

**System Check\_E-Field\_835\_120806**

**DUT: HAC Dipole 835 MHz; Type: CD835V3; SN: 1041**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Hearing Aid Compatibility (41x361x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 156.7 V/m

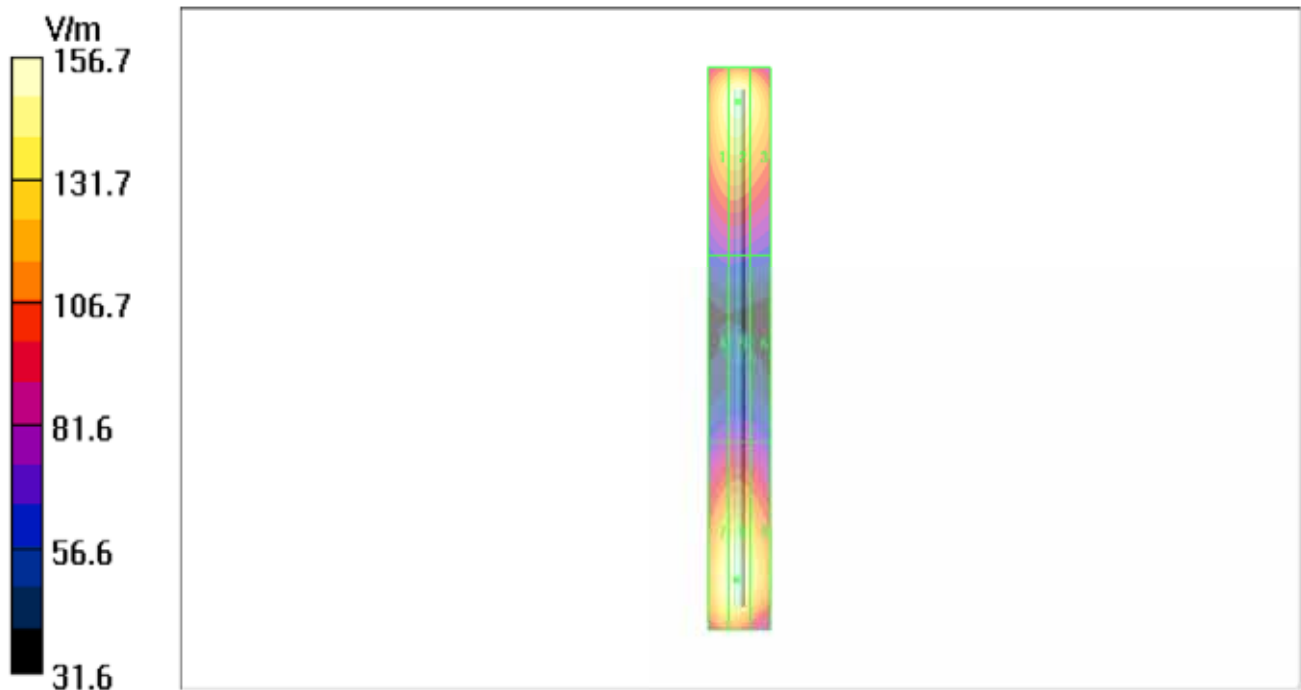
Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 115.8 V/m; Power Drift = -0.098 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>148.6 M4</b>	Grid 2 <b>154.6 M4</b>	Grid 3 <b>145.8 M4</b>
Grid 4 <b>79.6 M4</b>	Grid 5 <b>81.8 M4</b>	Grid 6 <b>78.1 M4</b>
Grid 7 <b>153.2 M4</b>	Grid 8 <b>156.7 M4</b>	Grid 9 <b>145.3 M4</b>



**System Check\_E-Field\_1880\_120806**

**DUT: HAC Dipole 1880 MHz; Type: CD1880V3; SN: 1032**

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C;

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn910; Calibrated: 2011/12/07

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Hearing Aid Compatibility (41x181x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 144.2 V/m

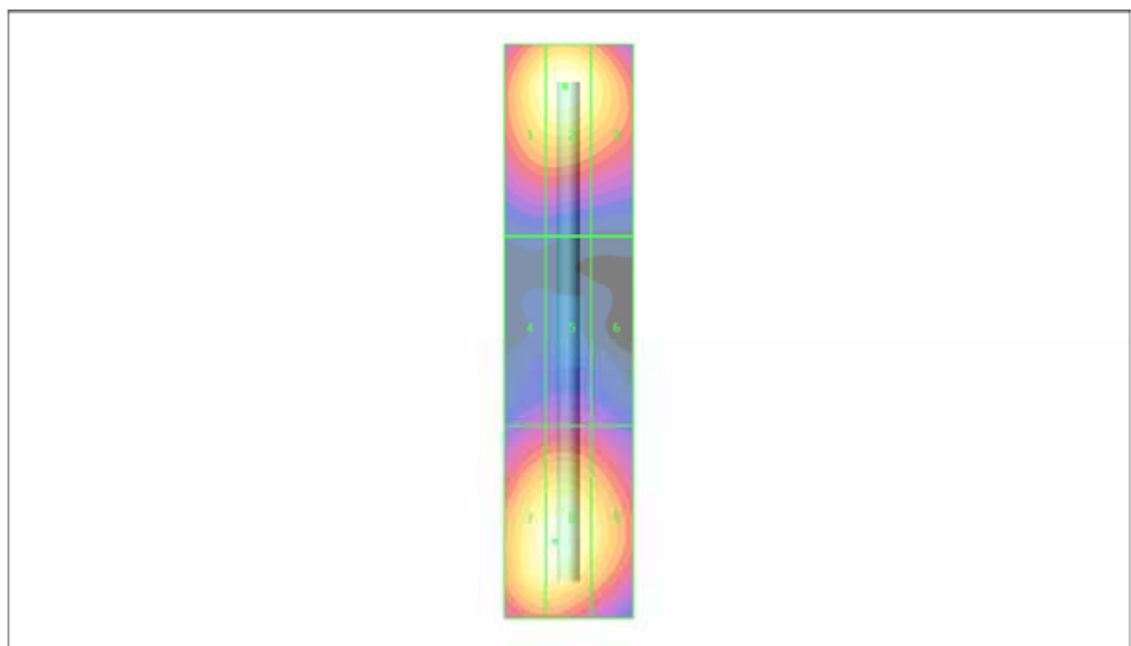
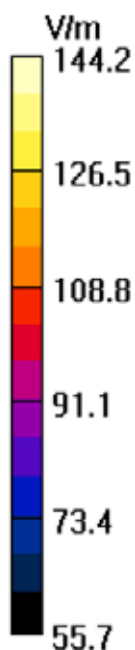
Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 142.1 V/m; Power Drift = -0.045 dB

**Hearing Aid Near-Field Category: M2 (AWF 0 dB)**

Grid 1 <b>139.2 M2</b>	Grid 2 <b>144.2 M2</b>	Grid 3 <b>135.0 M2</b>
Grid 4 <b>91.7 M3</b>	Grid 5 <b>94.4 M3</b>	Grid 6 <b>90.4 M3</b>
Grid 7 <b>141.7 M2</b>	Grid 8 <b>142.4 M2</b>	Grid 9 <b>132.3 M2</b>



**System Check\_H-Field\_835\_120806**

**DUT: HAC Dipole 835 MHz; Type: CD835V3; SN: 1041**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn910; Calibrated: 2011/12/07

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Hearing Aid Compatibility (41x361x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.436 A/m

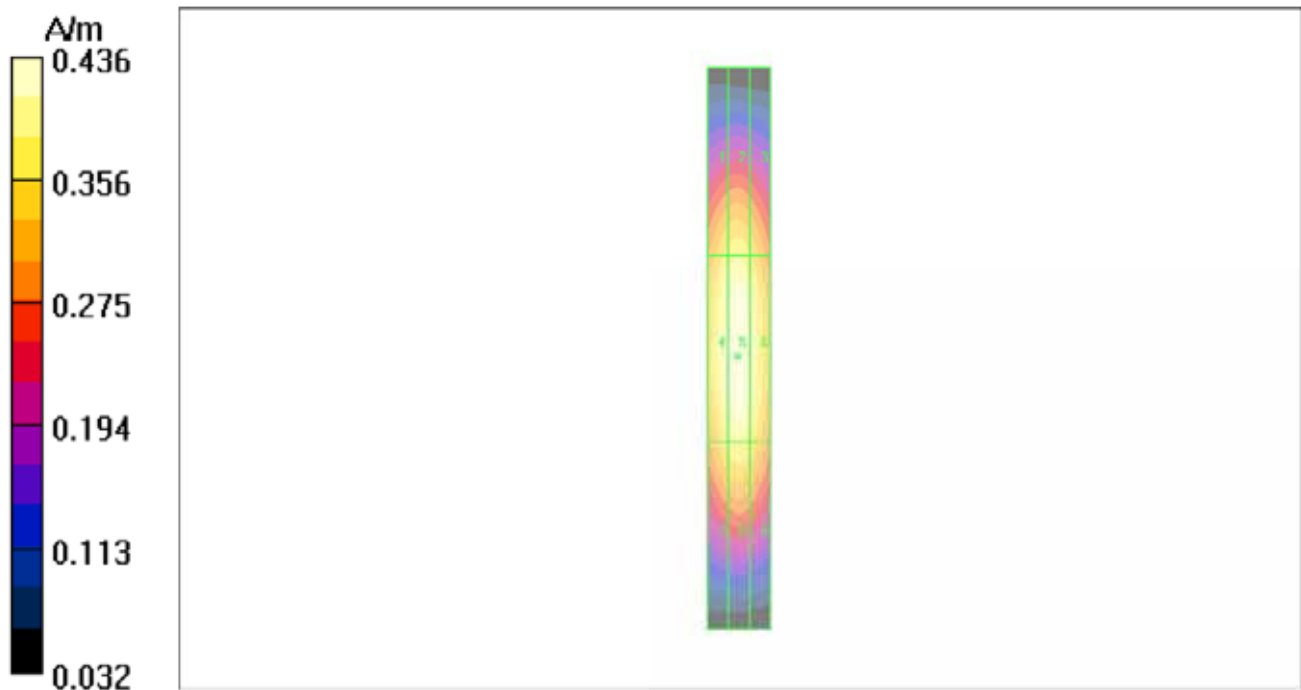
Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.466 A/m; Power Drift = -0.057 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.368 M4</b>	Grid 2 <b>0.380 M4</b>	Grid 3 <b>0.359 M4</b>
Grid 4 <b>0.421 M4</b>	Grid 5 <b>0.436 M4</b>	Grid 6 <b>0.412 M4</b>
Grid 7 <b>0.369 M4</b>	Grid 8 <b>0.384 M4</b>	Grid 9 <b>0.365 M4</b>



### System Check\_H-Field\_1880\_120806

**DUT: HAC Dipole 1880 MHz; Type: CD1880V3; SN: 1032**

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Hearing Aid Compatibility (41x181x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.438 A/m

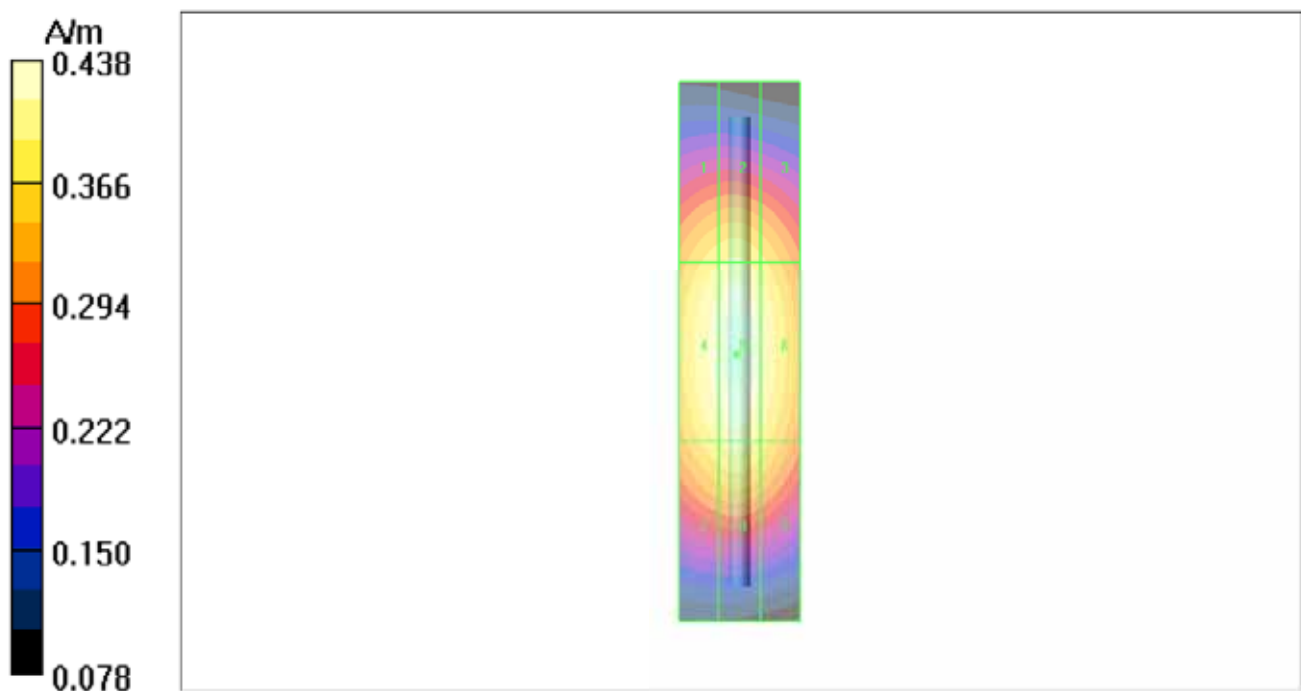
Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.462 A/m; Power Drift = -0.028 dB

