

Appendix C for KSCR220700111501

Calibration Certificate

Object	Apply	No	Model	SN	Calibration Date
Dipole	☐	1	CLA150	4025	2021/04/26
	☐	2	D450V3	1103	2021/04/21
	☐	3	D750V3	1188	2022/03/29
	☒	4	D835V2	4d114	2022/03/31
	☐	5	D900V2	1d079	2022/06/07
	☒	6	D1800V2	2d170	2022/03/31
	☒	7	D1900V2	5d1136	2022/06/07
	☐	8	D2000V2	1041	2022/06/06
	☒	9	D2300V2	1096	2022/03/31
	☒	10	D2450V2	817	2022/04/01
	☒	11	D2600V2	1158	2022/03/31
	☐	12	D5GHzV2	1095	2022/06/01
DAE	☒	13	DAE4	1245	2022/05/30
Probe	☒	14	EX3DV4	7346	2022/03/30



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学院创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

1 Dipole

1.1 CLA150 - SN 4025

Calibration Laboratory of Schmid & Partner Engineering AG Zugstrasse 43, 8004 Zurich, Switzerland		S Schweizerischer Kalibrierdienst C Service suisse de l'étalonnage S Swiss Calibration Service	
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		Accreditation No.: SCS 0108	
Client: SGS-CN (Audeon)		Certificate No.: CLA150-4025_Apr21	
CALIBRATION CERTIFICATE			
Object: CLA150 - SN: 4025			
Calibration procedure(s): QA CAL-15.v9 Calibration Procedure for SAR Validation Sources below 700 MHz			
Calibration date: April 26, 2021			
The calibration certificate documents the traceability to national standards, which require the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and on 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&E critical for calibration)			
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 10476	09-Apr-21 (No. 217-03001/03002)	Apr-22
Power sensor NRP 20i	SN: 10384	09-Apr-21 (No. 217-03001)	Apr-22
Power sensor NRP 20i	SN: 10385	09-Apr-21 (No. 217-03002)	Apr-22
Reference 20 dB Attenuator	SN: C23602 (20i)	09-Apr-21 (No. 217-03003)	Apr-22
Type-N mismatch combination	SN: 310907 / 0007	09-Apr-21 (No. 217-03004)	Apr-22
Reference Probe EX300i4	SN: 3877	30-Dec-20 (No. 13X3077_Dec20)	Dec-21
EXE4	SN: 661	16-Jul-20 (No. 13458-650_Jul20)	Jul-21
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter S4419E	SN: G341303024	09-Apr-15 (in house check Jun-20)	In house check Jun-20
Power sensor E413A	SN: MY4169007	09-Apr-15 (in house check Jun-20)	In house check Jun-20
Power sensor E413A	SN: 00010010	09-Apr-15 (in house check Jun-20)	In house check Jun-20
RF generator HP 8594C	SN: US400401709	04-Aug-09 (in house check Jun-20)	In house check Jun-20
Network Analyzer Agilent T8368A	SN: US41000477	31-Mar-14 (in house check Oct-19)	In house check Oct-21
Calibrated by:	Name: Jurek Katschur	Function: Laboratory Technician	Signature:
Approved by:	Name: Kaja Polovic	Function: Technical Manager	Signature:
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			
Issued: April 26, 2021			
Certificate No.: CLA150-4025_Apr21		Page 1 of 5	

Measurement Conditions	
DASY system configuration, as far as not given on page 1.	
DASY Version	V52.10.4
Extrapolation	Advanced Extrapolation
Phantom	ELIA Flat Phantom
EUT Positioning	Touch Position
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm
Frequency	150 MHz ± 1 MHz
Graded Ratio	1.4 (Z direction)

Head TSL parameters	
The following parameters and calculations were applied.	
Temperature	22.0 °C
Permittivity	52.3
Conductivity	0.75 mho/m
Nominal Head TSL parameters	(22.0 ± 0.2) °C
Measured Head TSL parameters	51.1 ± 6 %
Head TSL temperature change during test	< 0.5 °C

SAR result with Head TSL	
SAR averaged over 1 cm³ (1 g) of Head TSL	Condition
SAR measured	1 W input power
SAR for nominal Head TSL parameters	normalized to 1W
	3.90 W/kg
	3.88 W/kg ± 19.4 % (k=2)
SAR averaged over 10 cm³ (10 g) of Head TSL	condition
SAR measured	1 W input power
SAR for nominal Head TSL parameters	normalized to 1W
	2.60 W/kg
	2.59 W/kg ± 18.0 % (k=2)

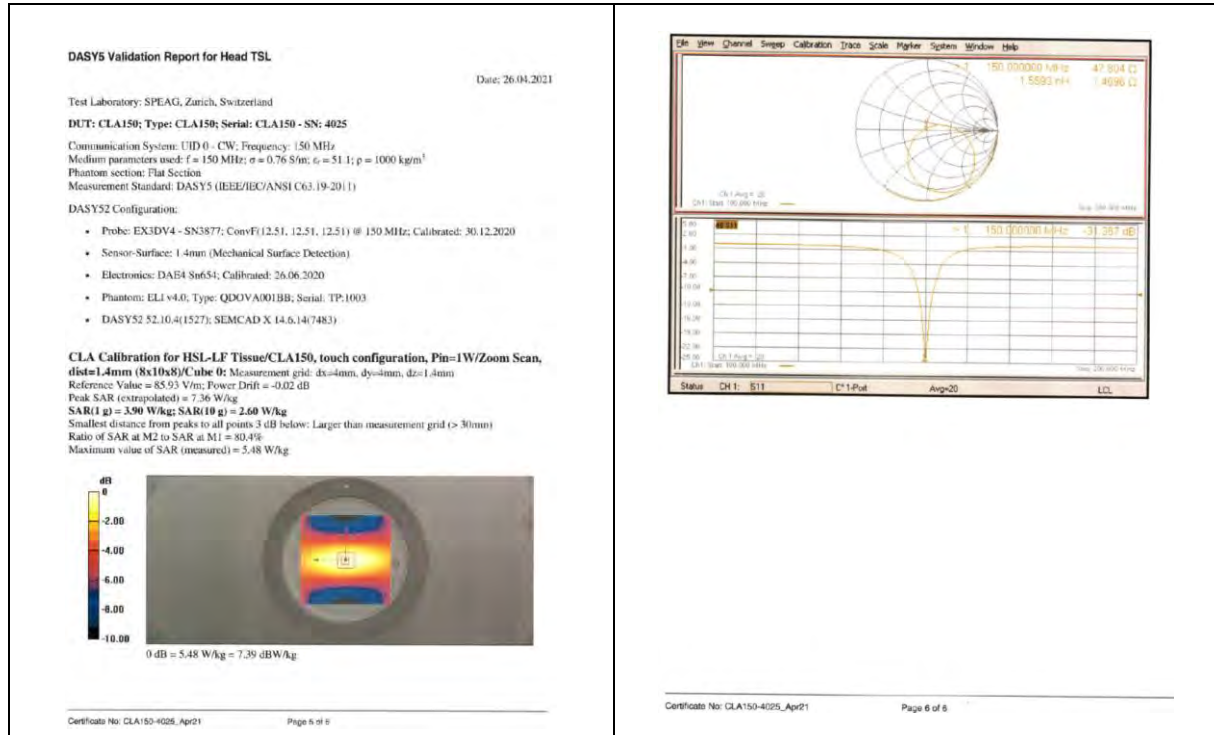
Appendix (Additional assessments outside the scope of SCS 0108)	
Antenna Parameters with Head TSL	
Impedance, transformed to feed point	47.9 Ω ± 1.5 Ω
Return Loss	-31.4 dB
Additional EUT Data	
Manufactured by	SPLEAG

Certificate No.: CLA150-4025_Apr21	
Page 3 of 5	Page 4 of 5



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us by telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
No. 10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300
(86-512) 57355888 (86-512) 57370818 www.sgsgroup.com.cn
(86-512) 57355888 (86-512) 57370818 sgs.china@sgs.com



1.2 D450V3 - SN 1103

Calibration Laboratory of Schmid & Partner Engineering AG
Zugstrasse 43, 8604 Zurich, Switzerland

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: **SGS-CN (Aiden)** Certificate No: **D450V3-1103_Apr21**

Accreditation No: **SCS 0108**

CALIBRATION CERTIFICATE

Object: **D450V3 - SN: 1103**

Calibration procedure(s): **QA CAL-15-V9**
Calibration Procedure for SAR Validation Sources below 700 MHz

Calibration date: **April 21, 2021**

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 (20 ± 2) °C and humidity < 75%.

Calibration Equipment used (MPE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN 104779	09-Apr-21 (No. 217-0301103020)	Apr-22
Power sensor MHP-291	SN 103244	09-Apr-21 (No. 217-030211)	Apr-22
Power sensor MHP-291	SN 103245	09-Apr-21 (No. 217-030212)	Apr-22
Reference 20 dB Attenuator	SN C2552 (200)	09-Apr-21 (No. 217-03043)	Apr-22
Type-N measurement combination	SN 310852 / 06327	09-Apr-21 (No. 217-03044)	Apr-22
Reference Probe EX3DV4	SN 3877	30-Dec-20 (No. EX3-2077 Dec20)	Dec-21
DA54	SN 454	05-Jun-20 (No. DA54-664-Jun20)	Jun-21

Secondary Standards

ID #	Cal Date (In House)	Scheduled Check
Power meter E44188	SN GB41200274 09-Apr-21 (In house check Jun-20)	In house check Jun-20
Power sensor E4412A	SN MY41496047 09-Apr-21 (In house check Jun-20)	In house check Jun-20
Power sensor E4412A	SN 000110010 09-Apr-21 (In house check Jun-20)	In house check Jun-20
RF generator HP 8448C	SN L03340010100 09-Apr-21 (In house check Jun-20)	In house check Jun-20
Network Analyzer Agilent E8358A	SN L044080477 31-Mar-14 (In house check Dec-20)	In house check Oct-21

Calibrated by: **Christoph Linder** Function: **Laboratory Technician**

Approved by: **Klaus Frensch** Function: **Technical Manager**

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

Certificate No: D450V3-1103_Apr21 Page 1 of 6

Calibration Laboratory of Schmid & Partner Engineering AG
Zugstrasse 43, 8604 Zurich, Switzerland

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

Accreditation No: **SCS 0108**

Glossary:

TSL: Issue simulating liquid sensitivity in TSL / NORM x,y,z

ConvF: not applicable or not measured

N/A: not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- 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
- 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
- KDB 665664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- 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: D450V3-1103_Apr21 Page 2 of 6

Measurement Conditions

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

DASY Version	DASY5	V82.10.4
Extrapolation	Advanced Extrapolation	
Phantom	ELJ Flat Phantom	Shell thickness: 2 ± 0.2 mm
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied:

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	43.5	0.57 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	43.1 $\pm$ 6 %	0.07 mho/m $\pm$ 8 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	4.55 W/kg $\pm$ 18.1 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	0.757 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	3.06 W/kg $\pm$ 17.6 % (k=2)

Certificate No: D450V3-1103_Apr21

Page 3 of 6

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

Date: 21.04.2021

DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN:1103

Communication System: UTD 0 - CW; Frequency: 450 MHz

Medium parameters used: f = 450 MHz; α = 0.87 S/m; ϵ_r = 43.1; ρ = 1000 kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF [10.64, 10.64] @ 450 MHz; Calibrated: 30.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 26.06.2020
- Phantom: ELJ v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.10.4 (1527); SEMCAD X (4.6.14/7483)

Dipole Calibration for Head Tissue d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 39.18 V/m; Power Dfitt = -0.08 dB

Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.767 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 64.9%

Maximum value of SAR (measured) = 1.53 W/kg

Certificate No: D450V3-1103_Apr21

Page 4 of 6

Appendix (Additional assessments outside the scope of SCS 0106)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	57.1 Ω - j2.6 jΩ
Return Loss	-23.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.346 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 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
-----------------	-------

Certificate No: D450V3-1103_Apr21

Page 4 of 6

Certificate No: D450V3-1103_Apr21

Page 4 of 6



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学院创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

1.3 D750V3 - SN 1188

TTL Speag CALIBRATION LABORATORY		CAICT																					
Add: No.52 HuaYuanli Road, Haidian District, Beijing, 100191 Tel: +86-10-4236633-2172 Fax: +86-10-4236633-2564 E-mail: cti@china-test.com http://www.china-test.com		Add: No.52 HuaYuanli Road, Haidian District, Beijing, 100191 Tel: +86-10-4236633-2079 Fax: +86-10-4236633-2564 E-mail: cti@china-test.com http://www.china-test.com																					
Client: SGS-CN		Certificate No.: Z22-60103																					
CALIBRATION CERTIFICATE																							
Object: D750V3 - SN: 1188																							
Calibration Procedure(s): FF-Z11-003-01 Calibration Procedures for dipole validation kits																							
Calibration date: March 28, 2022																							
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)																							
<table border="1"><thead><tr><th>Primary Standards</th><th>ID #</th><th>Cal Date (Calibrated by Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Power Meter NRP2</td><td>104277</td><td>24-Sep-21 (CTTL No. J21X08328)</td><td>Sep-22</td></tr><tr><td>Power sensor NRP88</td><td>104291</td><td>24-Sep-21 (CTTL No. J21X08328)</td><td>Sep-22</td></tr><tr><td>Reference Probe EX30V4</td><td>SN 7307</td><td>26-May-21 (SPEAG No. EX3-7307_May21)</td><td>May-22</td></tr><tr><td>DAE4</td><td>SN 1556</td><td>12-Jan-22 (CTTL-SPEAG No. Z22-60007)</td><td>Jan-23</td></tr></tbody></table>				Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration	Power Meter NRP2	104277	24-Sep-21 (CTTL No. J21X08328)	Sep-22	Power sensor NRP88	104291	24-Sep-21 (CTTL No. J21X08328)	Sep-22	Reference Probe EX30V4	SN 7307	26-May-21 (SPEAG No. EX3-7307_May21)	May-22	DAE4	SN 1556	12-Jan-22 (CTTL-SPEAG No. Z22-60007)	Jan-23
Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration																				
Power Meter NRP2	104277	24-Sep-21 (CTTL No. J21X08328)	Sep-22																				
Power sensor NRP88	104291	24-Sep-21 (CTTL No. J21X08328)	Sep-22																				
Reference Probe EX30V4	SN 7307	26-May-21 (SPEAG No. EX3-7307_May21)	May-22																				
DAE4	SN 1556	12-Jan-22 (CTTL-SPEAG No. Z22-60007)	Jan-23																				
<table border="1"><thead><tr><th>Secondary Standards</th><th>ID #</th><th>Cal Date (Calibrated by Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Signal Generator S4436C</td><td>MY46071430</td><td>13-Jan-22 (CTTL No. J22X00406)</td><td>Jan-23</td></tr><tr><td>Network Analyzer E5071C</td><td>MY46110673</td><td>14-Jan-22 (CTTL No. J22X00406)</td><td>Jan-23</td></tr></tbody></table>				Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration	Signal Generator S4436C	MY46071430	13-Jan-22 (CTTL No. J22X00406)	Jan-23	Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL No. J22X00406)	Jan-23								
Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration																				
Signal Generator S4436C	MY46071430	13-Jan-22 (CTTL No. J22X00406)	Jan-23																				
Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL No. J22X00406)	Jan-23																				
Calibrated by: Zhao Jing SAR Test Engineer		Signature: [Signature]																					
Reviewed by: Lin Hao SAR Test Engineer		Signature: [Signature]																					
Approved by: Qi Dianyun SAR Project Leader		Signature: [Signature]																					
Issued: April 3, 2022																							
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.																							
Certificate No: Z22-60103		Page 1 of 6																					

