

SAR Compliance Test Report

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Testing laboratory:	TCC Microsoft Salo Laboratory P.O.Box 86 Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 44122	Client:	Microsoft Mobile 16620 West Bernardo Drive SAN DIEGO CA. 92127 USA Tel. +1 858 831 5000 Fax. +1 858 831 6500
Responsible test engineer:	Juha-Matti Varjonen	Product contact person:	Victoria Abadilla
Measurements made by:	Marko Laaksonen, Sami Savela, Nina Koskinen, Eva Lehtinen, Juha-Matti Varjonen, Jani Tuomela		
Tested device:	RM-984		
FCC ID:	QMNRM-984	IC:	-
Supplement reports:	SAR_Photo_RM-984_04		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC published RF exposure KDB procedures RSS-102, Issue 4 Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields IEEE 1528 - 2013 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Microsoft.		
Test results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Date and signatures:			
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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2014-06-16 to 2014-07-03
SN, HW and SW numbers of tested device	SN: 004402/47/822229/6, HW: 0200, SW: 02028.00000.14224.06001, DUT: 18408 SN: 004402/47/822206/4, HW: 0200, SW: 02028.00000.14224.06001, DUT: 18406 SN: 004402/47/822208/0, HW: 0200, SW: 02028.00000.14224.06001, DUT: 18405 SN: 004402/47/822204/9, HW: 0200, SW: 02028.00000.14224.06001, DUT: 18404 SN: 004402/47/822255/1, HW: 0200, SW: 02028.00000.14224.06001, DUT: 18377 SN: 004402/47/822207/2, HW: 0200, SW: 02028.00000.14224.06001, DUT: 18376
Batteries used in testing	BV-L4A, DUT: 18409, 18410, 18411, 18412, 18413, 18417, 18418, 18419, 18420, 18421
Headsets used in testing	WH-208, DUT:18392, 18395, 18393, 18394,18391
Other accessories used in testing	Cover CP-627 Optional Wireless Charging back cover, DUT: 18396, 18397, 18398, 18402, 18403
State of sample	Prototype unit
Notes	-

1.2 Maximum Results

The maximum measured SAR values for Head, Body Worn and Wireless Router configuration are given in section 1.2.1, 1.2.2 and 1.2.3 respectively. The device conforms to the requirements of the standards when the maximum measured SAR value is less than or equal to the limit.

1.2.1 Head Configuration

Mode	Ch / f(MHz)	Conducted power	Position	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
2-slot GPRS850	190 / 836.6	30.0 dBm	Left, Cheek	0.379 W/kg	0.47 W/kg	1.6 W/kg	PASSED	1
WCDMA850 (Band 5)	4233 / 846.6	23.4 dBm	Left, Cheek	0.329 W/kg	0.37 W/kg	1.6 W/kg	PASSED	2
3-slot GPRS1900	810 / 1909.8	26.7 dBm	Right, Cheek	0.184 W/kg	0.19 W/kg	1.6 W/kg	PASSED	3
WCDMA1900 (Band2)	9262 / 1852.4	23.4 dBm	Righ, Cheek	0.348 W/kg	0.39 W/kg	1.6 W/kg	PASSED	4
LTE2500 (Band 7)	21100 / 2535.0	23.4 dBm	Left, Cheek	0.204 W/kg	0.23 W/kg	1.6 W/kg	PASSED	5
WLAN2450	6 / 2437.0	18.4 dBm	Right, Tilt	0.625 W/kg	0.81 W/kg	1.6 W/kg	PASSED	9
WLAN5000	136 / 5680.0	16.2 dBm	Right, Cheek	0.235 W/kg	0.32 W/kg	1.6 W/kg	PASSED	10
2-slot GPRS850 + WLAN2450	-	-	Right, Tilt	0.677 W/kg	0.87 W/kg	1.6 W/kg	PASSED	-
WCDMA850 (Band 5) + WLAN2450	-	-	Right, Tilt	0.656 W/kg	0.83 W/kg	1.6 W/kg	PASSED	-
3-slot GPRS1900 + WLAN2450	-	-	Right, Tilt	0.625 W/kg	0.81 W/kg	1.6 W/kg	PASSED	9**
WCDMA1900 + WLAN2450	-	-	Right, Tilt	0.625 W/kg	0.81 W/kg	1.6 W/kg	PASSED	9**
LTE2500 (Band 7) + WLAN2450	-	-	Right, Tilt	0.625 W/kg	0.81 W/kg	1.6 W/kg	PASSED	9**
2-slot GPRS850 + WLAN5000	-	-	Left, Cheek	0.379 W/kg	0.47 W/kg	1.6 W/kg	PASSED	1**
WCDMA850 (Band 5) + WLAN5000	-	-	Left, Cheek	0.329 W/kg	0.37 W/kg	1.6 W/kg	PASSED	2**
3-slot GPRS1900 + WLAN5000	-	-	Right, Cheek	0.235 W/kg	0.32 W/kg	1.6 W/kg	PASSED	10**
WCDMA1900 + WLAN5000	-	-	Right, Cheek	0.354 W/kg	0.40 W/kg	1.6 W/kg	PASSED	-
LTE2500 (Band 7) + WLAN5000	-	-	Right, Cheek	0.235 W/kg	0.32 W/kg	1.6 W/kg	PASSED	10**

1.2.2 Body Worn Configuration

Mode	Ch / f(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
2-slot GPRS850	190 / 836.6	30.0 dBm	1.5 cm	0.239 W/kg	0.29 W/kg	1.6 W/kg	PASSED	11
WCDMA850 (Band 5)	4175 / 835.0	23.4 dBm	1.5 cm	0.396 W/kg	0.44 W/kg	1.6 W/kg	PASSED	12
3-slot GPRS1900	810 / 1909.8	26.7 dBm	1.5 cm	0.458 W/kg	0.48 W/kg	1.6 W/kg	PASSED	13
WCDMA1900 (Band2)	9262 / 1852.4	23.4 dBm	1.5 cm	0.742 W/kg	0.83 W/kg	1.6 W/kg	PASSED	14
LTE2500 (Band 7)	21100 / 2535.0	23.4 dBm	1.5 cm	0.587 W/kg	0.66 W/kg	1.6 W/kg	PASSED	18
WLAN2450	1 / 2412.0	18.3 dBm	1.5 cm	0.157 W/kg	0.21 W/kg	1.6 W/kg	PASSED	19
WLAN5000	165 / 5825.0	16.0 dBm	1.5 cm	0.198 W/kg	0.28 W/kg	1.6 W/kg	PASSED	20
2-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.239 W/kg	0.29 W/kg	1.6 W/kg	PASSED	11**
WCDMA850 (Band 5) + WLAN2450	-	-	1.5 cm	0.396 W/kg	0.44 W/kg	1.6 W/kg	PASSED	12**
3-slot GPRS1900 + WLAN2450	-	-	1.5 cm	0.458 W/kg	0.48 W/kg	1.6 W/kg	PASSED	13**
WCDMA1900 + WLAN2450	-	-	1.5 cm	0.742 W/kg	0.83 W/kg	1.6 W/kg	PASSED	14**
LTE2500 (Band 7) + WLAN2450	-	-	1.5 cm	0.587 W/kg	0.66 W/kg	1.6 W/kg	PASSED	18**
2-slot GPRS850 + WLAN5000	-	-	1.5 cm	0.250 W/kg	0.34 W/kg	1.6 W/kg	PASSED	-
WCDMA850 (Band 5) + WLAN5000	-	-	1.5 cm	0.396 W/kg	0.44 W/kg	1.6 W/kg	PASSED	12**
3-slot GPRS1900 + WLAN5000	-	-	1.5 cm	0.458 W/kg	0.48 W/kg	1.6 W/kg	PASSED	13**
WCDMA1900 + WLAN5000	-	-	1.5 cm	0.742 W/kg	0.83 W/kg	1.6 W/kg	PASSED	14**
LTE2500 (Band 7) + WLAN5000	-	-	1.5 cm	0.587 W/kg	0.66 W/kg	1.6 W/kg	PASSED	18**

1.2.3 Wireless Router Configuration

Summary of Maximum Results for Wireless Router mode at 10.0mm.

Mode	Ch / f(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
2-slot GPRS850	190 / 836.6	30.0 dBm	10.0 mm	0.612 W/kg	0.75 W/kg	1.6 W/kg	PASSED	21
WCDMA850 (Band 5)	4233 / 846.6	23.4 dBm	10.0 mm	0.652 W/kg	0.73 W/kg	1.6 W/kg	PASSED	22
1-slot GPRS1900	810 / 1909.8	27.9 dBm	10.0 mm	0.808 W/kg	0.91 W/kg	1.6 W/kg	PASSED	23
WCDMA1900 (Band2)	9538 / 1907.6	18.0 dBm	10.0 mm	0.852 W/kg	0.93 W/kg	1.6 W/kg	PASSED	24
LTE2500 (Band 7)	21100 / 2535.0	18.3 dBm	10.0 mm	0.735 W/kg	0.84 W/kg	1.6 W/kg	PASSED	27
WLAN2450	1 / 2412.0	18.3 dBm	10.0 mm	0.347 W/kg	0.46 W/kg	1.6 W/kg	PASSED	30
3-slot GPRS850 + WLAN2450	-	-	10.0 mm	0.612 W/kg	0.75 W/kg	1.6 W/kg	PASSED	21**
WCDMA850 (Band 5) + WLAN2450	-	-	10.0 mm	0.652 W/kg	0.73 W/kg	1.6 W/kg	PASSED	22**
3-slot GPRS1900 + WLAN2450	-	-	10.0 mm	0.808 W/kg	0.91 W/kg	1.6 W/kg	PASSED	23**
WCDMA1900 + WLAN2450	-	-	10.0 mm	0.852 W/kg	0.93 W/kg	1.6 W/kg	PASSED	24**
LTE2500 (Band 7) + WLAN2450	-	-	10.0 mm	0.735 W/kg	0.84 W/kg	1.6 W/kg	PASSED	27**

* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

** This is due to fact that in some of the cases combined SAR values are less than the maximum SAR values for the contributing individual band and therefore plot numbers might be the same i.e. the ones providing highest SAR value. Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular or WLAN band.

1.2.4 Summary SAR data

	FCC-defined SAR values for the Grants of Equipment Authorization		
	PCE	DTS	NII
Maximum Head SAR values	0.47 W/kg	0.81 W/kg	0.32 W/Kg
{Max + Max} Simultaneous Head SAR value	1.07 W/kg		
Maximum Body SAR values	0.83 W/kg	0.28 W/kg	0.22 W/Kg
{Max + Max} Simultaneous Body SAR value	0.91 W/kg		
Maximum Product Specific (Wireless Router) SAR values	0.93 W/kg	0.46 W/kg	-
{Max + Max} Simultaneous Product Specific SAR value	1.12 W/kg		
Maximum Simultaneous SAR value Wireless Router at 10.0mm: 2-slot GPRS850 + WLAN2450	1.12 W/kg		

Note:

PCE contains the highest results between all cellular modes (cellular, AWS and PCS bands)
DTS contains the highest results between WLAN 2.4GHz + RLAN 5725-5850MHz
NII contains the highest results between RLAN 5150-5250, 5250-5350 and 5470-5725

1.2.5 Maximum Drift

Maximum drift covered by 5% scaling up of the SAR values	Maximum drift during measurements
0.2dB	0.20dB

1.2.6 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	± 29.8%
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2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population / uncontrolled

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)	Power Tuning Target (dBm)				Upper Limit of Power Tuning Tolerance (dBm)			
					1-slot	2-slot	3-slot	4-slot	1-slot	2-slot	3-slot	4-slot
GSM / GPRS	850	GMSK	1/8 to 4/8	824 – 849	32.5	30.5	28.0	27.0	32.9	30.9	28.4	27.4
	1900			1850 – 1910	30.0	27.5	26.5	25.0	30.4	27.9	26.9	25.4
EGPRS	850	8PSK	1/8 to 4/8	824 – 849	27.0	27.0	25.0	24.0	27.4	27.4	25.4	24.4
	1900			1850 – 1910	26.0	26.0	24.0	23.0	26.4	26.4	24.4	23.4
WCDMA	850 (Band 5)		1	826 – 847	23.5				23.9			
WCDMA	1900 (Band 2)		1	1852 – 1908	23.5				23.9			
HSUPA	850 (Band 5)		1	826 – 847	See Appendix D for details See Appendix D for details							
HSUPA	1900 (Band 2)		1	1852 – 1908								
LTE	2500 (Band 7)	QPSK / 16QAM		2510 - 2560	23.5				23.9			
BT	2450	GFSK	1	2402 – 2480	6.0				7.5			
					Ch 1 -11				Ch 1 -11			
WLAN b-mode*	2450	BPSK / QPSK Up to 11 Mbps	1	2412 – 2462	18.0				19.5			
WLAN g-mode*	2450	Up to 64QAM / 54 Mbps	1	2412 – 2462	16.0				17.5			
WLAN n-mode 20MHz*	2450	Up to 64QAM / 72.2 Mbps	1	2412 – 2462	14.0				15.5			
					Ch 36 - 165				Ch 36 - 165			
WLAN a-mode*	5000	BPSK / QPSK Up to 11 Mbps	1	5150 – 5825	16.0				17.5			
WLAN n-mode 20MHz*	5000	Up to 64QAM / 54 Mbps	1	5150 – 5825	14.0				15.5			
					Ch 38 - 163				Ch 38 - 163			
WLAN n-mode 40MHz*	5000	Up to 64QAM / 150 Mbps	1	5150 – 5825	10.0				11.5			

* See Appendix J for details

Outside of USA, the transmitter of the device is capable of operating also in GSM/GPRS/EGPRS900, GSM/GPRS/EGPRS1800, WCDMA900 (Band 8), WCDMA2100 (Band 1), LTE850 (Band 20), LTE900 (Band 8), LTE1800 (Band 3) and LTE2100 (Band 1) bands which are not part of this filing.

This device has Voice-over-IP/Dual Transfer Mode capability for use at the ear. Therefore, SAR for multi slot GPRS mode was evaluated against the head profile of the phantom. Dual Transfer Mode is a feature that utilises the multi-slot GPRS capability in this device; it allows simultaneous transmission of voice and data during the same call, using the same transmitter and antenna.

This is a WCDMA HSUPA device, but SAR tests for HSUPA mode have not been performed as no HSUPA Sub-test mode has an average power > 0.25dB above the basic WCDMA 12.2kbps RMC mode. Appendix D of this report gives a summary of the measured WCDMA and HSUPA average powers and details of the HSUPA MPRscheme. Additionally, Appendix I lists target and measured conducted powers for WCDMA bands.

This is a BT Class 1 device and its power tuning target upper limit is 7.5dBm. WLAN2450 power tuning target upper limit is 19.5dBm. Since WLAN2450 and BT use same frequency and antenna, WLAN2450 power is 12.0dB higher, and they cannot transmit simultaneously, the WLAN2450 standalone SAR is conservative estimation of BT SAR. As WLAN2450 SAR result is below limit, also BT SAR can be deemed to comply without further analysis or standalone measurements. Also WLAN2450+cellular bands combined SAR results can be regarded as conservative estimation of BT+cellular combined SARs. As WLAN2450+cellular combined SAR result are below limit, also BT+cellular combined SAR can be deemed to comply without further analysis and estimations required in KDB 447498 for simultaneous transmission exclusion.

This is an LTE device LTE bands and Channel Bandwidths are given in the table below.

Band	Channel Bandwidth MHz					
	20	15	10	5	3	1.4
LTE2500 (Band 7)	x	x	x	x		

Simultaneous transmission of any singular cellular and PCS band is possible with WLAN in Head, Body-worn and Wireless router use according to the tables below.

Simultaneous transmission capabilities in Head and Body-worn use		
	WLAN2450	WLAN5000
GSM/GPRS/EGPRS850	✓	✓
WCDMA850	✓	✓
GSM/GPRS/EGPRS1900	✓	✓
WCDMA1900	✓	✓
LTE2500	✓	✓
Simultaneous transmission capabilities in Wireless Router use		
	WLAN2450	WLAN5000
GSM/GPRS/EGPRS850	✓	-
WCDMA850	✓	-
GSM/GPRS/EGPRS1900	✓	-
WCDMA1900	✓	-
LTE2500	✓	-

The hotspot mode (Wireless Router mode) may operate concurrently in DTM mode with voice calls. The reported SAR test results are conservative regarding that use case, since output power in hotspot mode is equal to or lower than in normal voice and data modes. See following chapter for hotspot mode power reductions. Also simultaneous transmissions with WLANs are already conservatively assessed for head and body-worn exposure conditions due to VoIP capability.

2.1 Power reductions in Wireless Router configurations

The following table details the power reductions active in Wireless Router mode:

Band	Power reduction in WR mode	Target tuning power in WR mode
GPRS/EGPRS850	0 dB	1-slot GPRS: 32.5 dBm 2-slot GPRS: 30.5 dBm 3-slot GPRS: 28.0 dBm 4-slot GPRS: 27.0 dBm
WCDMA850	0 dB	23.5 dBm
GPRS/EGPRS1900	1-slot GPRS: 2.0 dB 2-slot GPRS: 3.0 dB 3-slot GPRS: 3.8 dB 4-slot GPRS: 3.5 dB 1-slot EGPRS: 0.0 dB 2-slot EGPRS: 1.5 dB 3-slot EGPRS: 1.3 dB 4-slot EGPRS: 1.5 dB	1-slot GPRS: 28.0 dBm 2-slot GPRS: 24.5 dBm 3-slot GPRS: 22.7 dBm 4-slot GPRS: 21.5 dBm 1-slot EGPRS: 26.0 dBm 2-slot EGPRS: 24.5 dBm 3-slot EGPRS: 22.7 dBm 4-slot EGPRS: 21.5 dBm
WCDMA1900	5.5 dB	18.0 dBm
LTE2500	5.0 dB	18.5 dBm
WLAN2450 b-mode (BPSK 1 Mbps)	0 dB	Ch 1 - 11: 18.0 dBm
WLAN2450 g-mode (BPSK 6 Mbps)	0 dB	Ch 1 - 11: 16.0 dBm
WLAN2450 n-mode 20MHz (BPSK 6.5/7.25 Mbps)	0 dB	Ch 1 - 11: 14.0 dBm
WLAN5000 a-mode (BPSK 6 Mbps)	N/A	N/A
WLAN5000 n-mode 20MHz (BPSK 6.5 Mbps)	N/A	N/A
WLAN5000 n-mode 40MHz (BPSK 13.5/15.0 Mbps)	N/A	N/A

2.2 Description of the Antenna

The device has internal antennas for both cellular and WLAN use. The cellular antenna is located at the bottom underneath the back cover. The WLAN antenna is located at the top underneath the back cover.

Picture of antenna dimensions and antenna interdistances can be found from Exhibit_QMNRM-984_Antenna_Description document

The device has an antenna tuner. See section 3.3 for more details.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.5 – 22.5
Ambient humidity (RH %):	35 - 55

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester except for testing WLAN2450/WLAN5000 where control software was used. Communication between the device and the call tester was established by air link.

A CMW500 call tester was used to configure the test device for transmitting all the LTE bands; in each band, the Uplink Power Control was set to 'Max Power'. Additional Spectrum Emission was set to 'NS_01' to disable A-MPR.

A CMU200 call tester was used for all the GSM/GPRS/EGPRS and WCDMA bands; in the case of GSM/GPRS/EGPRS the MS signal was always set to maximum power, whereas for WCDMA the UE uplink signal was configured to 12.2kbps RMC with all TPC bit set to 1.

The conducted output power of the device was measured by a separate test laboratory on the same units as used for SAR testing. The results are given in the appendixes G-J of this report.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on lowest, middle and highest channels, and/or on all required test channels as defined in Published FCC KDB Procedures.

Dual Transfer Mode was not specifically tested as the average power in multi-slot GMSK GPRS mode is always greater than, or equal to, the average power in Dual Transfer Mode in Microsoft devices.

The number of Tx slots in all GSM/GPRS mode tests was based on tuning target/conducted power data, see Appendix H. The number of slots with highest or equal highest time-average power was tested.

The transmission mode of the device in all WCDMA tests was configured to 12.2kbps RMC with all TPC bits set as "1". All WCDMA testing has been carried out in accordance with FCC KDB 941225: SAR Measurement Procedures for 3G Devices.

The standard transmission mode of the device in all WLAN b-mode tests was BPSK QPSK 1Mbps. Additionally in WLAN b-mode, QPSK 5.5 Mbps was used for check measurements. The standard transmission mode of the device in all WLAN a-mode tests was BPSK 6 Mbps. The standard

transmission modes used have maximum time-averaged output powers within 0.25dB of the highest time-averaged output power of all the WLAN a, b, g and n modulation modes in this device as illustrated by the tables in Appendix J. All WLAN testing has been carried out in accordance with FCC KDB 248227: SAR Measurement Procedures for 802.11 a/b/g Transmitters.

LTE band has been tested according to the guidance given in KDB941225 D05 SAR for LTE Devices v02r02. MPR values as stipulated in Table 6.2.3_1 of 3GPP TS 36.101 (presented below) have been incorporated into the device; these MPR values are dependent on the modulation, Channel Bandwidth and Resource Block allocations as shown:

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

No additional MPR settings have been incorporated into the design of the device and therefore no A-MPR settings have been active during its testing.

Here is a summary list of the KDB documents used in the reported testing:

KDB 941225 D05 SAR for LTE Devices v02r02
 KDB 941225 D01 SAR Measurement Procedures for 3G Devices
 KDB 248227 SAR Measurement Procedures for 802.11 a/b/g Transmitters
 KDB 648474 D04 SAR Handsets Multi Xmitter and Ant v01
 KDB 941225 D06 v01 Hot Spot SAR
 KDB 447498 D01 General RF Exposure Guidance v05
 KDB 690783 D01 SAR Listings on Grants
 KDB 865664 D01 SAR Measurements 100MHz to 6GHz v01
 KDB 865664 D02 SAR Reporting v01

3.3 Special consideration for antenna tuner

The device has an antenna tuner. The antenna is used for all bands and protocols supported by the device. The FCC regulated bands and protocols supported in the device are given in the table below. The number and naming of the sub-bands and tuning scenarios are also included in the table below.

Band	Technology	Sub-band	Scenario	Tune-word	C1 (state)	S1	C2 (state)	S2	S3
7	LTE	1	0	1F C0	F	open	0	open	open
		1	1	1F C1	F	open	1	open	open
		1	2	1F C5	F	open	5	open	open
		2	0	1F C0	F	open	0	open	open
		2	1	1F C1	F	open	1	open	open
		2	2	1F C5	F	open	5	open	open
		3	0	1F C0	F	open	0	open	open
		3	1	1F C1	F	open	1	open	open
		3	2	1F C5	F	open	5	open	open
850	GSM	1	0	1F 19	F	open	19	closed	closed
1900	GSM	1	0	1F E3	F	open	23	open	open
2	WCDMA	1	0	1F E2	F	open	22	open	open
5	WCDMA	1	0	1F A1	F	open	21	closed	open

Tuning words used for each band, sub-band and scenario. Format used is Hex. The tune-word is also converted to show the individual state of each RF component. The details can be found from supporting documentation of this filing.

The details of the antenna tuner and the selected tuner states based on to pre-screening results between the different states are attached in Appendix K.

Following test conditions have been agreed via KDB Inquiry process.

Band/protocols with 3 sub-bands, either 1) the middle channel of the sub-band was tested or 2) the valid channel that is nearest to the middle channel of the sub-band was tested. The tables below show the channels that were tested for SAR and/or conducted power for LTE2500 (Band 7).

LTE Band	Channel BW (MHz)	Sub-band	Range of LTE channels used for each sub-band		Mid channel of sub-band	Low-channel of valid LTE channels of TX part of sub-band	High-channel of valid LTE channels of TX part of sub-band	Test channel
7	20	1	20750	20983	20867	20850	20983	20867
7	20	2	20984	21216	21100	20984	21216	21100
7	20	3	21217	21449	21333	21217	21350	21333
7	15	1	20750	20983	20867	20825	20983	20867
7	15	2	20984	21216	21100	20984	21216	21100
7	15	3	21217	21449	21333	21217	21375	21333
7	10	1	20750	20983	20867	20800	20983	20867
7	10	2	20984	21216	21100	20984	21216	21100
7	10	3	21217	21449	21333	21217	21400	21333
7	5	1	20750	20983	20867	20775	20983	20867
7	5	2	20984	21216	21100	20984	21216	21100
7	5	3	21217	21449	21333	21217	21425	21333

LTE: In section K.4, for purpose of applying the LTE test procedures for full SAR measurements, treat the highest SAR tuner state in each sub-band as the equivalent of a test channel normally required for SAR testing; that is, highest SAR tuner state in the high sub-band would be equivalent to the high channel for normal SAR testing and the highest SAR tuner state in the low sub-band would be equivalent to the low channel for normal SAR testing. The highlighted SAR (highest among the 3 sub-bands) would be equivalent to the initial test configuration in section 4.2.1 of the Rel. 8 LTE SAR test procedures in KDB 941225. Apply the normally required Rel. 8 LTE SAR procedures accordingly to determine SAR test reduction for full SAR where the RB offsets would be equivalent to the antenna tuner states in each sub-band.

