

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Dec.18, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(6.29, 6.29, 6.29); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 4183/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.241 mW/g

WCDMA 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

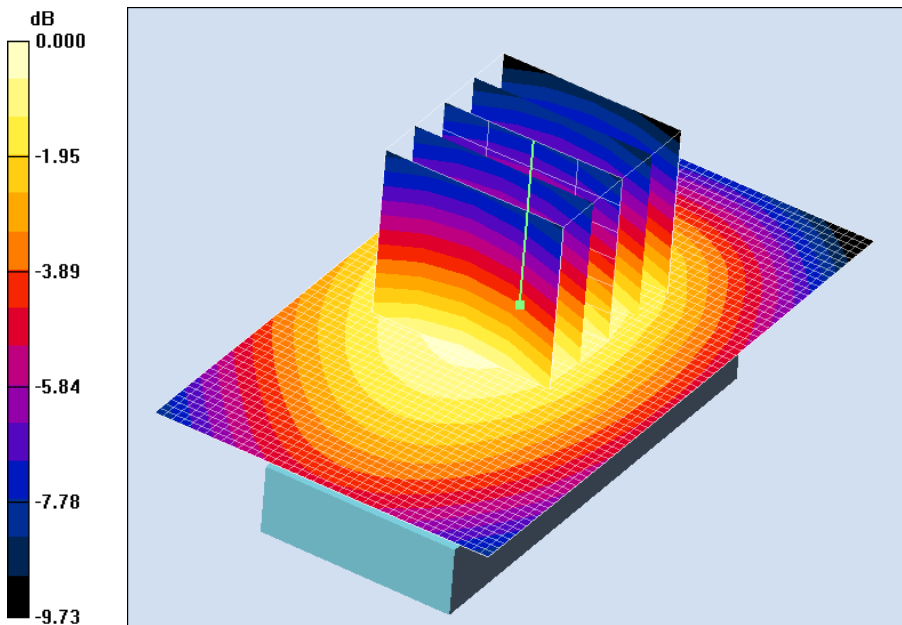
Reference Value = 14.0 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.298 W/kg

SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.163 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.242 mW/g



0 dB = 0.242mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 512/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.12 mW/g

GSM 1900 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

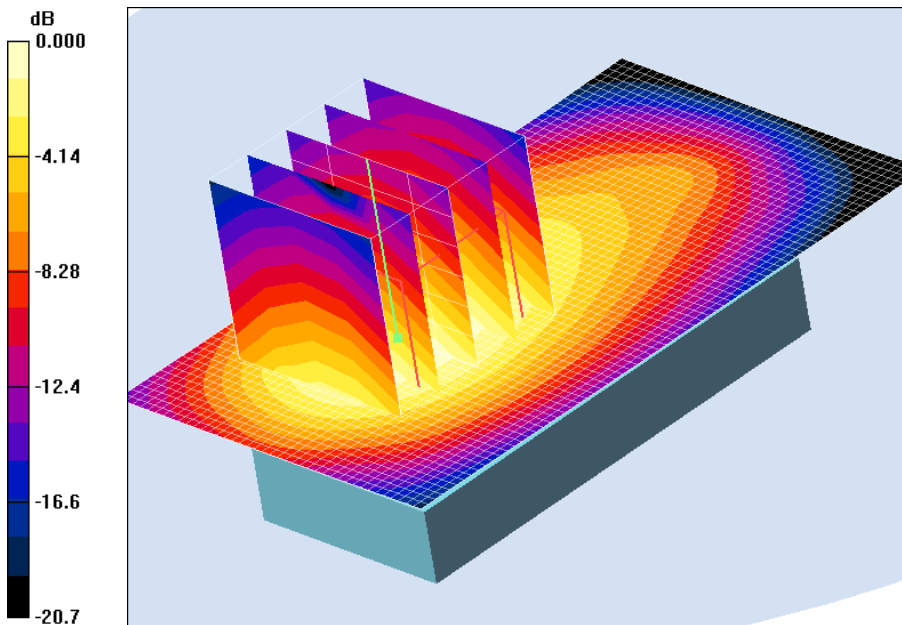
Reference Value = 16.1 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.584 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.07 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

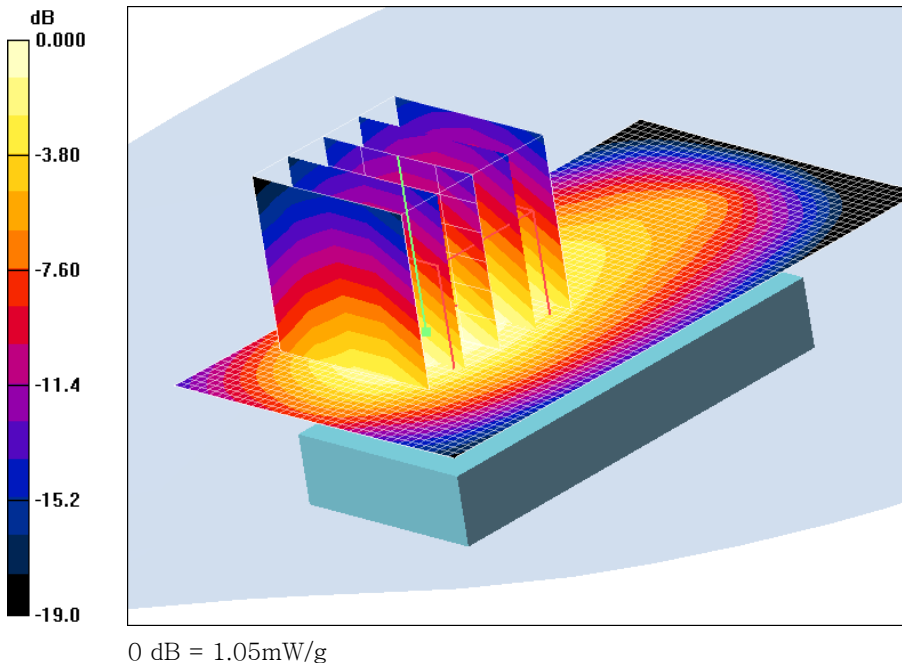
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 661/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

GSM 1900 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.9 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.987 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

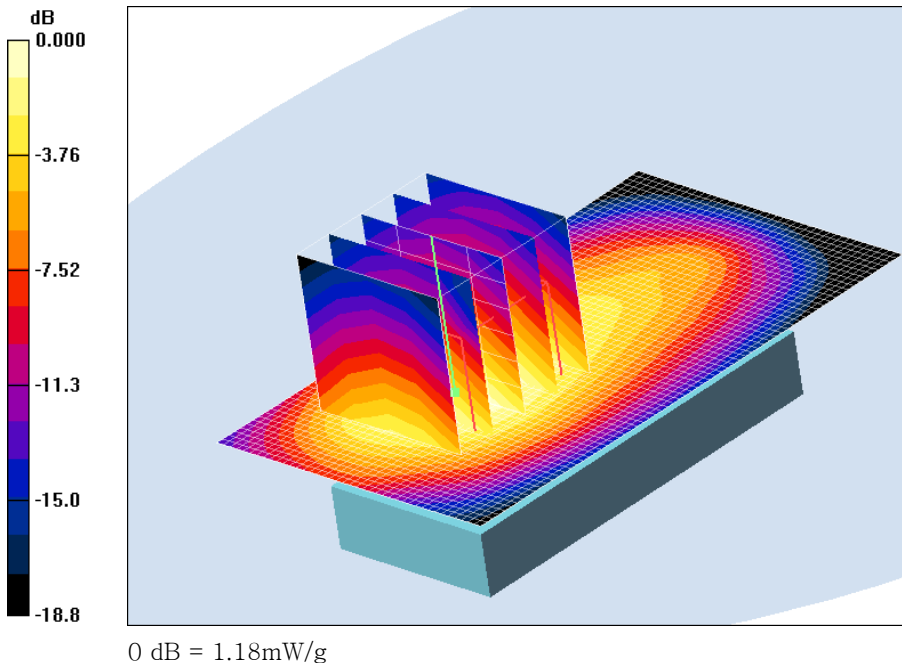
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.27 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.7 V/m; Power Drift = -0.204 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.636 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



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GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 512/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.23 mW/g

GSM 1900 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

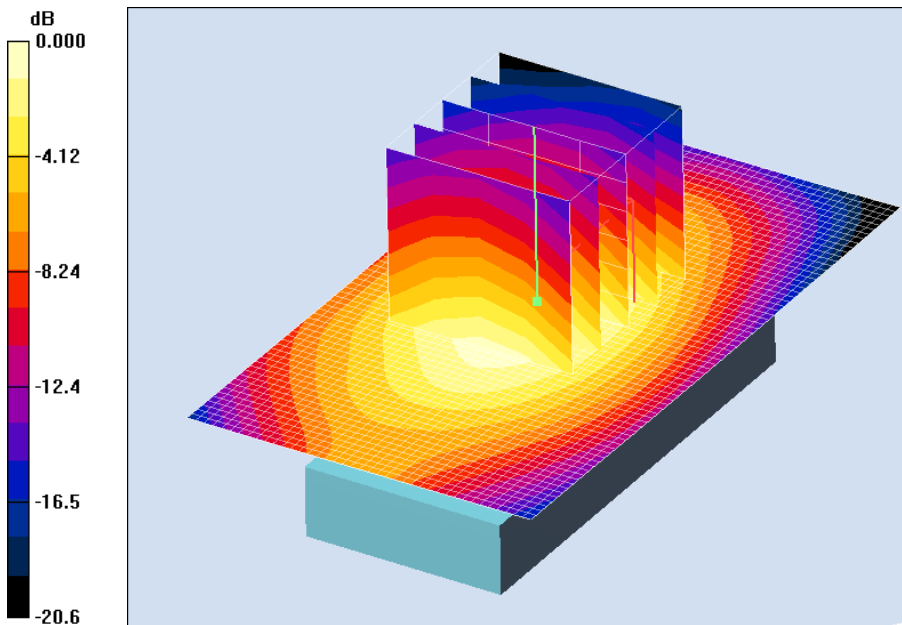
Reference Value = 16.6 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.640 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.16 mW/g



Test Laboratory: HCT CO., LTD
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GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

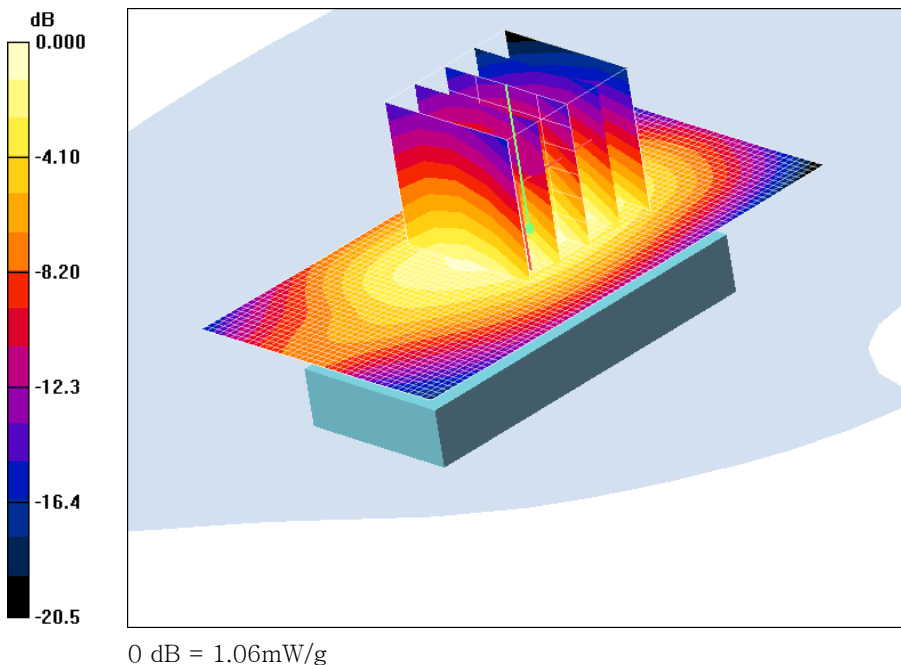
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 661/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 1.07 mW/g

