

Appendix C for KSCR230200014201

Calibration Certificate

Object	Apply	No	Model	SN	Calibration Date	Due date of calibration
Dipole	<input type="checkbox"/>	1	CLA150	4025	2021/04/26	2024/04/25
	<input type="checkbox"/>	2	D450V3	1103	2021/04/21	2024/04/20
	<input type="checkbox"/>	3	D750V3	1188	2022/03/29	2025/03/28
	<input type="checkbox"/>	4	D835V2	4d114	2022/03/31	2025/03/30
	<input type="checkbox"/>	5	D900V2	1d079	2022/06/07	2025/06/06
	<input type="checkbox"/>	6	D1800V2	2d170	2022/03/31	2025/03/30
	<input type="checkbox"/>	7	D1900V2	5d136	2022/06/07	2025/06/06
	<input type="checkbox"/>	8	D2000V2	1041	2022/06/06	2025/06/05
	<input type="checkbox"/>	9	D2300V2	1096	2022/03/31	2025/03/30
	<input checked="" type="checkbox"/>	10	D2450V2	817	2022/04/01	2025/03/31
	<input type="checkbox"/>	11	D2600V2	1158	2022/03/31	2025/03/30
	<input type="checkbox"/>	12	D5GHzV2	1095	2022/06/01	2025/05/31
DAE	<input checked="" type="checkbox"/>	13	DAE4	1245	2022/05/30	2023/05/29
Probe	<input checked="" type="checkbox"/>	14	EX3DV4	7767	2022/10/28	2023/10/27

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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

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1 Dipole

1.1 CLA150 - SN 4025

<p>Calibration Laboratory of Schmid & Partner Engineering AG Zugstrasse 45, 8001 Zurich, Switzerland</p> <p>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</p> <p>Client: SGS-CN (Auden) Certificate No: CLA150-4025_Apr21</p> <p>CALIBRATION CERTIFICATE</p> <table border="1"> <tr> <td>Object</td> <td>CLA150 - SN: 4025</td> </tr> <tr> <td>Calibration procedure</td> <td>QA CAL-15.v9 Calibration Procedure for SAR Validation Sources below 700 MHz</td> </tr> <tr> <td>Calibration date</td> <td>April 26, 2021</td> </tr> <tr> <td colspan="2">This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). 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All figures stated in the certificate are valid at the frequency indicated. Antenna Parameters with TSL: The source is mounted in a touch configuration below the center marking of the flat phantom. Return Loss: This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low required power. 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. <p>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%.</p> <p>Certificate No: CLA150-4025_Apr21 Page 2 of 6</p>
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Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Grated Ratio = 1.4 (Z direction)																																																																																																																																																								
Frequency	150 MHz ± 1 MHz																																																																																																																																																									
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Nominal Head TSL parameters	Temperature	Permittivity	Conductivity																																																																																																																																																							
22.0 °C	62.3	0.78 mho/m																																																																																																																																																								
(22.0 ± 0.2) °C	51.1 ± 6 %	0.78 mho/m ± 6 %																																																																																																																																																								
Head TSL temperature change during test	< 0.5 °C	---	---																																																																																																																																																							
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SAR measured	1 W input power	3.90 W/kg																																																																																																																																																								
SAR for nominal Head TSL parameters	normalized to 1W	3.88 W/kg ± 18.4 % (k=2)																																																																																																																																																								
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition																																																																																																																																																									
SAR measured	1 W input power	2.60 W/kg																																																																																																																																																								
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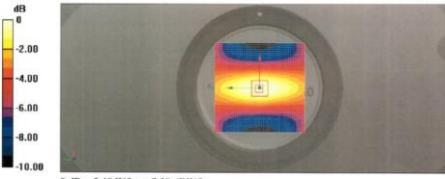
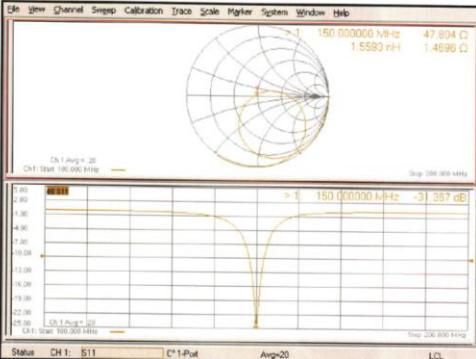
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<p>DASY5 Validation Report for Head TSL</p> <p>Date: 26.04.2021</p> <p>Test Laboratory: SPEAG, Zurich, Switzerland</p> <p>DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4025</p> <p>Communication System: UUD 0 - CW; Frequency: 150 MHz</p> <p>Medium parameters used: $\epsilon_r = 1.0$; $\sigma = 0.76 \text{ S/m}$; $\epsilon_0 = 51.1$; $\rho = 1000 \text{ kg/m}^3$</p> <p>Phantom section: Flat Section</p> <p>Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)</p> <p>DASY52 Configuration:</p> <ul style="list-style-type: none"> Probe: EX3DV4 - SN3877; ConvF(12.51, 12.51, 12.51) @ 150 MHz; Calibrated: 30.12.2020 Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAB4 Suf654; Calibrated: 26.06.2020 Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003 DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483) <p>CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x10x8) /Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm</p> <p>Reference Value = 85.93 V/m; Power Drift = -0.02 dB</p> <p>Peak SAR (extrapolated) = 7.36 W/kg</p> <p>SAR(1 g) = 3.90 W/kg; SAR(10 g) = 2.00 W/kg</p> <p>Small distances tend to result in amounts 3 dB below; Larger than measurement grid (>30mm)</p> <p>Ratio of SAR at M2 to SAR at M1 = 80.4%</p> <p>Maximum value of SAR (measured) = 5.48 W/kg</p> <p>0 dB = 5.48 W/kg = 7.39 dBW/kg</p>  <p>Certificates No: CLA150-4025_Apr21 Page 5 of 6</p>	 <p>Certificates No: CLA150-4025_Apr21 Page 6 of 6</p>
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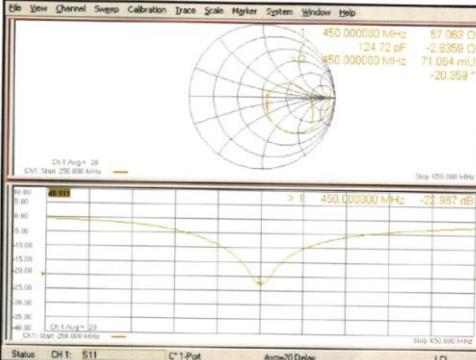
1.2 D450V3 - SN 1103

<p>Calibration Laboratory of Schmid & Partner Engineering AG Zughestrasse 43, 8004 Zurich, Switzerland</p> <p> </p> <p>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</p> <p>Client: SGS-CN (Auden) Certificate No: D450V3-1103_Apr21</p> <p>CALIBRATION CERTIFICATE</p> <p>Object: D450V3 - SN:1103</p> <p>Calibration procedure(s): QA CAL-15.v9 Calibration Procedure for SAR Validation Sources below 700 MHz</p> <p>Calibration date: April 21, 2021</p> <p>This calibration certificate documents the traceability to national standards, which realize the physical units of measurement (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.</p> <p>All calibrations have been conducted in the closed laboratory facility; environment temperature ($20 \pm 3^\circ\text{C}$) and humidity $\approx 75\%$.</p> <p>Calibration Equipment used (M/TE critical for calibration):</p> <table border="1"> <tr> <td>Primary Standards</td> <td>ID #</td> <td>Cal Date (Certificate No.)</td> <td>Scheduled Calibration</td> </tr> <tr> <td>Power meter NIP-291</td> <td>SN: 100778</td> <td>09-Apr-21 (No. 217-0021-0320)</td> <td>Apr-22</td> </tr> <tr> <td>Power sensor NIP-291</td> <td>SN: 100284</td> <td>09-Apr-21 (No. 217-0021)</td> <td>Apr-22</td> </tr> <tr> <td>Power sensor NIP-291</td> <td>SN: 103219</td> <td>09-Apr-21 (No. 217-0021)</td> <td>Apr-22</td> </tr> <tr> <td>Reference 20 dB Attenuator</td> <td>SN: CC2652 (200)</td> <td>09-Apr-21 (No. 217-0043)</td> <td>Apr-22</td> </tr> <tr> <td>Type-N minmax combination</td> 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simulating liquid ConvF: sensitivity in TSL / NORM x,y,z N/A: not applicable or not measured <p>Calibration is Performed According to the Following Standards:</p> <ol style="list-style-type: none"> IEEE Std 1628-2013, "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 605864, "SAR Measurement Requirements for 100 MHz to 6 GHz" <p>Additional Documentation:</p> <ol style="list-style-type: none"> DASY4/5 System Handbook <p>Method Applied and Interpretation of Parameters:</p> <ul style="list-style-type: none"> 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. Peak Power 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. <p>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%.</p> <p>Certificate No: D450V3-1103_Apr21 Page 2 of 6</p>
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Measurement Conditions DASY system configuration, as far as not given on page 1. <table border="1"> <tr><td>DASY Version</td><td>DASY5</td><td>V62.10.4</td></tr> <tr><td>Extrapolation</td><td colspan="2">Advanced Extrapolation</td></tr> <tr><td>Phantom</td><td>ELI Flat Phantom</td><td>Shell thickness: 2 ± 0.2 mm</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>$\Delta x, \Delta y, \Delta z = 6 \text{ mm}$</td><td></td></tr> <tr><td>Frequency</td><td>450 MHz ± 1 MHz</td><td></td></tr> </table>		DASY Version	DASY5	V62.10.4	Extrapolation	Advanced Extrapolation		Phantom	ELI Flat Phantom	Shell thickness: 2 ± 0.2 mm	Distance Dipole Center - TSL	15 mm	with Spacer	Zoom Scan Resolution	$\Delta x, \Delta y, \Delta z = 6 \text{ mm}$		Frequency	450 MHz ± 1 MHz		Appendix (Additional assessments outside the scope of SCS 0108) Antenna Parameters with Head TSL <table border="1"> <tr><td>Impedance, transformed to feed point</td><td>57.1 Ω - 2.8 jΩ</td></tr> <tr><td>Return Loss</td><td>-23.0 dB</td></tr> </table> General Antenna Parameters and Design <table border="1"> <tr><td>Electrical Delay (one direction)</td><td>1.346 ns</td></tr> </table> <p>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 semi-glossy copper cable. The outer 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 arms, the small end caps are added to the dipole arms in order to improve matching when loaded according to the test and 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.</p>		Impedance, transformed to feed point	57.1 Ω - 2.8 jΩ	Return Loss	-23.0 dB	Electrical Delay (one direction)	1.346 ns
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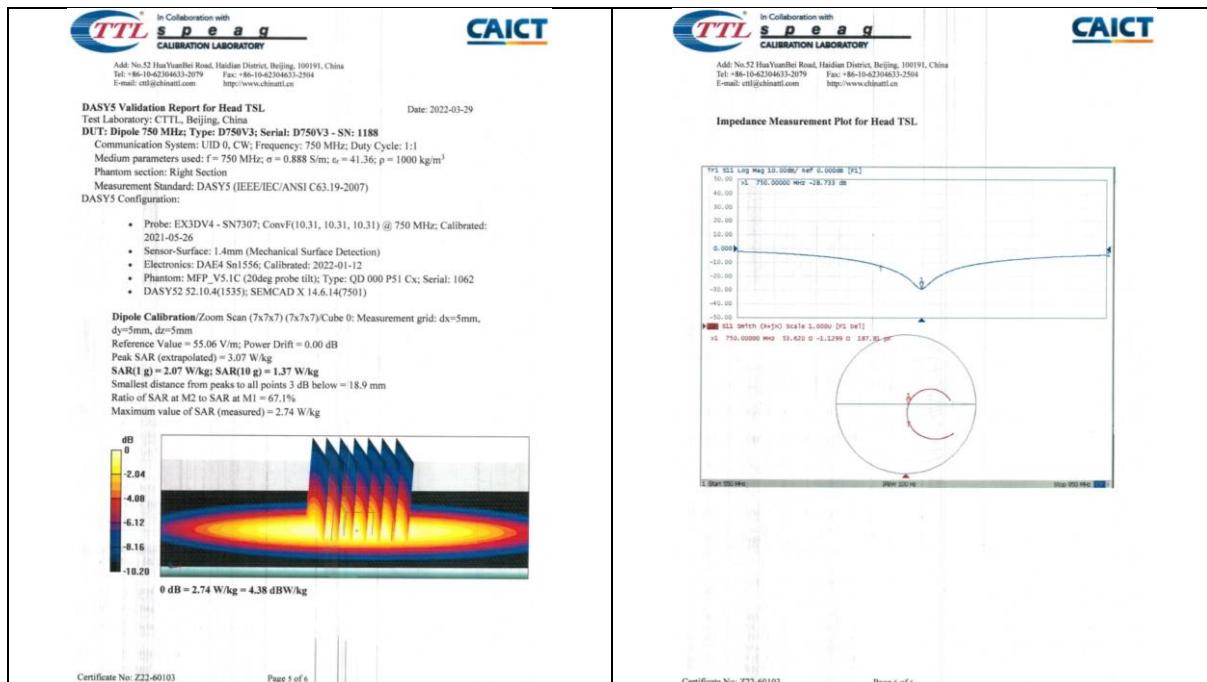
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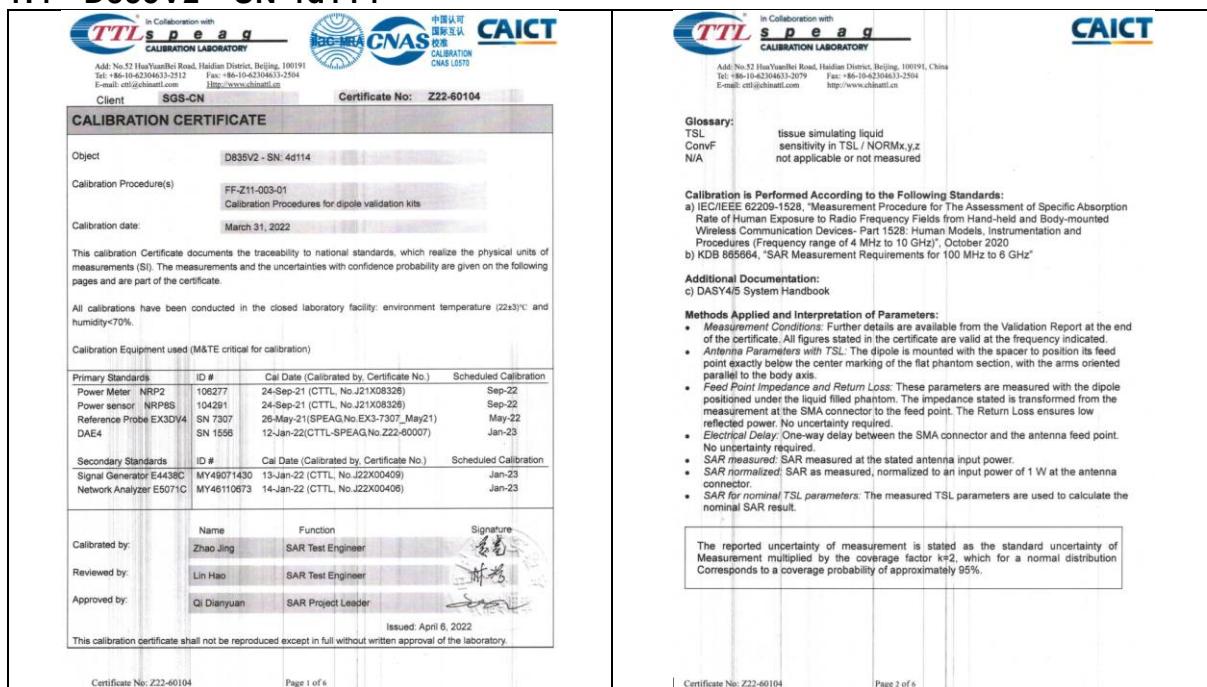
1.3 D750V3 - SN 1188