TTL Speag CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanli Road, Haidian District, Beijing, 100191 Tel: +86-10-4236633-2079 Fax: +86-10-4236633-2564 E-mail: cti@china-test.com http://www.china-test.com		Add: No.52 HuaYuanli Road, Haidian District, Beijing, 100191 Tel: +86-10-4236633-2079 Fax: +86-10-4236633-2564 E-mail: cti@china-test.com http://www.china-test.com	
Measurement Conditions DASY system configuration, as far as not given on page 1:			
DASY Version		DASY52	
Extrapolation		Advanced Extrapolation	
Phantom		Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL		15 mm with Spacer	
Zoom Scan Resolution		dx, dy, dz = 5 mm	
Frequency		750 MHz ± 1 MHz	

Head TSL parameters			
The following parameters and calculations were applied:			
	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	42.0	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.4 ± 0.5 %	0.89 mho/m ± 0 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL		
SAR averaged over 1 cm ² (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.27 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ² (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.48 W/kg ± 18.7 % (k=2)

Appendix (Additional assessments outside the scope of CNAS L0570)	
Antenna Parameters with Head TSL	
Impedance, transformed to head point	53.60 - 1.13jΩ
Return Loss	-28.7dB
General Antenna Parameters and Design	
Electrical Delay (one direction)	0.947 ns
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 and caps are added to the dipole arms in order to improve matching when placed 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 feed-point may be damaged.	
Additional EUT Data	
Manufactured by	SPEAG

TTL Speag CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanli Road, Haidian District, Beijing, 100191 Tel: +86-10-4236633-2079 Fax: +86-10-4236633-2564 E-mail: cti@china-test.com http://www.china-test.com		Add: No.52 HuaYuanli Road, Haidian District, Beijing, 100191 Tel: +86-10-4236633-2079 Fax: +86-10-4236633-2564 E-mail: cti@china-test.com http://www.china-test.com	
Certificate No: Z22-60103			
Page 1 of 6			

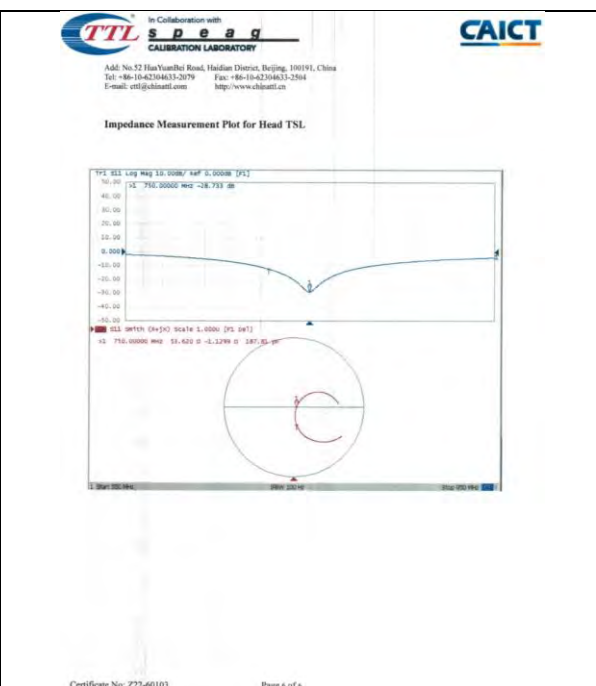


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

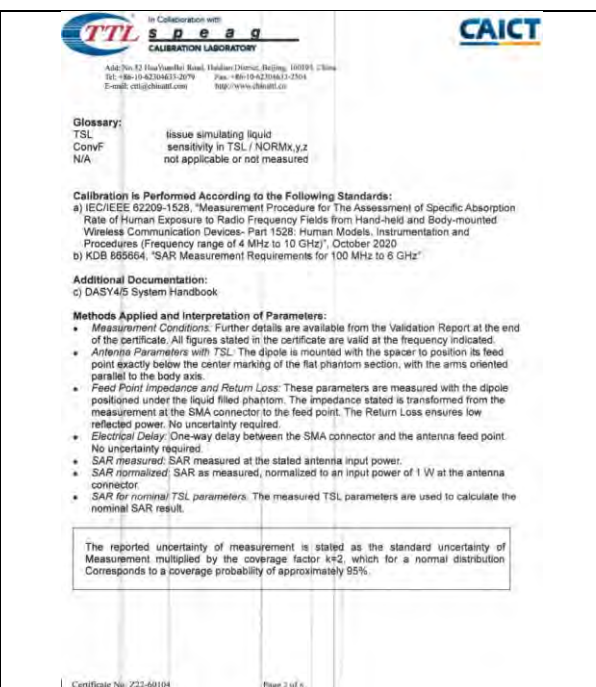
Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

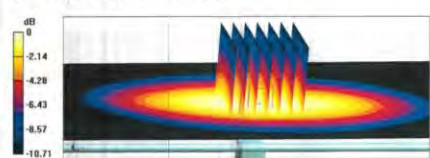
t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

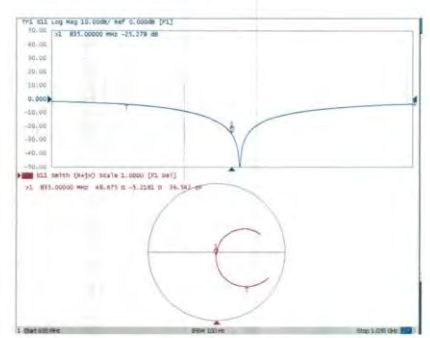


		中国认证 中国认可 校准 CALIBRATION CNAS LISTED	
Add: No.32 HuaYuanliu Road, Haidian District, Beijing, 100191 Tel: +86-10-82304033-2312 Fax: +86-10-82304813-2304 E-mail: cttli@chinaulm.com http://www.chinaulm.com		客户: S05-CN 证书编号: 222-60104	
CALIBRATION CERTIFICATE			
Object		D835V2 - SN: 41914	
Calibration Procedure(s)		FF-Z11-003-01 Calibration Procedures for dipole validation kits	
Calibration date		March 31, 2022	
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 (MATE critical for calibration)			
Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Power Meter NRP/2	100277	24-Sep-21 (CTTL No.J21X08326)	Sep-22
Power sensor NRP/PS	104261	24-Sep-21 (CTTL No.J21X08326)	Sep-22
Reference Probe EX3D/V4	SN 7307	26-May-21 (SPEAG No.EX3-7307_May21)	May-22
DAE4	SN 1556	12-Jan-22 (CTTL-SPEAG No.222-60007)	Jan-23
Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Signal Generator E438C	MY49071430	13-Jan-22 (CTTL No.222X0409)	Jan-23
Network Analyzer ES071C	MY46110673	14-Jan-22 (CTTL No.222X0408)	Jan-23
Calibrated by:	Name Zhao Jing	Function SAR Test Engineer	Signature
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyun	SAR Project Leader	
Issued: April 6, 2022 This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			



TTL SPEAG CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanHe Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com http://www.china.ttl.com		Add: No.52 HuaYuanHe Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com http://www.china.ttl.com	
Measurement Conditions DASY system configuration, as far as not given on page 1			
DASY Version	DASY52	VS2 10.4	
Extrapolation	Advanced Extrapolation		
Phantom	Triple Flat Phantom 5.1C		
Distance Dipole Center - TSL	15 mm	with Spacer	
Zoom Scan Resolution	dx, dy, dz = 5 mm		
Frequency	835 MHz ± 1 MHz		
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	41.0 ± 0.5	0.91 mho/m ± 0.5%
Head TSL temperature change during last	< 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	2.37 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	6.40 W/kg ± 18.8% (k=2)	
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition		
SAR measured	250 mW input power	1.54 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	6.12 W/kg ± 18.7% (k=2)	
Appendix (Additional assessments outside the scope of CNAS L0570)			
Antenna Parameters with Head TSL			
Impedance, transformed to feed point	48.70 - j5.22Ω		
Return Loss	-25.3dB		
General Antenna Parameters and Design			
Electrical Delay (one direction)	1.307 ns		
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 feed-point may be damaged.			
Additional EUT Data			
Manufactured by	SPEAG		
Certificate No: Z22-60104 Page 1 of 6			

TTL SPEAG CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanHe Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com http://www.china.ttl.com		Add: No.52 HuaYuanHe Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com http://www.china.ttl.com	
DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 40114 Communication System: UTD 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium parameters used: f = 835 MHz; σ = 0.907 S/m; ε _r = 40.98; ρ = 1000 kg/m ³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration: - Probe: EX3DV4 - SN7307; ConvF(10.13, 10.13, 10.13) @ 835 MHz; Calibrated: 2021-05-26 - Sensor Surface: 1.4mm (Mechanical Surface Detection) - Electronics: DA64 Sn1556; Calibrated: 2022-01-12 - Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062 - DASY52 52.10.4(153); SEMCAD X 14.6.14(7501)			
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7) Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 57.88 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 3.56 W/kg SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.54 W/kg Smallest distance from peaks to all points 3 dB below = 15.8 mm Ratio of SAR at M2 to SAR at M1 = 66.2% Maximum value of SAR (measured) = 3.17 W/kg			
			
0 dB = 3.17 W/kg = 5.01 dBW/kg			
Certificate No: Z22-60104 Page 1 of 6			

TTL SPEAG CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanHe Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com http://www.china.ttl.com		Add: No.52 HuaYuanHe Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com http://www.china.ttl.com	
Impedance Measurement Plot for Head TSL			
			
Certificate No: Z22-60104 Page 6 of 6			



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
 No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
 中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
 t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

1.5 D900V2 - SN 1d079

TTL S p e a g CALIBRATION LABORATORY		CAICT																					
Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn		Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn																					
Client: SGS-CN		Certificate No: Z22-60184																					
CALIBRATION CERTIFICATE																							
Object: D900V2 - SN 1d079																							
Calibration Procedure(s): PF-Z11-003-01																							
Calibration date: June 7, 2022																							
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 (23±1)°C and humidity 70%.																							
Calibration Equipment used (M&E critical for calibration)																							
<table border="1"><thead><tr><th>Primary Standards</th><th>ID #</th><th>Cal Date (Calibrated by Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Power Meter NRP2</td><td>106277</td><td>24-Sep-21 (CTTL No. J21X08326)</td><td>Sep-22</td></tr><tr><td>Power sensor NRP85</td><td>104291</td><td>24-Sep-21 (CTTL No. J21X08326)</td><td>Sep-22</td></tr><tr><td>Reference Probe EX32V4</td><td>SN 7464</td><td>26-Jan-22 (SPEAG No. EX3-7464_Jan22)</td><td>Jan-23</td></tr><tr><td>DAE4</td><td>SN 1586</td><td>12-Jan-22 (CTTL-SPEAG No. Z22-60007)</td><td>Jan-23</td></tr></tbody></table>				Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration	Power Meter NRP2	106277	24-Sep-21 (CTTL No. J21X08326)	Sep-22	Power sensor NRP85	104291	24-Sep-21 (CTTL No. J21X08326)	Sep-22	Reference Probe EX32V4	SN 7464	26-Jan-22 (SPEAG No. EX3-7464_Jan22)	Jan-23	DAE4	SN 1586	12-Jan-22 (CTTL-SPEAG No. Z22-60007)	Jan-23
Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration																				
Power Meter NRP2	106277	24-Sep-21 (CTTL No. J21X08326)	Sep-22																				
Power sensor NRP85	104291	24-Sep-21 (CTTL No. J21X08326)	Sep-22																				
Reference Probe EX32V4	SN 7464	26-Jan-22 (SPEAG No. EX3-7464_Jan22)	Jan-23																				
DAE4	SN 1586	12-Jan-22 (CTTL-SPEAG No. Z22-60007)	Jan-23																				
<table border="1"><thead><tr><th>Secondary Standards</th><th>ID #</th><th>Cal Date (Calibrated by Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Signal Generator E2438C</td><td>MY43071430</td><td>13-Jan-22 (CTTL No. J22X00406)</td><td>Jan-23</td></tr><tr><td>Network Analyzer E5071C</td><td>MY43110473</td><td>14-Jan-22 (CTTL No. J22X00406)</td><td>Jan-23</td></tr></tbody></table>				Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration	Signal Generator E2438C	MY43071430	13-Jan-22 (CTTL No. J22X00406)	Jan-23	Network Analyzer E5071C	MY43110473	14-Jan-22 (CTTL No. J22X00406)	Jan-23								
Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration																				
Signal Generator E2438C	MY43071430	13-Jan-22 (CTTL No. J22X00406)	Jan-23																				
Network Analyzer E5071C	MY43110473	14-Jan-22 (CTTL No. J22X00406)	Jan-23																				
Calibrated by: Name: Zhao Jing, Function: SAR Test Engineer, Signature: [Signature]																							
Reviewed by: Lin Hao, SAR Test Engineer, Signature: [Signature]																							
Approved by: Qi Dianyan, SAR Project Leader, Signature: [Signature]																							
Issued: June 13, 2022																							
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.																							
Certificate No: Z22-60184		Page 1 of 6																					

TTL S p e a g CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn		Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn	
Glossary:			
TSL: tissue simulating liquid			
ConvF: sensitivity in TSL / NORM.y,z			
N/A: not applicable or not measured			
Calibration is Performed According to the Following Standards:			
a) IEC/IEEE 62209-1529, "Measurement Procedure for The Assessment of Specific Absorption Rate of Human Exposure to Radio Frequency Fields from Hand-held and Body-mounted Wireless Communication Devices-Part 1529: Human Models, Instrumentation and Procedures (Frequency range of 4 MHz to 10 GHz)", October 2020			
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"			
Additional Documentation:			
c) DASYS45 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: Z22-60184		Page 1 of 6	

TTL S p e a g CALIBRATION LABORATORY		CAICT																			
Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn		Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn																			
Measurement Conditions																					
DASYS system configuration, as far as is given on page 1:																					
<table border="1"><thead><tr><th>DASYS Version</th><th>DASYS2</th><th>52.10.4</th></tr></thead><tbody><tr><td>Extrapolation</td><td>Advanced Extrapolation</td><td></td></tr><tr><td>Phantom</td><td>Triple Flat Phantom 5.1C</td><td></td></tr><tr><td>Distance Dipole Center - TSL</td><td>15 mm</td><td>with Spacer</td></tr><tr><td>Zoom Scan Resolution</td><td>0x, dy, dz = 5 mm</td><td></td></tr><tr><td>Frequency</td><td>900 MHz ± 1 MHz</td><td></td></tr></tbody></table>				DASYS Version	DASYS2	52.10.4	Extrapolation	Advanced Extrapolation		Phantom	Triple Flat Phantom 5.1C		Distance Dipole Center - TSL	15 mm	with Spacer	Zoom Scan Resolution	0x, dy, dz = 5 mm		Frequency	900 MHz ± 1 MHz	
DASYS Version	DASYS2	52.10.4																			
Extrapolation	Advanced Extrapolation																				
Phantom	Triple Flat Phantom 5.1C																				
Distance Dipole Center - TSL	15 mm	with Spacer																			
Zoom Scan Resolution	0x, dy, dz = 5 mm																				
Frequency	900 MHz ± 1 MHz																				
Head TSL parameters																					
The following parameters and calculations were applied:																					
<table border="1"><thead><tr><th></th><th>Temperature</th><th>Permittivity</th><th>Conductivity</th></tr></thead><tbody><tr><td>Nominal Head TSL parameters</td><td>22.0 °C</td><td>41.5</td><td>0.97 mho/m</td></tr><tr><td>Measured Head TSL parameters</td><td>(22.0 ± 0.2) °C</td><td>42.1 ± 6 %</td><td>0.98 mho/m ± 6 %</td></tr><tr><td>Head TSL temperature change during test</td><td><+1.0 °C</td><td>—</td><td>—</td></tr></tbody></table>					Temperature	Permittivity	Conductivity	Nominal Head TSL parameters	22.0 °C	41.5	0.97 mho/m	Measured Head TSL parameters	(22.0 ± 0.2) °C	42.1 ± 6 %	0.98 mho/m ± 6 %	Head TSL temperature change during test	<+1.0 °C	—	—		
	Temperature	Permittivity	Conductivity																		
Nominal Head TSL parameters	22.0 °C	41.5	0.97 mho/m																		
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.1 ± 6 %	0.98 mho/m ± 6 %																		
Head TSL temperature change during test	<+1.0 °C	—	—																		
SAR result with Head TSL																					
<table border="1"><thead><tr><th>SAR averaged over 1 cm³ (1 g) of Head TSL</th><th>Condition</th><th></th></tr></thead><tbody><tr><td>SAR measured</td><td>250 mW input power</td><td>2.75 W/kg</td></tr><tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>11.0 W/kg ± 18.8 % (k=2)</td></tr><tr><td>SAR averaged over 10 cm³ (10 g) of Head TSL</td><th>Condition</th><th></th></tr><tr><td>SAR measured</td><td>250 mW input power</td><td>1.75 W/kg</td></tr><tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>7.09 W/kg ± 18.7 % (k=2)</td></tr></tbody></table>				SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition		SAR measured	250 mW input power	2.75 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	11.0 W/kg ± 18.8 % (k=2)	SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition		SAR measured	250 mW input power	1.75 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	7.09 W/kg ± 18.7 % (k=2)
SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition																				
SAR measured	250 mW input power	2.75 W/kg																			
SAR for nominal Head TSL parameters	normalized to 1W	11.0 W/kg ± 18.8 % (k=2)																			
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition																				
SAR measured	250 mW input power	1.75 W/kg																			
SAR for nominal Head TSL parameters	normalized to 1W	7.09 W/kg ± 18.7 % (k=2)																			
Certificate No: Z22-60184		Page 1 of 6																			

