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Test report No:
2360091R-RF-US-P03V01

SAR TEST REPORT

Product Name	VR All-In-One Headset
Trademark	HMD Model: A7H10
Model and /or type reference	PICO
FCC ID	2ATRW-A7H10-1
IC	25707-A7H10-1
Applicant´s name / address	Qingdao Pico Technology Co., Ltd. 4 Floor, 3 Building, No. 393 Songling Road, Laoshan District, Qingdao, China
Test method requested, standard	FCC 47CFR §2.1093 BS IEC/IEEE 62209-1528:2020 IEEE Std 1528-2013 ANSI C95.1:2019 RSS-102 Measurement (SAR):2021
Maximum SAR	Head SAR: Standalone SAR **0.708** W/kg; Simultaneous SAR **0.74** W/kg Limbs SAR: Standalone SAR **1.115** W/kg; Simultaneous SAR **1.246** W/kg
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Tim Cao/Project Manager Tim Cao
Approved by (name / position & signature)	Jack Zhang/ Manager Jack Zhang
Date of issue	2023-07-05
Report version	V1.0
Report template No	Template_FCC&ISED SAR-RF-V1.0

FCC Designation Number	CN1199
ISED CAB identifier	CN0040

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.
In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date (receive sample)	Jun. 05, 2023
Date (start test)	Jun. 09, 2023
Date (finish test)	Jun. 30, 2023

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
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ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	18 °C – 25 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2360091R-RF-US-P03V01	V1.0	Initial issue of report.	Jul. 05, 2023

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with FCC 47 CFR§2.1093,BS IEC/IEEE 62209-1528:2020,IEEE Std 1528-2013,ANSI C95.1:2019,RSS-102 Measurement (SAR):2021.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:

- Chapter 1.1 General Description of the Item(s);
- Chapter 1.2 Antenna Information.
- Chapter 1.3 Antenna location map.
- Chapter 1.4 802.11ax RU configurations
- Chapter 1.5 Power setting in test.

1 General Information

1.1 General Description of the Item(s)

Product Name ..... :	VR All-In-One Headset
Model No. ..... :	HMD Model:A7H10
Hardware Version. ..... :	R4
Software Version. ..... :	5.9.0.0
Firmware Version. ..... :	5.9.0.0
FCC ID ..... :	2ATRW-A7H10-1
IC ..... :	25707-A7H10-1
Manufacturer ..... :	Qingdao Pico Technology Co., Ltd.
Manufacturer address ..... :	4 Floor, 3 Building, No. 393 Songling Road, Laoshan District, Qingdao, China

Wireless specifiction..... :	Wi-Fi	
Operating frequency range(s) ..... :	2400~2483.5MHz	
Type of modulation..... :	DSSS: BPSK,QPSK,CCK OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM	
Number of channel..... :	802.11b/g/n/ax(20MHz): 11 802.11n/ax(40MHz): 7	
Data Rate ..... :	802.11b: 1/2/5.5/11 Mbps	
	802.11g: 6/9/12/18/24/36/48/54 Mbps	
	802.11n: up to 300 Mbps	
	802.11ax: up to 574 Mbps	
Device category ..... :	☐	Fixed point-to-point
	☐	Emit multiple directional beams, simultaneously or sequentially
	☒	Other cases

Wireless specifiction..... :	Wi-Fi			
Type of Modulation..... :	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM			
Frequency Range ..... :	☒	5150MHz~5250MHz	☐	Outdoor AP
			☐	Indoor AP
			☐	Fixed point-to-point AP

			☒	Mobile and Portable Client
	☒	5250MHz~5350MHz		
	☒	5470MHz~5725MHz	☒	With TDWR Channels
			☐	Without TDWR Channels
	☒	5725MHz~5850MHz		
Date Rate ..... :	802.11a: 6/9/12/18/24/36/48/54 Mbps			
	802.11n: up to 600 Mbps			
	802.11ac: up to 1.7 Gbps			
	802.11ax: up to 2.4 Gbps			

Wireless specification..... :	Bluetooth					
Operating frequency range(s) ..... :	2400~2483.5MHz					
Type of Modulation..... :	GFSK					
PHYs ..... :	☒	GFSK	☒	Pi/4 DQPSK	☒	8DPSK
Data Rate ..... :	☒	1Mbit/s	☒	2Mbit/s	☒	3Mbit/s
Number of channel..... :	79					

Wireless specifiction..... :	Bluetooth					
Operating frequency range(s)	2402~2480MHz					
Type of Modulation..... :	GFSK					
PHYs ..... :	☒	LE 1M	☒	LE 2M	☒	LE Coded S=2/8
Data Rate ..... :	☒	1Mbit/s	☒	2Mbit/s	☒	500/125 Kbit/s
Number of channel..... :	40					

Rated power supply ..... :	Voltage and Frequency	
	☐	AC: 220 – 240 V, 50/60 Hz
	☐	AC: 100 – 240 V, 50/60 Hz
	☐	DC: 3.85 Vdc
	☒	Battery: …3.85Vdc…
	☒	Adapter: Input: 100-240V,50/60Hz,0.5A Output:5V.3A/9V,2A/12V,1.5A

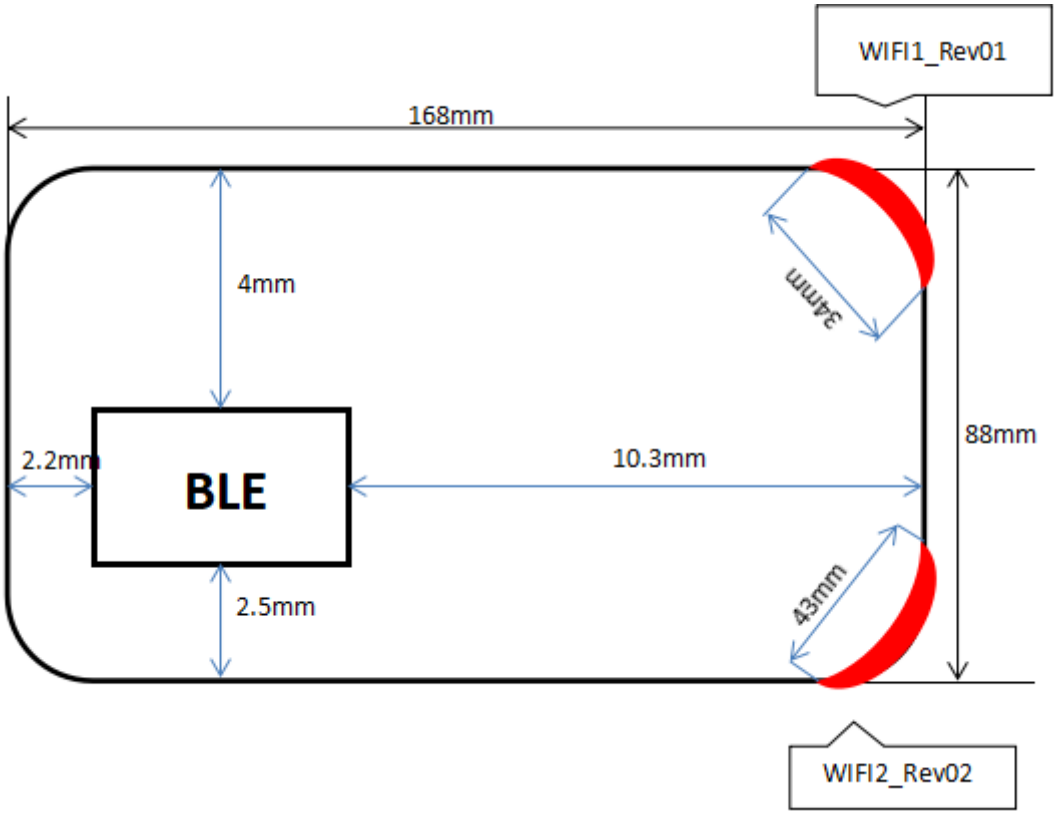
Mounting position ..... :	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☒	Head-mounted equipment
	☐	Other: ……

1.2 Antenna Information

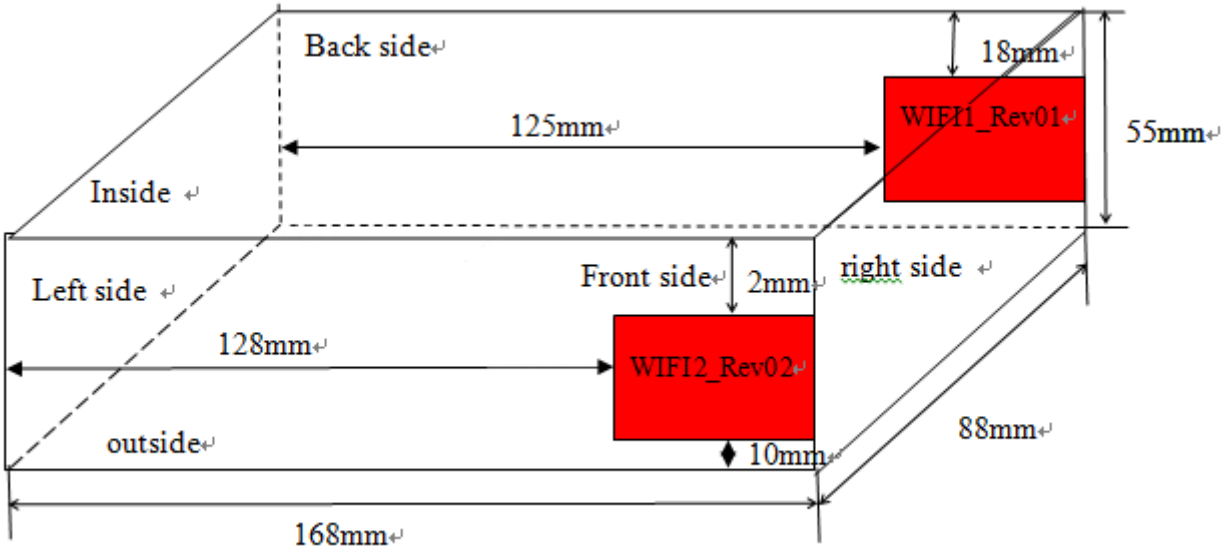
Antenna Delivery ..... :	☒	1TX + 1RX		
	☒	2TX + 2RX		
	☐	Others:……		
Antenna technology ..... :	☒	SISO		
	☒	MIMO	☒	CDD
			☐	Beam-forming
Antenna Type ..... :	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☐	Ceramic Chip
			☐	PIFA
			☒	FPC
			☐	Others……..

1.3 Antenna location map

Edge inside (Close to the face)



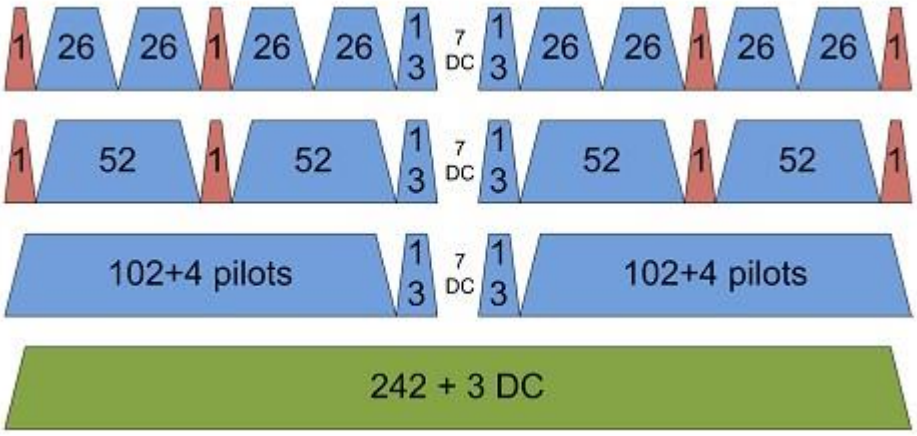
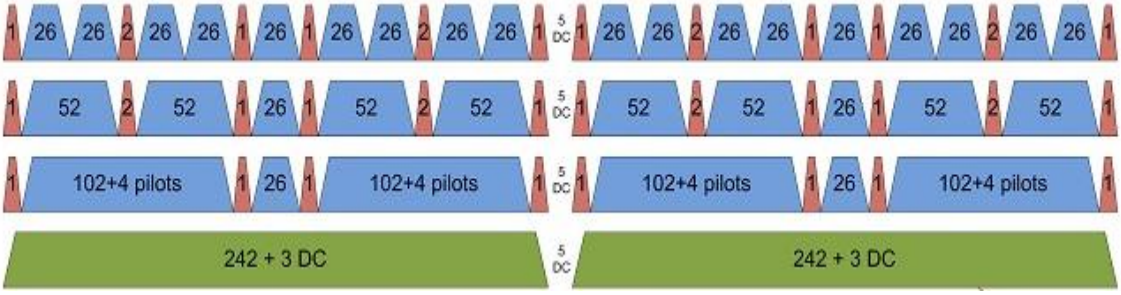
Graphic model



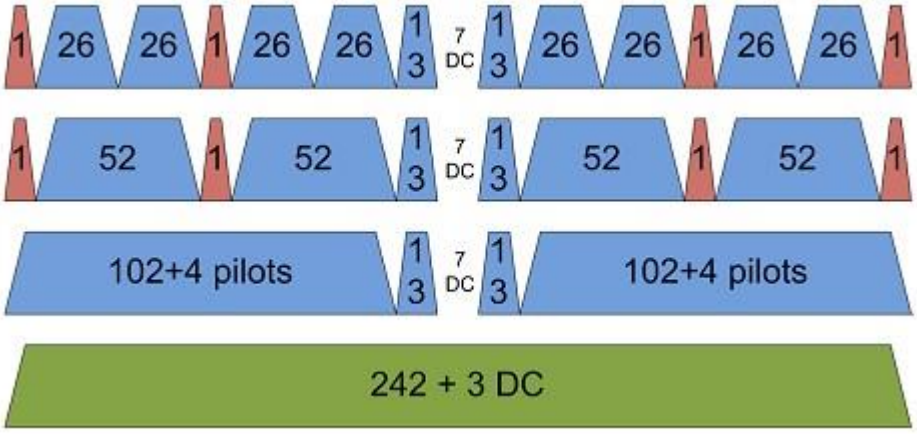
Exposure Position	Wireless Interface	2.4GHz WLAN ANT 1	2.4GHz WLAN ANT 2	2.4GHz WLAN ANT 1+2	5GHz WLAN ANT 1	5GHz WLAN ANT 2	5GHz WLAN ANT 1+2
	Calculated Frequency	2462MHz	2462MHz	2462MHz	5825MHz	5825MHz	5825MHz
	Maximum power (dBm)	17	17	20	20	20	23
	Maximum rated power(mW)	50.0	50.0	100.0	100.0	100.0	200.0
In Side	Separation distance(mm)	5.0	5.0	5.0	5.0	5.0	5.0
	exclusion threshold	15.7	15.7	31.4	48.3	48.3	96.5
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Out Side	Separation distance(mm)	10.0	10.0	10.0	10.0	10.0	10.0
	exclusion threshold	7.9	7.9	15.7	24.1	24.1	48.3
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Front	Separation distance(mm)	88.0	0.0	0.0	88.0	0.0	0.0
	exclusion threshold	476.0	15.7	31.4	442.0	48.3	96.5
	Testing required?	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
Back	Separation distance(mm)	0.0	88.0	0.0	0.0	88.0	0.0
	exclusion threshold	15.7	476.0	31.4	48.3	442.0	96.5
	Testing required?	**Yes**	**No**	**Yes**	**Yes**	**No**	**Yes**
Left Side	Separation distance(mm)	125.0	128.0	125.0	125.0	128.0	125.0
	exclusion threshold	846.0	876.0	846.0	812.0	842.0	812.0
	Testing required?	**No**	**No**	**No**	**No**	**No**	**No**
Right Side	Separation distance(mm)	0.0	0.0	0.0	0.0	0.0	0.0
	exclusion threshold	15.7	15.7	31.4	48.3	48.3	96.5
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

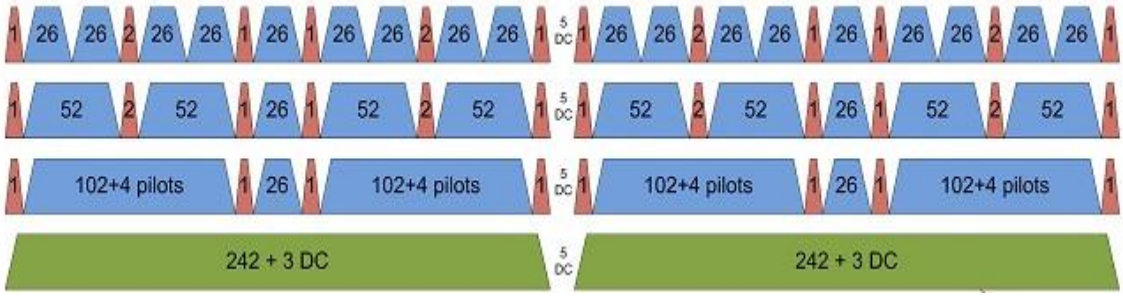
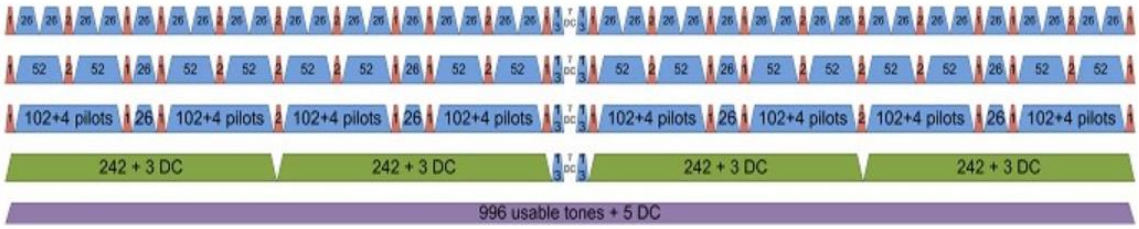
1.4 802.11ax RU configurations:

For 2.4G Wi-Fi

Bandwidth	RU all configurations
20MHz	
40MHz	

For 5G Wi-Fi

Bandwidth	RU all configurations
20MHz	

40MHz	
80MHz	

Note:

1. Note 1: For partial RU, the value of Determine δ =PSDpar- PSDfull≤0, so band edge only shown wost data in each band.
2. The output power of partial RU is lower than that of full RU, so we did not evaluate the test for partial RU.

