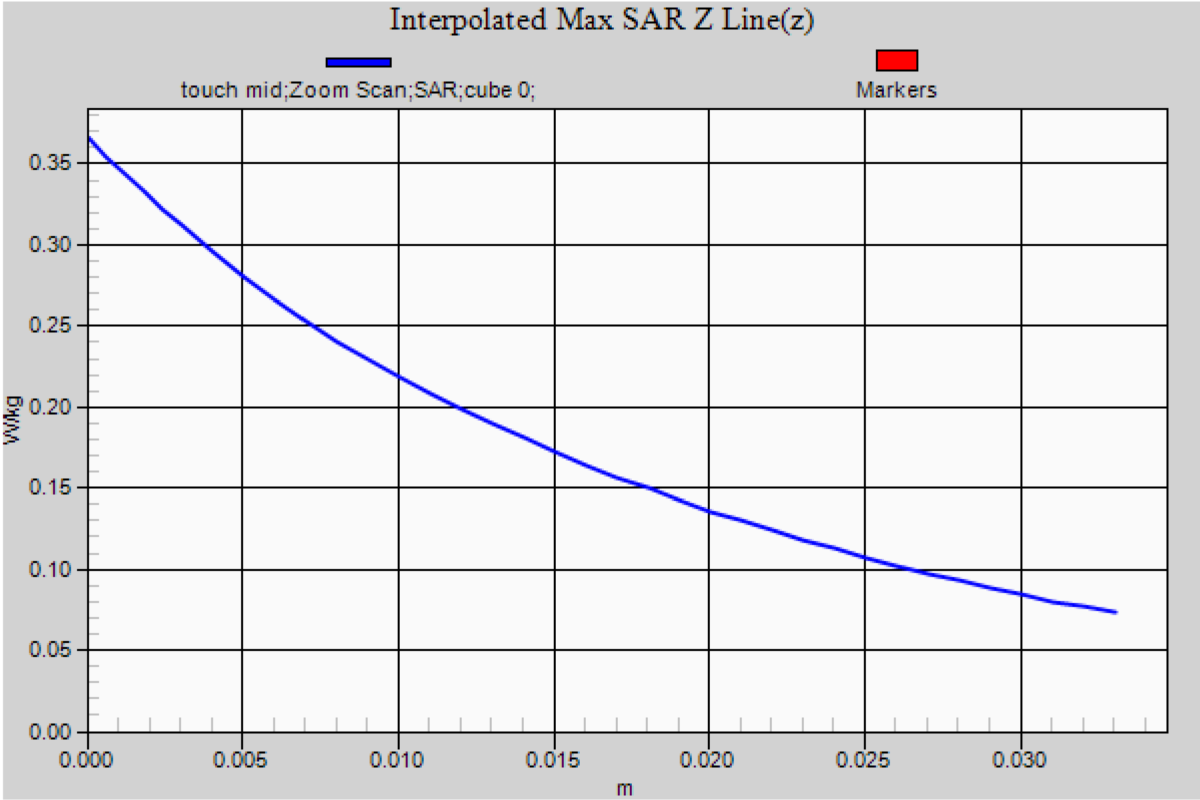
Peak SAR (extrapolated) = 0.366 W/kg

**SAR(1 g) = 0.281 W/kg; SAR(10 g) = 0.210 W/kg**

Maximum value of SAR (measured) = 0.310 W/kg




0 dB = 0.315 W/kg = -5.01 dBW/kg


Interpolated Max SAR Z Line(z)
touch mid;Zoom Scan;SAR;cube 0;
Markers
W/kg
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

**WCDMA BNAD V left tilt mid**

Date/Time: 17/07/2014 14:38:54

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): f = 836.6 MHz; $\sigma$ = 0.883 S/m; $\varepsilon_r$ = 41.292; $\rho$ = 1000 $kg/m^3$

Phantom section: Left Section

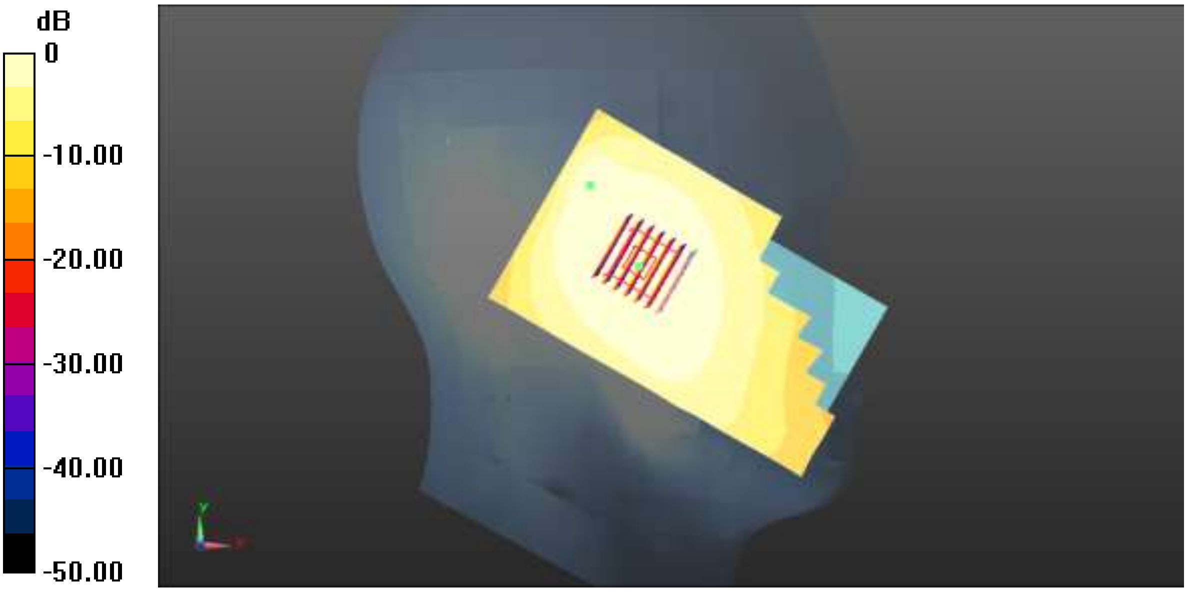
Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.43, 6.43, 6.43); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: SAM 1; Type: SAM; Serial: TP:1702
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**left/tilt mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.149 W/kg

**left/tilt mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.074 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.174 W/kg
**SAR(1 g) = 0.137 W/kg; SAR(10 g) = 0.105 W/kg**
Maximum value of SAR (measured) = 0.151 W/kg




0 dB = 0.149 W/kg = -8.27 dBW/kg

**WCDMA BNAD V right touch mid**

Date/Time: 17/07/2014 15:14:07

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.883 S/m; $\varepsilon_r$ = 41.292; ρ = 1000 kg/m$^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.43, 6.43, 6.43); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: SAM 1; Type: SAM; Serial: TP:1702
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**right/touch mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.259 W/kg

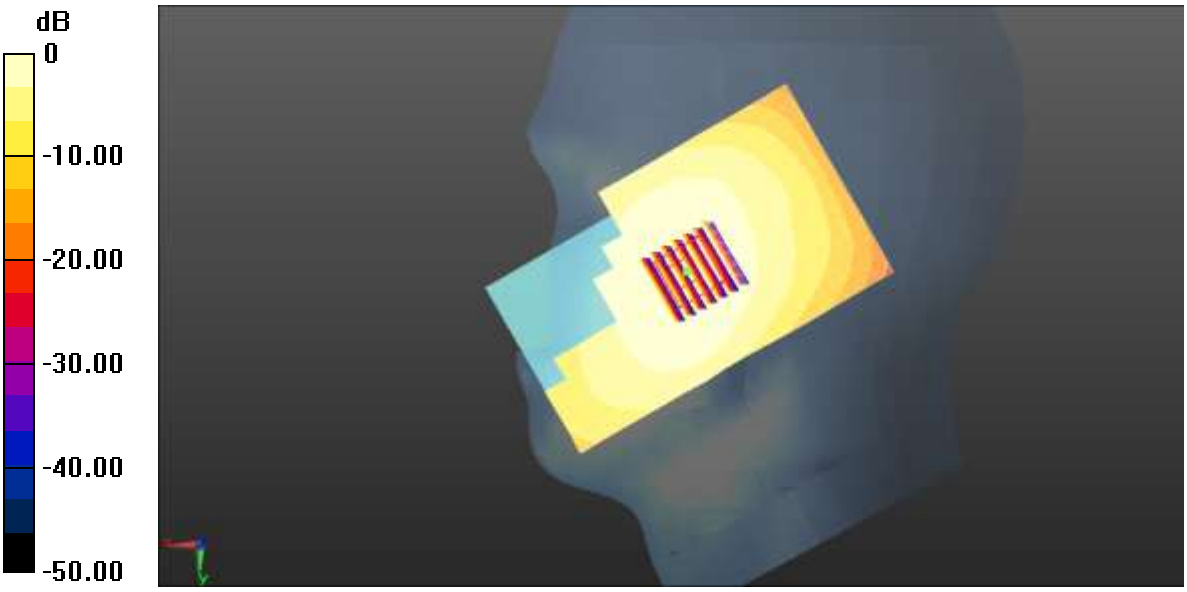
**right/touch mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.312 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.296 W/kg

**SAR(1 g) = 0.234 W/kg; SAR(10 g) = 0.177 W/kg**

Maximum value of SAR (measured) = 0.257 W/kg




0 dB = 0.259 W/kg = -5.86 dBW/kg

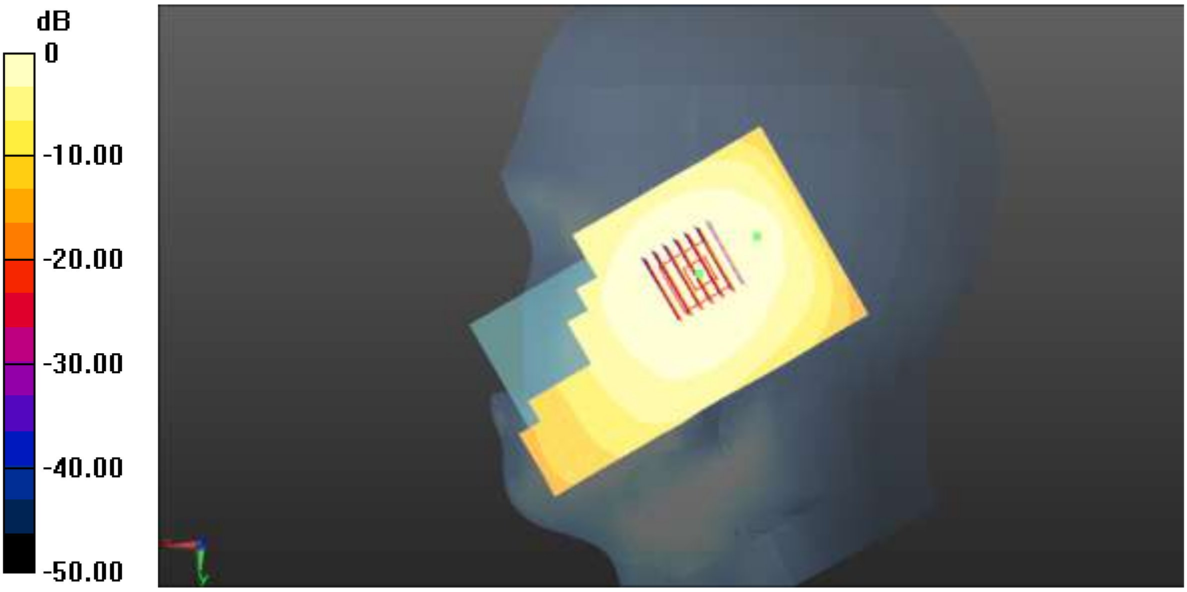
## WCDMA BNAD V right tilt mid

Date/Time: 17/07/2014 15:43:01
Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.883 S/m; $\varepsilon_r$ = 41.292; ρ = 1000 kg/$m^3$
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE1528-2013)
DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.43, 6.43, 6.43); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: SAM 1; Type: SAM; Serial: TP:1702
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**right/tilt mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.206 W/kg

**right/tilt mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.684 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.235 W/kg
**SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.146 W/kg**
Maximum value of SAR (measured) = 0.207 W/kg




0 dB = 0.206 W/kg = -6.87 dBW/kg

**WCDMA BNAD V left touch low**

Date/Time: 17/07/2014 16:55:11

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 826.4 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 827 MHz; σ = 0.874 S/m; $\varepsilon_r$ = 41.411; ρ = 1000 kg/m$^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.43, 6.43, 6.43); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: SAM 1; Type: SAM; Serial: TP:1702
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**left/touch low/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.171 W/kg

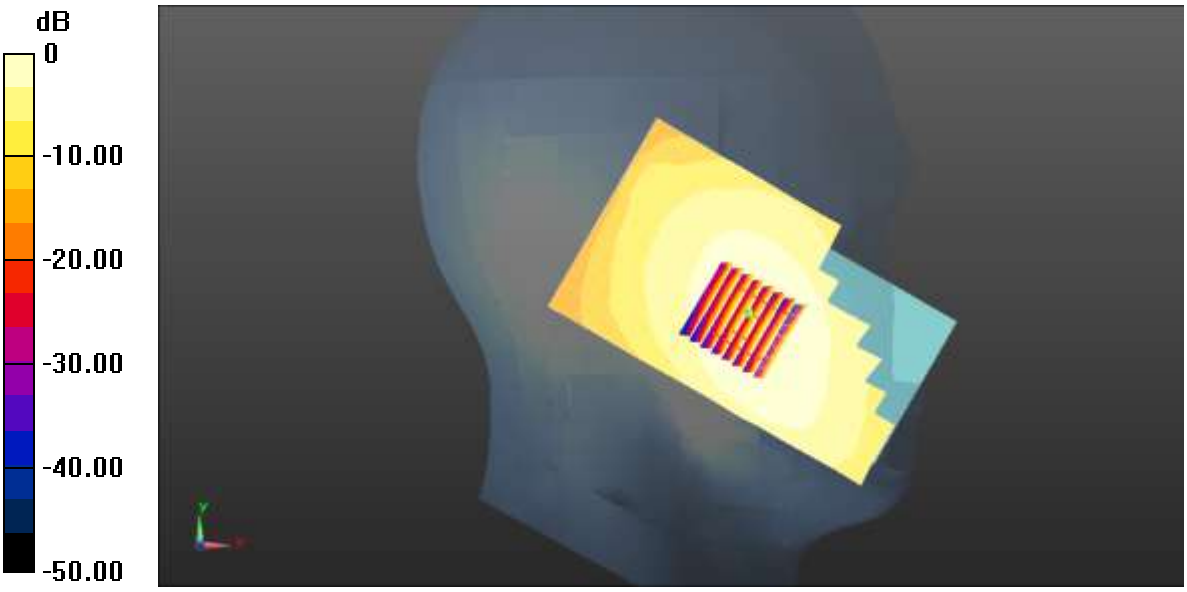
**left/touch low/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.935 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.204 W/kg

**SAR(1 g) = 0.155 W/kg; SAR(10 g) = 0.117 W/kg**

Maximum value of SAR (measured) = 0.171 W/kg




0 dB = 0.171 W/kg = -7.66 dBW/kg

## WCDMA BNAD V left touch high

Date/Time: 17/07/2014 17:28:15

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 846.6 MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.893 S/m; $\varepsilon_r$ = 41.161; ρ = 1000 kg/$m^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.43, 6.43, 6.43); Calibrated: 06/09/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: SAM 1; Type: SAM; Serial: TP:1702
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**left/touch high/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.209 W/kg

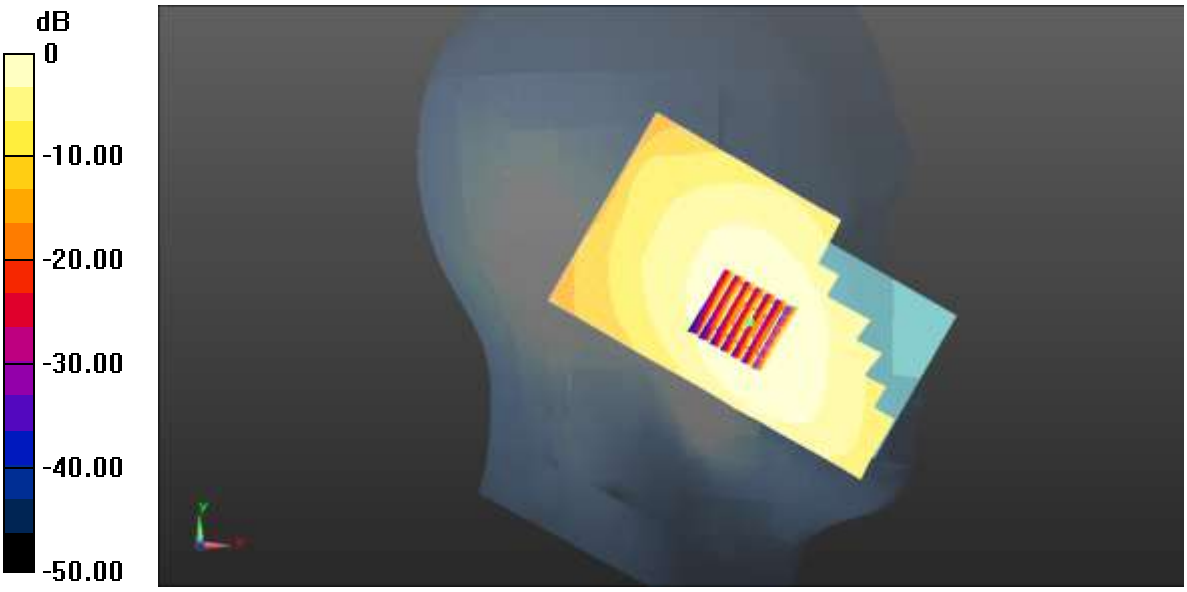
**left/touch high/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.452 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.249 W/kg

**SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.142 W/kg**

Maximum value of SAR (measured) = 0.209 W/kg




0 dB = 0.209 W/kg = -6.80 dBW/kg

**WCDMA BNAD V towards phantom mid**

Date/Time: 18/07/2014 15:23:41

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 837 MHz; $\sigma$ = 0.951 S/m; $\varepsilon_r$ = 54.241; $\rho$ = 1000 $kg/m^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards phantom mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.176 W/kg

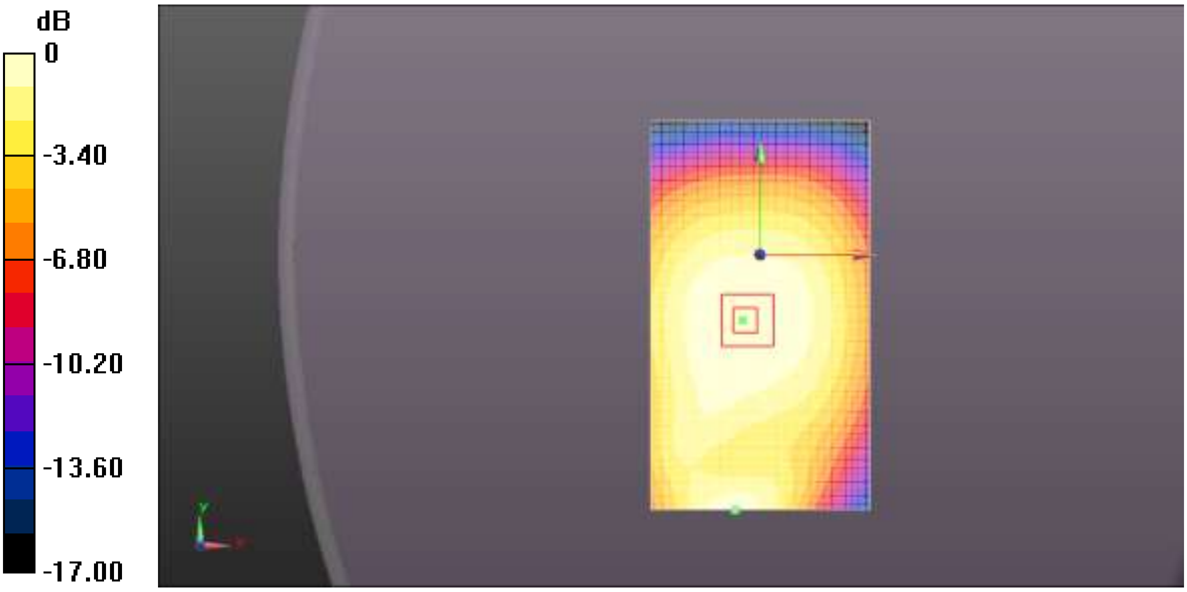
**body/towards phantom mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.251 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.206 W/kg

**SAR(1 g) = 0.169 W/kg; SAR(10 g) = 0.131 W/kg**

Maximum value of SAR (measured) = 0.177 W/kg




0 dB = 0.176 W/kg = -7.54 dBW/kg

## WCDMA BNAD V towards ground mid

Date/Time: 18/07/2014 14:50:27

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 837 MHz; $\sigma$ = 0.951 S/m; $\varepsilon_r$ = 54.241; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards ground mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.531 W/kg

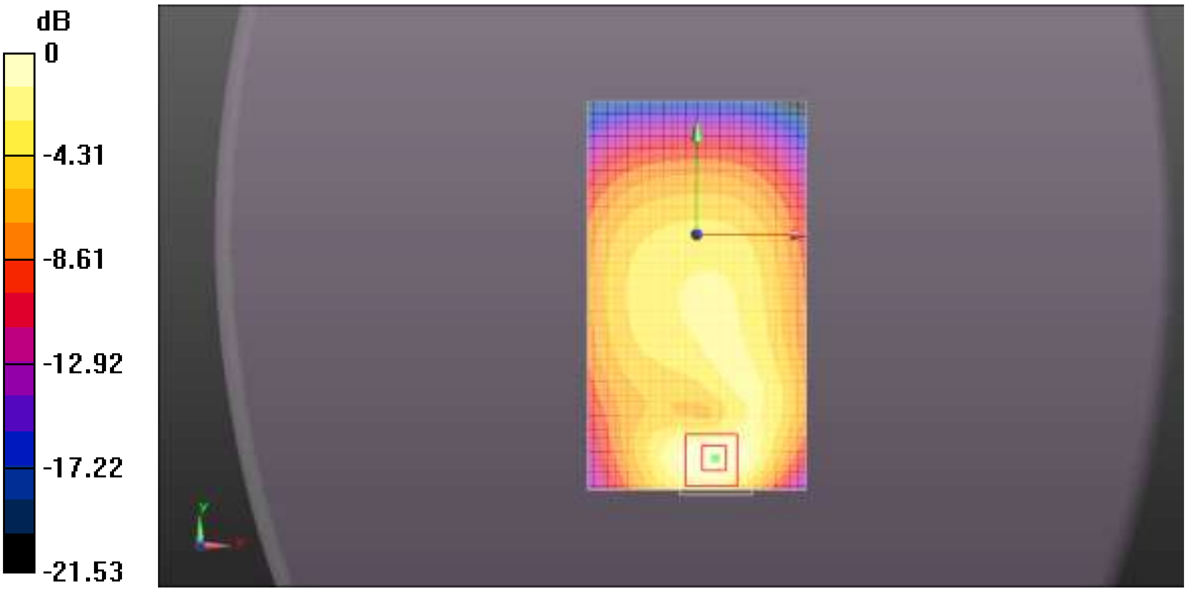
**body/towards ground mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.870 V/m; Power Drift = -0.04 dB