**Hearing Aid Near-Field Category: M2 (AWF 0 dB)**

Grid 1 <b>0.387 M2</b>	Grid 2 <b>0.395 M2</b>	Grid 3 <b>0.376 M2</b>
Grid 4 <b>0.427 M2</b>	Grid 5 <b>0.438 M2</b>	Grid 6 <b>0.417 M2</b>
Grid 7 <b>0.391 M2</b>	Grid 8 <b>0.403 M2</b>	Grid 9 <b>0.382 M2</b>



### P12 E\_Field GSM850\_Ch128

**DUT: 120713C03**

Communication System: GSM850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch128/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 96.3 V/m

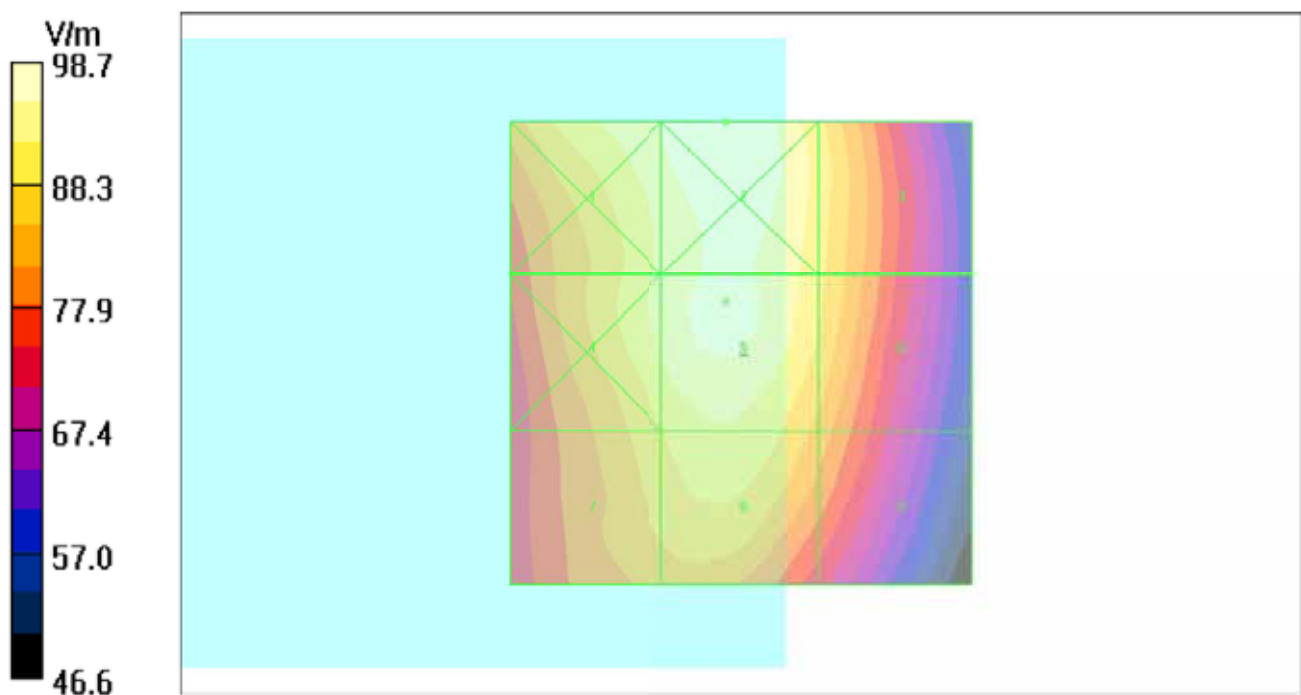
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 42.6 V/m; Power Drift = -0.016 dB

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Grid 1	Grid 2	Grid 3
<b>95.7 M4</b>	<b>98.7 M4</b>	<b>90.6 M4</b>
Grid 4	Grid 5	Grid 6
<b>93.2 M4</b>	<b>96.3 M4</b>	<b>89.4 M4</b>
Grid 7	Grid 8	Grid 9
<b>88.1 M4</b>	<b>91.5 M4</b>	<b>83.5 M4</b>



**P13 E\_Field GSM850\_Ch189**

**DUT: 120713C03**

Communication System: GSM850; Frequency: 836.4 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch189/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 112.5 V/m

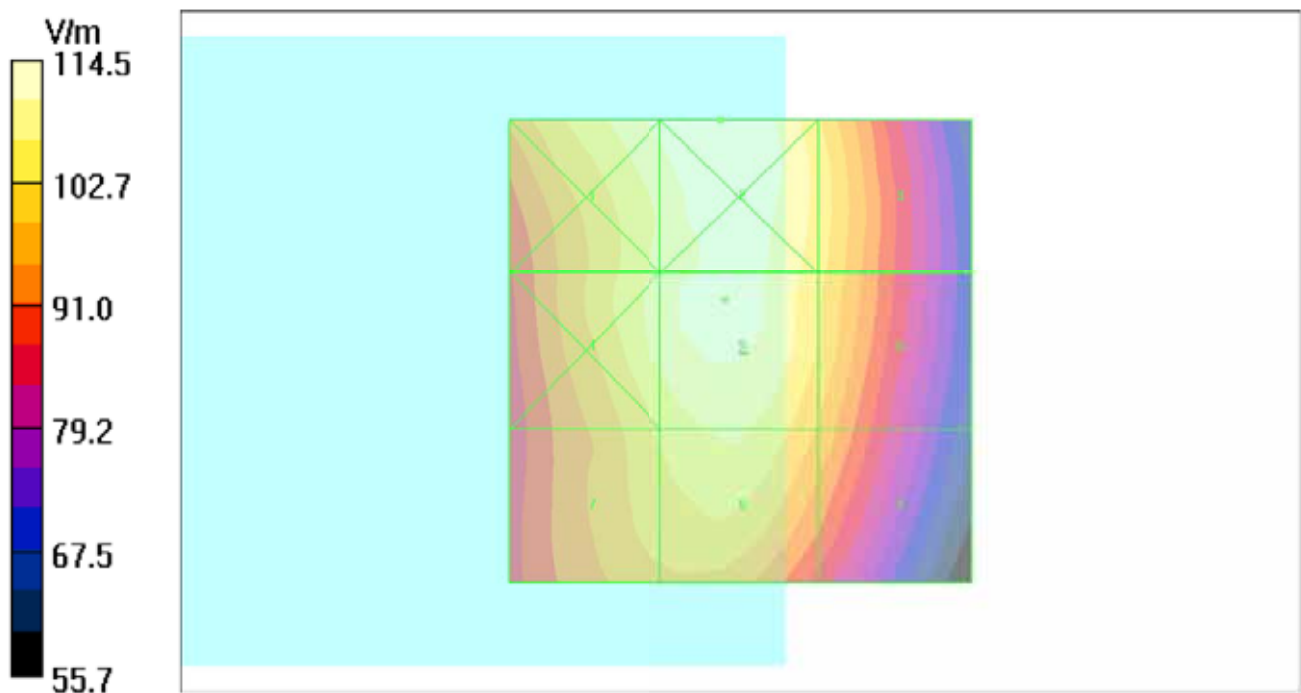
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 49.8 V/m; Power Drift = -0.008 dB

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Grid 1 <b>111.8 M4</b>	Grid 2 <b>114.5 M4</b>	Grid 3 <b>105.5 M4</b>
Grid 4 <b>108.8 M4</b>	Grid 5 <b>112.5 M4</b>	Grid 6 <b>104.2 M4</b>
Grid 7 <b>103.5 M4</b>	Grid 8 <b>107.4 M4</b>	Grid 9 <b>98.5 M4</b>





**P14 E\_Field GSM850\_Ch251**

**DUT: 120713C03**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch251/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 96.0 V/m

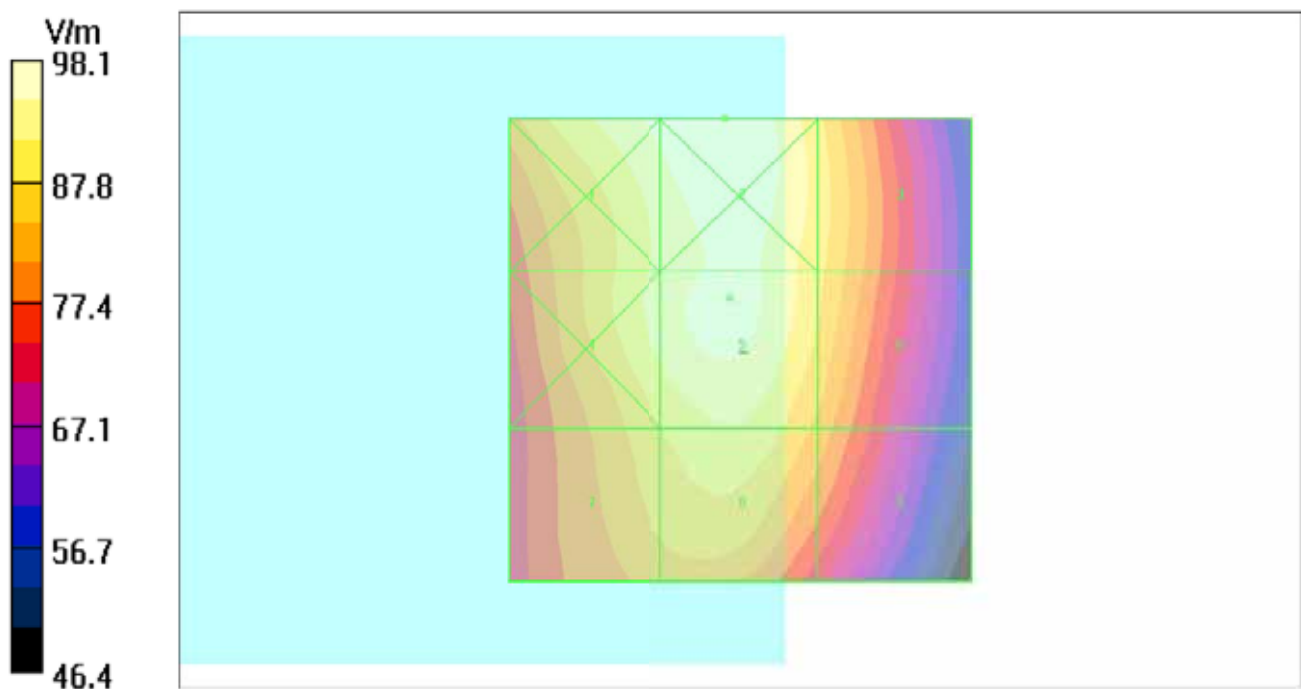
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 42.4 V/m; Power Drift = -0.016 dB

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Grid 1	Grid 2	Grid 3
<b>95.8 M4</b>	<b>98.1 M4</b>	<b>89.9 M4</b>
Grid 4	Grid 5	Grid 6
<b>93.0 M4</b>	<b>96.0 M4</b>	<b>88.8 M4</b>
Grid 7	Grid 8	Grid 9
<b>87.6 M4</b>	<b>91.1 M4</b>	<b>83.2 M4</b>



### P15 E\_Field GSM1900\_Ch512

**DUT: 120713C03**

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch512/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 76.4 V/m

