TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Dell Inspiron 1011 Netbook PC

Regulatory Model-Type: PP19S

To: OET Bulletin 65 Supplement C: (2001-01)

Test Report Serial No:
RFI/SAR3/RP75258JD01A

Supersedes Test Report Serial No:
RFI/SAR2/RP75258JD01A

This Test Report Is Issued Under The Authority Of Scott D'Adamo, Group Service Manager Wireless and Cellular:  **pp Brian Watson**	
Checked By: Brian Watson 	**Report Copy No: PDF01**
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To: OET Bulletin 65 Supplement C: (2001-01)

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1. Customer Information

Company Name:	Dell Inc.
Address:	One Dell Way Round Rock TX 78682 USA

2. Equipment Under Test (EUT)

2.1. Identification of Equipment Under Test (EUT)

Description:	Netbook PC
Brand Name:	Dell
Model Name or Number:	Inspiron 1011
Regulatory Model-Type:	PP19S
Serial Number:	Unique Netbook Identifier: D-1011-32-721
Ericsson F3607gw SKU-850 Module IMEI Number:	004401700230986
Ericsson F3607gw SKU-900 Module IMEI Number:	004401700317833
Hardware Version Number:	A00
Software Version Number:	Rev.A
Hardware Revision of GSM Module:	R1
Software Revision of GSM Module:	R1G05
FCC ID Number F3607gw SKU-850:	VV7-MBMF3607GW1-D
FCC ID Number F3607gw SKU-900:	VV7-MBMF3607GW2-D
Country of Manufacture:	China
Date of Receipt:	05 July 2009

2.2. Description of EUT

The equipment under test is a Dell mini Netbook fitted with an Ericsson mobile broadband modules F3607gw (SKU-900 and SKU850), alternate model name Dell Wireless 5540 HSPA Mobile Broadband Mini-card.

2.3. Modifications Incorporated in the EUT

There were no modifications incorporated in the EUT.

2.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	Battery
Brand Name:	Compal
Model Name or Number:	Dynapack Bear 3c
Serial Number:	SDI-GC02000VM00
Cable Length and Type:	Not Applicable
Country of Manufacture:	Korea
Connected to Port	7 Pin Array Contact Point

Description:	*Bluetooth* + UWB Module
Brand Name:	Broadcom Corporation
Model Name or Number:	BCM92046
FCC ID:	MCLBCM92046
Cable Length and Type:	Not Applicable
Country of Manufacture:	China
Connected to Port	Bus Slot Unique to Manufacturer

Description:	WLAN Module 802.11a/b/g/n
Brand Name:	Broadcom Corporation
Model Name or Number:	BCM94322HM8L
FCC ID:	QDS-BRCM1031
Cable Length and Type:	Not Applicable
Country of Manufacture:	China
Connected to Port	Bus Slot Unique to Manufacturer

Description:	WLAN Module 802.11b/g
Brand Name:	Broadcom Corporation
Model Name or Number:	BCM94312HMG
FCC ID:	QDS-BRCM1030
Cable Length and Type:	Not Applicable
Country of Manufacture:	China
Connected to Port	Bus Slot Unique to Manufacturer

2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Wireless Communication Test Set
Brand Name:	Agilent
Model Name or Number:	8960 Series 10
Serial Number:	MY48360671
Cable Length and Type:	1.5m Utiflex Cable
Connected to Port:	RF (Input/Output) Air Link

2.6. Additional Information Related to Testing

Equipment Category	GPRS850/900/1800/1900; EGPRS850/900/1800/1900; UMTS FDD1/FDD2/FDD5/FDD8 HSPA, WiFi 802.11a/b/g/n, Bluetooth	
Type of Unit	Portable Transceiver	
Intended Operating Environment:	Within 2G GSM, 3G UMTS, WiFi 802.11n and Bluetooth coverage	
Transmitter Maximum Output Power Characteristics:	GPRS/EGPRS850	33dBm
	GPRS/EGPRS1900	30dBm
	UMTS/HSPA FDD V	24dBm
	UMTS/HSPA FDD II	24dBm
	WiFi 2540	24dBm
	WiFi 5800	22dBm
	Bluetooth	6dBm
Transmitter Frequency Range:	GPRS/EGPRS850	824 to 849 MHz
	GPRS/EGPRS1900	1850 to 1910 MHz
	UMTS/HSPA FDD V	826 to 847 MHz
	UMTS/HSPA FDD II	1880 to 1908 MHz
	WiFi 2540	2412 to 2462 MHz
	WiFi 5800	5745 to 5825 MHz
	Bluetooth	2402 to 2480 MHz

Additional Information Related to Testing (continued)

Transmitter Frequency Allocation of EUT When Under Test:	Channel Number	Channel Description	Frequency (MHz)
	128	Low	824.2
	189	Middle	836.4
	251	High	848.8
	512	Low	1850.2
	660	Middle	1879.8
	810	High	1909.8
	9262	Low	1852.4
	9400	Middle	1880
	9538	High	1907.6
	4132	Low	826.4
	4183	Middle	836.6
	4233	High	846.6
	1	Low	2312
	6	Middle	2437
	11	High	2462
	149	Low	5745
	157	Middle	5785
	165	High	5825
	0	Low	2441
	39	Middle	2480
	78	High	2437
Modulation(s):	GMSK:217Hz, QPSK/CCK:0Hz		
Modulation Scheme (Crest Factor):	GMSK(GPRS/EGPRS):4, QPSK/CCK(UMTS/HSPA/WiFi):1		
Antenna Type:	Integral fixed onto the screen surrounding.		
Antenna Length:	Internal antennas of unknown lengths		
Number of Antenna Positions:	1 Fixed		
Power Supply Requirement:	14.8V dc		
Battery Type(s):	Li-ion		

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	OET Bulletin 65 Supplement C: (2001-01)
Title:	Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
Purpose of Test:	To determine whether the equipment met the basic restrictions as defined in OET Bulletin 65 Supplement C: (2001-01) using the SAR averaging method as described in the test specification above.

