

DASY5 Validation Report for Head TSL

Date: 20.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 853

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.87$ S/m; $\epsilon_r = 37.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

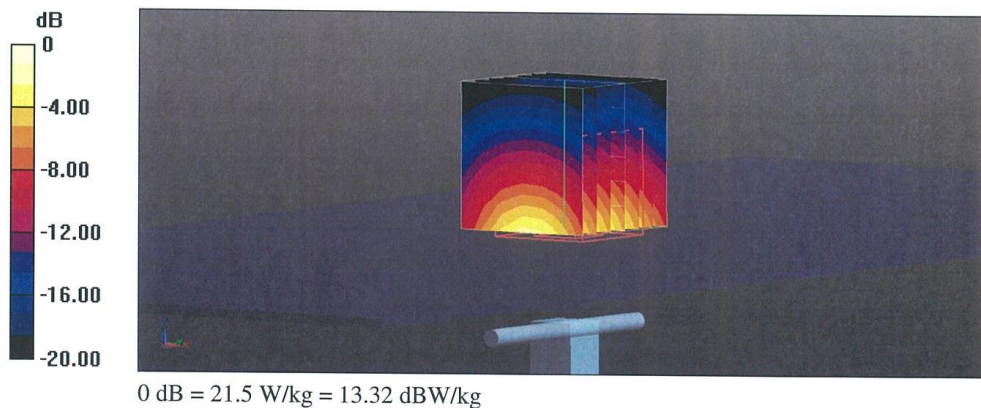
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 112.7 V/m; Power Drift = -0.00 dB

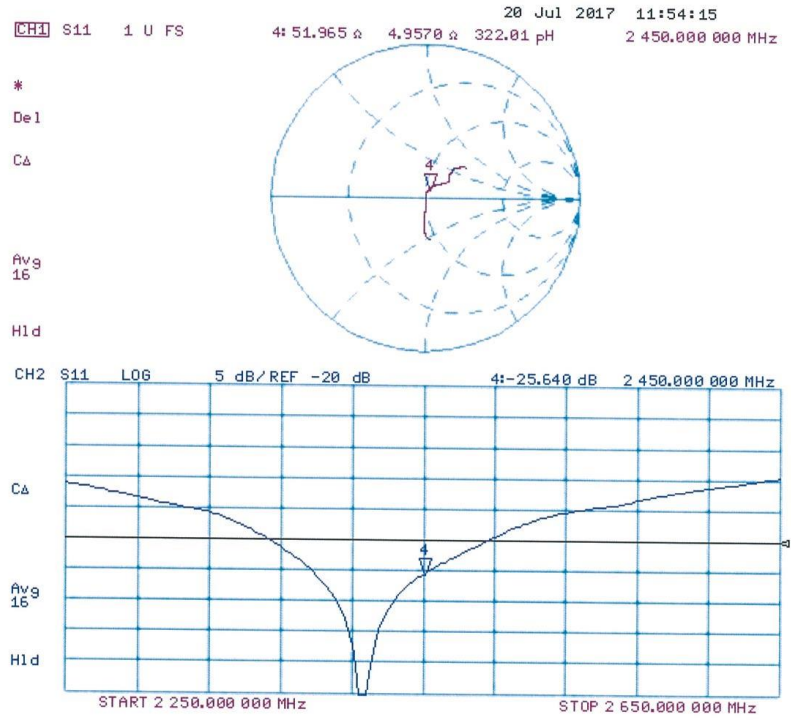
Peak SAR (extrapolated) = 27.0 W/kg

SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.26 W/kg

Maximum value of SAR (measured) = 21.5 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 21.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 853

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ S/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.1, 8.1, 8.1); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

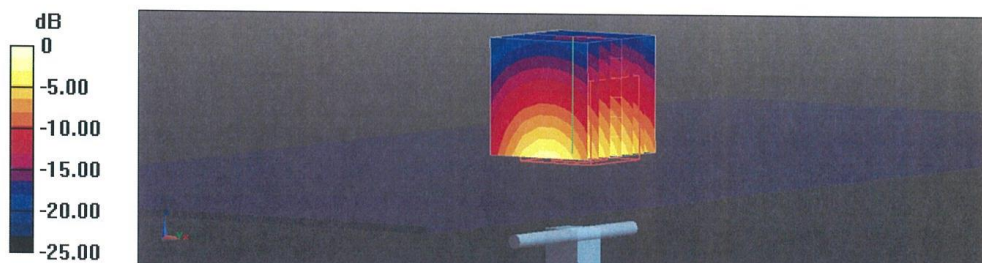
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.1 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 25.5 W/kg