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

The measurements were performed using an automated DASY near-field scanning system manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the 'advanced extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration date	Calibration expiry
DAE4	538	2013-11	2014-11
DAE4	728	2013-11	2014-11
DAE4	1355	2014-05	2015-05
DAE4	1302	2013-11	2014-11
E-field Probe ES3DV3	3194	2013-11	2014-11
E-field Probe EX3DV4	3834	2014-05	2015-05
E-field Probe EX3DV4	3892	2013-11	2014-11
E-field Probe EX3DV4	3960	2013-12	2014-12
Dipole Validation Kit, D835V2	480	2012-12	2014-12
Dipole Validation Kit, D1900V2	5d030	2014-05	2016-05
Dipole Validation Kit, D2450V2	749	2012-12	2014-12
Dipole Validation Kit, D2600V2	1056	2012-11	2014-11
Dipole Validation Kit, D5GHzV2	1048	2012-12	2014-12
DASY5 software	Version 52.8	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration expiry
Signal Generator	E4438C	MY42080610	2013-08	2014-08
Signal Generator	SML03	101264	2013-08	2014-08
Signal Generator	SMB100A	105735	2013-08	2014-08
Signal Generator	E4436B	US39260114	2013-08	2014-08
Amplifier	5S1G4M3	302338	-	-
Amplifier	ZHL-42-SMA	N072095-5	-	-
Amplifier	5S4G11	312661	-	-
Amplifier	5S1G4	25583	-	-
Power Meter	NRVS	838624/032	2013-08	2014-08
Power Meter	NRVD	840023/028	2013-08	2014-08
Power Meter	NRP	100714	2013-08	2014-08
Power Meter	NRVZ	849305/029	2013-08	2014-08
Power Sensor	NRV-Z32	100067	2013-08	2014-08
Power Sensor	NRV-Z32	849745/018	2013-08	2014-08
Power Sensor	NRP-Z92	100085	2013-08	2014-08
Power Sensor	NRV-Z32	825600/002	2013-08	2014-08
Call Tester	CMU 200	103293	-	-
Call Tester	CMU 200	104983	-	-
Call Tester	CMU 200	103294	-	-
Call Tester	MT8820C	6200883095	-	-
Call Tester	CMW 500	145474	-	-
Call Tester	CMW 500	110565	-	-
Network Analyzer	ENA E5071C	MY46213166	2013-08	2014-08
Dielectric Probe Kit	DAK-3.5	1042	-	-

4.1.1 Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix E
Frequency	10 MHz to 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 20 mm Body diameter: 12 mm Tip diameter: 3.9 mm
Application	Distance from probe tip to dipole centers: 2.0 mm General dosimetry up to 4 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.1.2 Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix E
Frequency	10 MHz to >6 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g, Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 10 mm Body diameter: 12 mm Tip diameter: 2.5 mm
Application	Distance from probe tip to dipole centers: 1.0 mm General dosimetry up to 6 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

The phantom used for all Head SAR tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG; the SAM phantom conforms to the requirements of IEEE 1528.

The phantom used for all Body SAR tests i.e. for both system checks and device testing, was a flat phantom also manufactured by SPEAG this phantom conform to the requirements of FCC published RF Exposure KDB Procedures.

The SPEAG device holder (see Section 5.1) was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

4.3 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528 and FCC published RF Exposure KDB Procedures. All tests were carried out using simulants whose dielectric parameters were within $\pm 5\%$ of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.

The depth of the tissue simulant was at least 15.0 cm for all system check and device tests, measured from the ear reference point in the case of the SAM phantom and from the inner surface of the flat phantom.

4.3.1 Tissue Simulant Recipes

The following recipes were used for Head and Body tissue simulants:

800MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	51.50	69.25
Tween 20	47.35	30.00
Salt	1.15	0.75

1900MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.50	70.25
Tween 20	45.23	29.41
Salt	0.27	0.34

2450-2600MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	56.0	70.20
Tween 20	44.0	29.62
Salt	-	0.18

5000MHz band †

Ingredient	Head (% by weight)	Body (% by weight)
Water	50-65	60-80
Oil	10-30	-
Emulsifiers, Esters, Inhibitors	8-25	20-40
Sodium salt	0-1.5	0-1.5

† Recipe is proprietary to SPEAG. The proportions of the constituents have not been disclosed.

4.4 System validation and System checking

4.4.1 System validation status

Probe Calibration Point f / MHz	Test System	DASY SW	Dipole Type / SN	Probe Type / SN	Calibrated signal types	DAE unit Type / SN	Validation done	
							Head tissue simulant	Body tissue simulant
835	TCC Salo / SAR-2	V52.8	D835V2 / 480	ES3DV4 / 3194	CW	DAE4 / 538	2014-02	2013-12
1900	TCC Salo / SAR-1	V52.8	D1900V2 / 5d030	EX3DV4 / 3834	CW	DAE4 / 1355	2014-06	2014-06
2450	TCC Salo / SAR-4	V52.8	D2450V2 / 749	EX3DV4 / 3960	CW	DAE4 / 1302	2014 -01	2014-01
2600	TCC Salo / SAR-4	V52.8	D2600V2 / 1056	EX3DV4 / 3960	CW	DAE4 / 1302	2014-02	2014-02
5200	TCC Salo / SAR-3	V52.8	D5GHzV2 / 1048	EX3DV4 / 3892	CW	DAE4 / 728	2014 -01	2014-01
5300	TCC Salo / SAR-3	V52.8	D5GHzV2 / 1048	EX3DV4 / 3892	CW	DAE4 / 728	2014 -01	2014 -01
5500	TCC Salo / SAR-3	V52.8	D5GHzV2 / 1048	EX3DV4 / 3892	CW	DAE4 / 728	2014 -01	2014 -01
5600	TCC Salo / SAR-3	V52.8	D5GHzV2 / 1048	EX3DV4 / 3892	CW	DAE4 / 728	2014 -01	2014 -01
5800	TCC Salo / SAR-3	V52.8	D5GHzV2 / 1048	EX3DV4 / 3892	CW	DAE4 / 728	2014 -01	2014 -01

4.4.2 System checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna (except in the case of the 5000MHz dipole for which 100mW was supplied), which was placed under the flat section of the twin SAM phantom for head system checking, and under the flat phantom for body system checking. The system checking results (dielectric parameters and SAR values) are given in the table below.

System checking, head tissue simulant

f [MHz]	Description	SAR 1g [W/kg]	Estimated SAR 1g [W/kg]	Estimated SAR 1g Deviation	Scaled 1W SAR 1g [W/kg]	Dielectric Parameters*		SAR 1g Deviation from target	Dielectric Parameters Deviation from target		Temp [°C]	Plot #
				dSAR [%]		ϵ_r	σ [S/m]	dSAR [%]	$d\epsilon_r$ [%]	$d\sigma$ [%]		
	Tolerances			±3%				±10 %	±5 %	±5 %		
835	Reference result SN:480	-	-	-	9.40	41.5	0.90	TCC Salo/SAR-2 ES3DV3 SN:3194 Head 835MHz				
	2014-06-25	2.31	2.36	2.16	9.24	40.0	0.90	-1.70	-3.61	0.00	22.2	1
1900	Reference result SN:5d030	-	-	-	39.70	40.0	1.40	TCC Salo/SAR-1 EX3DV4 SN:3834 Head 1900MHz				
	2014-06-23	10.30	10.40	0.97	41.20	39.0	1.41	3.78	-2.50	0.71	21.4	2
2450	Reference result SN:749	-	-	-	53.90	39.2	1.80	TCC Salo/SAR-4 EX3DV4 SN:3960 Head 2450MHz				
	2014-06-17	14.00	14.00	0.00	56.00	38.7	1.87	3.90	-1.28	3.89	21.0	3
	2014-06-18	13.70	13.70	0.00	54.80	39.1	1.84	1.67	-0.26	2.22	21.2	-
2600	Reference result SN:1056	-	-	-	57.80	39.0	1.96	TCC Salo/SAR-4 EX3DV4 SN:3960 Head 2600MHz				
	2014-06-26	14.70	15.10	2.72	58.80	38.1	2.02	1.73	-2.31	3.06	21.1	4
	2014-07-03	14.50	14.80	2.07	58.00	38.7	1.99	0.35	-0.77	1.53	21.1	-
5200	Reference result SN:1048	-	-	-	79.90	36.0	4.66	TCC Salo/SAR-3 EX3DV4 SN:3892 Head 5200MHz				
	2014-06-23	7.42	6.99	-5.80	74.20	35.2	4.59	-7.13	-2.22	-1.50	22.3	5
5300	Reference result SN:1048	-	-	-	82.60	35.9	4.76	TCC Salo/SAR-3 EX3DV4 SN: 3892 Head 5300MHz				
	2014-06-24	7.75	7.00	-9.68	77.50	34.8	4.68	-6.17	-3.06	-1.68	22.1	6

(Table continues)

(Table continues)

f [MHz]	Description	SAR 1g [W/kg]	Estimated SAR 1g [W/kg]	Estimated SAR 1g Deviation	Scaled 1W SAR 1g [W/kg]	Dielectric Parameters*		SAR 1g Deviation from target	Dielectric Parameters Deviation from target		Temp	Plot #
				dSAR [%]		ε _r	σ [S/m]		dSAR [%]	dε _r [%]		
	Tolerances			±3%				±10 %	±5 %	±5 %		
5500	Reference result SN:1048	-	-	-	82.20	35.6	4.96	TCC Salo/SAR-3 EX3DV4 SN: 3892 Head 5500MHz				
	2014-06-24	8.03	7.99	-0.50	80.30	34.6	4.86	-2.31	-2.81	-2.02	22.1	7
5600	Reference result SN:1048	-	-	-	83.10	35.5	5.07	TCC Salo/SAR-3 EX3DV4 SN: 3892 Head 5600MHz				
	2014-06-24	8.48	8.46	-0.24	84.80	34.4	4.98	2.05	-3.10	-1.78	22.1	8
5800	Reference result SN:1048	-	-	-	81.10	35.3	5.27	TCC Salo/SAR-3 EX3DV4 SN: 3892 Head 5800MHz				
	2014-06-18	7.86	7.17	-8.78	78.60	34.7	5.16	0.26	-1.70	-2.09	23.0	-
	2014-06-25	7.59	7.06	-6.98	75.90	33.9	5.18	-3.19	-3.97	-1.71	21.5	9

* Dielectric parameter reference data taken from IEEE1528/IEC62209

System checking, body tissue simulant

f [MHz]	Description	SAR 1g [W/kg]	Estimated SAR 1g [W/kg]	Estimated SAR 1g Deviation	Scaled 1W SAR 1g [W/kg]	Dielectric Parameters*		SAR 1g Deviation from target	Dielectric Parameters Deviation from target		Temp [°C]	Plot #
				dSAR [%]		ϵ_r	σ [S/m]	dSAR [%]	$d\epsilon_r$ [%]	$d\sigma$ [%]		
	Tolerances			±3%				±10 %	±5 %	±5 %		
835	Reference result SN:480	-	-	-	9.51	55.2	0.97	TCC Salo/SAR-2 ES3DV3 SN:3194 Body 835MHz				
	2014-06-26	2.41	2.46	2.07	9.64	54.2	0.98	1.37	-1.81	1.03	21.8	10
1900	Reference result SN:5d030	-	-	-	40.30	53.3	1.52	TCC Salo/SAR-1 EX3DV4 SN:3834 Body 1900MHz				
	2014-06-25	10.30	10.10	-1.94	41.20	51.8	1.57	0.49	-2.81	3.29	21.0	11
2450	Reference result SN: 749	-	-	-	51.50	52.7	1.95	TCC Salo/SAR-4 ES3DV3 SN:3960 Body 2450MHz				
	2014-06-17	12.50	12.40	-0.80	50.00	51.8	1.98	-2.91	-1.71	1.54	21.0	12
2600	Reference result SN: 1056	-	-	-	55.60	52.5	2.16	TCC Salo/SAR-4 ES3DV3 SN:3960 Body 2600MHz				
	2014-07-03	13.60	13.80	1.47	54.40	51.2	2.13	-2.16	-2.48	-1.39	20.8	13
5200	Reference result SN:1048	-	-	-	71.40	49.0	5.30	TCC Salo/SAR-3 EX3DV4 SN: 3892 Body 5200MHz				
	2014-06-16	7.71	7.13	-7.52	77.10	48.1	5.44	7.98	-1.84	2.64	22.3	14
	2014-06-23	7.51	7.03	-6.39	75.10	48.0	5.47	5.18	-2.04	3.21	22.0	-
5300	Reference result SN:1048	-	-	-	73.90	48.9	5.42	TCC Salo/SAR-3 EX3DV4 SN: 3892 Body 5300MHz				
	2014-06-17	8.01	7.63	-4.74	80.10	48.4	5.59	8.39	-1.02	3.14	22.1	15
5500	Reference result SN:1048	-	-	-	75.60	48.6	5.65	TCC Salo/SAR-3 EX3DV4 SN: 3892 Body 5500MHz				
	2014-06-17	7.60	7.24	-4.74	76.00	48.0	5.84	0.53	-1.23	3.36	22.1	16
5600	Reference result SN:1048	-	-	-	76.70	48.5	5.77	TCC Salo/SAR-3 EX3DV4 SN: 3892 Body 5600MHz				
	2014-06-17	7.78	7.55	-2.96	77.80	47.8	5.97	1.43	-1.44	3.47	22.1	17
5800	Reference result SN:1048	-	-	-	71.70	48.2	6.00	TCC Salo/SAR-3 EX3DV4 SN: 3892 Body 5800MHz				
	2014-06-18	7.52	7.01	-6.78	75.20	47.1	6.25	4.59	-2.28	4.17	22.0	18

* Dielectric parameter reference data taken from FCC Published RF Exposure KDB Procedures

Plots of the system checking scans are given in Appendix A.

4.5 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Dielectric Parameters Deviation from recommended value		Temp [°C]
		ϵ_r	σ [S/m]	$d\epsilon_r$ [%]	$d\sigma$ [%]	
	Tolerances			±5 %	±5 %	
835	Recommended value	41.5	0.90			
	2014-06-25	40.0	0.90	-3.61	0.00	22.2
836	Recommended value	41.5	0.90			
	2014-06-25	40.0	0.90	-3.61	0.00	22.2
1880	Recommended value	40.0	1.40			
	2014-06-23	39.0	1.39	-2.50	-0.71	21.4
2437	Recommended value	39.2	1.79			
	2014-06-17	38.7	1.86	-1.28	3.91	21.0
	2014-06-18	39.2	1.83	0.00	2.23	21.2
2535	Recommended value	39.1	1.89			
	2014-06-26	38.4	1.95	-1.79	3.17	21.1
	2014-07-03	38.9	1.92	-0.51	1.59	21.1
5210	Recommended value	36.0	4.67			
	2014-06-23	35.2	4.60	-2.22	-1.50	22.3
5290	Recommended value	35.9	4.75			
	2014-06-24	34.8	4.66	-3.06	-1.89	22.1
5520	Recommended value	35.6	4.99			
	2014-06-24	34.5	4.88	-3.09	-2.20	22.1
5620	Recommended value	35.5	5.09			
	2014-06-24	34.4	4.99	-3.10	-1.96	22.1
5760	Recommended value	35.3	5.23			
	2014-06-18	34.7	5.10	-1.70	-2.49	23.0
	2014-06-25	33.9	5.12	-3.97	-2.10	21.5

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Dielectric Parameters Deviation from Recommended value		Temp [°C]
		ϵ_r	σ [S/m]	$d\epsilon_r$ [%]	$d\sigma$ [%]	
	Tolerances			±5 %	±5 %	
835	Recommended value	55.2	0.97			
	2014-06-26	54.2	0.98	-1.81	1.03	21.8
836	Recommended value	55.2	0.97			
	2014-06-26	54.1	0.98	-1.99	1.03	21.8
1880	Recommended value	53.3	1.52			
	2014-06-25	51.9	1.55	-2.63	1.97	21.0
2437	Recommended value	52.7	1.94			
	2014-06-17	51.9	1.97	-1.52	1.55	21.0
2535	Recommended value	52.6	2.07			
	2014-07-03	51.4	2.06	-2.28	-0.48	20.8
5210	Recommended value	49.0	5.31			
	2014-06-16	48.1	5.46	-1.84	2.82	22.3
	2014-06-23	48.0	5.49	-2.04	3.39	22.0
5290	Recommended value	48.9	5.40			
	2014-06-17	48.4	5.57	-1.02	3.15	22.1
5520	Recommended value	48.6	5.67			
	2014-06-17	48.0	5.87	-1.23	3.53	22.1
5620	Recommended value	48.4	5.79			
	2014-06-17	47.7	6.00	-1.45	3.63	22.1
5760	Recommended value	48.3	5.95			
	2014-06-18	47.1	6.19	-2.48	4.03	22.0

Dielectric parameter data for the band edges is given in Appendix C.

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



Device holder supplied by SPEAG

A spacer (illustrated below) was used to position the device within the SPEAG holder. The spacer positions the device so that the holder has minimal effect on the test results but still holds the device securely. The spacer was removed before the tests.



Spacer

5.2 Test Positions

5.2.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Microsoft spacer and placed below the flat phantom. The distance between the device and the phantom was kept at the separation distance indicated in Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements. The device was oriented with both sides facing the phantom to find the highest results.

Microsoft body-worn accessories are commonly available for the separation distance used in this testing.

5.2.3 Wireless Router Configuration

The device was placed in the SPEAG holder and, in sequence, the back, display and each of the 4 edges was positioned 10.0mm away from the flat phantom. The spacer was removed before the start of the measurements.

5.3 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom scan, a minimum of 5x5x7 points covering a volume of at least 30x30x30mm, was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan. Fast SAR is measured according to the KDB 447498 D01 General RF Exposure Guidance v05r01.

5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy52 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighbouring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation for 1g Full SAR in 0.3-6GHz range

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	G_i	$G_i \cdot U_i$ (%)	V_i
Measurement System							
Probe Calibration	E2.1	±6.6	N	1	1	±6.6	∞
Axial Isotropy	E2.2	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	E2.2	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	E2.3	±2.0	R	√3	1	±1.2	∞
Linearity	E2.4	±4.7	R	√3	1	±2.7	∞
System Detection Limits	E2.5	±1.0	R	√3	1	±0.6	∞
Modulation response	E2.5	±2.4	R	√3	1	±1.4	
Readout Electronics	E2.6	±0.3	N	1	1	±0.3	∞
Response Time	E2.7	±0.8	R	√3	1	±0.5	∞
Integration Time	E2.8	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	E6.1	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	E6.1	±3.0	R	√3	1	±1.7	∞
Probe Positioner Mechanical Tolerance	E6.2	±0.8	R	√3	1	±0.5	∞
Probe Positioning with respect to Phantom Shell	E6.3	±6.7	R	√3	1	±3.9	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E5	±4.0	R	√3	1	±2.3	∞
Test sample Related							
Test Sample Positioning	E4.2	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1	±3.6	N	1	1	±3.6	5
Output Power Variation - SAR drift measurement	E2.9	±5.0	R	√3	1	±2.9	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±6.6	R	√3	1	±3.8	∞
SAR correction	E3.2	±1.9	R	√3	1	±1.1	∞
Conductivity Target - tolerance	E3.4	±5.0	R	√3	0.6	±1.8	∞
Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.6	±3.5	5
Permittivity Target - tolerance	E3.4	±5.0	R	√3	0.6	±1.7	∞
Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			±14.0	198
Coverage Factor for 95%			k=2				
Expanded Uncertainty						±28.2	

Table 6.2 – Measurement uncertainty evaluation for 1g Fast SAR in 0.3-6GHz range

Relative DASY5 Uncertainty Budget for Fast SAR Tests According to IEEE 1528/2011 and IEC 62209-1/2011 (0.3-6 GHz range)						
Uncertainty Component	Tol. (%)	Prob Dist.	Div.	C_i	$C_i \cdot U_i$ (%)	V_i
Measurement System						
Probe Calibration	±6.6	N	1	0		
Axial Isotropy	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	±2.0	R	√3	1	±1.2	∞
Linearity	±4.7	R	√3	1	±2.7	∞
System Detection Limits	±1.0	R	√3	1	±0.6	∞
Modulation Response	±2.4	R	√3	1	±1.4	∞
Readout Electronics	±0.3	N	1	0		
Response Time	±0.8	R	√3	0		
Integration Time	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	±3.0	R	√3	0		
Probe Positioner Mechanical Tolerance	±0.8	R	√3	1	±0.5	∞
Probe Positioning with respect to Phantom Shell	±6.7	R	√3	1	±3.9	∞
Spatial x-y Resolution	±10.0	R	√3	1	±5.8	∞
Fast SAR z Approximation	±14.0	R	√3	1	±8.1	∞
Test sample Related						
Test Sample Positioning	±6.0	N	1	1	±6.0	12
Device Holder Uncertainty	±3.6	N	1	1	±3.6	5
Output Power Variation - SAR drift measurement	±5.0	R	√3	1	±2.9	∞
Power Scaling	±0	R	√3	0		
Phantom and Setup						
Phantom Uncertainty (shape and thickness tolerances)	±6.6	R	√3	1	±3.8	∞
SAR correction	±1.9	R	√3	0		
Conductivity Target - tolerance	±1.9	R	√3	0		
Conductivity - measurement uncertainty	±5.0	R	√3	0		
Permittivity Target - tolerance	±5.5	N	1	0		
Permittivity - measurement uncertainty	±5.0	R	√3	0		
Combined Standard Uncertainty						
		RSS			±14.9	748
Coverage Factor for 95%						
		k=2				
Expanded Uncertainty						
					±29.8	

7. RESULTS

7.1 The measured Head SAR values for the test device are tabulated below:

850MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz		
GSM	Tuning Target + Tolerance [dBm]		32.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		32.3	32.5	32.6	0.6	0.4	0.3	dB	
	Time-averaged power [dBm]		23.3	23.5	23.6	1.15	1.10	1.07	Lin	
			No testing required for this slot configuration.							
2-slot GPRS	Tuning Target + Tolerance [dBm]		30.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		30.7	30.0	30.7	0.2	0.9	0.2	dB	
	Time-averaged power [dBm]		24.7	24.0	24.7	1.05	1.23	1.05	Lin	
	Left Cheek	Estimated SAR Full SAR	0.359	0.361	0.339	0.376	0.444	0.355	0.02	1
			-	0.379	-	-	0.466	-		
	Left Tilt	Estimated SAR Full SAR	-	0.187	-	-	0.230	-	-	-
			-	-	-	-	-	-	-	-
	Right Cheek	Estimated SAR Full SAR	-	0.282	-	-	0.347	-	-	-
			-	-	-	-	-	-	-	-
	Right Tilt	Estimated SAR Full SAR	-	0.217	-	-	0.267	-	-	-
		-	-	-	-	-	-	-	-	
	CP-627 Left Cheek	Estimated SAR Full SAR	0.367	0.364	0.336	0.384	0.448	0.352	0.03	-
			-	0.377	-	-	0.464	-		
3-slot GPRS	Tuning Target + Tolerance [dBm]		28.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		28.1	27.5	28.2	0.3	0.9	0.2	dB	
	Time-averaged power [dBm]		23.8	23.2	23.9	1.07	1.23	1.05	Lin	
			No testing required for this slot configuration.							
4-slot GPRS	Tuning Target + Tolerance [dBm]		27.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		27.1	26.5	27.2	0.3	0.9	0.2	dB	
	Time-averaged power [dBm]		24.1	23.5	24.2	1.07	1.23	1.05	Lin	
			No testing required for this slot configuration.							

(850MHz Head SAR Table continues)

(850MHz Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 128	Ch 190	Ch 251	Ch 128	Ch 190	Ch 251		
			824.2 MHz	836.6 MHz	848.8 MHz	824.2 MHz	836.6 MHz	848.8 MHz		
1-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		27.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		27.4	26.7	27.3	0.0	0.7	0.1	dB	
	Time-averaged power [dBm]		18.4	17.7	18.3	1.00	1.17	1.02	Lin	
			No testing required for this slot configuration.							
2-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		27.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		27.4	26.6	27.3	0.0	0.8	0.1	dB	
	Time-averaged power [dBm]		21.4	20.6	21.3	1.00	1.20	1.02	Lin	
	Left Cheek	Estimated SAR	-	0.175	-	-	0.210	-	-	-
		Full SAR	-	-	-	-	-	-		
3-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		25.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		25.2	24.5	25.2	0.2	0.9	0.2	dB	
	Time-averaged power [dBm]		20.9	20.2	20.9	1.05	1.23	1.05	Lin	
			No testing required for this slot configuration.							
4-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		24.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		24.1	23.6	24.2	0.3	0.8	0.2	dB	
	Time-averaged power [dBm]		21.1	20.6	21.2	1.07	1.20	1.05	Lin	
			No testing required for this slot configuration.							