    <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191 Tel: +86-10-62305012 Fax: +86-10-62304633-2504 E-mail: cttf@chinaitt.com http://www.chinaitt.com</p> <p>Client: SGS-CN Certificate No: Z22-60103</p> <p>CALIBRATION CERTIFICATE</p> <p>Object: D750V3 - SN: 1188</p> <p>Calibration Procedure(s): FF-Z11-003-01 Calibration Procedures for dipole validation kits</p> <p>Calibration date: March 29, 2022</p> <p>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.</p> <p>All calibration have been conducted in the closed laboratory facility: environment temperature (22±3)°C; and humidity<70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> <table border="1"> <tr> <th>Primary Standards</th> <th>ID #</th> <th>Cal Date (Calibrated by, Certificate No.)</th> <th>Scheduled Calibration</th> </tr> <tr> <td>Power Meter NRP2</td> <td>105277</td> <td>24-Sep-21 (CTTL, No.J21X08326)</td> <td>Sep-22</td> </tr> <tr> <td>Power sensor NRP8S</td> <td>104291</td> <td>24-Sep-21 (CTTL, No.J21X08326)</td> <td>Sep-22</td> </tr> <tr> <td>Reference Probe EX3DV4 DAE4</td> <td>SN 7307 SN 1556</td> <td>26-May-21 (SPEAG No EX3-7307, May21) 12-Jan-22 (CTTL-SPEAG, No.Z22-60007)</td> <td>May-22 Jan-23</td> </tr> <tr> <th>Secondary Standards</th> <th>ID #</th> <th>Cal Date (Calibrated by, Certificate No.)</th> <th>Scheduled Calibration</th> </tr> <tr> <td>Signal Generator E4438C</td> <td>MY49071430</td> <td>13-Jan-22 (CTTL, No.J22X04049)</td> <td>Jan-23</td> </tr> <tr> <td>Network Analyzer E5071C</td> <td>MY46110673</td> <td>14-Jan-22 (CTTL, No.J22X04046)</td> <td>Jan-23</td> </tr> </table> <p>Calibrated by: Zhao Jing Reviewed by: Lin Hao Approved by: Qi Dianyuan</p> <p>Issued: April 3, 2022</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory.</p>		Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration	Power Meter NRP2	105277	24-Sep-21 (CTTL, No.J21X08326)	Sep-22	Power sensor NRP8S	104291	24-Sep-21 (CTTL, No.J21X08326)	Sep-22	Reference Probe EX3DV4 DAE4	SN 7307 SN 1556	26-May-21 (SPEAG No EX3-7307, May21) 12-Jan-22 (CTTL-SPEAG, No.Z22-60007)	May-22 Jan-23	Secondary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration	Signal Generator E4438C	MY49071430	13-Jan-22 (CTTL, No.J22X04049)	Jan-23	Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL, No.J22X04046)	Jan-23	  <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504 E-mail: cttf@chinaitt.com http://www.chinaitt.com</p> <p>Glossary: TSL tissue simulating liquid ConvF sensitivity in TSL / NORMx,y,z N/A not applicable or not measured</p> <p>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 655564, "SAR Measurement Requirements for 100 MHz to 6 GHz"</p> <p>Additional Documentation: c) DASY4/S System Handbook</p> <p>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 measured value 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.</p> <p>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%.</p>																																
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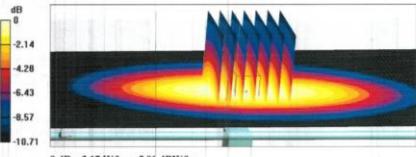
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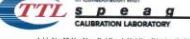
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DASY5's Variations Report for Head TSL Test Laboratory: CAICT, Beijing China DUT: Dipole 835 MHz; Type: DR35V2; Serial: 4d114 Communication System: UID 0; CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium parameters used: $\epsilon' = 835 \text{ MHz}$; $\sigma = 0.907 \text{ S/m}$; $\tau_s = 40.98$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration: <ul style="list-style-type: none"> • Probe: EX3DV4 - SN7307; ConvF(10.13, 10.13, 10.13) @ 835 MHz; Calibrated: 2021-05-26 • Sensor-Surface: 1.4mm (Mechanical Surface Detection) • Electronics: DAE4.5n1556; Calibrated: 2022-01-12 • Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062 • DASY52 S2.10.4(1535); SEMICAD X 14.6.14(7501) <p>Diode 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) = 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  <p>0 dB = 3.17 W/kg = 5.01 dBW/kg</p> </p>																																																													
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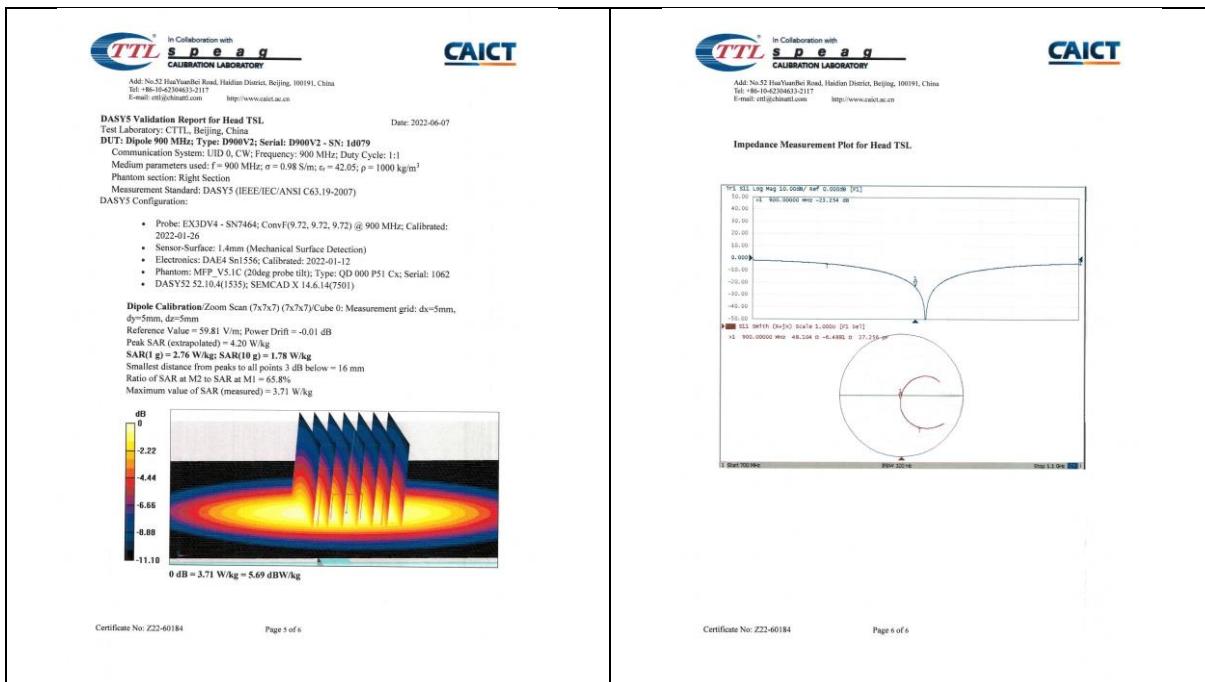
1.5 D900V2 - SN 1d079