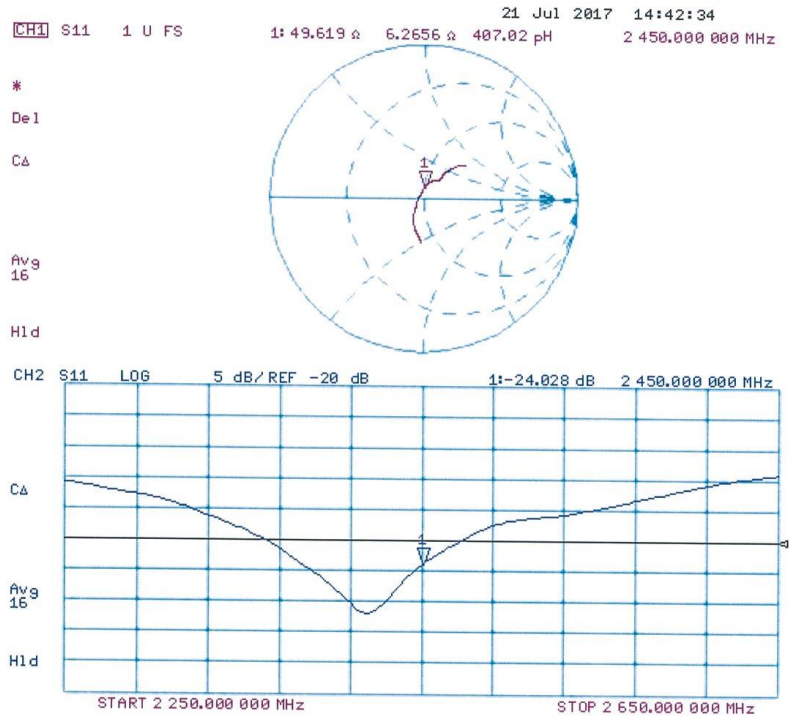
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.03 W/kg

Maximum value of SAR (measured) = 20.0 W/kg



0 dB = 20.0 W/kg = 13.01 dBW/kg

Impedance Measurement Plot for Body TSL



ANNEX I SPOT CHECK for 5026D

I.1 Conducted power of selected case

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

GSM 850MHz	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	32.68	32.70	32.71
GSM 1900MHz	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	29.89	30.02	30.06

Table I.1-2: The conducted power results for GPRS

GSM 850 GPRS (GMSK)	Measured Power (dBm)		
	251	190	128
2 Txslots	31.16	31.16	31.70
PCS1900 GPRS (GMSK)	Measured Power (dBm)		
	810	661	512
2 Txslots	28.33	28.49	28.45

Table I.1-3: The conducted Power for WCDMA

Item	band	FDDV result		
	ARFCN	4233 (846.6MHz)	4182 (836.4MHz)	4132 (826.4MHz)
WCDMA	\	22.82	22.93	22.84
Item	band	FDDII result		
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	\	22.50	22.85	22.95

Table I.1-5: The conducted Power for WLAN

Mode / data rate	Channel	Measured Power (dBm)
802.11b – 1Mbps	11	14.65
802.11b – 1Mbps	6	14.80
802.11b – 1Mbps	1	14.74

I.2 Measurement results

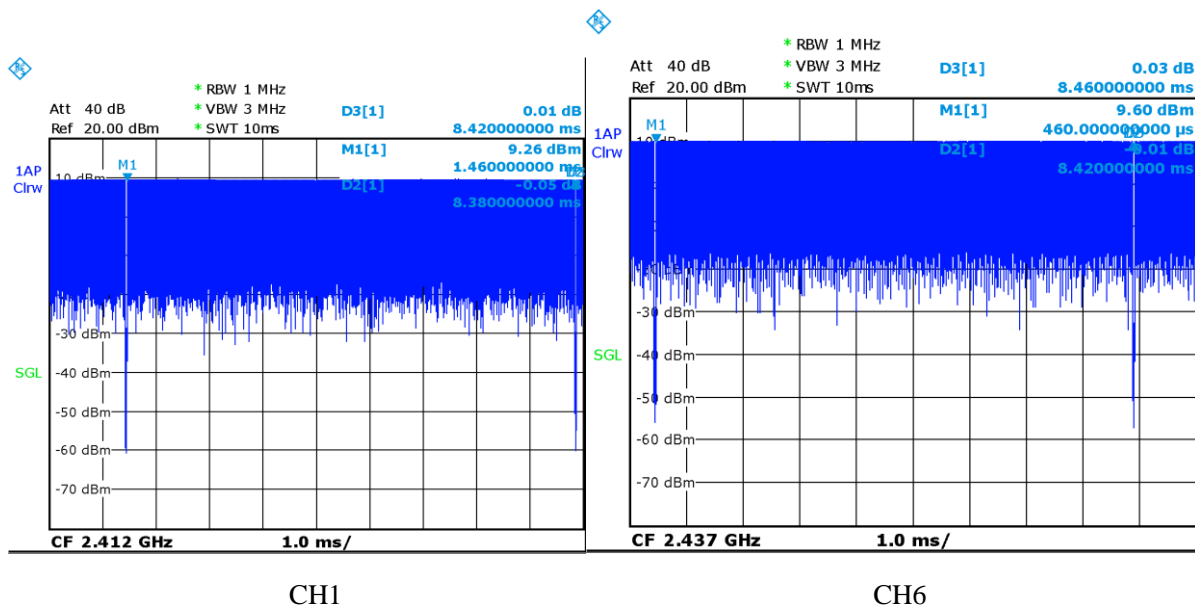
Test Band	Channel	Frequency	Tune-Up	Measured Power	Test Position	Measured 10g SAR	Measured 1g SAR	Reported 10g SAR	Reported 1g SAR	Power Drift	Figure
GSM850	CH251	848.8 MHz	34.5	32.68	Left Cheek	0.103	0.139	0.16	0.21	-0.05	Fig I.1
GSM850	CH251	848.8 MHz	32.5	31.16	Rear	0.18	0.329	0.25	0.45	-0.07	Fig I.2
PCS1900	CH512	1850.2 MHz	31	30.06	Right Cheek	0.049	0.081	0.06	0.10	0.02	Fig I.3
PCS1900	CH512	1850.2 MHz	29.5	28.45	Bottom edge	0.443	0.847	0.56	1.08	-0.07	Fig I.4
WCDMA1900-BII	CH9262	1852.4 MHz	24	22.95	Right Cheek	0.096	0.159	0.12	0.20	0.09	Fig I.5
WCDMA1900-BII	CH9262	1852.4 MHz	24	22.95	Bottom edge	0.481	0.897	0.61	1.14	-0.02	Fig I.6
WCDMA850-BV	CH4182	835.4 MHz	24.5	22.93	Left Cheek	0.121	0.164	0.17	0.24	0.03	Fig I.7
WCDMA850-BV	CH4233	846.6 MHz	24.5	22.82	Rear	0.15	0.273	0.22	0.40	-0.01	Fig I.8
WLAN2450	CH1	2412 MHz	15.5	14.74	Left Cheek	0.414	0.93	0.49	1.11	0.1	Fig I.9
WLAN2450	CH6	2437 MHz	15.5	14.74	Front	0.054	0.104	0.06	0.12	-0.03	Fig I.10