(850MHz Head SAR Table continues)

(850MHz Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 4132	Ch 4175	Ch 4233	Ch 4132	Ch 4175	Ch 4233		
			826.4 MHz	835.0 MHz	846.6 MHz	826.4 MHz	835.0 MHz	846.6 MHz		
WCDMA	Tuning Target + Tolerance [dBm]		23.9			Scaling factor*				
	Conducted Power [dBm]		23.4	23.4	23.4	0.5	0.5	0.5	dB	
	Time-averaged power [dBm]		23.4	23.4	23.4	1.12	1.12	1.12	Lin	
	Left Cheek	Estimated SAR	0.303	0.312	0.314	0.340	0.350	0.352	0.02	2
		Full SAR	-	-	0.329	-	-	0.369		
	Left Tilt	Estimated SAR	-	0.150	-	-	0.168	-	-	-
		Full SAR	-	-	-	-	-	-		
	Right Cheek	Estimated SAR	-	0.218	-	-	0.245	-	-	-
		Full SAR	-	-	-	-	-	-		
	Right Tilt	Estimated SAR	-	0.179	-	-	0.201	-	-	-
		Full SAR	-	-	-	-	-	-		
	CP-627 Left Cheek	Estimated SAR	0.302	0.312	0.315	0.339	0.350	0.353	0.01	-
		Full SAR	-	-	0.324	-	-	0.364		

1900MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz		
GSM	Tuning Target + Tolerance [dBm]		30.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		30.0	30.1	30.2	0.4	0.3	0.2	dB	
	Time-averaged power [dBm]		21.0	21.1	21.2	1.10	1.07	1.05	Lin	
			No testing required for this slot configuration.							
2-slot GPRS	Tuning Target + Tolerance [dBm]		27.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		27.6	27.9	27.7	0.3	0.0	0.2	dB	
	Time-averaged power [dBm]		21.6	21.9	21.7	1.07	1.00	1.05	Lin	
			No testing required for this slot configuration.							
3-slot GPRS	Tuning Target + Tolerance [dBm]		26.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		26.5	26.8	26.7	0.4	0.1	0.2	dB	
	Time-averaged power [dBm]		22.2	22.5	22.4	1.10	1.02	1.05	Lin	
	Left Cheek	Estimated SAR	-	0.109	-	-	0.112	-	-	-
		Full SAR	-	-	-	-	-	-		
	Left Tilt	Estimated SAR	-	0.075	-	-	0.077	-	-	-
		Full SAR	-	-	-	-	-	-		
	Right Cheek	Estimated SAR	0.159	0.141	0.180	0.174	0.144	0.188	0.01	-
		Full SAR	-	-	0.175	-	-	0.183		
	Right Tilt	Estimated SAR	-	0.054	-	-	0.055	-	-	-
		Full SAR	-	-	-	-	-	-		
	CP-627 Right Cheek	Estimated SAR	0.165	0.159	0.188	0.181	0.163	0.197	0.00	3
Full SAR		-	-	0.184	-	-	0.193			
4-slot GPRS	Tuning Target + Tolerance [dBm]		25.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		25.1	25.2	25.2	0.3	0.2	0.2	dB	
	Time-averaged power [dBm]		22.1	22.2	22.2	1.07	1.05	1.05	Lin	
			No testing required for this slot configuration.							

(1900MHz Head SAR Table continues)

(1900MHz Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz		
1-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		26.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		26.2	26.3	26.2	0.2	0.1	0.2	dB	
	Time-averaged power [dBm]		17.2	17.3	17.2	1.05	1.02	1.05	Lin	
			No testing required for this slot configuration.							
2-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		26.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		26.2	26.2	26.1	0.2	0.2	0.3	dB	
	Time-averaged power [dBm]		20.2	20.2	20.1	1.05	1.05	1.07	Lin	
			No testing required for this slot configuration.							
3-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		24.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		24.0	24.2	24.0	0.4	0.2	0.4	dB	
	Time-averaged power [dBm]		19.7	19.9	19.7	1.10	1.05	1.10	Lin	
			No testing required for this slot configuration.							
4-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		23.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		23.2	23.3	23.2	0.2	0.1	0.2	dB	
	Time-averaged power [dBm]		20.2	20.3	20.2	1.05	1.02	1.05	Lin	
	CP-627 Right Cheek	Estimated SAR	-	-	0.106	-	-	0.111	-	-
		Full SAR	-	-	-	-	-	-	-	-

(1900MHz Head SAR Table continues)

(1900MHz Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 9262	Ch 9400	Ch 9538	Ch 9262	Ch 9400	Ch 9538		
			1852.4 MHz	1880.0 MHz	1907.6 MHz	1852.4 MHz	1880.0 MHz	1907.6 MHz		
WCDMA	Tuning Target + Tolerance [dBm]		23.9			Scaling factor*				
	Conducted Power [dBm]		23.4	23.6	23.5	0.5	0.3	0.4	dB	
	Time-averaged power [dBm]		23.4	23.6	23.5	1.12	1.07	1.10	Lin	
	Left Cheek	Estimated SAR	-	0.203	-	-	0.218	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Left Tilt	Estimated SAR	-	0.123	-	-	0.132	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Right Cheek	Estimated SAR	0.362	0.264	0.363	0.406	0.283	0.398	0.01	4
		Full SAR	0.348	-	-	0.390	-	-		
	Right Tilt	Estimated SAR	-	0.087	-	-	0.093	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	CP-627 Right Cheek	Estimated SAR	0.276	0.255	0.279	0.310	0.273	0.306	0.00	-
		Full SAR	0.275	-	-	0.309	-	-		

LTE2500 (Band 7) Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 20867	Ch 21100	Ch 21333	Ch 20867	Ch 21100	Ch 21333		
			2511.7 MHz	2535 MHz	2558.3 MHz	2511.7 MHz	2535 MHz	2558.3 MHz		
20MHz Ch BW 1RB 0% offset	Tuning Target + Tolerance [dBm]		23.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		23.6	23.4	23.5	0.3	0.5	0.4	dB	
	Time-averaged power [dBm]		23.6	23.4	23.5	1.07	1.12	1.10	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 1RB 50% offset	Tuning Target + Tolerance [dBm]		23.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		23.5	23.3	23.6	0.4	0.6	0.3	dB	
	Time-averaged power [dBm]		23.5	23.3	23.6	1.10	1.15	1.07	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							

(LTE2500 (Band 7) Head SAR Table continues)

(LTE2500 (Band 7) Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz	Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz		
20MHz Ch BW 1RB 100% offset	Tuning Target + Tolerance [dBm]		23.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		23.5	23.4	23.8	0.4	0.5	0.1	dB	
	Time-averaged power [dBm]		23.5	23.4	23.8	1.10	1.12	1.02	Lin	
	Left Cheek	Scenario	-	2	-	-	-	-	0.00	-
		Estimated SAR	-	0.204	-	-	0.229	-		
		Full SAR	-	0.200	-	-	0.224	-		
	Left Tilt	Scenario	-	-	1	-	-	-	-	6
		Estimated SAR	-	-	0.081	-	-	0.083		
		Full SAR	-	-	-	-	-	-		
	Right Cheek	Scenario	-	0	-	-	-	-	-	7
		Estimated SAR	-	0.113	-	-	0.127	-		
		Full SAR	-	-	-	-	-	-		
	Right Tilt	Scenario	-	2	-	-	-	-	-	8
		Estimated SAR	-	0.038	-	-	0.042	-		
		Full SAR	-	-	-	-	-	-		
	CP-627 Left Cheek	Scenario	-	2	-	-	-	-	0.00	5
		Estimated SAR	-	0.201	-	-	0.226	-		
		Full SAR	-	0.204	-	-	0.229	-		
20MHz Ch BW 50% RB 0% offset	Tuning Target + Tolerance [dBm]		22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.6	22.3	22.5	0.3	0.6	0.4	dB	
	Time-averaged power [dBm]		22.6	22.3	22.5	1.07	1.15	1.10	Lin	
	Left Cheek	Scenario	-	2	-	-	-	-	-	-
		Estimated SAR	-	0.156	-	-	0.179	-		
		Full SAR	-	-	-	-	-	-		
	Left Tilt	Scenario	-	-	1	-	-	-	-	-
		Estimated SAR	-	-	0.049	-	-	0.053		
		Full SAR	-	-	-	-	-	-		
	Right Cheek	Scenario	-	0	-	-	-	-	-	-
		Estimated SAR	-	0.084	-	-	0.096	-		
		Full SAR	-	-	-	-	-	-		
	Right Tilt	Scenario	-	2	-	-	-	-	-	-
		Estimated SAR	-	0.030	-	-	0.034	-		
		Full SAR	-	-	-	-	-	-		

(LTE2500 (Band 7) Head SAR Table continues)

(LTE2500 (Band 7) Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz	Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz		
20MHz Ch BW 50% RB 50% offset	Tuning Target + Tolerance [dBm]		22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.5	22.3	22.6	0.4	0.6	0.3	dB	
	Time-averaged power [dBm]		22.5	22.3	22.6	1.10	1.15	1.07	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 50% RB 100% offset	Tuning Target + Tolerance [dBm]		22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.4	22.2	22.6	0.5	0.7	0.3	dB	
	Time-averaged power [dBm]		22.4	22.2	22.6	1.12	1.17	1.07	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 100%RB	Tuning Target + Tolerance [dBm]		22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.6	22.3	22.6	0.3	0.6	0.3	dB	
	Time-averaged power [dBm]		22.6	22.3	22.6	1.07	1.15	1.07	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							

2450MHz Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 1	Ch 6	Ch 11	Ch 1	Ch 6	Ch 11		
			2412.0 MHz	2437.0 MHz	2462.0 MHz	2412.0 MHz	2437.0 MHz	2462.0 MHz		
WLAN b-mode BPSK 1Mbps	Tuning Target + Tolerance [dBm]		19.5			Scaling factor*				
	Conducted Power [dBm]		18.3	18.4	18.4	1.2	1.1	1.1	dB	
	Time-averaged power [dBm]		18.3	18.4	18.4	1.32	1.29	1.29	Lin	
	Left Cheek	Estimated SAR	-	0.316	-	-	0.407	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Left Tilt	Estimated SAR	-	0.410	-	-	0.528	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Right Cheek	Estimated SAR	-	0.460	-	-	0.593	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Right Tilt	Estimated SAR	0.556	0.571	0.565	0.733	0.736	0.728	0.05	9
		Full SAR		0.625		-	0.805	-		
	CP-627 Right Tilt	Estimated SAR	0.504	0.501	0.463	0.664	0.645	0.596	0.01	-
		Full SAR	0.518	-	-	0.683	-	-		-

(2450MHz Head SAR Table continues)

(2450MHz Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 2 2417 MHz	Ch 6 2437.0 MHz	Ch 10 2457.0 MHz	Ch 2 2417 MHz	Ch 6 2437.0 MHz	Ch 10 2457.0 MHz		
WLAN b-mode QPSK 5.5 Mbps	Tuning Target + Tolerance [dBm]		19.5			Scaling factor*				
	Conducted Power [dBm]		18.8	18.7	18.7	0.7	0.8	0.8	dB	
	Time-averaged power [dBm]		18.8	18.7	18.7	1.17	1.20	1.20	Lin	
	Right Tilt	Estimated SAR	0.605	0.627	0.604	0.711	0.754	0.726	0.03	-
		Full SAR	-	0.656	-	-	0.789	-		

5000MHz Head SAR results
5150–5250 MHz and 5250–5350 MHz

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 40 5200.0 MHz	Ch 44 5220.0 MHz	Ch 52 5260.0 MHz	Ch 64 5320.0 MHz	Ch 40 5200.0 MHz	Ch 44 5220.0 MHz	Ch 52 5260.0 MHz	Ch 64 5320.0 MHz		
WLAN a-mode BPSK 6 Mbps	Tuning Target + Tolerance [dBm]		17.5				Scaling factor*					
	Conducted Power [dBm]		16.1	16.0	16.1	16.1	1.4	1.5	1.4	1.4	dB	
	Time-averaged power [dBm]		16.1	16.0	16.1	16.1	1.38	1.41	1.38	1.38	Lin	
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	0.112	0.117	0.098	0.092	0.155	0.165	0.135	0.127		
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	-	0.103	0.090	-	-	0.145	0.125	-		
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	-	0.120	0.111	-	-	0.170	0.153	-		
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	-	0.102	0.091	-	-	0.144	0.126	-		
	CP-627 Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-	-
Full SAR		-	0.120	0.107	-	-	0.170	0.148	-			

**5000MHz Head SAR results
5470–5725 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 104 5520.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 136 5680.0 MHz	Ch 104 5520.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 136 5680.0 MHz		
WLAN a-mode BPSK 6 Mbps	Tuning Target + Tolerance [dBm]		17.5				Scaling factor*					
	Conducted Power [dBm]		16.1	16.1	16.1	16.2	1.4	1.4	1.4	1.3	dB	
	Time-averaged power [dBm]		16.1	16.1	16.1	16.2	1.38	1.38	1.38	1.35	Lin	
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	0.095	0.104	0.120	0.152	0.131	0.144	0.166	0.205		
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.123	-	-	-	0.166		
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-	10
		Full SAR	-	-	-	0.235	-	-	-	0.317		
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.203	-	-	-	0.274		
	CP-627 Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.199	-	-	-	0.268		

**5000MHz Head SAR results
5725–5850 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 153	Ch 157	Ch 165	Ch 153	Ch 157	Ch 165		
			5765.0 MHz	5785.0 MHz	5825.0 MHz	5765.0 MHz	5785.0 MHz	5825.0 MHz		
WLAN a-mode BPSK 6 Mbps	Tuning Target + Tolerance [dBm]		17.5			Scaling factor*				
	Conducted Power [dBm]		16.0	16.0	16.0	1.5	1.5	1.5	dB	
	Time-averaged power [dBm]		16.0	16.0	16.0	1.41	1.41	1.41	Lin	
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-
		Full SAR	0.139	0.130	0.119	0.196	0.184	0.168		
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-
		Full SAR	0.145	-	-	0.205	-	-		
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-
		Full SAR	0.185	-	-	0.261	-	-		
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-
		Full SAR	0.167	-	-	0.236	-	-		
	CP-627 Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-
		Full SAR	0.147	-	-	0.208	-	-		

Simultaneous transmissions: Combined head SAR results – Individual band Max results

Test configuration	Max. Reported* 1g SAR results						
	WLAN 2450	WLAN 5000	2-slot GPRS850	WCDMA 850	3-slot GPRS1900	WCDMA 1900	LTE2500
Head: Left, Cheek	0.407	0.205	0.466	0.369	0.112	0.218	0.229
Head: Left, Tilt	0.528	0.205	0.230	0.168	0.077	0.132	0.083
Head: Right, Cheek	0.593	0.317	0.347	0.245	0.193	0.390	0.127
Head: Right, Tilt	0.805	0.274	0.267	0.201	0.055	0.093	0.042

Simultaneous transmissions: Combined head SAR results – Max + Max combined results

Test configuration	Max. Reported* 1g SAR results				
	2-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450	WCDMA 1900 + WLAN2450	LTE2500 + WLAN2450
Head: Left, Cheek	0.873	0.776	0.519	0.625	0.636
Head: Left, Tilt	0.758	0.696	0.605	0.660	0.611
Head: Right, Cheek	0.940	0.838	0.786	0.983	0.720
Head: Right, Tilt	1.07	1.01	0.860	0.898	0.847
Test configuration	2-slot GPRS850 + WLAN5000	WCDMA850 + WLAN5000	3-slot GPRS1900 + WLAN5000	WCDMA1900 + WLAN5000	LTE2500 + WLAN5000
Head: Left, Cheek	0.671	0.574	0.317	0.423	0.434
Head: Left, Tilt	0.435	0.373	0.282	0.337	0.288
Head: Right, Cheek	0.664	0.562	0.510	0.707	0.444
Head: Right, Tilt	0.541	0.475	0.329	0.367	0.316

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product.

7.1.1 Combined Head SAR data

The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values for WLAN2450 or WLAN5000 and the cellular bands point-by-point and c) calculates the combined average SAR values.

Simultaneous transmissions: Combined head SAR results – SPEAG Combined Multiband algorithm results

Test configuration	Max. Reported* 1g SAR results				
	2-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450	LTE2500 +WLAN2450
Head: Left, Cheek	-	-	-	-	-
Head: Left, Tilt	-	-	-	-	-
Head: Right, Cheek	-	-	-	0.620	-
Head: Right, Tilt	0.866	0.832	0.770	-	0.760
Test configuration	2-slot GPRS850 + WLAN5000	WCDMA850 + WLAN5000	3-slot GPRS1900 + WLAN5000	WCDMA1900 + WLAN5000	LTE2500 +WLAN5000
Head: Left, Cheek	0.447	0.355	-	-	-
Head: Left, Tilt	-	-	-	-	-
Head: Right, Cheek	-	-	0.305	0.396	0.284
Head: Right, Tilt	-	-	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 or WLAN5000 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular band.

Note:

* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan results are given in Section for each simultaneous transmitter combination.

7.2 The measured Body SAR values for the test device are tabulated below:

850MHz Band Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #	
				Ch 128	Ch 190	Ch 251	Ch 128	Ch 190	Ch 251			
				824.2 MHz	836.6 MHz	848.8 MHz	824.2 MHz	836.6 MHz	848.8 MHz			
2-slot GPRS	Tuning Target + Tolerance [dBm]			30.9			Scaling factor*					
	Conducted Slot Average Power [dBm]			30.7	30.0	30.7	0.2	0.9	0.2	dB		
	Time-averaged power [dBm]			24.7	24.0	24.7	1.05	1.23	1.05	Lin		
	Back facing phantom	Without headset	Estimated SAR	-	0.219	-	-	0.269	-	-	-	
			Full SAR	-	-	-	-	-	-	-	-	
		Headset WH-208	Estimated SAR	-	0.199	-	-	0.245	-	-	-	-
			Full SAR	-	-	-	-	-	-	-	-	-
	Display facing phantom	Without headset	Estimated SAR	0.227	0.238	0.224	0.238	0.293	0.235	0.00	11	
			Full SAR	-	0.239	-	-	0.294	-	-	-	-
		Headset WH-208	Estimated SAR	-	0.232	-	-	0.285	-	-	-	-
			Full SAR	-	-	-	-	-	-	-	-	-
	CP-627 Display facing phantom Without headset			Estimated SAR	0.208	0.210	0.198	0.218	0.258	0.207	0.00	-
				Full SAR	-	0.210		-	0.258	-	-	-

(850MHz Body SAR Table continues)

(850MHz Body SAR Table continues)

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #	
				Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz			
WCDMA	Tuning Target + Tolerance [dBm]			23.9			Scaling factor*					
	Conducted Power [dBm]			23.4	23.4	23.4	0.5	0.5	0.5	dB		
	Time-averaged power [dBm]			23.4	23.4	23.4	1.12	1.12	1.12	Lin		
	Back facing phantom	Without headset	Estimated SAR	-	0.375	-	-	0.421	-	-	-	
			Full SAR	-	-	-	-	-	-	-	-	
		Headset WH-208	Estimated SAR	-	0.354	-	-	0.397	-	-	-	-
			Full SAR	-	-	-	-	-	-	-	-	-
	Display facing phantom	Without headset	Estimated SAR	0.377	0.395	0.392	0.423	0.443	0.440	0.00	12	
			Full SAR	-	0.396	-	-	0.444	-	-	-	-
		Headset WH-208	Estimated SAR	-	0.382	-	-	0.429	-	-	-	-
			Full SAR	-	-	-	-	-	-	-	-	-
	CP-627 Display facing phantom Without headset		Estimated SAR	0.331	0.339	0.338	0.371	0.380	0.379	0.01	-	
			Full SAR	-	0.346	-	-	0.388	-	-	-	-

1900MHz Band Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #	
				Ch 512	Ch 661	Ch 810	Ch 512	Ch 661	Ch 810			
				1850.2 MHz	1880.0 MHz	1909.8 MHz	1850.2 MHz	1880.0 MHz	1909.8 MHz			
3-slot GPRS	Tuning Target + Tolerance [dBm]			26.9			Scaling factor*					
	Conducted Slot Average Power [dBm]			26.5	26.8	26.7	0.4	0.1	0.2	dB		
	Time-averaged power [dBm]			22.2	22.5	22.4	1.10	1.02	1.05	Lin		
	Back facing phantom	Without headset	Estimated SAR	-	0.295	-	-	0.302	-	-	-	
			Full SAR	-	-	-	-	-	-	-	-	
		Headset WH-208	Estimated SAR	-	0.310	-	-	0.317	-	-	-	-
			Full SAR	-	-	-	-	-	-	-	-	-
	Display facing phantom	Without headset	Estimated SAR	-	0.370	-	-	0.379	-	-	-	
			Full SAR	-	-	-	-	-	-	-	-	
		Headset WH-208	Estimated SAR	0.351	0.373	0.434	0.385	0.382	0.454	0.02	13	
			Full SAR	-	-	0.458	-	-	0.480			
	CP-627 Display facing phantom Headset WH-208			Estimated SAR	0.305	0.312	0.356	0.334	0.319	0.373	0.02	-
				Full SAR	-	-	0.372	-	-	0.390		

(1900MHz Body SAR Table continues)

(1900MHz Body SAR Table continues)

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #	
				Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz			
WCDMA	Tuning Target + Tolerance [dBm]			23.9			Scaling factor*					
	Conducted Power [dBm]			23.4	23.6	23.5	0.5	0.3	0.4	dB		
	Time-averaged power [dBm]			23.4	23.6	23.5	1.12	1.07	1.10	Lin		
	Back facing phantom	Without headset	Estimated SAR	-	0.570	-	-	0.611	-	-	-	
			Full SAR	-	-	-	-	-				
		Headset WH-208	Estimated SAR	-	0.552	-	-	0.591	-	-	-	
			Full SAR	-	-	-	-	-				
	Display facing phantom	Without headset	Estimated SAR	0.700	0.734	0.720	0.785	0.786	0.789	0.03	-	
			Full SAR	-	-	0.746	-	-	0.818			
		Headset WH-208	Estimated SAR		0.732	-	-	0.784	-	-	-	
			Full SAR	-	-	-	-	-				
	CP-627 Display facing phantom Without headset			Estimated SAR	0.666	0.686	0.654	0.747	0.735	0.717	0.08	14
				Full SAR	0.742	-	-	0.833	-	-		

LTE2500 (Band 7) Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #	
				Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz	Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz			
20MHz Ch BW 1RB 0% offset	Tuning Target + Tolerance [dBm]			23.9			Scaling factor*					
	Conducted Slot Average Power [dBm]			23.6	23.4	23.5	0.3	0.5	0.4	dB		
	Time-averaged power [dBm]			23.6	23.4	23.5	1.07	1.12	1.10	Lin		
				No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02								
20MHz Ch BW 1RB 50% offset	Tuning Target + Tolerance [dBm]			23.9			Scaling factor*					
	Conducted Slot Average Power [dBm]			23.5	23.3	23.6	0.4	0.6	0.3	dB		
	Time-averaged power [dBm]			23.5	23.3	23.6	1.10	1.15	1.07	Lin		
				No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02								
20MHz Ch BW 1RB 100% offset	Tuning Target + Tolerance [dBm]			23.9			Scaling factor*					
	Conducted Slot Average Power [dBm]			23.5	23.4	23.8	0.4	0.5	0.1	dB		
	Time-averaged power [dBm]			23.5	23.4	23.8	1.10	1.12	1.02	Lin		
	Back facing phantom	Without headset	Scenario	-	0	-	-	-	-	-	15	
			Estimated SAR	-	0.473	-	-	0.531	-			
			Full SAR	-	-	-	-	-	-			
		Headset WH-208	Scenario	-	0	-	-	-	-	-	16	
			Estimated SAR	-	0.467	-	-	0.524	-			
			Full SAR	-	-	-	-	-	-			
	Display facing phantom	Without headset	Scenario	-	0	-	-	-	-	-	17	
			Estimated SAR	-	0.578	-	-	0.649	-			
			Full SAR	-	-	-	-	-	-			
		Headset WH-208	Scenario	-	0	-	-	-	-	0.01	18	
			Estimated SAR	-	0.582	-	-	0.653	-			
			Full SAR	-	0.587	-	-	0.659	-			
	CP-627 Display facing phantom Headset WH-208			Scenario	-	0	-	-	-	0.01	-	
				Estimated SAR	-	0.463	-	-	0.519			-
				Full SAR	-	0.468	-	-	0.525			-

(LTE2500 (Band 7) Body SAR Table continues)

(LTE2500 (Band 7) Body SAR Table continues)

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
				Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz	Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz		
20MHz Ch BW 50% RB 0% offset	Tuning Target + Tolerance [dBm]			22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]			22.6	22.3	22.5	0.3	0.6	0.4	dB	
	Time-averaged power [dBm]			22.6	22.3	22.5	1.07	1.15	1.10	Lin	
	Back facing phantom	Without headset	Scenario	-	0	-	-	-	-	-	-
			Estimated SAR	-	0.364	-	-	0.418	-		
			Full SAR	-	-	-	-	-	-		
		Headset WH-208	Scenario	-	0	-	-	-	-	-	-
			Estimated SAR	-	0.366	-	-	0.420	-		
			Full SAR	-	-	-	-	-	-		
	Display facing phantom	Without headset	Scenario	-	0	-	-	-	-	-	-
			Estimated SAR	-	0.442	-	-	0.507	-		
			Full SAR	-	-	-	-	-	-		
		Headset WH-208	Scenario	-	0	-	-	-	-	-	-
			Estimated SAR	-	0.446	-	-	0.512	-		
			Full SAR	-	-	-	-	-	-		

(LTE2500 (Band 7) Body SAR Table continues)