GSM 1900 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 19.8 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.989 mW/g; SAR(10 g) = 0.566 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



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Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

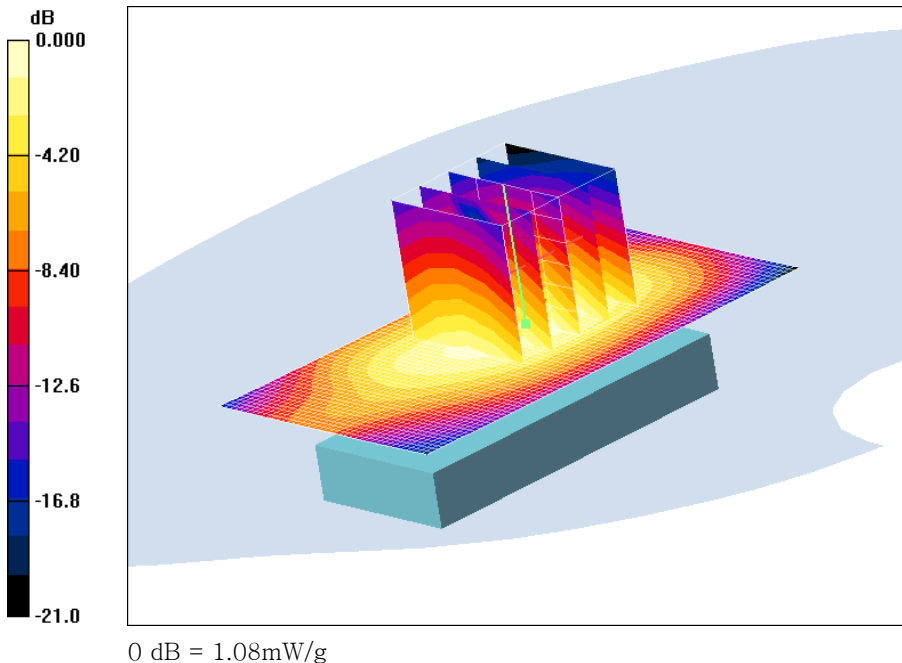
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.11 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.1 V/m; Power Drift = -0.116 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 1.08 mW/g



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GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Left side

DUT: LHU-2100T; Type: Bar; Serial: #1

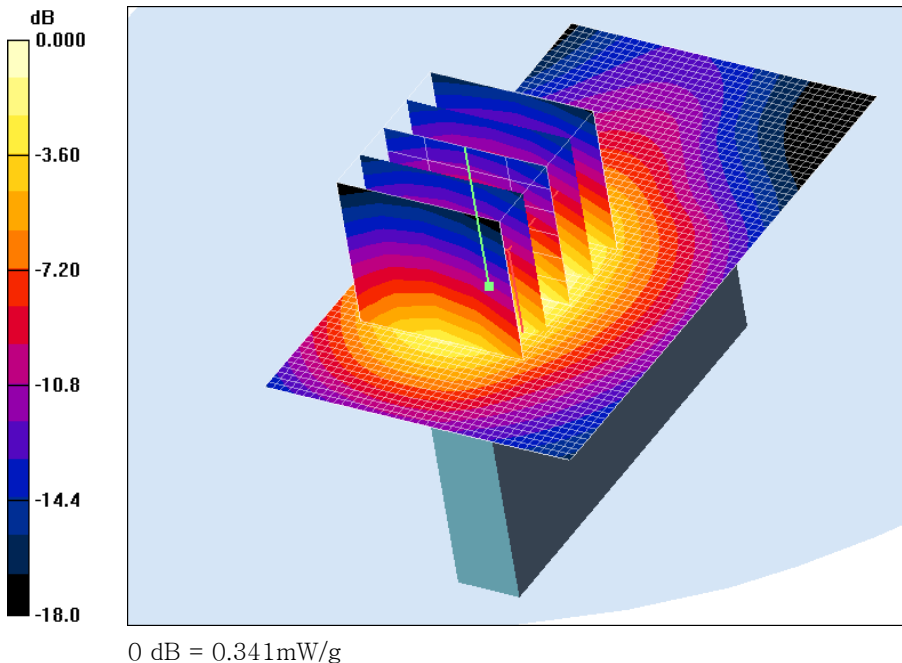
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 661/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.397 mW/g

GSM 1900 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 5.25 V/m; Power Drift = 0.049 dB
Peak SAR (extrapolated) = 0.560 W/kg
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.172 mW/g
Maximum value of SAR (measured) = 0.341 mW/g



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GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Right side

DUT: LHU-2100T; Type: Bar; Serial: #1

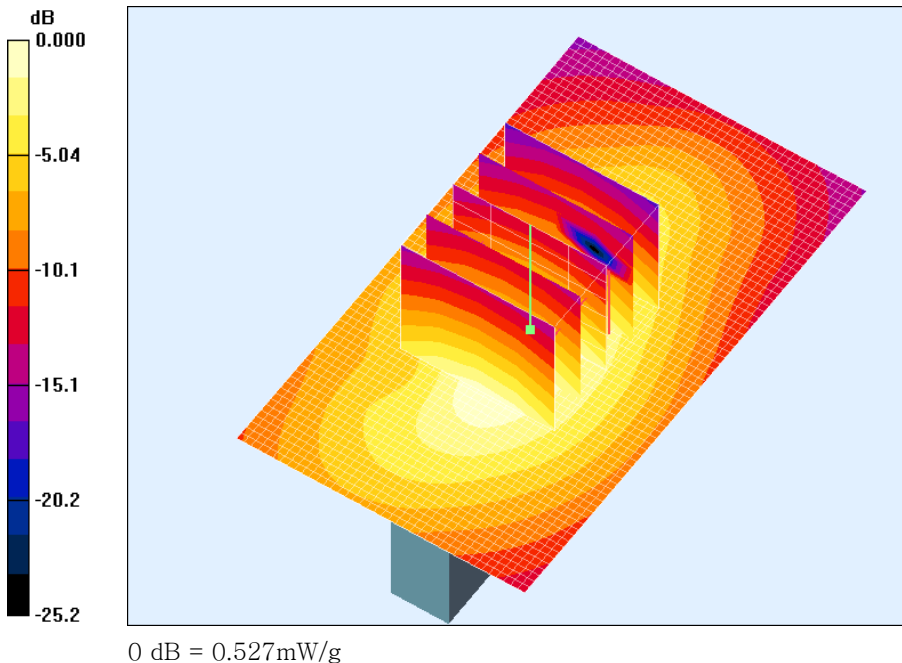
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 661/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.542 mW/g

GSM 1900 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.501 mW/g; SAR(10 g) = 0.288 mW/g
Maximum value of SAR (measured) = 0.527 mW/g



Test Laboratory: HCT CO., LTD
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GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Top

DUT: LHU-2100T; Type: Bar; Serial: #1

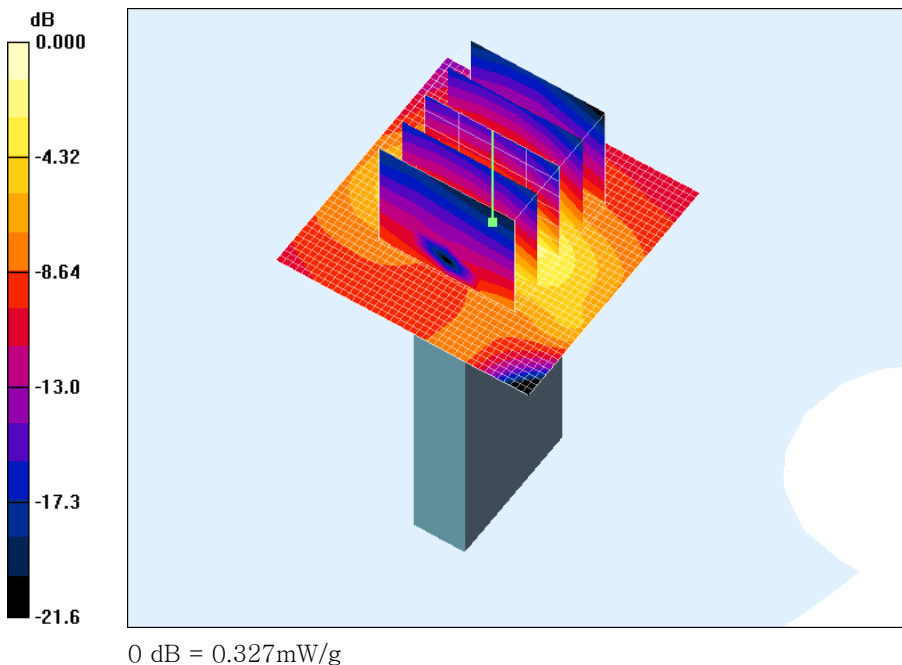
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM1900 661/Area Scan (41x41x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.315 mW/g

GSM1900 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 14.9 V/m; Power Drift = -0.099 dB
Peak SAR (extrapolated) = 0.634 W/kg
SAR(1 g) = 0.287 mW/g; SAR(10 g) = 0.133 mW/g
Maximum value of SAR (measured) = 0.327 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

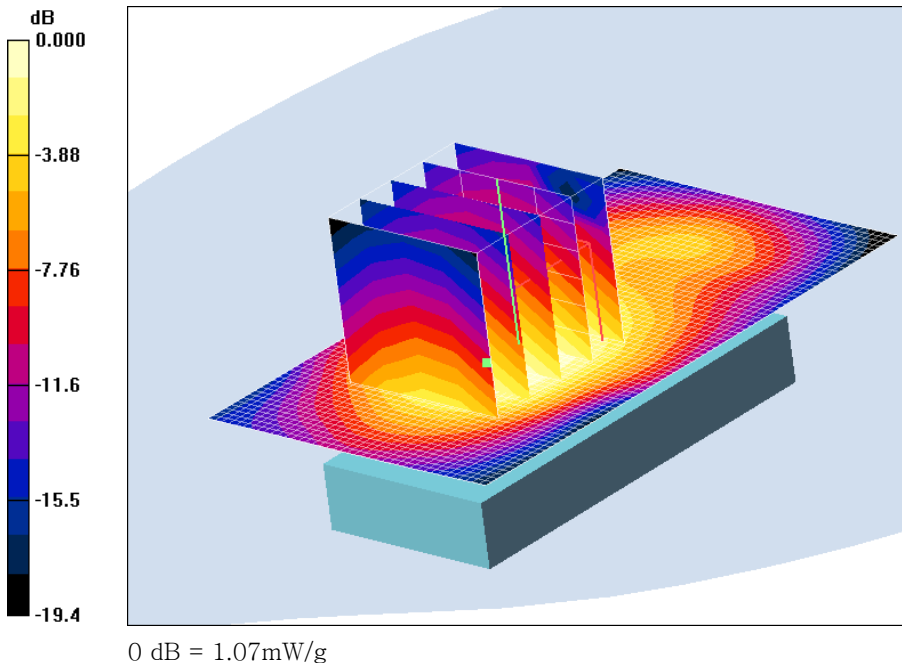
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.22 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = 0.037 dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.589 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



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EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