TTL S p e a g CALIBRATION LABORATORY		CAICT							
Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn		Add: No.52 HuaYuan Road, Haidian District, Beijing, 100191 Tel: +86-10-62346323/3117 E-mail: cti@sgs.com.cn							
Appendix (Additional assessments outside the scope of CNAS L0670)									
Antenna Parameters with Head TSL									
<table border="1"><thead><tr><th></th><th>48 (10-9-450)</th></tr></thead><tbody><tr><td>Impedance, transformed to feed point</td><td></td></tr><tr><td>Return Loss</td><td>-23.3 dB</td></tr></tbody></table>					48 (10-9-450)	Impedance, transformed to feed point		Return Loss	-23.3 dB
	48 (10-9-450)								
Impedance, transformed to feed point									
Return Loss	-23.3 dB								
General Antenna Parameters and Design									
<table border="1"><thead><tr><th>Electrical Delay (90° direction)</th><th>1.312 ns</th></tr></thead><tbody><tr><td></td><td></td></tr></tbody></table>				Electrical Delay (90° direction)	1.312 ns				
Electrical Delay (90° direction)	1.312 ns								
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.									
The dipole is made of standard serringid 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 feed-point may be damaged.									
Additional EUT Data									
<table border="1"><thead><tr><th>Manufactured by</th><th>SPEAG</th></tr></thead><tbody><tr><td></td><td></td></tr></tbody></table>				Manufactured by	SPEAG				
Manufactured by	SPEAG								
Certificate No: Z22-60184		Page 1 of 6							

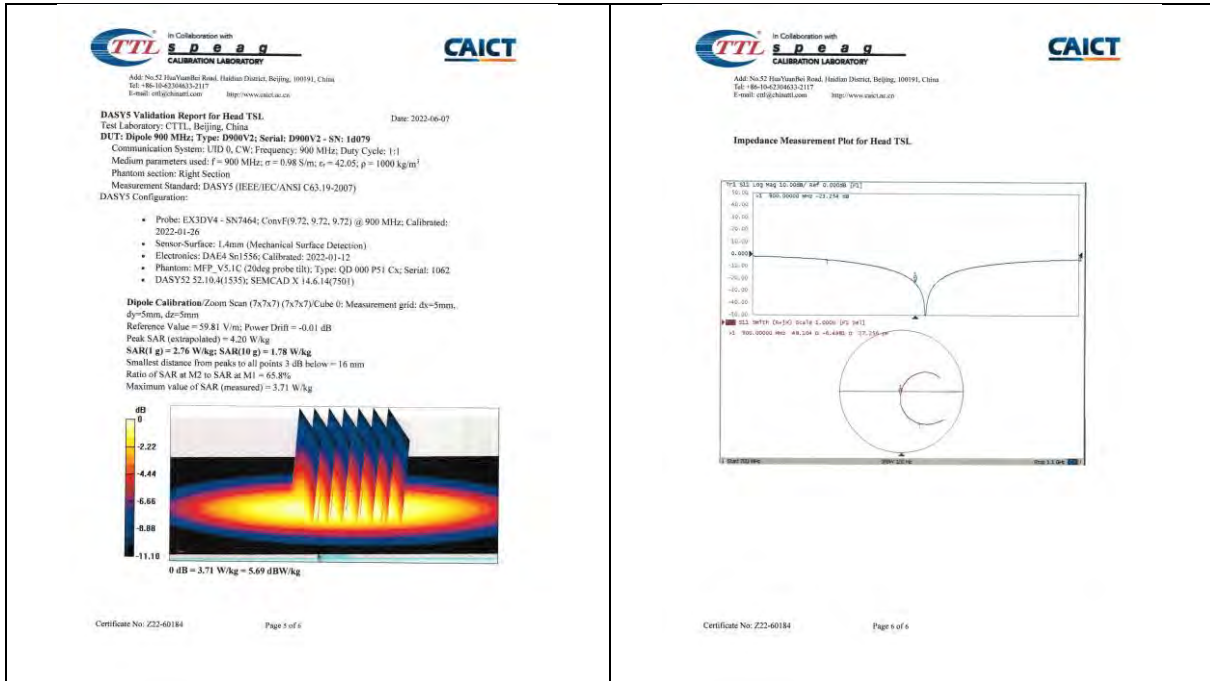


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>, and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

(86-512) 57355888 (86-512) 57370818 www.sgs.com.cn
(86-512) 57355888 (86-512) 57370818 sgs.china@sgs.com



1.6 D1800V2 - SN 2d170

TTL Calibration Laboratory
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-4230633-2117
E-mail: cti@china.ttl.com.cn

CAICT

Client: **SGS-CN** Certificate No: **Z22-60105**

CALIBRATION CERTIFICATE

Object: **D1800V2 - SN: 2d170**

Calibration Procedure(s): **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

Calibration date: **March 31, 2022**

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 NRP2	106277	24-Sep-21 (CTTL No.J21X05326)	Sep-22
Power sensor NRP8S	104291	24-Sep-21 (CTTL No.J21X05326)	Sep-22
Reference Probe EX3DV4	SN 7307	26-May-21 (SPEAG No.EX3-7307_May21)	May-22
DAE4	SN 1556	12-Jan-22 (CTTL-SPEAG No.Z22-60007)	Jan-23

Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	13-Jan-22 (CTTL No.J22X00409)	Jan-23
Network Analyzer E5071C	MY48110673	14-Jan-22 (CTTL No.J22X00409)	Jan-23

Calibrated by: **Zhao Jing** SAR Test Engineer
Reviewed by: **Lin Hao** SAR Test Engineer
Approved by: **Qi Dianyan** SAR Project Leader

Issued: April 6, 2022
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z22-60105 Page 1 of 6

TTL Calibration Laboratory
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-4230633-2117
E-mail: cti@china.ttl.com.cn

CAICT

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:

- IEC/IEEE 62209-1528, "Measurement Procedure for The Assessment of Specific Absorption Rate of Human Exposure to Radio Frequency Fields from Hand-held and Body-mounted Wireless Communication Devices- Part 1528: Human Models, Instrumentation and Procedures (Frequency range of 4 MHz to 10 GHz)", October 2020
- KDB 855664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:
c) 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: Z22-60105 Page 2 of 6

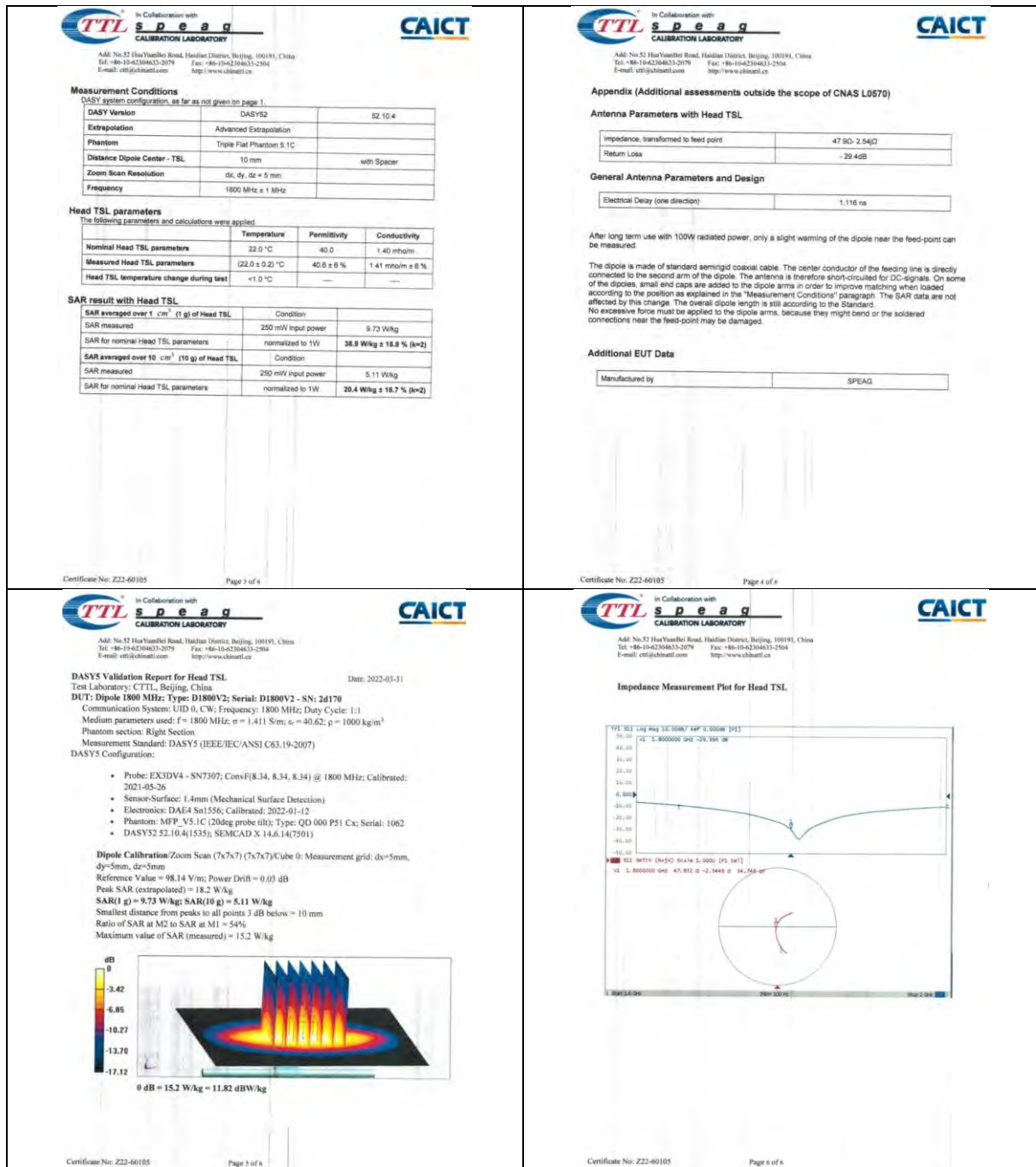


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

1.7 D1900V2 - SN 5d136

TTL S p e a g CALIBRATION LABORATORY		CAICT																					
Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn		Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn																					
Client: SGS-CN		Certificate No: Z22-60185																					
CALIBRATION CERTIFICATE																							
Object: D1900V2 - SN 5d136																							
Calibration Procedure(s): FF-Z11-003-01 Calibration Procedures for dipole validation kits																							
Calibration date: June 7, 2022																							
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 (23±1)°C and humidity <70%.																							
Calibration Equipment used (M&E critical for calibration)																							
<table border="1"><thead><tr><th>Primary Standards</th><th>ID #</th><th>Cal Date (Calibrated by Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Power Meter NRP2</td><td>106277</td><td>24-Sep-21 (CTTL No. J21X08326)</td><td>Sep-22</td></tr><tr><td>Power sensor NRP65</td><td>104291</td><td>24-Sep-21 (CTTL No. J21X08326)</td><td>Sep-22</td></tr><tr><td>Reference Probe EXSDV4</td><td>SN 7404</td><td>28-Jan-22 (SPEAG No. EX3-7404_Jan22)</td><td>Jan-23</td></tr><tr><td>DAEA</td><td>SN 1558</td><td>12-Jan-22 (CTTL No. J22-60007)</td><td>Jan-23</td></tr></tbody></table>				Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration	Power Meter NRP2	106277	24-Sep-21 (CTTL No. J21X08326)	Sep-22	Power sensor NRP65	104291	24-Sep-21 (CTTL No. J21X08326)	Sep-22	Reference Probe EXSDV4	SN 7404	28-Jan-22 (SPEAG No. EX3-7404_Jan22)	Jan-23	DAEA	SN 1558	12-Jan-22 (CTTL No. J22-60007)	Jan-23
Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration																				
Power Meter NRP2	106277	24-Sep-21 (CTTL No. J21X08326)	Sep-22																				
Power sensor NRP65	104291	24-Sep-21 (CTTL No. J21X08326)	Sep-22																				
Reference Probe EXSDV4	SN 7404	28-Jan-22 (SPEAG No. EX3-7404_Jan22)	Jan-23																				
DAEA	SN 1558	12-Jan-22 (CTTL No. J22-60007)	Jan-23																				
<table border="1"><thead><tr><th>Secondary Standards</th><th>ID #</th><th>Cal Date (Calibrated by Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Signal Generator E4438C</td><td>MY48271430</td><td>13-Jan-22 (CTTL No. J22X00409)</td><td>Jan-23</td></tr><tr><td>Network Analyzer E5071C</td><td>MY48110073</td><td>14-Jan-22 (CTTL No. J22X00406)</td><td>Jan-23</td></tr></tbody></table>				Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration	Signal Generator E4438C	MY48271430	13-Jan-22 (CTTL No. J22X00409)	Jan-23	Network Analyzer E5071C	MY48110073	14-Jan-22 (CTTL No. J22X00406)	Jan-23								
Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration																				
Signal Generator E4438C	MY48271430	13-Jan-22 (CTTL No. J22X00409)	Jan-23																				
Network Analyzer E5071C	MY48110073	14-Jan-22 (CTTL No. J22X00406)	Jan-23																				
Calibrated by: Name: Zhao Jing, Function: SAR Test Engineer, Signature: [Signature]																							
Reviewed by: Name: Lin Hao, Function: SAR Test Engineer, Signature: [Signature]																							
Approved by: Name: Qi Diqian, Function: SAR Project Leader, Signature: [Signature]																							
Issued: June 13, 2022																							
The calibration certificate shall not be reproduced except in full without written approval of the laboratory.																							
Certificate No: Z22-60185		Page 1 of 8																					

TTL S p e a g CALIBRATION LABORATORY		CAICT	
Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn		Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn	
Client: SGS-CN		Certificate No: Z22-60185	
Glossary:			
TSL		Issue simulating liquid	
ConF		sensitivity in TSL / NORM x y,z	
NA		not applicable or not measured	
Calibration is performed according to the following standards:			
a) IEC/IEEE 62209-1528, "Measurement Procedure for The Assessment of Specific Absorption Rate of Human Exposure to Radio Frequency Fields from Hand-held and Body-mounted Wireless Communication Devices- Part 1528: Human Models, Instrumentation and Procedures (Frequency range of 4 MHz to 10 GHz)", October 2020			
b) KDB 855884, "SAR Measurement Requirements for 100 MHz to 6 GHz"			
Additional Documentation:			
c) 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: Z22-60185		Page 2 of 8	

