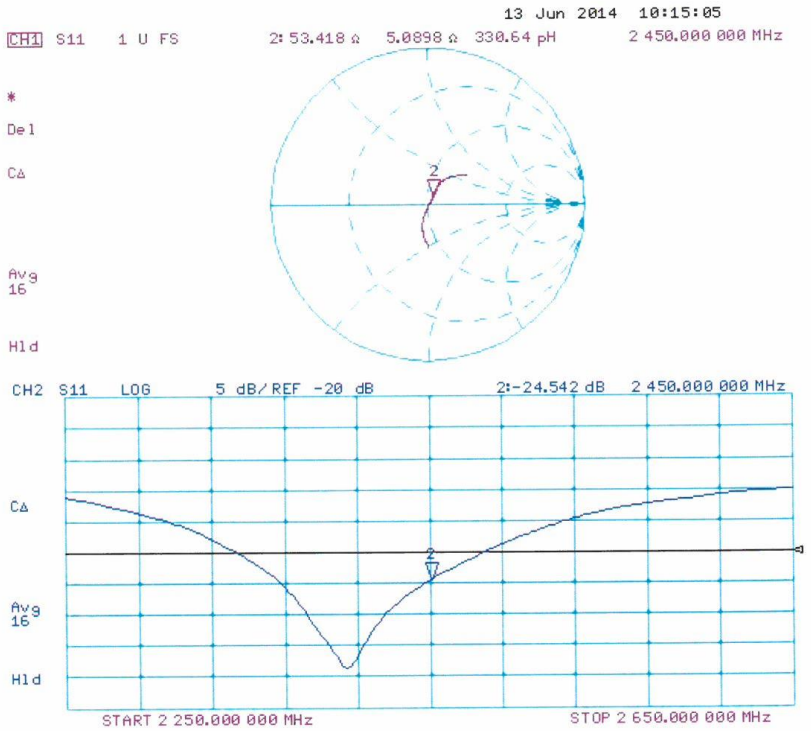
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 13.06.2014

Test Laboratory: SPEAG, Zurich, Switzerland

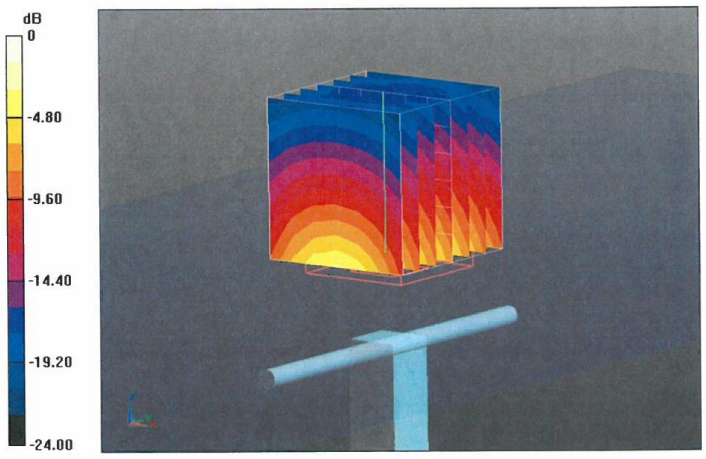
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 869

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.03 S/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.35, 4.35, 4.35); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.93 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 26.7 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6 W/kg
Maximum value of SAR (measured) = 17.0 W/kg



0 dB = 17.0 W/kg = 12.30 dBW/kg

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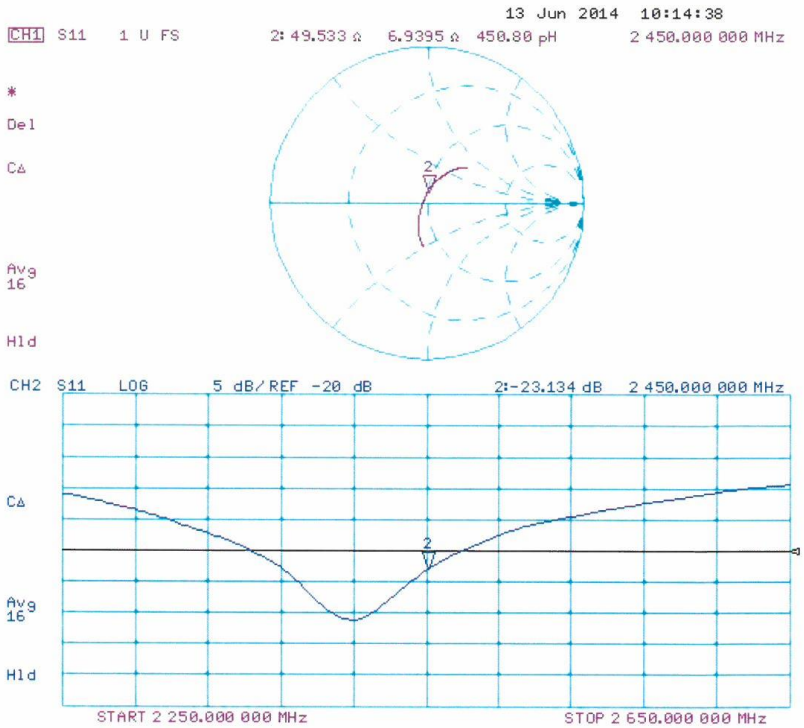
Impedance Measurement Plot for Body TSL



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ANNEX I SPOT CHECK TEST

As the test lab for 4003A from TCL Communication Ltd, we, CTTL(Shouxiang), declare on our sole responsibility that, according to "Declaration of changes" provided by applicant, only the Spot check test should be performed. The test results are as below.

