

Appendix C

Phantom Description

Schmid & Partner Engineering AG

е a g S р

Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 44 245 9700, Fax +41 44 245 9779 info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

Item	Oval Flat Phantom ELI 5.0
Type No	QD OVA 002 A
Series No	1108 and higher
Manufacturer	Untersee Composites
	Knebelstrasse 8, CH-8268 Mannenbach, Switzerland

Tests

Complete tests were made on the prototype units QD OVA 001 A, pre-series units QD OVA 001 B as well as on some series units QD OVA 001 B. Some tests are made on all series units QD OVA 002 A.

Test	Requirement	Details	Units tested
Shape	Internal dimensions, depth and sagging are compatible with standards	Bottom elliptical 600 x 400 mm, Depth 190 mm, dimension compliant with [1] for f > 375 MHz	Prototypes
Material thickness	Bottom: 2.0mm +/- 0.2mm	dimension compliant with [3] for f > 800 MHz	all
Material parameters	rel. permittivity 2 – 5, loss tangent ≤ 0.05, at f ≤ 6 GHz	rel. permittivity 3.5 +/- 0.5 loss tangent ≤ 0.05	Material samples
Material resistivity	Compatibility with tissue simulating liquids .	Compatible with SPEAG liquids. **	Phantoms, Material sample
Sagging	Sagging of the flat section in tolerance when filled with tissue simulating liquid.	within tolerance for filling height up to 155 mm	Prototypes, samples

Note: Compatibility restrictions apply certain liquid components mentioned in the standard.

containing e.g. DGBE, DGMHE or Triton X-100. Observe technical note on material compatibility

Standards

OET Bulletin 65, Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 01-01
 IEEE 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific

- Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques, December 2003
- [3] IEC 62209-1 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close
- proximity to the ear (frequency range of 300 MHz to 3 GHz)", 2005-02-18 [4] IEC 62209-2 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 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)", 2010-03-30

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of body-worn SAR measurements and system performance checks as specified in [1 - 4] and further standards.

Date 25.7.2011 Signature / Stamp

speag Schmid & Partner-Engineering/AG Zeugbarestrasse 43, 8004 Zeich, Smithiand Phone/441 44/255 9708, Few-444 64 44 59779

Doc No 881 - QD OVA 002 A - A

1 (1) Page

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279 台灣檢驗科技股份有限公司

f (886-2) 2298-0488

www.sqs.com.tw



System Validation from Original Equipment Supplier

Add: No.52 HuaYuanBei Ro Tel: +86-10-62304633-2117		beijing, tooryr	AS L0570
E-mail: emf@caict.ac.cn Client SGS	http://www.caic		2-60431
CALIBRATION CI	ERTIFICAT	E	
Object	D750V	3 - SN: 1015	
Calibration Procedure(s)		-003-01 tion Procedures for dipole validation kits	
Calibration date:		r 9, 2022	
pages and are part of the ce			
All calibrations have been humidity<70%.	conducted in t	he closed laboratory facility: environment t	temperature (22±3)°C and
All calibrations have been humidity<70%. Calibration Equipment used	conducted in t	or calibration)	
All calibrations have been humidity<70%. Calibration Equipment used	conducted in t		temperature (22±3)°C and Scheduled Calibration May-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards	conducted in t (M&TE critical fo	or calibration) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	conducted in t (M&TE critical fr ID # 106276 101369	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	conducted in t (M&TE critical fr ID # 106276 101369	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23 May-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	conducted in t (M&TE critical fr ID# 106276 101369 SN 7464	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22)	Scheduled Calibration May-23 May-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	conducted in t (M&TE critical fo ID # 106276 101369 SN 7464 SN 1556	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG, No.EX3-7464_Jan22) 12-Jan-22(CTTL-SPEAG, No.Z22-60007)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	conducted in t (M&TE critical fe 106276 101369 SN 7464 SN 1556 ID # MY49071430	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power Sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	conducted in t (M&TE critical fe 106276 101369 SN 7464 SN 1556 ID # MY49071430	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	conducted in t (M&TE critical fr 106276 101369 SN 7464 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	conducted in t (M&TE critical fe 106276 101369 SN 7464 SN 1556 ID # MY49071430 MY46110673 Name	Cal Date (Calibrated by, Certificate No.) Cal Date (Calibrated by, Certificate No.) O-May-22 (CTTL, No.J22X03103) Ca-Jan-22 (CTTL, No.J22X03103) Cal Date (Calibrated by, Certificate No.) Function Function	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration Jan-23 Jan-23

Certificate No: Z22-60431

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 indergrade and the document and the document document document and the document and the document document document and the document docum prosecuted to the fullest extent of the law.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 3 of 76





Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn E-mail: emf@caict.ac.cn

Glossary:

TSL ConvF N/A

tissue simulating liquid sensitivity in TSL / NORMx,y,z 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 865664, "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: Z22-60431

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caiet.ac.cn http://www.caiet.ac.cn

Measurement Conditions

DASY Version	DASY52	V52.10.4
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	750 MHz ±1 MHz	

Head TSL parameters

	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	41.5 ±6 %	0.90 mho/m ±6 %
Head TSL temperature change during test	<1.0 °C		

And the second second second

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.56 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.72 W/kg ±18.7 % (k=2)

Certificate No: Z22-60431

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留的天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn http://www.caict.ac.cn

Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

A REAL PROPERTY OF A REA	53.0Q+ 0.70jQ
Return Loss	- 30.4dB
eneral Antenna Parameters and Design	

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 The dipole is made or standard semingic coasta 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: Z22-60431

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

```
www.sqs.com.tw
```



Report No. : TESA2211000479EN Page: 6 of 76





Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn http://www.caict.ac.cn

DASY5 Validation Report for Head TSL

Date: 2022-10-09

Test Laboratory: CTL, Beijing, China DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1015 Communication System: UID 0, CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz; σ = 0.899 S/m; ϵ_r = 41.5; ρ = 1000 kg/m³ Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 SN7464; ConvF(10.26, 10.26, 10.26) @ 750 MHz; Calibrated: 2022-01-26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; 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) .

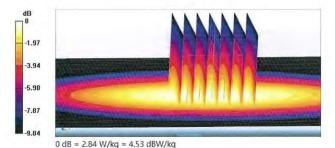
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 54.40 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 3.15 W/kg

SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.44 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 15 mm)

Ratio of SAR at M2 to SAR at M1 = 68.3%

Maximum value of SAR (measured) = 2.84 W/kg



Certificate No: Z22-60431

Page 5 of 6

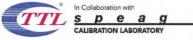
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

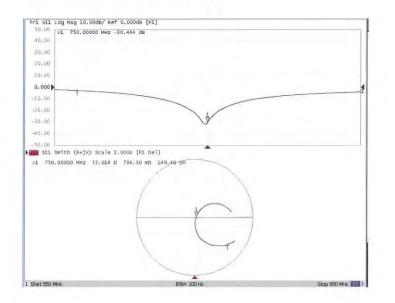






Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn http://www.caict.ac.cn

Impedance Measurement Plot for Head TSL



Certificate No: Z22-60431

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

```
www.sgs.com.tw
```



		3011	ALIBRATION
Add: No.52 HuaYuanBei Ro Tel: +86-10-62304633-2117		Beijing, 100191	NAS L0570
E-mail: emf@caict.ac.cn	http://www.caic		00.00400
Client SGS		Certificate No: Z	22-60428
CALIBRATION CE	ERTIFICAT	E	
Object	D835V	2 - SN: 4d063	
Calibration Procedure(s)	FF 744	-003-01	
		tion Procedures for dipole validation kits	
Calibration date:	Septem	iber 26, 2022	
neasurements (SI). The me bages and are part of the ce		the uncertainties with confidence probability	y are given on the following
humidity<70%.		he closed laboratory facility: environment	temperature (22±3)°C and
numidity<70%. Calibration Equipment used	(M&TE critical fo	or calibration)	
numidity<70%. Calibration Equipment used Primary Standards	(M&TE critical fo	or calibration) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
uumidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	(M&TE critical fo	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	(M&TE critical fe ID # 106276 101369	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23 May-23
uumidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	(M&TE critical fe ID # 106276 101369	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23 May-23
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	(M&TE critical fr ID # 106276 101369 SN 3846	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22(SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007)	Scheduled Calibration May-23 May-23) May-23
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	(M&TE critical fo ID # 106276 101369 SN 3846 SN 1556	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG,No.EX3-3846_May22) 12-Jan-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration May-23 May-23) May-23 Jan-23
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	(M&TE critical fo 10 # 106276 101369 SN 3846 SN 1556 ID #	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22(SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007)	Scheduled Calibration May-23 May-23 Jay-23 Jan-23 Scheduled Calibration
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	(M&TE critical fo ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG,No.EX3-3846_May22) 12-Jan-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409)	Scheduled Calibration May-23 May-23) May-23 Jan-23 Scheduled Calibration Jan-23
aumidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power Sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	(M&TE critical fo 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406)	Scheduled Calibration May-23 May-23) May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	(M&TE critical fo ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673 Name	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406) Function	Scheduled Calibration May-23 May-23) May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	(M&TE critical fo 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673 Name Zhao Jing	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406) Function SAR Test Engineer	Scheduled Calibration May-23 May-23) May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23

Certificate No: Z22-60428

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 9 of 76





Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn E-mail: emf@caict.ac.cn

Glossary: TSL ConvF

N/A

tissue simulating liquid sensitivity in TSL / NORMx,y,z 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 865664, "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: Z22-60428

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn http://www.caict.ac.cn

Measurement Conditions

DASY Version	DASY52	V52.10.4
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

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ±0.2) ℃	42.0 ±6 %	0.91 mho/m ±6 %
Head TSL temperature change during test	<1.0 °C	_	-

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.82 W/kg ±18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.36 W/kg ±18.7 % (k=2)

Certificate No: Z22-60428

Page 3 of 6

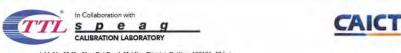
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留的天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488





Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn http://www.caict.ac.cn

Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.4Ω- 3.34jΩ	
Return Loss	- 29.5dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.313 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 The dipole is made of standard semingic coaxia cable. The center conductor of the feeding time 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: Z22-60428

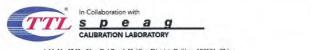
Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

f (886-2) 2298-0488







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn E-mail: emf@caict.ac.cn

DASY5 Validation Report for Head TSL

Date: 2022-09-26

Test Laboratory: CTTL, Beijing, China DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063 Communication System: UID 0, CW; Frequency: 835 MHz Medium parameters used: f = 835 MHz; σ = 0.911 S/m; ϵ_r = 42; ρ = 1000 kg/m^3 Phantom section: Right Section

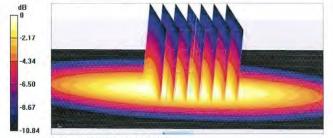
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 SN3846; ConvF(10.04, 10.04, 10.04) @ 835 MHz; Calibrated: 2022-05-20
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; 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 = 59.56 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 3.80 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.6 W/kg Smallest distance from peaks to all points 3 dB below = 16.2 mm Ratio of SAR at M2 to SAR at M1 = 64.7% Maximum value of SAR (measured) = 3.35 W/kg



