Date/Time: 8/2/2011 6:47:20 PM

Test Laboratory: Electronics Testing Center, Taiwan

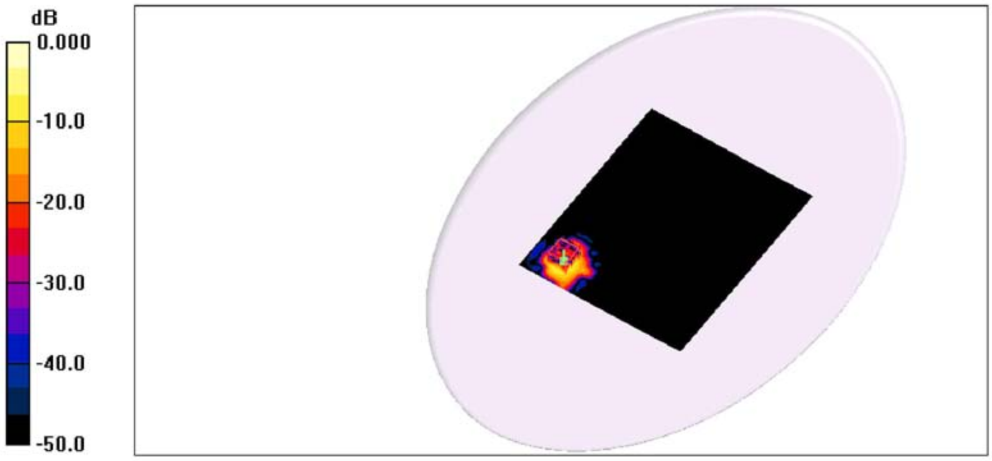
DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5620 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5620 MHz; σ = 5.81 mho/m; ε_r = 48.4; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.17, 3.17, 3.17); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH124_A_Side/Area Scan (191x231x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.62 mW/g

802.11a_CH124_A_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.793 V/m; Power Drift = 0.116 dB
Peak SAR (extrapolated) = 3.88 W/kg
SAR(1 g) = 0.865 mW/g; SAR(10 g) = 0.199 mW/g
Maximum value of SAR (measured) = 1.69 mW/g



0 dB = 1.69mW/g

Date/Time: 8/2/2011 7:59:49 PM

Test Laboratory: Electronics Testing Center, Taiwan

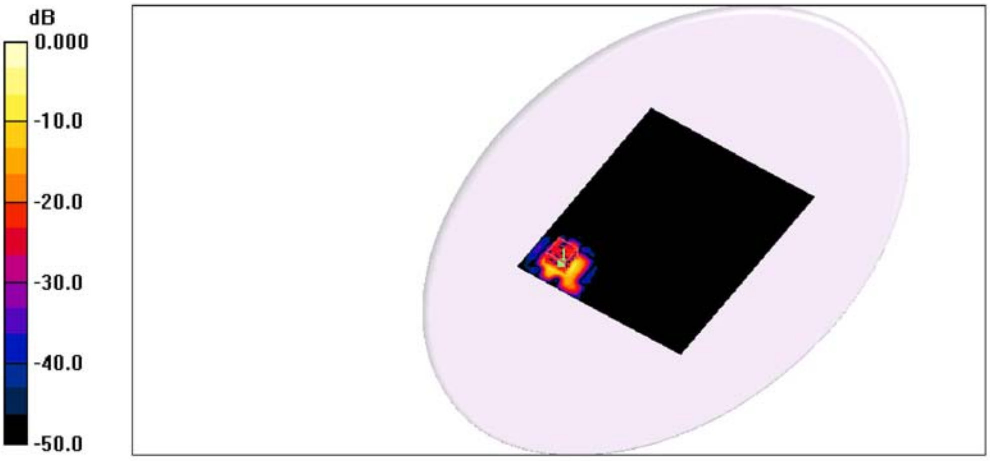
DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5680 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5680 MHz; σ = 5.91 mho/m; ε_r = 48.3; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.17, 3.17, 3.17); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH136_A_Side/Area Scan (191x231x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.19 mW/g