1.5 Power setting in test

Mode	Frequency (MHz)	Power setting		
		SISO:ANT1	SISO:ANT2	CDD:ANT1+2
802.11b	2412	15	15	14
	2437	15	15	14
	2462	15	15	14
802.11g	2412	14.5	14.5	14
	2437	14.5	14.5	14
	2462	14.5	14.5	14
802.11n(20MHz)	2412	14.5	14.5	15
	2437	14.5	14.5	15
	2462	14.5	14.5	15
802.11n(40MHz)	2422	15	15	15
	2437	15	15	15
	2452	15	15	15
802.11ax(20MHz)	2412	14.5	14.5	15
	2437	14.5	14.5	15
	2462	14.5	14.5	15
802.11ax(40MHz)	2422	15	15	15
	2437	15	15	15
	2452	15	15	15

Test Mode	Frequency	Power Setting		
		SISO:ANT1	SISO:ANT2	CDD:ANT1+2
802.11a	5180	14	14	8.5
	5220	14	14	8.5
	5240	14	14	8.5
	5260	18	18	15
	5300	18	18	15
	5320	18	18	15
	5500	18	18	15
	5580	18	18	15
	5700	18	18	15
	5745	18	18	18
	5785	18	18	18

	5825	18	18	18
802.11n(20MHz)	5180	14	14	8.5
	5220	14	14	8.5
	5240	14	14	8.5
	5260	18	18	15
	5300	18	18	15
	5320	18	18	15
	5500	18	18	15
	5580	18	18	15
	5700	18	18	15
	5745	18	18	18
	5785	18	18	18
	5825	18	18	18
802.11n(40MHz)	5190	11	11	15.5
	5230	11	11	15.5
	5270	18	18	18
	5310	18	18	18
	5510	16	16	16
	5550	16	16	16
	5670	16	16	16
	5755	16	16	16
	5795	16	16	16
802.11ac(20MHz)	5180	14	14	8.5
	5220	14	14	8.5
	5240	14	14	8.5
	5260	18	18	15
	5300	18	18	15
	5320	18	18	15
	5500	18	18	15
	5580	18	18	15
	5700	18	18	15
	5745	18	18	18
	5785	18	18	18
	5825	18	18	18
802.11ac(40MHz)	5190	11	11	15.5
	5230	11	11	15.5

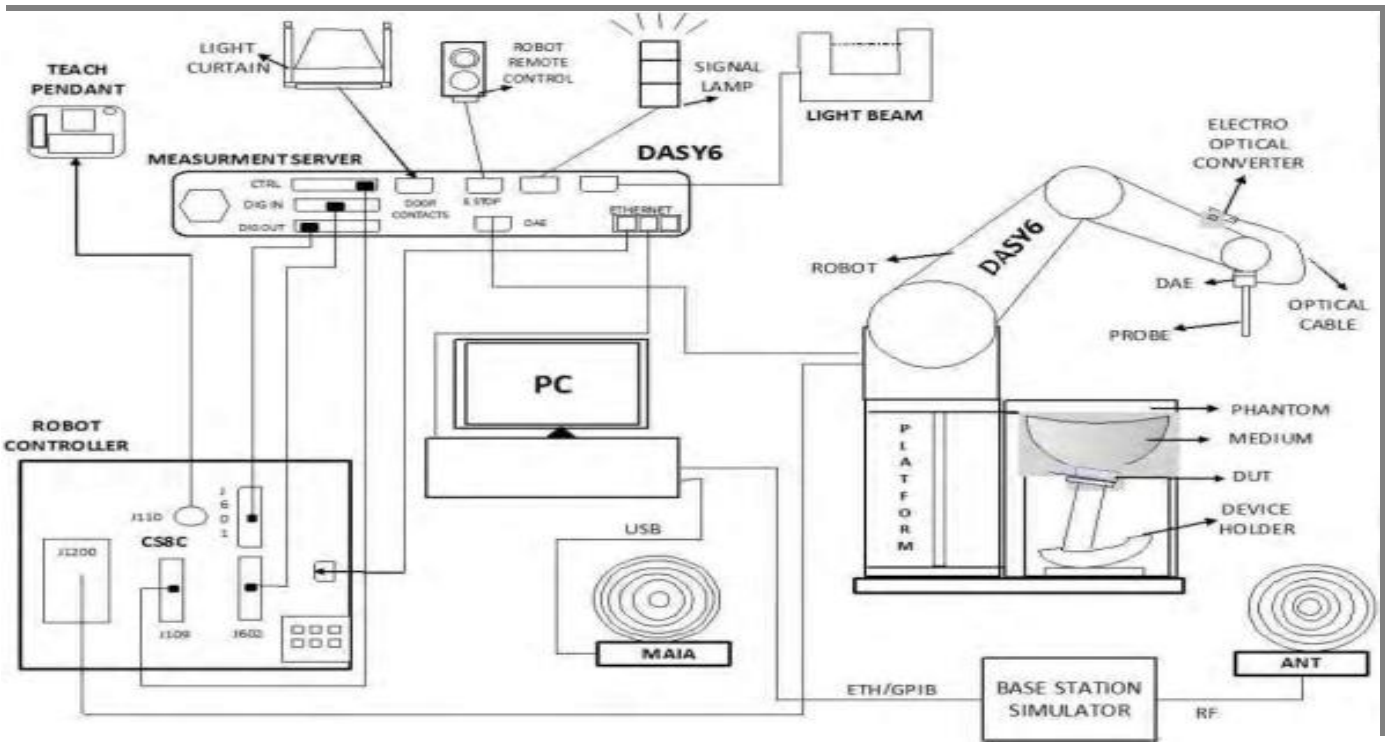
	5270	18	18	18
	5310	18	18	18
	5510	16	16	16
	5550	16	16	16
	5670	16	16	16
	5755	16	16	16
	5795	16	16	16
802.11ac(80MHz)	5210	15.5	15.5	12
	5290	16	16	16
	5530	16	16	16
	5775	16	16	16
802.11ax(20MHz)	5180	14	14	8.5
	5220	14	14	8.5
	5240	14	14	8.5
	5260	18	18	15
	5300	18	18	15
	5320	18	18	15
	5500	18	18	15
	5580	18	18	15
	5700	18	18	15
	5745	18	18	18
	5785	18	18	18
	5825	18	18	18

Mode	Channel	Frequency (MHz)	Power Setting
DH5	00	2402	Default
	39	2441	Default
	78	2480	Default
2DH5	00	2402	Default
	39	2441	Default
	78	2480	Default
3DH5	00	2402	Default
	39	2441	Default
	78	2480	Default

Mode	Channel	Frequency (MHz)	Power setting
LE_1Mbps	00	2402	Default
	19	2440	Default
	39	2480	Default
LE_2Mbps	00	2402	Default
	19	2440	Default
	39	2480	Default
LE_Coded S=2	00	2402	Default
	19	2440	Default
	39	2480	Default
LE_Coded S=8	00	2402	Default
	19	2440	Default
	39	2480	Default

2 SAR MEASUREMENT SYSTEM

2.1 DASY6 System Description



The DASY5 system for performing compliance tests consists of the following items:
1. A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
3. The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
4. The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
5. A computer running WinXP and the DASY6 software.
6. Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
7. The phantom, the device holder and other accessories according to the targeted measurement.

2.1.1. Applications

Predefined procedures and evaluations for automated compliance testing with all worldwide standards, e.g., IEC/IEEE 62209-1528, EN 50566, EN 50383, EN62311 and others.

2.1.2. Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 10mm² step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEC/IEEE 62209-1528 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

2.1.3. Zoom Scan (Cube Scan Averaging)

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. A density of 1000 kg/m³ is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21,5mm.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of 7x7x7 (5mmx5mmx5mm) providing a volume of 30mm in the X & Y axis, and 30mm in the Z axis.

2.1.4. Uncertainty of Inter-/Extrapolation and Averaging

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Postprocessor, DASY6 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEC/IEEE 62209-1528.The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x,y,z) = Ae^{-\frac{z}{2a}} \cos^2\left(\frac{\pi}{2}\frac{\sqrt{x'^2+y'^2}}{5a}\right)$$

$$f_2(x,y,z) = Ae^{-\frac{z}{a}} \frac{a^2}{a^2+x'^2}\left(3-e^{-\frac{2z}{a}}\right)\cos^2\left(\frac{\pi}{2}\frac{y'}{3a}\right)$$

$$f_3(x,y,z) = A\frac{a^2}{\frac{a^2}{4}+x'^2+y'^2}\left(e^{-\frac{2z}{a}}+\frac{a^2}{2(a+2z)^2}\right)$$

2.2 DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.
SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEC/IEEE 62209-1528, etc.) under ISO 17025. The calibration data are in Appendix D**.**

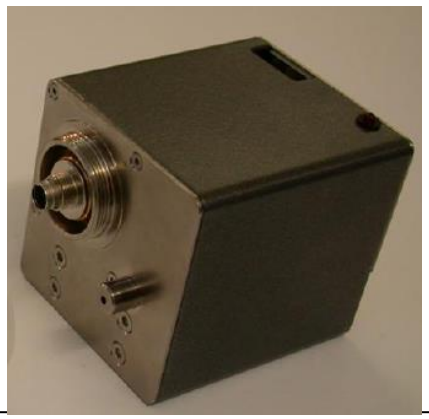
Model	EX3DV4	
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

2.3 Boundary Detection Unit and Probe Mounting Device

The DASY probes use a precise connector and an additional holder for the probe, consisting of a plastic tube and a flexible silicon ring to center the probe. The connector at the DAE is flexibly mounted and held in the default position with magnets and springs. Two switching systems in the connector mount detect frontal and lateral probe collisions and trigger the necessary software response.

2.4 DATA Acquisition Electronics (DAE) and Measurement Server

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit.
Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.



The DASY6 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chipdisk and 128MB RAM. The necessary circuits for communication with the DAE electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY6 I/O board, which is directly connected to the PC/104 bus of the CPU board.

2.5 Robot

The DASY6 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY6 system, the CS8C robot controller version from Stäubli is used.

The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller

2.6 Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.

The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.

2.7 Device Holder

The DASY6 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).

Thus the device needs no repositioning when changing the angles.

The DASY6 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity εr =3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

The DASY6 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity εr =3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

2.8 SAM Twin Phantom

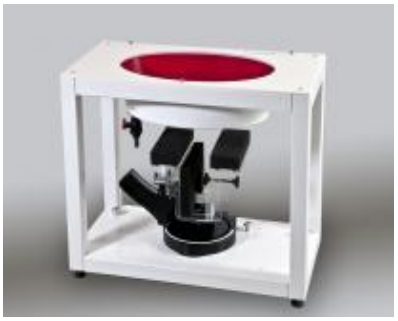
SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

ELI Phantom



The SAM phantom is a fiberglass shell phantom with 2mm shell thickness. It has one measurement areas:

- ELI phantom

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

3 TISSUE SIMULATING LIQUID

3.1 The composition of the tissue simulating liquid

Simulate 600MHz~10000MHz liquid, manufactured by SPEAG

Table F.1 – Suggested recipes for achieving target dielectric properties, 30 MHz to 900 MHz

Frequency (MHz)	30	50		144		450		835	900	
Recipe source number	3	3	2	2	3	2	4	2	2	4
Ingredients (% by weight)										
De-ionized water	48,30	48,30	53,53	55,12	48,30	48,53	56	50,36	50,31	56
Tween 20			44,70	43,31		49,51		48,39	48,34	
Oxidized mineral oil							44			44
Diethylenglycol monohexylether										
Triton X-100										
Diacetin	50,00	50,00			50,00					
DGBE										
NaCl	1,60	1,60	1,77	1,57	1,60	1,96		1,25	1,35	
Additives and salt	0,10	0,10			0,10					
Measured temperature dependence										
Temp. (°C)			21	21		21	20	21	21	20
$\varepsilon_{\text{liquid temp. unc.}}$ (%)	0,8	0,1			0,1	0,1		0,04	0,04	
$\sigma_{\text{liquid temp. unc.}}$ (%)	2,8	2,8			2,6	4,2		1,6	1,6	

Table F.2 – Suggested recipes for achieving target dielectric properties, 1 800 MHz to 10 000 MHz

Frequency (MHz)	1 800		2 450	4 000	5 000	5 200	5 800	6 000	8 000	10 000
Recipe source number	2	4	4	4	4	1	1	4	5	5
Ingredients (% by weight)										
De-ionized water	54,23	56	56	56	56	65,53	65,53	56	67,8	66,0
Tween	45,27								31,1	33,0
Oxidized mineral oil		44	44	44	44			44		
Diethylenglycol monohexylether						17,24	17,24			
Triton X-100						17,24	17,24			
Diacetin										
DGBE										
NaCl	0,50									
Additives and salt										
Measured temperature dependence										
Temp. (°C)	21	20	20	20	20	22	22	20	20	20
$\varepsilon_{\text{liquid temp. unc.}}$ (%)	0,4					1,7	1,8			
$\sigma_{\text{liquid temp. unc.}}$ (%)	2,3					2,7	2,6			

NOTE 1 Multiple columns under a single frequency indicate optional recipes.

NOTE 2 Recipe source numbers: 1 verified by different labs, 2 Reference [59], 3 developed by IT'IS Foundation, 4 developed by IT'IS Foundation, 5 Reference [60].

NOTE 3 The values of $\varepsilon_{\text{liquid temp. unc.}}$ and $\sigma_{\text{liquid temp. unc.}}$ are liquid temperature uncertainties described in O.9.6, based on measurements of the applicable liquid recipes given above. These are not part of the original publications but have been subsequently developed by the project team.

NOTE 4 The recipes at 8 000 MHz and 10 000 MHz are sufficiently broadband that they cover the frequency range of 6 000 MHz to 10 000 MHz within a tolerance of ±10 % for permittivity and conductivity.

3.2 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY6 Dielectric Probe Kit and Agilent Vector Network Analyzer E5071C

Head Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
2450 MHz	Reference result ± 5% window	39.2 37.24 to 41.16	1.80 1.71 to 1.89	N/A
	28-06-2023	38.53	1.86	21.0
5250 MHz	Reference result ± 5% window	35.9 34.11 to 37.70	4.71 4.47 to 4.95	N/A
	30-06-2023	36.40	4.59	21.0
5600 MHz	Reference result ± 5% window	35.5 33.73 to 37.28	5.07 4.82 to 5.32	N/A
	05-08-2023	35.82	4.98	21.0
5750 MHz	Reference result ± 5% window	35.4 33.63 to 37.17	5.22 4.96 to 5.48	N/A
	03-23-2023	35.57	5.16	21.0

Head Tissue Simulant Measurement							
Frequency [MHz]	Dielectric Parameters						Tissue Temp. [°C]
	Permittivity ε_r	Conductivity σ	Permittivity Target ε_r	Conductivity Target σ	Delta (ε_r) %	Delta (σ) %	
2412	38.74	1.80	39.27	1.77	-1.42	1.69	21.0
2422	38.64	1.82	39.25	1.78	-1.68	2.25	21.0
2437	38.61	1.84	39.22	1.79	-1.51	2.79	21.0
2462	38.49	1.87	39.20	1.80	-1.81	3.89	21.0
2480	38.43	1.89	39.15	1.83	-1.96	3.28	21.0
5260	36.55	4.51	35.94	4.72	1.81	-4.45	21.0
5320	36.30	4.67	35.87	4.78	1.11	-2.30	21.0
5500	36.38	4.83	35.63	4.97	2.19	-2.82	21.0
5580	35.96	4.91	35.53	5.05	1.30	-2.77	21.0
5700	35.66	5.10	35.40	5.17	0.73	-1.35	21.0
5745	35.61	5.13	35.36	5.22	0.59	-1.72	21.0
5785	35.55	5.20	35.32	5.26	0.71	-1.14	21.0
5825	35.52	5.23	35.28	5.30	0.62	-1.32	21.0

Note:

1. The delta (ε_r) and (σ) are within ±5%, delta SAR value was not calculated in this report.
2. As per IEC/IEEE 62209-1528 Annex F, the SAR correction factor is given by:

   $\Delta SAR = c_\varepsilon \Delta\varepsilon_r + c_\sigma \Delta\sigma$

   For the1g average SAR Cε and Cσ are given by:

   Cε = -7.854x10^-4f^3 + 9.402x10^-3f^2 – 2.742x10^-2f – 0.2026

   Cσ = 9.804x10^-3f^3 – 8.661x10^-2f^2 + 2.981x10^-2f + 0.7829

   Where f is the frequency in GHz.

Head Tissue Simulant Measurement						
Frequency [MHz]	Dielectric Parameters					Tissue Temp. [°C]
	Delta (ε_r) %	Delta (σ) %	Cε	Cσ	Delta SAR%	
2412	-1.42	1.69	-0.22	0.75	1.59	21.0
2422	-1.68	2.25	-0.22	0.75	2.06	21.0
2437	-1.51	2.79	-0.22	0.75	2.43	21.0
2462	-1.81	3.89	-0.23	0.60	2.76	21.0
2480	-1.96	3.28	-0.23	0.60	2.40	21.0
5260	1.81	-4.45	-0.23	0.59	-3.04	21.0
5320	1.11	-2.30	-0.23	0.60	-1.64	21.0
5500	2.19	-2.82	-0.23	0.60	-2.18	21.0
5580	1.30	-2.77	-0.23	0.59	-1.94	21.0
5700	0.73	-1.35	-0.23	0.63	-1.02	21.0
5745	0.59	-1.72	-0.23	0.63	-1.21	21.0
5785	0.71	-1.14	-0.23	0.62	-0.87	21.0
5825	0.62	-1.32	-0.22	0.75	-1.13	21.0
Note: The ΔSAR refers to the percent change in SAR relative to the percent change in dielectric properties versus the target values. A negative ΔSAR would translate to a lower measured SAR value than what would be measured if using dielectric properties equal to the target values. A positive ΔSAR would translate to a higher measured SAR value than what would be measured if using dielectric properties equal to the target values. SAR correction shall not be made when the ΔSAR has a positive sign to provide a conservative SAR value.The SAR is only corrected when ΔSAR has a negative sign.						

