C SAR Test Report No: RXA1711-0362SAR01R2

### **Measurement Conditions**

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	min opacer
Frequency	2600 MHz ± 1 MHz	

### **Head TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	2.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.9 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	25.4 W/kg ± 16.5 % (k=2)

### **Body TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.5 ± 6 %	2.22 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

#### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	14.4 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	56.4 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.36 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	25.1 W/kg ± 16.5 % (k=2)

Certificate No: D2600V2-1025\_Dec14

Page 3 of 8

SAR Test Report No: RXA1711-0362SAR01R2

#### Appendix (Additional assessments outside the scope of SCS108)

#### **Antenna Parameters with Head TSL**

Impedance, transformed to feed point	49.7 Ω - 6.2 jΩ	
Return Loss	- 24.2 dB	

#### **Antenna Parameters with Body TSL**

Impedance, transformed to feed point	46.6 Ω - 5.4 jΩ	
Return Loss	- 23.6 dB	

#### **General Antenna Parameters and Design**

	•
Electrical Delay (one direction)	1.150 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
Manufactured on	May 13, 2008

Certificate No: D2600V2-1025\_Dec14

Page 4 of 8

### **DASY5 Validation Report for Head TSL**

Date: 08.12.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1025

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz;  $\sigma$  = 2.02 S/m;  $\epsilon_r$  = 39.1;  $\rho$  = 1000 kg/m<sup>3</sup>

Phantom section: Flat Section

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

### DASY52 Configuration:

Probe: ES3DV3 - SN3205; ConvF(4.46, 4.46, 4.46); Calibrated: 30.12.2013;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 18.08.2014

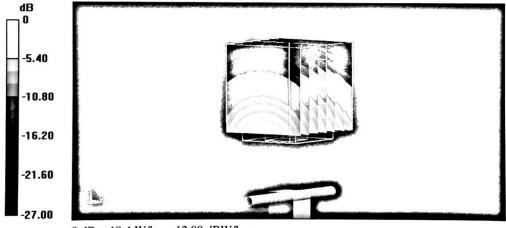
Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

### 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 = 102.3 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 30.9 W/kg SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.4 W/kg

Maximum value of SAR (measured) = 19.4 W/kg

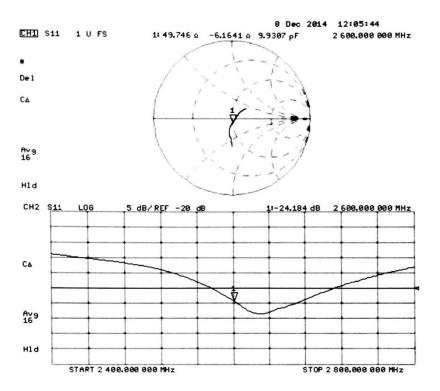


0 dB = 19.4 W/kg = 12.88 dBW/kg

Certificate No: D2600V2-1025\_Dec14

Page 5 of 8

#### Impedance Measurement Plot for Head TSL



Certificate No: D2600V2-1025\_Dec14

Page 6 of 8

#### **DASY5 Validation Report for Body TSL**

Date: 08.12.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1025

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz;  $\sigma = 2.22 \text{ S/m}$ ;  $\varepsilon_r = 50.5$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

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

#### **DASY52 Configuration:**

• Probe: ES3DV3 - SN3205; ConvF(4.24, 4.24, 4.24); Calibrated: 30.12.2013;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 18.08.2014

Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002

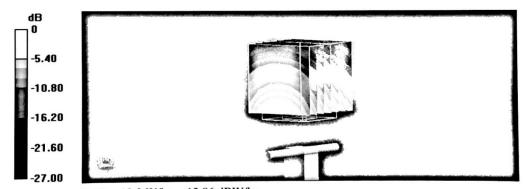
DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.72 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 30.9 W/kg

**SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.36 W/kg** Maximum value of SAR (measured) = 19.3 W/kg



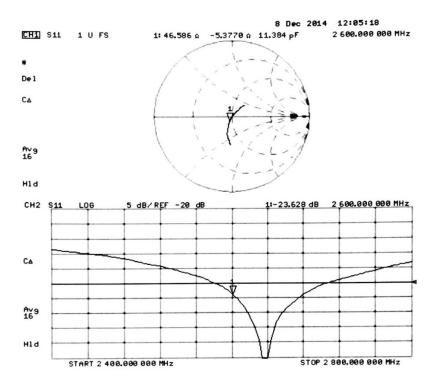
0 dB = 19.3 W/kg = 12.86 dBW/kg

Certificate No: D2600V2-1025\_Dec14

Page 7 of 8



### Impedance Measurement Plot for Body TSL





CC SAR Test Report No: RXA1711-0362SAR01R2

# ANNEX I: D2600V2 Dipole Calibration Certificate (SN: 1058)

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Client Auden Certificate No: D2600V2-1058\_Jun17

Object	D2600V2 - SN:1	058	
Calibration procedure(s)	QA CAL-05.v9 Calibration proce	edure for dipole validation kits abo	ove 700 MHz
Calibration date:	June 27, 2017		
The measurements and the unce	rtainties with confidence particular the closed laborate	ional standards, which realize the physical un robability are given on the following pages ar ry facility: environment temperature $(22 \pm 3)^n$	nd are part of the certificate.
Calibration Equipment used (M&) Primary Standards	(E critical for calibration)	GARAGE AND	
	10 #	Cal Date (Certificate No.)	Scheduled Calibration
	CN1-404770	04 4-147 (41-047 00504 (00577)	4 10
ower meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
wer meter NRP wer sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
wer meter NRP wer sensor NRP-Z91 wer sensor NRP-Z91	SN: 103244 SN: 103245	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522)	Apr-18 Apr-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 eference 20 dB Attenuator	SN: 103244 SN: 103245 SN: 5058 (20k)	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528)	Apr-18 Apr-18 Apr-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 eference 20 dB Attenuator ype-N mismatch combination	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529)	Apr-18 Apr-18 Apr-18 Apr-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 deference 20 dB Attenuator ype-N mismatch combination teference Probe EX3DV4	SN: 103244 SN: 103245 SN: 5058 (20k)	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528)	Apr-18 Apr-18 Apr-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 ower sensor NRP-Z91 deference 20 dB Attenuator ype-N mismatch combination deterence Probe EX3DV4 AE4	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 eference 20 dB Attenuator ype-N mismatch combination leference Probe EX3DV4 AE4 econdary Standards	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 05327 SN: 7349 SN: 601	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17)	Apr-18 Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 deference 20 dB Attenuator ype-N mismatch combination deference Probe EX3DV4 AE4 econdary Standards ower meter EPM-442A	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 05327 SN: 7349 SN: 601	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17) Check Date (in house)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18 Scheduled Check In house check: Oct-18
Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Recondary Standards Power meter EPM-442A Power sensor HP 8481A	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 05327 SN: 7349 SN: 601	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17) Check Date (in house) 07-Oct-15 (in house check Oct-16)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18 Scheduled Check In house check: Oct-18 In house check: Oct-18
Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Power sensor NRP-Z91 Reference Probe EX3DV4 Reference Probe EX3DV4 Recondary Standards Power meter EPM-442A Power sensor HP 8481A	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17) Check Date (in house) 07-Oct-15 (in house check Oct-16)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18 Scheduled Check In house check: Oct-18 In house check: Oct-18 In house check: Oct-18
ower meter NRP ower sensor NRP-Z91 ower sensor NRP-Z91 ower sensor NRP-Z91 teference 20 dB Attenuator ype-N mismatch combination teterence Probe EX3DV4 AE4 tecondary Standards ower meter EPM-442A tower sensor HP 8481A ower sensor HP 8481A iF generator R&S SMT-06	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: MY41092317	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17)  Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18  Scheduled Check In house check: Oct-18 In house check: Oct-18 In house check: Oct-18 In house check: Oct-18
Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Recondary Standards Power meter EPM-442A Power sensor HP 8481A RF generator R&S SMT-06	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: MY41092317 SN: 100972	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17)  Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18
Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 8481A Ref generator R&S SMT-06 Network Analyzer HP 8753E	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 05327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: MY41092317 SN: 100972 SN: US37390585	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17)  Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16) 18-Oct-01 (in house check Oct-16)	Apr-18 Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18  Scheduled Check In house check: Oct-18 In house check: Oct-18 In house check: Oct-18 In house check: Oct-18 In house check: Oct-17
Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reterence Probe EX3DV4 DAE4  Secondary Standards Power meter EPM-442A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E  Calibrated by:	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 05327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: WY41082317 SN: 100972 SN: US37390585	04-Apr-17 (No. 217-02521) 04-Apr-17 (No. 217-02522) 07-Apr-17 (No. 217-02528) 07-Apr-17 (No. 217-02529) 31-May-17 (No. EX3-7349_May17) 28-Mar-17 (No. DAE4-601_Mar17)  Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16) 18-Oct-01 (in house check Oct-16)	Apr-18 Apr-18 Apr-18 Apr-18 May-18 Mar-18  Scheduled Check In house check: Oct-18 In house check: Oct-18 In house check: Oct-18 In house check: Oct-18 In house check: Oct-17