0 dB = 3.35 W/kg = 5.25 dBW/kg

Certificate No: Z22-60428

Page 5 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

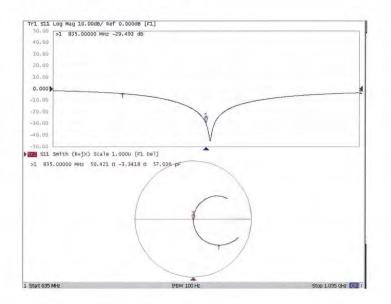






Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn http://www.caict.ac.cn

Impedance Measurement Plot for Head TSL



Certificate No: Z22-60428

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

www.sgs.com.tw



Add: No.52 HuaYuanBei Road Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn Client SGS	http://www.caict	Beijing, 100191	AS L0570
	http://www.caict		10 20070
Client SGS			0 00400
Client		Certificate No: Z2	2-60432
CALIBRATION CE	RTIFICAT	E	
Object	D1750\	/2 - SN: 1008	
Calibration Procedure(s)		000.04	
	FF-Z11- Calibrat	-003-01 tion Procedures for dipole validation kits	
Calibration date:	Septem	ber 27, 2022	
All calibrations have been o humidity<70%.	conducted in th	he closed laboratory facility: environment t	emperature (22±3)℃ and
Calibration Equipment used (I	M&TE critical fo	or calibration)	
	M&TE critical fo		Scheduled Calibration
		or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23
Primary Standards	ID#	Cal Date (Calibrated by, Certificate No.)	
Primary Standards Power Meter NRP2	ID # 106276	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103)	May-23
Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101369	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103)	May-23 May-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	ID # 106276 101369 SN 3846 SN 1556	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22(SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007)	May-23 May-23 May-23 Jan-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	ID # 106276 101369 SN 3846 SN 1556 ID #	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (CTTL, No.J22X03103) 20-May-22 (CTTL-SPEAG,No.Z22-60007) 12-Jan-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.)	May-23 May-23 May-23 Jan-23 Scheduled Calibration
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	ID # 106276 101369 SN 3846 SN 1556	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22(SPEAG,No.EX3-3846_May22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007)	May-23 May-23 May-23 Jan-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG, No.EX3-3846_May22) 12-Jan-22 (CTTL-SPEAG, No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409)	May-23 May-23 May-23 Jan-23 Scheduled Calibration Jan-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG, No.EX3-3846_May22) 12-Jan-22 (CTTL-SPEAG, No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406) Function	May-23 May-23 May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG, No.EX3-3846_May22) 12-Jan-22 (CTTL-SPEAG, No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406)	May-23 May-23 May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (SPEAG, No.EX3-3846_May22) 12-Jan-22 (CTTL-SPEAG, No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406) Function	May-23 May-23 May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C Calibrated by: Reviewed by:	ID # 106276 101369 SN 3846 SN 1556 ID # MY49071430 MY46110673 Name Zhao Jing	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 20-May-22 (CTTL, No.J22X03103) 20-May-22 (CTTL-SPEAG,No.Z22-60007) 12-Jan-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406) Function SAR Test Engineer	May-23 May-23 May-23 Jan-23 Scheduled Calibration Jan-23 Jan-23

Certificate No: Z22-60432

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



CAICT



E-mail: emf@caict.ac.cn http://www.caict.ac.cn

Glossary: TSI

ConvF N/A

tissue simulating liquid sensitivity in TSL / NORMx,y,z 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 865664, "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: Z22-60432

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

```
www.sqs.com.tw
```







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: emf@caiet.ac.cn http://www.eaiet.ac.cn

Measurement Conditions

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	1750 MHz ±1 MHz	

Head TSL parameters

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ±0.2) ℃	39.9 ±6 %	1.36 mho/m ±6 %
Head TSL temperature change during test	<1.0 °C	_	-

SAR result with Head TSI

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.4 W/kg ±18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.3 W/kg ±18.7 % (k=2)

Certificate No: Z22-60432

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留的天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

```
www.sgs.com.tw
```







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn E-mail: emf@caict.ac.cn

Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.4Ω+ 0.09jΩ
Return Loss	- 35.5dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.133 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: Z22-60432

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 18 of 76



DASY5 Validation Report for Head TSL



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn E-mail: emf@caict.ac.cn

Date: 2022-09-27

Test Laboratory: CTTL, Beijing, China DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1008 Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1750 MHz; $\sigma = 1.355$ S/m; $\epsilon_r = 39.91$; $\rho = 1000$ kg/m³ Phantom section: Right Section

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

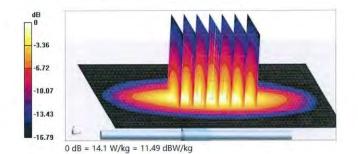
DASY5 Configuration:

- Probe: EX3DV4 SN3846; ConvF(8.29, 8.29, 8.29) @ 1750 MHz; Calibrated: 2022-05-20
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; 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 = 93.03 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 9.06 W/kg; SAR(10 g) = 4.8 W/kg Smallest distance from peaks to all points 3 dB below = 10 mm Ratio of SAR at M2 to SAR at M1 = 54.1% Maximum value of SAR (measured) = 14.1 W/kg



Certificate No: Z22-60432

Page 5 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

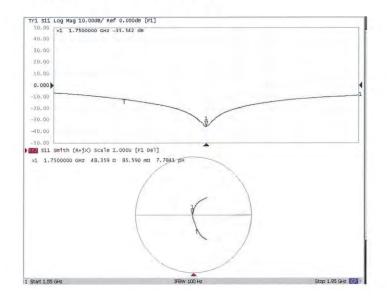






Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn E-mail: emf@caict.ac.cn

Impedance Measurement Plot for Head TSL



Certificate No: Z22-60432

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 20 of 76

in the second			
Accredited by the Swiss Accreditation Service fulfilateral Agreement for the re	is one of the signatorie	es to the EA	Accreditation No.: SCS 0108
lient SGS-TW (Aude			No: D1900V2-5d173_Apr2
CALIBRATION C	ERTIFICAT	E	
Object	D1900V2 - SN:5	d173	
Calibration procedure(s)	QA CAL-05.v11 Calibration Proce	adure for SAR Validation Source	s between 0.7-3 GHz
Calibration date:	April 28, 2022		
The measurements and the uncer	tainties with confidence p led in the closed laborato	onal standards, which realize the physical ur robability are given on the following pages a ry facility: environment temperature (22 ± 3)	nd are part of the certificate:
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T) Primary Standards	tainties with confidence p led in the closed laborato E critical for calibration)	robability are given on the following pages a ry facility: environment temperature (22 ± 3)" Cal Date (Certificate No.)	nd are part of the certificate:
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP	tainties with confidence p led in the closed laborato E critical for calibration) ID # SN: 104778	robability are given on the following pages a ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03526/03524)	nd are part of the certificate. 'C and humidity < 70%. Scheduled Calibration Apr:23
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Yower sensor NRP-291	tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244	robability are given on the following pages a ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03524)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power sensor NRP-291 Tower sensor NRP-291	tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245	robability are given on the following pages a ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525)	nd are part of the certificate: 'C and humidity < 70%. Schaduled Calibration Apr-23 Apr-23 Apr-23
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Prover meter NRP Power sensor NRP-291 Reference 20 dB Attenuator	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH3394 (20k)	robability are given on the following pages a ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03527)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23
The measurements and the uncer All Calibration's have been conduct Calibration Equipment used (M&T Primary Standards Prower meter NRP Power sansor NRP-Z91 Nowr sansor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH3394 (20k) SN: 31982 / 06327	Coll Date (Certificate No.) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03056/03524) 04-Apr-22 (No. 217-030526) 04-Apr-22 (No. 217-03352)	nd are part of the certificate: 'C and humidity < 70%, Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Primary Standards Prover meter NRP Power sensor NRP-Z91 Yower Sensor NRP-Z91 Reference Pro& Z0 dB Attenuator Ype-X mismatch combination Reference Pro& EX30V4	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH3394 (20k)	robability are given on the following pages a ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03527)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4	tainties with confidence p led in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 5H9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601	robability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 31-Dec-21 (No. 217-03528) 31-Dec-21 (No. DAE4-601_Nov21) 01-Nov-21 (No. DAE4-601_Nov21)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power sensor NRP-281 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	tainties with confidence p ted in the closed laborato E critical for calibration) 1D # SN: 104778 SN: 103245 SN: 103245 SN: 510934 (20k) SN: 310982 / 06327 SN: 7310982	robability are given on the following pages a ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03526/03524) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. EX3-7349 Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-24 Apr-24 Apr-25 Apr-25 Apr-26
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B	Ibit He closed laborato E critical for calibration) ID # SN: 104778 SN: 10244 SN: 103245 SN: 7349 SN: 601 ID # SN: 6639512475	robability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. 217-03528) 31-Dec-21 (No. DA24-601_Nov21) 01-Nov-21 (No. DA24-601_Nov21) Check Date (in house)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22 Scheduled Check In house check: Oct-22
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E419B Power sensor HP B481A	tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 103244 SN: 103245 SN: 5H3984 (20k) SN: 310982 (20k) SN: 310982 (20k) SN: 310982 (20k) SN: 310982 (20k) SN: 310982 (20k) SN: 5019 ID # SN: 5B39512475 SN: US37292783	cobability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. 217-03528) 31-Dec-21 (No. 217-03528) 31-Dec-21 (No. 218-03528) 31-Dec-21 (No. 218-01_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-24 Apr-26 Apr-26 Apr-27 Apr-26 Apr-26 Apr-27
The measurements and the uncer All Calibration's have been conduct Calibration Equipment used (M&T Primary Standards Prower meter NRP Power sensor NRP-Z91 Newer sensor NRP-Z91 Newer sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A	Ibit He closed laborato Ecritical for calibration) ID # SN: 104778 SN: 104778 SN: 104245 SN: 10245 SN: 103244 SN: 310982 / 06327 SN: 7349 SN: 6039512475 SN: US37282783 SN: W: 47093315	cobability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. 127-03528) 31-Dec-21 (No. 127-03528) 33-Dec-21 (No. 127-03528) 33-Oct-14 (in house) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	nd are part of the certificate: 'C and humidity < 70% Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Calibration Apr-23 Apr-24 Apr-24 Apr-25 Apr-25 Apr-25 Apr-26 Apr-26 Apr-26 Apr-26 Apr-26 Apr-26 Apr-27 Apr-27 Apr-26 Apr-27 Apr-27 Apr-27 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-28 Apr-29 Apr-29 Apr-29 Apr-29 Apr-29 Apr-29 Apr-29 Apr-29 Apr-20 Apr-20 Apr-29 Apr-20
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A	tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 5H9394 (20k) SN: 310982 / 06327 SN: 5H9394 (20k) SN: 601 ID # SN: 0639512475 SN: US37292783 SN: W741093315 SN: W741093315 SN: W741093315	cobability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03528) 04-Apr-21 (No. DAE+601_Nov21) Check Date (In house check Cd-20) 07-Oct-15 (In house check Cd-20)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-24 Apr-24 Apr-25 Apr-25 Apr-26 Apr-27
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A	Ibit He closed laborato Ecritical for calibration) ID # SN: 104778 SN: 104778 SN: 104245 SN: 10245 SN: 103244 SN: 310982 / 06327 SN: 7349 SN: 6039512475 SN: US37282783 SN: W: 47093315	cobability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. 127-03528) 31-Dec-21 (No. 127-03528) 33-Dec-21 (No. 127-03528) 33-Oct-14 (in house) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	nd are part of the certificate: 'C and humidity < 70% Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Calibration Apr-23 Apr-24 Apr-24 Apr-25 Apr-25 Apr-25 Apr-26 Apr-26 Apr-26 Apr-26 Apr-26 Apr-27 Apr-27 Apr-27 Apr-27 Apr-28 Apr-29
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power Sensor HP 8481A	tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 5H8394 (20k) SN: 31082 / 06327 SN: 5H8394 (20k) SN: 31082 / 06327 SN: 6B3512475 SN: 0537282783 SN: WY41083315 SN: 103722 SN: US41080477 Name	Cal Date (Certificate No.) O4-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528) 31-Doc 21 (No. EX3-7349 Doc21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Od-15 (in house check Oct-20) 07-Od-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-24 Apr-24 Apr-25 Apr-25 Apr-26 Apr-27
The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power Sensor HP 8481A	Ibin the closed laborato E critical for calibration) ID # SN: 104778 SN: 10244 SN: 103245 SN: 310827 (06327 SN: 73498 SN: 601 ID # SN: 0537522783 SN: W: V303315 SN: 10932 SN: 10932 SN: 5137292783 SN: W: V303315 SN: US41080477	cobability are given on the following pages a Cal Date (Certificate No.) 04-Apr-22 (No. 217-03526/03924) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. 217-03528) 33-Dec-21 (No. DAE-4601_Nov21) 01-Nov-21 (No. DAE-4601_Nov21) 01-Nov-21 (No. DAE-4601_Nov21) 07-Oct-15 (in house check Cct-20) 07-Oct-15 (in house check Cct-20) 15-Jun-15 (in house check Cct-20) 31-Mar-14 (in house check Cct-20)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncer	tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 5H8394 (20k) SN: 31082 / 06327 SN: 5H8394 (20k) SN: 31082 / 06327 SN: 6B3512475 SN: 0537282783 SN: WY41083315 SN: 103722 SN: US41080477 Name	Cal Date (Certificate No.) O4-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528) 31-Doc 21 (No. EX3-7349 Doc21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Od-15 (in house check Oct-20) 07-Od-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	nd are part of the certificate: 'C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22