3.2. Methods and Procedures Reference Documentation

The methods and procedures used were as detailed in:

Federal Communications Commission, "Evaluating compliance with FCC Guidelines for human exposure to radio frequency electromagnetic fields", OET Bulletin 65 Supplement C, FCC, Washington, D.C, 20554, 2001.

Thomas Schmid, Oliver Egger and Neils Kuster, "Automated E-field scanning system for dosimetric assessments", IEEE Transaction on microwave theory and techniques,
Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

KDB 447498 D01 Mobile Portable RF Exposure v03.

KDB 616217 D01 SAR for Laptop v01.

KDB 248227 SAR Measurement Procedures for 802.11 a/b/g Transmitters Rev.1.2

KDB 941225 D01 SAR 3G Test Procedures v02

KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1

KDB 450824 D01 SAR Prob Cal and Ver Meas v01r01

3GPP TS 34.121

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

Test was performed as per "FCC KDB 447498 D01 Mobile Portable RF Exposure v03", "KDB 248227 SAR Measurement Procedures for 802.11 a/b/g Transmitters Rev.1.2" and according to the body-worn procedures in consideration with FCC KDB 616217, FCC KDB 248227, FCC KDB 941225 SAR 3G devices v02, KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1 and KDB 450824 test Procedures and OET Bulletin 65 Supplement C 01-01 specific FCC test procedures. Testing followed the letter of TS-34.121 5.2B.4.2.

Prior to commencement of SAR testing the FCC was contacted to request permission to test the Netbook as the display is < 12 inches and it had more than one WLAN module available. Details of the Netbook were submitted to the FCC including calculations for simultaneous transmission and the support of HSPA. Permission was granted and the following KDB tracking number acquired: 853269.

SAR test for WWAN was performed using Ericsson F3607gw SKU-850 module, the worst case test configuration from the SKU-850 module was used to performed test on the SKU-900 module for frequencies that both modules supported. The additional frequency band that the SKU-900 module supported UMTS FDD VIII was also evaluated.

5. Operation and Configuration of the EUT during Testing

5.1. Operating Modes

The EUT was tested in the following operating mode(s) unless otherwise stated:

- Test was performed on a Dell Bear mini 1011Netbook with Windows XP Home Edition Version 2002 SP3 operating system installed.
- Test was performed with Bluetooth disabled as the output power was < 60/f(GHz) and antenna to antenna distance > 5cm.
- Throughout the duration of testing the HSPA channels remained active with the required E-TFCI and AG index values being maintained. This was verified by observing the HSUPA and HSDP uplink and downlink throughput parameters using an Agilent 8960 series 10 wireless communications test set which supports HSPA release 6.
- Simultaneous transmission was not evaluation as the sum of the 1-g SAR was <1.6 W/kg and r>5 cm.
- UMTS FDD - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"
- UMTS FDD - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's" with HSDPA enabled.
- UMTS FDD - FRC configured to HS-DPCCH Sub-test 1 and H-Set 1 and QPSK settings with HSPA enabled.
- EGPRS850 / EGPRS900 / EGPRS1800 / EGPRS1900 Data allocated mode using Agilent 8960 configured to allow WWAN module to transmit at maximum output power.
- GPRS850 / GPRS900 / GPRS1800 / GPRS1900 Data allocated mode using Agilent 8960 configured to allow WWAN module to transmit at maximum output power.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration(s) unless otherwise stated:

- Standalone Battery Operated
- EUT was tested in the Body-Worn configuration only, with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
- The power measurements at maximum output power is verified on the High, Middle and Low channels according to Release 6 procedures in section 5.2 of 3GPP TS 34.121 using the appropriate RMC, FRC and E-DCH configurations. Prior to commencement of SAR testing the module power levels were measured in both HSPA and 3G RMC 12.2kbps modes and compared to ensure the correct mode of operation had been established.
- Throughout the duration of testing the HSPA channels remained active with the required E-TFCI and AG index values being maintained. This was verified by observing the HSUPA and HSDP uplink and downlink throughput parameters using an Agilent 8960 series 10 wireless communications test set which supports HSPA release 6. The test parameters were in accordance with power table settings in KDB 941225 for HSDPA Release 5 and HSPA Release 6 and TS 34.121 Table C.10.1 – C.10.4.

Body Configuration

a) The EUT was placed in a normal operating position where the centre of EUT was aligned with the centre reference point on the flat section of the 'OVAL 3mm' phantom.

b) With the EUT touching the phantom at an imaginary centre line. The EUT was aligned with a marked plane (X and Y axis) consisting of two lines.

c) For the touch-safe position the handset was gradually moved towards the flat section of the 'Oval 3mm' phantom until any point of the EUT touched the phantom.

d) For position(s) greater then 0mm separation the EUT was positioned as per the touch-safe position, and then the vertical height was decreased/adjusted as required.

e) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.

f) The device was keyed to operate continuously in the transmit mode for the duration of the test.

g) The location of the maximum spatial SAR distribution (hot spot) was determined relative to the handset and its antenna.

h) The EUT was transmitting at predefined power stated in section 5.1 throughout the duration of the test.

