

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.3 °C  
Ambient Temperature: 21.5 °C  
Test Date: Jul.08, 2013  
Plot NO. 16  
Distance 10 mm

**DUT: C6522N; Type: bar;**

Communication System: LTE 17; Frequency: 709 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 709 \text{ MHz}$ ;  $\sigma = 0.932 \text{ mho/m}$ ;  $\epsilon_r = 55.4$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.62, 6.62, 6.62); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front QPSK 10MHz 1RB 49offst 23780ch/Area Scan (61x101x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.378 mW/g

**Body front QPSK 10MHz 1RB 49offst 23780ch/Zoom Scan (5x5x7)/Cube 0:**

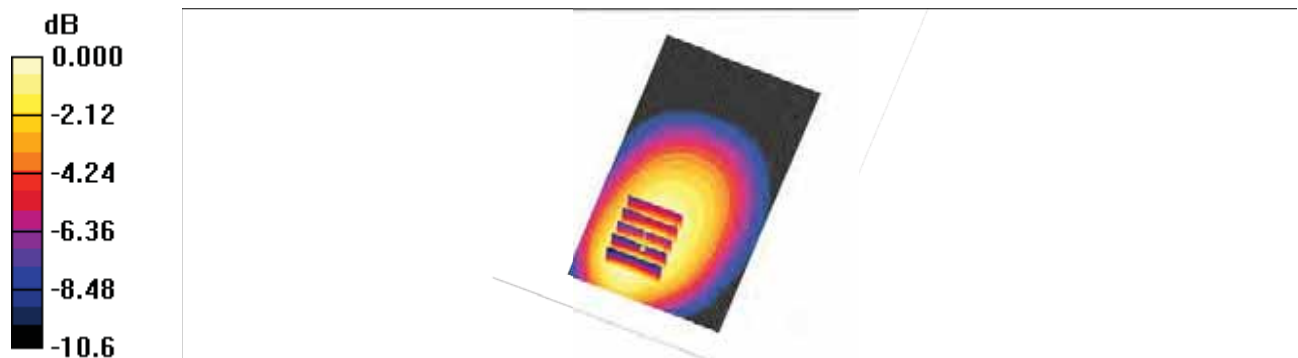
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 4.54 V/m; Power Drift = -0.084 dB

Peak SAR (extrapolated) = 0.472 W/kg

**SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.256 mW/g**

Maximum value of SAR (measured) = 0.371 mW/g



0 dB = 0.371mW/g

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.2 °C  
Ambient Temperature: 21.4 °C  
Test Date: Jul.10, 2013  
Plot NO. 17  
Distance 10 mm

**DUT: C6522N; Type: bar;**

Communication System: LTE Band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 1732.5$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 55.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.93, 4.93, 4.93); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body rear QPSK 20MHz 1RB 99offset 20175ch/Area Scan (61x101x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.961 mW/g

**Body rear QPSK 20MHz 1RB 99offset 20175ch/Zoom Scan (5x5x7)/Cube 0:**

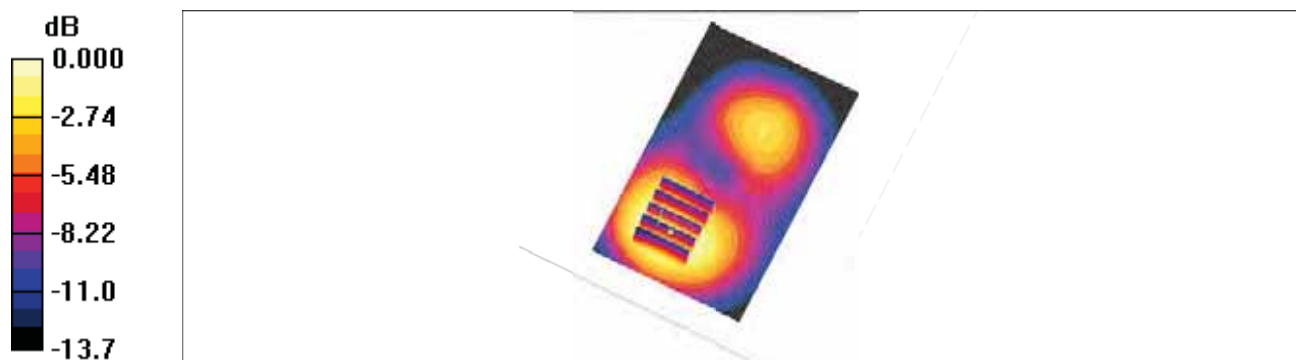
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.24 W/kg

**SAR(1 g) = 0.888 mW/g; SAR(10 g) = 0.582 mW/g**

Maximum value of SAR (measured) = 0.952 mW/g



0 dB = 0.952mW/g

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.3 °C  
Ambient Temperature: 21.5 °C  
Test Date: Jul.11, 2013  
Plot NO. 18  
Distance 10 mm

**DUT: C6522N; Type: bar;**

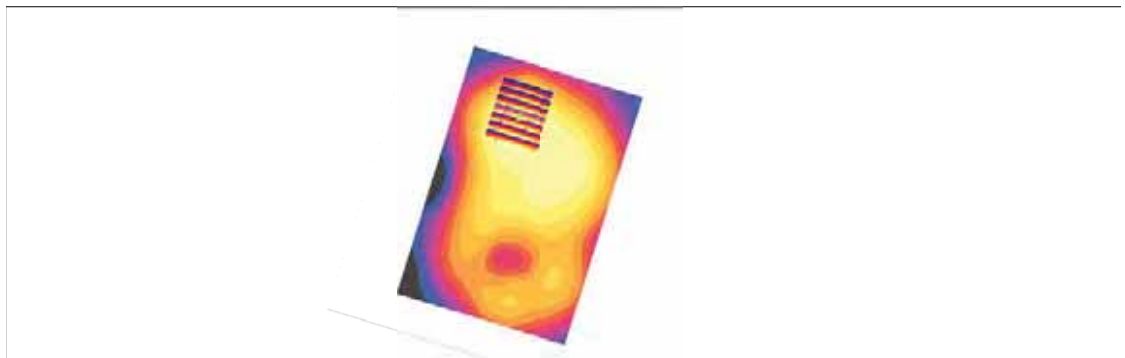
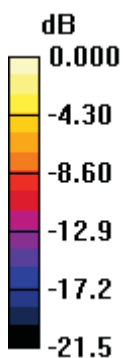
Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.97$  mho/m;  $\epsilon_r = 53.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.16, 4.16, 4.16); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 1Mbps 6ch/Area Scan (81x121x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (interpolated) = 0.099 mW/g

**Body front 1Mbps 6ch/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 5.32 V/m; Power Drift = -0.034 dB  
Peak SAR (extrapolated) = 0.220 W/kg  
**SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.051 mW/g**  
Maximum value of SAR (measured) = 0.098 mW/g



0 dB = 0.098mW/g

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.2 °C  
Ambient Temperature: 21.4 °C  
Test Date: Jul.03, 2013  
Plot NO. 19  
Distance 10 mm

**DUT: C6522N; Type: bar;**

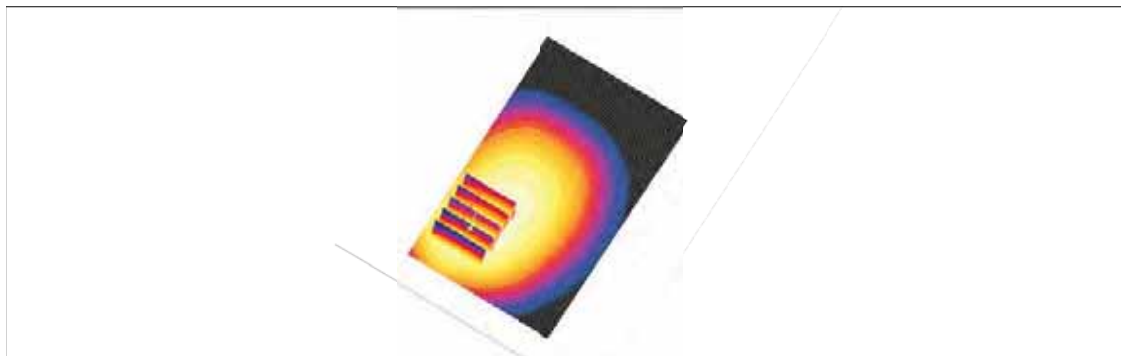
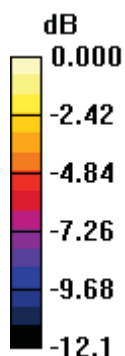
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3  
Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.981$  mho/m;  $\epsilon_r = 56.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.46, 6.46, 6.46); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 190/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 0.286 mW/g

**Body front 190/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 4.41 V/m; Power Drift = -0.044 dB  
Peak SAR (extrapolated) = 0.352 W/kg  
**SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.199 mW/g**  
Maximum value of SAR (measured) = 0.283 mW/g



0 dB = 0.283mW/g

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.4 °C  
Ambient Temperature: 21.6 °C  
Test Date: Jul.05, 2013  
Plot NO. 20  
Distance 10 mm

**DUT: C6522N; Type: bar;**

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3  
Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.53$  mho/m;  $\epsilon_r = 52.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.7, 4.7, 4.7); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 661/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 0.382 mW/g

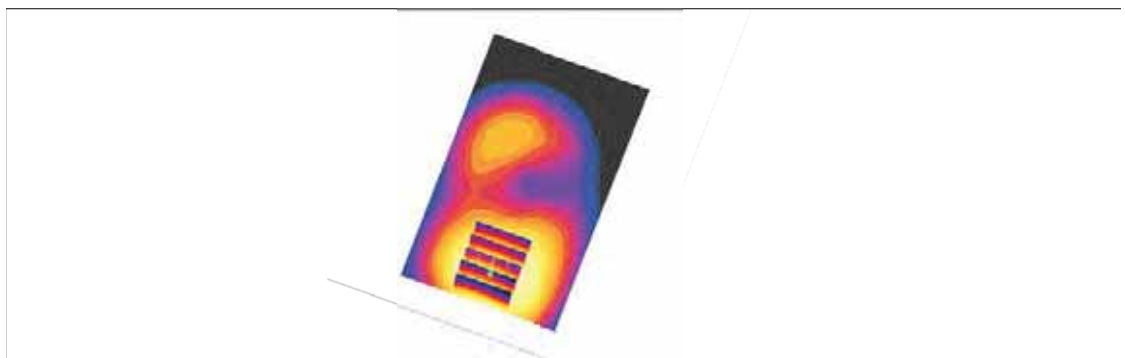
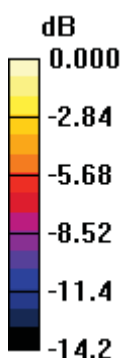
**Body front 661/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.12 V/m; Power Drift = -0.108 dB

Peak SAR (extrapolated) = 0.496 W/kg

**SAR(1 g) = 0.356 mW/g; SAR(10 g) = 0.234 mW/g**

Maximum value of SAR (measured) = 0.378 mW/g



0 dB = 0.378mW/g

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.4 °C  
Ambient Temperature: 21.6 °C  
Test Date: Jul.05, 2013  
Plot NO. 21  
Distance 10 mm

