

Other Probe Parameters	
Sensor Arrangement	Triangular
Connector Angle (°)	23.2
Nechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm

1.1. D750V3 Dipole Calibration Certificate

Add: No.51 Xueyuan Ro Tel: +86-10-62304633-2	0/9 Tax. 100-1	whineftl cn	CNAS L0570
E-mail: cttl@chinattl.cor	n http://www	Certificate No: Z21-60	016
ALIBRATION CER	TIFICATE		
	1.05		10.00
bject	D750V3 -	SN: 1180	
alibration Procedure(s)	FF-Z11-0	03-01	
andration (1000000-10-1	Calibratio	on Procedures for dipole validation kits	
	1.1		3
calibration date:	January 2	aceability to national standards, which realize	the advisional units (
All calibrations have been	ificate. conducted in th	he closed laboratory facility: environment ten	nperature(22±3)°C ar
All calibrations have been on humidity<70%. Calibration Equipment used (conducted in th	ne closed laboratory facility: environment ten	
humidity<70%. Calibration Equipment used (conducted in th	calibration) Cal Date(Calibrated by, Certificate No.)	Scheduled Calibratio
humidity<70%. Calibration Equipment used (Primary Standards	conducted in th	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibratio May-21
numidity<70%. Calibration Equipment used (Primary Standards Power Meter NRP2	Conducted in the M&TE critical for 10 # 106276 101369	Cal Date(Calibrated by, Certificate No.) 5 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	Scheduled Calibratio
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Glossary:

ating liquid
TSL / NORMx,y,z
e or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna 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: Z21-60016

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S p e g а CALIBRATION LABORATORY

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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 The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		

SAR result with Head TSL

Condition	
250 mW input power	2.13 W/kg
normalized to 1W	8.43 W/kg ± 18.8 % (k=2)
Condition	
250 mW input power	1.41 W/kg
normalized to 1W	5.59 W/kg ± 18.7 % (k=2)
	250 mW input power normalized to 1W Condition 250 mW input power

Certificate No: Z	21-60016
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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.6Ω- 1.34jΩ	
Return Loss	- 28.6dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	0.944 ns
Electrical Boldy (one anotabily	

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	CV Elle		SPEAG	
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DASY5 Validation Report for Head TSL Text Laboratory: CTTL Beijing China

Date: 01.22.2021

Test Laboratory: CTTL, Beijing, China DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1180

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

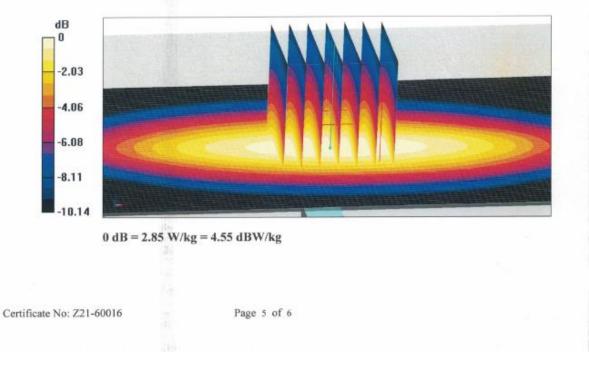
Medium parameters used: f = 750 MHz; σ = 0.905 S/m; ϵ_r = 42.25; ρ = 1000 kg/m3 Phantom section: Right Section

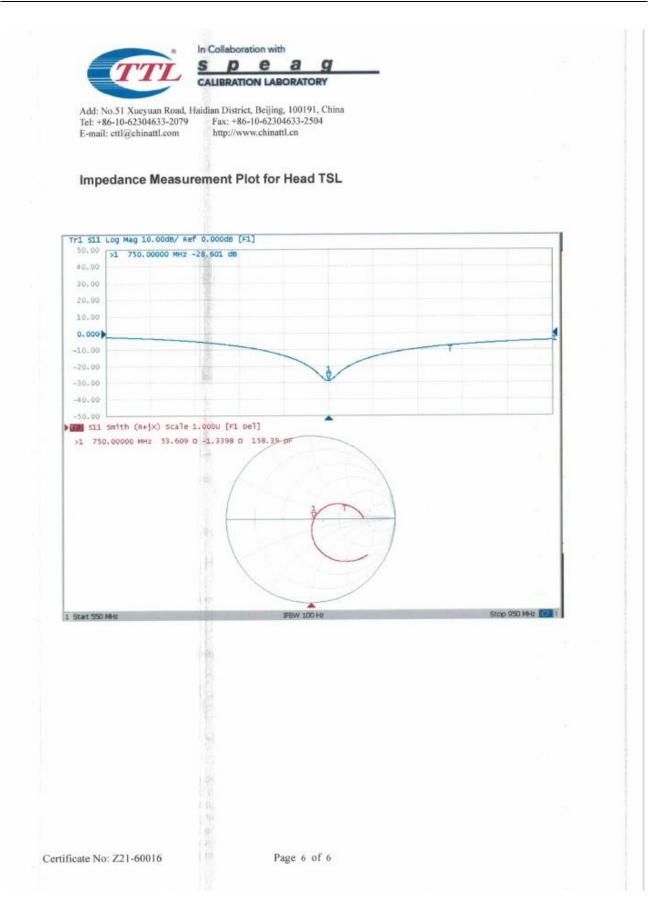
DASY5 Configuration:

- Probe: EX3DV4 SN7600; ConvF(10.88, 10.88, 10.88) @ 750 MHz; Calibrated: 2020-11-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.99 V/m; Power Drift = 0.00 dB Peak SAR (extrapolated) = 3.25 W/kg SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.41 W/kg Smallest distance from peaks to all points 3 dB below = 22.7 mm Ratio of SAR at M2 to SAR at M1 = 65.6% Maximum value of SAR (measured) = 2.85 W/kg