3.3 Tissue Dielectric Parameters for Head Phantoms

The head tissue dielectric parameters recommended by the IEC/IEEE 62209-1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in IEC/IEEE 62209-1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in IEC/IEEE 62209-1528.

Target Frequency	Head	
(MHz)	ε_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
750	41.9	0.89
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

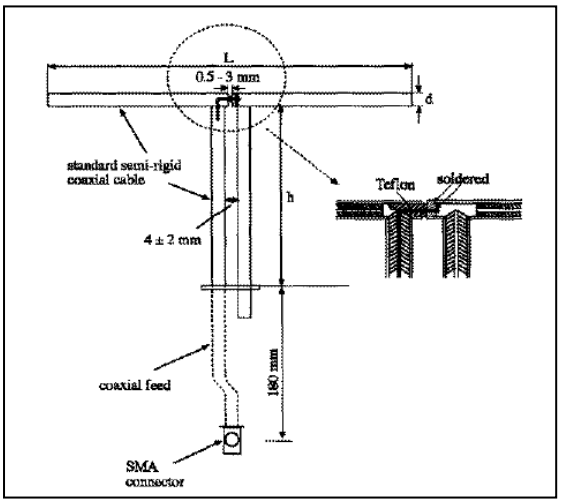
3500	37.9	2.91
4000	37.4	3.43
4500	36.8	3.94
5000	36.2	4.45
5200	36.0	4.66
5600	35.5	5.07
5800	35.3	5.27
6000	35.1	5.48
6500	34.5	6.07
7000	33.9	6.65

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

4 SAR MEASUREMENT PROCEDURE

4.1 SAR System Validation

4.1.1. Validation Dipoles



The dipoles used is based on the IEC/IEEE 62209-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
2450MHz	53.5	30.4	3.6
5250MHz	20.6	14.2	3.6
5600MHz	20.6	14.2	3.6
5750MHz	20.6	14.2	3.6

4.1.2. Validation Result

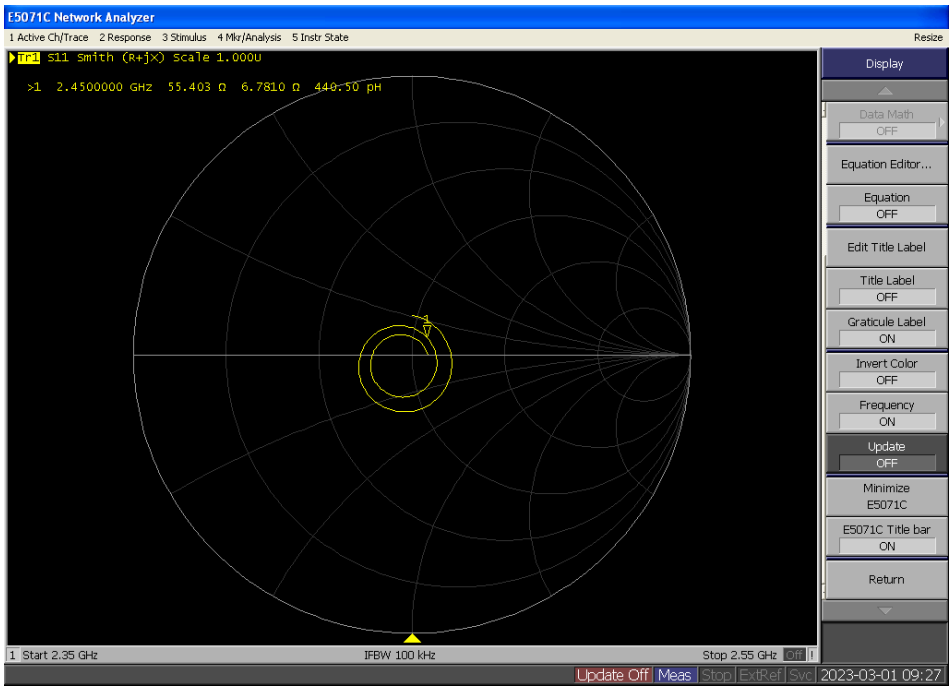
System Performance Check at 2450MHz, 5250MHz, 5600MHz, 5750MHz				
Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
2450 MHz	Reference result ± 10% window	52.6 47.3 to 57.9	24.3 21.9 to 26.7	N/A
	28-06-2023	50.0	23.1	21.0
5250 MHz	Reference result ± 10% window	76.0 68.4 to 83.6	21.6 19.44 to 23.76	N/A
	30-06-2023	77.7	21.9	21.0
5600 MHz	Reference result ± 10% window	79.5 71.6 to 87.5	22.4 20.2 to 24.6	N/A
	30-06-2023	81.8	22.9	21.0
5750 MHz	Reference result ± 10% window	75.7 68.1 to 83.3	22.0 19.8 to 24.2	N/A
	30-06-2023	76.3	21.5	21.0
Note: All SAR values are normalized to 1W forward power.				

4.1.3. Dipole Calibration Data

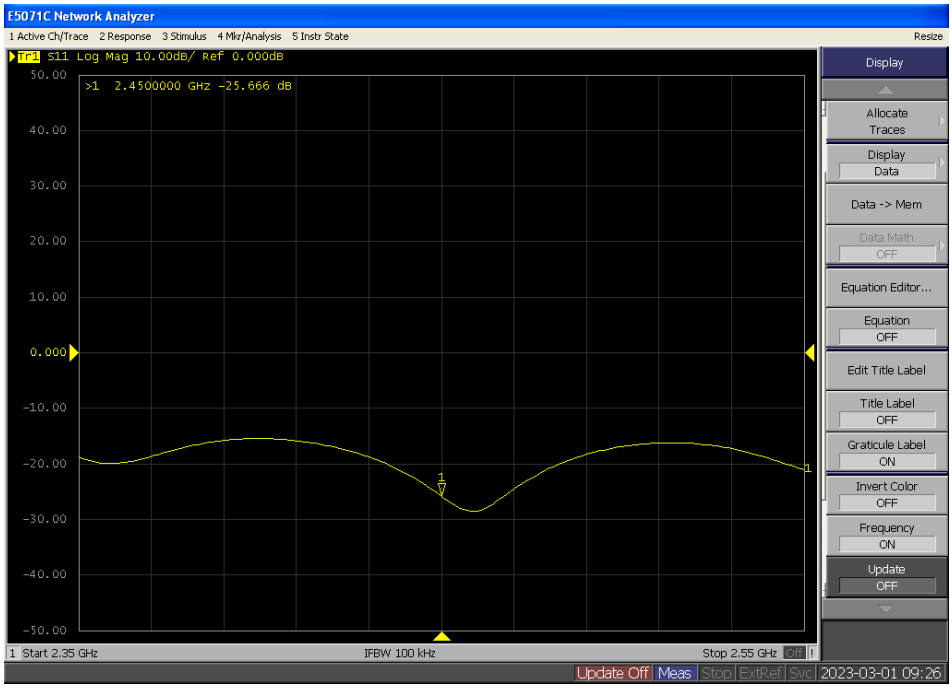
Impedance Plot for D2450V2

2450MHz Head

Calibrated impedance: 54.028 Ω; Measured impedance: 55.403 Ω (within 5Ω)



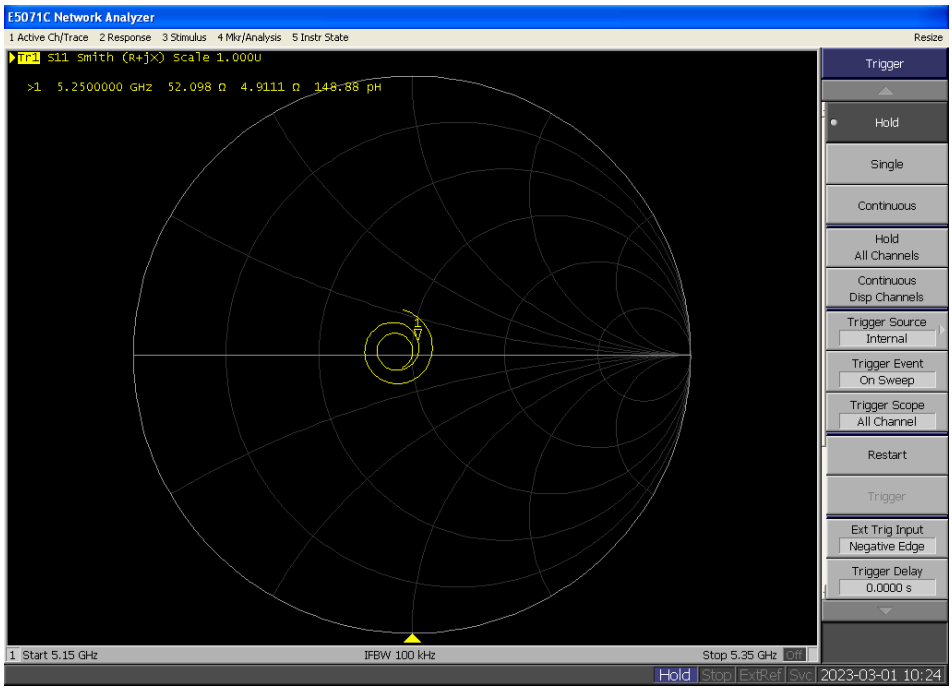
Calibrated return loss: -25.693 dB; Measured impedance: -25.666 dB (within 20%)



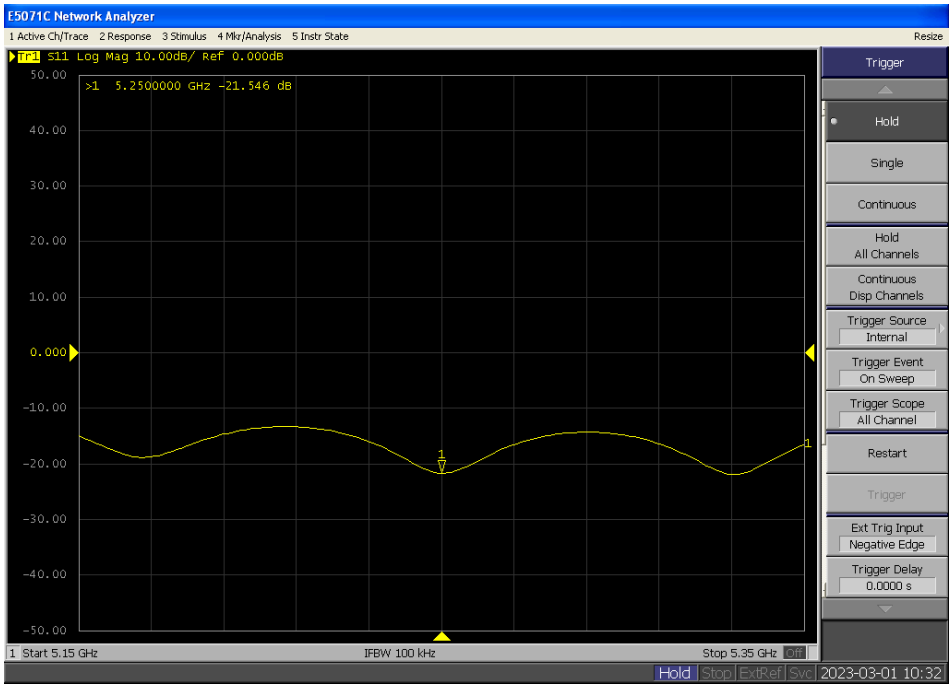
Impedance Plot for D5GHzV2

5250MHz Head

Calibrated impedance: 52.316 Ω; Measured impedance: 52.096 Ω (within 5Ω)



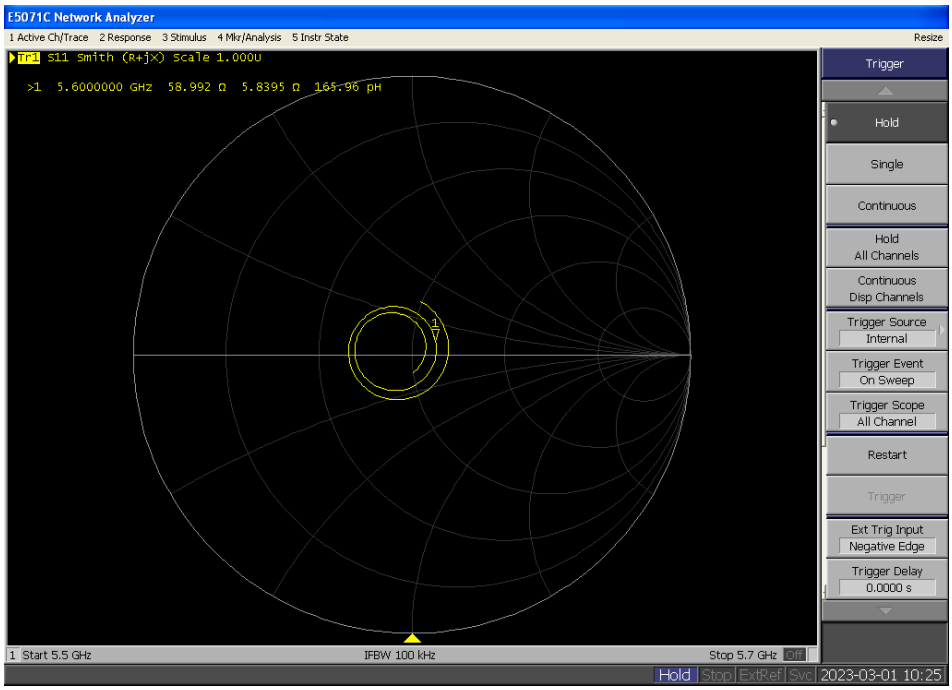
Calibrated return loss: -22.294 dB; Measured impedance: -21.546 dB (within 20%)



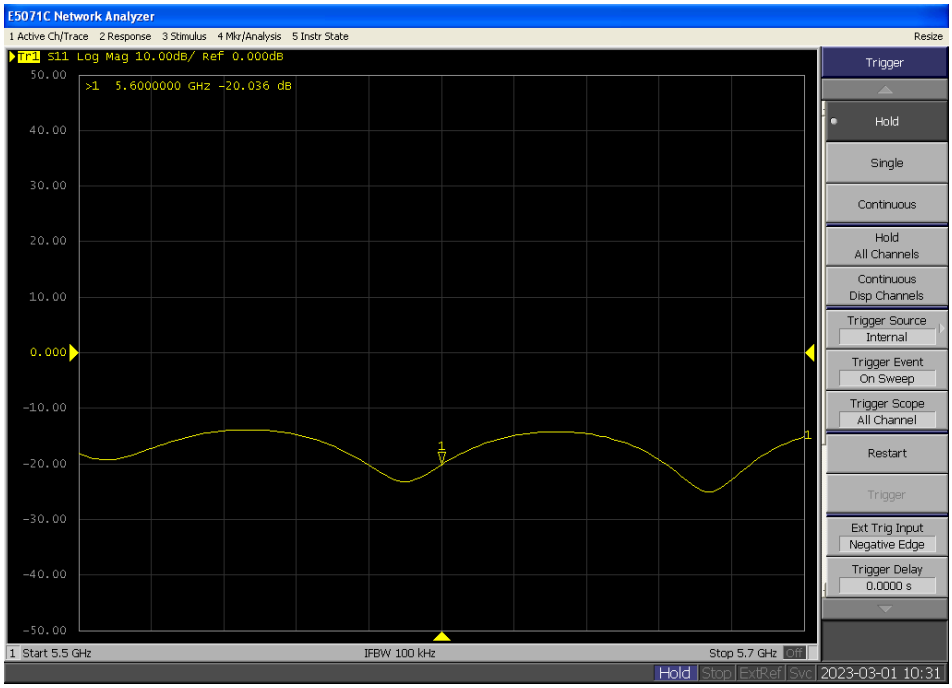
Impedance Plot for D5GHzV2

5600MHz Head

Calibrated impedance: 58.284 Ω; Measured impedance: 59.992 Ω (within 5Ω)



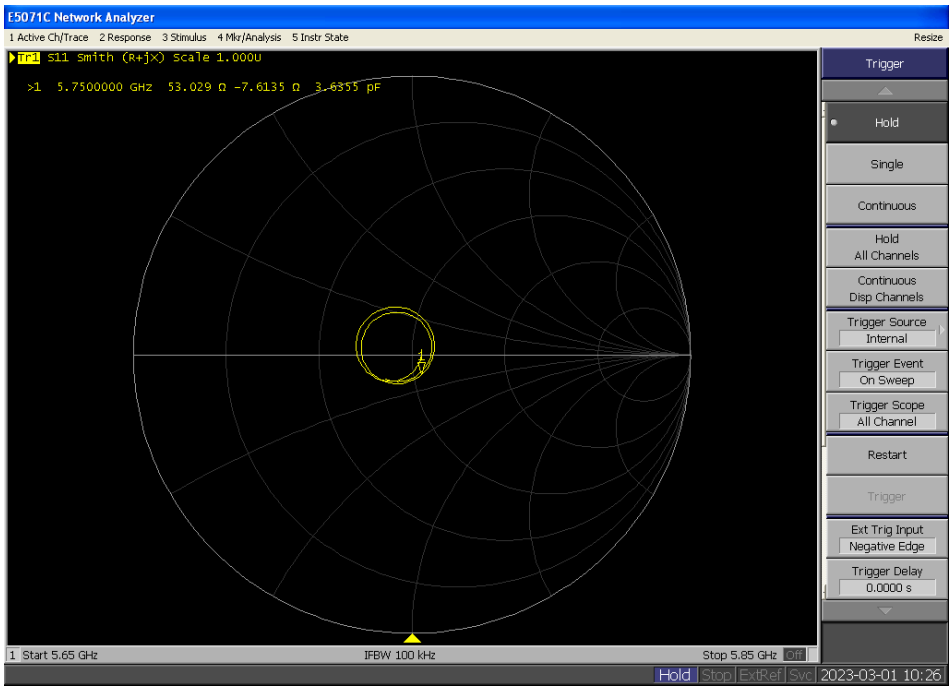
Calibrated return loss: -21.282 dB; Measured impedance: -20.036 dB (within 20%)