802.11a_CH136_A_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.000 V/m; Power Drift = 0.159 dB
Peak SAR (extrapolated) = 2.94 W/kg
SAR(1 g) = 0.681 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.31mW/g

Date/Time: 8/1/2011 6:18:56 PM

Test Laboratory: Electronics Testing Center, Taiwan

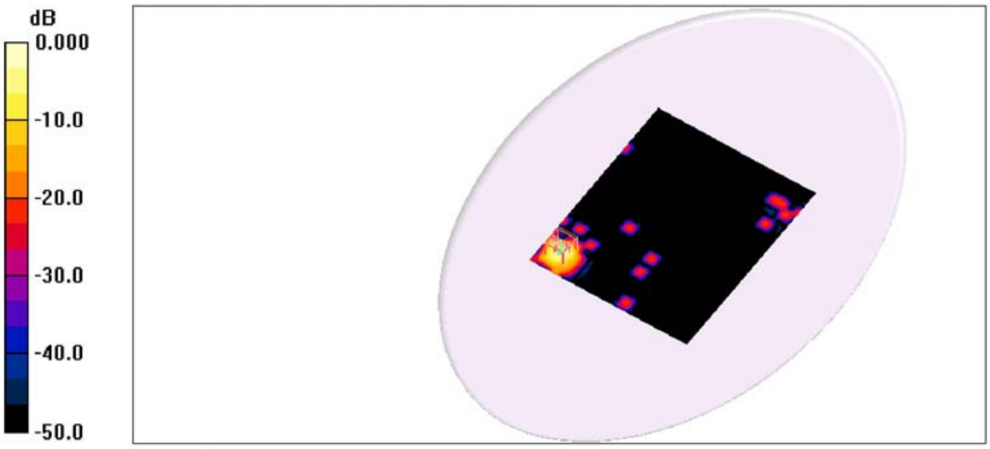
DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5785 MHz; σ = 6.03 mho/m; ε_r = 48; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.51, 3.51, 3.51); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH157_A_Side/Area Scan (191x231x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.29 mW/g

802.11a_CH157_A_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.00 V/m; Power Drift = 0.103 dB
Peak SAR (extrapolated) = 2.69 W/kg
SAR(1 g) = 0.576 mW/g; SAR(10 g) = 0.138 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.29mW/g

Date/Time: 8/2/2011 9:24:33 AM

Test Laboratory: Electronics Testing Center, Taiwan

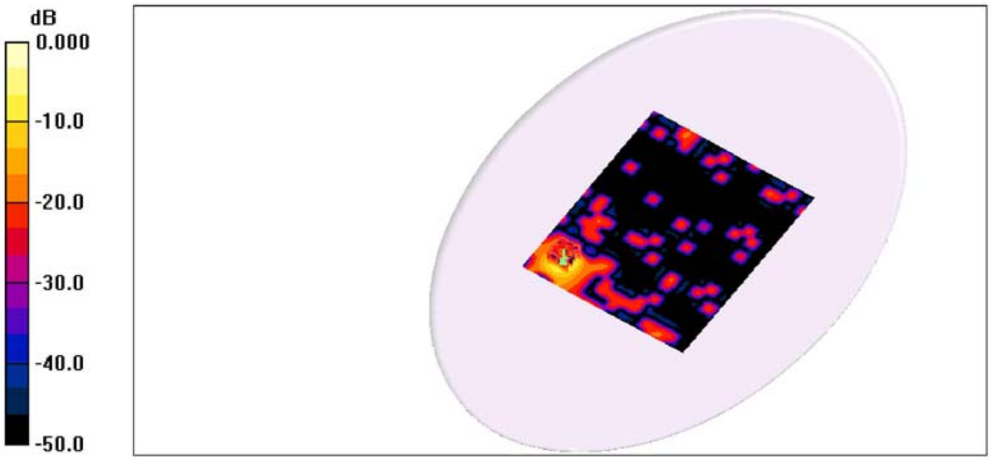
DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 5.99 mho/m; ε_r = 48.1; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.51, 3.51, 3.51); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH149_A_Side/Area Scan (191x231x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