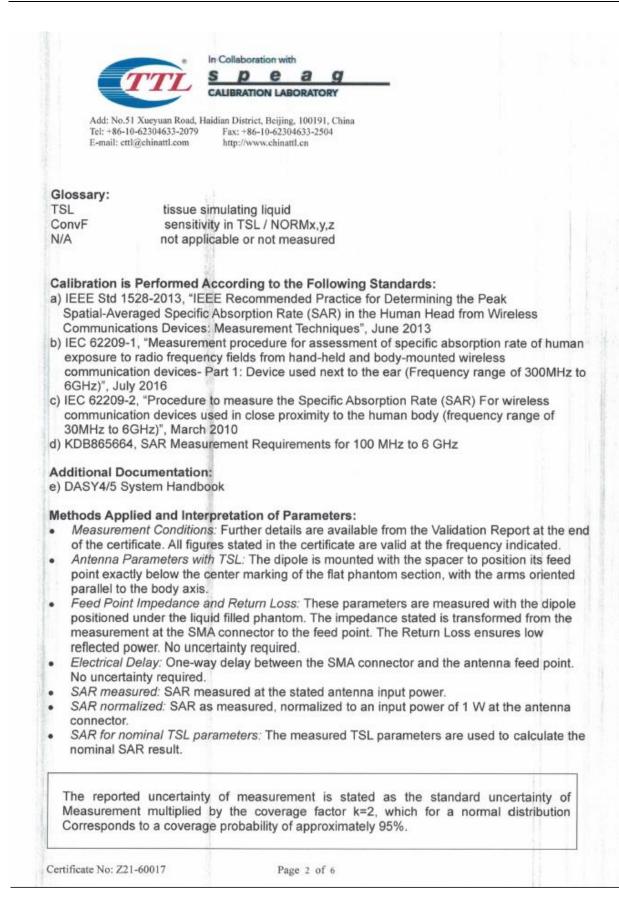


Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

			Head-750			
Date of	Poturn loop (dP)	Dolto (9/)	Real Impedance	Delta	Imaginary	Delta
measurement	Return-loss (dB)	Delta (%)	(ohm)	(ohm)	impedance (ohm)	(ohm)
2021-01-22	-28.6		53.6		-1.34	
2022-01-17	-28.1	-1.75	53.5	0.1	-1.11	0.23
2023-01-15	-28.3	-1.05	53.3	0.3	-1.22	0.12

1.2. D835V2 Dipole Calibration Certificate

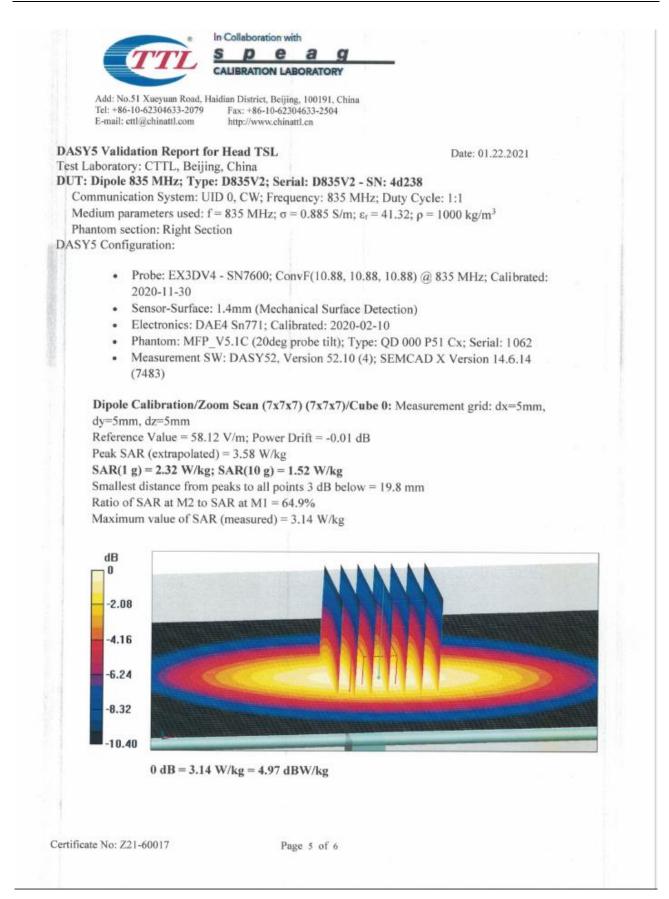
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Tel: +86-10-62304 E-mail: cttl@china		+86-10-62304633-2504 /www.chinattl.cn	"Maladalater		CNAS L057	0
Client HTW			Certificate No:	Z21-60017		
CALIBRATION C	EDTIEICAT	re	A CARLEN IN ANY	11.3.3 11.1	I PARTY	
CALIBRATION C	EKTIFICA			Stell 1	A CONTRACT	
Object						
Object	D835V	2 - SN: 4d238				
Calibration Procedure(s)		000.04				
		I-003-01	dipole validation kits			
	Gample		apple valuation kits			
Calibration date:	Januar	y 22, 2021				
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C		or calibration) Cal Date(Calibrat 12-May-20 (CTTL, 12-May-20 (CTTL, 30-Nov-20(CTTL-5 10-Feb-20(CTTL-5	ed by, Certificate No No.J20X02965) No.J20X02965) SPEAG,No.Z20-6042 SPEAG,No.Z20-6001 ed by, Certificate No.) No.J20X00516)	.) Schediu 21) 7)	ure(22±3)℃ and led Calibration May-21 May-21 Nov-21 Feb-21 Ied Calibration Feb-21 Feb-21	-
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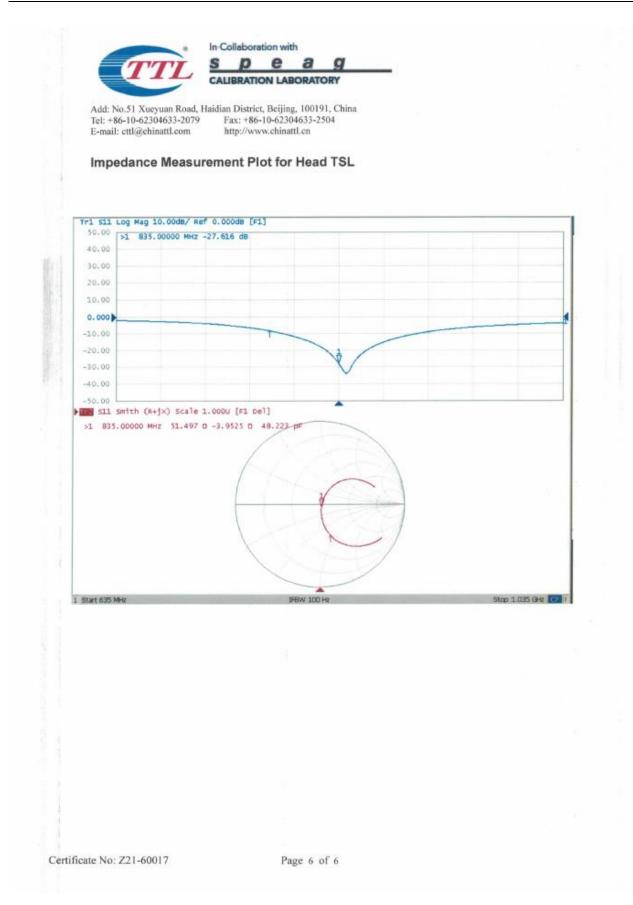