    <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191 Tel: +86-10-62794531-2117 E-mail: offi@caict.ac.cn http://www.caict.ac.cn</p> <p>Client: SGS-CN Certificate No: Z22-60184</p> <p>CALIBRATION CERTIFICATE</p> <p>Object: D900V2 - SN: 1d079</p> <p>Calibration Procedure(s): FF-Z11-003-01 Calibration Procedures for dipole validation kits</p> <p>Calibration date: June 7, 2022</p> <p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility, environment temperature (22±5)°C and humidity<70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> <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: NIP82</td> <td>10277</td> <td>24-Jan-21 (CTTL, No. J22X00260)</td> <td>Sept-22</td> </tr> <tr> <td>Power sensor: NIP85</td> <td>10491</td> <td>24-Sep-21 (CTTL, No. J21X03262)</td> <td>Sept-22</td> </tr> <tr> <td>Reference Probe EX3DV4</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 1558</td> <td>12-Jan-22(CTTL-SPEAG No Z22-80007)</td> <td>Jan-23</td> </tr> <tr> <td>Secondary Standards</td> <td>ID #</td> <td>Cal Date (Calibrated by, Certificate No.)</td> <td>Scheduled Calibration</td> </tr> <tr> <td>Signal Generator E4438C</td> <td>MY49071430</td> <td>13-Jan-22 (CTTL, No. J22X00409)</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> <table border="1"> <thead> <tr> <th>Name</th> <th>Function</th> <th>Signature</th> </tr> </thead> <tbody> <tr> <td>Zhao Jing</td> <td>SAR Test Engineer</td> <td></td> </tr> <tr> <td>Lin Hao</td> <td>SAR Test Engineer</td> <td></td> </tr> <tr> <td>Qi Dianyuan</td> <td>SAR Project Leader</td> <td></td> </tr> </tbody> </table> <p>Issued: June 13, 2022</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory.</p> <p>Certificate No: Z22-60184 Page 1 of 6</p>	Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration	Power Meter: NIP82	10277	24-Jan-21 (CTTL, No. J22X00260)	Sept-22	Power sensor: NIP85	10491	24-Sep-21 (CTTL, No. J21X03262)	Sept-22	Reference Probe EX3DV4	SN 7464	26-Jan-22(SPEAG No EX3-7464, Jan22)	Jan-23	DAE4	SN 1558	12-Jan-22(CTTL-SPEAG No Z22-80007)	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	MY46110673	14-Jan-22 (CTTL, No. J22X00406)	Jan-23	Name	Function	Signature	Zhao Jing	SAR Test Engineer		Lin Hao	SAR Test Engineer		Qi Dianyuan	SAR Project Leader		  <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62794531-3217 E-mail: offi@caict.ac.cn http://www.caict.ac.cn</p> <p>Glossary:</p> <p>TSL: tissue simulating liquid ConvF: sensitivity in TSL / NORMxyz N/A: not applicable or not measured</p> <p>Calibration is Performed According to the Following Standards:</p> <p>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 895994, "SAR Measurement Requirements for 100 MHz to 6 GHz"</p> <p>Additional Documentation:</p> <p>o DASY4.5 System Handbook</p> <p>Methods Applied and Interpretation of Parameters:</p> <ul style="list-style-type: none"> • Antenna Configuration: Further details are available from the Validation Report at the end of the certificate. All parameters 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. • Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance value is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required. • Time 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. <p>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%.</p> <p>Certificate No: Z22-60184 Page 2 of 6</p>																
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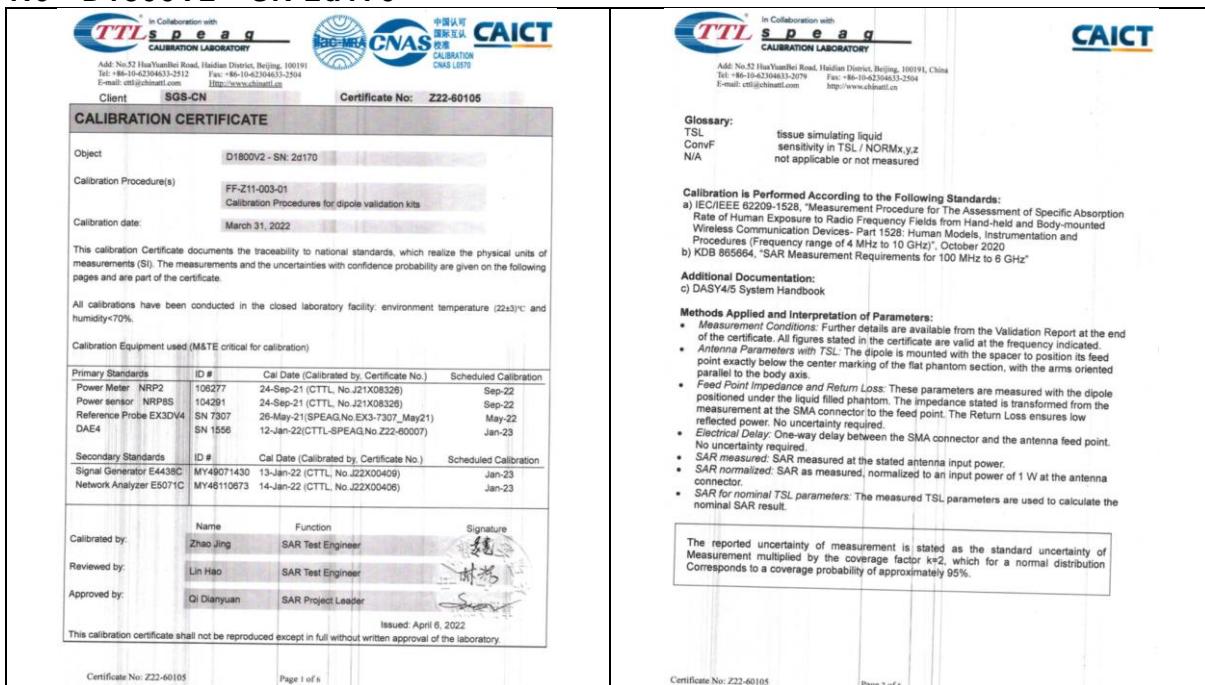
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<p>TTL <small>In Collaboration with</small> SPeAG CALIBRATION LABORATORY</p> <p>Add: No.53 HuaYanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304613-2079 Fax: +86-10-62304613-2504 E-mail: ctt@chinattt.cn http://www.chinattt.cn</p> <p>CAICT</p> <p>Measurement Conditions DASY5 system configuration, as far as not given on page 1.</p> <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>1800 MHz ± 1 MHz</td><td></td></tr> </table> <p>Head TSL parameters The following parameters and calculations were applied.</p> <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>40.0</td><td>1.40 mho/m</td></tr> <tr><td>Measured Head TSL parameters</td><td>(22.0 ± 0.2) °C</td><td>40.6 ± 6 %</td><td>1.41 mho/m ± 6 %</td></tr> <tr><td>Head TSL temperature change during test</td><td><1.0 °C</td><td>—</td><td>—</td></tr> </table> <p>SAR result with Head TSL</p> <table border="1"> <tr><th>SAR averaged over 1 cm³ (1 g) of Head TSL</th><th>Condition</th></tr> <tr><td>SAR measured</td><td>250 mW input power 9.73 W/kg</td></tr> <tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W 38.9 W/kg ± 18.8 % (k=2)</td></tr> <tr><th>SAR averaged over 10 cm³ (10 g) of Head TSL</th><th>Condition</th></tr> <tr><td>SAR measured</td><td>250 mW input power 5.11 W/kg</td></tr> <tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W 20.4 W/kg ± 18.7 % (k=2)</td></tr> </table> <p>Certificate No: Z22-60105 Page 3 of 6</p>	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	1800 MHz ± 1 MHz			Temperature	Permittivity	Conductivity	Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m	Measured Head TSL parameters	(22.0 ± 0.2) °C	40.6 ± 6 %	1.41 mho/m ± 6 %	Head TSL temperature change during test	<1.0 °C	—	—	SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	SAR measured	250 mW input power 9.73 W/kg	SAR for nominal Head TSL parameters	normalized to 1W 38.9 W/kg ± 18.8 % (k=2)	SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	SAR measured	250 mW input power 5.11 W/kg	SAR for nominal Head TSL parameters	normalized to 1W 20.4 W/kg ± 18.7 % (k=2)	<p>TTL <small>In Collaboration with</small> SPeAG CALIBRATION LABORATORY</p> <p>Add: No.53 HuaYanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304613-2079 Fax: +86-10-62304613-2504 E-mail: ctt@chinattt.cn http://www.chinattt.cn</p> <p>CAICT</p> <p>Appendix (Additional assessments outside the scope of CNAS L0570)</p> <p>Antenna Parameters with Head TSL</p> <table border="1"> <tr><td>Impedance, transformed to feed point</td><td>47.90- 2.54jΩ</td></tr> <tr><td>Return Loss</td><td>-29.4dB</td></tr> </table> <p>General Antenna Parameters and Design</p> <table border="1"> <tr><td>Electrical Delay (one direction)</td><td>1.116 ns</td></tr> </table> <p>After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.</p> <p>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 standard. The overall dipole design is still according to the Standard. The SAR data are not affected by this change. The overall dipole design is still according to the Standard.</p> <p>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.</p> <p>Additional EUT Data</p> <table border="1"> <tr><td>Manufactured by</td><td>SPeAG</td></tr> </table> <p>Certificate No: Z22-60105 Page 4 of 6</p>	Impedance, transformed to feed point	47.90- 2.54jΩ	Return Loss	-29.4dB	Electrical Delay (one direction)	1.116 ns	Manufactured by	SPeAG
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SAR measured	250 mW input power 5.11 W/kg																																																						
SAR for nominal Head TSL parameters	normalized to 1W 20.4 W/kg ± 18.7 % (k=2)																																																						
Impedance, transformed to feed point	47.90- 2.54jΩ																																																						
Return Loss	-29.4dB																																																						
Electrical Delay (one direction)	1.116 ns																																																						
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<p>TTL <small>In Collaboration with</small> SPeAG CALIBRATION LABORATORY</p> <p>Add: No.53 HuaYanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304613-2079 Fax: +86-10-62304613-2504 E-mail: ctt@chinattt.cn http://www.chinattt.cn</p> <p>CAICT</p> <p>DASV5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China Date: 2022-03-31</p> <p>DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d170 Communication System: UUD 0; CW; Frequency: 1800 MHz; Duty Cycle: 1:1 Medium parameters used: $\epsilon = 1800 \text{ MHz}$; $\sigma = 1.411 \text{ S/m}$; $\epsilon_r = 40.62$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section Measurement Standard: DASV5 (IEEE/IEC/ANSI C63.19-2007)</p> <p>DASV5 Configuration:</p> <ul style="list-style-type: none"> Probe: EX3DV4 - SN7307; ConvF(8.34, 8.34, 8.34) @ 1800 MHz; Calibrated: 2021-05-26 Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1556; Calibrated: 2022-01-12 Phantom: MFP_V3.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062 DASV52 52.10.4(1535); SEMCAD X 14.6.14(7501) <p>Probe Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 98.14 V/m; Power Drift = 0.03 dB Peak SAR (1 g) = 9.73 W/kg; SAR(10 g) = 38.9 W/kg Smallest distance from peaks to all points 3 dB below = 10 mm Ratio of SAR at M2 to SAR at M1 = 54% Maximum value of SAR (measured) = 15.2 W/kg</p> <p>Figure: A 3D heatmap showing SAR distribution. The color scale ranges from -17.12 dB to 0 dB. The text at the bottom indicates $0 \text{ dB} = 15.2 \text{ W/kg} = 11.82 \text{ dBW/kg}$.</p> <p>Certificate No: Z22-60105 Page 5 of 6</p>	<p>TTL <small>In Collaboration with</small> SPeAG CALIBRATION LABORATORY</p> <p>Add: No.53 HuaYanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304613-2079 Fax: +86-10-62304613-2504 E-mail: ctt@chinattt.cn http://www.chinattt.cn</p> <p>CAICT</p> <p>Impedance Measurement Plot for Head TSL</p> <p>Certificate No: Z22-60105 Page 6 of 6</p>																																																						