802.11a_CH149_A_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.38 V/m; Power Drift = 0.093 dB
Peak SAR (extrapolated) = 2.67 W/kg
SAR(1 g) = 0.557 mW/g; SAR(10 g) = 0.132 mW/g
Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Date/Time: 8/2/2011 2:22:44 PM

Test Laboratory: Electronics Testing Center, Taiwan

DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5785 MHz; σ = 6.03 mho/m; ε_r = 48; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

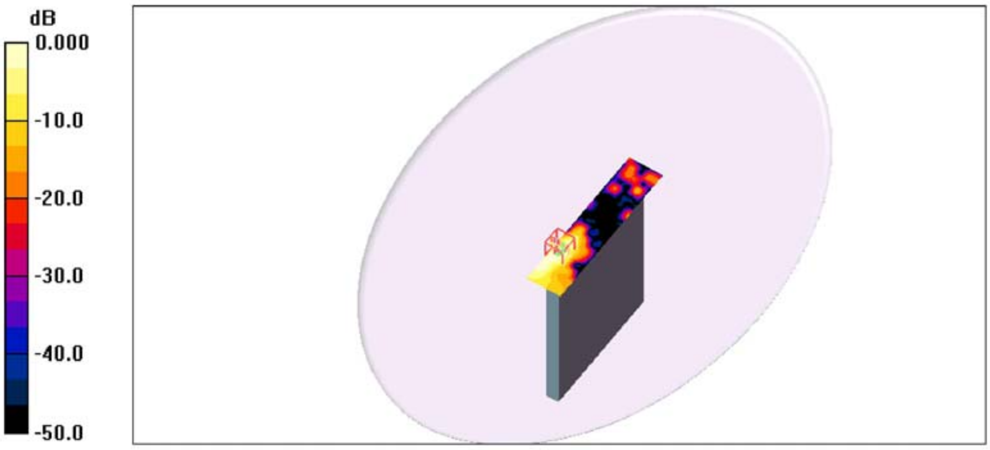
DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.51, 3.51, 3.51); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH157_C_Side/Area Scan (41x181x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.356 mW/g

802.11a_CH157_C_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.10 V/m; Power Drift = -0.116 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.059 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.361 mW/g



0 dB = 0.356mW/g

Date/Time: 8/2/2011 4:33:26 PM

Test Laboratory: Electronics Testing Center, Taiwan

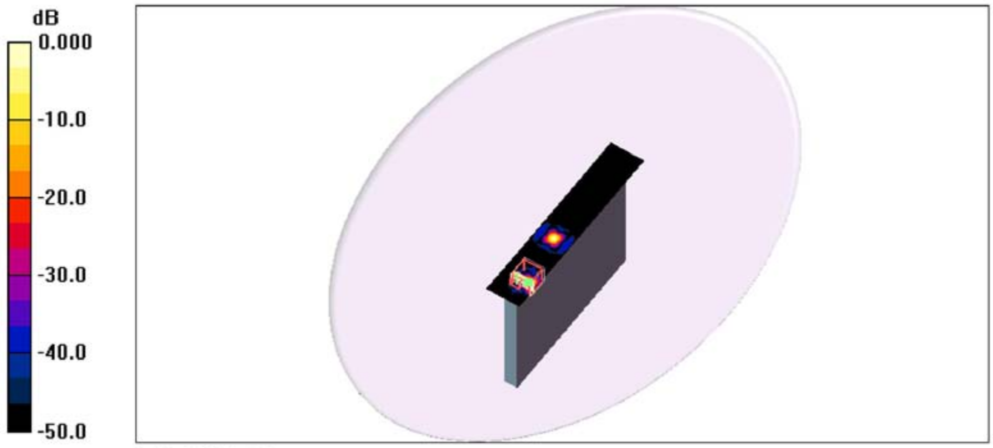
DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; σ = 5.15 mho/m; ε_r = 49.2; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.91, 3.91, 3.91); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH157_E_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.000 V/m; Power Drift = -0.199 dB
Peak SAR (extrapolated) = 0.032 W/kg
SAR(1 g) = 0.000621 mW/g; SAR(10 g) = 0.000278 mW/g
Maximum value of SAR (measured) = 0.020 mW/g