(LTE2500 (Band 7) Body SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz	Ch 20867 2511.7 MHz	Ch 21100 2535 MHz	Ch 21333 2558.3 MHz		
20MHz Ch BW 50% RB 100% offset	Tuning Target + Tolerance [dBm]		22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.4	22.2	22.6	0.5	0.7	0.3	dB	
	Time-averaged power [dBm]		22.4	22.2	22.6	1.12	1.17	1.07	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 100%RB B	Tuning Target + Tolerance [dBm]		22.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.6	22.3	22.6	0.3	0.6	0.3	dB	
	Time-averaged power [dBm]		22.6	22.3	22.6	1.07	1.15	1.07	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							

2450MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
				Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz		
WLAN b-mode BPSK 1 Mbps	Tuning Target + Tolerance [dBm]			19.5			Scaling factor*				
	Conducted Power [dBm]			18.3	18.4	18.4	1.2	1.1	1.1	dB	
	Time-averaged power [dBm]			18.3	18.4	18.4	1.32	1.29	1.29	Lin	
	Back facing phantom	Without headset	Estimated SAR	0.155	0.131	0.129	0.204	0.169	0.166	0.00	19
			Full SAR	0.157	-	-	0.207	-	-		
		Headset WH-208	Estimated SAR	-	0.087	-	-	0.113	-	-	-
			Full SAR	-	-	-	-	-	-		
	Display facing phantom	Without headset	Estimated SAR	-	0.057	-	-	0.073	-	-	-
			Full SAR	-	-	-	-	-	-		
		Headset WH-208	Estimated SAR	-	0.019	-	-	0.025	-	-	-
			Full SAR	-	-	-	-	-	-		
	CP-627 Back facing phantom No headset		Estimated SAR	0.096	0.082	0.081	0.127	0.106	0.104	0.01	-
			Full SAR	0.103	-	-	0.136	-	-		

(WLAN2450 Body SAR Table continues)

(WLAN2450 Body SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 2	Ch 6	Ch 10	Ch 2	Ch 6	Ch 10		
			2417 MHz	2437.0 MHz	2457.0 MHz	2417 MHz	2437.0 MHz	2457.0 MHz		
WLAN b-mode QPSK 5.5 Mbps	Tuning Target + Tolerance [dBm]		19.5			Scaling factor*				
	Conducted Power [dBm]		18.8	18.7	18.7	0.7	0.8	0.8	dB	
	Time-averaged power [dBm]		18.8	18.7	18.7	1.17	1.20	1.20	Lin	
	Back facing phantom No headset	Estimated SAR	0.157	0.162	0.126	0.184	0.195	0.151	0.01	-
		Full SAR	-	0.148	-	-	0.178	-		

5000MHz Body SAR results
5150–5250 MHz and 5250–5350 MHz

Mode	Test configuration		SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
				Ch 40 5200.0 MHz	Ch 44 5220.0 MHz	Ch 52 5260.0 MHz	Ch 64 5320.0 MHz	Ch 40 5200.0 MHz	Ch 44 5220.0 MHz	Ch 52 5260.0 MHz	Ch 64 5320.0 MHz		
WLAN a-mode BPSK 6 Mbps	Tuning Target + Tolerance [dBm]			17.5				Scaling factor*					
	Conducted Power [dBm]			16.1	16.0	16.1	16.1	1.4	1.5	1.4	1.4	dB	
	Time-averaged power [dBm]			16.1	16.0	16.1	16.1	1.38	1.41	1.38	1.38	Lin	
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	0.080	0.071	0.070	0.078	0.110	0.100	0.096	0.107		
		Headset WH-208	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	0.080	-	-	0.067	0.111	-	-	0.092		
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	0.016	-	-	0.008	0.023	-	-	0.011		
		Headset WH-208	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	0.003	-	-	0.001	0.005	-	-	0.001		
	CP-627 Back facing phantom Headset WH-208			Estimated SAR	-	-	-	-	-	-	-	-	-
				Full SAR	0.076	-	-	-	0.105	-	-		
	CP-627 Back Facing phantom Without headset			Estimated SAR	-	-	-	-	-	-	-	-	-
				Full SAR	-	-	-	0.077	-	-	-		

**5000MHz Body SAR results
5470-5725 MHz**

Mode	Test configuration		SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
				Ch 104 5520.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 136 5680.0 MHz	Ch 104 5520.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 136 5680.0 MHz		
WLAN a-mode BPSK 6 Mbps	Tuning Target + Tolerance [dBm]			17.5				Scaling factor*					
	Conducted Power [dBm]			16.1	16.1	16.1	16.2	1.4	1.4	1.4	1.3	dB	
	Time-averaged power [dBm]			16.1	16.1	16.1	16.2	1.38	1.38	1.38	1.35	Lin	
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	0.070	0.070	0.098	0.149	0.097	0.096	0.135	0.201		
		Headset WH-208	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.095	-	-	-	0.128		
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.008	-	-	-	0.011		
		Headset WH-208	Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.016	-	-	-	0.022		
	CP-627 Back facing phantom Without headset		Estimated SAR	-	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.166	-	-	-	0.224		

**5000MHz Body SAR results
5725–5850 MHz**

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #	
				Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz			
WLAN b-mode BPSK 6 Mbps	Tuning Target + Tolerance [dBm]			17.5			Scaling factor*					
	Conducted Power [dBm]			16.0	16.0	16.0	1.5	1.5	1.5	dB		
	Time-averaged power [dBm]			16.0	16.0	16.0	1.41	1.41	1.41	Lin		
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	
			Full SAR	0.149	0.142	0.155	0.210	0.201	0.219			
		Headset WH-208	Estimated SAR	-	-	-	-	-	-	-	-	
			Full SAR	-	-	0.099	-	-	0.139			
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	
			Full SAR	-	-	0.002	-	-	0.002			
		Headset WH-208	Estimated SAR	-	-	-	-	-	-	-	-	
			Full SAR	-	-	0.008	-	-	0.011			
	CP-627 Back facing phantom Without headset			Estimated SAR	-	-	-	-	-	-	-	20
				Full SAR	-	-	0.198	-	-	0.280		

Simultaneous transmissions: Combined body SAR results – Individual band Max results

Test configuration	Max. Reported* 1g SAR results						
	WLAN 2450	WLAN 5000	2-slot GPRS 850	WCDMA 850	3-slot GPRS1900	WCDMA 1900	LTE 2500
Body: Back facing phantom, Without Headset	0.207	0.280	0.269	0.421	0.302	0.611	0.531
Body: Back facing phantom, Headset WH-208	0.113	0.139	0.245	0.397	0.317	0.591	0.524
Body: Display facing phantom, Without Headset	0.073	0.023	0.294	0.444	0.379	0.833	0.649
Body: Display facing phantom, Headset WH-208	0.025	0.022	0.285	0.429	0.480	0.784	0.659

Simultaneous transmissions: Combined body SAR results – Max + Max combined results

Test configuration	Max. Reported* 1g SAR results				
	2-GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450	LTE2500 + WLAN2450
Body: Back facing phantom, Without Headset	0.476	0.628	0.509	0.818	0.738
Body: Back facing phantom, Headset WH-208	0.358	0.510	0.430	0.704	0.637
Body: Display facing phantom, Without Headset	0.367	0.517	0.452	0.906	0.722
Body: Display facing phantom, Headset WH-208	0.310	0.454	0.505	0.809	0.684
Test configuration	2-GPRS850 + WLAN5000	WCDMA850 + WLAN5000	3-slot GPRS 1900 + WLAN5000	WCDMA1900 + WLAN5000	LTE2500 + WLAN5000
Body: Back facing phantom, Without Headset	0.549	0.701	0.582	0.891	0.811
Body: Back facing phantom, Headset WH-208	0.384	0.536	0.456	0.730	0.663
Body: Display facing phantom, Without Headset	0.317	0.467	0.402	0.856	0.672
Body: Display facing phantom, Headset WH-208	0.307	0.451	0.502	0.806	0.681

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product.

7.2.1 Combined Body SAR data

The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values

for WLAN2450 or WLAN5000 and the cellular bands point-by-point and c) calculates the combined average SAR values.

**Simultaneous transmissions: Combined body SAR results –
SPEAG Combined Multiband algorithm results**

Test configuration	Max. Reported* 1g SAR results				
	2-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450	LTE2500 +WLAN2450
Body: Back facing phantom, Without Headset	0.275	0.425	0.305	-	0.533
Body: Back facing phantom, Headset WH-208	-	-	-	-	-
Body: Display facing phantom, Without Headset	-	-	-	0.751	-
Body: Display facing phantom, Headset WH-208	-	-	-	-	-
Test configuration	2-slot GPRS850 + WLAN5000	WCDMA850 + WLAN5000	3-slot GPRS1900 + WLAN5000	WCDMA1900 + WLAN5000	LTE2500 +WLAN5000
Body: Back facing phantom, Without Headset	0.343	0.419	0.310	0.611	0.530
Body: Back facing phantom, Headset WH-208	-	-	-	-	-
Body: Display facing phantom, Without Headset	-	-	-	-	-
Body: Display facing phantom, Headset WH-208	-	-	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 or WLAN5000 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular band.

Note:

* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan results are given in Section for each simultaneous transmitter combination.

7.3 Body SAR assessment of Wireless Router mode at 10.0mm separation distance

850MHz Band Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz		
2-slot GPRS	Tuning Target + Tolerance [dBm]		30.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		30.7	30.0	30.7	0.2	0.9	0.2	dB	
	Time-averaged power [dBm]		24.7	24.0	24.7	1.05	1.23	1.05	Lin	
	Back facing phantom	Estimated SAR	-	0.540	-	-	0.664	-	-	-
		Full SAR	-	-	-	-	-	-		
	Display facing phantom	Estimated SAR	0.595	0.599	0.587	0.623	0.737	0.615	0.01	21
		Full SAR	-	0.612	-	-	0.753	-		
	Top edge facing phantom	Estimated SAR	-	0.013	-	-	0.016	-	-	-
		Full SAR	-	-	-	-	-	-		
	Bottom edge facing phantom	Estimated SAR	-	0.435	-	-	0.535	-	-	-
		Full SAR	-	-	-	-	-	-		
	Left edge facing phantom	Estimated SAR	-	0.475	-	-	0.584	-	-	-
		Full SAR	-	-	-	-	-	-		
	Right edge facing phantom	Estimated SAR	-	0.211	-	-	0.260	-	-	-
		Full SAR	-	-	-	-	-	-		
	CP-627 Display facing phantom	Estimated SAR	0.528	0.511	0.486	0.553	0.629	0.509	0.02	-
		Full SAR	-	0.529	-	-	0.651	-		

(850MHz WR SAR Table continues)

(850MHz WR SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz		
WCDMA	Tuning Target + Tolerance [dBm]		23.9			Scaling factor*				
	Conducted Power [dBm]		23.4	23.4	23.4	0.5	0.5	0.5	dB	
	Time-averaged power [dBm]		23.4	23.4	23.4	1.12	1.12	1.12	Lin	
	Back facing phantom	Estimated SAR	-	0.473	-	-	0.531	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Display facing phantom	Estimated SAR	0.598	0.543	0.621	0.671	0.609	0.697	0.03	22
		Full SAR	-	-	0.652	-	-	0.732		
	Top edge facing phantom	Estimated SAR	-	0.012	-	-	0.014	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Bottom edge facing phantom	Estimated SAR	-	0.394	-	-	0.442	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Left edge facing phantom	Estimated SAR	-	0.410	-	-	0.460	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Right edge facing phantom	Estimated SAR	-	0.162	-	-	0.182	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	CP-627 Display facing phantom	Estimated SAR	0.437	0.451	0.452	0.490	0.506	0.507	0.01	-
		Full SAR	-	-	0.464	-	-	0.521		

1900MHz Band Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz		
1-slot GPRS	Tuning Target + Tolerance [dBm]		28.4			Scaling factor*				
	Conducted Slot Average Power [dBm]		27.8	28.0	27.9	0.6	0.4	0.5	dB	
	Time-averaged power [dBm]		18.8	19.0	18.9	1.15	1.10	1.12	Lin	
	Back facing phantom	Estimated SAR	-	0.243	-	-	0.266	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Display facing phantom	Estimated SAR	-	0.318	-	-	0.349	-	0.05	-
		Full SAR	-	0.365	-	-	0.400	-	-	-
	Top edge facing phantom	Estimated SAR	-	0.004	-	-	0.005	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Bottom edge facing phantom	Estimated SAR	0.587	0.662	0.791	0.674	0.726	0.888	0.01	-
		Full SAR	-	-	0.801	-	-	0.899	-	-
	Left edge facing phantom	Estimated SAR	-	0.054	-	-	0.059	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
	Right edge facing phantom	Estimated SAR	-	0.077	-	-	0.085	-	-	-
		Full SAR	-	-	-	-	-	-	-	-
CP-627 Bottom edge facing phantom	Estimated SAR	0.584	0.665	0.790	0.671	0.729	0.886	0.01	-	
	Full SAR	-	-	0.800	-	-	0.898	-	-	
Repeated Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-	23	
	Full SAR	-	-	0.808	-	-	0.907	-		
2-slot GPRS	Tuning Target + Tolerance [dBm]		24.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		24.3	24.5	24.3	0.6	0.4	0.6	dB	
	Time-averaged power [dBm]		18.3	18.5	18.3	1.15	1.10	1.15	Lin	
			No testing required for this slot configuration.							
3-slot GPRS	Tuning Target + Tolerance [dBm]		23.1			Scaling factor*				
	Conducted Slot Average Power [dBm]		22.5	22.6	22.6	0.6	0.5	0.5	dB	
	Time-averaged power [dBm]		18.2	18.3	18.3	1.15	1.12	1.12	Lin	
			No testing required for this slot configuration.							
4-slot GPRS	Tuning Target + Tolerance [dBm]		21.9			Scaling factor*				
	Conducted Slot Average Power [dBm]		21.1	21.4	21.2	0.8	0.5	0.7	dB	
	Time-averaged power [dBm]		18.1	18.4	18.2	1.20	1.12	1.17	Lin	
			No testing required for this slot configuration.							

(1900MHz WR SAR Table continues)

(1900MHz WR SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz		
WCDMA	Tuning Target + Tolerance [dBm]		18.4			Scaling factor*				
	Conducted Power [dBm]		18.0	18.2	18.0	0.4	0.2	0.4	dB	
	Time-averaged power [dBm]		18.0	18.2	18.0	1.10	1.05	1.10	Lin	
	Back facing phantom	Estimated SAR	-	0.332	-	-	0.348	-	-	-
		Full SAR	-	-	-	-	-	-		
	Display facing phantom	Estimated SAR	-	0.395	-	-	0.414	-	0.03	-
		Full SAR	-	0.425	-	-	0.445	-		
	Top edge facing phantom	Estimated SAR	-	0.003	-	-	0.003	-	-	-
		Full SAR	-	-	-	-	-	-		
	Bottom edge facing phantom	Estimated SAR	0.690	0.767	0.840	0.757	0.803	0.921	0.01	24
		Full SAR	-	-	0.852	-	-	0.934		
	Left edge facing phantom	Estimated SAR	-	0.067	-	-	0.070	-	-	-
		Full SAR	-	-	-	-	-	-		
	Right edge facing phantom	Estimated SAR	-	0.095	-	-	0.100	-	-	-
		Full SAR	-	-	-	-	-	-		
	CP-627 Bottom edge facing phantom	Estimated SAR	0.687	0.778	0.784	0.753	0.815	0.860	0.03	-
		Full SAR	-	-	0.815	-	-	0.894		
	Repeated SAR Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-	-
		Full SAR	-	-	0.852	-	-	0.934		

LTE2500 (Band 7) Wireless Router SAR result

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR)	Plot #
			Ch 20867	Ch 21100	Ch 21333	Ch 20867	Ch 21100	Ch 21333		
			2511.7 MHz	2535 MHz	2558.3 MHz	2511.7 MHz	2535 MHz	2558.3 MHz	[W/kg]	
20MHz Ch BW 1RB 0% offset	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.7	18.4	18.6	0.2	0.5	0.3	dB	
	Time-averaged power [dBm]		18.7	18.4	18.6	1.05	1.12	1.07	Lin	
	Back facing phantom	Scenario	-	2	-	-	-	-	-	25
		Estimated SAR	-	0.248	-	-	0.278	-		
		Full SAR	-	-	-	-	-	-		
	Display facing phantom	Scenario	-	0	-	-	-	-	-	26
		Estimated SAR	-	0.320	-	-	0.359	-		
		Full SAR	-	-	-	-	-	-		
	Top edge facing phantom	Scenario	Not tested for bottom antenna							
		Estimated SAR								
		Full SAR								
	Bottom edge facing phantom	Scenario	1	2	0	-	-	-	0.01	-
		Estimated SAR	0.717	0.729	0.746	0.751	0.818	0.799		
		Full SAR	-	0.734	0.751	-	0.824	0.805		
	Left edge facing phantom	Scenario	-	1	-	-	-	-	-	28
		Estimated SAR	-	0.051	-	-	0.057	-		
		Full SAR	-		-	-	-	-		
	Right edge facing phantom	Scenario	-	-	1	-	-	-	-	29
		Estimated SAR	-	-	0.108	-	-	0.116		
		Full SAR	-	-	-	-	-	-		

(LTE2500 (Band 7) Body WR SAR Table continues)

(LTE2500 (Band 7) Body WR SAR Table continues)

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 20867	Ch 21100	Ch 21333	Ch 20867	Ch 21100	Ch 21333		
			2511.7 MHz	2535 MHz	2558.3 MHz	2511.7 MHz	2535 MHz	2558.3 MHz		
20MHz Ch BW 1RB 50% offset	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.6	18.3	18.7	0.3	0.6	0.2	dB	
	Time-averaged power [dBm]		18.6	18.3	18.7	1.07	1.15	1.05	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 1RB 100% offset	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.5	18.4	18.7	0.4	0.5	0.2	dB	
	Time-averaged power [dBm]		18.5	18.4	18.7	1.10	1.12	1.05	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							

(LTE2500 (Band 7) Body WR SAR Table continues)

(LTE2500 (Band 7) Body WR SAR Table continues)

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR)	Plot #
			Ch 20867	Ch 21100	Ch 21333	Ch 20867	Ch 21100	Ch 21333		
			2511.7 MHz	2535 MHz	2558.3 MHz	2511.7 MHz	2535 MHz	2558.3 MHz	[W/kg]	
20MHz Ch BW 50% RB 0% offset	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.7	18.4	18.8	0.2	0.5	0.1	dB	
	Time-averaged power [dBm]		18.7	18.4	18.8	1.05	1.12	1.02	Lin	
	Back facing phantom	Scenario	-	2	-	-	-	-	-	-
		Estimated SAR	-	0.241	-	-	0.270	-		
		Full SAR	-	-	-	-	-	-		
	Display facing phantom	Scenario	-	0	-	-	-	-	-	-
		Estimated SAR	-	0.315	-	-	0.353	-		
		Full SAR	-	-	-	-	-	-		
	Top edge facing phantom	Scenario	Not tested for bottom antenna							
		Estimated SAR								
		Full SAR								
	Bottom edge facing phantom	Scenario	-	-	0	-	-	-	-	-
		Estimated SAR	-	-	0.769	-	-	0.787		
		Full SAR	-	-	-	-	-	-		
	Left edge facing phantom	Scenario	-	1	-	-	-	-	-	-
		Estimated SAR	-	0.048	-	-	0.054	-		
		Full SAR	-	-	-	-	-	-		
	Right edge facing phantom	Scenario	-	-	1	-	-	-	-	-
		Estimated SAR	-	-	0.111	-	-	0.114		
		Full SAR	-	-		-	-	-		

(LTE2500 (Band 7) Body WR SAR Table continues)

(LTE2500 (Band 7) Body WR SAR Table continues)

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 20867	Ch 21100	Ch 21333	Ch 20867	Ch 21100	Ch 21333		
			2511.7 MHz	2535 MHz	2558.3 MHz	2511.7 MHz	2535 MHz	2558.3 MHz		
20MHz Ch BW 50% RB 50% offset	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.6	18.4	18.7	0.3	0.5	0.2	dB	
	Time-averaged power [dBm]		18.6	18.4	18.7	1.07	1.12	1.05	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 50% RB 100% offset	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.6	18.4	18.7	0.3	0.5	0.2	dB	
	Time-averaged power [dBm]		18.6	18.4	18.7	1.07	1.12	1.05	Lin	
			No testing required for this CBW/RB/RB offset configuration according to KDB 941225 D05 SAR for LTE Devices v02r02							
20MHz Ch BW 100%RB	Tuning Target + Tolerance [dBm]		18.9			Scaling factor*				
	Conducted Power [dBm]		18.6	18.3	18.7	0.3	0.6	0.2	dB	
	Time-averaged power [dBm]		18.6	18.3	18.7	1.07	1.15	1.05	Lin	
	Bottom edge facing phantom	Scenario	1	2	0	-	-	-	0.00	27
		Estimated SAR	0.715	0.732	0.751	0.766	0.840	0.786		
		Full SAR	-	0.735	-	-	0.844	-		
	CP-627 Bottom edge facing phantom	Scenario	1	2	0	-	-	-	0.01	-
		Estimated SAR	0.705	0.704	0.696	0.755	0.808	0.729		
		Full SAR	-	0.709	-	-	0.814	-		

2450MHz Wireless Router SAR results

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz		
WLAN b-mode BPSK 1 Mbps	Tuning Target + Tolerance [dBm]		19.5			Scaling factor*				
	Conducted Power [dBm]		18.3	18.4	18.4	1.2	1.1	1.1	dB	
	Time-averaged power [dBm]		18.3	18.4	18.4	1.32	1.29	1.29	Lin	
	Back facing phantom	Estimated SAR	0.338	0.322	0.289	0.446	0.415	0.372	0.01	30
		Full SAR	0.347	-	-	0.457	-	-		
	Display facing phantom	Estimated SAR	-	0.092	-	-	0.119	-	-	-
		Full SAR	-	-	-	-	-	-		
	Top edge facing phantom	Estimated SAR	-	0.090	-	-	0.115	-	-	-
		Full SAR	-	-	-	-	-	-		
	Bottom edge facing phantom	Estimated SAR	-	0.001	-	-	0.002	-	-	-
		Full SAR	-	-	-	-	-	-		
	Left edge facing phantom	Estimated SAR	-	0.044	-	-	0.057	-	-	-
		Full SAR	-	-	-	-	-	-		
	Right edge facing phantom	Estimated SAR	-	0.034	-	-	0.044	-	-	-
		Full SAR	-	-	-	-	-	-		
CP-627 Back facing phantom	Estimated SAR	0.239	0.213	0.200	0.315	0.274	0.258	0.01	-	
	Full SAR	0.248	-	-	0.327	-	-			
Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Max Deviation (Estimated SAR - Full SAR) [W/kg]	Plot #
			Ch 2 2417 MHz	Ch 6 2437.0 MHz	Ch 10 2457.0 MHz	Ch 2 2417 MHz	Ch 6 2437.0 MHz	Ch 10 2457.0 MHz		
WLAN b-mode QPSK 5.5 Mbps	Tuning Target + Tolerance [dBm]		19.5			Scaling factor*				
	Conducted Power [dBm]		18.8	18.7	18.7	0.7	0.8	0.8	dB	
	Time-averaged power [dBm]		18.8	18.7	18.7	1.17	1.20	1.20	Lin	
	Back facing phantom	Estimated SAR	0.344	0.321	0.283	0.404	0.386	0.340	0.01	-
		Full SAR	0.357	-	-	0.419	-	-		

Simultaneous transmissions: Combined SAR results – Individual band Max results

Test configuration	Max. Reported* 1g SAR results					
	WLAN 2450	2-slot GPRS850	WCDMA 850	1-slot GPRS1900	WCDMA 1900	LTE 2500
Back facing phantom	0.457	0.664	0.531	0.266	0.348	0.278
Display facing phantom	0.119	0.753	0.732	0.400	0.445	0.359
Top edge facing phantom	0.115	0.016	0.014	0.005	0.003	-
Bottom edge facing phantom	0.002	0.535	0.442	0.907	0.934	0.844
Left edge facing phantom	0.057	0.584	0.460	0.059	0.070	0.057
Right edge facing phantom	0.044	0.260	0.182	0.085	0.100	0.116

Simultaneous transmissions: Combined SAR results – Max + Max combined results

Test configuration	Max. Reported* 1g SAR results				
	2-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	1-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450	LTE2500 + WLAN2450
Back facing phantom	1.12	0.988	0.723	0.805	0.735
Display facing phantom	0.872	0.851	0.519	0.564	0.478
Top edge facing phantom	0.131	0.129	0.120	0.118	-
Bottom edge facing phantom	0.537	0.444	0.909	0.936	0.846
Left edge facing phantom	0.641	0.517	0.116	0.127	0.114
Right edge facing phantom	0.304	0.226	0.129	0.144	0.160

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product.

7.3.1 Combined Body SAR data

The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values for WLAN2450 and the cellular bands point-by-point and c) calculates the combined average SAR values.

**Simultaneous transmissions: Combined SAR results –
SPEAG Combined Multiband algorithm results**

Test configuration	Antenna 1 + WLAN				
	Max. Reported* 1g SAR results				
	2-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	1-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450	LTE2500 + WLAN2450
Back facing phantom	0.669	0.541	-	-	-
Display facing phantom	-	-	-	-	-
Top edge facing phantom	-	-	-	-	-
Bottom edge facing phantom	-	-	0.881	0.924	0.843
Left edge facing phantom	-	-	-	-	-
Right edge facing phantom	-	-	-	-	-

All of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular band.