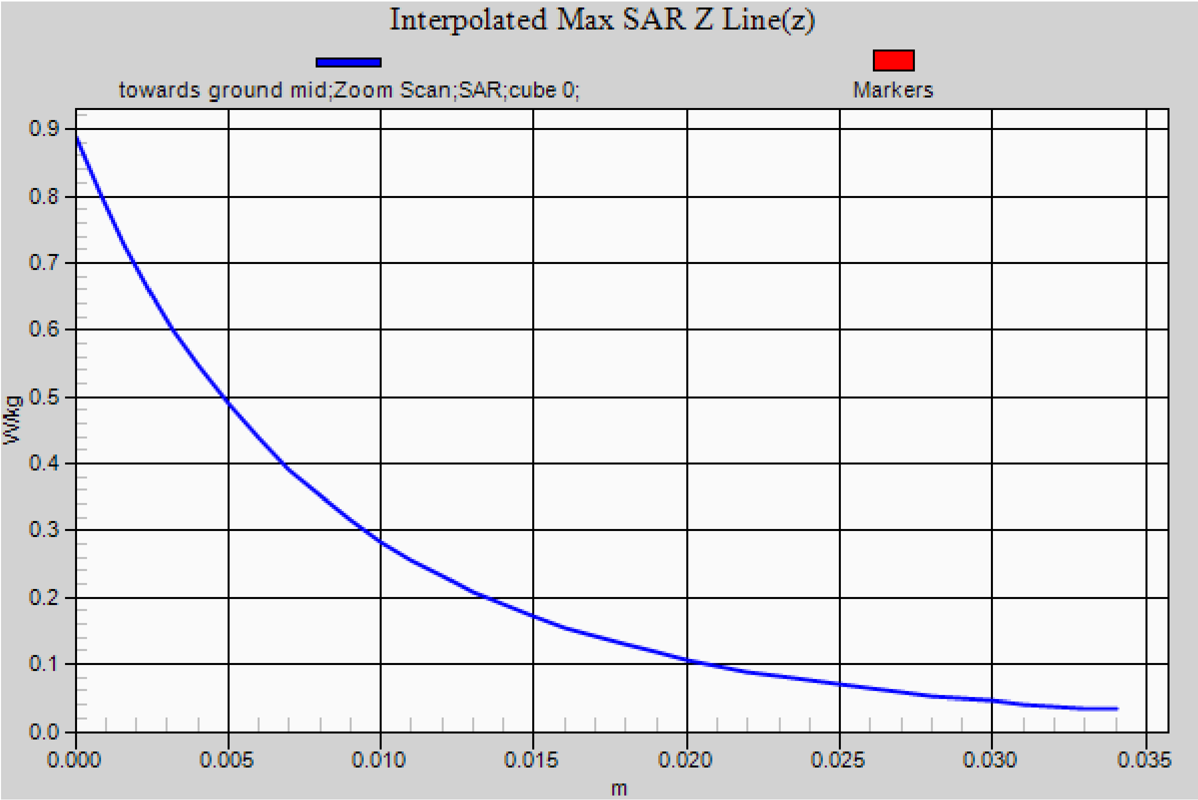
Peak SAR (extrapolated) = 0.887 W/kg

**SAR(1 g) = 0.488 W/kg; SAR(10 g) = 0.265 W/kg**

Maximum value of SAR (measured) = 0.548 W/kg




0 dB = 0.531 W/kg = -2.75 dBW/kg


Interpolated Max SAR Z Line(z)
towards ground mid;Zoom Scan;SAR;cube 0;
Markers
W/kg
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

**WCDMA BNAD V front mid**

Date/Time: 18/07/2014 16:57:18

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 837 MHz; $\sigma$ = 0.951 S/m; $\varepsilon_r$ = 54.241; $\rho$ = 1000 kg/$m^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/front mid/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.280 W/kg

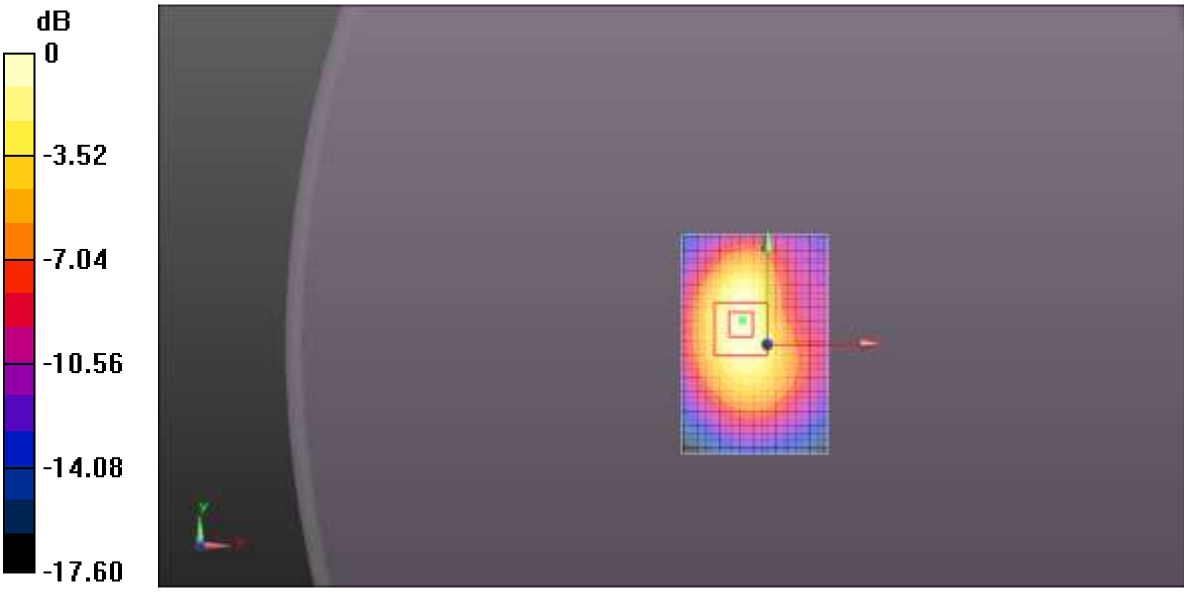
**body/front mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.038 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.429 W/kg

**SAR(1 g) = 0.245 W/kg; SAR(10 g) = 0.137 W/kg**

Maximum value of SAR (measured) = 0.272 W/kg




0 dB = 0.280 W/kg = -5.52 dBW/kg

**WCDMA BNAD V left side mid**

Date/Time: 18/07/2014 15:59:00

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 837 MHz; σ = 0.951 S/m; $\varepsilon_r$ = 54.241; ρ = 1000 kg/$m^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body 2/left side mid/Area Scan (61x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.355 W/kg

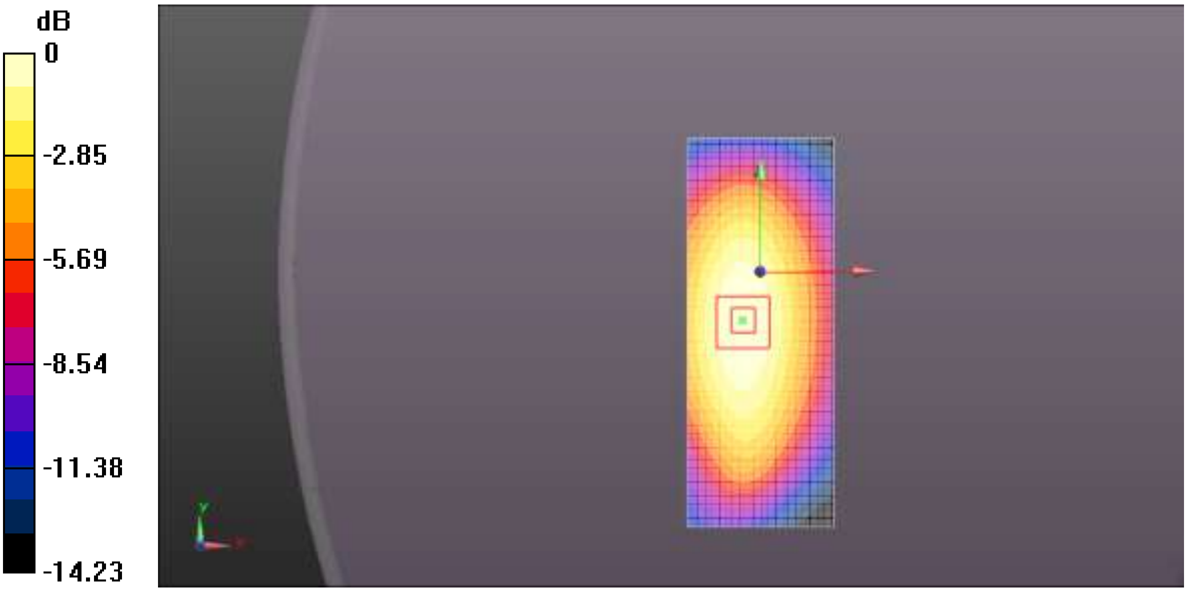
**body 2/left side mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.548 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.461 W/kg

**SAR(1 g) = 0.334 W/kg; SAR(10 g) = 0.232 W/kg**

Maximum value of SAR (measured) = 0.358 W/kg




0 dB = 0.355 W/kg = -4.50 dBW/kg

**WCDMA BNAD V right side mid**

Date/Time: 18/07/2014 16:27:07

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 837 MHz; σ = 0.951 S/m; $\varepsilon_r$ = 54.241; ρ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body 2/right side mid/Area Scan (61x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.107 W/kg

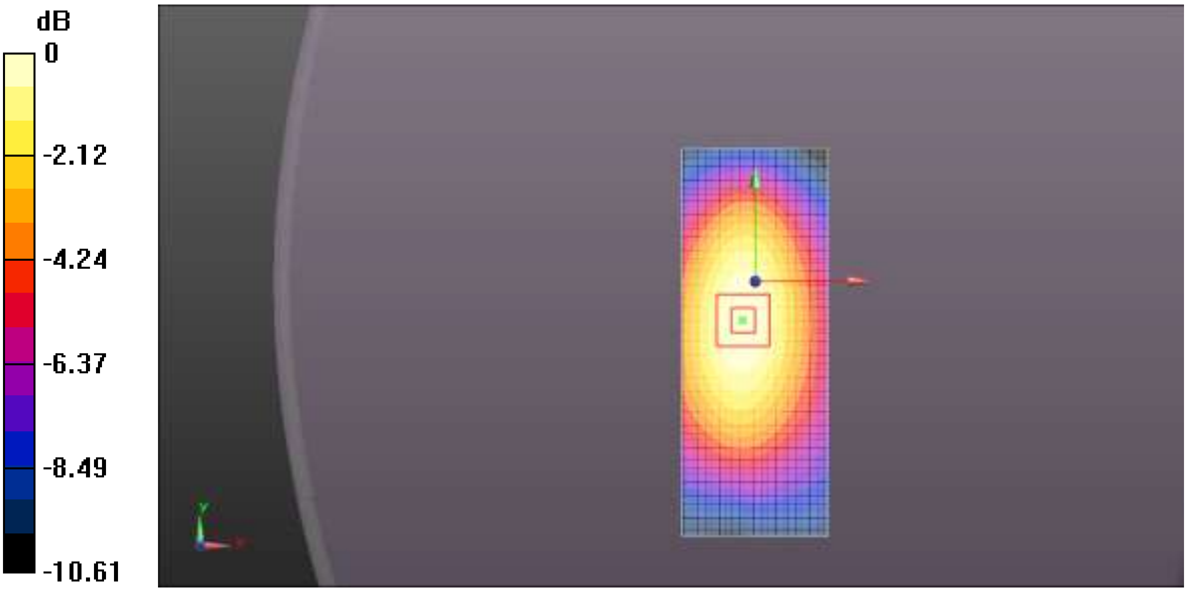
**body 2/right side mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.112 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.138 W/kg

**SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.071 W/kg**

Maximum value of SAR (measured) = 0.108 W/kg




0 dB = 0.107 W/kg = -9.71 dBW/kg

**WCDMA BNAD V towards ground low**

Date/Time: 21/07/2014 10:06:07

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 826.4 MHz;Communication System PAR: 0 dB

Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.936 S/m; $\varepsilon_r$ = 54.3; ρ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards ground low/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.382 W/kg

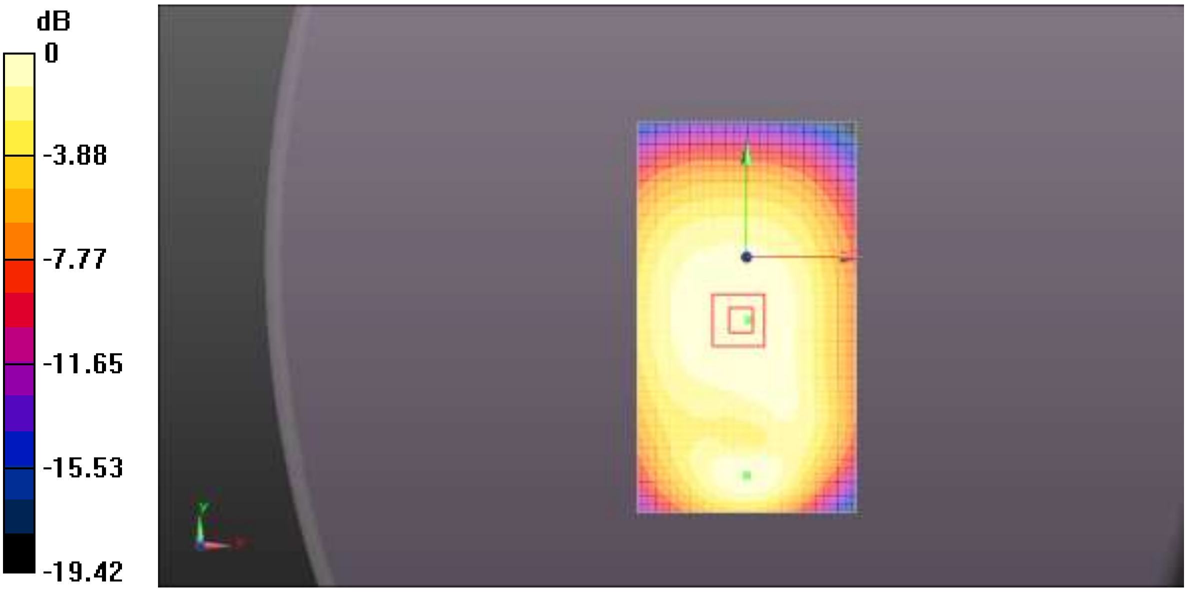
**body/towards ground low/Zoom Scan (8x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.839 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.444 W/kg

**SAR(1 g) = 0.366 W/kg; SAR(10 g) = 0.286 W/kg**

Maximum value of SAR (measured) = 0.382 W/kg




0 dB = 0.382 W/kg = -4.18 dBW/kg

## WCDMA BNAD V towards ground high

Date/Time: 21/07/2014 10:40:59

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 846.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 847 MHz; σ = 0.965 S/m; $\varepsilon_r$ = 54.169; ρ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards ground high/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.425 W/kg

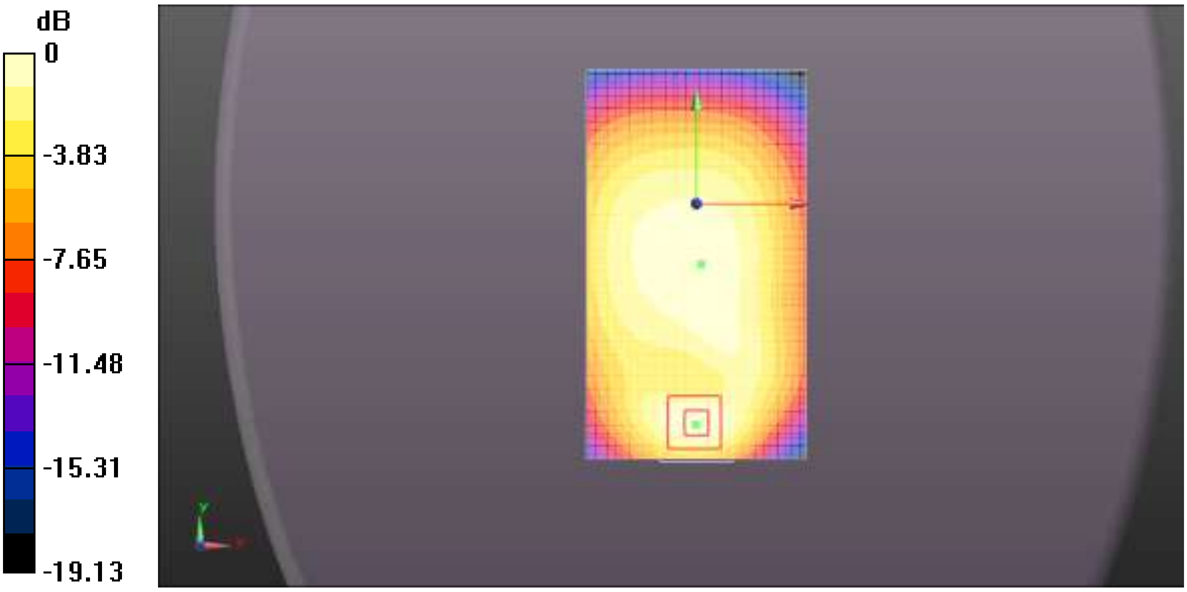
**body/towards ground high/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.759 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.683 W/kg

**SAR(1 g) = 0.388 W/kg; SAR(10 g) = 0.215 W/kg**

Maximum value of SAR (measured) = 0.432 W/kg




0 dB = 0.425 W/kg = -3.71 dBW/kg

## WCDMA BNAD V towards ground mid with earphone

Date/Time: 21/07/2014 12:07:55

Communication System: UID 0, WCDMA (0); Communication System Band: BAND 5; Frequency: 836.6 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 837 MHz; $\sigma$ = 0.951 S/m; $\varepsilon_r$ = 54.241; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.58, 6.58, 6.58); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards ground mid earphone/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.463 W/kg

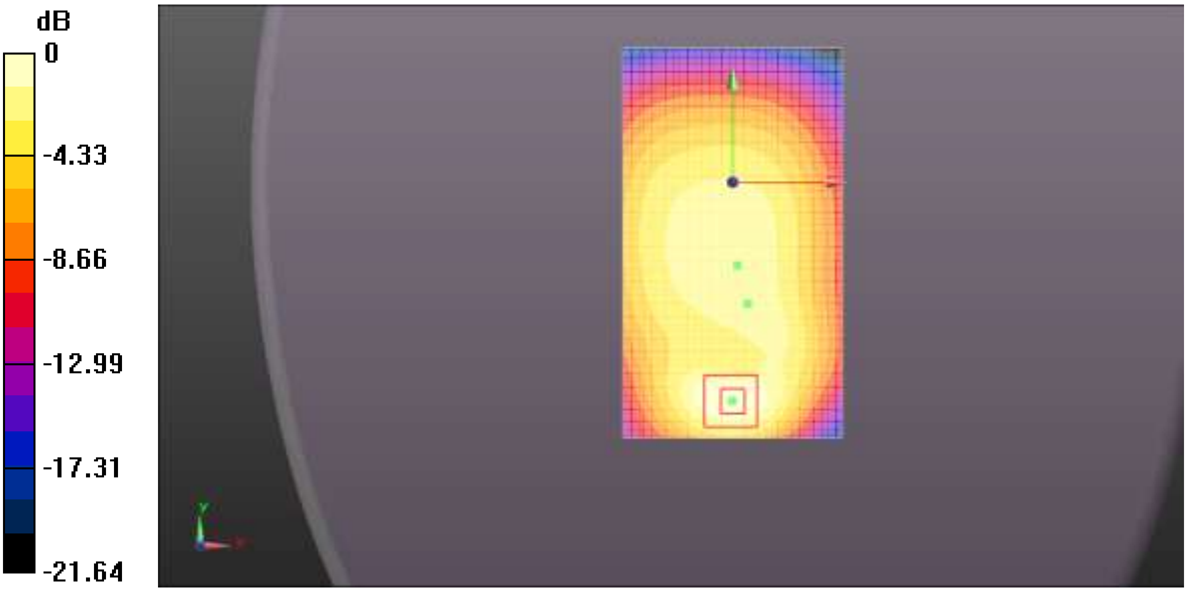
**body/towards ground mid earphone/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.242 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.744 W/kg

**SAR(1 g) = 0.421 W/kg; SAR(10 g) = 0.232 W/kg**

Maximum value of SAR (measured) = 0.474 W/kg




0 dB = 0.463 W/kg = -3.34 dBW/kg

**802.11b Data Rate: 1 Mbps left touch mid**

Date/Time: 31/07/2014 11:29:43

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.776 S/m; $\varepsilon_r$ = 37.832; $\rho$ = 1000 kg/m$^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: EX3DV4 - SN3661; ConvF(7.59, 7.59, 7.59); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 29/08/2013
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**left/touch mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.379 W/kg

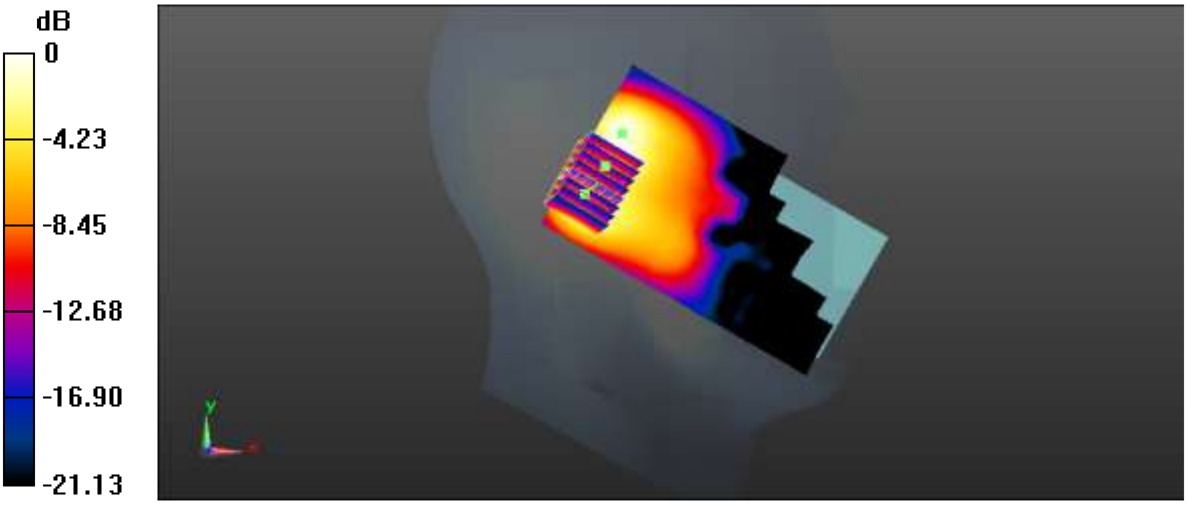
**left/touch mid/Zoom Scan (8x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.247 V/m; Power Drift = 0.27 dB

Peak SAR (extrapolated) = 0.672 W/kg

**SAR(1 g) = 0.330 W/kg; SAR(10 g) = 0.165 W/kg**

Maximum value of SAR (measured) = 0.366 W/kg




0 dB = 0.366 W/kg = -4.37 dBW/kg

**802.11b Data Rate: 1 Mbps left tilt mid**

Date/Time: 31/07/2014 12:04:37

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.776 S/m; $\varepsilon_r$ = 37.832; $\rho$ = 1000 kg/$m^3$

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: EX3DV4 - SN3661; ConvF(7.59, 7.59, 7.59); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 29/08/2013
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**left/tilt mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.520 W/kg

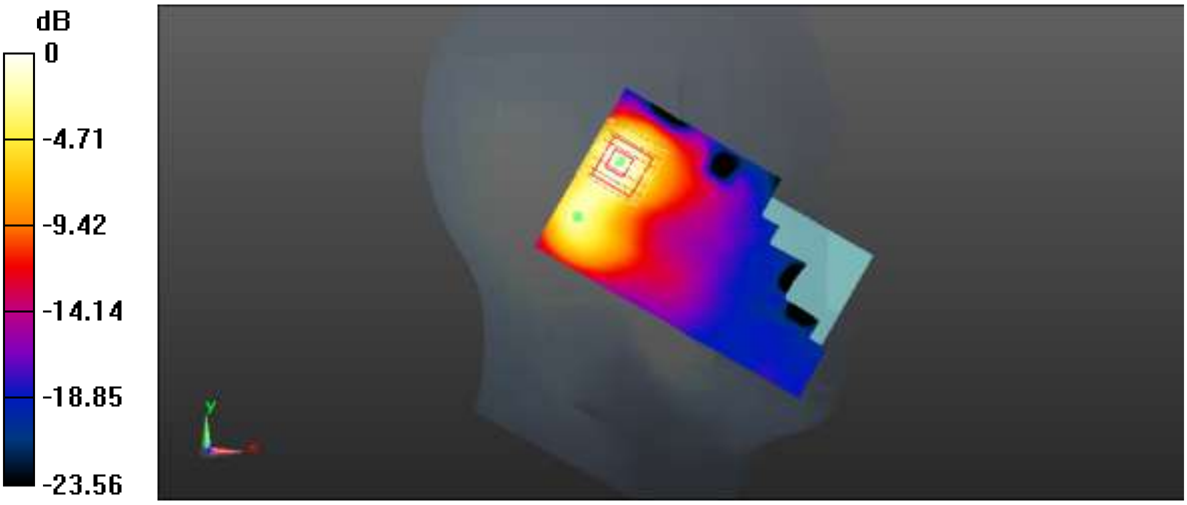
**left/tilt mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.360 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.923 W/kg

**SAR(1 g) = 0.455 W/kg; SAR(10 g) = 0.213 W/kg**

Maximum value of SAR (measured) = 0.524 W/kg




0 dB = 0.524 W/kg = -2.81 dBW/kg

**802.11b Data Rate: 1 Mbps right touch mid**

Date/Time: 31/07/2014 10:29:27

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.776 S/m; $\varepsilon_r$ = 37.832; $\rho$ = 1000 kg/m$^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: EX3DV4 - SN3661; ConvF(7.59, 7.59, 7.59); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 29/08/2013
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**right/touch mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.840 W/kg