Certificate No: D1900V2-5d173_Apr22

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

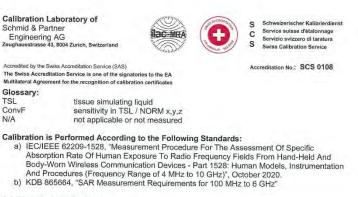
Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 21 of 76



Additional Documentation: c) DASY 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 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 reflected 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

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: D1900V2-5d173_Apr22

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 22 of 76

Measurement Conditions

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

	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	39.1 ± 6 %	1.41 mho/m ± 6 %
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	10.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.6 W/kg ± 17.0 % (k=2)
CAD analyzed and the state in the state		
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	5.22 W/kg

Certificate No: D1900V2-5d173_Apr22

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留的天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 23 of 76

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω + 5.0 jΩ
Return Loss	- 25.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 ns
----------------------------------	----------

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 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: D1900V2-5d173_Apr22

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 24 of 76

DASY5 Validation Report for Head TSL

Date: 28.04.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW; Frequency: 1900 MHz Medium parameters used: f = 1900 MHz; σ = 1.41 S/m; ϵ_r = 39.1; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

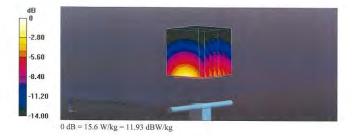
DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.43, 8.43, 8.43) @ 1900 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

Reasurement grid: dx = 5mm, dy = 5mm, dz = 5mmReference Value = 110.1 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 18.6 W/kg SAR(1g) = 10 W/kg; SAR(10 g) = 5.22 W/kg Smallest distance from peaks to all points 3 dB below = 10 mm Ratio of SAR at M2 to SAR at M1 = 54.3%

Maximum value of SAR (measured) = 15.6 W/kg



Certificate No: D1900V2-5d173_Apr22

Page 5 of 6

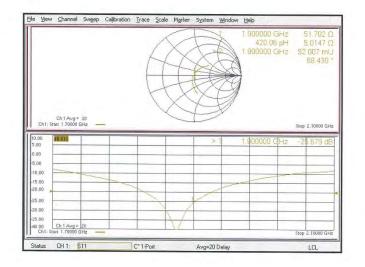
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d173_Apr22

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 26 of 76

Accredited by the Swiss Accreditati	ion Service (SAS)		
he Swiss Accreditation Service	in one of the elemeteric	to to the EA	Accreditation No.: SCS 0108
Aultilateral Agreement for the re-			
lient SGS-TW (Auder	n)	Certificate I	No: D2450V2-727_Apr22
CALIBRATION C	ERTIFICATI		
Object	D2450V2 - SN:7	07	
	DEHOUVE ON	<i>L</i> /	
Calibration procedure(s)	QA CAL-05.v11 Calibration Proce	edure for SAR Validation Source	as between 0.7-3 GHz
Calibration date:	April 25, 2022		
The measurements and the uncert	tainties with confidence p	ional standards, which realize the physical u robability are given on the following pages a	and are part of the certificate.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI	tainties with confidence p red in the closed laborato E critical for calibration)	robability are given on the following pages i ry facility: environment temperature (22 \pm 3)	and are part of the certificate.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards	tainties with confidence p ed in the closed laborato E critical for calibration)	robability are given on the following pages i ry facility: environment temperature (22 \pm 3) Cal Date (Certificate No.)	and are part of the certificate.)°C and humidity < 70%. Scheduled Calibration
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power meter NBP	tainties with confidence p ed in the closed laborato E critical for calibration)	robability are given on the following pages i ny facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524)	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Apr:23
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power meter NBP Power sensor NBP-291	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244	robability are given on the following pages <i>i</i> ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03524)	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power sensor NRP-291 Power sensor NRP-291	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245	robability are given on the following pages i ry facility: environment temperature (22 ± 3) Cal Date (Centificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525)	and are part of the certificate. (°C and humidity < 70%. Scheduled Calibration Apr/23 Apr/23 Apr/23
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BHS394 (20k)	robability are given on the following pages i ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 04-Apr-22 (No. 217-033525) 04-Apr-22 (No. 217-033524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03527)	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103245 SN: 103244 SN: 103244 SN: 103245 SN: 814394 (20k) SN: 310982 / 06327	robability are given on the following pages i ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03524) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528)	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Apr/23 Apr/23 Apr/23 Apr/23 Apr/23
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Dower mater NRP 291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EXSIDV4	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BHS394 (20k)	robability are given on the following pages i ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 04-Apr-22 (No. 217-033525) 04-Apr-22 (No. 217-033524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03527)	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23
The measurements and the oncert All calibrations have been conduct Calibration Equipment used (M&TT Primary Standards Power meter NRP-291 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismath-combination Reference Probe EX3DV4 DAE4	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 103778 SN: 103244 SN: 103244 SN: 5H3394 (20k) SN: 310982 / 06327 SN: 3N: 3749	robability are given on the following pages i ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03529) 31-Dec-21 (No. EX3-7349, Dec21)	and are part of the certificate. "C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Primary Standards Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N misimatch combination Reference Probe EXSDV4 DAE4 Secondary Standards	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 103244 SN: 103245 SN: 5H9394 (20k) SN: 3H9394 (20k) SN: 30482 / 06327 SN: 7349 SN: 501	Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 31-Dec-21 (No. 213-03528) 31-Dec-21 (No. EX3-7346_Dec21) 01-Nov-21 (No. DAE4-601_Nov21).	and are part of the certificate. InC and humidity < 70%. Scheduled Calibration Apr/23 Apr/23 Apr/23 Apr/23 Apr/23 Apr/23 Dec-22 Nov-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primury Standards Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4198 Power sensor 147 8481A	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103245 SN: 310982 (06327 SN: 310982 (06327 SN: 310982 (06327 SN: 510982 (06327 SN: 510982 (06327 SN: 501	robability are given on the following pages i ry facility: environment temperature (22 ± 3) O4-Apr-22 (No. 217-033255/03524) O4-Apr-22 (No. 217-033525) O4-Apr-22 (No. 217-03525) O4-Apr-22 (No. 217-03525) O4-Apr-22 (No. 217-03527) O4-Apr-22 (No. 217-03527)	and are part of the certificate. (*C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22 Scheduled Check
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EXSDV4 DAE4 Secondary Standards Power motor E44198 Power sensor HP 8481A Power sensor HP 8481A	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 103244 SN: 103245 SN: 013245 ID # SN: 0601 ID # SN: 0139512475 SN: US37252783 SN: W14/03315	robability are given on the following pages i robability are given on the following pages i Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 01-Nov-21 (No. DA3-7490, Dec21) 01-Nov-21 (No. DA3-7490, Dec21) Check Date (in house) 30-Oct-14 (in house check Oct-20)	and are part of the certificate. (*C and humidity < 70%. Scheduled Calibration Apr/23 Apr/23 Apr/23 Apr/23 Apr/23 Dec-22 Nov-22 Scheduled Check In house check: Cct-22
The measurements and the oncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A	tainties with confidence p ad in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103244 SN: 310982 / 06327 SN: 503 SN: 601 ID # SN: US37292783 SN: W141093315 SN: W141093215 SN: W1410972	Cal Date (Certificate No.) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528) 31-Dec-21 (No. 217-03528) 30-Dec14 (in house check Oct-20) 07-Ce1-15 (in house check Oct-20)	and are part of the certificate. (°C and humidity < 70%. Scheduled Calibration Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Dec-22 Nov-22 Scheduled Chacki In house check: Cot-22 In house check: Cot-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TT Primary Standards Power ansor NRP-291 Power ansor NRP-291 Power ansor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 103244 SN: 103245 SN: 013245 ID # SN: 0601 ID # SN: 0139512475 SN: US37252783 SN: W14/03315	Cal Date (Certificate No.) Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03527) 04-Apr-22 (No. 217-03528) 31-Dac-21 (No. 217-03528) 31-Dac-21 (No. 217-03528) 30-Oct-14 (in house rheck Oct-20) Check Date (in house 0-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Apr.23 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TI Primary Standards Dewer mater NRP-291 Power sensor NRP-291 Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E419B Power sensor HP 8481A Power sensor HP 8481A	tainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH394 (20k) SN: 310882 / 06327 SN: 310882 / 06327 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: WY41093315 SN: WY41093315 SN: WY41093315 SN: WY41093315 SN: US41080477 Name	Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03529) 31-Dac-21 (No. 217-03529) 31-Dac-22 (No. 217-03529) 31-Dac-21 (No. DAF4-601_Nov21) Check Date (in house) 30-CH-14 (in house check Cd-20) 07-Cd-15 (in house check Cd-20) 07-Cd-15 (in house check Cd-20) 07-Cd-15 (in house check Cd-20)	and are pert of the certificate. (°C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22 Scheduled Chack In house chack: Oct-22 In house chack: Oct-22
The measurements and the uncert	tainlies with confidence p ad in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 503245 SN: 601 ID # SN: 0GB39512475 SN: VS37292783 SN: VS3709315 SN: 100972 SN: US41080477	Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03525) 04-Apr-22 (No. 217-03526) 31-Doc-21 (No. 217-03528) 33-Doc-14 (In house rheck Cot-20) 07-Oct-15 (In house rheck Cot-20) 07-Oct-15 (In house rheck Cot-20) 07-Oct-15 (In house rheck Cot-20) 15-Jun-15 (In house rheck Cot-20) 31-Mar-14 (In house rheck Cot-20)	and are part of the certificate. (*C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-23 Apr-23 Apr-23 Dec-22 Nov-22 Scheduled Check In house check: Cot-22 In house check: Cot-22

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

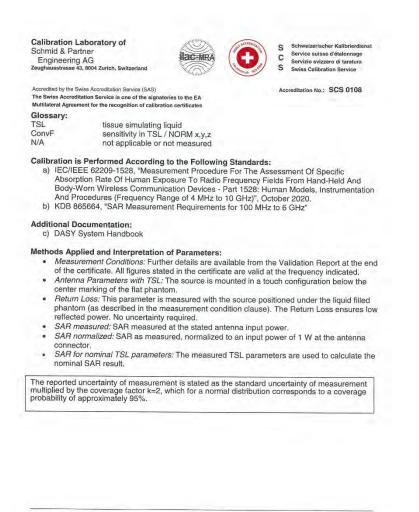
No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 27 of 76



Certificate No: D2450V2-727_Apr22

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sqs.com.tw



Report No. : TESA2211000479EN Page: 28 of 76

Measurement Conditions

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

	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	37.8 ± 6 %	1.87 mho/m ± 6 %
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	13.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.8 W/kg ± 17.0 % (k=2)
SAB averaged over 10 cm ³ (10 g) of Head TSI	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	6.34 W/kg

Certificate No: D2450V2-727_Apr22

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留的天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.