TTL S p e a g CALIBRATION LABORATORY		CAICT																			
Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn		Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn																			
Client: SGS-CN		Certificate No: Z22-60185																			
Measurement Conditions																					
DASY system configuration, as far as not given on page 1:																					
DASY Version: DASY52, 52.10.4																					
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:																					
<table border="1"><thead><tr><th>Nominal Head TSL parameters</th><th>Temperature</th><th>Permittivity</th><th>Conductivity</th></tr></thead><tbody><tr><td></td><td>22.0 °C</td><td>46.0</td><td>1.40 return</td></tr><tr><td>Measured Head TSL parameters</td><td>(22.0 ± 0.5) °C</td><td>39.9 ± 0.5 %</td><td>1.39 return ± 0.5 %</td></tr><tr><td>Head TSL temperature change during test</td><td>+1.0 °C</td><td>—</td><td>—</td></tr></tbody></table>				Nominal Head TSL parameters	Temperature	Permittivity	Conductivity		22.0 °C	46.0	1.40 return	Measured Head TSL parameters	(22.0 ± 0.5) °C	39.9 ± 0.5 %	1.39 return ± 0.5 %	Head TSL temperature change during test	+1.0 °C	—	—		
Nominal Head TSL parameters	Temperature	Permittivity	Conductivity																		
	22.0 °C	46.0	1.40 return																		
Measured Head TSL parameters	(22.0 ± 0.5) °C	39.9 ± 0.5 %	1.39 return ± 0.5 %																		
Head TSL temperature change during test	+1.0 °C	—	—																		
SAR result with Head TSL																					
The following parameters and calculations were applied:																					
<table border="1"><thead><tr><th>SAR averaged over 1 cm³ (1 g) of Head TSL</th><th>Condition</th><th>Result</th></tr></thead><tbody><tr><td>SAR measured</td><td>250 mW input power</td><td>9.65 W/kg</td></tr><tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>40.0 W/kg ± 16.8 % (k=2)</td></tr><tr><td>SAR averaged over 10 cm³ (10 g) of Head TSL</td><td>Condition</td><th>Result</th></tr><tr><td>SAR measured</td><td>250 mW input power</td><td>5.18 W/kg</td></tr><tr><td>SAR for nominal TSL parameters</td><td>normalized to 1W</td><td>20.8 W/kg ± 16.7 % (k=2)</td></tr></tbody></table>				SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	Result	SAR measured	250 mW input power	9.65 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	40.0 W/kg ± 16.8 % (k=2)	SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	Result	SAR measured	250 mW input power	5.18 W/kg	SAR for nominal TSL parameters	normalized to 1W	20.8 W/kg ± 16.7 % (k=2)
SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	Result																			
SAR measured	250 mW input power	9.65 W/kg																			
SAR for nominal Head TSL parameters	normalized to 1W	40.0 W/kg ± 16.8 % (k=2)																			
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	Result																			
SAR measured	250 mW input power	5.18 W/kg																			
SAR for nominal TSL parameters	normalized to 1W	20.8 W/kg ± 16.7 % (k=2)																			
Certificate No: Z22-60185		Page 3 of 8																			

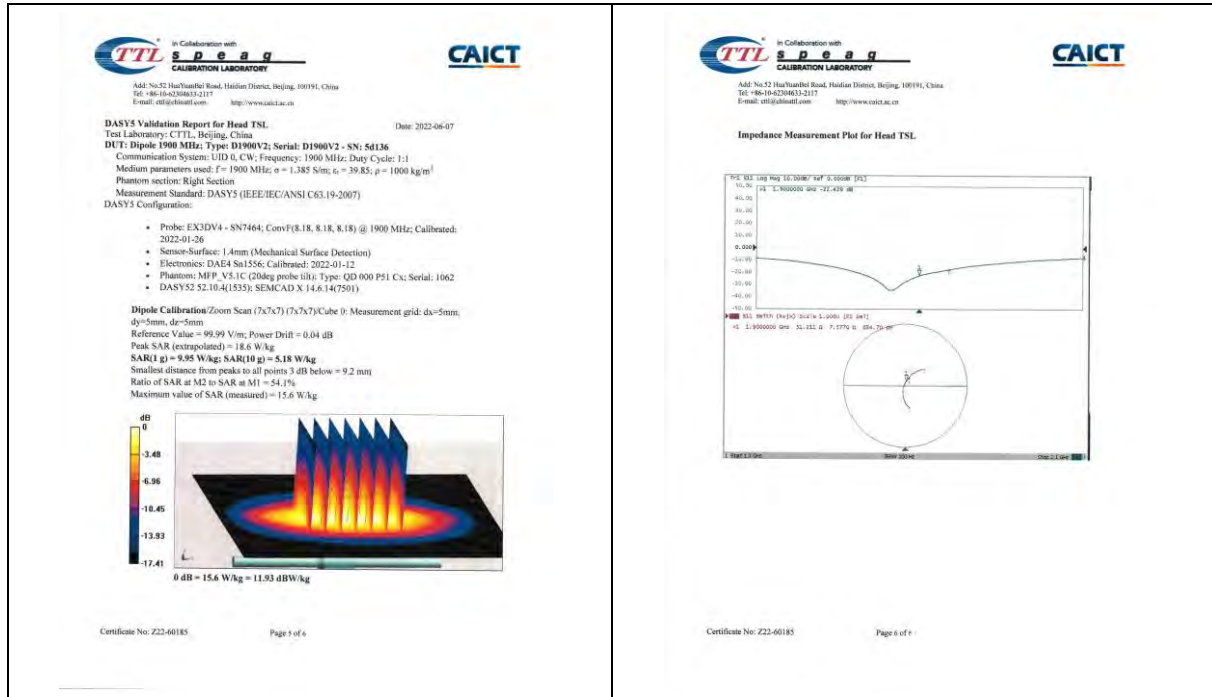
TTL S p e a g CALIBRATION LABORATORY		CAICT					
Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn		Add: No. 52 Huayuan Road, Haidian District, Beijing 101901 Tel: +86-10-4236403-2117 E-mail: csl@sgs.com.cn					
Client: SGS-CN		Certificate No: Z22-60185					
Appendix (Additional assessments outside the scope of CNAS L0570)							
Antenna Parameters with Head TSL							
<table border="1"><thead><tr><th>Impedance, transformed to feed point</th><th>51.02 ± 1.56 Ω</th></tr><tr><th>Return Loss</th><th>22.4 dB</th></tr></thead></table>				Impedance, transformed to feed point	51.02 ± 1.56 Ω	Return Loss	22.4 dB
Impedance, transformed to feed point	51.02 ± 1.56 Ω						
Return Loss	22.4 dB						
General Antenna Parameters and Design							
<table border="1"><thead><tr><th>Electrical Delay (one direction)</th><th>1.109 ns</th></tr></thead></table>				Electrical Delay (one direction)	1.109 ns		
Electrical Delay (one direction)	1.109 ns						
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 caps are added to the dipole arms in order to improve matching when loaded according to the position as specified 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 feed-point may be damaged.							
Additional EUT Data							
<table border="1"><thead><tr><th>Manufactured by</th><th>SPEAG</th></tr></thead></table>				Manufactured by	SPEAG		
Manufactured by	SPEAG						
Certificate No: Z22-60185		Page 4 of 8					



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
No. 10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

(86-512) 57355888 (86-512) 57370818 www.sgs.com.cn
(86-512) 57355888 (86-512) 57370818 sgs.china@sgs.com



1.8 D2000V2 - SN 1041

TTLSPEAG Calibration Laboratory
CAICT

Address: No.52 Huaiyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62586331-1117
E-mail: cti@ttspeag.com.cn

Client: **SGS-CN** Certificate No: **Z22-60186**

CALIBRATION CERTIFICATE

Object: D2000V2 - SN: 1041

Calibration Procedure(s): FF-Z11-003-01
Calibration Procedure for dipole validation kits

Calibration date: June 6, 2022

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 (23±3)°C and humidity <70%.

Calibration Equipment used (MATE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	24-Sep-21 (CTTL No. J21X08328)	Sep-22
Power sensor NRP5	104291	24-Sep-21 (CTTL No. J21X08328)	Sep-22
Reference Probe EX3DV4	SN 7464	26-Jan-22 (SPEAG No. EX3-7464, Jan22)	Jan-23
DAE4	SN 1556	12-Jan-22 (CTTL-SPEAG No. Z22-60007)	Jan-23

Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	13-Jan-22 (CTTL No. Z22X00408)	Jan-23
Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL No. Z22X00408)	Jan-23

Calibrated by: Zhao Jing SAR Test Engineer

Reviewed by: Lin Hao SAR Test Engineer

Approved by: Qi Danyuan SAR Project Leader

Issued: June 13, 2022

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

Certificate No: Z22-60186 Page 1 of 6

TTLSPEAG Calibration Laboratory
CAICT

Address: No.52 Huaiyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62586331-1117
E-mail: cti@ttspeag.com.cn

Glossary:

TSL: Issue simulating liquid

ConvF: sensitivity in TSL / NORMx.y.z

N/A: not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEC/IEEE 62209-1528, Measurement Procedure for The Assessment of Specific Absorption Rate of Human Exposure to Radio Frequency Fields from Hand-Head and Body-Mounted Wireless Communication Devices: Part 1528 Human Models, Instrumentation and Procedures (Frequency range of 4 MHz to 10 GHz), October 2020
- KDB 865564, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/S 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 Parameter 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: Z22-60186 Page 2 of 6

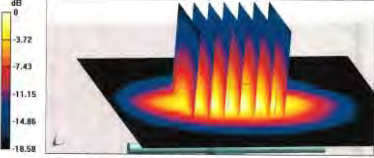
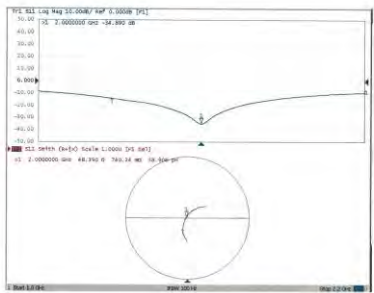


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No. 52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6204832-2117 E-mail: emc@chinaict.com.cn http://www.chinaict.com.cn Measurement Conditions DASY system configuration, as for as not given on page 1: <table border="1"><tr><td>DASY Version</td><td>DASY52</td><td>52.10.4</td></tr><tr><td>Extrapolation</td><td>Advanced Extrapolation</td><td></td></tr><tr><td>Phantom</td><td>Triple Flat Phantom S.1C</td><td></td></tr><tr><td>Distance Dipole Center - TSL</td><td>10 mm</td><td>with Spacer</td></tr><tr><td>Zoom Scan Resolution</td><td>dx, dy, dz = 5 mm</td><td></td></tr><tr><td>Frequency</td><td>2000 MHz ± 1 MHz</td><td></td></tr></table> Head TSL parameters The following parameters and calculations were applied: <table border="1"><tr><th></th><th>Temperature</th><th>Permittivity</th><th>Conductivity</th></tr><tr><td>Nominal Head TSL parameters</td><td>22.9 °C</td><td>40.0</td><td>1.40 mho/cm</td></tr><tr><td>Measured Head TSL parameters</td><td>(22.0 ± 0.2) °C</td><td>40.2 ± 0.6 %</td><td>1.36 mho/cm ± 0.6 %</td></tr><tr><td>Head TSL temperature change during test</td><td><1.0 °C</td><td></td><td></td></tr></table> SAR result with Head TSL <table border="1"><tr><th></th><th>Condition</th><th></th></tr><tr><td>SAR averaged over 1 cm² (1 g) of Head TSL</td><td></td><td></td></tr><tr><td>SAR measured</td><td>250 mW input power</td><td>10.4 W/kg</td></tr><tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>41.8 W/kg ± 15.8 % (n=2)</td></tr><tr><td>SAR averaged over 10 cm² (10 g) of Head TSL</td><td></td><td></td></tr><tr><td>SAR measured</td><td>250 mW input power</td><td>5.30 W/kg</td></tr><tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>21.3 W/kg ± 18.7 % (n=2)</td></tr></table> Certificate No: Z22-60186 Page 3 of 6	DASY Version	DASY52	52.10.4	Extrapolation	Advanced Extrapolation		Phantom	Triple Flat Phantom S.1C		Distance Dipole Center - TSL	10 mm	with Spacer	Zoom Scan Resolution	dx, dy, dz = 5 mm		Frequency	2000 MHz ± 1 MHz			Temperature	Permittivity	Conductivity	Nominal Head TSL parameters	22.9 °C	40.0	1.40 mho/cm	Measured Head TSL parameters	(22.0 ± 0.2) °C	40.2 ± 0.6 %	1.36 mho/cm ± 0.6 %	Head TSL temperature change during test	<1.0 °C				Condition		SAR averaged over 1 cm ² (1 g) of Head TSL			SAR measured	250 mW input power	10.4 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	41.8 W/kg ± 15.8 % (n=2)	SAR averaged over 10 cm ² (10 g) of Head TSL			SAR measured	250 mW input power	5.30 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	21.3 W/kg ± 18.7 % (n=2)	In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No. 52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6204832-2117 E-mail: emc@chinaict.com.cn http://www.chinaict.com.cn Appendix (Additional assessments outside the scope of CNAS L0570) Antenna Parameters with Head TSL <table border="1"><tr><td>Impedance, transformed to feed point</td><td>48.4Ω ± 0.74Ω</td></tr><tr><td>Return Loss</td><td>-34.8dB</td></tr></table> General Antenna Parameters and Design <table border="1"><tr><td>Electrical Delay (one direction)</td><td>1.08 ns</td></tr></table> After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured. The dipole is made of standard semi-rigid 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 and large 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 feed-point may be damaged. Additional EUT Data <table border="1"><tr><td>Manufactured by</td><td>SPEAQ</td></tr></table> Certificate No: Z22-60186 Page 4 of 6	Impedance, transformed to feed point	48.4Ω ± 0.74Ω	Return Loss	-34.8dB	Electrical Delay (one direction)	1.08 ns	Manufactured by	SPEAQ
DASY Version	DASY52	52.10.4																																																														
Extrapolation	Advanced Extrapolation																																																															
Phantom	Triple Flat Phantom S.1C																																																															
Distance Dipole Center - TSL	10 mm	with Spacer																																																														
Zoom Scan Resolution	dx, dy, dz = 5 mm																																																															
Frequency	2000 MHz ± 1 MHz																																																															
	Temperature	Permittivity	Conductivity																																																													
Nominal Head TSL parameters	22.9 °C	40.0	1.40 mho/cm																																																													
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.2 ± 0.6 %	1.36 mho/cm ± 0.6 %																																																													
Head TSL temperature change during test	<1.0 °C																																																															
	Condition																																																															
SAR averaged over 1 cm ² (1 g) of Head TSL																																																																
SAR measured	250 mW input power	10.4 W/kg																																																														
SAR for nominal Head TSL parameters	normalized to 1W	41.8 W/kg ± 15.8 % (n=2)																																																														
SAR averaged over 10 cm ² (10 g) of Head TSL																																																																
SAR measured	250 mW input power	5.30 W/kg																																																														
SAR for nominal Head TSL parameters	normalized to 1W	21.3 W/kg ± 18.7 % (n=2)																																																														
Impedance, transformed to feed point	48.4Ω ± 0.74Ω																																																															
Return Loss	-34.8dB																																																															
Electrical Delay (one direction)	1.08 ns																																																															
Manufactured by	SPEAQ																																																															
In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No. 52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6204832-2117 E-mail: emc@chinaict.com.cn http://www.chinaict.com.cn DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China DUT: Dipole 2000 MHz; Type: D2000V2; Serial: D2000V2 - SN: 1041 Communication System: UTD 0; CW; Frequency: 2000 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2000 MHz; σ = 1.392 S/m; ε = 40.21; ρ = 1000 kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration: - Probe: EX3DV4 - SN7464; ConvF(R2, R2, R2) @ 2000 MHz; Calibrated: 2022-01-26 - Sensor Surface: 1.4mm (Mechanical Surface Detection) - Electronics: DA64 Sn1556; Calibrated: 2022-01-12 - Phantom: MPP_V5.1C (204kg probe tilt); Type: QD 000 P51 Cx; Serial: 1062 - DASY52: S2.10.4(1555); SEMCAD X 14.6.14(7501) Dipole Calibration/Zoom Scan (7x7x7) (7x7x7) Cube (0; Measurement grid: dx=5mm, dy=5mm, dz=5mm) Reference Value = 103.4 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 19.6 W/kg SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.3 W/kg Smallest distance from peaks to all points 3 dB below = 9.1 mm Ratio of SAR at M2 to SAR at M1 = 51.0 % Maximum value of SAR (measured) = 16.3 W/kg  0 dB = 16.3 W/kg = 12.12 dBW/kg Certificate No: Z22-60186 Page 5 of 6	In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No. 52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6204832-2117 E-mail: emc@chinaict.com.cn http://www.chinaict.com.cn Impedance Measurement Plot for Head TSL  Certificate No: Z22-60186 Page 6 of 6																																																															