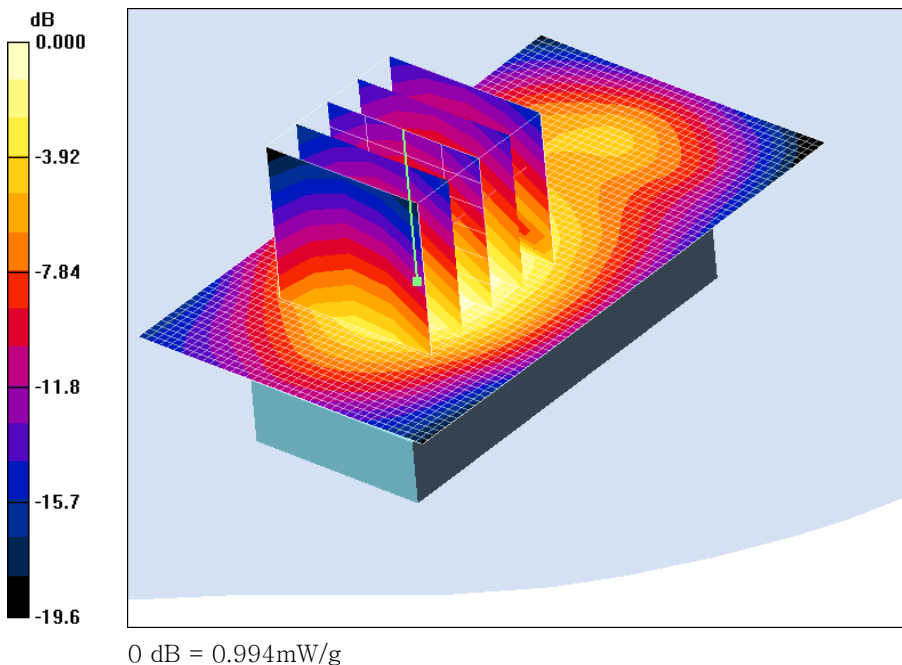
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 4.50 W/kg
SAR(1 g) = 0.982 mW/g; SAR(10 g) = 0.563 mW/g
Maximum value of SAR (measured) = 0.994 mW/g



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GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

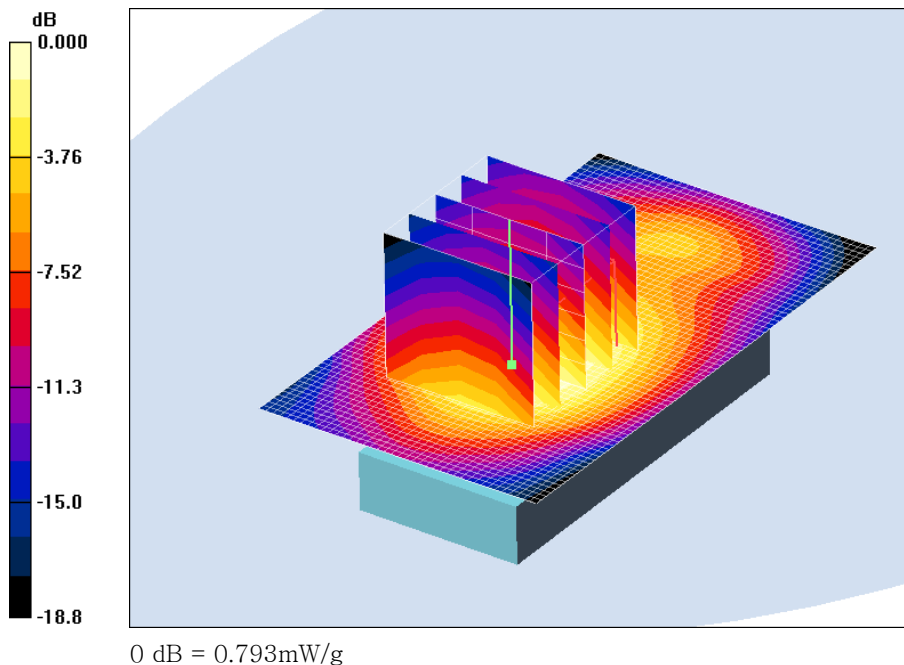
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.897 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.744 mW/g; SAR(10 g) = 0.440 mW/g
Maximum value of SAR (measured) = 0.793 mW/g



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EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

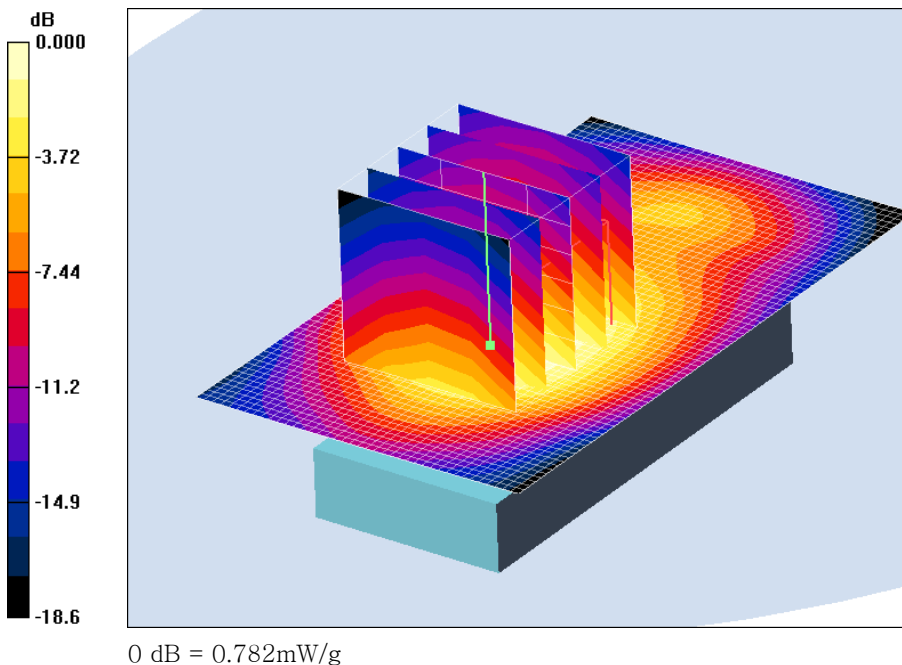
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.867 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = -0.086 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.731 mW/g; SAR(10 g) = 0.435 mW/g
Maximum value of SAR (measured) = 0.782 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

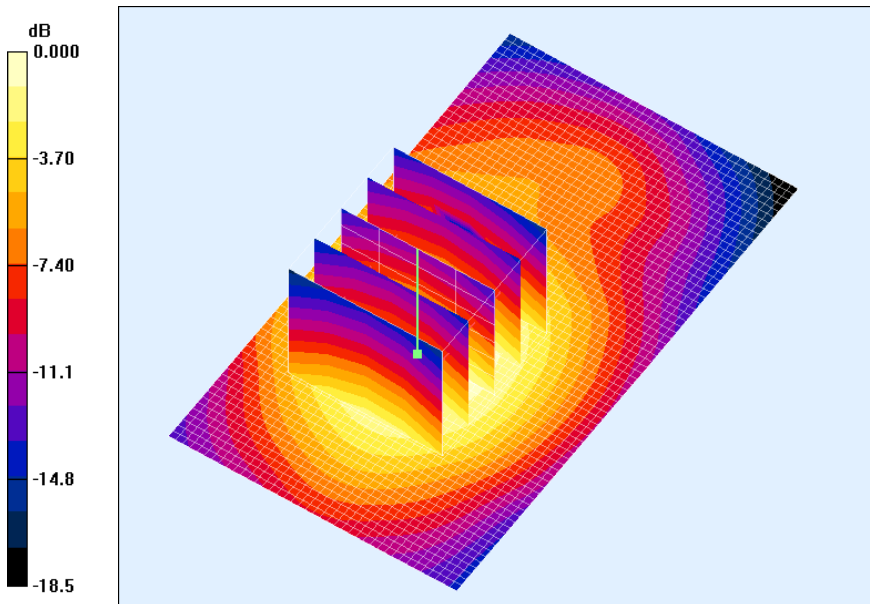
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.567 mW/g

GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.43 V/m; Power Drift = -0.199 dB
Peak SAR (extrapolated) = 0.779 W/kg
SAR(1 g) = 0.484 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 0.521 mW/g



0 dB = 0.521mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9262/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.50 mW/g

WCDMA 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

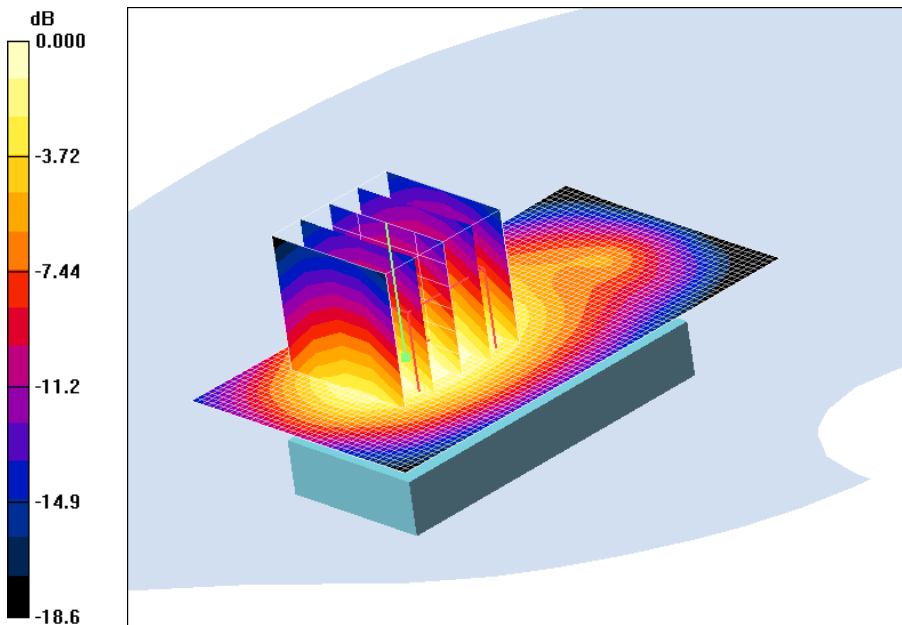
Reference Value = 16.4 V/m; Power Drift = -0.198 dB

Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.693 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.26 mW/g



0 dB = 1.26mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

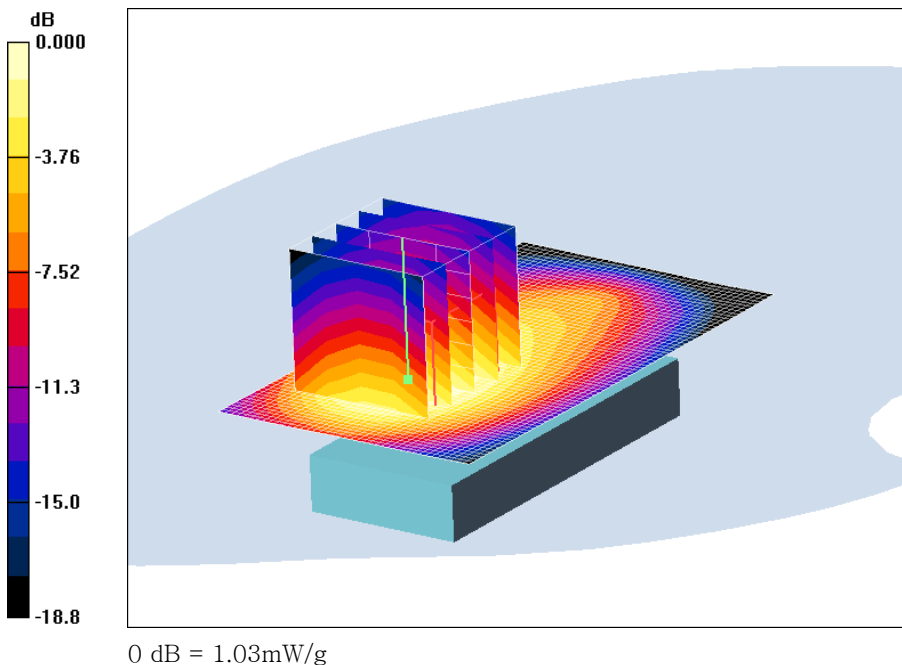
Communication System: WCDMA1900(FCC); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9400/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 1.21 mW/g