I.1 Internal Identification of EUT used during the spot check test

EUT ID*	IMEI	HW Version	SW Version
EUT1	014264000002556	PIO	v5B4
EUT2	014264000001673	PIO	v5B4
EUT3	014264000001699	PIO	v5B4

*EUT ID: is used to identify the test sample in the lab internally.

Note: It is performed to test SAR with the EUT1&2 and conducted power with the EUT3.

I.2 Conducted power of selected case

Table I.1: The conducted power results for GSM850/1900

GSM 850MHz	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	32.52	\	\
GSM 1900MHz	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	\	\	29.14

Table I.2: The conducted power results for GPRS

GSM 850 GPRS (GMSK)	Measured Power (dBm)		
	251	**190**	**128**
2 Txslots	29.53	\	\
PCS1900 GPRS (GMSK)	Measured Power (dBm)		
	810	**661**	**512**
4 Txslots	\	\	23.74

Table I.3: The conducted power results for WCDMA

Item	**band**	**FDD V result**		
	ARFCN	**4233 (846.6MHz)**	**4182 (836.4MHz)**	**4132 (826.4MHz)**
WCDMA	****	23.74	23.36	\
Item	**band**	**FDD II result**		
	ARFCN	**9538 (1907.6MHz)**	**9400 (1880MHz)**	**9262 (1852.4MHz)**
WCDMA	****	\	22.92	\

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I.3 Measurement results

SAR Values (GSM 850 MHz Band - Head)

Frequency		Side	Test Position	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.				Original data	Spot check data
848.8	251	Left	Touch	CAB31P0000C1	0.602	0.565

SAR Values (GSM 850 MHz Band - Body)

Frequency		Mode/Band	Test Position	Spacing (mm)	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.					Original data	Spot check data
848.8	251	GPRS	Rear	10	CAB31P0000C1	0.687	0.648

SAR Values (PCS 1900 MHz Band - Head)

Frequency		Side	Test Position	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.				Original data	Spot check data
1850.2	512	Left	Touch	CAB31P0000C1	0.474	0.431

SAR Values (PCS 1900 MHz Band - Body)

Frequency		Mode/Band	Test Position	Spacing (mm)	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.					Original data	Spot check data
1850.2	512	GPRS	Rear	10	CAB31P0000C1	0.703	0.554

SAR Values (WCDMA 850 MHz Band - Head)

Frequency		Side	Test Position	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.				Original data	Spot check data
836.4	4182	Left	Touch	CAB31P0000C1	0.652	0.364

SAR Values (WCDMA 850 MHz Band - Body)

Frequency		Test Position	Spacing (mm)	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.				Original data	Spot check data
846.6	4233	Rear	10	CAB31P0000C1	0.64	0.567

SAR Values (WCDMA 1900 MHz Band - Head)

Frequency		Side	Test Position	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.				Original data	Spot check data
1880	9400	Left	Touch	CAB31P0000C1	0.906	0.513

SAR Values (WCDMA 1900 MHz Band - Body)

Frequency		Test Position	Spacing (mm)	Battery Type	SAR(1g) (W/kg)	
MHz	Ch.				Original data	Spot check data
1880	9400	Rear	10	CAB31P0000C1	0.737	0.719

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I.4 Reported SAR Comparison

Exposure Configuration	Technology Band	Reported SAR 1g (W/Kg): original	Reported SAR 1g (W/Kg): spot check
Head (Separation Distance 0mm)	GSM 850	0.73	0.68
	PCS 1900	0.65	0.56
	UMTS FDD 5	0.73	0.42
	UMTS FDD 2	1.09	0.63
Body-worn (Separation Distance 10mm)	GSM 850	0.76	0.72
	PCS 1900	0.96	0.74
	UMTS FDD 5	0.68	0.60
	UMTS FDD 2	0.88	0.88

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I.5 Graphic results

GSM850 Left Cheek High

Date: 2014-12-22
Electronics: DAE4 Sn777
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.909 S/m; ε_r = 41.036; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 - SN3846 ConvF(9.18, 9.18, 9.18)

Cheek High/Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.625 W/kg

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.21 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.704 W/kg
SAR(1 g) = 0.565 W/kg; SAR(10 g) = 0.429 W/kg
Maximum value of SAR (measured) = 0.621 W/kg