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No. 10, Weyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

1.9 D2300V2 - SN 1096

TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanbei Road, Haidian District, Beijing, 100191 Tel: +86-10-6230433-2512 Fax: +86-10-6230433-2504 E-mail: cti@chinaul.com http://www.chinaul.cn		Add: No.52 HuaYuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6230433-2079 Fax: +86-10-6230433-2504 E-mail: cti@chinaul.com http://www.chinaul.cn	
Client: SGS-CN		Certificate No: Z22-60106	
CALIBRATION CERTIFICATE			
Object	D2300V2 - SN 1096		
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits		
Calibration date:	March 31, 2022		
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 NRP2	106277	24-Sep-21 (CTTL No.J21X08328)	Sep-22
Power sensor NRP8	104291	24-Sep-21 (CTTL No.J21X08328)	Sep-22
Reference Probe EX30V4	SN 7307	26-May-21 (SPEAG No.EK3-7307_May21)	May-22
DA4	SN 1556	12-Jan-22 (CTTL-SPEAG No.Z22-60007)	Jan-23
Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Signal Generator E4439C	MY49071430	13-Jan-22 (CTTL No.J22X00406)	Jan-23
Network Analyzer E5071C	MY48110673	14-Jan-22 (CTTL No.J22X00406)	Jan-23
Calibrated by:	Name	Function	Signature
	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Diqian	SAR Project Leader	
Issued: April 6, 2022			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory			
Certificate No: Z22-60106		Page 1 of 6	
TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6230433-2079 Fax: +86-10-6230433-2504 E-mail: cti@chinaul.com http://www.chinaul.cn		Add: No.52 HuaYuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6230433-2079 Fax: +86-10-6230433-2504 E-mail: cti@chinaul.com http://www.chinaul.cn	
Measurement Conditions DASY system configuration, as far as not given on page 1:			
DASY Version	DASY2	52.10.4	
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	2300 MHz ± 1 MHz		
Head TSL parameters The following parameters and calculations were applied:			
	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.5	1.67 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 9 %	1.70 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	—	
SAR result with Head TSL			
SAR averaged over 1 cm ² (1 g) of Head TSL	Condition		
SAR measured	250 mW input power	12.4 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	49.2 W/kg ± 18.8 % (k=2)	
SAR averaged over 10 cm ² (10 g) of Head TSL	Condition		
SAR measured	250 mW input power	5.88 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	23.4 W/kg ± 18.7 % (k=2)	
Certificate No: Z22-60106		Page 3 of 6	
TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6230433-2079 Fax: +86-10-6230433-2504 E-mail: cti@chinaul.com http://www.chinaul.cn		Add: No.52 HuaYuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-6230433-2079 Fax: +86-10-6230433-2504 E-mail: cti@chinaul.com http://www.chinaul.cn	
Appendix (Additional assessments outside the scope of CNAS L0570)			
Antenna Parameters with Head TSL			
Impedance, transformed to feed point	45.20 - 4.50j		
Return Loss	-26.6dB		
General Antenna Parameters and Design			
Electrical Delay (one direction)	1.083 ns		
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 backed 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 feed-point may be damaged.			
Additional EUT Data			
Manufactured by	SPEAG		
Certificate No: Z22-60106		Page 4 of 6	



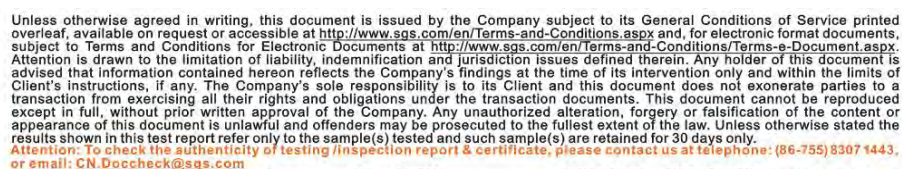
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

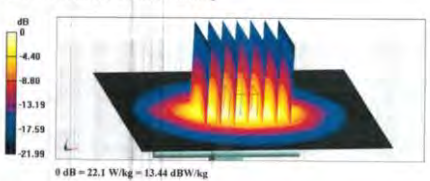
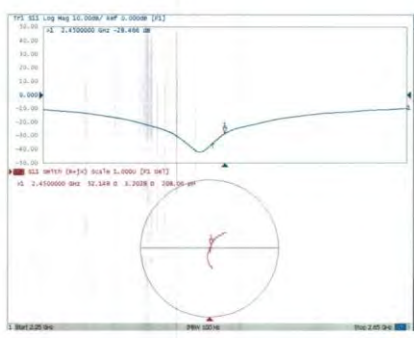
Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

(86-512)57355888 (86-512)57370818 www.sgs.com.cn
(86-512)57355888 (86-512)57370818 sgs.china@sgs.com



1.10 D2450V2 - SN 817



TTL Speaq CALIBRATION LABORATORY		CAICT																		
Address: No. 52 HuaYuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2079 Fax: +86-10-42304633-2504 E-mail: cti@china.ttl.com.cn http://www.china.ttl.com.cn																				
Measurement Conditions DASY system configuration, as far as not given on page 1: <table border="1"> <tr> <td>DASY Version</td> <td>DASY52</td> <td>52.10.4</td> </tr> <tr> <td>Extrapolation</td> <td>Advanced Extrapolation</td> <td></td> </tr> <tr> <td>Phantom</td> <td>Triple Flat Phantom 5.1C</td> <td></td> </tr> <tr> <td>Distance Dipole Center - TSL</td> <td>10 mm</td> <td>with Spacer</td> </tr> <tr> <td>Zoom Scan Resolution</td> <td>dx, dy, dz = 5 mm</td> <td></td> </tr> <tr> <td>Frequency</td> <td>2450 MHz ± 1 MHz</td> <td></td> </tr> </table>			DASY Version	DASY52	52.10.4	Extrapolation	Advanced Extrapolation		Phantom	Triple Flat Phantom 5.1C		Distance Dipole Center - TSL	10 mm	with Spacer	Zoom Scan Resolution	dx, dy, dz = 5 mm		Frequency	2450 MHz ± 1 MHz	
DASY Version	DASY52	52.10.4																		
Extrapolation	Advanced Extrapolation																			
Phantom	Triple Flat Phantom 5.1C																			
Distance Dipole Center - TSL	10 mm	with Spacer																		
Zoom Scan Resolution	dx, dy, dz = 5 mm																			
Frequency	2450 MHz ± 1 MHz																			
Head TSL parameters The following parameters and calculations were applied: <table border="1"> <tr> <th></th> <th>Temperature</th> <th>Permittivity</th> <th>Conductivity</th> </tr> <tr> <td>Nominal Head TSL parameters</td> <td>22.0 °C</td> <td>39.2</td> <td>1.80 mho/m</td> </tr> <tr> <td>Measured Head TSL parameters</td> <td>(22.0 ± 0.2) °C</td> <td>39.5 ± 6 %</td> <td>1.79 mho/m ± 8 %</td> </tr> <tr> <td>Head TSL temperature change during test</td> <td><+1.0 °C</td> <td>—</td> <td>—</td> </tr> </table>				Temperature	Permittivity	Conductivity	Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m	Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5 ± 6 %	1.79 mho/m ± 8 %	Head TSL temperature change during test	<+1.0 °C	—	—		
	Temperature	Permittivity	Conductivity																	
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m																	
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5 ± 6 %	1.79 mho/m ± 8 %																	
Head TSL temperature change during test	<+1.0 °C	—	—																	
SAR result with Head TSL <table border="1"> <tr> <th>SAR averaged over 1 cm³ (1 g) of Head TSL</th> <th>Condition</th> <th></th> </tr> <tr> <td>SAR measured</td> <td>250 mW input power</td> <td>13.2 W/kg</td> </tr> <tr> <td>SAR for nominal Head TSL parameters</td> <td>normalized to 1W</td> <td>53.0 W/kg ± 18.8 % (k=2)</td> </tr> <tr> <th>SAR averaged over 10 cm³ (10 g) of Head TSL</th> <th>Condition</th> <th></th> </tr> <tr> <td>SAR measured</td> <td>250 mW input power</td> <td>6.15 W/kg</td> </tr> <tr> <td>SAR for nominal Head TSL parameters</td> <td>normalized to 1W</td> <td>24.7 W/kg ± 18.7 % (k=2)</td> </tr> </table>			SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition		SAR measured	250 mW input power	13.2 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	53.0 W/kg ± 18.8 % (k=2)	SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition		SAR measured	250 mW input power	6.15 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	24.7 W/kg ± 18.7 % (k=2)
SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition																			
SAR measured	250 mW input power	13.2 W/kg																		
SAR for nominal Head TSL parameters	normalized to 1W	53.0 W/kg ± 18.8 % (k=2)																		
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition																			
SAR measured	250 mW input power	6.15 W/kg																		
SAR for nominal Head TSL parameters	normalized to 1W	24.7 W/kg ± 18.7 % (k=2)																		
Certificate No: Z22-40107 Page 3 of 6																				
Appendix (Additional assessments outside the scope of CNAS L0570) Antenna Parameters with Head TSL <table border="1"> <tr> <td>Impedance, transformed to feed point</td> <td>52.10 ± 3.23Ω</td> </tr> <tr> <td>Return Loss</td> <td>-26.5dB</td> </tr> </table> General Antenna Parameters and Design <table border="1"> <tr> <td>Electrical Delay (one direction)</td> <td>1.006 ns</td> </tr> </table> After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured. The dipole is made of standard serringid 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 feed-point may be damaged. Additional EUT Data <table border="1"> <tr> <td>Manufactured by</td> <td>SPEAG</td> </tr> </table>			Impedance, transformed to feed point	52.10 ± 3.23Ω	Return Loss	-26.5dB	Electrical Delay (one direction)	1.006 ns	Manufactured by	SPEAG										
Impedance, transformed to feed point	52.10 ± 3.23Ω																			
Return Loss	-26.5dB																			
Electrical Delay (one direction)	1.006 ns																			
Manufactured by	SPEAG																			
Certificate No: Z22-40107 Page 4 of 6																				
DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 817 Communication System: UTD 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; σ = 1.79 S/m; ε = 39.52; ρ = 1000 kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration: - Probe: EX3DV4 - SN7307; ConvF(7.75, 7.75) @ 2450 MHz; Calibrated: 2021-05-26 - Sensor-Surface: 1.4mm (Mechanical Surface Detection) - Electronics: DA14 Snt1556; Calibrated: 2022-01-12 - Phantom: MFP-V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062 - DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501) Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 104.6 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 27.0 W/kg SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.15 W/kg Smallest distance from peaks to all points 3 dB below = 8.9 mm Ratio of SAR at M2 to SAR at M1 = -49.2% Maximum value of SAR (measured) = 22.1 W/kg  0 dB = 22.1 W/kg = 13.44 dBW/kg																				
Certificate No: Z22-40107 Page 5 of 6																				
Impedance Measurement Plot for Head TSL 																				
Certificate No: Z22-40107 Page 6 of 6																				



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
No. 10, Weyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

1.11 D2600V2 - SN 1158

TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191 Tel: +86-10-42304633-2512 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn		Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191 Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn	
Client: SGS-CN		Certificate No: Z22-60108	
CALIBRATION CERTIFICATE			
Object	D2600V2 - SN: 1158		
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits		
Calibration date	March 31, 2022		
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 (23±3)°C and humidity<70%.			
Calibration Equipment used (MSTE critical for calibration)			
Primary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Power Meter NRP2	102377	24-Sep-21 (CTTL No.J21X08326)	Sep-22
Power sensor NRP8S	104291	24-Sep-21 (CTTL No.J21X08326)	Sep-22
Reference Probe EX3/DVA	SN 7307	26-May-21 (SPEAG No EX3-7307_May21)	May-22
DAE4	SN 1556	12-Jan-22 (CTTL-SPEAG No Z22-60007)	Jan-23
Secondary Standards	ID #	Cal Date (Calibrated by Certificate No.)	Scheduled Calibration
Signal Generator E5438C	MY48071430	13-Jan-22 (CTTL No.Z22X00406)	Jan-23
Network Analyzer E5071C	MY48110673	14-Jan-22 (CTTL No.Z22X00406)	Jan-23
Calibrated by:	Name	Function	Signature
	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	
Issued: April 6, 2022			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			
Certificate No: Z22-60108		Page 1 of 6	

TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn		Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn	
Measurement Conditions DASY system configuration, as far as not given on page 1:			
DASY Version	DASY52	52.10.4	
Extrapolation	Advanced Extrapolation		
Phantom	Triple Flat Phantom S.1C		
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	38.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.7 ± 6 %	1.96 mho/m ± 6 %
Head TSL temperature change during test	< ± 0.2 °C	—	
SAR result with Head TSL			
SAR averaged over 1 cm ² (1 g) of Head TSL		Condition	
SAR measured		250 mW input power	
SAR for nominal Head TSL parameters		normalized to 1W	
SAR averaged over 10 cm ² (10 g) of Head TSL		Condition	
SAR measured		250 mW input power	
SAR for nominal Head TSL parameters		normalized to 1W	
		24.5 W/kg ± 18.7 % (k=2)	

TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn		Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn	
Appendix (Additional assessments outside the scope of CNAS L0570)			
Antenna Parameters with Head TSL			
Impedance, transformed to feed point	49.90 - j6.49Ω		
Return Loss	-23.9dB		
General Antenna Parameters and Design			
Electrical Delay (one direction)	1.053 ns		
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 feed-point may be damaged.			
Additional EUT Data			
Manufactured by	SPEAG		

TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn		Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn	
Measurement Conditions DASY system configuration, as far as not given on page 1:			
DASY Version	DASY52	52.10.4	
Extrapolation	Advanced Extrapolation		
Phantom	Triple Flat Phantom S.1C		
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	38.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.7 ± 6 %	1.96 mho/m ± 6 %
Head TSL temperature change during test	< ± 0.2 °C	—	
SAR result with Head TSL			
SAR averaged over 1 cm ² (1 g) of Head TSL		Condition	
SAR measured		250 mW input power	
SAR for nominal Head TSL parameters		normalized to 1W	
SAR averaged over 10 cm ² (10 g) of Head TSL		Condition	
SAR measured		250 mW input power	
SAR for nominal Head TSL parameters		normalized to 1W	
		24.5 W/kg ± 18.7 % (k=2)	

TTL Speaq CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn		Add: No.52 HuaYuan Rd, Haidian District, Beijing, 100191, China Tel: +86-10-42304633-2519 Fax: +86-10-42304633-2504 E-mail: cti@china-test.com.cn http://www.china-test.cn	
Appendix (Additional assessments outside the scope of CNAS L0570)			
Antenna Parameters with Head TSL			
Impedance, transformed to feed point	49.90 - j6.49Ω		
Return Loss	-23.9dB		
General Antenna Parameters and Design			
Electrical Delay (one direction)	1.053 ns		
After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 feed-point may be damaged.			
Additional EUT Data			
Manufactured by	SPEAG		