Note:

* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan results are given in Section for each simultaneous transmitter combination.

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Plot #1

Date/Time: 2014-06-25 07:53:42

Test Laboratory: TCC Microsoft

Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL835; Medium Notes: t= 22.2 C

Medium parameters used: f = 835 MHz; $\sigma = 0.901$ S/m; $\epsilon_r = 40.023$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.12, 6.12, 6.12); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1596
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=15mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 53.50 V/m

Fast SAR: SAR(1 g) = 2.36 W/kg

Fast SAR(10 g) = 1.59 W/kg

Maximum value of SAR (interpolated) = 2.71 W/kg

d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 53.50 V/m

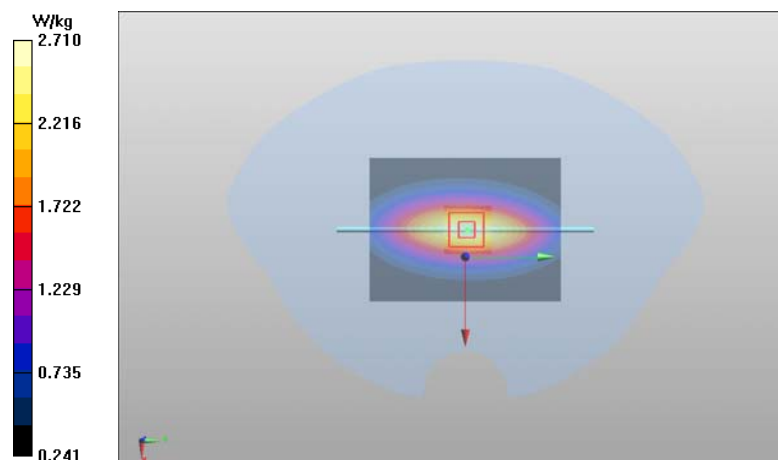
Peak SAR (extrapolated) = 3.40 W/kg

SAR(1 g) = 2.31 W/kg

SAR(10 g) = 1.51 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 2.71 W/kg



Plot #2

Date/Time: 2014-06-23 08:35:55

Test Laboratory: TCC Microsoft
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: $t = 21.4$ C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.413$ S/m; $\epsilon_r = 38.951$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.33, 7.33, 7.33); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY52, Version 52.8 (6); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 90.03 V/m

Fast SAR: SAR(1 g) = 10.4 W/kg

Fast SAR(10 g) = 5.37 W/kg

Maximum value of SAR (interpolated) = 13.1 W/kg

d=10mm, Pin=250mW/Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 90.03 V/m

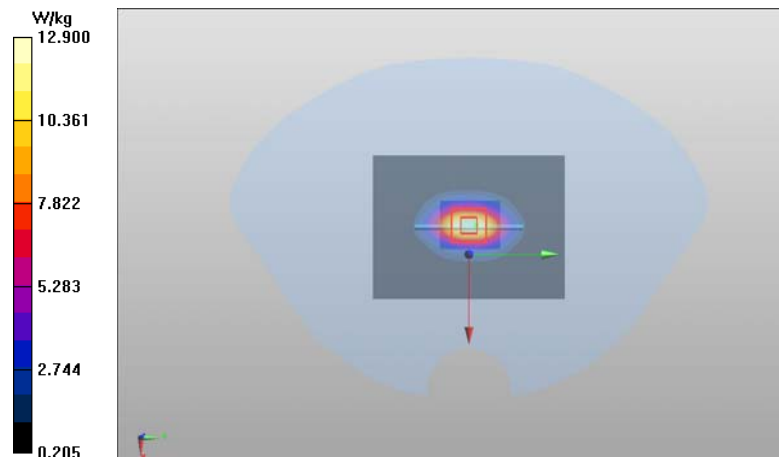
Peak SAR (extrapolated) = 18.9 W/kg

SAR(1 g) = 10.3 W/kg

SAR(10 g) = 5.38 W/kg

Power Drift = 0.04 dB

Maximum value of SAR (measured) = 12.9 W/kg



Plot #3

Date/Time: 2014-06-17 06:15:58

Test Laboratory: TCC Microsoft

Type: D2450V2; Serial: D2450V2 - SN:749

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: $t = 21,0$ C

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.877$ S/m; $\epsilon_r = 38.663$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.39, 7.39, 7.39); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 91.49 V/m

Fast SAR: SAR(1 g) = 14 W/kg

Fast SAR(10 g) = 6.16 W/kg

Maximum value of SAR (interpolated) = 18.6 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.49 V/m

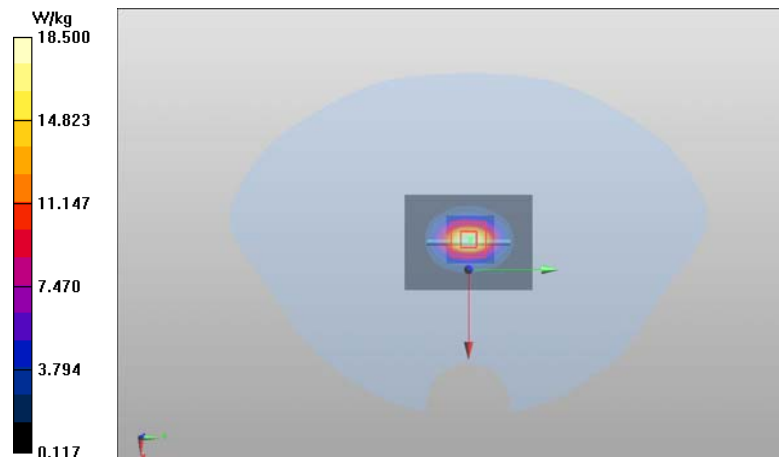
Peak SAR (extrapolated) = 29.0 W/kg

SAR(1 g) = 14 W/kg

SAR(10 g) = 6.44 W/kg

Power Drift = 0.02 dB

Maximum value of SAR (measured) = 18.5 W/kg



Plot #4

Date/Time: 2014-06-26 10:25:33

Test Laboratory: TCC Microsoft
Type: D2600V2; Serial: D2600V2 - SN:1056

Communication System: CW2600

Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: $t = 21,1$ C

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.024$ S/m; $\epsilon_r = 38.071$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.33, 7.33, 7.33); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 90.72 V/m

Fast SAR: SAR(1 g) = 15.1 W/kg

Fast SAR(10 g) = 6.72 W/kg

Maximum value of SAR (interpolated) = 20.3 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 90.72 V/m

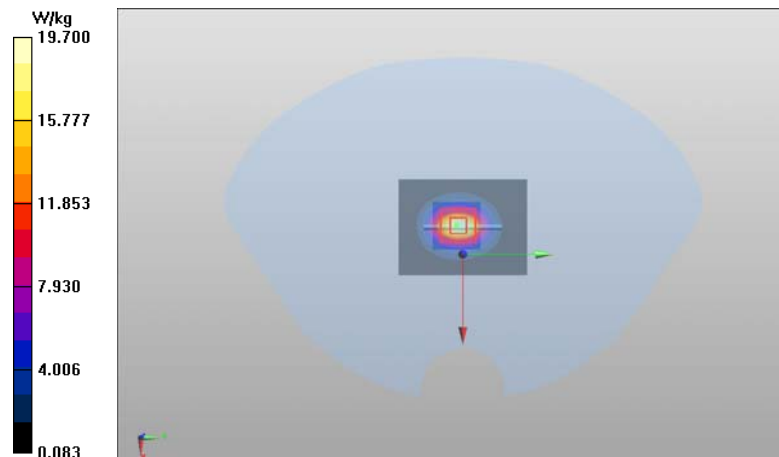
Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 14.7 W/kg

SAR(10 g) = 6.51 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 19.7 W/kg



Plot #5

Date/Time: 2014-06-23 12:29:18

Test Laboratory: TCC Microsoft

Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5200

Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: HSL 5000; Medium Notes: $t = 22,3$ C

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.595$ S/m; $\epsilon_r = 35.243$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(5.29, 5.29, 5.29); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 57.22 V/m

Fast SAR: SAR(1 g) = 6.99 W/kg

Fast SAR(10 g) = 1.94 W/kg

Maximum value of SAR (interpolated) = 15.5 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.22 V/m

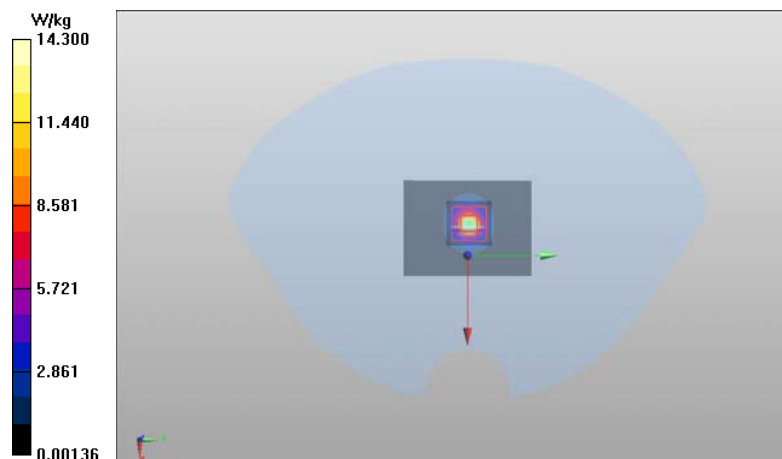
Peak SAR (extrapolated) = 30.5 W/kg

SAR(1 g) = 7.42 W/kg

SAR(10 g) = 2.09 W/kg

Power Drift = -0.13 dB

Maximum value of SAR (measured) = 14.3 W/kg



Plot #6

Date/Time: 2014-06-24 08:17:42

Test Laboratory: TCC Microsoft
Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5300

Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: HSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5300$ MHz; $\sigma = 4.685$ S/m; $\epsilon_r = 34.812$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.96, 4.96, 4.96); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 62.06 V/m

Fast SAR: SAR(1 g) = 7 W/kg

Fast SAR(10 g) = 1.91 W/kg

Maximum value of SAR (interpolated) = 15.6 W/kg

d=10mm, Pin=100mW /Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 62.06 V/m

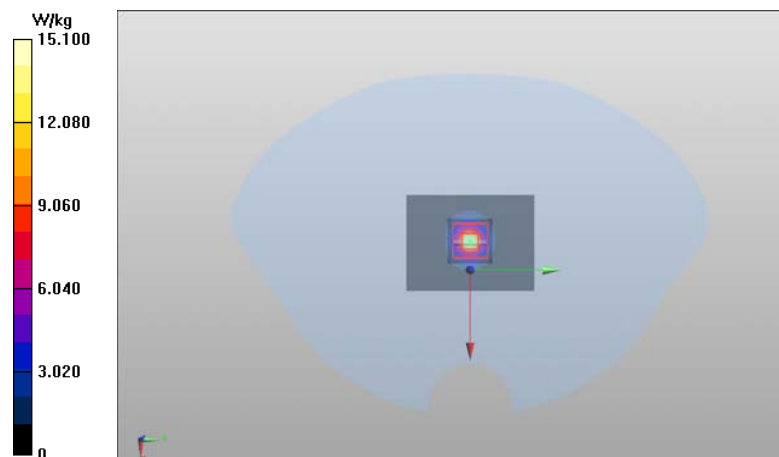
Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.75 W/kg

SAR(10 g) = 2.17 W/kg

Power Drift = 0.05 dB

Maximum value of SAR (measured) = 15.1 W/kg



Plot #7

Date/Time: 2014-06-24 14:58:52

Test Laboratory: TCC Microsoft
Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5500

Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: HSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5500$ MHz; $\sigma = 4.872$ S/m; $\epsilon_r = 34.576$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.84, 4.84, 4.84); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 61.08 V/m

Fast SAR: SAR(1 g) = 7.99 W/kg

Fast SAR(10 g) = 2.17 W/kg

Maximum value of SAR (interpolated) = 18.1 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 61.08 V/m

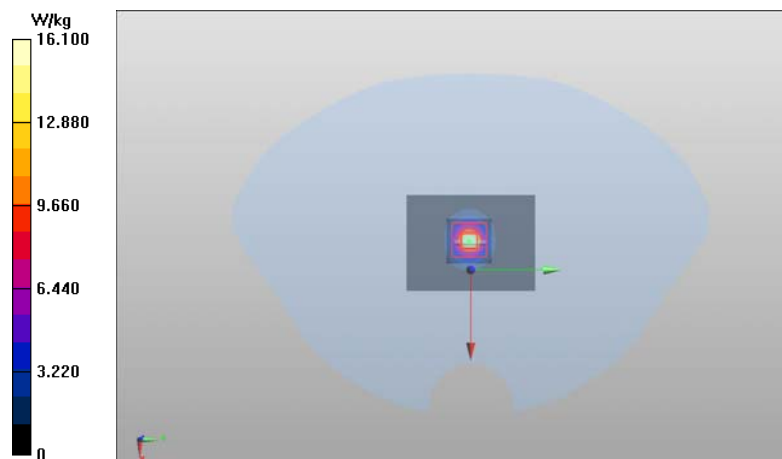
Peak SAR (extrapolated) = 36.1 W/kg

SAR(1 g) = 8.03 W/kg

SAR(10 g) = 2.21 W/kg

Power Drift = -0.01 dB

Maximum value of SAR (measured) = 16.1 W/kg



Plot #8

Date/Time: 2014-06-24 15:36:17

Test Laboratory: TCC Microsoft
Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5600

Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: HSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5600$ MHz; $\sigma = 4.985$ S/m; $\epsilon_r = 34.446$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.66, 4.66, 4.66); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 61.04 V/m

Fast SAR: SAR(1 g) = 8.46 W/kg

Fast SAR(10 g) = 2.29 W/kg

Maximum value of SAR (interpolated) = 19.1 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 61.04 V/m

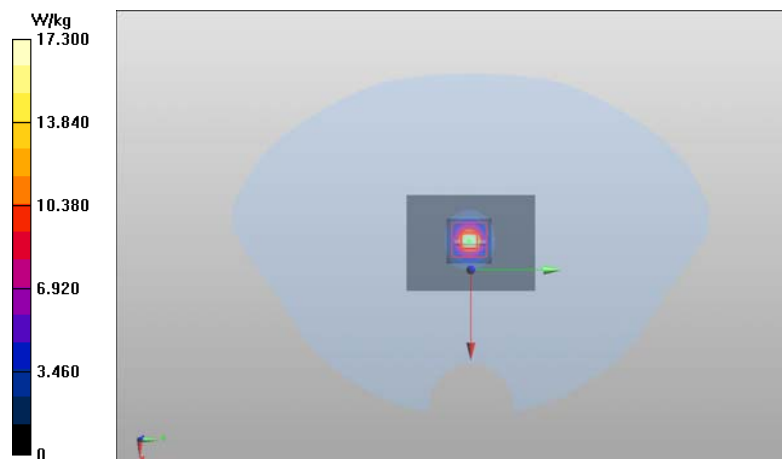
Peak SAR (extrapolated) = 38.9 W/kg

SAR(1 g) = 8.48 W/kg

SAR(10 g) = 2.33 W/kg

Power Drift = 0.02 dB

Maximum value of SAR (measured) = 17.3 W/kg



Plot #9

Date/Time: 2014-06-25 14:42:13

Test Laboratory: TCC Microsoft

Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5800

Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: HSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.188$ S/m; $\epsilon_r = 33.906$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.6, 4.6, 4.6); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 59.41 V/m

Fast SAR: SAR(1 g) = 7.06 W/kg

Fast SAR(10 g) = 1.91 W/kg

Maximum value of SAR (interpolated) = 16.2 W/kg

d=10mm, Pin=100mWZoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 59.41 V/m

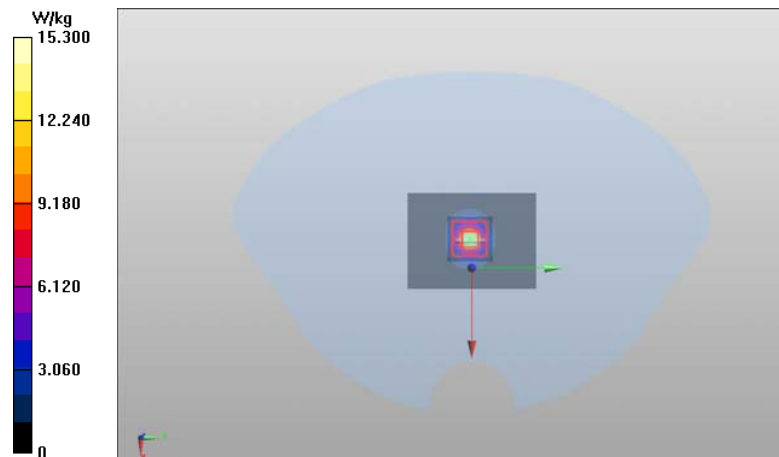
Peak SAR (extrapolated) = 34.6 W/kg

SAR(1 g) = 7.59 W/kg

SAR(10 g) = 2.1 W/kg

Power Drift = -0.00 dB

Maximum value of SAR (measured) = 15.3 W/kg



Plot #10

Date/Time: 2014-06-26 08:55:53

Test Laboratory: TCC Microsoft

Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 835 MHz; σ = 0.983 S/m; ϵ_r = 54.151; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.05, 6.05, 6.05); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=15mm, Pin=250mW/Area Scan (81x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 52.31 V/m

Fast SAR: SAR(1 g) = 2.46 W/kg

Fast SAR(10 g) = 1.64 W/kg

Maximum value of SAR (interpolated) = 2.82 W/kg

d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 52.31 V/m

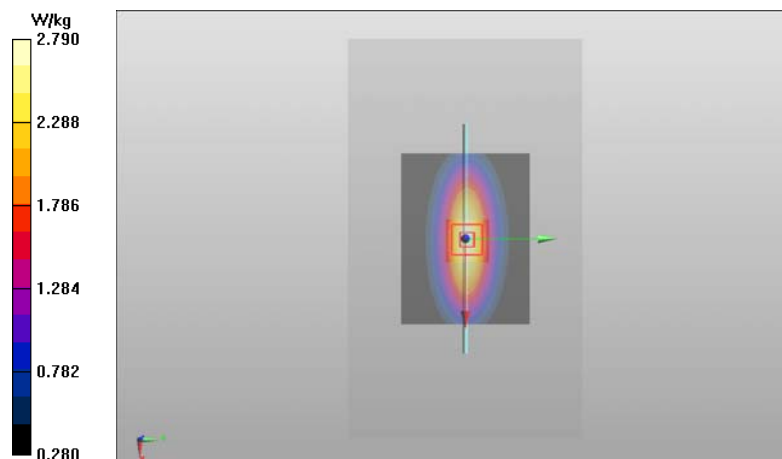
Peak SAR (extrapolated) = 3.49 W/kg

SAR(1 g) = 2.41 W/kg

SAR(10 g) = 1.59 W/kg

Power Drift = -0.02 dB

Maximum value of SAR (measured) = 2.79 W/kg



Plot #11

Date/Time: 2014-06-25 12:15:26

Test Laboratory: TCC Microsoft
Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: BSL1900; Medium Notes: $t = 21$ C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.571$ S/m; $\epsilon_r = 51.84$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.15, 7.15, 7.15); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 86.48 V/m

Fast SAR: SAR(1 g) = 10.1 W/kg

Fast SAR(10 g) = 5.11 W/kg

Maximum value of SAR (interpolated) = 12.9 W/kg

d=10mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 86.48 V/m

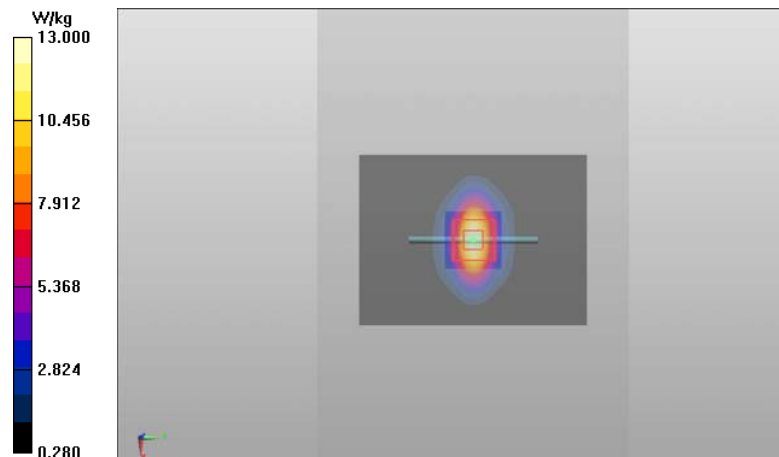
Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 10.3 W/kg

SAR(10 g) = 5.38 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 13.0 W/kg



Plot #12

Date/Time: 2014-06-17 18:47:08

Test Laboratory: TCC Microsoft

Type: D2450V2; Serial: D2450V2 - SN:749

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 21.0$ C

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.984$ S/m; $\epsilon_r = 51.823$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.44, 7.44, 7.44); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (81x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 84.09 V/m

Fast SAR: SAR(1 g) = 12.4 W/kg

Fast SAR(10 g) = 5.41 W/kg

Maximum value of SAR (interpolated) = 16.7 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 84.09 V/m

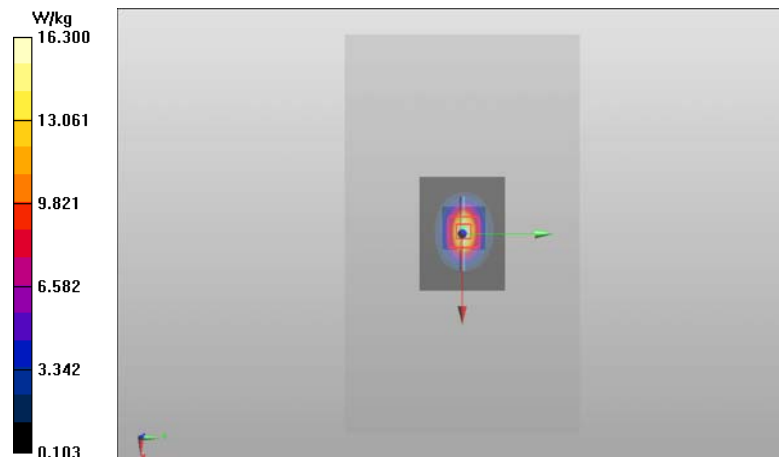
Peak SAR (extrapolated) = 25.4 W/kg

SAR(1 g) = 12.5 W/kg

SAR(10 g) = 5.86 W/kg

Power Drift = 0.00 dB

Maximum value of SAR (measured) = 16.3 W/kg



Plot #13

Date/Time: 2014-07-03 17:03:42

Test Laboratory: TCC Microsoft
Type: D2600V2; Serial: D2600V2 - SN:1056

Communication System: CW2600

Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: $t = 20.8\text{ C}$

Medium parameters used: $f = 2600\text{ MHz}$; $\sigma = 2.137\text{ S/m}$; $\epsilon_r = 51.163$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (81x61x1): Interpolated grid: $dx=1.000\text{ mm}$, $dy=1.000\text{ mm}$

Reference Value = 86.11 V/m

Fast SAR: SAR(1 g) = 13.8 W/kg

Fast SAR(10 g) = 6.05 W/kg

Maximum value of SAR (interpolated) = 18.8 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 86.11 V/m

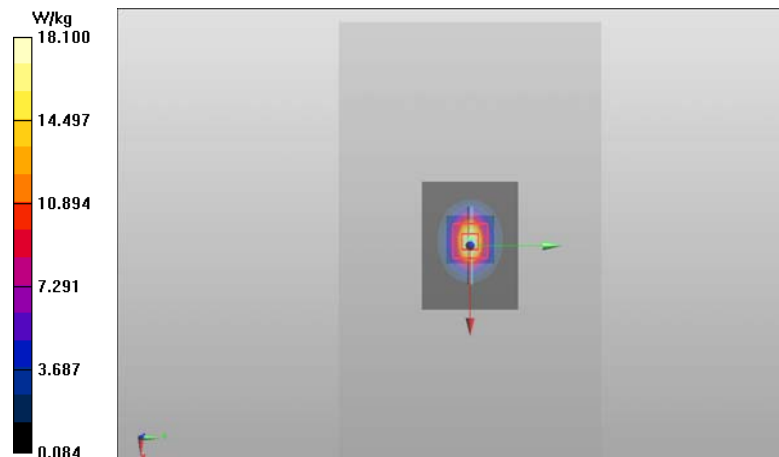
Peak SAR (extrapolated) = 28.8 W/kg

SAR(1 g) = 13.6 W/kg

SAR(10 g) = 6.09 W/kg

Power Drift = -0.11 dB

Maximum value of SAR (measured) = 18.1 W/kg



Plot #14

Date/Time: 2014-06-16 15:31:27

Test Laboratory: TCC Microsoft
Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5200

Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: BSL 5000; Medium Notes: t= 22,3 C

Medium parameters used: f = 5200 MHz; σ = 5.451 S/m; ϵ_r = 48.112; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.34, 4.34, 4.34); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (81x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 57.99 V/m

Fast SAR: SAR(1 g) = 7.13 W/kg

Fast SAR(10 g) = 1.95 W/kg

Maximum value of SAR (interpolated) = 15.8 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.99 V/m