Table I.2-1: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g) (W/kg)	Scaled reported SAR (1g) (W/kg)
MHz	Ch.						
2412	1	Left	Touch	99.52%	100%	1.11	1.12

Table I.2-2: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g) (W/kg)	Scaled reported SAR (1g) (W/kg)
MHz	Ch.					
2437	6	Front	99.53%	100%	0.12	0.12



I.3 Reported SAR Comparison

Exposure Configuration	Technology Band	Reported SAR 1g (W/Kg): spot check	Reported SAR 1g (W/Kg): original
Head (Separation Distance 0mm)	GSM 850	0.21	0.19
	PCS 1900	0.10	0.11
	UMTS FDD 2	0.20	0.20
	UMTS FDD 5	0.24	0.21
	WLAN 2.4 GHz	1.11	1.27
Hotspot (Separation Distance 10mm)	GSM 850	0.45	0.31
	PCS 1900	1.08	0.93
	UMTS FDD 2	1.14	1.16
	UMTS FDD 5	0.40	0.28
	WLAN 2.4 GHz	0.12	0.13

Note: All the spot check results marked blue are larger than the original result. So it replace the original results and others are shared.

GSM850_CHCH251 Left Cheek

Date: 11/8/2017

Electronics: DAE4 Sn1331

Medium: Head 835 MHz

Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.918$ mho/m; $\epsilon_r = 42.24$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: GSM850 848.8 MHz Duty Cycle: 1: 8.3

Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.159 W/kg

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

Reference Value = 5.182 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.189 W/kg

SAR(1 g) = 0.139 W/kg; SAR(10 g) = 0.103 W/kg

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

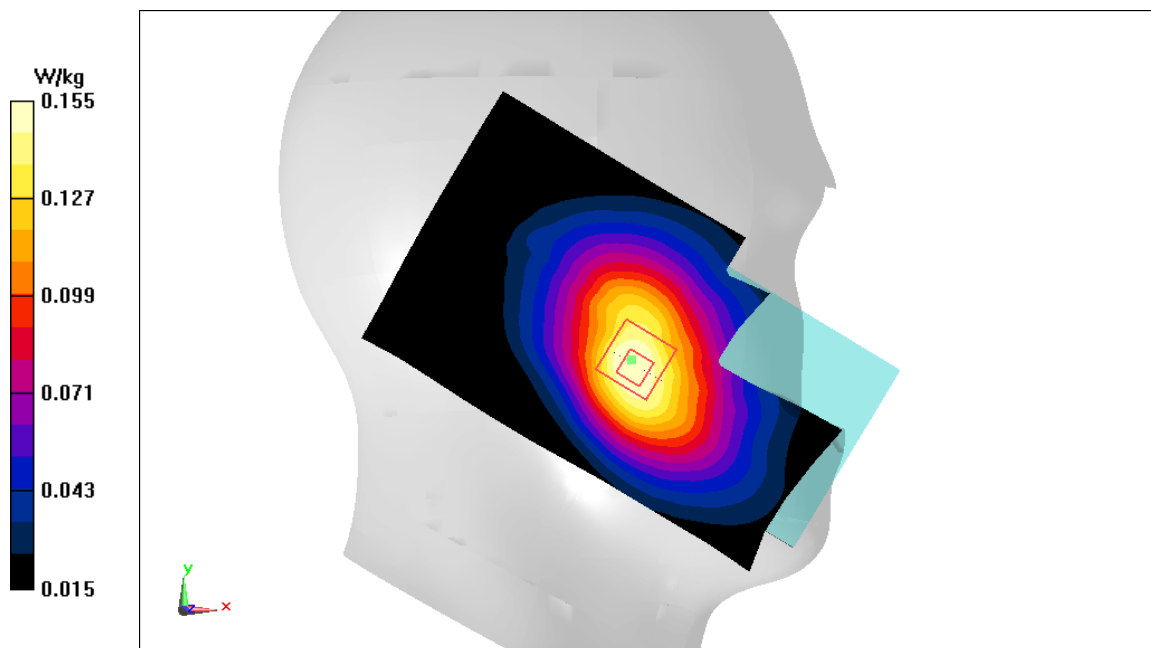


Fig I.1

GSM850_CHCH251 Rear

Date: 11/8/2017

Electronics: DAE4 Sn1331

Medium: Head 835 MHz

Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 54.33$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: GSM850 848.8 MHz Duty Cycle: 1: 4

Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.444 W/kg

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

Reference Value = 16.09 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.603 W/kg