Certificate No: D2600V2-1058\_Jun17

Page 1 of 8



Report No: RXA1711-0362SAR01R2

### Calibration Laboratory of Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

#### Glossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORM x.v.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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

e) 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
- 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: D2600V2-1058 Jun17

Page 2 of 8

#### **Measurement Conditions**

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

DASY Version	DASY5		SY Version DASY5 V52	
Extrapolation	Advanced Extrapolation			
Phantom	Modular Flat Phantom			
Distance Dipole Center - TSL	10 mm	with Spacer		
Zoom Scan Resolution	dx, $dy$ , $dz = 5 mm$			
Frequency	2600 MHz ± 1 MHz			

#### **Head TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.3 ± 6 %	2.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	57.0 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.46 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	25.5 W/kg ± 16.5 % (k=2)

### **Body TSL parameters**

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.7 ± 6 %	2.22 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

#### SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	54.3 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	24.3 W/kg ± 16.5 % (k=2)

Certificate No: D2600V2-1058\_Jun17

Page 3 of 8



### Appendix (Additional assessments outside the scope of SCS 0108)

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.4 Ω - 7.5 jΩ
Return Loss	- 22.2 dB

Report No: RXA1711-0362SAR01R2

#### Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.8 Ω - 5.7 jΩ
Return Loss	- 22.6 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.149 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
Manufactured on	August 14, 2012

Certificate No: D2600V2-1058\_Jun17

#### **DASY5 Validation Report for Head TSL**

Date: 27.06.2017

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1058

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz;  $\sigma = 2.02$  S/m;  $\epsilon_r = 37.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

#### DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.96, 7.96, 7.96); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

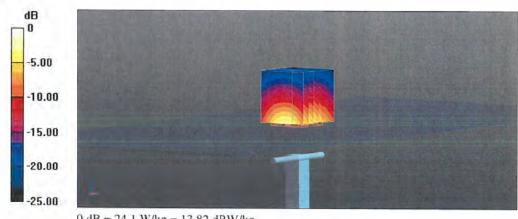
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 113.9 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 31.3 W/kg

SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.46 W/kg

Maximum value of SAR (measured) = 24.1 W/kg

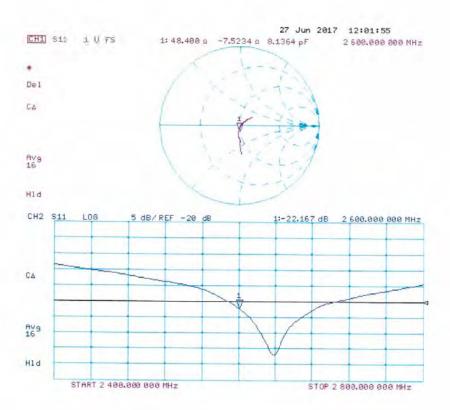


0 dB = 24.1 W/kg = 13.82 dBW/kg

Certificate No: D2600V2-1058\_Jun17

Page 5 of 8

## Impedance Measurement Plot for Head TSL



Certificate No: D2600V2-1058\_Jun17

Page 6 of 8

### **DASY5 Validation Report for Body TSL**

Date: 27.06.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1058

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz;  $\sigma = 2.22$  S/m;  $\epsilon_r = 51.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

#### DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.94, 7.94, 7.94); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52,10.0(1446); SEMCAD X 14.6.10(7417)

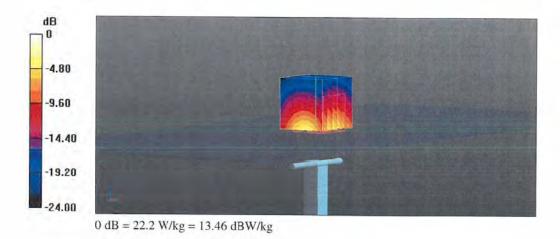
### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 104.3 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 29.2 W/kg

SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.14 W/kg

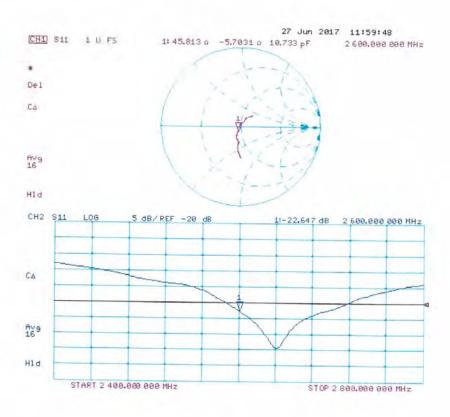
Maximum value of SAR (measured) = 22.2 W/kg



Certificate No: D2600V2-1058\_Jun17

Page 7 of 8

# Impedance Measurement Plot for Body TSL



Certificate No: D2600V2-1058\_Jun17

Page 8 of 8

Report No: RXA1711-0362SAR01R2

### ANNEX J: DAE4 Calibration Certificate



E-mail: cttl@chinattl.com

TA(Shanghai)

Http://www.chinattl.cn

Certificate No: Z17-97011

### CALIBRATION CERTIFICATE

Object

DAE4 - SN: 1291

Calibration Procedure(s)

Client :

FD-Z11-002-01

Calibration Procedure for the Data Acquisition Electronics

(DAEx)

Calibration date:

January 19, 2017

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

Process Calibrator 753 1971018 27-June-16 (CTTL, No:J16X04778) June-17

Calibrated by:

Name Function

Lu Bingsong

SAR Test Engineer Yu Zongying

Reviewed by: Approved by:

Qi Dianyuan SAR Project Leader

Deputy Director of the laboratory

Issued:

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

Certificate No: Z17-97011

Page 1 of 3





Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2218 Fax; +86-10-62304633-2209 E-mail: ettl@chinattl.com Http://www.chinattl.cn

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.

Certificate No: Z17-97011

Page 2 of 3





Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209 E-mail: ettl@chinattl.com Http://www.chinattl.cn

### DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:  $1LSB = 6.1 \mu V$ , full range = -100...+300 mVLow Range: 1LSB = 61 nV, full range = -1......+3 mVDASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	x	Y	z
High Range	402.659 ± 0.15% (k=2)	403.334 ± 0.15% (k=2)	403.248 ± 0.15% (k=2)
Low Range	3.97545 ± 0.7% (k=2)	3.93432 ± 0.7% (k=2)	3.99217 ± 0.7% (k=2)