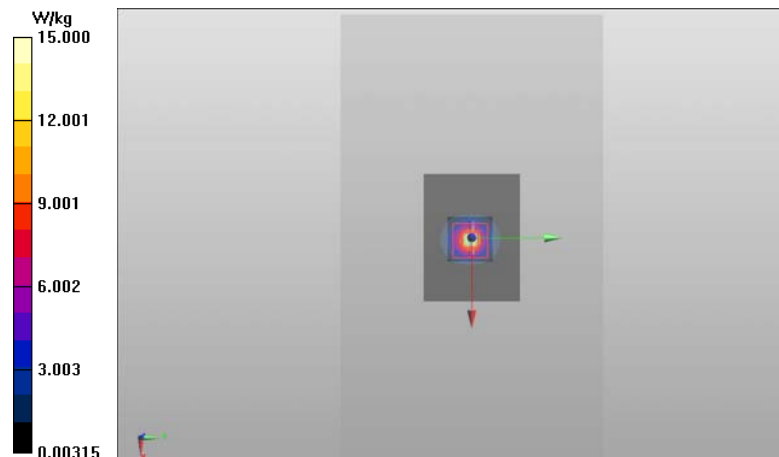
Peak SAR (extrapolated) = 30.8 W/kg

SAR(1 g) = 7.71 W/kg

SAR(10 g) = 2.16 W/kg

Power Drift = -0.07 dB

Maximum value of SAR (measured) = 15.0 W/kg



Plot #15

Date/Time: 2014-06-17 12:31:44

Test Laboratory: TCC Microsoft

Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5300

Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: BSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5300$ MHz; $\sigma = 5.596$ S/m; $\epsilon_r = 48.365$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.15, 4.15, 4.15); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (81x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 57.34 V/m

Fast SAR: SAR(1 g) = 7.63 W/kg

Fast SAR(10 g) = 2.06 W/kg

Maximum value of SAR (interpolated) = 17.3 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.34 V/m

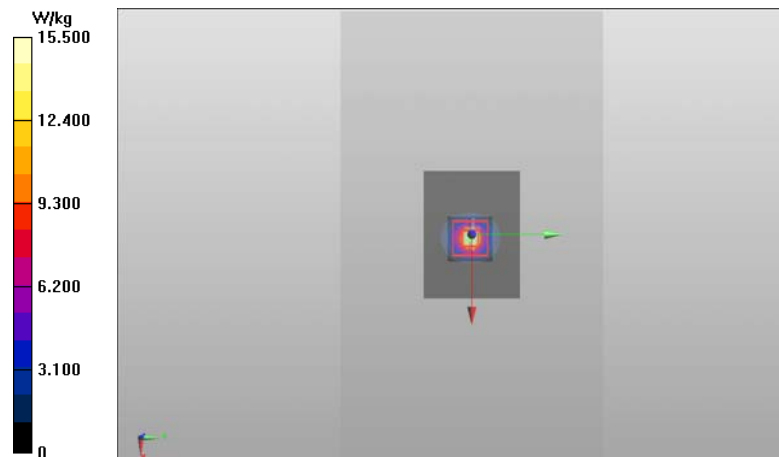
Peak SAR (extrapolated) = 33.1 W/kg

SAR(1 g) = 8.01 W/kg

SAR(10 g) = 2.22 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 15.5 W/kg



Plot #16

Date/Time: 2014-06-17 17:14:41

Test Laboratory: TCC Microsoft

Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5500

Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: BSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.848$ S/m; $\epsilon_r = 48.015$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.12, 4.12, 4.12); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (81x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 56.62 V/m

Fast SAR: SAR(1 g) = 7.24 W/kg

Fast SAR(10 g) = 1.93 W/kg

Maximum value of SAR (interpolated) = 16.5 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.62 V/m

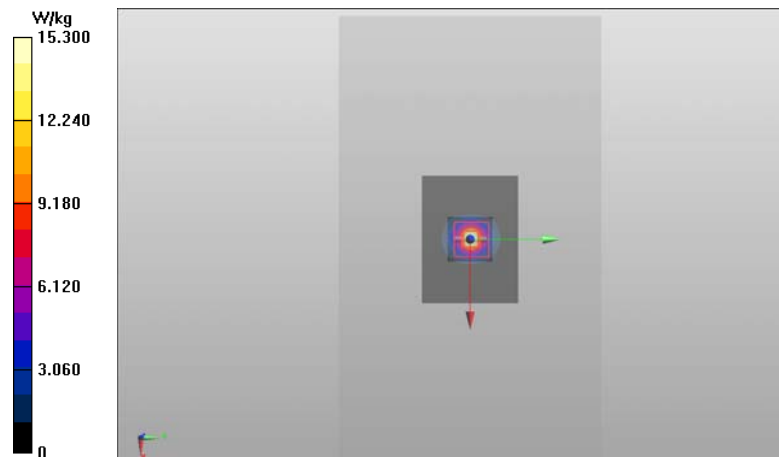
Peak SAR (extrapolated) = 32.6 W/kg

SAR(1 g) = 7.6 W/kg

SAR(10 g) = 2.1 W/kg

Power Drift = 0.05 dB

Maximum value of SAR (measured) = 15.3 W/kg



Plot #17

Date/Time: 2014-06-17 17:54:20

Test Laboratory: TCC Microsoft
Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW5600

Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: BSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5600$ MHz; $\sigma = 5.981$ S/m; $\epsilon_r = 47.814$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4, 4, 4); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (81x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 57.88 V/m

Fast SAR: SAR(1 g) = 7.55 W/kg

Fast SAR(10 g) = 2.01 W/kg

Maximum value of SAR (interpolated) = 17.3 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.88 V/m

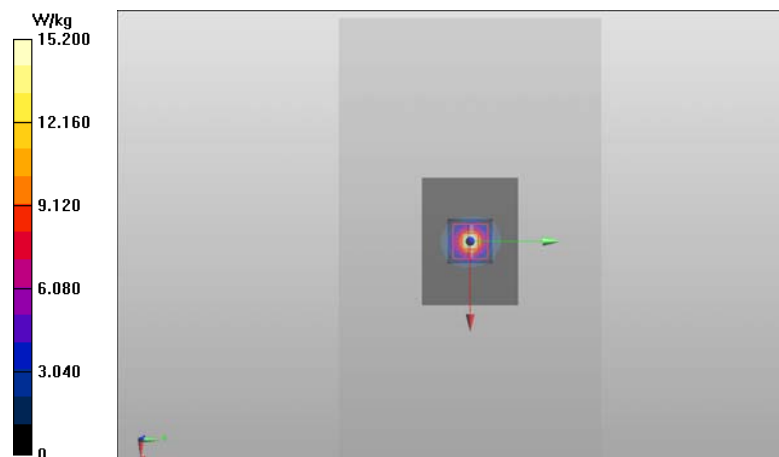
Peak SAR (extrapolated) = 34.5 W/kg

SAR(1 g) = 7.78 W/kg

SAR(10 g) = 2.13 W/kg

Power Drift = -0.06 dB

Maximum value of SAR (measured) = 15.2 W/kg



Plot #18

Date/Time: 2014-06-18 11:10:30

Test Laboratory: TCC Microsoft

Type: D5GHzV2; Serial: D5GHzV2 - SN: 1048

Communication System: CW

Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: BSL 5000; Medium Notes: $t = 22,1$ C

Medium parameters used: $f = 5800$ MHz; $\sigma = 6.26$ S/m; $\epsilon_r = 47.057$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.02, 4.02, 4.02); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=100mW/Area Scan (81x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 53.93 V/m

Fast SAR: SAR(1 g) = 7.01 W/kg

Fast SAR(10 g) = 1.89 W/kg

Maximum value of SAR (interpolated) = 16.2 W/kg

d=10mm, Pin=100mW/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 53.93 V/m

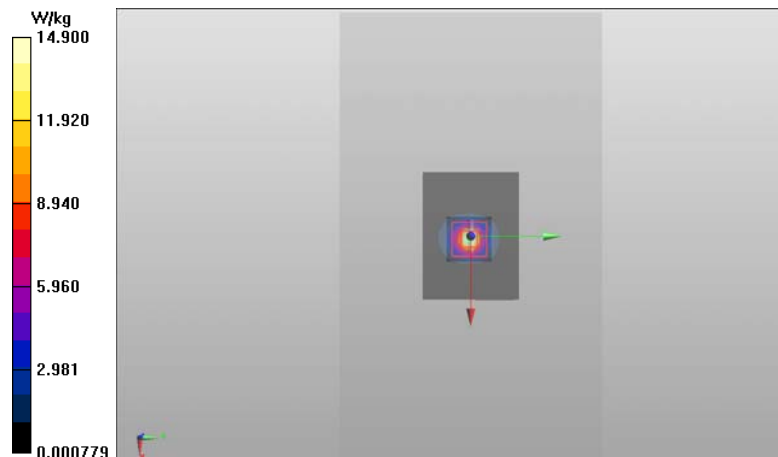
Peak SAR (extrapolated) = 33.2 W/kg

SAR(1 g) = 7.52 W/kg

SAR(10 g) = 2.08 W/kg

Power Drift = 0.01 dB

Maximum value of SAR (measured) = 14.9 W/kg



APPENDIX B: MEASUREMENT SCANS

Plot #1

Date/Time: 2014-06-25 09:15:46

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822208/0

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium: HSL835; Medium Notes: t= 22.2 C

Medium parameters used: f = 837 MHz; $\sigma = 0.902$ S/m; $\epsilon_r = 40.014$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.12, 6.12, 6.12); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1596
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2-slot GPRS850 - Left/Cheek - Middle/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 21.35 V/m

Fast SAR: SAR(1 g) = 0.361 W/kg

Fast SAR(10 g) = 0.255 W/kg

Maximum value of SAR (interpolated) = 0.406 W/kg

2-slot GPRS850 - Left/Cheek - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 21.23 V/m

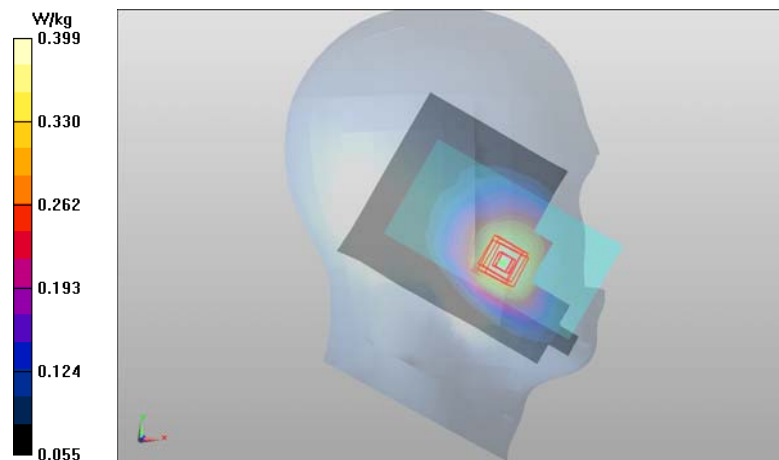
Peak SAR (extrapolated) = 0.453 W/kg

SAR(1 g) = 0.379 W/kg

SAR(10 g) = 0.298 W/kg

Power Drift = 0.08 dB

Maximum value of SAR (measured) = 0.399 W/kg



Plot #2

Date/Time: 2014-06-25 17:47:43

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822208/0

Communication System: WCDMA850 (Band 5)

Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: HSL835; Medium Notes: t= 22.2 C

Medium parameters used: f = 847 MHz; $\sigma = 0.91$ S/m; $\epsilon_r = 39.957$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.12, 6.12, 6.12); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1596
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WCDMA850 (Band 5) - Left/Cheek - High/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 19.76 V/m

Fast SAR: SAR(1 g) = 0.314 W/kg

Fast SAR(10 g) = 0.222 W/kg

Maximum value of SAR (interpolated) = 0.354 W/kg

WCDMA850 (Band 5) - Left/Cheek - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 20.03 V/m

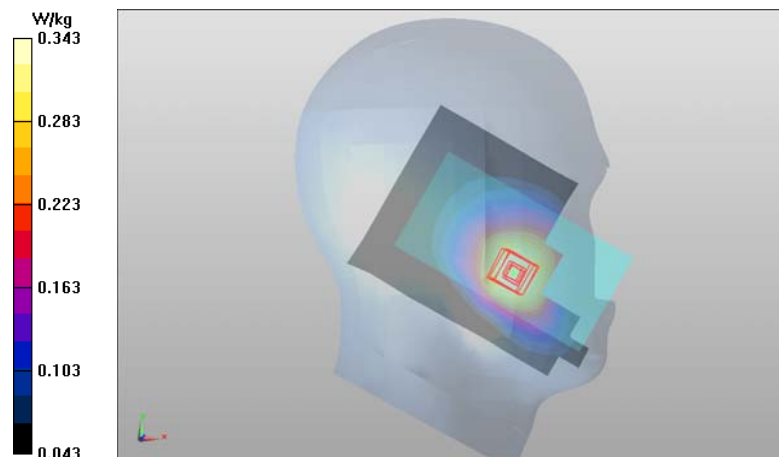
Peak SAR (extrapolated) = 0.391 W/kg

SAR(1 g) = 0.329 W/kg

SAR(10 g) = 0.258 W/kg

Power Drift = 0.04 dB

Maximum value of SAR (measured) = 0.343 W/kg



Plot #3

Date/Time: 2014-06-23 12:46:27

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822204/9

Communication System: 3-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:2.80027

Medium: HSL1900; Medium Notes: $t = 21.4$ C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.421$ S/m; $\epsilon_r = 38.911$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.33, 7.33, 7.33); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY52, Version 52.8 (6); SEMCAD X Version 14.6.10 (7331)

3-slot GPRS1900 - Right/Cheek - High - Cover CP-627/Area Scan (81x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Reference Value = 12.06 V/m

Fast SAR: SAR(1 g) = 0.188 W/kg

Fast SAR(10 g) = 0.105 W/kg

Maximum value of SAR (interpolated) = 0.239 W/kg

3-slot GPRS1900 - Right/Cheek - High - Cover CP-627/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 12.06 V/m

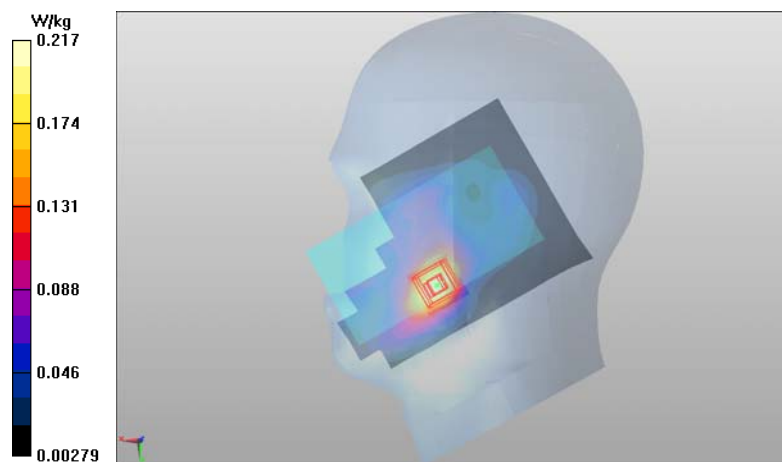
Peak SAR (extrapolated) = 0.282 W/kg

SAR(1 g) = 0.184 W/kg

SAR(10 g) = 0.114 W/kg

Power Drift = 0.06 dB

Maximum value of SAR (measured) = 0.217 W/kg



Plot #4

Date/Time: 2014-06-23 14:50:12

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822204/9

Communication System: WCDMA1900 (Band 2)

Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: $t = 21.4$ C

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.368$ S/m; $\epsilon_r = 39.122$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.33, 7.33, 7.33); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY52, Version 52.8 (6); SEMCAD X Version 14.6.10 (7331)

WCDMA1900 (Band 2) - Right/Cheek - Low/Area Scan (81x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Reference Value = 17.00 V/m

Fast SAR: SAR(1 g) = 0.362 W/kg

Fast SAR(10 g) = 0.204 W/kg

Maximum value of SAR (interpolated) = 0.462 W/kg

WCDMA1900 (Band 2) - Right/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 17.05 V/m

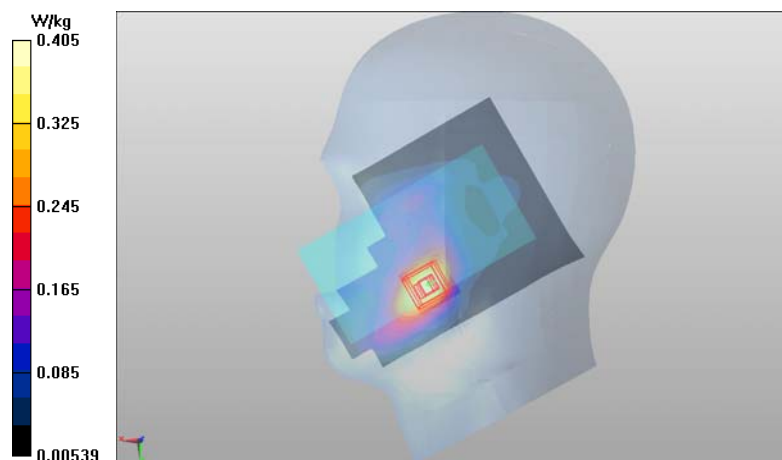
Peak SAR (extrapolated) = 0.534 W/kg

SAR(1 g) = 0.348 W/kg

SAR(10 g) = 0.217 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 0.405 W/kg



Plot #5

Date/Time: 2014-07-03 15:29:35

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: HSL2600; Medium Notes: $t = 21.1$ C

Medium parameters used: $f = 2535$ MHz; $\sigma = 1.922$ S/m; $\epsilon_r = 38.911$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.33, 7.33, 7.33); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7) - Left/Cheek - Sub 2 - Scenario 2 - QPSK - 20MHz - 1RB - 100% offset - Cover CP-627/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 2.165 V/m

Fast SAR: SAR(1 g) = 0.201 W/kg

Fast SAR(10 g) = 0.103 W/kg

Maximum value of SAR (interpolated) = 0.259 W/kg

LTE2500 (Band 7) - Left/Cheek - Sub 2 - Scenario 2 - QPSK - 20MHz - 1RB - 100% offset - Cover CP-627/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.938 V/m

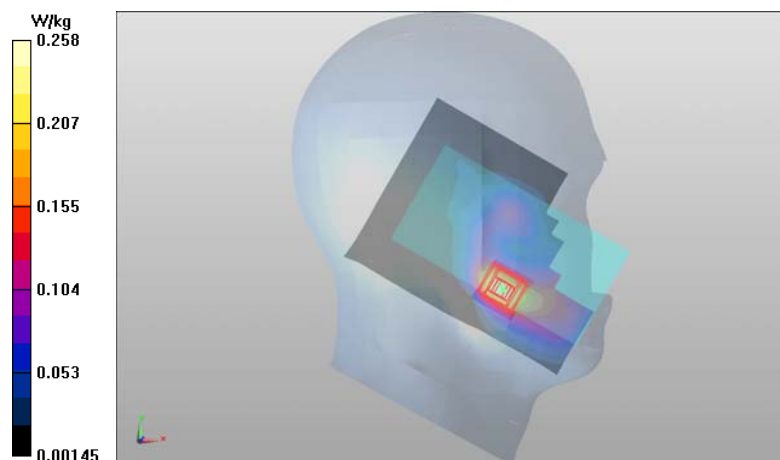
Peak SAR (extrapolated) = 0.379 W/kg

SAR(1 g) = 0.204 W/kg

SAR(10 g) = 0.108 W/kg

Power Drift = -0.04 dB

Maximum value of SAR (measured) = 0.258 W/kg



Plot #6

Date/Time: 2014-06-26 15:58:00

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2558.3 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 21,1 C

Medium parameters used (interpolated): f = 2558.3 MHz; $\sigma = 1.976$ S/m; $\epsilon_r = 38.275$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.33, 7.33, 7.33); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7) - Left/Tilt - Sub 3 - Scenario 1 - QPSK - 20MHz - 1RB - 100% offset/Area Scan (121x181x1):

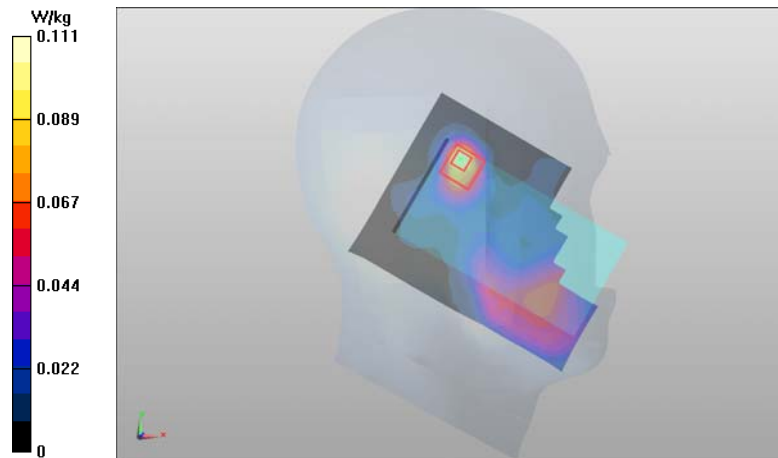
Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 2.322 V/m

Fast SAR: SAR(1 g) = 0.081 W/kg

Fast SAR(10 g) = 0.039 W/kg

Maximum value of SAR (interpolated) = 0.111 W/kg



Plot #7

Date/Time: 2014-06-26 17:11:20

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 21,1 C

Medium parameters used: f = 2535 MHz; $\sigma = 1.953 \text{ S/m}$; $\epsilon_r = 38.355$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.33, 7.33, 7.33); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7) - Right/Cheek - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 100% offset/Area Scan (121x181x1):

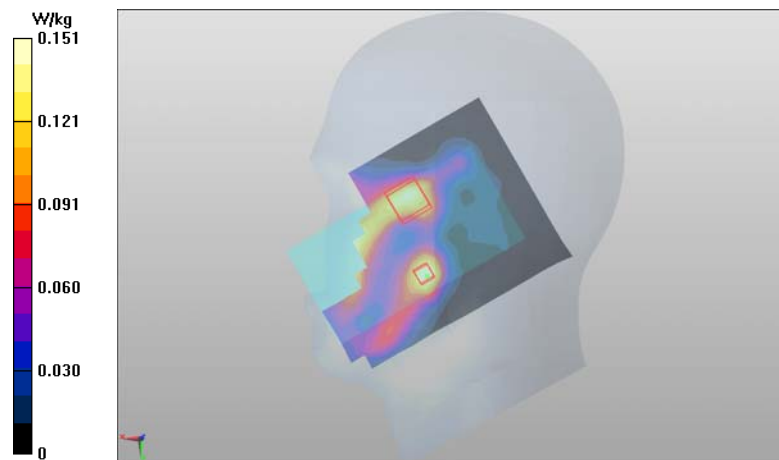
Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 8.658 V/m

Fast SAR: SAR(1 g) = 0.113 W/kg

Fast SAR(10 g) = 0.059 W/kg

Maximum value of SAR (interpolated) = 0.151 W/kg



Plot #8

Date/Time: 2014-07-03 16:45:35

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2511.7 MHz; Duty Cycle: 1:1

Medium: HSL2600; Medium Notes: t= 21.1 C

Medium parameters used: f = 2512 MHz; $\sigma = 1.895$ S/m; $\epsilon_r = 38.99$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.33, 7.33, 7.33); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7) - Right/Tilt - Sub 2 - Scenario 2 - QPSK - 20MHz - 1RB - 100% offset/Area Scan (121x181x1):

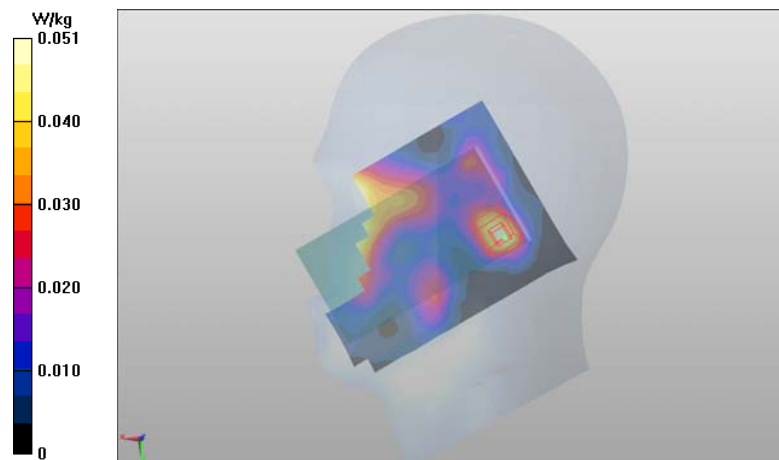
Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 4.928 V/m

Fast SAR: SAR(1 g) = 0.038 W/kg

Fast SAR(10 g) = 0.020 W/kg

Maximum value of SAR (interpolated) = 0.0506 W/kg



Plot #9

Date/Time: 2014-06-17 08:43:52

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822255/1

Communication System: WLAN2450

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 21,0 C

Medium parameters used: f = 2437 MHz; $\sigma = 1.863$ S/m; $\epsilon_r = 38.721$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.39, 7.39, 7.39); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WLAN2450 b-mode - Right/Tilt - Channel 6 - BPSK 1 Mbps/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 18.17 V/m

