Report No.: R2309A0988-S1

ANNEX D: Probe Calibration Certificate (SN: 3883)

= 1/01	http://www.caict.ac.cn	Certificate No: Z23	-60185
Client TA(Shar	Sector and sectors	Gertificate No. 223	
CALIBRATION CEN			
Object	EX3DV4 - S	N : 3883	
Calibration Procedure(s)	FF-Z11-004	-02	
	Calibration F	Procedures for Dosimetric E-field Probes	
Calibration date:	April 10, 202	23	
numidity<70%.		closed laboratory facility: environment temp libration)	erature(22±3)℃ and
humidity<70%. Calibration Equipment used (M		libration)	erature(22±3)°C and
humidity<70%. Calibration Equipment used (M	&TE critical for ca	libration)	
humidity<70%. Calibration Equipment used (M Primary Standards	&TE critical for ca	libration) Cal Date(Calibrated by, Certificate No.) Sc	heduled Calibration
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2	&TE critical for ca ID # 101919	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181)	heduled Calibration Jun-23
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91	&TE critical for ca ID # 101919 101547	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181)	heduled Calibration Jun-23 Jun-23
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91	&TE critical for ca ID # 101919 101547 101548	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181)	heduled Calibration Jun-23 Jun-23 Jun-23
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212)	heduled Calibration Jun-23 Jun-23 Jun-23 Jun-25
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23
Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846	libration) <u>Cal Date(Calibrated by, Certificate No.)</u> <u>Sc</u> 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846 SN 1555	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22) 25-Aug-22(SPEAG, No.DAE4-1555_Aug22) 24-Jan-23(SPEAG, No.DAE4-549_Jan23)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23 Aug-23
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 DAE4	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846 SN 1555 SN 549 ID # 6201052605	libration) Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22) 25-Aug-22(SPEAG, No.DAE4-1555_Aug22) 24-Jan-23(SPEAG, No.DAE4-549_Jan23)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23 Aug-23 Jan-24
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 DAE4 Secondary Standards	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846 SN 1555 SN 549 ID #	Ibbration) Sc Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22) 25-Aug-22(SPEAG, No.DAE4-1555_Aug22) 24-Jan-23(SPEAG, No.DAE4-549_Jan23) Cal Date(Calibrated by, Certificate No.)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23 Aug-23 Jan-24 eduled Calibration
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846 SN 1555 SN 549 ID # 6201052605	Ibbration) Sc Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22) 25-Aug-22(SPEAG, No.DAE4-1555_Aug22) 24-Jan-23(SPEAG, No.DAE4-549_Jan23) Cal Date(Calibrated by, Certificate No.) Sch 14-Jun-22(CTTL, No.J22X04182) 10-Jan-23(CTTL, No.J23X00104)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23 Aug-23 Jan-24 eduled Calibration Jun-23
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846 SN 1555 SN 549 ID # 6201052605 MY46110673	Ibbration) Sc Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22) 25-Aug-22(SPEAG, No.DAE4-1555_Aug22) 24-Jan-23(SPEAG, No.DAE4-549_Jan23) Cal Date(Calibrated by, Certificate No.) Sch 14-Jun-22(CTTL, No.J22X04182) 10-Jan-23(CTTL, No.J23X00104)	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23 Aug-23 Jan-24 eduled Calibration Jun-23 Jan-24
humidity<70%. Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C Na Calibrated by: Yu	&TE critical for ca ID # 101919 101547 101548 18N50W-10dB 18N50W-20dB SN 3846 SN 1555 SN 549 ID # 6201052605 MY46110673 me	Cal Date(Calibrated by, Certificate No.) Sc 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 14-Jun-22(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J22X04181) 19-Jan-23(CTTL, No.J23X00212) 19-Jan-23(CTTL, No.J23X00211) 20-May-22(SPEAG, No.EX3-3846_May22) 25-Aug-22(SPEAG, No.DAE4-1555_Aug22) 24-Jan-23(SPEAG, No.DAE4-549_Jan23) Cal Date(Calibrated by, Certificate No.) Sch 14-Jun-22(CTTL, No.J22X04182) 10-Jan-23(CTTL, No.J23X00104) Function S	heduled Calibration Jun-23 Jun-23 Jun-23 Jan-25 Jan-25 May-23 Aug-23 Jan-24 eduled Calibration Jun-23 Jan-24

Certificate No: Z23-60185

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SAR Test Report

Report No.: R2309A0988-S1 CALIBRATION LABORATORY



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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ =0 is normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system Calibration is Performed According to the Following Standards:

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

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

- Methods Applied and Interpretation of Parameters:
- NORMx,y,z: Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z* frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- Ax, y, z; Bx, y, z; Cx, y, z; VRx, y, z: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3883

Basic Calibration Parameters

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	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(µV/(V/m)2)^	0.39	0.23	0.40	±10.0%
DCP(mV) ^B	100.1	97.7	99.3	- H

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	C	D dB	VR mV	Unc ^E (<i>k</i> =2)
0	CW	X	0.0	0.0	1.0	0.00	153.1	±2.6%
	10.2	Y	0.0	0.0	1.0	19.7	104.6	
	1	Z	0.0	0.0	1.0		153.3	

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%.

^A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4).

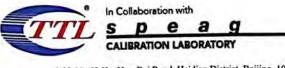
^B Numerical linearization parameter: uncertainty not required.

E Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3883

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz] ^c	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	9.70	9.70	9.70	0.20	1.12	±12.7%
835	41.5	0.90	9.35	9.35	9.35	0.12	1.41	±12.7%
1750	40.1	1.37	8.10	8.10	8.10	0.22	1.15	±12.7%
1900	40.0	1.40	7.85	7.85	7.85	0.22	1.15	±12.7%
2100	39.8	1.49	7.92	7.92	7.92	0.24	1.09	±12.7%
2300	39.5	1.67	7.71	7.71	7.71	0.53	0.70	±12.7%
2450	39.2	1.80	7.46	7.46	7.46	0.54	0.70	±12.7%
2600	39.0	1.96	7.19	7.19	7.19	0.42	0.81	±12.7%
3300	38.2	2.71	6.94	6.94	6.94	0.30	0.98	±13.9%
3500	37.9	2.91	6.74	6.74	6.74	0.27	1.06	±13.9%
3700	37.7	3.12	6.58	6.58	6.58	0.26	1.16	±13.9%
3900	37.5	3.32	6.45	6.45	6.45	0.30	1.45	±13.9%
4100	37.2	3.53	6.34	6.34	6.34	0.30	1.40	±13.9%
4400	36.9	3.84	6.15	6.15	6.15	0.30	1.48	±13.9%
4600	36.7	4.04	6.06	6.06	6.06	0.30	1.55	±13.9%
4800	36.4	4.25	6.02	6.02	6.02	0.40	1.38	±13.9%
4950	36.3	4.40	5.80	5.80	5.80	0.40	1.38	±13.9%
5250	35.9	4.71	5.19	5.19	5.19	0.45	1.40	±13.9%
5600	35.5	5.07	4.60	4.60	4.60	0.45	1.40	±13.9%
5750	35.4	5.22	4.71	4.71	4.71	0.45	1.40	±13.9%

^c Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequency up to 6 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

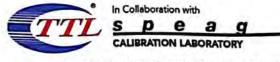
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than \pm 1% for frequencies below 3 GHz and below \pm 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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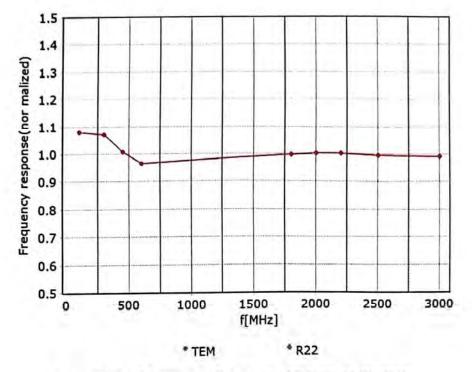






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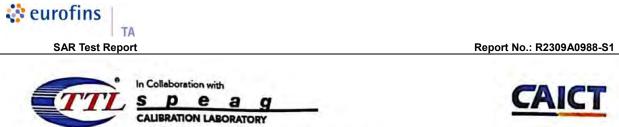
Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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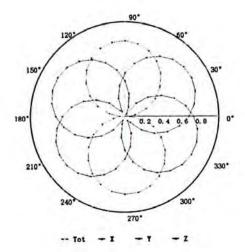
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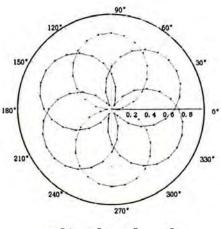
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Receiving Pattern (Φ), θ=0°

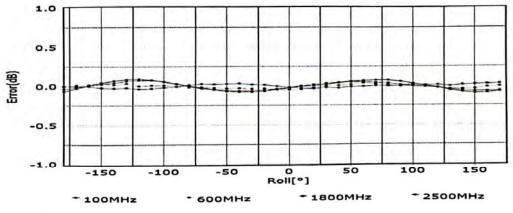
f=600 MHz, TEM

f=1800 MHz, R22





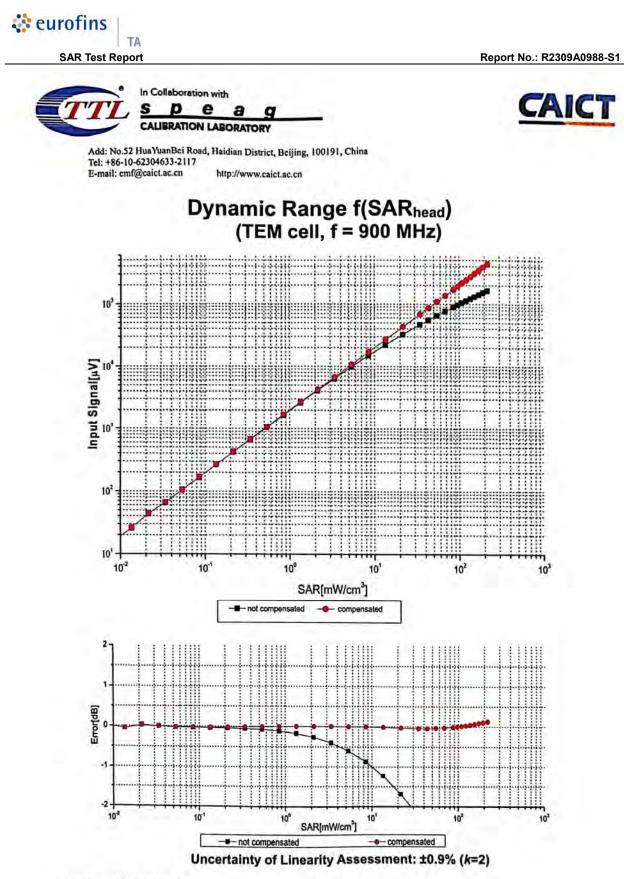




Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

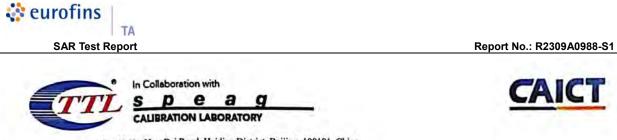
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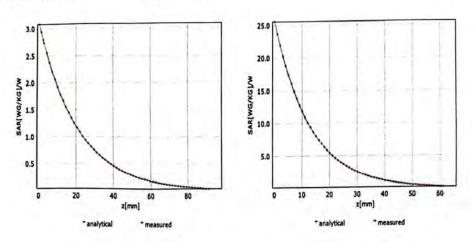


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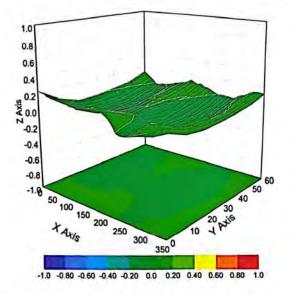
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)



Deviation from Isotropy in Liquid

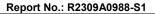


Uncertainty of Spherical Isotropy Assessment: ±3.2% (k=2)

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3883

Sensor Arrangement	Triangular
Connector Angle (°)	132.3
Mechanical 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

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Report No.: R2309A0988-S1

ANNEX E: Probe Calibration Certificate (SN: 3677)

nginee	tion Laboratory & Partner ering AG strasse 43, 8004 Zuric			Schweizerischer Kallbrierdien Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service
e Swis		itation Service (SAS) lice is one of the signator a recognition of calibratio	les to the EA	reditation No.: SCS 0108
ent	TA Shanghai City		Certificate No.	(-3677_Jul23
CAL	IBRATION CE	ERTIFICATE		
Object		EX3DV4 - SN:36	77	
Calibra	tion procedure(s)	QA CAL-25.v8	QA CAL-12.v10, QA CAL-14.v7, 0 edure for dosimetric E-field probes	
Calibra	tion date	July 20, 2023		
All calit	brations have been co	nducted in the closed labora	e probability are given on the following pages utory facility: environment temperature (22±3)	
All calit Calibra	brations have been con ation Equipment used (nducted in the closed labora M&TE critical for calibration	atory facility: environment temperature (22 ± 3))℃ and humidity < 70%.
All calit Calibra Primary	brations have been con ation Equipment used (y Standards	nducted in the closed labora M&TE critical for calibration	tory facility: environment temperature (22±3)) Cal Date (Certificate No.)	
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All calibra Calibra Primary Power r	brations have been con tition Equipment used (y Standards meter NRP2	M&TE critical for calibration	Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 20-Oct-22 (OCP-DAK3.5-1249_Oct22)	PC and humidity < 70%. Scheduled Calibration Mar-24 Mar-24 Oct-23
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Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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Schweizerischer Kalibrierdienst

Service suisse d'étalonnage

С 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

Glossary

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
CONVE	sensitivity in TSL / NORMx,y,z
DCP	diade compression point
OF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization w	protation around probe axis
Polarization #	O rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., 0 = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

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"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization θ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz; R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E2-field uncertainty inside TSL (see below ConvF).
- NORM(I)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvE
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal, DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z; A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum callbration range expressed in RMS voltage across the diode.
- · ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for t > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ±50 MHz to ±100 MHz.
- Spherical Isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- · Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis) No tolerance required.
- · Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required)

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EX3DV4 - SN:3677

Parameters of Probe: EX3DV4 - SN:3677

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc $(k = 2)$
Norm (µV/(V/m) ²) A	0.40	0.45	0.39	±10.1%
DCP (mV) B	101.0	102.0	102.5	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dBõV	C	D dB	WR mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	125.6	±1.9%	±4.7%
		Y	0.00	0.00	1.00		121.0		
		Z	0.00	0.00	1.00	The second	122.5		
10352	Pulse Waveform (200Hz, 10%)	X	20.00	89.56	19.55	10.00	60.0	±2.7%	±9.6%
		Y	20.00	88.90	19.41	100000	60.0	1	
		Z	20.00	87.18	18.16		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	91.43	19.38	6.99	80.0	±1.5%	±9.6%
1000	and the second second second	Y	20.00	89.58	18.35	1.1.1.1	80.0	11.5	1.10
	the second se	Z	20.00	88.39	17.59		80.0	1	
10354	Pulse Waveform (200Hz, 40%)	X	20.00	95.46	19.97	3.98	95.0	±1.3%	±9.6%
	and a second second second second	Y	20.00	89.26	16.58		95.0		
		Z	20.00	91.18	17.61		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	20.00	99.05	20.33	2.22	120.0	±1.2%	±9.6%
	And the second second second second	Y	20.00	83.90	12.80		120.0	1	1.00
		Z	20.00	93.78	17.60		120.0	1	1.1.1
10387	QPSK Waveform, 1 MHz	X	1.51	66.00	14.40	1.00	150.0	±3.5%	±9.6%
	an en grege anna river	Y	1.29	64.03	13.00	1.11	150.0	1	
	and the second sec	Z	1.42	66.25	14.23		150.0		
10388	OPSK Waveform, 10 MHz	X	2.03	67.08	15.21	0.00	150.0	±1.0%	±9.6%
	and another to the fi	Y	1.77	65.25	14.04		150.0		
	and a standard strength of the standard strength of the streng	Z	1.91	66.70	15.02	1	150.0	1	1
10396	64-QAM Waveform, 100 kHz	X	2.64	69.26	18.29	3.01	150.0	±1.1%	±9.6%
	and a state of the second	Y	2.33	66.49	16.64		150.0	1	1200
		Z	2.02	65.39	16.32		150.0	1	
10399	64-QAM Waveform, 40 MHz	X	3.37	66.69	15.51	0.00	150.0	±2.6%	±9.6%
10000	and a contract of the state of the	Y	3.33	66.54	15.28		150.0	1000	
	and the second s	Z	3.28	66.50	15.39	1	150.0	1	
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.70	65.49	15.43	0.00	150.0	±4.5%	±9.6%
	to according to react	Y	4.69	65.54	15.36	10000	150.0		1
		Z	4.55	65.38	15.33		150.0	1	

Note: For details on UID parameters see Appendix

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%,

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6). ^B Linearization parameter uncertainty for maximum specified field strength.

E Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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Parameters of Probe: EX3DV4 - SN:3677

Sensor Model Parameters

	C1 fF	C2 fF	α V ⁻¹	T1 msV ⁻²	T2 msV ⁻¹	T3 ms	T4 V ⁻²	T5 V ⁻¹	Т6
x	36.2	270.59	35.62	12.53	0.00	5.08	0.93	0,23	1.01
y	35.7	269.30	35.97	8.51	0.37	5.07	0.00	0.44	1.01
z	30.7	227.00	34.93	10.81	0.00	5.06	0.00	0.25	1.00

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-66.7°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

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EX3DV4 - SN:3677

Parameters of Probe: EX3DV4 - SN:3677

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
13	55.0	0.75	15.21	15.21	15.21	0.00	1.25	±13.3%
750	41.9	0.89	9.03	9.80	9.03	0.45	1.27	±12.0%
835	41.5	0.90	8.66	9.52	8.51	0.43	1.27	±12.0%
1750	40.1	1.37	7.80	8.35	7.88	0.29	1,27	±12.0%
1900	40.0	1.40	7.70	8.25	7.79	0.31	1.27	±12.0%
2000	40.0	1.40	7.55	8.11	7.69	0.32	1.27	±12.0%
2300	39.5	1.67	7.45	8.00	7.60	0.33	1.27	±12.0%
2450	39.2	1.80	7.18	7.67	7.29	0.32	1.27	±12.0%
2600	39.0	1,96	7.10	7.59	7.21	0.32	1.27	±12.0%
3300	38.2	2.71	6.95	7.41	7.04	0.35	1,27	±14.0%
3500	37.9	2.91	6.87	7.33	6.99	0.34	1.27	±14.0%
3700	37.7	3.12	6.80	7.27	6.93	0.33	1.27	±14.0%
3900	37.5	3.32	6.85	7.30	6.98	0.33	1.27	±14.0%
4100	37.2	3.53	6.65	7.07	6.82	0.34	1.27	±14.0%
4400	36.9	3.84	6.55	6.97	6.67	0.34	1.27	±14.0%
4600	36.7	4.04	6,50	6.92	6.63	0.35	1.27	±14.0%
4800	36.4	4.25	6.40	6.81	6.55	0.39	1.27	±14.0%
4950	36.3	4.40	6.00	6.39	6.14	0.44	1.36	±14.0%
5250	35.9	4.71	5.65	5.99	5.81	0.43	1.53	±14.0%
5600	35.5	5.07	4.92	5.23	5.04	0.41	1.75	±14.0%
5750	35.4	5.22	5,14	5.41	5,20	0.39	1.84	±14.0%

© Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity be ow 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.
F The probes are calibrated using tissue simulating liquids (TSL) that deviate for *c* and *c* by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7 – 3 GHz and 13.1% for 3 + 6 GHz.

G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3-B GHz at any distance larger than half the probe tip diameter from the boundary.

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Parameters of Probe: EX3DV4 - SN:3677

Calibration Parameter Determined in Head Tissue Simulating Media

1 (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
6500	34.5	6.07	5.51	5.85	5.61	0.20	2.00	±18.6%

^C Frequency validity at 6.5 GHz is -600/+700 MHz, and ± 700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for c and σ by less than $\pm 10\%$ from the target values (typically better than $\pm 5\%$) and are valid for TSL with deviations of up to $\pm 10\%$.

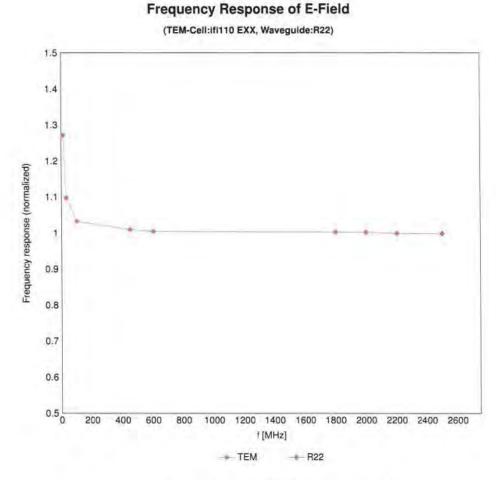
G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3-6 GHz; and below ±4% for frequencies between 6-10 GHz at any distance larger than half the probe tip diameter from the boundary.

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Uncertainty of Frequency Response of E-field: ±6.3% (k=2)

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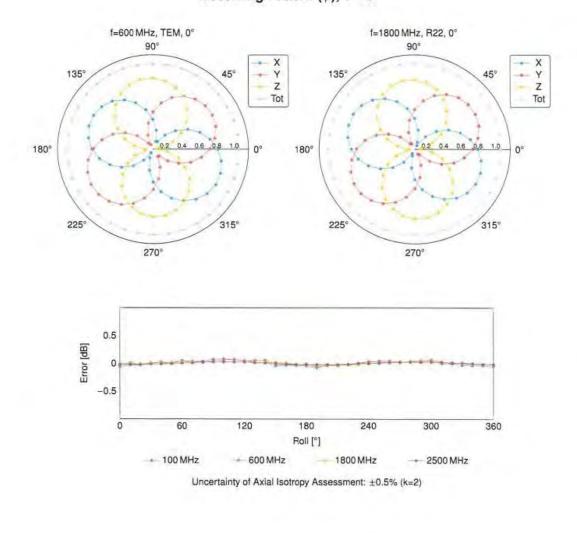
TA

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EX3DV4 - SN:3677

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Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$

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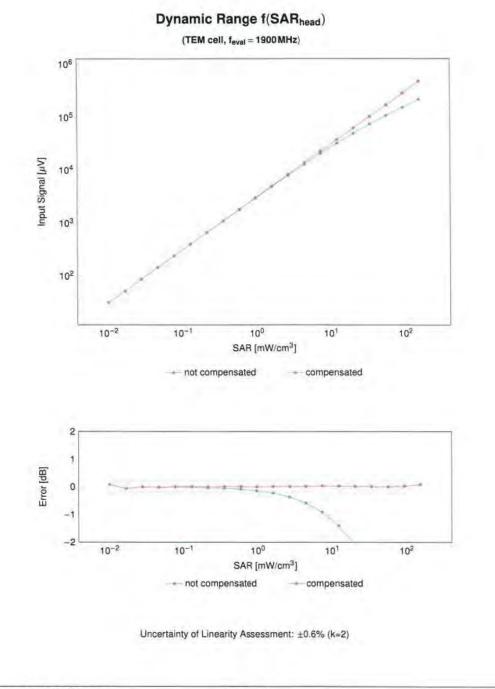
TA

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EX3DV4 - SN:3677

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Report No.: R2309A0988-S1



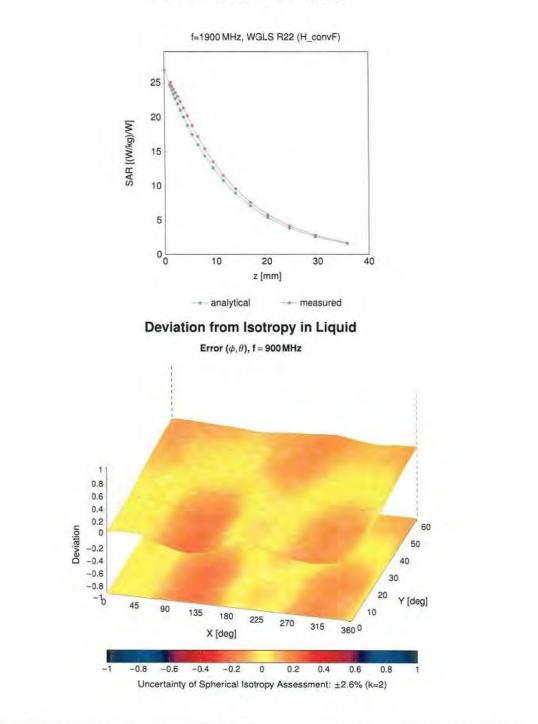
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EX3DV4 - SN:3677

Conversion Factor Assessment



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Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k = 2
0	1.000	CW	CW	0,00	±4.7
0010	CAB	SAR Validation (Square, 100 ms, 10 ms)	Test	10.00	±9.6
0011	CAC	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
0012	CAB	IEEE 802.11b WIFI 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±9.6
0013	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	±9.6
0021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	±9.6
0023	DAG	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	±9.6
0024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	±9.6
0025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	±9.6
0026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	±9.6
0027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	±9.6
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	±9.6
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	±9.6
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	±9.6
10031	CAA	IEEE 802.15.1 Bluetopth (GFSK, DH3)	Bluetooth	1.87	±9.6
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	±9.6
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	±9,6
10034	CAA	IEEE 802.15.1 Bluetooth (Pl/4-DQPSK, DH3)	Bluetooth	4.53	±9.6
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	±9.6
1	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	8.01	±9.6
10036	-		Bluetooth	4.77	±9.6
10037	CAA	IEEE 802.15.1 Bluetouth (8-DPSK, DH3)	Bluetooth	4.10	±9.6
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)			
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7,78	±9.6
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	±9.6
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	±9.6
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.6
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	±9.6
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	±9.6
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	±9.6
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2,83	±9.6
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.50	±9.6
10062	CAD	IEEE 802-11a/h WIFI 5 GHz (OFDM, 6 Mbps)	WLAN	B.68	±9.6
10063	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	B-63	±9.6
10064	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	±9.6
10065	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	±9.6
10066	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	±9.6
10067	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.6
10068	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	±9.6
10069	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	±9.6
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	±9.6
10072		IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	±9.6
10073	-	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	±9.6
10074		IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	±9.6
10075	- management	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	±9.6
10076	-	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	±9.6
10076		IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	±9.6
10077	-	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	±9.6
	_	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DOPSK, Fullrate)	AMPS	4.77	19.6
10082	-		GSM	6.56	±9.6
10090	and the second second	GPRS-FDD (TDMA, GMSK, TN 0-4)			
10097	- Andrewson and the second		WCDMA	3.98	±9.6
10098		UMTS-FDD (HSUPA, Sublest 2)	WCDMA	3.98	±9.6
10099	the second s		GSM	9.55	±9.6
		LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	±9,6
10101	and the second second	and the second se	LTE-FOD	6.42	±9.6
10102	-		LTE-FDD	6.60	±9.6
10103			LTE-TOD	9,29	±9.6
10104			LTE-TDD	9.97	±9.6
10105	CAH	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	±9.6
10108	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-FDD	5.80	±9.6
10109	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9,6
10110	_	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	±9.6
10111	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16 QAM)	LTE-FDD	6.44	±9.8

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UID	Rev.	Communication System Name	Group	PAR (dB)	Unc ^E k =
0112	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FOD	6.59	±9.8
0113	CAH	LTE-FDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-FDD	6,62	±9.6
0114	CAD	IEEE 802.11n (HT Greenfield, 13.5 Mops. BPSK)	WLAN	8,10	±9.6
0115	CAD	IEEE 802.11n (HT Greenfield, 81 Mpps, 16-QAM)	WLAN	8,46	±9.6
0116	CAD	IEEE 802.11n (HT Greenfield, 135 Mops, 64-QAM)	WLAN	8,15	±9,6
0117	CAD	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±9.6
0118	CAD	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8,59	19.6
0119	CAD	IEEE 802.11rr (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	±9.6
0140	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 18-QAM)	LTE-FDD	6.49	±9.6
0141	CAF	LTE-FDD (SC-FDMA, 100% RB, 15MHz, 54-QAM)	LTE-FDD	6.53	±9.6
0142	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
0143	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-DAM)	LTE-FDD	6.35	19.6
0144	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	±9.6
0145	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	19.6
0146	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 18-QAM)	LTE-FDD	6.41	±9.6
0147	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 10-QAM)	LTE-FDD	6.72	±9.6
			and the second se	6.42	
0149	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	the second se	±9.6
0150	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 54-QAM)	LTE-FDD	6.60	±9.6
0151	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.28	±9.6
0152	GAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.82	±9.6
0153	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	±9.6
0154	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5,75	±9.6
0155	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6,43	±9,6
0156	CAH	LTE-FDD (SC-FDMA, 50% RB, 5MHz, QPSK)	LTE-FDD	5.79	±9.6
0157	CAH	LTE-FDD (SC-FDMA, 50% RB, 5MHz, 16-QAM)	LTE-FDD	6.49	±9.6
0158	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10159	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-GAM)	LTE-FDD	6.56	±9,6
10160	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	±9.6
10151	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-DAM)	LTE-FDD	6.43	±9.6
10162	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	±9.6
10166	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	±9.6
10167	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	±9.6
10168	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	±9.6
10169	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	±9.6
10170	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10171	AAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	±9.6
10172	Sector Sector	LTE-TDD (SC-FDMA, 1 RB. 20 MHz, QPSK)	LTE-TDD	9.21	±9.6
10173	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TOD	9.48	±9.6
10174	and a stand from	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TOD	10.25	±9.6
10175		LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	19.6
10176	and the second second	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	±9.8
10177		LTE-FOD (SC-FDMA, 1 RB, 5MHz, QPSK)	LTE-FDD	5.73	19.6
10178	-	LTE-FDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10179	and the second second	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 54-QAM)	LTE-FDD	6.50	19.6
of the state of the	and the second second		and the second se		
10180	10000	LTE-FDD (SC-FDMA, 1 RB, 5MHz, 64-QAM)	LTE-FDD	6.50	19.6
10181	-	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, OPSK)	LTE-FDD	5,72	19.6
10182	- International	LTE-FDD (SC-FDMA, 1 RB, 15MHz, 16-OAM)	LTE-FDD	6.52	±9.6
10183	100000	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10184		LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10185	and the state of the second	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	±9.6
10186		LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10187	and include and	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	±9.6
10188		LTE-FDD (SC-FDMA, 1 RB. 1.4 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10189		LTE-FDD (SC-FDMA, 1 RB. 1.4 MHz, 64-QAM)	LTE-FDD	6.50	±9.8
10193	-		WLAN	8.09	±9.6
10194	-	the hardware and an an and an an an and an and an and an and an and an and and	WLAN	8.12	±9.6
10195			WLAN	8.21	±9.6
10196	CAD	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	±9.6
10197	CAD	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.6
10198	CAD	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	±9.6
10219	_	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	±9.6
10220	-	IEEE 802.11n (HT Mixed, 43.3 Mbps, 15-QAM)	WLAN	8.13	±9.6
10221	-	IEEE 802 11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±9.6
10222			WLAN	8.06	±9.6
10223	-		WLAN	8.48	±9.6
	CAD		WLAN	8.08	±9.6

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UID	Rev	Communication System Name	Group	PAR (dB)	UncE k =:
0225	CAC	UMTS-FDD (HSPA+)	WCOMA	5.97	±9,6
0228	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TOD	9.49	±9.6
0227	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 84-QAM)	LTE-TOD	10.26	±9.6
0228	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	±9.6
0229	CAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 16-QAM)	LTE-TOD	9.48	±9.6
0230	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
0231	CAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, QPSK)	LTE-TDD	9.19	±9.6
0232	CAH	LTE-TDD (SC-FDMA, 1 AB, 5 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10233	CAH	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TOD	10.25	±9.6
10234	CAH	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TOD	9.21	±9.6
10235	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 18-QAM)	LTE-TOD	9.48	19.6
10236	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 13-GAM)	LTE-TDD	10.25	19.6
10230	CAH	LTE-TOD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	19.6
	CAG		and the second second	9.48	-
10238	-	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD		19.6
10239	CAG	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 84-QAM)	LTE-TOD	10:25	19.6
10240	CAG	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TOD	9.21	19.6
10241	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 18-QAM)	LTE-TDD	9.82	±9.8
10242	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9,86	19.6
10243	CAG	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	±9.5
10244	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	±9.6
10245	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TOD	10.06	±9.6
10246	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TOD	9.30	±9,6
10247	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	±9.6
10248	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	±9.6
10249	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	±9.6
10250	CAH	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	±9.6
10251	CAH	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	±9.6
10252	CAH	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	±9.8
10253	CAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TOD	9.90	±9.6
10254	CAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	±9.6
10255	CAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TOD	9.20	±9.6
10256	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TOD	9.96	±9.6
10257	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TOD	10.08	=9.6
10258	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	=9.8
10259	CAE	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 16-QAM)	LTE-TDD	89.9	_9.6
10260	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9,97	±9.8
10261	CAE	LTE-TOD (SC-FDMA, 100% RB, 3MHz, QPSK)	LTE-TDD	9.24	29.6
10262			LTE-TDD	9.83	±9.6
10262	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-TDD	10.16	±9.6
10264		LTE-TDD (SC-FDMA, 100% HB, 5 MHz, 0PSK)	LTE-TDD	9.23	±9.0 ±9.6
10265			LTE-TOD	9.92	±9.6
		LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-OAM)			
10266	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TOO	10.07	29.6
10267	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TOD	9.30	±9.6
10268	-		LTE-TDD	10.06	±9.6
10269	CAG	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	±9.6
10270			LTE-TOC	9.58	±9.6
10274		UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	<u></u>
10275			WCDMA	3.96	±9.6
10277	-		PHB	11.81	±9.6
10278		PHS (QPSK, BW 864 MHz, Rollott 0.5)	PHS	11.81	±9.6
10279	CAA	PHS (QPSK, BW 884 MHz, Rolloff 0.38)	PHS	12:18	±9.6
10290			CDMA2000	3.91	±9.6
10291	AAB	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	±9.6
10292	AAB	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	±9.6
10293	AAB	CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	±9.6
10295	AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 /r	CDMA2000	12.49	±9.6
10297	AAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	±9.6
10298		LTE-FDD (SC-FDMA, 50% RB, 3MHz, QPSK)	LTE-FDD	5.72	±9.6
10299	-		LTE-FDD	6.39	:9.6
10300			LTE-FDD	6.60	=9.6
10301			WIMAX.	12.03	±9.6
10302	the second s		WIMAX	12.57	±9.6
10303	the second second		WIMAX		
10303	and the second second		and the state of t	12,52	±9.6
-	the second second		WIMAX	11,86	19.6
10305	AAA	IEEE 802.16e WIMAX (31:15, 10 ms, 10 MHz, 64QAM, PUSC, 15 symbols) IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC, 18 symbols)	WIMAX	15.24	±9.6 ±9.6

