



Measurement Conditions

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

DASY Version	DASY52	52.8.8.1222
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.1 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.7 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.34 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	25.3 mW /g ± 20.4 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.4 ± 6 %	1.99 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	52.0 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	6.19 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	24.5 mW /g ± 20.4 % (k=2)

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.7Ω+ 5.02jΩ	
Return Loss	- 26.0dB	

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.7Ω+ 5.68jΩ	
Return Loss	- 24.6dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.043 ns	

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

	Manufactured by	SPEAG
- 1		

Date: 03.11.2014





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DASY5 Validation Report for Head TSL

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 873

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; $\sigma = 1.842$ S/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3617; ConvF(7.19, 7.19, 7.19); Calibrated: 2014-08-28;

• Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1331; Calibrated: 2014-01-23

Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (8x7x7)/Cube 0: Measurement grid:

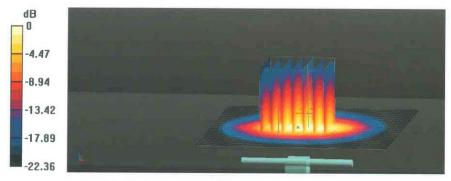
dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.3 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 27.3 W/kg

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.34 W/kg

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

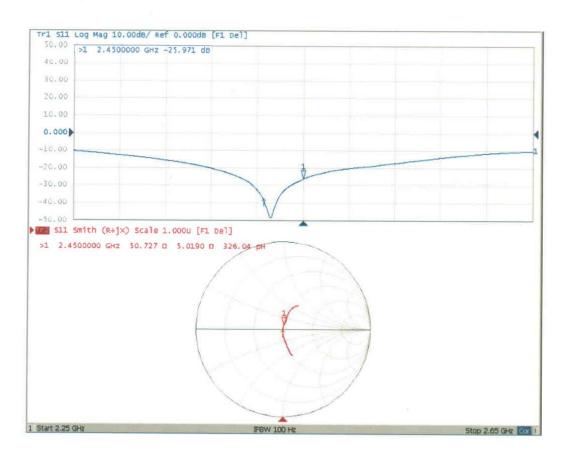


0 dB = 20.3 W/kg = 13.07 dBW/kg





Impedance Measurement Plot for Head TSL







DASY5 Validation Report for Body TSL

Date: 02.11.2014

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 873

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; σ = 1.991 S/m; ϵ_r = 51.37; ρ = 1000 kg/m³

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(7.31, 7.31, 7.31); Calibrated: 2014-08-28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (8x7x7)/Cube 0: Measurement grid:

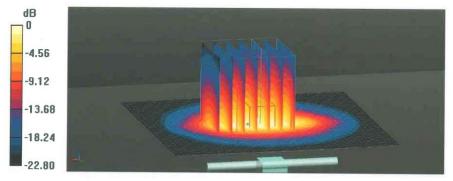
dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.6 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 27.1 W/kg

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.19 W/kg

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

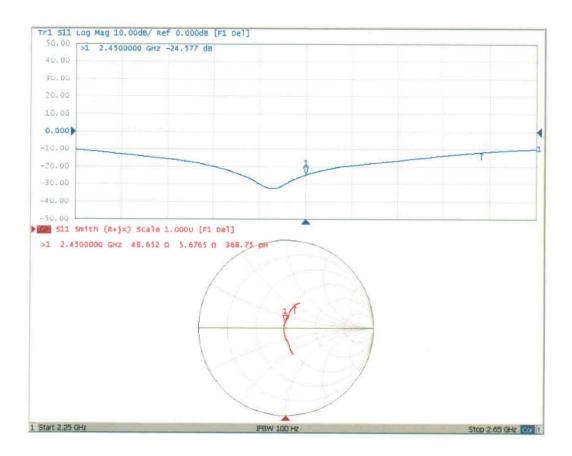


0 dB = 20.3 W/kg = 13.07 dBW/kg





Impedance Measurement Plot for Body TSL





ANNEX I SPOT CHECK TEST

As the test lab for 4023A from TCL Communication Ltd., we, CTTL Shenzhen, 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	014257000100156	PIO	v7G1D