**DUT: C6522N; Type: bar;**

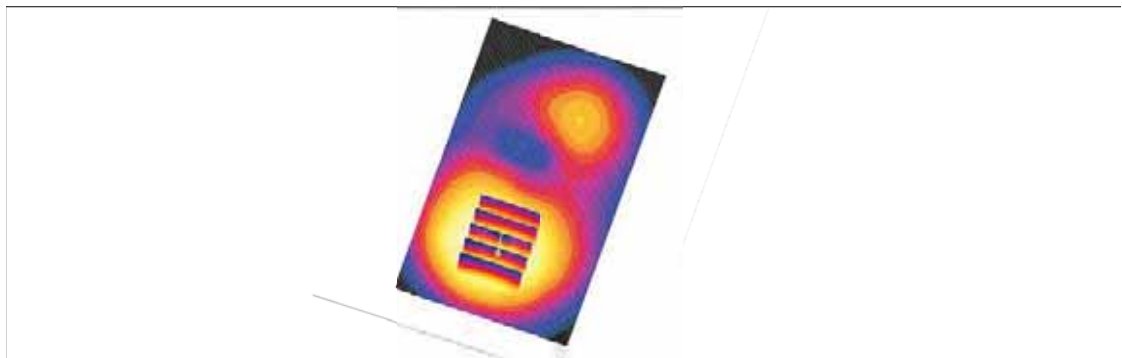
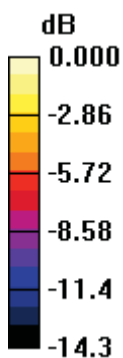
Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.075  
Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.7, 4.7, 4.7); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 512 4Tx/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 1.19 mW/g

**Body front 512 4Tx/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 15.6 V/m; Power Drift = 0.031 dB  
Peak SAR (extrapolated) = 1.51 W/kg  
**SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.754 mW/g**  
Maximum value of SAR (measured) = 1.19 mW/g



0 dB = 1.19mW/g

Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.2 °C  
Ambient Temperature: 21.4 °C  
Test Date: Jul.10, 2013  
Plot NO. 22  
Distance 10 mm

**DUT: C6522N; Type: bar;**

Communication System: LTE Band 4; Frequency: 1720 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1720$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 55.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right touch QPSK 20MHz 1RB 0offset 20050/Area Scan (61x111x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.35 mW/g

**Right touch QPSK 20MHz 1RB 0offset 20050/Zoom Scan (5x5x7)/Cube 0:**

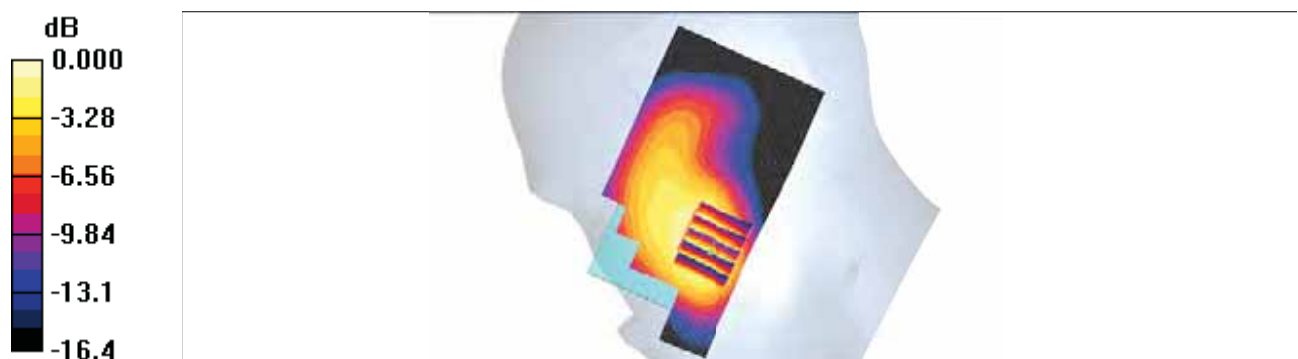
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.6 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 2.05 W/kg

**SAR(1 g) = 1.28 mW/g; SAR(10 g) = 0.772 mW/g**

Maximum value of SAR (measured) = 1.38 mW/g



0 dB = 1.38mW/g



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.4 °C  
 Ambient Temperature: 21.6 °C  
 Test Date: Jul.02, 2013  
 Plot NO. 1

DUT: C6522N; Type: bar;

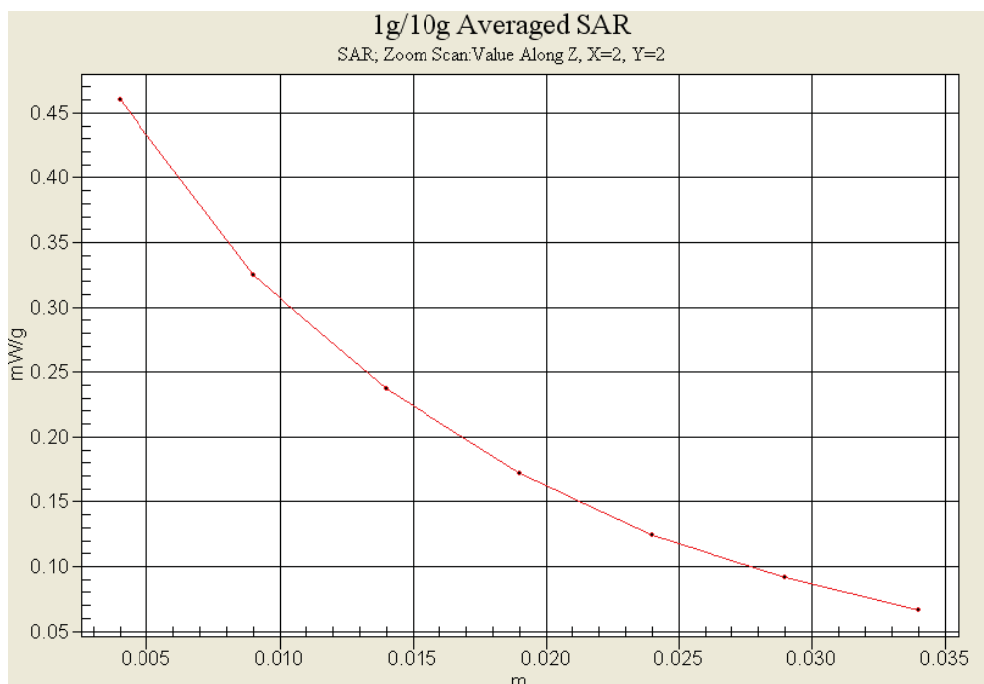
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3  
 Medium parameters used (interpolated):  $f = 836.6 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 40.4$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Left Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(9.3, 9.3, 9.3); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: SAM 835/900 MHz; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Touch 190/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.457 mW/g

**Left Touch 190/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 7.98 V/m; Power Drift = 0.019 dB  
 Peak SAR (extrapolated) = 0.616 W/kg  
**SAR(1 g) = 0.430 mW/g; SAR(10 g) = 0.296 mW/g**  
 Maximum value of SAR (measured) = 0.461 mW/g





Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.1 °C  
 Ambient Temperature: 21.3 °C  
 Test Date: Jul.04, 2013  
 Plot NO. 2

DUT: C6522N; Type: bar;

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3  
 Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.39 \text{ mho/m}$ ;  $\epsilon_r = 39.8$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Right Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(8.22, 8.22, 8.22); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right touch 661/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.395 mW/g

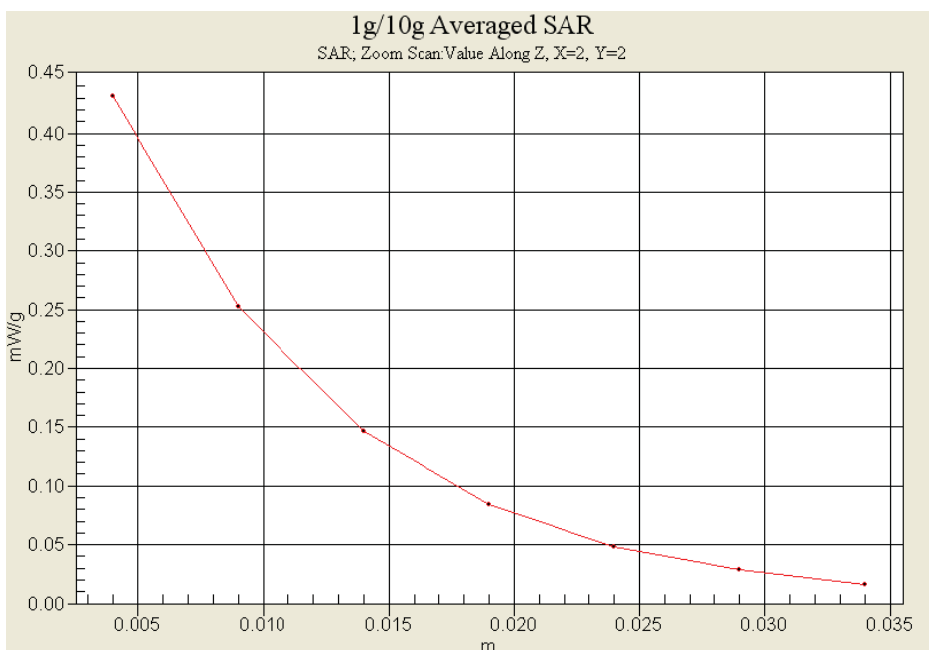
**Right touch 661/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 5.75 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 0.679 W/kg

**SAR(1 g) = 0.393 mW/g; SAR(10 g) = 0.225 mW/g**

Maximum value of SAR (measured) = 0.432 mW/g



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.4 °C  
 Ambient Temperature: 21.6 °C  
 Test Date: Jul.02, 2013  
 Plot NO. 3

DUT: C6522N; Type: bar;

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1  
 Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.92$  mho/m;  $\epsilon_r = 40.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Left Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(9.3, 9.3, 9.3); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: SAM 835/900 MHz; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Touch 4183/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm  
 Maximum value of SAR (interpolated) = 0.687 mW/g

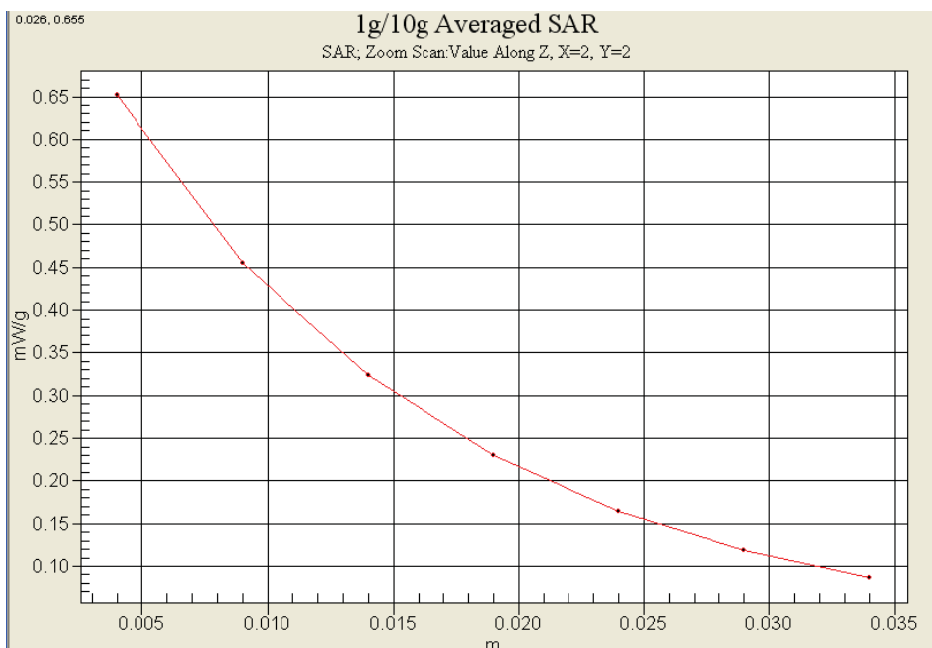
**Left Touch 4183/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.87 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.883 W/kg