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0307	AAA	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, PUSC, 18 symbols)	WIMAX.	14.49	±9.6
0308	AAA	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 16QAM, PUSC)	WIMAX	14.46	±9.6
0309	AAA	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 16QAM, AMC 2x3, 18 symbols)	WIMAX	14.58	±9.6
0310	AAA	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x3, 18 symbols)	WIMAX	14.57	±9.6
0311	AAE	LTE-FDD (SC-FDMA, 100% RB, 15MHz, QPSK)	LTE-FDD	6.06	±9.6
0313	AAA	IDEN 1:3	IDEN	10.51	±9.6
0314	AAA	IDEN 1:6	IDEN	13,48	±9.6
0315	AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	WLAN	1.71	19.6
0316	AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	±9.6
0317	AAD	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	±9.6
0352	AAA	Pulse Waveform (200Hz, 10%)	Generic	10.00	±9.6
0353	AAA	Pulse Waveform (200Hz, 20%)	Generic	6.99	19.6
0354	AAA	Pulse Waveform (200Hz, 20%)	Generic	3.98	-
0355	AAA	Pulse Waveform (200Hz, 60%)	Generic	2.22	±9.6
0356	AAA	Pulse Waveform (200Hz; 80%)			±9.6
0387	AAA	QPSK Waveform, 1 MHz	Generic	0.97	±9.6
	and the second se		Generic	5.10	±9.6
0388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±9.6
0396	AAA	64-QAM Waveform, 100 kHz	Genéric	6.27	±9.6
0399	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	±9.6
0400	AAE	IEEE 802.11ac WiFi (20 MHz, 64-QAM, 99pc duty cycle)	WLAN	8.37	±9.6
0401	AAE	IEEE 802.11ac WiFi (40 MHz, 64-QAM, 99pc duty cycle)	WLAN	8.60	±9.6
0402	AAE	IEEE 802.11ac WIFI (80 MHz, 64-QAM, 99pc duty cycle)	WLAN	8.53	±9,6
0403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.76	±9.6
0.404	AAB	CDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.77	≡9.6
0406	AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	CDMA2000	5.22	±9.6
0410	AAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2.3,4,7,8,9, Subframe Cont=4)	LTE-TDD	7.82	±9.6
0414	AAA	WLAN CCDF, 64-QAM, 40 MHz	Generic	8.54	±9.6
0415	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	WLAN	1.54	±9.6
0416	AAA	IEEE 802.11g WiFI 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycla)	WLAN	8.23	±9.6
0417	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
0418	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	WLAN	8.14	±9.6
0419	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	WLAN	8.19	±9.6
0422	AAC	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	±9.6
0423	AAC	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8.47	±9.6
0424	AAC	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.40	±9.6
0425	AAC	IEEE 602.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.41	±9.6
0426	AAC	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WLAN	8.45	±9.6
0427	AAC	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	B.41	±9.6
10430	AAE	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	±9.6
10431	AAE	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	±9.6
10432	AAD	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10433	AAD	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
0434	AAB	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	±9.6
0435		LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2.3,4,7,8,9)	LTE-TDD	7.82	±9.6
10447	AAE	LTE-FDD (OFDMA, 5MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	19.6
10448	-	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.53	19.6
10449	and the second second	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Gliping 44%)	LTE-FDD	7.51	19.6
10450		LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	±9.6
10451	AAB	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	WGDMA	7.59	19.0
10453	-	Validation (Square, 10 ms, 1 ms)	Test		
0456	and the second second	IEEE 802.11ac WiFi (160 MHz; 64-QAM, 99pc duty cycle)	WLAN	10,00	±9.6
10456	a second second second	UMTS-FDD (DC-HSDPA)		8.63	±9.6
10458		CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	WCDMA	6,62	±9.6
			CDMA2000	6.55	19.6
0459		CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	±9.6
0460	and the second data	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	±9.6
0461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10462		LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subirame=2,3,4,7,8,9)	LTE-TDD	8.30	±9.6
10463	C	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.56	±9.6
10464	_	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10465		LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10466		LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±9.6
10467	and the second second	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10468	-	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10469		LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	±9.6
10470	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, OPSK, UL Subtrame=2.3,4,7,8,9)	LTE-TOD	7.82	±9.6
10471	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6

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0472	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	19.6
0473	AAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QFSK, UL Subframe=2.3.4,7.8.9)	LTE-TOD	7.82	±9.6
0474	AAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 15-QAM, UL Subframe=2.3.4.7.8.9)	LTE-TOD	8.32	±9.6
0.475	AAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 84-QAM, UL Subframe=2.3.4.7,8.9)	LTE-TOO	8.57	19.6
0477	AAG	LTE-TOD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Sublrame=2,3,4,7,8,9)	LTE-TOD	8.32	±9.6
0.478	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 84-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.57	±9.6
0.479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	=9.6
0.480	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3.4,7,8,9)	LTE-TDD	8.18	29.6
0481	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2.3.4,7,8,9)	LTE-TDD	8 45	+9.6
0482	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2.3,4,7,8,9)	LTE-TDD	7.71	+9.6
10483	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.39	±9.6
10484	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe+2,3,4,7,8,9)	LTE-TDD	8.47	±9.6
10485	AAG	LTE-TDD (SC-FDMA, 50% RB, 5MHz, OPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.59	±9.6
10486	AAG	LTE-TOD (SC-FDMA, 50% RB, 5MHz, 16-QAM, UL Subframt=2,3,4,7,8,9)	LTE-TOD	8.38	±9.6
10487	AAG	LTE-TOD (SC-FDMA, 50% RB, 5MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.60	±9.6
10488	AAG	LTE-TOD (SC-FDMA, 50% RB, 10 MHz, OPSK, UL Subframe=2,3,4,7,8,9)	LTE-TOD	7.70	±9,6
10489	AAG	LTE-TOD (SC-FDMA, 50% RB, 10 MHz, 04 Sk, 02 Subirandez, 9, 7, 8, 9)	LTE-TOD	8.31	19,6
10490	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16 GAM, 0L Subtraine=2,3,4,7,8,9)	LTE-TOD	8.54	
10490	AAF	LTE-TOD (SC-FOMA, 50% RB, 15MHz, QPSK, UL Subtrame=2,3,4,7,8,9)	LTE-TOD	7.74	±9,6
10491	AAF	LTE-TOD (SC-FOMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TOD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.41	±9.6
10493	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD		±9.6
10493	AAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHZ, 64-DAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 50% RB, 20 MHZ, OPSK, UL Subframe=2,3,4,7,8,9)	and the second se	8.55	±9.6
1.7	1 million 1 million	LTE-TOD (SC-FDMA, 50% RB, 20 MHz, 0PSK, 0L Subtrame=2,3,4,7,8,9) LTE-TOD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subtrame=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6
10495	AAG		LTE-TDD	8.37	±9.6
10496	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subtrame=2,3,4,7,8,9)	LTE-TDD	8.54	±9.6
10497	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±9.6
10498	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.40	±9.6
10499	AAG	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subtrame=2,3,4,7,8,9)	LTE-TDD	8.68	±9.6
10500	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, OPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±9.6
10501	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subtrame=2,3,4,7,8,9)	LTE-TDD	B.44	±9.6
10502	AAD	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.52	±9.6
10503	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.72	±9.6
10504	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	L'TE-TDD	8.31	±9.6
10505	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±9.6
10506	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7 74	±9.6
10507	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz; 16-0AM, UL Subframe=2,3,4,7,6,9)	LTE TOD	8.36	±9.6
10508	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-OAM, UL Subframe=2,3,4,7,8,9)	LTE TOD	8,55	±9.6
10509	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Sub/rame=2,3,4,7,8,9)	LTE-TOD	7,99	±9.6
10510	and the state of the	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subtrame=2,3,4,7,8,9)	LTE TOD	8,49	±9,6
10511	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subtrame=2,3,4,7,8,9)	LTE-TOD	8.51	±9.6
10512	and the second second	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TOD	7.74	19,6
10513	and the second sec	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TOD	8.42	±9.6
10514	and the second second	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2.3,4,7,8,9)	LTE-TOD	8.45	±9,6
10515	AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 2Mbps, 99pc duty cycle)	WLAN	1.58	±9.6
10516	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	WLAN	1,57	±9,6
10517	AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	WLAN	1.58	±9,6
10518	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	WLAN	8.23	±9,6
10519	AAC	IEEE 802 11a/h WIFI 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	WLAN	8.39	±9,6
10520	AAC	IEEE 802-11a/h WIFI 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	WLAN	8 12	±9,6
10521	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	WLAN	7.97	±9,6
10522	AAC	IEEE 802.11 m/h WIFI 5 GHz (OFDM, 36 Mops, 99pc duty cycle)	WLAN	8.45	±9,6
10523	AAC	IEEE 802.11 m/h WiFi 5 GHz (OFDM, 48 Mops, 99pc duty cycle)	WLAN	8.08	±9.6
10524	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	WLAN	8.27	±9,6
10525	AAC	IEEE 802.11 ac WIFI (20 MHz, MCS0, 99pc duty cycle)	WLAN	8.36	±9.8
10526	AAC	IEEE 802.11ac WIF) (20 MHz, MCS1, 99pc duty cycle)	WLAN	8.42	±9,6
10527	and the second second	IEEE 802.11ac WIFI (20 MHz, MCS2, 99pc duty cycla)	WLAN	8.21	±9.6
10528	AAC		WLAN	8.36	19.6
10529		IEEE 802.11ac W/Fi (20 MHz, MCS4, 99pc duty cycle)	WLAN	8.36	±9.6
10531	and the local division of the local division	IEEE 802.11ac WIFI (20 MHz, MCS6, 99pc duty cycle)	WLAN	8.43	19.6
10532	and the second sec	IEEE 802.11ac WIFI (20 MHz, MCS7, 99pc duty cycla)	WLAN	8.29	19.6
10533		IEEE 802.11ac WIFI (20 MHz, MCS8, 99pc duty cycle)	WLAN	8.38	±9.6
10534	- Contractor	IEEE 802.11ac WIFI (40 MHz, MCS0, 99pc duty cycle)	WLAN	8.45	19.6
10535	and the second se		WLAN	8.45	19.6
10536	and the second second	IEEE 802.11ac WIFI (40 MHz, MCS2, 99pc duty cycle)	WLAN	8.32	19.6
10537			WLAN	8.44	±9.6
10538	A DESCRIPTION OF THE OWNER OF THE		WLAN	8.54	±9.0 ±9.6
1 10 March 10	1.0.100	IEEE 802 11ac WiFi (40 MHz, MCS6, 99pc duty cycle)	WLAN	0.04	20.0

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0541	AAC	IEEE 802.11ac WiFi (40 MHz, MCS7, 99pc duty cycle)	WLAN	8.46	196
0542	AAC	IEEE 802.11ac WiFi (40 MHz, MCS8: 99pc duty cycle)	WLAN	8.65	19.6
0543	AAC	IEEE 802,11ac WiFi (40 MHz, MCS9, 99pc duty cycle)	WLAN	8.65	196
0544	AAC	IEEE 802.11ac WiFi (80 MHz, MCS0, 99pc duty cycle)	WLAN	8.47	±9.6
0545	AAC	IEEE 802.11ac WIFI (80 MHz, MCS1, 99pc duty cycle)	WLAN	8.55	±9.6
0546	AAC	IEEE 802,11ac WiFi (80 MHz, MCS2, 99pc duty cycle)	WLAN	8.35	19,6
0547	AAC	IEEE 802.11ac WiFi (80 MHz, MCS3, 99pc duty cycle)	WLAN	8.49	±9.6
0548	AAC	IEEE 802.11ac W/F/ (80 MHz, MCS4, 99pc duty cycle)	WLAN	8.37	±9.6
0550	AAC	IEEE 802.11ac WIFI (80 MHz, MCS6, 99pc duty cycle)	WLAN	8.38	±9.6
0551	AAC	IEEE 802.11ac WiFi (80 MHz, MCS7, 99pc duty cycle)	WLAN	8.50	±9,6
0552	AAC	IEEE 802,11ac WIFI (80 MHz, MCS8, 99pc duty cycle)	WLAN	8.42	±9.6
0553	AAC	IEEE 802 11ac WIF) (80 MHz, MCS9, 99pc duty cycle)	WLAN	8.45	±9.6
0.554	AAD	IEEE 802.11ac WIFI (160 MHz, MCS0, 99pc duty cycle)	WLAN	8.48	±9.6
D655	AAD	IEEE 802 11ac WiFi (160 MHz, MCS1, 99pc duty cycle)	WLAN	8.47	±9.6
0556	AAD	IEEE 802.11ac WiFi (160 MHz, MCS2, 99pc duty cycle)	WLAN	8.50	±9.6
0557	AAD	IEEE 802.11ao WiFi (160 MHz, MCS3, 99pc duty cycle)	WLAN	8.52	±9.6
0558	AAD	IEEE 802.11ac WIFI (160 MHz, MCS4, 99pc duty cycle)	WLAN	8.61	±9.6
0560	AAD	IEEE 802.11 ac WIFI (160 MHz, MCS6, 99pc duty cycle)	WLAN	8.73	±9.6
0561	AAD	IEEE 802 11ac WIFI (160 MHz, MCS7, 99pc duty cycle)	WLAN	8.56	
0562	AAD	IEEE 802.11ac WIFI (160 MHz, MCS7, 99pc duty cycle)	WLAN	8.56	±9.6
0563	AAD	IEEE 802.11ac WIFI (160 MHz, MCS8, 99pc duty cycle)	WLAN		±9.6
0564	AAA	IEEE 602.11ac WIFI (160 MHz, MUS9, 99pc duty cycle) IEEE 602.11g WIFI 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	and the second se	8.77	19.6
0565	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 9 Mops, 99pc duty cycle) IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	WLAN	8,25	3.6
0566	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	WLAN	8,45	19.6
0567	AAA	IEEE 802.11g WiFI 2.4 GHz (DSSS-OFDM, 16 Mbps, 99pc duty cycle)	WLAN	8,13	3.8
			WLAN	8.00	±9.8
0568	and the second se	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	WLAN	8.37	±9.6
0569	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	WLAN	8,10	±9,6
0570	and the station	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	WLAN	8,30	±9,6
0571	AAA	IEEE 802.116 WIFI 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	WLAN	1.99	19,6
0572	AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	WLAN	1.99	±9,6
0573	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	WLAN	1,98	19.6
0574		IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	WLAN	1.98	1,9,6
0575	-	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	19,6
0576	and the second	IEEE 802.11g WiFI 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duly cycle)	WLAN	8,60	19,6
0577	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.70	3,9±
10578		IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8,49	±9,8
0579	the second s	IEEE 802.11g WiFI 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±9,6
0580	and the second second	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8,76	±9.6
10581	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8,35	±9.6
10562	and the second second	IEEE 802.11g WIFI 2,4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	±9.6
10583		IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	±9.6
10584	-	IEEE 802.11a/h WIFI 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.60	±9.6
0585	AAC	IEEE 802.1*a/h WIFI 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.70	±9.6
0586	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.49	±9.6
10587	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±9.6
10588	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.76	±9.6
10589	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.35	±9.6
10590	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	±9.6
0.591	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc duty cycle)	WLAN	B.63	±9.6
0592	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc duty cycle)	WLAN	8.79	±9.6
0593	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc duty cycle)	WLAN	8.64	±9.6
10594	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±9.6
0.595	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc duty cycle)	WLAN	8.74	±9.6
0596	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc duty cycle)	WLAN	8.71	19.6
0597		IEEE 802.11# (HT Mixed, 20 MHz, MCS6, 90pc duty cycle)	WLAN	8.72	19.8
0598	-	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc duty cycle)	WLAN	8.50	19.6
0.599	-	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc duty cycle)	WLAN	8.79	19.5
0600	-	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc duty cycle)	WLAN	8.65	19.6
0601		IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc duty cycle)	WLAN	8.82	19.6
0802	and the local data	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc duty cycle)	WLAN		and the second s
10603	the second se	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc duty cycle)	WLAN	8.94	19.6
10604	the second second second	IEEE 802.11h (HT Mixed, 40 MHz, MCS5, 90pc duty cycle)	WLAN	9.03	19.5
0805	100 C	IEEE 802.11h (HT Mixed, 40 MHz, MCS6, 90pc duty cycle)		8.76	19,6
10606		IEEE 802.110 (HT Mixed, 40 MHz, MCS5, 90pc duty cycle) IEEE 802.110 (HT Mixed, 40 MHz, MCS7, 90pc duty cycle)	WLAN	8.97	29.6
			WLAN	8.82	±9.6
0607	and the second second	IEEE 802.11sc WiFi (20 MHz, MCS0, 90pc duty cycle)	WLAN	8.64	2,9,6
NDB111	AAC	IEEE 802.11ao WiFi (20 MHz, MCS1. 90pc duty cycle)	WLAN	8.77	19.6