802.11a_CH157_E_Side/Area Scan (41x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.011 mW/g



0 dB = 0.011mW/g

Date/Time: 8/2/2011 10:49:12 AM

Test Laboratory: Electronics Testing Center, Taiwan

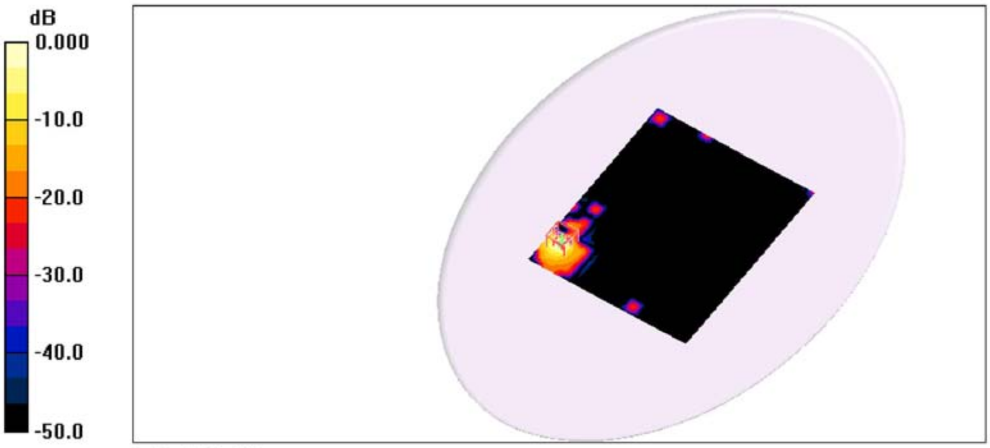
DUT: Tablet; Type: Mobile Collaboration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5700 MHz; σ = 5.94 mho/m; ε_r = 48.2; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.17, 3.17, 3.17); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH140_A_Side/Area Scan (191x231x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.63 mW/g

802.11a_CH140_A_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.000 V/m; Power Drift = -0.199 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 0.784 mW/g; SAR(10 g) = 0.189 mW/g
Maximum value of SAR (measured) = 1.58 mW/g



0 dB = 1.63mW/g

Date/Time: 8/2/2011 3:01:17 PM

Test Laboratory: Electronics Testing Center, Taiwan

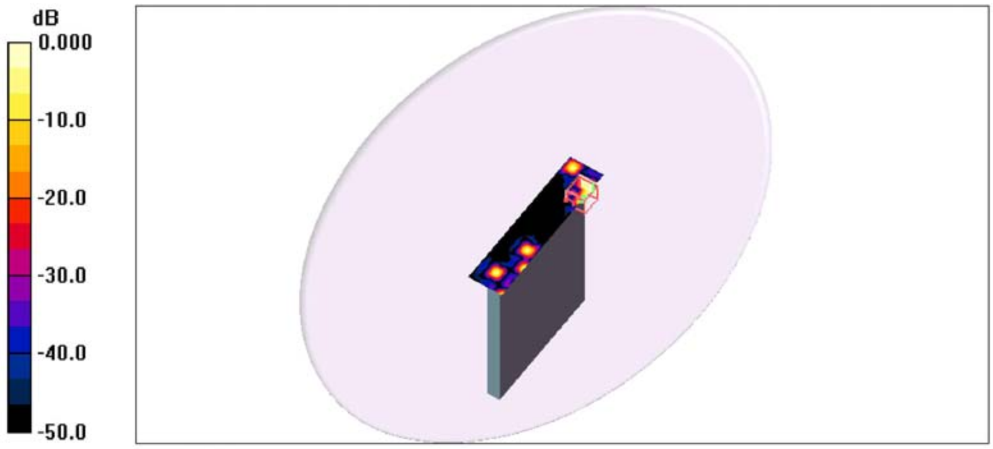
DUT: Tablet; Type: Mobile Collaboration; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.63 mho/m; ε_r = 48.6; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.17, 3.17, 3.17); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH100_D_Side/Area Scan (41x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.020 mW/g