**SAR(1 g) = 0.615 mW/g; SAR(10 g) = 0.422 mW/g**

Maximum value of SAR (measured) = 0.653 mW/g



Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.6 °C  
Ambient Temperature: 21.8 °C  
Test Date: Jul.09, 2013  
Plot NO. 4

DUT: C6522N; Type: bar;

Communication System: WCDMA IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 1712.4$  MHz;  $\sigma = 1.3$  mho/m;  $\epsilon_r = 39.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(8.46, 8.46, 8.46); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Touch 1312/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 1.17 mW/g

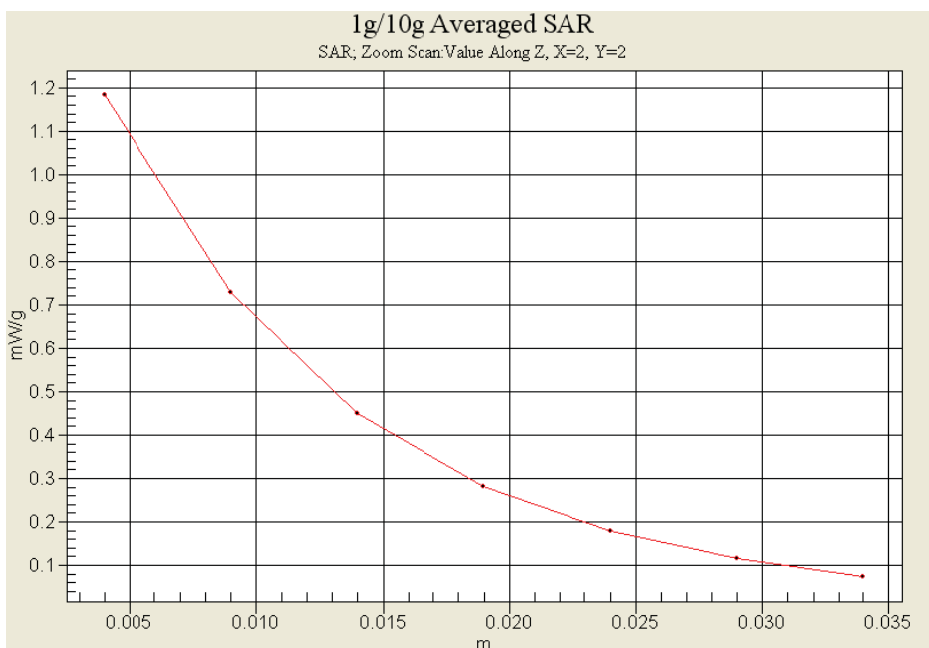
**Right Touch 1312/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.2 V/m; Power Drift = 0.127 dB

Peak SAR (extrapolated) = 1.80 W/kg

**SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.661 mW/g**

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



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.1 °C  
 Ambient Temperature: 21.3 °C  
 Test Date: Jul.04, 2013  
 Plot NO. 5

DUT: C6522N; Type: bar;

Communication System: WCDMA1900; Frequency: 1852.4 MHz; Duty Cycle: 1:1  
 Medium parameters used (interpolated):  $f = 1852.4 \text{ MHz}$ ;  $\sigma = 1.36 \text{ mho/m}$ ;  $\epsilon_r = 40$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Right Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(8.22, 8.22, 8.22); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right touch 9262/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.790 mW/g

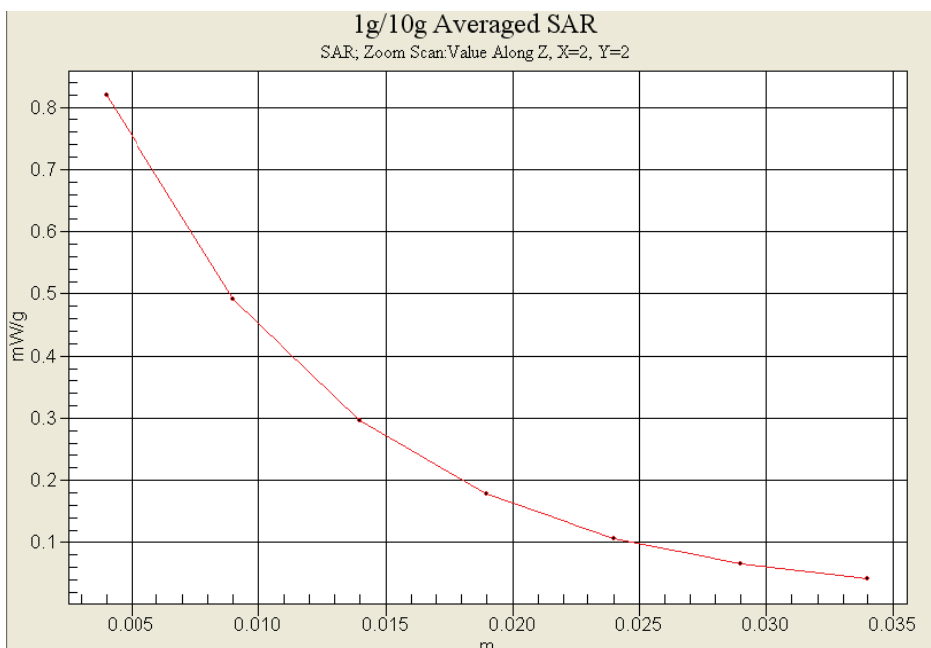
**Right touch 9262/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.33 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 1.25 W/kg

**SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.446 mW/g**

Maximum value of SAR (measured) = 0.820 mW/g



Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.5 °C  
Ambient Temperature: 21.7 °C  
Test Date: Jul.06, 2013  
Plot NO. 6

DUT: C6522N; Type: bar;

Communication System: LTE 17; Frequency: 709 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 709$  MHz;  $\sigma = 0.877$  mho/m;  $\epsilon_r = 42.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(9.53, 9.53, 9.53); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 1800/1900 Phantom; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Touch QPSK 10MHz 1RB 49offset 23780ch/Area Scan (61x111x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.566 mW/g

**Left Touch QPSK 10MHz 1RB 49offset 23780ch/Zoom Scan (5x5x7)/Cube 0:**

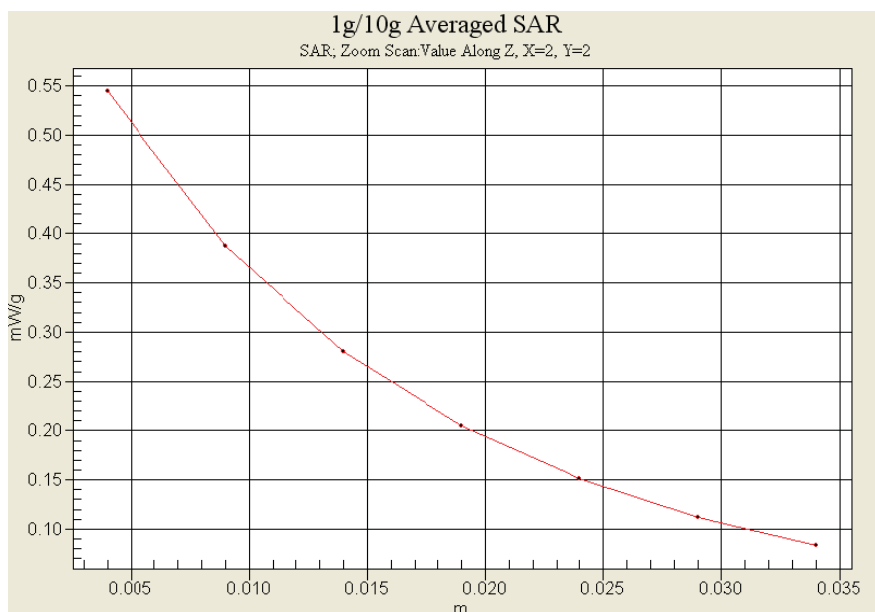
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.91 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.719 W/kg

**SAR(1 g) = 0.510 mW/g; SAR(10 g) = 0.357 mW/g**

Maximum value of SAR (measured) = 0.542 mW/g



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.6 °C  
 Ambient Temperature: 21.8 °C  
 Test Date: Jul.09, 2013  
 Plot NO. 7

DUT: C6522N; Type: bar;

Communication System: LTE Band 4; Frequency: 1720 MHz; Duty Cycle: 1:1  
 Medium parameters used:  $f = 1720 \text{ MHz}$ ;  $\sigma = 1.44 \text{ mho/m}$ ;  $\epsilon_r = 55.2$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Right Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right touch QPSK 20MHz 1RB 0offset 20050/Area Scan (61x111x1):

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.33 mW/g

Right touch QPSK 20MHz 1RB 0offset 20050/Zoom Scan (5x5x7)/Cube 0:

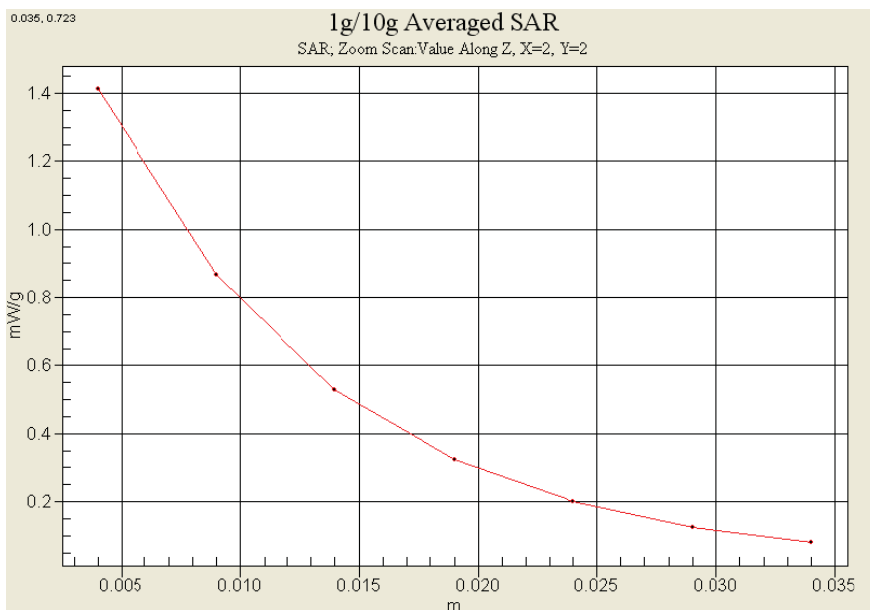
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 10.5 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 2.09 W/kg

**SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.777 mW/g**

Maximum value of SAR (measured) = 1.41 mW/g



Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.3 °C  
Ambient Temperature: 21.5 °C  
Test Date: Jul.11, 2013  
Plot NO. 8

DUT: C6522N; Type: bar;

Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.79$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASy4 (High Precision Assessment)

DASy4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(7.19, 7.19, 7.19); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom ; Type: SAM;
- Measurement SW: DASy4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right tilt 1Mbps 6ch/Area Scan (81x121x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (interpolated) = 0.617 mW/g