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0609	AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.57	±9.6
0610	AAC	IEEE 802.11ac WiFi (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.78	±9.6
0611	AAC	IEEE 802.11ac WIFI (20 MHz, MCS4, 90pc duly cycle)	WLAN	8.70	196
0612	AAC	IEEE 802.11ac WiFi (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	19.6
0613	AAC	IEEE 802.11ac WIFI (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.94	19.6
0614	AAC	IEEE 802.11ac WIFI (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.59	19.6
0615	AAC	IEEE 802.11ac WIFI (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	19.6
0616	AAC	IEEE 802.11ac WIFI (20 MHz, MCS0, Sope duty cycle)	and the second se	8.82	
-	AAC		WLAN	and the second se	19.6
0617		IEEE 802.11ac WIFi (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.81	+9.6
0618	AAG	IEEE 802.11ac WiFi (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.58	±9.6
0619	AAC	IEEE 802.11ac WiFi (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.86	±9.6
0620	AAC	IEEE 802.11ac WiFi (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.87	±9.6
0621	AAC	IEEE 802.1 Tac WiFI (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
0622	AAC	IEEE 802 11ac WIFI (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.68	±9.6
0623	AAC	IEEE 802.11ac WiFi (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±9.6
0624	AAC	IEEE 802.11ac WIFI (40 MHz, MC58, 90pc duty cycle)	WLAN	8.96	±9.6
0625	AAC	IEEE 802.11ac WIFI (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.96	±9.6
0526	AAC	IEEE 802.11ac WIFI (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±9.6
0627	AAC	IEEE 802,11ac WIFI (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.88	±9.6
0628	AAC	IEEE 802.11ac WIFI (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.71	±9.6
0.629	AAG	IEEE 802.11ac WIFI (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	+9.6
0630	AAC	IEEE 802 11ac WiFi (60 MHz, MCS4, 90pc duty cycle)	WLAN	8.72	±9.6
0631	AAC	IEEE 802.11ac WiFi (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.81	±9.6
0632	and the second second	IEEE 802.11ac WIFI (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±9.6
0633	AAC	IEEE 802 11ac WiFi (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.83	±9,6
10634	and the second second	IEEE 802.11ac WIFI (80 MHz; MCS8, 90pc duty cycle)	WLAN	8.80	the second se
10635	AAC	IEEE 802 11ac WIFI (80 MHz, MCS8, 90pc duty cycle)	WLAN		±9.6
10636				8.81	±9.6
	and the second se	TEEE 802 11ac WIFI (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±9,6
10637	AAD	JEEE 802 11ac WIFI (160 MHz, MCS1, 90pc duty cycle)	WLAN	8,79	±9.6
10638	and the second sec	IEEE 802.11ac WiFi (160 MHz_MCS2, 90pc duty cycle)	WLAN	8.86	±9.6
10639		IEEE 802 11ac WiFi (160 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±9,5
10640		IEEE 802.11ac WiFi (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.96	19,5
10641	AAD	IEEE 802 11ac WIFI (160 MHz, MCS5, 90pc duty cycle)	WLAN	9.06	±9.5
10642	AAD	IEEE 802.11ac WIFI (160 MHz, MCS6, 90pc duty cycle)	WLAN	9.05	±9,6
10643	AAD	IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc duty cycle)	WLAN	8,89	±9,6
10644	AAD	IEEE 802.11ac WIFi (160 MHz, MCS8, 90pc duty cycle)	WLAN	9.05	±9.6
10645	AAD	IEEE 802.11ac WIF) (160 MHz, MCS9, 90pc duty cycle)	WLAN	9.11	±9.6
10546	AAH	LTE-TDD (SC-FDMA, 1 HB, 5 MHz, QPSK, UL Subframe=2,7)	LTE-TDD	11.96	±9.6
10547	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	LTE-TOD	11,96	±9.6
10648	AAA	CDMA2000 (1x Advanced)	CDMA2000	3.45	±9.6
10652	AAF	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.91	±9.6
10653	and the second second	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	±9,6
10654	and the second second	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	±9.6
10655	and the second se	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	7.21	±9.6
10658	and the second	Pulse Waveform (200Hz, 10%)	Test		
10659	1	Pulse Wavelorm (200Hz, 20%)		10.00	±9.6
10659	and the second second		Test	6.99	29.8
100 Aug 100		Pulse Waveform (200Hz, 40%)	Test	3.98	±9.6
10661		Pulse Waveform (200Hz, 60%)	Test	2.22	±9.6
10662		Pulse Waveform (200Hz, 80%)	Test	D.97	±9.6
10670		Bluetoch Low Energy	Bluetooth	2.19	±9.6
10671	and the second second	IEEE 802.11ax (20 MHz, MCS0, 90pc duty cycle)	WLAN	9,09	±9.6
10672	and the second s	IEEE 802.11ax (20 MHz, MCS1, 90pc duty cycle)	WLAN	8.57	±9.6
10673		IEEE 802.11ax (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.78	±9.6
10674		IEEE 802.11ax (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±9.6
10675		IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.90	28.6
10876	AAC	IEEE 802.11ax (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	39.5
10677	AAC	IEEE 802 11ax (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.73	±9.5
10678	AAC	IEEE 802.11ax (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.78	±9.6
10679		IEEE 802.11ax (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.89	:9.8
10680	-	IEEE 802.11ax (20 MHz, MCS9, 90pc duty cycle)	WLAN	8.80	19.6
10681	100 100 100	IEEE 802.11ax (20 MHz, MCS10, 90pc duty cycle)	WLAN	and a second	
10682		IEEE 802.11ax (20 MHz, MCS11, 90pc duty cycle)		8.62	+9.6
10683		IEEE 802.11ax (20 MHz, MCS11, 900c buly cycle) IEEE 802.11ax (20 MHz, MCS0, 99pc duty cycle)	WLAN	8.83	19.6
	-		WLAN	8.42	±9.6
10684	_	IEEE 802.11ax (20 MHz, MCS1, 99pc duty cycle)	WLAN	8.26	±9,6
10685	-	IEEE 802.11ax (20 MHz, MCS2, 99pc duty cycle)	WLAN	8.33	+9.6
	AAC	IEEE 802.11ax (20 MHz, MCS3, 99pc duty cycle)	WLAN	8.28	±9.6

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0687	AAC	IEEE 802.11ax (20 MHz, MCS4, 99pc duty cycle)	WLAN	8,45	±9.6
0688	AAC	IEEE 802.11ax (20 MHz, MCS5, 99pc duty cycle)	WLAN	8.29	±9.6
0689	AAC	IEEE 802.11ax (20 MHz, MCS6, 99pc duty cycle)	WLAN	8.55	±9.6
0690	AAC	(EEE 802.11ax (20 MHz. MCS7, 99pc duty cycle)	WLAN	8.29	±9.6
0691	AAC	IEEE 802.11ax (20 MHz, MCS8, 99pc duty cycle)	WLAN	8.25	±9.6
0692	AAC	IEEE 802 11ax (20 MHz, MCS9, 99pc duty cycle)	WLAN	8.29	±9.6
0693	AAC	IEEE 802.11ax (20 MHz, MCS10, 99pc duty cycle)	WLAN	8.25	±9.6
0694	AAC	IEEE 802.11ax (20 MHz, MCS11, 99pc duty cycle)	WLAN	8.57	19.6
0695	AAC	IEEE 802.11ax (40 MHz, MCS0, 90pc duty cycle)	WLAN	8.78	19.6
0696	AAC	IEEE 802,11ax (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.91	19.6
	AAC	IEEE 802,11ax (40 MHz, MCS1, 90pc duty cycle)	WLAN	the second s	19.6
0.697	1.1.1		WLAN	8.61	
0698	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle) IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)		and the second se	±9.6
0699	AAC		WLAN	8.82	19.6
0700	AAG	IEEE 802.1 tax (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.73	±9.6
0701	AAC	IEEE 802 1 lax (40 MHz, MCS6, 90pc duty cycle)		8.86	29.6
0702	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.70	±9.6
0703	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±9.6
0704	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.56	±9,6
0705	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	8.69	±9.6
0706	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.66	±9.6
0707	AAC	IEEE 802.11ax (40 MHz, MCS0, 99pc duty cycle)	WLAN	8.32	±9.6
0708	AAC	IEEE 802.11ax (40 MHz, MCS1, 99pc duty cycle)	WLAN	8.55	±9.6
0709	AAC	IEEE 802.11ax (40 MHz, MCS2, 99pc duty cycle)	WLAN	8.33	±9.6
0710	AAC	IEEE 802.11ax (40 MHz, MCS3, 99pc duty cycle)	WLAN	8.29	±9.6
0711	AAC	IEEE 802.11ax (40 MHz, MCS4, 99pc duty cycle)	WLAN	8.39	±9.6
0712	AAC	IEEE 802.11ax (40 MHz, MCS5, 99pc duty cycle)	WLAN	8.67	19.6
0713	AAC	IEEE 802.11ax (40 MHz, MCS6, ii9pc duty cycle)	WLAN	B.33	±9.6
0714	AAC	IEEE 802.11ax (40 MHz, MCS7, 99pc duty cycle)	WLAN	8.26	±9.6
0715	AAC	IEEE 802.11ax (40 MHz, MCS8, 99pc duty cycle)	WLAN	8.45	±9.6
0716	AAC	IEEE 802.11ax (40 MHz, MCS9, 99pc duty cycle)	WLAN	8.30	19.6
0717	AAC	IEEE 802.11ax (40 MHz, MCS10, 99pc duty cycle)	WLAN	8.48	±9.6
0718	AAC	IEEE 802.11ax (40 MHz, MCS11, 99pc duty cycle)	WLAN	8.24	±9.6
0719	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.81	±9.6
0720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.87	±9.6
0721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.76	±9.6
10722	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.55	±9.6
10723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	=9.6
10724	AAC	IEEE 802 11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.90	±9.6
10725	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±9.6
10726	AAC	IEEE 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.72	±9.6
10727	AAC	IEEE 802 11ax (60 MHz, MCS8, 90pc duty cycle)	WLAN	8.65	±9.6
0728	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.65	±9.6
10729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.64	19.6
0730	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.67	±9.6
10731	AAC	IEEE 802.1 tax (80 MHz, MCS0, 99pc duty cycle)	WLAN	8.42	±9.6
10732		IEEE 802.11ax (80 MHz, MCS0, 99pc duty cycle)	WLAN	8.46	±9.6
10732	AAC	IEEE 602.11ax (80 MHz, MCS1, 99pc duty cycle)	WLAN	8.40	±9.6
10734	AAC	IEEE 802.11 ax (80 MHz, MCS2, 99pc duty cycle)	WLAN	8.40	
10734	10000		WLAN		±9.6
1. C. 11. C.	a succession of	IEEE 802.11 ax (80 MHz, MCS4, 99pc duty cycle)		8.33	±9.6
10736	a second second second second	IEEE 802.11ax (80 MHz, MCS5, 99pc duty cycle)	WLAN	8.27	±9.6
10737	AAC	IEEE 802.11ax (80 MHz, MCS5, 99pc duty cycle)	WLAN	8.36	±9.6
0.00		IEEE 802.11ax (80 MHz, MCS7, 99pc duty cycle)	WLAN	8.42	±9.6
10739	1.2.2.0	IEEE 802.11ax (80 MHz, MCS8, 99pc duty cycle)	WLAN	8.29	±9.5
10740	-	IEEE 802.11ax (80 MHz, MCS9, 99pc duty cycle)	WLAN	8.48	±9.6
10741		IEEE 802.11ax (80 MHz, MCS10, 99pc duty cycle)	WLAN	8.40	±9.6
10742	-	IEEE 802.11ax (80 MHz, MCS11, 99pc duty cycle)	WLAN	8.43	±9,6
10743	-	IEEE 802.11ax (160 MHz, MCS0, 90pc duty cycle)	WLAN	8,94	±9,6
10744		IEEE 802.11ax (160 MHz, MCS1, 90pc duly cycle)	WLAN	9,16	±9,6
10745		IEEE 802.11ax (160 MHz, MCS2, 90pc duty cycle)	WLAN	8,93	±9,6
10746	AAC	IEEE 802.11ax (160 MHz, MCS3, 90pc duty cycle)	WLAN	9.11	±9.6
10747		IEEE 802.11ax (160 MHz, MCS4, 90pc duty cycle)	WLAN	9.04	±9,6
10748	AAC	IEEE 802.11ax (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.93	±9.6
10749	AAC	IEEE 802.11ax (160 MHz, MCS6, 90pc duty cycle)	WLAN	8,90	±9.6
10750	_	IEEE 802.11ax (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.79	±9.6
10751		IEEE 802.11ax (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±9.6
10752	and the second second	IEEE 802.11ax (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.81	±9.6

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0753	AAC	IEEE 802.11ax (160 MHz, MCS10, 90pc duty cycle)	WLAN	9.00	±9.8
3754	AAC	IEEE 802.11ax (160 MHz, MCS11, 90pc duty cycle)	WLAN	8,94	±9.6
1755	AAC	IEEE 802.11ax (160 MHz, MCS0, B9pc duty cycle)	WLAN	8.64	±9.8
756	AAC	IEEE 802.11ax (160 MHz, MCS1, 99pc duty cycle)	WLAN	8.77	3.8±
757	AAC	IEEE 802.11ax (160 MHz, MCS2, 99pc duty cycle)	WLAN	8,77	±8.6
0758	AAC	IEEE 802.11ax (160 MHz, MCS3, 99pc duty cycle)	WLAN	8,69	±9.6
0759	AAC	IEEE 802 11ax (160 MHz, MCS4, 89pc duty cycle)	WLAN	8,58	±9,6
0760	AAC	IEEE 802.11ax (160 MHz. MCS5, 99pc duty cycle)	WLAN	8.49	±9.6
0761	AAC	IEEE 802.11ax (160 MHz, MCS6, 99pc duty cycle)	WLAN	8.58	±9,6
0762	AAG	IEEE 802.11ax (160 MHz, MCS7, 99pc duty cycle)	WLAN	8.49	±9,6
0763	AAC	IEEE 802.11ax (160 MHz, MCS8, 99pc duty cycle)	WLAN	8.53	±9.6
0764	AAC	IEEE 802.11ax (160 MHz, MCS9, 99pc duty cycle)	WLAN	8.54	±9.6
0765	AAC	IEEE 802.11ax (160 MHz, MCS10, 99pc duty cycle)	WLAN	8.54	+9.6
0766	AAC	IEEE 802.11ax (160 MHz, MCS11, 99pc duty cycle)	WLAN	8.51	±9.6
0767	AAE	5G NR (CP-OFDM, 1 RB, 5MHz, QPSK, 15kHz)	5G NR FR1 TDD	7.99	±9.6
0768	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.01	±9.6
0769	AAD	5G NR (CP-OFDM, 1 RB, 15MHz, OPSK, 15kHz)	5G NR FR1 TOD	8.01	±9.6
0770	AAD	SG NR (CP-OFDM, 1 RB, 10MHz, OPSK, 15kHz)	5G NR FR1 TDD	8.02	±9.6
			5G NR FR1 TDD	8.02	±9.6
0771	AAD	SG NR (CP-OFDM, 1 RB, 25MHz, OPSK, 15kHz)	SG NR FR1 TDD	8.23	±9.6
0772	AAD	SG NR (CP-OFDM, 1 RB, 30 MHz, OPSK, 15 kHz)	5G NR FR1 TDD	8.23 B.03	±9.6
0773	AAD	SG NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
0774		5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	
0775	AAD	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)			±9,6
0776	AAD	5G NR (CP-OFDM, 50% RB, 10 MHz, OPSK, 15 kHz)	5G NR FR1 TDD	8.30	±9.6
0777	AAG	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	SG NR FR1 TDD	8.30	±9.6
0778	AAD	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	±9.6
0779	AAC	5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.42	±9.6
0780	AAD	5G NR (CP-QFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	±9.6
0781	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	±9.6
0782	AAD	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.43	±9.6
0783	AAE	5G NR (CP-OFDM, 100% RB, 5 MHz, OPSK, 15 kHz)	5G NR FR1 TDD	8.31	±9.6
0784	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.29	±9.6
0785	AAD	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.40	±9.6
0786	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8,35	±9.6
0787	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.44	±9:6
0788	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	≘9.6
0789	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.37	±9.6
10790	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR PRI TDD	8.39	29.8
0791	AAE	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	±9.8
0792	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.92	±9.6
0793	AAD	5G NR (CP OFDM, 1 RB, 15 MHz, OPSK, 30 kHz)	5G NR FR1 TD0	7.95	::9.8
10794	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FRI TOO	7.82	±9.6
10795	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	7.84	±9.5
10796	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±9.5
10797	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	SG NR FR1 TOD	8.01	19.5
10798	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	7.89	±9.6
10799	AAD	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	±9.6
10801	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±9.6
10802	AAD	5G NR (CP-DFDM, 1 RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.87	19.6
10803	and the second second	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	:9.6
10805	and the second s	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	8.34	±9.6
10806		5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.37	19.6
10809		5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 KHz)	5G NR FR1 TDD	8.34	±9.6
10810	and the second second	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
10812	_		5G NR FR1 TOD	8.35	±9.6
10817	and the second sec	and the second	5G NR FR1 TDD	8.35	±9.6
10818	-		5G NR FR1 TDD		±9.6
10819		5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	-	19.6
10820		5G NR (GP-OFDM, 100% RB, 20 MHz, GPSK, 30 kHz)	5G NR FR1 TDD	8.30	=9.6
10821	_	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	and the second	=9.6
10822		5G NR (CP-OFDM, 100% RB, 30 MHz, CP-SK, 30 KHz)	5G NR FR1 TDD		:9.6
			5G NR FR1 TDD		-
10823	and the second second	5G NR (CP-OFDM, 100% RB, 40 MHz, OPSK, 30 kHz)			±9.6
10824		5G NR (CP-DFDM, 100% RB, 50 MHz, OPSK, 30 kHz)	5G NR FR1 TDD		=9.6
10825	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz) 5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD 5G NR FR1 TDD	and the second second	±9.6 ±9.6
10827	AAD				

