

No. I15N01419-SAR Page 144 of 179

DASY5 Validation Report for Head TSL

Date: 28.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

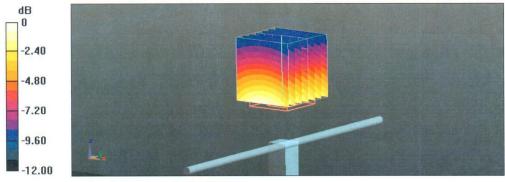
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1017

Communication System: UID 0 - CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ϵ_r = 42.2; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.37, 6.37, 6.37); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 53.72 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 3.14 W/kg SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.39 W/kg Maximum value of SAR (measured) = 2.47 W/kg



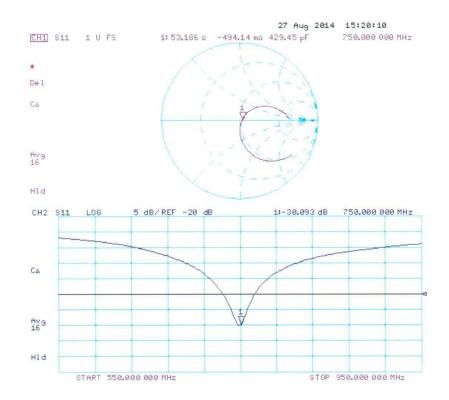
0 dB = 2.47 W/kg = 3.93 dBW/kg

Certificate No: D750V3-1017_Aug14

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Impedance Measurement Plot for Head TSL



Certificate No: D750V3-1017_Aug14

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DASY5 Validation Report for Body TSL

Date: 27.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

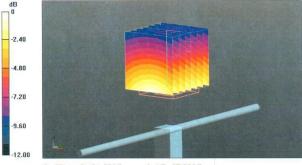
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1017

Communication System: UID 0 - CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ϵ_r = 55.4; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.13, 6.13, 6.13); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 53.10 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 3.29 W/kg SAR(1 g) = 2.24 W/kg; SAR(10 g) = 1.49 W/kg Maximum value of SAR (measured) = 2.61 W/kg



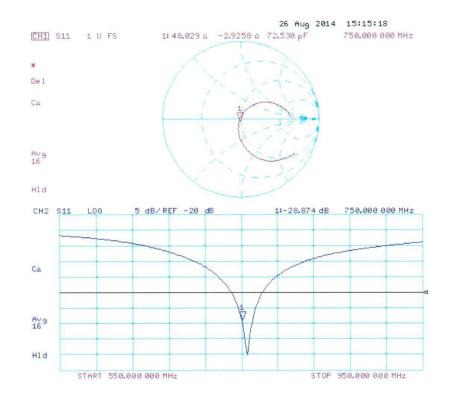
0 dB = 2.61 W/kg = 4.17 dBW/kg

Certificate No: D750V3-1017_Aug14

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Impedance Measurement Plot for Body TSL



Certificate No: D750V3-1017_Aug14

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835 MHz Dipole Calibration Certificate

	CALIBRA	TION LABORATORY	C-MRA
Add: No.51 Xueyu Tel: +86-10-62304 E-mail: cttl@china	633-2079 Fax: +	trict, Beijing, 100191, China 86-10-62304633-2504 /www.chinattl.cn	CALIBRATIO No. L0570
Client CTT	L(South Branc	h) Certificate No: Z1	5-97173
CALIBRATION C	ERTIFICAT	E	
Object	D835V	2 - SN: 4d057	
Calibration Procedure(s)	ED 744	0.000.04	
		-2-003-01 tion Procedures for dipole validation kits	
Calibration date:		r 22, 2015	
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bages and are part of the ca All calibrations have beer numidity<70%. Calibration Equipment used	ertificate.	the closed laboratory facility: environment	
Primary Standards Power Meter NRP2	ertificate.	the closed laboratory facility: environment	temperature(22±3) [°] C an
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91	ertificate. a conducted in the d (M&TE critical for ID # 101919 101547	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256)	temperature(22±3) [°] C an Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4	ertificate. a conducted in t d (M&TE critical for ID # 101919 101547 SN 3617	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15)	temperature(22±3) [°] C an Scheduled Calibration Jun-16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91	ertificate. a conducted in the d (M&TE critical for ID # 101919 101547	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256)	temperature(22±3) [°] C an Scheduled Calibration Jun-16 Jun-16
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pages and are part of the ca All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	ertificate. a conducted in a d (M&TE critical for ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728)	temperature(22±3)°C and Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ertificate. a conducted in the d (M&TE critical for ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673 Name	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728) Function	temperature(22±3)℃ and Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16 Feb-16