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

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)
	32.93	1	1
CCM	Conducted Power (dBm)		
GSM	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
1900MHz	29.75	1	1

Table I.2: The conducted power results for GPRS

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GSM 850	Measured Power (dBm)		
GPRS (GMSK)	251 190 128		
4 Txslots	26.99	/	/
PCS1900	Measured Power (dBm)		
GPRS (GMSK)	810	661	512
4 Txslots	24.31	1	1

Table I.3: The conducted power results for WCDMA

Item	band		FDD V result	
item	ARFCN	4233 (846.6MHz)	4182 (836.4MHz)	4132 (826.4MHz)
WCDMA	١	23.44	1	1
ltom	band		FDD II result	
Item	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	1	23.42	1	1



I.3 Measurement results

SAR Values (GSM 850 MHz Band - Head)

Freque	Frequency		requency		Test	Pattory Type	SAR(1g) (W/kg)	
MHz	Ch.	Side	Position	Battery Type	Original data	Spot check data		
848.8	251	Left	Touch	CAB31P0000C1	0.793	0.766		

SAR Values (GSM 850 MHz Band - Body)

Freque	ency		Test	Spacing		SAR(1	g) (W/kg)
MHz	Ch.	Mode/Band	Position		Battery Type	Original data	Spot check data
848.8	251	GPRS	Rear	10	CAB31P0000C1	0.924	0.852

SAR Values (PCS 1900 MHz Band - Head)

Frequency		Cido	Test	Pottomy Type	SAR(1g) (W/kg)	
MHz	Ch.	Side	Position	Battery Type	Original data	Spot check data
1909.8	810	Left	Touch	CAB31P0000C1	0.543	0.342

SAR Values (PCS 1900 MHz Band - Body)

Freque	ency	Toot		Specina		SAR(1g) (W/kg)	
MHz	Ch.	Mode/Band	Test Position	Spacing (mm)	Battery Type	Original data	Spot check data
1909.8	810	GPRS	Front	10	CAB31P0000C1	0.572	0.489

SAR Values (WCDMA 850 MHz Band - Head)

Frequency		Side Test		Pattory Type	SAR(1g) (W/kg)	
MHz	Ch.	Side	Position	Battery Type	Original data	Spot check data
846.6	4233	Left	Touch	CAB31P0000C1	0.720	0.549

SAR Values (WCDMA 850 MHz Band - Body)

Frequ	iency	Test	Spacing	Pattory Type	SAR(1	lg) (W/kg)
MHz	Ch.	Position	(mm)	Battery Type	Original data	Spot check data
846.6	4233	Rear	10	CAB31P0000C1	0.967	0.856

SAR Values (WCDMA 1900 MHz Band - Head)

Frequency		Side	Test	Pottom, Tuno	SAR(1g) (W/kg)	
MHz	Ch.	Side	Position	Battery Type	Original data	Spot check data
1907.6	9538	Right	Touch	CAB31P0000C1	0.864	0.643

SAR Values (WCDMA 1900 MHz Band - Body)

Frequ	ency	Test	Spacing	Pottomy Type	SAR(1	lg) (W/kg)
MHz	Ch.	Position	(mm)	Battery Type	Original data	Spot check data
1907.6	9538	Rear	10	CAB31P0000C1	1.10	0.904



I.4 Reported SAR Comparison

Evaceure		Reported SAR	Reported SAR
Exposure Configuration	Technology Band	1g (W/Kg):	1g (W/Kg):
Comiguration		original	spot check
Lload	GSM 850	0.90	0.83
Head (Separation Distance	PCS 1900	0.62	0.39
(Separation Distance 0mm)	UMTS FDD 2	0.92	0.62
Offiliti)	UMTS FDD 5	0.99	0.73
Daduusana	GSM 850	1.09	0.96
Body-worn	PCS 1900	0.67	0.57
(Separation Distance	UMTS FDD 2	1.23	0.97
10mm)	UMTS FDD 5	1.27	1.03



850 Left Cheek High

Date/Time: 2014-12-25 Electronics: DAE4 Sn786 Medium: Head 900 MHz

Medium parameters used (interpolated): f = 848.8 MHz; $\sigma = 0.937 \text{ S/m}$; $\varepsilon_r = 41.723$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:22.7°C Liquid Temperature:22.2°C