802.11a_CH100_D_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.07 V/m; Power Drift = -0.132 dB
Peak SAR (extrapolated) = 0.028 W/kg
SAR(1 g) = 0.00357 mW/g; SAR(10 g) = 0.00123 mW/g
Maximum value of SAR (measured) = 0.028 mW/g



0 dB = 0.020mW/g

Date/Time: 8/2/2011 10:10:37 PM

Test Laboratory: Electronics Testing Center, Taiwan

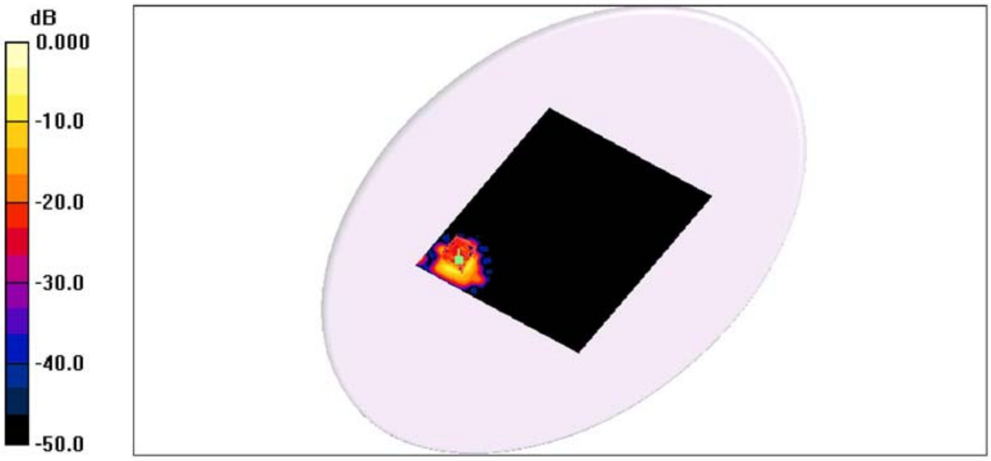
DUT: Tablet; Type: Mobile Collration Tablet; Serial: N/A

Communication System: IEEE 802.11a; Frequency: 5825 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5825 MHz; σ = 6.07 mho/m; ε_r = 48; ρ = 1000 kg/m^3
Air temperature: 23degC; Liquid temperature: 22.5degC;
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV4 - SN3555; ConvF(3.51, 3.51, 3.51); Calibrated: 9/22/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn629; Calibrated: 9/17/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1055
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a_CH165_A_Side/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.97 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 1.97 W/kg
SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.809 mW/g

802.11a_CH165_A_Side/Area Scan (191x231x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.803 mW/g



0 dB = 0.809mW/g

ANNEX B: DIPOLE CERTIFICATE

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 **ETC (Auden)**

Certificate No: **D2450V2-764_Sep10**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 764
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	September 21, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	D. Iliev
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 22, 2010

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

Certificate No: D2450V2-764_Sep10 Page 1 of 9

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

Calibration is Performed According to the Following Standards:

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

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.2
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	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.74 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.0 mW / g
SAR normalized	normalized to 1W	52.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.8 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.09 mW / g
SAR normalized	normalized to 1W	24.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.5 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.95 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 mW / g
SAR normalized	normalized to 1W	51.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**51.5 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.00 mW / g
SAR normalized	normalized to 1W	24.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**24.0 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.4 Ω + 1.5 jΩ
Return Loss	- 31.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.8 Ω + 3.3 jΩ
Return Loss	- 28.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.150 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	August 10, 2004