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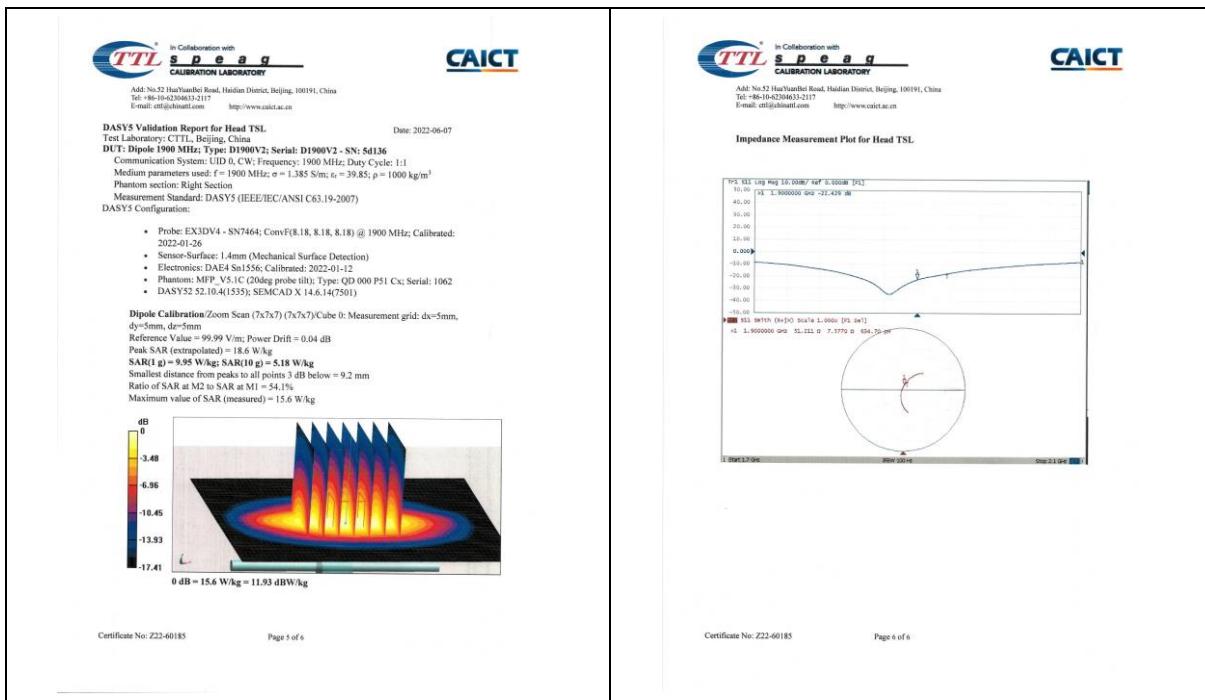
1.7 D1900V2 - SN 5d136

<div style="text-align: center;">   <p>In Collaboration with SGS CALIBRATION LABORATORY Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191 Tel: +86-10-62904532-2117 E-mail: sgs.cn@kcaict.com Client: SGS-CN Certificate No: Z22-60185</p> <p>CALIBRATION CERTIFICATE</p> <p>Object: D1900V2 - SN: 5d136</p> <p>Calibration Procedure(s): FF-Z11-003-01 Calibration Procedures for dipole validation kits</p> <p>Calibration date: June 7, 2022</p> <p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility, environment temperature (22±5)°C and humidity<70%.</p> <p>Calibration Equipment used (M&TE criteria for calibration)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Primary Standards</th> <th>ID #</th> <th>Cal Date Calibrated by, Certificate No.</th> <th>Scheduled Calibration</th> </tr> <tr> <td>Power sensor NRP2</td> <td>102277</td> <td>24-Jan-22 (CTTL No.J22X00209)</td> <td>Sep-22</td> </tr> <tr> <td>Power sensor NRP85</td> <td>104291</td> <td>24-Sep-21 (CTTL No.J21X00326)</td> <td>Sep-22</td> </tr> <tr> <td>Reference Probe EX3DV4</td> <td>SN 7464</td> <td>26-Jan-22(SPEAG No EX3-7464, Jan22)</td> <td>Jan-23</td> </tr> <tr> <td>DAEA</td> <td>SN 1558</td> <td>12-Jan-22(CTTL-SPEAG No 222-60007)</td> <td>Jan-23</td> </tr> <tr> <th>Secondary Standards</th> <th>ID #</th> <th>Cal Date (Calibrated by, Certificate No.)</th> <th>Scheduled Calibration</th> </tr> <tr> <td>Signal Generator E4438C</td> <td>MY49071430</td> <td>13-Jan-22 (CTTL No.J22X00409)</td> <td>Jan-23</td> </tr> <tr> <td>Network Analyzer E5071C</td> <td>MY48110673</td> <td>14-Jan-22 (CTTL No.J22X00406)</td> <td>Jan-23</td> </tr> </table> <p>Calibrated by: Zhao Jing SAR Test Engineer</p> <p>Reviewed by: Lin Hao SAR Test Engineer</p> <p>Approved by: Qi Danyuan SAR Project Leader</p> <p>Issued: June 13, 2022</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory</p> <p>Certificate No: Z22-60185 Page 1 of 6</p> </div>	Primary Standards	ID #	Cal Date Calibrated by, Certificate No.	Scheduled Calibration	Power sensor NRP2	102277	24-Jan-22 (CTTL No.J22X00209)	Sep-22	Power sensor NRP85	104291	24-Sep-21 (CTTL No.J21X00326)	Sep-22	Reference Probe EX3DV4	SN 7464	26-Jan-22(SPEAG No EX3-7464, Jan22)	Jan-23	DAEA	SN 1558	12-Jan-22(CTTL-SPEAG No 222-60007)	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.J22X00406)	Jan-23	<div style="text-align: center;">   <p>In Collaboration with SGS CALIBRATION LABORATORY Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62904532-2117 E-mail: sgs.cn@kcaict.com http://www.caict.ac.cn</p> <p>Glossary:</p> <p>TSL tissue simulating liquid Conv/F sensitivity in TSL / NORMLxyz N/A not applicable or not measured</p> <p>Calibration is Performed According to the Following Standards:</p> <p>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 Personal Communication Devices- Part 1528: Human Models, Instrumentation and Procedure (Frequency range of 4 MHz to 10 GHz)", October 2020 b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"</p> <p>Additional Documentation:</p> <p>c) DASY4.3 System Handbook</p> <p>Methods Applied and Interpretation of Parameters:</p> <ul style="list-style-type: none"> Measurement Conditions: Further details are available from the Validation Report at the end of this document. All figures and tables 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 transferred from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required. Electrical Delay: The electrical delay between the SMA connector and the antenna feed point. No uncertainty required. SAR measured: SAR measured at the stated antenna input power. SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result. <p>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%.</p> <p>Certificate No: Z22-60185 Page 2 of 6</p> </div>																																				
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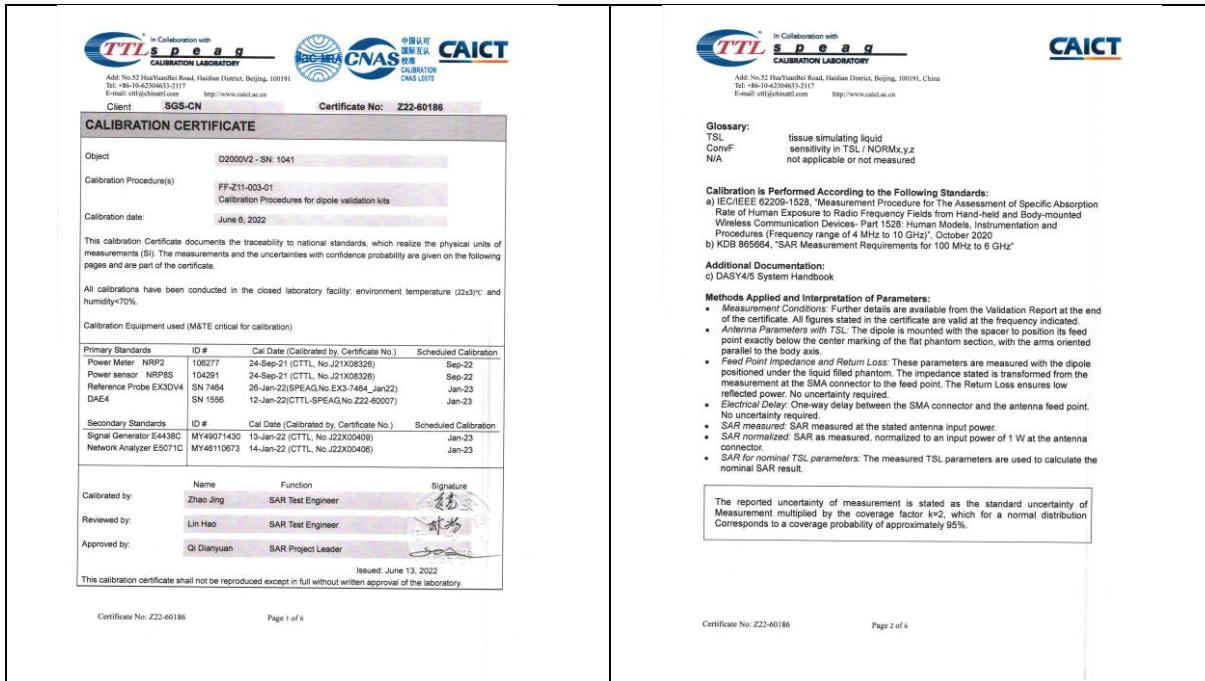
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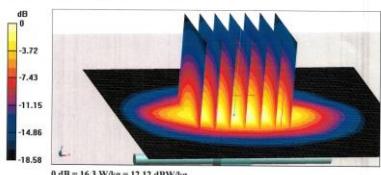
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<div style="text-align: center;">  <p>In Collaboration with CAICT</p> <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: cttf@caict.ac.cn http://www.caict.ac.cn</p> <p>Measurement Conditions DASY system configuration, as far as given on page 1.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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>2000 MHz ± 1 MHz</td><td></td></tr> </table> <p>Head TSL parameters The following parameters and calculations were applied:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Temperature</td><td>Permittivity</td><td>Conductivity</td></tr> <tr><td>22.0 °C</td><td>40.0</td><td>1.40 mho/m</td></tr> <tr><td>Measured Head TSL parameters</td><td>(22.0 ± 0.2) °C</td><td>40.2 ± 6 % 1.39 mho/m ± 6 %</td></tr> <tr><td>Head TSL temperature change during test</td><td><1.0 °C</td><td>—</td></tr> </table> <p>SAR result with Head TSL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>SAR averaged over 1 cm³ (1 g) of Head TSL</td><td>Condition</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 ± 18.8 % (n=2)</td></tr> <tr><td>SAR averaged over 10 cm³ (10 g) of Head TSL</td><td>Condition</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> </div>	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	2000 MHz ± 1 MHz		Temperature	Permittivity	Conductivity	22.0 °C	40.0	1.40 mho/m	Measured Head TSL parameters	(22.0 ± 0.2) °C	40.2 ± 6 % 1.39 mho/m ± 6 %	Head TSL temperature change during test	<1.0 °C	—	SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	SAR measured	250 mW input power	10.4 W/kg	SAR for nominal Head TSL parameters	normalized to 1W	41.8 W/kg ± 18.8 % (n=2)	SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	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)	<div style="text-align: center;">  <p>In Collaboration with CAICT</p> <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: cttf@caict.ac.cn http://www.caict.ac.cn</p> <p>Appendix (Additional assessments outside the scope of CNAS L0570)</p> <p>Antenna Parameters with Head TSL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Impedance, transformed to feed port</td><td>48.40 ± 0.74(j0)</td></tr> <tr><td>Return Loss</td><td>-34.9dB</td></tr> </table> <p>General Antenna Parameters and Design</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Electric Delay (one direction)</td><td>1.088 ns</td></tr> </table> <p>After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.</p> <p>The dipole is made of standard semirigid coaxial cable. The center conductor of the testing 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 with a phantom. Measurement conditions: Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still adapted to the phantom.</p> <p>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.</p> <p>Additional EUT Data</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Manufactured by</td><td>SPEAG</td></tr> </table> </div>	Impedance, transformed to feed port	48.40 ± 0.74(j0)	Return Loss	-34.9dB	Electric Delay (one direction)	1.088 ns	Manufactured by	SPEAG
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<p>Certificate No: Z22-60186 Date: 2022-06-06</p> <p>DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China DUT: Dipole 2000 MHz, Type: D2000V2; Serial: D2000V2 - SN: 1041 Customer Specification: IED 0, CW, Frequency: 2000 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2000 MHz; ε = 1.392 Sim; σ = 40.21; ρ = 1000 kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration:<ul style="list-style-type: none">• Probe: EX300V4 - SN7464; ConvF(8.2, 8.2, 8.2) @ 2000 MHz; Calibrated: 2022-01-26• Sensor-Surface: 1.4mm (Mechanical Surface Detection)• Electronics: DAE4 Snt156; Calibrated: 2022-01-12• Phantom: MPP_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 = 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 = 53.6% Maximum value of SAR (measured) = 16.3 W/kg</p> 																																																							
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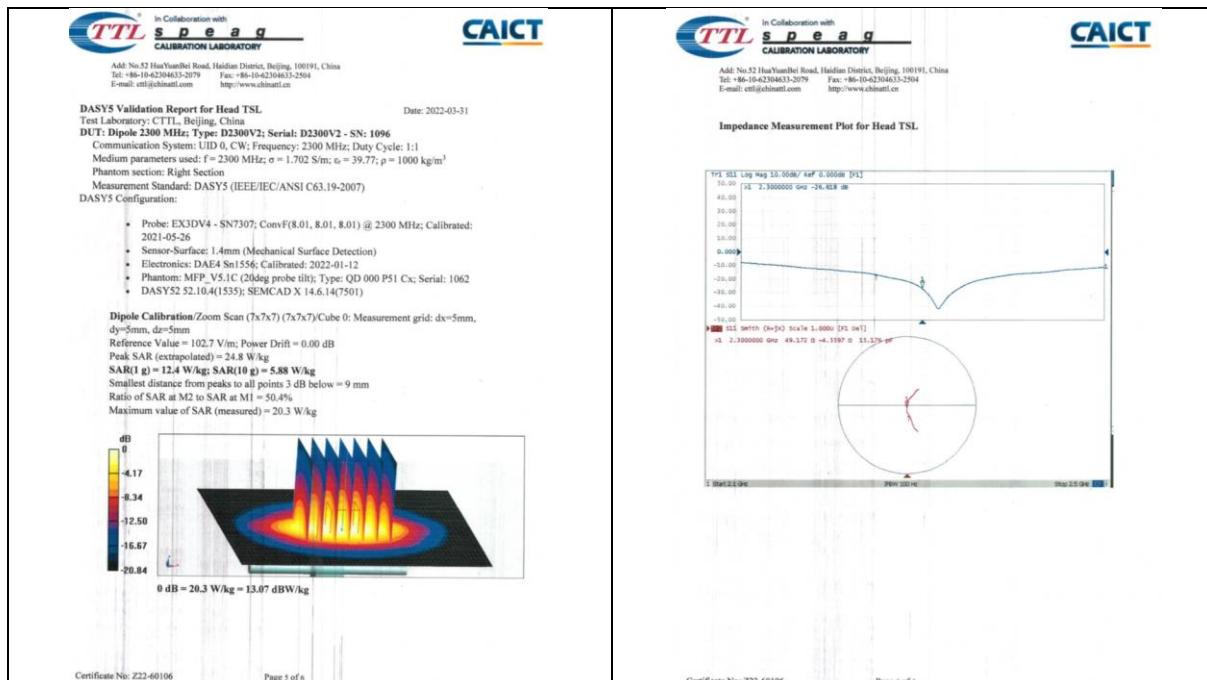
1.9 D2300V2 - SN 1096