Report No. : TESA2211000479EN Page: 29 of 76

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.7 Ω + 3.0 jΩ
Return Loss	- 24.4 dB

General Antenna Parameters and Design

lectrical Delay (one direction)	1.149 ns
the second se	11140 113

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is diractly 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: D2450V2-727_Apr22

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 30 of 76

DASY5 Validation Report for Head TSL

Date: 25.04.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 727

 $\begin{array}{l} Communication \mbox{ System: UID 0 - CW; Frequency: 2450 MHz} \\ Medium \mbox{ parameters used: } f=2450 \mbox{ MHz; } \sigma=1.87 \mbox{ S/m; } \epsilon_r=37.8; \mbox{ } \rho=1000 \mbox{ kg/m}^3 \\ Phantom \mbox{ section: Flat Section} \\ Measurement \mbox{ Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)} \end{array}$

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.96, 7.96, 7.96) @ 2450 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

Measurement grid: (x = 5mm, dy = 5mm, dz = 5mm)Reference Value = 115.6 V/m; Power Drift = 0.09 dB Peak SAR (extrapolated) = 26.5 W/kg SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.34 W/kg Smallest distance from peaks to all points 3 dB below = 9 mm Ratio of SAR at M2 to SAR at M1 = 51% Maximum value of SAR (measured) = 22.1 W/kg

0		
o		
20		
60		
00		
0 dB = 22.1	1 W/kg = 13.45 dBW/kg	

Certificate No: D2450V2-727_Apr22

Page 5 of 6

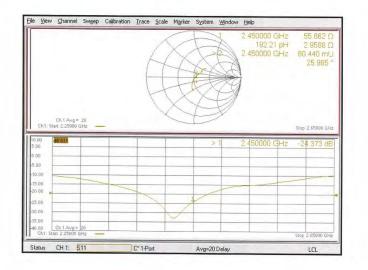
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-727_Apr22

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Zeughausstrasse 43, 8004 Zurich	y of I, Switzerland	Hac-MRA	 S Schweizerischer Kalibrierdiens S Service suisse d'étalonnage S Servizio svizzero di taratura S Swiss Calibration Service
Accredited by the Swiss Accreditat The Swiss Accreditation Service Multilateral Agreement for the re	is one of the signatorie	es to the EA a certificates	Accreditation No.: SCS 0108
Client SGS (Auden)	FRTIFICAT		No: D2600V2-1005_Jan22
Object	D2600V2 - SN:1		
Calibration procedure(s)	QA CAL-05.v11 Calibration Proce	edure for SAR Validation Source	es between 0.7-3 GHz
Calibration date:	January 18, 2022	2	
Calibration Equipment used (M&TE	E critical for calibration)	ry facility: environment temperature (22 ± 3)	°C and humidity < 70%.
Calibration Equipment used (M&TE Primary Standards	E critical for calibration)	Cal Date (Certificate No.)	"C and humidity < 70%. Scheduled Calibration
Calibration Equipment used (M&TE Primary Standards Power meter NRP	E critical for calibration)	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292)	Scheduled Calibration Apr-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91	E critical for calibration) ID # SN: 104778 SN: 103244	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291)	Scheduled Calibration Apr-22 Apr-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k)	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k)	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID #	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: GB39512475	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A	E critical for calibration) ID # SN: 104778 SN: 103245 SN: 8H9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: 6B39512475 SN: US37292783	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: M341093315 SN: 100972	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: B19394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: G839512475 SN: US37292783 SN: WY41093315 SN: US37292783 SN: WY41093315 SN: 100972 SN: US41080477 Name	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: 6839512475 SN: US37292783 SN: WY41093315 SN: US41080477	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A Calibrated by:	E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: B19394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: G839512475 SN: US37292783 SN: WY41093315 SN: US37292783 SN: WY41093315 SN: 100972 SN: US41080477 Name	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-7349_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22

Certificate No: D2600V2-1005_Jan22

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



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



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

S

S

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

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

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,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-Worn Wireless Communication Devices - Part 1528: 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) DASY 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 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 reflected 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.

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

Certificate No: D2600V2-1005_Jan22

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

```
Member of SGS Group
```



Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.7 ± 6 %	2.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.8 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	6.42 W/kg

Certificate No: D2600V2-1005_Jan22

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.4 Ω - 4.4 jΩ	
Return Loss	- 26.9 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.158 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured	by
--------------	----

SPEAG

Certificate No: D2600V2-1005_Jan22

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.



Date: 18.01.2022

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1005

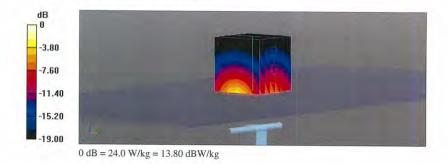
Communication System: UID 0 - CW; Frequency: 2600 MHz Medium parameters used: f = 2600 MHz; $\sigma = 2.02 \text{ S/m}$; $\varepsilon_r = 37.7$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.84, 7.84, 7.84) @ 2600 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 120.0 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 28.6 W/kg SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.42 W/kg Smallest distance from peaks to all points 3 dB below = 8.9 mm Ratio of SAR at M2 to SAR at M1 = 50.4% Maximum value of SAR (measured) = 24.0 W/kg



Certificate No: D2600V2-1005_Jan22

Page 5 of 6

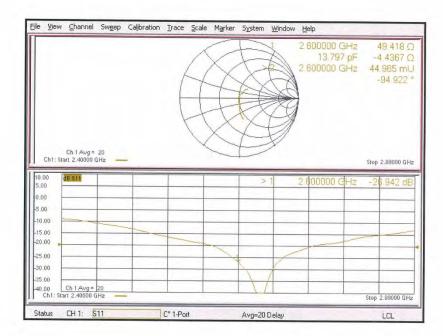
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

f (886-2) 2298-0488



Impedance Measurement Plot for Head TSL



Certificate No: D2600V2-1005 Jan22

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Add: No.52 HuaYuanBei Ros Tel: +86-10-62304633-2117 E-mail: cttl@chinattl.com	ad, Haidian District, http://www.cai	beijing, 100191	NAS L0570
Client SGS	шарл ч ч ч.сал		22-60433
CALIBRATION CE	ERTIFICAT	E	
Object	D3500	/2 - SN: 1009	
Calibration Procedure(s)			
		-003-01 tion Procedures for dipole validation kits	
	Calibra	tion Procedures for dipole validation kits	
Calibration date:	Octobe	r 9, 2022	
pages and are part of the ce			
	conducted in t	he closed laboratory facility: environment or calibration)	temperature (22±3)°C and
All calibrations have been humidity<70%. Calibration Equipment used	conducted in t		temperature (22±3)°C and Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used	conducted in t	or calibration)	
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards	conducted in t (M&TE critical fo	or calibration) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	conducted in t (M&TE critical fr ID # 106276 101369 SN 7464	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22)	Scheduled Calibration May-23 May-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	Conducted in t (M&TE critical fr ID # 106276 101369	or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103)	Scheduled Calibration May-23 May-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Sensor NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	conducted in t (M&TE critical fr ID # 106276 101369 SN 7464	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007)	Scheduled Calibration May-23 May-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	conducted in t (M&TE critical fo 106276 101369 SN 7464 SN 1556	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	conducted in t (M&TE critical fo 10 # 106276 101369 SN 7464 SN 1556 ID #	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	conducted in t (M&TE critical fe 106276 101369 SN 7464 SN 1556 ID # MY49071430	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	conducted in t (M&TE critical fo 106276 101369 SN 7464 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 26-Jan-22(SPEAG,No.EX3-7464_Jan22) 12-Jan-22(CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) 13-Jan-22 (CTTL, No.J22X00409) 14-Jan-22 (CTTL, No.J22X00406)	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration Jan-23 Jan-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	conducted in t (M&TE critical fr 106276 101369 SN 7464 SN 1556 ID # MY49071430 MY46110673 Name	Cal Date (Calibrated by, Certificate No.) Cal Date (Calibrated by, Certificate No.) Oh-May-22 (CTTL, No.J22X03103) Oh-May-22 (CTTL, No.J22X03103) Cal-Jan-22(SPEAG,No.EX3-7464_Jan22) Oh-May-22 (CTTL-SPEAG,No.Z22-60007) Cal Date (Calibrated by, Certificate No.) Oh-May-22 (CTTL, No.J22X00409) Oh-May-22 (CTTL, No.J22X00406) Function	Scheduled Calibration May-23 May-23 Jan-23 Jan-23 Scheduled Calibration Jan-23 Jan-23

Certificate No: Z22-60433

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 39 of 76





Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: cttl@chinattl.com http://www.caict.ac.cn

Glossary:

TSL ConvF N/A

tissue simulating liquid sensitivity in TSL / NORMx,y,z 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 865664, "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: Z22-60433

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: cttl@chinattl.com http://www.caict.ac.cn

Measurement Conditions

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 = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3500 MHz ± 1 MHz	

Head TSL parameters

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.9	2.91 mho/m
Measured Head TSL parameters	(22.0 ±0.2) °C	38.1 ±6 %	2.93 mho/m ±6 %
Head TSL temperature change during test	<1.0 °C	-	

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	65.2 W/kg ±24.4 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.50 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	25.0 W/kg ±24.2 % (k=2)

Certificate No: Z22-60433

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

```
www.sgs.com.tw
```







Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: cttl@chinattl.com http://www.caiet.ac.cn

Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	56.3Ω- 3.27jΩ
Return Loss	- 23.5dB

General Antenna Parameters and Design

lectrical Delay (one direction)	1.044 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: Z22-60433

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 42 of 76





Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 E-mail: cttl@chinattl.com http://www.caict.ac.cn

DASY5 Validation Report for Head TSL

Date: 2022-10-09

Test Laboratory: CTTL, Beijing, China DUT: Dipole 3500 MHz; Type: D3500V2; Serial: D3500V2 - SN: 1009 Communication System: UID 0, CW; Frequency: 3500 MHz Medium parameters used: f = 3500 MHz; σ = 2.933 S/m; ϵ r = 38.08; ρ = 1000 kg/m³ Phantom section: Right Section

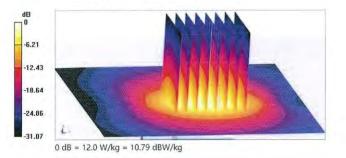
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 SN7464; ConvF(7.2, 7.2, 7.2) @ 3500 MHz; Calibrated: 2022-01-26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; 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 /Pin=100mW, d=10mm, f=3500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 62.29 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 16.7 W/kg SAR(1 g) = 6.53 W/kg; SAR(10 g) = 2.5 W/kg Smallest distance from peaks to all points 3 dB below = 8.2 mm Ratio of SAR at M2 to SAR at M1 = 76.7%

Maximum value of SAR (measured) = 12.0 W/kg



Certificate No: 722-60433

Page 5 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

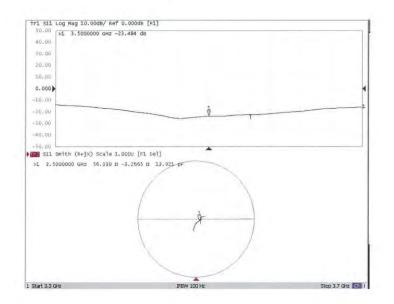






Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2117 http://www.caict.ac.cn il: cttl@chinattl.com