SAR(1 g) = 0.329 W/kg; SAR(10 g) = 0.18 W/kg

Maximum value of SAR (measured) = 0.397 W/kg

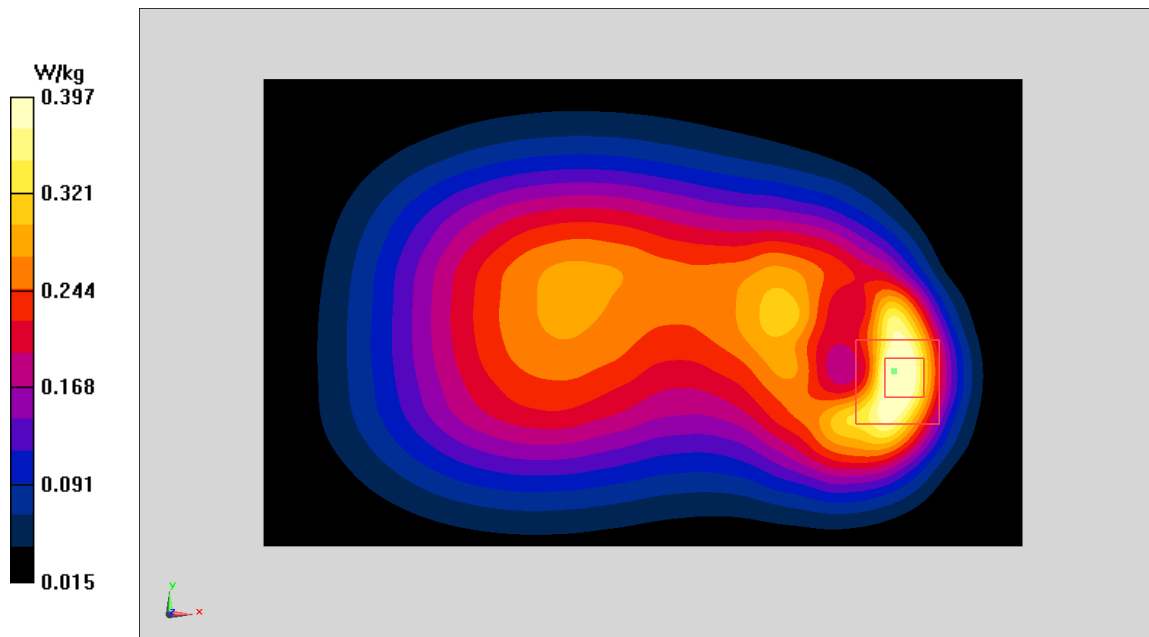


Fig I.2

PCS1900_CHCH512 Right Cheek

Date: 11/10/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.338$ mho/m; $\epsilon_r = 39.84$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: PCS1900 1850.2 MHz Duty Cycle: 1: 8.3

Probe: EX3DV4 – SN3846 ConvF(7.89,7.89,7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0995 W/kg

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

Reference Value = 2.506 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.128 W/kg

SAR(1 g) = 0.081 W/kg; SAR(10 g) = 0.049 W/kg

Maximum value of SAR (measured) = 0.0972 W/kg

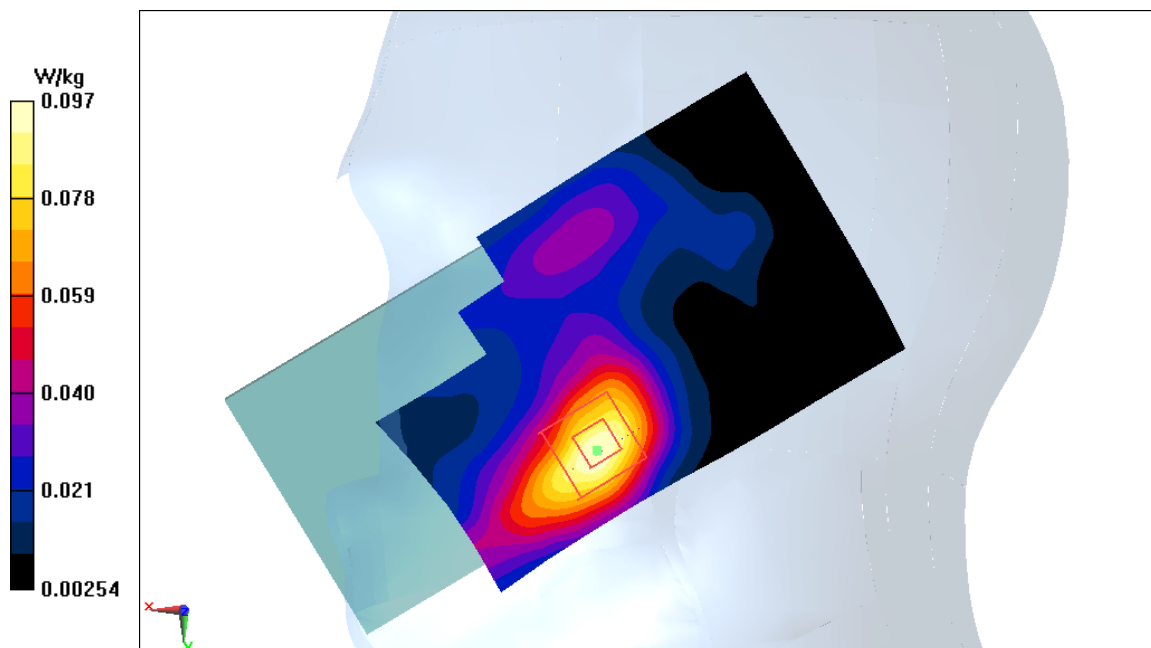


Fig I.3

PCS1900_CHCH512 Bottom edge

Date: 11/10/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.477$ mho/m; $\epsilon_r = 54.16$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: PCS1900 1850.2 MHz Duty Cycle: 1: 4