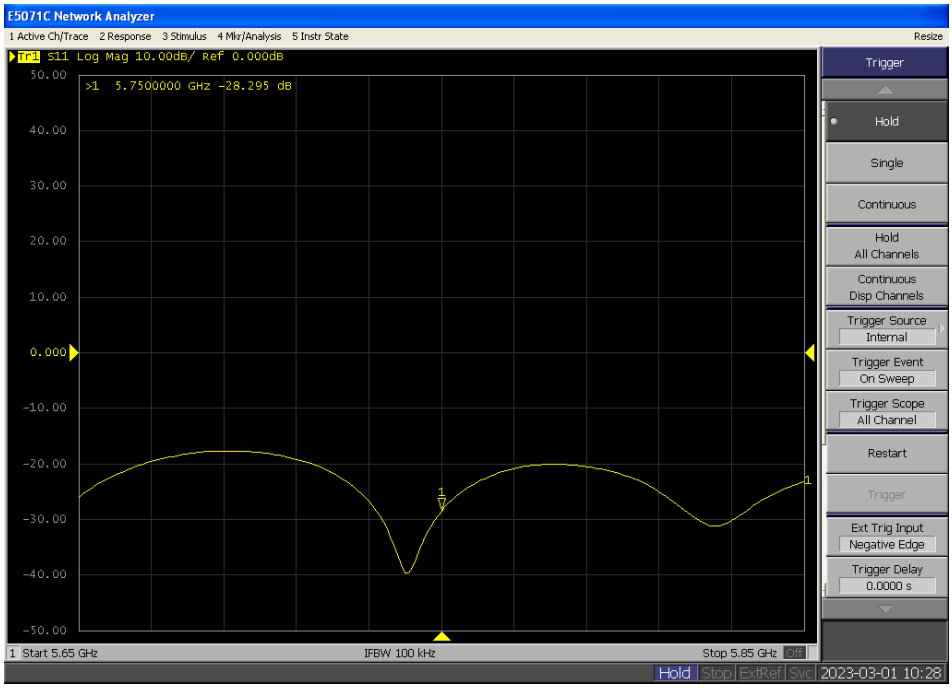
Impedance Plot for D5GHzV2

5750MHz Head

Calibrated impedance: 53.508 Ω; Measured impedance: 53.029 Ω (within 5Ω)



Calibrated return loss: -29.164 dB; Measured impedance: -28.295 dB (within 20%)



Note: Per KDB 450824 D02 requirements for dipole calibration, DEKRA Lab has adopted three years calibration interval. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;

2. System validation with specific dipole is within 10% of calibrated value;

3. Return-loss is within 20% of calibrated measurement (Show above);

4. Impedance is within 5Ω of calibrated measurement (Show above).

4.2 SAR Measurement Procedure

The DASY 6 calculates SAR using the following equation,

$$SAR = \frac{\sigma |E|^2}{\rho}$$

σ: represents the simulated tissue conductivity
ρ: represents the tissue density

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

The EUT is placed against the Universal Phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at $1mm^2$) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at $1mm^3$).

5 SAR EXPOSURE LIMITS

SAR assessments have been made in line with the requirements of IEC/IEEE 62209-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1 “Uncontrolled Environments” limits. These limits apply to a location which is deemed as “Uncontrolled Environment” which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

Limits for General Population/Uncontrolled Exposure (W/kg)

Type Exposure	Uncontrolled Environment Limit
Spatial Peak SAR (1g cube tissue for brain or body)	**1.60 W/kg**
Spatial Average SAR (whole body)	**0.08 W/kg**
Spatial Peak SAR (10g for hands, feet, ankles and wrist)	**4.00 W/kg**

6 TEST EQUIPMENT LIST

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Stäubli Robot TX60L	Stäubli	TX60L	F10/5C90A1/A/01	N/A
Controller	Stäubli	SP1	S-0034	N/A
Dipole Validation Kits	Speag	D2450V2	839	2024.03.31
Dipole Validation Kits	Speag	D5GHzV2	1078	2024.03.27
SAM Twin Phantom	Speag	SAM	TP-1561/1562	N/A
Device Holder	Speag	SD 000 H01 HA	N/A	N/A
Data Acquisition Electronic	Speag	DAE4	1220	2024.03.20
E-Field Probe	Speag	EX3DV4	7761	2023.09.11
SAR Software	Speag	DASY6	V5.2 Build 162	N/A
Power Amplifier	Mini-Circuit	ZVA-183-S+	N657400950	2023.12.09
Dual Directional Coupler	woken	0110A05A82Z-20	CMLC66W1A1	2023.08.18
Tissue fluid test probe	SPEAG	DAK 3.5	1308	
Vector Network	Agilent	E5071C	MY46103316	2023.09.16
Signal Generator	Agilent	E4438C	MY49070163	2023.06.30
Spectrum Analyzer	Agilent	N9010A	MY48030494	2023.12.08
Temperature/Humidity Meter	Zhichen	ZC1-2	N/A	2023.07.06
Temperature/Humidity Mete	RTS	RTS-8S	RF-06	2024.05.18

7 MEASUREMENT UNCERTAINTY

DASY6 SAR Uncertainty Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram / 10 gram.								
Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) veff
Measurement System								
Probe Calibration	±5.5%	N	1	1	1	±5.5%	±5.5%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.26	0.26	±0.6%	±0.7%	∞
Combined Std. Uncertainty						±10.6%	±10.5%	361
Expanded STD Uncertainty						±21.2%	±21.1%	

DASY6 SAR Uncertainty

Measurement uncertainty for 3 GHz to 6 GHz averaged over 1 gram / 10 gram.

Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.65%	N	1	1	1	±6.65%	±6.65%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±2.0%	R	$\sqrt{3}$	1	1	±1.2%	±1.2%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Probe Positioning	±6.7%	R	$\sqrt{3}$	1	1	±3.9%	±3.9%	∞
Max. SAR Eval.	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.26	0.26	±0.6%	±0.7%	∞
Combined Std. Uncertainty						±12.0%	±12.0%	784
Expanded STD Uncertainty						±24.0%	±23.9%	

8 POWER TEST RESULTS

2.4GHz：

SISO:

Mode	Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
			Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
802.11b	1	2412	15.25	15.24	17.00	17.00	1.496	1.500
	6	2437	15.45	15.42	17.00	17.00	1.429	1.439
	11	2462	15.33	15.28	17.00	17.00	1.469	1.486
802.11g	1	2412	14.29	14.84	16.00	16.50	1.483	1.466
	6	2437	14.37	14.82	16.00	16.50	1.455	1.472
	11	2462	14.25	15.00	16.00	16.50	1.496	1.413
802.11n (20MHz)	1	2412	14.49	14.86	16.00	16.50	1.416	1.459
	6	2437	14.37	14.79	16.00	16.50	1.455	1.483
	11	2462	14.41	14.92	16.00	16.50	1.442	1.439
802.11n (40MHz)	3	2422	15.28	15.22	17.00	17.00	1.486	1.507
	6	2437	15.21	15.24	17.00	17.00	1.510	1.500
	9	2452	15.19	15.18	17.00	17.00	1.517	1.521
802.11ax (20MHz)	1	2412	14.87	14.51	16.00	16.50	1.297	1.581
	6	2437	14.89	14.48	16.00	16.50	1.291	1.592
	11	2462	15.07	14.45	16.00	16.50	1.239	1.603

802.11ax (40MHz)	3	2422	15.14	15.24	17.00	17.00	1.535	1.500
	6	2437	15.17	15.21	17.00	17.00	1.496	1.500
	9	2452	15.19	15.16	17.00	17.00	1.429	1.439

CDD

Mode	Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power (dBm)	Tune up Factor
802.11g	1	2412	16.95	18.50	1.429
	6	2437	16.89	18.50	1.449
	11	2462	16.90	18.50	1.445
802.11n (20MHz)	1	2412	17.55	19.50	1.567
	6	2437	17.55	19.50	1.567
	11	2462	17.55	19.50	1.567
802.11n (40MHz)	3	2422	18.25	20.00	1.496
	6	2437	18.17	20.00	1.524
	9	2452	18.20	20.00	1.514
802.11ax (20MHz)	1	2412	17.50	19.50	1.585
	6	2437	17.49	19.50	1.589
	11	2462	17.45	19.50	1.603
802.11ax (40MHz)	3	2422	18.20	20.00	1.514
	6	2437	18.18	20.00	1.521
	9	2452	18.19	20.00	1.517

5GHz 802.11a：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
36	5180	14.48	14.27	16.00	16.00	1.419	1.489
44	5220	14.27	14.36	16.00	16.00	1.489	1.459
48	5240	14.44	14.29	16.00	16.00	1.432	1.483
52	5260	18.22	18.09	20.00	20.00	1.507	1.552
60	5300	18.35	18.02	20.00	20.00	1.462	1.578
64	5320	18.07	18.24	20.00	20.00	1.560	1.500
100	5500	18.29	18.37	20.00	20.00	1.483	1.455
116	5580	18.44	18.32	20.00	20.00	1.432	1.472
140	5700	18.35	17.98	20.00	19.50	1.462	1.419
149	5745	18.06	17.75	19.50	19.50	1.393	1.496
157	5785	18.01	17.76	19.50	19.50	1.409	1.493
165	5825	17.92	17.94	19.50	19.50	1.439	1.432

5GHz 802.11n(20MHz):

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
36	5180	14.28	13.98	16.00	16.00	1.486	1.592
44	5220	14.07	14.16	16.00	16.00	1.560	1.528
48	5240	14.22	14.08	16.00	16.00	1.507	1.556
52	5260	18.07	17.91	19.50	19.50	1.390	1.442
60	5300	18.13	17.85	19.50	19.50	1.371	1.462
64	5320	17.82	17.98	19.50	19.50	1.472	1.419
100	5500	18.08	18.12	19.50	19.50	1.387	1.374
116	5580	18.16	18.05	19.50	19.50	1.361	1.396
140	5700	18.03	17.25	19.50	19.50	1.403	1.679
149	5745	18.23	17.96	19.50	19.50	1.340	1.426
157	5785	18.25	18.06	19.50	19.50	1.334	1.393
165	5825	18.19	18.19	19.50	19.50	1.352	1.352

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
36	5180	11.23	13.00	1.503
44	5220	11.94	13.00	1.276
48	5240	11.99	13.00	1.262
52	5260	18.17	20.00	1.524
60	5300	18.09	20.00	1.552
64	5320	18.39	20.00	1.449
100	5500	17.95	19.50	1.429
116	5580	17.97	19.50	1.422
140	5700	18.01	19.50	1.409
149	5745	21.00	23.00	1.585
157	5785	21.02	23.00	1.578
165	5825	21.01	23.00	1.581

5GHz 802.11n(40MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
38	5190	15.42	15.10	17.00	17.00	1.439	1.549
46	5230	15.16	15.19	17.00	17.00	1.528	1.517
54	5270	17.79	18.11	19.50	19.50	1.483	1.377
62	5310	18.03	18.14	19.50	19.50	1.403	1.368
102	5510	16.33	16.25	17.50	17.50	1.309	1.334
118	5590	15.93	15.78	17.50	17.50	1.435	1.486
134	5670	16.04	15.96	17.50	17.50	1.400	1.426
151	5755	16.19	15.94	17.50	17.50	1.352	1.432
159	5795	16.41	16.16	17.50	17.50	1.285	1.361

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
38	5190	13.96	15.50	1.426
46	5230	13.84	15.50	1.466
54	5270	17.96	19.50	1.426
62	5310	18.04	19.50	1.400
102	5510	19.03	20.50	1.403
118	5590	18.61	20.50	1.545
134	5670	18.99	20.50	1.416
151	5755	18.65	20.50	1.531
159	5795	19.39	20.50	1.291

5GHz 802.11ac(20MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
36	5180	14.25	13.99	15.50	15.50	1.334	1.416
44	5220	14.11	14.19	15.50	15.50	1.377	1.352
48	5240	14.20	14.11	15.50	15.50	1.349	1.377
52	5260	18.09	17.98	19.50	19.50	1.384	1.419
60	5300	18.11	18.23	19.50	19.50	1.377	1.340
64	5320	17.84	17.94	19.50	19.50	1.466	1.432
100	5500	18.12	18.09	19.50	19.50	1.374	1.384
116	5580	18.14	18.01	19.50	19.50	1.368	1.409
140	5700	18.02	18.17	19.50	19.50	1.406	1.358
149	5745	18.19	17.89	19.50	19.50	1.352	1.449
157	5785	18.21	17.99	19.50	19.50	1.346	1.416
165	5825	18.15	18.12	19.50	19.50	1.365	1.374

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
36	5180	12.26	13.50	1.330
44	5220	11.94	13.50	1.432
48	5240	11.98	13.50	1.419
52	5260	17.96	19.50	1.426
60	5300	17.92	19.50	1.439
64	5320	18.17	19.50	1.358
100	5500	17.78	19.50	1.486
116	5580	17.75	19.50	1.496
140	5700	18.29	19.50	1.321
149	5745	19.21	21.00	1.510
157	5785	20.95	22.50	1.429
165	5825	21.02	22.50	1.406

5GHz 802.11ac(40MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
38	5190	15.45	15.13	17.00	17.00	1.429	1.538
46	5230	15.14	15.12	17.00	17.00	1.535	1.542
54	5270	17.75	18.14	19.50	19.50	1.496	1.368
62	5310	18.06	18.17	19.50	19.50	1.393	1.358
102	5510	15.80	15.76	17.50	17.50	1.479	1.493
118	5590	15.92	15.83	17.50	17.50	1.439	1.469
134	5670	16.05	15.95	17.50	17.50	1.396	1.429
151	5755	16.19	15.98	17.50	17.50	1.352	1.419
159	5795	16.39	16.14	17.50	17.50	1.291	1.368

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
38	5190	13.97	15.50	1.422
46	5230	13.75	15.50	1.496
54	5270	20.94	22.50	1.432
62	5310	21.02	22.50	1.406
102	5510	19.03	20.50	1.403
118	5590	18.56	20.50	1.563
134	5670	18.96	20.50	1.426
151	5755	18.65	20.50	1.531
159	5795	19.38	20.50	1.294

5GHz 802.11ac(80MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
42	5210	15.76	15.24	17.00	17.00	1.330	1.500
58	5290	16.25	15.90	17.50	17.50	1.334	1.445
106	5530	15.96	15.77	17.50	17.50	1.426	1.489
155	5775	16.28	16.33	17.50	17.50	1.324	1.309

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
42	5210	14.89	16.50	1.449
58	5290	18.96	20.50	1.426
106	5530	18.65	20.50	1.531
155	5775	18.84	20.50	1.466

5GHz 802.11ax(20MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
36	5180	14.41	14.36	15.50	15.50	1.285	1.300
44	5220	14.22	13.93	15.50	15.50	1.343	1.435
48	5240	13.95	13.81	15.50	15.50	1.429	1.476
52	5260	17.71	17.72	19.50	19.50	1.510	1.507
60	5300	17.88	17.61	19.50	19.50	1.452	1.545
64	5320	18.10	17.75	19.50	19.50	1.380	1.496
100	5500	17.88	17.92	19.50	19.50	1.452	1.439
116	5580	17.95	17.87	19.50	19.50	1.429	1.455
140	5700	17.80	17.92	19.50	19.50	1.479	1.439
149	5745	18.07	17.81	19.50	19.50	1.390	1.476
157	5785	18.04	17.74	19.50	19.50	1.400	1.500
165	5825	17.95	17.97	19.50	19.50	1.429	1.422

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
36	5180	12.42	14.00	1.439
44	5220	12.15	14.00	1.531
48	5240	12.23	14.00	1.503
52	5260	17.97	19.50	1.422
60	5300	17.92	19.50	1.439
64	5320	18.14	19.50	1.368
100	5500	17.73	19.50	1.503
116	5580	17.72	19.50	1.507
140	5700	18.32	19.50	1.312
149	5745	20.64	22.50	1.535
157	5785	20.95	22.50	1.429
165	5825	21.03	22.50	1.403

5GHz 802.11ax(40MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
38	5190	15.32	15.01	17.00	17.00	1.472	1.581
46	5230	15.03	15.05	17.00	17.00	1.574	1.567
54	5270	18.09	18.05	19.50	19.50	1.384	1.396
62	5310	17.96	18.11	19.50	19.50	1.426	1.377
102	5510	16.18	16.15	17.50	17.50	1.355	1.365
118	5590	15.82	16.22	17.50	17.50	1.472	1.343
134	5670	15.92	15.82	17.50	17.50	1.439	1.472
151	5755	16.08	15.86	17.50	17.50	1.387	1.459
159	5795	16.26	15.99	17.50	17.50	1.330	1.416

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
38	5190	15.01	17.00	1.581
46	5230	15.05	17.00	1.567
54	5270	18.05	19.50	1.396
62	5310	18.11	19.50	1.377
102	5510	16.15	18.00	1.531
118	5590	16.22	18.00	1.507
134	5670	15.82	17.50	1.472
151	5755	15.86	17.50	1.459
159	5795	15.99	17.50	1.416

5GHz 802.11ax(80MHz)：

SISO:

Channel	Test Frequency (MHz)	Conducted Power Output (dBm)		Tune up Power Output (dBm)		Tune up Factor	
		Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
42	5210	15.75	15.25	17.00	17.00	1.334	1.496
58	5290	16.20	15.88	17.50	17.50	1.349	1.452
106	5530	15.92	15.75	17.50	17.50	1.439	1.496
155	5775	16.31	16.25	17.50	17.50	1.315	1.334