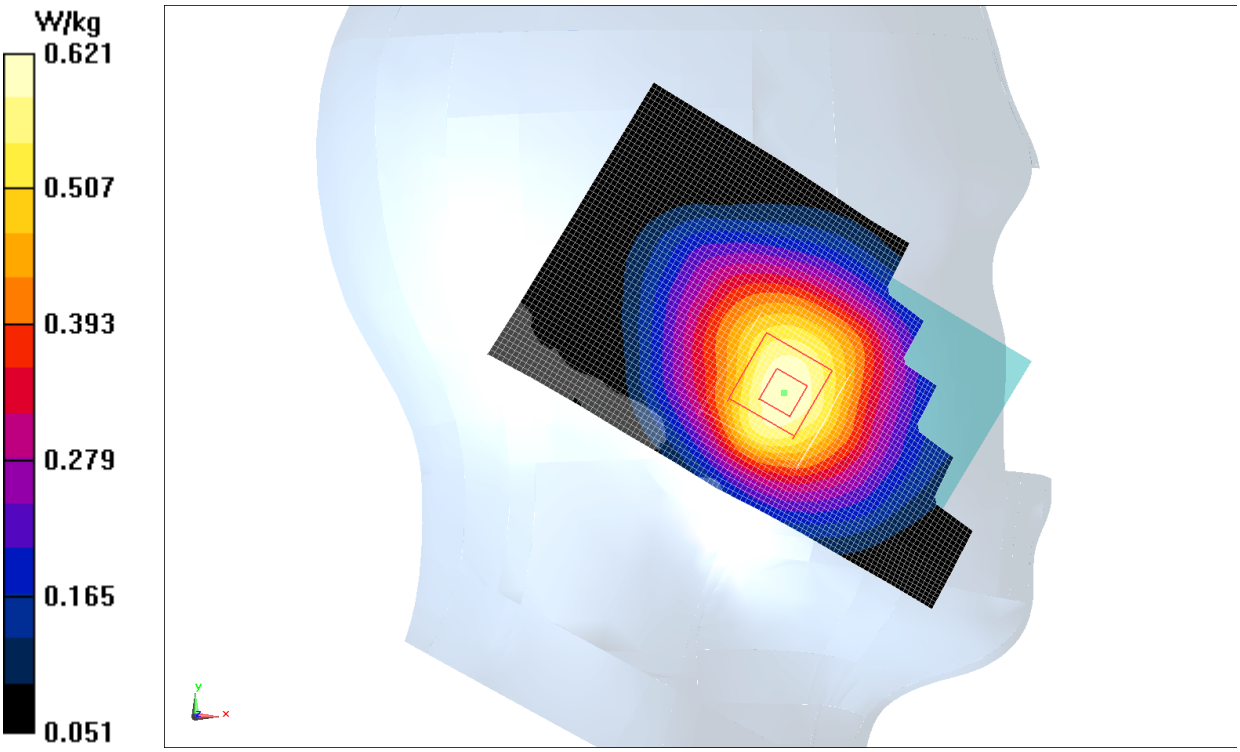

Fig.1 850MHz 251

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GSM850 Body Rear High with GPRS

Date: 2014-12-22
Electronics: DAE4 Sn777
Medium: Body 850 MHz
Medium parameters used(interpolated): f = 848.8 MHz; σ = 9.994 S/m; ε_r = 53.263; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:4
Probe: EX3DV4 - SN3846 ConvF(9.09, 9.09, 9.09)

Rear High/Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.685 W/kg

Rear High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.24 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.822 W/kg
SAR(1 g) = 0.648 W/kg; SAR(10 g) = 0.484 W/kg
Maximum value of SAR (measured) = 0.679 W/kg