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	ALIBRATION LA	BORATORY			
Add: No.51 Xueyuan Road, Hai Tel: +86-10-62304633-2079 E-mail: cttl@chinattl.com	idian District, Beijin Fax: +86-10-623 http://www.china	04633-2504			
DASY system configuration, as f	ar as not given o	n page 1.			
DASY Version		DASY52			V52.10.4
Extrapolation	Advand	ced Extrapolation			
Phantom	Triple	Flat Phantom 5.1C			
Distance Dipole Center - TSL		15 mm		6	with Spacer
Zoom Scan Resolution	dx,	dy, dz = 5 mm			
Frequency	835	MHz ± 1 MHz			
lead TSL parameters The following parameters and ca	culations were a	pplied. Temperature	Permitti	vitv	Conductivity
Nominal Head TSL paramete	rs	22.0 °C	41.5		0.90 mho/m
Measured Head TSL paramet		(22.0 ± 0.2) °C	41.3 ± 0	3 %	0.89 mho/m ± 6 %
tota ano astro da la companya da la companya da companya da companya da companya da companya da companya da com		<1.0 °C			
Head ISL temperature chance	c canng core				
Head TSL temperature changes		1 Con 1 Con 1	ion		
SAR averaged over 1 cm ³ (1	g) of Head TSL	Condit			2.32 W/kg
AR result with Head TSL	g) of Head TSL	250 mW in	put power	1	
SAR result with Head TSL SAR averaged over 1 cm ³ (1		07.0223		9.39	W/kg ± 18.8 % (k=2)
AR result with Head TSL SAR averaged over 1 cm ³ (1 SAR measured	ameters	250 mW in normalize	d to 1W	9.39	W/kg ± 18.8 % (k=2)
AR result with Head TSL SAR averaged over 1 cm ³ (1 SAR measured SAR for nominal Head TSL par	ameters	250 mW in normalize	d to 1W ion	9.39	W/kg ± 18.8 % (k=2) 1.52 W/kg

Certificate No: Z21-60017

TTI	s p e a g		
	CALIBRATION LABORATORY		
Add: No.51 Xueyuan Road, Ha Tel: +86-10-62304633-2079 E-mail: ettl@chinattl.com	idian District, Beijing, 100191, China Fax: +86-10-62304633-2504 http://www.chinattl.cn		
Annondix (Additional ass			
Appendix (Additional ass	essments outside the sco	pe of CNAS L0570)	
Antenna Parameters with	Head TSL		
Impedance, transformed to fee	ed point	51.5Ω- 3.95jΩ	
Return Loss		- 27.6dB	
Seneral Antenna Parame	ters and Design		
Electrical Delay (one direction))	1.298 ns	
e measured. he dipole is made of standard onnected to the second arm of the dipoles, small end caps a ccording to the position as exp fected by this change. The ov o excessive force must be app	radiated power, only a slight war semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor erall dipole length is still accordi plied to the dipole arms, because may be damaged.	ter conductor of the feeding fore short-circuited for DC- rder to improve matching wi iditions" paragraph. The SA ng to the Standard.) line is directly signals. On som hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching wi iditions" paragraph. The SA ng to the Standard.) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching wi iditions" paragraph. The SA ng to the Standard.) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ater conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ing to the Standard. In they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not
e measured. he dipole is made of standard onnected to the second arm of f the dipoles, small end caps a ccording to the position as exp ffected by this change. The ov o excessive force must be app onnections near the feedpoint dditional EUT Data	semirigid coaxial cable. The cer f the dipole. The antenna is there are added to the dipole arms in o plained in the "Measurement Cor rerall dipole length is still accordi plied to the dipole arms, because	ter conductor of the feeding fore short-circuited for DC- rder to improve matching w iditions" paragraph. The SA ng to the Standard. a they might bend or the sole) line is directly signals. On some hen loaded R data are not