  <p>Object: D2300V2 - SN: 1096</p> <p>Calibration Procedure(s): FF-Z11-003-01 Calibration Procedures for dipole validation kits</p> <p>Calibration date: March 31, 2022</p> <p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity <70%.</p> <p>Calibration Equipment used (MATE critical for calibration)</p> <table border="1"> <tr> <th>Primary Standards</th> <th>ID #</th> <th>Cal Date (Calibrated by, Certificate No.)</th> <th>Scheduled Calibration</th> </tr> <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 NRP8S</td> <td>104291</td> <td>24-Sep-21 (CTTL, No. J21X08326)</td> <td>Sep-22</td> </tr> <tr> <td>Reference Probe EX3DV4</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. 222-60007)</td> <td>Jan-23</td> </tr> <tr> <th>Secondary Standards</th> <th>ID #</th> <th>Cal Date (Calibrated by, Certificate No.)</th> <th>Scheduled Calibration</th> </tr> <tr> <td>Signal Generator E4438C</td> <td>MY49071430</td> <td>13-Jan-22 (CTTL, No. J22X00409)</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> </table> <p>Calibrated by: Zhao Jing Reviewed by: Lin Hao Approved by: Qi Dianyuan</p> <p>Issued: April 6, 2022</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory.</p>		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 NRP8S	104291	24-Sep-21 (CTTL, No. J21X08326)	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. 222-60007)	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	MY46110673	14-Jan-22 (CTTL, No. J22X00406)	Jan-23	  <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191 Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504 E-mail: ctli@chinaitt.com http://www.chinaitt.cn</p> <p>Glossary: TSL tissue simulating liquid ConvF sensitivity in TSL / NORMx,y,z N/A not applicable or not measured</p> <p>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 655664, "SAR Measurement Requirements for 100 MHz to 6 GHz"</p> <p>Additional Documentation: c) DASY4/S System Handbook</p> <p>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 measured value 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.</p> <p>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%.</p>																												
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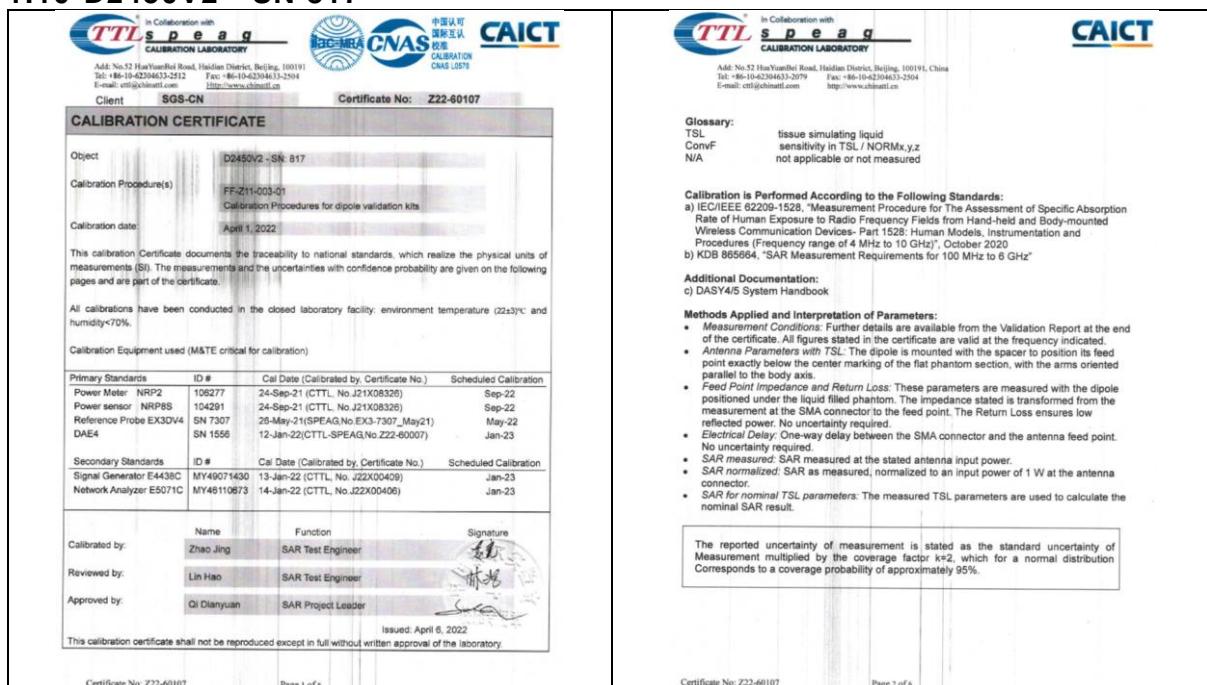
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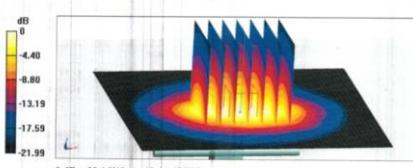
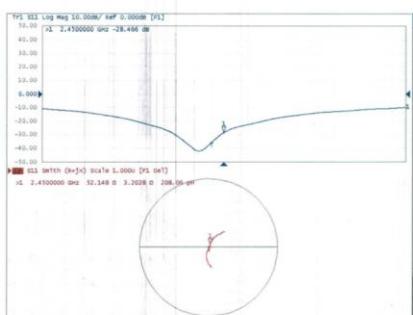
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<div style="text-align: center;">  <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504 E-mail: ctfl@chinattl.com http://www.chinattl.cn</p> <p>Measurement Conditions DASY system configuration, as far as not given on page 1.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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> <p>Head TSL parameters The following parameters and calculations were applied.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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 ± 6 %</td></tr> <tr><td>Head TSL temperature change during test</td><td><1.0 °C</td><td>—</td><td>—</td></tr> </table> <p>SAR result with Head TSL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>SAR averaged over 1 cm³ (1 g) of Head TSL</td><td>Condition</td><td></td></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>83.0 W/kg ± 18.8 % (k=2)</td></tr> <tr><td>SAR averaged over 10 cm³ (10 g) of Head TSL</td><td>Condition</td><td></td></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> </div>	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		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 ± 6 %	Head TSL temperature change during test	<1.0 °C	—	—	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	83.0 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)	<div style="text-align: center;">  <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504 E-mail: ctfl@chinattl.com http://www.chinattl.cn</p> <p>Appendix (Additional assessments outside the scope of CNAS L0570)</p> <p>Antenna Parameters with Head TSL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Impedance, transformed to feed point</td><td>52.10 ± 3.20Ω</td></tr> <tr><td>Return Loss</td><td>-28.5dB</td></tr> </table> <p>General Antenna Parameters and Design</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Electrical Delay (one direction)</td><td>1.066 ns</td></tr> </table> <p>After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.</p> <p>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 standard. The overall dipole length is still according to the Standard. 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.</p> <p>Additional EUT Data</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Manufactured by</td><td>SPEAG</td></tr> </table> </div>	Impedance, transformed to feed point	52.10 ± 3.20Ω	Return Loss	-28.5dB	Electrical Delay (one direction)	1.066 ns	Manufactured by	SPEAG
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1.11 D2600V2 - SN 1158