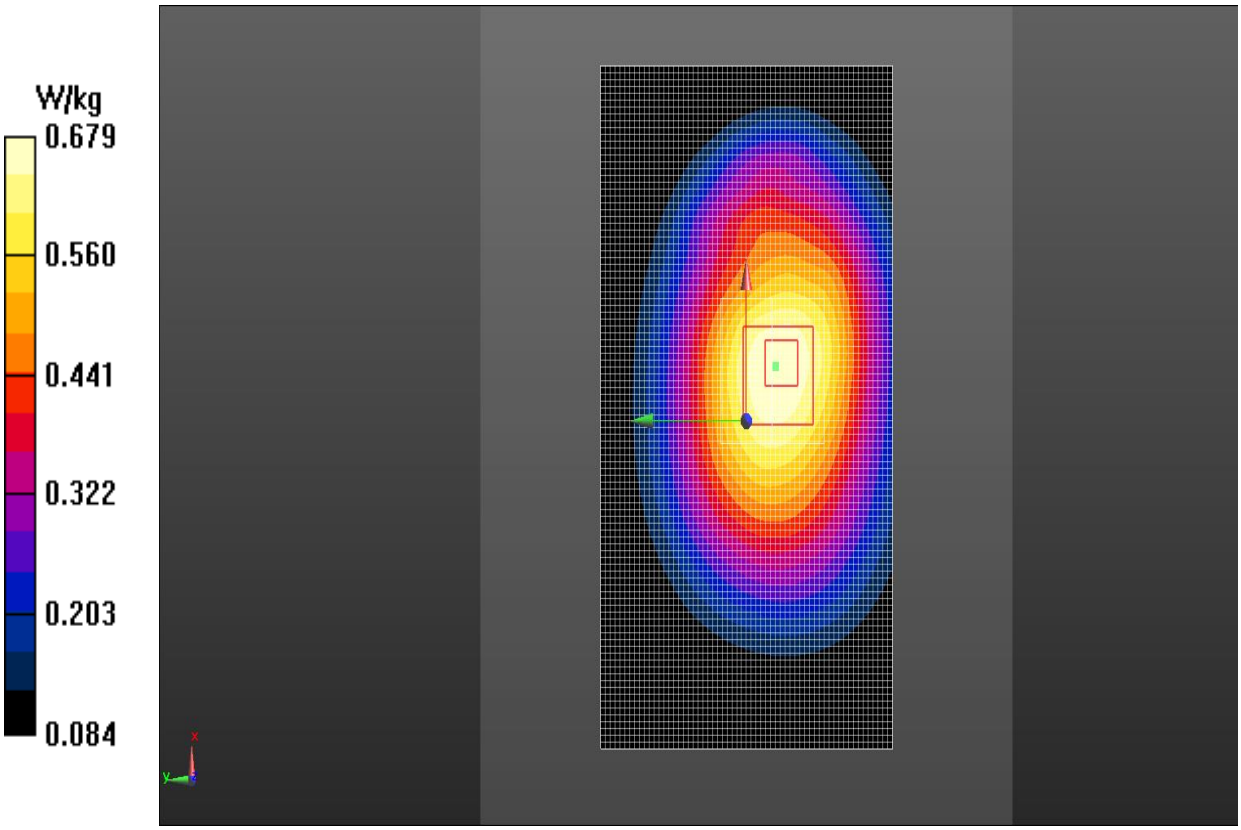

Fig.2 850 MHz CH251

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GSM1900 Left Cheek Low

Date: 2014-12-11
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used(interpolated): f = 1850.2 MHz; σ = 1.355 S/m; ε_r = 40.591; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 - SN3846 ConvF(7.26, 7.26, 7.26)

Cheek Low/Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.481 W/kg

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.850 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.684 W/kg
SAR(1 g) = 0.431 W/kg; SAR(10 g) = 0.254 W/kg
Maximum value of SAR (measured) = 0.473 W/kg