Impedance Measurement Plot for Head TSL



Certificate No: Z22-60433

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279 台灣檢驗科技股份有限公司

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 44 of 76

chmid & Partner Engineering AG aughausstrasse 43, 8004 Zurich,	of Switzerland	HAC MRA	S Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura S swiss Calibration Service
ccredited by the Swiss Accreditation he Swiss Accreditation Service in Iultilateral Agreement for the rec	is one of the signatorie	s to the EA	Accreditation No.: SCS 0108
lient Auden		Certificate	No: D3700V2-1074_Jan22
CALIBRATION C			
Object	D3700V2 - SN:10	074	
Calibration procedure(s)	QA CAL-22.v6 Calibration Proce	dure for SAR Validation Sourc	es between 3-10 GHz
Calibration date:	January 25, 2022	2	
The measurements and the uncertain	ainties with confidence p ed in the closed laborator	ional standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3	and are part of the certificate.
The measurements and the uncert All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards	ainties with confidence p ed in the closed laborator E critical for calibration)	robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.)	and are part of the certificate. a)°C and humidity < 70%. Scheduled Calibration
The measurements and the uncert. All calibrations have been conducts Calibration Equipment used (M&TE Primary Standards Power meter NRP	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104778	robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292)	and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Ower sensor NRP-Z91	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104778 SN: 103244	robability are given on the following pages ry facility: environment temperature (22 ± 2 Cal Date (Centificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291)	and are part of the certificate. 3)°C and humidity < 70%. <u>Scheduled Calibration</u> Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power sensor NRP-291 Power sensor NRP-291	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104776 SN: 103244 SN: 103245	robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292)	and are part of the certificate. a)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22
The measurements and the uncert. All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104778 SN: 103244	robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343)	and are part of the certificate. s)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power sensor NRP-201 Power sensor NRP-201 Power sensor NRP-201 Reference 20 dB Attenuator Type-N mismatch combination	ainties with confidence p ed in the closed laborator E critical (or calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH-9394 (20k)	robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292)	and are part of the certificate. a)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 10244 SN: 103245 SN: 103244 SN: 103245 SN: 814394 (20k) SN: 310982 / 66327	robability are given on the following pages ry facility: environment temperature (22 ± 2 Gal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343)	and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	ainties with confidence p ed in the closed laborator critical for calibration) ID # SN: 103244 SN: 103244 SN: 03244 SN: 3H9394 (20k) SN: 310982 / 06527 SN: 3503	robability are given on the following pages ry facility: environment temperature (22 ± 3 OP-Apr-21 (No. 217-03291/03292) OP-Apr-21 (No. 217-03291) OP-Apr-21 (No. 217-03342) OP-Apr-21 (No. 217-03342) OP-Apr-21 (No. 217-03344) 31-Dec-21 (No. 217-03344)	and are part of the certificate. s)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B	ainties with confidence p ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103245 SN: 103244 SN: 103244 SN: 103244 SN: 103242 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475	robability are given on the following pages ry facility: environment temperature (22 ± 2 Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-0334) 09-Apr-21 (No. 217-0334) 31-Dec-21 (No. 217-0334) 31-Dec-21 (No. 217-0334)	and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power sensor NRP-201 Power sensor NRP-201 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power meter E44198	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104778 SN: 104778 SN: 103244 SN: 103244 SN: 103244 SN: 103244 SN: 103244 SN: 103245 SN: 310982 / 06327 SN: 3503 SN: 5601 ID # SN: GB39512475 SN: US37282783	robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 30-Apr-21 (No. 217-03343) 31-Dec-21 (No. 217-03343) 31-Dec-21 (No. 217-03343) 31-Dec-21 (No. 217-03343) 30-Oct-14 (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	and are part of the certificate. a)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A	ainties with confidence p ed in the closed laborator critical for calibration) ID # SN: 103244 SN: 103244 SN: 303244 SN: 310982 / 06327 SN: 3503 SN: 601 ID # ID # SN: 0639512475 SN: US37292783 SN: W141083315	robability are given on the following pages ry facility: environment temperature (22 ± 3 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03342) 09-Apr-21 (No. 217-03342) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	and are part of the certificate: s)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104778 SN: 103245 SN: 103244 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 10325 SN: 1037292783 SN: MY4108315 SN: 10972	robability are given on the following pages ry facility: environment temperature (22 ± 2 OB-Apr-21 (No. 217-03291/03292) OB-Apr-21 (No. 217-03291) OB-Apr-21 (No. 217-03291) OB-Apr-21 (No. 217-03343) OB-Apr-21 (No. 217-03343) OB-Apr-21 (No. 217-03343) OB-Apr-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) OB-Apr-21 (No. 217-0344) OB-Apr-21 (No. 217-0344)	and are part of the certificate: s)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	ainties with confidence p ed in the closed laborator critical for calibration) ID # SN: 103244 SN: 103244 SN: 303244 SN: 310982 / 06327 SN: 3503 SN: 601 ID # ID # SN: 0639512475 SN: US37292783 SN: W141083315	robability are given on the following pages ry facility: environment temperature (22 ± 3 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03342) 09-Apr-21 (No. 217-03342) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	and are part of the certificate: scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Rei generator R&S SMT-06 Network Analyzer Agilent E8358A	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: W37292783 SN: W1093315 SN: W1093315 SN: US41080477 Name	robability are given on the following pages ry facility: environment temperature (22 ± 2 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 33-Oct-14 (In Duse check Oct-20) 07-Oct-15 (In house check Oct-20) 07-Oct-15 (In house check Oct-20) 31-Mar-14 (In house check Oct-20) 31-Mar-14 (In house check Oct-20) Function	and are part of the certificate: s)°C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Rei generator R&S SMT-06 Network Analyzer Agilent E8358A	ainties with confidence p ed in the closed laborator critical for calibration) ID # SN: 103244 SN: 103244 SN: 303244 SN: 303244 SN: 310982 / 66327 SN: 310982 / 66327 SN: 3503 SN: 601 ID # SN: 6639512475 SN: US37292783 SN: W141083315 SN: 100972 SN: US41080477	robability are given on the following pages ry facility: environment temperature (22 ± 3 O9-Apr-21 (No. 217-03291/03292) O9-Apr-21 (No. 217-03291) O9-Apr-21 (No. 217-03292) O9-Apr-21 (No. 217-03342) O9-Apr-21 (No. 217-03342) O9-Apr-21 (No. 217-03342) 31-Dec-21 (No. 217-03342) 31-Dec-21 (No. 217-03342) 31-Dec-21 (No. 217-03342) 31-Dec-21 (No. 217-03342) 31-Dec-21 (No. 217-03342) 31-Dec-21 (No. 217-03342) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	and are part of the certificate: and are part of the certificate: Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Rei generator R&S SMT-06 Network Analyzer Agilent E8358A	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W372972 SN: US41080477 Name	robability are given on the following pages ry facility: environment temperature (22 ± 2 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 33-Oct-14 (In Duse check Oct-20) 07-Oct-15 (In house check Oct-20) 07-Oct-15 (In house check Oct-20) 31-Mar-14 (In house check Oct-20) 31-Mar-14 (In house check Oct-20) Function	and are part of the certificate: and are part of the certificate: Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncert	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W37292783 SN: W372972 SN: US41080477 Name	robability are given on the following pages ry facility: environment temperature (22 ± 2 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 33-Oct-14 (In Duse check Oct-20) 07-Oct-15 (In house check Oct-20) 07-Oct-15 (In house check Oct-20) 31-Mar-14 (In house check Oct-20) 31-Mar-14 (In house check Oct-20) Function	and are part of the certificate: and are part of the certificate: Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
The measurements and the uncerti- All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A Calibrated by:	ainties with confidence p ed in the closed laborator E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103244 SN: 3103244 SN: 3103244 SN: 3103244 SN: 3103244 SN: 3103244 SN: 3103244 SN: 310324 SN: 310	robability are given on the following pages ry facility: environment temperature (22 ± 2 OB-Apr-21 (No. 217-03291/03292) OB-Apr-21 (No. 217-03291) OB-Apr-21 (No. 217-03291) OB-Apr-21 (No. 217-03343) OB-Apr-21 (No. 217-03343) OB-Apr-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) 31-Dec-21 (No. 217-03344) OB-Apr-21 (No. 217-03440) OB-Apr-21 (No. 217-03440) OB-Ap	and are part of the certificate: any of the certificate: any of the certificate: Scheduled Calibration Apr.22 Apr.22 Apr.22 Apr.22 Apr.22 Dec.22 Nov.22 Scheduled Check In house check: Oct-22 In house check: Oct-24 In house check: Oc

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

```
www.sgs.com.tw
```



Report No. : TESA2211000479EN Page: 45 of 76

Calibration Laboratory of Schmid & Partner s Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Engineering AG sughausstrasse 43, 8004 Zurich, Switzerland Hac-MRA C S Swiss Calibration Service Accredited by the Swiss Accreditation Service (SAS) Accreditation No.: SCS 0108 The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary: TSL

ConvF

N/A

tissue simulating liquid sensitivity in TSL / NORM x,y,z 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-Worn Wireless Communication Devices - Part 1528: 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) DASY 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 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 seffected 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.

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: D3700V2-1074_Jan22

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 46 of 76

Measurement Conditions

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3700 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.7	3.12 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.0 ± 6 %	3.07 mho/m ± 6 %
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	100 mW input power	6.85 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	68.5 W/kg ± 19.9 % (k=2)
	, , , , , , , , , , , , , , , , , , , ,	
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.47 W/kg

Certificate No: D3700V2-1074 Jan22

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 47 of 76

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	43.7 Ω + 1.5 ΙΩ
Return Loss	- 23.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.139 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedoint may be damaged.

feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Certificate No: D3700V2-1074_Jan22

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sqs.com.tw



Report No. : TESA2211000479EN Page: 48 of 76

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

Date: 25.01.2022

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: D3700V2 - SN: 1074

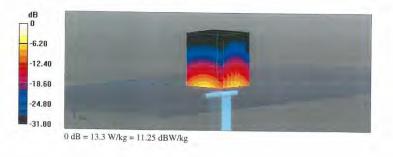
Communication System: UID 0 - CW; Frequency: 3700 MHz Medium parameters used: f = 3700 MHz; σ = 3.07 S/m; ϵ_r = 37; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(7.73, 7.73, 7.73) @ 3700 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection) .
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3700MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 72.90 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 19.3 W/kg SAR(1 g) = 6.85 W/kg; SAR(10 g) = 2.47 W/kg

Smallest distance from peaks to all points 3 dB below = 8 mm Ratio of SAR at M2 to SAR at M1 = 73.8%Maximum value of SAR (measured) = 13.3 W/kg



Certificate No: D3700V2-1074_Jan22

Page 5 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

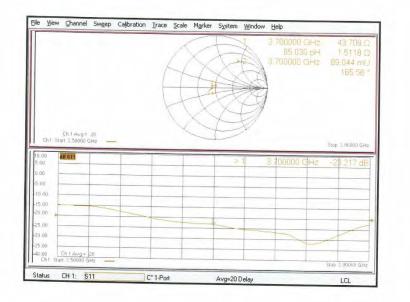
除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Impedance Measurement Plot for Head TSL