Certificate No: Z15-97173

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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

Certificate No: Z15-97173

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Measurement Conditions

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

DASY52	52.8.8.1222
Advanced Extrapolation	
Triple Flat Phantom 5.1C	
15 mm	with Spacer
dx, dy, dz = 5 mm	
835 MHz ± 1 MHz	
	Advanced Extrapolation Triple Flat Phantom 5.1C 15 mm dx, dy, dz = 5 mm

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.2 ± 6 %	0.91 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	2.31 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.22 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.51 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.03 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	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.1 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.34 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.44 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.54 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.20 mW /g ± 20.4 % (k=2)

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.2Ω- 3.12jΩ	
Return Loss	- 29.8dB	

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.1Ω- 5.38jΩ	
Return Loss	- 24.7dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.500 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

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DASY5 Validation Report for Head TSL

Date: 10.22.2015

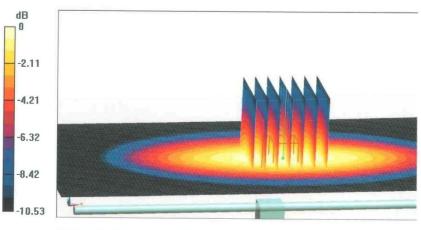
Test Laboratory: CTTL, Beijing, China **DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d057** Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1 Medium parameters used: f = 835 MHz; $\sigma = 0.907$ S/m; $\varepsilon_r = 42.15$; $\rho = 1000$ kg/m³ Phantom section: Center Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(9.56, 9.56, 9.56); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- 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)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 57.74 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.47 W/kg SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.51 W/kg Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

Certificate No: Z15-97173

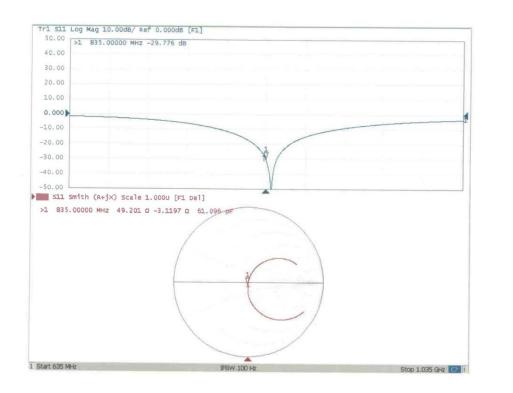
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il: cttl@chinattl.com Http://www.chinattl.cn

Impedance Measurement Plot for Head TSL



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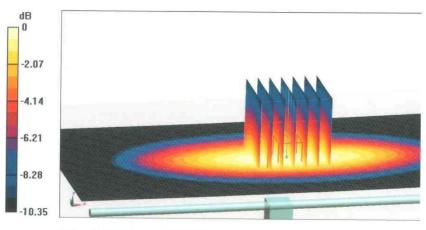
DASY5 Validation Report for Body TSL

Date: 10.22.2015

Test Laboratory: CTTL, Beijing, China **DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d057** Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1 Medium parameters used: f = 835 MHz; $\sigma = 0.958$ S/m; $\epsilon_r = 55.11$; $\rho = 1000$ kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(9.71,9.71, 9.71); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- 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)

Dipole Calibration/Zoom Scan (7x7x7)/(7x7x7)/(Cube 0): Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 56.68 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 3.46 W/kg SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.54 W/kg Maximum value of SAR (measured) = 2.95 W/kg



0 dB = 2.95 W/kg = 4.70 dBW/kg

Certificate No: Z15-97173

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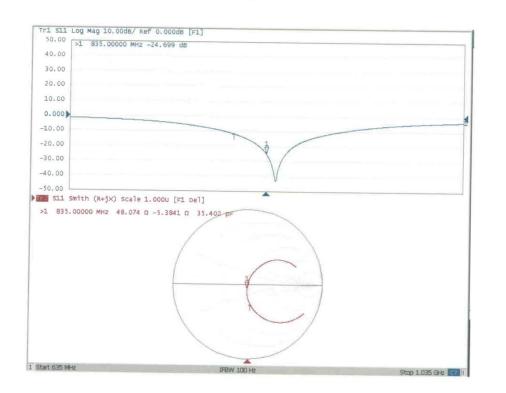