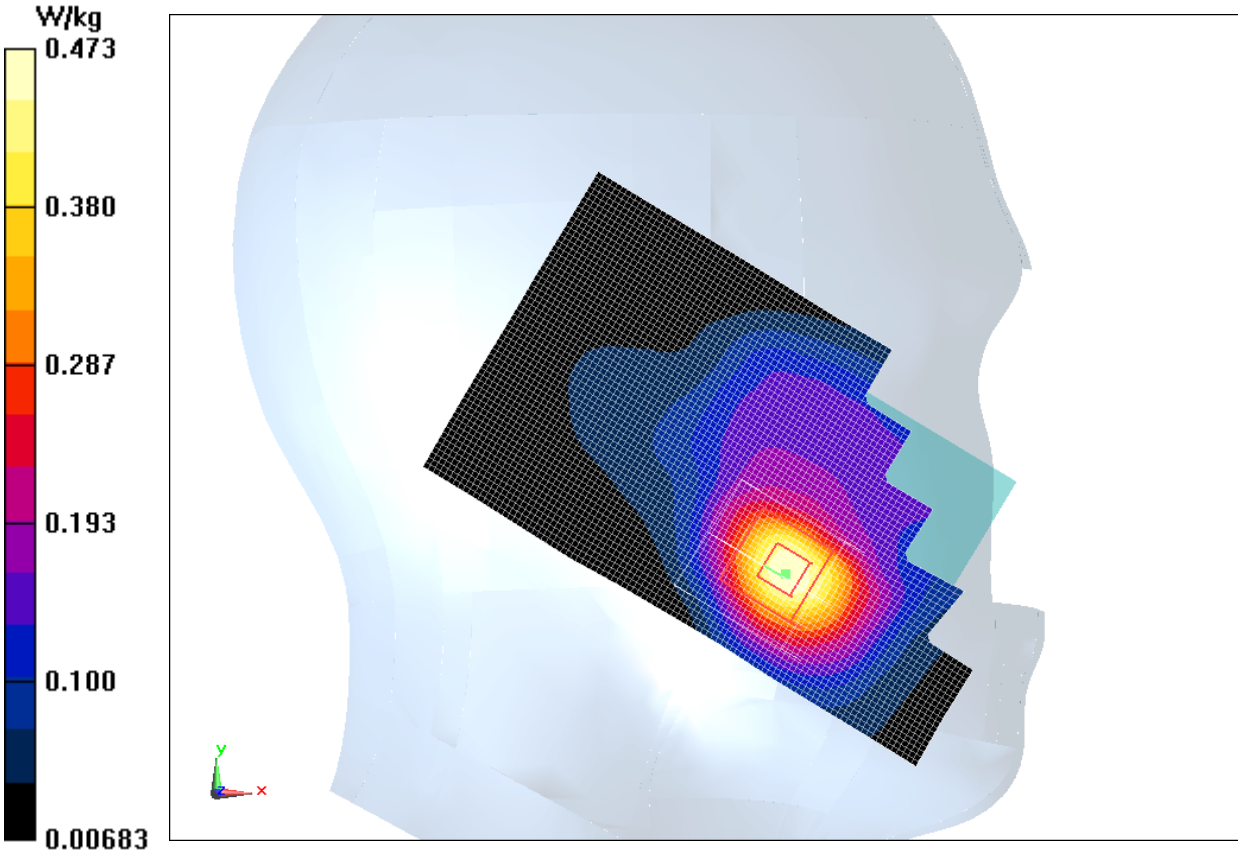

Fig.3 1900 MHz CH512

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GSM1900 Body Rear Low with GPRS

Date: 2014-12-11
Electronics: DAE4 Sn777
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.505 S/m; ε_r = 53.038; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 - SN3846 ConvF(7.15, 7.15, 7.15)

Rear Low/Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.588 W/kg

Rear Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.502 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.928 W/kg
SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.331 W/kg
Maximum value of SAR (measured) = 0.603 W/kg

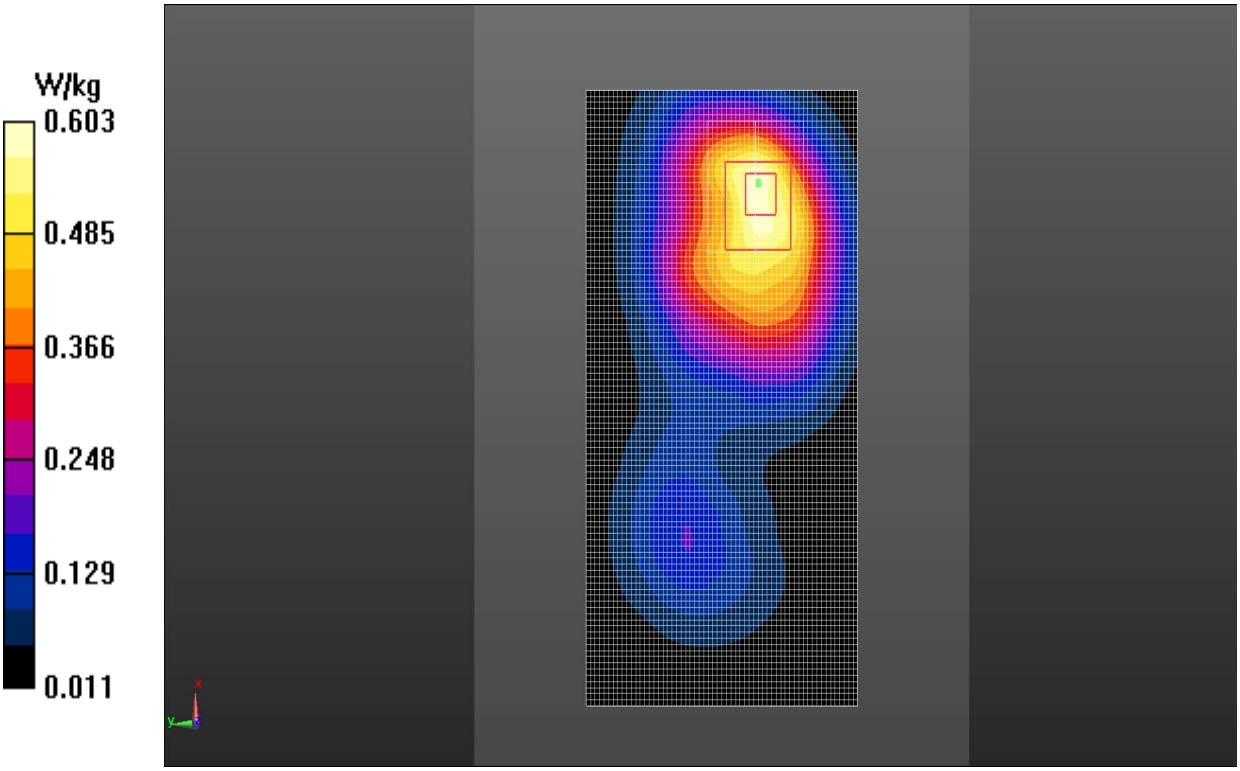

Fig.4 1900 MHz CH512

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WCDMA 850 Left Cheek Middle

Date: 2014-12-22
Electronics: DAE4 Sn777
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.898 S/m; ε_r = 41.39; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: WCDMA; Frequency: 836.4 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3846 ConvF(9.18, 9.18, 9.18)

Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.394 W/kg

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.800 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.436 W/kg
SAR(1 g) = 0.364 W/kg; SAR(10 g) = 0.279 W/kg
Maximum value of SAR (measured) = 0.397 W/kg

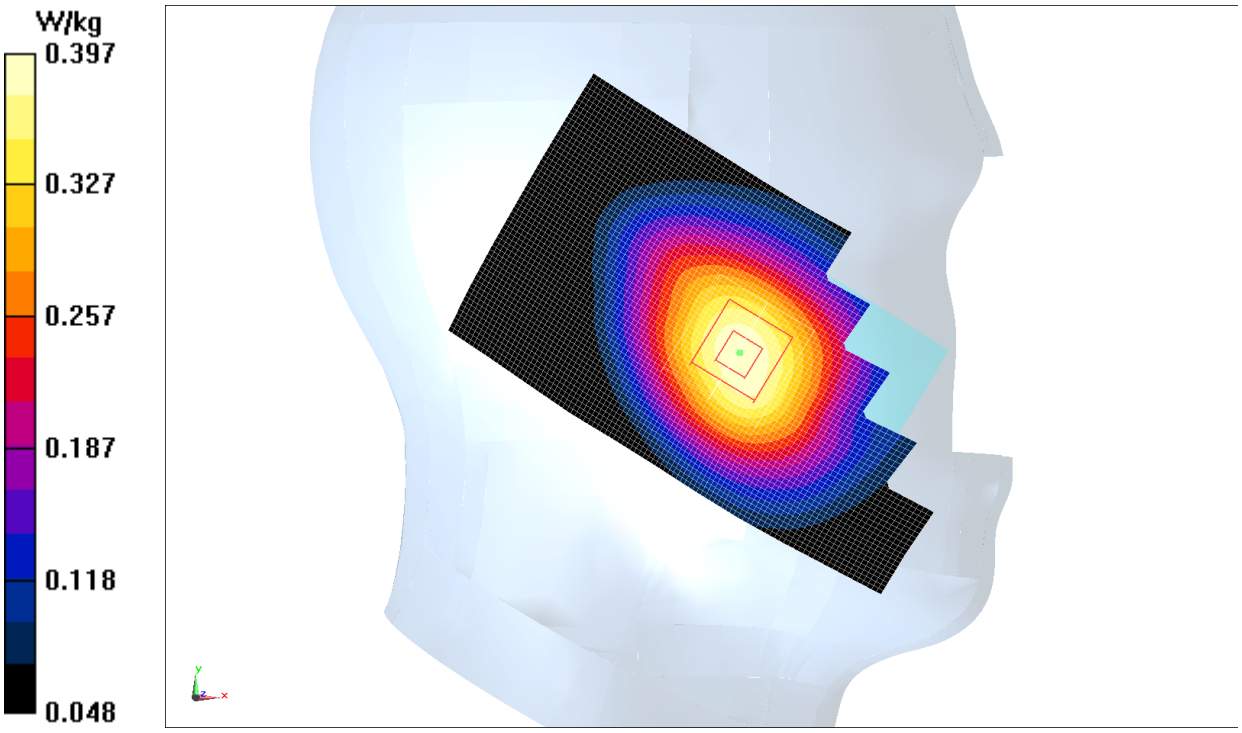

Fig.5 WCDMA 850 CH4182

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WCDMA 850 Body Rear High

Date: 2014-12-22
Electronics: DAE4 Sn777
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 846.6 MHz; σ = 9.992 S/m; ε_r = 53.286; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3846 ConvF(9.09, 9.09, 9.09)

Rear High/Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.631 W/kg

Rear High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.97 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.724 W/kg
SAR(1 g) = 0.567 W/kg; SAR(10 g) = 0.422 W/kg
Maximum value of SAR (measured) = 0.625 W/kg