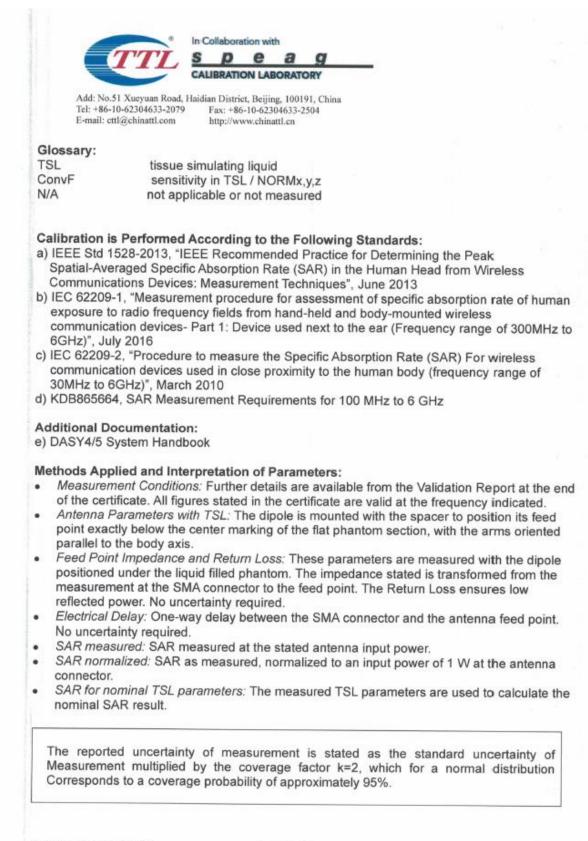


Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

			Head-835			
Date of	Poturn loop (dP)	Dolto (9/)	Real Impedance	Delta	Imaginary	Delta
measurement	Return-loss (dB)	Delta (%)	(ohm)	(ohm)	impedance (ohm)	(ohm)
2022-01-22	-27.6		51.5		-3.95	
2022-01-17	-27.3	-1.09	51.8	0.3	-3.45	0.5
2023-01-15	-27.5	-0.36	51.6	0.1	-3.55	0.4

1.3. D1750V2 Dipole Calibration Certificate

Client HTW		the second s	
Client HTW		Certificate No: Z2	1-60018
CALIBRATION C	ERTIFICA	TE	and the state of the state
Object	D1750	0V2 - SN: 1164	
Calibration Procedure(s)	FF 74		
		1-003-01 ation Procedures for dipole validation kits	
Calibration date:			
Campration date.	Janua	ry 22, 2021	
measurements(SI). The me pages and are part of the c	easurements and ertificate.	traceability to national standards, which re the uncertainties with confidence probability the closed laboratory facility: environment	are given on the following
individually - i o vu.			
	d (M&TE critical f	for calibration)	-
Calibration Equipment used	ID #		Scheduled Calibration
Calibration Equipment used		for calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965)	Scheduled Calibration May-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	ID #	Cal Date(Calibrated by, Certificate No.)	
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4	ID # 106276 101369 SN 7600	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421)	May-21 May-21 Nov-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101369	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	May-21 May-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4	ID # 106276 101369 SN 7600	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421)	May-21 May-21 Nov-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards	ID # 106276 101369 SN 7600 SN 771 ID #	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.)	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430 MY46110673 Name	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG, No.Z20-60421) 10-Feb-20(CTTL-SPEAG, No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430 MY46110673 Name Zhao Jing Lin Hao	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function SAR Test Engineer SAR Test Engineer	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430 MY46110673 Name Zhao Jing	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function SAR Test Engineer	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106276 101369 SN 7600 SN 771 ID # MY49071430 MY46110673 Name Zhao Jing Lin Hao	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function SAR Test Engineer SAR Test Engineer	May-21 May-21 Nov-21 Feb-21 Scheduled Calibration Feb-21 Feb-21 Signature



Certificate No: Z21-60018

Page 2 of 6

	stem configuration, as far as no Version		page I.			
	TO OTO I		DASY52	+		V52.10.4
Extrap	olation	Advance	ed Extrapolation			
Phanto	m	Triple Flat Phantom 5.1C				
Distan	ce Dipole Center - TSL	10 mm				with Spacer
Zoom	Scan Resolution	dx, d	dy, dz = 5 mm			
Freque	Incv	1750) MHz ± 1 MHz			
	ving parameters and calculatio	ns were ap	Temperature	Permitti	vity	Conductiv
The follow	ving parameters and calculation	ns were ap		Pormitti	uitu	Conductivi
	ving parameters and calculatio	ns were ap		Permitti 40.1	vity	Conductivi 1.37 mho/m
Nomina			Temperature			
Nomina	al Head TSL parameters	(Temperature 22.0 °C	40.1		1.37 mho/m
Nomina Measu Head T	al Head TSL parameters red Head TSL parameters SL temperature change durin It with Head TSL	ng test	Temperature 22.0 °C (22.0 ± 0.2) °C	40.1 39.8 ± 6		1.37 mho/m
Nomina Measur Head T SAR resu SAR av	al Head TSL parameters red Head TSL parameters SL temperature change durin It with Head TSL eraged over 1 cm ³ (1 g) of H	ng test	Temperature 22.0 °C (22.0 ± 0.2) °C	40.1 39.8 ± 6		1.37 mho/m
Nomina Measur Head T SAR resu SAR av	al Head TSL parameters red Head TSL parameters SL temperature change durin It with Head TSL	ng test	Temperature 22.0 °C (22.0 ± 0.2) °C <1.0 °C	40.1 39.8 ± 6		1.37 mho/m
Nomina Measur Head T SAR resu SAR av	al Head TSL parameters red Head TSL parameters SL temperature change durin It with Head TSL eraged over 1 cm ³ (1 g) of H	iead TSL	Temperature 22.0 °C (22.0 ± 0.2) °C <1.0 °C	40.1 39.8 ± 6 	3 %	1.37 mho/n 1.37 mho/m ±
Nomina Measur Head T SAR resu SAR av SAR for	al Head TSL parameters red Head TSL parameters 'SL temperature change durin It with Head TSL reraged over 1 cm^3 (1 g) of H easured	lead TSL	Temperature 22.0 °C (22.0 ± 0.2) °C <1.0 °C	40.1 39.8 ± 6 ion put power d to 1W	3 %	1.37 mho/m 1.37 mho/m ± 9.13 W/kg
Nomina Measur Head T SAR av SAR av SAR for SAR av	al Head TSL parameters red Head TSL parameters SL temperature change durin It with Head TSL reraged over 1 cm^3 (1 g) of H easured r nominal Head TSL parameter	lead TSL	Temperature 22.0 °C (22.0 ± 0.2) °C <1.0 °C	40.1 39.8 ± 6 ion put power d to 1W ion	3 %	1.37 mho/m 1.37 mho/m ± 9.13 W/kg