6. Summary of Test Results

Test Name	Specification Reference	Result
Specific Absorption Rate-GPRS850 Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-EGPRS850 Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-UMTS FDD V Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-UMTS FDD V HSPA Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-GPRS1900 Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-EGPRS1900 Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-UMTS FDD II Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-UMTS FDD II HSPA Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-WiFi Broadcom 802.11b/g 1397 Module Body Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied
Specific Absorption Rate-WiFi Broadcom 802.11n Body Module Configuration 1g	OET Bulletin 65 Supplement C: (2001-01)	Complied

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Individual Evaluations

Module Name	device, mode	Frequency (MHz)	Pi = Module Power Level stated in FCC Grant Conducted (mW)	Pth = 60/f (mW)	n (cm)	r (cm)	R (cm)	single SAR	remarks
F3607 gw	WWAN, PCS1900	1900	1030	32	34	17.00	21.84	Y	test normal evaluation
	WWAN, GSM850	850	2240	71	32	17.00	21.09	Y	test normal evaluation
	WWAN, UMTS V	850	650	71	9	17.00	9.67	Y	test highest output channel
	WWAN, UMTS II	1900	680	32	22	17.00	16.12	Y	test highest output channel
Dell 1397	WLAN, 802.11b/g	2450	202	24	9	17.00	9.30	Y	test highest output channel
Dell 1510	WLAN, 802.11b/g	2450	159	24	7	17.00	8.38	Y	test highest output channel
	WLAN, 802.11a/n	5800	159	10	17	17.00	13.51	Y	test highest output channel
BCM92046	BT, Bluetooth	2410	4.1	25	0	0.70	5.09	n/a	Not required {Pi<=Pth} {rBT<5cm}

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Simultaneous Evaluation — PCS1900 (x)

Module Name	(x,y)	$d_{(x,y)}$ cm	$D_{(x,y)}$ cm	sim-Tx SAR	remarks
Dell 1397	$WWAN_{PCS1900}$, $WLAN_{802.11b/g}$	8.2	26	Y*	$\{P_{PCS1900}>P_{th}\}$ $\{d_{PCS1900,WLAN}<D_{PCS1900,WLAN}\}$ $\{r_{PCS1900}>5cm\}$
Dell 1510	$WWAN_{PCS1900}$, $WLAN_{802.11b/g}$	8.2	25	Y*	$\{P_{PCS1900}>P_{th}\}$ $\{d_{PCS1900,WLAN}<D_{PCS1900,WLAN}\}$ $\{r_{PCS1900}>5cm\}$
	$WWAN_{PCS1900}$, $WLAN_{802.11a}$	8.2	30	Y*	$\{P_{PCS1900}>P_{th}\}$ $\{d_{PCS1900,WLAN}<D_{PCS1900,WLAN}\}$ $\{r_{PCS1900}>5cm\}$
BCM92046	$WWAN_{PCS1900}$, BT	24.0	22	N	$\{P_{PCS1900}>P_{th}\}$ $\{d_{PCS1900,WLAN}>5cm\}$ {Σall SAR1g < 1.6 W/kg}

*Simultaneous transmission not required if the following conditions are met: {Σall SAR1g < 1.6 W/kg} & {rx ≥ 5 cm}

Simultaneous Evaluation – GSM850 (x)

Module Name	(x,y)	d(x,y) cm	D(x,y) cm	sim-Tx SAR	remarks
Dell 1397	$WWAN_{GSM850}$, $WLAN_{802.11b/g}$	8.2	25	Y*	$\{P_{GSM850}>P_{th}\}$ $\{d_{GSM850,WLAN}<D_{GSM850,WLAN}\}$ $\{r_{GSM850}>5cm\}$
Dell 1510	$WWAN_{GSM850}$, $WLAN_{802.11b/g}$	8.2	24	Y*	$\{P_{GSM850}>P_{th}\}$ $\{d_{GSM850,WLAN}<D_{GSM850,WLAN}\}$ $\{r_{GSM850}>5cm\}$
	$WWAN_{GSM850}$, $WLAN_{802.11a}$	8.2	30	Y*	$\{P_{GSM850}>P_{th}\}$ $\{d_{GSM850,WLAN}<D_{GSM850,WLAN}\}$ $\{r_{GSM850}>5cm\}$
BCM92046	$WWAN_{GSM850}$, BT	24.0	21	N	$\{P_{GSM850}>P_{th}\}$ $\{d_{GSM850,WLAN}>5cm\}$ {Σall SAR1g < 1.6 W/kg}

*Simultaneous transmission not required if the following conditions are met: {Σall SAR1g < 1.6 W/kg} & {rx ≥ 5 cm}

Simultaneous Evaluation – UMTS Band V (x)