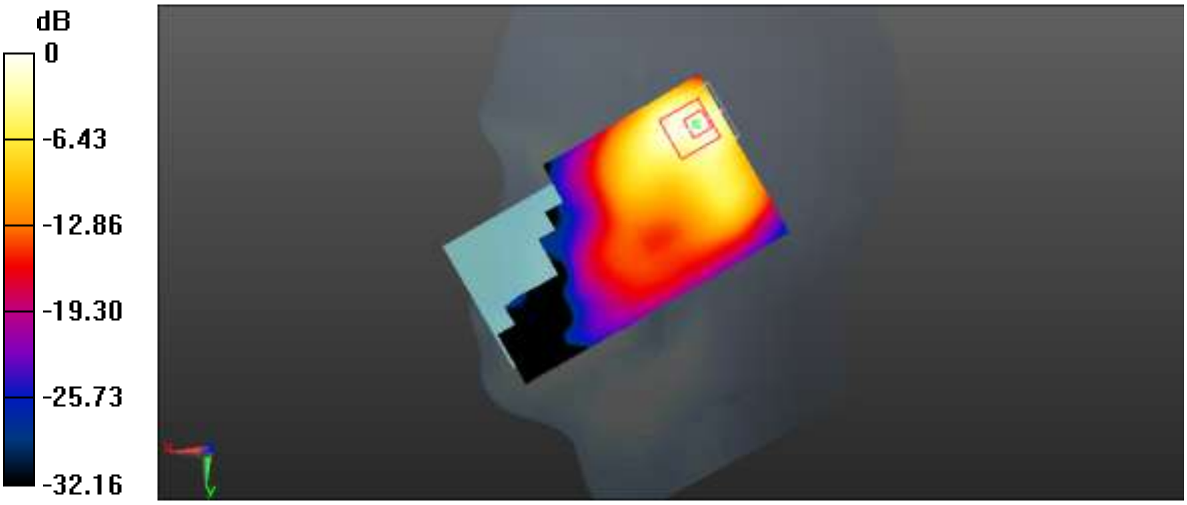
**right/touch mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.456 V/m; Power Drift = 0.07 dB

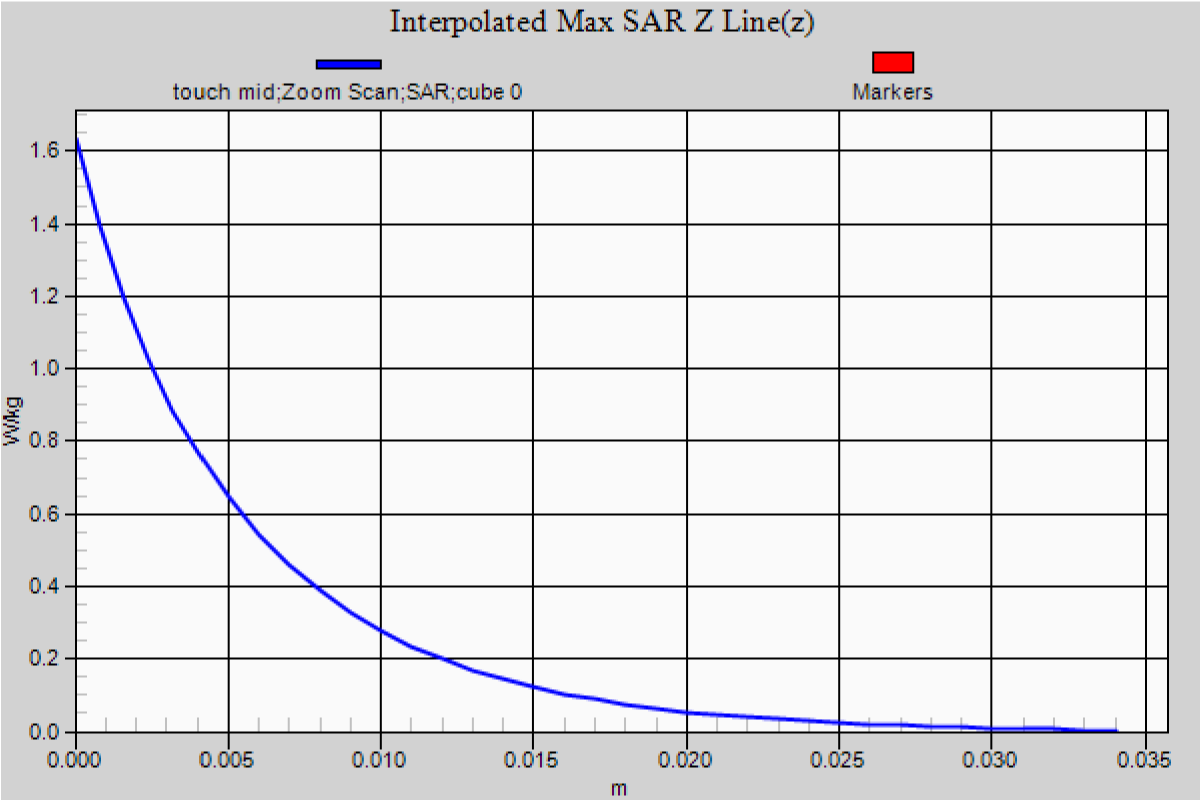
Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 0.680 W/kg; SAR(10 g) = 0.307 W/kg**

Maximum value of SAR (measured) = 0.762 W/kg




0 dB = 0.762 W/kg = -1.18 dBW/kg


Interpolated Max SAR Z Line(z)
touch mid;Zoom Scan;SAR;cube 0
Markers
W/kg
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

**802.11b Data Rate: 1 Mbps right tilt mid**

Date/Time: 31/07/2014 10:59:06

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.776 S/m; $\varepsilon_r$ = 37.832; $\rho$ = 1000 kg/$m^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: EX3DV4 - SN3661; ConvF(7.59, 7.59, 7.59); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 29/08/2013
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**right/tilt mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.768 W/kg

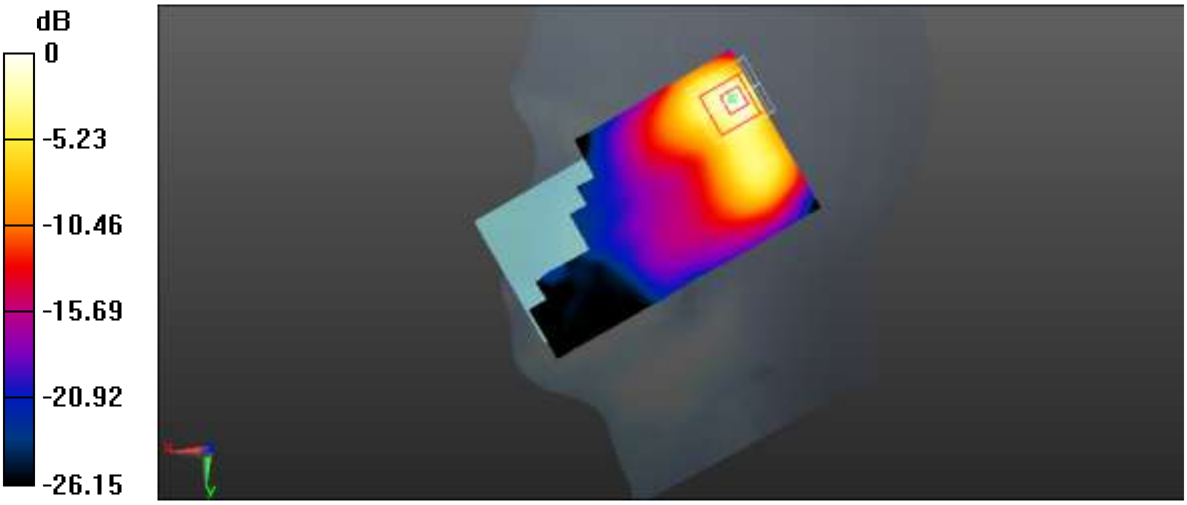
**right/tilt mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.866 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.47 W/kg

**SAR(1 g) = 0.628 W/kg; SAR(10 g) = 0.263 W/kg**

Maximum value of SAR (measured) = 0.738 W/kg




0 dB = 0.738 W/kg = -1.32 dBW/kg

**802.11b Data Rate: 1 Mbps right touch low**

Date/Time: 31/07/2014 12:35:06

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2412 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2412 MHz; σ = 1.74 S/m; $\varepsilon_r$ = 37.907; ρ = 1000 kg/$m^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: EX3DV4 - SN3661; ConvF(7.59, 7.59, 7.59); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 29/08/2013
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**right/touch low/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.622 W/kg

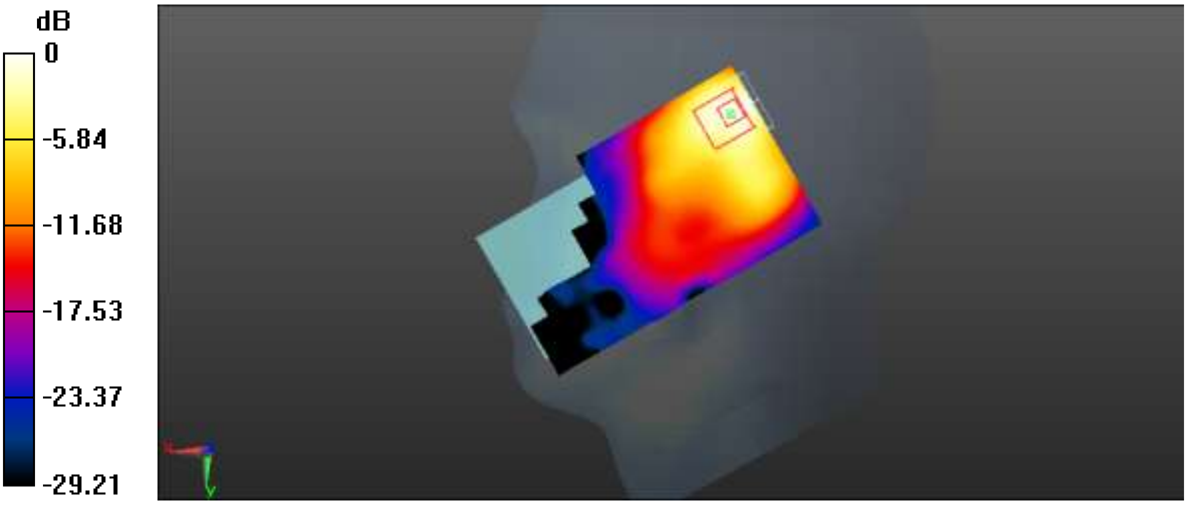
**right/touch low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.866 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 1.41 W/kg

**SAR(1 g) = 0.597 W/kg; SAR(10 g) = 0.272 W/kg**

Maximum value of SAR (measured) = 0.671 W/kg




0 dB = 0.671 W/kg = -1.73 dBW/kg

## 802.11b Data Rate: 1 Mbps right touch high

Date/Time: 31/07/2014 13:05:37

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2462 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2462 MHz; $\sigma$ = 1.789 S/m; $\varepsilon_r$ = 37.883; $\rho$ = 1000 kg/m$^3$

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: EX3DV4 - SN3661; ConvF(7.59, 7.59, 7.59); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 29/08/2013
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**right/touch high/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.786 W/kg

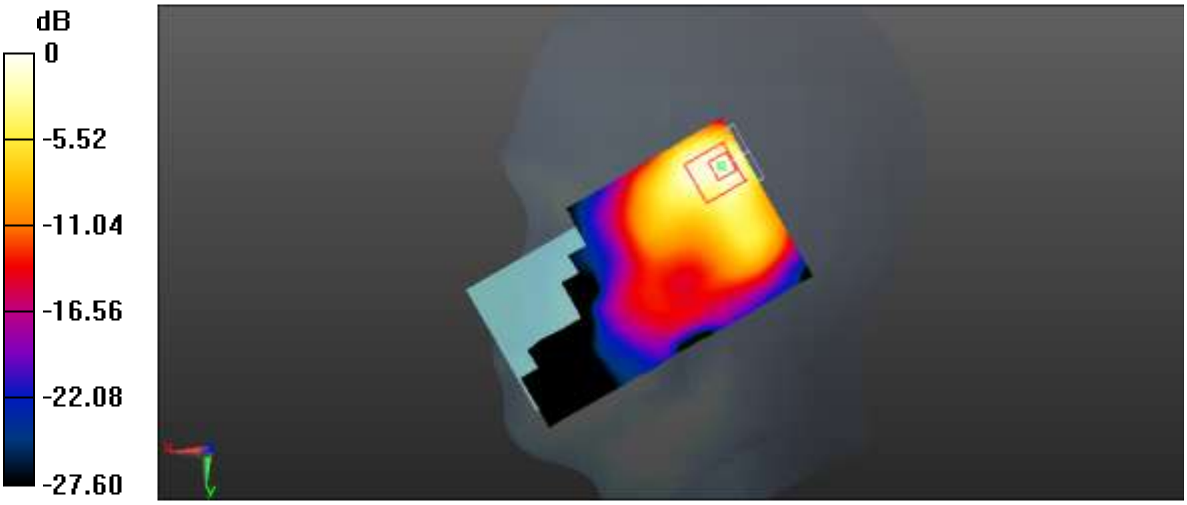
**right/touch high/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.359 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.51 W/kg

**SAR(1 g) = 0.639 W/kg; SAR(10 g) = 0.290 W/kg**

Maximum value of SAR (measured) = 0.726 W/kg




0 dB = 0.726 W/kg = -1.39 dBW/kg

**802.11b Data Rate: 1 Mbps towards phantom mid**

Date/Time: 31/07/2014 13:51:29

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.906 S/m; $\varepsilon_r$ = 51.957; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(4.87, 4.87, 4.87); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards phantom mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.152 W/kg

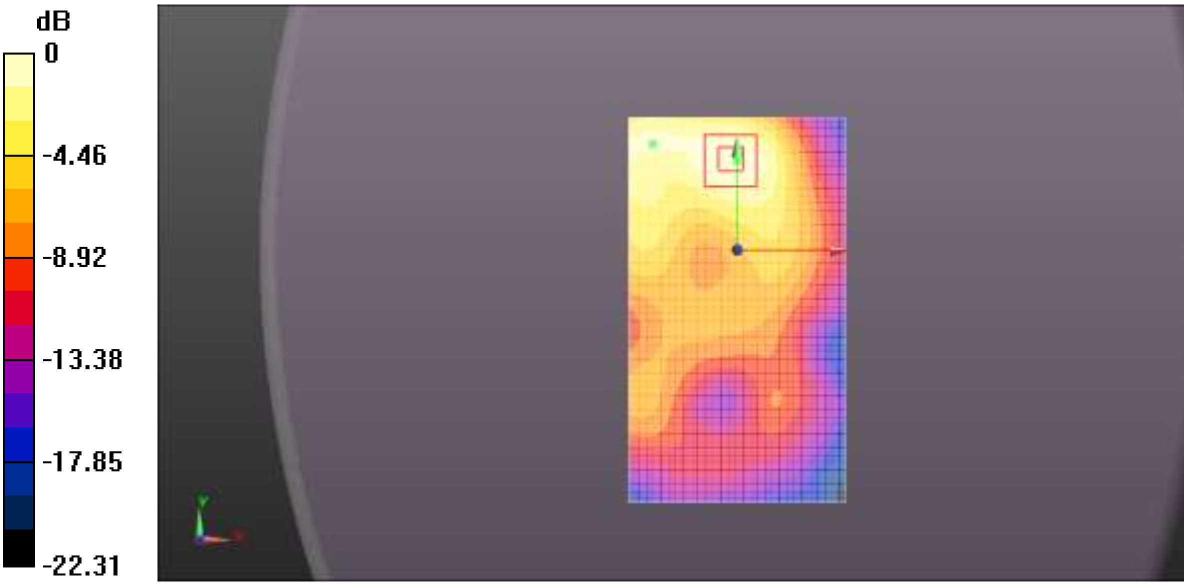
**body/towards phantom mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.244 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.268 W/kg

**SAR(1 g) = 0.143 W/kg; SAR(10 g) = 0.077 W/kg**

Maximum value of SAR (measured) = 0.155 W/kg




0 dB = 0.152 W/kg = -8.17 dBW/kg

**802.11b Data Rate: 1 Mbps towards ground mid**

Date/Time: 31/07/2014 14:24:05

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.906 S/m; $\varepsilon_r$ = 51.957; $\rho$ = 1000 kg/$m^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(4.87, 4.87, 4.87); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/towards ground mid/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.154 W/kg

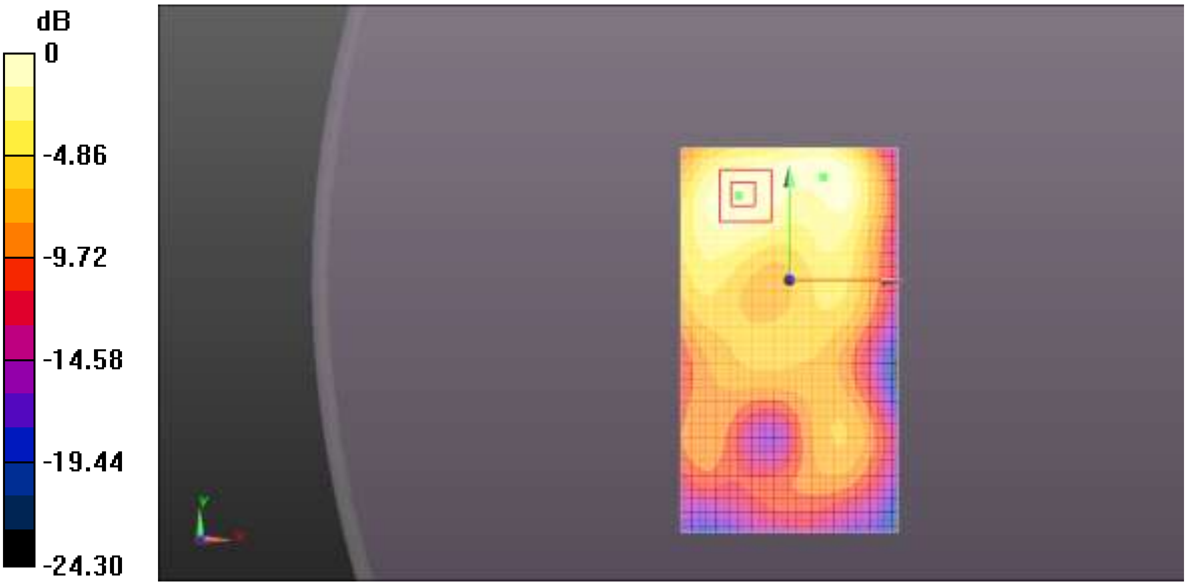
**body/towards ground mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.140 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.257 W/kg

**SAR(1 g) = 0.140 W/kg; SAR(10 g) = 0.077 W/kg**

Maximum value of SAR (measured) = 0.153 W/kg




0 dB = 0.154 W/kg = -8.14 dBW/kg

**802.11b Data Rate: 1 Mbps back mid**

Date/Time: 31/07/2014 15:32:36

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.906 S/m; $\varepsilon_r$ = 51.957; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(4.87, 4.87, 4.87); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/back mid/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.186 W/kg

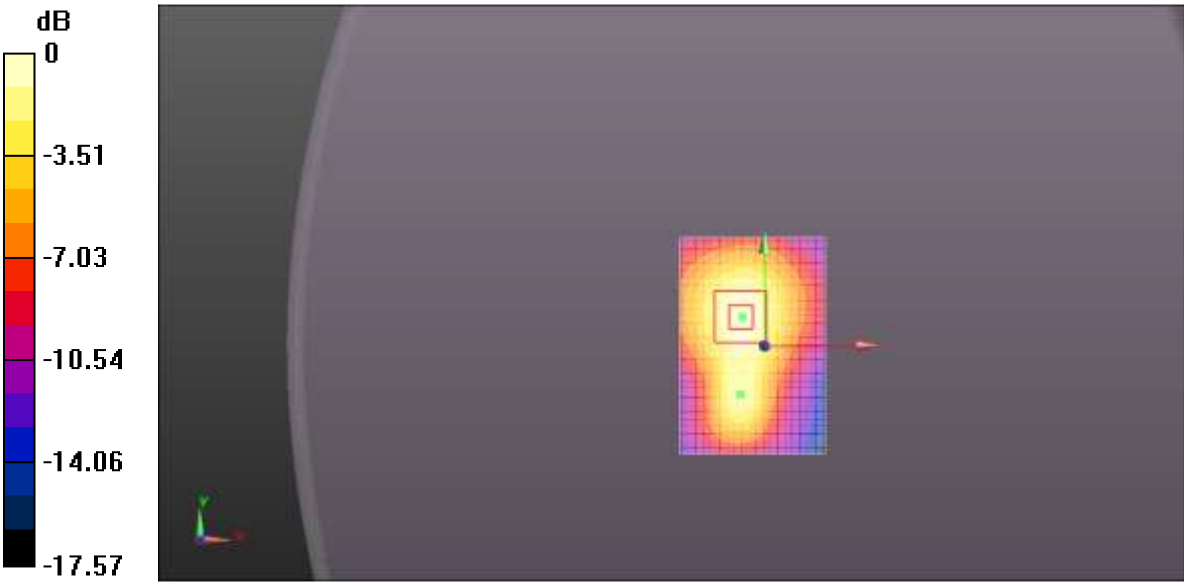
**body/back mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.478 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.314 W/kg

**SAR(1 g) = 0.168 W/kg; SAR(10 g) = 0.090 W/kg**

Maximum value of SAR (measured) = 0.186 W/kg




0 dB = 0.186 W/kg = -7.31 dBW/kg

**802.11b Data Rate: 1 Mbps left side mid**

Date/Time: 31/07/2014 14:56:48

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2437 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.906 S/m; $\varepsilon_r$ = 51.957; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(4.87, 4.87, 4.87); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body2/left side mid/Area Scan (61x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0746 W/kg

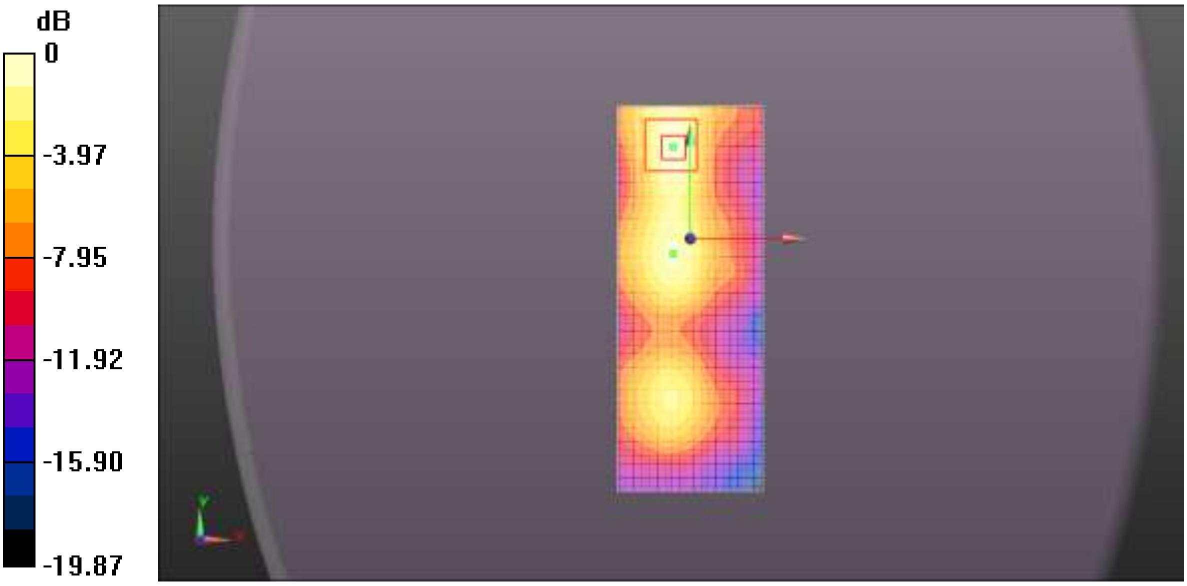
**body2/left side mid/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.642 V/m; Power Drift = 0.21 dB

Peak SAR (extrapolated) = 0.133 W/kg

**SAR(1 g) = 0.065 W/kg; SAR(10 g) = 0.031 W/kg**

Maximum value of SAR (measured) = 0.0740 W/kg




0 dB = 0.0746 W/kg = -11.27 dBW/kg

**802.11b Data Rate: 1 Mbps back low**

Date/Time: 31/07/2014 15:56:01

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2412 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2412 MHz; σ = 1.874 S/m; $\varepsilon_r$ = 51.963; ρ = 1000 kg/$m^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(4.87, 4.87, 4.87); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/back low/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.186 W/kg