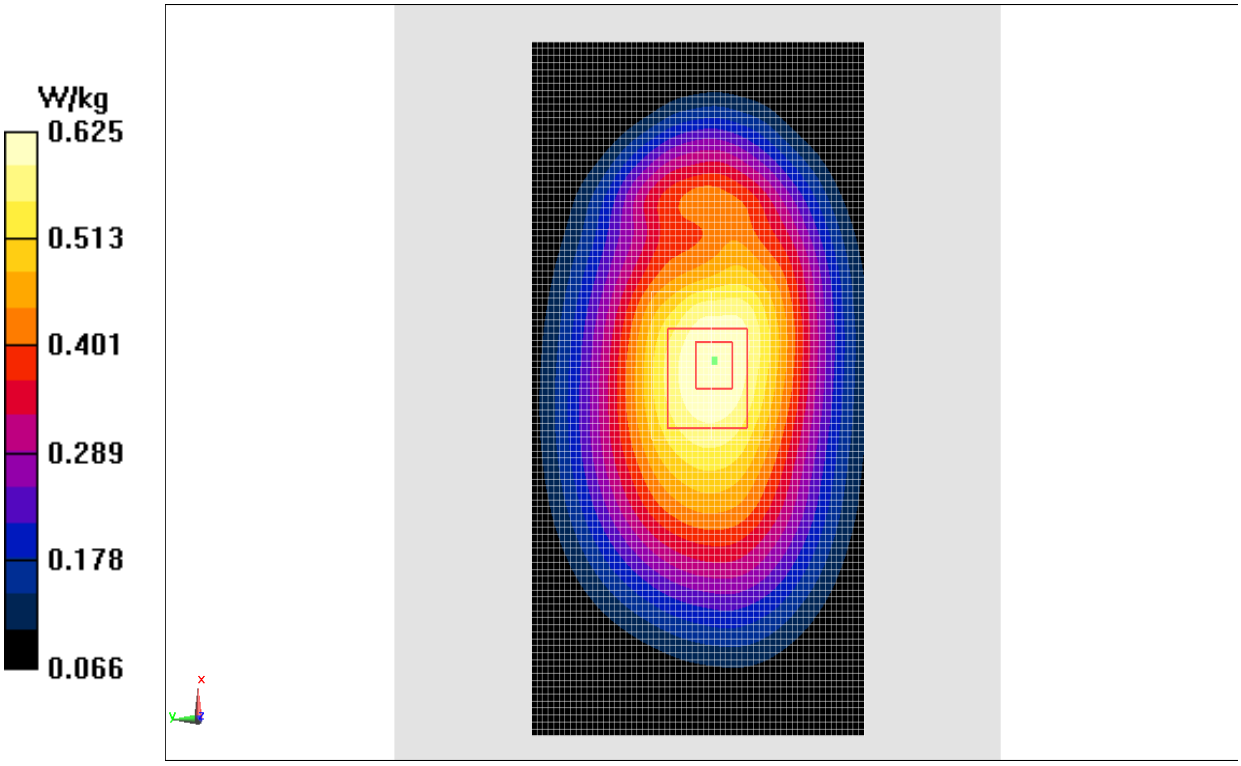

Fig.6 WCDMA 850 CH4233

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WCDMA 1900 Left Cheek Middle

Date: 2014-12-11
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1880 MHz; σ = 1.381 S/m; ε_r = 40.50; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: WCDMA 1900 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3846 ConvF(7.26, 7.26, 7.26)

Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.553 W/kg

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.372 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.803 W/kg
SAR(1 g) = 0.513 W/kg; SAR(10 g) = 0.311 W/kg
Maximum value of SAR (measured) = 0.553 W/kg