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Impedance Measurement Plot for Body TSL



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1800 MHz Dipole Calibration Certificate

T	TL S_P	oration with	CNAS
Tel: +86-10-62304 E-mail: cttl@china	633-2079 Fax: -	trict, Beijing, 100191, China +86-10-62304633-2504 //www.chinattl.cn (h) Certificate No: Z	CALIBRATION No. L0570
CALIBRATION C			13-37170
Object	D1800	V2 - SN: 2d147	
Calibration Procedure(s)	FD-Z11	-2-003-01	
	Calibra	tion Procedures for dipole validation kits	
Calibration date:	Novem	ber 3, 2015	
All calibrations have been		the closed laboratory facility: environmen	t temperature(22±3)°C and
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	I (M&TE critical for ID# 101919	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256)	Scheduled Calibration Jun-16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards	I (M&TE critical for ID# 101919 101547	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256)	Scheduled Calibration Jun-16 Jun-16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91	I (M&TE critical fo ID# 101919 101547	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256)	Scheduled Calibration Jun-16 Jun-16 Aug -16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4	I (M&TE critical for ID# 101919 101547 SN 3617	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15)	Scheduled Calibration Jun-16 Jun-16 Aug -16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	Conducted in (M&TE critical for 101919 101547 SN 3617 SN 777 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards	Conducted in (M&TE critical for 101919 101547 SN 3617 SN 777 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15 (CTTL, No.J15X04256) 26-Aug-15 (SPEAG,No.DAE4-777_Aug15) 26-Aug-15 (SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	Conducted in (M&TE critical for 101919 101547 SN 3617 SN 777 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15 (CTTL, No.J15X04256) 26-Aug-15 (SPEAG,No.DAE4-777_Aug15) 26-Aug-15 (SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	n conducted in I (M&TE critical for ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	n conducted in (M&TE critical for ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673 Name	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728) Function	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	n conducted in (M&TE critical for ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673 Name Zhao Jing	Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728) Function SAR Test Engineer	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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

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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	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.39 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	9.70 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	38.8 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.14 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.6 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	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.2 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.83 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	39.6 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.24 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.1 mW /g ± 20.4 % (k=2)

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.6Ω- 3.68jΩ	
Return Loss	- 26.9dB	

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.4Ω- 6.17jΩ
Return Loss	- 21.1dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.321 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	
		_

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DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China

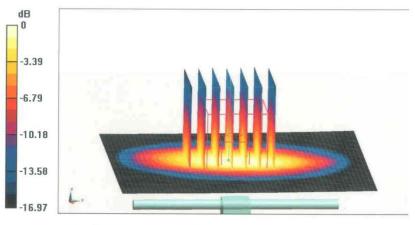
Date: 11.03.2015

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d147 Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1800 MHz; $\sigma = 1.388$ S/m; $\epsilon r = 38.94$; $\rho = 1000$ kg/m3 Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(8.13, 8.13, 8.13); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- 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/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 100.6 V/m; Power Drift = -0.06 dB Peak SAR (extrapolated) = 17.7W/kg SAR(1 g) = 9.7 W/kg; SAR(10 g) = 5.14 W/kg Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

Certificate No: Z15-97178

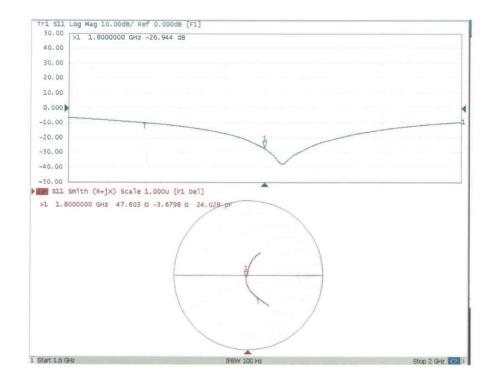
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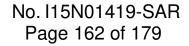
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504 E-mail: cttl@chinattl.com Http://www.chinattl.cn

Impedance Measurement Plot for Head TSL



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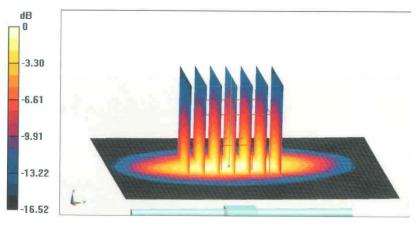