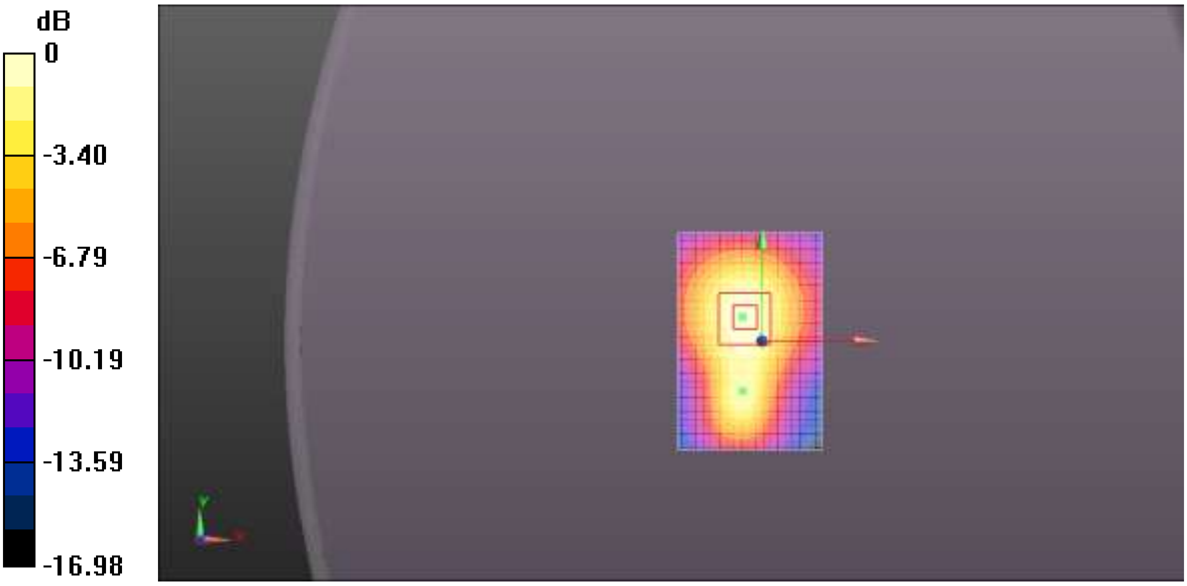
**body/back low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.345 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.316 W/kg

**SAR(1 g) = 0.168 W/kg; SAR(10 g) = 0.089 W/kg**

Maximum value of SAR (measured) = 0.186 W/kg




0 dB = 0.186 W/kg = -7.31 dBW/kg

**802.11b Data Rate: 1 Mbps back high**

Date/Time: 31/07/2014 16:18:27

Communication System: UID 0, 802.11b/g/n 2.45GHz (0); Communication System Band: 2400-2483.5; Frequency: 2462 MHz;Communication System PAR: 0 dB

Medium parameters used: f = 2462 MHz; $\sigma$ = 1.934 S/m; $\varepsilon_r$ = 51.886; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528-2013)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(4.87, 4.87, 4.87); Calibrated: 06/09/2013;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1327; Calibrated: 05/05/2014
- Phantom: ELI v4.0; Type: ELI4; Serial: TP:1086
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**body/back high/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.191 W/kg

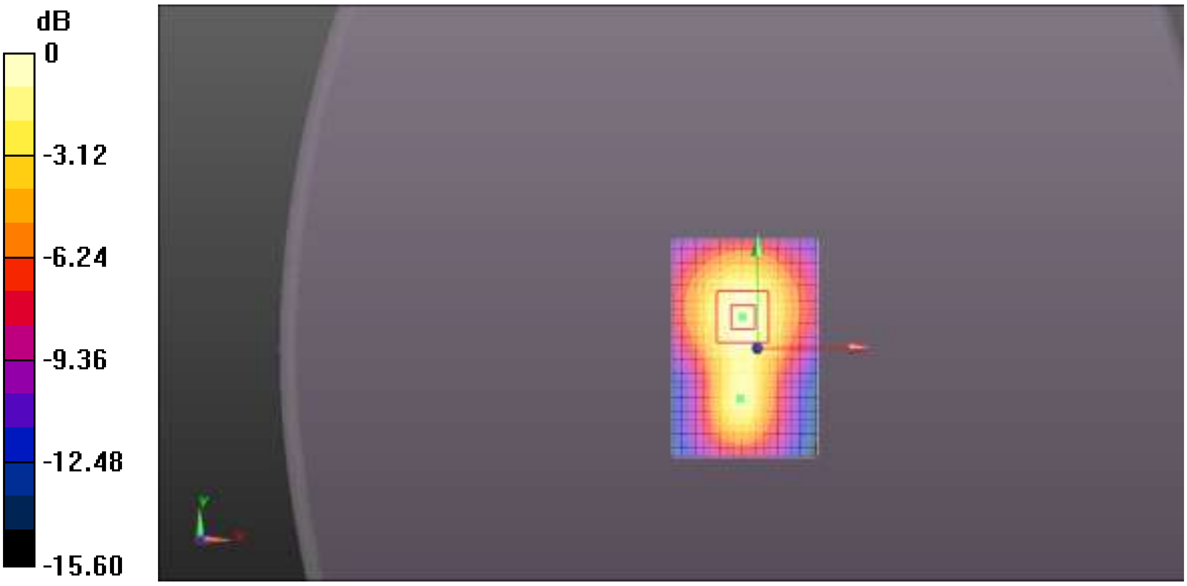
**body/back high/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.144 V/m; Power Drift = 0.15 dB

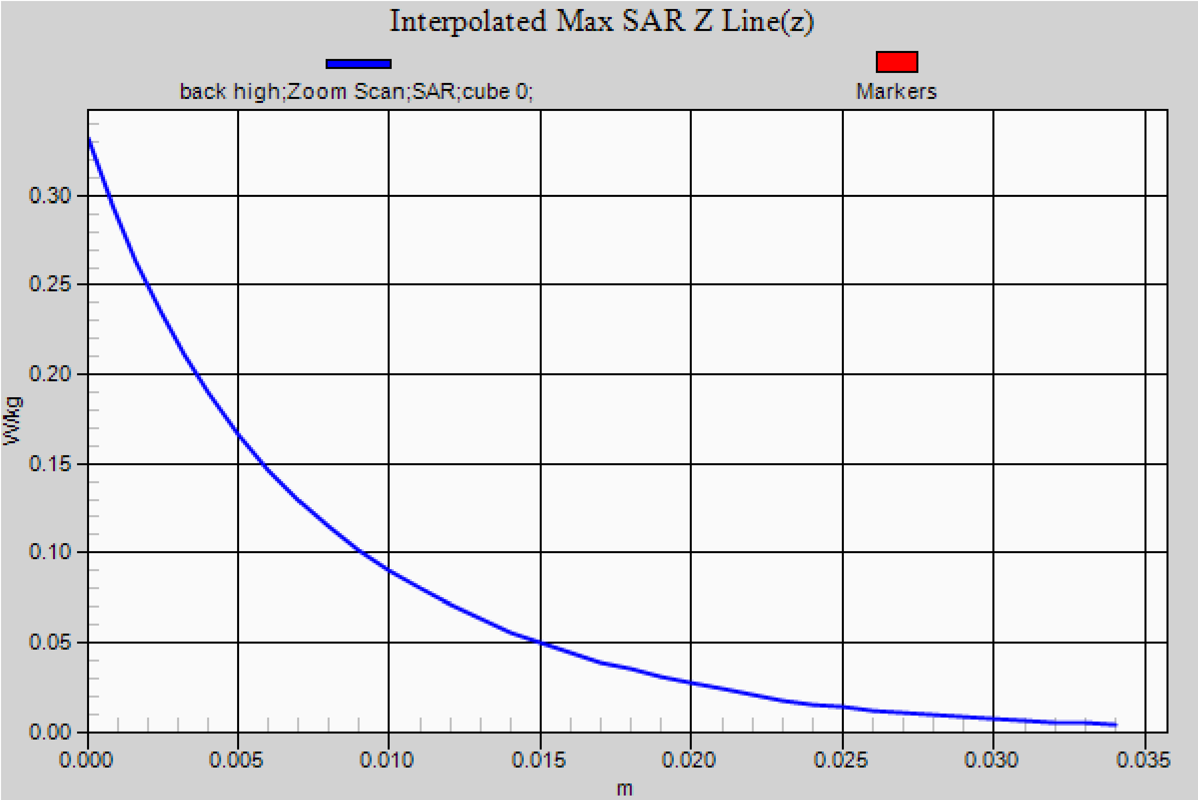
Peak SAR (extrapolated) = 0.332 W/kg

**SAR(1 g) = 0.172 W/kg; SAR(10 g) = 0.090 W/kg**

Maximum value of SAR (measured) = 0.190 W/kg




0 dB = 0.191 W/kg = -7.19 dBW/kg


Interpolated Max SAR Z Line(z)
back high;Zoom Scan;SAR;cube 0;
Markers
W/kg
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

# ANNEX B: Calibration Certificate

## Annex B.1 Probe Calibration Certificate

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ilac-MRA CNAS 校准 CNAS L0442

Client Auden Certificate No: Z14-97002

**CALIBRATION CERTIFICATE**

Object EX3DV4 - SN:3661

Calibration Procedure(s) TMC-OS-E-02-195
Calibration Procedures for Dosimetric E-field Probes

Calibration date: March 10, 2014

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 101919 | 01-Jul-13 (TMC, No.JW13-044) | Jun-14 |
| Power sensor NRP-Z91 | 101547 | 01-Jul-13 (TMC, No.JW13-044) | Jun-14 |
| Power sensor NRP-Z91 | 101548 | 01-Jul-13 (TMC, No.JW13-044) | Jun-14 |
| Reference10dBAttenuator | BT0520 | 12-Dec-12(TMC,No.JZ12-867) | Dec-14 |
| Reference20dBAttenuator | BT0267 | 12-Dec-12(TMC,No.JZ12-866) | Dec-14 |
| Reference Probe EX3DV4 | SN 3846 | 03-Sep-13(SPEAG,No.EX3-3846_Sep13) | Sep-14 |
| DAE4 | SN 777 | 22-Feb-13 (SPEAG, DAE4-777_Feb13) | Feb -14 |
| DAE4 | SN 905 | 11-Jun-13 (SPEAG, DAE4-905_Jun13) | Jun -14 |
| Secondary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| SignalGeneratorMG3700A | 6201052605 | 01-Jul-13 (TMC, No.JW13-045) | Jun-14 |
| Network Analyzer E5071C | MY46110673 | 15-Feb-14 (TMC, No.JZ14-781) | Feb-15 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: March 12, 2014



Certificate No: Z14-97002 Page 1 of 11

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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A,B,C,D | modulation dependent linearization parameters |
| Polarization Φ | Φ rotation around probe axis |
| Polarization θ | θ rotation around an axis that is in the plane normal to probe axis (at measurement center), θ=0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

**Methods Applied and Interpretation of Parameters:**

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the $E^2$-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z:* A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

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# Probe EX3DV4

# SN: 3661

Calibrated: March 10, 2014

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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# DASY – Parameters of Probe: EX3DV4 - SN: 3661

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm(μV/(V/m)²)^A | 0.45 | 0.49 | 0.47 | ±10.8% |
| DCP(mV)^B | 102.2 | 100.3 | 100.2 | |

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Unc^E (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 198.0 | ±2.0% |
| | | Y | 0.0 | 0.0 | 1.0 | | 204.8 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 200.9 | |

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X, Y, Z do not affect the $E^2$-field uncertainty inside TSL (see Page 5 and Page 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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# DASY – Parameters of Probe: EX3DV4 - SN: 3661

## Calibration Parameter Determined in Head Tissue Simulating Media

| f [MHz][C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 10.13 | 10.13 | 10.13 | 2.70 | 0.45 | ±12% |
| 850 | 41.5 | 0.92 | 9.50 | 9.50 | 9.50 | 0.08 | 1.39 | ±12% |
| 900 | 41.5 | 0.97 | 9.73 | 9.73 | 9.73 | 0.09 | 1.72 | ±12% |
| 1750 | 40.1 | 1.37 | 8.29 | 8.29 | 8.29 | 0.18 | 1.38 | ±12% |
| 1900 | 40.0 | 1.40 | 8.18 | 8.18 | 8.18 | 0.17 | 1.50 | ±12% |
| 2000 | 40.0 | 1.40 | 8.21 | 8.21 | 8.21 | 0.14 | 1.68 | ±12% |
| 2450 | 39.2 | 1.80 | 7.59 | 7.59 | 7.59 | 0.60 | 0.67 | ±12% |
| 2600 | 39.0 | 1.96 | 7.38 | 7.38 | 7.38 | 0.58 | 0.67 | ±12% |
| 5200 | 36.0 | 4.66 | 5.43 | 5.43 | 5.43 | 0.35 | 1.51 | ±13% |
| 5300 | 35.9 | 4.76 | 5.27 | 5.27 | 5.27 | 0.37 | 1.07 | ±13% |
| 5500 | 35.6 | 4.96 | 4.90 | 4.90 | 4.90 | 0.39 | 1.27 | ±13% |
| 5600 | 35.5 | 5.07 | 4.67 | 4.67 | 4.67 | 0.43 | 1.26 | ±13% |
| 5800 | 35.3 | 5.27 | 4.81 | 4.81 | 4.81 | 0.47 | 1.22 | ±13% |

[C] Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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# DASY – Parameters of Probe: EX3DV4 - SN: 3661

## Calibration Parameter Determined in Body Tissue Simulating Media

| f [MHz][C] | Relative Permittivity[F] | Conductivity (S/m)[F] | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 9.92 | 9.92 | 9.92 | 0.93 | 0.64 | ±12% |
| 850 | 55.2 | 0.99 | 9.45 | 9.45 | 9.45 | 0.20 | 1.21 | ±12% |
| 900 | 55.0 | 1.05 | 9.38 | 9.38 | 9.38 | 0.26 | 1.06 | ±12% |
| 1750 | 53.4 | 1.49 | 8.06 | 8.06 | 8.06 | 0.13 | 1.83 | ±12% |
| 1900 | 53.3 | 1.52 | 7.75 | 7.75 | 7.75 | 0.16 | 1.86 | ±12% |
| 2000 | 53.3 | 1.52 | 8.01 | 8.01 | 8.01 | 0.15 | 2.85 | ±12% |
| 2450 | 52.7 | 1.95 | 7.47 | 7.47 | 7.47 | 0.45 | 0.83 | ±12% |
| 2600 | 52.5 | 2.16 | 7.15 | 7.15 | 7.15 | 0.66 | 0.66 | ±12% |
| 5200 | 49.0 | 5.30 | 4.77 | 4.77 | 4.77 | 0.41 | 1.44 | ±13% |
| 5300 | 48.9 | 5.42 | 4.52 | 4.52 | 4.52 | 0.43 | 1.59 | ±13% |
| 5500 | 48.6 | 5.65 | 4.28 | 4.28 | 4.28 | 0.44 | 1.57 | ±13% |
| 5600 | 48.5 | 5.77 | 4.21 | 4.21 | 4.21 | 0.45 | 1.57 | ±13% |
| 5800 | 48.2 | 6.00 | 4.30 | 4.30 | 4.30 | 0.47 | 1.69 | ±13% |

[C] Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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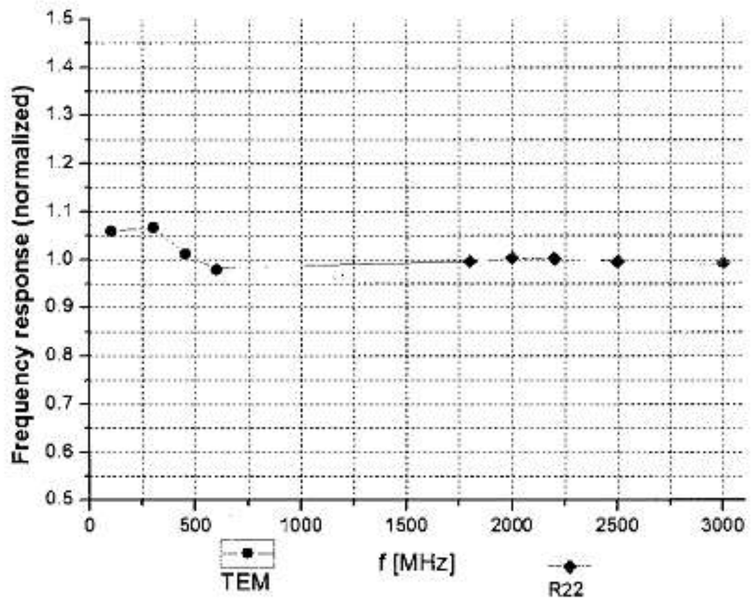
# Frequency Response of E-Field
## (TEM-Cell: ifi110 EXX, Waveguide: R22)




**Uncertainty of Frequency Response of E-field: ±7.5% (k=2)**

Certificate No: Z14-97002 Page 7 of 11

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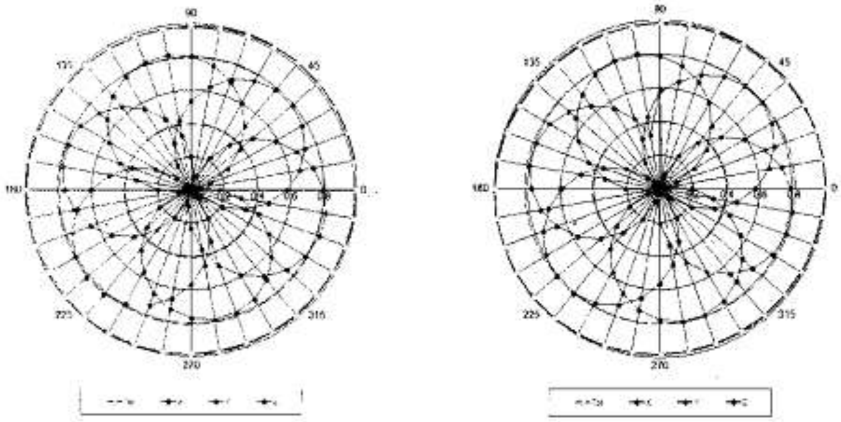
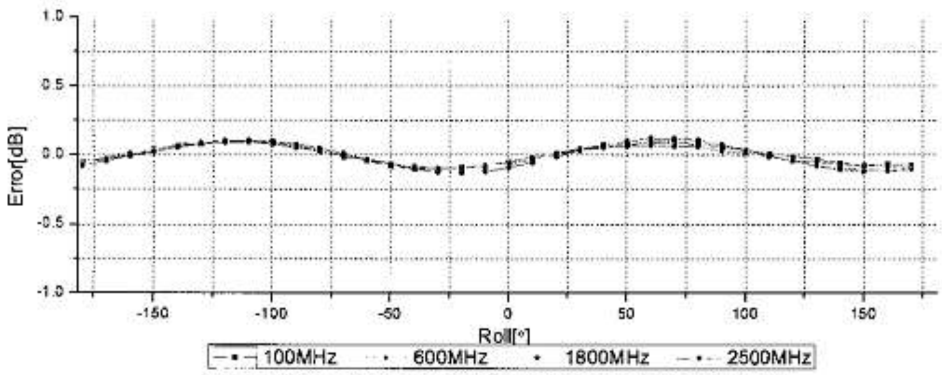
# Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM f=1800 MHz, R22






**Uncertainty of Axial Isotropy Assessment: ±0.9% (k=2)**

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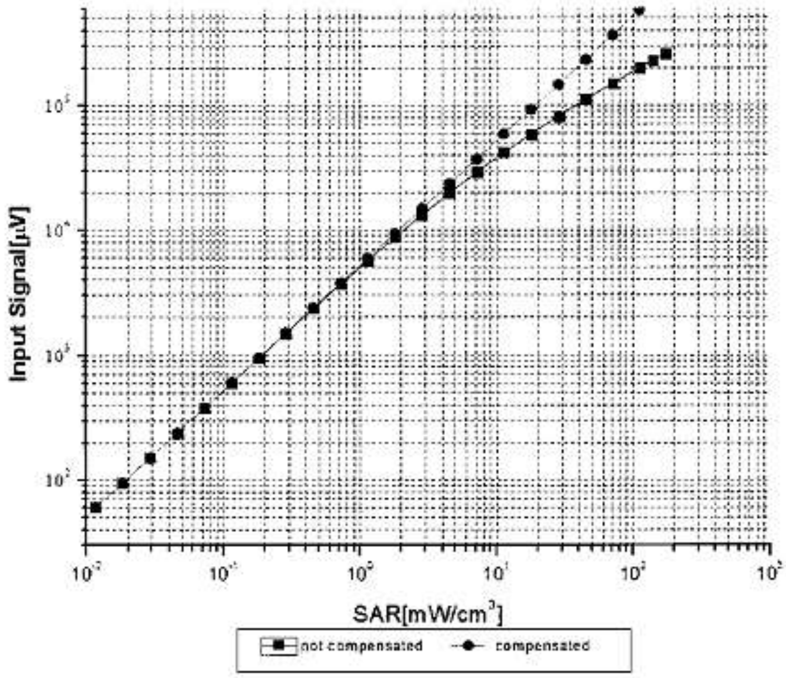
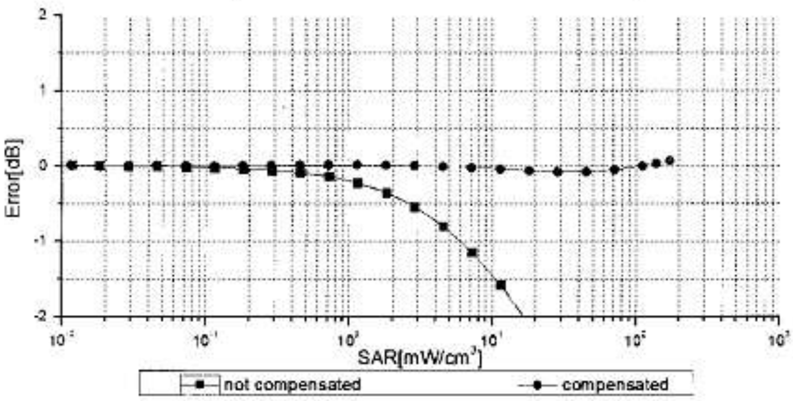
## Dynamic Range f($SAR_{head}$)
## (TEM cell, f = 900 MHz)




**Uncertainty of Linearity Assessment: ±0.9% (k=2)**

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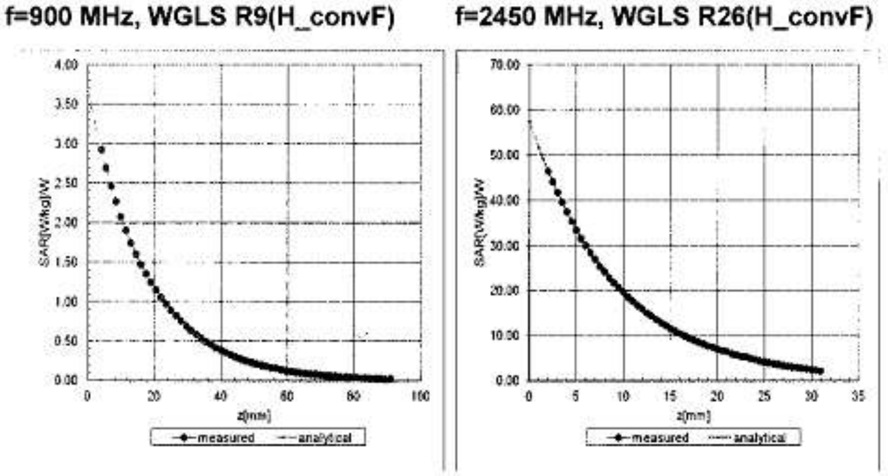
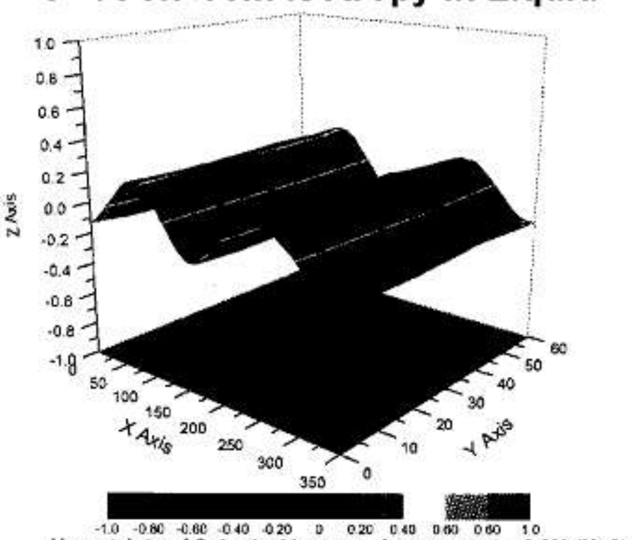
# Conversion Factor Assessment




# Deviation from Isotropy in Liquid




Uncertainty of Spherical Isotropy Assessment: ±2.8% (K=2)

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# DASY - Parameters of Probe: EX3DV4 - SN: 3661

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 18.4 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disable |
| Probe Overall Length | 337mm |
| Probe Body Diameter | 10mm |
| Tip Length | 9mm |
| Tip Diameter | 2.5mm |
| Probe Tip to Sensor X Calibration Point | 1mm |
| Probe Tip to Sensor Y Calibration Point | 1mm |
| Probe Tip to Sensor Z Calibration Point | 1mm |
| Recommended Measurement Distance from Surface | 2mm |

OET
June 26, 2013

**Acceptable Conditions for SAR Measurements Using Probes and Dipoles Calibrated under the SPEAG-TMC Dual-Logo Calibration Program to Support FCC Equipment Certification**

The acceptable conditions for SAR measurements using probes, dipoles and DAEs calibrated by TMC (*Telecommunication Metrology Center of MIIT in Beijing, China*), under the Dual-Logo Calibration Certificate program and quality assurance (QA) protocols established between SPEAG (*Schmid & Partner Engineering AG, Switzerland*) and TMC, to support FCC (*U.S. Federal Communications Commission*) equipment certification are defined and described in the following.