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0829	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, OPSK, 30 kHz)	5G NR FR1 TDD	8.40	±9.6
0830	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.63	19.6
0831	AAD	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDO	7.73	±9.6
0832	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.74	±9.6
0833	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
0834	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.75	±9.6
0835	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
0836	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, OPSK, 60 kHz)	5G NR FR1 TDD	7.68	±9.6
0837	AAD	5G NR (CP-OFDM, 1 RB, E0 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.68	19.5
0839	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	19.6
0840	AAD	5G NR (CP-DFDM, 1 RB, 90 MHz, OPSK, 60 kHz)	5G NR FR1 TDD	7.67	19.6
10841	AAD	5G NR (CP-DFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.71	19.6
10843	AAD	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	19.6
10844	AAD	5G NR (CP-DFDM, 50% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	+9.5
10846	AAD	5G NR (CP-DFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	19.6
10854	AAD	5G NR (CP-DFDM, 100% RB, 10 MHz; QPSK, 60 kHz)	5G NR FR1 TDD	8.34	19.6
10855	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, OPSK, 60 kHz)	5G NR FR1 TDD	8.36	19.6
10856	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	19.6
10857	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	and the second s
10858	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	±9.6
10.859	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)		the second se	19.6
10860	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz; CP-SK, 60 kHz)	5G NR FR1 TDD	8.34	19.6
10881	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, GPSK, 60 KHz)	5G NR FR1 TDD 5G NR FR1 TDD	8.41	±9.6
10863	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz; QPSK, 60 kHz)		8.40	19.6
10864	AAD	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
10865	AAD		5G NR FR1 TOD	8.37	:9.6
	AAD	5G NR (CP OFDM, 100% RB, 100 MHz, OPSK, 60 kHz)	5G NR FR1 TDD	B.41	:9.6
10866	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FRI TDD	5.68	: 9.6
10868	-	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, DPSK, 30 kHz)	5G NR FR1 TDD	5.B9	29.6
10869		5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	±9.6
10870		5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TOD	5.86	±9.6
10871	AAE	5G NR (DFTs-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.75	29.6
10872		5G.NR (DFTs-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.52	29.6
10873		5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 KHz)	5G NR FR2 TDD	8.61	±9.6
10874		5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	29.6
10875		5G NR (CP-OFDM, 1 RB, 100.MHz, QPSK, 120.kHz)	56 NR FR2 TD0	7.78	±9.6
	AAE	5G NR (CP OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.39	±9.6
10877		5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	7.95	±9.6
10878		5G NR (CP-OFDM, 100% RB, 100 MHz, 160AM, 120 kHz)	5G NR FR2 TDD.	8,41	±9.6
10879		5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TOD	8.12	±9.6
10880		5G NR (CP-OFDM, 100% RB, 100 MHz, 84QAM, 120 kHz)	5G NR FR2 TDD	8.38	±9.6
10881	AAE	5G NR (DFTs-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TOD	5.75	±9.6
10882	AAE	5G NR (DFT-s-OFOM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.96	:96
10883	AAE	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.57	±9.6
10884	AAE	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 180AM, 120 kHz)	5G NR FR2 TDD	6.53	19.6
10885	AAE	5G NR (DFT/s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TOD	6.61	19.6
10886	AAE	5G NR (DFT-8-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	±9.6
10887	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	±9.6
10888	AAE	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.35	±9.6
10889	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.02	±9.6
10890	AAE	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.40	±9.6
10891	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, 54QAM, 120 kHz)	5G NR FR2 TDD	8.13	195
10892	AAE	5G NR (CP-OFDM, 100% RB, 50 MHz, 64GAM, 120 kHz)	5G NR FR2 TDD	8.41	29.6
10897	AAC	5G NR (DFTs-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.65	19.6
10898	AAB	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 KHz)	5G NR FR1 TDD	5.67	195
	AAB	5G NR (DFTs-OFDM, 1 RB, 15MHz, OPSK, 30kHz)	5G NR FR1 TOD	5.67	19.6
10900		5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	19.5
10901		5G NR (DFT:s-OFDM, 1 RB, 25MHz, QPSK, 30kHz)	5G NR FR1 TDD	5.68	19.0
10902		5G NR (DFTs-OFDM, 1 RB, 30 MHz, OPSK, 30 kHz)	5G NR FR1 TDD		
10903		5G NR (DFTs-OFDM, 1 RB, 40 MHz, OPSK, 30 KHz)	and the second se	5,68	+9.6
10904		5G NR (DFTs-OFDM T RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±98
10905	-	5G NR (DFTs-OFDM, 1 RB, 50 MHz, QPSK, 30 KHz)	5G NR FR1 TDD	5.68	±9.6
10905	-	5G NR (DFTs-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz) 5G NR (DFTs-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10905	-		5G NR FR1 TDD	5,68	+9.6
_	-	5G NR (DFTs-OFDM, 50% RB, 5MHz, QPSK, 30kHz)	5G NR FR1 TDD	5,78	±9.6
10908		5G NR (DFTs-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6
10909	-	5G NR (DFTs-OFDM 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5,96	±9.6
10910	AAB	5G NR (DFT-s-OFDM 50% RB, 20 MHz, GPSK, 30 kHz)	50 NR FR1 T00	5.83	±9.6

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0911	AAB	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6
0912	AAB	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
0913	AAB	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	+9.6
0914	AAB	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.85	±9.6
0915	AAB	5G NR (DFTs-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	±9.6
0916	AAB	5G NR (DFTs-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FRI TOD	5,87	±9.6
0917	AAB	5G NR (DFT/s-OFDM, 50% RB, 100 MHz, QPSK, 30 kHz)	5G NR FRI TDO	5,94	±9.6
0918	AAC	5G NR (DFTs-OFDM, 100% RB, 5MHz, QPSK, 30kHz)	5G NR FR1 TOD	5.86	±9.6
0919	AAB	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, OPSK, 30 kHz)	5G NR FR1 TDD	5.86	±9.6
0920	AAB	5G NR (DFTs-OFDM, 100% RB, 15 MHz, OPSK, 30 kHz)	5G NR FR1 TDD	5.87	±9.6
0921	AAB	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
0922	AAB	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	19.6
0923	AAB	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 30 KHz)	5G NR FR1 TDD	5.84	±9.6
0924	AAB	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	+9.6
0925	AAB		5G NR FR1 TDD	5.95	±9.6
1	AAB	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	19.6
0926	-	5G NR (DFTs-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±9.6
0927	AAB	5G NR (DFTs OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)		5.52	±9.6
0928	AAC	5G NR (DFT-s-OFDM, 1 RB, 5MHz, QPSK, 15kHz)	SG NR FR1 FDD		
0929	AAC	5G NR (DFTs-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9,6
0930	AAC	5G NR (DFTs OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9,6.
0931	AAC	5G NR (DFTs-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
0932	AAC	5G NR (DFTs-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9,6.
0933	AAC	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
0934	AAC	5G NR (DFTs-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
0935	AAD	5G NR (DFT/s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5,51	±9.6
0936	AAC	5G NR (DFTs-OFDM, 50% RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±9.6
0.937	AAC	5G NR (DFT/s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5,77	±9.6
0938	AAC	5G NR (DFT's OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±9.6
0939	AAC	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 KHz)	5G NR FR1 FDD	5.82	±9.6
0940	AAC	5G NR (DFTs-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.89	±9.6
0941	AAC	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	±9.6
0942	AAC	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±9.6
0943	AAD	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.95	±9.6
10944	AAG	5G NR (DFT-s-OFDM, 100% RB, 5MHz, OPSK, 15kHz)	5G NR FR1 FDD	5.81	±9.6
10945	AAG	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±9,6
10946	AAC	5G NR (DFT-s-OFDM, 100% RB, 15MHz, QPSK, 15kHz)	5G NR FR1 FDD	5.83	±9.6
10947	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±9.6
10948	AAC	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
10949	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±9.5
10950	AAC	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
10951	AAD	5G NR (DFT-s-OFDM, 100% R8, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.92	19.6
10952	1000	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.25	±9.6
10953		5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.15	19.6
10954	1 1 2 2 2 2 3	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 PDD	8.23	±9.6
10955		5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	19.6
10956	-	5G NR DL (CP-DFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.14	19.6
10957	-	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 84-QAM, 30 kHz)	5G NR FR1 FDD	8.31	±9.6
10958	10,000.0	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	±9.6
10959		5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 84-QAM, 30 kHz)	5G NR FR1 FDD	8.33	±9.6
10960		5G NR DL (CP-OFDM, TM 3.1, 5MHz, 84-QAM, 15 kHz)	5G NR FR1 TDD	9.32	±9.6
10960		5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.36	19.6
10962	-	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 KHz)	5G NR FR1 TDD	9.40	±9.6
10962	1 1 1 1 1 1 1 1	5G NR DL (CF-OFDM, TM 3.1, 15 MHz, 64-OAM, 15 kHz)	5G NR FR1 TDD	9.40	#9.6
	1.1.0	and the set of the second se	SG NR FR1 TDD		1 100
10964		5G NH DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 30kHz)			=9.6
10965	-	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	SG NR FR1 TDD	9.37	#9.6
10966	and the second second	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.55	±9.6
10967		5G NFI DL (CP-OFDM, TM 3.1, 20 MHz, 64-OAM, 30 kHz)	5G NR FR1 TDD	9.42	±9.6
10968	-	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.49	±9.6
10972			5G NR FR1 TDD	11.59	±9.6
10973		5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	the second second	±9.6
10974	-	5G NR (CP-OFDM, 100% RB, 100 MHz, 256-QAM, 30 kHz)	5G NR FRI TDD	10.28	±9.6
10978		CASE AND AND A	ULLA	1.16	±9.6
10979	AAA	ULLA HDR4	ULLA	8,58	±9.6
10980	AAA	ULLA HDR8	ULLA	10,32	±9.6
10981	AAA	ULLA HDRp4	ULLA	3,19	±9.6
10.201					

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July 20, 2023

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k = 2
10983	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.31	±9.6
10984	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.42	±9.6
10985	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	±9.6
10986	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	±9.6
10987	AAA	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.53	±9.6
10988	AAA	5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.38	±9.6
10989	AAA	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 54-QAM, 30 kHz)	5G NR FR1 TDD	9.33	±9.6
10990	AAA	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.52	±9.6
11003	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	10.24	±9.6
11004	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	10.73	±9.6
11005	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.70	±9.6
11006	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.55	±9.6
11007	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.46	±9.6
11008	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.51	±9.6
11009	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8,76	±9.6
11010	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.95	±9.6
11011	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.96	±9.6
11012	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.68	±9.6
11013	AAA	IEEE 802.11be (320 MHz, MCS1, 99pc duty cycle)	WLAN	8.47	±9.6
11014	AAA	IEEE 802.11be (320 MHz, MCS2, 99pc duty cycle)	WLAN	8.45	±9.6
11015	AAA	IEEE 802.11be (320 MHz, MCS3, 99pc duty cycle)	WLAN	8.44	±9.6
11016	AAA	IEEE 802.11be (320 MHz, MCS4, 99pc duty cycle)	WLAN	8.44	±9.6
11017	AAA	IEEE 802.11be (320 MHz, MCS5, 99pc duty cycle)	WLAN	8.41	±9.6
11018	AAA	IEEE 802.11be (320 MHz, MCS6, 99pc duty cycle)	WLAN	8.40	±9.6
11019	AAA	IEEE 802.11be (320 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±9.6
11020	AAA	IEEE 802.11be (320 MHz, MCS8, 99pc duty cycle)	WLAN	8.27	±9.6
11021	AAA	IEEE 802.11be (320 MHz, MCS9, 99pc duty cycle)	WLAN	8.46	±9.6
11022	AAA	IEEE 802.11be (320 MHz, MCS10, 99pc duty cycle)	WLAN	8.36	±9.6
11023	AAA	IEEE 802.11be (320 MHz, MCS11, 99pc duty cycle)	WLAN	8.09	±9.6
11024	AAA	IEEE 802.11be (320 MHz, MCS12, 99pc duty cycle)	WLAN	8.42	±9.6
11025	AAA	IEEE 802.11be (320 MHz, MCS13, 99pc duty cycle)	WLAN	8.37	±9.6
11026	AAA	IEEE 802.11be (320 MHz, MCS0, 99pc duty cycle)	WLAN	8.39	±9.6

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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ANNEX F: D750V3 Dipole Calibration Certificate

E-mail: emf@caict.ac.cn	http://www.caict		
	anghai)	Certificate No: 23	J02Z80016
CALIBRATION CE	RTIFICAT	E	
Object	D750V3	3 - SN: 1045	
Calibration Procedure(s)	FF-Z11	002.01	
		tion Procedures for dipole validation kits	
Calibration date:	Septem	ber 12, 2023	
		he closed laboratory facility: environment	temnerature (22+3)% and
All calibrations have been humidity<70%.	conducted in th	he closed laboratory facility: environment or calibration)	temperature (22±3)°C and
All calibrations have been humidity<70%. Calibration Equipment used	conducted in th		
All calibrations have been humidity<70%. Calibration Equipment used	conducted in the conducted in the conducted in the conducted in the conducted for the conducted for the conducted for the conducted in the con	or calibration)	
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards	CONDUCTED IN 11 (M&TE critical for ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4	conducted in th (M&TE critical for ID # 106277 104291	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161)	Scheduled Calibration Sep-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S	Conducted in the conducted in the conducted in the conducted for t	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561)	Scheduled Calibration Sep-23 Sep-23
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4	conducted in th (M&TE critical fo ID # 106277 104291 SN 3617	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161)	Scheduled Calibration Sep-23 Sep-23 Mar-24
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4	conducted in th (M&TE critical fo ID # 106277 104291 SN 3617 SN 1556	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards	conducted in th (M&TE critical for 106277 104291 SN 3617 SN 1556 ID # MY49071430	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	conducted in th (M&TE critical for 106277 104291 SN 3617 SN 1556 ID # MY49071430	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	conducted in th (M&TE critical fo ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430 MY46110673	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107) 10-Jan-23 (CTTL, No. J23X00104)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24 Jan-24
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	conducted in th (M&TE critical for 10 # 106277 104291 SN 3617 SN 1556 1D # MY49071430 MY46110673 Name	Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60034) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107) 10-Jan-23 (CTTL, No. J23X00104) Function	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24 Jan-24

Certificate No: 23J02Z80016

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Add: No.52 HuaVuanBei Roed, Haidian District, Beijing, 100191, China Teli +86-10-62304633-2117 E-mail: emf@calct.ac.en http://www.easet.ac.en

CALIBRATION LABORATORY

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) 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%.