Certificate No: Z21-60018



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 Fax: +86-10-62304633-2504

 E-mail: cttl@chinattl.com
 http://www.chinattl.cn

Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.9Ω- 3.86jΩ	
Return Loss	- 28.3 dB	

General Antenna Parameters and Design

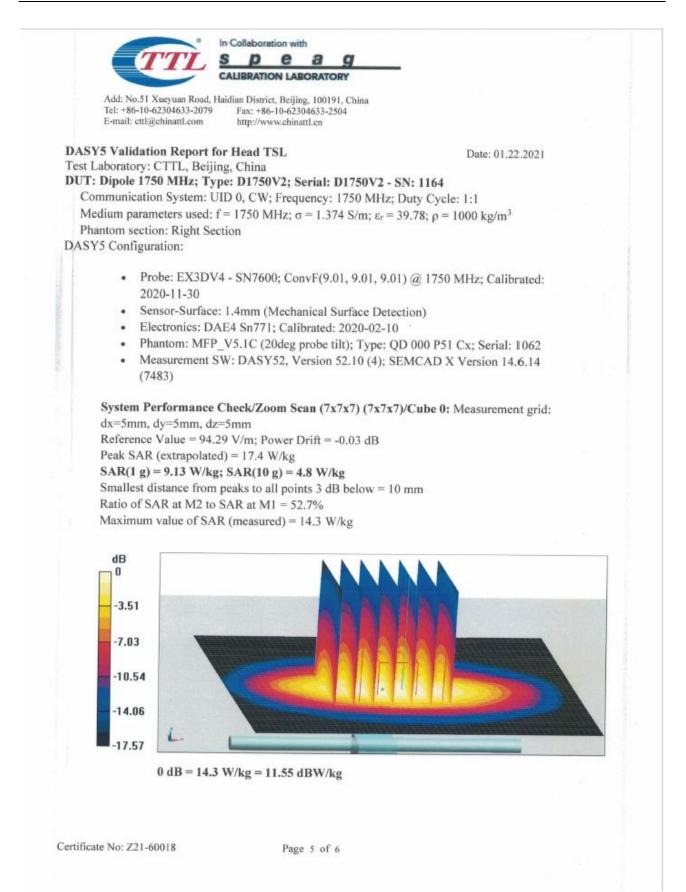
Electrical Delay (one direction)	1.124 ns	
----------------------------------	----------	--

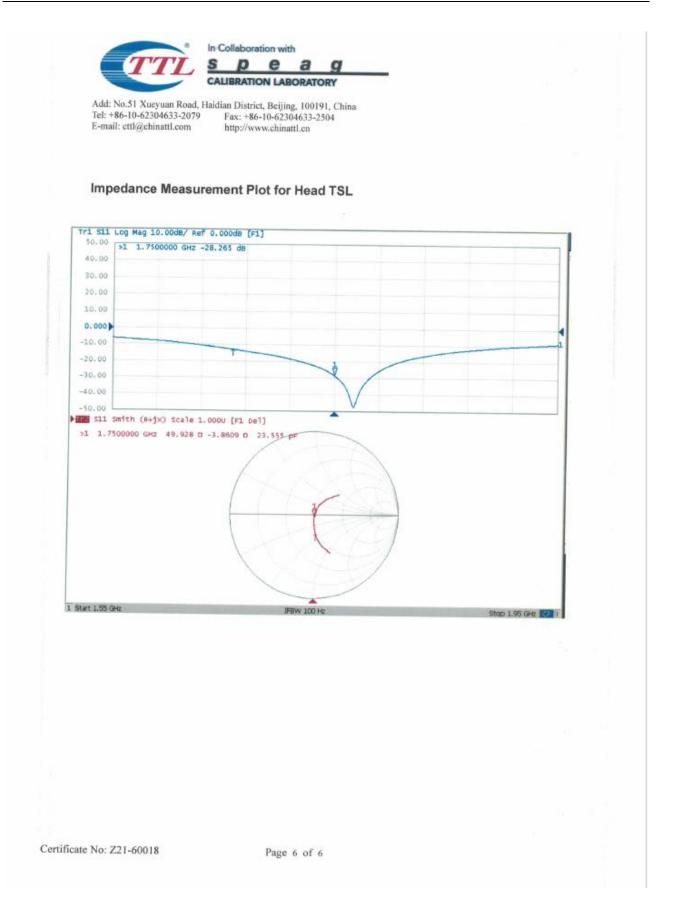
After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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	
ficate No: Z21-60018	Page 4 of 6		





Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

			Head-1750			
Date of	Poturn loop (dP)	Dolto (9/)	Real Impedance	Delta	Imaginary	Delta
measurement	Return-loss (dB)	Delta (%)	(ohm)	(ohm)	impedance (ohm)	(ohm)
2021-01-22	-28.3		49.9		-3.86	
2022-01-17	-27.9	-1.41	50.4	0.5	-3.46	0.4
2023-01-15	-28.1	-0.71	50.2	0.3	-3.66	0.2