Module Name	(x,y)	d(x,y) cm	D(x,y) cm	sim-Tx SAR	remarks
Dell 1397	$WWAN_{UMTS\ V}$, $WLAN_{802.11b/g}$	8.2	14	Y*	$\{P_{UMTS\ V}>P_{th}\}$ $\{d_{UMTS\ V,WLAN}<D_{UMTS\ V,WLAN}\}$ $\{r_{UMTS\ V>5cm}\}$
Dell 1510	$WWAN_{UMTS\ V}$, $WLAN_{802.11b/g}$	8.2	13	Y*	$\{P_{UMTS\ V}>P_{th}\}$ $\{d_{UMTS\ V,WLAN}<D_{UMTS\ V,WLAN}\}$ $\{r_{UMTS\ V>5cm}\}$
	$WWAN_{UMTS\ V}$, $WLAN_{802.11a}$	8.2	18	Y*	$\{P_{UMTS\ V}>P_{th}\}$ $\{d_{UMTS\ V,WLAN}<D_{UMTS\ V,WLAN}\}$ $\{r_{UMTS\ V>5cm}\}$
BCM92046	$WWAN_{GSM850}$, BT	24.0	10	N	$\{P_{UMTS\ V}>P_{th}\}$ $\{d_{PMTS\ V,WLAN}>5cm\}$ {Σall SAR1g < 1.6 W/kg}

*Simultaneous transmission not required if the following conditions are met: {Σall SAR1g < 1.6 W/kg} & {rx ≥ 5 cm}

Simultaneous Evaluation – UMTS Band II (x)

Module Name	(x,y)	d(x,y) cm	D(x,y) cm	sim-Tx SAR	remarks
Dell 1397	$WWAN_{UMTS\ II}$, $WLAN_{802.11b/g}$	8.2	20	Y*	$\{P_{UMTS\ II}>P_{th}\}$ $\{d_{UMTS\ II,WLAN}<D_{UMTS\ II,WLAN}\}$ $\{r_{UMTS\ II>5cm}\}$
Dell 1510	$WWAN_{UMTS\ II}$, $WLAN_{802.11b/g}$	8.2	20	Y*	$\{P_{UMTS\ II}>P_{th}\}$ $\{d_{UMTS\ II,WLAN}<D_{UMTS\ II,WLAN}\}$ $\{r_{UMTS\ II>5cm}\}$
	$WWAN_{UMTS\ II}$, $WLAN_{802.11a}$	8.2	25	Y*	$\{P_{UMTS\ II}>P_{th}\}$ $\{d_{UMTS\ II,WLAN}<D_{UMTS\ II,WLAN}\}$ $\{r_{UMTS\ II>5cm}\}$
BCM92046	$WWAN_{GSM850}$, BT	24.0	16	N	$\{P_{UMTS\ II}>P_{th}\}$ $\{d_{PMTS\ II,WLAN}>5cm\}$ {Σall SAR1g < 1.6 W/kg}

*Simultaneous transmission not required if the following conditions are met: {Σall SAR1g < 1.6 W/kg} & {rx ≥ 5 cm}

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG United Kingdom

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to section 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1.Specific Absorption Rate - GPRS850 Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.108

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	189	0.108	1.600	1.492	1, 2	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	189	0.058	1.600	1.549	1, 3	Complied

Note(s):

1. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
2. WWAN SKU-850 module
3. WWAN SKU-900 module using worst case configuration from WWAN SKU-850 module

7.2.2.Specific Absorption Rate - EGPRS850 Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.046

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	189	0.046	1.600	1.554	1, 2	Complied

Note(s):

1. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
2. WWAN SKU-850 module

7.2.3.Specific Absorption Rate - UMTS FDD V Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.052

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	4183	0.052	1.600	1.548	1, 2, 3	Complied

Note(s):

1. RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"
2. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
3. WWAN SKU-850 module

7.2.4.Specific Absorption Rate - UMTS FDD V HSPA Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.052

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	4183	0.052	1.600	1.548	1, 3, 4	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	4183	0.018	1.600	1.582	2, 3, 4	Complied

Note(s):

1. RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's" with HSDPA enabled.
2. FRC configured to HS-DPCCH Sub-test 1 and H-Set 1 and QPSK settings with HSPA enabled.
3. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
4. WWAN SKU-850 module

7.2.5.Specific Absorption Rate - GPRS1900 Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.017

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	660	0.017	1.600	1.583	1, 2	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	660	0.009	1.600	1.591	1, 3	Complied

Note(s):

1. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
2. WWAN SKU-850 module
3. WWAN SKU-900 module using worst case configuration from WWAN SKU-850 module

7.2.6.Specific Absorption Rate - EGPRS1900 Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.015

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	660	0.015	1.600	1.585	1, 2	Complied

Note(s):

1. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
2. WWAN SKU-850 module

7.2.7.Specific Absorption Rate - UMTS FDD II Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.033

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	9400	0.033	1.600	1.567	1, 2, 3	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	9400	0.011	1.600	1.589	1, 2, 4	Complied

Note(s):

1. RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"
2. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
3. WWAN SKU-850 module
4. WWAN SKU 900 Module

7.2.8.Specific Absorption Rate - UMTS FDD II HSPA Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.038

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 22.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	9400	0.038	1.600	1.562	1, 3, 4	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	9400	0.027	1.600	1.573	2, 3, 4	Complied

Note(s):

1. RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's" with HSDPA enabled.
2. FRC configured to HS-DPCCH Sub-test 1 and H-Set 1 and QPSK settings with HSPA enabled.
3. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.
4. WWAN SKU-850 module

7.2.9.Specific Absorption Rate - WiFi Broadcom 1397 802.11g/b Module Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.042

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 23.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	6	0.042	1.600	1.558	1, 3, 4	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	6	0.038	1.600	1.562	2, 4	Complied

Note(s):

1. 802.11b (1Mbps)
2. 802.11g (6Mbps)
3. Power Drift exceeded -5% as measured level was close to noise floor
4. EUT was tested in the Body-Worn configuration with the bottom of the Netbook in direct contact against the flat phantom (0mm separation) and display open at 90 degrees to the keypad.

