

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 204 of 233

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$55.0 \Omega + 2.4 j\Omega$
Return Loss	- 25.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$50.4 \Omega + 3.5 j\Omega$
Return Loss	- 29.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.154 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.

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
Manufactured on	May 06, 2005

DASY5 Validation Report for Head TSL

Date: 29.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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

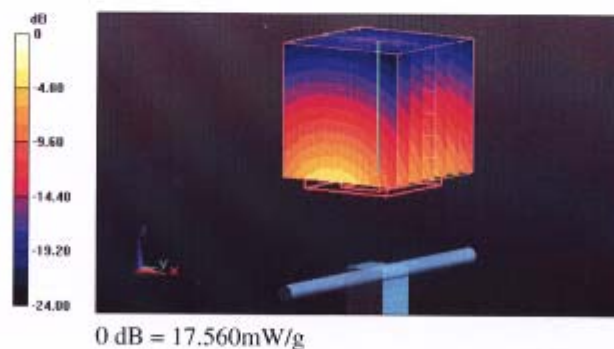
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.5 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 28.303 W/kg

SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.41 mW/g

Maximum value of SAR (measured) = 17.561 mW/g

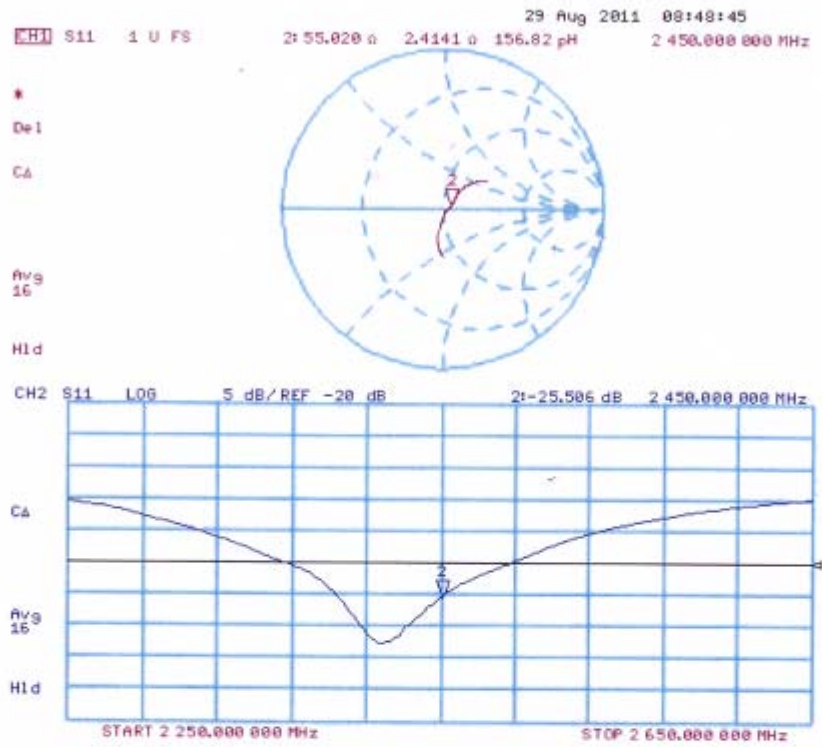


TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 206 of 233

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 29.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.02$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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

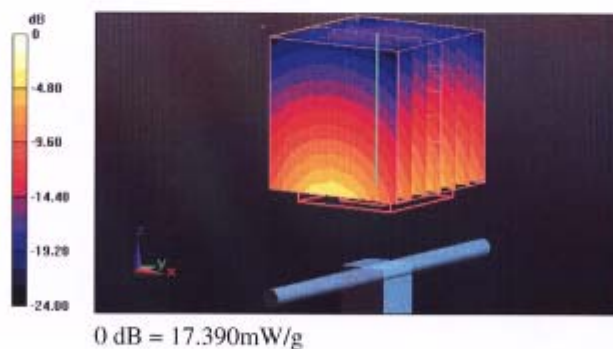
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.118 V/m; Power Drift = 0.0072 dB