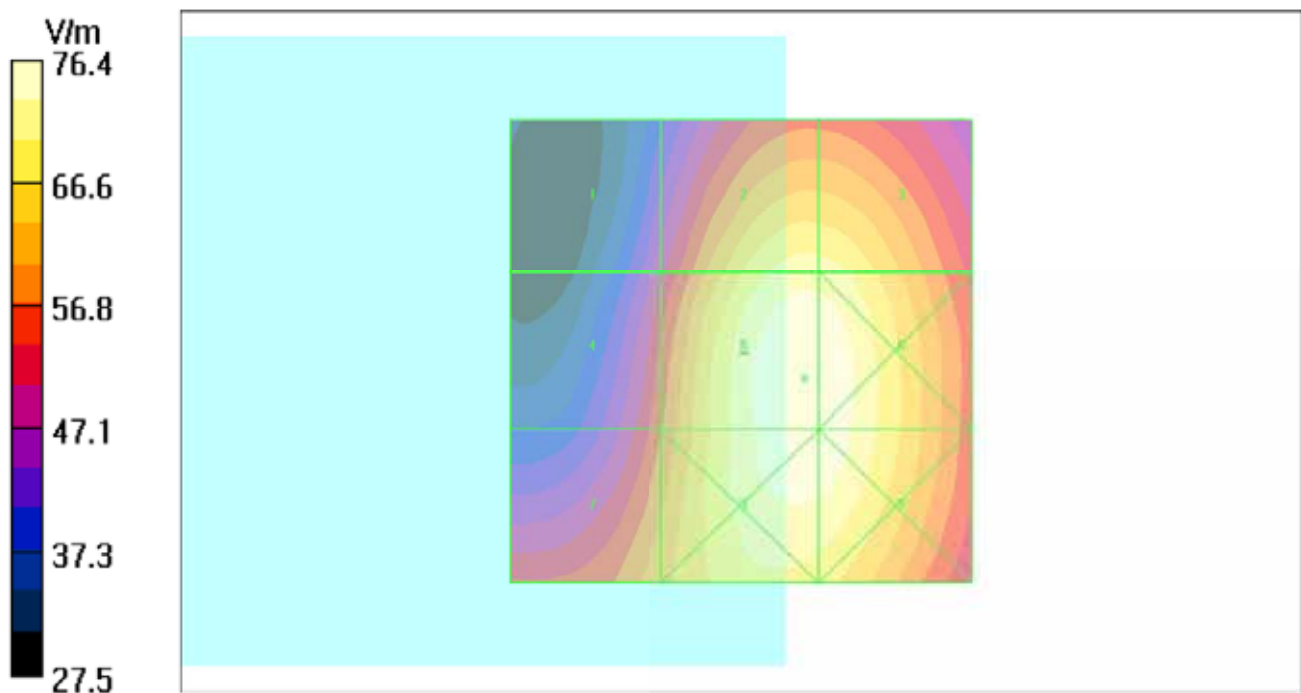
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 31.6 V/m; Power Drift = -0.068 dB

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Grid 1	Grid 2	Grid 3
<b>49.6 M3</b>	<b>71.8 M3</b>	<b>71.5 M3</b>
Grid 4	Grid 5	Grid 6
<b>56.7 M3</b>	<b>76.4 M3</b>	<b>76.1 M3</b>
Grid 7	Grid 8	Grid 9
<b>62.5 M3</b>	<b>76.0 M3</b>	<b>75.7 M3</b>





**P16 E\_Field GSM1900\_Ch661**

**DUT: 120713C03**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch661/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 75.8 V/m

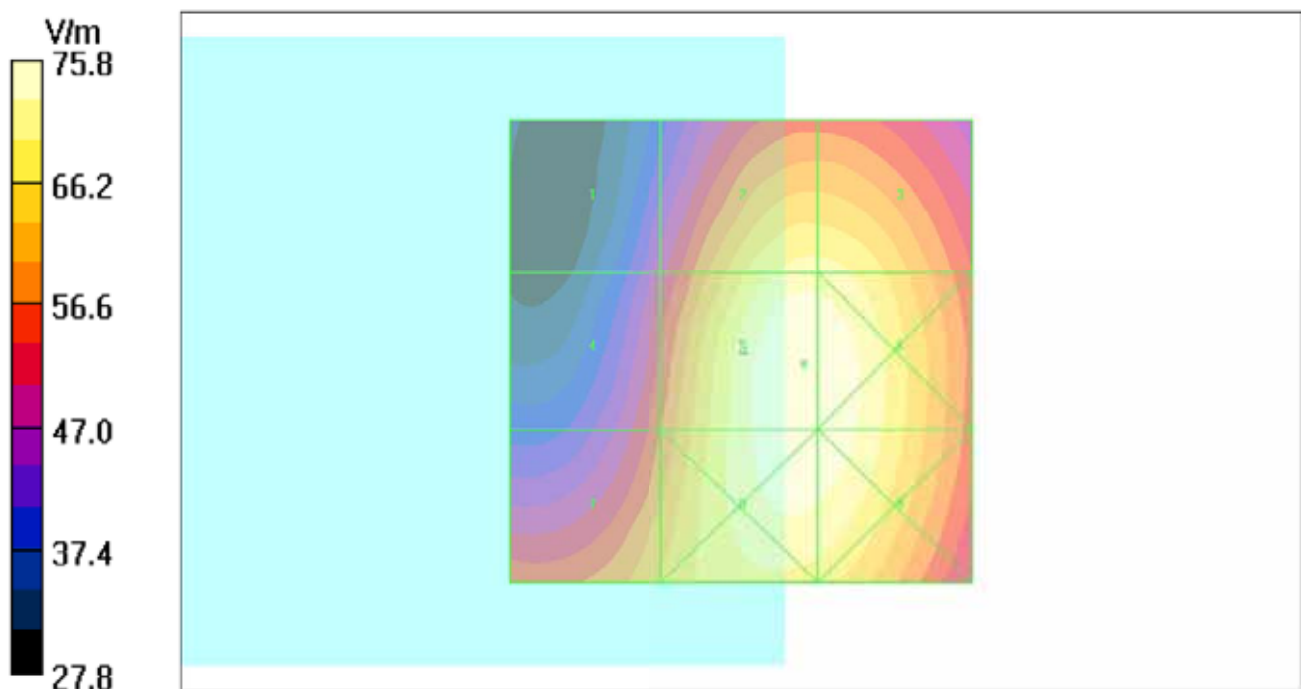
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 31.1 V/m; Power Drift = -0.030 dB

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Grid 1 <b>49.1 M3</b>	Grid 2 <b>71.0 M3</b>	Grid 3 <b>70.9 M3</b>
Grid 4 <b>56.4 M3</b>	Grid 5 <b>75.8 M3</b>	Grid 6 <b>75.6 M3</b>
Grid 7 <b>63.0 M3</b>	Grid 8 <b>75.4 M3</b>	Grid 9 <b>75.2 M3</b>



**P17 E\_Field GSM1900\_Ch810**

**DUT: 120713C03**

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch810/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 70.7 V/m

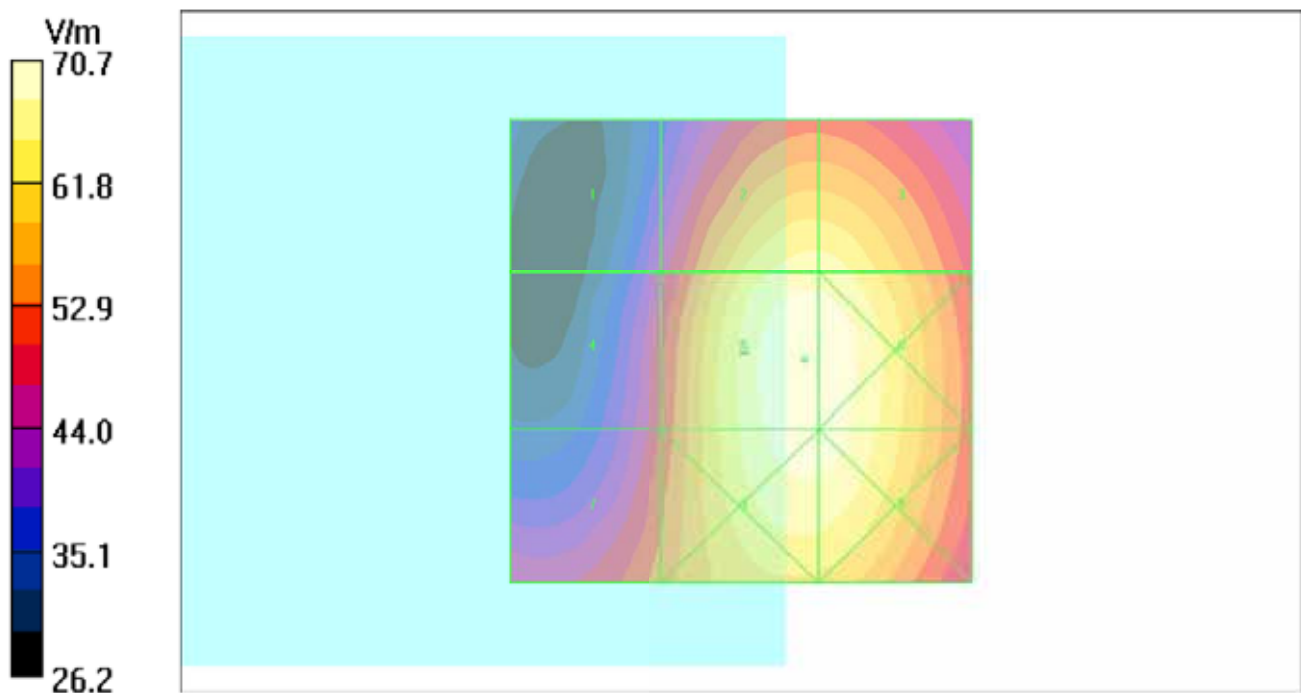
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 29.1 V/m; Power Drift = -0.070 dB

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Grid 1 <b>45.6 M4</b>	Grid 2 <b>66.7 M3</b>	Grid 3 <b>66.6 M3</b>
Grid 4 <b>50.3 M3</b>	Grid 5 <b>70.7 M3</b>	Grid 6 <b>70.5 M3</b>
Grid 7 <b>54.2 M3</b>	Grid 8 <b>69.5 M3</b>	Grid 9 <b>69.3 M3</b>



**P18 E\_Field WCDMA V\_RMC12.2K\_Ch4132**

**DUT: 120713C03**

Communication System: WCDMA V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch4132/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 36.5 V/m

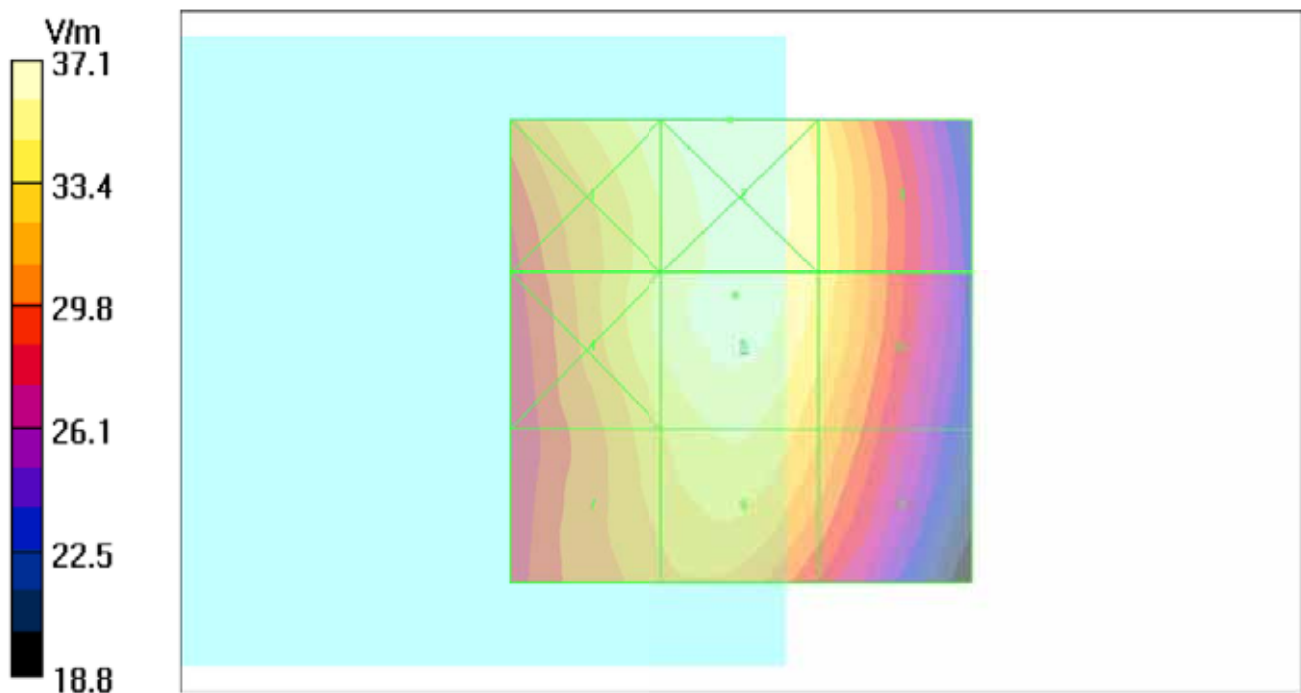
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 46.6 V/m; Power Drift = 0.000 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1	Grid 2	Grid 3
<b>35.7 M4</b>	<b>37.1 M4</b>	<b>34.7 M4</b>
Grid 4	Grid 5	Grid 6
<b>35.0 M4</b>	<b>36.5 M4</b>	<b>34.6 M4</b>
Grid 7	Grid 8	Grid 9
<b>33.4 M4</b>	<b>34.9 M4</b>	<b>32.4 M4</b>