1) The agreement established between SPEAG and TMC is only applicable to calibration services performed by TMC where its clients (companies and divisions of such companies) are headquartered in the Greater China Region, including Taiwan and Hong Kong. This agreement is subject to renewal at the end of each calendar year between SPEAG and TMC. TMC shall inform the FCC of any changes or early termination to the agreement.
2) Only a subset of the calibration services specified in the SPEAG-TMC agreement, while it remains valid, are applicable to SAR measurements performed using such equipment for supporting FCC equipment certification. These are identified in the following.
   a) Calibration of dosimetric (SAR) probes EX3DVx, ET3DVx and ES3DVx.
      i) Free-space E-field and H-field probes, including those used for HAC (hearing aid compatibility) evaluation, temperature probes, other probes or equipment not identified in this document, when calibrated by TMC, are excluded and cannot be used for measurements to support FCC equipment certification.
      ii) Signal specific and bundled probe calibrations based on PMR (probe modulation response) characteristics are handled according to the requirements of KDB 865664; that is, "Until standardized procedures are available to make such determination, the applicability of a signal specific probe calibration for testing specific wireless modes and technologies is determined on a case-by-case basis through KDB inquiries, including SAR system verification requirements."
   b) Calibration of SAR system validation dipoles, excluding HAC dipoles.
   c) Calibration of data acquisition electronics DAE3Vx, DAE4Vx and DAEasyVx.
   d) For FCC equipment certification purposes, the frequency range of SAR probe and dipole calibrations is limited to 700 MHz - 6 GHz and provided it is supported by the equipment identified in the TMC QA protocol (a separate attachment to this document).
   e) The identical system and equipment setup, measurement configurations, hardware, evaluation algorithms, calibration and QA protocols, including the format of calibration certificates and reports used by SPEAG shall be applied by TMC.
   f) The calibrated items are only applicable to SPEAG DASY 4 and DASY 5 or higher version systems.

1

OET
June 26, 2013

3) The SPEAG-TMC agreement includes specific protocols identified in the following to ensure the quality of calibration services provided by TMC under this SPEAG-TMC Dual-Logo calibration agreement are equivalent to the calibration services provided by SPEAG. TMC shall, upon request, provide copies of documentation to the FCC to substantiate program implementation.
   a) The Inter-laboratory Calibration Evaluation (ILCE) stated in the TMC QA protocol shall be performed between SPEAG and TMC at least once every 12 months. The ILCE acceptance criteria defined in the TMC QA protocol shall be satisfied for the TMC, SPEAG and FCC agreements to remain valid.
   b) Check of Calibration Certificate (CCC) shall be performed by SPEAG for all calibrations performed by TMC. Written confirmation from SPEAG is required for TMC to issue calibration certificates under the SPEAG-TMC Dual-Logo calibration program. Quarterly reports for all calibrations performed by TMC under the program are also issued by SPEAG.
   c) The calibration equipment and measurement system used by TMC shall be verified before each calibration service according to the specific reference SAR probes, dipoles, and DAE calibrated by SPEAG. The results shall be reproducible and within the defined acceptance criteria specified in the TMC QA protocol before each actual calibration can commence. TMC shall maintain records of the measurement and calibration system verification results for all calibrations.
   d) Quality Check of Calibration (QCC) certificates shall be performed by SPEAG at least once every 12 months. SPEAG shall visit TMC facilities to verify the laboratory, equipment, applied procedures and plausibility of randomly selected certificates.
4) A copy of this document, to be updated annually, shall be provided to TMC clients that accept calibration services according to the SPEAG-TMC Dual-Logo calibration program, which should be presented to a TCB (*Telecommunication Certification Body*), to facilitate FCC equipment approval.
5) TMC shall address any questions raised by its clients or TCBs relating to the SPEAG-TMC Dual-Logo calibration program and inform the FCC and SPEAG of any critical issues.

Change Note: Revised on June 26 to clarify the applicability of PMR and Bundled probe calibrations according to the requirements of KDB 865664.

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Client **Tejet** **Certificate No: J13-2-2369**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | ES3DV3 - SN:3241 |
| Calibration Procedure(s) | TMC-OS-E-02-195<br>Calibration Procedures for Dosimetric E-field Probes |
| Calibration date: | September 6, 2013 |

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 101919 | 01-Jul-13 (TMC, No.JW13-044) | Jun-14 |
| Power sensor NRP-Z91 | 101547 | 01-Jul-13 (TMC, No.JW13-044) | Jun-14 |
| Power sensor NRP-Z91 | 101548 | 01-Jul-13 (TMC, No.JW13-044) | Jun-14 |
| Reference10dBAttenuator | BT0520 | 12-Dec-12(TMC,No.JZ12-867) | Dec-14 |
| Reference20dBAttenuator | BT0267 | 12-Dec-12(TMC,No.JZ12-866) | Dec-14 |
| Reference Probe EX3DV4 | SN 3820 | 10-Dec-12(SPEAG,No.EX3-3820_Dec12) | Dec-13 |
| Reference Probe EX3DV4 | SN 3898 | 14-Jan-13(SPEAG,No.EX3-3898_Jan13) | Jan-14 |
| DAE4 | SN 777 | 22-Feb-13 (SPEAG, DAE4-777_Feb13) | Feb -14 |
| | | | |
| Secondary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| SignalGeneratorMG3700A | 6201052605 | 01-Jul-13 (TMC, No.JW13-045) | Jun-14 |
| Network Analyzer E5071C | MY46110673 | 15-Feb-13 (TMC, No.JZ13-781) | Feb-14 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: September 9, 2013

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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A,B,C,D | modulation dependent linearization parameters |
| Polarization Φ | Φ rotation around probe axis |
| Polarization θ | θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

**Methods Applied and Interpretation of Parameters:**

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the $E^2$-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

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# Probe ES3DV3

# SN: 3241

Calibrated: August 31, 2013

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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# DASY – Parameters of Probe: ES3DV3 - SN: 3241

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm(μV/(V/m)$^2$)[A] | 1.08 | 0.79 | 0.97 | ±10.8% |
| DCP(mV)[B] | 105.8 | 108.2 | 107.6 | |

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 190.5 | ±2.0% |
| | | Y | 0.0 | 0.0 | 1.0 | | 158.6 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 178.3 | |

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X, Y, Z do not affect the $E^2$-field uncertainty inside TSL (see Page 5 and Page 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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# DASY – Parameters of Probe: ES3DV3 - SN: 3241

## Calibration Parameter Determined in Head Tissue Simulating Media

| f [MHz][C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 835 | 41.5 | 0.90 | 6.43 | 6.43 | 6.43 | 0.23 | 2.16 | ±12% |
| 900 | 41.5 | 0.97 | 6.44 | 6.44 | 6.44 | 0.27 | 1.98 | ±12% |
| 1750 | 40.1 | 1.37 | 5.65 | 5.65 | 5.65 | 0.34 | 2.09 | ±12% |
| 1900 | 40.0 | 1.40 | 5.51 | 5.51 | 5.51 | 0.38 | 1.92 | ±12% |
| 2450 | 39.2 | 1.80 | 4.90 | 4.90 | 4.90 | 0.80 | 1.16 | ±12% |

[C] Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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# DASY – Parameters of Probe: ES3DV3 - SN: 3241

## Calibration Parameter Determined in Body Tissue Simulating Media

| f [MHz][C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|---|---|---|---|---|---|---|---|---|
| 835 | 55.2 | 0.97 | 6.58 | 6.58 | 6.58 | 0.27 | 1.99 | ±12% |
| 900 | 55.0 | 1.05 | 6.66 | 6.66 | 6.66 | 0.31 | 1.90 | ±12% |
| 1750 | 53.4 | 1.49 | 5.31 | 5.31 | 5.31 | 0.32 | 2.46 | ±12% |
| 1900 | 53.3 | 1.52 | 5.18 | 5.18 | 5.18 | 0.32 | 2.57 | ±12% |
| 2450 | 52.7 | 1.95 | 4.87 | 4.87 | 4.87 | 0.84 | 1.21 | ±12% |

[C] Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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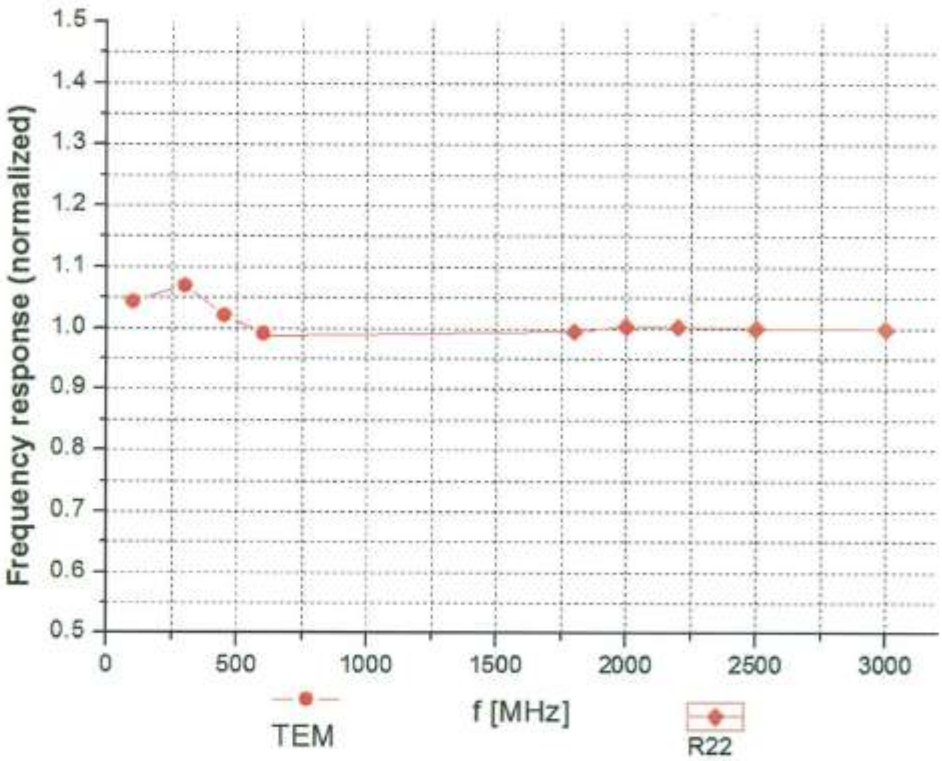
## Frequency Response of E-Field
### (TEM-Cell: ifi110 EXX, Waveguide: R22)




**Uncertainty of Frequency Response of E-field: ±7.5% (k=2)**

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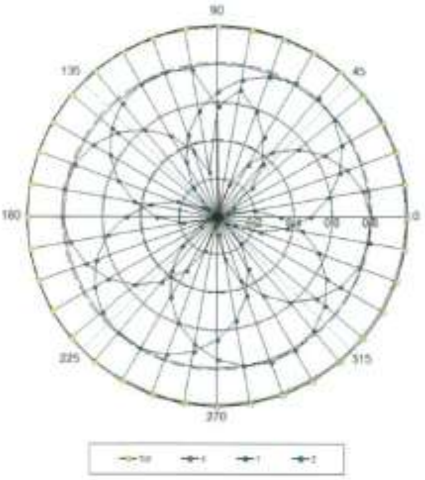
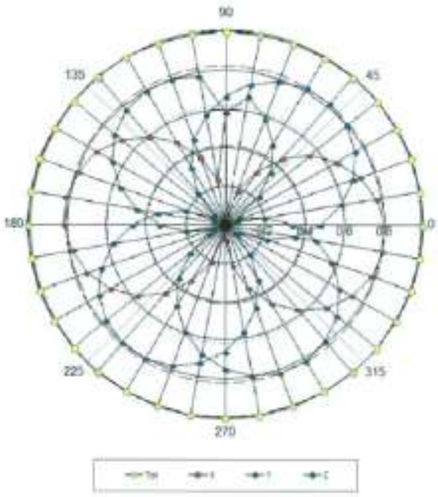
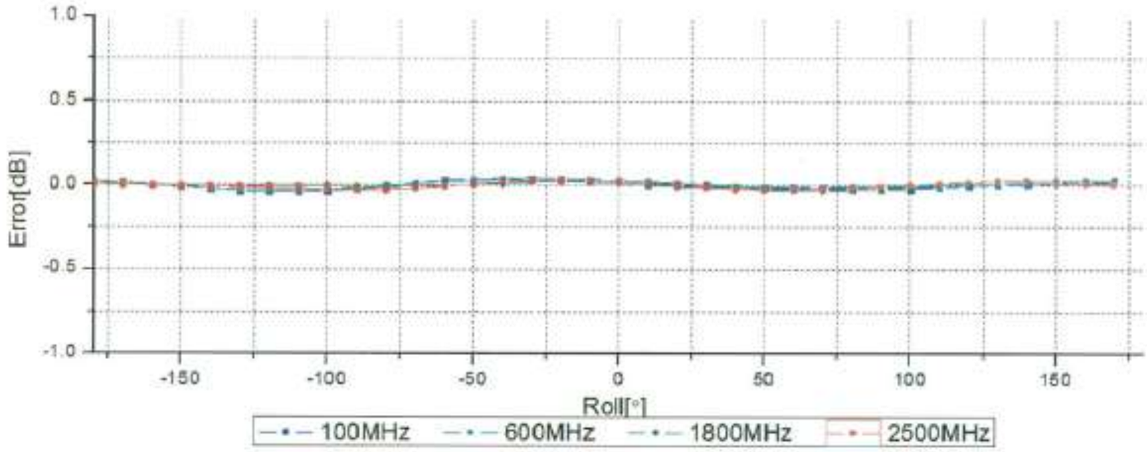
# Receiving Pattern (Φ), θ=0°

## f=600 MHz, TEM



## f=1800 MHz, R22






**Uncertainty of Axial Isotropy Assessment: ±0.9% (k=2)**

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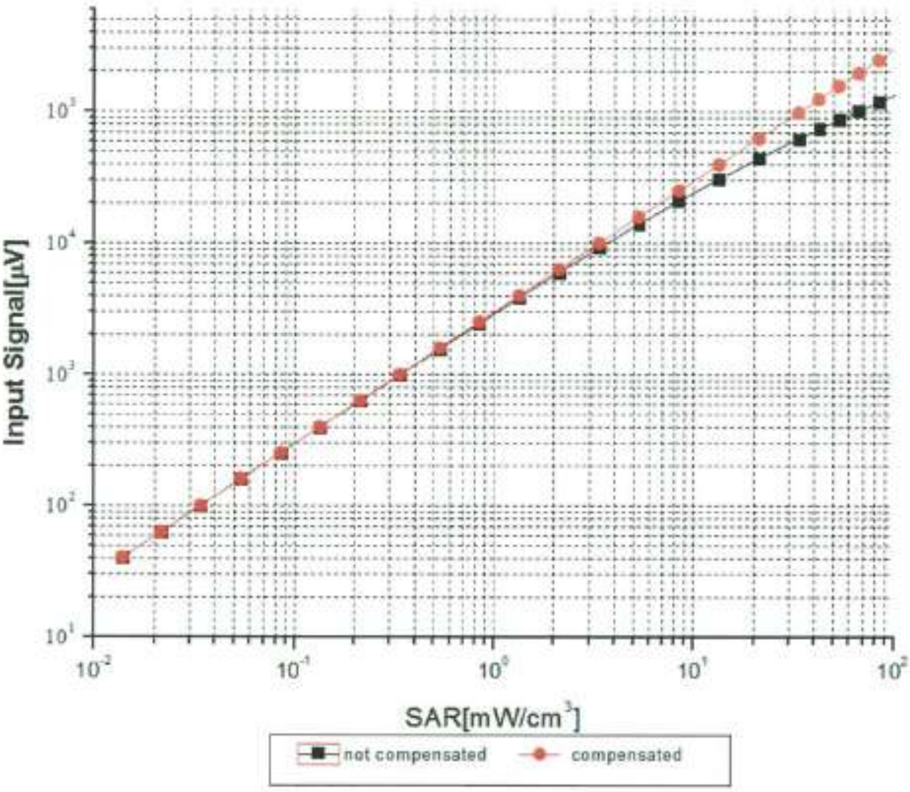
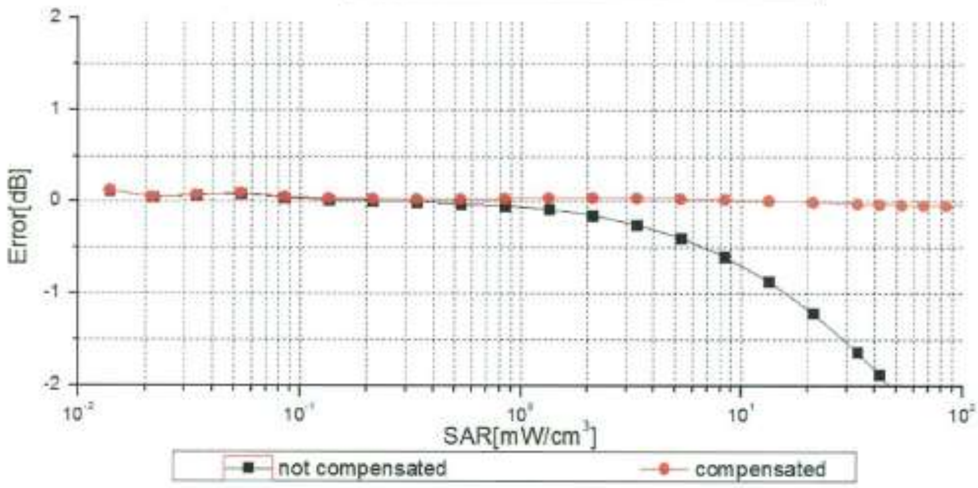
## Dynamic Range f(SAR$_{head}$)
## (TEM cell, f = 900 MHz)




**Uncertainty of Linearity Assessment: ±0.9% (k=2)**

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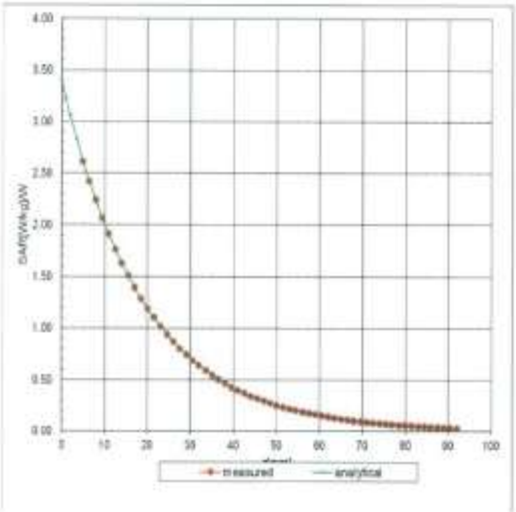
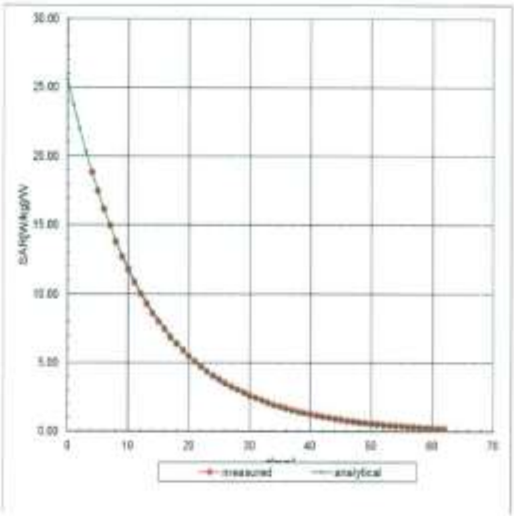
# Conversion Factor Assessment

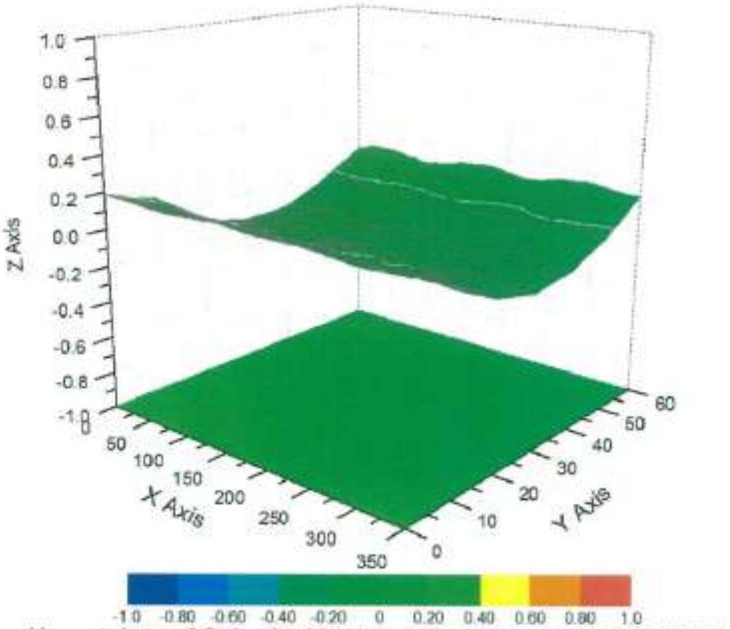
**f=835 MHz, WGLS R9(H_convF)**




**f=1750 MHz, WGLS R22(H_convF)**




# Deviation from Isotropy in Liquid




**Uncertainty of Spherical Isotropy Assessment: ±2.8% (K=2)**

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# DASY - Parameters of Probe: ES3DV3 - SN: 3241

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 149 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disable |
| Probe Overall Length | 337mm |
| Probe Body Diameter | 10mm |
| Tip Length | 10mm |
| Tip Diameter | 4mm |
| Probe Tip to Sensor X Calibration Point | 2mm |
| Probe Tip to Sensor Y Calibration Point | 2mm |
| Probe Tip to Sensor Z Calibration Point | 2mm |
| Recommended Measurement Distance from Surface | 3mm |

June 26, 2013

**Acceptable Conditions for SAR Measurements Using Probes and Dipoles Calibrated under the SPEAG-TMC Dual-Logo Calibration Program to Support FCC Equipment Certification**

The acceptable conditions for SAR measurements using probes, dipoles and DAEs calibrated by TMC (*Telecommunication Metrology Center of MIIT in Beijing, China*), under the Dual-Logo Calibration Certificate program and quality assurance (QA) protocols established between SPEAG (*Schmid & Partner Engineering AG, Switzerland*) and TMC, to support FCC (*U.S. Federal Communications Commission*) equipment certification are defined and described in the following.

1) The agreement established between SPEAG and TMC is only applicable to calibration services performed by TMC where its clients (companies and divisions of such companies) are headquartered in the Greater China Region, including Taiwan and Hong Kong. This agreement is subject to renewal at the end of each calendar year between SPEAG and TMC. TMC shall inform the FCC of any changes or early termination to the agreement.
2) Only a subset of the calibration services specified in the SPEAG-TMC agreement, while it remains valid, are applicable to SAR measurements performed using such equipment for supporting FCC equipment certification. These are identified in the following.
   a) Calibration of dosimetric (SAR) probes EX3DVx, ET3DVx and ES3DVx.
      i) Free-space E-field and H-field probes, including those used for HAC (hearing aid compatibility) evaluation, temperature probes, other probes or equipment not identified in this document, when calibrated by TMC, are excluded and cannot be used for measurements to support FCC equipment certification.
      ii) Signal specific and bundled probe calibrations based on PMR (probe modulation response) characteristics are handled according to the requirements of KDB 865664; that is, "Until standardized procedures are available to make such determination, the applicability of a signal specific probe calibration for testing specific wireless modes and technologies is determined on a case-by-case basis through KDB inquiries, including SAR system verification requirements."
   b) Calibration of SAR system validation dipoles, excluding HAC dipoles.
   c) Calibration of data acquisition electronics DAE3Vx, DAE4Vx and DAEasyVx.
   d) For FCC equipment certification purposes, the frequency range of SAR probe and dipole calibrations is limited to 700 MHz - 6 GHz and provided it is supported by the equipment identified in the TMC QA protocol (a separate attachment to this document).
   e) The identical system and equipment setup, measurement configurations, hardware, evaluation algorithms, calibration and QA protocols, including the format of calibration certificates and reports used by SPEAG shall be applied by TMC.
   f) The calibrated items are only applicable to SPEAG DASY 4 and DASY 5 or higher version systems.