CDD

Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
42	5210	14.82	16.50	1.472
58	5290	18.99	20.50	1.416
106	5530	18.69	20.50	1.517
155	5775	18.88	20.50	1.452

Bluetooth

Mode	Channel	Test Frequency (MHz)	Total Conducted Power (dBm)	Total Tune up Power Output (dBm)	Tune up Factor
GFSK	00	2402	2.25	4.00	1.496
	39	2441	2.52	4.00	1.406
	78	2480	2.87	4.00	1.297
Pi/4 DQPSK	00	2402	2.27	4.00	1.489
	39	2441	2.51	4.00	1.409
	78	2480	2.78	4.00	1.324
8DPSK	00	2402	2.34	4.00	1.466
	39	2441	2.64	4.00	1.368
	78	2480	2.82	4.00	1.312
LE 1M	00	2402	3.75	4.00	1.059
	19	2440	4.32	4.50	1.042
	39	2480	5.12	5.50	1.091
LE 2M	00	2402	3.85	4.00	1.035
	19	2440	4.32	4.50	1.042
	39	2480	4.86	5.00	1.033
Code 2	0	2402	3.75	4.00	1.059
	19	2440	4.04	4.50	1.112
	39	2480	4.65	5.00	1.084
Code8	0	2402	3.73	4.00	1.064
	19	2440	4.58	5.00	1.102
	39	2480	4.79	5.00	1.050

DUTY CYCLE

Test Mode	Duty Cycle (%)	Duty Cycle Factor
2.4GHz 802.11b	100.00	1.000
2.4GHz 802.11g	87.30	1.150
2.4GHz 802.11n(20MHz)	100.00	1.000
2.4GHz 802.11n(40MHz)	100.00	1.000
2.4GHz 802.11ax(20MHz)	100.00	1.000
2.4GHz 802.11ax(40MHz)	100.00	1.000
5GHz 802.11a	89.50	1.117
5GHz 802.11n(20MHz)	99.00	1.010
5GHz 802.11n(40MHz)	98.80	1.012
5GHz 802.11ac(20MHz)	99.00	1.010
5GHz 802.11ac(40MHz)	98.60	1.014
5GHz 802.11ac(80MHz)	98.30	1.017
5GHz 802.11ax(20MHz)	99.00	1.010
5GHz 802.11ax(40MHz)	98.80	1.012
5GHz 802.11ax(80MHz)	98.80	1.012
BT DH5	76.00	1.316
BT 2DH5	63.00	1.587
BT 3DH5	76.00	1.316
BLE	61.00	1.639
2LE	32.00	3.125
Code2	57.00	1.754
Code8	82.00	1.220

9 SAR TEST RESULTS

9.1 Standalone SAR

Head SAR

Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna1	6	2437	1.429	1.000	0.060	0.086
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna1	1	2412	1.496	1.000	0.052	0.077
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna1	11	2462	1.469	1.000	**0.069**	**0.102**
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna2	6	2437	1.439	1.000	0.009	0.013
WLAN 2.4G	802.11n HT40-MCS 0	In Side	0	Antenna1+2	3	2422	1.496	1.000	0.067	0.100
Bluetooth	DH5	In Side	0	Antenna1	78	2480	1.297	1.316	**0.019**	**0.032**
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna1	60	5300	1.462	1.117	0.337	0.550
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna1	52	5260	1.507	1.117	0.333	0.560
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna1	64	5320	1.560	1.117	0.344	0.599
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna2	64	5320	1.500	1.117	0.258	0.432
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna1	116	5580	1.432	1.117	0.434	0.694
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna1	100	5500	1.483	1.117	0.410	0.679
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna1	140	5700	1.462	1.117	0.420	0.686
WLAN 5G	802.11a-6Mbps	In Side	0	Antenna2	100	5500	1.455	1.117	0.236	0.384
WLAN 5G	802.11n HT20-MCS 0	In Side	0	Antenna1+2	165	5825	1.585	1.010	0.432	0.692
WLAN 5G	802.11n HT20-MCS 0	In Side	0	Antenna1+2	149	5745	1.578	1.010	0.387	0.617
WLAN 5G	802.11n HT20-MCS 0	In Side	0	Antenna1+2	157	5785	1.581	1.010	**0.444**	**0.708**

Limbs SAR

Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna1	6	2437	1.429	1.000	0.060	0.086
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna1	1	2412	1.496	1.000	0.052	0.077
WLAN 2.4G	802.11b 1Mbps	In Side	0	Antenna1	11	2462	1.469	1.000	0.061	0.090
WLAN 2.4G	802.11n HT40-MCS 0	In Side	0	Antenna1+2	3	2422	1.496	1.000	0.067	0.100
WLAN 2.4G	802.11n HT40-MCS 0	Front	0	Antenna1+2	3	2422	1.496	1.000	**0.193**	**0.289**
Bluetooth	DH5	Front	0	Antenna1	78	2480	1.297	1.316	**0.077**	**0.131**
WLAN 5G	802.11n HT20-MCS 0	In Side	0	Antenna1+2	165	5825	1.585	1.010	0.432	0.692
WLAN 5G	802.11n HT20-MCS 0	In Side	0	Antenna1+2	149	5745	1.578	1.010	0.387	0.617
WLAN 5G	802.11n HT20-MCS 0	In Side	0	Antenna1+2	157	5785	1.581	1.010	0.444	0.708
WLAN 5G	802.11n HT20-MCS 0	Out Side	0	Antenna1+2	157	5785	1.578	1.010	0.082	0.130
WLAN 5G	802.11n HT20-MCS 0	Front	0	Antenna1+2	157	5785	1.578	1.010	**0.700**	**1.115**
WLAN 5G	802.11n HT20-MCS 0	Back	0	Antenna1+2	157	5785	1.578	1.010	0.372	0.593
WLAN 5G	802.11n HT20-MCS 0	Right Side	0	Antenna1+2	157	5785	1.578	1.010	0.327	0.521
WLAN 5G	802.11a-6Mbps	Front	0	Antenna2	64	5320	1.500	1.117	0.340	0.570
WLAN 5G	802.11a-6Mbps	Front	0	Antenna2	100	5500	1.455	1.117	0.678	1.102

Note:

1: * - repeated at the highest measured SAR according to the FCC KDB 865664

2: When the reported SAR of the initial test position is > 0.4 W/kg, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.

3: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or

all required channels are tested.

4: Per NOTICE 2012-DRS0529, the SAR need to calculated only when the △SAR is a negative value.

5: Reference standard KDB447498 D04 formula calculation In SISO mode, some test surfaces meet the exemption requirements. For example, when the Main antenna is used, Bottom and Right meet the exemption requirements, and when the Aux antenna is used, Bottom and Left meet the exemption requirements.

6: All test positions were evaluated and only the worst positions were represented.

9.2 Test position and configuration

1. Liquid tissue depth was at least 15.0 cm for all frequencies.
2. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
3. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01 and RSS-102.

9.3 Simultaneous Transmission Analysis

Simultaneous Transmission Scenario with Bluetooth

Simult Tx	5G WLAN SAR (W/kg)	BT SAR (W/kg)	5G+BT SAR (W/kg)
Head	0.708	0.032	0.74
Simult Tx	5G WLAN SAR (W/kg)	BT SAR (W/kg)	5G+BT SAR (W/kg)
Limbs	1.115	0.131	1.246

Appendix A. SAR Validation Data

Date: 28/6/2023

Test Laboratory: DEKRA Lab

System Check Head 2450MHz

DUT: Dipole 2450 MHz

Communication System: UID 0, CW; Communication System Band: D2450; Duty Cycle: 1:1; Frequency: 2450 MHz;

Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; εr = 38.536; ρ = 1000 kg/m3 ; Phantom section: Flat Section ;

Input Power=250mW

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.57, 7.57, 7.57) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 24/3/2022
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 17.2 W/kg

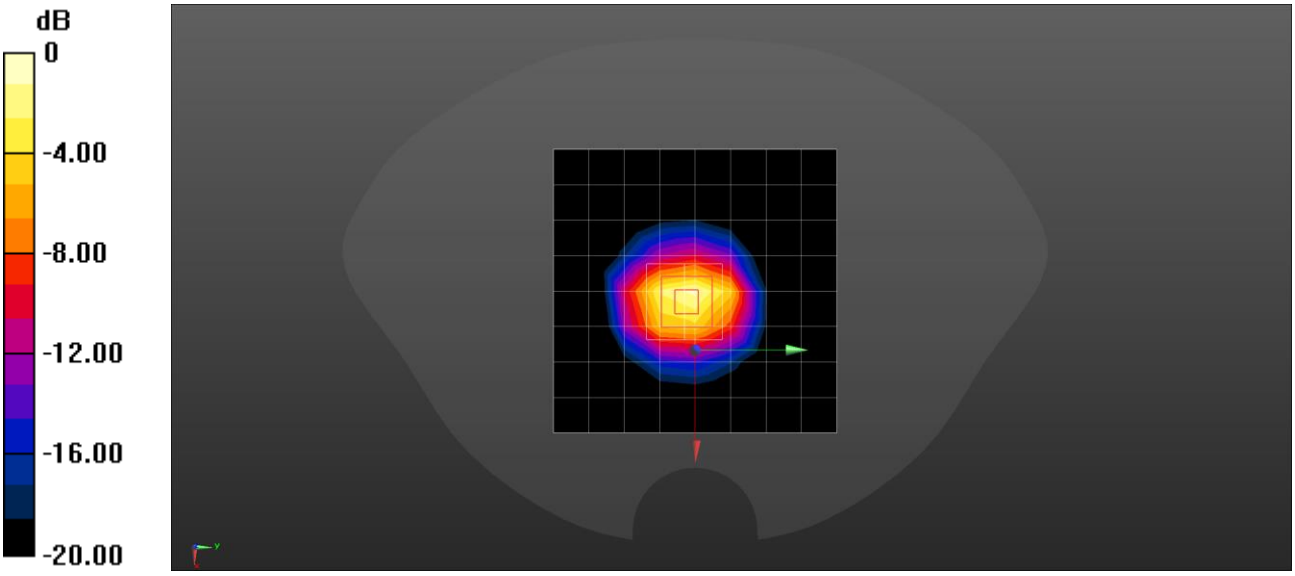
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 82.63 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 25.7 W/kg

SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.78 W/kg

Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 20.9 W/kg = 13.20 dBW/kg

Date: 30/6/2023

Test Laboratory: DEKRA Lab

System Check Head 5250MHz

DUT: Dipole D5GHzV2

Communication System: UID 0, CW (0); Communication System Band: 5GHz; Duty Cycle: 1:1; Frequency: 5250 MHz;

Medium parameters used: f = 5250 MHz; σ = 4.595 S/m; εr = 36.4; ρ = 1000 kg/m3 ; Phantom section: Flat Section ;

Input Power=100mW

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.3, 5.3, 5.3) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

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

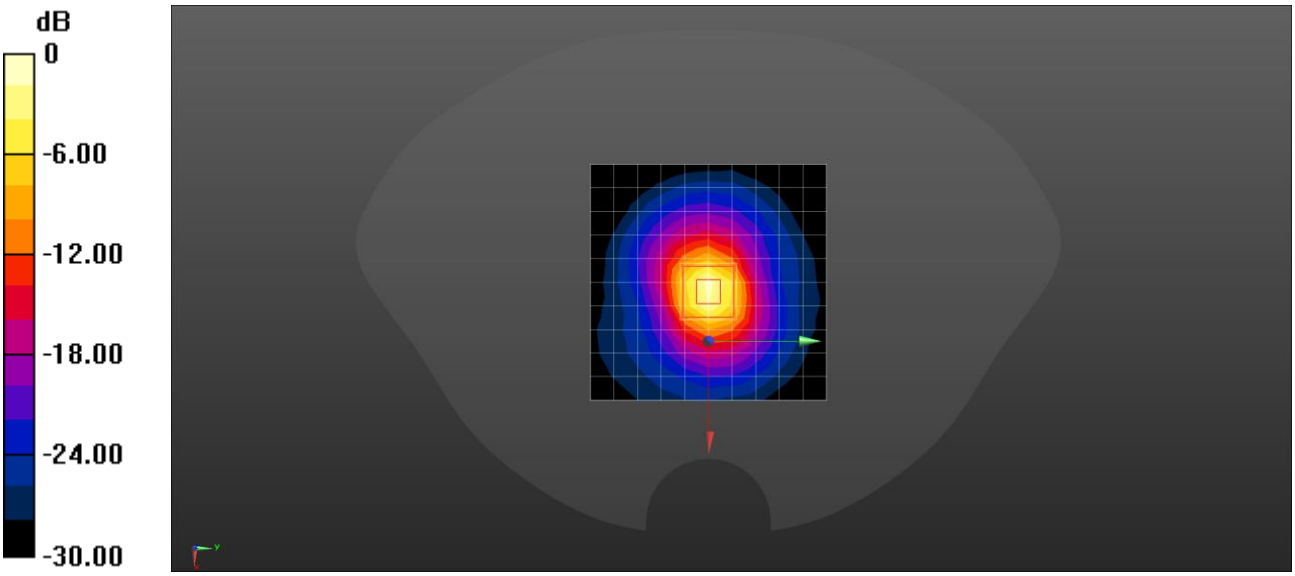
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 41.18 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 31.4 W/kg

SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.19 W/kg

Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg

Date: 30/6/2023

Test Laboratory: DEKRA Lab

System Check Head 5600MHz

DUT: Dipole D5GHzV2

Communication System: UID 0, CW (0); Communication System Band: 5GHz; Duty Cycle: 1:1; Frequency: 5600 MHz;

Medium parameters used: f = 5600 MHz; σ = 4.984 S/m; εr = 35.824; ρ = 1000 kg/m3 ; Phantom section: Flat Section ;

Input Power=100mW

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.7, 4.7, 4.7); Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 17.2 W/kg

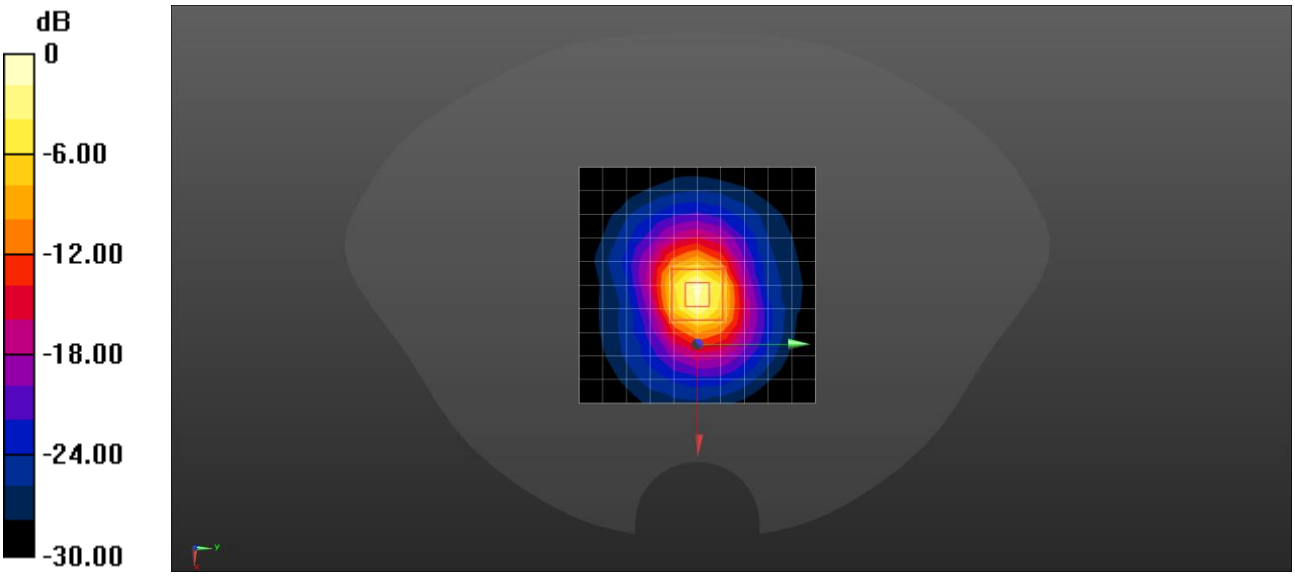
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.88 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 36.5 W/kg

SAR(1 g) = 8.18 W/kg; SAR(10 g) = 2.29 W/kg

Maximum value of SAR (measured) = 21.8 W/kg



0 dB = 21.8 W/kg = 13.38 dBW/kg

Date 30/6/2023

Test Laboratory: DEKRA Lab

System Check Head 5750MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2

Communication System: UID 0, CW (0); Communication System Band: 5GHz; Duty Cycle: 1:1; Frequency: 5750 MHz;

Medium parameters used: f = 5750 MHz; σ = 5.16 S/m; εr = 35.569; ρ = 1000 kg/m3 ; Phantom section: Flat Section ;

Input Power=100mW

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.84, 4.84) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 16.1 W/kg