1.4. D1900V2 Dipole Calibration Certificate

E-mail: ettl@ehinattl. Client HTW		ww.chinattl.cn	Certificate No:	Z21-6	0019	
ALIBRATION CE	RTIFICATE				0010	
bject	D1900V2	2 - SN: 5d226	121222			
alibration Procedure(s)	FF-Z11-Calibrati		s for dipole validation ki	its		
Calibration date:	January	22, 2021				
All calibrations have been humidity<70%.	conducted in t	he closed lal	boratory facility: enviro	onment te	mperature(22±3)°C and
numidity<70%. Calibration Equipment used Primary Standards		Cal Date(Cal 12-May-20 (alibrated by, Certificate CTTL, No.J20X02965)		Scheduled Cali May-2	bration
numidity<70%. Calibration Equipment used	(M&TE critical fo	Cal Date(Cal 12-May-20 (12-May-20 (30-Nov-20(C	alibrated by, Certificate	No.)	Scheduled Cali	bration 1 1
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4	(M&TE critical fo ID # 106276 101369 SN 7600	Cal Date(Ca 12-May-20 (12-May-20 (30-Nov-20(C 10-Feb-20(C	alibrated by, Certificate CTTL, No.J20X02965) CTTL, No.J20X02965) CTTL-SPEAG,No.Z20-6	No.) 60421) 60017)	Scheduled Cali May-2 May-2 Nov-2 Feb-2 Scheduled Cal	bration 1 1 1 1 1
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4	(M&TE critical fo ID # 106276 101369 SN 7600 SN 771 ID # MY49071430	Cal Date(Ca 12-May-20 (12-May-20 (30-Nov-20(C 10-Feb-20(C Cal Date(Ca 25-Feb-20 (alibrated by, Certificate CTTL, No.J20X02965) CTTL, No.J20X02965) CTTL-SPEAG,No.Z20-6 CTTL-SPEAG,No.Z20-6	No.) 60421) 60017)	Scheduled Cali May-2 May-2 Nov-2 Feb-2	bration 1 1 1 1 1 ibration
aumidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A ReferenceProbe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	(M&TE critical fo ID # 106276 101369 SN 7600 SN 771 ID # MY49071430	Cal Date(Ca 12-May-20 (12-May-20 (30-Nov-20(C 10-Feb-20(C Cal Date(Ca 25-Feb-20 (10-Feb-20 (alibrated by, Certificate CTTL, No.J20X02965) CTTL, No.J20X02965) CTTL-SPEAG,No.Z20-6 CTTL-SPEAG,No.Z20-6 alibrated by, Certificate I CTTL, No.J20X00516)	No.) 60421) 60017)	Scheduled Cali May-2 May-2 Nov-2 Feb-2 Scheduled Cal Feb-2	bration 1 1 1 1 1 ibration 1 1
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lossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna 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: Z21-60019

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Measurement Conditions

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

 DASY Version
 DASY52
 V52.10.4

 Extrapolation
 Advanced Extrapolation

 Phantom
 Triple Flat Phantom 5.1C

 Distance Dipole Center - TSL
 10 mm
 with Spacer

 Zoom Scan Resolution
 dx, dy, dz = 5 mm
 Frequency
 1900 MHz ± 1 MHz

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.1 ± 6 %	1.38 mlho/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	9.85 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	39.8 W/kg ± 18.8 % (k=2)	
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	5.05 W/kg	
SAR measured	250 mW input power		
SAR for nominal Head TSL parameters	normalized to 1W	20.3 W/kg ± 18.7 % (k=2)	



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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.5Ω+ 7.88jΩ			
Return Loss	- 21.6dB			

General Antenna Parameters and Design

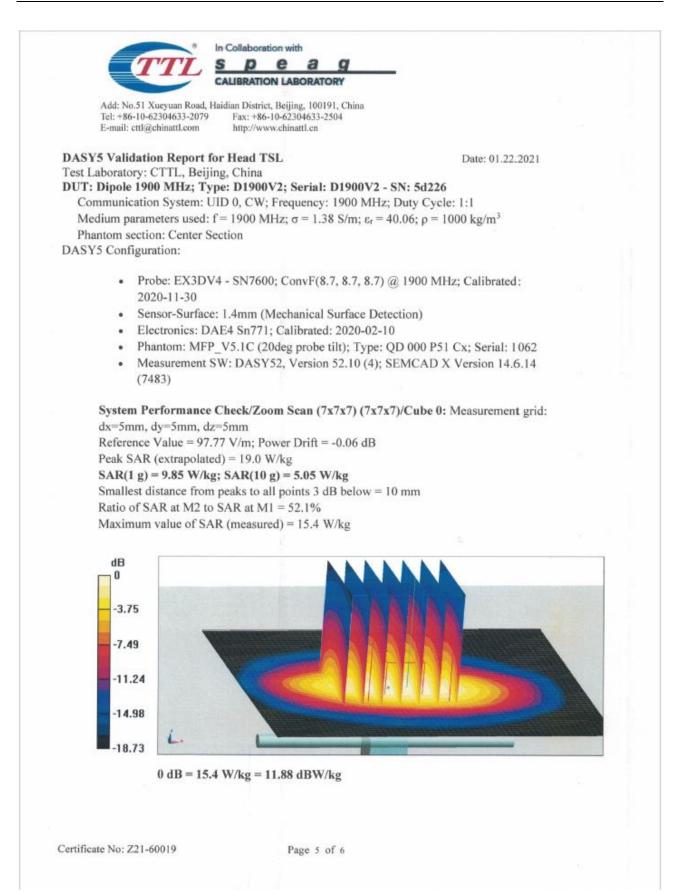
Electrical Delay (one direction)	1.102 ns
----------------------------------	----------