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The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> <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 NRP8</td> <td>104291</td> <td>24-Sep-21 (CTTL, No.J21X08326)</td> <td>Sep-22</td> </tr> <tr> <td>Reference Probe EX3DV4</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> <tr> <td>Secondary Standards</td> <td>ID #</td> <td>Cal Date (Calibrated by, Certificate No.)</td> <td>Scheduled Calibration</td> </tr> <tr> <td>Signal Generator E4438C</td> <td>MY49071430</td> <td>13-Jan-22 (CTTL, No.J22X04049)</td> <td>Jan-23</td> </tr> <tr> <td>Network Analyzer E5071C</td> <td>MY46110673</td> <td>14-Jan-22 (CTTL, No.J22X04046)</td> <td>Jan-23</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Calibrated by:</th> <th>Name</th> <th>Function</th> <th>Signature</th> </tr> </thead> <tbody> <tr> <td>Zhao Jing</td> <td>SAR Test Engineer</td> <td></td> </tr> <tr> <td>Reviewed by:</td> <td>Lin Hao</td> <td>SAR Test Engineer</td> <td></td> </tr> <tr> <td>Approved by:</td> <td>Qi Dianyuan</td> <td>SAR Project Leader</td> <td></td> </tr> </tbody> </table> <p>Issued: April 6, 2022</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory.</p>	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 NRP8	104291	24-Sep-21 (CTTL, No.J21X08326)	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.J22X04049)	Jan-23	Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL, No.J22X04046)	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		 <p>In Collaboration with CAICT CALIBRATION LABORATORY</p> <p>Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504 E-mail: ctli@chinatl.cn http://www.chinatl.cn</p> <p>Glossary: TSL tissue simulating liquid ConvF sensitivity in TSL / NORMx,y,z N/A not applicable or not measured</p> <p>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 Procedure (Frequency range of 4 MHz to 10 GHz)", October 2020 b) KDB 655664, "SAR Measurement Requirements for 100 MHz to 6 GHz"</p> <p>Additional Documentation: c) DASY4/S System Handbook</p> <p>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 fat 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 measured at the SMA connector to the feed point. The Return Loss ensures low reflected power. No absorption 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.</p> <p>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%.</p>													
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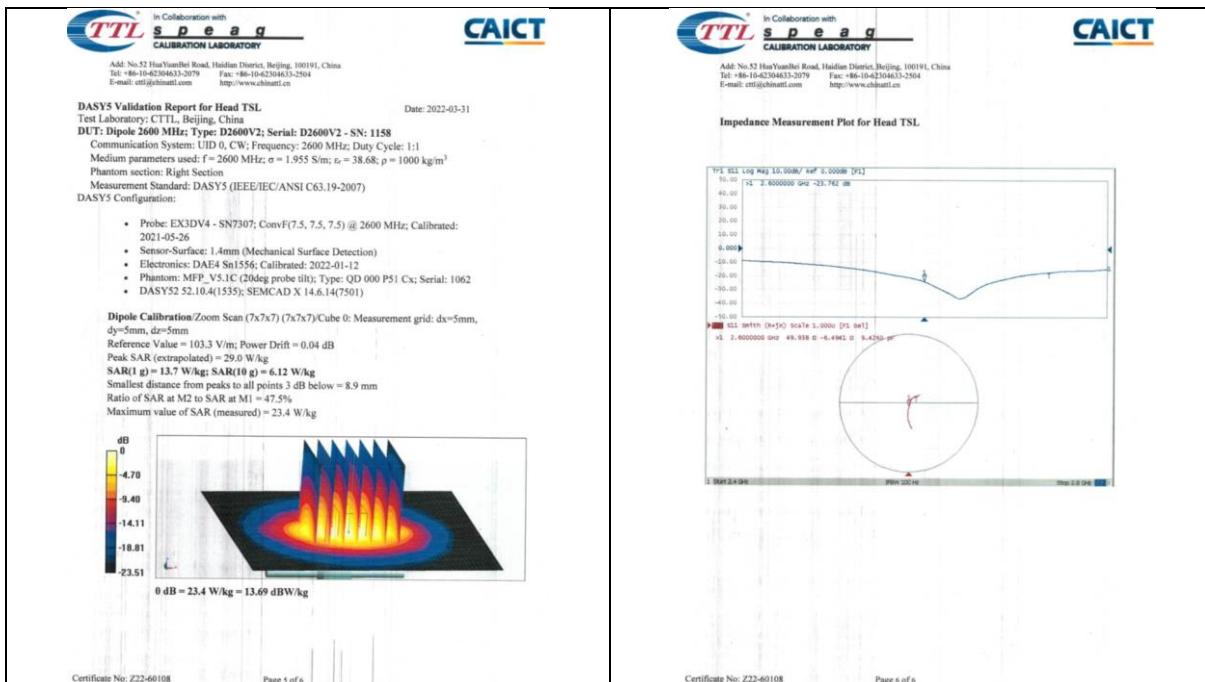
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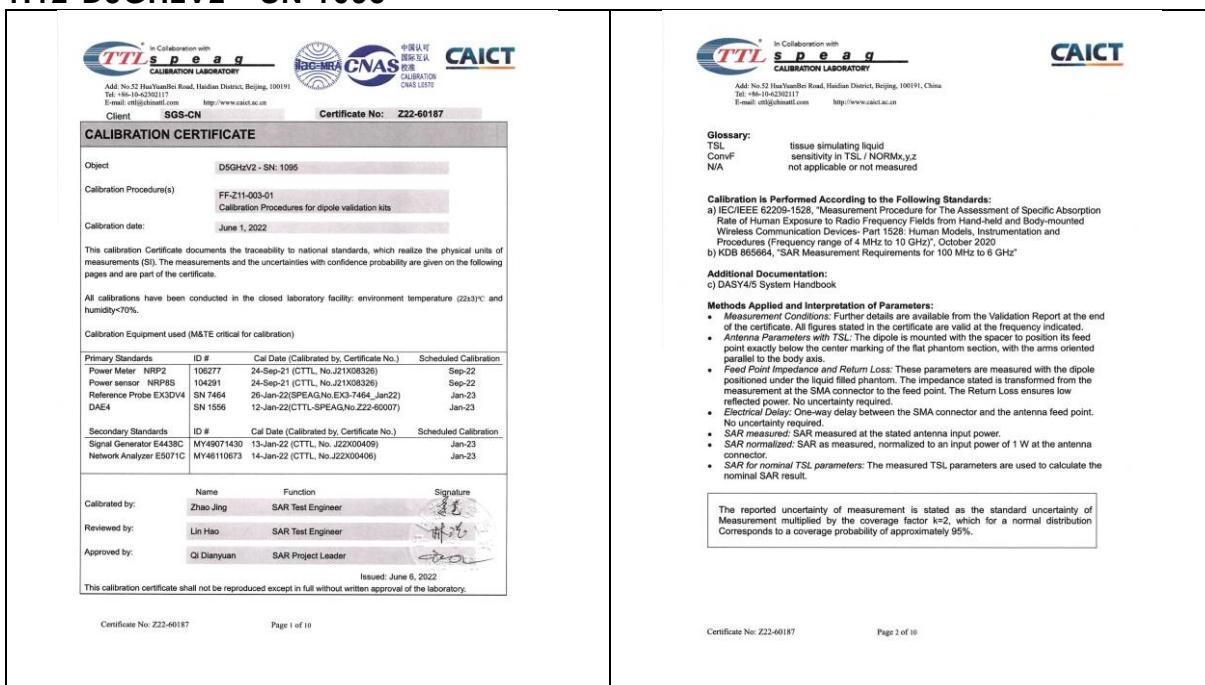
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1.12 D5GHzV2 - SN 1095