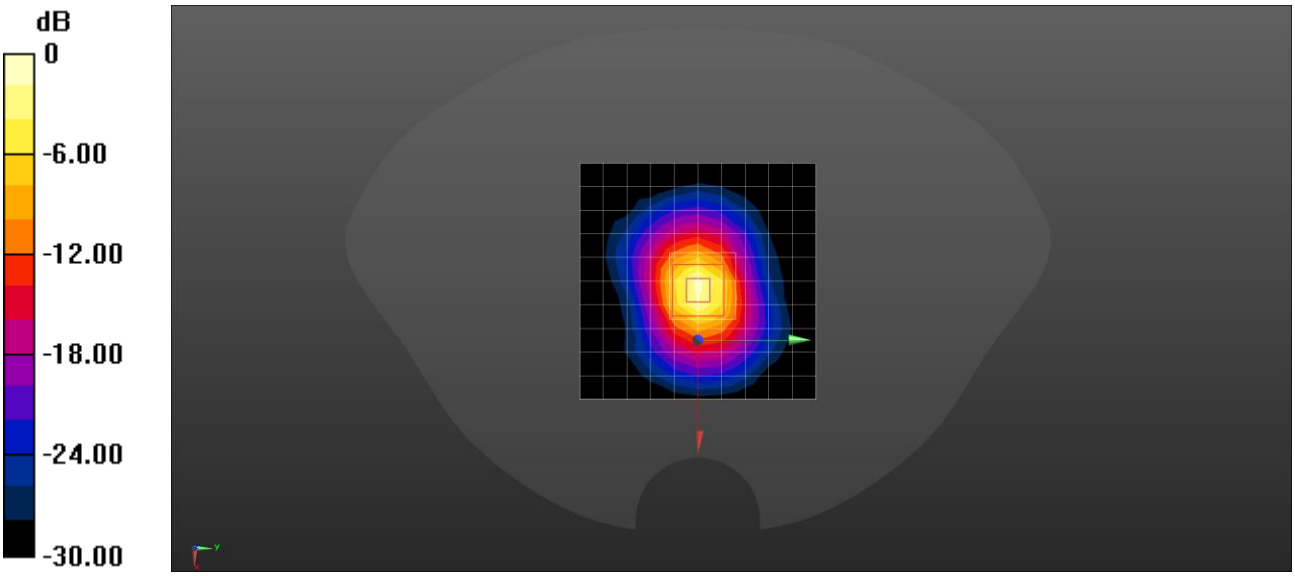
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 61.82 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 34.9 W/kg

SAR(1 g) = 7.63 W/kg; SAR(10 g) = 2.15 W/kg

Maximum value of SAR (measured) = 20.2 W/kg



0 dB = 20.2 W/kg = 13.05 dBW/kg

Appendix B. SAR Test Data

Head SAR

Date: 28/6/2023

Test Laboratory: DEKRA Lab

WLAN 2.4GHz_802.11b_CH11_2462MHz_In Side_Ant1

DUT: VR

Communication System: UID 0, WIFI 2.4G (0); Communication System Band: 802.11b(20M); Duty Cycle: 1:1;

Frequency: 2462 MHz; Medium parameters used: f = 2462 MHz; σ = 1.873 S/m; εr = 38.495; ρ = 1000 kg/m3 ;

Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.57, 7.57, 7.57) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH11/Area Scan (11x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.0971 W/kg

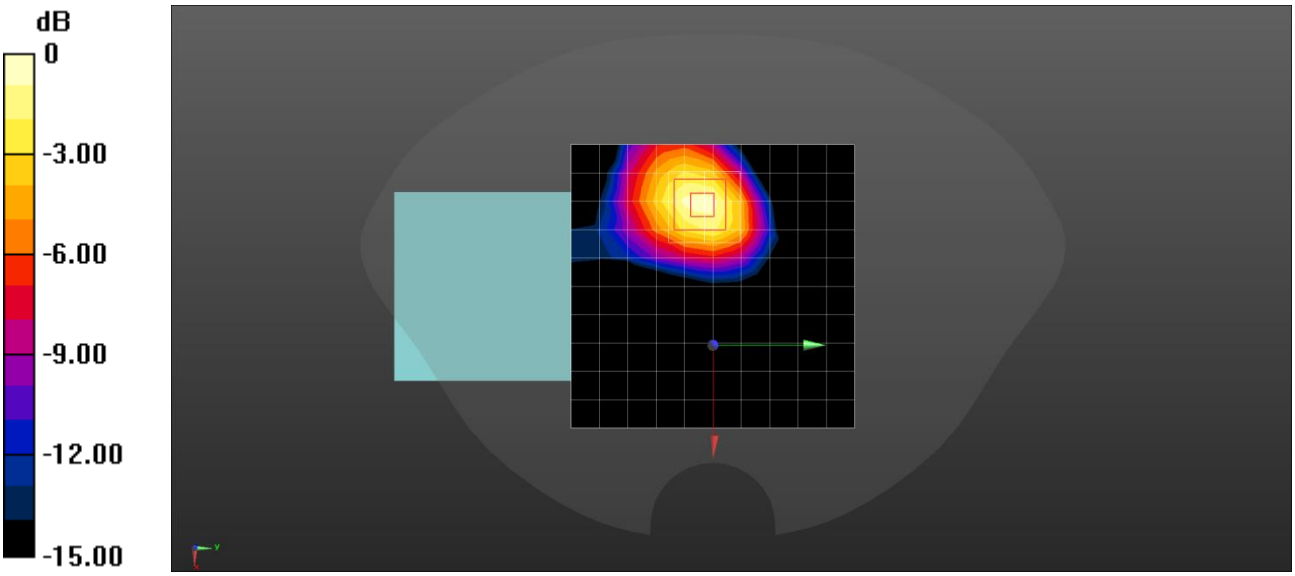
CH11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.755 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.132 W/kg

SAR(1 g) = 0.069 W/kg; SAR(10 g) = 0.035 W/kg

Maximum value of SAR (measured) = 0.108 W/kg



0 dB = 0.108 W/kg = -9.67 dBW/kg

Date: 28/6/2023

Test Laboratory: DEKRA Lab

Bluetooth DH5_CH78_2480MHz_In side_Ant1

DUT: VR;

Communication System: UID 0, Bluetooth (0); Communication System Band: BT; Duty Cycle: 1:1.316; Frequency: 2480 MHz; Medium parameters used: f = 2480 MHz; σ = 1.873 S/m; εr = 38.495; ρ = 1000 kg/m3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.57, 7.57, 7.57) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH78/Area Scan (13x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.102 W/kg

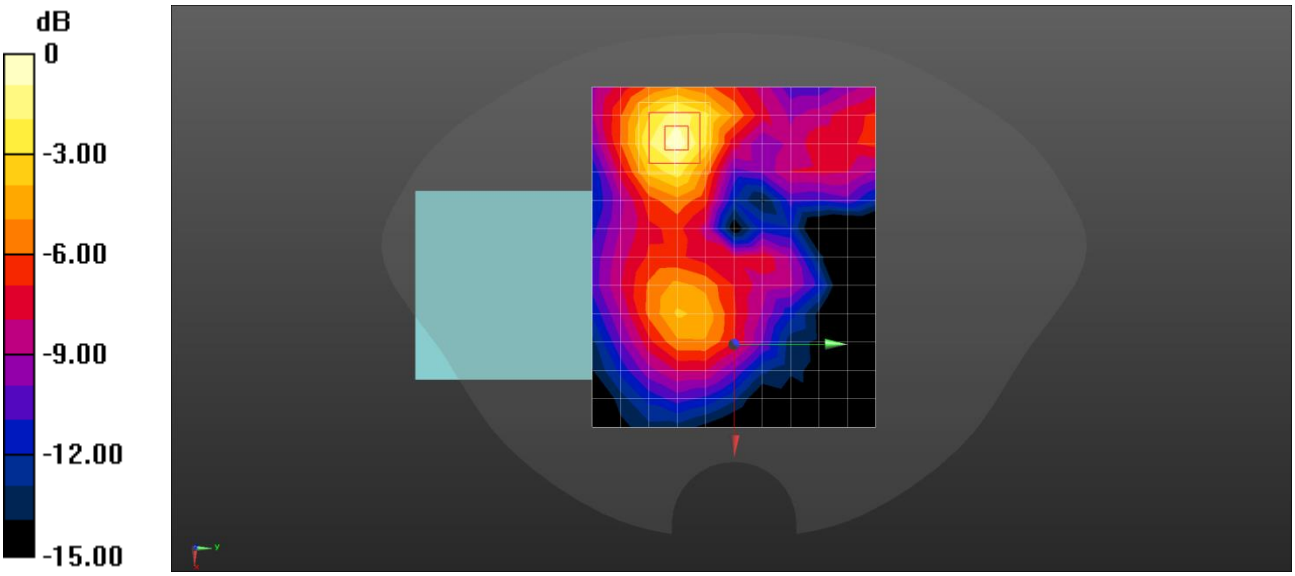
CH78/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.095 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.040 W/kg

SAR(1 g) = 0.019 W/kg; SAR(10 g) = 0.011 W/kg

Maximum value of SAR (measured) = 0.021 W/kg



0 dB = 0.021 W/kg = -6.76 dBW/kg

Date: 30/6/2023

Test Laboratory: DEKRA Lab

WLAN 5GHz_802.11a 6Mbps_CH64_5320MHz_In Side_Ant1

DUT: VR;

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.117;

Frequency: 5320 MHz; Medium parameters used: f = 5320 MHz; σ = 4.673 S/m; εr = 36.297; ρ = 1000 kg/m3 ;

Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(5.3, 5.3, 5.3) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH64/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.691 W/kg

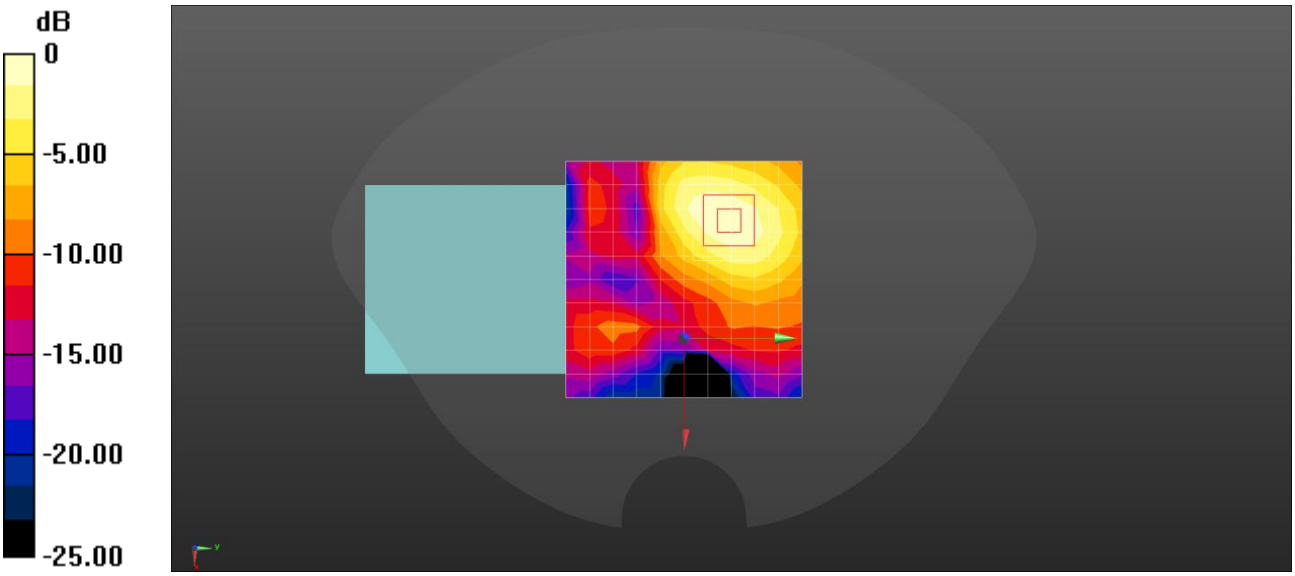
CH64/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 5.052 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.344 W/kg; SAR(10 g) = 0.144 W/kg

Maximum value of SAR (measured) = 0.740 W/kg



0 dB = 0.740 W/kg = -1.31 dBW/kg

Date: 30/6/2023

Test Laboratory: DEKRA Lab

WLAN 5GHz_802.11a 6Mbps_CH140_5700MHz_In Side_Ant1

DUT: VR;

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11a(20M); Duty Cycle: 1:1.117;

Frequency: 5700 MHz; Medium parameters used: f = 5700 MHz; σ = 5.101 S/m; εr = 35.664; ρ = 1000 kg/m3 ;

Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.84, 4.84) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH140/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.918 W/kg

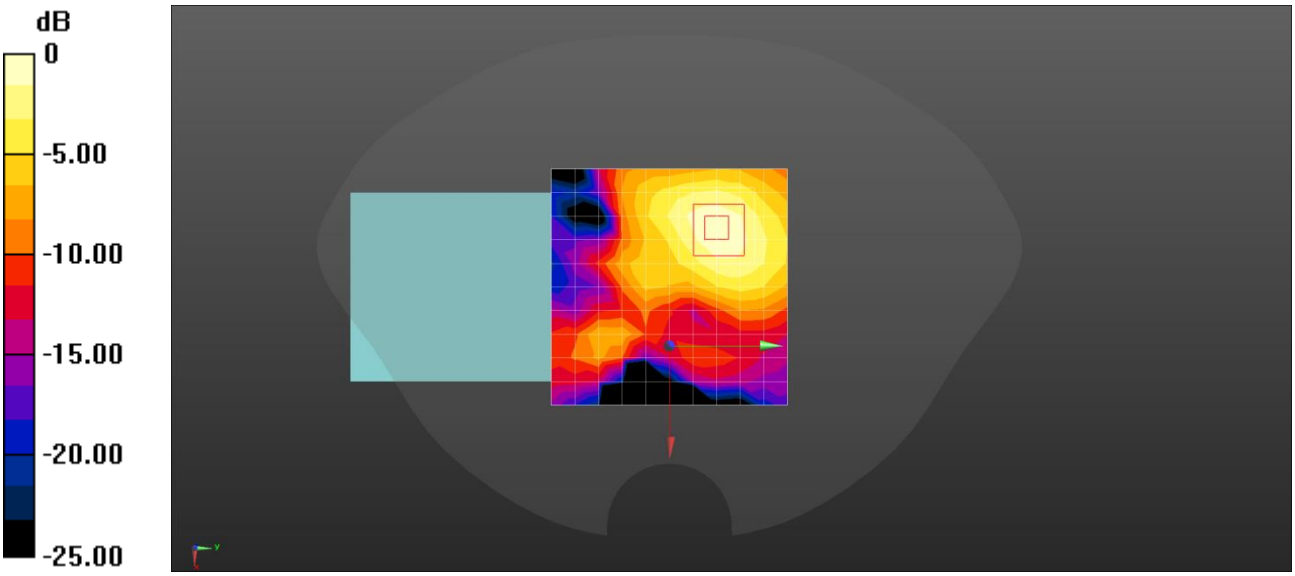
CH140/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 7.308 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 0.420 W/kg; SAR(10 g) = 0.179 W/kg

Maximum value of SAR (measured) = 0.990 W/kg



0 dB = 0.990 W/kg = -0.04 dBW/kg

Date: 30/6/2023

Test Laboratory: DEKRA Lab

WLAN 5GHz_802.11n-HT20 MSC0_CH157_5785MHz_In Side_Ant1+2

DUT: VR;

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11n(20M); Duty Cycle: 1:1.01;

Frequency: 5785 MHz; Medium parameters used: f = 5785 MHz; σ = 5.198 S/m; εr = 35.548; ρ = 1000 kg/m3 ;

Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.84, 4.84) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH157/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.945 W/kg

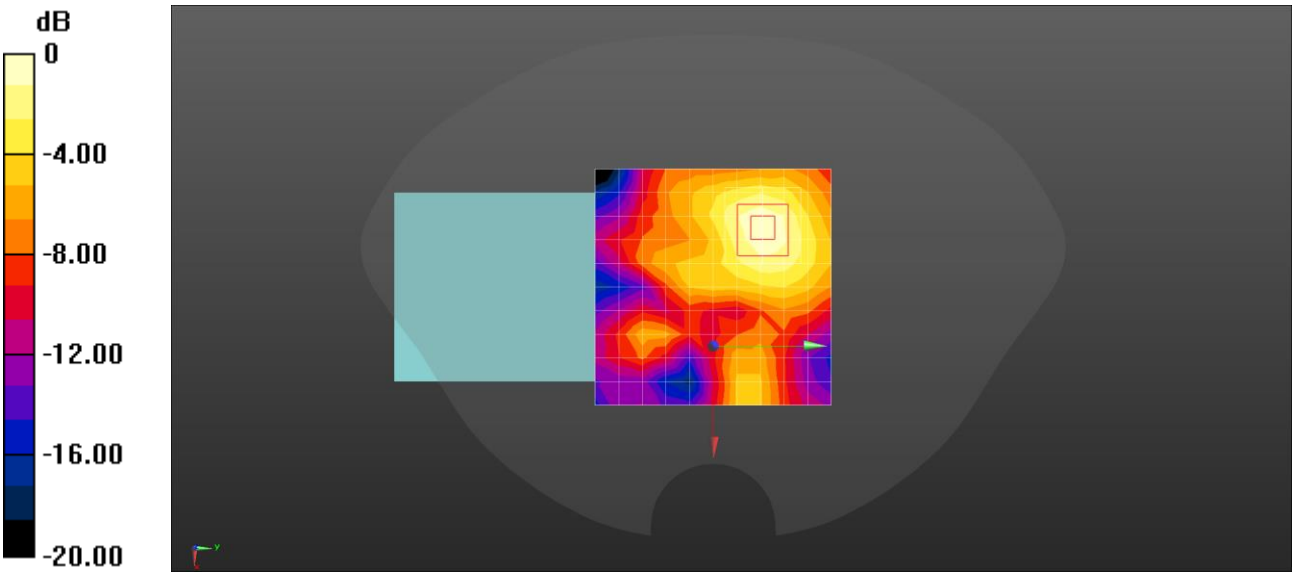
CH157/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 9.272 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 0.444 W/kg; SAR(10 g) = 0.183 W/kg

Maximum value of SAR (measured) = 1.02 W/kg



0 dB = 1.02 W/kg = 0.09 dBW/kg

Limbs SAR

Date: 28/6/2023

Test Laboratory: DEKRA Lab

WLAN 2.4GHz_802.11n(HT40)MCS0_CH3_2422MHz_Front_Ant1+2

DUT: VR;

Communication System: UID 0, WIFI 2.4G (0); Communication System Band: 802.11n(40M); Duty Cycle: 1:1; Frequency: 2422 MHz; Medium parameters used: f = 2422 MHz; σ = 1.823 S/m; εr = 38.64; ρ = 1000 kg/m3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.57, 7.57, 7.57); Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH03/Area Scan (11x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 1.01 W/kg