WCDMA 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 17.6 V/m; Power Drift = 0.162 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 0.961 mW/g; SAR(10 g) = 0.563 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1907.6$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9538/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.37 mW/g

WCDMA 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

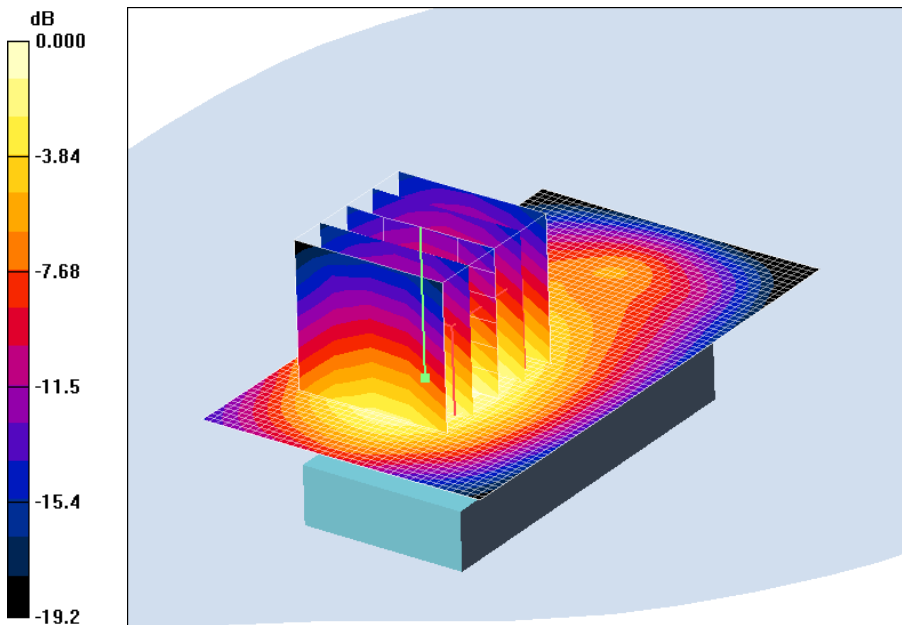
Reference Value = 15.5 V/m; Power Drift = -0.147 dB

Peak SAR (extrapolated) = 1.94 W/kg

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.680 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.25 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9262/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.21 mW/g

WCDMA 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

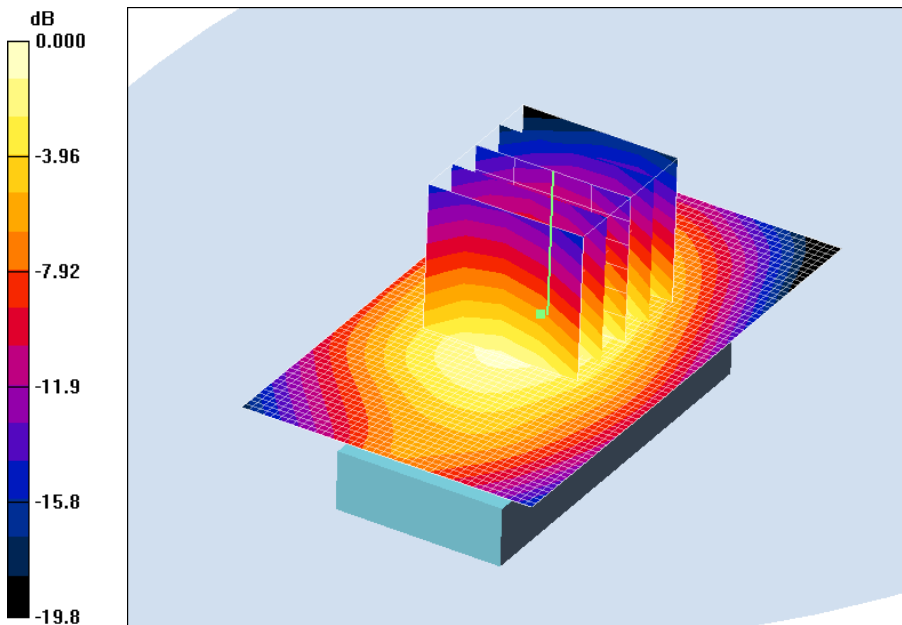
Reference Value = 19.8 V/m; Power Drift = -0.161 dB

Peak SAR (extrapolated) = 1.91 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.660 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

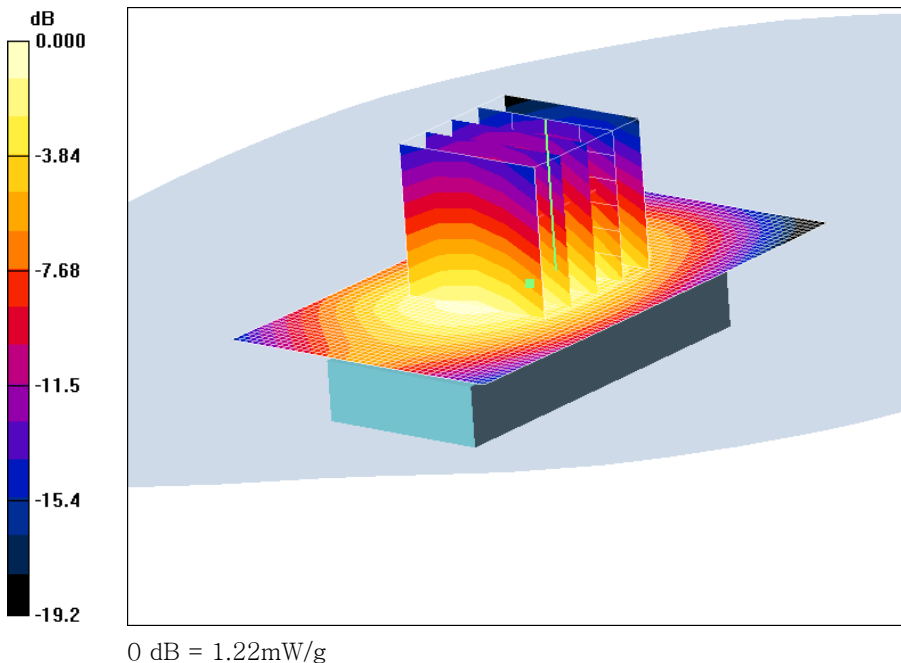
Communication System: WCDMA1900(FCC); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9400/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 1.15 mW/g

WCDMA 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 16.7 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 1.99 W/kg
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.692 mW/g
Maximum value of SAR (measured) = 1.22 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Back

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1907.6 \text{ MHz}$; $\sigma = 1.58 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9538/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.21 mW/g

WCDMA 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

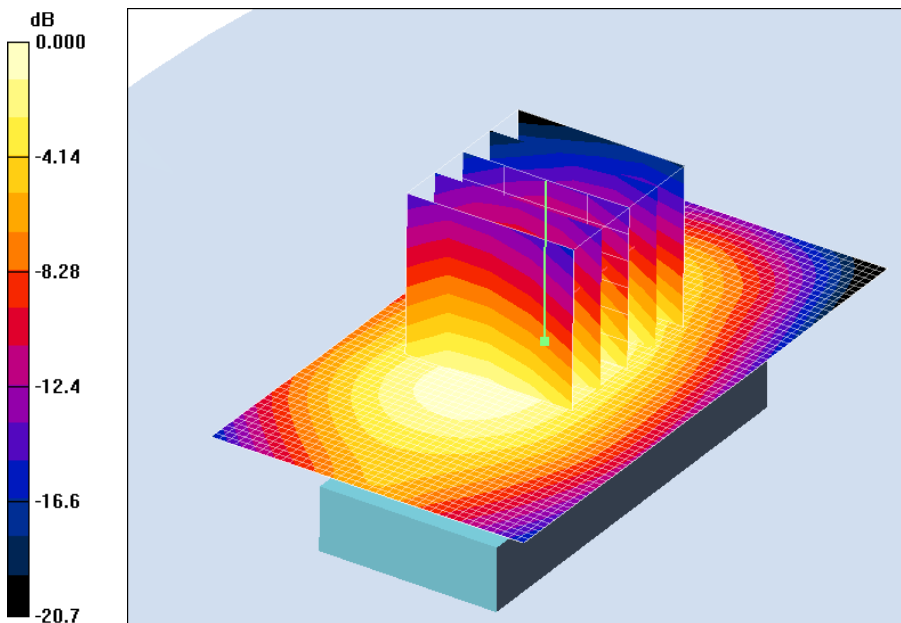
Reference Value = 19.6 V/m; Power Drift = -0.116 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.628 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.19 mW/g



0 dB = 1.19mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Left side

DUT: LHU-2100T; Type: Bar; Serial: #1

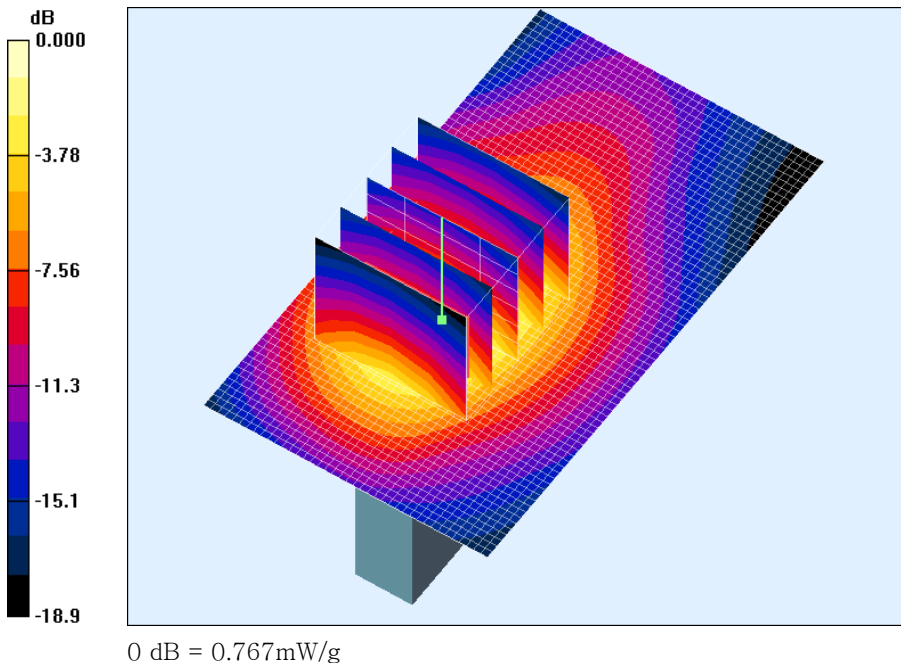
Communication System: WCDMA1900(FCC); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9400/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.817 mW/g

WCDMA 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 8.27 V/m; Power Drift = 0.169 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.697 mW/g; SAR(10 g) = 0.372 mW/g
Maximum value of SAR (measured) = 0.767 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Right side

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9262/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.628 mW/g

WCDMA 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

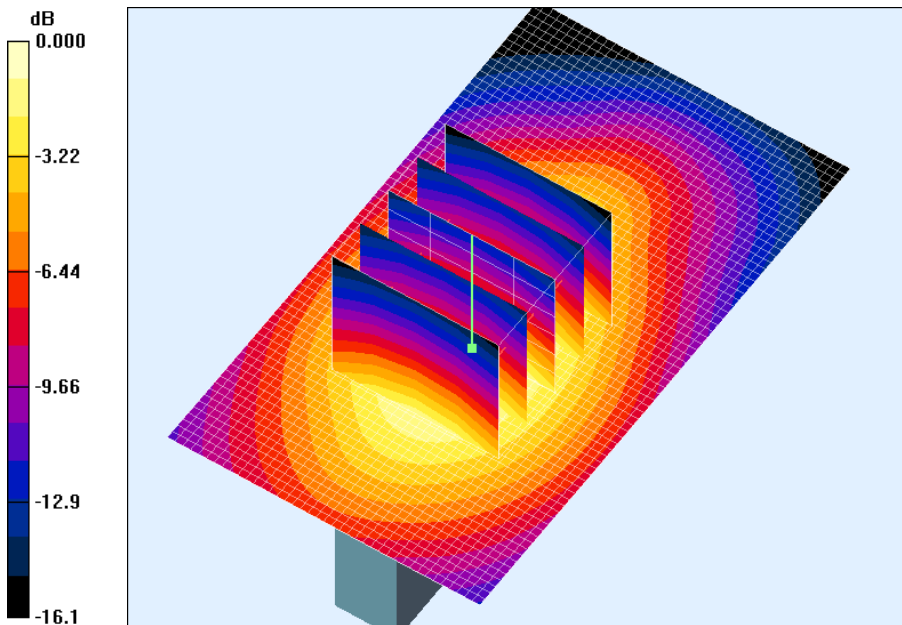
Reference Value = 14.9 V/m; Power Drift = 0.138 dB