7.2.10.Specific Absorption Rate - WiFi Broadcom 1510 802.11n Module Body Configuration 1g

Test Summary:

Tissue Volume:	1g
Maximum Level (W/kg):	0.194

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 23.0
Temperature Variation in Liquid (°C):	23.0 to 23.0

Results:

EUT Position	Phantom Configuration	Channel Number	Level (W/kg)	Limit (W/kg)	Margin (W/kg)	Note(s)	Result
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	6	0.029	1.600	1.571	1	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	6	0.029	1.600	1.571	3	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	6	0.015	1.600	1.585	4	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	157	0.158	1.600	1.442	2	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	157	0.127	1.600	1.473	3	Complied
Base of EUT Facing Phantom With Display 90° to Keyboard	Flat (OVAL 3mm)	159	0.194	1.600	1.406	4	Complied

Note(s):

1. 802.11b (1Mbps)
2. 802.11a
3. 802.11n 20MHz Channel
4. 802.11n 40MHz Channel

*SAR is not required for 802.11g as the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b.

7.2.11. Conducted Power Measurement

Ericsson F3607gw SKU 850 - GPRS/EGPRS

Channel Number	Frequency (MHZ)	GPRS TX Power before Test (dBm)	EGPRS TX Power before Test (dBm)	Note
128	824.2	27.13	25.80	Max Average Power
189	836.4	27.27	26.95	Max Average Power
251	848.8	27.40	25.65	Max Average Power
512	1850.2	25.97	25.85	Max Average Power
660	1879.8	25.37	25.50	Max Average Power
810	1909.8	24.87	24.85	Max Average Power

Ericsson F3607gw SKU 900 - GPRS/EGPRS

Channel Number	Frequency (MHZ)	GPRS TX Power before Test (dBm)	EGPRS TX Power before Test (dBm)	Note
128	824.2	27.77	25.56	Max Average Power
189	836.4	27.98	25.65	Max Average Power
251	848.8	28.14	25.80	Max Average Power
512	1850.2	26.00	25.13	Max Average Power
660	1879.8	25.46	25.46	Max Average Power
810	1909.8	24.71	24.72	Max Average Power

Test of: Dell Inspiron 1011 Netbook PC
To: OET Bulletin 65 Supplement C: (2001-01)

Ericsson F3607gw SKU-850 UMTS/HSPA – Average Power Measurements

Modes		HSDPA				HSPA					WCDMA
Sets		1	2	3	4	1	2	3	4	5	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
850	4132	22.85	20.78	20.14	19.96	19.60	20.00	19.36	20.65	19.57	22.27
	4183	23.43	21.40	20.85	20.19	20.23	20.57	19.71	21.36	20.13	23.34
	4233	23.07	21.00	20.50	20.12	19.74	20.06	19.38	20.95	20.17	22.97
1900	9262	24.00	22.15	21.50	21.55	20.27	20.50	20.21	21.10	20.90	24.25
	9400	24.46	22.44	21.73	21.44	20.40	20.70	20.37	21.34	21.60	24.37
	9538	23.84	21.77	21.22	20.81	20.10	20.00	19.67	20.95	20.97	23.85
ßc		2	12	15	15	11	6	15	2	15	
ßd		15	15	8	4	15	15	9	15	15	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	8	8	8	8	8	
AGV		-	-	-	-	20	12	15	17	21	

Ericsson F3607gw SKU-900 UMTS/HSPA – Average Power Measurements

Modes		HSDPA				HSPA					WCDMA
Sets		1	2	3	4	1	2	3	4	5	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
1900	9262	23.16	22.49	22.44	22.41	19.23	19.20	18.81	19.69	19.09	23.32
	9400	23.59	22.87	22.83	22.66	19.93	19.58	19.51	20.05	19.46	23.62
	9538	22.74	21.94	21.87	21.85	19.22	19.17	19.39	20.58	19.52	22.78
ßc		2	12	15	15	11	6	15	2	15	
ßd		15	15	8	4	15	15	9	15	15	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	8	8	8	8	8	
AGV		-	-	-	-	20	12	15	17	21	

* Prior to commencement of SAR testing the module power levels were measured in both HSPA and 3G RMC 12.2kbps modes and compared to ensure the correct mode of operation had been established.

The following tables taken from FCC 3G SAR procedures (KDB 941225 D01 SAR test for 3G devices v02) below were applied using an Agilent 8960 series 10 wireless communications test set which supports 3G / HSDPA release 5 / HSPA release 6.

Sub-test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	B_d *(SF)*	β_c/β_d	β_{hs} (1)	SM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $B_{hs}/\beta_c = 24/15$

Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

Sub-test 5 Setup for Release 6 HSPA

Sub-test	β_c	β_d	B_d *(SF)*	β_c/β_d	β_{hs} (1)	B_{oc}	B_{od}	B_{od} *(SF)*	B_{od} *(codes)*	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	31/15	B_{ad1}: 47/15 B_{ad2}: 47/15	4	1	2.0	1.0	15	92
4	2/15	15/15	64	2/15	2/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	24/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $B_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH AND E-DPCCH for the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Tavle 5.1g.

Note 6: B_{od} can not be set directly; it is set by Absolute Grant Value.