**P19 E\_Field WCDMA V\_RMC12.2K\_Ch4182**

**DUT: 120713C03**

Communication System: WCDMA V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch4182/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 37.3 V/m

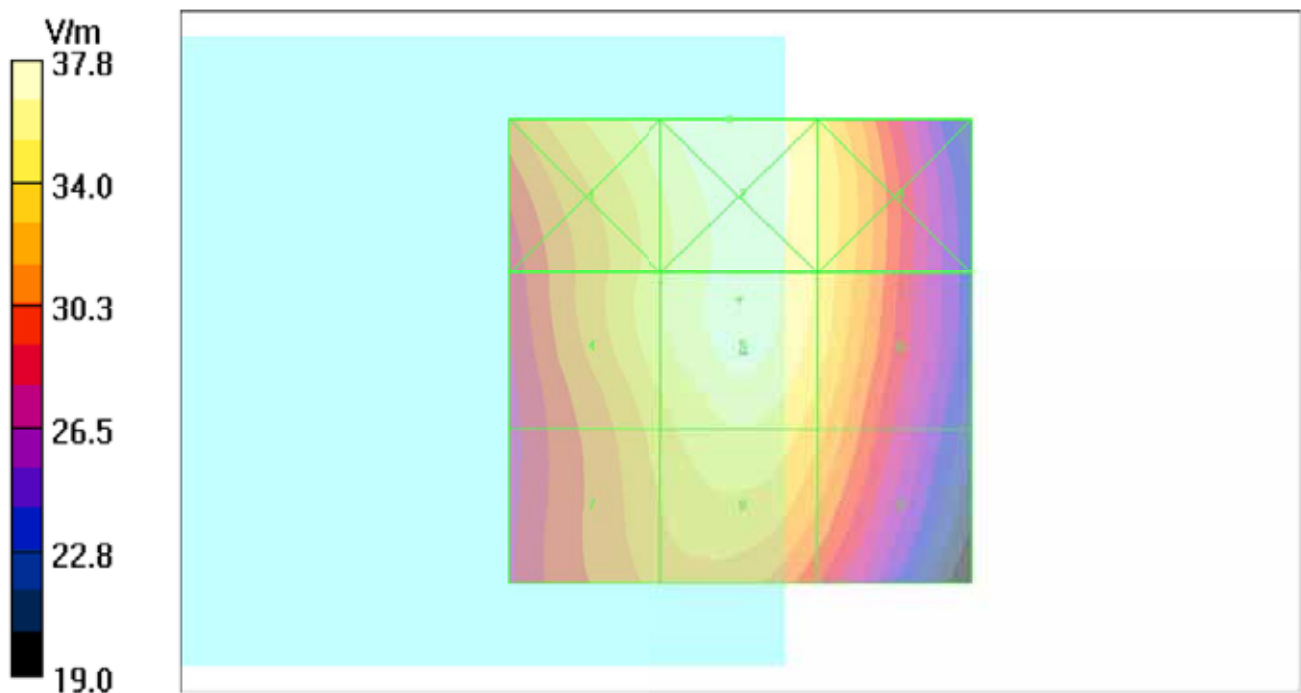
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 47.2 V/m; Power Drift = 0.017 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1	Grid 2	Grid 3
<b>36.3 M4</b>	<b>37.8 M4</b>	<b>35.4 M4</b>
Grid 4	Grid 5	Grid 6
<b>35.2 M4</b>	<b>37.3 M4</b>	<b>35.1 M4</b>
Grid 7	Grid 8	Grid 9
<b>33.5 M4</b>	<b>35.2 M4</b>	<b>33.2 M4</b>



**P20 E\_Field WCDMA V\_RMC12.2K\_Ch4233**

**DUT: 120713C03**

Communication System: WCDMA V; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch4233/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 30.5 V/m

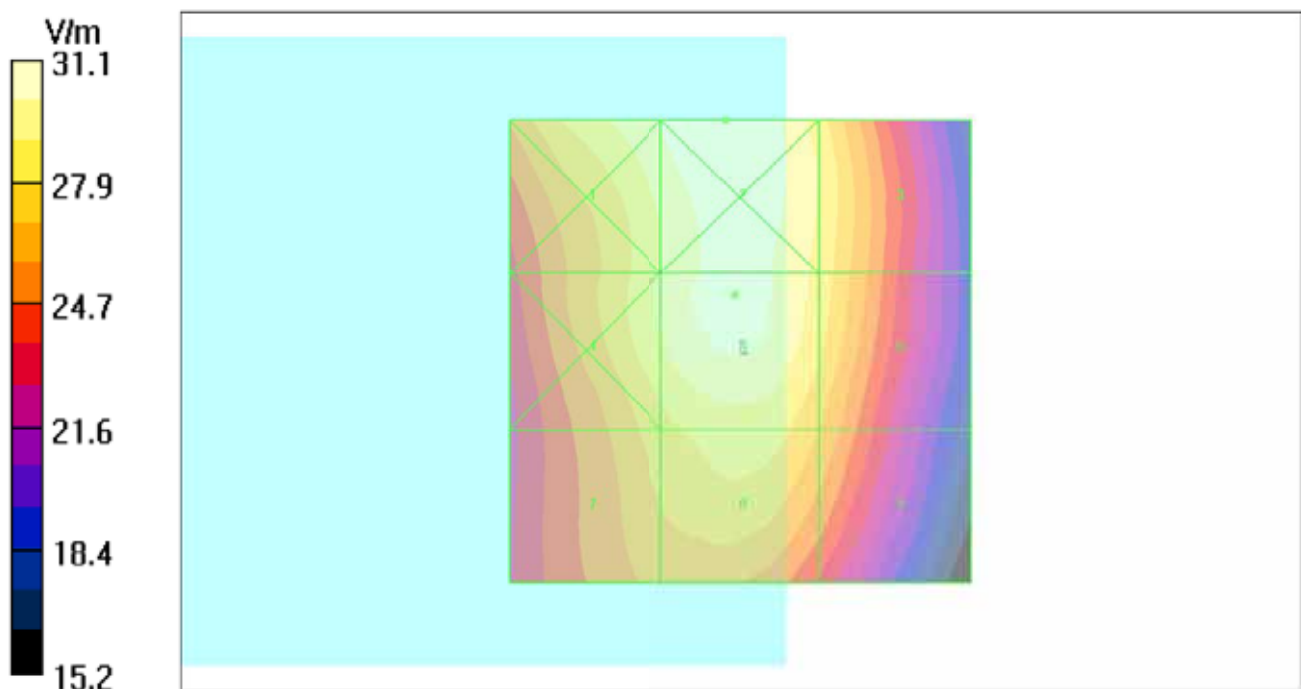
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 38.7 V/m; Power Drift = 0.053 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>30.2 M4</b>	Grid 2 <b>31.1 M4</b>	Grid 3 <b>28.9 M4</b>
Grid 4 <b>29.2 M4</b>	Grid 5 <b>30.5 M4</b>	Grid 6 <b>28.6 M4</b>
Grid 7 <b>27.5 M4</b>	Grid 8 <b>28.6 M4</b>	Grid 9 <b>26.9 M4</b>





**P21 E\_Field WCDMA II\_RMC12.2K\_Ch9262**

**DUT: 120713C03**

Communication System: WCDMA II; Frequency: 1852.4 MHz;Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch9262/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 34.4 V/m

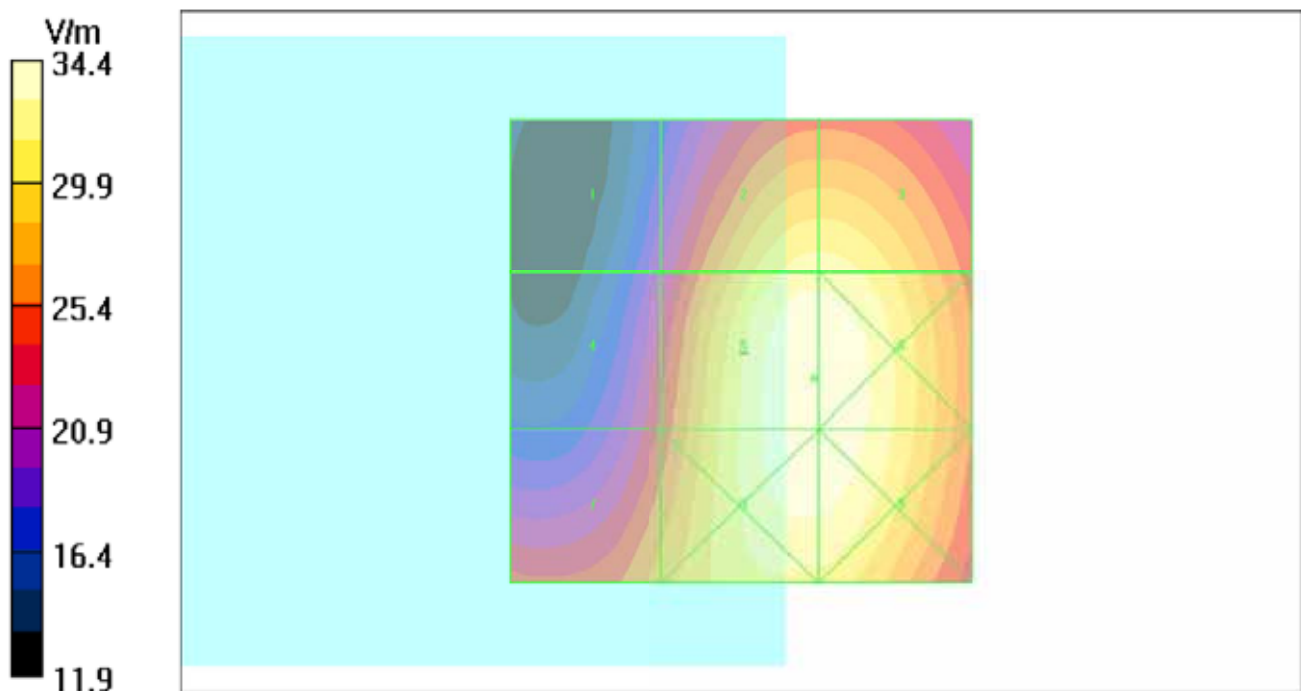
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 39.6 V/m; Power Drift = 0.104 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1	Grid 2	Grid 3
<b>21.1 M4</b>	<b>32.3 M4</b>	<b>32.3 M4</b>
Grid 4	Grid 5	Grid 6
<b>24.4 M4</b>	<b>34.4 M4</b>	<b>34.4 M4</b>
Grid 7	Grid 8	Grid 9
<b>27.5 M4</b>	<b>34.3 M4</b>	<b>34.2 M4</b>





**P22 E\_Field WCDMA II\_RMC12.2K\_Ch9400**

**DUT: 120713C03**

Communication System: WCDMA II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch9400/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 35.0 V/m