Probe: EX3DV4 – SN3846 ConvF(7.57,7.57,7.57)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.01 W/kg

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

Reference Value = 21.38 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.847 W/kg; SAR(10 g) = 0.443 W/kg

Maximum value of SAR (measured) = 1.04 W/kg

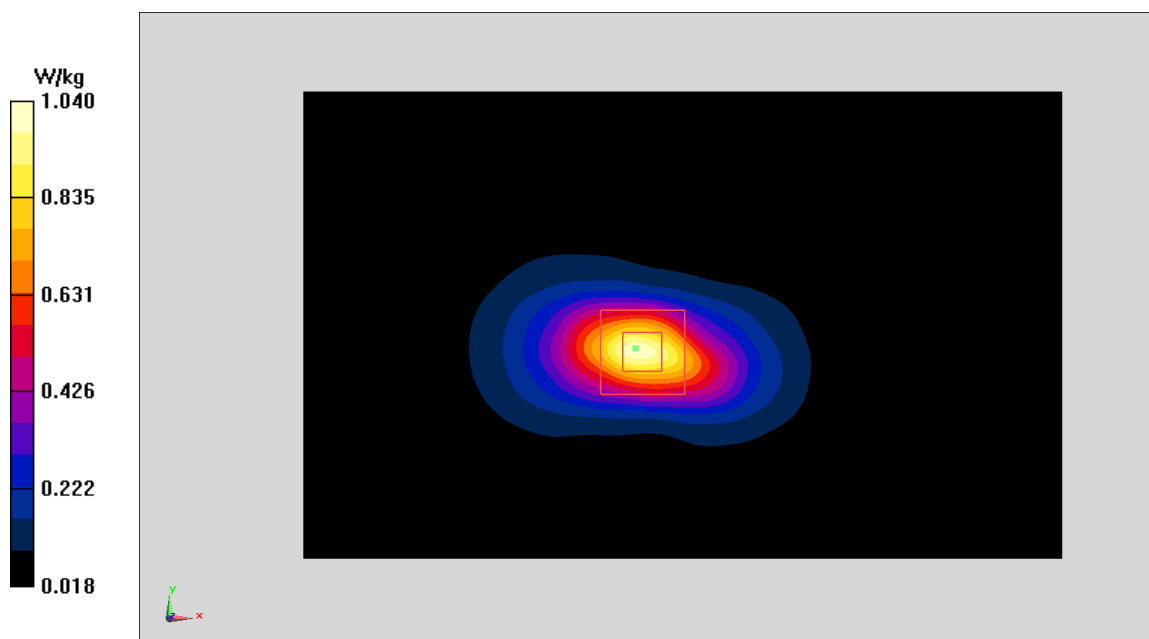


Fig I.4

WCDMA1900-BII_CHCH9262 Right Cheek

Date: 11/10/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.339$ mho/m; $\epsilon_r = 39.84$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA1900-BII 1852.4 MHz Duty Cycle: 1: 1

Probe: EX3DV4 – SN3846 ConvF(7.89,7.89,7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.193 W/kg

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

Reference Value = 4.068 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.25 W/kg