Communication System: GSM Frequency: 848.8 MHz Duty Cycle: 1:8.3 Probe: ES3DV3 - SN3151 ConvF(6.04, 6.04, 6.04); Calibrated: 2014-9-1

Left Cheek High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.833 W/kg

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

Reference Value = 13.922 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.939 W/kg

SAR(1 g) = 0.766 W/kg; SAR(10 g) = 0.584 W/kg

Maximum value of SAR (measured) = 0.804 W/kg

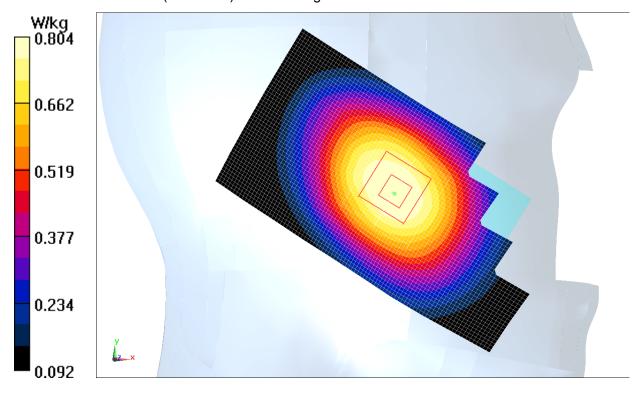


Fig.1 850MHz CH251



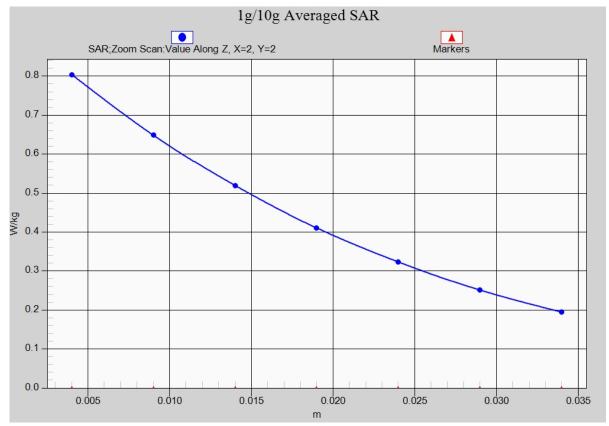


Fig. 1-1 Z-Scan at power reference point (850 MHz CH251)



850 Body Rear High

Date/Time: 2014-12-25 Electronics: DAE4 Sn786 Medium: Body 900 MHz

Medium parameters used (interpolated): f = 848.8 MHz; $\sigma = 0.987 \text{ S/m}$; $\varepsilon_r = 52.246$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:22.9°C Liquid Temperature:22.4°C

Communication System: 4 slot GPRS Frequency: 848.8 MHz Duty Cycle: 1:2.08018

Probe: ES3DV3 - SN3151 ConvF(6.14, 6.14, 6.14); Calibrated: 2014-9-1

Rear side High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.891 W/kg

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

Reference Value = 28.134 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.852 W/kg; SAR(10 g) = 0.620 W/kg