#### **Connector Angle**

Connector Angle to be used in DASY system	309°±1°
---	---------

Certificate No: Z17-97011



# **ANNEX K: The EUT Appearances and Test Configuration**



Front Side



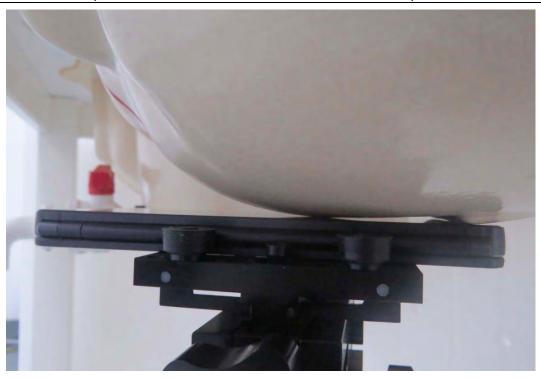
Back Side For Single Screen Mode



Front Side



Back Side
For Double Screen Mode
Picture 11: Constituents of EUT



Picture 12: Left Hand Touch Cheek Position For Single Screen Mode



Picture 13: Left Hand Tilt 15 Degree Position For Single Screen Mode



Picture 14: Right Hand Touch Cheek Position For Single Screen Mode



Picture 15: Right Hand Tilt 15 Degree Position For Single Screen Mode



Picture 16: Left Hand Touch Cheek Position For Double Screen Mode



Picture 17: Left Hand Tilt 15 Degree Position For Double Screen Mode



Picture 18: Right Hand Touch Cheek Position For Double Screen Mode



Picture 19: Right Hand Tilt 15 Degree Position For Double Screen Mode



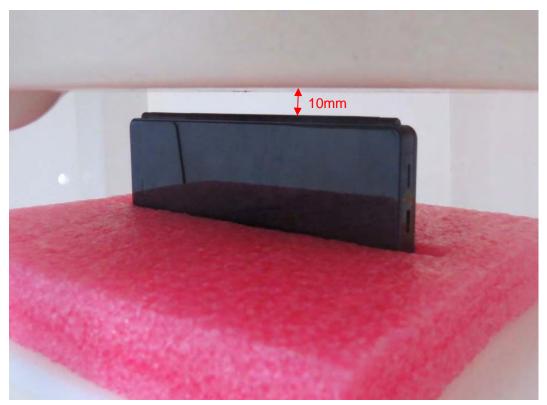
Picture 20: Back Side, the distance from handset to the bottom of the Phantom is 10mm For Single Screen Mode



Picture 21: Front Side, the distance from handset to the bottom of the Phantom is 10mm For Single Screen Mode



Picture 22: Left Side, the distance from handset to the bottom of the Phantom is 10mm For Single Screen Mode



Picture 23: Right Side, the distance from handset to the bottom of the Phantom is 10mm For Single Screen Mode



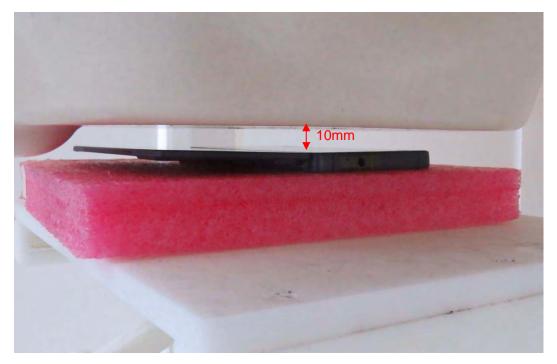
Picture 24: Top Side, the distance from handset to the bottom of the Phantom is 10mm For Single Screen Mode



Picture 25: Bottom Side, the distance from handset to the bottom of the Phantom is 10mm For Single Screen Mode



Picture 26: Back Side, the distance from handset to the bottom of the Phantom is 10mm For Double Screen Mode



Picture 27: Front Side, the distance from handset to the bottom of the Phantom is 10mm For Double Screen Mode



Picture 28: Left Side, the distance from handset to the bottom of the Phantom is 10mm For Double Screen Mode



Picture 29: Right Side, the distance from handset to the bottom of the Phantom is 10mm For Double Screen Mode



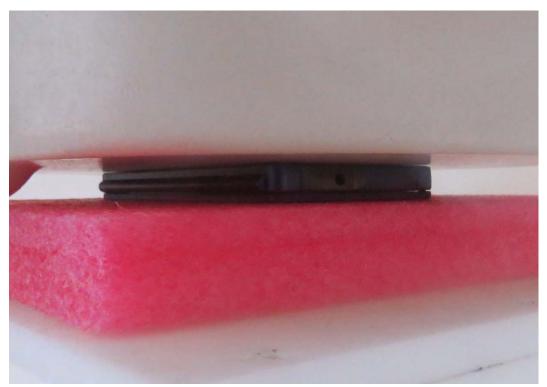
Picture 30: Top Side, the distance from handset to the bottom of the Phantom is 10mm For Double Screen Mode