Peak SAR (extrapolated) = 27.129 W/kg

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.1 mW/g

Maximum value of SAR (measured) = 17.387 mW/g

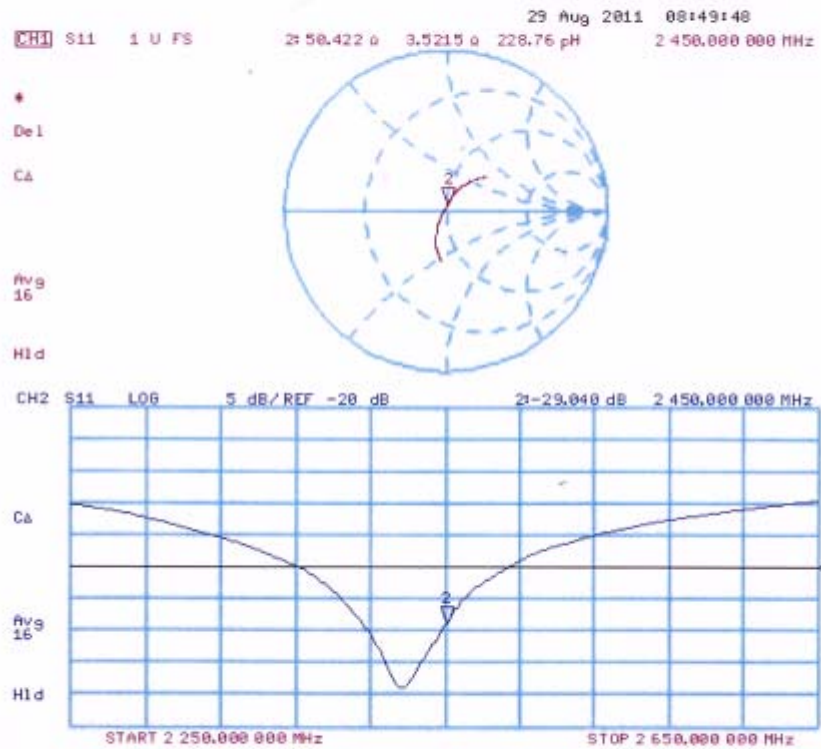


TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 208 of 233

Impedance Measurement Plot for Body TSL



TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1406-0060SAR01R1

Page 209 of 233

ANNEX H: D5GHzV2 Dipole Calibration Certificate



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com



Client **TA-Shanghai** Certificate No: **J13-2-3045**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1151**

Calibration Procedure(s) **TMC-OS-E-02-194**
Calibration procedure for dipole validation kits

Calibration date: **December 30, 2013**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	11-Sep-13 (TMC, No.JZ13-443)	Sep-14
Power sensor NRV-Z5	100595	11-Sep-13 (TMC, No. JZ13-443)	Sep -14
Reference Probe EX3DV4	SN 3846	3- Sep-13 (SPEAG, No.EX3-3846_Sep13)	Sep-14
DAE4	SN 777	22-Feb-13 (SPEAG, DAE4-777_Feb13)	Feb -14
Signal Generator E4438C	MY49070393	13-Nov-13 (TMC, No.JZ13-394)	Nov-14
Network Analyzer N5230C	MY49000861	31-Jan-13 (TMC, No.JZ13-633)	Jan-14

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: January 3, 2014

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

Certificate No: J13-2-3045

Page 1 of 15

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 210 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM _{x,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 62209-2, "Evaluation of Human Exposure to Radio Frequency Field from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", March 2010
- 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%.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 211 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

Measurement Conditions

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

DASY Version	DASY52	52.8.7.1137
Extrapolation	Advanced Extrapolation	
Phantom	ELI 4.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz $\pm$ 1 MHz 5300 MHz $\pm$ 1 MHz 5600 MHz $\pm$ 1 MHz 5800 MHz $\pm$ 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	36.4 $\pm$ 6 %	4.58 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.63 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	76.5 mW /g $\pm$ 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	22.3 mW /g $\pm$ 22.2 % (k=2)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 212 of 233



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.2 ± 6 %	4.71 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.02 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	80.3 mW /g ± 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.33 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.3 mW /g ± 22.2 % (k=2)