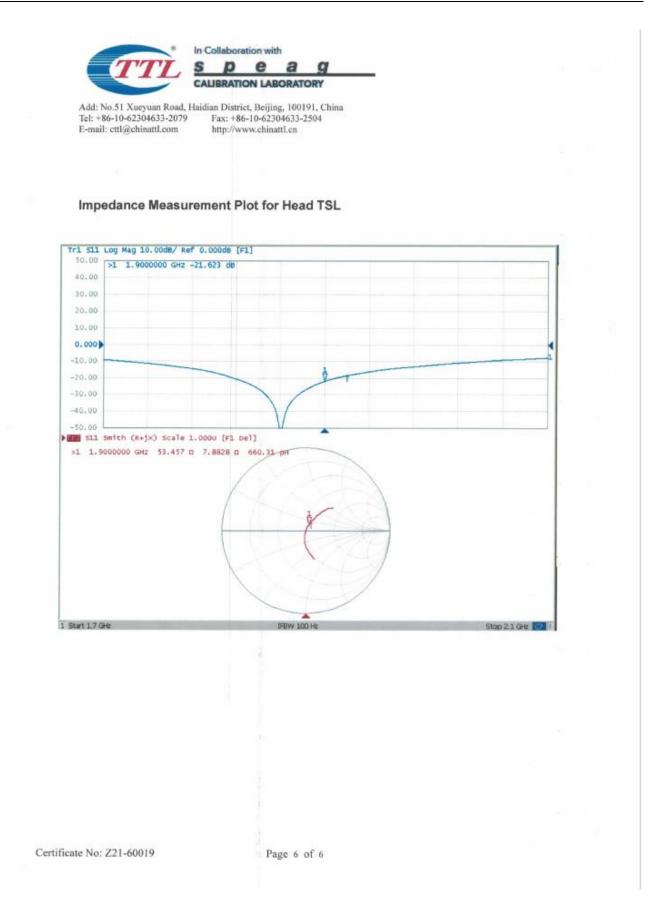
After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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	
icate No: Z21-60019	Page 4 of 6		





Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

Head-1900						
Date of	Poturn loop (dP)	eturn-loss (dB) Delta (%)		Delta	Imaginary	Delta
measurement	Return-loss (dB)	Della (%)	(ohm)	(ohm)	impedance (ohm)	(ohm)
2021-01-22	-21.6		53.5		7.88	
2022-01-17	-22.4	3.70	53.9	0.4	7.35	0.53
2023-01-15	-22.1	2.31	53.6	0.1	7.46	0.42

1.5. D2600V2 Dipole Calibration Certificate

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Client HTW			
CALIBRATION CEN	TIFICATE		
Dbject	D2600V2	- SN: 1150	
Calibration Procedure(s)	FF-Z11-0 Calibratio	003-01 on Procedures for dipole validation kits	111
Calibration date:	January	25, 2021	181 13
	conducted in tr	he closed laboratory facility: environment	temperature(2210) o di
All calibrations have been of humidity<70%. Calibration Equipment used (I		r calibration)	5
humidity<70%. Calibration Equipment used (I		r calibration) Cal Date(Calibrated by, Certificate No.)	Scheduled Calibratio
humidity<70%.	M&TE critical fo	r calibration)	5
humidity<70%. Calibration Equipment used (I Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	M&TE critical fo ID # 106276 101369 SN 7600 SN 771	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017)	Scheduled Calibratio May-21 May-21 Nov-21
humidity<70%. Calibration Equipment used (I Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	M&TE critical fo ID # 106276 101369 SN 7600	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421)	Scheduled Calibratio May-21 May-21 Nov-21 Feb-21
humidity<70%. Calibration Equipment used (I 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 7600 SN 771 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	Scheduled Calibratio May-21 May-21 Nov-21 Feb-21 Scheduled Calibratio Feb-21
humidity<70%. Calibration Equipment used (I 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 7600 SN 771 ID # MY49071430 MY46110673 Name	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	Scheduled Calibratio May-21 May-21 Nov-21 Feb-21 Scheduled Calibratio Feb-21 Feb-21
humidity<70%. Calibration Equipment used (I 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 7600 SN 771 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function	Scheduled Calibratio May-21 May-21 Nov-21 Feb-21 Scheduled Calibratio Feb-21 Feb-21
humidity<70%. Calibration Equipment used (I Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C Calibrated by:	M&TE critical fo ID # 106276 101369 SN 7600 SN 771 ID # MY49071430 MY46110673 Name Zhao Jing	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Nov-20(CTTL-SPEAG,No.Z20-60421) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function SAR Test Engineer	Scheduled Calibratio May-21 May-21 Nov-21 Feb-21 Scheduled Calibratio Feb-21 Feb-21



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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna 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%.

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Measurement Conditions

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

DASY52	V52.10.4
Advanced Extrapolation	
Triple Flat Phantom 5.1C	
10 mm	with Spacer
dx, dy, dz = 5 mm	
2600 MHz ± 1 MHz	
	Advanced Extrapolation Triple Flat Phantom 5.1C 10 mm dx, dy, dz = 5 mm

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.7 ± 6 %	1.97 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		

SAR result with Head TSL

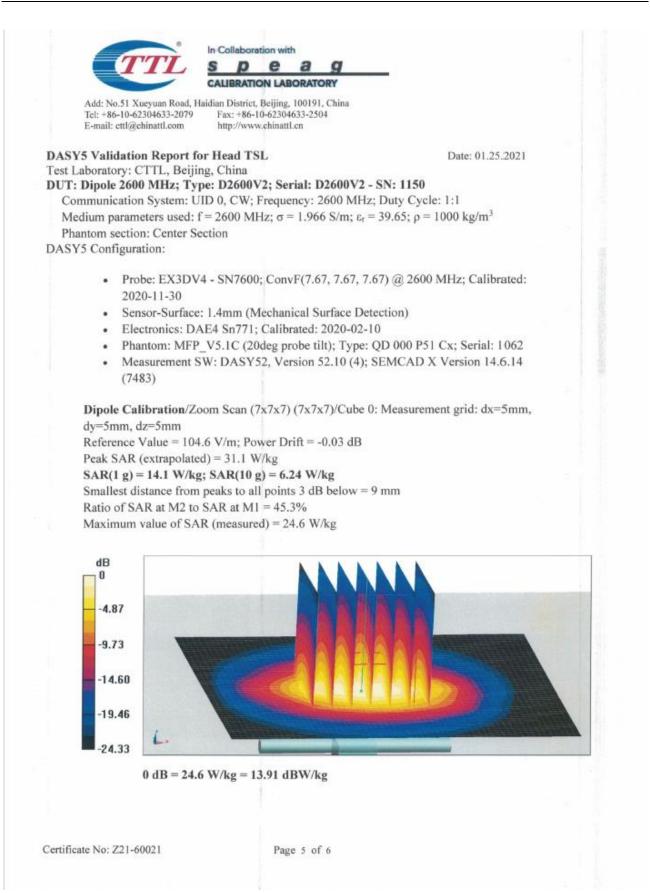
SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition		
SAR measured	250 mW input power	14.1 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	56.5 W/kg ± 18.8 % (k=2)	
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition		
SAR measured	250 mW input power	6.24 W/kg	
SAR for nominal Head TSL parameters	normalized to 1W	25.0 W/kg ± 18.7 % (k=2)	