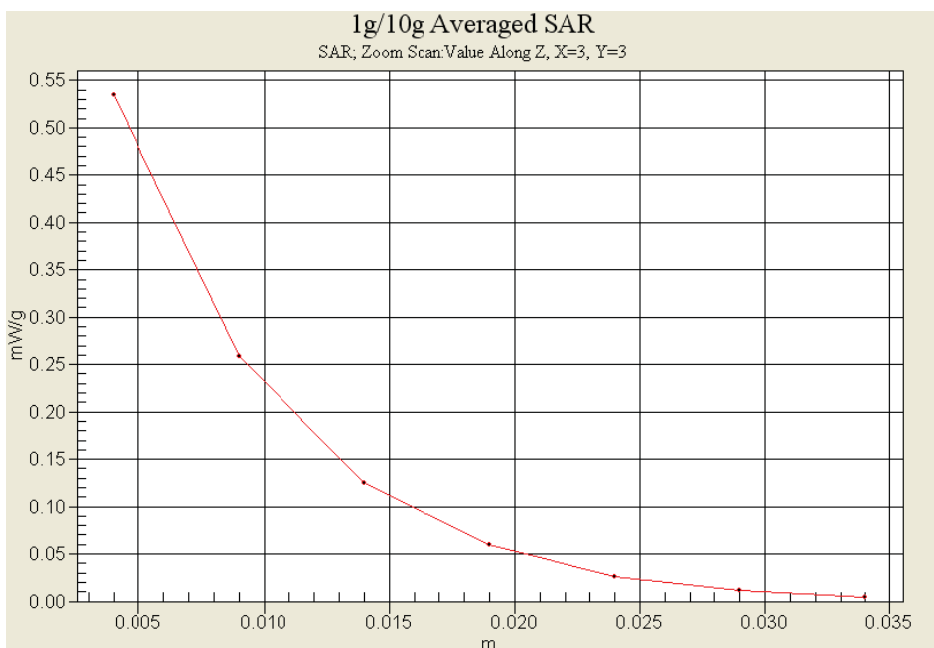
**Right tilt 1Mbps 6ch/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.3 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 1.02 W/kg

**SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.217 mW/g**

Maximum value of SAR (measured) = 0.534 mW/g





Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.2 °C  
 Ambient Temperature: 21.4 °C  
 Test Date: Jul.03, 2013  
 Plot NO. 9

DUT: C6522N; Type: bar;

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.075  
 Medium parameters used (interpolated):  $f = 836.6 \text{ MHz}$ ;  $\sigma = 0.981 \text{ mho/m}$ ;  $\epsilon_r = 56.9$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Center Section  
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.46, 6.46, 6.46); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 190 4Tx/Area Scan (61x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.591 mW/g

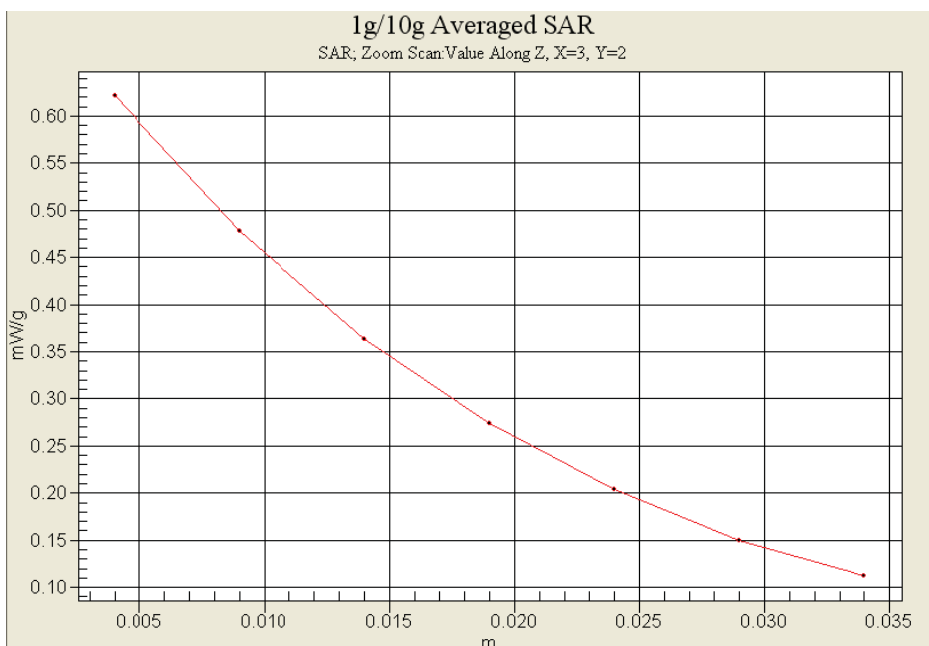
**Body front 190 4Tx/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 11.1 V/m; Power Drift = 0.186 dB

Peak SAR (extrapolated) = 0.770 W/kg

**SAR(1 g) = 0.590 mW/g; SAR(10 g) = 0.433 mW/g**

Maximum value of SAR (measured) = 0.622 mW/g



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.4 °C  
 Ambient Temperature: 21.6 °C  
 Test Date: Jul.05, 2013  
 Plot NO. 10

DUT: C6522N; Type: bar;

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.075  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.5 \text{ mho/m}$ ;  $\epsilon_r = 52.3$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Center Section  
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.7, 4.7, 4.7); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 512 4Tx/Area Scan (61x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 1.28 mW/g

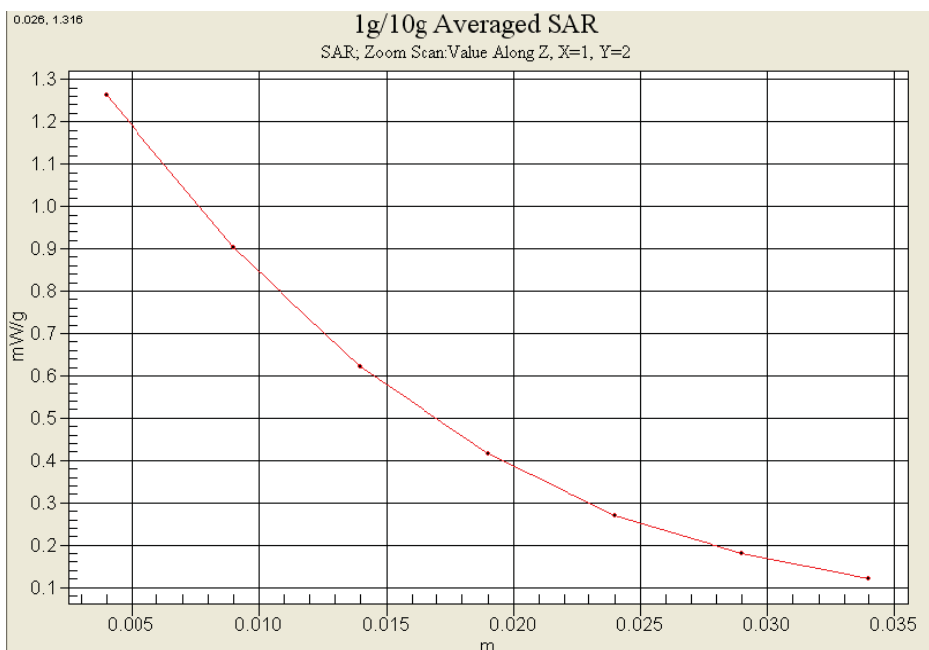
**Body front 512 4Tx/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 14.5 V/m; Power Drift = -0.070 dB

Peak SAR (extrapolated) = 1.56 W/kg

**SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.757 mW/g**

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



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.2 °C  
 Ambient Temperature: 21.4 °C  
 Test Date: Jul.03, 2013  
 Plot NO. 12

DUT: C6522N; Type: bar;

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1  
 Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.981$  mho/m;  $\epsilon_r = 56.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Center Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.46, 6.46, 6.46); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 4183/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm  
 Maximum value of SAR (interpolated) = 0.494 mW/g

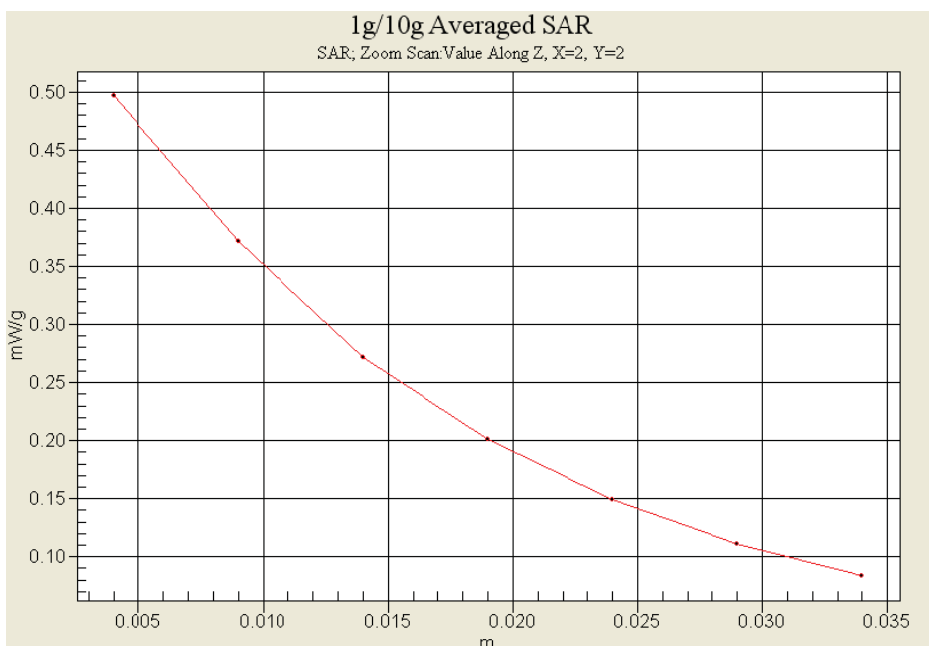
**Body front 4183/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.65 V/m; Power Drift = -0.161 dB

Peak SAR (extrapolated) = 0.636 W/kg

**SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.344 mW/g**

Maximum value of SAR (measured) = 0.497 mW/g



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.2 °C  
 Ambient Temperature: 21.4 °C  
 Test Date: Jul.10, 2013  
 Plot NO. 14

DUT: C6522N; Type: bar;

Communication System: WCDMA IV; Frequency: 1732.4 MHz; Duty Cycle: 1:1  
 Medium parameters used (interpolated):  $f = 1732.4$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 55.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Center Section  
 Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.93, 4.93, 4.93); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body rear 1412/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm  
 Maximum value of SAR (interpolated) = 1.22 mW/g

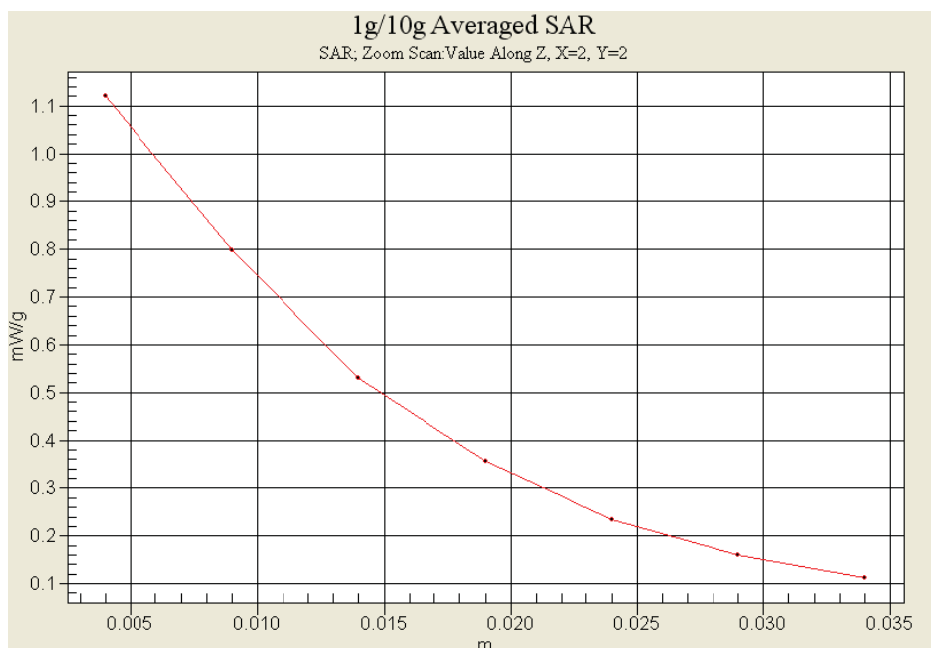
**Body rear 1412/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.3 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 1.43 W/kg

**SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.700 mW/g**

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



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.4 °C  
 Ambient Temperature: 21.6 °C  
 Test Date: Jul.05, 2013  
 Plot NO. 15

DUT: C6522N; Type: bar;

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1  
 Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.53 \text{ mho/m}$ ;  $\epsilon_r = 52.2$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Center Section  
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.7, 4.7, 4.7); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body rear 9400/Area Scan (61x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.704 mW/g

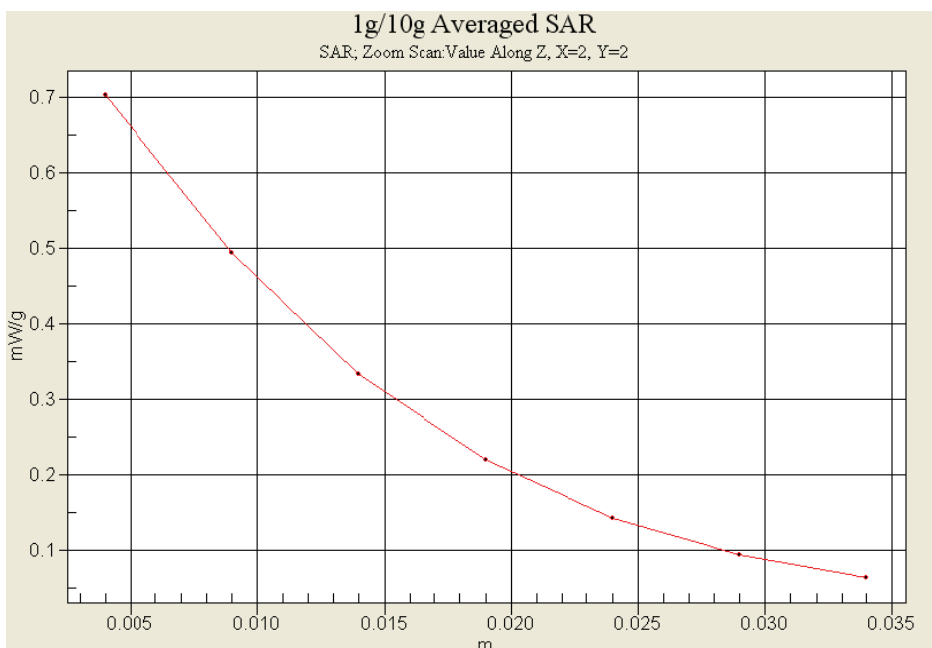
**Body rear 9400/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.46 V/m; Power Drift = -0.086 dB

Peak SAR (extrapolated) = 0.899 W/kg

**SAR(1 g) = 0.649 mW/g; SAR(10 g) = 0.426 mW/g**

Maximum value of SAR (measured) = 0.704 mW/g



Test Laboratory: HCT CO., LTD  
EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
Liquid Temperature: 21.3 °C  
Ambient Temperature: 21.5 °C  
Test Date: Jul.08, 2013  
Plot NO. 16

**DUT: C6522N; Type: bar;**

Communication System: LTE 17; Frequency: 709 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 709$  MHz;  $\sigma = 0.932$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

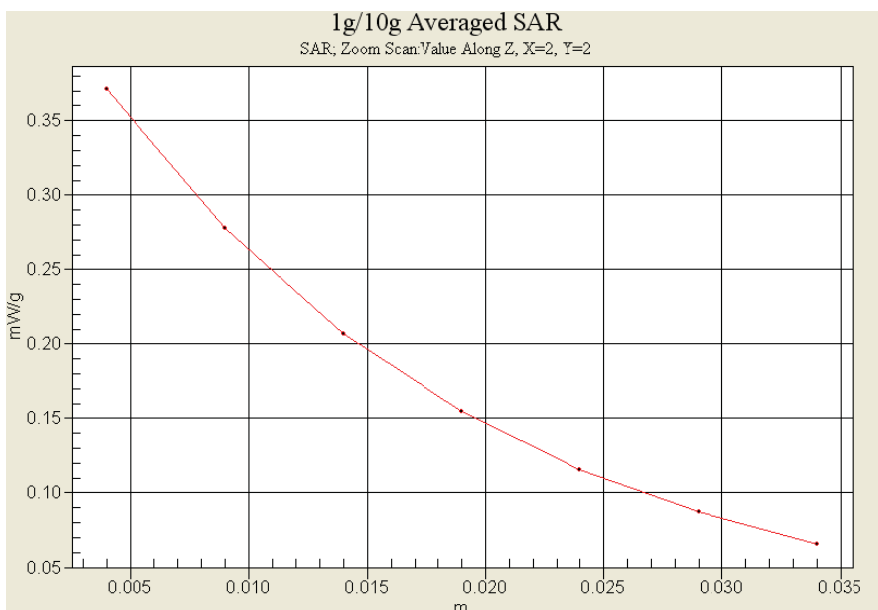
- Probe: ET3DV6 – SN1798; ConvF(6.62, 6.62, 6.62); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front QPSK 10MHz 1RB 49offst 23780ch/Area Scan (61x101x1):**

Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 0.378 mW/g

**Body front QPSK 10MHz 1RB 49offst 23780ch/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 4.54 V/m; Power Drift = -0.084 dB  
Peak SAR (extrapolated) = 0.472 W/kg  
**SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.256 mW/g**  
Maximum value of SAR (measured) = 0.371 mW/g



Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.2 °C  
 Ambient Temperature: 21.4 °C  
 Test Date: Jul.10, 2013  
 Plot NO. 17

DUT: C6522N; Type: bar;

Communication System: LTE Band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1  
 Medium parameters used (interpolated):  $f = 1732.5 \text{ MHz}$ ;  $\sigma = 1.45 \text{ mho/m}$ ;  $\epsilon_r = 55.2$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Center Section  
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.93, 4.93, 4.93); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body rear QPSK 20MHz 1RB 99offset 20175ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.961 mW/g

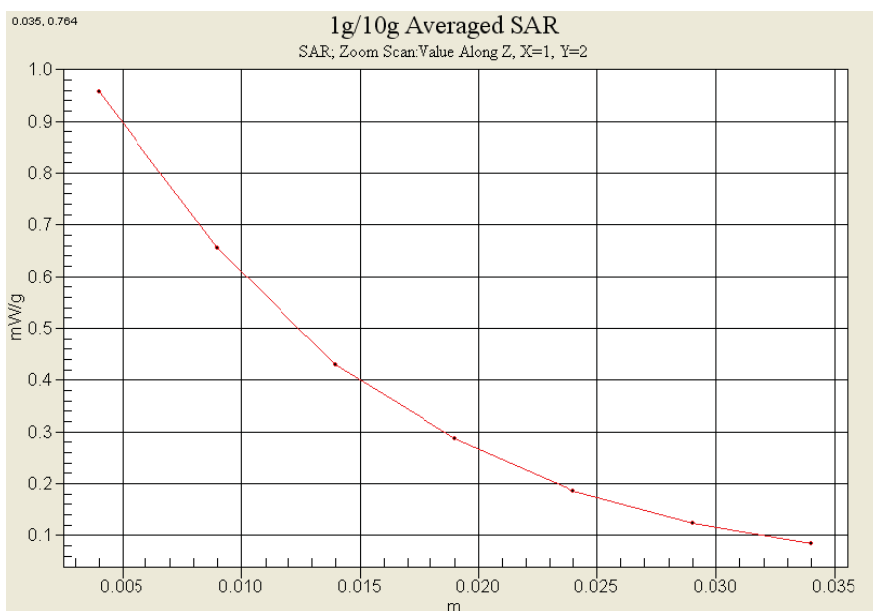
Body rear QPSK 20MHz 1RB 99offset 20175ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.24 W/kg

**SAR(1 g) = 0.888 mW/g; SAR(10 g) = 0.582 mW/g**

Maximum value of SAR (measured) = 0.952 mW/g





Test Laboratory: HCT CO., LTD  
 EUT Type: GSM/ WCDMA/ LTE Phone with Bluetooth/WLAN  
 Liquid Temperature: 21.3 °C  
 Ambient Temperature: 21.5 °C  
 Test Date: Jul.11, 2013  
 Plot NO. 18

DUT: C6522N; Type: bar;

Communication System: 2450MHz FCC; Frequency: 2437 MHz;Duty Cycle: 1:1  
 Medium parameters used (interpolated):  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.97 \text{ mho/m}$ ;  $\epsilon_r = 53.5$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Center Section  
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.16, 4.16, 4.16); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body front 1Mbps 6ch/Area Scan (81x121x1):** Measurement grid:  $dx=12\text{mm}$ ,  $dy=12\text{mm}$   
 Maximum value of SAR (interpolated) = 0.099 mW/g

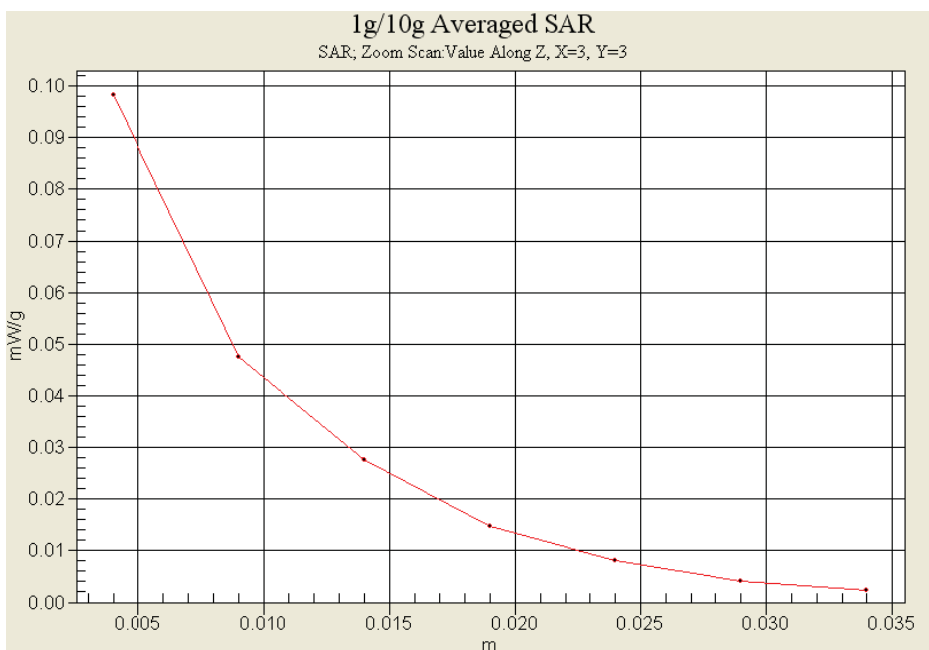
**Body front 1Mbps 6ch/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  
 $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 5.32 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 0.220 W/kg

**SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.051 mW/g**

Maximum value of SAR (measured) = 0.098 mW/g



## Attachment 2. – Dipole Verification Plots

## ■ Verification Data (750 MHz Head)

Test Laboratory: HCT CO., LTD  
Input Power: 100 mW (20 dBm)  
Liquid Temp: 21.5 °C  
Test Date: Jul.06, 2013

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 – SN:1014

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 750$  MHz;  $\sigma = 0.908$  mho/m;  $\epsilon_r = 42.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(9.53, 9.53, 9.53); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: SAM 1800/1900 MHz; Type: SAM; Serial: TP-1173
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Verification 750 MHz/Area Scan (61x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.937 mW/g

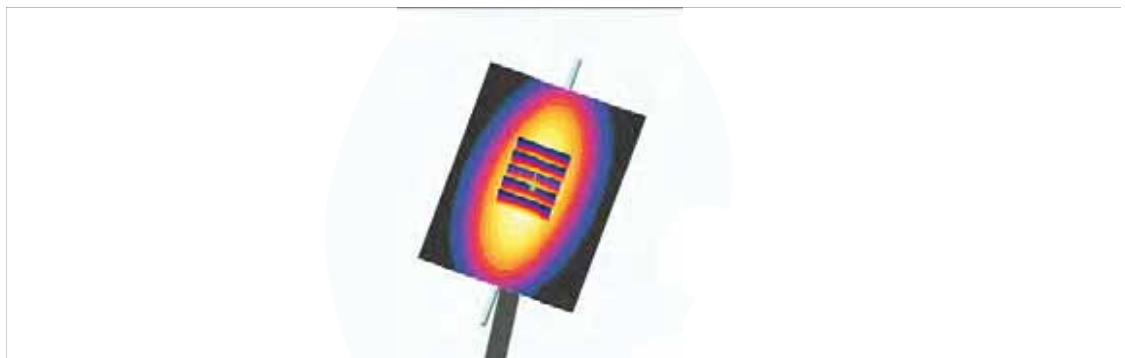
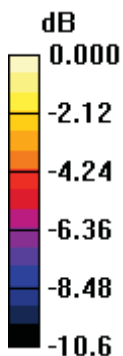
**Verification 750 MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 32.3 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 1.28 W/kg

**SAR(1 g) = 0.862 mW/g; SAR(10 g) = 0.565 mW/g**

Maximum value of SAR (measured) = 0.930 mW/g



0 dB = 0.930mW/g

## ■ Verification Data (750 MHz Body)

Test Laboratory: HCT CO., LTD  
Input Power: 100 mW (20 dBm)  
Liquid Temp: 21.0 °C  
Test Date: Jul.08, 2013

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 – SN:1014

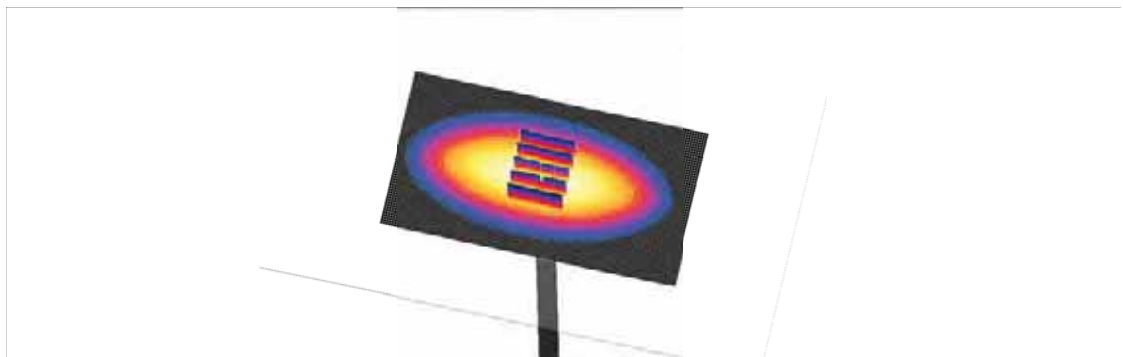
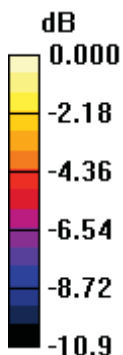
Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 750$  MHz;  $\sigma = 0.971$  mho/m;  $\epsilon_r = 54.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.62, 6.62, 6.62); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Verification 750MHz/Area Scan (111x61x1): Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 0.966 mW/g

Verification 750MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 32.8 V/m; Power Drift = -0.015 dB  
Peak SAR (extrapolated) = 1.33 W/kg  
SAR(1 g) = 0.894 mW/g; SAR(10 g) = 0.578 mW/g  
Maximum value of SAR (measured) = 0.969 mW/g



0 dB = 0.969mW/g

## ■ Verification Data (835 MHz Head)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.4 °C  
Test Date: Jul.02, 2013

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

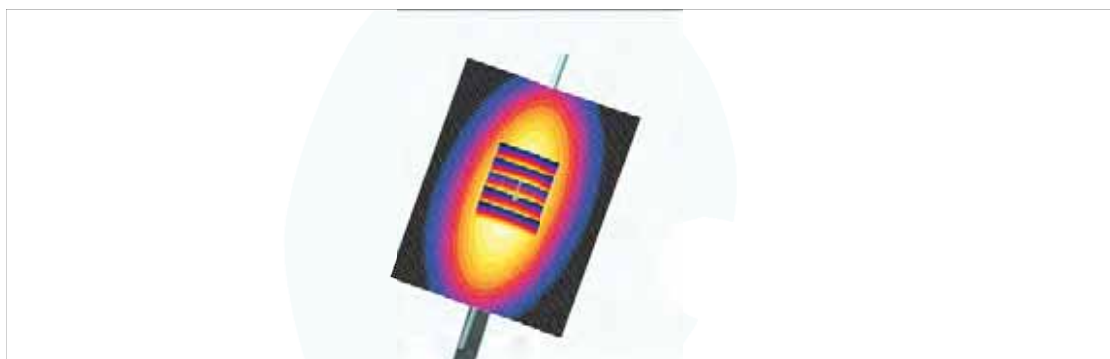
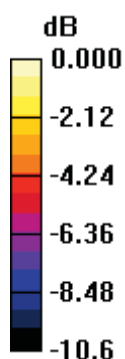
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.919$  mho/m;  $\epsilon_r = 40.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(9.3, 9.3, 9.3); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: SAM 1800/1900 MHz; Type: SAM; Serial: TP-1173
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Verification 835 MHz/Area Scan (61x81x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 1.07 mW/g

**Verification 835 MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 34.2 V/m; Power Drift = -0.034 dB  
Peak SAR (extrapolated) = 1.46 W/kg  
**SAR(1 g) = 0.982 mW/g; SAR(10 g) = 0.644 mW/g**  
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

## ■ Verification Data (835 MHz Body)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.2 °C  
Test Date: Jul.03, 2013

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

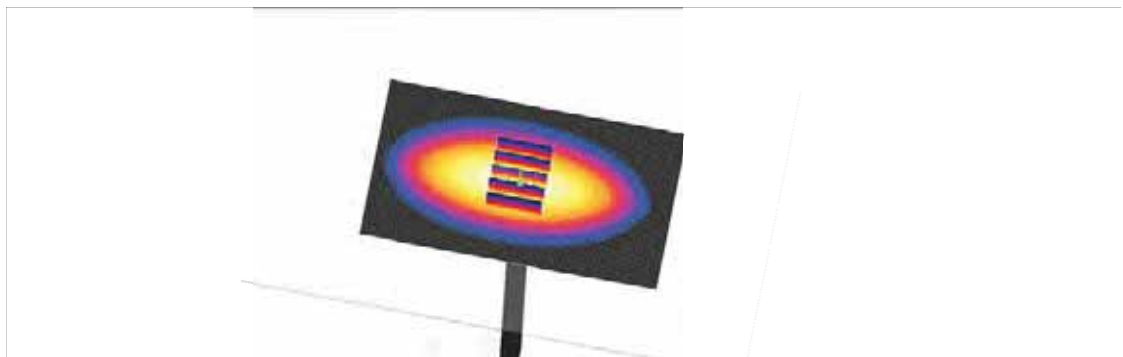
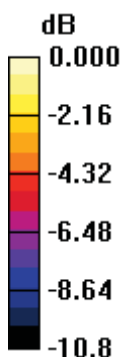
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 56.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(6.46, 6.46, 6.46); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Verification 835 MHz/Area Scan (111x61x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 1.04 mW/g

**Verification 835 MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 33.7 V/m; Power Drift = -0.013 dB  
Peak SAR (extrapolated) = 1.41 W/kg  
**SAR(1 g) = 0.956 mW/g; SAR(10 g) = 0.619 mW/g**  
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

## ■ Verification Data (1 800 MHz Head)

Test Laboratory: HCT CO., LTD  
Input Power: 100 mW (20 dBm)  
Liquid Temp: 21.6 °C  
Test Date: Jul.09, 2013

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 – SN:2d007

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1800$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 39.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(8.46, 8.46, 8.46); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: SAM 1800/1900 MHz; Type: SAM; Serial: TP-1173
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Dipole 1800MHz Verification/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 4.29 mW/g

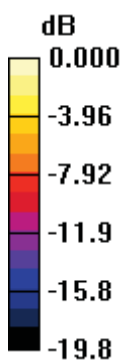
Dipole 1800MHz Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.1 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 7.10 W/kg

SAR(1 g) = 3.65 mW/g; SAR(10 g) = 1.86 mW/g

Maximum value of SAR (measured) = 3.99 mW/g



0 dB = 3.99mW/g



## ■ Verification Data (1 800 MHz body)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.2 °C  
Test Date: Jul.10, 2013

**DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 – SN: 2d007**

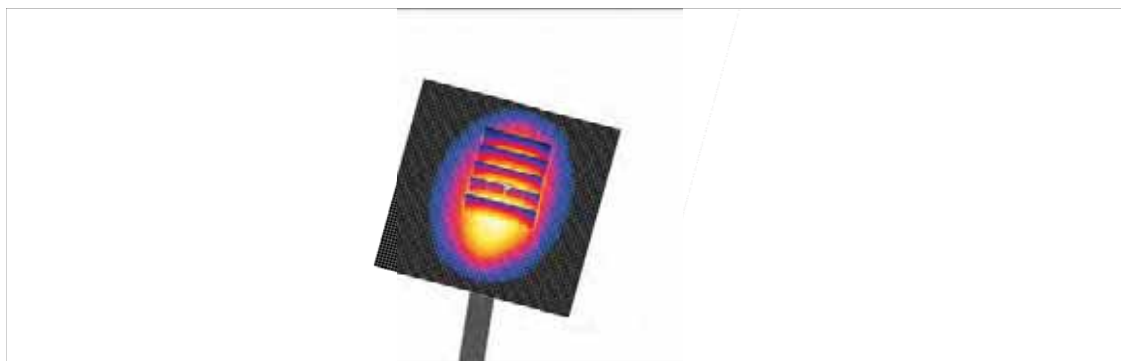
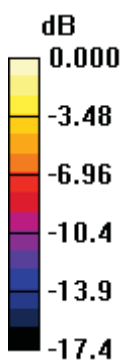
Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1800$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.93, 4.93, 4.93); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Verification 1800 MHz/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 4.48 mW/g