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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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	42.0	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.7 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	1	

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.47 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.51 W/kg ± 18.7 % (k=2)

Certificate No: 23J02Z80016

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.9Ω-2.47jΩ	
Return Loss	- 30.4dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	0.940 ns	1.11
----------------------------------	----------	------

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

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DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China

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CALIBRATION LABORATORY

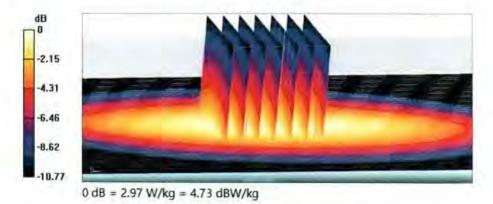
Date: 2023-09-12

Test Laboratory: CTTL, Beijing, China **DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045** Communication System: UID 0, CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz; σ = 0.901 S/m; ε_r = 41.74; ρ = 1000 kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(10.1, 10.1, 10.1) @ 750 MHz; Calibrated: 2023-03-31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2023-01-11
- 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 = 55.17 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.48 W/kg SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.39 W/kg Smallest distance from peaks to all points 3 dB below = 18.6 mm Ratio of SAR at M2 to SAR at M1 = 62% Maximum value of SAR (measured) = 2.97 W/kg



Certificate No: 23J02Z80016

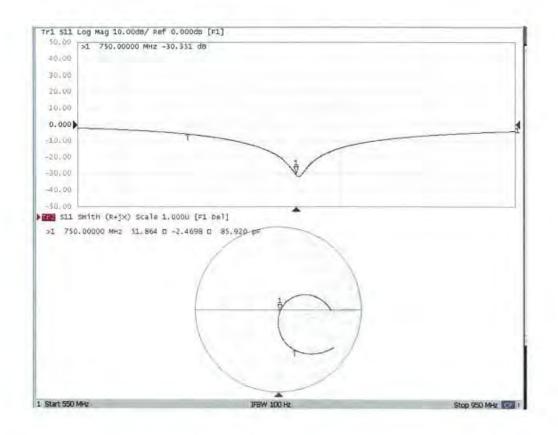
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	In Col	abora	tion wit	h		
TTL	S	P	е	а	g	CAICT
	CALIBRATION		ON LAP	ORAT	DRY	
Add: No.52	2 HuaYua	nBei R	oad, Ha	idian Di	istrict, Beijing, 100191, China	
Tel: +86-10	0-6230463	33-211	7			
E-mail: em	f@caict.s	ic.cn	h	ttp://ww	w.caict.ac.cn	

Impedance Measurement Plot for Head TSL



Certificate No: 23J02Z80016

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Report No.: R2309A0988-S1

ANNEX G: D835V2 Dipole Calibration Certificate

Engineering AG eughausstrasse 43, 8004 Zurici			C Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service
ocredited by the Swiss Accreditat he Swiss Accreditation Service fultilateral Agreement for the re	is one of the signatorie		Accreditation No.: SCS 0108
Client TA Shanghai City			D835V2-4d020_Sep23
CALIBRATION C	ERTIFICAT	E	
Object	D835V2 - SN:4d	020	
Calibration procedure(s)	QA CAL-05.v12 Calibration Proce	edure for SAR Validation Source	es between 0.7-3 GHz
Calibration date:	September 15, 2	023	
The measurements and the uncert All calibrations have been conduct	ainties with confidence p ed in the closed laborato	robability are given on the following pages a ry facility: environment temperature (22 ± 3)	nd are part of the certificate.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP2	ainties with confidence p ed 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 (Centilicate No.) 30-Mar-23 (No. 217-03804/03805)	nd are part of the certificate.
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP2 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination	ainties with confidence p ad in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 8H9394 (20k) SN: 310982 / 06327	robability are given on the following pages a ry facility: environment temperature (22 ± 3) <u>Cal Date (Certificate No.)</u> 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810)	nd 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&TE Primary Standards Power meter NRP2 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 laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 8H9394 (20k)	robability are given on the following pages a ry facility: environment temperature (22 ± 3) <u>Cal Date (Certificate No.)</u> 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809)	nd are part of the certificate, 'C and humidity < 70%, Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP2 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4	ainties with confidence p ad in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 8H9394 (20k) SN: 310982 / 06327 SN: 7349	robability are given on the following pages a ry facility: environment temperature (22 ± 3) <u>Cal Date (Certificate No.)</u> 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. EX3-7349_Jan23)	nd are part of the certificate. 'C and humidity < 70%. Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24 Dec-23
	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 104778 SN: 103245 SN: 8H9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601	Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. EX3-7349_Jan23) 19-Dec-22 (No. DAE4-601_Dec22)	nd are part of the certificate, 'C and humidity < 70%, Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24
The measurements and the uncert All calibrations have been conduct Calibration Equipment used (M&TE Primary Standards Power meter NRP2 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 Prover sensor HP 8481A	ainties with confidence p ed in the closed laborato critical for calibration) ID # SN: 104778 SN: 103245 SN: 103245 SN: 103245 SN: 8H9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 661 ID # SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972	Cal Date (Certilicate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. 217-03810) 10-Jan-23 (No. 217-03810) 10-Jan-23 (No. 217-03810) 10-Jan-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Ot-14 (In house) 30-Ot-14 (In house check Oct-22) 07-Oct-15 (In house check Oct-22) 07-Oct-15 (In house check Oct-22) 15-Jun-15 (In house check Oct-22)	nd are part of the certificate, 'C and humidity < 70%, Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24 Dec-23 Scheduled Check In house check: Oct-24 In house check: Oct-24
The measurements and the uncert All calibrations have been conducts Calibration Equipment used (M&TE Primary Standards Power meter NRP2 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 meter E44198 Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A	ainties with confidence p ed in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 8H9394 (20k) SN: 310982 (06327 SN: 7349 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: WY41093315 SN: 100972 SN: US41080477 Name	Cal Date (Certilicate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. 277-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. 277-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. 217-03804) 30-Oct-14 (In house) Check Date (In house) 30-Oct-14 (In house check Oct-22) 07-Oct-15 (In house check Oct-22) 07-Oct-15 (In house check Oct-22) 15-Jun-15 (In house check Oct-22) 31-Mar-14 (Im house check Oct-22) 31-Mar-14 (Im house check Oct-22)	nd are part of the certificate, 'C and humidity < 70%, Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24 Dec-23 Scheduled Check In house check: Oct-24 In house check: Oct-24



Calibration Laboratory	Ic
Schmid & Partner	
Engineering AG	

Zoughausstrasse 43, 6004 Zurich, Switzerland

According by the Swiss Accreditation Service (SAS)





S Schweizerlacher Kalibrierdienst Service suisse d'étalonnage Servizie svizzere di taratura Swiss Calibration Service

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	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%.

Contificate No: D835V2+4d020_Sap23

Page 2 of 6

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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	1

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity	
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m	
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.1 ± 6 %	0.93 mho/m ± 6 %	
Head TSL temperature change during test	< 0.5 °C			

SAR result with Head TSL

0 mW input power ormalized to 1W	2.49 W/kg 9.75 W/kg ± 17.0 % (k=2)
ormalized to 1W	9.75 W/kg ± 17.0 % (k=2)
condition	
0 mW input power	1.62 W/kg
overalling day atal	6.36 W/kg ± 16.5 % (k=2)
	0 mW input power

Certificate No; D835V2-4d020_Sep23

Page 3 of 6



Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.6 Ω - 3.8 jΩ	~
Return Loss	- 28.3 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.390 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

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Manufactured by		SPEAG	
ate No: D835V2-4d020_Sep23	Page 4 of 6		



DASY5 Validation Report for Head TSL

Date: 15.09.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d020

Communication System: UID 0 - CW; Frequency: 835 MHz Medium parameters used: f = 835 MHz; $\sigma = 0.93$ S/m; $\varepsilon_r = 42.1$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

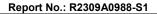
DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(9.69, 9.69, 9.69) @ 835 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

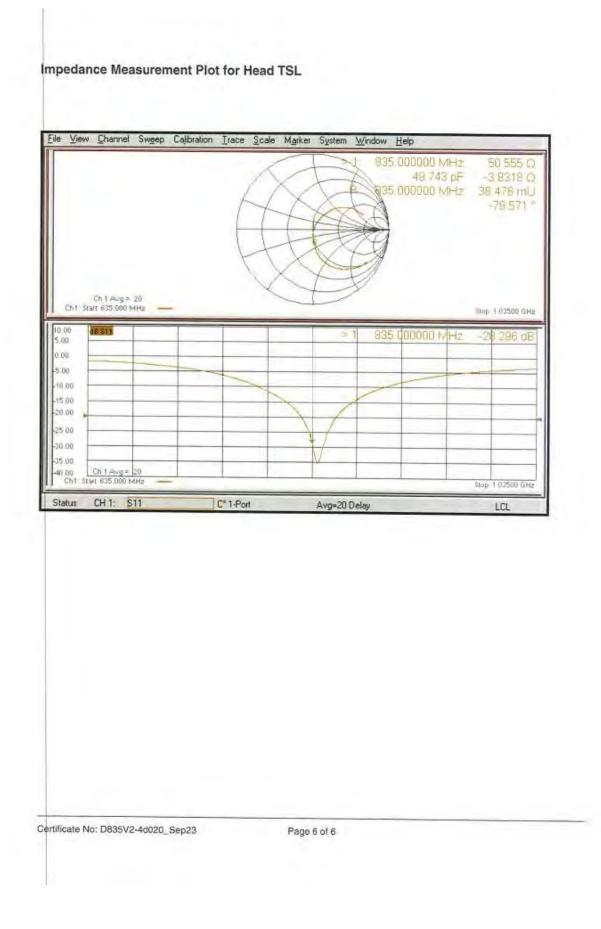
Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 66.58 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 3.74 W/kg SAR(1 g) = 2.49 W/kg; SAR(10 g) = 1.62 W/kg Smallest distance from peaks to all points 3 dB below = 16 mm Ratio of SAR at M2 to SAR at M1 = 66.4% Maximum value of SAR (measured) = 3.27 W/kg





eurofins

SAR Test Report



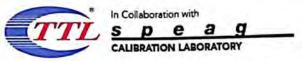
ANNEX H: D1750V2 Dipole Calibration Certificate

Add: No.52 HuaYuanBei Ro Tel: +86-10-62304633-2117 E-mail: emf@caict.ac.cn	http://www.caict		
•	hanghal)		23-60178
CALIBRATION CE	ERTIFICAT	E	
Object	D1750\	/2 - SN: 1033	
Calibration Procedure(s)	FF-Z11	-003-01	
	Calibra	tion Procedures for dipole validation kits	
Calibration date:	March 2	23, 2023	
		the uncertainties with confidence probabili	ty are given on the following
pages and are part of the ce	ertificate.	he closed laboratory facility: environmen	
pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used	ertificate.	he closed laboratory facility: environmen	
bages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used	ertificate. conducted in t (M&TE critical fo	he closed laboratory facility: environmen	t temperature (22±3)°C and
pages and are part of the ca All calibrations have been humidity<70%. Calibration Equipment used Primary Standards	ertificate. conducted in the (M&TE critical for ID #	he closed laboratory facility: environmen or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103)	t temperature (22±3)°C and Scheduled Calibration May-23 May-23
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pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	ertificate. conducted in t (M&TE critical for ID # 106276 101369 SN 7517 SN 1556	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23)	t temperature (22±3)°C and Scheduled Calibration May-23 May-23 Jan-24 Jan-24
pages and are part of the central calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	ertificate. conducted in the (M&TE critical for ID # 106276 101369 SN 7517 SN 1556 ID # ID # MY49070393	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.)	t temperature (22±3)°C and Scheduled Calibration May-23 May-23 Jan-24 Jan-24 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	ertificate. conducted in th (M&TE critical for ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No.J23X00104)	t temperature (22±3)°C and Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24 Jan-24
All calibrations have been 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	ertificate. conducted in the (M&TE critical for 10 # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673 Name	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No.J23X00104) Function	t temperature (22±3)°C and Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24
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	ertificate. conducted in th (M&TE critical for ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No.J23X00104)	t temperature (22±3)°C and Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24 Jan-24
Pages and are part of the cer 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	ertificate. conducted in the (M&TE critical for 10 # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673 Name	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No.J23X00104) Function	t temperature (22±3)°C and Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24 Jan-24

Certificate No: Z23-60178

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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) 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: Z23-60178

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Measurement Conditions

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

DASY Version	DASY52	52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

Carls of Company and Company of Company	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.5 ± 6 %	1.36 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	9.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.6 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.83 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.4 W/kg ± 18.7 % (k=2)

Certificate No: Z23-60178

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.2Ω- 0.98jΩ	
Return Loss	- 36.2dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1,128 ns
Electrical Delay (one anochory	The start

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
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Certificate No: Z23-60178

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DASY5 Validation Report for Head TSL

In Collaboration with

e

CALIBRATION LABORATORY

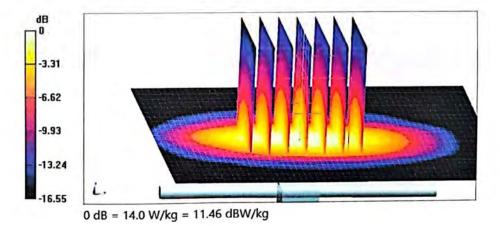
Date: 2023-03-23

Test Laboratory: CTTL, Beijing, China DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033 Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1750 MHz; $\sigma = 1.359 \text{ S/m}$; $\epsilon_r = 40.51$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) **DASY5** Configuration:

- Probe: EX3DV4 SN7517; ConvF(8.43, 7.84, 8.08) @ 1750 MHz; Calibrated: ٠ 2023-01-27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2023-01-11
- 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 = 92.78 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 16.5 W/kg SAR(1 g) = 9.09 W/kg; SAR(10 g) = 4.83 W/kg Smallest distance from peaks to all points 3 dB below = 10 mm Ratio of SAR at M2 to SAR at M1 = 55.7% Maximum value of SAR (measured) = 14.0 W/kg



Certificate No: Z23-60178

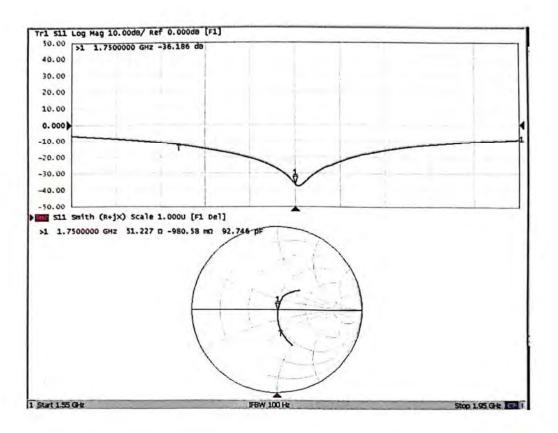
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Impedance Measurement Plot for Head TSL



Certificate No: Z23-60178

Page 6 of 6

ANNEX I: D1900V2 Dipole Calibration Certificate

B-mail: emf@caict.ac.cn Client TA(SI	http://www.caict hanghal)		3J02Z80017
CALIBRATION CI	A REAL PROPERTY AND	E	
Object	D1900	/2 - SN: 5d060	
Calibration Procedure(s)	EE 744	-003-01	
		tion Procedures for dipole validation kits	
Calibration date:	Septer	ber 12, 2023	
measurements (SI). The me	asurements and	the uncertainties with confidence probability	are given on the following
measurements (SI). The me pages and are part of the of All calibrations have been humidity<70%. Calibration Equipment used	easurements and ertificate. conducted in t I (M&TE critical for ID # 106277 104291	he closed laboratory facility: environment	
measurements (SI). The me pages and are part of the or All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4	easurements and ertificate. conducted in t (M&TE critical for ID # 106277 104291 SN 3617	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161)	temperature (22±3) ^{AC} and Scheduled Calibration Sep-23 Sep-23 Mar-24
measurements (SI). The me pages and are part of the or All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4	easurements and ertificate. conducted in t (M&TE critical for ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034)	temperature (22±3)°C and Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24
measurements (SI). The me pages and are part of the or All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	easurements and ertificate. conducted in t (M&TE critical for ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107)	temperature (22±3) ^{AC} and Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24
measurements (SI). The me pages and are part of the or All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E44380 NetworkAnalyzer E5071C	easurements and ertificate. conducted in t (M&TE critical fe ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430 MY46110673	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107) 10-Jan-23 (CTTL, No. J23X00104)	temperature (22±3)°C and Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24 Jan-24
pages and are part of the or All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	easurements and ertificate. conducted in t (M&TE critical for 106277 104291 SN 3617 SN 1556 ID # MY49071430 MY46110673 Name	he closed laboratory facility: environment or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107) 10-Jan-23 (CTTL, No. J23X00104) Function	temperature (22±3)°C and Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24 Jan-24

Certificate No: 23J02Z80017

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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) 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: 23J02Z80017

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Measurement Conditions

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

DASY Version	DASY52	52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	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	39.8 ± 6 %	1.42 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	10.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	40.4 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.25 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.9 W/kg ± 18.7 % (k=2)

Certificate No: 23J02Z80017

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.5Ω+ 6.32]Ω	
Return Loss	- 24.0dB	

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 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: 23J02Z80017

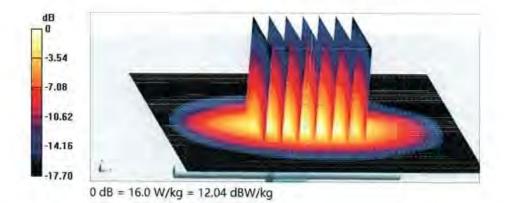
Page 4 of 6



In Collaboration with p е а CALIBRATION LABORATORY 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: 2023-09-12 Test Laboratory: CTTL, Beijing, China DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060 Communication System: UID 0, CW; Frequency: 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.42$ S/m; $\varepsilon_r = 39.77$; $\rho = 1000$ kg/m³ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration: . Probe: EX3DV4 - SN3617; ConvF(8.14, 8.14, 8.14) @ 1900 MHz; Calibrated: 2023-03-31 Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1556; Calibrated: 2023-01-11 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 = 96.76 V/m; Power Drift = -0.06 dB Peak SAR (extrapolated) = 19.4 W/kg SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.25 W/kg Smallest distance from peaks to all points 3 dB below = 9.2 mm

Ratio of SAR at M2 to SAR at M1 = 53%

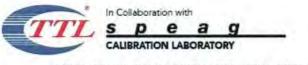
Maximum value of SAR (measured) = 16.0 W/kg



Certificate No: 23J02Z80017

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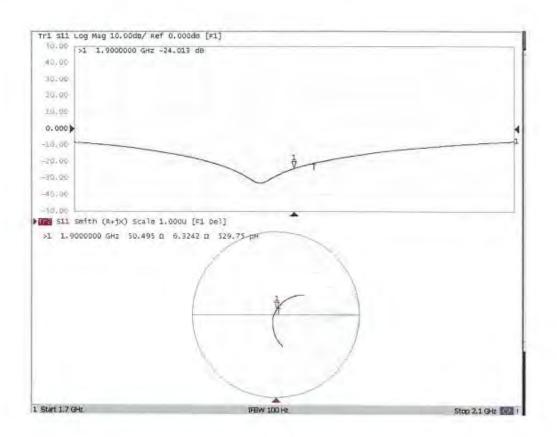






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Impedance Measurement Plot for Head TSL



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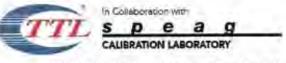
ANNEX J: D2450V2 Dipole Calibration Certificate

E-mail: cttl@chinattl.com	http://www.caic	Second (CE)	
Client TA(Sh	nanghal)	Certificate No: 23	J02Z80018
CALIBRATION CE	RTIFICAT	E	
Object	D2450\	/2 - SN: 786	
Calibration Procedure(s)	A.L	-003-01 tion Procedures for dipole validation kits	
Calibration date:	Septem	ber 12, 2023	
pages and are part of the ce	ertificate.	the uncertainties with confidence probability	
pages and are part of the ce All calibrations have been humidity<70%.	ertificate.	he closed laboratory facility: environment (
pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used	ertificate.	he closed laboratory facility: environment (
pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used	conducted in to (M&TE critical for	he closed laboratory facility: environment (or calibration)	lemperature (22±3)°C and
bages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S	(M&TE critical for ID # 106277 104291	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561)	emperature (22±3)°C and Scheduled Calibration Sep-23 Sep-23
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pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S	(M&TE critical for ID # 106277 104291	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561)	emperature (22±3)°C and Scheduled Calibration Sep-23 Sep-23
Pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4	ID # 106277 104291 SN 3617	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161)	emperature (22±3)°C and Scheduled Calibration Sep-23 Sep-23 Mar-24
pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24
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Pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24
Pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ertificate. conducted in the (M&TE critical for ID # 106277 104291 SN 3617 SN 3617 SN 1556 ID # MY49071430 MY46110673	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107) 10-Jan-23 (CTTL, No. J23X00104)	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24 Jan-24
Pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP8S Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	entificate. conducted in the (M&TE critical for ID # 106277 104291 SN 3617 SN 1556 ID # MY49071430 MY46110673 Name	he closed laboratory facility: environment (or calibration) Cal Date (Calibrated by, Certificate No.) 22-Sep-22 (CTTL, No.J22X09561) 22-Sep-22 (CTTL, No.J22X09561) 31-Mar-23(CTTL-SPEAG,No.Z23-60161) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 05-Jan-23 (CTTL, No. J23X00107) 10-Jan-23 (CTTL, No. J23X00104) Function	Scheduled Calibration Sep-23 Sep-23 Mar-24 Jan-24 Scheduled Calibration Jan-24 Jan-24

Certificate No: 23J02Z80018

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Report No.: R2309A0988-S1



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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.