1

3) The SPEAG-TMC agreement includes specific protocols identified in the following to ensure the quality of calibration services provided by TMC under this SPEAG-TMC Dual-Logo calibration agreement are equivalent to the calibration services provided by SPEAG. TMC shall, upon request, provide copies of documentation to the FCC to substantiate program implementation.
   a) The Inter-laboratory Calibration Evaluation (ILCE) stated in the TMC QA protocol shall be performed between SPEAG and TMC at least once every 12 months. The ILCE acceptance criteria defined in the TMC QA protocol shall be satisfied for the TMC, SPEAG and FCC agreements to remain valid.
   b) Check of Calibration Certificate (CCC) shall be performed by SPEAG for all calibrations performed by TMC. Written confirmation from SPEAG is required for TMC to issue calibration certificates under the SPEAG-TMC Dual-Logo calibration program. Quarterly reports for all calibrations performed by TMC under the program are also issued by SPEAG.
   c) The calibration equipment and measurement system used by TMC shall be verified before each calibration service according to the specific reference SAR probes, dipoles, and DAE calibrated by SPEAG. The results shall be reproducible and within the defined acceptance criteria specified in the TMC QA protocol before each actual calibration can commence. TMC shall maintain records of the measurement and calibration system verification results for all calibrations.
   d) Quality Check of Calibration (QCC) certificates shall be performed by SPEAG at least once every 12 months. SPEAG shall visit TMC facilities to verify the laboratory, equipment, applied procedures and plausibility of randomly selected certificates.
4) A copy of this document, to be updated annually, shall be provided to TMC clients that accept calibration services according to the SPEAG-TMC Dual-Logo calibration program, which should be presented to a TCB (*Telecommunication Certification Body*), to facilitate FCC equipment approval.
5) TMC shall address any questions raised by its clients or TCBs relating to the SPEAG-TMC Dual-Logo calibration program and inform the FCC and SPEAG of any critical issues.

Change Note: Revised on June 26 to clarify the applicability of PMR and Bundled probe calibrations according to the requirements of KDB 865664.

## Annex B.2 DAE4 Calibration Certificate

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
C Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Tejet-SH (Auden)**

Certificate No: **DAE4-1226_Aug13**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SD 000 D04 BJ - SN: 1226 |
| Calibration procedure(s) | QA CAL-06.v26<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | August 29, 2013 |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 02-Oct-12 (No:12728) | Oct-13 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 07-Jan-13 (in house check) | In house check: Jan-14 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 07-Jan-13 (in house check) | In house check: Jan-14 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | R.Mayoraz | Technician | [signature] |
| Approved by: | Fin Bomholt | Deputy Technical Manager | i.V. [signature] |

Issued: August 29, 2013

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: DAE4-1226_Aug13 Page 1 of 5

**Calibration Laboratory of**
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**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

Accreditation No.: **SCS 108**

**Glossary**

| | |
|---|---|
| DAE | data acquisition electronics |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

**Methods Applied and Interpretation of Parameters**

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

| | | | | |
|---|---|---|---|---|
| High Range: | 1LSB = | 6.1μV , | full range = | -100...+300 mV |
| Low Range: | 1LSB = | 61nV , | full range = | -1.......+3mV |

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| **High Range** | 404.601 ± 0.02% (k=2) | 404.368 ± 0.02% (k=2) | 404.093 ± 0.02% (k=2) |
| **Low Range** | 3.97815 ± 1.50% (k=2) | 4.00415 ± 1.50% (k=2) | 3.98434 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 112.5 ° ± 1 ° |

## Appendix

### 1. DC Voltage Linearity

| High Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 199993.63 | -3.02 | -0.00 |
| Channel X | + Input | 20000.39 | 0.62 | 0.00 |
| Channel X | - Input | -20000.48 | 1.45 | -0.01 |
| Channel Y | + Input | 199994.18 | -2.82 | -0.00 |
| Channel Y | + Input | 19999.20 | -0.75 | -0.00 |
| Channel Y | - Input | -20003.68 | -1.94 | 0.01 |
| Channel Z | + Input | 199994.43 | -2.44 | -0.00 |
| Channel Z | + Input | 19998.74 | -1.00 | -0.00 |
| Channel Z | - Input | -20002.32 | -0.52 | 0.00 |

| Low Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 1999.95 | 0.06 | 0.00 |
| Channel X | + Input | 200.63 | 0.31 | 0.15 |
| Channel X | - Input | -199.21 | 0.30 | -0.15 |
| Channel Y | + Input | 2000.03 | 0.11 | 0.01 |
| Channel Y | + Input | 199.33 | -1.07 | -0.53 |
| Channel Y | - Input | -200.68 | -1.18 | 0.59 |
| Channel Z | + Input | 1999.71 | -0.09 | -0.00 |
| Channel Z | + Input | 199.62 | -0.66 | -0.33 |
| Channel Z | - Input | -200.45 | -0.83 | 0.42 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (μV) | Low Range Average Reading (μV) |
|---|---|---|---|
| Channel X | 200 | 4.70 | 3.38 |
| | - 200 | -2.03 | -4.17 |
| Channel Y | 200 | -9.08 | -9.44 |
| | - 200 | 6.87 | 7.03 |
| Channel Z | 200 | -7.61 | -7.55 |
| | - 200 | 6.22 | 6.19 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|---|---|---|---|---|
| Channel X | 200 | - | 2.10 | -4.14 |
| Channel Y | 200 | 8.97 | - | 3.73 |
| Channel Z | 200 | 10.30 | 5.90 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| Channel X | 16033 | 12644 |
| Channel Y | 15877 | 15451 |
| Channel Z | 15997 | 15242 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| Channel X | 1.26 | 0.57 | 2.18 | 0.36 |
| Channel Y | -0.81 | -1.71 | 0.96 | 0.37 |
| Channel Z | 0.06 | -1.32 | 1.85 | 0.39 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| Channel X | 200 | 200 |
| Channel Y | 200 | 200 |
| Channel Z | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| Supply (+ Vcc) | +0.01 | +6 | +14 |
| Supply (- Vcc) | -0.01 | -8 | -9 |

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Tejet (Auden)**

Certificate No: **DAE4-1327_May14**

# CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BJ - SN: 1327

Calibration procedure(s): QA CAL-06.v26
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: May 05, 2014

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 01-Oct-13 (No:13976) | Oct-14 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 07-Jan-14 (in house check) | In house check: Jan-15 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 07-Jan-14 (in house check) | In house check: Jan-15 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | R.Mayoraz | Technician | |
| Approved by: | Fin Bomholt | Deputy Technical Manager | |

Issued: May 5, 2014

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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Accreditation No.: **SCS 108**

**Glossary**

| | |
|---|---|
| DAE | data acquisition electronics |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

**Methods Applied and Interpretation of Parameters**

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.......+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| High Range | 404.896 ± 0.02% (k=2) | 404.741 ± 0.02% (k=2) | 404.940 ± 0.02% (k=2) |
| Low Range | 3.99218 ± 1.50% (k=2) | 3.99097 ± 1.50% (k=2) | 3.99813 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 187.0 ° ± 1 ° |

**Appendix**

**1. DC Voltage Linearity**

| High Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 200036.27 | 0.51 | 0.00 |
| Channel X | + Input | 20005.01 | 1.05 | 0.01 |
| Channel X | - Input | -20004.10 | 1.80 | -0.01 |
| Channel Y | + Input | 200033.33 | -2.28 | -0.00 |
| Channel Y | + Input | 20003.31 | -0.48 | -0.00 |
| Channel Y | - Input | -20006.17 | -0.06 | 0.00 |
| Channel Z | + Input | 200033.50 | -2.00 | -0.00 |
| Channel Z | + Input | 20002.83 | -0.90 | -0.00 |
| Channel Z | - Input | -20008.51 | -2.38 | 0.01 |

| Low Range | | Reading (µV) | Difference (µV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2000.09 | -0.19 | -0.01 |
| Channel X | + Input | 200.72 | 0.41 | 0.20 |
| Channel X | - Input | -199.42 | 0.24 | -0.12 |
| Channel Y | + Input | 2000.87 | 0.57 | 0.03 |
| Channel Y | + Input | 200.02 | -0.13 | -0.06 |
| Channel Y | - Input | -198.35 | 1.42 | -0.71 |
| Channel Z | + Input | 2000.46 | 0.16 | 0.01 |
| Channel Z | + Input | 199.68 | -0.59 | -0.29 |
| Channel Z | - Input | -201.15 | -1.34 | 0.67 |

**2. Common mode sensitivity**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (µV) | Low Range Average Reading (µV) |
|---|---|---|---|
| Channel X | 200 | -1.49 | -2.80 |
| | - 200 | 4.58 | 3.19 |
| Channel Y | 200 | 15.02 | 14.91 |
| | - 200 | -16.06 | -16.06 |
| Channel Z | 200 | -9.51 | -9.74 |
| | - 200 | 8.51 | 8.58 |

**3. Channel separation**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (µV) | Channel Y (µV) | Channel Z (µV) |
|---|---|---|---|---|
| Channel X | 200 | - | -0.85 | -2.41 |
| Channel Y | 200 | 6.24 | - | 0.57 |
| Channel Z | 200 | 9.93 | 4.38 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| Channel X | 16000 | 14679 |
| Channel Y | 16291 | 17597 |
| Channel Z | 15620 | 15519 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| Channel X | 0.55 | -0.77 | 1.82 | 0.52 |
| Channel Y | 0.60 | -0.77 | 2.34 | 0.63 |
| Channel Z | -0.49 | -2.84 | 1.48 | 0.79 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| Channel X | 200 | 200 |
| Channel Y | 200 | 200 |
| Channel Z | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| Supply (+ Vcc) | +0.01 | +6 | +14 |
| Supply (- Vcc) | -0.01 | -8 | -9 |

## Annex B.3 D835V2 Calibration Certificate

TMC In Collaboration with speag CALIBRATION LABORATORY
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ilac-MRA CNAS 校准 CNAS L0442

Client Tejet Certificate No: J13-2-2363

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D835V2 - SN: 4d100 |
| Calibration Procedure(s) | TMC-OS-E-02-194<br>Calibration procedure for dipole validation kits |
| Calibration date: | October 9, 2013 |

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRVD | 102083 | 11-Sep-13 (TMC, No.JZ13-443) | Sep-14 |
| Power sensor NRV-Z5 | 100595 | 11-Sep-13 (TMC, No. JZ13-443) | Sep -14 |
| Reference Probe EX3DV4 | SN 3846 | 3- Sep-13 (SPEAG, No.EX3-3846_Sep13) | Sep-14 |
| DAE4 | SN 777 | 22-Feb-13 (SPEAG, DAE4-777_Feb13) | Feb -14 |
| Signal Generator E4438C | MY49070393 | 13-Nov-12 (TMC, No.JZ12-394) | Nov-13 |
| Network Analyzer E8362B | MY43021135 | 19-Oct-12 (TMC, No.JZ13-278) | Oct-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | [signature] |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | [signature] |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | [signature] |

Issued: October 11, 2013

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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORMx,y,z |
| N/A | not applicable or not measured |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY52 | 52.8.7.1137 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Twin Phantom | |
| **Distance Dipole Center - TSL** | 15 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 835 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 41.5 | 0.90 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 41.3 ± 6 % | 0.91 mho/m ± 6 % |
| **Head TSL temperature change during test** | <0.5 °C | ---- | ---- |

## SAR result with Head TSL

| | | |
|---|---|---|
| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 2.28 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **9.01 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 1.49 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **5.9 mW /g ± 20.4 % (k=2)** |

## Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 55.2 | 0.97 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 56.1 ± 6 % | 0.96 mho/m ± 6 % |
| **Body TSL temperature change during test** | <0.5 °C | ---- | ---- |

## SAR result with Body TSL

| | | |
|---|---|---|
| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 2.28 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **9.23mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 1.50 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **6.06 mW /g ± 20.4 % (k=2)** |

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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 44.8Ω - 5.68jΩ |
| Return Loss | - 21.9dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 43.8Ω - 4.04jΩ |
| Return Loss | - 21.8dB |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |

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**DASY5 Validation Report for Head TSL** Date: 09.10.2013

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d100**

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; σ = 0.914 mho/m; εr = 41.328; ρ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(9.32,9.32,9.32); Calibrated: 2013/9/3
- Sensor-Surface: 2mm (Mechanical Surface Detection); 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 22/2/2013
- Phantom: SAM 1593;Type: QD000P40CC;
- Measurement SW: DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

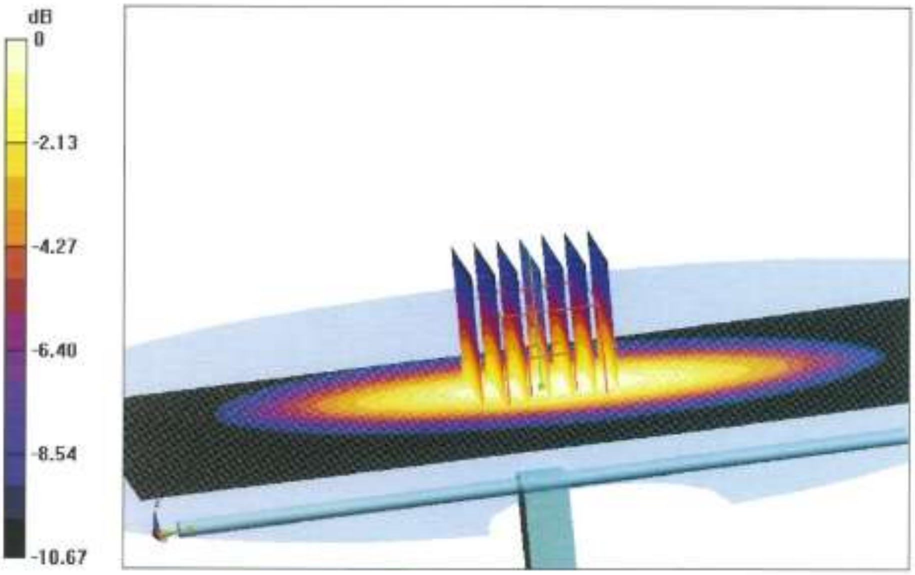
**Dipole Calibration for Head Tissue/Pin=250mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.850 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.41 W/kg

**SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.49 W/kg**

Maximum value of SAR (measured) = 2.89 W/kg




0 dB = 2.89 W/kg = 4.61 dBW/kg

Certificate No: J13-2-2363 Page 5 of 8

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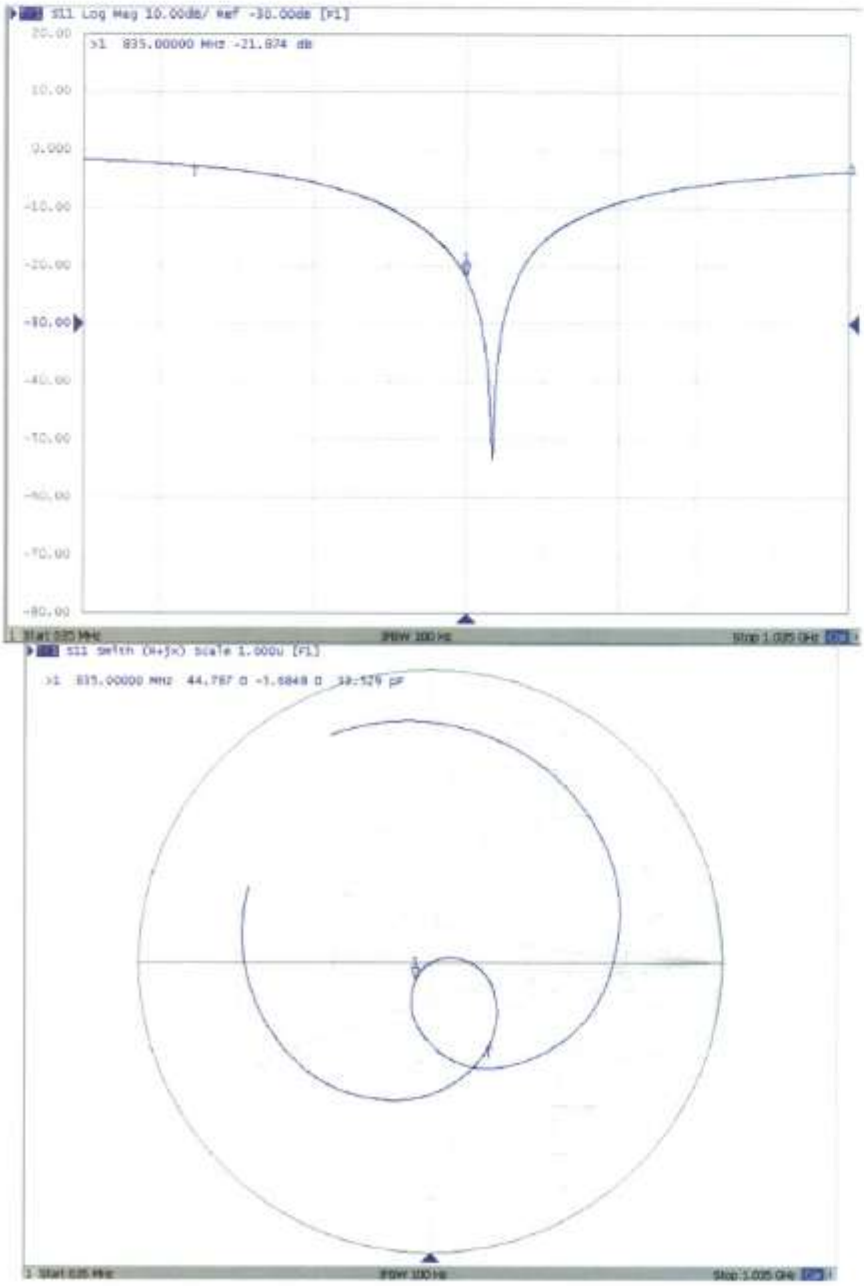
## Impedance Measurement Plot for Head TSL



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**DASY5 Validation Report for Body TSL** Date: 09.10.2013

Test Laboratory: TMC, Beijing, China

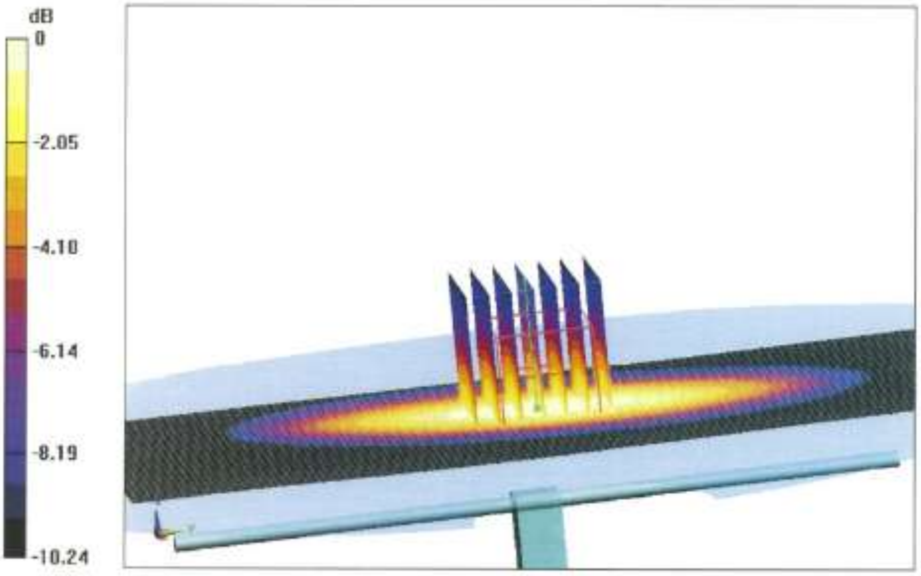
**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d100**

Communication System: CW; Frequency: 835 MHz;
Medium parameters used: f = 835 MHz; σ = 0.959 mho/m; εr = 56.13; ρ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(8.96,8.96,8.96) ; Calibrated: 2013/9/3
- Sensor-Surface: 2mm (Mechanical Surface Detection); 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 22/2/2013
- Phantom: SAM 1186;Type: QD000P40CC;
- Measurement SW: DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

**Dipole Calibration for Body Tissue/Pin=250mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.016 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.46 W/kg
**SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.5 W/kg**
Maximum value of SAR (measured) = 2.90 W/kg




0 dB = 2.90 W/kg = 4.62 dBW/kg

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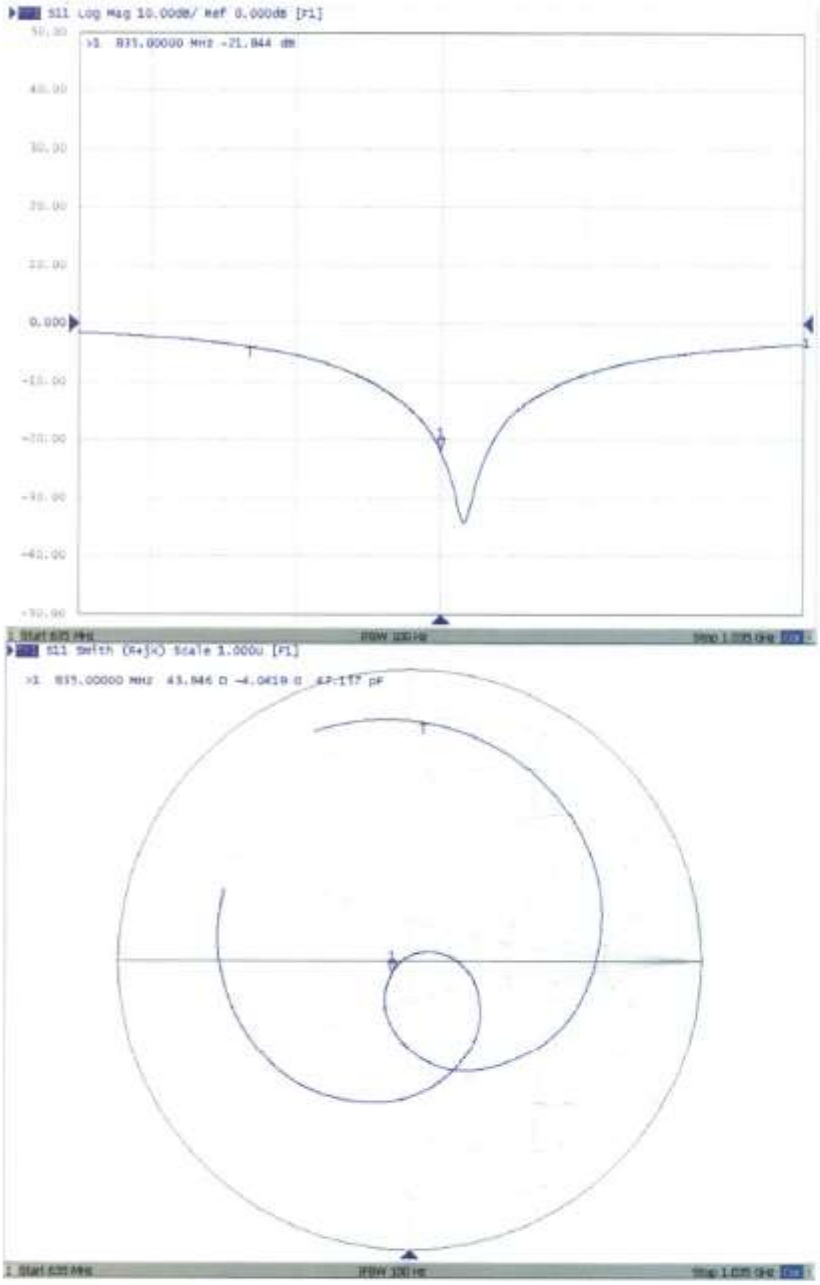
**Impedance Measurement Plot for Body TSL**



OET

June 26, 2013

**Acceptable Conditions for SAR Measurements Using Probes and Dipoles Calibrated under the SPEAG-TMC Dual-Logo Calibration Program to Support FCC Equipment Certification**

The acceptable conditions for SAR measurements using probes, dipoles and DAEs calibrated by TMC (*Telecommunication Metrology Center of MIIT in Beijing, China*), under the Dual-Logo Calibration Certificate program and quality assurance (QA) protocols established between SPEAG (*Schmid & Partner Engineering AG, Switzerland*) and TMC, to support FCC (*U.S. Federal Communications Commission*) equipment certification are defined and described in the following.