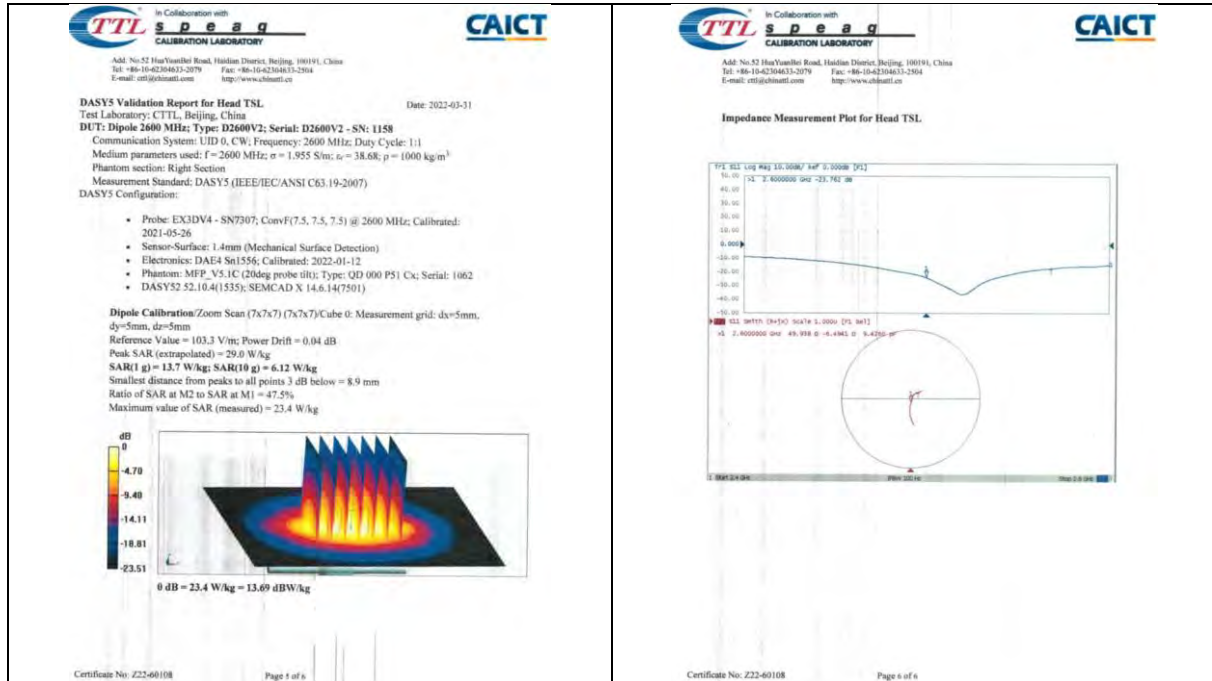


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

(86-512)57355888 (86-512)57370818 www.sgs.com.cn
(86-512)57355888 (86-512)57370818 sgs.china@sgs.com



1.12 D5GHZV2 - SN 1095

TTL 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: cti@sgs.com.cn http://www.cti.com.cn

CAICT

Client: SGS-CN Certificate No: Z22-60187

CALIBRATION CERTIFICATE

Object: D5GHZV2 - SN: 1095

Calibration Procedure(s): FF-Z11-003-01
Calibration Procedures for dipole validation kit

Calibration date: June 1, 2022

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 (23±3)°C and humidity <70%.

Calibration Equipment used (MSTE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by: Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	24-Sep-21 (CTTL No. J2100328)	Sep-22
Power sensor NRP8	104201	24-Sep-21 (CTTL No. J2100328)	Sep-22
Reference Probe EX3DV4	SN 7464	26-Jan-22 (SPEAG No. EX3-7464, Jan22)	Jan-23
DA64	SN 1556	12-Jan-22 (CTTL-SPEAG No. Z22-60007)	Jan-23

Secondary Standards	ID #	Cal Date (Calibrated by: Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY48071430	13-Jan-22 (CTTL No. J22000408)	Jan-23
Network Analyzer E5071C	MY46110873	14-Jan-22 (CTTL No. J22000406)	Jan-23

Calibrated by: Zhao Jing SAR Test Engineer

Reviewed by: Lin Hao SAR Test Engineer

Approved by: Qi Dianyan SAR Project Leader

Issued: June 6, 2022

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

Certificate No: Z22-60187 Page 1 of 10

TTL 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: cti@sgs.com.cn http://www.cti.com.cn

CAICT

Glossary:

TSL: Issue simulating liquid

CompF: sensitivity in TSL + NORMk,y,z

N/A: not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure for the Assessment of Specific Absorption Rate of Human Exposure to Radio Frequency Fields from Hand-held and Body-mounted Wireless Communication Devices-Part 1528: Human Models, Instrumentation and Procedures (Frequency range of 4 MHz to 10 GHz)", October 2020

b) KDB 665664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY45 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 station 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: Z22-60187 Page 7 of 10



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>, and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

In Collaboration with TTL s p e a g CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanDi Road, Haidian District, Beijing, 100191, China Tel: +86-10-62362117 E-mail: csl@ttsl.com.cn http://www.ttsl.com.cn		Add: No.52 HuaYuanDi Road, Haidian District, Beijing, 100191, China Tel: +86-10-62362117 E-mail: csl@ttsl.com.cn http://www.caict.ac.cn	
Measurement Conditions SAR system configuration, as for as not given on page 1.			
DASY Version		DASY2	
Extrapolation		Advanced Extrapolation	
Phantom		Triple Flat Phantom S1C	
Distance Dipole Center - TSL		10 mm	
Zoom Scan Resolution		dx, dy = 4 mm, dz = 1.4 mm	
Frequency		3000 MHz ± 1 MHz 3500 MHz ± 1 MHz 3800 MHz ± 1 MHz 5800 MHz ± 1 MHz	
Head TSL parameters at 5200MHz The following parameters and calculations were applied.			
Nominal Head TSL parameters		Temperature	22.0 °C
Measured Head TSL parameters		Permittivity	35.9
Head TSL temperature change during test		Conductivity	4.76 mho/m
			4.73 mho/m ± 5 %
SAR result with Head TSL at 5200MHz The following parameters and calculations were applied.			
SAR averaged over 1 cm ³ (1 g) of Head TSL		Condition	
SAR measured		100 mW input power	7.94 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	79.1 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL		Condition	
SAR measured		100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	22.6 W/kg ± 24.2 % (k=2)
Head TSL parameters at 5500MHz The following parameters and calculations were applied.			
Nominal Head TSL parameters		Temperature	22.0 °C
Measured Head TSL parameters		Permittivity	35.8
Head TSL temperature change during test		Conductivity	4.88 mho/m
			4.84 mho/m ± 5 %
SAR result with Head TSL at 5500MHz The following parameters and calculations were applied.			
SAR averaged over 1 cm ³ (1 g) of Head TSL		Condition	
SAR measured		100 mW input power	8.26 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	82.6 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL		Condition	
SAR measured		100 mW input power	2.34 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	23.4 W/kg ± 24.2 % (k=2)
Certificate No: Z22-60187 Page 4 of 10			

In Collaboration with TTL s p e a g CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanDi Road, Haidian District, Beijing, 100191, China Tel: +86-10-62362117 E-mail: csl@ttsl.com.cn http://www.ttsl.com.cn		Add: No.52 HuaYuanDi Road, Haidian District, Beijing, 100191, China Tel: +86-10-62362117 E-mail: csl@ttsl.com.cn http://www.caict.ac.cn	
Head TSL parameters at 5600MHz The following parameters and calculations were applied.			
Nominal Head TSL parameters		Temperature	22.0 °C
Measured Head TSL parameters		Permittivity	35.5
Head TSL temperature change during test		Conductivity	5.07 mho/m
			5.05 mho/m ± 5 %
SAR result with Head TSL at 5600MHz The following parameters and calculations were applied.			
SAR averaged over 1 cm ³ (1 g) of Head TSL		Condition	
SAR measured		100 mW input power	8.12 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	80.8 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL		Condition	
SAR measured		100 mW input power	2.38 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	23.8 W/kg ± 24.2 % (k=2)
Head TSL parameters at 5800MHz The following parameters and calculations were applied.			
Nominal Head TSL parameters		Temperature	22.0 °C
Measured Head TSL parameters		Permittivity	35.3
Head TSL temperature change during test		Conductivity	5.25 mho/m
			5.25 mho/m ± 5 %
SAR result with Head TSL at 5800MHz The following parameters and calculations were applied.			
SAR averaged over 1 cm ³ (1 g) of Head TSL		Condition	
SAR measured		100 mW input power	7.71 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	76.7 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL		Condition	
SAR measured		100 mW input power	2.16 W/kg
SAR for nominal Head TSL parameters		normalized to 1W	21.6 W/kg ± 24.2 % (k=2)
Certificate No: Z22-60187 Page 5 of 10			

In Collaboration with TTL s p e a g CALIBRATION LABORATORY		CAICT	
Add: No.52 HuaYuanDi Road, Haidian District, Beijing, 100191, China Tel: +86-10-62362117 E-mail: csl@ttsl.com.cn http://www.ttsl.com.cn		Add: No.52 HuaYuanDi Road, Haidian District, Beijing, 100191, China Tel: +86-10-62362117 E-mail: csl@ttsl.com.cn http://www.caict.ac.cn	
Appendix (Additional assessments outside the scope of CNAS L0570)			
Antenna Parameters with Head TSL at 5200MHz			
Impedance, transformed to feed point		48.10 - j0.03j	
Return Loss		-23.8dB	
Antenna Parameters with Head TSL at 5300MHz			
Impedance, transformed to feed point		47.80 - 2.42j	
Return Loss		-23.5dB	
Antenna Parameters with Head TSL at 5500MHz			
Impedance, transformed to feed point		50.30 - 4.36j	
Return Loss		-27.4dB	
Antenna Parameters with Head TSL at 5600MHz			
Impedance, transformed to feed point		54.80 - 4.89j	
Return Loss		-24.6dB	
Antenna Parameters with Head TSL at 5800MHz			
Impedance, transformed to feed point		51.50 - 5.61j	
Return Loss		-24.9dB	
Certificate No: Z22-60187 Page 6 of 10			

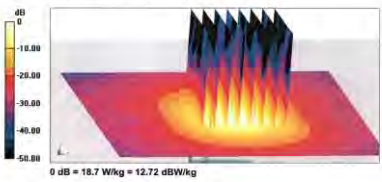
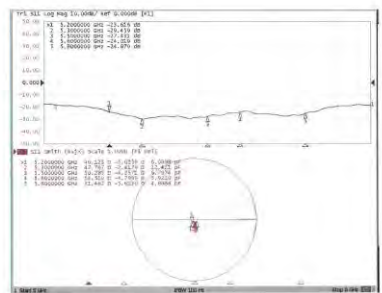


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgs.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62302117 E-mail: csl@speaq.com.cn http://www.spsaq.com.cn General Antenna Parameters and Design Electrical Delay (one direction): 1.021 ns After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured. The dipole is made of standard semirigid coaxial cable. The carrier conductor of the feeding line is directly connected to the second arm of the dipole. This 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 feed-point may be damaged. Additional EUT Data Manufactured by: SPEAQ Certificate No: Z22-60187 Page 1 of 10	In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62302117 E-mail: csl@speaq.com.cn http://www.spsaq.com.cn DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1095 Communication System: CW; Frequency: 5200 MHz; Frequency: 5300 MHz; Frequency: 5500 MHz; Frequency: 5600 MHz; Frequency: 5800 MHz; Duty Cycle: 1:1 Medium parameters used: $f = 5200$ MHz; $\sigma = 4.82$ S/m; $\epsilon = 35.39$; $\rho = 1000$ kg/m³ Medium parameters used: $f = 5300$ MHz; $\sigma = 4.73$ S/m; $\epsilon = 35.19$; $\rho = 1000$ kg/m³ Medium parameters used: $f = 5500$ MHz; $\sigma = 4.939$ S/m; $\epsilon = 34.83$; $\rho = 1000$ kg/m³ Medium parameters used: $f = 5600$ MHz; $\sigma = 5.051$ S/m; $\epsilon = 34.89$; $\rho = 1000$ kg/m³ Medium parameters used: $f = 5800$ MHz; $\sigma = 5.247$ S/m; $\epsilon = 34.42$; $\rho = 1000$ kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C38.19-2007) DASY5 Configuration: - Probe: EX3DV4 - SN7484; ConvF(5.6, 5.6) @ 5200 MHz; ConvF(5.32, 5.32) @ 5300 MHz; ConvF(5.11, 5.11) @ 5500 MHz; ConvF(4.91, 4.91) @ 5800 MHz; ConvF(5.5, 5.5) @ 5600 MHz; Calibrated: 2022-01-26 - Sensor-Surface: 1.4mm (Mechanical Surface Detection) - Electronics: DA84 Sn1556; Calibrated: 2022-01-12 - Phantom: MPF_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062 - DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501) Dipole Calibration /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 = 60.80 V/m; Power Drift = -0.06 dB; Peak SAR (extrapolated) = 29.8 W/kg; SAR(1 g) = 7.73 W/kg; SAR(10 g) = 2.22 W/kg; Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 66.8%; Maximum value of SAR (measured) = 19.3 W/kg Dipole Calibration /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 = 61.08 V/m; Power Drift = -0.07 dB; Peak SAR (extrapolated) = 31.5 W/kg; SAR(1 g) = 7.94 W/kg; SAR(10 g) = 2.27 W/kg; Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 65.5%; Maximum value of SAR (measured) = 19.0 W/kg Certificate No: Z22-60187 Page 2 of 10
In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62302117 E-mail: csl@speaq.com.cn http://www.spsaq.com.cn Dipole Calibration /Pin=100mW, d=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0; Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Reference Value = 61.92 V/m; Power Drift = -0.08 dB; Peak SAR (extrapolated) = 34.7 W/kg; SAR(1 g) = 8.28 W/kg; SAR(10 g) = 2.34 W/kg; Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 63.9%; Maximum value of SAR (measured) = 20.2 W/kg Dipole Calibration /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 = 65.08 V/m; Power Drift = -0.07 dB; Peak SAR (extrapolated) = 35.2 W/kg; SAR(1 g) = 8.12 W/kg; SAR(10 g) = 2.3 W/kg; Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 62.5%; Maximum value of SAR (measured) = 19.1 W/kg Dipole Calibration /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 = 62.13 V/m; Power Drift = -0.06 dB; Peak SAR (extrapolated) = 34.8 W/kg; SAR(1 g) = 7.71 W/kg; SAR(10 g) = 2.16 W/kg; Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 61.6%; Maximum value of SAR (measured) = 18.7 W/kg  0 dB = 18.7 W/kg = 12.72 dBW/kg Certificate No: Z22-60187 Page 3 of 10	In Collaboration with TTL speaq CALIBRATION LABORATORY CAICT Address: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62302117 E-mail: csl@speaq.com.cn http://www.spsaq.com.cn Impedance Measurement Plot for Head TSL  Certificate No: Z22-60187 Page 4 of 10



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

(86-512)57355888 (86-512)57370818 www.sgs.com.cn
(86-512)57355888 (86-512)57370818 sgs.china@sgs.com