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.6 ± 6 %	5.11 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.94 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	78.5 mW /g ± 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.29 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	22.9 mW /g ± 22.2 % (k=2)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 213 of 233



Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.1 ± 6 %	5.36 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.67 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	76.7 mW / g ± 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	22.2 mW / g ± 22.2 % (k=2)

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.6 ± 6 %	5.38 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.48 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	74.7 mW / g ± 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.17 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.7 mW / g ± 22.2 % (k=2)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 214 of 233



Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.5 ± 6 %	5.50 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.70 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	76.9 mW /g ± 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.20 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	22.0 mW /g ± 22.2 % (k=2)

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.1 ± 6 %	5.85 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.08 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	80.7 mW /g ± 23.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.27 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	22.7 mW /g ± 22.2 % (k=2)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 215 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2079

Fax: +86-10-62304633-2504

E-mail: Info@emcite.com

[Http://www.emcite.com](http://www.emcite.com)

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.8 ± 6 %	6.09 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.26 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	72.5 mW /g ± 23.0 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	100 mW input power	2.04 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	20.4 mW /g ± 22.2 % (k=2)

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 216 of 233



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	$54.6\Omega - 3.74j\Omega$
Return Loss	- 24.9dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	$45.2\Omega - 4.88j\Omega$
Return Loss	- 22.8dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	$57.6\Omega + 3.63j\Omega$
Return Loss	- 22.1dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	$50.6\Omega - 9.91j\Omega$
Return Loss	- 20.2dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	$53.8\Omega - 3.44j\Omega$
Return Loss	- 26.2dB

Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	$46.4\Omega - 3.33j\Omega$
Return Loss	- 25.8dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	$58.1\Omega - 2.54j\Omega$
Return Loss	- 22.1dB

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 217 of 233



Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	47.9Ω - 8.33jΩ
Return Loss	- 21.2dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 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
-----------------	-------

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 218 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

DASY5 Validation Report for Head TSL

Date: 30.12.2013

Test Laboratory: TMC, Beijing, China

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1151

Communication System: CW; Frequency: 5200 MHz, Frequency: 5300 MHz,
Frequency: 5600 MHz, Frequency: 5800 MHz;
Medium parameters used: f = 5200 MHz; $\sigma = 4.58$ mho/m; $\epsilon_r = 36.42$; $\rho = 1000$ kg/m³,
Medium parameters used: f = 5300 MHz; $\sigma = 4.71$ mho/m; $\epsilon_r = 36.19$; $\rho = 1000$ kg/m³,
Medium parameters used: f = 5600 MHz; $\sigma = 5.11$ mho/m; $\epsilon_r = 35.62$; $\rho = 1000$ kg/m³,
Medium parameters used: f = 5800 MHz; $\sigma = 5.36$ mho/m; $\epsilon_r = 35.11$; $\rho = 1000$ kg/m³
Phantom section: ELI 4.0

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(5.25,5.25,5.25); Calibrated: 2013/9/3,
ConvF(5.04,5.04,5.04); Calibrated: 2013/9/3, ConvF(4.52,4.52,4.52);
Calibrated: 2013/9/3, ConvF(4.51,4.51,4.51); Calibrated: 2013/9/3,
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 22/2/2013
- Phantom: ELI 4.0; Type: QDOVA001BA;
- DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

Dipole Calibration for Head Tissue/Pin=100mW, d=10mm, f=5200

MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm,
dy=4mm, dz=1.4mm

Reference Value = 67.621 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 32.8 W/kg

SAR(1 g) = 7.63 W/kg; SAR(10 g) = 2.22 W/kg

Maximum value of SAR (measured) = 18.0 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, d=10mm, f=5300

MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm,
dy=4mm, dz=1.4mm

Reference Value = 69.925 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 35.5 W/kg

SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.33 W/kg

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

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 219 of 233



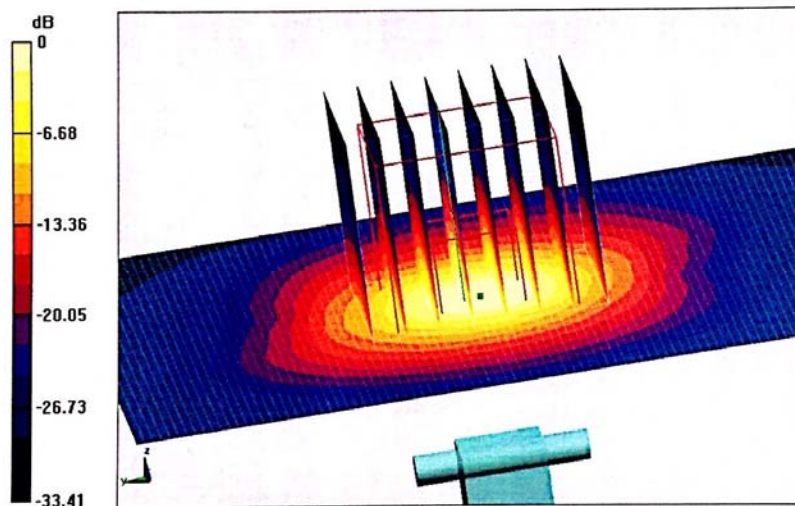
In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

Dipole Calibration for Head Tissue/Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.807 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 35.3 W/kg
SAR(1 g) = 7.94 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 19.4 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, d=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.108 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 35.5 W/kg
SAR(1 g) = 7.67 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.5 W/kg = 12.67 dBW/kg

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 220 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China

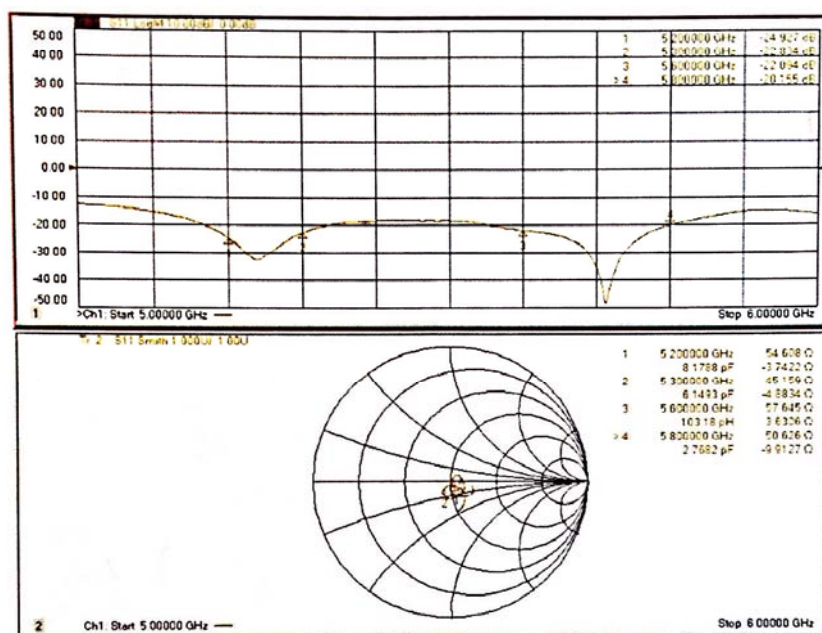
Tel: +86-10-62304633-2079

Fax: +86-10-62304633-2504

E-mail: Info@emcite.com

[Http://www.emcite.com](http://www.emcite.com)

Impedance Measurement Plot for Head TSL



TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 221 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

DASY5 Validation Report for Body TSL

Date: 24.12.2013

Test Laboratory: TMC, Beijing, China

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1151

Communication System: CW; Frequency: 5200 MHz, Frequency: 5300 MHz,
Frequency: 5600 MHz, Frequency: 5800 MHz,
Medium parameters used: $f = 5200$ MHz; $\sigma = 5.38$ mho/m; $\epsilon_r = 48.56$; $\rho = 1000$ kg/m³,
Medium parameters used: $f = 5300$ MHz; $\sigma = 5.501$ mho/m; $\epsilon_r = 48.46$; $\rho = 1000$
kg/m³, Medium parameters used: $f = 5600$ MHz; $\sigma = 5.851$ mho/m; $\epsilon_r = 48.09$; $\rho =$
1000 kg/m³, Medium parameters used: $f = 5800$ MHz; $\sigma = 6.094$ mho/m; $\epsilon_r = 47.81$; ρ
= 1000 kg/m³