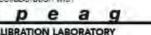
The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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Measurement Conditions

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

DASY Version	DASY52	52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	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	38.9 ± 6 %	1.81 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	13.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.6 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.13 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg ± 18.7 % (k=2)

Certificate No: 23J02Z80018

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.2Ω+ 3.34jΩ	
Return Loss	- 28.2dB	

General Antenna Parameters and Design

1.060 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
manual su of	or Erto

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DASY5 Validation Report for Head TSL

In Collaboration with p

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CALIBRATION LABORATORY

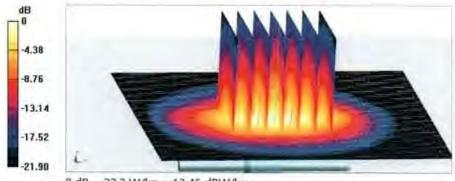
Date: 2023-09-12

Test Laboratory: CTTL, Beijing, China DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786 Communication System: UID 0, CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz; $\sigma = 1.809 \text{ S/m}$; $\varepsilon_r = 38.86$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(7.68, 7.68, 7.68) @ 2450 MHz; Calibrated: 2023-03-31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2023-01-11
- 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 = 100.7 V/m; Power Drift = -0.05 dB Peak SAR (extrapolated) = 27.6 W/kg SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.13 W/kg Smallest distance from peaks to all points 3 dB below = 8.5 mm Ratio of SAR at M2 to SAR at M1 = 48.5%

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



0 dB = 22.2 W/kg = 13.46 dBW/kg

Certificate No: 23J02Z80018

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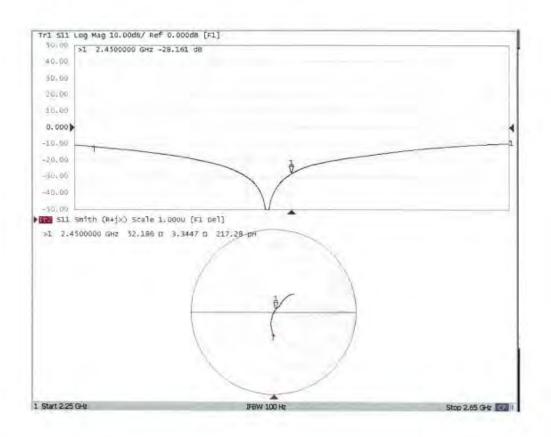






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Impedance Measurement Plot for Head TSL



Certificate No: 23J02Z80018

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ANNEX K: D2600V2 Dipole Calibration Certificate

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SAR Test Report

5-11-51- E3-11	Boi Road Haulian I	District, Beijing, 100191, Chi	NAS 校准 CALIBRATIO
Tel: +86-10-6230463	33-2079 Fax: +1	86-10-62304633-2504	CNAS L057
	nanghai)		21-60156
CALIBRATION CE	RTIFICAT	E	
Object	D2600V	/2 - SN: 1025	
Calibration Procedure(s)			
terrester and the second of all	FF-Z11-		
	Calibrat	tion Procedures for dipole validation kits	
Calibration date:	April 23	, 2021	
pages and are part of the ce	asurements and ertificate.		
	ertificate: conducted in t	he closed laboratory facility: environment or calibration)	temperature (22±3)*(* an
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards	ertificate: conducted in t		
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	ID # 106276	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965)	Scheduled Calibration May-21
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101359	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	Scheduled Calibration May-21 May-21
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	rtificate. conducted in t (M&TE critical for ID # 106276 101369 SN 3617	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21)	Scheduled Calibration May-21 May-21 Jan-22
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101359	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	Scheduled Calibration May-21 May-21
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	rtificate. conducted in t (M&TE critical for ID # 106276 101369 SN 3617	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21)	Scheduled Calibration May-21 May-21 Jan-22 Jan-22
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	rtificate. conducted in t (M&TE critical for ID # 106276 101369 SN 3617 SN 777	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(CTTL, No.EX3-3617_Jan21) 08-Jan-21(CTTL-SPEAG,No.Z21-60003)	Scheduled Calibration May-21 May-21 Jan-22 Jan-22
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	rtificate. conducted in t (M&TE critical for ID # 106276 101369 SN 3617 SN 777 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21 (CTTL, No.J20X02965) 28-Jan-21 (CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration May-21 May-21 Jan-22 Jan-22 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	rtificate. conducted in t (M&TE critical for ID # 106276 101369 SN 3617 SN 777 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21 (SPEAG,No.EX3-3617_Jan21) 08-Jan-21 (CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232)	Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22 Jan-22
All calibrations have been 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	rtificate. conducted in t (M&TE critical for ID # 106276 101389 SN 3617 SN 777 ID # MY49071430 MY46110673 Name	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21) 08-Jan-21(CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232) Function	Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22
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	rtificate. conducted in t (M&TE critical for ID # 106276 101369 SN 3617 SN 777 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21 (SPEAG,No.EX3-3617_Jan21) 08-Jan-21 (CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232)	Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22 Jan-22
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	rtificate. conducted in t (M&TE critical for ID # 106276 101389 SN 3617 SN 777 ID # MY49071430 MY46110673 Name	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21) 08-Jan-21(CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232) Function	Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22 Jan-22

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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%.

Certificate No: Z21-60156

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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	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

Temperature	Permittivity	Conductivity
22.0 °C	39.0	1.96 mho/m
(22.0 ± 0.2) *C	39.9±6%	1.94 mho/m ± 6 %
<1.0 °C		_
	22.0 °C (22.0 ± 0.2) °C	22.0 °C 39.0 (22.0 ± 0.2) °C 39.9 ± 6 %

SAR result with Head TSL

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.9 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.1 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg ± 18.7 % (k=2)

Certificate No: Z21-60156

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Appendix(Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1Q-7.19jQ	
Return Loss	- 22.9dB	_

General Antenna Parameters and Design

Electrical Delay (one direction)	1.055 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.

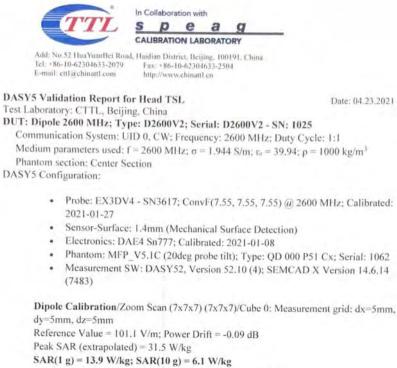
Additional EUT Data

Manufactured by	SPEAG
	01210

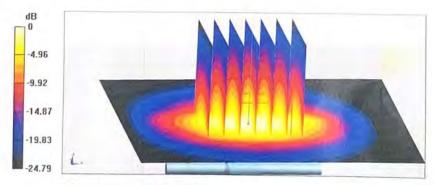
Certificate No: Z21-60156

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Smallest distance from peaks to all points 3 dB below = 9 mm Ratio of SAR at M2 to SAR at M1 = 44% Maximum value of SAR (measured) = 24.4 W/kg



0 dB = 24.4 W/kg = 13.87 dBW/kg

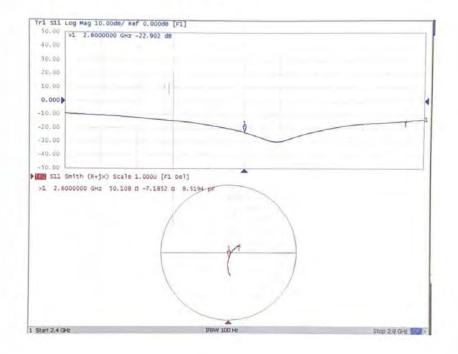
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Impedance Measurement Plot for Head TSL



Certificate No: Z21-60156

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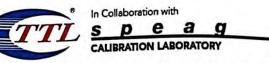
ANNEX L: D5GHzV2 Dipole Calibration Certificate

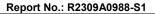
Client TA(S	hanghal)	Certificate No: Z2	23-60179
CALIBRATION CI	I LOT TO STORE OF LES	E	
Object	D5GHz	V2 - SN: 1151	
Calibration Procedure(s)	FF-Z11	-003-01	
		tion Procedures for dipole validation kits	
Calibration date:	March 2	24, 2023	
All calibrations have been humidity<70%.	conducted in t	he closed laboratory facility: environment	temperature (22±3)°C an
numidity<70%. Calibration Equipment used	I (M&TE critical fo	or calibration)	
numidity<70%. Calibration Equipment used Primary Standards	I (M&TE critical fo	or calibration) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
umidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	I (M&TE critical fo ID # 106276	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	I (M&TE critical fo ID # 106276 101369	or calibration) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	I (M&TE critical fo 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
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	I (M&TE critical fe ID # 106276 101369 SN 7517	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23)	Scheduled Calibration May-23 May-23 Jan-24
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	I (M&TE critical fo ID # 106276 101369 SN 7517 SN 1556	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034)	Scheduled Calibration May-23 May-23 Jan-24 Jan-24
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	I (M&TE critical fe ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	I (M&TE critical fe ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No. J23X00104)	Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24 Jan-24
numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	I (M&TE critical fe ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157)	Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	I (M&TE critical fo ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673 Name	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No.J23X00104) Function	Scheduled Calibration May-23 May-23 Jan-24 Jan-24 Scheduled Calibration May-24 Jan-24
humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	I (M&TE critical fe ID # 106276 101369 SN 7517 SN 1556 ID # MY49070393 MY46110673 Name Zhao Jing	Cal Date (Calibrated by, Certificate No.) 10-May-22 (CTTL, No.J22X03103) 10-May-22 (CTTL, No.J22X03103) 27-Jan-23(SPEAG,No.EX3-7517_Jan23) 11-Jan-23(CTTL-SPEAG,No.Z23-60034) Cal Date (Calibrated by, Certificate No.) 17-May-23 (CTTL, No.J22X03157) 10-Jan-23 (CTTL, No.J23X00104) Function SAR Test Engineer	Scheduled Calibratio May-23 May-23 Jan-24 Jan-24 Scheduled Calibratio May-24 Jan-24

Certificate No: Z23-60179

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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) 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%.

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Measurement Conditions

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

DASY Version	DASY52	52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 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 5250MHz

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	36.3 ± 6 %	4.80 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		<u> </u>

SAR result with Head TSL at 5250MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.77 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	77.9 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.0 W/kg ± 24.2 % (k=2)

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Head TSL parameters at 5600MHz

	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	35.7 ± 6 %	5.19 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		

SAR result with Head TSL at 5600MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	and the second second
SAR measured	100 mW input power	8.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.9 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.0 W/kg ± 24.2 % (k=2)

Head TSL parameters at 5750MHz

The following parameters and calculations were applied.

	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	35.4 ± 6 %	5.35 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		

SAR result with Head TSL at 5750MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.79 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	78.0 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	21.8 W/kg ± 24.2 % (k=2)

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CALIBRATION LABORATORY

Appendix (Additional assessments outside the scope of CNAS L0570)

a

Antenna Parameters with Head TSL at 5250MHz

In Collaboration with

s

Impedance, transformed to feed point	50.5Ω- 7.30jΩ	
Return Loss	- 22.8dB	

Antenna Parameters with Head TSL at 5600MHz

Impedance, transformed to feed point	55.9Ω- 4.67jΩ
Return Loss	- 23.0dB

Antenna Parameters with Head TSL at 5750MHz

Impedance, transformed to feed point	55.2Ω- 1.66jΩ
Return Loss	- 25.8dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.107 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.

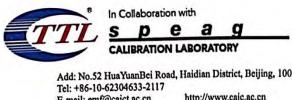
Additional EUT Data

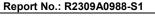
Manufactured by	SPEAG

Certificate No: Z23-60179

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Date: 2023-03-24

DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1151 Communication System: CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz Medium parameters used: f = 5250 MHz; σ = 4.799 S/m; ε r = 36.27; ρ = 1000 kg/m³

Medium parameters used: f = 5600 MHz; σ = 5.186 S/m; ε r = 35.66; ρ = 1000 kg/m³ Medium parameters used: f = 5750 MHz; σ = 5.354 S/m; ϵ r = 35.44; ρ = 1000 kg/m³ Phantom section: Right Section

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

- Probe: EX3DV4 SN7517; ConvF(5.83, 5.28, 5.47) @ 5250 MHz; ConvF(4.91, 4.55, 4.63) @ 5600 MHz; ConvF(5.16, 4.72, 4.83) @ 5750 MHz; Calibrated: 2023-01-27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2023-01-11
- 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=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 58.56 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 34.0 W/kg SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.19 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 62.8% Maximum value of SAR (measured) = 18.6 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan. dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 59.88 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 36.5 W/kg SAR(1 g) = 8.17 W/kg; SAR(10 g) = 2.3 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 62% Maximum value of SAR (measured) = 19.9 W/kg

Certificate No: Z23-60179

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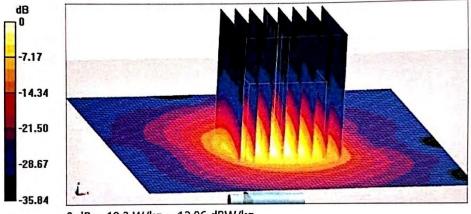






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Dipole Calibration /Pin=100mW, d=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 58.42 V/m; Power Drift = -0.06 dB Peak SAR (extrapolated) = 36.5 W/kg SAR(1 g) = 7.79 W/kg; SAR(10 g) = 2.18 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 60.6% Maximum value of SAR (measured) = 19.3 W/kg



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

Certificate No: Z23-60179

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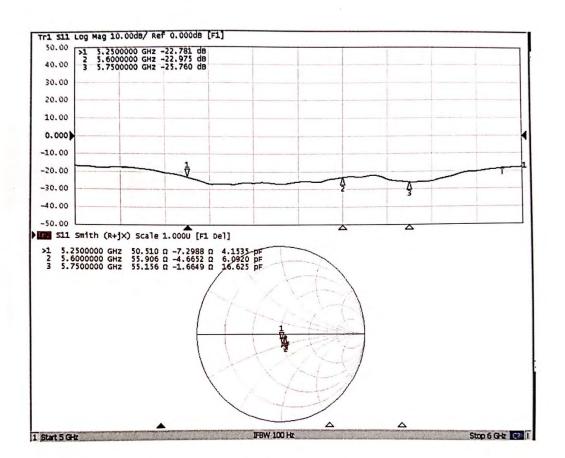






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Impedance Measurement Plot for Head TSL