2 DAE4 - SN 1245

Schmid & Partner Engineering AG Zugzwangstrasse 13, 8004 Zurich, Switzerland Phone +41 (0)43 9702, Fax +41 (0)43 9775 info@sgs.ch, calibration@sgs.ch s p e a g IMPORTANT NOTICE USAGE OF THE DAE4 The DAE4 unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE4. Special attention shall be given to the following points: Battery Exchange: The battery cover of the DAE4 unit is fixed using a screw, over tightening the screw may cause the threads inside the DAE4 to wear out. Shipping of the DAE4: Before shipping the DAE4 to SPEAG for calibration, remove the batteries and pack the DAE4 in an anti-static bag. This anti-static bag shall then be packed into a larger box or container which protects the DAE4 from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside. E-stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE4 carefully and keep the DAE4 unit in a non-dusty environment if not used for measurements. Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect. DASY Configuration Files: Since the exact values of the DAE4 input resistances, as measured during the calibration procedure of a DAE4 unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file. Important Note: Warning and calibration is void if the DAE4 unit is disassembled partly or fully by the Customer. Important Note: Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure. Important Note: To prevent damage of the DAE4 probe connector pins, use great care when installing the probe to the DAE4. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE4 while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE4. TM_EH190326AE_DAE4.docx 07.03.2019	Calibration Laboratory of Schmid & Partner Engineering AG Zugzwangstrasse 13, 8004 Zurich, Switzerland 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: SGS-CN (Auden) Certificate No.: DAE4-1245_May22 Accreditation No.: SCS 0108 CALIBRATION CERTIFICATE Object: DAE4 - SD 000 D04 BM - SN: 1245 Calibration procedure(s): QA CAL-06 v30 Calibration procedure for the data acquisition electronics (DAE) Calibration date: May 30, 2022 This calibration certificate documents the traceability to national standards, which include the physical units of measurement (SI). The measurement 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 ± 1 °C and humidity < 70%). Calibration Equipment used (MATE critical for calibration) <table border="1"><thead><tr><th>Primary Standards</th><th>ID #</th><th>Due Date (Certificate No.)</th><th>Scheduled Calibration</th></tr></thead><tbody><tr><td>Kathrein Multimeter Type 2001</td><td>SN: 0810278</td><td>31-Aug-21 (No: 31368)</td><td>Aug-22</td></tr></tbody></table> <table border="1"><thead><tr><th>Secondary Standards</th><th>ID #</th><th>Check Date (in hours)</th><th>Scheduled Check</th></tr></thead><tbody><tr><td>Auto DAE Calibration Unit</td><td>SE LWS 05A AA 1001</td><td>24-Jan-22 (in hours check)</td><td>In house check: Jan-22</td></tr><tr><td>Calibration Box V2.1</td><td>SE LWS 00B AA 1002</td><td>24-Jan-22 (in hours check)</td><td>In house check: Jan-22</td></tr></tbody></table> Calibrated by: Dominique Stiller Function: Laboratory Technician Signature: <i>[Signature]</i> Approved by: (Ben Kuhn) Technical Manager Signature: <i>[Signature]</i> This calibration certificate shall not be reproduced except in full without written approval of the laboratory. Calibration No.: DAE4-1245_May22 Page 1 of 5	Primary Standards	ID #	Due Date (Certificate No.)	Scheduled Calibration	Kathrein Multimeter Type 2001	SN: 0810278	31-Aug-21 (No: 31368)	Aug-22	Secondary Standards	ID #	Check Date (in hours)	Scheduled Check	Auto DAE Calibration Unit	SE LWS 05A AA 1001	24-Jan-22 (in hours check)	In house check: Jan-22	Calibration Box V2.1	SE LWS 00B AA 1002	24-Jan-22 (in hours check)	In house check: Jan-22
Primary Standards	ID #	Due Date (Certificate No.)	Scheduled Calibration																		
Kathrein Multimeter Type 2001	SN: 0810278	31-Aug-21 (No: 31368)	Aug-22																		
Secondary Standards	ID #	Check Date (in hours)	Scheduled Check																		
Auto DAE Calibration Unit	SE LWS 05A AA 1001	24-Jan-22 (in hours check)	In house check: Jan-22																		
Calibration Box V2.1	SE LWS 00B AA 1002	24-Jan-22 (in hours check)	In house check: Jan-22																		
Calibration Laboratory of Schmid & Partner Engineering AG Zugzwangstrasse 13, 8004 Zurich, Switzerland 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 Accreditation No.: SCS 0108 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 following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty. • DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement. • Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement. • Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage. • AD Converter Values with inputs shorted: Values on the internal AD converter corresponding to zero input voltage. • Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements. • Input Offset Current: Typical value for information; Maximum channel input offset current, not considering the input resistance. • Input resistance: Typical value for information; DAE input resistance at the connector, during internal auto-zeroing and during measurement. • Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated. • Power consumption: Typical value for information. Supply currents in various operating modes. Certificate No.: DAE4-1245_May22 Page 2 of 5	DC Voltage Measurement AD - Converter Resolution nominal High Range: 1LSB = 6.1 μV, full range = -190...+320 mV Low Range: 1LSB = 61 μV, full range = -1...+3 mV DASY measurement parameters: Auto Zero-Time: 3 sec; Measuring time: 3 sec <table border="1"><thead><tr><th>Calibration Factors</th><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>High Range</td><td>405.265 ± 0.02% (k=2)</td><td>403.974 ± 0.02% (k=2)</td><td>406.092 ± 0.02% (k=2)</td></tr><tr><td>Low Range</td><td>3.99534 ± 1.50% (k=2)</td><td>3.99508 ± 1.50% (k=2)</td><td>4.01015 ± 1.50% (k=2)</td></tr></tbody></table> Connector Angle <table border="1"><thead><tr><th>Connector Angle to be used in DASY system</th><th>30.0° ± 1°</th></tr></thead></table> Certificate No.: DAE4-1245_May22 Page 3 of 5	Calibration Factors	X	Y	Z	High Range	405.265 ± 0.02% (k=2)	403.974 ± 0.02% (k=2)	406.092 ± 0.02% (k=2)	Low Range	3.99534 ± 1.50% (k=2)	3.99508 ± 1.50% (k=2)	4.01015 ± 1.50% (k=2)	Connector Angle to be used in DASY system	30.0° ± 1°						
Calibration Factors	X	Y	Z																		
High Range	405.265 ± 0.02% (k=2)	403.974 ± 0.02% (k=2)	406.092 ± 0.02% (k=2)																		
Low Range	3.99534 ± 1.50% (k=2)	3.99508 ± 1.50% (k=2)	4.01015 ± 1.50% (k=2)																		
Connector Angle to be used in DASY system	30.0° ± 1°																				



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>; and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	19994.45	1.52	0.00
Channel X + Input	20004.58	2.22	0.01
Channel X - Input	-20000.14	1.12	-0.01
Channel Y + Input	19994.72	1.58	0.00
Channel Y + Input	20001.22	-1.00	-0.00
Channel Y - Input	-20003.05	-1.57	0.01
Channel Z + Input	19992.44	0.19	0.00
Channel Z + Input	20003.09	0.58	0.00
Channel Z - Input	-20001.73	-0.27	0.00

Low Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	2001.91	0.41	0.22
Channel X + Input	202.54	0.65	0.32
Channel X - Input	-197.86	0.07	-0.04
Channel Y + Input	2002.05	0.58	0.03
Channel Y + Input	201.27	-0.57	-0.28
Channel Y - Input	-196.23	-0.06	0.03
Channel Z + Input	2001.96	0.08	0.00
Channel Z + Input	200.09	-1.03	-0.76
Channel Z - Input	-199.85	-1.57	0.79

2. Common mode sensitivity

Channel	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-3.87	-7.69
	-200	9.12	7.79
Channel Y	200	-8.68	-9.28
	-200	8.52	6.36
Channel Z	200	-5.36	-5.60
	-200	3.58	3.08

3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	-	4.07	-3.14
Channel Y	200	9.36	-	4.27
Channel Z	200	10.11	7.14	-

Certificate No: DAE4-1245_May22

Page 4 of 5

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	15984	17040
Channel Y	16562	16768
Channel Z	16035	15968

5. Input Offset Measurement

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

Input (mV)	Average (µV)	min. Offset (µV)	max. Offset (µV)	Std. Deviation (µV)
Channel X	1.00	-0.15	1.93	0.45
Channel Y	-0.18	-1.28	0.94	0.45
Channel Z	-0.58	-2.81	0.58	0.60

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25nA

7. Input Resistance (Typical values for information)

	Zeroing (Ohm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+8	+14
Supply (- Vcc)	-0.01	-8	-9

Certificate No: DAE4-1245_May22

Page 5 of 5

3 EX3DV4 - SN 7346

Calibration Laboratory of Schmid & Partner Engineering AG
Zürcherstrasse 65, 8048 Zug, Switzerland



Schweizerischer Kantonsschied
C Service suisse d'expertise
Service suisse d'expertise
Service suisse d'expertise
Service suisse d'expertise

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

Accreditation No.: SCS 0108

Client: Auden

Certificate No: EX3-7346_May22

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN 7346

Customer procedure: QA CAL-01 vs. QA CAL-14 vs. QA CAL-23 vs. QA CAL-25-V
Calibration procedure for domestic E-field probes

Calibration date: March 30, 2022

This calibration certificate documents the traceability to national standards, which require the physical units of measurement (SI).
The measurement data and the uncertainty with confidence probability are given on the following pages and are part of the certificate.
All measurements have been conducted in the closed laboratory facility, environmental temperature (22 ± 0.1 °C and humidity < 70%).
Calibration Equipment used (MKE): (not for calibration):

Primary Standards	SI	Cal Date (Certificate No.)	Scheduled Calibration
Power meter MPE	86.10479	08-Apr-21 (No. 211-0501-0303)	Apr-22
Power sensor MPE-291	86.10304	08-Apr-21 (No. 211-0501-0301)	Apr-22
Power sensor MPE-291	86.10304	08-Apr-21 (No. 211-0501-0302)	Apr-22
Reference 20 dB attenuator	86.10304 (20)	08-Apr-21 (No. 211-0501-0303)	Apr-22
DASY	86.10304	13-Dec-21 (No. DAE4-1245_May22)	Dec-22
Reference Probe (ES202)	86.10304	13-Dec-21 (No. DAE4-1245_May22)	Dec-22

Secondary Standards

SI	Check Date (in house)	Scheduled Date
Power meter E4130	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Power meter E4130A	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Power sensor E4130A	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Power sensor E4130A	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Reference HP 8440C	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Reference HP 8440C	08-Apr-21 (in house check Jan-22)	In house check Jan-22

Calibrated by: Hans Koller

Function: Laboratory Technician

Signature: [Signature]

Approved by: Hans Koller

Signature: [Signature]

Issued: March 31, 2022

This certificate is valid and not to be reproduced (except at full written approval of the laboratory).

Certificate No: EX3-7346_May22

Page 1 of 24

Calibration Laboratory of Schmid & Partner Engineering AG
Zürcherstrasse 65, 8048 Zug, Switzerland



Schweizerischer Kantonsschied
C Service suisse d'expertise
Service suisse d'expertise
Service suisse d'expertise
Service suisse d'expertise

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

Accreditation No.: SCS 0108

Client: Auden

Certificate No: EX3-7346_May22

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN 7346

Customer procedure: QA CAL-01 vs. QA CAL-14 vs. QA CAL-23 vs. QA CAL-25-V
Calibration procedure for domestic E-field probes

Calibration date: March 30, 2022

This calibration certificate documents the traceability to national standards, which require the physical units of measurement (SI).
The measurement data and the uncertainty with confidence probability are given on the following pages and are part of the certificate.
All measurements have been conducted in the closed laboratory facility, environmental temperature (22 ± 0.1 °C and humidity < 70%).
Calibration Equipment used (MKE): (not for calibration):

Primary Standards	SI	Cal Date (Certificate No.)	Scheduled Calibration
Power meter MPE	86.10479	08-Apr-21 (No. 211-0501-0303)	Apr-22
Power sensor MPE-291	86.10304	08-Apr-21 (No. 211-0501-0301)	Apr-22
Power sensor MPE-291	86.10304	08-Apr-21 (No. 211-0501-0302)	Apr-22
Reference 20 dB attenuator	86.10304 (20)	08-Apr-21 (No. 211-0501-0303)	Apr-22
DASY	86.10304	13-Dec-21 (No. DAE4-1245_May22)	Dec-22
Reference Probe (ES202)	86.10304	13-Dec-21 (No. DAE4-1245_May22)	Dec-22

Secondary Standards

SI	Check Date (in house)	Scheduled Date
Power meter E4130	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Power meter E4130A	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Power sensor E4130A	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Power sensor E4130A	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Reference HP 8440C	08-Apr-21 (in house check Jan-22)	In house check Jan-22
Reference HP 8440C	08-Apr-21 (in house check Jan-22)	In house check Jan-22

Calibrated by: Hans Koller

Function: Laboratory Technician

Signature: [Signature]

Approved by: Hans Koller

Signature: [Signature]

Issued: March 31, 2022

This certificate is valid and not to be reproduced (except at full written approval of the laboratory).

Certificate No: EX3-7346_May22

Page 2 of 24

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

(86-512)57355888 (86-512)57370818 www.sgsgroup.com.cn
(86-512)57355888 (86-512)57370818 sgs.china@sgs.com

检验检测专用章
Inspection & Testing Services
Compliance Certification Services (Kunshan) Inc.
EMC Laboratory

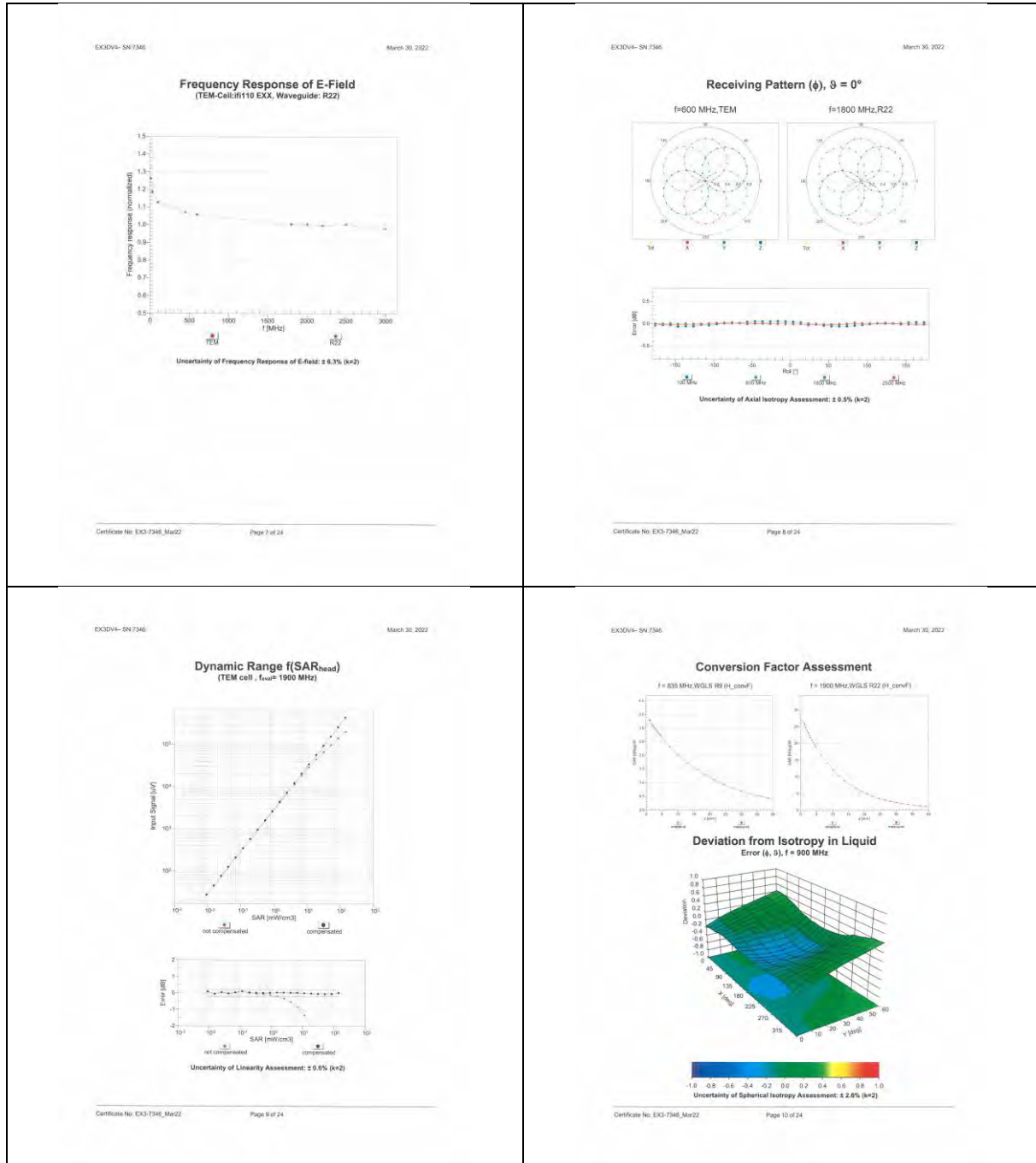
Test Report Form Version: Rev01

Member of the SGS Group (SGS SA)