DASY5 Validation Report for Body TSL Date: 11.03.2015 Test Laboratory: CTTL, Beijing, China DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d147 Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1800 MHz; $\sigma = 1.512$ S/m; $\varepsilon_r = 54.19$; $\rho = 1000$ kg/m³ Phantom section: Center Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) **DASY5** Configuration: Probe: EX3DV4 - SN3617; ConvF(7.88, 7.88, 7.88); Calibrated: 8/26/2015; . Sensor-Surface: 2mm (Mechanical Surface Detection) Electronics: DAE4 Sn777; Calibrated: 8/26/2015 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/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.79 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 17.4 W/kg SAR(1 g) = 9.83 W/kg; SAR(10 g) = 5.24 W/kg Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

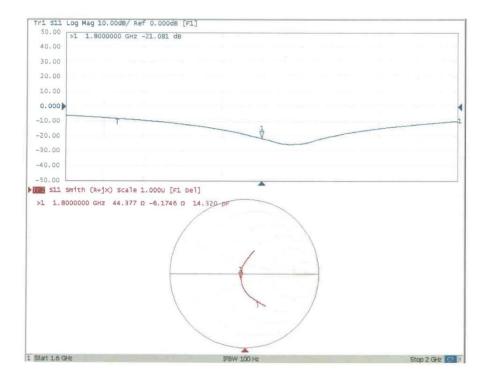
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Impedance Measurement Plot for Body TSL



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1900 MHz Dipole Calibration Certificate

T		Noration with	CNAS
Add: No.51 Xueyu Tel: +86-10-62304 E-mail: cttl@china	633-2079 Fax:	strict, Beijing, 100191, China +86-10-62304633-2504 ://www.chinattl.cn	CALIBRATION No. L0570
Client CT CALIBRATION C	ERTIFICA		15-97179
		The second second	
Object	D1900	0V2 - SN: 5d088	
Calibration Procedure(s)		1-2-003-01 ation Procedures for dipole validation kits	
Calibration date:	Noven	nber 4, 2015	
	n conducted in	the closed laboratory facility: environment	t temperature(22±3) $^{\circ}$ and
umidity<70%. Calibration Equipment used		for calibration)	t temperature(22±3)℃ and Scheduled Calibration
umidity<70%. Calibration Equipment used Primary Standards	I (M&TE critical f		
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	I (M&TE critical f	for calibration) Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
umidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91	I (M&TE critical 1 ID # 101919 101547	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256)	Scheduled Calibration Jun-16
numidity<70%. Calibration Equipment used Primary Standards	I (M&TE critical 1 ID # 101919 101547	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256)	Scheduled Calibration Jun-16 Jun-16
Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4	I (M&TE critical 1 ID # 101919 101547 SN 3617	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15)	Scheduled Calibration Jun-16 Jun-16 Aug -16
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Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	I (M&TE critical 1 ID # 101919 101547 SN 3617 SN 777 ID # MY49071430	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards	I (M&TE critical 1 ID # 101919 101547 SN 3617 SN 777 ID # MY49071430	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	I (M&TE critical 1 ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728)	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	I (M&TE critical 1 ID # 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673 Name	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728) Function	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16 Signature
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C Calibrated by: Reviewed by:	I (M&TE critical 1 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673 Name Zhao Jing	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728) Function SAR Test Engineer	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16 Signature
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	I (M&TE critical f 101919 101547 SN 3617 SN 777 ID # MY49071430 MY46110673 Name Zhao Jing Qi Dianyuan	for calibration) Cal Date(Calibrated by, Certificate No.) 01-Jul-15 (CTTL, No.J15X04256) 01-Jul-15 (CTTL, No.J15X04256) 26-Aug-15(SPEAG,No.EX3-3617_Aug15) 26-Aug-15(SPEAG,No.DAE4-777_Aug15) Cal Date(Calibrated by, Certificate No.) 02-Feb-15 (CTTL, No.J15X00729) 03-Feb-15 (CTTL, No.J15X00728) Function Function SAR Test Engineer SAR Project Leader Deputy Director of the laboratory	Scheduled Calibration Jun-16 Jun-16 Aug -16 Aug -16 Scheduled Calibration Feb-16 Feb-16 Signature