Peak SAR (extrapolated) = 0.968 W/kg

SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.327 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.611 mW/g



0 dB = 0.611mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Right side

DUT: LHU-2100T; Type: Bar; Serial: #1

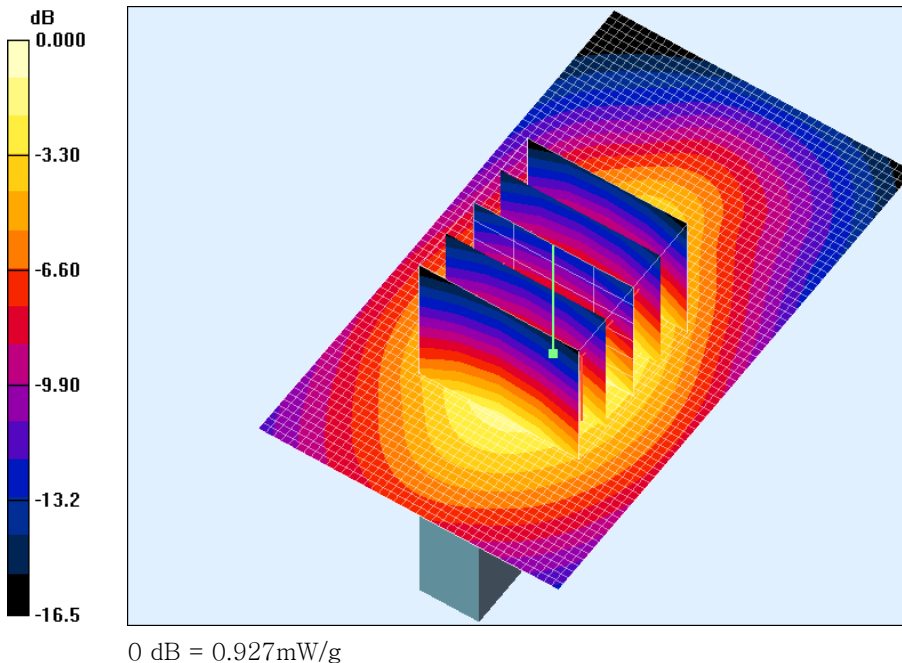
Communication System: WCDMA1900(FCC); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9400/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.909 mW/g

WCDMA 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 14.6 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.851 mW/g; SAR(10 g) = 0.486 mW/g
Maximum value of SAR (measured) = 0.927 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Right side

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1907.6 \text{ MHz}$; $\sigma = 1.58 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9538/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.599 mW/g

WCDMA 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

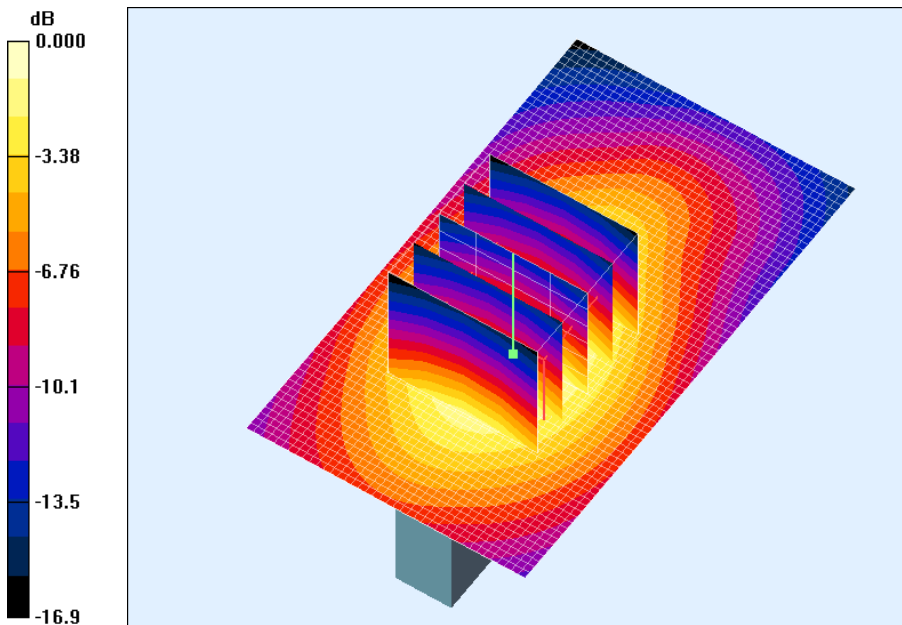
Reference Value = 11.8 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 0.953 W/kg

SAR(1 g) = 0.536 mW/g; SAR(10 g) = 0.305 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.583 mW/g



0 dB = 0.583mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Top

DUT: LHU-2100T; Type: Bar; Serial: #1

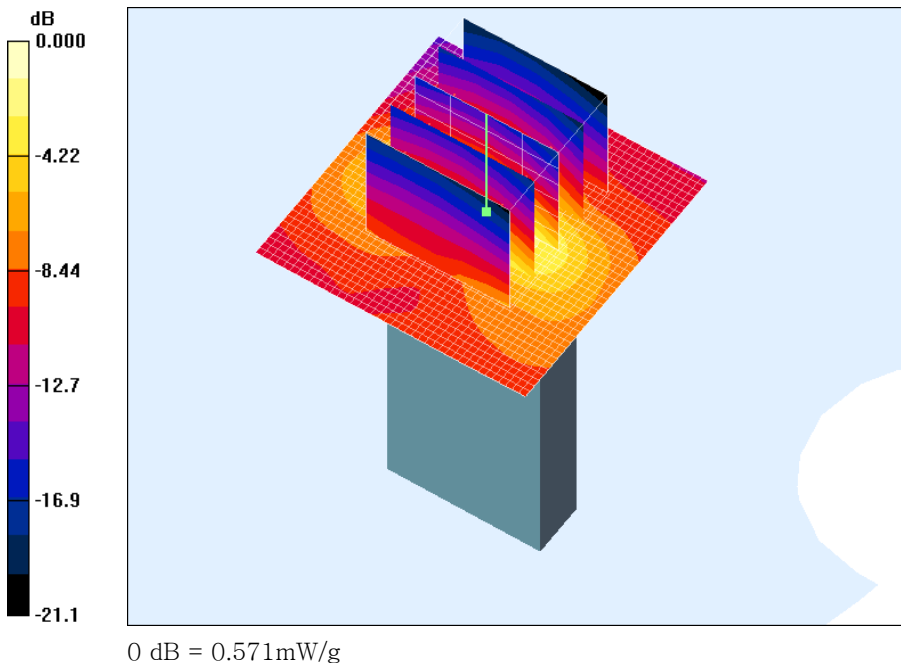
Communication System: WCDMA1900(FCC); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9400/Area Scan (41x41x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.572 mW/g

WCDMA 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 20.1 V/m; Power Drift = 0.137 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.496 mW/g; SAR(10 g) = 0.226 mW/g
Maximum value of SAR (measured) = 0.571 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008
Option Front

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9262/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.648 mW/g

WCDMA 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

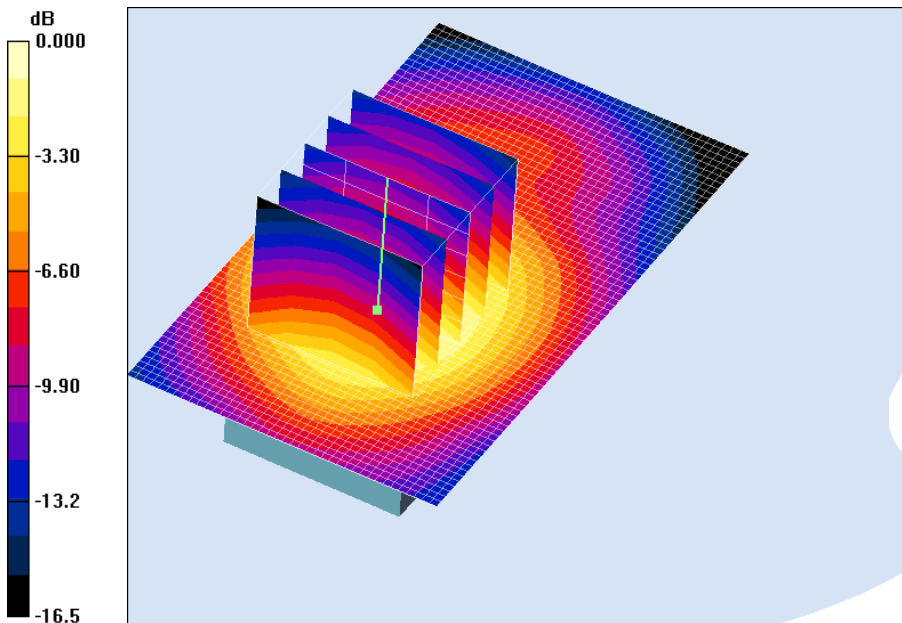
Reference Value = 8.78 V/m; Power Drift = -0.182 dB

Peak SAR (extrapolated) = 0.895 W/kg

SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.342 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.605 mW/g



0 dB = 0.605mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Dec.18, 2008

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:2
Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.999$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(6.29, 6.29, 6.29); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 850 251/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.31 mW/g

GSM 850 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

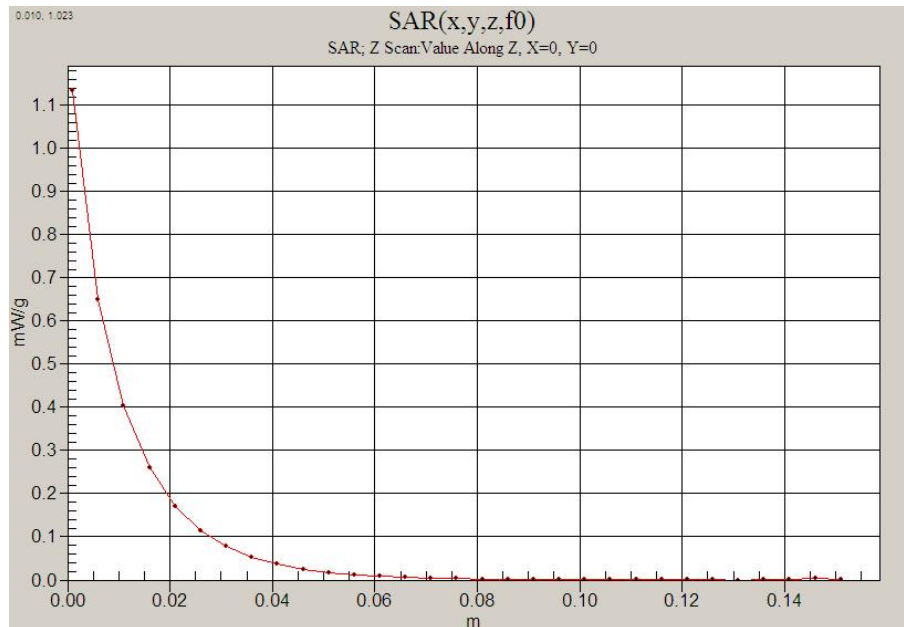
Reference Value = 36.4 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.673 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.24 mW/g