SAR(1 g) = 0.159 W/kg; SAR(10 g) = 0.096 W/kg

Maximum value of SAR (measured) = 0.188 W/kg

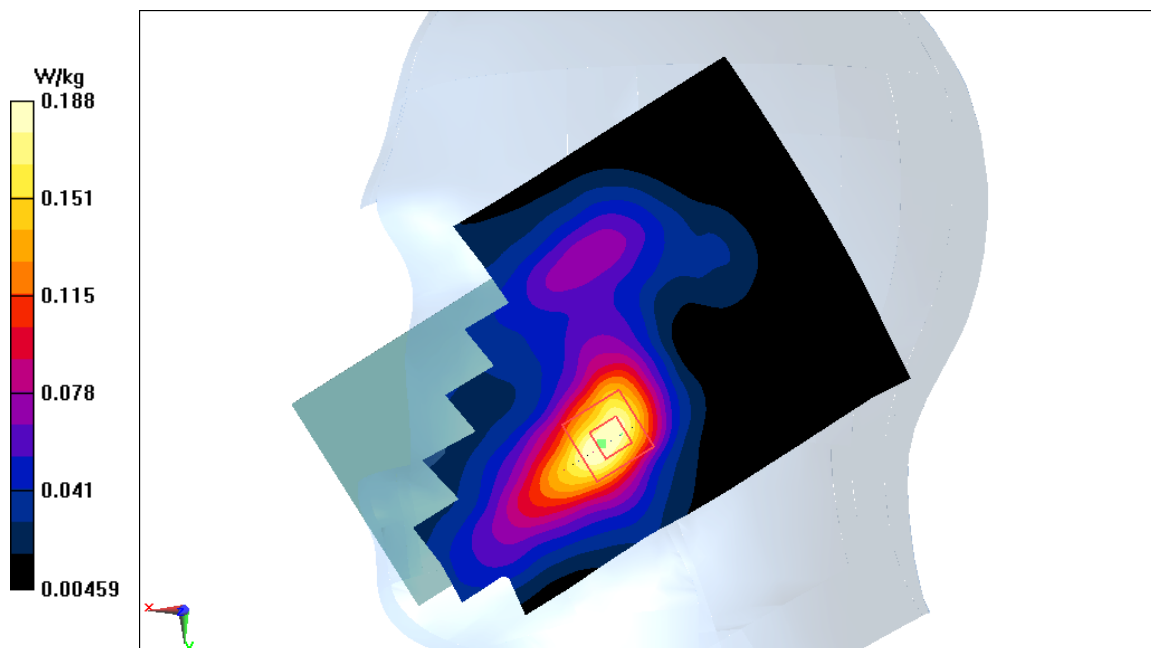


Fig I.5

WCDMA1900-BII_CHCH9262 Bottom edge

Date: 11/10/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.479$ mho/m; $\epsilon_r = 54.16$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA1900-BII 1852.4 MHz Duty Cycle: 1: 1

Probe: EX3DV4 – SN3846 ConvF(7.57,7.57,7.57)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.07 W/kg

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

Reference Value = 25.73 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.5 W/kg

SAR(1 g) = 0.897 W/kg; SAR(10 g) = 0.481 W/kg

Maximum value of SAR (measured) = 1.11 W/kg

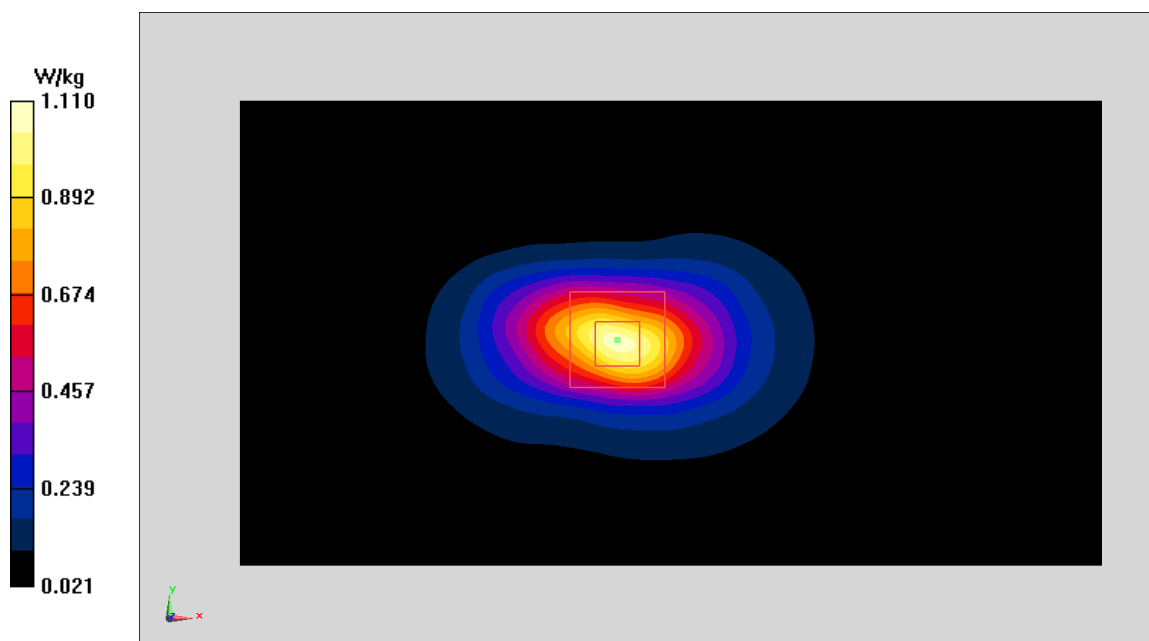


Fig I.6

WCDMA850-BV_CHCH4182 Left Cheek

Date: 11/8/2017

Electronics: DAE4 Sn1331

Medium: Head 835 MHz

Medium parameters used: $f = 835.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.26$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA850-BV 835.4 MHz Duty Cycle: 1: 1

Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.187 W/kg

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

Reference Value = 4.354 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.222 W/kg