DASY5 Validation Report for Head TSL

Date/Time: 20.09.2010 14:17:25

Test Laboratory: SPEAG, Zurich, Switzerland

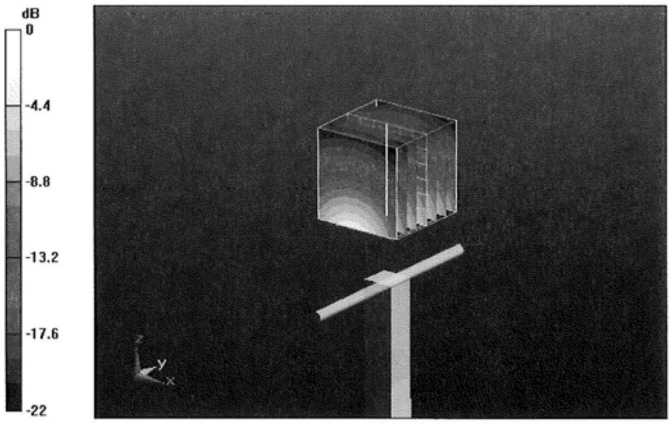
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:764

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.74 mho/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

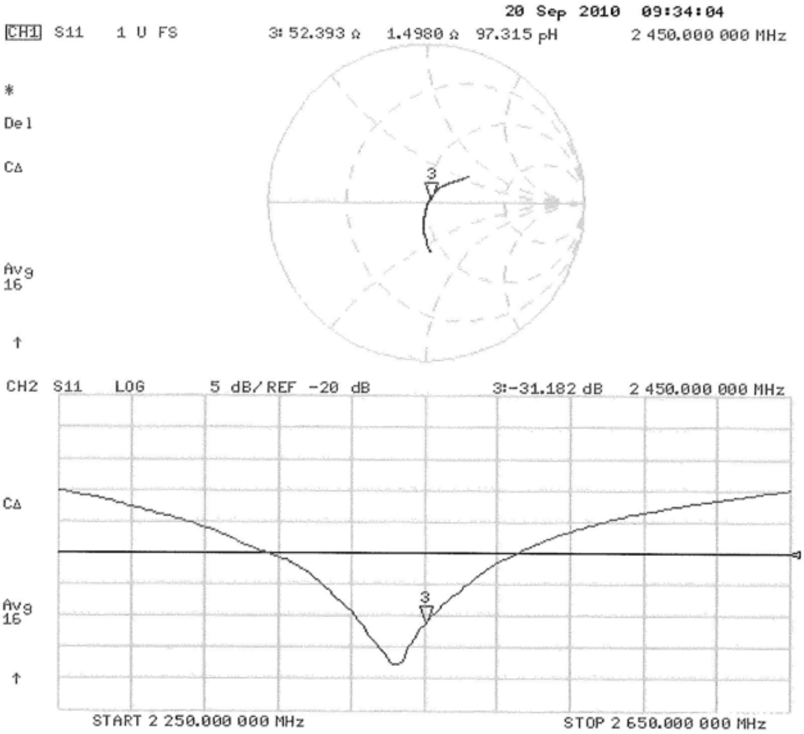
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.4 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 26.5 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 6.09 mW/g
Maximum value of SAR (measured) = 16.6 mW/g



0 dB = 16.6mW/g

Certificate No: D2450V2-764_Sep10 Page 6 of 9

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 21.09.2010 14:15:54

Test Laboratory: SPEAG, Zurich, Switzerland

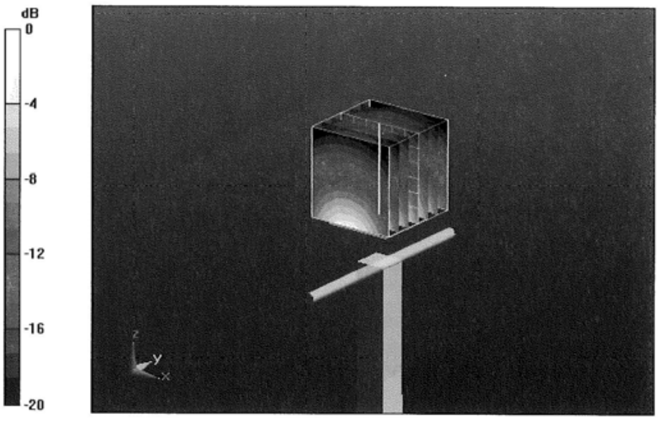
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:764

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.95 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