Fast SAR: SAR(1 g) = 0.571 W/kg

Fast SAR(10 g) = 0.260 W/kg

Maximum value of SAR (interpolated) = 0.897 W/kg

WLAN2450 b-mode - Right/Tilt - Channel 6 - BPSK 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.62 V/m

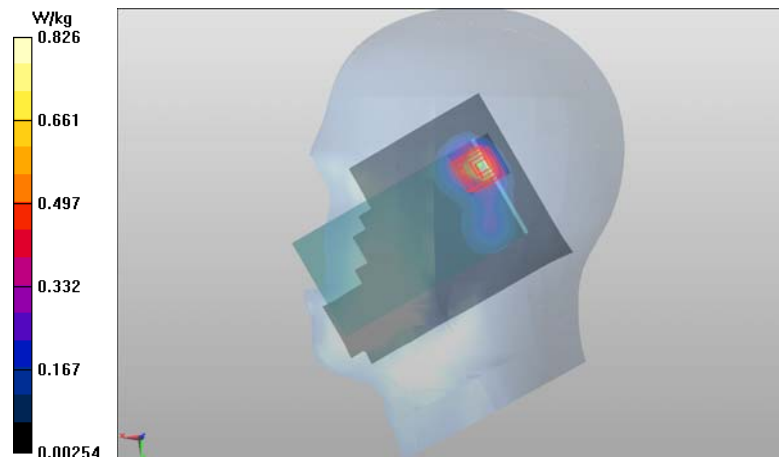
Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.625 W/kg

SAR(10 g) = 0.270 W/kg

Power Drift = 0.07 dB

Maximum value of SAR (measured) = 0.826 W/kg



Plot #10

Date/Time: 2014-06-24 20:23:37

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822207/2

Communication System: WLAN5000

Frequency: 5680 MHz; Duty Cycle: 1:1

Medium: HSL 5000; Medium Notes: t= 22,1 C

Medium parameters used: f = 5680 MHz; σ = 5.067 S/m; ϵ_r = 34.291; ρ = 1000 kg/m³

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.66, 4.66, 4.66); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WLAN5000 a-mode - Right/Cheek - Channel 136 - BPSK 6 Mbps/Area Scan (121x181x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

Reference Value = 6.287 V/m

Fast SAR: SAR(1 g) = 0.199 W/kg

Fast SAR(10 g) = 0.078 W/kg

Maximum value of SAR (interpolated) = 0.612 W/kg

WLAN5000 a-mode - Right/Cheek - Channel 136 - BPSK 6 Mbps/Zoom Scan (9x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.287 V/m

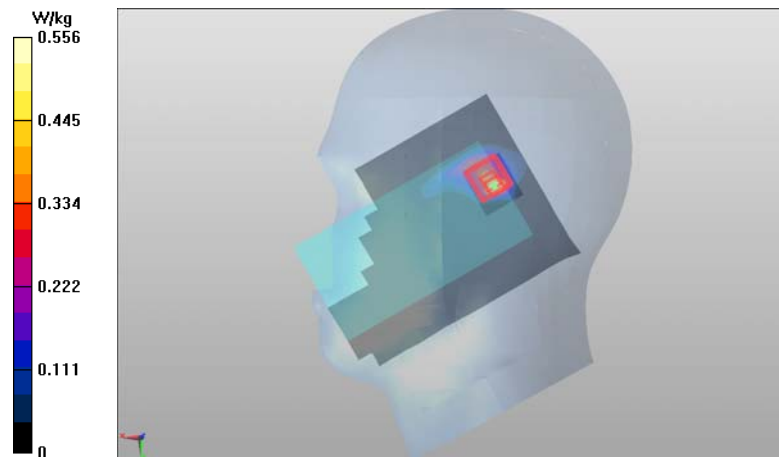
Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.235 W/kg

SAR(10 g) = 0.077 W/kg

Power Drift = 0.13 dB

Maximum value of SAR (measured) = 0.556 W/kg



Plot #11

Date/Time: 2014-06-26 09:49:54

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822208/0

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 837 MHz; σ = 0.984 S/m; ϵ_r = 54.146; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.05, 6.05, 6.05); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2-slot GPRS850/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Area Scan (81x121x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 17.23 V/m

Fast SAR: SAR(1 g) = 0.238 W/kg

Fast SAR(10 g) = 0.168 W/kg

Maximum value of SAR (interpolated) = 0.268 W/kg

2-slot GPRS850/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Zoom Scan (6x6x7)/Cube

0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 17.22 V/m

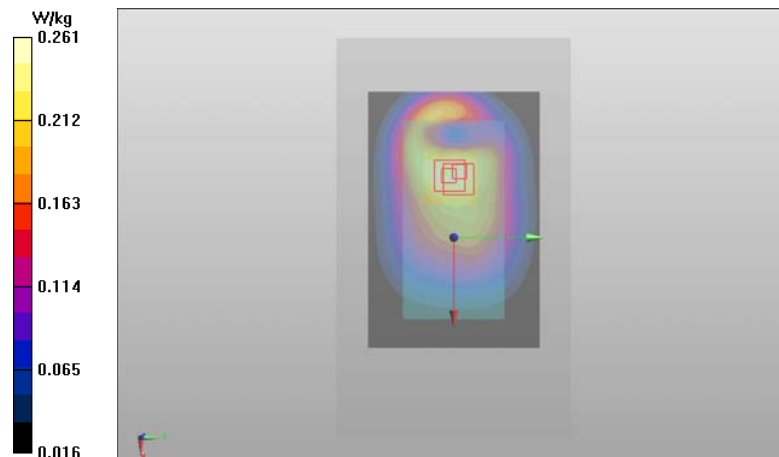
Peak SAR (extrapolated) = 0.318 W/kg

SAR(1 g) = 0.239 W/kg

SAR(10 g) = 0.177 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 0.261 W/kg



Plot #12

Date/Time: 2014-06-26 11:38:43

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822208/0

Communication System: WCDMA850 (Band 5)

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 835 MHz; $\sigma = 0.983$ S/m; $\epsilon_r = 54.151$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.05, 6.05, 6.05); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 21.85 V/m

Fast SAR: SAR(1 g) = 0.395 W/kg

Fast SAR(10 g) = 0.282 W/kg

Maximum value of SAR (interpolated) = 0.443 W/kg

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 22.01 V/m

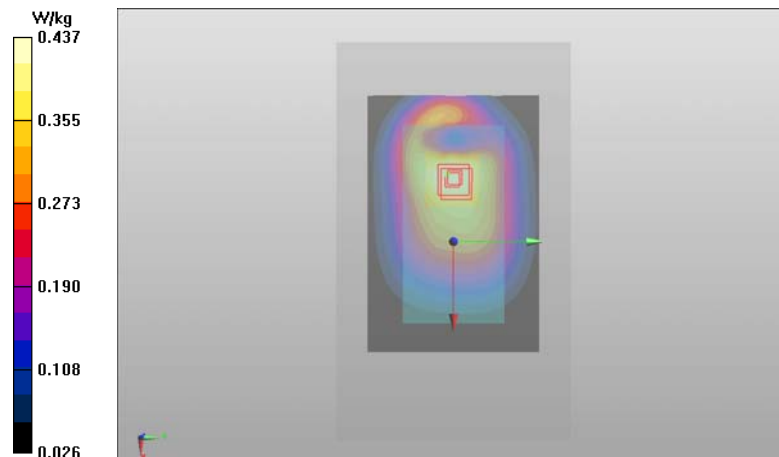
Peak SAR (extrapolated) = 0.507 W/kg

SAR(1 g) = 0.396 W/kg

SAR(10 g) = 0.297 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 0.437 W/kg



Plot #13

Date/Time: 2014-06-25 13:29:00

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822204/9

Communication System: 3-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:2.80027

Medium: BSL1900; Medium Notes: $t = 21\text{ C}$

Medium parameters used: $f = 1910\text{ MHz}$; $\sigma = 1.58\text{ S/m}$; $\epsilon_r = 51.796$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.15, 7.15, 7.15); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

3-slot GRPS1900/Body - High - Spacer 15mm - WH-208 - Display Facing Phantom/Area Scan (81x121x1):

Interpolated grid: $dx=1.500\text{ mm}$, $dy=1.500\text{ mm}$

Reference Value = 18.07 V/m

Fast SAR: $SAR(1\text{ g}) = 0.434\text{ W/kg}$

Fast SAR(10 g) = 0.240 W/kg

Maximum value of SAR (interpolated) = 0.541 W/kg

3-slot GRPS1900/Body - High - Spacer 15mm - WH-208 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.94 V/m

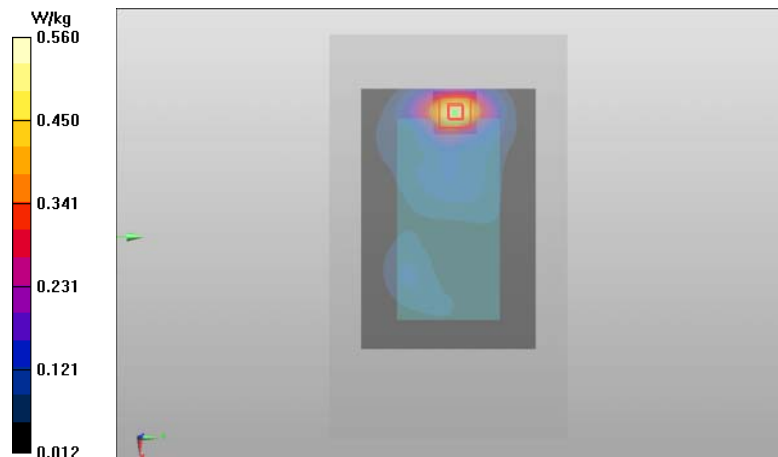
Peak SAR (extrapolated) = 0.746 W/kg

$SAR(1\text{ g}) = 0.458\text{ W/kg}$

$SAR(10\text{ g}) = 0.264\text{ W/kg}$

Power Drift = 0.02 dB

Maximum value of SAR (measured) = 0.560 W/kg



Plot #14

Date/Time: 2014-06-25 15:55:27

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822204/9

Communication System: WCDMA1900 (Band 2)

Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: BSL1900; Medium Notes: t= 21 C

Medium parameters used (interpolated): f = 1852.4 MHz; $\sigma = 1.527$ S/m; $\epsilon_r = 51.989$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.15, 7.15, 7.15); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WCDMA1900 (Band 2)/Body - Low - Spacer 15mm - No Headset - Display Facing Phantom - Cover CP-627/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 22.32 V/m

Fast SAR: SAR(1 g) = 0.666 W/kg

Fast SAR(10 g) = 0.373 W/kg

Maximum value of SAR (interpolated) = 0.826 W/kg

WCDMA1900 (Band 2)/Body - Low - Spacer 15mm - No Headset - Display Facing Phantom - Cover CP-627/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 23.57 V/m

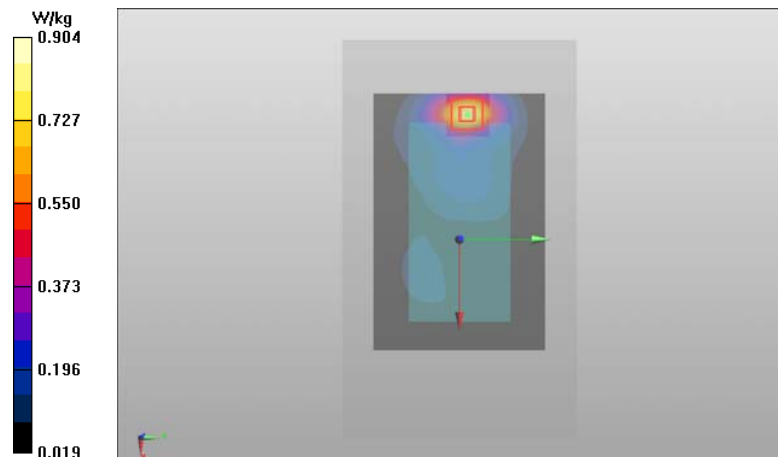
Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.742 W/kg

SAR(10 g) = 0.430 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 0.904 W/kg



Plot #15

Date/Time: 2014-07-03 17:36:25

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; $\sigma = 2.06$ S/m; $\epsilon_r = 51.376$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

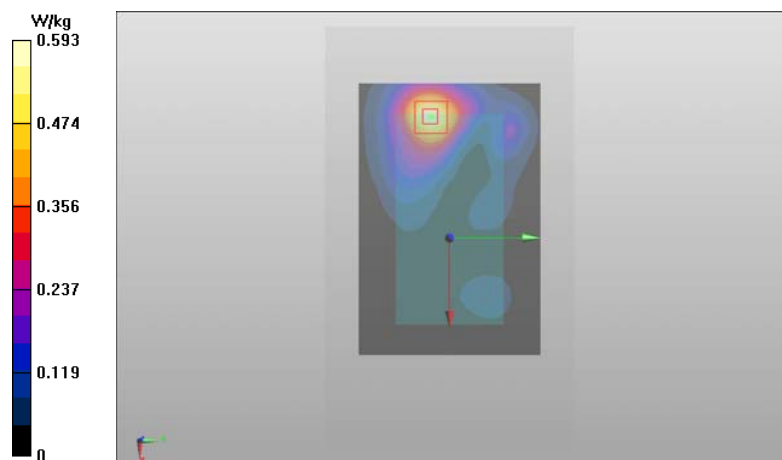
LTE2500 (Band 7)/Body - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 100% offset - Spacer 15mm - No Headset - Back Facing Phantom/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 16.66 V/m

Fast SAR: SAR(1 g) = 0.473 W/kg

Fast SAR(10 g) = 0.255 W/kg

Maximum value of SAR (interpolated) = 0.593 W/kg



Plot #16

Date/Time: 2014-07-03 18:00:38

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: $t = 20.8$ C

Medium parameters used: $f = 2535$ MHz; $\sigma = 2.06$ S/m; $\epsilon_r = 51.376$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7)/Body - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 100% offset - Spacer 15mm - WH-208 - Back Facing Phantom/Area Scan (121x181x1); Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 16.80 V/m

Fast SAR: SAR(1 g) = 0.467 W/kg

Fast SAR(10 g) = 0.251 W/kg

Maximum value of SAR (interpolated) = 0.586 W/kg



Plot #17

Date/Time: 2014-07-03 18:59:52

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; $\sigma = 2.06$ S/m; $\epsilon_r = 51.376$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7)/Body - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 100% offset - Spacer 15mm - No Headset - Display Facing Phantom/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 13.46 V/m

Fast SAR: SAR(1 g) = 0.578 W/kg

Fast SAR(10 g) = 0.303 W/kg

Maximum value of SAR (interpolated) = 0.729 W/kg



Plot #18

Date/Time: 2014-07-03 19:16:26

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822206/4

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; $\sigma = 2.06$ S/m; $\epsilon_r = 51.376$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7)/Body - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 100% offset - Spacer 15mm - WH-208 - Display Facing Phantom/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 13.69 V/m

Fast SAR: SAR(1 g) = 0.582 W/kg

Fast SAR(10 g) = 0.305 W/kg

Maximum value of SAR (interpolated) = 0.735 W/kg

LTE2500 (Band 7)/Body - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 100% offset - Spacer 15mm - WH-208 - Display Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.59 V/m

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.587 W/kg

SAR(10 g) = 0.315 W/kg

Power Drift = -0.01 dB

Maximum value of SAR (measured) = 0.734 W/kg



Plot #19

Date/Time: 2014-06-17 20:56:03

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822255/1

Communication System: WLAN2450

Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 21.0$ C

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.948$ S/m; $\epsilon_r = 51.919$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.44, 7.44, 7.44); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WLAN2450 b-mode/Body - Channel 1 - BPSK 1 Mbps - Spacer 15mm - No Headset - Back Facing Phantom/Area Scan (121x181x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Reference Value = 9.416 V/m

Fast SAR: SAR(1 g) = 0.155 W/kg

Fast SAR(10 g) = 0.075 W/kg

Maximum value of SAR (interpolated) = 0.208 W/kg

WLAN2450 b-mode/Body - Channel 1 - BPSK 1 Mbps - Spacer 15mm - No Headset - Back Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.416 V/m

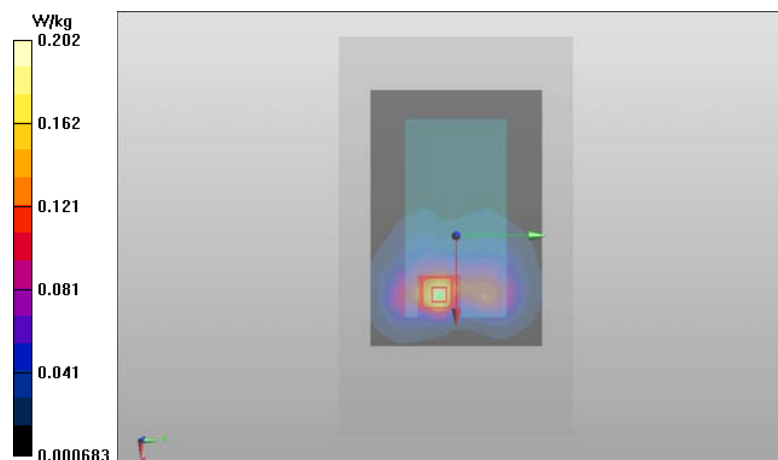
Peak SAR (extrapolated) = 0.304 W/kg

SAR(1 g) = 0.157 W/kg

SAR(10 g) = 0.079 W/kg

Power Drift = 0.04 dB

Maximum value of SAR (measured) = 0.202 W/kg



Plot #20

Date/Time: 2014-06-18 16:47:58

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822207/2

Communication System: WLAN5000

Frequency: 5825 MHz; Duty Cycle: 1:1

Medium: BSL 5000; Medium Notes: $t = 22,1\text{ C}$

Medium parameters used: $f = 5825\text{ MHz}$; $\sigma = 6.291\text{ S/m}$; $\epsilon_r = 47.047$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3892
- ConvF(4.02, 4.02, 4.02); Calibrated: 2013-11-15;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2013-11-11
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WLAN5000 a-mode/Body - Channel 165 - BPSK 6 Mbps - Spacer 15mm - No Headset - Back Facing Phantom - Cover CP-627/Area Scan (121x181x1): Interpolated grid: $dx=1.000\text{ mm}$, $dy=1.000\text{ mm}$

Reference Value = 7.058 V/m

Fast SAR: $\text{SAR}(1\text{ g}) = 0.201\text{ W/kg}$

Fast SAR(10 g) = 0.077 W/kg

Maximum value of SAR (interpolated) = 0.390 W/kg

WLAN5000 a-mode/Body - Channel 165 - BPSK 6 Mbps - Spacer 15mm - No Headset - Back Facing Phantom - Cover CP-627/Zoom Scan (8x8x12)/Cube 0: Measurement grid: $dx=4\text{ mm}$, $dy=4\text{ mm}$, $dz=2\text{ mm}$

Reference Value = 7.058 V/m

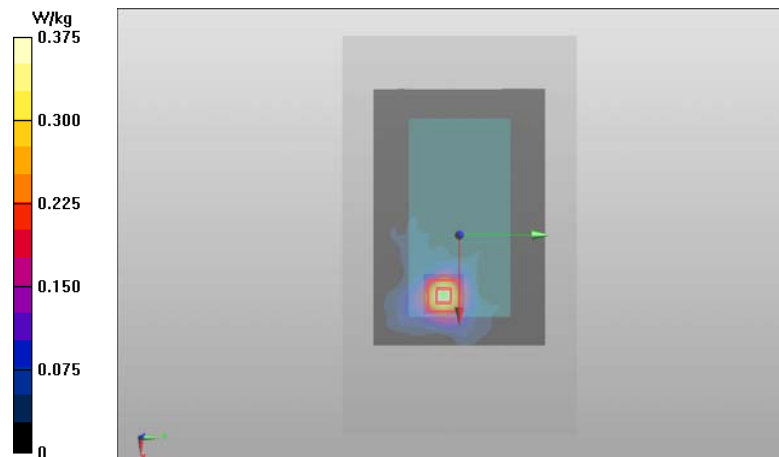
Peak SAR (extrapolated) = 0.752 W/kg

$\text{SAR}(1\text{ g}) = 0.198\text{ W/kg}$

$\text{SAR}(10\text{ g}) = 0.073\text{ W/kg}$

Power Drift = -0.20 dB

Maximum value of SAR (measured) = 0.375 W/kg



Plot #21

Date/Time: 2014-06-26 17:26:34

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822208/0

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 837 MHz; σ = 0.984 S/m; ϵ_r = 54.146; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.05, 6.05, 6.05); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2-slot GPRS850/Body - Middle - Spacer 10mm - No Headset - Display Facing Phantom/Area Scan (81x121x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 25.95 V/m

Fast SAR: SAR(1 g) = 0.599 W/kg

Fast SAR(10 g) = 0.406 W/kg

Maximum value of SAR (interpolated) = 0.736 W/kg

2-slot GPRS850/Body - Middle - Spacer 10mm - No Headset - Display Facing Phantom/Zoom Scan (5x5x7)/Cube

0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 26.14 V/m

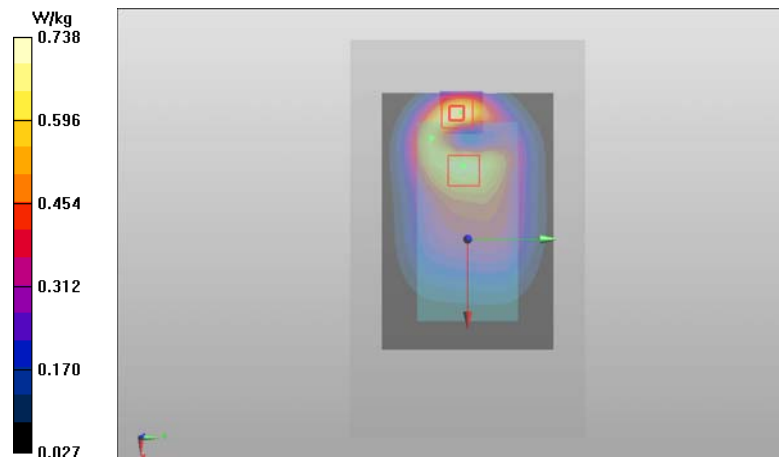
Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.612 W/kg

SAR(10 g) = 0.356 W/kg

Power Drift = -0.02 dB

Maximum value of SAR (measured) = 0.738 W/kg



Plot #22

Date/Time: 2014-06-26 15:02:16

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822208/0

Communication System: WCDMA850 (Band 5)

Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 847 MHz; σ = 0.991 S/m; ϵ_r = 54.114; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.05, 6.05, 6.05); Calibrated: 2013-11-14;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2013-11-19
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WCDMA850 (Band 5)/Body - High - Spacer 10mm - No Headset - Display Facing Phantom/Area Scan (81x121x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 28.03 V/m

Fast SAR: SAR(1 g) = 0.621 W/kg

Fast SAR(10 g) = 0.383 W/kg

Maximum value of SAR (interpolated) = 0.766 W/kg

WCDMA850 (Band 5)/Body - High - Spacer 10mm - No Headset - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 28.13 V/m

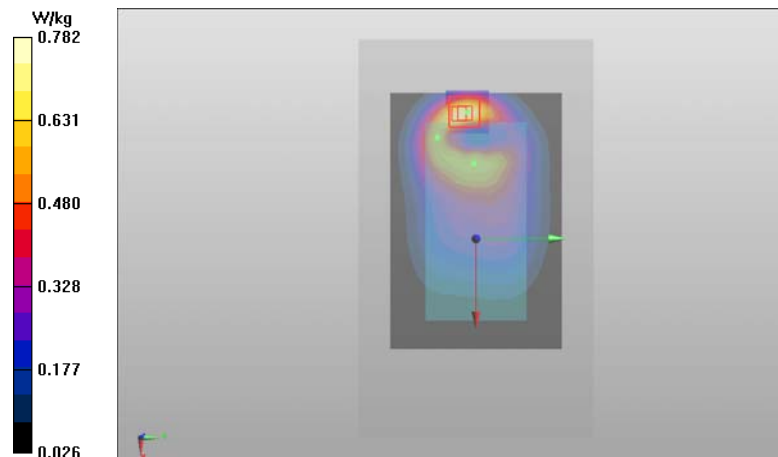
Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.652 W/kg

SAR(10 g) = 0.370 W/kg

Power Drift = 0.03 dB

Maximum value of SAR (measured) = 0.782 W/kg



Plot #23

Date/Time: 2014-06-26 10:10:29

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: 1-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042

Medium: BSL1900; Medium Notes: t= 21 C

Medium parameters used: f = 1910 MHz; $\sigma = 1.58$ S/m; $\epsilon_r = 51.796$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.15, 7.15, 7.15); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1-slot GPRS1900 - Top_Bottom/Body - High - Spacer 10mm - No Headset - Bottom Edge Facing Phantom - Repeated/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 25.36 V/m

Fast SAR: SAR(1 g) = 0.787 W/kg

Fast SAR(10 g) = 0.392 W/kg

Maximum value of SAR (interpolated) = 1.03 W/kg

1-slot GPRS1900 - Top_Bottom/Body - High - Spacer 10mm - No Headset - Bottom Edge Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 25.36 V/m