Maximum value of SAR (measured) = 0.902 W/kg

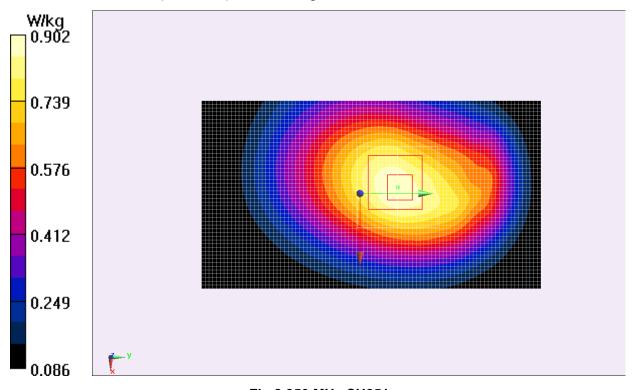


Fig.2 850 MHz CH251



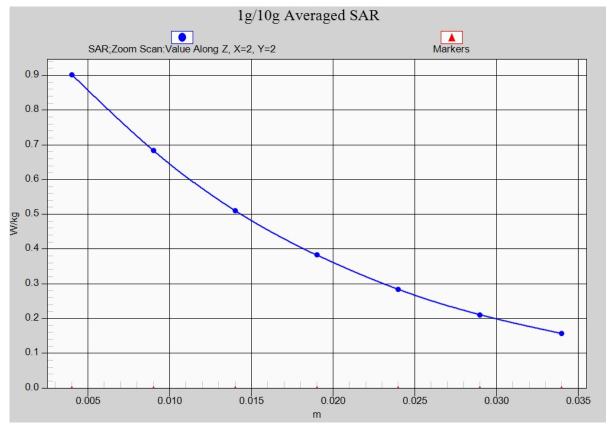


Fig. 2-1 Z-Scan at power reference point (850 MHz CH251)



GSM1900 Right Cheek High

Date/Time: 2014-12-25 Electronics: DAE4 Sn786 Medium: Head 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.45 S/m; ε_r = 41.032; ρ = 1000 kg/m³

Ambient Temperature:21.7°C Liquid Temperature:21.2°C

Communication System: GSM Frequency: 1910 MHz Duty Cycle: 1:8.3 Probe: ES3DV3 - SN3151 ConvF(5.16, 5.16, 5.16); Calibrated: 2014-9-1

Right Cheek High /Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.391 W/kg

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

Reference Value = 9.889 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.575 W/kg

SAR(1 g) = 0.342 W/kg; SAR(10 g) = 0.191 W/kg

Maximum value of SAR (measured) = 0.377 W/kg

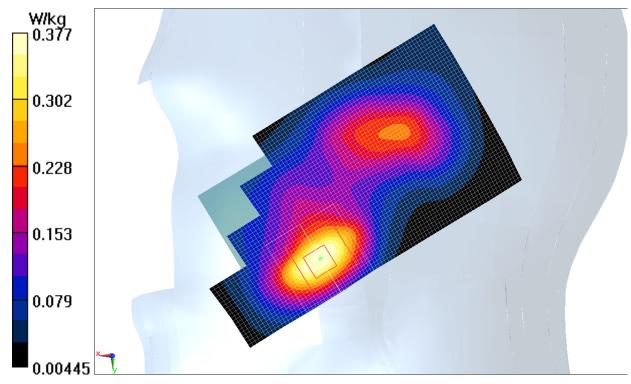


Fig.3 1900 MHz CH810



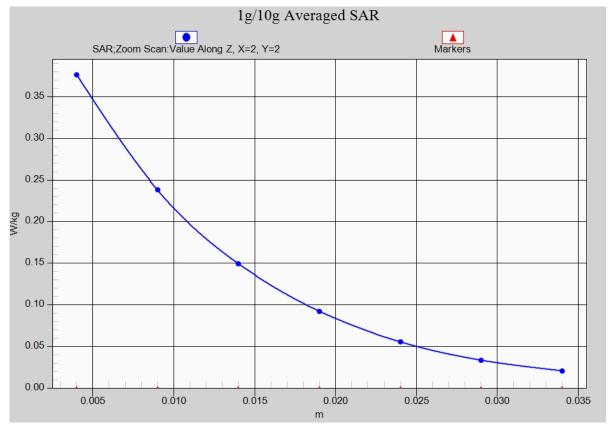


Fig. 3-1 Z-Scan at power reference point (1900 MHz CH810)



GSM1900 Body Rear High

Date/Time: 2014-12-26 Electronics: DAE4 Sn786 Medium: Body 1900MHz

Medium parameters used: f = 1910 MHz; σ = 1.557 S/m; ϵ_r = 51.433; ρ = 1000 kg/m³

Ambient Temperature:21.5°C Liquid Temperature:21.0°C

Communication System: 4 slot GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2.08018

Probe: ES3DV3 - SN3151 ConvF(4.77, 4.77, 4.77); Calibrated: 2014-9-1

Rear side High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 0.542 W/kg

Rear side High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 8.461 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.789 W/kg