**Verification 1800 MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 57.1 V/m; Power Drift = -0.027 dB  
Peak SAR (extrapolated) = 6.20 W/kg  
**SAR(1 g) = 3.84 mW/g; SAR(10 g) = 2.09 mW/g**  
Maximum value of SAR (measured) = 4.29 mW/g



0 dB = 4.29mW/g

## ■ Verification Data (1 900 MHz Head)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.1 °C  
Test Date: Jul.04, 2013

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d038**

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 39.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(8.22, 8.22, 8.22); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: SAM 1800/1900 MHz; Type: SAM; Serial: TP-1173
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Dipole 1900MHz Verification/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 4.45 mW/g

**Dipole 1900MHz Verification/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 54.5 V/m; Power Drift = -0.013 dB  
Peak SAR (extrapolated) = 7.35 W/kg  
**SAR(1 g) = 3.79 mW/g; SAR(10 g) = 1.93 mW/g**  
Maximum value of SAR (measured) = 4.14 mW/g



0 dB = 4.14mW/g

## ■ Verification Data (1 900 MHz Body)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.4 °C  
Test Date: Jul.05, 2013

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN: 5d038

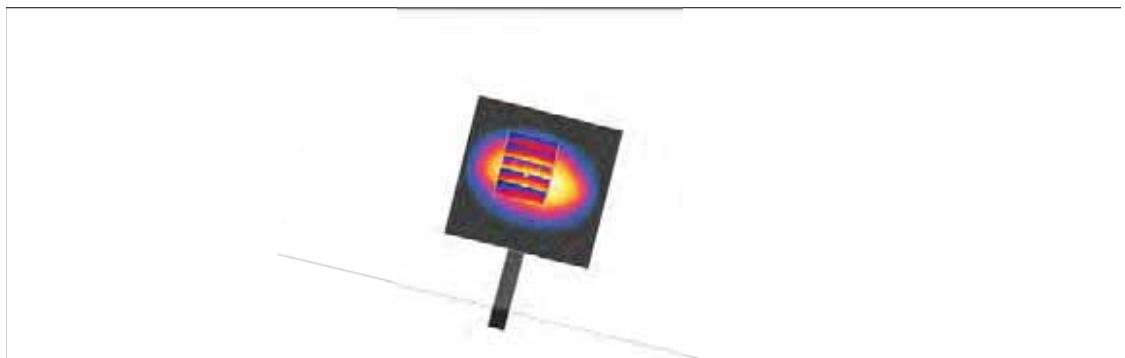
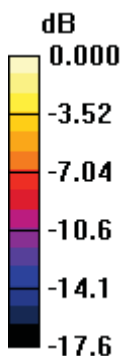
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.55$  mho/m;  $\epsilon_r = 52.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.7, 4.7, 4.7); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C\_20120905; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Verification 1900 MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 4.58 mW/g

Verification 1900 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 56.6 V/m; Power Drift = -0.032 dB  
Peak SAR (extrapolated) = 6.45 W/kg  
SAR(1 g) = 3.94 mW/g; SAR(10 g) = 2.14 mW/g  
Maximum value of SAR (measured) = 4.41 mW/g



0 dB = 4.41 mW/g

## ■ Verification Data (2 450 MHz Head)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.3 °C  
Test Date: Jul.11, 2013

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743**

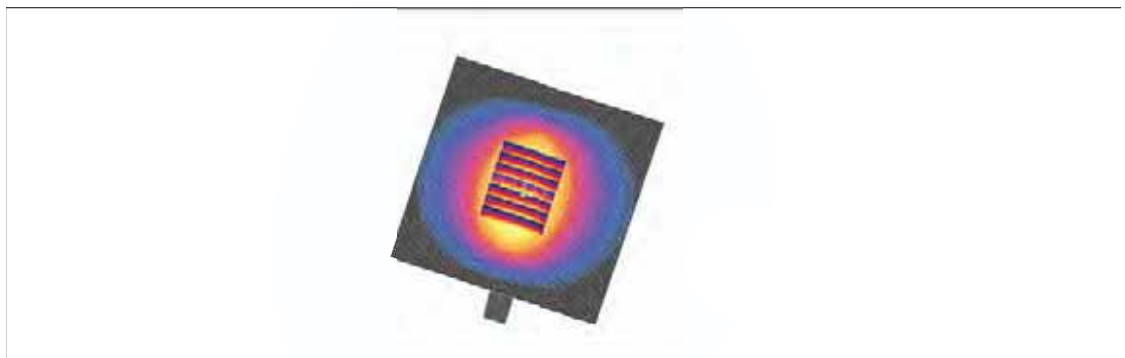
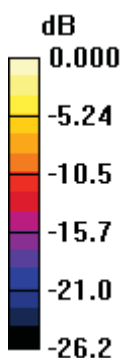
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.8$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(7.19, 7.19, 7.19); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2013-01-16
- Phantom: 835/900 Phantom ; Type: SAM; Serial:
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Verification 2450MHz/Area Scan (81x81x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (interpolated) = 8.32 mW/g

**Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 56.6 V/m; Power Drift = -0.052 dB  
Peak SAR (extrapolated) = 11.7 W/kg  
**SAR(1 g) = 5.06 mW/g; SAR(10 g) = 2.2 mW/g**  
Maximum value of SAR (measured) = 8.14 mW/g



0 dB = 8.14mW/g

## ■ Verification Data (2 450 MHz Body)

Test Laboratory: HCT CO., LTD  
Input Power 100 mW (20 dBm)  
Liquid Temp: 21.3 °C  
Test Date: Jul.11, 2013

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743

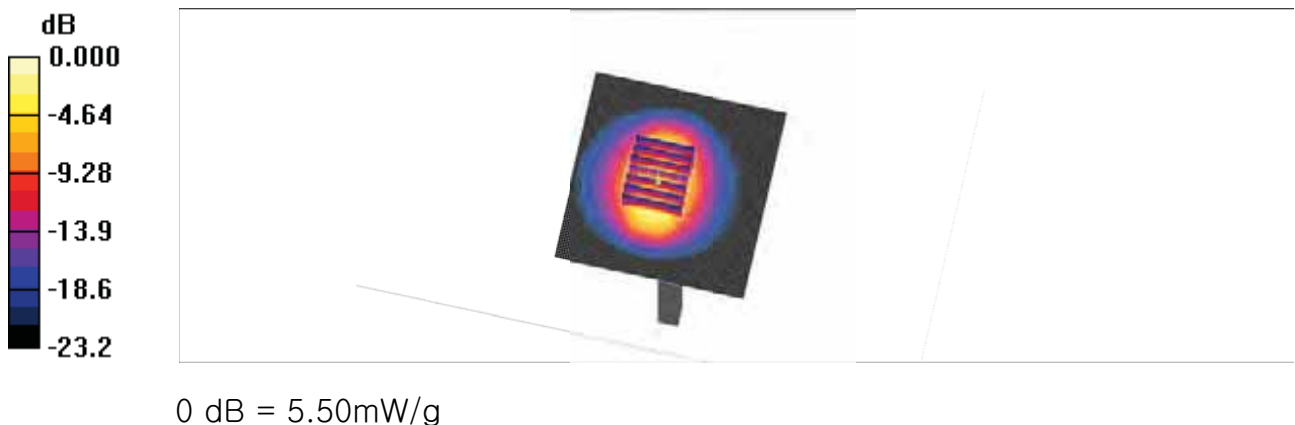
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.99$  mho/m;  $\epsilon_r = 53.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Center Section  
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 – SN1798; ConvF(4.16, 4.16, 4.16); Calibrated: 2013-04-29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2013-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Verification 2450MHz/Area Scan (81x81x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (interpolated) = 5.70 mW/g

**Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 46.7 V/m; Power Drift = -0.009 dB  
Peak SAR (extrapolated) = 13.6 W/kg  
**SAR(1 g) = 5.09 mW/g; SAR(10 g) = 2.25 mW/g**  
Maximum value of SAR (measured) = 5.50 mW/g



## Attachment 3. – Probe Calibration Data

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



S Schweizerischer Kalibrierdienst  
S 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: EX3-3863\_Jul12

## CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3863

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4  
Calibration procedure for dosimetric E-field probes

Calibration date: July 13, 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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (MSTE critical for calibration):

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	CB41253874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41450087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-2013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8548G	US3B42U01700	4-Aug-99 (in house check Apr-11)	in house check: Apr-13
Network Analyzer HP 8753E	US37310565	18-Oct-01 (in house check Oct-11)	in house check: Oct-12

Calibrated by:	Name Jelon Kastali	Function Laboratory Technician	Signature 
Approved by:	Name Korja Polovic	Technical Manager	

Issued: July 14, 2012

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



**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

**Glossary:**

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\theta$	$\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ 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<sub>x,y,z</sub>:** Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* 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<sub>x,y,z</sub>:** DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR:** PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; VR<sub>x,y,z</sub>:** A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  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<sub>x,y,z</sub> \* 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  $\pm 50$  MHz to  $\pm 100$  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.

EX3DV4 – SN:3863

July 13, 2012

# Probe EX3DV4

## SN:3863

Manufactured: February 2, 2012

Calibrated: July 13, 2012

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

EX3DV4- SN:3863

July 13, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	0.36	0.36	0.45	$\pm 10.1 \%$
DCP (mV) <sup>B</sup>	103.0	100.6	98.8	

### Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc <sup>C</sup> (k=2)
0	CW	0.00	X	0.00	0.00	1.00	138.3	$\pm 2.2 \%$
			Y	0.00	0.00	1.00	134.3	
			Z	0.00	0.00	1.00	115.9	

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

<sup>A</sup> The uncertainties of Norm X, Y, Z do not affect the  $E^2$ -field uncertainty inside T&L. (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter; uncertainty not required.

<sup>C</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4 - SN:3863

July 13, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>c</sup>	Relative Permittivity <sup>d</sup>	Conductivity (S/m) <sup>d</sup>	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	9.53	9.53	9.53	0.48	0.80	± 12.0 %
835	41.5	0.90	9.30	9.30	9.30	0.73	0.63	± 12.0 %
900	41.5	0.97	8.96	8.96	8.96	0.25	1.20	± 12.0 %
1750	40.1	1.37	8.46	8.46	8.46	0.10	0.50	± 12.0 %
1900	40.0	1.40	8.22	8.22	8.22	0.79	0.59	± 12.0 %
1950	40.0	1.40	7.79	7.79	7.79	0.25	1.02	± 12.0 %
2450	39.2	1.80	7.19	7.19	7.19	0.49	0.74	± 12.0 %
5200	36.0	4.66	4.96	4.96	4.96	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.79	4.79	4.79	0.38	1.80	± 13.1 %
5500	35.6	4.96	4.66	4.66	4.66	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.56	4.56	4.56	0.38	1.80	± 13.1 %
5800	35.3	5.27	4.61	4.61	4.61	0.40	1.80	± 13.1 %

<sup>c</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>d</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

EX3DV4-SN:3863

July 13, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

### Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.35	9.35	9.35	0.28	1.11	± 12.0 %
835	55.2	0.97	9.25	9.25	9.25	0.37	0.91	± 12.0 %
1750	53.4	1.49	7.80	7.80	7.80	0.42	0.85	± 12.0 %
1900	53.3	1.52	7.46	7.46	7.46	0.24	1.19	± 12.0 %
2450	52.7	1.95	7.00	7.00	7.00	0.60	0.50	± 12.0 %
5200	49.0	5.30	4.35	4.35	4.35	0.45	1.90	± 13.1 %
5300	48.9	5.42	4.10	4.10	4.10	0.48	1.90	± 13.1 %
5500	48.6	5.65	3.91	3.91	3.91	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.86	3.86	3.86	0.55	1.90	± 13.1 %
5800	48.2	6.00	3.81	3.81	3.81	0.58	1.90	± 13.1 %