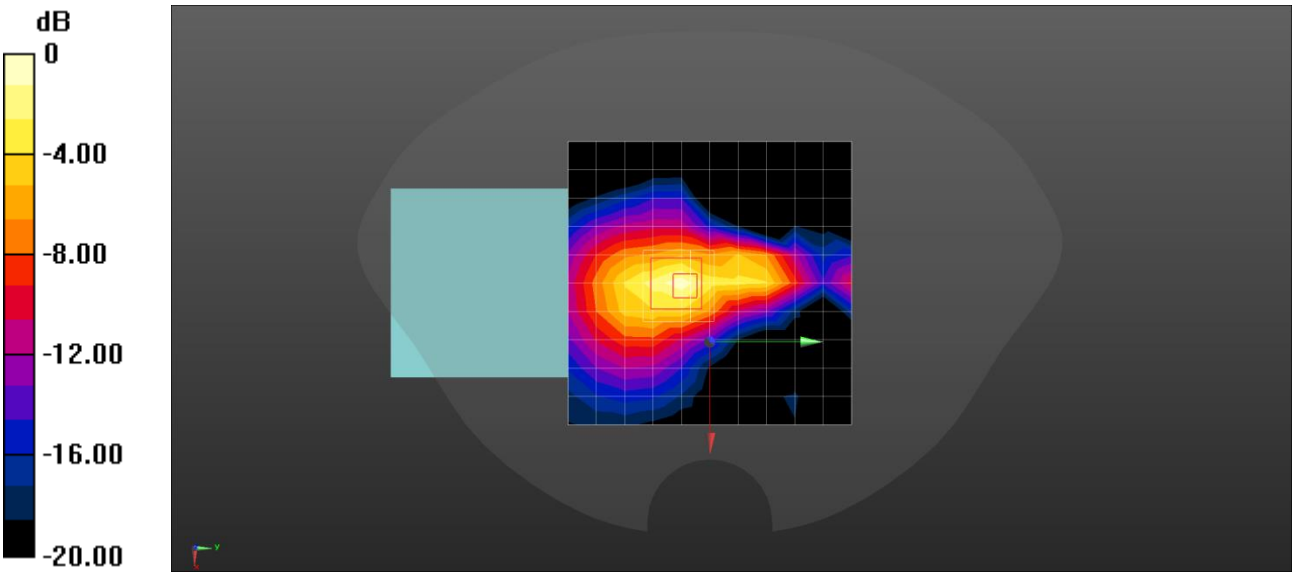
CH03/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.37 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 0.487 W/kg; SAR(10 g) = 0.193 W/kg

Maximum value of SAR (measured) = 1.08 W/kg



0 dB = 1.08 W/kg = 0.33 dBW/kg

Date: 28/6/2023

Test Laboratory: DEKRA Lab

Bluetooth DH5_CH78_2480MHz_Front_Ant1

DUT: VR;

Communication System: UID 0, Bluetooth (0); Communication System Band: BT; Duty Cycle: 1:1.316; Frequency: 2480 MHz; Medium parameters used: f = 2480 MHz; σ = 1.892 S/m; εr = 38.429; ρ = 1000 kg/m3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(7.57, 7.57, 7.57) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH78/Area Scan (11x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.309 W/kg

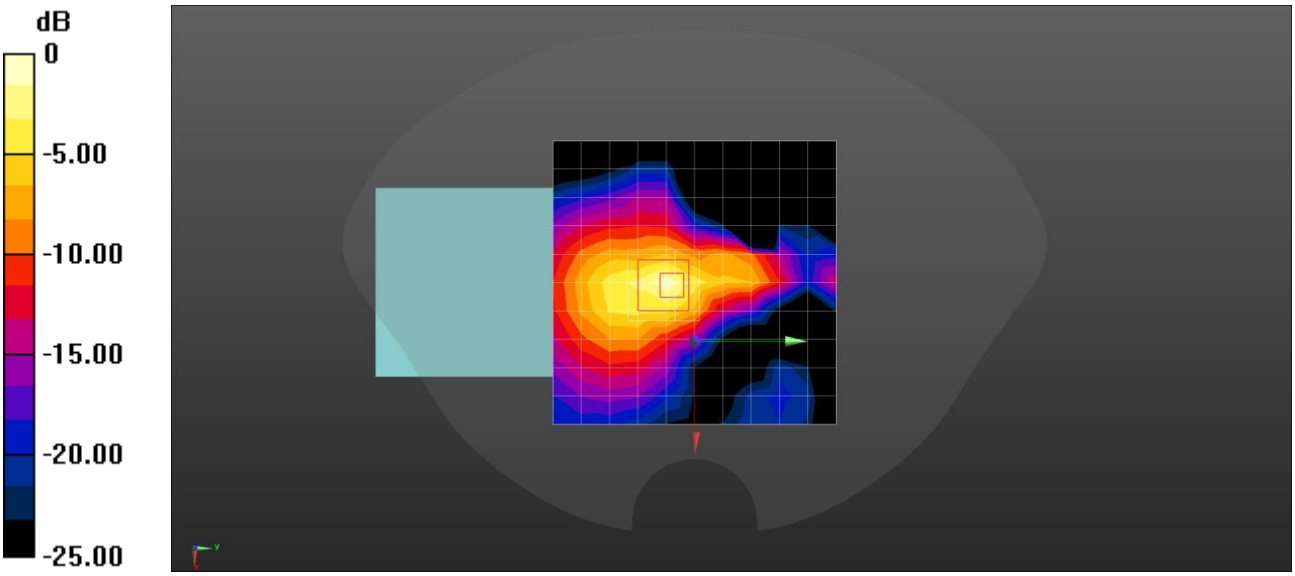
CH78/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.82 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.80 W/kg

SAR(1 g) = 0.131 W/kg; SAR(10 g) = 0.077 W/kg

Maximum value of SAR (measured) = 0.33 W/kg



0 dB = 0.33 W/kg = 0.13 dBW/kg

Date: 30/6/2023

Test Laboratory: DEKRA Lab

WLAN 5GHz_802.11n-HT20 MSC0_CH157_5785MHz_Front_Ant1+2

DUT: VR;

Communication System: UID 0, WIFI 5G (0); Communication System Band: 802.11n(20M); Duty Cycle: 1:1.01;

Frequency: 5785 MHz; Medium parameters used: f = 5785 MHz; σ = 5.198 S/m; εr = 35.548; ρ = 1000 kg/m3 ;

Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN7761; ConvF(4.84, 4.84, 4.84) ; Calibrated: 12/9/2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 20/3/2023
- Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP-1562
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

CH157/Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 3.43 W/kg

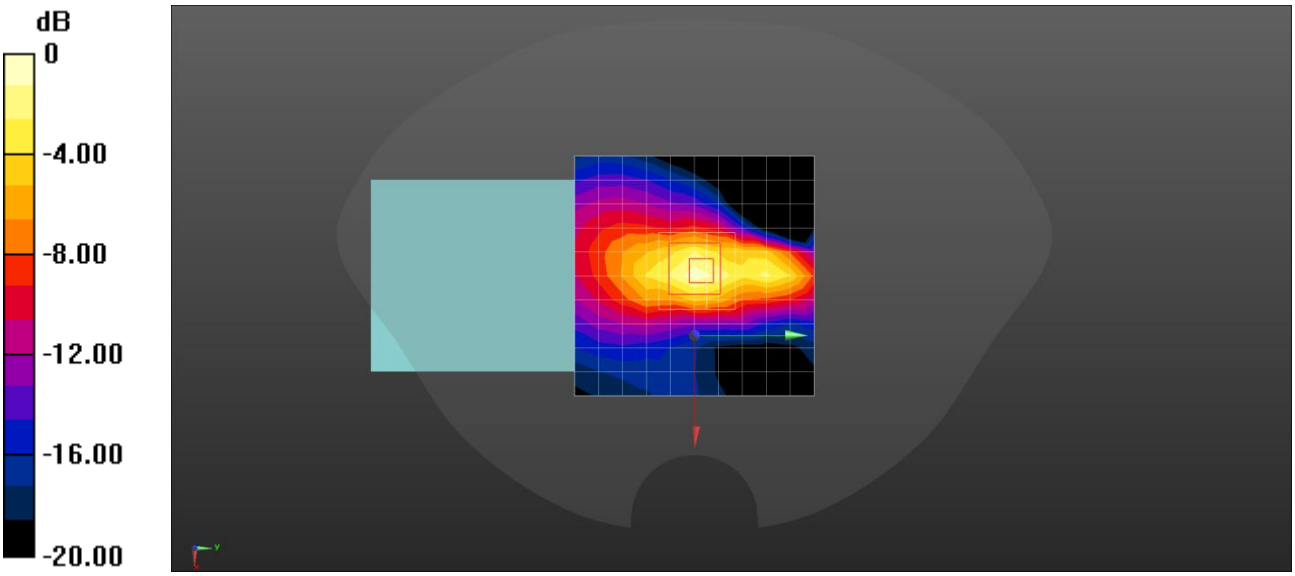
CH157/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 29.11 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 6.70 W/kg

SAR(1 g) = 1.68 W/kg; SAR(10 g) = 0.700 W/kg

Maximum value of SAR (measured) = 3.84 W/kg



0 dB = 3.84 W/kg = 5.84 dBW/kg

Note：

We evaluated all tests and only represented the test charts with the worst data.

Appendix C. Probe Calibration Data

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

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

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

Accreditation No.: SCS 0108

Client Dekra-CN (Auden) **Certificate No** EX-7761_Sep22

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:7761
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes
Calibration date	September 12, 2022

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-21 (OCP-DAK3.5-1249_Oct21)	Oct-22
OCP DAK-12	SN: 1016	20-Oct-21 (OCP-DAK12-1016_Oct21)	Oct-22
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	Apr-23
DAE4	SN: 660	13-Oct-21 (No. DAE4-660_Oct21)	Oct-22
Reference Probe ES3DV2	SN: 3013	27-Dec-21 (No. ES3-3013_Dec21)	Dec-22

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22

	Name	Function	Signature
Calibrated by	Jeton Kastrati	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: September 12, 2022

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

Certificate No: EX-7761_Sep22 Page 1 of 22

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

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

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

Accreditation No.: SCS 0108

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.e., $\vartheta = 0$ 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 $\vartheta = 0$ ($f \leq 900$ 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 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 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 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 $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ 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).

Parameters of Probe: EX3DV4 - SN:7761

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc ($k = 2$)
Norm (μV/(V/m)^2) [A]	0.65	0.60	0.64	±10.1%
DCP (mV) [B]	111.9	113.5	107.3	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Max Unc[E] $k = 2$
0	CW	X	0.00	0.00	1.00	0.00	162.6	±3.3%	±4.7%
		Y	0.00	0.00	1.00		166.9		
		Z	0.00	0.00	1.00		145.2		
10352	Pulse Waveform (200Hz, 10%)	X	1.37	60.00	5.95	10.00	60.0	±3.9%	±9.6%
		Y	1.57	60.60	6.19		60.0		
		Z	1.54	60.81	6.52		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	0.85	60.00	4.84	6.99	80.0	±2.9%	±9.6%
		Y	0.91	60.00	4.94		80.0		
		Z	0.85	60.00	5.05		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	0.11	131.69	0.01	3.98	95.0	±2.8%	±9.6%
		Y	0.57	60.00	3.83		95.0		
		Z	2.00	64.00	5.00		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	6.77	159.89	3.78	2.22	120.0	±1.9%	±9.6%
		Y	13.12	151.80	4.39		120.0		
		Z	10.56	155.82	12.29		120.0		
10387	QPSK Waveform, 1 MHz	X	0.48	60.85	9.80	1.00	150.0	±5.0%	±9.6%
		Y	0.47	61.25	10.37		150.0		
		Z	0.58	61.90	10.43		150.0		
10388	QPSK Waveform, 10 MHz	X	1.30	64.55	12.93	0.00	150.0	±1.3%	±9.6%
		Y	1.19	63.97	12.67		150.0		
		Z	1.27	63.69	12.66		150.0		
10396	64-QAM Waveform, 100 kHz	X	1.66	64.32	15.84	3.01	150.0	±1.1%	±9.6%
		Y	1.77	65.10	15.87		150.0		
		Z	1.61	63.48	15.45		150.0		
10399	64-QAM Waveform, 40 MHz	X	2.80	65.73	14.57	0.00	150.0	±2.9%	±9.6%
		Y	2.68	65.42	14.39		150.0		
		Z	2.75	65.13	14.31		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.86	65.51	14.92	0.00	150.0	±5.1%	±9.6%
		Y	3.85	65.99	15.06		150.0		
		Z	4.02	65.78	15.10		150.0		

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 E^2-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.

Parameters of Probe: EX3DV4 - SN:7761

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 ms V^{-2}	T2 ms V^{-1}	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
x	11.8	85.35	33.24	5.48	0.00	4.93	0.51	0.00	1.01
y	10.4	72.34	31.28	6.90	0.00	4.90	0.72	0.00	1.00
z	12.9	93.91	33.47	5.21	0.00	4.94	0.00	0.06	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-153.7°
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.

Parameters of Probe: EX3DV4 - SN:7761

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 ($k = 2$)
450	43.5	0.87	10.36	10.36	10.36	0.16	1.30	±13.3%
750	41.9	0.89	9.84	9.84	9.84	0.50	0.85	±12.0%
835	41.5	0.90	9.66	9.66	9.66	0.30	1.12	±12.0%
900	41.5	0.97	9.45	9.45	9.45	0.44	0.84	±12.0%
1750	40.1	1.37	8.65	8.65	8.65	0.28	0.86	±12.0%
1900	40.0	1.40	8.34	8.34	8.34	0.24	0.86	±12.0%
2100	39.8	1.49	7.93	7.93	7.93	0.32	0.90	±12.0%
2300	39.5	1.67	7.92	7.92	7.92	0.32	0.90	±12.0%
2450	39.2	1.80	7.57	7.57	7.57	0.38	0.90	±12.0%
2600	39.0	1.96	7.32	7.32	7.32	0.43	0.90	±12.0%
3300	38.2	2.71	6.88	6.88	6.88	0.30	1.35	±13.1%
3500	37.9	2.91	6.83	6.83	6.83	0.30	1.35	±13.1%
3700	37.7	3.12	6.55	6.55	6.55	0.30	1.35	±13.1%
3900	37.5	3.32	6.22	6.22	6.22	0.40	1.50	±13.1%
4100	37.2	3.53	6.05	6.05	6.05	0.40	1.50	±13.1%
4200	37.1	3.63	6.00	6.00	6.00	0.40	1.70	±13.1%
4400	36.9	3.84	5.94	5.94	5.94	0.40	1.70	±13.1%
4600	36.7	4.04	5.85	5.85	5.85	0.40	1.70	±13.1%
4800	36.4	4.25	5.83	5.83	5.83	0.40	1.80	±13.1%
4950	36.3	4.40	5.60	5.60	5.60	0.40	1.80	±13.1%
5250	35.9	4.71	5.30	5.30	5.30	0.40	1.80	±13.1%
5600	35.5	5.07	4.70	4.70	4.70	0.40	1.80	±13.1%
5750	35.4	5.22	4.84	4.84	4.84	0.40	1.80	±13.1%

[C] 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 below 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] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. 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 ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

Parameters of Probe: EX3DV4 - SN:7761

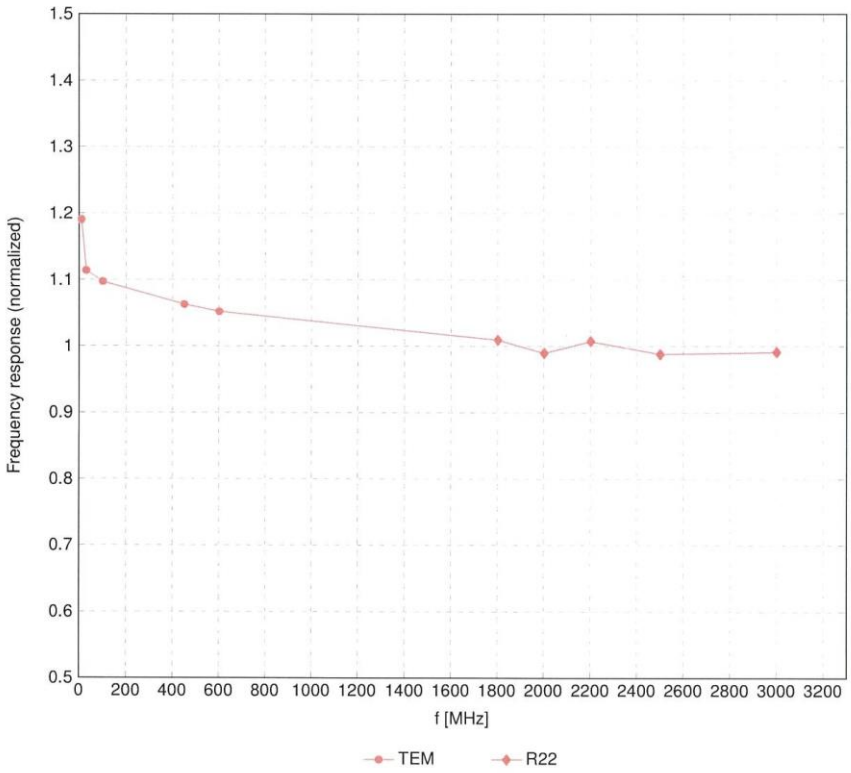
Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz)[C]	Relative Permittivity[F]	Conductivity[F] (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unc ($k = 2$)
6500	34.5	6.07	5.05	5.05	5.05	0.20	2.50	±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] At frequencies 6–10 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 ±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.