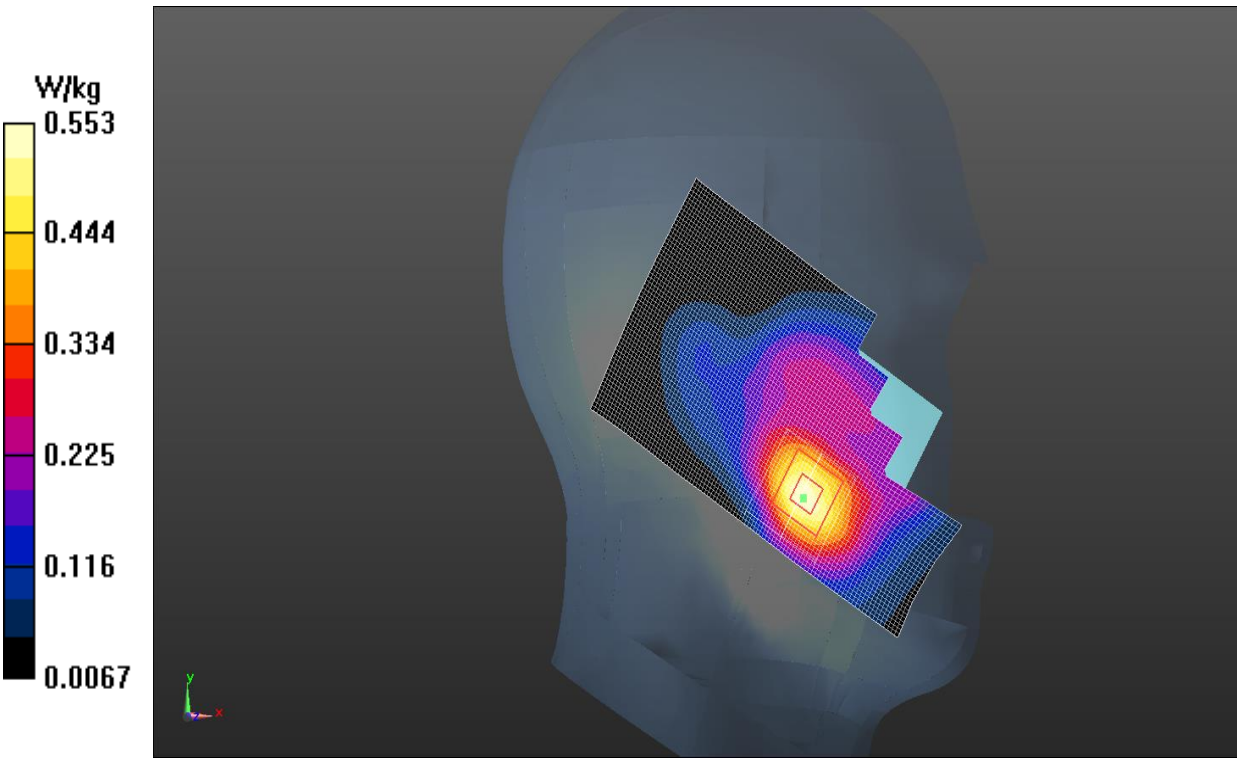

Fig.7 WCDMA1900 CH9400

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WCDMA 1900 Body Rear Middle

Date: 2014-12-11
Electronics: DAE4 Sn777
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.524 S/m; ε_r = 52.857; ρ = 1000 kg/m^3
Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.8^{o}C
Communication System: WCDMA 1900 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3846 ConvF(7.15, 7.15, 7.15)

Rear Middle/Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.823 W/kg

Rear Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.884 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.719 W/kg; SAR(10 g) = 0.446 W/kg
Maximum value of SAR (measured) = 0.768 W/kg

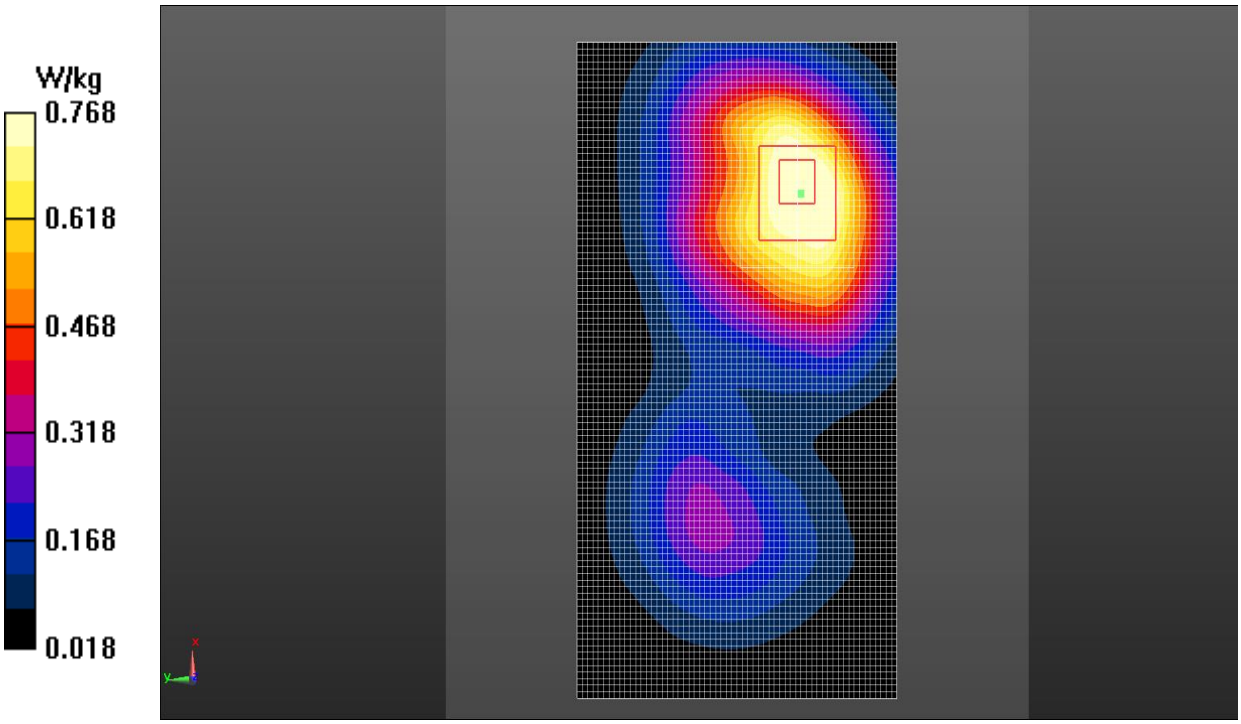

Fig.8 WCDMA1900 CH9400

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ANNEX J Accreditation Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L0570)

Telecommunication Technology Labs,

Academy of Telecommunication Research, MIIT

No.52, Huayuan North Road, Haidian District, Beijing, China

No.51, Xueyuan Road, Haidian District, Beijing, China

to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing and calibration.

The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.

Date of Issue: 2014-10-29

Date of Expiry: 2017-06-19

Date of Initial Accreditation: 1998-07-03

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

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