0 dB = 1.24mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Dec.18, 2008

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(6.29, 6.29, 6.29); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 4183/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.22 mW/g

WCDMA 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

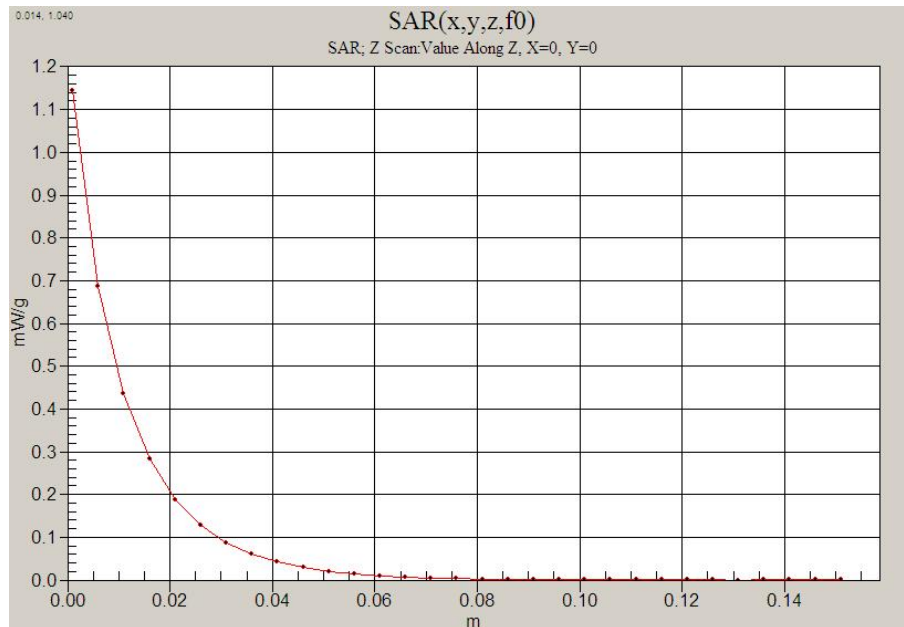
Reference Value = 36.5 V/m; Power Drift = 0.079 dB

Peak SAR (extrapolated) = 2.05 W/kg

SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.696 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

GSM 1900 810/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.27 mW/g

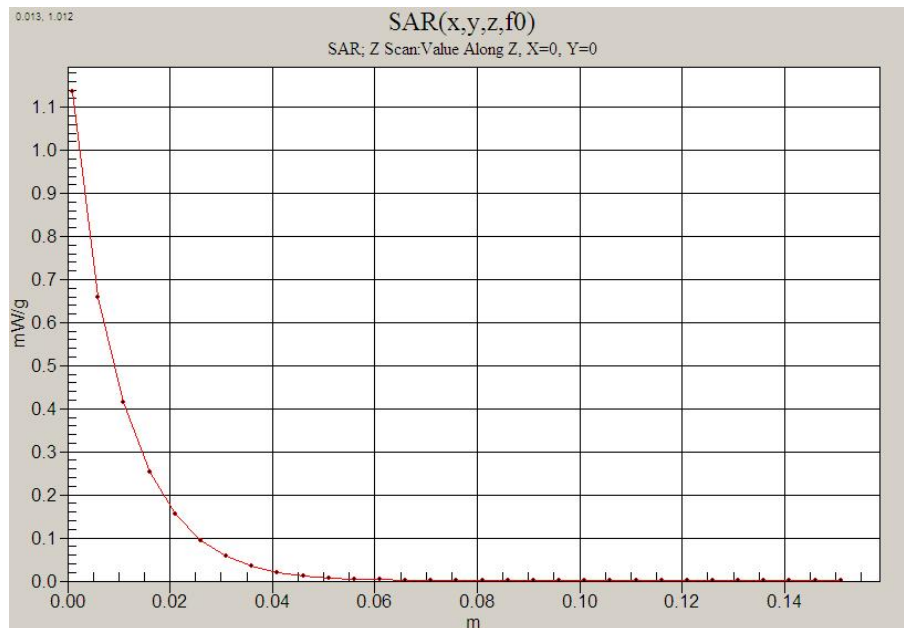
GSM 1900 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.7 V/m; Power Drift = -0.204 dB

Peak SAR (extrapolated) = 1.79 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.636 mW/g

Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE/WCDMA USB Modem
GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Dec.17, 2008

DUT: LHU-2100T; Type: Bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1798; ConvF(5.38, 5.38, 5.38); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: 835/900 Phantom ; Type: SAM

WCDMA 9262/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.50 mW/g

WCDMA 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

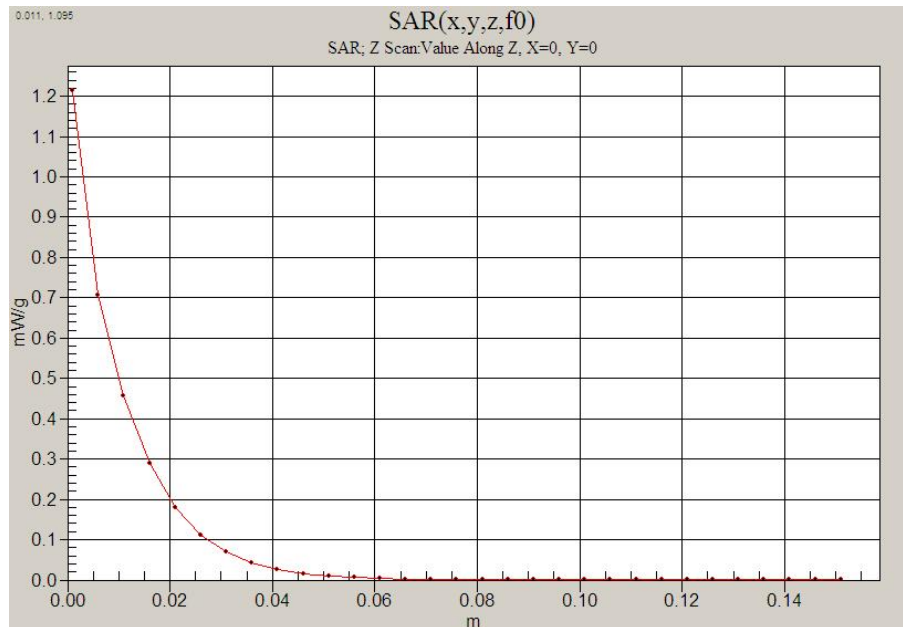
Reference Value = 16.4 V/m; Power Drift = -0.198 dB

Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.693 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.26 mW/g



0 dB = 1.26mW/g

Attachment 2. – Dipole Validation Plots

■ Validation Data (835 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 °C

Test Date: Dec.18, 2008

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 – SN:441

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

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.879 \text{ mho/m}$; $\epsilon_r = 41.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.79, 6.79, 6.79); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: SAM 835/900 MHz; Type: SAM

Validation 835 MHz/Area Scan (61x81x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.999 mW/g

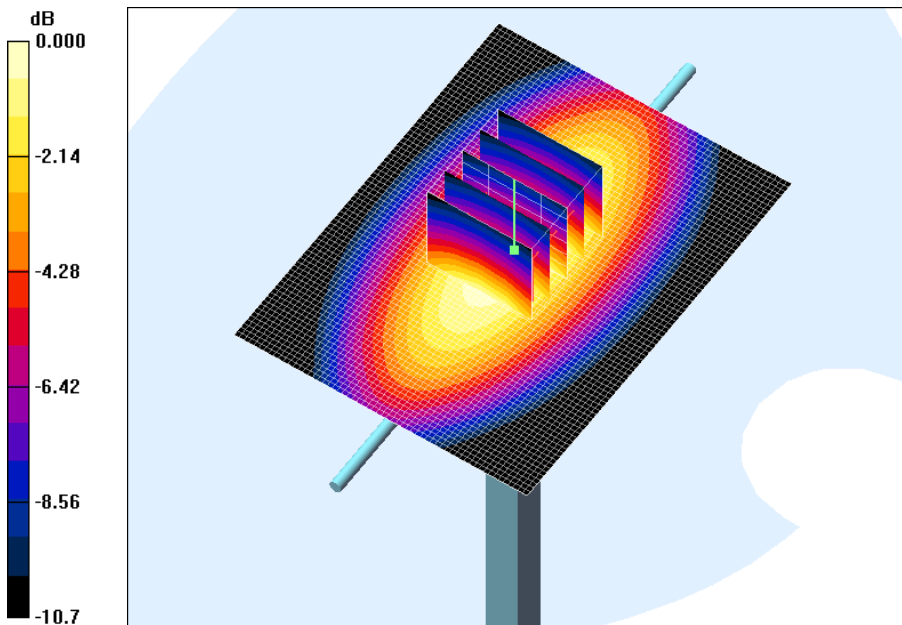
Validation 835 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 34.8 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.921 mW/g; SAR(10 g) = 0.604 mW/g

Maximum value of SAR (measured) = 0.995 mW/g



0 dB = 0.995mW/g

■ Validation Data (1900 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.1 °C

Test Date: Dec.17, 2008

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d032

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(5.58, 5.58, 5.58); Calibrated: 2008-03-20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2008-07-17
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 1900MHz/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 4.50 mW/g

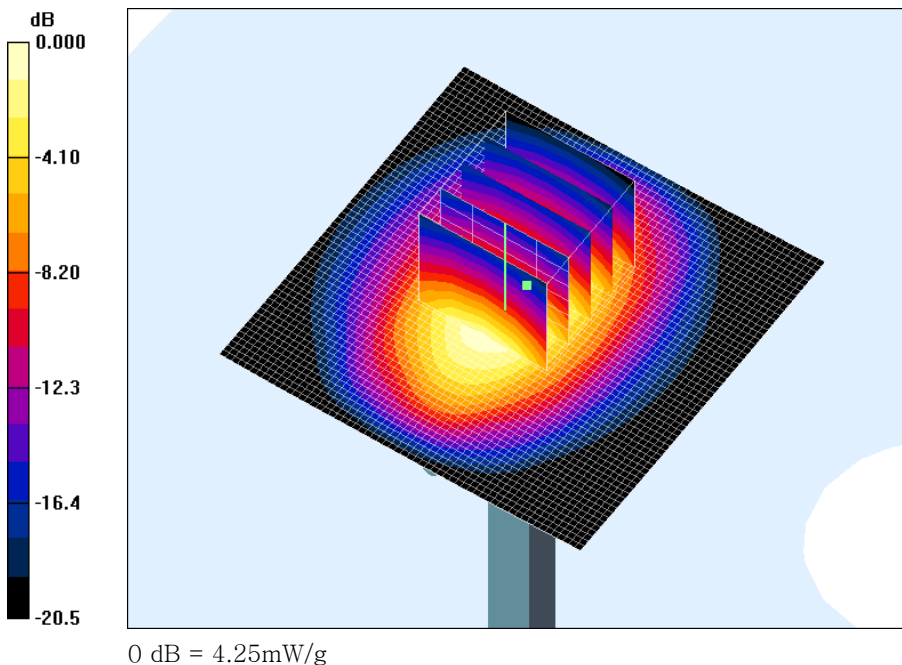
Validation 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.7 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 7.18 W/kg

SAR(1 g) = 3.83 mW/g; SAR(10 g) = 1.94 mW/g

Maximum value of SAR (measured) = 4.25 mW/g



■ Dielectric Parameter (835 MHz Head)

Title LHU-2100T
 SubTitle 850 MHz
 Test Date Dec.18, 2008

Frequency	e'	e''
800000000	41.7247	18.9607
805000000	41.6322	18.9214
810000000	41.5327	18.9115
815000000	41.4474	18.9089
820000000	41.3651	18.8738
825000000	41.2779	18.8936
830000000	41.2458	18.8983
835000000	41.1366	18.9243
840000000	41.0740	18.9062
845000000	41.0083	18.9102
850000000	40.9929	18.8691
855000000	40.9099	18.8782
860000000	40.8672	18.9171
865000000	40.8175	18.8558
870000000	40.7752	18.8894
875000000	40.7296	18.8379
880000000	40.6550	18.8406
885000000	40.6486	18.7987
890000000	40.5633	18.8099
895000000	40.4971	18.7464
900000000	40.4702	18.7806