WiFi Conducted Average Power Measurements

Channel Number	Frequency (GHZ)	TX Power before Test (dBm)	Note
1	2.412	19.00	Broadcom '1397' BCM94312HMG **2.4GHz 802.11b** (1Mbps)
6	**2.437**	**19.09**	
11	2.462	19.06	
1	2.412	19.00	Broadcom '1397' BCM94312HMG **2.4GHz 802.11g** (6Mbps)
6	**2.437**	**19.04**	
11	2.462	19.10	
1	2.412	19.00	Broadcom '1510' BCM94312HMG **2.4GHz 802.11b** (1Mbps)
6	**2.437**	**19.02**	
11	2.462	19.14	
1	2.412	18.80	Broadcom '1510' BCM94312HMG **2.4GHz 802.11g** (6Mbps)
6	2.437	18.75	
11	2.462	18.76	
36	5.180	12.24	Broadcom '1510' BCM94312HMG **5GHz 802.11a UNII**
40	5.200	12.24	
48	5.240	12.04	
52	5.260	14.89	
604	5.30	14.92	
64	5.320	13.12	
100	5.500	15.75	
104	5.520	15.71	
120	5.600	15.70	
140	5.700	15.06	
149	5.745	14.70	Broadcom '1510' BCM94312HMG **5GHz 802.11a UNII Or 15.247**
157	**5.785**	**14.91**	
165	5.825	14.71	

WiFi Conducted Average Power Measurements(continued)

Channel Number	Frequency (GHZ)	TX Power before Test (dBm) 20MHz Channel (MIMO)		Note
		Main Antenna	Aux Antenna	
1	2.412	18.7	18.08	Broadcom '1510' BCM94312HMG Main Antenna **2.4GHz 802.11n**
6	**2.437**	**18.7**	**18.10**	
11	2.462	18.8	18.10	
36	5.180	7.20	7.20	Broadcom '1510' BCM94312HMG Main Antenna **5GHz 802.11n UNII**
40	5.200	7.20	7.22	
48	5.240	7.40	7.44	
52	5.260	13.97	14.00	
60	5.32	14.83	14.84	
64	5.320	13.55	13.24	
100	5.500	16.91	16.21	
120	5.600	17.30	17.00	
140	5.700	17.00	17.00	
149	5.745	16.52	16.48	Broadcom '1510' BCM94312HMG Aux Antenna **5GHz 802.11n UNII Or 15.247**
157	**5.785**	**17.00**	**16.99**	
165	5.825	14.66	14.61	

WiFi Conducted Average Power Measurements(continued)

Channel Number	Frequency (GHZ)	TX Power before Test (dBm) 40MHz Channel (MIMO)		Note
		Main Antenna	Aux Antenna	
3	2.412	14.59	14.79	Broadcom '1510' BCM94312HMG Aux Antenna **2.4GHz 802.11n**
6	**2.437**	**14.70**	**14.84**	
9	2.462	14.79	14.80	
38	-	9.13	10.95	Broadcom '1510' BCM94312HMG Main Antenna **5GHz 802.11n UNII**
46	-	9.20	11.16	
54	-	14.83	16.20	
62	-	10.08	11.70	
102	-	18.10	17.65	
118	-	18.05	17.46	
134	-	17.00	17.10	
151	-	16.45	17.70	Broadcom '1510' BCM94312HMG Aux Antenna **5GHz 802.11n UNII Or 15.247**
159	**5.795**	**16.00**	**15.00**	

8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Test Name	Confidence Level	Calculated Uncertainty
Specific Absorption Rate- GPRS850 / GPRS900 Body Configuration 1g	95%	18.03%
Specific Absorption Rate- GPRS1900 Body Configuration 1g	95%	18.30%
Specific Absorption Rate- WCDMA FDD 1 Body Configuration 1g	95%	18.19%
Specific Absorption Rate- 2450 MHz Body Configuration 1g	95%	19.33%
Specific Absorption Rate- 5800 MHz Body Configuration 1g	95%	20.80%

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

Measurement Uncertainty (Continued)

8.1. Specific Absorption Rate Uncertainty at 850 MHz Body 1g, GPRS Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\,(10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	11.000	11.000	normal (k=2)	2.0000	1.0000	5.500	5.500	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	0.584	0.584	normal (k=1)	1.0000	1.0000	0.584	0.584	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	3.600	3.600	normal (k=1)	1.0000	0.6400	2.304	2.304	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.000	4.000	normal (k=1)	1.0000	0.6000	2.400	2.400	5
	Combined standard uncertainty			t-distribution			9.20	9.20	>500
	Expanded uncertainty			k = 1.96			18.03	18.03	>500

8.2. Specific Absorption Rate Uncertainty at 1900 MHz Body 1g, GPRS Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\,(10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	11.000	11.000	normal (k=2)	2.0000	1.0000	5.500	5.500	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	0.584	0.584	normal (k=1)	1.0000	1.0000	0.584	0.584	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	4.170	4.170	normal (k=1)	1.0000	0.6400	2.669	2.669	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.230	4.230	normal (k=1)	1.0000	0.6000	2.538	2.538	5
	Combined standard uncertainty			t-distribution			9.34	9.34	>400
	Expanded uncertainty			k = 1.96			18.30	18.30	>400