SAR(1 g) = 0.489 W/kg; SAR(10 g) = 0.292 W/kg

Maximum value of SAR (measured) = 0.528 W/kg

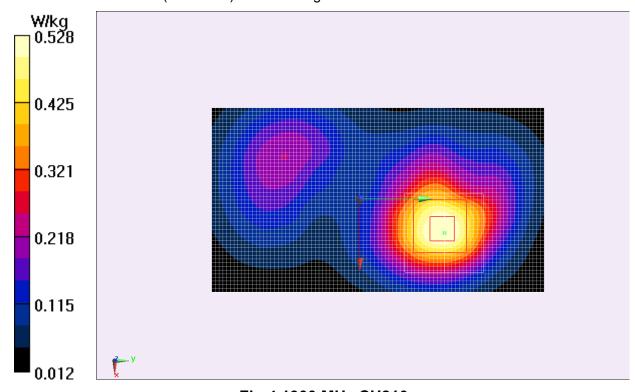


Fig.4 1900 MHz CH810



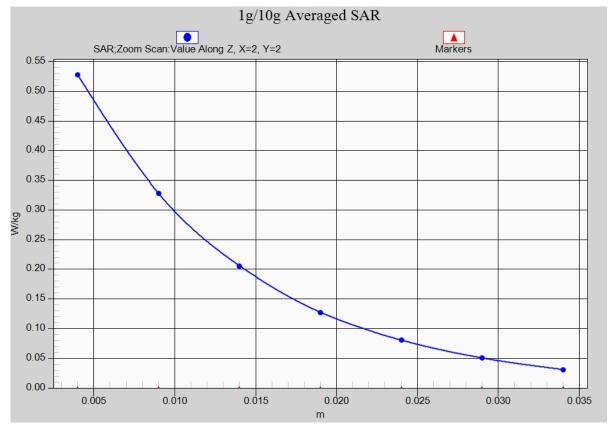


Fig.4-1 Z-Scan at power reference point (1900 MHz CH810)



WCDMA 850 Left Cheek High

Date/Time: 2014-12-25 Electronics: DAE4 Sn786 Medium: Head 900 MHz

Medium parameters used (interpolated): f = 846.6 MHz; $\sigma = 0.937 \text{S/m}$; $\varepsilon_r = 41.741$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:21.6°C Liquid Temperature:21.1°C

Communication System: WCDMA Frequency: 846.6 MHz Duty Cycle: 1:1 Probe: ES3DV3 - SN3151 ConvF(6.04, 6.04, 6.04); Calibrated: 2014-9-1

Left Cheek High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.547 W/kg

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

Reference Value = 9.863 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.695 W/kg

SAR(1 g) = 0.549 W/kg; SAR(10 g) = 0.401 W/kg

Maximum value of SAR (measured) = 0.579 W/kg

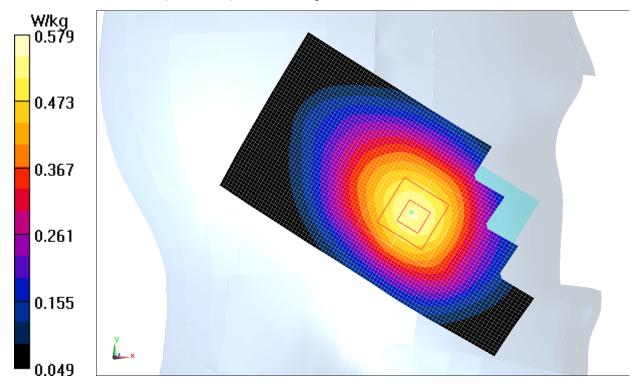


Fig.5 WCDMA 850 CH4233



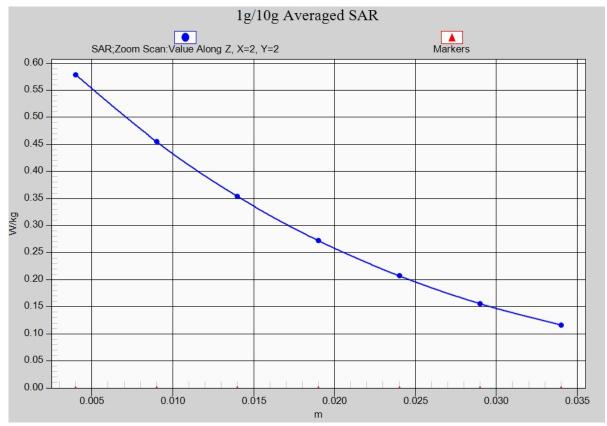


Fig. 5-1 Z-Scan at power reference point (WCDMA 850 CH4233)