Page 3 of 24Page 4 of 24Page 5 of 24

Step 6 of 24





Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学院创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

ECN3042-EN7346

March 31, 2022

ECN3046-EN7346

March 31, 2022

Appendix: Modulation Calculation Parameters

Line	Rev	Communication System Name	Group	PAE (dB)	Use1		
1000	0	SW	SW	0.00	0.0%		
10012	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10013	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10014	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10015	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10016	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10017	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10018	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10019	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10020	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10021	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10022	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10023	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10024	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10025	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10026	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10027	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10028	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10029	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10030	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10031	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10032	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10033	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10034	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10035	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10036	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10037	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10038	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10039	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10040	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10041	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10042	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10043	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10044	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10045	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10046	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10047	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10048	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10049	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10050	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10051	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10052	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10053	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10054	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10055	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10056	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10057	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10058	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10059	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		
10060	CAS	SAE-100M (E-UTRA, 100% RB)	SW	0.00	0.0%		

Document No: E3X-7346_Mar22

Page 11 of 24

Document No: E3X-7346_Mar22

Page 12 of 24

ECN3046-EN7346

March 30, 2022

ECN3046-EN7346

March 30, 2022

10060	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	0.66%		
10061	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.50	0.66%		
10062	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.53	0.66%		
10063	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.51	0.66%		
10064	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.50	0.66%		
10065	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.53	0.66%		
10066	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	0.66%		
10067	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.50	0.66%		
10068	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.00	0.66%		
10069	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.12	0.66%		
10070	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.10	0.66%		
10071	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.13	0.66%		
10072	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.12	0.66%		
10073	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.03	0.66%		
10074	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.13	0.66%		
10075	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.27	0.66%		
10076	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.06	0.66%		
10077	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.48	0.66%		
10078	CAS	IEEE 802.11n HT Overhead, 6.5 MHz, BPSK	WLAN	6.08	0.66%		
10079	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.48	0.66%		
10080	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.19	0.66%		
10081	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.48	0.66%		
10082	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.48	0.66%		
10083	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.29	0.66%		
10084	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.21	0.66%		
10085	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.48	0.66%		
10086	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.25	0.66%		
10087	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.25	0.66%		
10088	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.21	0.66%		
10089	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.82	0.66%		
10090	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.86	0.66%		
10091	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.48	0.66%		
10092	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.08	0.66%		
10093	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.08	0.66%		
10094	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.30	0.66%		
10095	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.91	0.66%		
10096	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.08	0.66%		
10097	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.29	0.66%		
10098	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.81	0.66%		
10099	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.17	0.66%		
10100	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.24	0.66%		
10101	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.90	0.66%		
10102	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.14	0.66%		
10103	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.30	0.66%		
10104	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.96	0.66%		
10105	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	10.08	0.66%		
10106	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.34	0.66%		
10107	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.98	0.66%		
10108	CAS	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	9.97	0.66%		

Certificate No: E3X-7346_Mar22

Page 13 of 24

10080	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10082	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10083	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	10.13	1.6%		
10084	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10085	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10086	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10087	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10088	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10089	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10090	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10091	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10092	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10093	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10094	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10095	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10096	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10097	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10098	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10099	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10100	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10101	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10102	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10103	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10104	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10105	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10106	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10107	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10108	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10109	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10110	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10111	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10112	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10113	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10114	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10115	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10116	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10117	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10118	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10119	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10120	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10121	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10122	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10123	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10124	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10125	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10126	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10127	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10128	CAS	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	9.87	1.6%		
10129							

Unless otherwise agreed in writing this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is deemed to have accepted the Terms and Conditions of the document and the instructions of the Client. The Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is strictly prohibited and may result in severe civil or criminal penalties. Samples otherwise stated on the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection rep
or email: CN.Doccheck@sqs.com

e, please contact us at telephone: (86-755) 8307 1443.

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>, and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of the Client's instructions. It is the Company's sole responsibility to its Client to ensure that the Client is aware of the Client's rights and obligations under the transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this report refer only to the sample(s) tested and such sample(s) are retained for 90 days.

Attention: To check the authenticity of testing (Inspection report & Certificate), please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No. 10, Weiyue Road, Innovation Park, Kunshan, Jiangsu, China 215300
 中国·江苏·昆山市留学院创业园伟业路10号 邮编 215300

(86-512)5127355888 (86-512)5127370818 www.sgsgroup.com.cn
 (86-512)5127355888 (86-512)5127370818 sgschina@sgs.com

EX3014- SN7346				March 30, 2022				EX3014- SN7346				March 30, 2022					
10673	AAC	IEEE 802.11ax (20MHz, MCS2, 90pcu)	WLAN	8.78	9.9%	10729	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.64	9.9%	10785	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.64	9.9%
10674	AAC	IEEE 802.11ax (20MHz, MCS3, 90pcu)	WLAN	8.74	9.8%	10730	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.67	9.9%	10786	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.67	9.9%
10675	AAC	IEEE 802.11ax (20MHz, MCS4, 90pcu)	WLAN	8.80	9.9%	10731	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.69	9.9%	10787	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.69	9.9%
10676	AAC	IEEE 802.11ax (20MHz, MCS5, 90pcu)	WLAN	8.77	9.9%	10732	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.66	9.8%	10788	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.66	9.8%
10677	AAC	IEEE 802.11ax (20MHz, MCS6, 90pcu)	WLAN	8.73	9.8%	10733	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.60	9.8%	10789	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.60	9.8%
10678	AAC	IEEE 802.11ax (20MHz, MCS7, 90pcu)	WLAN	8.78	9.9%	10734	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.72	9.9%	10790	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.72	9.9%
10679	AAC	IEEE 802.11ax (20MHz, MCS8, 90pcu)	WLAN	8.89	9.9%	10735	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.73	9.9%	10791	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.73	9.9%
10680	AAC	IEEE 802.11ax (20MHz, MCS9, 90pcu)	WLAN	8.80	9.9%	10736	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10792	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10681	AAC	IEEE 802.11ax (20MHz, MCS10, 90pcu)	WLAN	8.82	9.9%	10737	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10793	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10682	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.83	9.9%	10738	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10794	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10683	AAC	IEEE 802.11ax (20MHz, MCS12, 90pcu)	WLAN	8.82	9.9%	10739	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10795	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10684	AAC	IEEE 802.11ax (20MHz, MCS13, 90pcu)	WLAN	8.25	9.9%	10740	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.48	9.9%	10796	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.48	9.9%
10685	AAC	IEEE 802.11ax (20MHz, MCS14, 90pcu)	WLAN	8.33	9.9%	10741	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.47	9.9%	10797	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.47	9.9%
10686	AAC	IEEE 802.11ax (20MHz, MCS15, 90pcu)	WLAN	8.28	9.9%	10742	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.42	9.8%	10798	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.42	9.8%
10687	AAC	IEEE 802.11ax (20MHz, MCS16, 90pcu)	WLAN	8.45	9.9%	10743	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.45	9.9%	10799	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.45	9.9%
10688	AAC	IEEE 802.11ax (20MHz, MCS17, 90pcu)	WLAN	8.29	9.8%	10744	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.45	9.9%	10800	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.45	9.9%
10689	AAC	IEEE 802.11ax (20MHz, MCS18, 90pcu)	WLAN	8.55	9.9%	10745	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10801	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10690	AAC	IEEE 802.11ax (20MHz, MCS19, 90pcu)	WLAN	8.29	9.8%	10746	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10802	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10691	AAC	IEEE 802.11ax (20MHz, MCS19, 90pcu)	WLAN	8.25	9.8%	10747	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10803	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10692	AAC	IEEE 802.11ax (20MHz, MCS20, 90pcu)	WLAN	8.29	9.8%	10748	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10804	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10693	AAC	IEEE 802.11ax (20MHz, MCS20, 90pcu)	WLAN	8.25	9.8%	10749	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10805	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10694	AAC	IEEE 802.11ax (20MHz, MCS21, 90pcu)	WLAN	8.57	9.9%	10750	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10806	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10695	AAC	IEEE 802.11ax (20MHz, MCS22, 90pcu)	WLAN	8.78	9.9%	10751	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%	10807	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.85	9.9%
10696	AAC	IEEE 802.11ax (20MHz, MCS21, 90pcu)	WLAN	8.81	9.9%	10752	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.81	9.9%	10808	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.81	9.9%
10697	AAC	IEEE 802.11ax (20MHz, MCS22, 90pcu)	WLAN	8.81	9.9%	10753	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.81	9.9%	10809	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.81	9.9%
10698	AAC	IEEE 802.11ax (20MHz, MCS23, 90pcu)	WLAN	8.89	9.9%	10754	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.89	9.9%	10810	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.89	9.9%
10699	AAC	IEEE 802.11ax (20MHz, MCS24, 90pcu)	WLAN	8.82	9.9%	10755	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10811	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10700	AAC	IEEE 802.11ax (20MHz, MCS25, 90pcu)	WLAN	8.73	9.9%	10756	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.77	9.9%	10812	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.77	9.9%
10701	AAC	IEEE 802.11ax (20MHz, MCS26, 90pcu)	WLAN	8.86	9.9%	10757	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.77	9.9%	10813	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.77	9.9%
10702	AAC	IEEE 802.11ax (20MHz, MCS27, 90pcu)	WLAN	8.70	9.8%	10758	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10814	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10703	AAC	IEEE 802.11ax (20MHz, MCS28, 90pcu)	WLAN	8.82	9.9%	10759	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%	10815	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.82	9.9%
10704	AAC	IEEE 802.11ax (20MHz, MCS29, 90pcu)	WLAN	8.86	9.9%	10760	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10816	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10705	AAC	IEEE 802.11ax (20MHz, MCS30, 90pcu)	WLAN	8.69	9.9%	10761	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10817	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10706	AAC	IEEE 802.11ax (20MHz, MCS31, 90pcu)	WLAN	8.68	9.9%	10762	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10818	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10707	AAC	IEEE 802.11ax (20MHz, MCS32, 90pcu)	WLAN	8.32	9.9%	10763	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10819	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10708	AAC	IEEE 802.11ax (20MHz, MCS33, 90pcu)	WLAN	8.55	9.9%	10764	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10820	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10709	AAC	IEEE 802.11ax (20MHz, MCS34, 90pcu)	WLAN	8.33	9.9%	10765	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10821	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10710	AAC	IEEE 802.11ax (20MHz, MCS35, 90pcu)	WLAN	8.29	9.9%	10766	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10822	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10711	AAC	IEEE 802.11ax (20MHz, MCS36, 90pcu)	WLAN	8.39	9.9%	10767	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10823	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10712	AAC	IEEE 802.11ax (20MHz, MCS37, 90pcu)	WLAN	8.67	9.9%	10768	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10824	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10713	AAC	IEEE 802.11ax (20MHz, MCS38, 90pcu)	WLAN	8.33	9.9%	10769	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10825	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10714	AAC	IEEE 802.11ax (20MHz, MCS39, 90pcu)	WLAN	8.28	9.9%	10770	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10826	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10715	AAC	IEEE 802.11ax (20MHz, MCS39, 90pcu)	WLAN	8.45	9.9%	10771	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10827	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10716	AAC	IEEE 802.11ax (20MHz, MCS40, 90pcu)	WLAN	8.39	9.9%	10772	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10828	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10717	AAC	IEEE 802.11ax (20MHz, MCS40, 90pcu)	WLAN	8.48	9.9%	10773	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10829	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10718	AAC	IEEE 802.11ax (20MHz, MCS41, 90pcu)	WLAN	8.24	9.8%	10774	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10830	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10719	AAC	IEEE 802.11ax (20MHz, MCS42, 90pcu)	WLAN	8.81	9.9%	10775	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10831	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10720	AAC	IEEE 802.11ax (20MHz, MCS41, 90pcu)	WLAN	8.87	9.9%	10776	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10832	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10721	AAC	IEEE 802.11ax (20MHz, MCS42, 90pcu)	WLAN	8.78	9.9%	10777	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10833	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10722	AAC	IEEE 802.11ax (20MHz, MCS43, 90pcu)	WLAN	8.55	9.9%	10778	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10834	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10723	AAC	IEEE 802.11ax (20MHz, MCS44, 90pcu)	WLAN	8.70	9.9%	10779	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10835	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10724	AAC	IEEE 802.11ax (20MHz, MCS45, 90pcu)	WLAN	8.90	9.9%	10780	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10836	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10725	AAC	IEEE 802.11ax (20MHz, MCS46, 90pcu)	WLAN	8.74	9.8%	10781	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10837	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10726	AAC	IEEE 802.11ax (20MHz, MCS47, 90pcu)	WLAN	8.72	9.8%	10782	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10838	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10727	AAC	IEEE 802.11ax (20MHz, MCS48, 90pcu)	WLAN	8.86	9.9%	10783	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10839	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%
10728	AAC	IEEE 802.11ax (20MHz, MCS49, 90pcu)	WLAN	8.65	9.9%	10784	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%	10840	AAC	IEEE 802.11ax (20MHz, MCS11, 90pcu)	WLAN	8.86	9.9%

Certificate No: EX3-7346_Mar22
Page 19 of 24

Certificate No: EX3-7346_Mar22
Page 20 of 24



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is deemed to have read, understood and accepted the Terms and Conditions of the document and the instructions of the Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is strictly prohibited and may result in severe civil and criminal penalties. Otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report
or email: CN.Doccheck@sqs.com

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园佳业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sqs.china@sqs.com

EXCIV4-SN 7346 March 30, 2022 15985 AAA 50 NR DL (CP-CFOM, TM 3.1, 40 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.54 ± 9.8 % 15986 AAA 50 NR DL (CP-CFOM, TM 3.1, 50 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.50 ± 9.8 % 15987 AAA 50 NR DL (CP-CFOM, TM 3.1, 60 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.50 ± 9.8 % 15988 AAA 50 NR DL (CP-CFOM, TM 3.1, 70 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.38 ± 9.8 % 15989 AAA 50 NR DL (CP-CFOM, TM 3.1, 80 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.33 ± 9.8 % 15990 AAA 50 NR DL (CP-CFOM, TM 3.1, 90 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.52 ± 9.8 % 1 Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value. Certificate No. EXC-7346_Mar22 Page 24 of 24	EXCIV4-SN 7346 March 30, 2022 15985 AAA 50 NR DL (CP-CFOM, TM 3.1, 40 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.54 ± 9.8 % 15986 AAA 50 NR DL (CP-CFOM, TM 3.1, 50 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.50 ± 9.8 % 15987 AAA 50 NR DL (CP-CFOM, TM 3.1, 60 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.50 ± 9.8 % 15988 AAA 50 NR DL (CP-CFOM, TM 3.1, 70 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.38 ± 9.8 % 15989 AAA 50 NR DL (CP-CFOM, TM 3.1, 80 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.33 ± 9.8 % 15990 AAA 50 NR DL (CP-CFOM, TM 3.1, 90 MHz, 64-QAM, 30 kHz) SG NR PR1 TDD 9.52 ± 9.8 % 1 Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value. Certificate No. EXC-7346_Mar22 Page 24 of 24
---	---

4 Impedance and return loss

Dipole CLA150 SN 4025				
Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	ΔΩ
2021/4/26	-31.4	/	47.8	/
Dipole D450V3 SN 1103				
Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	ΔΩ
2021/4/21	-23	/	57.1	/



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No. 10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300
中国·江苏·昆山市留学生创业园伟业路10号 邮编 215300

t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com