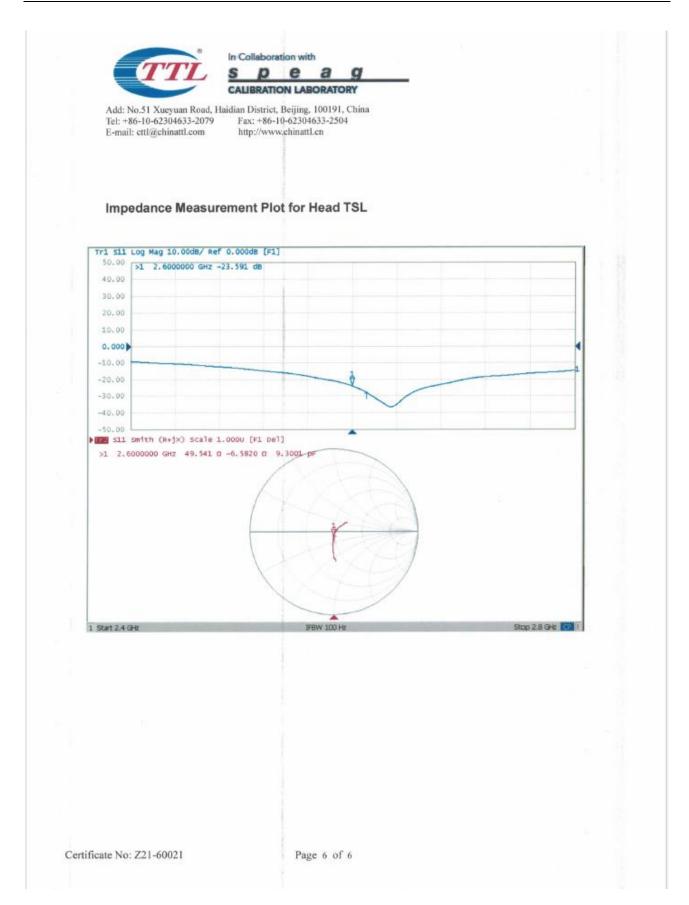
Certificate No: Z21-60021

	RATION LABORATORY	
	strict, Beijing, 100191, China +86-10-62304633-2504 //www.chinattl.cn	1
Appendix(Additional assessm	onte outeido the er	cope of CNAS L0570)
Appendix(Additional assessing	ents outside the st	ope of ondo Loorof
Antenna Parameters with Head	TSL	
Impedance, transformed to feed poin	t	49.5Ω- 6.58jΩ
Return Loss		- 23.6dB
General Antenna Parameters a	Ind Design	
Electrical Delay (one direction)		1.047 ns
be measured. The dipole is made of standard semin connected to the second arm of the di of the dipoles, small end caps are ado according to the position as explained affected by this change. The overall d No excessive force must be applied to	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	
be measured. The dipole is made of standard semini- connected to the second arm of the di- of the dipoles, small end caps are add according to the position as explained affected by this change. The overall d No excessive force must be applied to connections near the feedpoint may b	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions'' paragraph. The SAR data are ording to the Standard.
be measured. The dipole is made of standard semini connected to the second arm of the di of the dipoles, small end caps are add	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions'' paragraph. The SAR data are ording to the Standard.
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be measured. The dipole is made of standard seminiconnected to the second arm of the dipoles, small end caps are address according to the position as explained affected by this change. The overall d No excessive force must be applied to connections near the feedpoint may be Additional EUT Data	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions" paragraph. The SAR data are ording to the Standard. huse they might bend or the soldered
be measured. The dipole is made of standard seminiconnected to the second arm of the dipoles, small end caps are address according to the position as explained affected by this change. The overall d No excessive force must be applied to connections near the feedpoint may be	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions" paragraph. The SAR data are ording to the Standard. huse they might bend or the soldered
be measured. The dipole is made of standard seminiconnected to the second arm of the dipoles, small end caps are address according to the position as explained affected by this change. The overall d No excessive force must be applied to connections near the feedpoint may be	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions" paragraph. The SAR data are ording to the Standard. huse they might bend or the soldered
be measured. The dipole is made of standard seminiconnected to the second arm of the dipoles, small end caps are address according to the position as explained affected by this change. The overall d No excessive force must be applied to connections near the feedpoint may be	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions" paragraph. The SAR data are ording to the Standard. huse they might bend or the soldered
be measured. The dipole is made of standard seminiconnected to the second arm of the dipoles, small end caps are address according to the position as explained affected by this change. The overall d No excessive force must be applied to connections near the feedpoint may be	igid coaxial cable. The ipole, The antenna is the ded to the dipole arms d in the "Measurement dipole length is still accord to the dipole arms, beca	center conductor of the feeding line is dire herefore short-circuited for DC-signals. On in order to improve matching when loaded Conditions" paragraph. The SAR data are ording to the Standard. huse they might bend or the soldered

Certificate No: Z21-60021

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Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

	Head-2600						
Date of	Poturo logo (dP)	Return-loss (dB) Delta (%)		Delta	Imaginary	Delta	
measurement	Return-loss (dB)	Della (%)	(ohm)	(ohm)	impedance (ohm)	(ohm)	
2022-01-25	-23.6		49.5		-6.58		
2022-01-17	-24.0	1.69	49.1	0.4	-6.03	0.55	
2023-01-15	-23.8	0.85	49.3	0.2	-6.33	0.25	