SAR(1 g) = 0.164 W/kg; SAR(10 g) = 0.121 W/kg

Maximum value of SAR (measured) = 0.183 W/kg

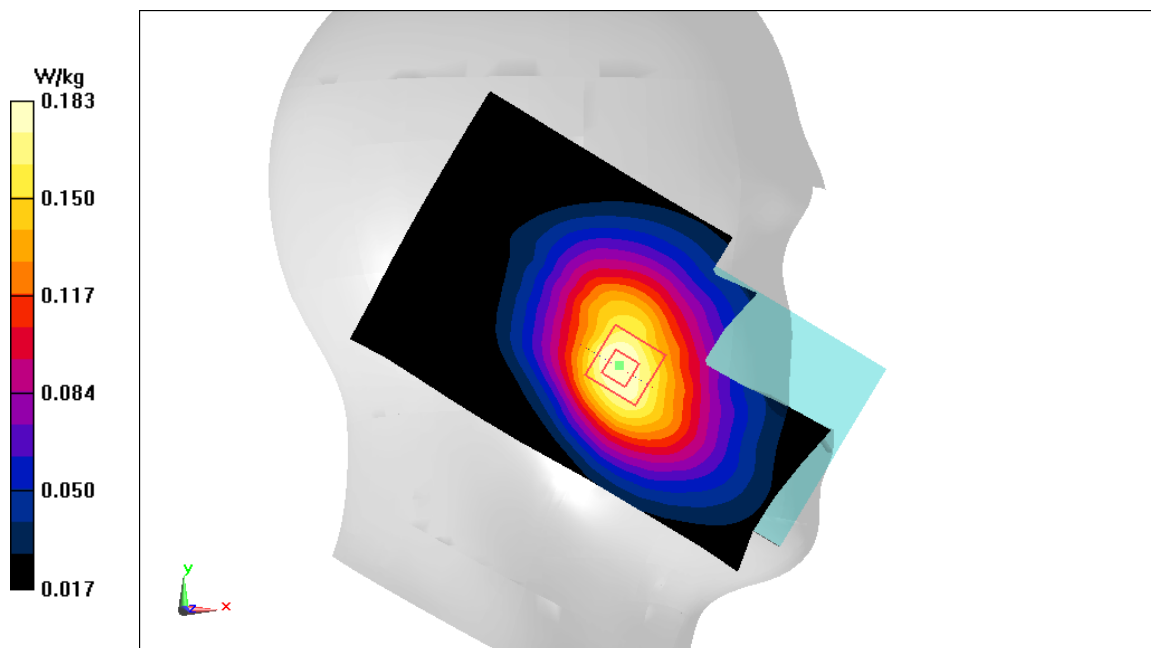


Fig I.7

WCDMA850-BV_CHCH4233 Rear

Date: 11/8/2017

Electronics: DAE4 Sn1331

Medium: Head 835 MHz

Medium parameters used: $f = 846.6$ MHz; $\sigma = 0.978$ mho/m; $\epsilon_r = 54.34$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA850-BV 846.6 MHz Duty Cycle: 1: 1

Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.364 W/kg

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

Reference Value = 14.82 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.501 W/kg

SAR(1 g) = 0.273 W/kg; SAR(10 g) = 0.15 W/kg

Maximum value of SAR (measured) = 0.335 W/kg

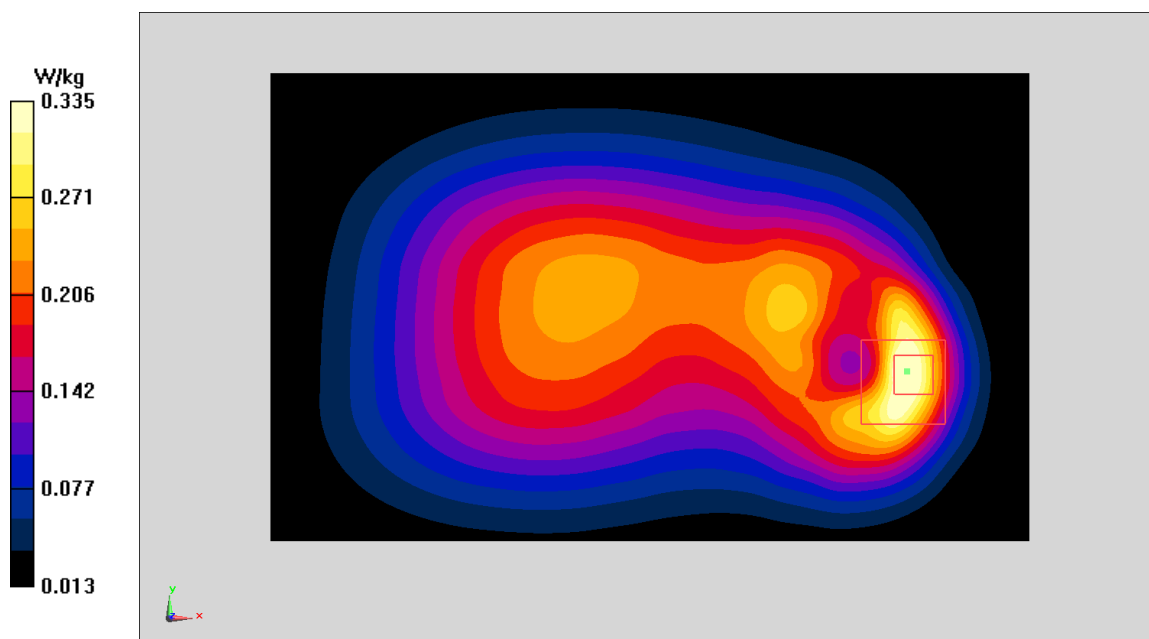


Fig L.8

WLAN2450_CHCH1 Left Cheek

Date: 11/11/2017

Electronics: DAE4 Sn1331

Medium: Head 2450 MHz

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.731$ mho/m; $\epsilon_r = 39.3$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WLAN2450 2412 MHz Duty Cycle: 1: 1

Probe: EX3DV4 – SN3846 ConvF(7.22,7.22,7.22)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.39 W/kg