■ Dielectric Parameter (835 MHz Body)

Title LHU-2100T
 SubTitle 850 MHz
 Test Date Dec.18, 2008

Frequency	e'	e''
800000000	55.3771	21.3660
805000000	55.3264	21.2912
810000000	55.2230	21.2872
815000000	55.1773	21.2514
820000000	55.0891	21.2652
825000000	55.0254	21.2199
830000000	54.9797	21.2352
835000000	54.9200	21.2390
840000000	54.8457	21.1712
845000000	54.8400	21.1662
850000000	54.8026	21.1621
855000000	54.7452	21.1167
860000000	54.6707	21.1379
865000000	54.6201	21.0906
870000000	54.5474	21.0954
875000000	54.5124	21.0697
880000000	54.5050	21.0441
885000000	54.4429	21.0399
890000000	54.4340	21.0202
895000000	54.3595	20.9792
900000000	54.2951	20.9347

■ Dielectric Parameter (1900 MHz Head)

Title LHU-2100T
 SubTitle 1900 MHz
 Test Date Dec.17, 2008

Frequency	e'	e''
1850000000	40.9487	13.0031
1855000000	40.9136	13.0237
1860000000	40.9272	13.0671
1865000000	40.9153	13.0756
1870000000	40.8995	13.0684
1875000000	40.8870	13.1258
1880000000	40.8708	13.1310
1885000000	40.8128	13.1638
1890000000	40.8062	13.1779
1895000000	40.8026	13.2141
1900000000	40.7658	13.2271
1905000000	40.7390	13.2365
1910000000	40.7146	13.2534
1915000000	40.6662	13.2924
1920000000	40.6540	13.3042
1925000000	40.6110	13.3098
1930000000	40.5821	13.3001
1935000000	40.5686	13.3219
1940000000	40.5087	13.3453
1945000000	40.4916	13.3696
1950000000	40.4653	13.4062

■ Dielectric Parameter (1900 MHz Body)

Title LHU-2100T
 SubTitle 1900 MHz
 Test Date Dec.17, 2008

Frequency	e'	e''
1850000000	53.3524	14.7725
1855000000	53.3300	14.8152
1860000000	53.3563	14.8214
1865000000	53.3306	14.8673
1870000000	53.3342	14.8718
1875000000	53.3083	14.8555
1880000000	53.3076	14.8824
1885000000	53.2709	14.8615
1890000000	53.2471	14.8582
1895000000	53.1913	14.8956
1900000000	53.1534	14.8800
1905000000	53.1215	14.8665
1910000000	53.0858	14.8604
1915000000	53.0552	14.8753
1920000000	52.9956	14.9174
1925000000	52.9759	14.9153
1930000000	52.9175	14.9457
1935000000	52.9160	14.9817
1940000000	52.8769	15.0237
1945000000	52.9025	15.0599
1950000000	52.8967	15.0818

Attachment 3. – Probe Calibration Data

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S 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 **HCT (Dymstec)**

Certificate No: **ET3-1798_Mar08**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1798**

Calibration procedure(s) **QA CAL-01.v6
Calibration procedure for dosimetric E-field probes**

Calibration date: **March 20, 2008**

Condition of the calibrated item **In Tolerance**

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (SPEAG, No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642UD1700	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: March 21, 2008

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

Certificate No: ET3-1798_Mar08

Page 1 of 9

**Calibration Laboratory of
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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
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.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- 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
- 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 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,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.
- DCP_{x,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.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,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 ± 50 MHz to ± 100 MHz.
- 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.

ET3DV6 SN:1798

March 20, 2008

Probe ET3DV6

SN:1798

Manufactured:	August 14, 2003
Last calibrated:	August 25, 2006
Recalibrated:	March 20, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1798

March 20, 2008

DASY - Parameters of Probe: ET3DV6 SN:1798

Sensitivity in Free Space^A

Diode Compression^B

NormX	1.97 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	93 mV
NormY	1.84 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	93 mV
NormZ	2.00 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	94 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{iso} [%]	Without Correction Algorithm	9.5	5.7
SAR _{iso} [%]	With Correction Algorithm	0.8	0.7

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{iso} [%]	Without Correction Algorithm	12.4	7.8
SAR _{iso} [%]	With Correction Algorithm	0.9	0.8

Sensor Offset

Probe Tip to Sensor Center 2.7 mm

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 NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

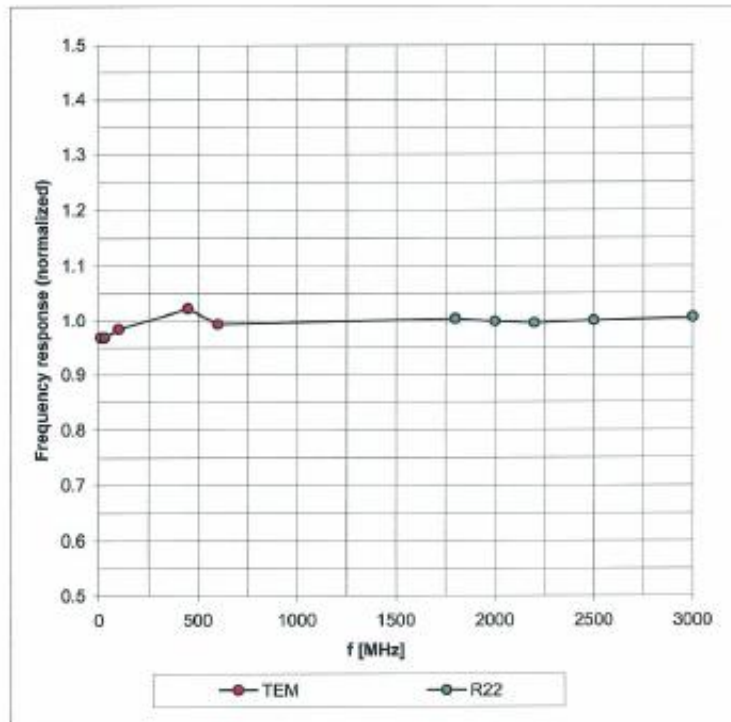
^B Numerical linearization parameter; uncertainty not required.

ET3DV6 SN:1798

March 20, 2008

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)

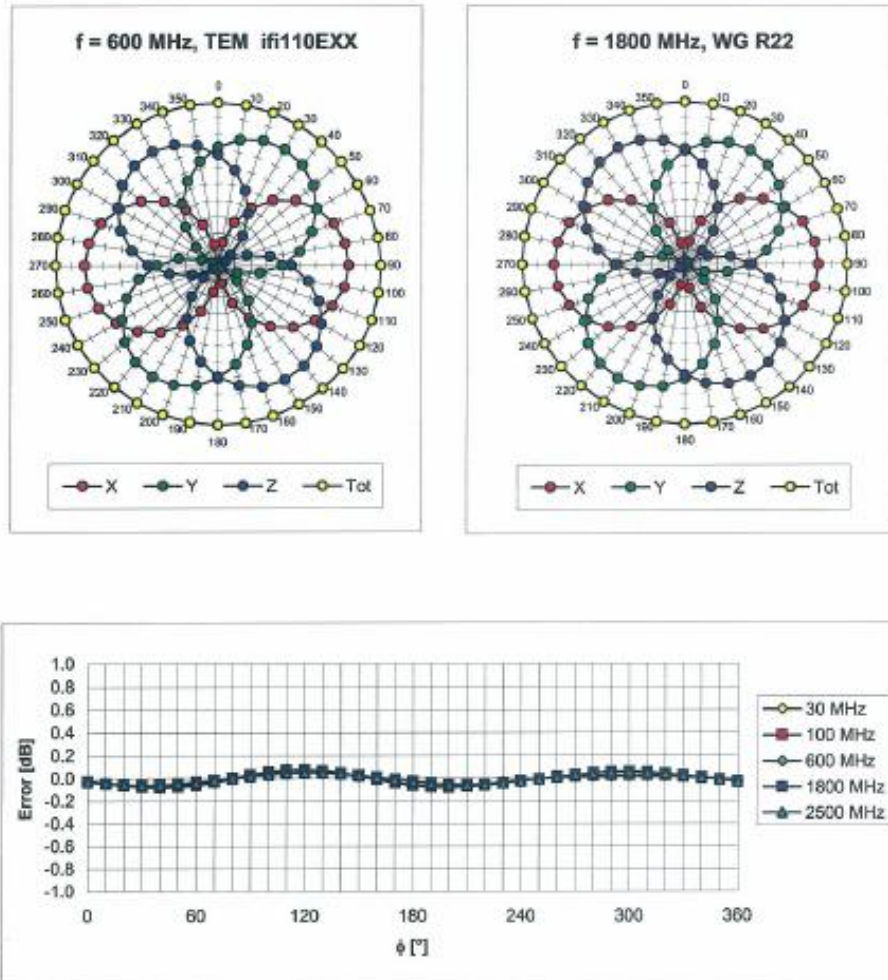


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ET3DV6 SN:1798

March 20, 2008

Receiving Pattern (ϕ), $\theta = 0^\circ$

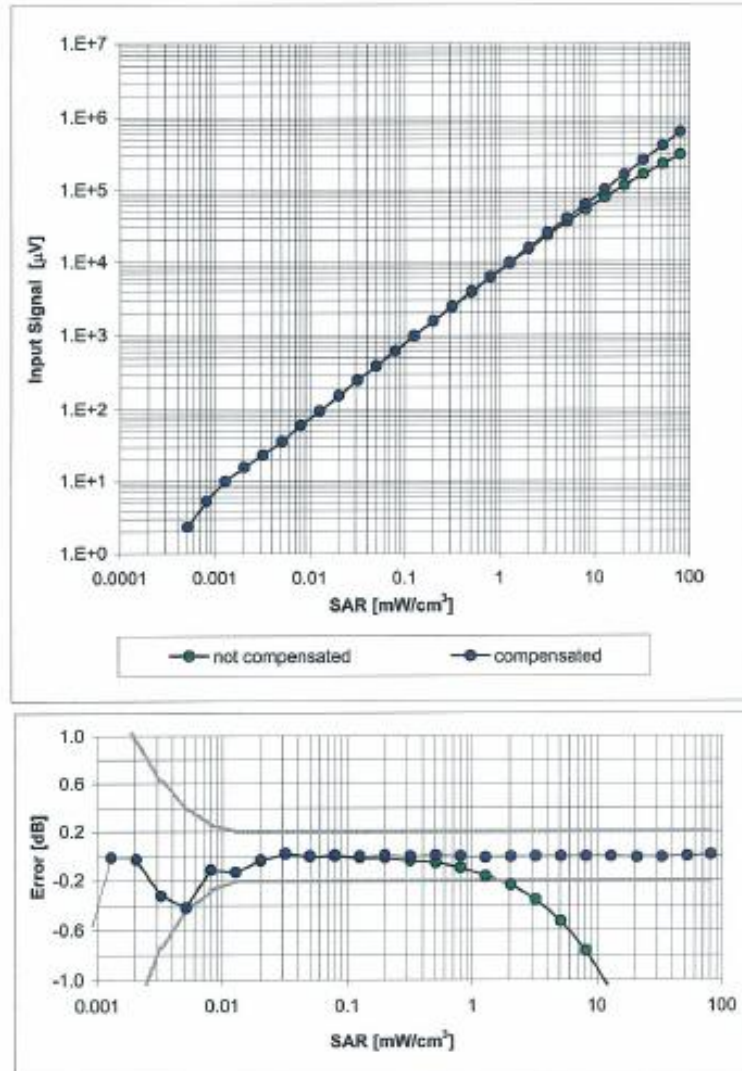


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ET3DV6 SN:1798

March 20, 2008

Dynamic Range f(SAR_{head}) (Waveguide R22, f = 1800 MHz)