Phantom section: ELI 4.0

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(4.36,4.36,4.36); Calibrated: 2013/9/3,
ConvF(4.17,4.17,4.17); Calibrated: 2013/9/3, ConvF(3.77,3.77,3.77);
Calibrated: 2013/9/3, ConvF(3.94,3.94,3.94); Calibrated: 2013/9/3,
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 22/2/2013
- Phantom: ELI 4.0; Type: QDOVA001BA;
- DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

Dipole Calibration for Body Tissue/Pin=100mW, d=10mm, f=5200

MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm,
dy=4mm, dz=1.4mm

Reference Value = 65.005 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 30.9 W/kg

SAR(1 g) = 7.48 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 17.4 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, d=10mm, f=5300

MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm,
dy=4mm, dz=1.4mm

Reference Value = 65.871 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 32.8 W/kg

SAR(1 g) = 7.7 W/kg; SAR(10 g) = 2.2 W/kg

Maximum value of SAR (measured) = 18.3 W/kg

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 222 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2079

E-mail: Info@emcite.com

Fax: +86-10-62304633-2504

[Http://www.emcite.com](http://www.emcite.com)

Dipole Calibration for Body Tissue/Pin=100mW, d=10mm, f=5600

MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.323 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 38.4 W/kg

SAR(1 g) = 8.08 W/kg; SAR(10 g) = 2.27 W/kg

Maximum value of SAR (measured) = 19.6 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, d=10mm, f=5800

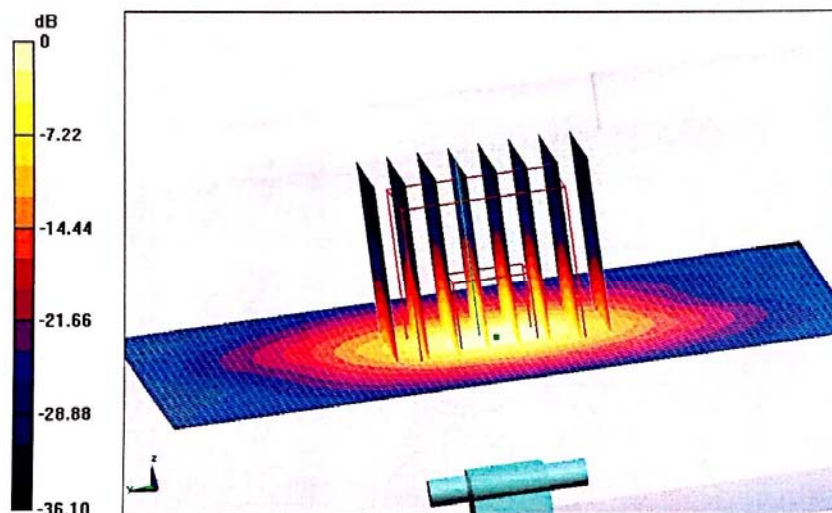
MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 62.571 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 34.7 W/kg