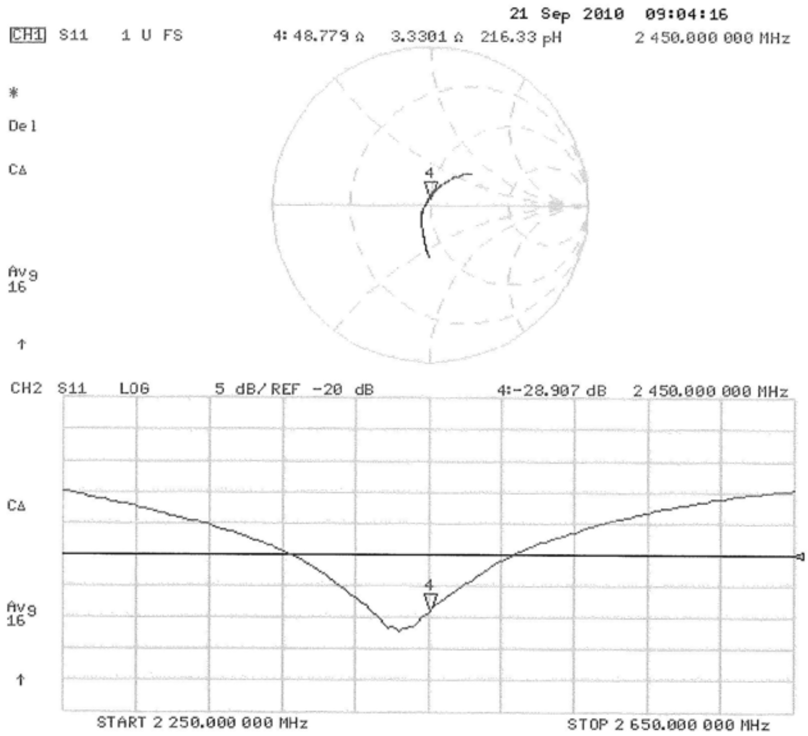
- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.2 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 27.2 W/kg
SAR(1 g) = 12.9 mW/g; SAR(10 g) = 6 mW/g
Maximum value of SAR (measured) = 17 mW/g



0 dB = 17mW/g

Impedance Measurement Plot for Body TSL



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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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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 **ETC (Auden)**

Certificate No: **D5GHzV2-1030_Sep10**

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN: 1030
Calibration procedure(s)	QA CAL-22.v1 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	September 15, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe EX3DV4	SN: 3503	05-Mar-10 (No. EX3-3503_Mar10)	Mar-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	D. Iliev
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 16, 2010

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

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Swiss Calibration Service

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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:

a) IEC Std 62209 Part 2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", Draft Version 0.9, December 2004
b) 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:

c) 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	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan resolution	dx, dy = 10 mm	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 2.5 mm	
Frequency	5200 MHz ± 1 MHz 5500 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.7 ± 6 %	5.34 mho/m ± 6 %
Body TSL temperature during test	(22.1 ± 0.2) °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.71 mW / g
SAR normalized	normalized to 1W	77.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**76.7 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.16 mW / g
SAR normalized	normalized to 1W	21.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.5 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.1 ± 6 %	5.69 mho/m ± 6 %
Body TSL temperature during test	(22.1 ± 0.2) °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	100 mW input power	8.13 mW / g
SAR normalized	normalized to 1W	81.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**80.8 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.25 mW / g
SAR normalized	normalized to 1W	22.5 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**22.4 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.5 ± 6 %	6.05 mho/m ± 6 %
Body TSL temperature during test	(22.1 ± 0.2) °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.10 mW / g
SAR normalized	normalized to 1W	71.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**70.5 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	1.96 mW / g
SAR normalized	normalized to 1W	19.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**19.5 mW / g ± 19.5 % (k=2)**

Appendix

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	51.0 Ω - 8.2 jΩ
Return Loss	-21.8 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	54.9 Ω - 2.0 jΩ
Return Loss	-26.0 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	58.8 Ω - 2.4 jΩ
Return Loss	-21.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 ns

After long term use with 40 W 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	July 09, 2004