8.3. Specific Absorption Rate Uncertainty at 1900 MHz Body 1g, WCDMA Modulation Scheme calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\ (10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	11.000	11.000	normal (k=2)	2.0000	1.0000	5.500	5.500	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	0.584	0.584	normal (k=1)	1.0000	1.0000	0.584	0.584	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	4.170	4.170	normal (k=1)	1.0000	0.6400	2.669	2.669	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.230	4.230	normal (k=1)	1.0000	0.6000	2.538	2.538	5
	Combined standard uncertainty			t-distribution			9.28	9.28	>400
	Expanded uncertainty			k = 1.96			18.19	18.19	>400

8.4. Specific Absorption Rate Uncertainty at 2400 MHz Body 1g, calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\,(10g)}$	Standard Uncertainty		v_i or v_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	11.800	11.800	normal (k=2)	2.0000	1.0000	5.900	5.900	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.920	2.920	normal (k=1)	1.0000	1.0000	2.920	2.920	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	3.930	3.930	normal (k=1)	1.0000	0.6400	2.515	2.515	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	3.940	3.940	normal (k=1)	1.0000	0.6000	2.364	2.364	5
	Combined standard uncertainty			t-distribution			9.86	9.86	>400
	Expanded uncertainty			k = 1.96			19.33	19.33	>400

8.5. Specific Absorption Rate Uncertainty at 5800 MHz Body 1g, calculated in accordance with IEC 62209-1 & IEEE 1528

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	$c_{i\ (10g)}$	Standard Uncertainty		υ_i or υ_{eff}
							+ u (%)	- u (%)	
B	Probe calibration	13.100	13.100	normal (k=2)	2.0000	1.0000	6.550	6.550	∞
B	Axial Isotropy	0.500	0.500	normal (k=2)	2.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	2.600	2.600	normal (k=2)	2.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.560	0.560	normal (k=2)	2.0000	1.0000	0.280	0.280	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.920	2.920	normal (k=1)	1.0000	1.0000	2.920	2.920	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	5.000	5.000	normal (k=1)	1.0000	0.6400	3.200	3.200	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	5.000	5.000	normal (k=1)	1.0000	0.6000	3.000	3.000	5
	Combined standard uncertainty			t-distribution			10.61	10.61	>250
	Expanded uncertainty			k = 1.96			20.80	20.80	>250

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A034	Narda 20W Termination	Narda	374BNM	8706	Calibrated as part of system	-
A1094	Digital Camera	Sony	MVC - FD81	125805	-	-
A1097	SMA Directional Coupler	MiDISCO	MDC6223-30	None	Calibrated as part of system	-
A1137	3dB Attenuator	Narda	779	04690	Calibrated as part of system	-
A1174	Dielectric Probe Kit	Agilent Technologies	85070C	Us99360072	Calibrated before use	-
A1328	Handset Positioner	Schmid & Partner Engineering AG	Modification	SD 000 H01 DA	-	-
A1182	Handset Positioner	Schmid & Partner Engineering AG	V3.0	None	-	-
A1234	Data Acquisition Electronics	Schmid & Partner Engineering AG	DAE3	450	30 April 2009	12
A1378	Probe	Schmid & Partner Engineering AG	EX3 DV3	3508	16 Jan 2009 (additional cal up to 5 GHz) 26 June 2009 (below 2.5 GHz)	12
A1498	Oval Phantom 3mm	MCL	OVAL 3mm	None	Calibrated before use	-
A1566	SAM Phantom	Schmid & Partner Engineering AG	SAM a	002	Calibrated before use	-
A1235	900 MHz Dipole Kit	Schmid & Partner Engineering AG	D900V2	124	23 Aug 2007	24
A1237	1900 MHz Dipole Kit	Schmid & Partner Engineering AG	D1900V2	540	26 June 2009	24
A1322	2450 MHz Dipole Kit	Schmid & Partner Engineering AG	D2450V2	725	08 Jan 2009	24
A1377	5 GHz Dipole Kit	Schmid & Partner Engineering AG	D5GHzV2	1062	14 Jan 2009	12
A1474	Amplifier	Mini-Circuits	ZVE-8G	638700305	Calibrated as part of system	-
A1497	Amplifier	Mini-Circuits	zhl-42w (sma)	e020105	Calibrated as part of system	-

Test of: Dell Inspiron 1011 Netbook PC

To: OET Bulletin 65 Supplement C: (2001-01)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A215	20 dB Attenuator	Narda	766-20	9402	Calibrated as part of system	-
A1531	Antenna	AARONIA AG	7025	02458	-	-
C1144	Cable	Rosenberger MICRO-COAX	FA147AF00 1503030	41842-1	Calibrated as part of system	-
C1145	Cable	Rosenberger MICRO-COAX	FA147AF00 3003030	41843-1	Calibrated as part of system	-
C1146	Cable	Rosenberger MICRO-COAX	FA147AF03 0003030	41752-1	Calibrated as part of system	-
C1092	Cable	RS Components	293-334	1087200-3 3402	Internal Calibration	-
G0528	Robot Power Supply	Schmid & Partner Engineering AG	DASY	None	Calibrated before use	-
G087	PSU	Thurlby Thandar	CPX200	100701	Calibrated before use	-
M1015	Network Analyser	Agilent Technologies	8753ES	US39172406	16 Sept 2008	12
M1047	Robot Arm	Staubli	RX908 L	F00/SD89A1/ A/01	Calibrated before use	-
M1159	Signal Generator	Agilent Technologies	E8241A	US42110332	Internal Checked 01 April 2009	4
M1071	Spectrum Analyzer	Agilent	HP8590E	3647U00514	(Monitoring use only)	-
M1044	Diode Power Sensor	Rohde & Schwarz	NRV-Z1	893350/019	19 May 2009	12
M265	Diode Power Sensor	Rohde & Schwarz	NRV-Z1	893350/017	19 May 2009	12
M263	Dual Channel Power Meter	Rohde & Schwarz	NRVD	826558/004	20 May 2009	12
M1270	Temperature/ Humidity/ Pressure Meter	RS Components	None	None	June 2008 (Internal Calibration)	12
S256	SAR Lab	RFI	Site 56	N/A	Calibrated before use	-

A.1.1. Calibration Certificates

This section contains the calibration certificates and data for the Probe(s) and Dipole(s) used, which are not included in the total number of pages for this report.