SAR(1 g) = 7.26 W/kg; SAR(10 g) = 2.04 W/kg

Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1406-0060SAR01R1

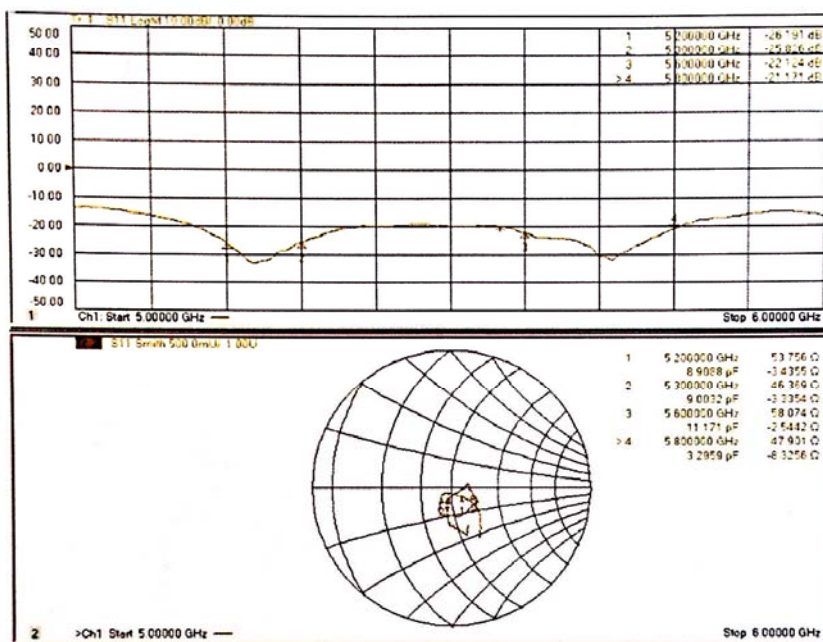
Page 223 of 233



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Impedance Measurement Plot for Body TSL



TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1406-0060SAR01R1

Page 224 of 233

ANNEX I: DAE4 Calibration Certificate



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: info@emcste.com Http://www.emcste.com

In Collaboration with

s p e a g
CALIBRATION LABORATORY



Client : **TA(Shanghai)**

Certificate No: **J14-2-0052**

CALIBRATION CERTIFICATE

Object **DAE4 - SN: 1317**

Calibration Procedure(s) **TMC-OS-E-01-198**
Calibration Procedure for the Data Acquisition Electronics (DAEx)

Calibration date: **January 16, 2014**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Documenting Process Calibrator 753	1971018	01-July-13 (TMC, No:JW13-049)	July-14

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: January 16, 2014

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

Certificate No: J14-2-0052

Page 1 of 3

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 225 of 233



In Collaboration with

s p e a g
CALIBRATION LABORATORY

Add: No 52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Glossary:

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1406-0060SAR01R1

Page 226 of 233



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com [Http://www.emcite.com](http://www.emcite.com)

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = $6.1\mu\text{V}$, full range = $-100\dots+300\text{ mV}$
Low Range: 1LSB = 61 nV , full range = $-1\dots+3\text{ mV}$

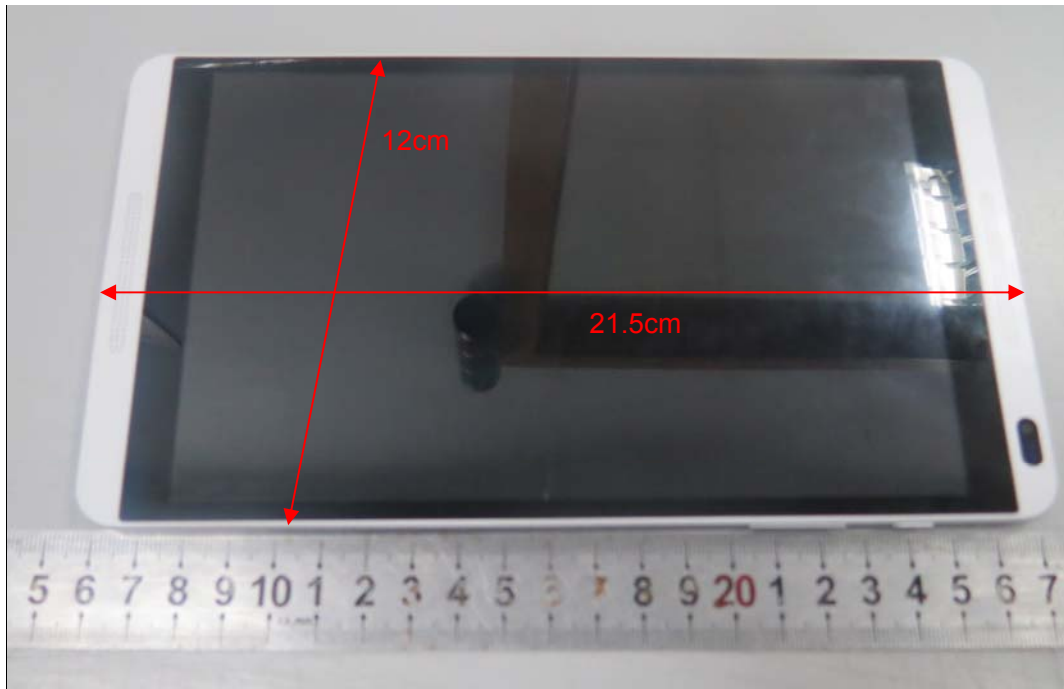
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	$404.058 \pm 0.15\% (k=2)$	$404.060 \pm 0.15\% (k=2)$	$403.954 \pm 0.15\% (k=2)$
Low Range	$3.99002 \pm 0.7\% (k=2)$	$3.99910 \pm 0.7\% (k=2)$	$3.98303 \pm 0.7\% (k=2)$