Certificate No: D3700V2-1074 Jan22

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

```
www.sgs.com.tw
```



CALIBRATION CERTIFICATE Object D5GHzV2 - SN:1023 Calibration procedure(s) QA CAL-22.v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz Calibration date: January 27, 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 calibration settificate 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 calibration Equipment used (M&TE critical for calibration) Primary Standards ID # Cal Date (Certificate No.) Scheduled Calibration Power meter NRP SN: 103244 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-291 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-291 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-291 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 SN: BH9394 (20k) 09-Apr-21 (No. 217-03343) Apr-22 Ower sensor NRP-291 SN: 603 9512475 30-Oct-14 (in house check Oct-20) <	eughausstrasse 43, 8004 Zurich	ı, Switzerland	Statement of the state of the s	Service suisse d'étalonnage Servizio svizzero di taratura
CALIBRATION CERTIFICATE Object D5GHzV2 - SN:1023 Calibration procedure(s) CA CAL-22,v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz Calibration date: January 27, 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 calibration shave 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 (Certificate No.) Scheduled Calibration Power meter NRP SN: 104776 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 0303 31-Dec-21 (No. EX3-3503 Dec-21) Dec-22 SN: BH3934 (20K) 09-Apr-21 (No. 217-0334) Apr-22 SN: 01 01-Nov-21 (No. DAE	The Swiss Accreditation Service	is one of the signatorie	es to the EA	ccreditation No.: SCS 0108
Object D5GHzV2 - SN:1023 Calibration procedure(s) QA CAL-22,v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz Calibration date: January 27, 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 (Certificate No.) Scheduled Calibration Power sensor NRP-291 SN: 104778 09-Apr-21 (No. 217-03291/03292) Apr-22 Power sensor NRP-291 SN: 103244 09-Apr-21 (No. 217-03291/03292) Apr-22 Reference 20 dB Altenuator SN: 310982/0327 09-Apr-21 (No. 217-03341) Apr-22 SN: 601 01-Nov-21 (No. 217-03341) Apr-22 SN: 601 01-Nov-21 (No. 217-03341) Apr-22 SN: 601 01-Nov-21 (No. 247-0302) Apr-22 SN: 601 01-Nov-21 (No. 247-030341) Apr-22 SN: 601 01-Nov-21 (No. 247-03342) Apr-22 SN: 601	In the second second		and a state of the	o: D5GHzV2-1023_Jan22
Calibration procedure(s) OA CAL-22.v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz Calibration date: January 27, 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 calibration Equipment used (M&TE critical for calibration) Primary Standards ID # Cal Date (Certificate No.) Scheduled Calibration Power sensor NRP-291 Power sensor NRP-291 SN: 104778 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-291 Power sensor NRP-291 SN: 103244 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-291 Power sensor NRP-291 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-291 SN: 103245 09-Apr-21 (No. 217-03343) Apr-22 Power sensor NRP-291 SN: 103245 SN: 108026 (20k) 09-Apr-21 (No. 217-03344) Apr-22 Power sensor NRP-291 SN: 108627 SN: 108027 0.0-Apr-21 (No. 217-03344) Apr-22 Power sensor NRP-291 SN: 001 01-Nov-21 SN: 001 01-Nov-21 (No. 217-03344) Apr-22 Power sensor NRP-291 SN: 005/203 SCheduled Check Power sensor NRP 4811A SN: US37282783 0	CALIBRATION C	ERTIFICAT	E	
Calibration Procedure for SAR Validation Sources between 3-10 GHz Calibration date: January 27, 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 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 calibration shave 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 (Certificate No.) Scheduled Calibration Power sensor NRP-291 SN: 103244 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-291 SN: 103245 09-Apr-21 (No. 217-03343) Apr-22 Still 2082 / 06327 09-Apr-21 (No. 217-03343) Apr-22 Still 2082 / 06327 09-Apr-21 (No. 217-03343) Apr-22 Still 20 # Check Date (in house) Scheduled Check Sched	Object	D5GHzV2 - SN:1	1023	
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (S). 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 procedure(s)		edure for SAR Validation Sources	s between 3-10 GHz
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 (Certificate No.) Scheduled Calibration Power meter NRP SN: 104778 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103244 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Reference 20 dB Attenuator SN: 819394 (20k) 09-Apr-21 (No. 217-03243) Apr-22 Type-N mismatch combination SN: 3503 31-Dec-21 (No. 217-03344) Apr-22 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Ref generator R&S SMT-06 SN: US	Calibration date:	January 27, 2022	2	
Power meter NRP SN: 104778 09-Apr-21 (No. 217-03291/03292) Apr-22 Power sensor NRP-Z91 SN: 103244 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Reference 20 dB Attenuator SN: 810984 (20K) 09-Apr-21 (No. 217-03343) Apr-22 Type-N mismatch combination SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 DAE4 SN: 601 01-Nov-21 (No. DAE4-601_Nov21) Nov-22 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: 10972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 RF generator R&S SMT-06 SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Name Function Signature Na			ry facility: environment temperature $(22 \pm 3)^{\circ}$	C and humidity < 70%.
Power sensor NRP-Z91 SN: 103244 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Reference 20 dB Attenuator SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Reference 20 dB Attenuator SN: 8H9394 (20k) 09-Apr-21 (No. 217-03343) Apr-22 Reference 20 dB Attenuator SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 Strippe-N mismatch combination SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 SALE SN: 503 31-Dec-21 (No. 217-03344) Apr-22 SALE SN: 601 01-Nov-21 (No. 243-3503_Dec21) Dec-22 Secondary Standards ID # Check Date (in house) Scheduled Check Power sensor HP 8481A SN: US37282783 07-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37282783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 SN: US41080477 S1-Jun-15 (in house check Oct-20) In house check	Delete and Chan devide	Lin H		a second and second
Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Reference 20 dB Attenuator SN: BH9394 (20k) 09-Apr-21 (No. 217-03243) Apr-22 Sype-N mismatch combination SN: BH9394 (20k) 09-Apr-21 (No. 217-03343) Apr-22 Seference 20 dB Attenuator SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 Seference Probe EX3DV4 SN: 3503 31-Dec-21 (No. 217-03344) Apr-22 DAE4 SN: 601 01-Nov-21 (No. DAE4-601_Nov21) Nov-22 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: W19702 15-Jun-15 (in house check Oct-20) In house check: Oct-22 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 SN: US41080477 31-Mar-1				
BH9394 (20k) 09-Apr-21 (No. 217-03343) Apr-22 Ype-N mismatch combination SN: 819984 (20k) 09-Apr-21 (No. 217-03343) Apr-22 SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 SN: 3503 31-Dec-21 (No. 217-03344) Apr-22 SN: 503 31-Dec-21 (No. 217-03344) Apr-22 Secondary Standards ID # Check Date (In house) Nov-21 Secondary Standards ID # Check Date (In house) Scheduled Check Power meter E419B SN: US37292783 07-Oct-15 (In house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (In house check Oct-20) In house check: Oct-22 SN: 100972 15-Jun-15 (In house check Oct-20) In house check: Oct-22 SN: US41080477 S1-Mar-14 (In house c	Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Type-N mismatch combination Reference Probe EX3DV4 SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 DAE4 SN: 3503 31-Dec-21 (No. EX3-3503_Dec21) Dec-22 SN: 601 01-Nov-21 (No. DAE4-601_Nov21) Nov-22 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 6481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 SN: WY41093315 07-Oct-15 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 Calibrated by: Name Function Signature	Power meter NRP Power sensor NRP-Z91	SN: 104778 SN: 103244	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291)	Apr-22 Apr-22
Reference Probe EX3DV4 SN: 3503 31-Dec-21 (No. EX3-3503_Dec21) Dec-22 DAE4 SN: 601 01-Nov-21 (No. DAE4-601_Nov21) Nov-22 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: 603 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 SN: WY41093315 07-Oct-15 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Calibrated by: Name Function Signature	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91	SN: 104778 SN: 103244 SN: 103245	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292)	Apr-22 Apr-22 Apr-22
Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E44198 SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Calibrated by: Name Function Signature	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k)	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343)	Apr-22 Apr-22 Apr-22 Apr-22
Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check Oct-20 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Regreared re R&S SMT-06 SN: US41080315 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Name Function Signature Calibrated by: Aldonia Georgiadou Laboratory Technician MUSC	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344)	Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Name Function Signature Aldonia Georgladou Laboratory Techniclan Mutual	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-3503_Dec21)	Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22
Power sensor HP 8481A SN: MY41093315 07-Oct-15 (in house check Oct-20) In house check: Oct-22 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Name Function Signature Calibrated by: Aldonia Georgiadou Laboratory Technician	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503 SN: 601 ID #	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house)	Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22 Nov-22 Scheduled Check
RF generator R&S SMT-06 Network Analyzer Agilent E8358A SN: 100972 SN: US41080477 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20) In house check: Oct-22 In house check: Oct-22 Name Function Signature Calibrated by: Aldonia Georgladou Laboratory Technician	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20)	Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22
Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Name Function Signature Calibrated by: Aldonia Georgladou Laboratory Technician	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
Calibrated by: Name Function Signature Aldonia Georgiadou Laboratory Techniclan	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475 SN: 0537292783 SN: MY41093315	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. DAE4-601_Nov21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Calibrated by: Aldonia Georgladou Laboratory Technician	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	SN: 104778 SN: 103244 SN: 103245 SN: 8H9394 (20k) SN: 310962 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: 100972	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-3503, Dec-21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20)	Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
AS	Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Fype-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	SN: 104778 SN: 103244 SN: 103245 SN: 8H9394 (20k) SN: 310962 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: 100972	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. EX3-3503, Dec-21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20)	Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Approved by: Sven Kühn Deputy Manager	Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972 SN: US41080477 Name	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. DAE4-601_Nov21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20) Function	Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
	Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A	SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972 SN: US41080477 Name	09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 31-Dec-21 (No. DAE4-601_Nov21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house) Check Date (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20) Function	Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22

Certificate No: D5GHzV2-1023_Jan22

Page 1 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 51 of 76

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



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

Accreditation No.: SCS 0108

S

С

S

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,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-Worn Wireless Communication Devices - Part 1528: 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) DASY 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 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 reflected 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.

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: D5GHzV2-1023_Jan22

Page 2 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

f (886-2) 2298-0488



Measurement Conditions

ASY system configuration, as far as no	t given on page 1.	
DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.9 ± 6 %	4.52 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.0 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.34 W/kg

Head TSL parameters at 5600 MHz

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.4 ± 6 %	4.87 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.51 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	84.4 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.40 W/kg

Certificate No: D5GHzV2-1023_Jan22

Page 3 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sgs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Head TSL parameters at 5750 MHz

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.2 ± 6 %	5.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	****	-

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.0 W/kg ± 19.9 % (k=2)
	1	
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.31 W/kg

Certificate No: D5GHzV2-1023_Jan22

Page 4 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

t (886-2) 2299-3279 台灣檢驗科技股份有限公司

f (886-2) 2298-0488

www.sgs.com.tw



Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	52.0 Ω - 5.2 jΩ
Return Loss	- 25.3 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	54.7 Ω + 0.2 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	57.2 Ω + 2.1 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

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

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Certificate No: D5GHzV2-1023_Jan22

Page 5 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form exercising all their rights and obligations under the transaction document. 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.



DASY5 Validation Report for Head TSL

Date: 27 01 2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1023

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz Medium parameters used: f = 5250 MHz; $\sigma = 4.52 \text{ S/m}$; $\varepsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$. Medium parameters used: f = 5600 MHz; $\sigma = 4.87 \text{ S/m}$; $\epsilon_r = 34.4$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: f = 5750 MHz; $\sigma = 5.02 \text{ S/m}$; $\varepsilon_r = 34.2$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.5, 5.5, 5.5) @ 5250 MHz, ConvF(5.1, 5.1, 5.1) @ 5600 MHz, ConvF(5.08, 5.08, 5.08) @ 5750 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001 .
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 76.83 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 28.0 W/kg SAR(1 g) = 8.16 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 = 70.7% Maximum value of SAR (measured) = 18.6 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 77.04 V/m; Power Drift = 0.06 dB Peak SAR (extrapolated) = 31.5 W/kg SAR(1 g) = 8.51 W/kg; SAR(10 g) = 2.40 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 68% Maximum value of SAR (measured) = 20.1 W/kg

Certificate No: D5GHzV2-1023_Jan22

Page 6 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



Report No. : TESA2211000479EN Page: 56 of 76

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 74.27 V/m; Power Drift = 0.09 dB Peak SAR (extrapolated) = 31.8 W/kg SAR(1 g) = 8.17 W/kg; SAR(10 g) = 2.31 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mmRatio of SAR at M2 to SAR at M1 = 66.3%Maximum value of SAR (measured) = 19.8 W/kg



Certificate No: D5GHzV2-1023 Jan22

Page 7 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

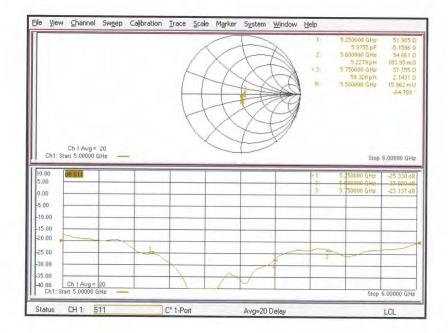
No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Impedance Measurement Plot for Head TSL



Certificate No: D5GHzV2-1023_Jan22

Page 8 of 8

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 58 of 76

ccredited by the Swiss Accreditati he Swiss Accreditation Service Iultilateral Agreement for the red	is one of the signatorie	s to the EA	creditation No.: SCS 0108
ilient SGS (Auden)	ERTIFICATE		: D6.5GHzV2-1006_Aug
Dbject	D6.5GHzV2 - SN	:1006	
Calibration procedure(s)	QA CAL-22.v6 Calibration Proce	dure for SAR Validation Sources	between 3-10 GHz
Calibration date:	August 26, 2021		
The measurements and the uncert	ainties with confidence p	onal standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature $(22 \pm 3)^\circ$ C	d are part of the certificate.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf	ainties with confidence p ed in the closed laborato E critical for calibration)	robability are given on the following pages an ny facility: environment temperature (22 \pm 3)°(d are part of the certificate. C and humidity < 70%.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards	ainties with confidence p ed in the closed laborato E critical for calibration)	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.)	d are part of the certificate. 2 and humidity < 70%. Scheduled Calibration
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power meter NRP	ainties with confidence p ed in the closed laborato E critical for calibration)	robability are given on the following pages an ny facility: environment temperature (22 \pm 3)°(d are part of the certificate. C and humidity < 70%.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power meter NRP Power sensor NRP-291	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C <u>Cal Date (Certificate No.)</u> 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291)	d are part of the certificate. 2 and humidity < 70%. <u>Scheduled Calibration</u> Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Power sensor R&S NRP33T Reference 20 dB Attenuator	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C <u>Cal Date (Certificate No.)</u> 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03292)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 100967 SN: 2H9394 (20k) SN: 310982 / 06327	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03344)	d are part of the certificate. 2 and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 10967 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7405	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 100967 SN: 2H9394 (20k) SN: 310982 / 06327	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03344)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-371 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 10967 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7405	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21)	d are part of the certificate. 2 and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103967 SN: BH3394 (20k) SN: 310982 / 06327 SN: 7405 SN: 908	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards RF generator Anapico APSIN20G	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 10967 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7405 SN: 908	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards RF generator Anapico APSIN20G	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 7405 SN: 7405 SN: 908 ID # SN: 669 SN: 101093	robability are given on the following pages an ry facility: environment temperature (22 ± 3)*0 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house) 28-Mar-17 (in house check Dec-18) 10-May-12 (in house check Dec-18)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check In house check: Dec-21 In house check: Dec-21
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&Tf Primary Standards Power sensor NRP-291 Power sensor NRP-	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103245 SN: 103967 SN: 119334 (20k) SN: 310982 / 06327 SN: 7405 SN: 310982 / 06327 SN: 7405 SN: 908 ID # SN: 669 SN: 101093	robability are given on the following pages an ry facility: environment temperature (22 ± 3)°C O9-Apr-21 (No. 217-03291/03292) O9-Apr-21 (No. 217-03291) O9-Apr-21 (No. 217-03293) O9-Apr-21 (No. 217-03293) O9-Apr-21 (No. 217-03343) O9-Apr-21 (No. 217-03343) O9-Apr-21 (No. 217-03343) O9-Apr-21 (No. 217-03343) O9-Apr-21 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house) 28-Mar-17 (in house check Dec-18) 10-May-12 (in house check Dec-18) Function	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check In house check: Dec-21
The measurements and the uncert	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 103245 SN: 7405 SN: 7405 SN: 908 ID # SN: 669 SN: 101093	robability are given on the following pages an ry facility: environment temperature (22 ± 3)*0 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house) 28-Mar-17 (in house check Dec-18) 10-May-12 (in house check Dec-18)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check In house check: Dec-21 In house check: Dec-21

Certificate No: D6.5GHzV2-1006_Aug21

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 59 of 76

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



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

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

chossary.	
TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) 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-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.