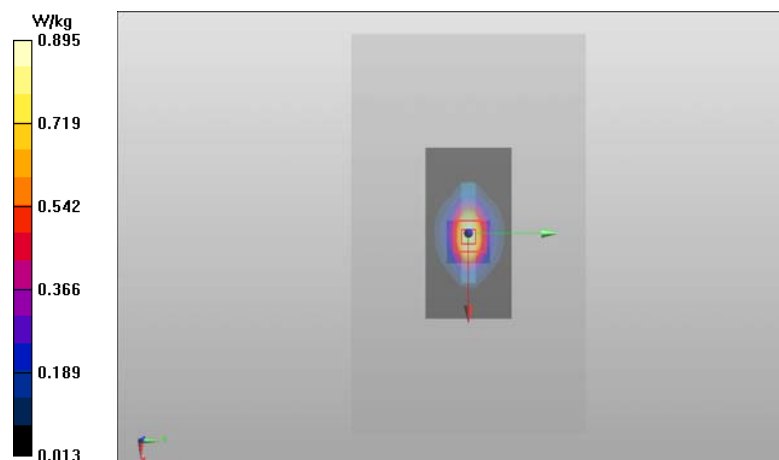
Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.808 W/kg

SAR(10 g) = 0.428 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 0.895 W/kg



Plot #24

Date/Time: 2014-06-25 19:06:58

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: WCDMA1900 (Band 2)

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: BSL1900; Medium Notes: $t = 21\text{ C}$

Medium parameters used: $f = 1908\text{ MHz}$; $\sigma = 1.579\text{ S/m}$; $\epsilon_r = 51.805$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3834
- ConvF(7.15, 7.15, 7.15); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1355; Calibrated: 2014-05-13
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WCDMA1900 (Band 2) - Top_Bottom/Body - High - Spacer 10mm - No Headset - Bottom Edge Facing

Phantom/Area Scan (41x81x1): Interpolated grid: $dx=1.500\text{ mm}$, $dy=1.500\text{ mm}$

Reference Value = 26.52 V/m

Fast SAR: SAR(1 g) = 0.840 W/kg

Fast SAR(10 g) = 0.420 W/kg

Maximum value of SAR (interpolated) = 1.06 W/kg

WCDMA1900 (Band 2) - Top_Bottom/Body - High - Spacer 10mm - No Headset - Bottom Edge Facing

Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{ mm}$, $dy=7.5\text{ mm}$, $dz=5\text{ mm}$

Reference Value = 26.56 V/m

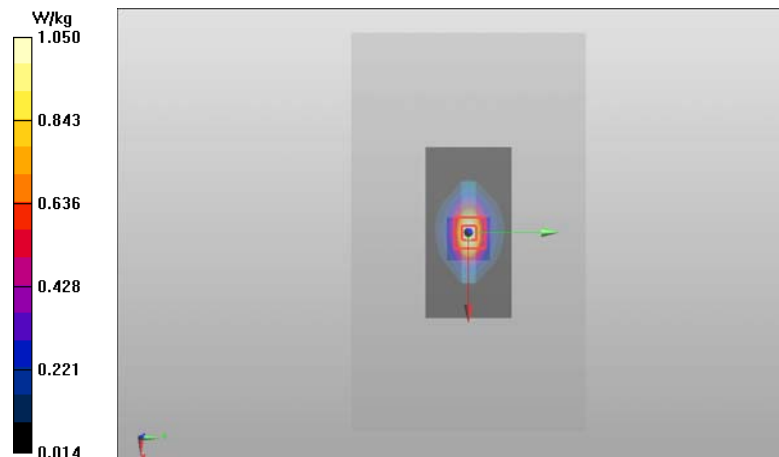
Peak SAR (extrapolated) = 1.47 W/kg

SAR(1 g) = 0.852 W/kg

SAR(10 g) = 0.454 W/kg

Power Drift = -0.03 dB

Maximum value of SAR (measured) = 1.05 W/kg



Plot #25

Date/Time: 2014-07-04 10:04:37

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; σ = 2.06 S/m; ϵ_r = 51.376; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7)/Body - Sub 2 - Scenario 2 - QPSK - 20MHz - 1RB - 0% offset - Spacer 10mm - No Headset - Back Facing Phantom/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 12.11 V/m

Fast SAR: SAR(1 g) = 0.248 W/kg

Fast SAR(10 g) = 0.130 W/kg

Maximum value of SAR (interpolated) = 0.316 W/kg



Plot #26

Date/Time: 2014-07-04 10:21:19

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; $\sigma = 2.06$ S/m; $\epsilon_r = 51.376$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

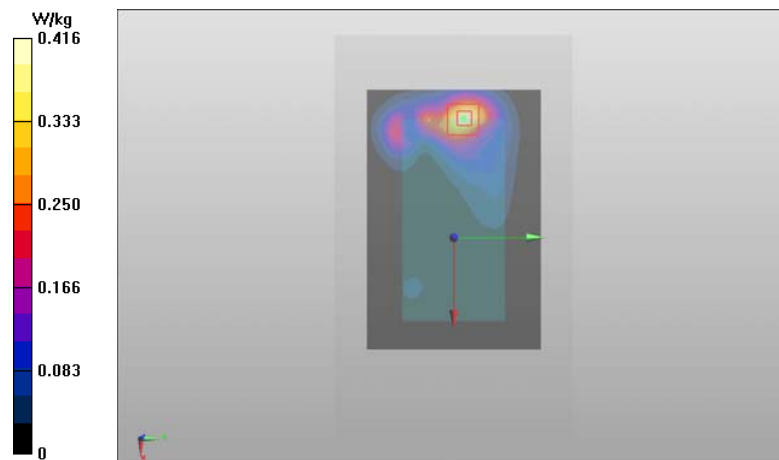
LTE2500 (Band 7)/Body - Sub 2 - Scenario 0 - QPSK - 20MHz - 1RB - 0% offset - Spacer 10mm - No Headset - Display facing Facing Phantom/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 10.33 V/m

Fast SAR: SAR(1 g) = 0.320 W/kg

Fast SAR(10 g) = 0.161 W/kg

Maximum value of SAR (interpolated) = 0.416 W/kg



Plot #27

Date/Time: 2014-07-04 13:22:03

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; σ = 2.06 S/m; ϵ_r = 51.376; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7)/Body - Sub 2 - Scenario 2 - QPSK - 20MHz - 100%RB - Spacer 10mm - No Headset - Top

Bottom Facing Phantom/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 20.81 V/m

Fast SAR: SAR(1 g) = 0.732 W/kg

Fast SAR(10 g) = 0.346 W/kg

Maximum value of SAR (interpolated) = 0.967 W/kg

LTE2500 (Band 7)/Body - Sub 2 - Scenario 2 - QPSK - 20MHz - 100%RB - Spacer 10mm - No Headset - Top

Bottom Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.66 V/m

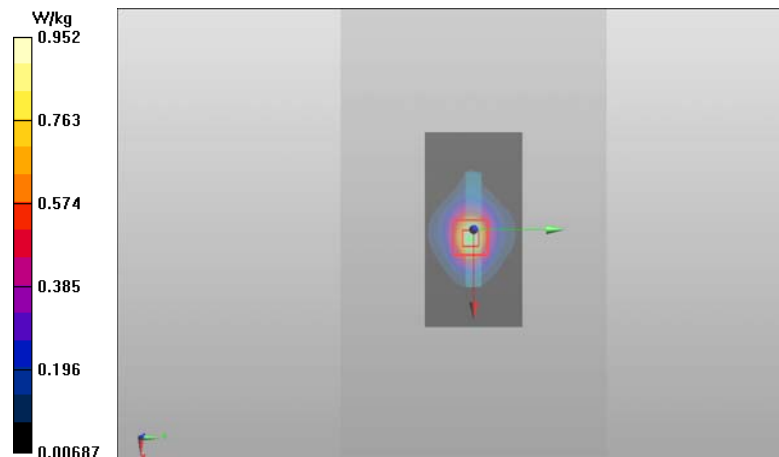
Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.735 W/kg

SAR(10 g) = 0.358 W/kg

Power Drift = 0.04 dB

Maximum value of SAR (measured) = 0.952 W/kg



Plot #28

Date/Time: 2014-07-04 10:57:36

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: LTE2500 (Band 7)

Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used: f = 2535 MHz; $\sigma = 2.06$ S/m; $\epsilon_r = 51.376$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

LTE2500 (Band 7)/Body - Sub 2 - Scenario 1 - QPSK - 20MHz - 1RB - 0% offset - Spacer 10mm - No Headset - Left Edge Facing Phantom/Area Scan (61x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 5.698 V/m

Fast SAR: SAR(1 g) = 0.051 W/kg

Fast SAR(10 g) = 0.027 W/kg

Maximum value of SAR (interpolated) = 0.0651 W/kg



Plot #29

Date/Time: 2014-07-04 11:51:25

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822229/6

Communication System: LTE2500 (Band 7)

Frequency: 2558.3 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 20.8 C

Medium parameters used (interpolated): f = 2558.3 MHz; σ = 2.087 S/m; ϵ_r = 51.311; ρ = 1000 kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.14, 7.14, 7.14); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

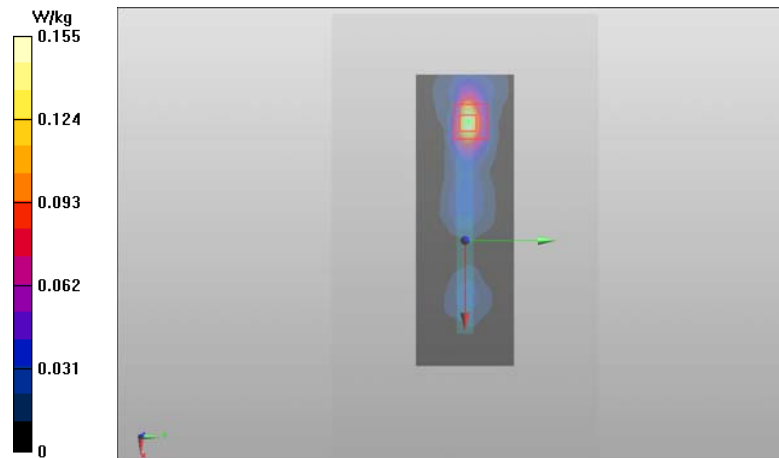
LTE2500 (Band 7)/Body - Sub 3 - Scenario 1 - QPSK - 20MHz - 1RB - 0% offset - Spacer 10mm - No Headset - Right Edge Facing Phantom/Area Scan (61x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 8.324 V/m

Fast SAR: SAR(1 g) = 0.108 W/kg

Fast SAR(10 g) = 0.044 W/kg

Maximum value of SAR (interpolated) = 0.155 W/kg



Plot #30

Date/Time: 2014-06-18 09:04:20

Test Laboratory: TCC Microsoft

Type: RM-984; Serial: 004402/47/822255/1

Communication System: WLAN2450

Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 21.0$ C

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.948$ S/m; $\epsilon_r = 51.919$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3960
- ConvF(7.44, 7.44, 7.44); Calibrated: 2013-12-10;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1302; Calibrated: 2013-11-08
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

WLAN2450 b-mode/Body - Channel 1 - BPSK 1 Mbps - Spacer 10mm - No Headset - Back Facing Phantom/Area Scan (121x181x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Reference Value = 14.17 V/m

Fast SAR: SAR(1 g) = 0.338 W/kg

Fast SAR(10 g) = 0.151 W/kg

Maximum value of SAR (interpolated) = 0.476 W/kg

WLAN2450 b-mode/Body - Channel 1 - BPSK 1 Mbps - Spacer 10mm - No Headset - Back Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 13.94 V/m

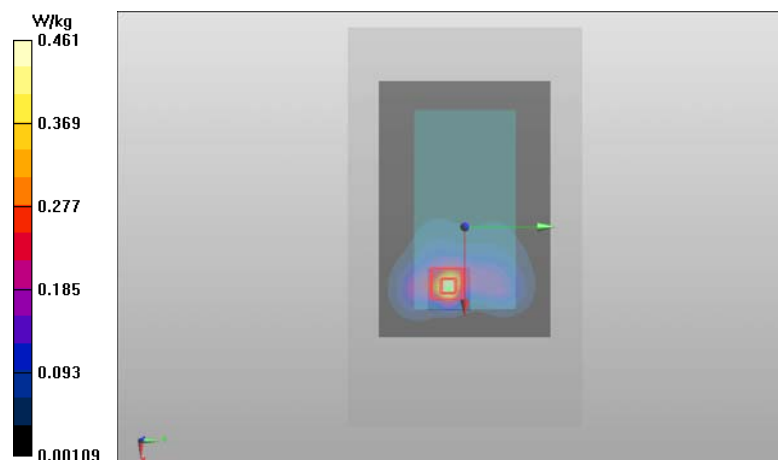
Peak SAR (extrapolated) = 0.734 W/kg

SAR(1 g) = 0.347 W/kg

SAR(10 g) = 0.160 W/kg

Power Drift = 0.01 dB

Maximum value of SAR (measured) = 0.461 W/kg



APPENDIX C: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

Head tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
835	2014-06-25	40.1	0.89	40.0	0.90	40.0	0.91
f (MHz)	Date	Dielectric Parameters					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
836	2014-06-25	40.1	0.89	40.0	0.90	39.9	0.91
f (MHz)	Date	Dielectric Parameters					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
1880	2014-06-23	39.1	1.36	39.0	1.39	38.9	1.42
f (MHz)	Date	Dielectric Parameters					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
1880	2014-06-23	39.1	1.37	39.0	1.39	38.9	1.42
f (MHz)	Date	Dielectric Parameters					
		Ch 1 2412.0 MHz		Ch 6 2437.0 MHz		Ch 11 2462.0 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
2437	2014-06-17	38.8	1.84	38.7	1.86	38.6	1.89
	2014-06-18	39.3	1.81	39.2	1.83	39.1	1.86
f (MHz)	Date	Dielectric Parameters					
		Ch 20867 2511.7 MHz		Ch 21100 2535.0 MHz		Ch 21333 2558.3 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
2535	2014-06-26	38.4	1.92	38.4	1.95	38.3	1.97
	2014-07-03	39.0	1.89	38.9	1.92	38.8	1.95

Head tissue simulant dielectric parameters used in the measurements 5200 – 5825 MHz:

f (MHz)	Date	Dielectric Parameters									
		Ch 40 5200.0 MHz		5210.0 MHz		Ch 44 5220.0 MHz		-		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
5210	2014-06-23	35.2	4.59	35.2	4.60	35.2	4.61	-	-	-	-
f (MHz)	Date	Dielectric Parameters									
		Ch 52 5260.0 MHz		5290.0 MHz		Ch 64 5320.0 MHz		-		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
5290	2014-06-24	34.9	4.64	34.8	4.66	34.8	4.71	-	-	-	-
f (MHz)	Date	Dielectric Parameters									
		Ch 104 5520.0 MHz		Ch 116 5580.0 MHz		Ch 124 5620.0 MHz		Ch 136 5680.0 MHz		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	ϵ_r	ϵ_r	σ [S/m]
5520 5620	2014-06-24	34.5	4.88	34.4	4.96	34.4	4.99	34.3	5.06	-	-
f (MHz)	Date	Dielectric Parameters									
		5760.0 MHz		Ch 153 5765.0 MHz		Ch 157 5785.0 MHz		Ch 165 5825.0 MHz		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
5760	2014-06-18	34.7	5.10	34.7	5.11	34.7	5.14	34.7	5.18	-	-
	2014-06-25	33.9	5.12	33.9	5.13	33.9	5.16	33.9	5.21	-	-

Body tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
835	2014-06-26	54.2	0.98	54.2	0.98	54.1	0.99
f (MHz)	Date	Dielectric Parameters					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
836	2014-06-26	54.2	0.97	54.1	0.98	54.1	0.99
f (MHz)	Date	Dielectric Parameters					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
1880	2014-06-25	52.0	1.52	51.9	1.55	51.8	1.58
f (MHz)	Date	Dielectric Parameters					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
1880	2014-06-25	52.0	1.53	51.9	1.55	51.8	1.58
f (MHz)	Date	Dielectric Parameters					
		Ch 1 2412.0 MHz		Ch 6 2437.0 MHz		Ch 11 2462.0 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
2437	2014-06-17	51.9	1.95	51.9	1.97	51.8	1.99
f (MHz)	Date	Dielectric Parameters					
		Ch 20867 2511.7 MHz		Ch 21100 2535.0 MHz		Ch 21333 2558.3 MHz	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
2535	2014-07-03	51.4	2.03	51.4	2.06	51.3	2.08

Body tissue simulant dielectric parameters used in the measurements 5200 – 5825 MHz:

f (MHz)	Date	Dielectric Parameters									
		Ch 40 5200.0 MHz		5210.0 MHz		Ch 44 5220.0 MHz		-		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
5210	2014-06-16	48.1	5.44	48.1	5.46	48.1	5.47	-	-	-	-
	2014-06-23	48.0	5.47	48.0	5.49	48.0	5.50				
f (MHz)	Date	Dielectric Parameters									
		Ch 52 5260.0 MHz		5290.0 MHz		Ch 64 5320.0 MHz		-		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
5290	2014-06-17	48.4	5.53	48.4	5.57	48.3	5.62	-	-	-	-
f (MHz)	Date	Dielectric Parameters									
		Ch 104 5520.0 MHz		Ch 116 5580.0 MHz		Ch 124 5620.0 MHz		Ch 136 5680.0 MHz		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	ϵ_r	ϵ_r	σ [S/m]
5520 5620	2014-06-17	48.0	5.87	47.9	5.95	47.7	6.00	47.6	6.07	-	-
f (MHz)	Date	Dielectric Parameters									
		5760.0 MHz		Ch 153 5765.0 MHz		Ch 157 5785.0 MHz		Ch 165 5825.0 MHz		-	
		ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]	ϵ_r	σ [S/m]
5760	2014-06-18	47.1	6.19	47.1	6.19	47.1	6.23	47.0	6.28	-	-

APPENDIX D: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Type: RM-984; Serial: 004402/47/822208/0, HW: 0200 SW: 02028.00000.14224.06001

D.1. WCDMA850 (Band 5) Test results

Average power

Ch / f(MHz)	P [dBm]
4132	23.4
4175	23.4
4233	23.4

D.2. HSUPA850 Test results

Average power

Ch / f (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
4132	21.8	21.5	21.2	22.1	22.6
4175	21.9	21.4	21.0	21.9	22.4
4233	22.5	22.5	22.5	22.5	22.5

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs two separate HSUPA power control routines: MPR, and additional 1dB reduction to ensure PA linearity. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
0.0dB	1.0dB	2.0dB	1.0dB	0.0dB

Type: RM-984; Serial: 004402/47/822204/9, HW: 0200 SW: 02028.00000.14224.06001

D.3. WCDMA1900 (Band 2) Test results

Average power

Ch / f (MHz)	P [dBm]
9262	23.4
9400	23.6
9538	23.5

D.4. HSUPA1900 Test results

Average power

Ch / f (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
9262	22.1	21.5	21.1	21.9	22.4
9400	22.3	21.6	21.5	22.2	22.7
9538	22.1	21.0	20.7	22.0	22.4

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs two separate HSUPA power control routines: MPR, and additional 1dB reduction to ensure PA linearity. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
0.0dB	1.0dB	2.0dB	1.0dB	0.0dB

Type: RM-984; Serial: 004402/47/822229/6, HW: 0200 SW: 02028.00000.14224.06001

D.5. WCDMA1900 (Band 2) Test results

Average power

Ch / f (MHz)	P [dBm]
9262	18.0
9400	18.2
9538	18.0

D.6. HSUPA1900 Test results

Average power

Ch / f (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
9262	16.7	15.3	15.6	16.3	16.9
9400	17.0	15.6	15.6	16.5	17.2
9538	16.7	15.8	15.8	16.4	17.0

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs two separate HSUPA power control routines: MPR, and additional 1dB reduction to ensure PA linearity. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
0.0dB	1.0dB	2.0dB	1.0dB	0.0dB

APPENDIX E: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS



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 **Nokia Salo TCC**

Certificate No: **EX3-3834_May14**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3834**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes**

Calibration date: **May 8, 2014**

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	03-Apr-14 (No. 217-01911)	Jan-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Jan-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Jan-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Jan-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Jan-15
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: May 12, 2014			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3834

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth (mm) ^G	Unct. (k=2)
1750	40.1	1.37	7.62	7.62	7.62	0.80	0.59	± 12.0 %
1900	40.0	1.40	7.33	7.33	7.33	0.63	0.66	± 12.0 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3834

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth (mm) ^G	Unct. (k=2)
1750	53.4	1.49	7.35	7.35	7.35	0.77	0.63	± 12.0 %
1900	53.3	1.52	7.15	7.15	7.15	0.45	0.81	± 12.0 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Salo TCC**

Certificate No: **ES3-3194_Nov13**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3194**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes**

Calibration date: **November 14, 2013**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 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	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	4-Sep-13 (No. DAE4-660_Sep13)	Sep-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: November 15, 2013			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3194

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
835	41.5	0.90	6.12	6.12	6.12	0.28	2.07	± 12.0 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3194

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Uncl. (k=2)
835	55.2	0.97	6.05	6.05	6.05	0.69	1.30	± 12.0 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Salo TCC**

Certificate No: **EX3-3892_Nov13**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3892**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6**
Calibration procedure for dosimetric E-field probes

Calibration date: **November 15, 2013**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	4-Sep-13 (No. DAE4-660_Sep13)	Sep-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: November 16, 2013			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3892

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	10.15	10.15	10.15	0.80	0.61	± 12.0 %
835	41.5	0.90	9.75	9.75	9.75	0.37	0.88	± 12.0 %
1750	40.1	1.37	8.43	8.43	8.43	0.49	0.82	± 12.0 %
1900	40.0	1.40	8.18	8.18	8.18	0.48	0.84	± 12.0 %
2450	39.2	1.80	7.40	7.40	7.40	0.43	0.87	± 12.0 %
2600	39.0	1.96	7.23	7.23	7.23	0.39	0.95	± 12.0 %
5200	36.0	4.66	5.29	5.29	5.29	0.35	1.80	± 13.1 %
5300	35.9	4.76	4.96	4.96	4.96	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.84	4.84	4.84	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.66	4.66	4.66	0.35	1.80	± 13.1 %
5800	35.3	5.27	4.60	4.60	4.60	0.40	1.80	± 13.1 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3892

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct, (k=2)
750	55.5	0.96	9.74	9.74	9.74	0.32	0.99	± 12.0 %
835	55.2	0.97	9.65	9.65	9.65	0.45	0.87	± 12.0 %
1750	53.4	1.49	7.86	7.86	7.86	0.39	0.87	± 12.0 %
1900	53.3	1.52	7.69	7.69	7.69	0.42	0.84	± 12.0 %
2450	52.7	1.95	7.27	7.27	7.27	0.75	0.56	± 12.0 %
2600	52.5	2.16	7.13	7.13	7.13	0.70	0.50	± 12.0 %
5200	49.0	5.30	4.34	4.34	4.34	0.45	1.90	± 13.1 %
5300	48.9	5.42	4.15	4.15	4.15	0.45	1.90	± 13.1 %
5500	48.6	5.65	4.12	4.12	4.12	0.45	1.90	± 13.1 %
5600	48.5	5.77	4.00	4.00	4.00	0.40	1.90	± 13.1 %
5800	48.2	6.00	4.02	4.02	4.02	0.50	1.90	± 13.1 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Salo TCC**

Certificate No: **EX3-3960_Dec13**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3960**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes**

Calibration date: **December 10, 2013**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	4-Sep-13 (No. DAE4-660_Sep13)	Sep-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

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

Signature

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

Issued: December 11, 2013

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3960

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	10.78	10.78	10.78	0.47	0.86	± 12.0 %
835	41.5	0.90	10.45	10.45	10.45	0.41	0.86	± 12.0 %
1750	40.1	1.37	8.49	8.49	8.49	0.57	0.67	± 12.0 %
1900	40.0	1.40	8.23	8.23	8.23	0.62	0.64	± 12.0 %
2450	39.2	1.80	7.39	7.39	7.39	0.38	0.83	± 12.0 %
2600	39.0	1.96	7.33	7.33	7.33	0.39	0.84	± 12.0 %
5200	36.0	4.66	5.27	5.27	5.27	0.35	1.80	± 13.1 %
5300	35.9	4.76	5.07	5.07	5.07	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.99	4.99	4.99	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.80	4.80	4.80	0.35	1.80	± 13.1 %
5800	35.3	5.27	4.80	4.80	4.80	0.40	1.80	± 13.1 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3960

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	55.5	0.96	10.24	10.24	10.24	0.43	0.86	± 12.0 %
835	55.2	0.97	10.08	10.08	10.08	0.34	1.00	± 12.0 %
1750	53.4	1.49	8.33	8.33	8.33	0.52	0.72	± 12.0 %
1900	53.3	1.52	7.88	7.88	7.88	0.62	0.64	± 12.0 %
2450	52.7	1.95	7.44	7.44	7.44	0.62	0.50	± 12.0 %
2600	52.5	2.16	7.14	7.14	7.14	0.59	0.50	± 12.0 %
5200	49.0	5.30	4.60	4.60	4.60	0.45	1.90	± 13.1 %
5300	48.9	5.42	4.33	4.33	4.33	0.50	1.90	± 13.1 %
5500	48.6	5.65	4.12	4.12	4.12	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.97	3.97	3.97	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.14	4.14	4.14	0.55	1.90	± 13.1 %

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

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.