Connector Angle

Connector Angle to be used in DASY system	$119^\circ \pm 1^\circ$
---	-------------------------

ANNEX J: The EUT Appearances and Test Configuration



a: EUT

Picture 14: Constituents of EUT



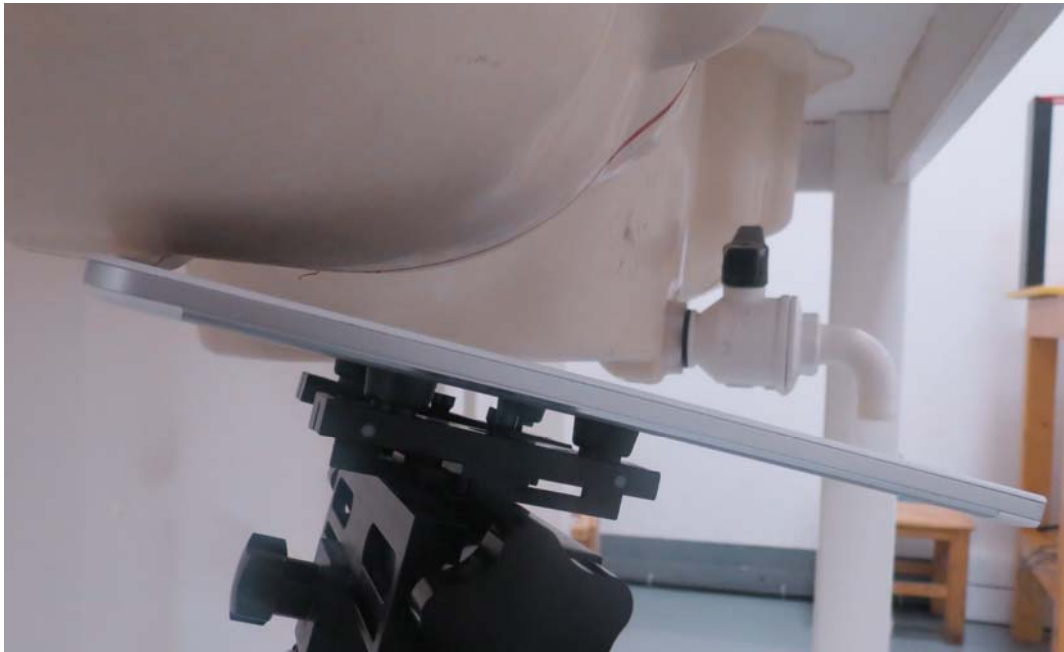
Picture 15: Left Hand Touch Cheek Position