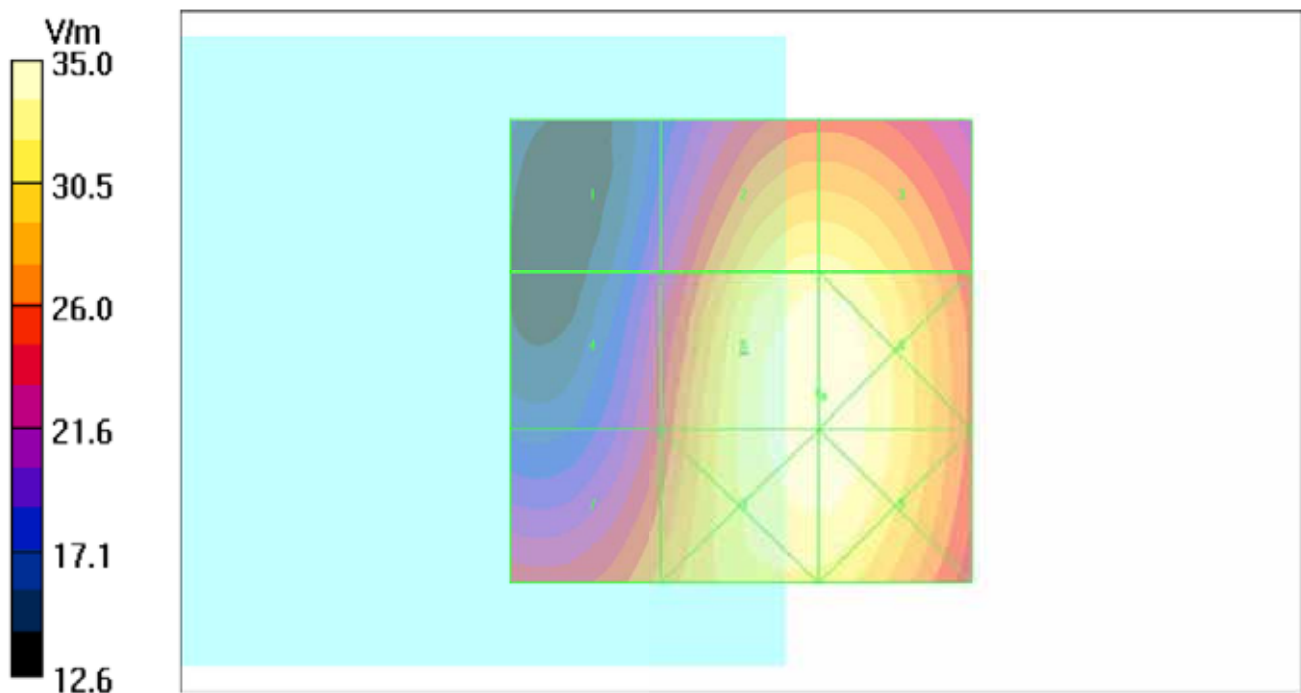
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 40.7 V/m; Power Drift = 0.019 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1	Grid 2	Grid 3
<b>21.4 M4</b>	<b>32.8 M4</b>	<b>32.8 M4</b>
Grid 4	Grid 5	Grid 6
<b>24.7 M4</b>	<b>35.0 M4</b>	<b>35.0 M4</b>
Grid 7	Grid 8	Grid 9
<b>28.0 M4</b>	<b>34.9 M4</b>	<b>34.9 M4</b>



**P23 E\_Field WCDMA II\_RMC12.2K\_Ch9538**

**DUT: 120713C03**

Communication System: WCDMA II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: ER3DV6 - SN2445; ConvF(1, 1, 1); Calibrated: 2012/06/22
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch9538/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 34.8 V/m

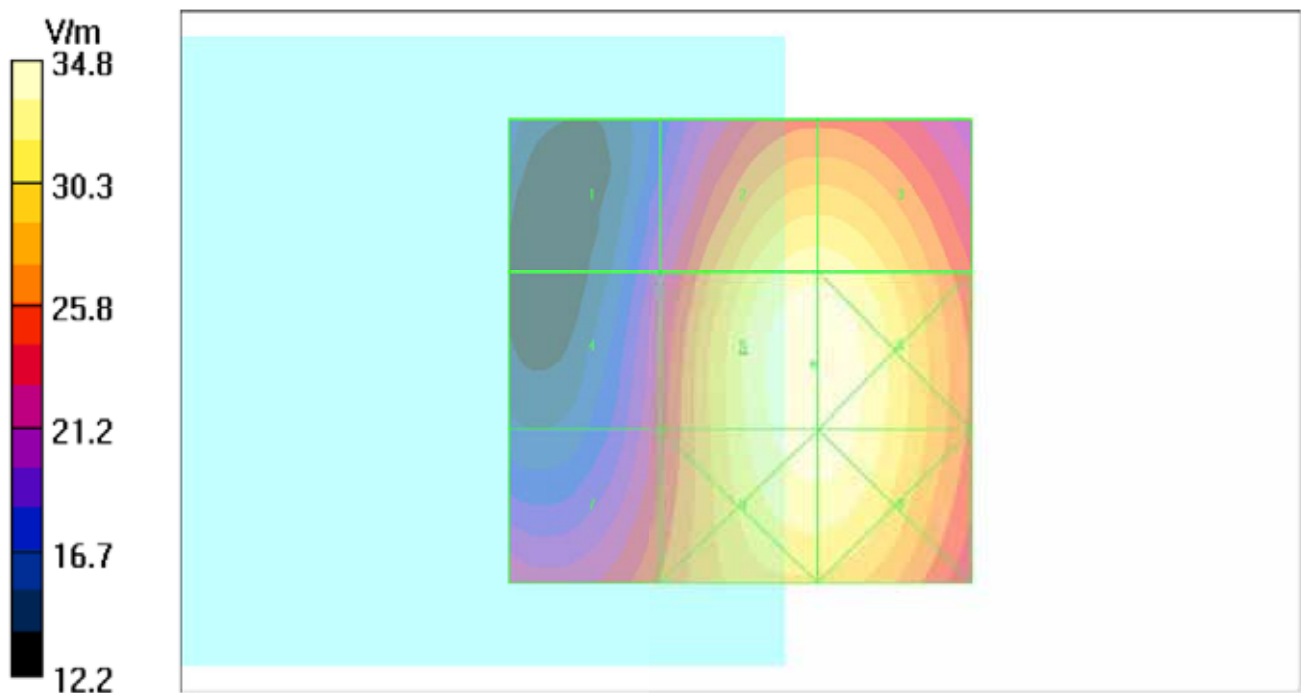
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 40.2 V/m; Power Drift = 0.015 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1	Grid 2	Grid 3
<b>21.5 M4</b>	<b>32.9 M4</b>	<b>32.9 M4</b>
Grid 4	Grid 5	Grid 6
<b>23.6 M4</b>	<b>34.8 M4</b>	<b>34.8 M4</b>
Grid 7	Grid 8	Grid 9
<b>25.8 M4</b>	<b>34.3 M4</b>	<b>34.3 M4</b>



## P24 H\_Field GSM850\_Ch128

**DUT: 120713C03**

Communication System: GSM850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch128/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.185 A/m

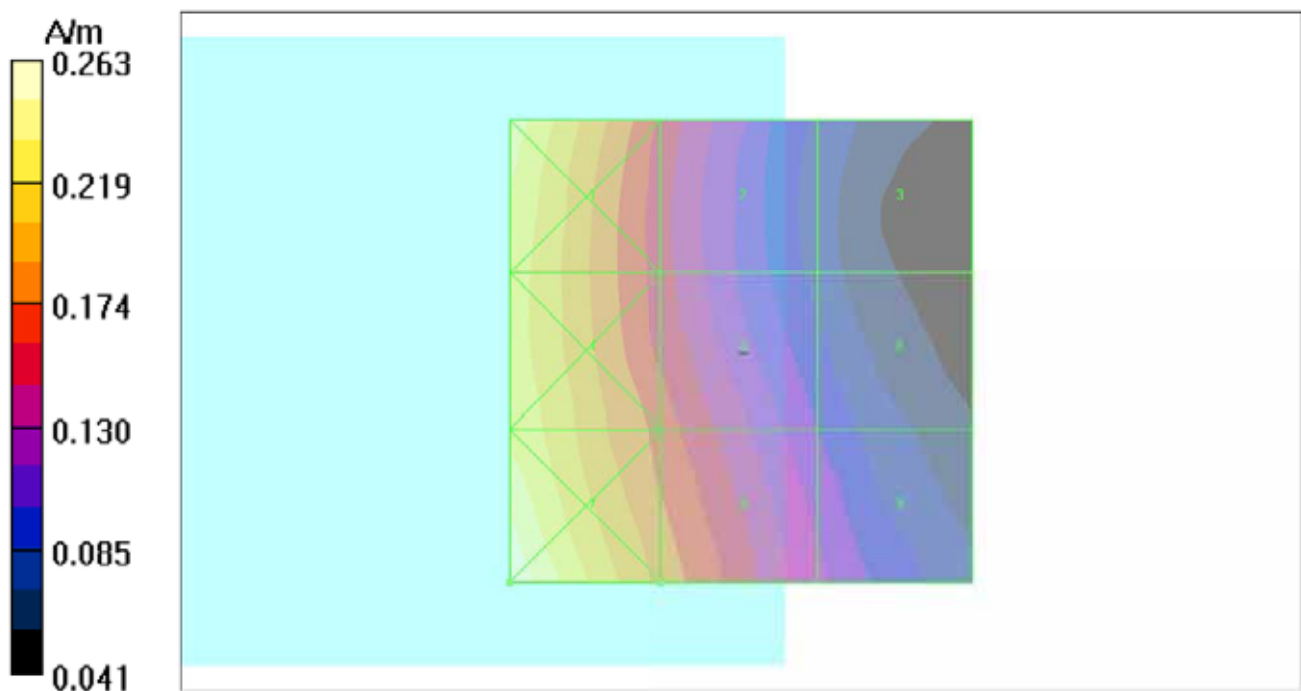
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.045 A/m; Power Drift = -0.073 dB

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Grid 1 <b>0.244 M4</b>	Grid 2 <b>0.158 M4</b>	Grid 3 <b>0.084 M4</b>
Grid 4 <b>0.231 M4</b>	Grid 5 <b>0.168 M4</b>	Grid 6 <b>0.101 M4</b>
Grid 7 <b>0.263 M4</b>	Grid 8 <b>0.185 M4</b>	Grid 9 <b>0.120 M4</b>



**P25 H\_Field GSM850\_Ch189**

**DUT: 120713C03**

Communication System: GSM850; Frequency: 836.4 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch189/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.139 A/m

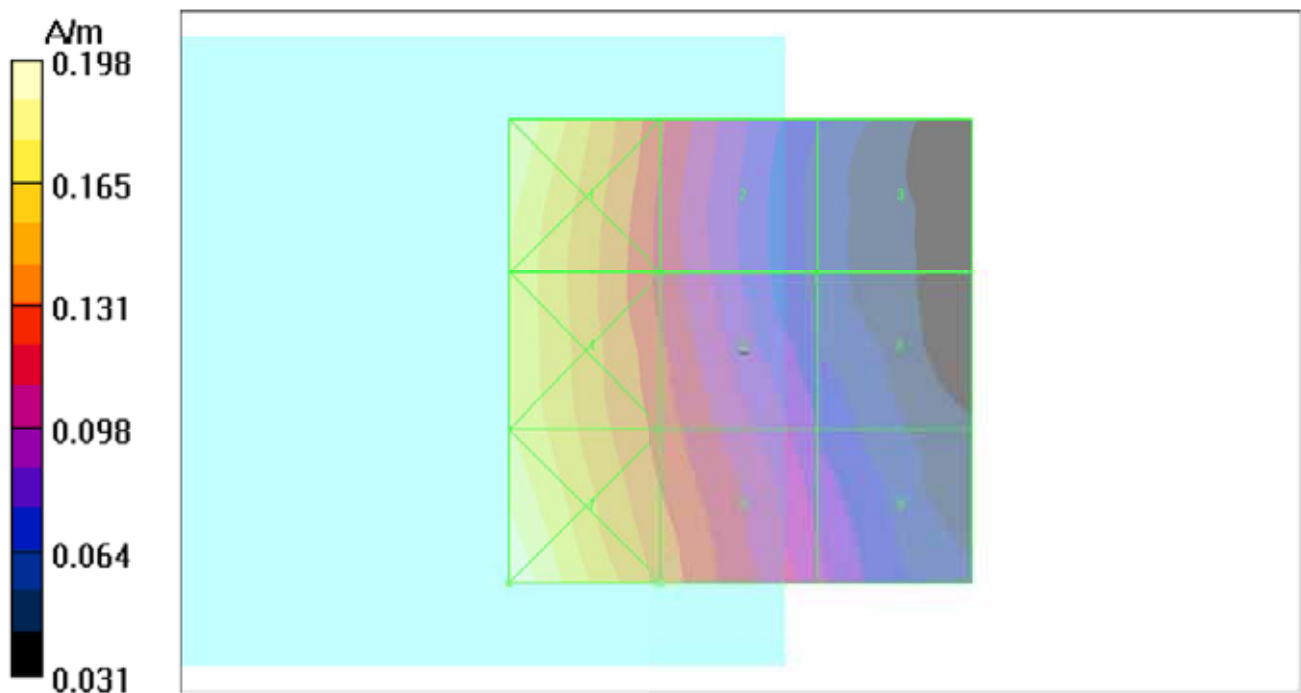
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.034 A/m; Power Drift = 0.035 dB

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Grid 1 <b>0.189 M4</b>	Grid 2 <b>0.123 M4</b>	Grid 3 <b>0.067 M4</b>
Grid 4 <b>0.178 M4</b>	Grid 5 <b>0.127 M4</b>	Grid 6 <b>0.076 M4</b>
Grid 7 <b>0.198 M4</b>	Grid 8 <b>0.139 M4</b>	Grid 9 <b>0.091 M4</b>



**P26 H\_Field GSM850\_Ch251**

**DUT: 120713C03**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch251/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.117 A/m