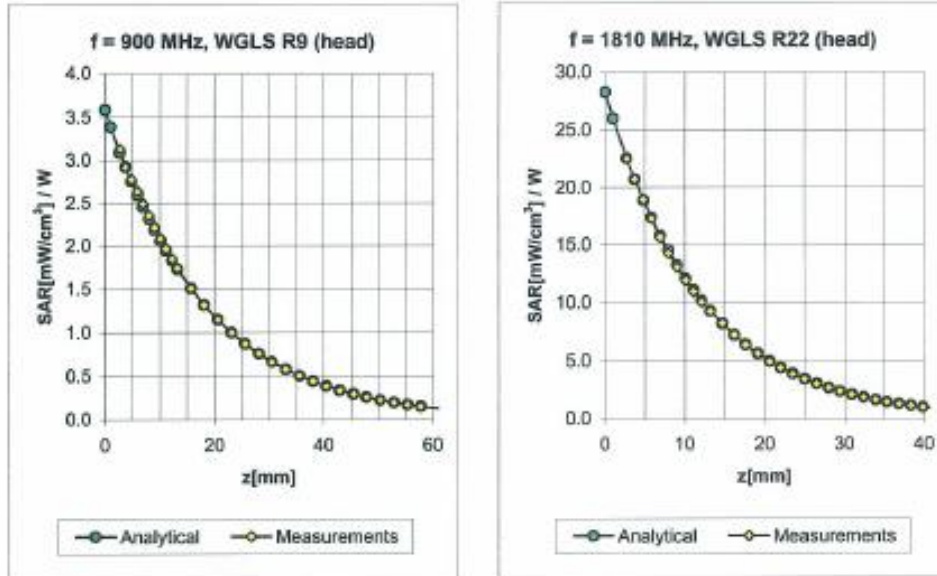


Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

ET3DV6 SN:1798

March 20, 2008

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.78	1.68	6.79 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.50	2.40	5.58 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.48	2.50	5.24 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.95	1.40	4.81 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.92	1.59	6.29 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.53	2.31	5.38 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.73	1.76	4.32 ± 11.8% (k=2)

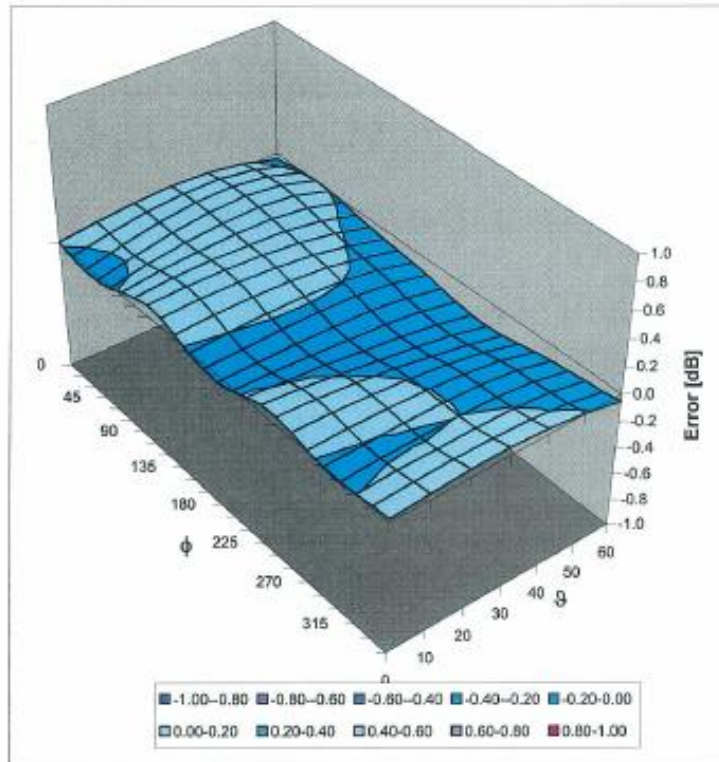
^c The validity of ± 100 MHz only applies for DASy v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ET3DV6 SN:1798

March 20, 2008

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

Attachment 4. – Dipole Calibration Data

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accreditation No.: **SCS 108**

Client **HCT (Dymstec)**

Certificate No: **D835V2-441_May08**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 441**

Calibration procedure(s) **QA CAL-05.v7**
Calibration procedure for dipole validation kits

Calibration date: **May 19, 2008**

Condition of the calibrated item **In Tolerance**

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 ($22 \pm 3^\circ\text{C}$) and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Type-N mismatch combination	SN: 5047.2 / 06327	08-Aug-07 (No. 217-00721)	Aug-08
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41082317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	04-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

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

Approved by: **Katja Pokovic** **Technical Manager**

Issued: May 20, 2008

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- 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 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- 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..

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 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 $\pm$ 0.2) °C	41.1 $\pm$ 6 %	0.91 mho/m $\pm$ 6 %
Head TSL temperature during test	(21.5 $\pm$ 0.2) °C	---	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.32 mW / g
SAR normalized	normalized to 1W	9.28 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.17 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 mW / g
SAR normalized	normalized to 1W	6.12 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.07 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	50.4 Ω - 7.6 j Ω
Return Loss	-22.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.377 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.

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
Manufactured on	March 09, 2001

DASY4 Validation Report for Head TSL

Date/Time: 19.05.2008 12:17:50

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:441

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

Medium: HSL 900 MHz;

Medium parameters used: $f = 835$ MHz; $\sigma = 0.909$ mho/m; $\epsilon_r = 41.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0:

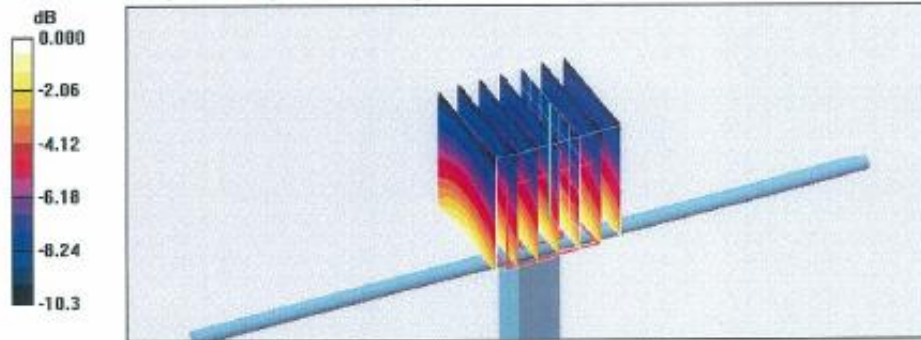
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.1 V/m; Power Drift = -0.008 dB

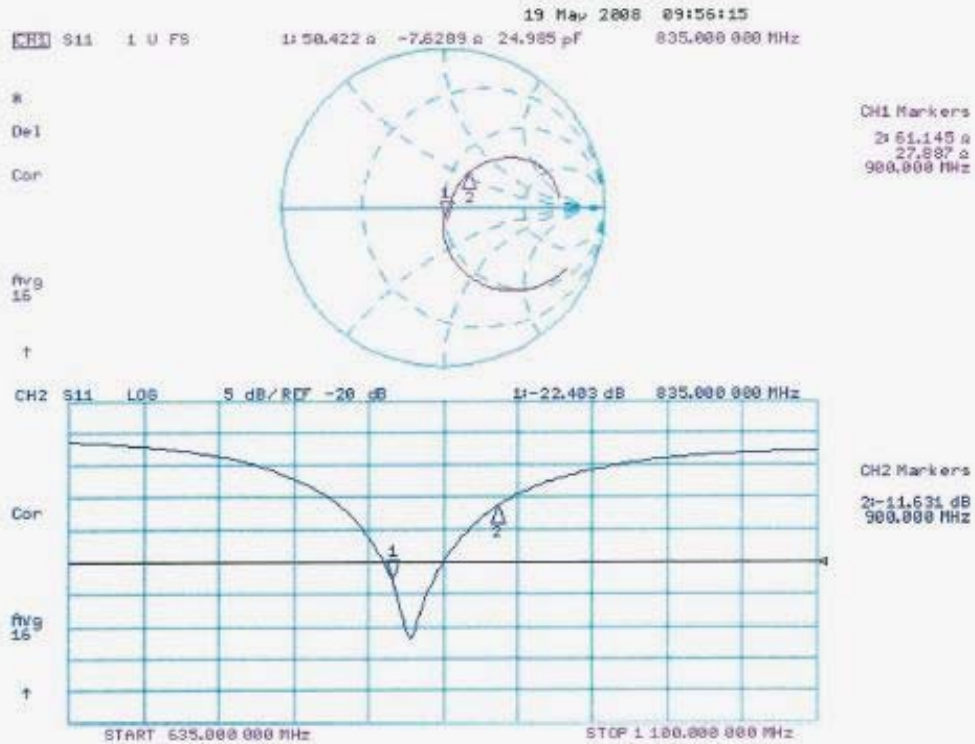
Peak SAR (extrapolated) = 3.38 W/kg

SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.53 mW/g

Maximum value of SAR (measured) = 2.62 mW/g



Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 108

Client **H-CT (Dymstec)**

Certificate No: D1900V2-5d032-Jul08

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d032**

Calibration procedure(s) **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **July 22, 2008**

Condition of the calibrated item **In Tolerance**

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 22, 2008

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- 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.

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz $\pm$ 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 $\pm$ 0.2) °C	38.8 $\pm$ 6 %	1.47 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.82 mW / g
SAR normalized	normalized to 1W	39.3 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	37.7 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.05 mW / g
SAR normalized	normalized to 1W	20.2 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	19.7 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	53.5 Ω + 4.9 j Ω
Return Loss	- 24.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.185 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.

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
Manufactured on	March 17, 2003

DASY4 Validation Report for Head TSL

Date/Time: 22.07.2008 10:06:43

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d032

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)

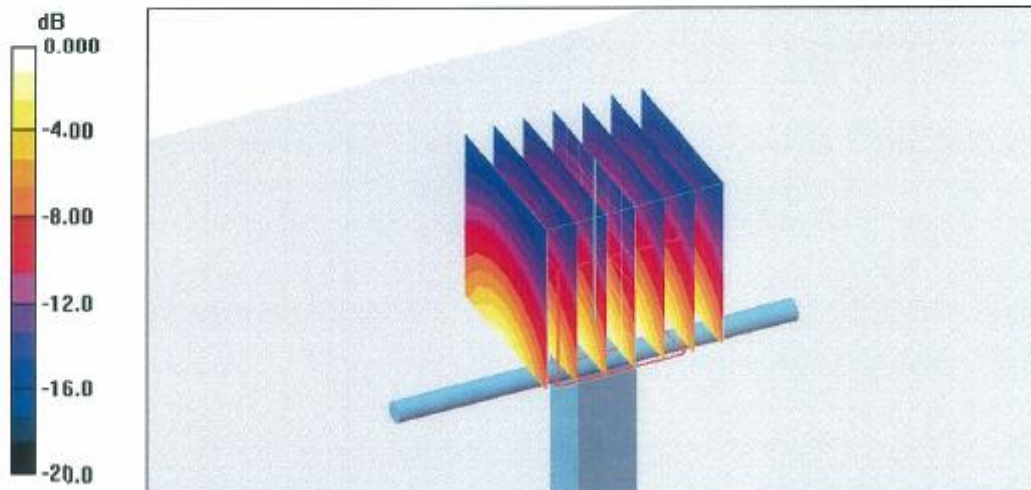
(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.2 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 9.82 mW/g; SAR(10 g) = 5.05 mW/g

Maximum value of SAR (measured) = 11.9 mW/g



0 dB = 11.9mW/g

Impedance Measurement Plot for Head TSL