A1378

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

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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 [redacted] Certificate No: EX3-3508_Jan09

CALIBRATION CERTIFICATE

Object	EX3DV3 - SN:3508
Calibration procedure(s)	QA CAL-01.v6, QA CAL-14.v3 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	January 16, 2009 (Additional Conversion Factors)
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

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

Issued: January 17, 2009

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

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV3

SN:3508

Additional Conversion Factors

Manufactured:	December 19, 2003
Last calibrated:	June 24, 2008
Recalibrated:	January 16, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV3 SN:3508

Sensitivity in Free Space[A] Diode Compression[B]

NormX	0.77 ± 10.1%	$\mu V/(V/m)^2$	DCP X	94 mV
NormY	0.64 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	93 mV
NormZ	0.61 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	92 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 5.

Boundary Effect

TSL **5200 MHz** **Typical SAR gradient: 25 % per mm**

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR_{be} [%]	Without Correction Algorithm	19.0	9.3
SAR_{be} [%]	With Correction Algorithm	0.9	0.6

TSL **5800 MHz** **Typical SAR gradient: 30 % per mm**

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR_{be} [%]	Without Correction Algorithm	16.1	7.6
SAR_{be} [%]	With Correction Algorithm	0.8	0.6

Sensor Offset

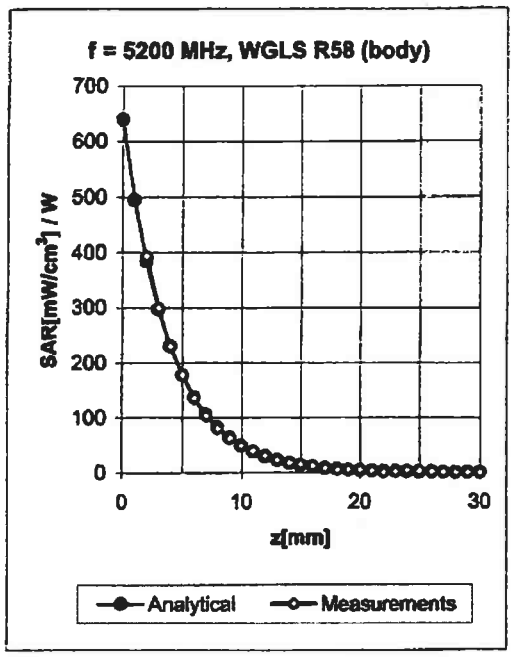
Probe Tip to Sensor Center	1.0 mm

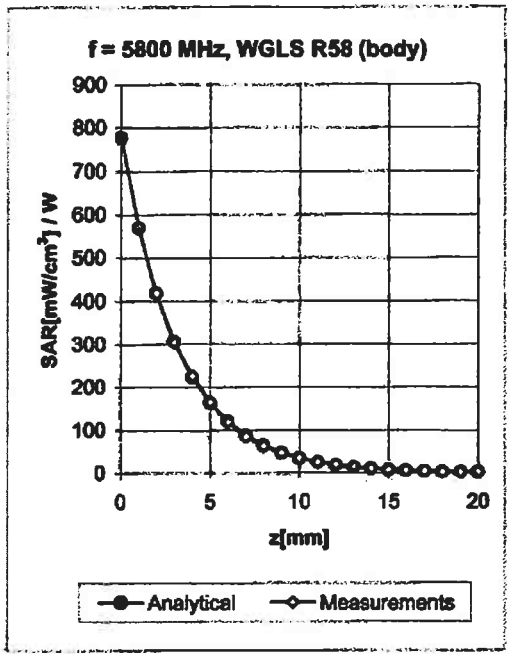
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
2600	± 50 / ± 100	Body	52.5 ± 5%	2.16 ± 5%	0.27	1.15	7.73 ± 11.0% (k=2)
3700	± 50 / ± 100	Body	51.0 ± 5%	3.55 ± 5%	0.32	1.30	6.78 ± 13.1% (k=2)
5200	± 50 / ± 100	Body	49.0 ± 5%	5.30 ± 5%	0.45	1.70	4.47 ± 13.1% (k=2)
5500	± 50 / ± 100	Body	48.6 ± 5%	5.65 ± 5%	0.45	1.70	3.97 ± 13.1% (k=2)
5800	± 50 / ± 100	Body	48.2 ± 5%	6.00 ± 5%	0.45	1.70	3.95 ± 13.1% (k=2)

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

A 1378
Checked on 01/07/2009 by

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

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Accreditation No.: SCS 108

Client RFI

Certificate No: EX3-3508_Jun09

CALIBRATION CERTIFICATE

Object	EX3DV3 - SN:3508
Calibration procedure(s)	QA CAL-01.v6, QA CAL-12.v5 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	June 26, 2009
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

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

Issued: June 26, 2009

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.