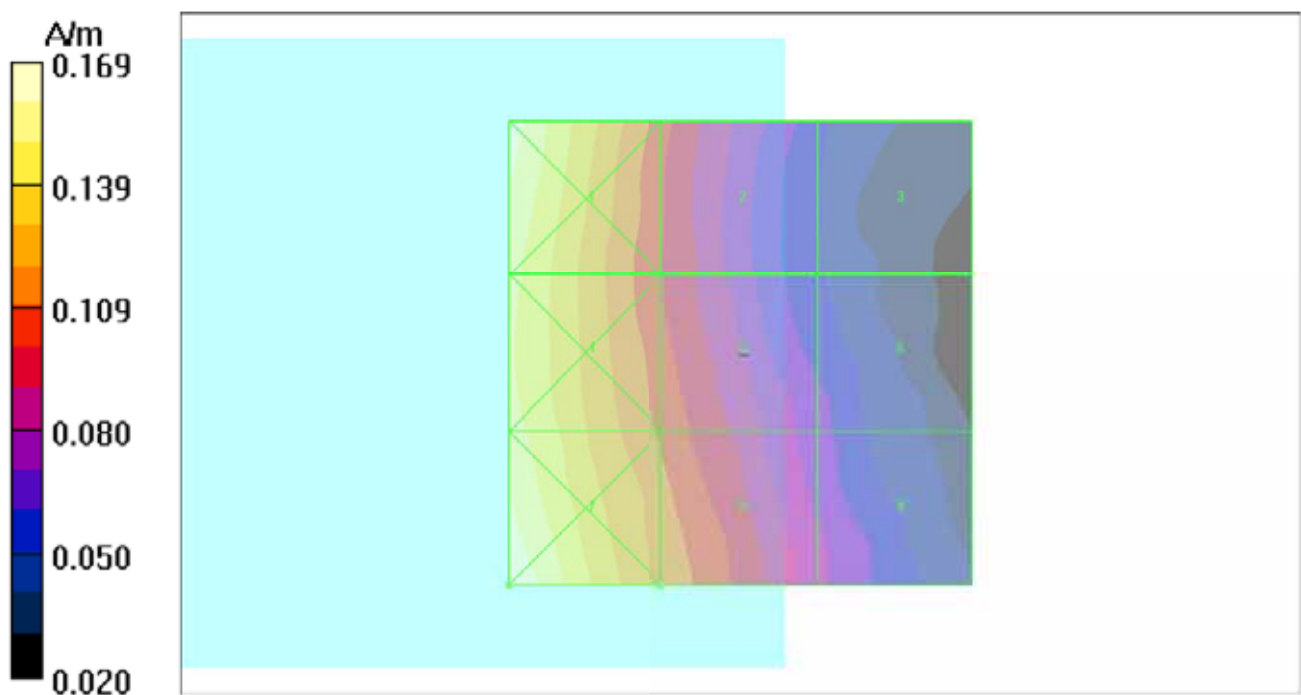
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.030 A/m; Power Drift = 0.056 dB

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Grid 1 <b>0.166 M4</b>	Grid 2 <b>0.105 M4</b>	Grid 3 <b>0.053 M4</b>
Grid 4 <b>0.154 M4</b>	Grid 5 <b>0.108 M4</b>	Grid 6 <b>0.064 M4</b>
Grid 7 <b>0.169 M4</b>	Grid 8 <b>0.117 M4</b>	Grid 9 <b>0.073 M4</b>





**P27 H\_Field GSM1900\_Ch512**

**DUT: 120713C03**

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch512/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.210 A/m

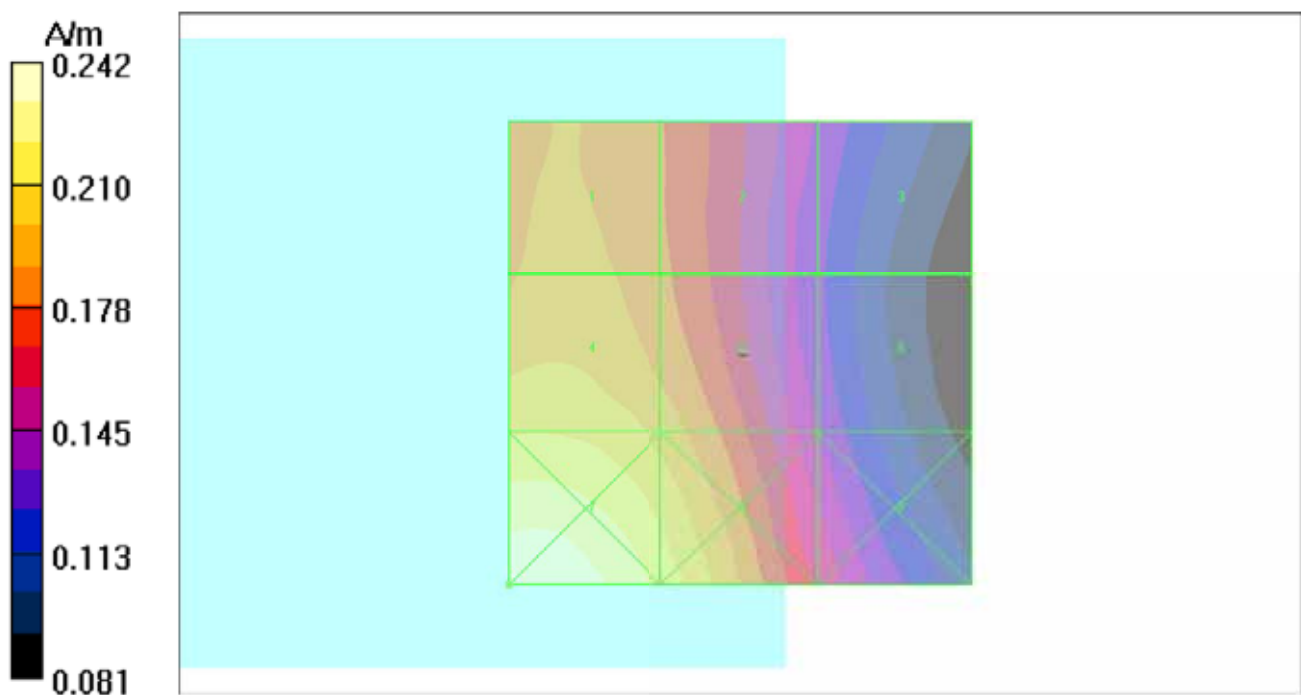
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.058 A/m; Power Drift = -0.013 dB

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Grid 1 <b>0.192 M3</b>	Grid 2 <b>0.181 M3</b>	Grid 3 <b>0.134 M4</b>
Grid 4 <b>0.210 M3</b>	Grid 5 <b>0.196 M3</b>	Grid 6 <b>0.136 M4</b>
Grid 7 <b>0.242 M3</b>	Grid 8 <b>0.217 M3</b>	Grid 9 <b>0.155 M3</b>





**P28 H\_Field GSM1900\_Ch661**

**DUT: 120713C03**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch661/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.210 A/m

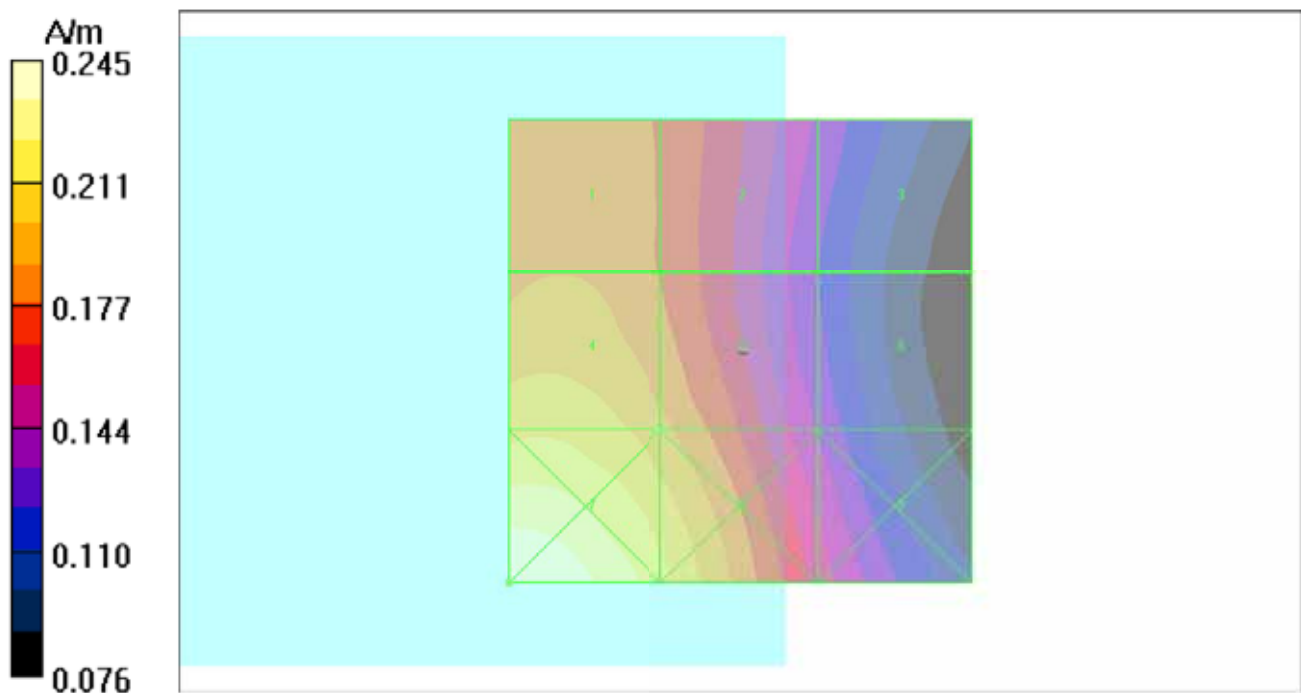
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.057 A/m; Power Drift = 0.029 dB

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Grid 1 <b>0.189 M3</b>	Grid 2 <b>0.177 M3</b>	Grid 3 <b>0.131 M4</b>
Grid 4 <b>0.210 M3</b>	Grid 5 <b>0.192 M3</b>	Grid 6 <b>0.132 M4</b>
Grid 7 <b>0.245 M3</b>	Grid 8 <b>0.215 M3</b>	Grid 9 <b>0.151 M3</b>



**P29 H\_Field GSM1900\_Ch810**

**DUT: 120713C03**

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch810/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.196 A/m

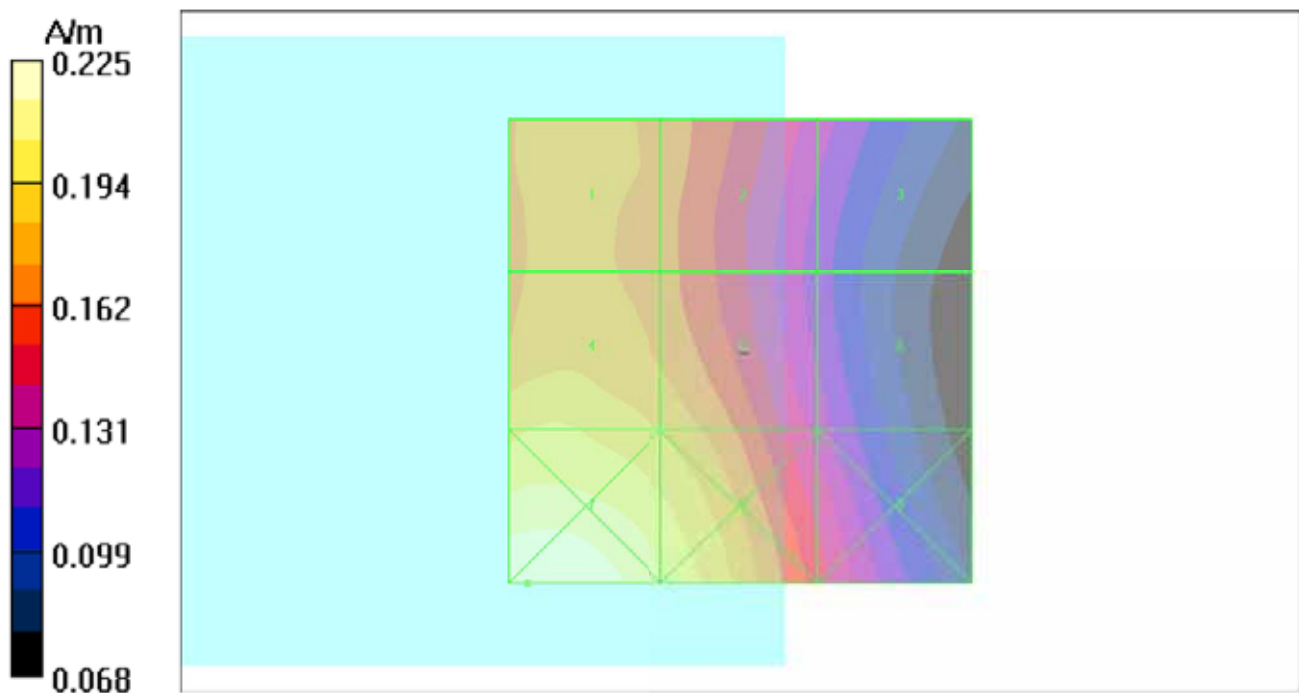
Probe Modulation Factor = 2.95

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.053 A/m; Power Drift = 0.047 dB