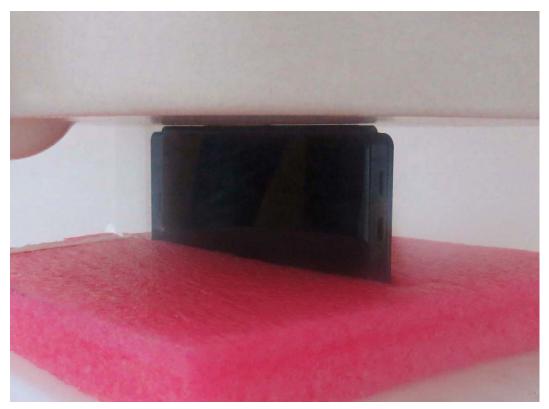
Picture 31: Bottom Side, the distance from handset to the bottom of the Phantom is 10mm For Double Screen Mode



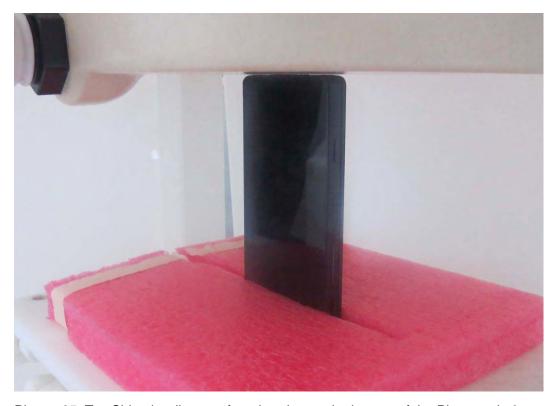
Picture 32: Back Side, the distance from handset to the bottom of the Phantom is 0mm For Single Screen Mode



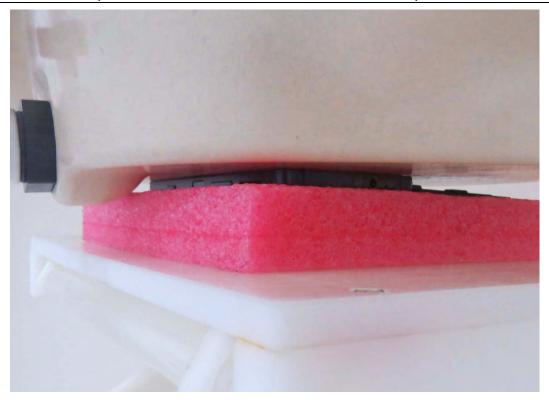
Picture 33: Front Side, the distance from handset to the bottom of the Phantom is 0mm For Single Screen Mode



Picture 34: Right Side, the distance from handset to the bottom of the Phantom is 0mm For Single Screen Mode



Picture 35: Top Side, the distance from handset to the bottom of the Phantom is 0mm For Single Screen Mode

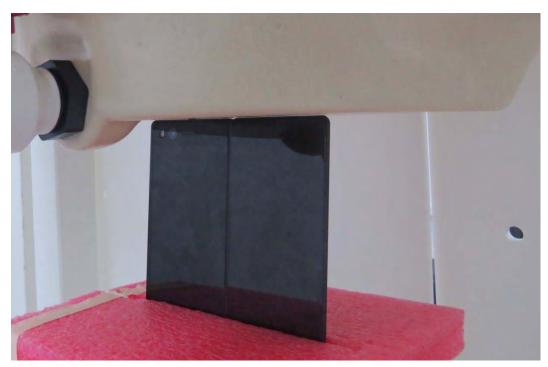


Picture 36: Back Side, the distance from handset to the bottom of the Phantom is 0mm For Double Screen Mode



Picture 37: Front Side, the distance from handset to the bottom of the Phantom is 0mm

For Double Screen Mode



Picture 38: Top Side, the distance from handset to the bottom of the Phantom is 0mm For Double Screen Mode



Picture 39: Bottom Side, the distance from handset to the bottom of the Phantom is 0mm For Double Screen Mode