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<p>SGS</p> <p>In Collaboration with TTL s p e a g CALIBRATION LABORATORY</p> <p>Add: No.52 HuaYuanBei Road, HuaLian District, Beijing, 100191, China Tel: +86-10-62302117 E-mail: ctttg@sohu.com http://www.caict.ac.cn</p> <p>Measurement Conditions DASY system configuration, as far as not given on page 1.</p> <table border="1"> <tr><td>DASY Version</td><td>DASY32</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 = 4 mm, dz = 1.4 mm</td><td>Graded Ratio = 1.4 (Z direction)</td></tr> <tr><td>Frequency</td><td>4000 MHz ± 1 MHz 5300 MHz ± 1 MHz 5500 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz</td><td></td></tr> </table> <p>Head TSL parameters at 5200MHz The following parameters and calculations were applied.</p> <table border="1"> <tr><td></td><td>Temperature</td><td>Permittivity</td><td>Conductivity</td></tr> <tr><td>Nominal Head TSL parameters</td><td>22.0 °C</td><td>36.0</td><td>4.66 mho/m</td></tr> <tr><td>Measured Head TSL parameters</td><td>(22.0 ± 0.2) °C</td><td>35.4 ± 6 %</td><td>4.62 mho/m ± 6 %</td></tr> <tr><td>Head TSL temperature change during test</td><td><1.0 °C</td><td>—</td><td>—</td></tr> </table> <p>SAR result with Head TSL at 5200MHz SAR averaged over 1 cm³ (1 g) of Head TSL</p> <table border="1"> <tr><td></td><td>Condition</td><td></td></tr> <tr><td>SAR measured</td><td>250 mW input power</td><td>7.79 W/kg</td></tr> <tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>77.6 W/kg ± 24.4 % (k=2)</td></tr> </table> <p>SAR result with Head TSL at 5200MHz SAR averaged over 10 cm³ (10 g) of Head TSL</p> <table border="1"> <tr><td></td><td>Condition</td><td></td></tr> <tr><td>SAR measured</td><td>250 mW input power</td><td>2.22 W/kg</td></tr> <tr><td>SAR for nominal Head TSL parameters</td><td>normalized to 1W</td><td>22.1 W/kg ± 24.2 % (k=2)</td></tr> </table>	DASY Version	DASY32	52.10.4	Extrapolation	Advanced Extrapolation		Phantom	Triple Flat Phantom 5.1C		Distance Dipole Center - 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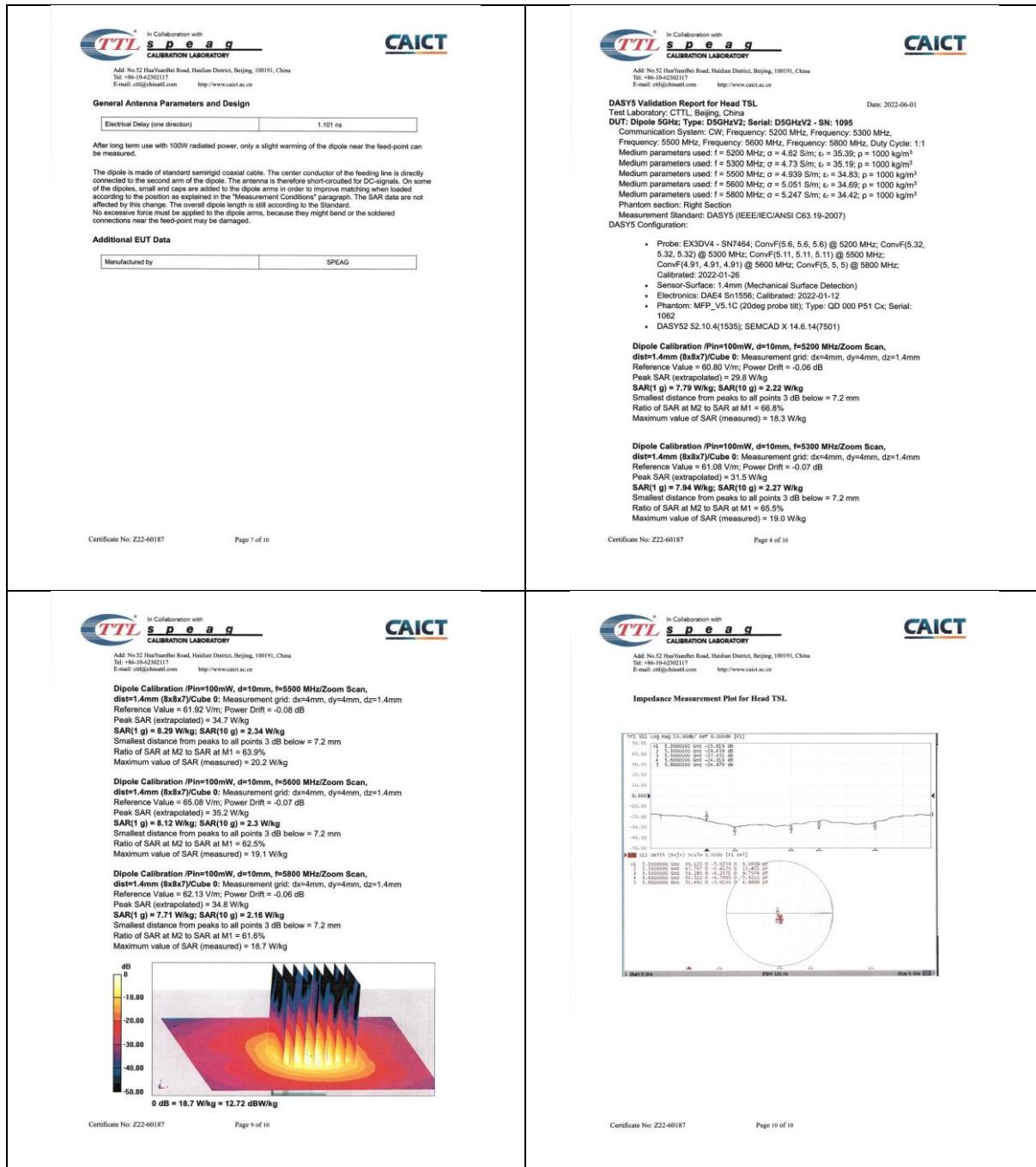


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2 DAE4 - SN 1245

<div style="border: 1px solid black; padding: 10px;"> <p>IMPORTANT NOTICE</p> <p>USAGE OF THE DAE4</p> <p>The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:</p> <p>Battery Exchange: The battery cover of the DAE4 unit is fixed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.</p> <p>Shipping of the DAE: Before shipping the DAE to SPEAG for calibration, remove the batteries and pack the DAE in an airtight bag. The airtight bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.</p> <p>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 accumulation on the E-stop. Therefore, the E-stop shall always mount the probe to the DAE carefully and never touch the DAE unit in a non-dust-free environment. It is not recommended to use the E-stop for safety applications.</p> <p>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.</p> <p>DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.</p> <p>Important Note: Warranty and calibration is valid if the DAE unit is disassembled partly or fully by the Customer.</p> <p>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.</p> <p>Important Note: To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.</p> <p>TN_EH190306AE DAE4.docx 07.03.2019</p> </div>	<div style="border: 1px solid black; padding: 10px;"> <p>Calibration Laboratory of Schmid & Partner Engineering AG Zugstrasse 43, 8004 Zurich, Switzerland Phone +41 44 245 9700, Fax +41 44 245 9779 www.speag.ch, info@speag.ch</p> <p>Accredited by: The Swiss Accreditation Service (SCS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates</p> <p>Client: SGS-CN (Auden) Certificate No.: DAE4-1245_May22</p> <p>CALIBRATION CERTIFICATE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Object</td> <td colspan="3">DAE4 - SD 000 D04 BM - SN: 1245</td> </tr> <tr> <td>Calibration procedure(s)</td> <td colspan="3">QA CAL-06.v30 Calibration procedure for the data acquisition electronics (DAE)</td> </tr> <tr> <td>Calibration date:</td> <td colspan="3">May 30, 2022</td> </tr> <tr> <td colspan="4">This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). 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Calibration Factors	X	Y	Z																																																																								
High Range	405.265 ± 0.02% (k=2)	403.974 ± 0.02% (k=2)	405.092 ± 0.02% (k=2)																																																																								
Low Range	3.99594 ± 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 °																																																																										