WCDMA 850 Body Rear High

Date/Time: 2014-12-25 Electronics: DAE4 Sn786 Medium: Body 900 MHz

Medium parameters used (interpolated): f = 846.6 MHz; $\sigma = 0.996 \text{ S/m}$; $\varepsilon_r = 52.245$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:21.9°C Liquid Temperature:21.4°C

Communication System: WCDMA Frequency: 846.6 MHz Duty Cycle: 1:1 Probe: ES3DV3 - SN3151 ConvF(6.14, 6.14, 6.14); Calibrated: 2014-9-1

Rear side High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.899 W/kg

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

Reference Value = 28.262 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.856 W/kg; SAR(10 g) = 0.618 W/kg

Maximum value of SAR (measured) = 0.902 W/kg

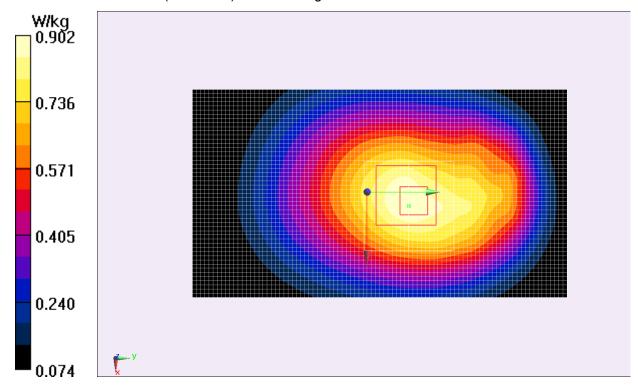


Fig.6 WCDMA 850 CH4233



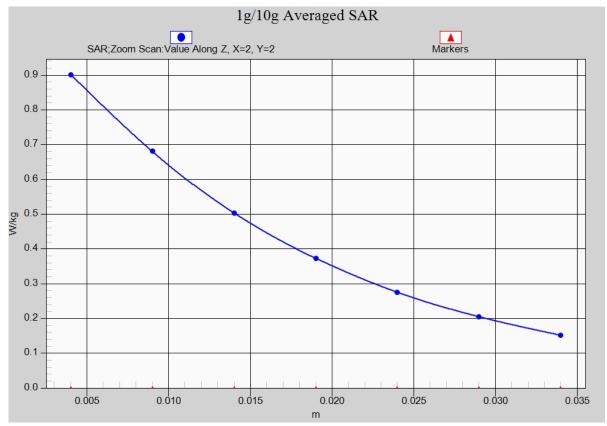


Fig. 6-1 Z-Scan at power reference point (WCDMA850 CH4233)



WCDMA 1900 Right Cheek High

Date/Time: 2014-12-25 Electronics: DAE4 Sn786 Medium: Head 1900

Medium parameters used: f = 1908 MHz; σ = 1.452 S/m; ε_r = 41.035; ρ = 1000 kg/m³

Ambient Temperature:21.8°C Liquid Temperature:21.3°C

Communication System: WCDMA Frequency: 1908 MHz Duty Cycle: 1:1 Probe: ES3DV3 - SN3151 ConvF(5.16, 5.16, 5.16); Calibrated: 2014-9-1

Right Cheek High /Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.718 W/kg

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

Reference Value = 12.907 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.643 W/kg; SAR(10 g) = 0.376 W/kg