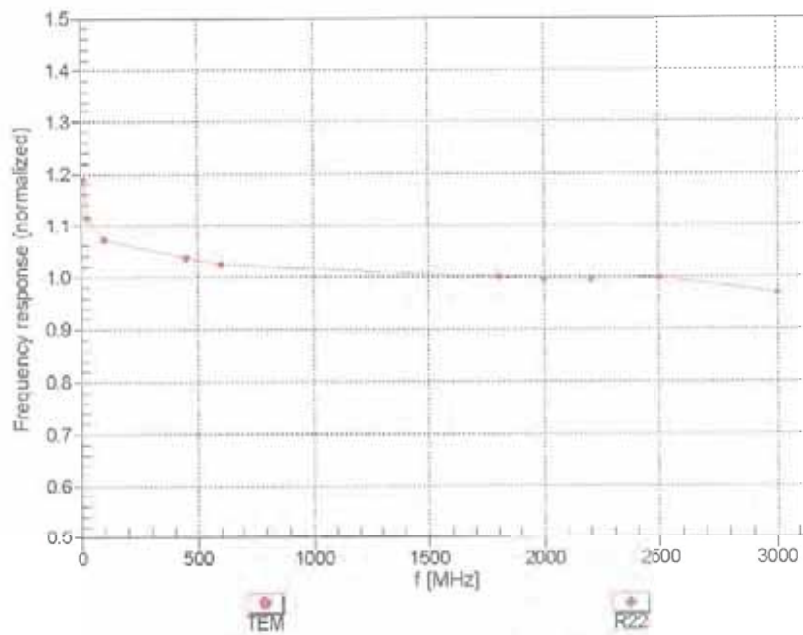
<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2); else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

EX3DV4-SN:3863

July 13, 2012

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



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

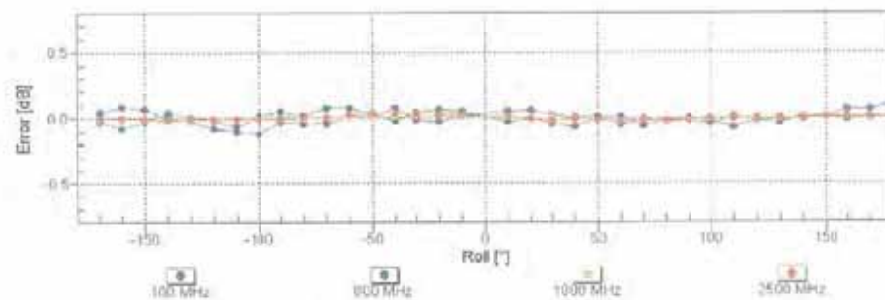
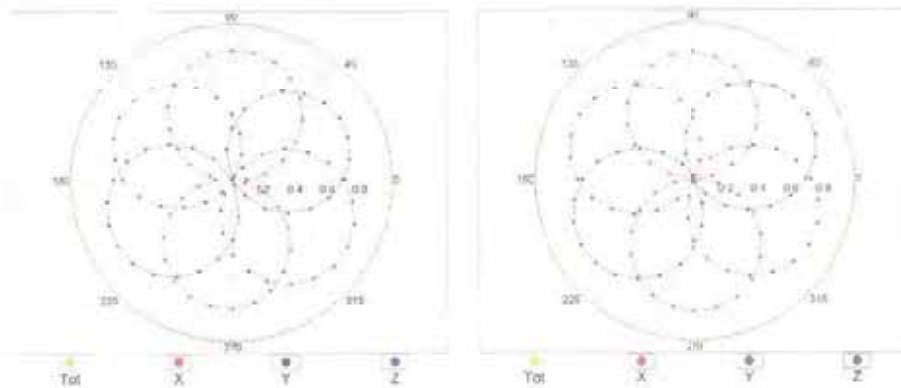
EX3DV4-SN:3863

July 13, 2012

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

f=600 MHz, TEM

f=1800 MHz, R22



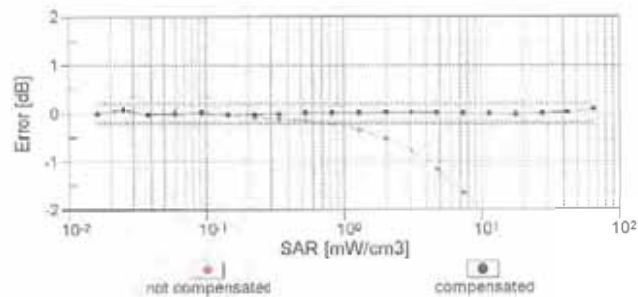
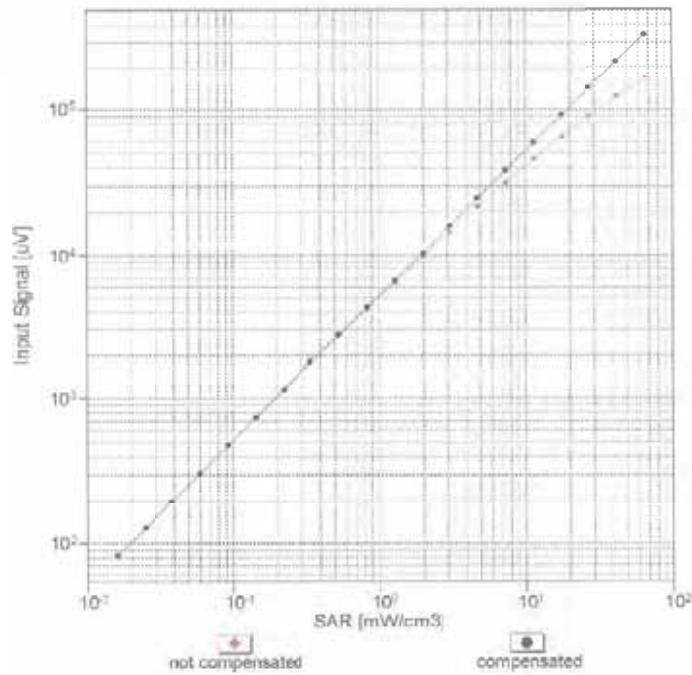
Uncertainty of Axial isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )



EX3DV4- SN:3863

July 13, 2012

### Dynamic Range f(SAR<sub>head</sub>) (TEM cell, f = 900 MHz)



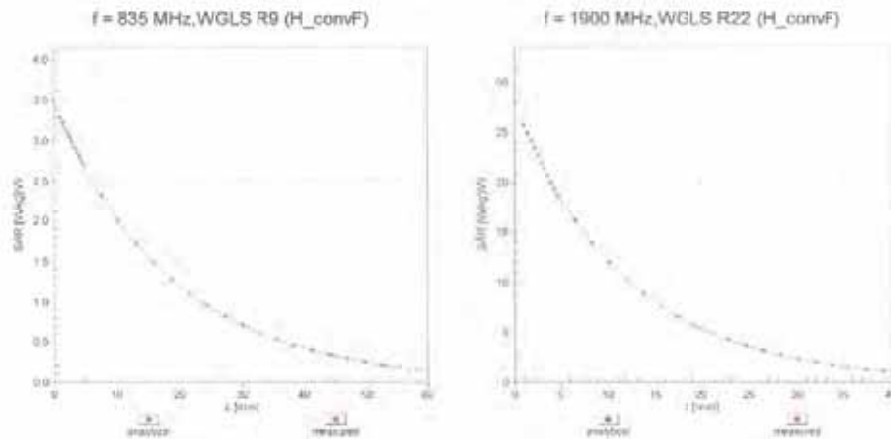
Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )



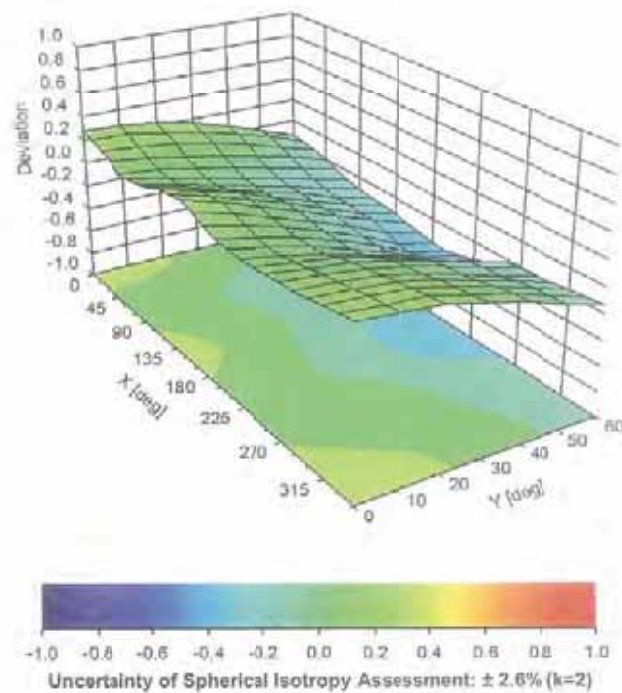
EX3DV4-5N:3863

July 13, 2012

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi, \theta$ ), f = 900 MHz



EX3DV4- SN:3863

July 13, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	110
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

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



**S** Schweizerischer Kalibrierdienst  
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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**

Client: **HCT (Dymstec)**

Certificate No: **ET3-1798\_Apr13**

## CALIBRATION CERTIFICATE

Object: **ET3DV6 - SN:1798**

Calibration procedure(s): **QA CAL-01.v8, QA CAL-12.v7, QA CAL-23.v4, QA CAL-25.v4**  
Calibration procedure for dosimetric E-field probes

Calibration date: **April 29, 2013**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	0-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498067	0-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	0-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20c)	0-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30c)	0-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	26-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	3-Jan-13 (No. DAE4-660_Jan13)	Jan-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	U1537390585	14-Oct-01 (in house check Oct-12)	In house check: Oct-13

Calibrated by:	Name <b>Claudio Leubler</b>	Function <b>Laboratory Technician</b>	Signature 
Approved by:	Name <b>Katja Pokovic</b>	Function <b>Technical Manager</b>	Signature 
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			Issued: April 30, 2013

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Accreditation No.: SCS 108

**Glossary:**

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\theta$	$\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ 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<sub>x,y,z</sub>: Assessed for E-field polarization  $\theta = 0$  ( $f < 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* 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<sub>x,y,z</sub>: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>, B<sub>x,y,z</sub>, C<sub>x,y,z</sub>, D<sub>x,y,z</sub>, VR<sub>x,y,z</sub>: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  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<sub>x,y,z</sub> \* 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  $\pm 50$  MHz to  $\pm 100$  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

April 29, 2013

# Probe ET3DV6

## SN:1798

Manufactured: August 14, 2003  
Calibrated: April 29, 2013

Calibrated for DASY/EASY Systems  
(Note: non-compatible with DASY2 system!)

ET3DV6- SN:1798

April 29, 2013

## DASY/EASY - Parameters of Probe: ET3DV6 - SN:1798

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	1.99	1.78	2.03	$\pm 10.1\%$
DGP (mV) <sup>B</sup>	99.9	101.3	97.3	

### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc <sup>C</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	152.8	$\pm 2.7\%$
		Y	0.0	0.0	1.0		146.8	
		Z	0.0	0.0	1.0		149.2	

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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter, uncertainty not required.

<sup>C</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.