1) The agreement established between SPEAG and TMC is only applicable to calibration services performed by TMC where its clients (companies and divisions of such companies) are headquartered in the Greater China Region, including Taiwan and Hong Kong. This agreement is subject to renewal at the end of each calendar year between SPEAG and TMC. TMC shall inform the FCC of any changes or early termination to the agreement.
2) Only a subset of the calibration services specified in the SPEAG-TMC agreement, while it remains valid, are applicable to SAR measurements performed using such equipment for supporting FCC equipment certification. These are identified in the following.
   a) Calibration of dosimetric (SAR) probes EX3DVx, ET3DVx and ES3DVx.
      i) Free-space E-field and H-field probes, including those used for HAC (hearing aid compatibility) evaluation, temperature probes, other probes or equipment not identified in this document, when calibrated by TMC, are excluded and cannot be used for measurements to support FCC equipment certification.
      ii) Signal specific and bundled probe calibrations based on PMR (probe modulation response) characteristics are handled according to the requirements of KDB 865664; that is, "Until standardized procedures are available to make such determination, the applicability of a signal specific probe calibration for testing specific wireless modes and technologies is determined on a case-by-case basis through KDB inquiries, including SAR system verification requirements."
   b) Calibration of SAR system validation dipoles, excluding HAC dipoles.
   c) Calibration of data acquisition electronics DAE3Vx, DAE4Vx and DAEasyVx.
   d) For FCC equipment certification purposes, the frequency range of SAR probe and dipole calibrations is limited to 700 MHz - 6 GHz and provided it is supported by the equipment identified in the TMC QA protocol (a separate attachment to this document).
   e) The identical system and equipment setup, measurement configurations, hardware, evaluation algorithms, calibration and QA protocols, including the format of calibration certificates and reports used by SPEAG shall be applied by TMC.
   f) The calibrated items are only applicable to SPEAG DASY 4 and DASY 5 or higher version systems.

1

3) The SPEAG-TMC agreement includes specific protocols identified in the following to ensure the quality of calibration services provided by TMC under this SPEAG-TMC Dual-Logo calibration agreement are equivalent to the calibration services provided by SPEAG. TMC shall, upon request, provide copies of documentation to the FCC to substantiate program implementation.
   a) The Inter-laboratory Calibration Evaluation (ILCE) stated in the TMC QA protocol shall be performed between SPEAG and TMC at least once every 12 months. The ILCE acceptance criteria defined in the TMC QA protocol shall be satisfied for the TMC, SPEAG and FCC agreements to remain valid.
   b) Check of Calibration Certificate (CCC) shall be performed by SPEAG for all calibrations performed by TMC. Written confirmation from SPEAG is required for TMC to issue calibration certificates under the SPEAG-TMC Dual-Logo calibration program. Quarterly reports for all calibrations performed by TMC under the program are also issued by SPEAG.
   c) The calibration equipment and measurement system used by TMC shall be verified before each calibration service according to the specific reference SAR probes, dipoles, and DAE calibrated by SPEAG. The results shall be reproducible and within the defined acceptance criteria specified in the TMC QA protocol before each actual calibration can commence. TMC shall maintain records of the measurement and calibration system verification results for all calibrations.
   d) Quality Check of Calibration (QCC) certificates shall be performed by SPEAG at least once every 12 months. SPEAG shall visit TMC facilities to verify the laboratory, equipment, applied procedures and plausibility of randomly selected certificates.
4) A copy of this document, to be updated annually, shall be provided to TMC clients that accept calibration services according to the SPEAG-TMC Dual-Logo calibration program, which should be presented to a TCB (*Telecommunication Certification Body*), to facilitate FCC equipment approval.
5) TMC shall address any questions raised by its clients or TCBs relating to the SPEAG-TMC Dual-Logo calibration program and inform the FCC and SPEAG of any critical issues.

Change Note: Revised on June 26 to clarify the applicability of PMR and Bundled probe calibrations according to the requirements of KDB 865664.

## Annex B.4 D1900V2 Calibration Certificate

TMC In Collaboration with s p e a g CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
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ilac-MRA CNAS 校准 CNAS L0442

Client TEJET Certificate No: Z14-97044

# CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d155

Calibration Procedure(s): TMC-OS-E-02-194
Calibration procedure for dipole validation kits

Calibration date: May 23, 2014

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRVD | 102083 | 11-Sep-13 (TMC, No.JZ13-443) | Sep-14 |
| Power sensor NRV-Z5 | 100595 | 11-Sep-13 (TMC, No. JZ13-443) | Sep -14 |
| Reference Probe EX3DV4 | SN 3846 | 3- Sep-13 (SPEAG, No.EX3-3846_Sep13) | Sep-14 |
| DAE4 | SN 1331 | 23-Jan-14 (SPEAG, DAE4-1331_Jan14) | Jan -15 |
| Signal Generator E4438C | MY49070393 | 13-Nov-13 (TMC, No.JZ13-394) | Nov-14 |
| Network Analyzer E8362B | MY43021135 | 19-Oct-13 (TMC, No.JZ13-278) | Oct-14 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: January 24, 2014



Certificate No: Z14-97044 Page 1 of 8

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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORMx,y,z |
| N/A | not applicable or not measured |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| DASY Version | DASY52 | 52.8.7.1137 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Twin Phantom | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 1900 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| Nominal Head TSL parameters | 22.0 °C | 40.0 | 1.40 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 40.3 ± 6 % | 1.37 mho/m ± 6 % |
| Head TSL temperature change during test | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| | | |
|---|---|---|
| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 9.69 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **39.3 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 5.21 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **21.0 mW /g ± 20.4 % (k=2)** |

## Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| Nominal Body TSL parameters | 22.0 °C | 53.3 | 1.52 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 52.7 ± 6 % | 1.48 mho/m ± 6 % |
| Body TSL temperature change during test | <1.0 °C | ---- | ---- |

## SAR result with Body TSL

| | | |
|---|---|---|
| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 10.1 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **40.9 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 5.29 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **21.3 mW /g ± 20.4 % (k=2)** |

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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 48.7Ω- 7.35jΩ |
| Return Loss | - 22.3dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 52.0Ω- 6.48jΩ |
| Return Loss | - 23.6dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.211 ns |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |

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**DASY5 Validation Report for Head TSL** Date: 21.05.2014

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 1900 MHz D1900V2; Type: D1900V2;Serial: D1900V2 - SN: 5d155**

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; $\sigma$ = 1.372 S/m; $\varepsilon_r$ = 40.27; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(7.57, 7.57, 7.57); Calibrated: 2013-09-03;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

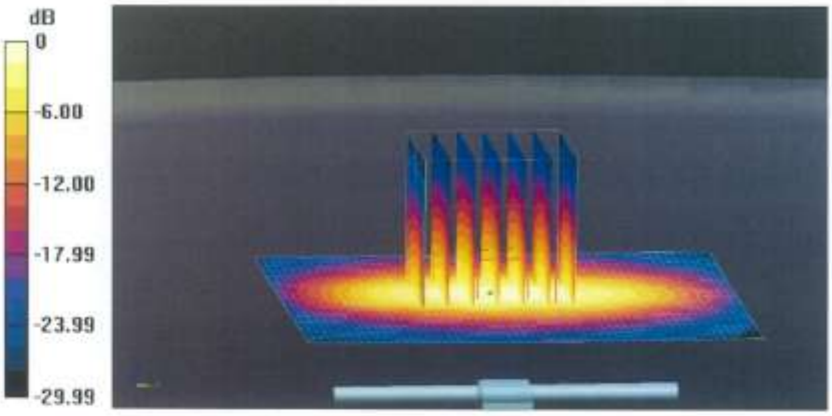
**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=xx mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.2 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 18.0 W/kg

**SAR(1 g) = 9.69 W/kg; SAR(10 g) = 5.21 W/kg**

Maximum value of SAR (measured) = 14.0 W/kg




0 dB = 14.0 W/kg = 11.46 dBW/kg

Certificate No: Z14-97044 Page 5 of 8

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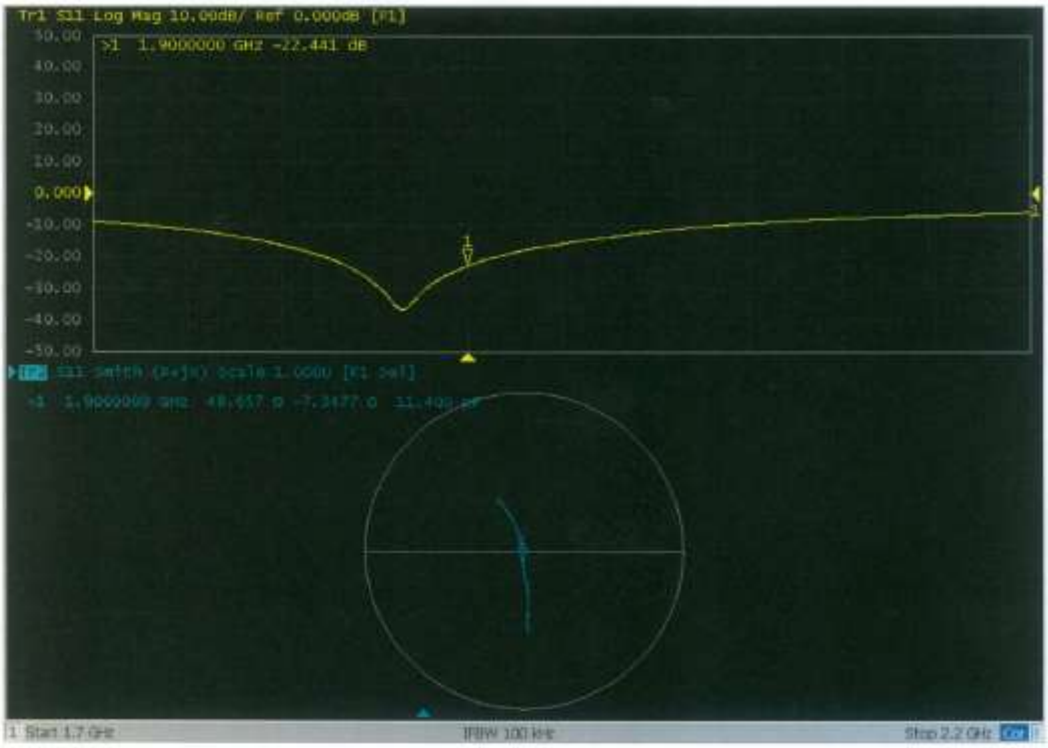
E-mail: Info@emcite.com Http://www.emcite.com

**Impedance Measurement Plot for Head TSL**



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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
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**DASY5 Validation Report for Body TSL** Date: 22.05.2014

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 1900 MHz D1900V2; Type: D1900V2;Serial: D1900V2 - SN: 5d155**

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; $\sigma$ = 1.48 S/m; $\varepsilon_r$ = 52.72; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(7.03, 7.03, 7.03); Calibrated: 2013-09-03;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

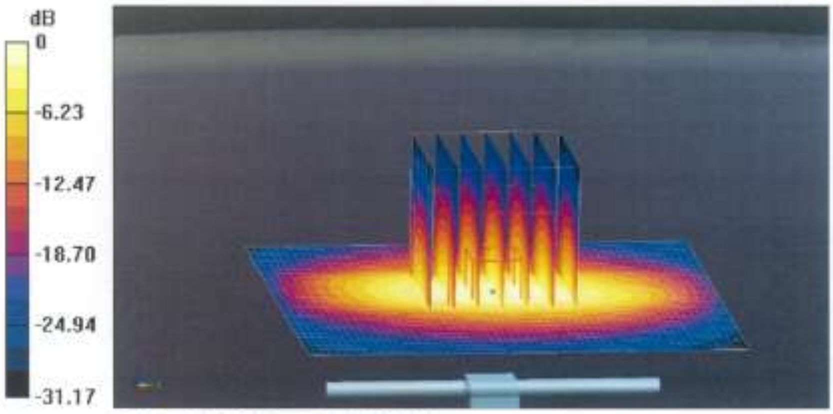
**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=xx mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.2 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 18.0 W/kg

**SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.29 W/kg**

Maximum value of SAR (measured) = 14.3 W/kg




0 dB = 14.1 W/kg = 11.49 dBW/kg

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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
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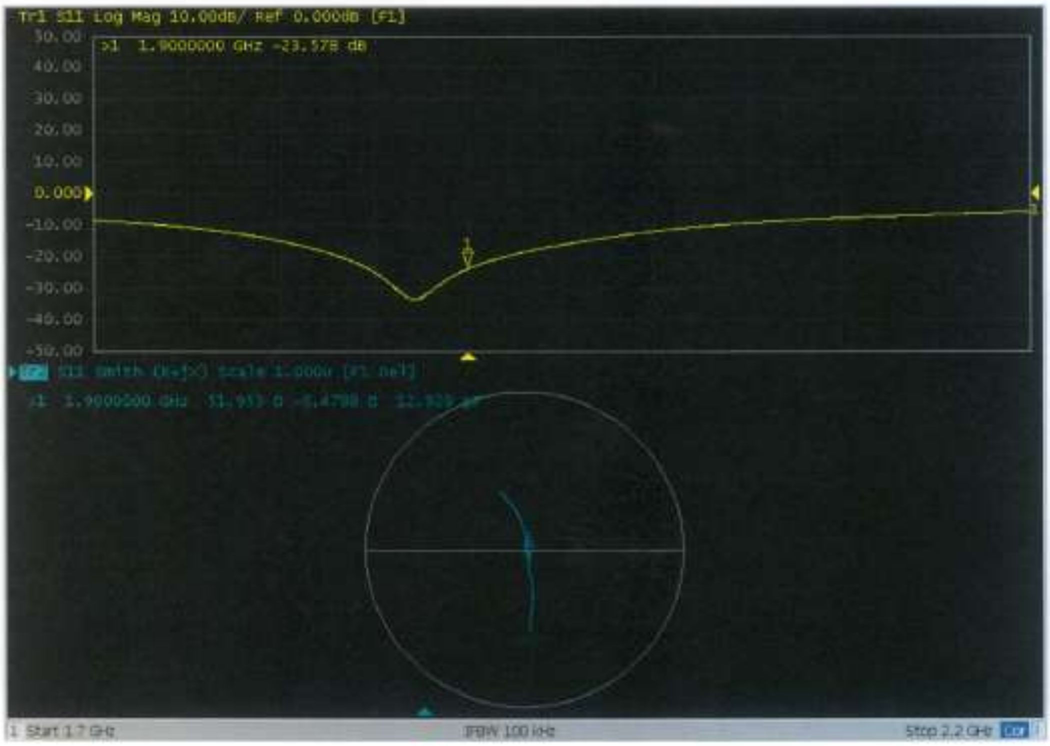
**Impedance Measurement Plot for Body TSL**



OET

June 26, 2013

**Acceptable Conditions for SAR Measurements Using Probes and Dipoles Calibrated under the SPEAG-TMC Dual-Logo Calibration Program to Support FCC Equipment Certification**

The acceptable conditions for SAR measurements using probes, dipoles and DAEs calibrated by TMC (*Telecommunication Metrology Center of MIIT in Beijing, China*), under the Dual-Logo Calibration Certificate program and quality assurance (QA) protocols established between SPEAG (*Schmid & Partner Engineering AG, Switzerland*) and TMC, to support FCC (*U.S. Federal Communications Commission*) equipment certification are defined and described in the following.

1) The agreement established between SPEAG and TMC is only applicable to calibration services performed by TMC where its clients (companies and divisions of such companies) are headquartered in the Greater China Region, including Taiwan and Hong Kong. This agreement is subject to renewal at the end of each calendar year between SPEAG and TMC. TMC shall inform the FCC of any changes or early termination to the agreement.
2) Only a subset of the calibration services specified in the SPEAG-TMC agreement, while it remains valid, are applicable to SAR measurements performed using such equipment for supporting FCC equipment certification. These are identified in the following.
   a) Calibration of dosimetric (SAR) probes EX3DVx, ET3DVx and ES3DVx.
      i) Free-space E-field and H-field probes, including those used for HAC (hearing aid compatibility) evaluation, temperature probes, other probes or equipment not identified in this document, when calibrated by TMC, are excluded and cannot be used for measurements to support FCC equipment certification.
      ii) Signal specific and bundled probe calibrations based on PMR (probe modulation response) characteristics are handled according to the requirements of KDB 865664; that is, "Until standardized procedures are available to make such determination, the applicability of a signal specific probe calibration for testing specific wireless modes and technologies is determined on a case-by-case basis through KDB inquiries, including SAR system verification requirements."
   b) Calibration of SAR system validation dipoles, excluding HAC dipoles.
   c) Calibration of data acquisition electronics DAE3Vx, DAE4Vx and DAEasyVx.
   d) For FCC equipment certification purposes, the frequency range of SAR probe and dipole calibrations is limited to 700 MHz - 6 GHz and provided it is supported by the equipment identified in the TMC QA protocol (a separate attachment to this document).
   e) The identical system and equipment setup, measurement configurations, hardware, evaluation algorithms, calibration and QA protocols, including the format of calibration certificates and reports used by SPEAG shall be applied by TMC.
   f) The calibrated items are only applicable to SPEAG DASY 4 and DASY 5 or higher version systems.

1

3) The SPEAG-TMC agreement includes specific protocols identified in the following to ensure the quality of calibration services provided by TMC under this SPEAG-TMC Dual-Logo calibration agreement are equivalent to the calibration services provided by SPEAG. TMC shall, upon request, provide copies of documentation to the FCC to substantiate program implementation.
   a) The Inter-laboratory Calibration Evaluation (ILCE) stated in the TMC QA protocol shall be performed between SPEAG and TMC at least once every 12 months. The ILCE acceptance criteria defined in the TMC QA protocol shall be satisfied for the TMC, SPEAG and FCC agreements to remain valid.
   b) Check of Calibration Certificate (CCC) shall be performed by SPEAG for all calibrations performed by TMC. Written confirmation from SPEAG is required for TMC to issue calibration certificates under the SPEAG-TMC Dual-Logo calibration program. Quarterly reports for all calibrations performed by TMC under the program are also issued by SPEAG.
   c) The calibration equipment and measurement system used by TMC shall be verified before each calibration service according to the specific reference SAR probes, dipoles, and DAE calibrated by SPEAG. The results shall be reproducible and within the defined acceptance criteria specified in the TMC QA protocol before each actual calibration can commence. TMC shall maintain records of the measurement and calibration system verification results for all calibrations.
   d) Quality Check of Calibration (QCC) certificates shall be performed by SPEAG at least once every 12 months. SPEAG shall visit TMC facilities to verify the laboratory, equipment, applied procedures and plausibility of randomly selected certificates.
4) A copy of this document, to be updated annually, shall be provided to TMC clients that accept calibration services according to the SPEAG-TMC Dual-Logo calibration program, which should be presented to a TCB (*Telecommunication Certification Body*), to facilitate FCC equipment approval.
5) TMC shall address any questions raised by its clients or TCBs relating to the SPEAG-TMC Dual-Logo calibration program and inform the FCC and SPEAG of any critical issues.

Change Note: Revised on June 26 to clarify the applicability of PMR and Bundled probe calibrations according to the requirements of KDB 865664.

## Annex B.5 D2450V2 Calibration Certificate

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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
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Client Tejet Certificate No: J13-2-2367

### CALIBRATION CERTIFICATE

Object: D2450V2 - SN: 845

Calibration Procedure(s): TMC-OS-E-02-194
Calibration procedure for dipole validation kits

Calibration date: September 16, 2013

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRVD | 102083 | 11-Sep-13 (TMC, No.JZ13-443) | Sep-14 |
| Power sensor NRV-Z5 | 100595 | 11-Sep-13 (TMC, No. JZ13-443) | Sep -14 |
| Reference Probe EX3DV4 | SN 3898 | 14- Jan-13 (SPEAG, No.EX3-3898_Jan13) | Jan-14 |
| DAE4 | SN 777 | 22-Feb-13 (SPEAG, DAE4-777_Feb13) | Feb -14 |
| Signal Generator E4438C | MY49070393 | 13-Nov-12 (TMC, No.JZ12-394) | Nov-13 |
| Network Analyzer E8362B | MY43021135 | 19-Oct-12 (TMC, No.JZ13-278) | Oct-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: September 18, 2013

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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORMx,y,z |
| N/A | not applicable or not measured |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY52 | 52.8.7.1137 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Twin Phantom | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2450 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.2 | 1.80 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 38.8 ± 6 % | 1.80 mho/m ± 6 % |
| **Head TSL temperature change during test** | <0.5 °C | ---- | ---- |

## SAR result with Head TSL

| | | |
|---|---|---|
| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 13.5 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **53.9 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 6.29 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **25.1 mW /g ± 20.4 % (k=2)** |

## Body TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 52.7 | 1.95 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 52.9 ± 6 % | 1.94 mho/m ± 6 % |
| **Body TSL temperature change during test** | <0.5 °C | ---- | ---- |

## SAR result with Body TSL

| | | |
|---|---|---|
| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 13.0 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **52.1 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 6.09 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **24.4 mW /g ± 20.4 % (k=2)** |

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Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 49.9Ω+3.65jΩ |
| Return Loss | - 28.9dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 45.1Ω+ 3.56jΩ |
| Return Loss | - 23.9dB |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |

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**DASY5 Validation Report for Head TSL** Date: 16.09.2013

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 845**

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; σ = 1.801 mho/m; $\varepsilon_r$ = 38.829; ρ = 1000 kg/m$^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.25,7.25,7.25); Calibrated:14,01,2013
- Sensor-Surface: 2mm (Mechanical Surface Detection); 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 22/2/2013
- Phantom: SAM 1186;Type: QD000P40CC;
- Measurement SW: DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

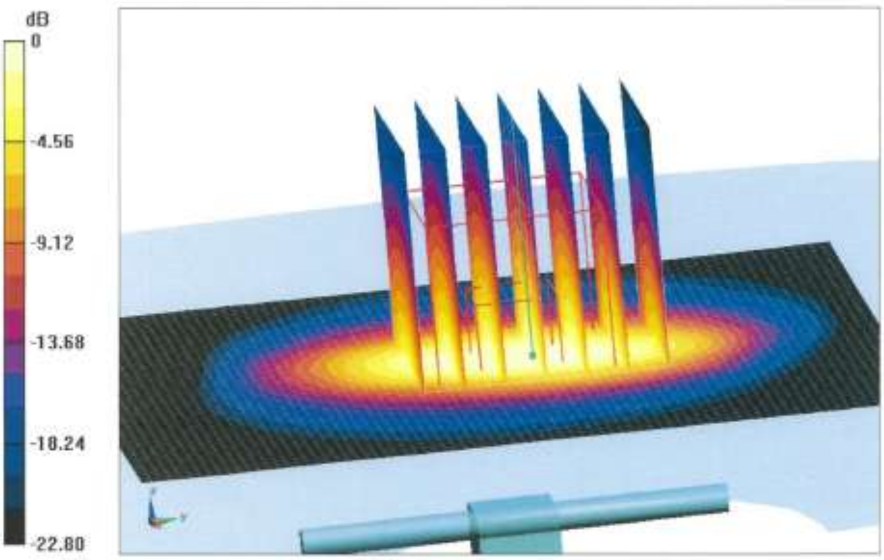
**Dipole Calibration for Head Tissue/Pin=250mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 107.4 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 27.5 W/kg

**SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.29 W/kg**

Maximum value of SAR (measured) = 20.4 W/kg




0 dB = 20.4 W/kg = 13.10 dBW/kg

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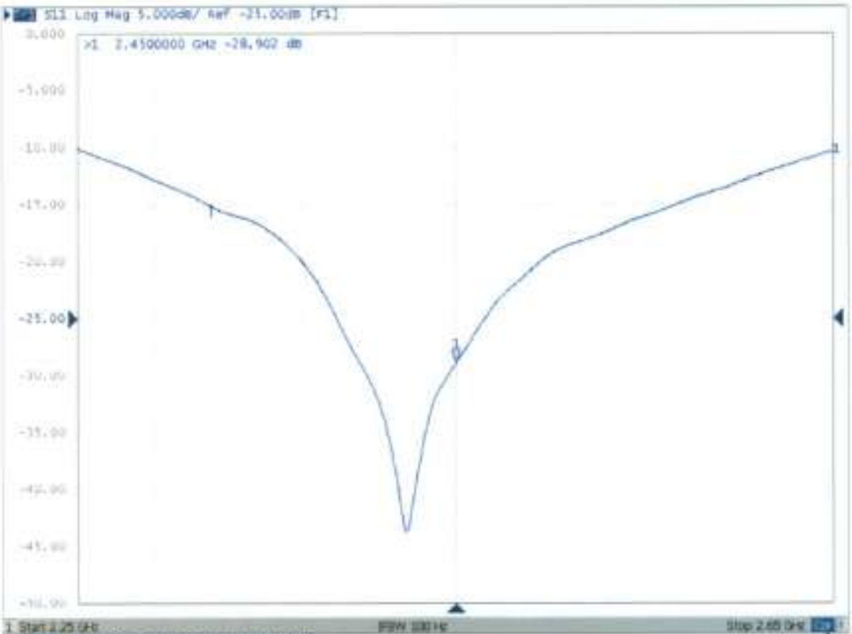
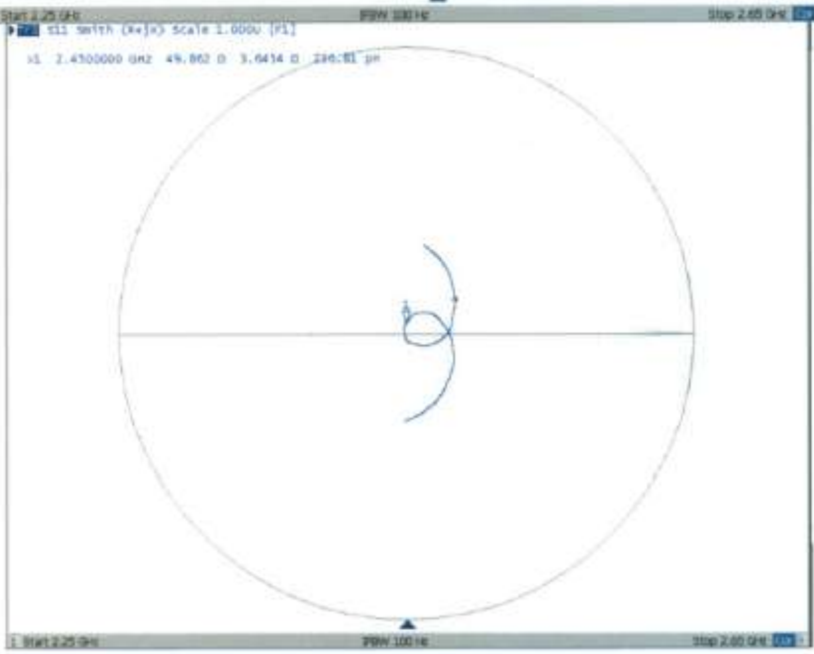
**Impedance Measurement Plot for Head TSL**

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**DASY5 Validation Report for Body TSL** Date: 16.09.2013

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 845**

Communication System: CW; Frequency: 2450 MHz;

Medium parameters used: f = 2450 MHz; σ = 1.942 mho/m; εr = 52.862; ρ = 1000 $kg/m^3$

Phantom section: Flat Phantom

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.17,7.17,7.17) ; Calibrated:14.01.2013
- Sensor-Surface: 2mm (Mechanical Surface Detection); 1.0, 31.0
- Electronics: DAE4 Sn777; Calibrated: 22/2/2013
- Phantom: SAM 1186;Type: QD000P40CC
- Measurement SW: DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

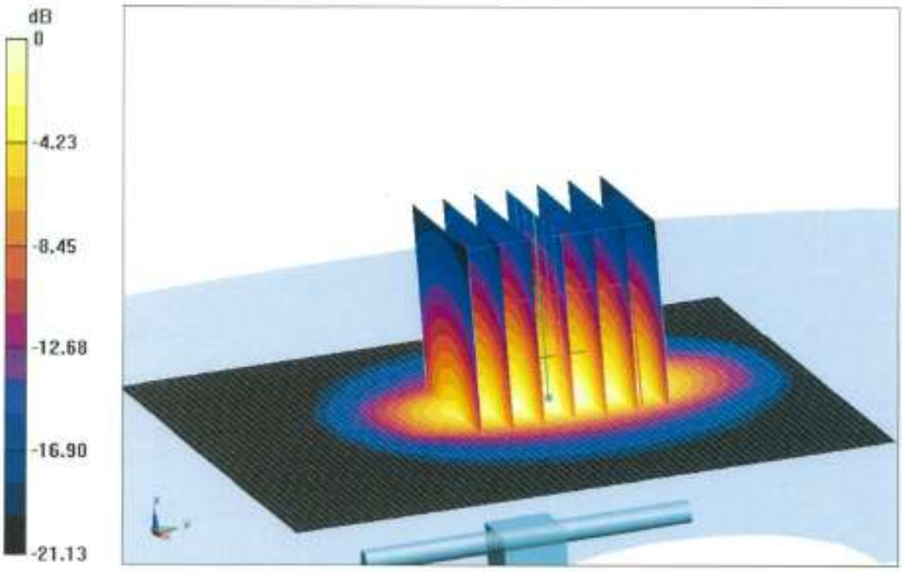
**Dipole Calibration for Body Tissue/Pin=250mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.335 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 26.4 W/kg

**SAR(1 g) = 13 W/kg; SAR(10 g) = 6.09 W/kg**

Maximum value of SAR (measured) = 19.8 W/kg




0 dB = 19.8 W/kg = 12.97 dBW/kg

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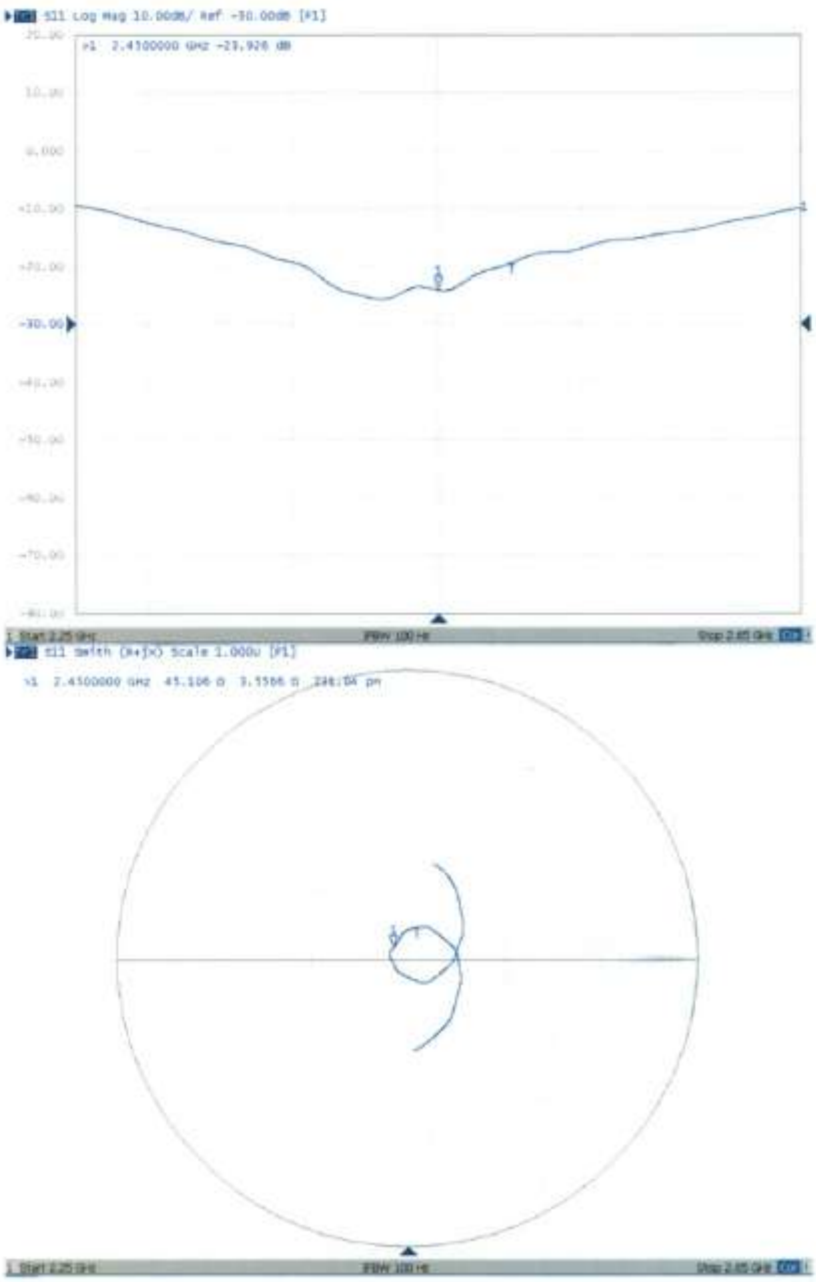
**Impedance Measurement Plot for Body TSL**



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OET
June 26, 2013

**Acceptable Conditions for SAR Measurements Using Probes and Dipoles Calibrated under the SPEAG-TMC Dual-Logo Calibration Program to Support FCC Equipment Certification**

The acceptable conditions for SAR measurements using probes, dipoles and DAEs calibrated by TMC (*Telecommunication Metrology Center of MIIT in Beijing, China*), under the Dual-Logo Calibration Certificate program and quality assurance (QA) protocols established between SPEAG (*Schmid & Partner Engineering AG, Switzerland*) and TMC, to support FCC (*U.S. Federal Communications Commission*) equipment certification are defined and described in the following.

1) The agreement established between SPEAG and TMC is only applicable to calibration services performed by TMC where its clients (companies and divisions of such companies) are headquartered in the Greater China Region, including Taiwan and Hong Kong. This agreement is subject to renewal at the end of each calendar year between SPEAG and TMC. TMC shall inform the FCC of any changes or early termination to the agreement.
2) Only a subset of the calibration services specified in the SPEAG-TMC agreement, while it remains valid, are applicable to SAR measurements performed using such equipment for supporting FCC equipment certification. These are identified in the following.
    a) Calibration of dosimetric (SAR) probes EX3DVx, ET3DVx and ES3DVx.
        i) Free-space E-field and H-field probes, including those used for HAC (hearing aid compatibility) evaluation, temperature probes, other probes or equipment not identified in this document, when calibrated by TMC, are excluded and cannot be used for measurements to support FCC equipment certification.
        ii) Signal specific and bundled probe calibrations based on PMR (probe modulation response) characteristics are handled according to the requirements of KDB 865664; that is, "Until standardized procedures are available to make such determination, the applicability of a signal specific probe calibration for testing specific wireless modes and technologies is determined on a case-by-case basis through KDB inquiries, including SAR system verification requirements."
    b) Calibration of SAR system validation dipoles, excluding HAC dipoles.
    c) Calibration of data acquisition electronics DAE3Vx, DAE4Vx and DAEasyVx.
    d) For FCC equipment certification purposes, the frequency range of SAR probe and dipole calibrations is limited to 700 MHz - 6 GHz and provided it is supported by the equipment identified in the TMC QA protocol (a separate attachment to this document).
    e) The identical system and equipment setup, measurement configurations, hardware, evaluation algorithms, calibration and QA protocols, including the format of calibration certificates and reports used by SPEAG shall be applied by TMC.
    f) The calibrated items are only applicable to SPEAG DASY 4 and DASY 5 or higher version systems.

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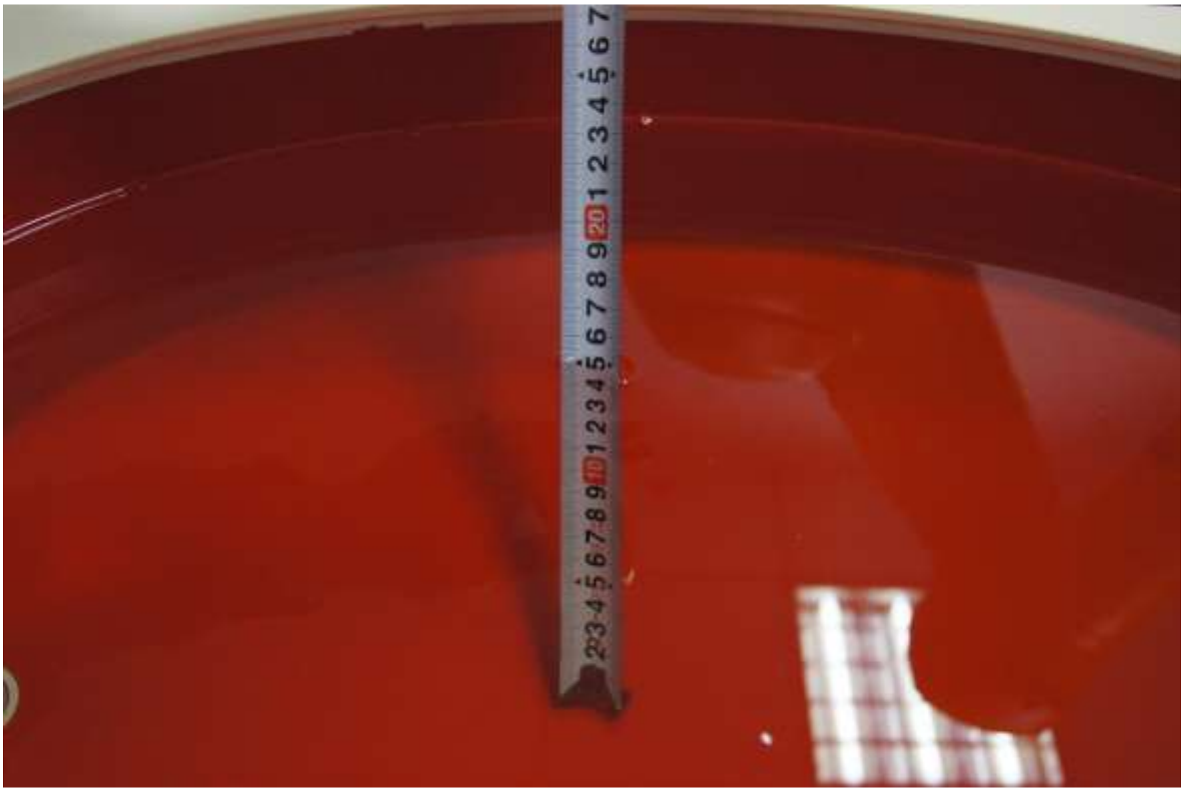
3) The SPEAG-TMC agreement includes specific protocols identified in the following to ensure the quality of calibration services provided by TMC under this SPEAG-TMC Dual-Logo calibration agreement are equivalent to the calibration services provided by SPEAG. TMC shall, upon request, provide copies of documentation to the FCC to substantiate program implementation.
    a) The Inter-laboratory Calibration Evaluation (ILCE) stated in the TMC QA protocol shall be performed between SPEAG and TMC at least once every 12 months. The ILCE acceptance criteria defined in the TMC QA protocol shall be satisfied for the TMC, SPEAG and FCC agreements to remain valid.
    b) Check of Calibration Certificate (CCC) shall be performed by SPEAG for all calibrations performed by TMC. Written confirmation from SPEAG is required for TMC to issue calibration certificates under the SPEAG-TMC Dual-Logo calibration program. Quarterly reports for all calibrations performed by TMC under the program are also issued by SPEAG.
    c) The calibration equipment and measurement system used by TMC shall be verified before each calibration service according to the specific reference SAR probes, dipoles, and DAE calibrated by SPEAG. The results shall be reproducible and within the defined acceptance criteria specified in the TMC QA protocol before each actual calibration can commence. TMC shall maintain records of the measurement and calibration system verification results for all calibrations.
    d) Quality Check of Calibration (QCC) certificates shall be performed by SPEAG at least once every 12 months. SPEAG shall visit TMC facilities to verify the laboratory, equipment, applied procedures and plausibility of randomly selected certificates.
4) A copy of this document, to be updated annually, shall be provided to TMC clients that accept calibration services according to the SPEAG-TMC Dual-Logo calibration program, which should be presented to a TCB (*Telecommunication Certification Body*), to facilitate FCC equipment approval.
5) TMC shall address any questions raised by its clients or TCBs relating to the SPEAG-TMC Dual-Logo calibration program and inform the FCC and SPEAG of any critical issues.

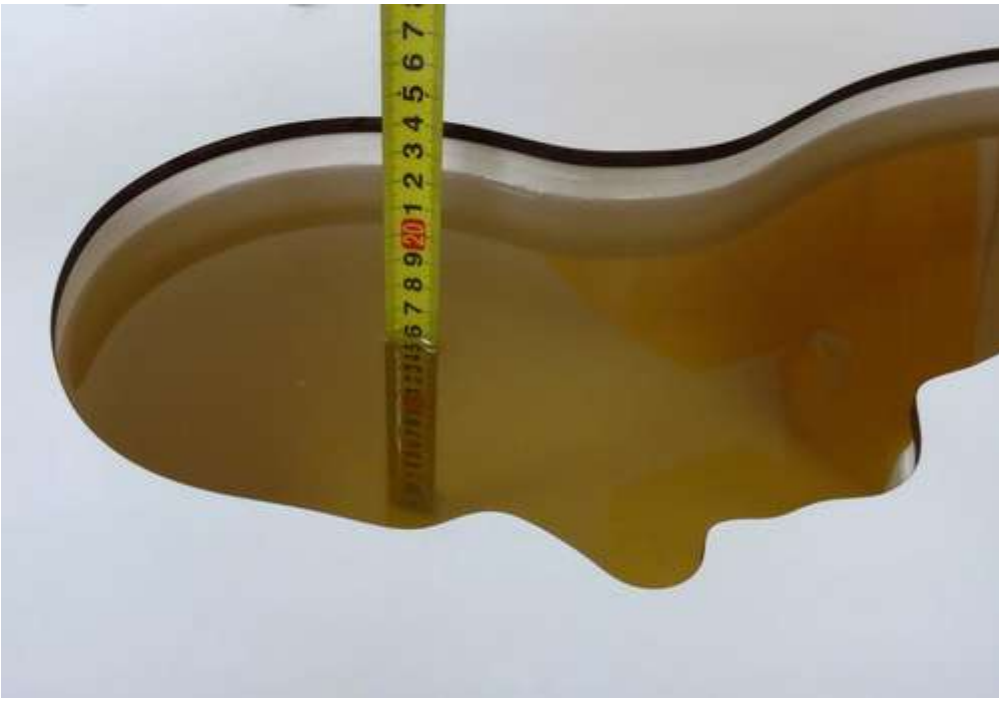
Change Note: Revised on June 26 to clarify the applicability of PMR and Bundled probe calibrations according to the requirements of KDB 865664.

## ANNEX C: Test Layout

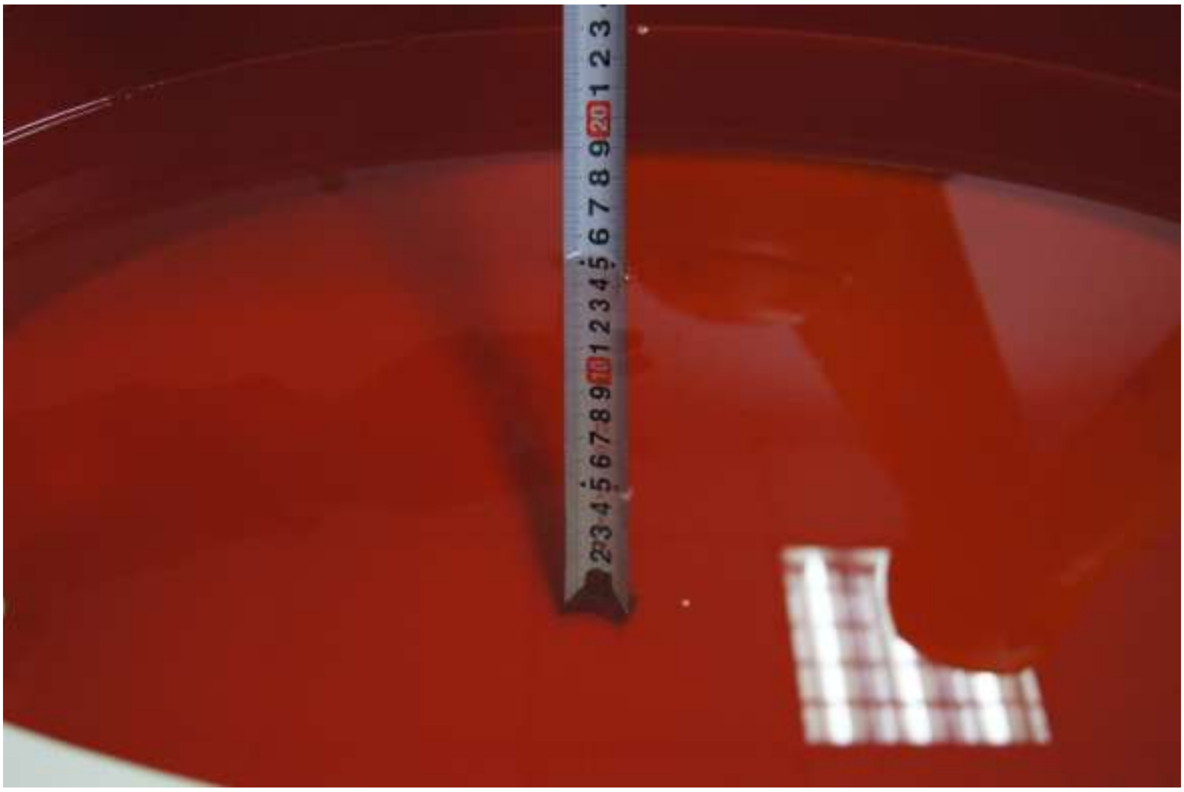

Picture C.1: Specific Absorption Rate Test Layout



Picture C.2: Liquid depth in the flat Phantom (835MHz) (15.1cm deep)

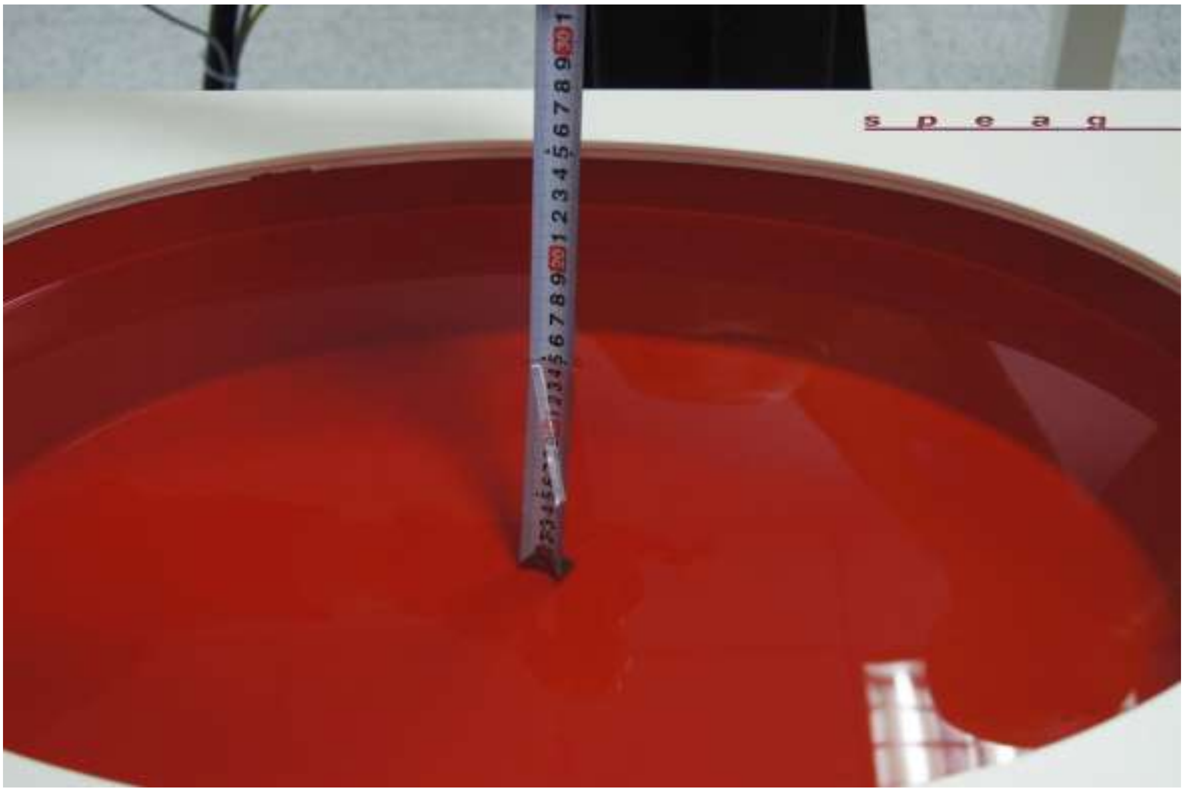


Picture C.3: Liquid depth in the head Phantom (835MHz)    (15.4cm deep)



Picture C.4: Liquid depth in the flat Phantom (1900 MHz)    (15.3cm deep)

Picture C.5: liquid depth in the head Phantom (1900 MHz)       (15.2cm deep)




Picture C.6: Liquid depth in the flat Phantom (2450 MHz)       (15.1cm deep)

Picture C.7: liquid depth in the head Phantom (2450 MHz)　　(15.2cm deep)

-----------------------------------------END OF REPORT----------------------------------------------------