Additional Documentation:

b) DASY 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.
- 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 absorbed power density (APD): The absorbed power density is evaluated according to Samaras T, Christ A, Kuster N, "Compliance assessment of the epithelial or absorbed power density above 6 GHz using SAR measurement systems", Bioelectromagnetics, 2021 (submitted). The additional evaluation uncertainty of 0.55 dB (rectangular distribution) is considered.

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: D6.5GHzV2-1006_Aug21

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

www.sqs.com.tw



Measurement Conditions

ASY system configuration, as far as no		
DASY Version	DASY6	V16.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	6500 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	34.5	6.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.6 ± 6 %	6.11 mho/m ± 6 %
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	100 mW input power	29.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	291 W/kg ± 24.7 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	5.39 W/kg

Certificate No: D6.5GHzV2-1006_Aug21

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.



Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	45.7 Ω - 6.6 jΩ
Return Loss	- 21.7 dB

APD (Absorbed Power Density)

APD averaged over 1 cm ²	Condition	
APD measured	100 mW input power	291 W/m ²
APD measured	normalized to 1W	2910 W/m ² ± 29.2 % (k=2)
APD averaged over 4 cm ²	condition	
		132 W/m ²
APD measured	100 mW input power	102 /////

General Antenna Parameters and Design

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the

feedpoint may be damaged.

Additional EUT Data

1.1. 3 P. 33 B. 447	
Manufactured by	SPEAG
	of Erici

Certificate No: D6.5GHzV2-1006_Aug21

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form exercising all their rights and obligations under the transaction document. 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.

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 62 of 76

DASY6 Validation Report for Head TSL

Measurement Report for D6.5GHz-1006, UID 0 -, Channel 6500 (6500.0MHz)

Name, Manufa	acturer D	imensions	[mm] II	VIEL	DUT Typ	P	
D6.5GHz		6.0 x 6.0 x	Contraction of the second seco	N: 1006			
Exposure Cond	litions						
Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz]	Conversion Factor	TSL Cond. [S/m]	TSL Permittivity
Flat, HSL	5.00	Band	CW,	6500	5.75	6.11	33.6
Hardware Setu Phantom		SL		D			
					pration Date		oration Date
MFP V8.0 Cent	er - 1182 H	BBL600-10	000V6	EX3DV4 - SM	7405, 2020-12-30	DAE4 Sn9	08, 2021-06-24
Scan Setup				Measureme	ent Results		
			Zoom Scar	1			Zoom Scan
Grid Extents [22.0 x 22.0 x 22.0) Date		2	021-08-26, 10:54
Grid Steps [m			3.4 x 3.4 x 1.4	psSAR1g [\	N/Kg]		29.3
Sensor Surfac	e [mm]		1.4	psSAR10g	[W/Kg]		5.39
Graded Grid			Ye	Power Drif	t [dB]		0.03
Grading Ratio	F)		1.4	Power Sca	ling		Disabled
MAIA			N/4	Scaling Fac	tor [dB]		
Surface Detec	tion		VMS + 6p	TSL Correc	tion		No correction
Scan Method			Measured	M2/M1 [%]		50.3
				Dist 3dB P	eak [mm]		4.8



Certificate No: D6.5GHzV2-1006_Aug21

Page 5 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

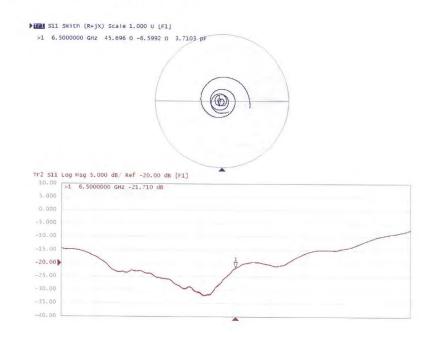
No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Impedance Measurement Plot for Head TSL



Certificate No: D6.5GHzV2-1006_Aug21

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 64 of 76

eughausstrasse 43, 8004 Zurich,	Switzerland	C S	Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service
ccredited by the Swiss Accreditation he Swiss Accreditation Service in Iultilateral Agreement for the rec	is one of the signatorie	s to the EA	ccreditation No.: SCS 0108
lient SGS (Auden)	FRTIFICATE		»: D7GHzV2-1007_Aug21
Dbject	D7GHzV2 - SN:1		
Calibration procedure(s)	QA CAL-22.v6 Calibration Proce	dure for SAR Validation Sources	between 3-10 GHz
Calibration date:	August 26, 2021		
		robability are given on the following pages ar ny facility: environment temperature $(22 \pm 3)^{\circ}$	
All calibrations have been conducte Calibration Equipment used (M&TE	ed in the closed laborato		
All calibrations have been conducte Calibration Equipment used (M&TE Primary Standards	ed in the closed laborato	ry facility: environment temperature (22 \pm 3)°(C and humidity < 70%.
Il calibrations have been conducte calibration Equipment used (M&TE trimary Standards tower meter NRP	ed in the closed laborator E critical for calibration)	ry facility: environment temperature (22 ± 3)°t Cal Date (Certificate No.)	C and humidity < 70%. Scheduled Calibration
Il calibrations have been conducte Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91	ad in the closed laborator critical for calibration) ID # SN: 104778	ry facility: environment temperature (22 ± 3)°(Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292)	C and humidity < 70%. Scheduled Calibration Apr-22
All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Yower sensor NRP-Z91 Power sensor NRP-Z91	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103244	cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22
All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T	ed in the closed laborator = critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245	ry facility: environment temperature (22 ± 3)°(Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22
All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103245 SN: 103245 SN: 103245 SN: 103265	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 08-Apr-21 (No. 217-03292)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22
All calibrations have been conducto Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 100967 SN: BH9394 (20k) SN: 310987 SN: 310987 SN: 7405	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03292) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
All calibrations have been conducto Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 10967 SN: 109934 (20k) SN: 310982 / 06327	ry facility: environment temperature (22 ± 3)°(O9-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22
All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 100967 SN: BH9394 (20k) SN: 310987 SN: 310987 SN: 7405	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21
All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Becondary Standards	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 10967 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7405 SN: 908	ry facility: environment temperature (22 ± 3)°(Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check
All calibrations have been conducto Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards RF generator Anapico APSIN20G	ed in the closed laborator E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103967 SN: BH9394 (20k) SN: 310982 / 06327 SN: 7405 SN: 908 ID #	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22
All calibrations have been conducto Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards RF generator Anapico APSIN20G	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 100967 SN: BH9394 (20k) SN: 310982 (06327 SN: 908 ID # SN: 669	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03242) 08-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house) 28-Mar-17 (in house check Dec-18) 10-May-12 (in house check Dec-18)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check In house check: Dec-21 In house check: Dec-21
	ad in the closed laborator E critical for calibration) ID # SN: 104778 SN: 103245 SN: 103245 SN: 100967 SN: BH9394 (20k) SN: 310982 (20k) SN: 310982 (20k) SN: 7405 SN: 908 ID # SN: 669 SN: 101093	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03343) 09-Apr-21 (No. 217-03344) 30-Dec-20 (No. EX3-7405_Dec20) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house) 28-Mar-17 (in house check Dec-18)	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check In house check: Dec-21
All calibrations have been conductor Calibration Equipment used (M&TE Primary Standards Power meter NRP Power sensor NRP-291 Power sensor NRP-291 Power sensor NRP-291 Power sensor R&S NRP33T Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards RF generator Anapico APSIN20G Network Analyzer R&S ZVL13	ad in the closed laborator critical for calibration) ID # SN: 104778 SN: 103245 SN: 103245 SN: 100967 SN: BH3394 (20k) SN: 310982 / 06327 SN: 7405 SN: 7405 SN: 908 ID # SN: 669 SN: 101093 Name	Cal Date (Certificate No.) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291/03292) 09-Apr-21 (No. 217-03291) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03293) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03243) 09-Apr-21 (No. 217-03242) 24-Jun-21 (No. DAE4-908_Jun21) Check Date (in house) 28-Mar-17 (in house check Dec-18) 10-May-12 (in house check Dec-18) Function	C and humidity < 70%. Scheduled Calibration Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Apr-22 Dec-21 Jun-22 Scheduled Check In house check: Dec-21 In house check: Dec-21

Certificate No: D7GHzV2-1007_Aug21

Page 1 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



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



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

Accreditation No.: SCS 0108

S

C

S

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary;	income the second second second second
TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) 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-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.

Additional Documentation:

b) DASY 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.
- 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 absorbed power density (APD): The absorbed power density is evaluated according to Samaras T, Christ A, Kuster N, "Compliance assessment of the epithelial or absorbed power density above 6 GHz using SAR measurement systems", Bioelectromagnetics, 2021 (submitted). The additional evaluation uncertainty of 0.55 dB (rectangular distribution) is considered.

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: D7GHzV2-1007_Aug21

Page 2 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

f (886-2) 2298-0488



Measurement Conditions

DASY Version	DASY6	V16.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	7000 MHz ± 1 MHz	i ha

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	33.9	6.65 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	32.7 ± 6 %	6.71 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	معتدر	

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	27.7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	275 W/kg ± 24.7 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	4.78 W/kg

Certificate No: D7GHzV2-1007_Aug21

Page 3 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

www.sgs.com.tw



Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.9 Ω - 3.8 jΩ	
Return Loss	- 26.6 dB	

APD (Absorbed Power Density)

APD averaged over 1 cm ²	Condition	
APD measured	100 mW input power	274 W/m ²
APD measured	normalized to 1W	2740 W/m ² ± 29.2 % (k=2)
APD averaged over 4 cm ²	condition	
APD averaged over 4 cm ² APD measured	condition 100 mW input power	119 W/m ²

General Antenna Parameters and Design

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured by	SPEAG

Certificate No: D7GHzV2-1007_Aug21

Page 4 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

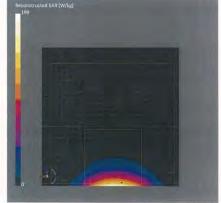
除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form exercising all their rights and obligations under the transaction document. 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.