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Grid 1 <b>0.179 M3</b>	Grid 2 <b>0.169 M3</b>	Grid 3 <b>0.126 M4</b>
Grid 4 <b>0.196 M3</b>	Grid 5 <b>0.183 M3</b>	Grid 6 <b>0.127 M4</b>
Grid 7 <b>0.225 M3</b>	Grid 8 <b>0.206 M3</b>	Grid 9 <b>0.147 M3</b>



**P30 H\_Field WCDMA V\_RMC12.2K\_Ch4132**

**DUT: 120713C03**

Communication System: WCDMA V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch4132/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.047 A/m

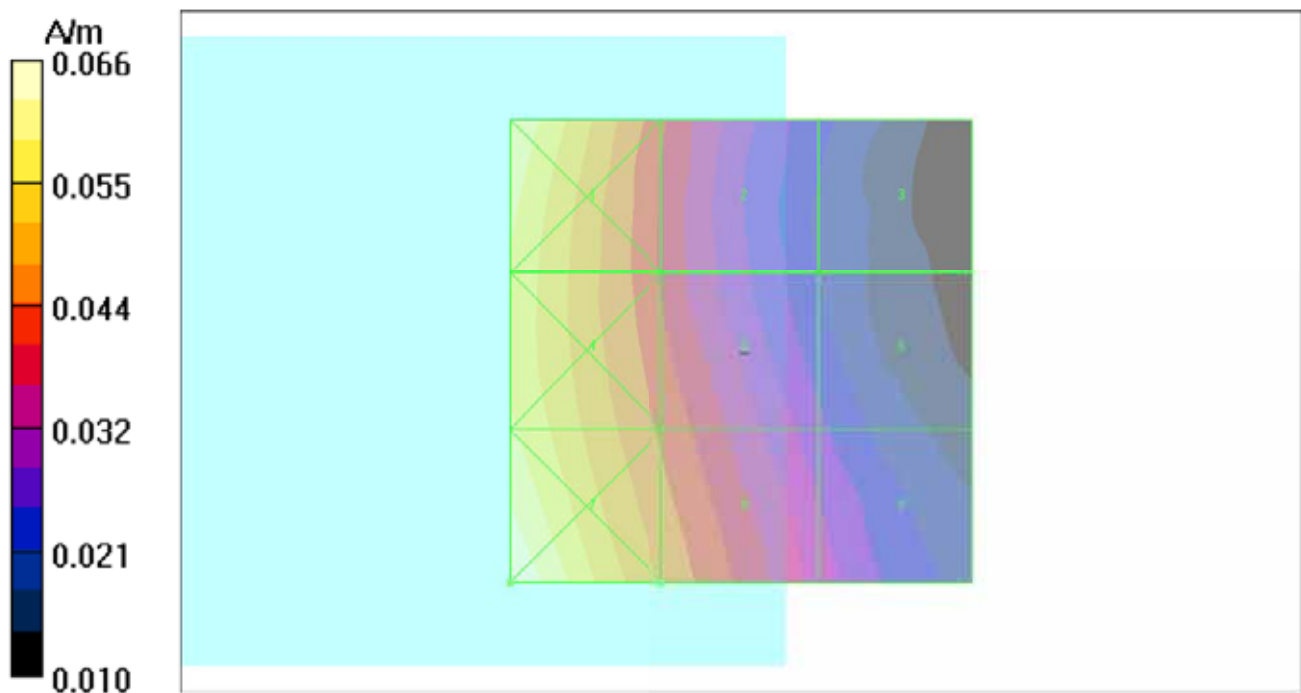
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.033 A/m; Power Drift = 0.147 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.063 M4</b>	Grid 2 <b>0.041 M4</b>	Grid 3 <b>0.023 M4</b>
Grid 4 <b>0.059 M4</b>	Grid 5 <b>0.043 M4</b>	Grid 6 <b>0.026 M4</b>
Grid 7 <b>0.066 M4</b>	Grid 8 <b>0.047 M4</b>	Grid 9 <b>0.031 M4</b>



**P31 H\_Field WCDMA V\_RMC12.2K\_Ch4182**

**DUT: 120713C03**

Communication System: WCDMA V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch4182/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.067 A/m

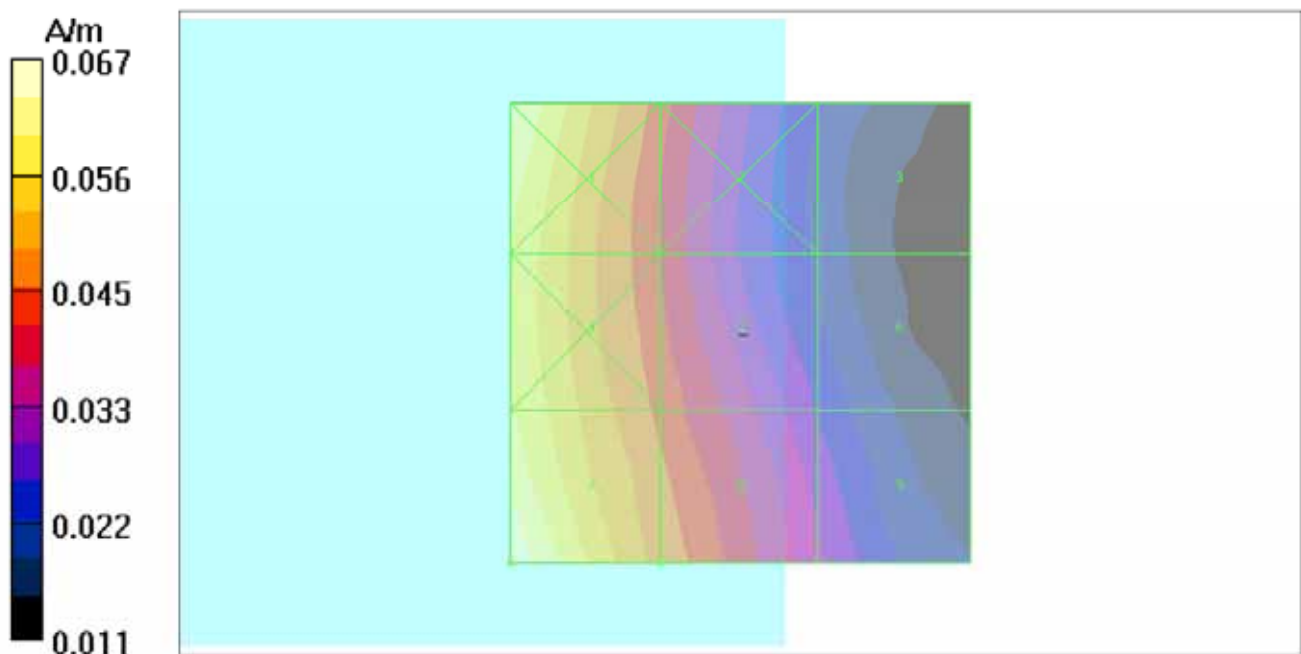
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.034 A/m; Power Drift = 0.006 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.064 M4</b>	Grid 2 <b>0.043 M4</b>	Grid 3 <b>0.023 M4</b>
Grid 4 <b>0.060 M4</b>	Grid 5 <b>0.044 M4</b>	Grid 6 <b>0.026 M4</b>
Grid 7 <b>0.067 M4</b>	Grid 8 <b>0.047 M4</b>	Grid 9 <b>0.031 M4</b>



**P32 H\_Field WCDMA V\_RMC12.2K\_Ch4233**

**DUT: 120713C03**

Communication System: WCDMA V; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch4233/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.039 A/m

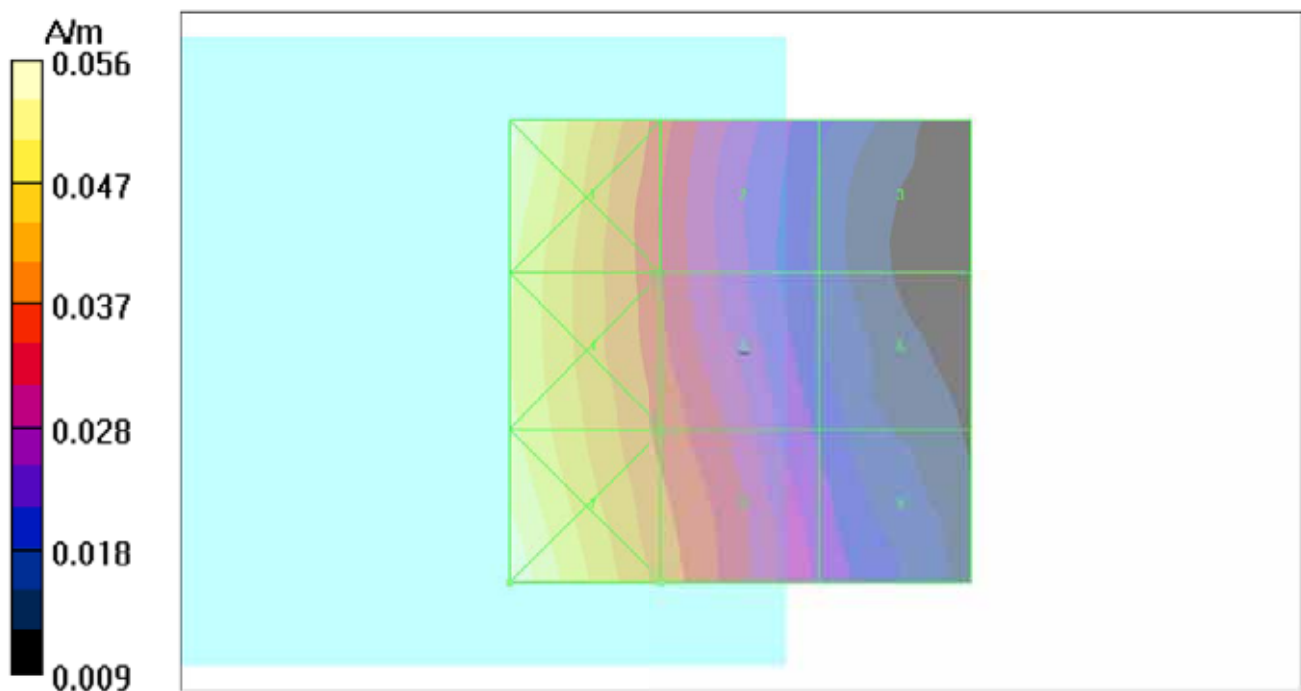
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.028 A/m; Power Drift = -0.051 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.055 M4</b>	Grid 2 <b>0.036 M4</b>	Grid 3 <b>0.020 M4</b>
Grid 4 <b>0.051 M4</b>	Grid 5 <b>0.036 M4</b>	Grid 6 <b>0.021 M4</b>
Grid 7 <b>0.056 M4</b>	Grid 8 <b>0.039 M4</b>	Grid 9 <b>0.024 M4</b>





**P33 H\_Field WCDMA II\_RMC12.2K\_Ch9262**

**DUT: 120713C03**

Communication System: WCDMA II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch9262/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.087 A/m