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

Reference Value = 11.64 V/m; Power Drift = 0.1 dB

Peak SAR (extrapolated) = 2.12 W/kg

SAR(1 g) = 0.93 W/kg; SAR(10 g) = 0.414 W/kg

Maximum value of SAR (measured) = 1.23 W/kg

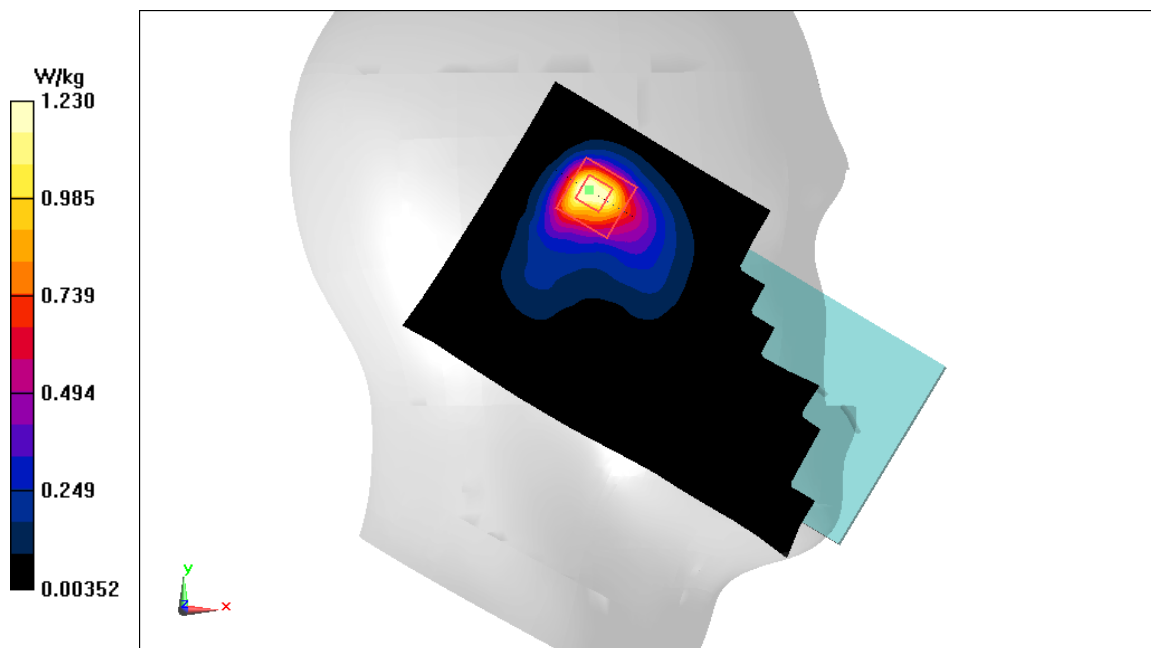


Fig I.9

WLAN2450_CHCH6 Front

Date: 11/11/2017

Electronics: DAE4 Sn1331

Medium: Head 2450 MHz

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.955$ mho/m; $\epsilon_r = 52.85$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WLAN2450 2437 MHz Duty Cycle: 1: 1

Probe: EX3DV4 – SN3846 ConvF(7.31,7.31,7.31)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.137 W/kg

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

Reference Value = 5.013 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.195 W/kg

SAR(1 g) = 0.104 W/kg; SAR(10 g) = 0.054 W/kg

Maximum value of SAR (measured) = 0.129 W/kg

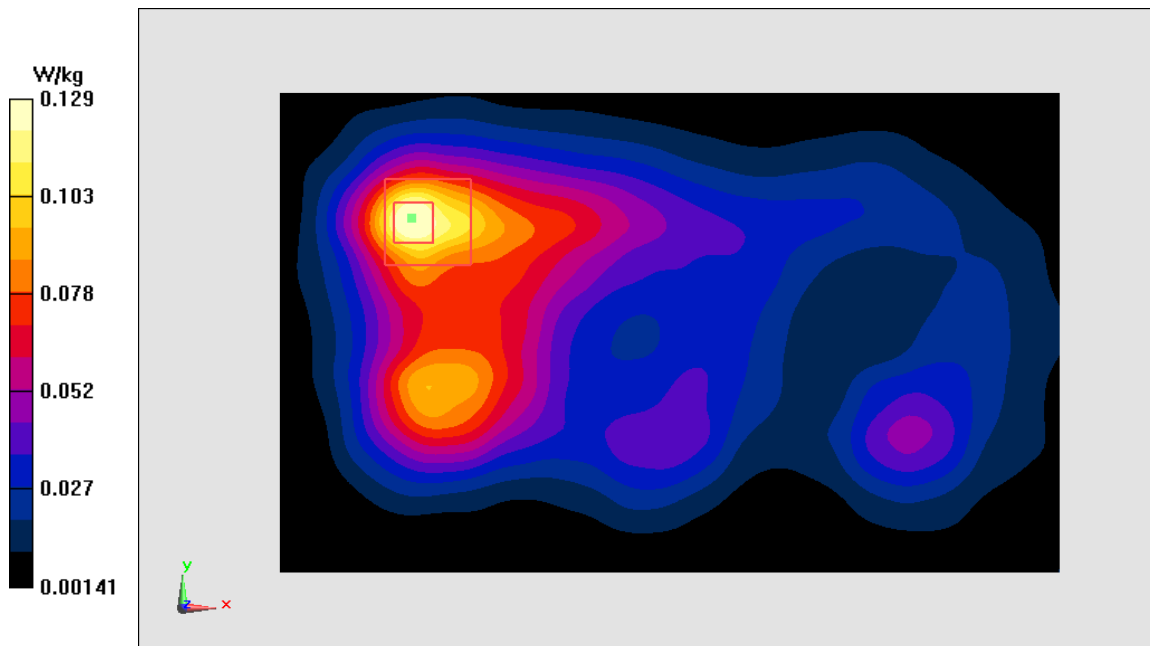


Fig I.10

ANNEX J Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT

Beijing
China

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2016-09-29 through 2017-09-30

Effective Dates




For the National Voluntary Laboratory Accreditation Program