DASY6 Validation Report for Head TSL

Measurement Report for D7GHz-1007, UID 0 -, Channel 7000 (7000.0MHz)

hantom ection, TSL	ons Position, Test	4.0 x 6.0 x 3	297.0 SN	: 1007	*		
ection, TSL	Position, Test						
ection, TSL	a state of the sta						
1-4 1101	Distance [mm]	Band	Group, UID	Frequency [MHz]	Conversion Factor	TSL Cond. [S/m]	TSL Permittivity
Flat, HSL	5.00	Band	CW,	7000	6.09	6.71	32.7
Hardware Setup						DAG C-UL	antion Data
Phantom		SL COO 10	0001/6		bration Date		oration Date 08, 2021-06-24
MFP V8.0 Center	- 1182 H	BBL600-10	00076	EX3DV4 - Sr	N7405, 2020-12-30	DAE4 SHIS	36, 2021-00-24
Scan Setup				Measureme	ent Results		
			Zoom Scan				Zoom Scan
Grid Extents [mi	m]		22.0 x 22.0 x 22.0	Date		2	021-08-26, 14:14
Grid Steps [mm]	1		3.0 x 3.0 x 1.4	psSAR1g [\	W/Kg]		27.7
Sensor Surface	[mm]		1.4	psSAR10g	[W/Kg]		4.78
Graded Grid			Yes	Power Drif	ft [dB]		0.05
Grading Ratio			1.4	Power Sca	ling		Disabled
MAIA			N/A	Scaling Fac	ctor [dB]		
Surface Detection	on		VMS + 6p	TSL Correc	tion		No correction
Scan Method			Measured	M2/M1 [%	6]		46.9
				Dist 3dB P	eak [mm]		4.6



Certificate No: D7GHzV2-1007_Aug21

Page 5 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

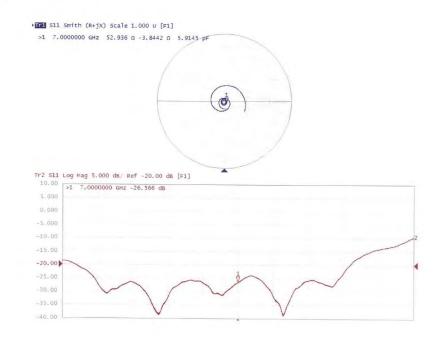
除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sgs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

```
www.sgs.com.tw
```



Impedance Measurement Plot for Head TSL



Certificate No: D7GHzV2-1007_Aug21

Page 6 of 6

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488

www.sgs.com.tw



Report No. : TESA2211000479EN Page: 70 of 76

	ch, Switzerland	Muladalation was	Swiss Calibration Service
Accredited by the Swiss Accredit The Swiss Accreditation Servic Multilateral Agreement for the r	e is one of the signat	tories to the EA	reditation No.: SCS 0108
Client SGS (Auden)		Certificate No:	5G-Veri10-1021_Jan22
CALIBRATION	CERTIFICA	TE	
Object	5G Verification Source 10 GHz - SN: 1021		
Calibration procedure(s)	QA CAL-45.v Calibration pr	Ηz	
Calibration date:	January 24, 2	2022	
This calibration certificate docum	nents the traceability to ertainties with confiden	national standards, which realize the physical units ice probability are given on the following pages and	of measurements (SI). are part of the certificate.
the measurements and the unc			
All calibrations have been condu	icted in the closed labo	pratory facility: environment temperature (22 \pm 3)°C a	
All calibrations have been condu Calibration Equipment used (M8	icted in the closed labo	pratory facility: environment temperature (22 \pm 3)°C a on)	and humidity < 70%.
All calibrations have been condu Calibration Equipment used (M8 Primary Standards	icted in the closed labo	vratory facility: environment temperature (22 ± 3)°C a on) Cal Date (Certificate No.)	and humidity < 70%. Scheduled Calibration
All calibrations have been condu	Inter the closed labored labored for calibratic LD #	pratory facility: environment temperature (22 \pm 3)°C a on)	and humidity < 70%.
All calibrations have been condu Calibration Equipment used (M8 Primary Standards Reference Probe EUmmWV3	TE critical for calibratic ID # SN: 9374	oratory facility: environment temperature (22 ± 3)°C a on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21)	and humidity < 70%. Scheduled Calibration Dec-22
All calibrations have been condu Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	TE critical for calibratic ID # SN: 9374 SN: 1602	vratory facility: environment temperature (22 ± 3)°C a on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	and humidity < 70%. Scheduled Calibration Dec-22 Jun-22
All calibrations have been condu Calibration Equipment used (M8 <u>Primary Standards</u> Reference Probe EUmmWV3 DAE4ip <u>Secondary Standards</u>	TE critical for calibratic ID # SN: 9374 SN: 1602	vratory facility: environment temperature (22 ± 3)°C a on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	and humidity < 70%. Scheduled Calibration Dec-22 Jun-22
All calibrations have been condu Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	In the closed labor TE critical for calibratic ID # SN: 9374 SN: 1602 ID # ID # Name	vratory facility: environment temperature (22 ± 3)°C a on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21) Check Date (in house) Function	and humidity < 70%. Scheduled Calibration Dec-22 Jun-22 Scheduled Check

Certificate No: 5G-Veri10-1021_Jan22 Page 1 of 7

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless otherwise stated the results shown in this test report reteriority to the sample(s) tested and sour sample(s) are related to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sqs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>http://www.sqs.com.tw/Terms-and-Conditions</u>. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 71 of 76

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



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

Accreditation No.: SCS 0108

S

C

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates Glossary

CW

Continuous wave

Calibration is Performed According to the Following Standards

- Internal procedure QA CAL-45-5Gsources
- IEC TR 63170 ED1, "Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz", January 2018

Methods Applied and Interpretation of Parameters

- Coordinate System: z-axis in the waveguide horn boresight, x-axis is in the direction of the E-field, y-axis normal to the others in the field scanning plane parallel to the horn flare and horn flange.
- Measurement Conditions: (1) 10 GHz: The radiated power is the forward power to the horn antenna minus ohmic and mismatch loss. The forward power is measured prior and after the measurement with a power sensor. During the measurements, the horn is directly connected to the cable and the antenna ohmic and mismatch losses are determined by farfield measurements. (2) 30, 45, 60 and 90 GHz. The verification sources are switched on for at least 30 minutes. Absorbers are used around the probe cub and at the ceiling to minimize reflections.
- Horn Positioning: The waveguide horn is mounted vertically on the flange of the waveguide source to allow vertical positioning of the EUmmW probe during the scan. The plane is parallel to the phantom surface. Probe distance is verified using mechanical gauges positioned on the flare of the horn.
- E- field distribution: E field is measured in two x-y-plane (10mm, 10mm + $\lambda/4$) with a vectorial E-field probe. The E-field value stated as calibration value represents the E-fieldmaxima and the averaged (1cm² and 4cm²) power density values at 10mm in front of the horn.
- Field polarization: Above the open horn, linear polarization of the field is expected. This is verified graphically in the field representation.

Calibrated Quantity

Local peak E-field (V/m) and average of peak spatial components of the poynting vector (W/m^2) averaged over the surface area of 1 cm² and 4cm² at the nominal operational frequency of the verification source. Both square and circular averaging results are listed.

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: 5G-Veri10-1021_Jan22

Page 2 of 7

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 form 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.

f (886-2) 2298-0488



Measurement Conditions

DASY system configuration, as	not given on page 1.
DACY Version	DAOVOU

DASY Version	cDASY6 Module mmWave	V2.4
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm	
XY Scan Resolution	dx, dy = 7.5 mm	
Number of measured planes	2 (10mm, 10mm + λ/4)	
Frequency	10 GHz ± 10 MHz	

Calibration Parameters, 10 GHz

Circular Averaging

Distance Horn Aperture to Measured Plane	Prad' (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg (psPD psPD	er Density n+, psPDtot+, mod+) /m ²)	Uncertainty (k = 2)
		11		1 cm ²	4 cm ²	
10 mm	86.1	148	1.27 dB	55.2	51.7	1.28 dB

Square Averaging

Distance Horn Aperture to Measured Plane	Prad ¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	AVg (psPDi psPDi		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	86.1	148	1.27 dB	55.2	51.5	1.28 dB

¹ Assessed ohmic and mismatch loss plus numerical offset: 0.55 dB

Certificate No: 5G-Veri10-1021_Jan22 Page 3 of 7

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sgs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

f (886-2) 2298-0488



Report No. : TESA2211000479EN Page: 73 of 76

DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type	
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1021	-	
Exposure Conditions				

Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor	
5G -	10.0 mm	Validation band	CW	10000.0,	1.0	

Hardware Setup

Phan Medium mmWave Phantom - 1002 Air

Probe, Calibration Date EUmmWV3 - SN9374_F1-55GHz, 2021-12-21

DAE, Calibration Date DAE4ip Sn1602, 2021-06-25

5G Scan

1.00 55.0

55.2 55.4 148 0.01

Scan Setup

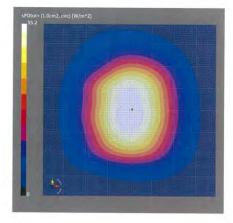
Grid Extents [mm] Grid Steps [lambda] Sensor Surface [mm] MAIA

1	20.0 x 120.0
	0.25 x 0.25
	10.0
M	AIA not used

1	Measurement Results
	Date
	Avg. Area [cm ²]
	psPDn+ [W/m ²]
	psPDtot+ [W/m ²]
	mm i freed to

psPDmod+ [W/m²] E_{max} [V/m] Power Drift [dB]

2022-01-24, 11:01



Certificate No: 5G-Veri10-1021_Jan22

Page 4 of 7

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sgs.com.tw/Terms-and-Conditions</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Name, Manufacturer	Dimensions [mr	n]	IMEI	DUT Type	
5G Verification Source	10 GHz 100.0 x 100.0 x	172.0	SN: 1021	-	
Exposure Conditio	ns				
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup Phante mmWave Phantom - 1002

Medium

Air

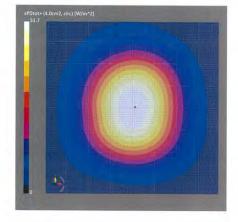
Probe, Calibration Date EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 DAE, Calibration Date DAE4ip Sn1602, 2021-06-25

Scan Setup

Grid Extents [mm] Grid Steps [lambda] Sensor Surface [mm] MAIA

Measurement Results 5G Scan 120.0 x 120.0 0.25 x 0.25 Date Date Avg. Area [cm²] psPDn+ [W/m²] psPDtot+ [W/m²] psPDmod+ [W/m²] E_{max} [V/m] Power Drift [dB] 10.0 MAIA not used

5G Scan 56 Scan 2022-01-24, 11:01 4.00 51.5 51.7 51.8 148 0.01



Certificate No: 5G-Veri10-1021_Jan22

Page 5 of 7

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

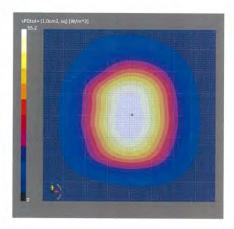
```
www.sgs.com.tw
```



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type	
5G Verification Source 10 G	Hz 100.0 x 100.0 x 1	172.0	SN: 1021		
Exposure Conditions					
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0
Hardware Setup					
Phantom	Medium		Pro	be, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air		EU	nmWV3 - SN9374_F1-55GHz, 21-12-21	DAE4ip Sn1602, 2021-06-25
Scan Setup			Me	asurement Results	
in the second		5G S			5G Scan
Grid Extents [mm]		120.0 x 12		ite	2022-01-24, 11:01
Grid Steps [lambda]		0.25 x 0		rg. Area [cm ²]	1.00
Sensor Surface [mm] MAIA				PDn+ [W/m ²]	55.0
(VIA)		MAIA not u		PDtot+ [W/m ²]	55.2
				PDmod+ [W/m ²] ax [V/m]	55.4
			Er	ax [V/III]	148



Certificate No: 5G-Veri10-1021_Jan22 Page 6 of 7

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279 台灣檢驗科技股份有限公司

f (886-2) 2298-0488

```
www.sgs.com.tw
```



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Name, Manufacturer 5G Verification Source 1	Dimensions [mm 0 GHz 100.0 x 100.0 x 1	·	IMEI SN: 1021	DUT Type	
Exposure Condition	IS				
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Phantom mmWave Phantom - 1002

Medium

Air

Scan Setup

Grid Extents [mm] Grid Steps [lambda] Sensor Surface [mm] MAIA

M	
	5G Scan
D	120.0 x 120.0
A	0.25 x 0.25
p	10.0
p	MAIA not used
p	

Measurement Results
Date
Avg. Area [cm ²]
psPDn+ [W/m ²]
psPDtot+ [W/m ²]
psPDmod+ [W/m ²]
Emax [V/m]

Power Drift [dB]

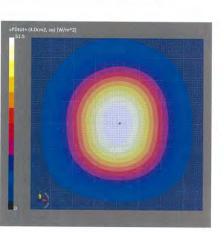
Probe, Calibration Date EUmmWV3 - SN9374_F1-55GHz, 2021-12-21

> 5G Scan 2022-01-24, 11:01 4.00 51.3 51.5 51.7

148

0.01

DAE, Calibration Date DAE4ip Sn1602, 2021-06-25



Certificate No: 5G-Veri10-1021_Jan22

Page 7 of 7

- End of report -

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 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.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. 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 not 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.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號