Maximum value of SAR (measured) = 0.688 W/kg

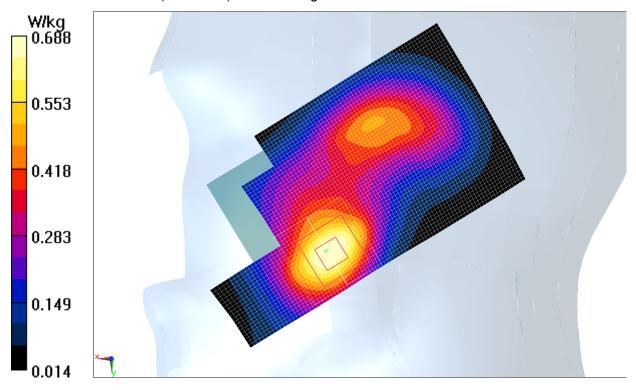


Fig.7 WCDMA1900 CH9538



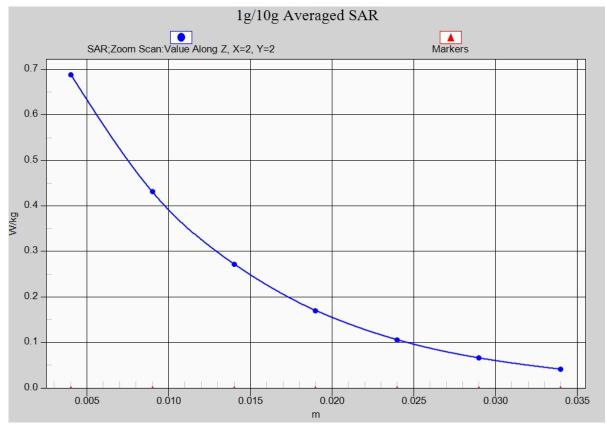


Fig. 7-1 Z-Scan at power reference point (WCDMA1900 CH9538)



WCDMA 1900 Body Rear High

Date/Time: 2014-12-26 Electronics: DAE4 Sn786 Medium: Body 1900MHz

Medium parameters used: f = 1908 MHz; σ = 1.557 S/m; ε_r = 51. 431; ρ = 1000 kg/m³

Ambient Temperature:21.5°C Liquid Temperature:21.0°C

Communication System: WCDMA Frequency: 1908 MHz Duty Cycle: 1:1 Probe: ES3DV3 - SN3151 ConvF(4.77, 4.77, 4.77); Calibrated: 2014-9-1

Rear side Middle High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.02 W/kg

Rear side Middle High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm,

dz=5mm

Reference Value = 11.133 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.904 W/kg; SAR(10 g) = 0.540 W/kg Maximum value of SAR (measured) = 0.974 W/kg

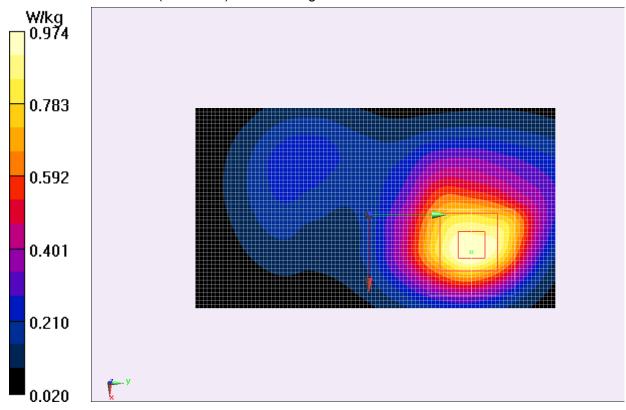


Fig.8 WCDMA1900 CH9538



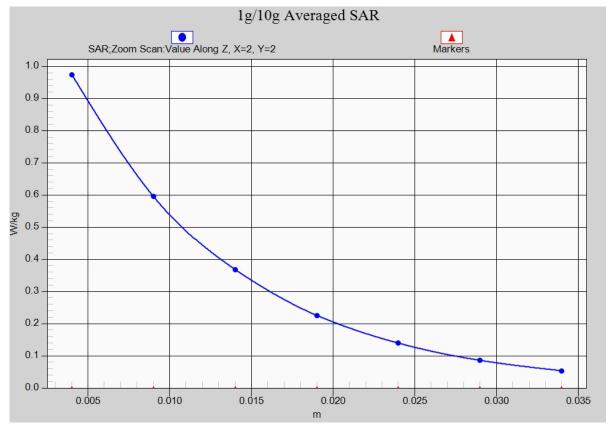


Fig. 8-1 Z-Scan at power reference point (WCDMA1900 CH9538)