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



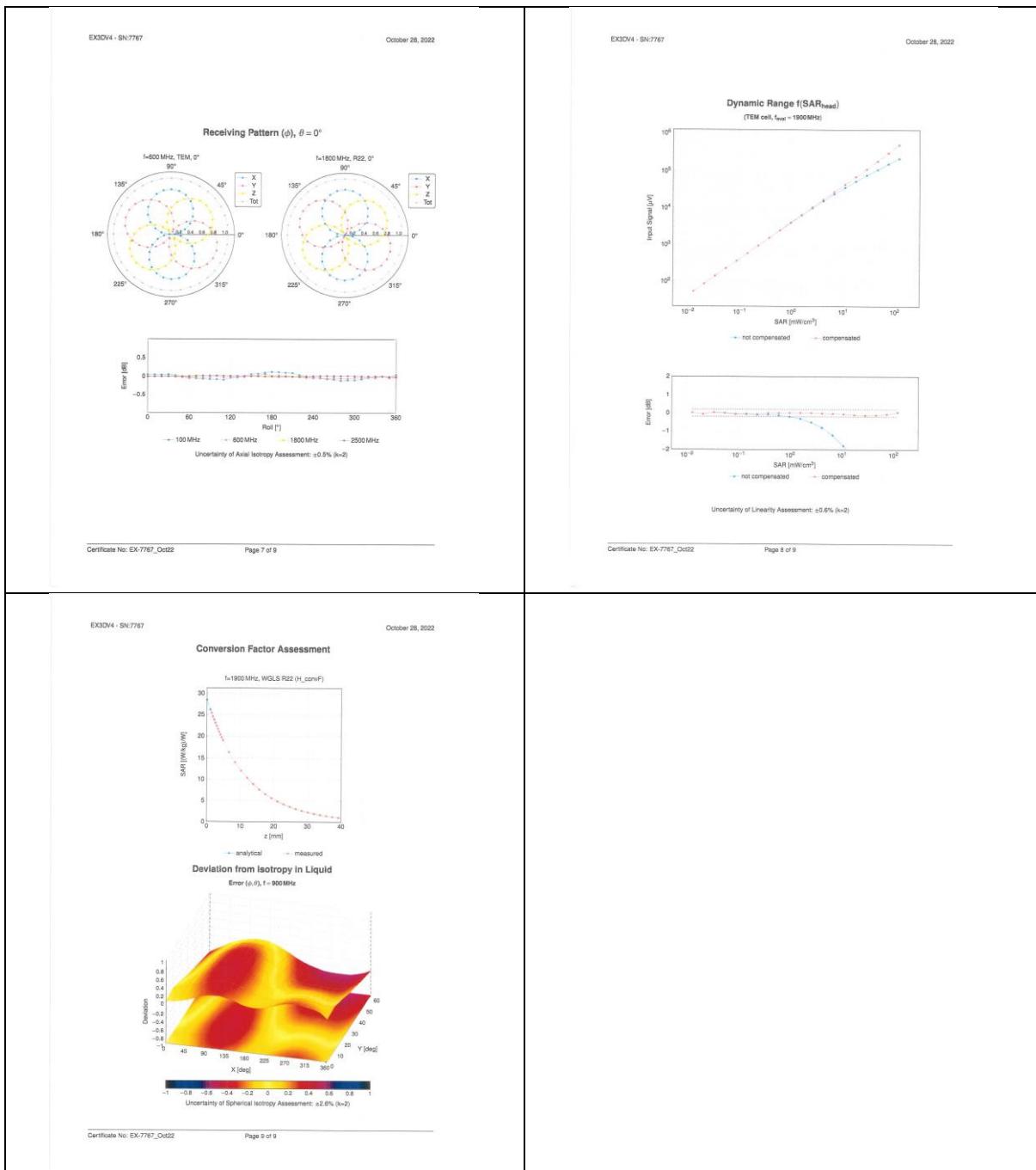
3 EX3DV4 - SN 7767

Calibration Laboratory of Schmid & Partner Engineering AG Zugstrasse 43, 8004 Zurich, Switzerland		  S Schweizerischer Kalibrierdienst S Service suisse d'etonnage C Servizio svizzero di taratura S Servizio calibrazione Service																																																				
Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Mutual Recognition Agreement on the recognition of calibration certificates		  S Schweizerischer Kalibrierdienst S Service suisse d'etonnage C Servizio svizzero di taratura S Servizio calibrazione Service																																																				
Accredited No.: SCS 0108		Accredited No.: SC 0108																																																				
Client: SGS-CN (Auden)		Certificate No: EX-7787_Oct22																																																				
CALIBRATION CERTIFICATE																																																						
Object: EX3DV4 - SN:7767																																																						
Calibration procedure(s): QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes																																																						
Calibration date: October 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 ± 0.5°C) and humidity < 70%.																																																						
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<p>EX3DV4 - SN:7767</p> <p>October 29, 2022</p> <p>Parameters of Probe: EX3DV4 - SN:7767</p> <p>Basic Calibration Parameters</p> <table border="1"> <tr> <th></th> <th>Sensor X</th> <th>Sensor Y</th> <th>Sensor Z</th> <th>Unc (k = 2)</th> </tr> <tr> <td>Norm (A/m²)^a</td> <td>0.67</td> <td>0.69</td> <td>0.66</td> <td>$\pm 10.1\%$</td> </tr> <tr> <td>DCP (mV)^b</td> <td>103.4</td> <td>107.3</td> <td>105.7</td> <td>$\pm 4.7\%$</td> </tr> </table> <p>Calibration Results for Modulation Response</p> <table border="1"> <thead> <tr> <th>UID / Communication System Name</th> <th>A dB</th> <th>B dB/mV</th> <th>C</th> <th>D dB</th> <th>VR mV</th> <th>Max dev.</th> <th>Max Unc^c k = 2</th> </tr> </thead> <tbody> <tr> <td>0 CW</td> <td>X: 0.00</td> <td>0.00</td> <td>1.00</td> <td>0.00</td> <td>164.7</td> <td>$\pm 3.9\%$</td> <td>$\pm 4.7\%$</td> </tr> <tr> <td></td> <td>Y: 0.00</td> <td>0.00</td> <td>1.00</td> <td>0.00</td> <td>166.7</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Z: 0.00</td> <td>0.00</td> <td>1.00</td> <td>0.00</td> <td>176.3</td> <td></td> <td></td> </tr> </tbody> </table> <p>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%.</p> <p>^a The uncertainty of Norm is 3.2% as per the 95% total uncertainty per Table 3B, (see Page 5). ^b Uncertainties per sensor uncertainty for maximum specified field strength. ^c Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.</p> <p>Certificate No: EX-7767_Oct22 Page 5 of 9</p>		Sensor X	Sensor Y	Sensor Z	Unc (k = 2)	Norm (A/m ²) ^a	0.67	0.69	0.66	$\pm 10.1\%$	DCP (mV) ^b	103.4	107.3	105.7	$\pm 4.7\%$	UID / Communication System Name	A dB	B dB/mV	C	D dB	VR mV	Max dev.	Max Unc ^c k = 2	0 CW	X: 0.00	0.00	1.00	0.00	164.7	$\pm 3.9\%$	$\pm 4.7\%$		Y: 0.00	0.00	1.00	0.00	166.7				Z: 0.00	0.00	1.00	0.00	176.3			<p>EX3DV4 - SN:7767</p> <p>October 29, 2022</p> <p>Parameters of Probe: EX3DV4 - SN:7767</p> <p>Other Probe Parameters</p> <table border="1"> <tr> <td>Sensor Arrangement</td> <td>Triangular</td> </tr> <tr> <td>Orientation</td> <td>144.8°</td> </tr> <tr> <td>Mechanical Surface Detection Mode</td> <td>enabled</td> </tr> <tr> <td>Optical Surface Detection Mode</td> <td>disabled</td> </tr> <tr> <td>Probe Overall Length</td> <td>337 mm</td> </tr> <tr> <td>Probe Body Diameter</td> <td>10 mm</td> </tr> <tr> <td>Tip Length</td> <td>9 mm</td> </tr> <tr> <td>Tip Diameter</td> <td>2.5 mm</td> </tr> <tr> <td>Probe Tip to Sensor X Calibration Point</td> <td>1 mm</td> </tr> <tr> <td>Probe Tip to Sensor Y Calibration Point</td> <td>1 mm</td> </tr> <tr> <td>Probe Tip to Sensor Z Calibration Point</td> <td>1 mm</td> </tr> <tr> <td>Recommended Measurement Distance from Surface</td> <td>1.4 mm</td> </tr> </table> <p>Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.</p> <p>Certificate No: EX-7767_Oct22 Page 4 of 9</p>	Sensor Arrangement	Triangular	Orientation	144.8°	Mechanical Surface Detection Mode	enabled	Optical Surface Detection Mode	disabled	Probe Overall Length	337 mm	Probe Body Diameter	10 mm	Tip Length	9 mm	Tip Diameter	2.5 mm	Probe Tip to Sensor X Calibration Point	1 mm	Probe Tip to Sensor Y Calibration Point	1 mm	Probe Tip to Sensor Z Calibration Point	1 mm	Recommended Measurement Distance from Surface	1.4 mm																																																																																																																																																																		
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<p>EX3DV4 - SN:7767</p> <p>October 29, 2022</p> <p>Parameters of Probe: EX3DV4 - SN:7767</p> <p>Calibration Parameter Determined in Head Tissue Simulating Media</p> <table border="1"> <thead> <tr> <th>T (GHz)^d</th> <th>Relative Permittivity^e</th> <th>Conductivity^f (S/m)</th> <th>Conv^g X</th> <th>Conv^g Y</th> <th>Conv^g Z</th> <th>Alpha^h</th> <th>Degⁱ (mm)</th> <th>Unc (k = 2)</th> </tr> </thead> <tbody> <tr><td>150</td><td>52.3</td><td>0.76</td><td>14.06</td><td>14.06</td><td>0.00</td><td>1.00</td><td>$\pm 13.3\%$</td><td></td></tr> <tr><td>450</td><td>43.5</td><td>0.87</td><td>11.90</td><td>11.90</td><td>0.16</td><td>1.30</td><td>$\pm 13.3\%$</td><td></td></tr> <tr><td>750</td><td>41.9</td><td>0.89</td><td>10.26</td><td>10.26</td><td>0.65</td><td>0.98</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>835</td><td>41.5</td><td>0.90</td><td>10.00</td><td>10.00</td><td>0.45</td><td>0.89</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>1750</td><td>40.1</td><td>1.37</td><td>9.32</td><td>9.32</td><td>0.36</td><td>0.86</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>1900</td><td>40.0</td><td>1.40</td><td>8.91</td><td>8.91</td><td>0.33</td><td>0.86</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>2100</td><td>39.8</td><td>1.49</td><td>8.60</td><td>8.60</td><td>0.30</td><td>0.86</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>2300</td><td>39.5</td><td>1.57</td><td>8.44</td><td>8.44</td><td>0.33</td><td>0.90</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>2450</td><td>39.2</td><td>1.80</td><td>8.24</td><td>8.24</td><td>0.24</td><td>0.92</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>2600</td><td>39.0</td><td>1.96</td><td>7.99</td><td>7.99</td><td>0.27</td><td>0.90</td><td>$\pm 12.0\%$</td><td></td></tr> <tr><td>3300</td><td>38.2</td><td>2.71</td><td>7.55</td><td>7.55</td><td>0.30</td><td>1.25</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>3500</td><td>37.9</td><td>2.91</td><td>7.45</td><td>7.45</td><td>0.30</td><td>1.25</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>3700</td><td>37.7</td><td>3.12</td><td>7.20</td><td>7.20</td><td>0.30</td><td>1.25</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>3900</td><td>37.6</td><td>3.32</td><td>6.84</td><td>6.84</td><td>0.40</td><td>1.60</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>4100</td><td>37.2</td><td>3.53</td><td>6.53</td><td>6.53</td><td>0.40</td><td>1.60</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>4200</td><td>37.1</td><td>3.63</td><td>6.30</td><td>6.30</td><td>0.40</td><td>1.70</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>4400</td><td>36.9</td><td>3.84</td><td>6.17</td><td>6.17</td><td>0.40</td><td>1.70</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>4600</td><td>36.7</td><td>4.04</td><td>6.15</td><td>6.15</td><td>0.40</td><td>1.70</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>4800</td><td>36.4</td><td>4.26</td><td>6.13</td><td>6.13</td><td>0.40</td><td>1.90</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>4900</td><td>36.3</td><td>4.40</td><td>6.07</td><td>6.07</td><td>0.40</td><td>1.80</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>5000</td><td>36.0</td><td>4.96</td><td>5.65</td><td>5.65</td><td>0.40</td><td>1.80</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>5300</td><td>35.9</td><td>4.76</td><td>5.48</td><td>5.48</td><td>0.40</td><td>1.80</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>5500</td><td>35.6</td><td>4.96</td><td>5.30</td><td>5.30</td><td>0.40</td><td>1.80</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>5600</td><td>35.5</td><td>5.07</td><td>5.14</td><td>5.14</td><td>0.40</td><td>1.80</td><td>$\pm 13.1\%$</td><td></td></tr> <tr><td>5800</td><td>35.3</td><td>5.27</td><td>5.10</td><td>5.10</td><td>0.40</td><td>1.80</td><td>$\pm 13.1\%$</td><td></td></tr> </tbody> </table> <p>^d Frequency validity above 300 MHz at ±10% by weight for EX3DV4.4 and higher class. Page 5, also it is mentioned at 450 MHz. The uncertainty is the RSS of the Conv^g uncertainty of calibration frequency and the uncertainty for the indicated frequency range. Frequency validity below 300 MHz is ±10.2%. ^e At 450 MHz for Conv^g assessments at 150, 450, 750, 835, 1750, 1900, 2100, 2300, 2450, 2600, 3300, 3500, 3700, 3900, 4100, 4200, 4400, 4600, 4800, 4900, 5000, 5300, 5500, 5600, 5800, 6000, 6300, 6500, 6700, 7000, 7500, 7800, 8000, 8300, 8500, 8800, 9000, 9300, 9500, 9800, 10000, 10300, 10500, 10800, 11000, 11300, 11500, 11800, 12000, 12300, 12500, 12800, 13000, 13300, 13500, 13800, 14000, 14300, 14500, 14800, 15000, 15300, 15500, 15800, 16000, 16300, 16500, 16800, 17000, 17300, 17500, 17800, 18000, 18300, 18500, 18800, 19000, 19300, 19500, 19800, 20000, 20300, 20500, 20800, 21000, 21300, 21500, 21800, 22000, 22300, 22500, 22800, 23000, 23300, 23500, 23800, 24000, 24300, 24500, 24800, 25000, 25300, 25500, 25800, 26000, 26300, 26500, 26800, 27000, 27300, 27500, 27800, 28000, 28300, 28500, 28800, 29000, 29300, 29500, 29800, 30000, 30300, 30500, 30800, 31000, 31300, 31500, 31800, 32000, 32300, 32500, 32800, 33000, 33300, 33500, 33800, 34000, 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12.0\%$		2450	39.2	1.80	8.24	8.24	0.24	0.92	$\pm 12.0\%$		2600	39.0	1.96	7.99	7.99	0.27	0.90	$\pm 12.0\%$		3300	38.2	2.71	7.55	7.55	0.30	1.25	$\pm 13.1\%$		3500	37.9	2.91	7.45	7.45	0.30	1.25	$\pm 13.1\%$		3700	37.7	3.12	7.20	7.20	0.30	1.25	$\pm 13.1\%$		3900	37.6	3.32	6.84	6.84	0.40	1.60	$\pm 13.1\%$		4100	37.2	3.53	6.53	6.53	0.40	1.60	$\pm 13.1\%$		4200	37.1	3.63	6.30	6.30	0.40	1.70	$\pm 13.1\%$		4400	36.9	3.84	6.17	6.17	0.40	1.70	$\pm 13.1\%$		4600	36.7	4.04	6.15	6.15	0.40	1.70	$\pm 13.1\%$		4800	36.4	4.26	6.13	6.13	0.40	1.90	$\pm 13.1\%$		4900	36.3	4.40	6.07	6.07	0.40	1.80	$\pm 13.1\%$		5000	36.0	4.96	5.65	5.65	0.40	1.80	$\pm 13.1\%$		5300	35.9	4.76	5.48	5.48	0.40	1.80	$\pm 13.1\%$		5500	35.6	4.96	5.30	5.30	0.40	1.80	$\pm 13.1\%$		5600	35.5	5.07	5.14	5.14	0.40	1.80	$\pm 13.1\%$		5800	35.3	5.27	5.10	5.10	0.40	1.80	$\pm 13.1\%$	
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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	/

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