Picture 16: Left Hand Tilt 15 Degree Position



Picture 17: Right Hand Touch Cheek Position



Picture 18: Right Hand Tilt 15 Degree Position

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 230 of 233



Picture 19: Test position 1



Picture 20: Test position 2

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 231 of 233



Picture 21: Test Position 3



Picture 22: Test Position 4

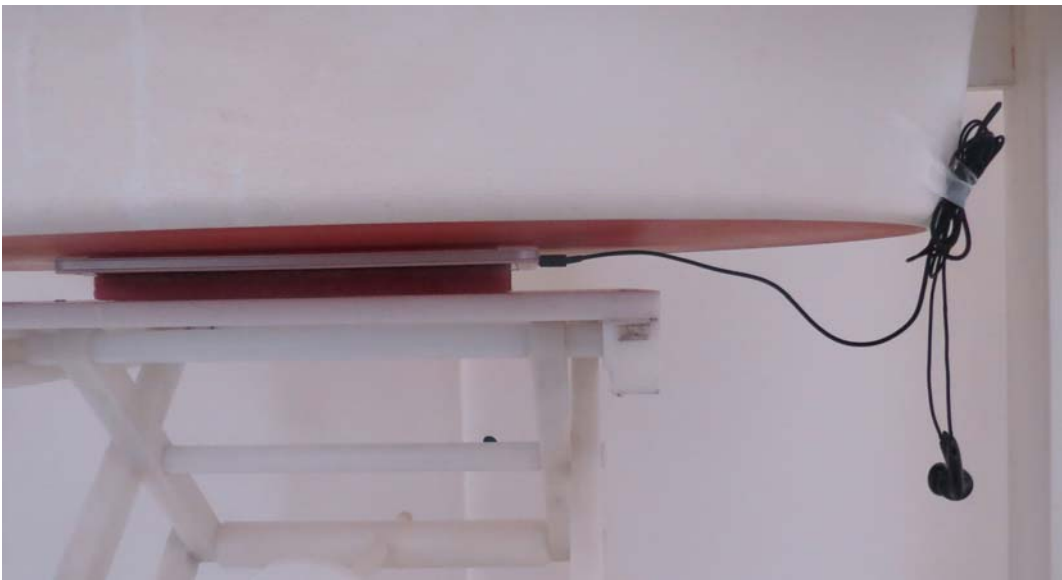
TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RHA1406-0060SAR01R1

Page 232 of 233

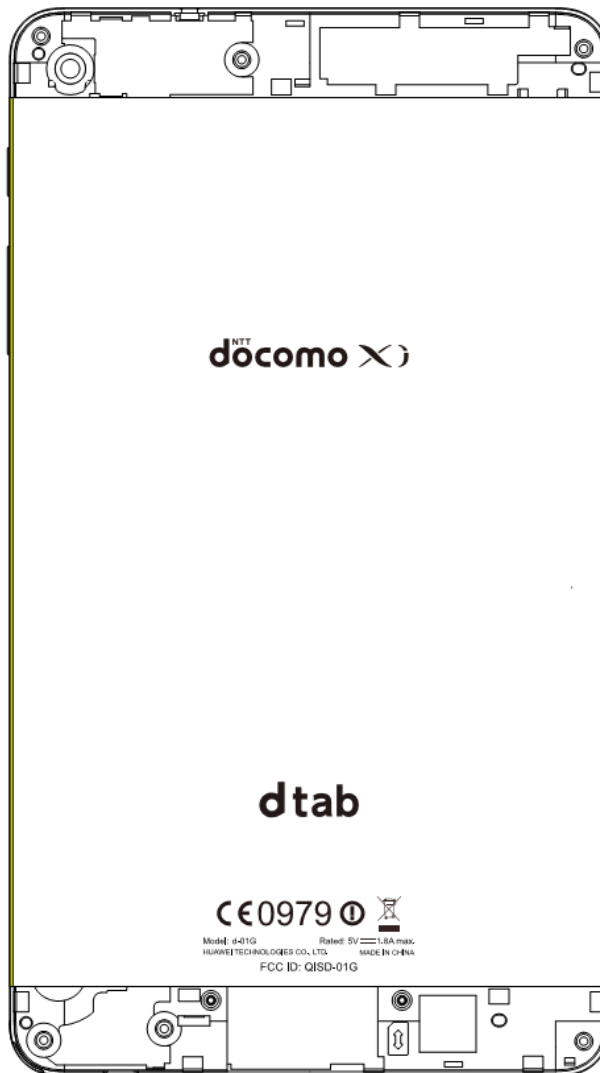


Picture 23: Test Position 5



Picture 24: Test position 1 with Earphone

ANNEX K: Product Change Description



The differences between S8-302L and d-01G are band different:

	S8-302L	d-01G
PCB	the same	the same
WIFI/BT 2.4G	the same	the same
WIFI 5G	the same	the same
GSM850/1900	the same	the same
WCDMA850	the same	the same
WCDMA1900/1700	the same	Not support
LTE band 4/7/17	the same	Not support