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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

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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	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.6 ± 6 %	1.39 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	10.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	40.8 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	21.0 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	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.1 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	41.1 mW /g ± 20.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.33 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.3 mW /g ± 20.4 % (k=2)

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.7Ω+ 7.33jΩ	
Return Loss	- 22.4dB	

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.9Ω+ 5.36jΩ	
Return Loss	- 25.4dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.303 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
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Certificate No: Z15-97179

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DASY5 Validation Report for Head TSL

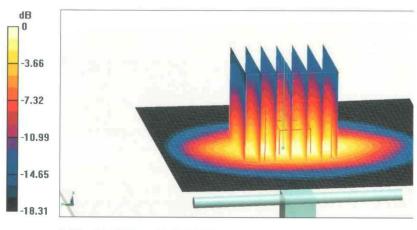
Date: 11.04.2015

Test Laboratory: CTTL, Beijing, China **DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d088** Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; σ = 1.385 S/m; εr = 40.56; ρ = 1000 kg/m3 Phantom section: Right Section

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

- Probe: EX3DV4 SN3617; ConvF(8.07, 8.07, 8.07); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- 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/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 100.6 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 18.9W/kg SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.22 W/kg Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dBW/kg

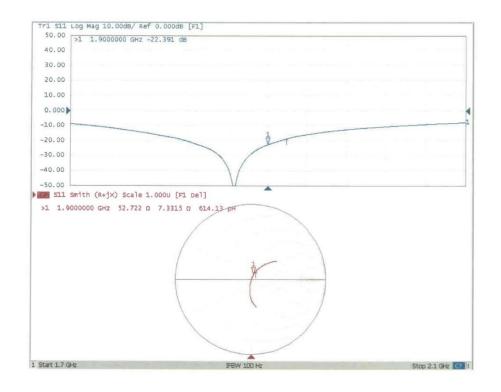
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Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Test Laboratory: CTTL, Beijing, China

Date: 11.04.2015

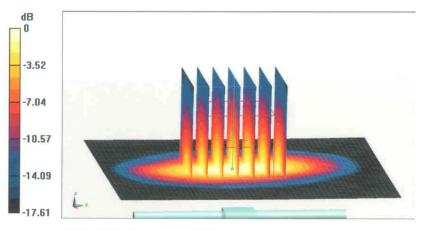
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d088

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; σ = 1.536 S/m; ϵ_r = 54.05; ρ = 1000 kg/m³ Phantom section: Center Section

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

- Probe: EX3DV4 SN3617; ConvF(7.74, 7.74, 7.74); Calibrated: 8/26/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/26/2015
- 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/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.09 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 18.9 W/kg SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.33 W/kg Maximum value of SAR (measured) = 14.9 W/kg



0 dB = 14.9 W/kg = 11.73 dBW/kg

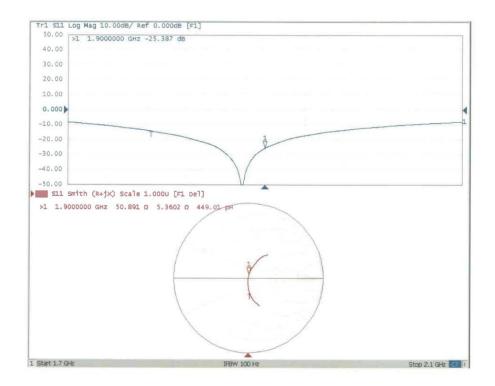
Certificate No: Z15-97179

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Impedance Measurement Plot for Body TSL



Certificate No: Z15-97179

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2450 MHz Dipole Calibration Certificate

	CALLINE	ATION LABORATORY	IC-MRA
Add: No.51 Xueyu Tel: +86-10-62304		strict, Beijing, 100191, China +86-10-62304633-2504	CALIBRATIO No. L0570
E-mail: cttl@china	attl.com <u>Http:</u>	//www.chinattl.cn	
Client CT	TL(South Bra	nch) Certificate No: Z1	15-97180
CALIBRATION C	ERTIFICA	ΓE	
Object	D2450	V2 - SN: 873	
Colibration Dressedure(a)			
Calibration Procedure(s)	FD-Z1	1-2-003-01	
	Calibra	ation Procedures for dipole validation kits	
Calibration date:	Octobe	er 30, 2015	
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Certificate No: Z15-97180

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