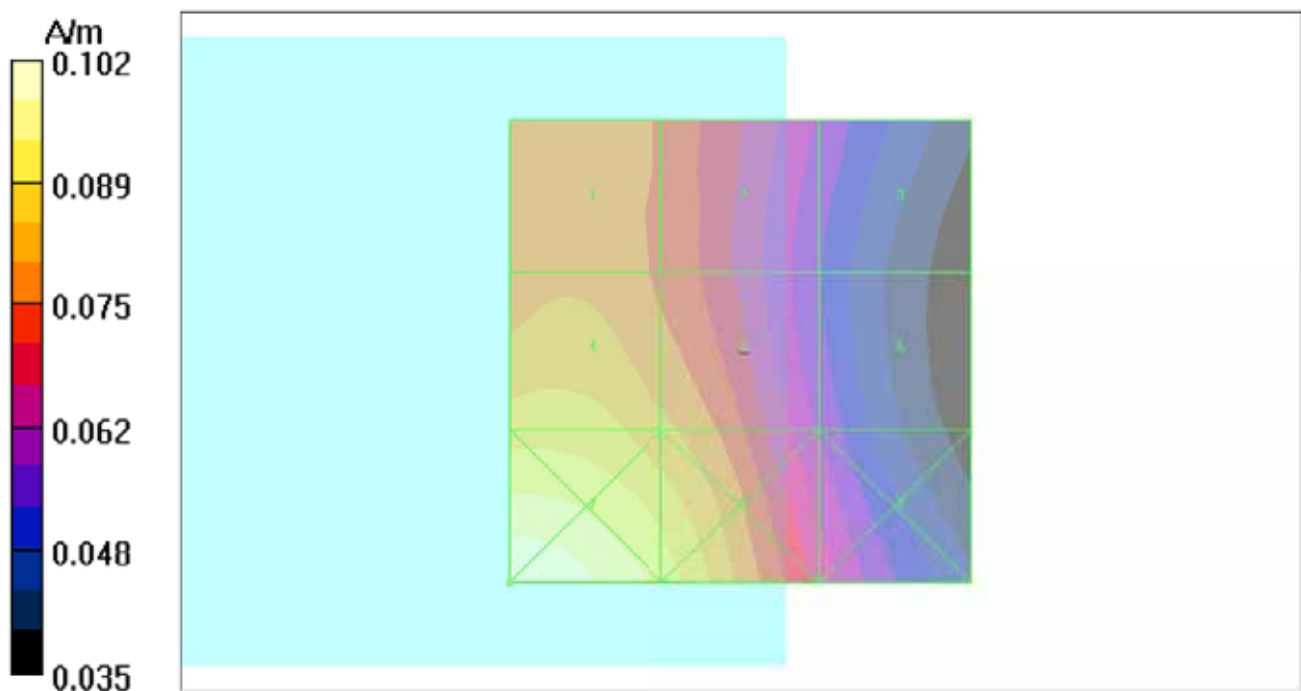
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.070 A/m; Power Drift = -0.022 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.079 M4</b>	Grid 2 <b>0.075 M4</b>	Grid 3 <b>0.057 M4</b>
Grid 4 <b>0.087 M4</b>	Grid 5 <b>0.081 M4</b>	Grid 6 <b>0.057 M4</b>
Grid 7 <b>0.102 M4</b>	Grid 8 <b>0.091 M4</b>	Grid 9 <b>0.065 M4</b>





**P34 H\_Field WCDMA II\_RMC12.2K\_Ch9400**

**DUT: 120713C03**

Communication System: WCDMA II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17

- Sensor-Surface: (Fix Surface)

- Electronics: DAE4 Sn910; Calibrated: 2011/12/07

- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch9400/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.095 A/m

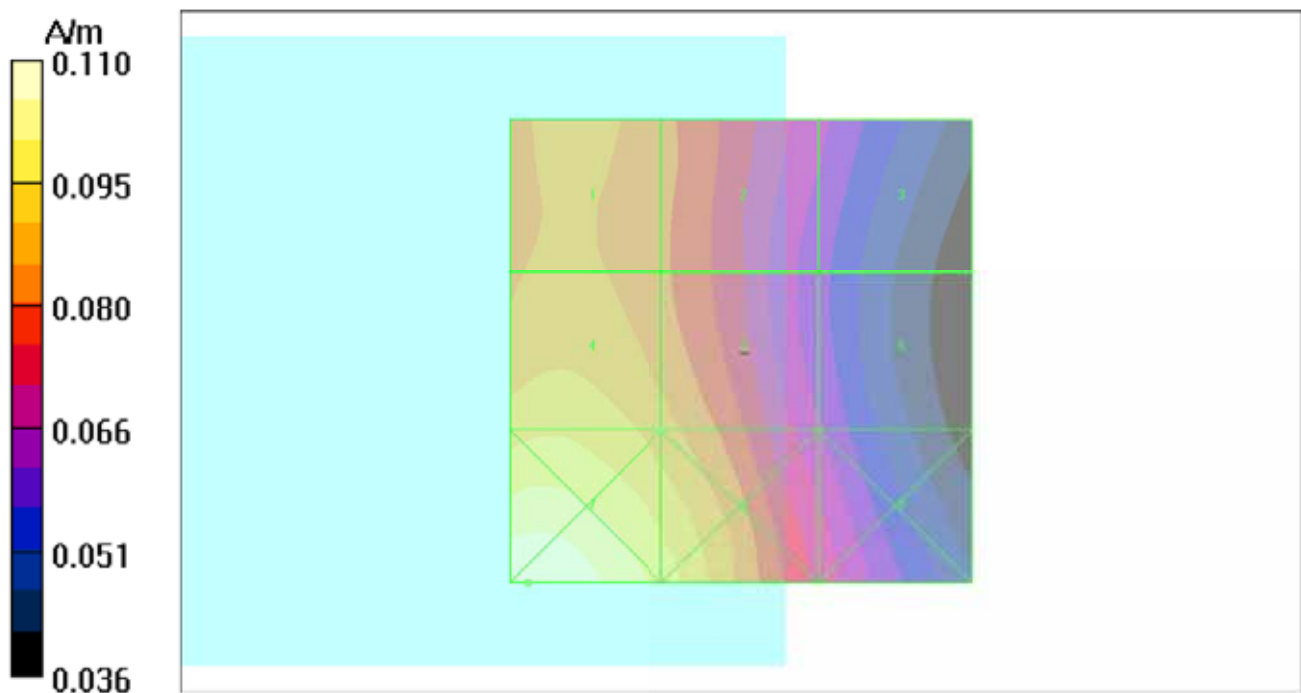
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.076 A/m; Power Drift = 0.026 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.086 M4</b>	Grid 2 <b>0.082 M4</b>	Grid 3 <b>0.062 M4</b>
Grid 4 <b>0.095 M4</b>	Grid 5 <b>0.088 M4</b>	Grid 6 <b>0.062 M4</b>
Grid 7 <b>0.110 M4</b>	Grid 8 <b>0.098 M4</b>	Grid 9 <b>0.069 M4</b>



**P35 H\_Field WCDMA II\_RMC12.2K\_Ch9538**

**DUT: 120713C03**

Communication System: WCDMA II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used:  $\sigma = 0$  mho/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature : 22.3 °C

DASY4 Configuration:

- Probe: H3DV6 - SN6274; ; Calibrated: 2012/02/17
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/07
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Ch9538/Hearing Aid Compatibility (101x101x1):** Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.093 A/m

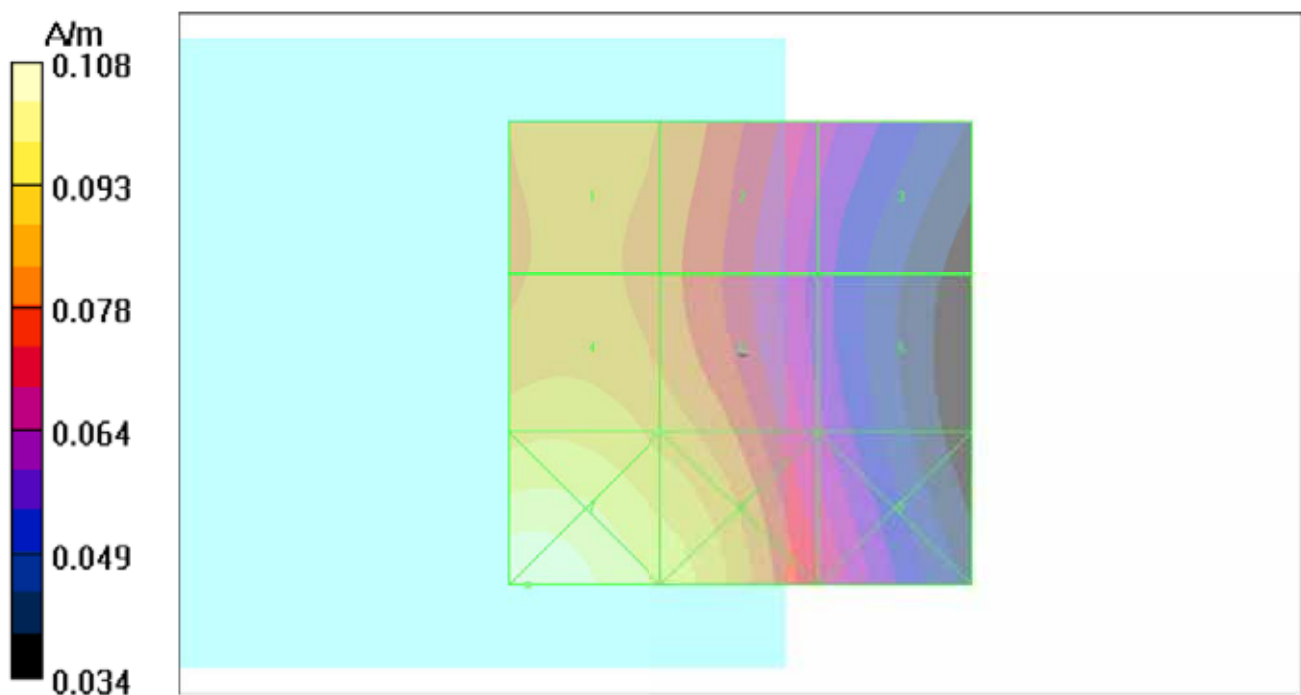
Probe Modulation Factor = 1.02

Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.076 A/m; Power Drift = -0.070 dB

**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Grid 1 <b>0.087 M4</b>	Grid 2 <b>0.083 M4</b>	Grid 3 <b>0.062 M4</b>
Grid 4 <b>0.093 M4</b>	Grid 5 <b>0.087 M4</b>	Grid 6 <b>0.061 M4</b>
Grid 7 <b>0.108 M4</b>	Grid 8 <b>0.097 M4</b>	Grid 9 <b>0.069 M4</b>





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 **B.V. ADT (Auden)**

Certificate No: **CD835V3-1041\_Mar12**

## CALIBRATION CERTIFICATE

Object **CD835V3 - SN: 1041**

Calibration procedure(s) **QA CAL-20.v6  
Calibration procedure for dipoles in air**

Calibration date: **March 19, 2012**

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
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 ( No. 217-01451)	Oct-12
Probe ER3DV6	SN: 2336	29-Dec-11 (No. ER3-2336_Dec11)	Dec-12
Probe H3DV6	SN: 6065	29-Dec-11 (No. H3-6065_Doc11)	Dec-12
DAE4	SN: 781	20-Apr-11 (No. DAE4-781_Apr11)	Apr-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-11)	In house check: Oct-12
Power sensor HP 8482H	SN: 3318A09450	09-Oct-09 (in house check Oct-11)	In house check: Oct-12
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-11)	In house check: Oct-12
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12
RF generator E4433B	MY 41000675	03-Nov-04 (in house check Oct-11)	In house check: Oct-13

Calibrated by: **Claudio Leubler**      Name: Claudio Leubler      Function: Laboratory Technician

Signature

Approved by: **Fin Bomholt**      Name: Fin Bomholt      Function: R&D Director

Issued: March 20, 2012

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



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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**

#### References

- [1] ANSI-C63.19-2007  
American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

#### Methods Applied and Interpretation of Parameters:

- **Coordinate System:** y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 10 mm above the top edge of the dipole arms.
- **Measurement Conditions:** Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- **Antenna Positioning:** The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections. It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- **Feed Point Impedance and Return Loss:** These parameters are measured using a HP 8753E Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminated by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- **E-field distribution:** E field is measured in the x-y-plane with an isotropic ER3D-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 10 mm (in z) above the top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, 10mm above the dipole surface.
- **H-field distribution:** H-field is measured with an isotropic H-field probe with 100mW forward power to the antenna feed point, in the x-y-plane. The scan area and sensor distance is equivalent to the E-field scan. The maximum of the field is available at the center (subgrid 5) above the feed point. The H-field value stated as calibration value represents the maximum of the interpolated H-field, 10mm above the dipole surface at the feed point.

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%.



## Measurement Conditions

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

DASY Version	DASY5	V52.8.0
Extrapolation	Advanced Extrapolation	
Phantom	HAC Test Arch	
Distance Dipole Top - Probe Center	10mm	
Scan resolution	dx, dy = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	
Input power drift	< 0.05 dB	

## Maximum Field values at 835 MHz

H-field 10 mm above dipole surface	condition	Interpolated maximum
Maximum measured	100 mW input power	0.455 A / m $\pm$ 8.2 % (k=2)

E-field 10 mm above dipole surface	condition	Interpolated maximum
Maximum measured above high end	100 mW input power	163.6 V / m
Maximum measured above low end	100 mW input power	159.3 V / m
Averaged maximum above arm	100 mW input power	161.5 V / m $\pm$ 12.8 % (k=2)

## Appendix

### Antenna Parameters

Frequency	Return Loss	Impedance
800 MHz	15.7 dB	42.5 $\Omega$ - 13.5 j $\Omega$
835 MHz	28.7 dB	48.0 $\Omega$ + 3.0 j $\Omega$
900 MHz	16.6 dB	57.5 $\Omega$ - 14.1 j $\Omega$
950 MHz	17.3 dB	45.3 $\Omega$ + 12.2 j $\Omega$
960 MHz	13.0 dB	56.0 $\Omega$ + 23.6 j $\Omega$

### 3.2 Antenna Design and Handling

The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.

The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.

Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

# Impedance Measurement Plot