Certificate No: Z23-60179



Report No.: R2309A0988-S1

ANNEX M: CLA13 Dipole Calibration Certificate

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



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

Accreditation No.: SCS 0108

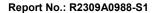
Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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CALIBRATION C	ERTIFICATE		
Object	CLA13 - SN: 102	4	
Calibration procedure(s)	QA CAL-15.v9 Calibration Proce	edure for SAR Validation Sources	below 700 MHz
Calibration date:	September 12, 2	022	
The measurements and the uncerta	ainties with confidence p	ional standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature $(22 \pm 3)^{\circ}$	ad are part of the certificate.
Primary Standards		Col Data (Contiliante No.)	
Power meter NRP	SN: 104778	Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524)	Scheduled Calibration
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03525/03524) 04-Apr-22 (No. 217-03524)	Apr-23 Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03524) 04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	
in and the set of the restored	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23 Apr-23
Type-N mismatch combination			
And the second	SN: 3877	31-Dec-21 (No EX3-3877 Dec21)	Dec. 22
Reference Probe EX3DV4	SN: 3877 SN: 654	31-Dec-21 (No. EX3-3877_Dec21) 26-Jan-22 (No. DAE4-654_Jan22)	Dec-22 Jan-23
Reference Probe EX3DV4 DAE4	1.80310.010		Jan-23
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B	SN: 654	26-Jan-22 (No. DAE4-654_Jan22)	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor E4412A	SN: 654 ID # SN: GB41293874 SN: MY41498087	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22)	Jan-23 Scheduled Check
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A	SN: 654 ID.# SN: GB41293874 SN: MY41498087 SN: 000110210	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22)	Jan-23 Scheduled Check In house check: Jun-24
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A RF generator HP 8648C	SN: 654 ID # SN: GB41293874 SN: MY41498087 SN: 000110210 SN: US3642U01700	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 04-Aug-99 (in house check Jun-22)	Jan-23 Scheduled Check In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Jun-24
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A RF generator HP 8648C	SN: 654 ID.# SN: GB41293874 SN: MY41498087 SN: 000110210	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22)	Jan-23 Scheduled Check In house check: Jun-24 In house check: Jun-24 In house check: Jun-24
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A RF generator HP 8648C	SN: 654 ID # SN: GB41293874 SN: MY41498087 SN: 000110210 SN: US3642U01700	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 04-Aug-99 (in house check Jun-22)	Jan-23 Scheduled Check In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Oct-22
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A	SN: 654 ID # SN: GB41293874 SN: MY41498087 SN: 000110210 SN: US3642U01700 SN: US41080477	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 04-Aug-99 (in house check Jun-22) 31-Mar-14 (in house check Oct-20)	Jan-23 Scheduled Check In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Oct-22 Signature
Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A RF generator HP 8648C Network Analyzer Agilent E8358A	SN: 654 ID # SN: GB41293874 SN: MY41498087 SN: 000110210 SN: US3642U01700 SN: US41080477 Name	26-Jan-22 (No. DAE4-654_Jan22) Check Date (in house) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 06-Apr-16 (in house check Jun-22) 04-Aug-99 (in house check Jun-22) 31-Mar-14 (in house check Oct-20) Function	Jan-23 Scheduled Check In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Jun-24 In house check: Oct-22



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



S Schweizerischer Kalibrierdienst Service sulsse 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

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: CLA13-1024_Sep22

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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	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	13 MHz ± 1 MHz	

Head TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	55.0	0.75 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	0.74 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	1 W input power	0.566 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	0.571 W/kg ± 18.4 % (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 1 W input power	0.352 W/kg

Certificate No: CLA13-1024_Sep22

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.3 Ω + 2.4 jΩ	
Return Loss	- 26.9 dB	

Additional EUT Data

13 / C 10 / C 10 / C	
Manufactured by	SPEAG

Certificate No: CLA13-1024_Sep22

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DASY5 Validation Report for Head TSL

Date: 12.09.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA13; Type: CLA13; Serial: CLA13 - SN: 1024

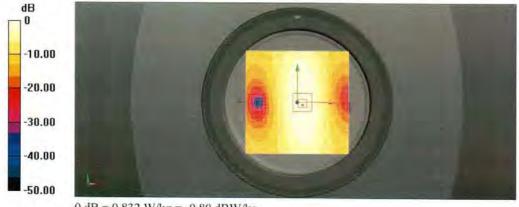
Communication System: UID 0 - CW; Frequency: 13 MHz Medium parameters used: f = 13 MHz; $\sigma = 0.74$ S/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: EX3DV4 SN3877; ConvF(15.33, 15.33, 15.33) @ 13 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 26.01.2022
- Phantom: ELI v4.0; Type: QDOVA001BB; Serial: TP:1003
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

CLA Calibration for HSL-LF Tissue/CLA-13, touch configuration, Pin=1W/Zoom Scan,

dist=1.4mm (8x10x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 29.77 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 1.14 W/kg SAR(1 g) = 0.566 W/kg; SAR(10 g) = 0.352 W/kg Smallest distance from peaks to all points 3 dB below = 18.7 mm Ratio of SAR at M2 to SAR at M1 = 78.6% Maximum value of SAR (measured) = 0.832 W/kg



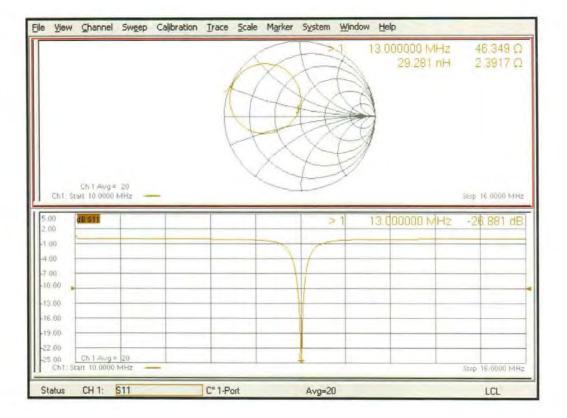
0 dB = 0.832 W/kg = -0.80 dBW/kg

Certificate No: CLA13-1024_Sep22

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Impedance Measurement Plot for Head TSL



Certificate No: CLA13-1024_Sep22

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ANNEX N: DAE4 Calibration Certificate (SN: 1291)

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SAR Test Report

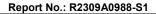
E-mail: emf@caict.ac.cn Client : TA(Shanghai)	Certificate	No: Z23-60184
CALIBRATION	CERTIFICAT	E	
Object	DAE4	SN: 1291	
Calibration Procedure(s)	FF-211	-002-01 Ition Procedure for the Data Acquis	ition Electronics
Calibration date:	March	17, 2023	
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Certificate No: Z23-60184

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DC Voltage Measurement A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV, 61nV, -100...+300 mV full range = Low Range: 1LSB = 61nV, full range = -1.....+3mV DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	x	Y	Z
High Range	402.588 ± 0.15% (k=2)	403.258 ± 0.15% (k=2)	403.183 ± 0.15% (k=2)
Low Range	3.97410 ± 0.7% (k=2)	3.97852±0.7% (k=2)	3.97390 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	167°±1°
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Glossary: DAE Connector angle

data acquisition electronics

information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

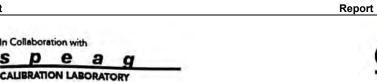
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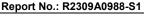
Certificate No: Z23-60185

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SAR Test Report







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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ =0 is normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system Calibration is Performed According to the Following Standards:

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

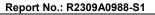
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

- Methods Applied and Interpretation of Parameters:
- NORMx,y,z: Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z* frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- Ax, y, z; Bx, y, z; Cx, y, z; VRx, y, z: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3883

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(µV/(V/m)2)^	0.39	0.23	0.40	±10.0%
DCP(mV) ^B	100.1	97.7	99.3	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	C	D dB	VR mV	Unc ^E (<i>k</i> =2)	
0 CW	CW	X	0.0	0.0	1.0	0.00	153.1	±2.6%	
		10.1	Y	0.0	0.0	1.0	19	104.6	
	1.4	Z	0.0	0.0	1.0		153.3		

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%.

A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4).

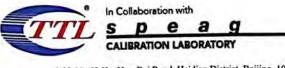
^B Numerical linearization parameter: uncertainty not required.

^E Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3883

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz] ^c	Relative Permittivity ^F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	9.70	9.70	9.70	0.20	1.12	±12.7%
835	41.5	0.90	9.35	9.35	9.35	0.12	1.41	±12.7%
1750	40.1	1.37	8.10	8.10	8.10	0.22	1.15	±12.7%
1900	40.0	1.40	7.85	7.85	7.85	0.22	1.15	±12.7%
2100	39.8	1.49	7.92	7.92	7.92	0.24	1.09	±12.7%
2300	39.5	1.67	7.71	7.71	7.71	0.53	0.70	±12.7%
2450	39.2	1.80	7.46	7.46	7.46	0.54	0.70	±12.7%
2600	39.0	1.96	7.19	7.19	7.19	0.42	0.81	±12.7%
3300	38.2	2.71	6.94	6.94	6.94	0.30	0.98	±13.9%
3500	37.9	2.91	6.74	6.74	6.74	0.27	1.06	±13.9%
3700	37.7	3.12	6.58	6.58	6.58	0.26	1.16	±13.9%
3900	37.5	3.32	6.45	6.45	6.45	0.30	1.45	±13.9%
4100	37.2	3.53	6.34	6.34	6.34	0.30	1.40	±13.9%
4400	36.9	3.84	6.15	6.15	6.15	0.30	1.48	±13.9%
4600	36.7	4.04	6.06	6.06	6.06	0.30	1.55	±13.9%
4800	36.4	4.25	6.02	6.02	6.02	0.40	1.38	±13.9%
4950	36.3	4.40	5.80	5.80	5.80	0.40	1.38	±13.9%
5250	35.9	4.71	5.19	5.19	5.19	0.45	1.40	±13.9%
5600	35.5	5.07	4.60	4.60	4.60	0.45	1.40	±13.9%
5750	35.4	5.22	4.71	4.71	4.71	0.45	1.40	±13.9%

^c Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequency up to 6 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

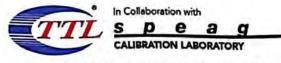
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than \pm 1% for frequencies below 3 GHz and below \pm 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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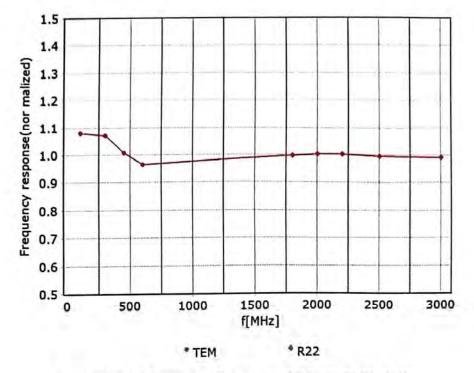






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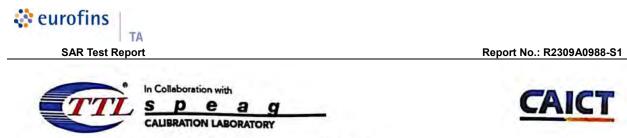
Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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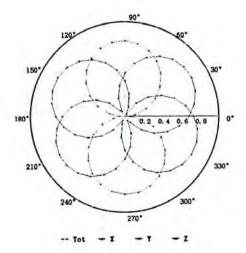


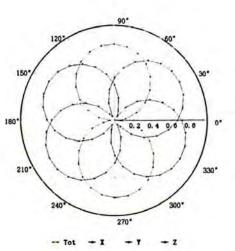
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Receiving Pattern (Φ), θ=0°

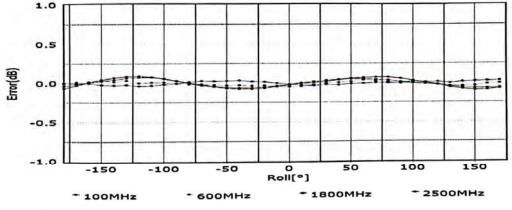
f=600 MHz, TEM

f=1800 MHz, R22





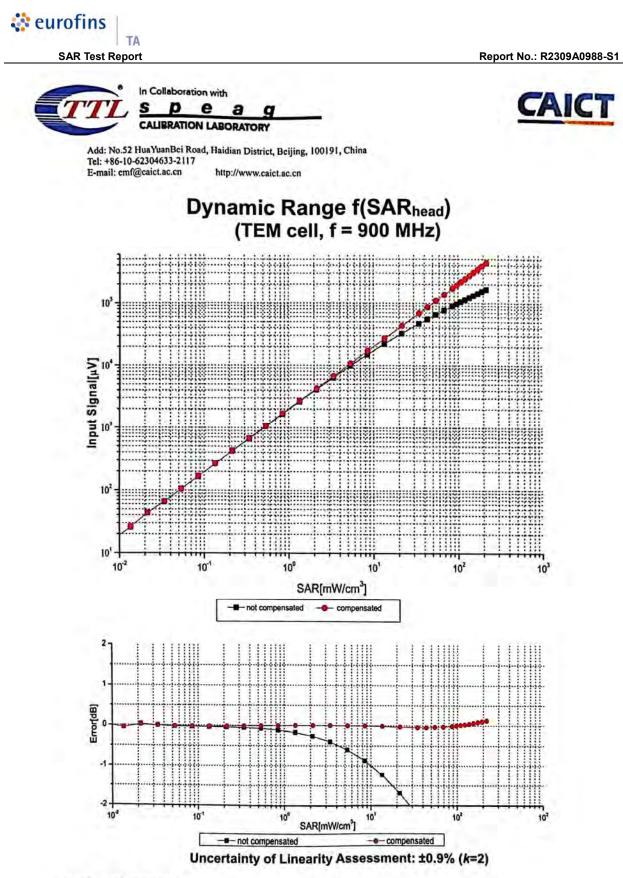




Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

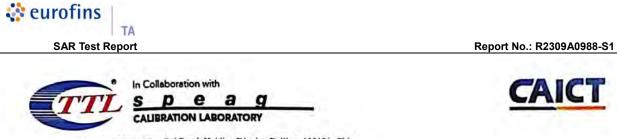
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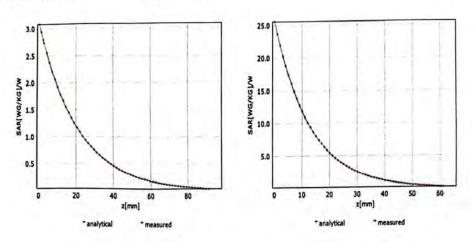


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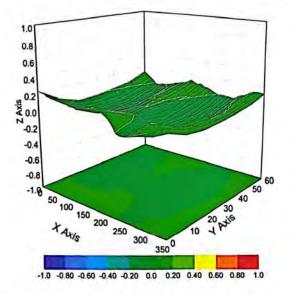
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)



Deviation from Isotropy in Liquid

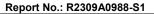


Uncertainty of Spherical Isotropy Assessment: ±3.2% (k=2)

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3883

Sensor Arrangement	Triangular
Connector Angle (°)	132.3
Mechanical 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

Other Probe Parameters

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🛟 eurofins

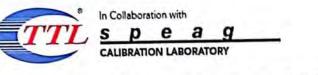
ANNEX O: DAE4 Calibration Certificate (SN: 1692)

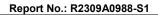
E-mail: emf@caict.ac.cn Client : TA(http://www.caict.ac.((Shanghal)		No: Z22-60518
CALIBRATION	CERTIFICA	TE	
Object	DAE4	- SN: 1692	
Calibration Procedure(s)	FF-Z1	1-002-01 ation Procedure for the Data Acquis <)	ition Electronics
Calibration date:	Nover	nber 18, 2022	
pages and are part of the	e certificate.	d the uncertainties with confidence probation of the closed laboratory facility: enviror	
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pages and are part of the All calibrations have be humidity<70%. Calibration Equipment us Primary Standards	e certificate. een conducted in sed (M&TE critical	the closed laboratory facility: enviror for calibration)	nment temperature(22±3)°C an
pages and are part of the All calibrations have be humidity<70%. Calibration Equipment us Primary Standards	e certificate. een conducted in sed (M&TE critical ID # Ca	the closed laboratory facility: enviror for calibration) al Date(Calibrated by, Certificate No.)	nment temperature(22±3)°C an Scheduled Calibration
pages and are part of the All calibrations have be humidity<70%. Calibration Equipment us Primary Standards Process Calibrator 753	e certificate. een conducted in sed (M&TE critical ID # Ca 1971018	the closed laboratory facility: enviror for calibration) al Date(Calibrated by, Certificate No.) 14-Jun-22 (CTTL, No.J22X04180)	nment temperature(22±3)°C an Scheduled Calibration Jun-23
pages and are part of the	e certificate. een conducted in sed (M&TE critical ID # Ca 1971018 Name	the closed laboratory facility: enviror for calibration) al Date(Calibrated by, Certificate No.) 14-Jun-22 (CTTL, No.J22X04180) Function	nment temperature(22±3)°C an Scheduled Calibration Jun-23

Certificate No: Z22-60518

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Glossary: DAE Connector angle

data acquisition electronics information used in DASY system to align probe sensor X to the robot coordinate system.

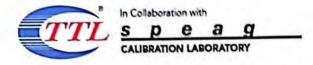
Methods Applied and Interpretation of Parameters:

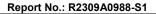
- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

Certificate No: Z22-60518

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DC Voltage Measurement

 A/D - Converter Resolution nominal

 High Range:
 1LSB =
 6.1μV ,
 full range =
 -100...+300 mV

 Low Range:
 1LSB =
 61nV ,
 full range =
 -1.....+30W

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

Calibration Factors	x	Y	Z
High Range	404.475±0.15% (k=2)	404.550 ± 0.15% (k=2)	404.407 ± 0.15% (k=2)
Low Range	3.95073 ± 0.7% (k=2)	$4.00277 \pm 0.7\%$ (k=2)	3.97904 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	335°±1°
New York, and the second s	

Certificate No: Z22-60518

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ANNEX P: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX Q: Test Setup Photos

The Test Setup Photos are submitted separately.



ANNEX R: Product Change Description

The Product Change Description are submitted separately.

******END OF REPORT ******