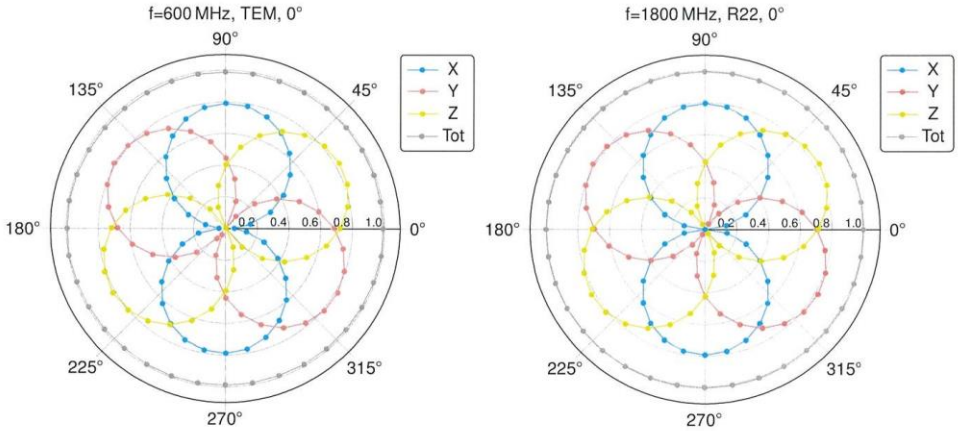
Frequency Response of E-Field

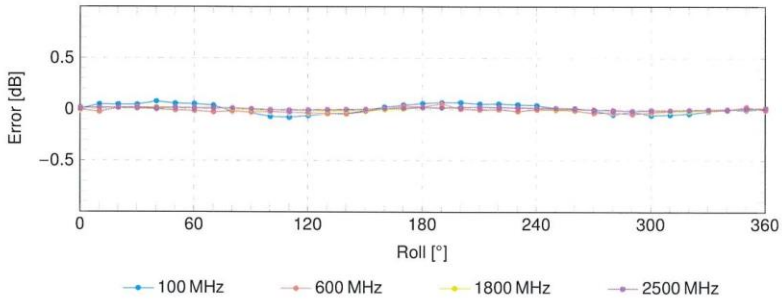
(TEM-Cell:ifi110 EXX, Waveguide:R22)



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

Receiving Pattern (ϕ), $\vartheta = 0°$

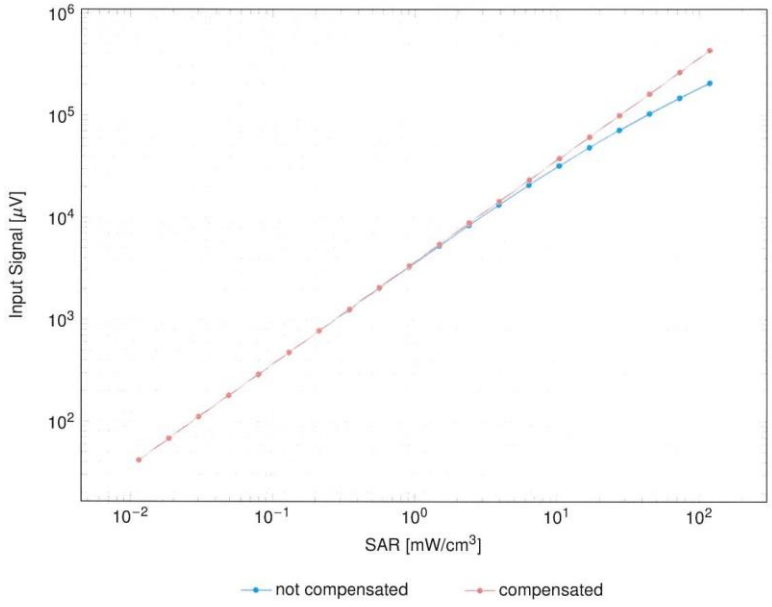


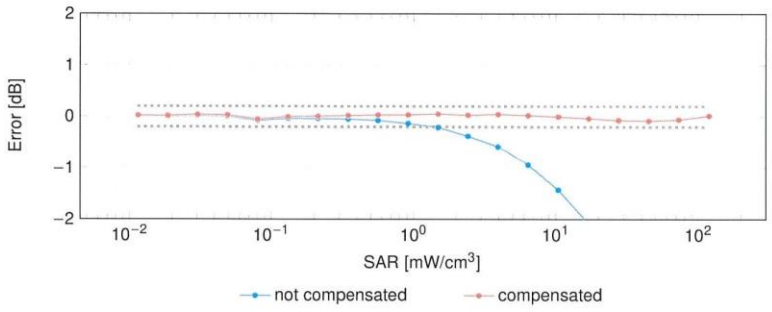


Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Dynamic Range f(SAR_{head})

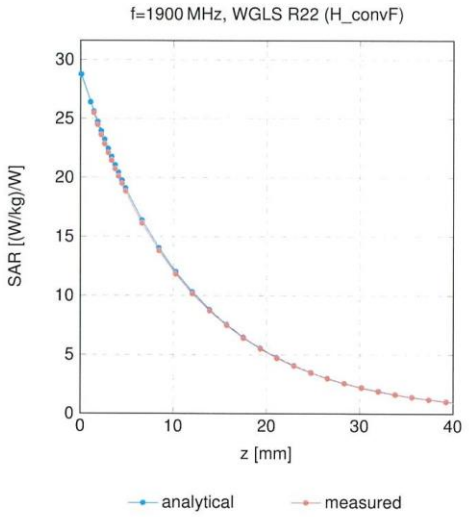
(TEM cell, f_{eval} = 1900 MHz)





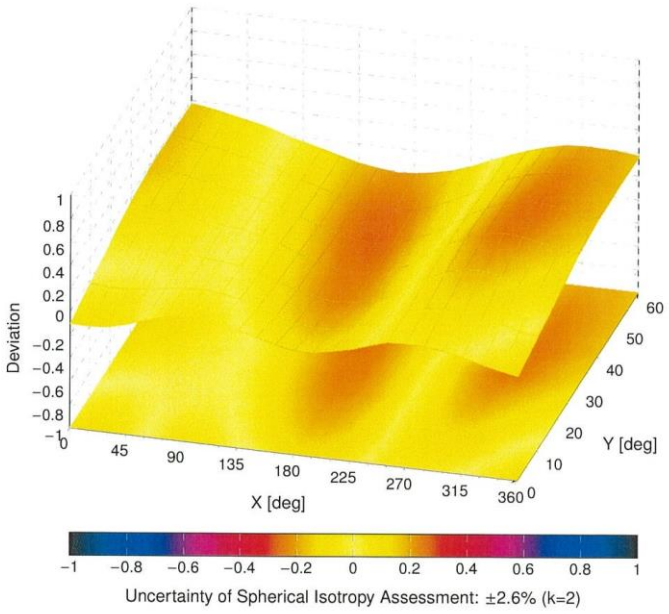
Uncertainty of Linearity Assessment: ±0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ,θ), f = 900 MHz



Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc^E $k = 2$
0		CW	CW	0.00	±4.7
10010	CAA	SAR Validation (Square, 100 ms, 10 ms)	Test	10.00	±9.6
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±9.6
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	±9.6
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	±9.6
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	±9.6
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	±9.6
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	±9.6
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	±9.6
10027	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 Bluetooth (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 (PI/4-DQPSK, DH3)	Bluetooth	4.53	±9.6
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	±9.6
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	±9.6
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	±9.6
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	±9.6
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	3.60	±9.6
10062	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	±9.6
10063	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	±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	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	±9.6
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	±9.6
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	±9.6
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	±9.6
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	±9.6
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	±9.6
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	±9.6
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	±9.6
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	±9.6
10097	CAC	UMTS-FDD (HSDPA)	WCDMA	3.98	±9.6
10098	DAC	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	±9.6
10099	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	±9.6
10100	CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	±9.6
10101	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10102	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10103	DAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	±9.6
10104	CAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.97	±9.6
10105	CAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	±9.6
10108	CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-FDD	5.80	±9.6
10109	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10110	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	±9.6
10111	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-FDD	6.44	±9.6

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10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.59	±9.6
10113	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10114	CAG	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	±9.6
10115	CAG	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	±9.6
10116	CAG	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	±9.6
10117	CAG	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±9.6
10118	CAD	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	±9.6
10119	CAD	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	±9.6
10140	CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	±9.6
10141	CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	±9.6
10142	CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10143	CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	±9.6
10144	CAC	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	±9.6
10145	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	±9.6
10146	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	±9.6
10147	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	±9.6
10149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10150	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10151	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.28	±9.6
10152	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	±9.6
10153	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	±9.6
10154	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	±9.6
10155	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10156	CAF	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	±9.6
10157	CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	±9.6
10158	CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10159	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	±9.6
10160	CAG	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	±9.6
10161	CAG	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10162	CAG	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	CAG	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	±9.6
10170	CAG	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10171	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	±9.6
10172	CAE	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	±9.6
10173	CAE	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10174	CAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10175	CAF	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	±9.6
10176	CAF	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10177	CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD	5.73	±9.6
10178	CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10179	AAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10180	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10181	CAG	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	±9.6
10182	CAG	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10183	CAG	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10184	CAG	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10185	CAI	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	±9.6
10186	CAG	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10187	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	±9.6
10188	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10189	CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10193	CAE	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	±9.6
10194	AAD	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	±9.6
10195	CAE	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	±9.6
10196	CAE	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	±9.6
10197	AAE	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.6
10198	CAF	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	±9.6
10219	CAF	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	±9.6
10220	AAF	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	±9.6
10221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±9.6
10222	CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	±9.6
10223	CAD	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	±9.6
10224	CAD	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	8.08	±9.6

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10225	CAD	UMTS-FDD (HSPA+)	WCDMA	5.97	±9.6
10226	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.49	±9.6
10227	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.26	±9.6
10228	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	±9.6
10229	DAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10230	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10231	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.19	±9.6
10232	CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10233	CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10234	CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TDD	9.21	±9.6
10235	CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10236	CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10237	CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	±9.6
10238	CAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10239	CAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10240	CAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	±9.6
10241	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	±9.6
10242	CAD	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9.86	±9.6
10243	CAD	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	±9.6
10244	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	±9.6
10245	CAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDD	10.06	±9.6
10246	CAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	±9.6
10247	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	±9.6
10248	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	±9.6
10249	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	±9.6
10250	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	±9.6
10251	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	±9.6
10252	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	±9.6
10253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.90	±9.6
10254	CAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	±9.6
10255	CAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	±9.6
10256	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	±9.6
10257	CAD	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	±9.6
10258	CAD	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	±9.6
10259	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TDD	9.98	±9.6
10260	CAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	±9.6
10261	CAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.24	±9.6
10262	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.83	±9.6
10263	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	10.16	±9.6
10264	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD	9.23	±9.6
10265	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TDD	9.92	±9.6
10266	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.07	±9.6
10267	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	±9.6
10268	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	±9.6
10269	CAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	±9.6
10270	CAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	±9.6
10274	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	±9.6
10275	CAD	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	±9.6
10277	CAD	PHS (QPSK)	PHS	11.81	±9.6
10278	CAD	PHS (QPSK, BW 884 MHz, Rolloff 0.5)	PHS	11.81	±9.6
10279	CAG	PHS (QPSK, BW 884 MHz, Rolloff 0.38)	PHS	12.18	±9.6
10290	CAG	CDMA2000, RC1, SO55, Full Rate	CDMA2000	3.91	±9.6
10291	CAG	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	±9.6
10292	CAG	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	±9.6
10293	CAG	CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	±9.6
10295	CAG	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	CDMA2000	12.49	±9.6
10297	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	±9.6
10298	CAF	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.72	±9.6
10299	CAF	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	6.39	±9.6
10300	CAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10301	CAC	IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC)	WiMAX	12.03	±9.6
10302	CAB	IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC, 3CTRL)	WiMAX	12.57	±9.6
10303	CAB	IEEE 802.16e WiMAX (31:15, 5 ms, 10 MHz, 64QAM, PUSC)	WiMAX	12.52	±9.6
10304	CAA	IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, 64QAM, PUSC)	WiMAX	11.86	±9.6
10305	CAA	IEEE 802.16e WiMAX (31:15, 10 ms, 10 MHz, 64QAM, PUSC)	WiMAX	15.24	±9.6
10306	CAA	IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC)	WiMAX	14.67	±9.6

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10307	AAB	IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, QPSK, PUSC)	WiMAX	14.49	±9.6
10308	AAB	IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 16QAM, PUSC)	WiMAX	14.46	±9.6
10309	AAB	IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 16QAM,AMC 2x3)	WiMAX	14.58	±9.6
10310	AAB	IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x3	WiMAX	14.57	±9.6
10311	AAB	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD	6.06	±9.6
10313	AAD	iDEN 1:3	iDEN	10.51	±9.6
10314	AAD	iDEN 1:6	iDEN	13.48	±9.6
10315	AAD	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc dc)	WLAN	1.71	±9.6
10316	AAD	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
10317	AAA	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
10352	AAA	Pulse Waveform (200 Hz, 10%)	Generic	10.00	±9.6
10353	AAA	Pulse Waveform (200 Hz, 20%)	Generic	6.99	±9.6
10354	AAA	Pulse Waveform (200 Hz, 40%)	Generic	3.98	±9.6
10355	AAA	Pulse Waveform (200 Hz, 60%)	Generic	2.22	±9.6
10356	AAA	Pulse Waveform (200 Hz, 80%)	Generic	0.97	±9.6
10387	AAA	QPSK Waveform, 1 MHz	Generic	5.10	±9.6
10388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±9.6
10396	AAA	64-QAM Waveform, 100 kHz	Generic	6.27	±9.6
10399	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	±9.6
10400	AAD	IEEE 802.11ac WiFi (20 MHz, 64-QAM, 99pc dc)	WLAN	8.37	±9.6
10401	AAA	IEEE 802.11ac WiFi (40 MHz, 64-QAM, 99pc dc)	WLAN	8.60	±9.6
10402	AAA	IEEE 802.11ac WiFi (80 MHz, 64-QAM, 99pc dc)	WLAN	8.53	±9.6
10403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.76	±9.6
10404	AAB	CDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.77	±9.6
10406	AAD	CDMA2000, RC3, SO32, SCH0, Full Rate	CDMA2000	5.22	±9.6
10410	AAA	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10414	AAA	WLAN CCDF, 64-QAM, 40 MHz	Generic	8.54	±9.6
10415	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc dc)	WLAN	1.54	±9.6
10416	AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc dc)	WLAN	8.23	±9.6
10417	AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc dc)	WLAN	8.23	±9.6
10418	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)	WLAN	8.14	±9.6
10419	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Short)	WLAN	8.19	±9.6
10422	AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	±9.6
10423	AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8.47	±9.6
10424	AAE	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.40	±9.6
10425	AAE	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.41	±9.6
10426	AAE	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WLAN	8.45	±9.6
10427	AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	8.41	±9.6
10430	AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	±9.6
10431	AAC	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	±9.6
10432	AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10433	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10434	AAG	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	±9.6
10435	AAA	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10447	AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	±9.6
10448	AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	LTE-FDD	7.53	±9.6
10449	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	LTE-FDD	7.51	±9.6
10450	AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	±9.6
10451	AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	WCDMA	7.59	±9.6
10453	AAC	Validation (Square, 10 ms, 1 ms)	Test	10.00	±9.6
10456	AAC	IEEE 802.11ac WiFi (160 MHz, 64-QAM, 99pc dc)	WLAN	8.63	±9.6
10457	AAC	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	±9.6
10458	AAC	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.55	±9.6
10459	AAC	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	±9.6
10460	AAC	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	±9.6
10461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10462	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.30	±9.6
10463	AAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.56	±9.6
10464	AAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10465	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6
10466	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±9.6
10467	AAA	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10468	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6
10469	AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.56	±9.6
10470	AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10471	AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6

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10472	AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±9.6
10473	AAA	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10474	AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6
10475	AAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±9.6
10477	AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6
10478	AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±9.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.74	±9.6
10480	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.18	±9.6
10481	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	±9.6
10482	AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.71	±9.6
10483	AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, Sub)	LTE-TDD	8.39	±9.6
10484	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.47	±9.6
10485	AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.59	±9.6
10486	AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.38	±9.6
10487	AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.60	±9.6
10488	AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.70	±9.6
10489	AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TDD	8.31	±9.6
10490	AAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	±9.6
10491	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.74	±9.6
10492	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Sub)	LTE-TDD	8.41	±9.6
10493	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.55	±9.6
10494	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.74	±9.6
10495	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.37	±9.6
10496	AAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	±9.6
10497	AAE	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.67	±9.6
10498	AAE	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.40	±9.6
10499	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.68	±9.6
10500	AAF	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.67	±9.6
10501	AAF	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDD	8.44	±9.6
10502	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.52	±9.6
10503	AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.72	±9.6
10504	AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.31	±9.6
10505	AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	±9.6
10506	AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.74	±9.6
10507	AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TDD	8.36	±9.6
10508	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.55	±9.6
10509	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.99	±9.6
10510	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Sub)	LTE-TDD	8.49	±9.6
10511	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.51	±9.6
10512	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.74	±9.6
10513	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.42	±9.6
10514	AAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	±9.6
10515	AAE	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc dc)	WLAN	1.58	±9.6
10516	AAE	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc dc)	WLAN	1.57	±9.6
10517	AAF	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc dc)	WLAN	1.58	±9.6
10518	AAF	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc dc)	WLAN	8.23	±9.6
10519	AAF	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc dc)	WLAN	8.39	±9.6
10520	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc dc)	WLAN	8.12	±9.6
10521	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc dc)	WLAN	7.97	±9.6
10522	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc dc)	WLAN	8.45	±9.6
10523	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc dc)	WLAN	8.08	±9.6
10524	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc dc)	WLAN	8.27	±9.6
10525	AAC	IEEE 802.11ac WiFi (20 MHz, MCS0, 99pc dc)	WLAN	8.36	±9.6
10526	AAF	IEEE 802.11ac WiFi (20 MHz, MCS1, 99pc dc)	WLAN	8.42	±9.6
10527	AAF	IEEE 802.11ac WiFi (20 MHz, MCS2, 99pc dc)	WLAN	8.21	±9.6
10528	AAF	IEEE 802.11ac WiFi (20 MHz, MCS3, 99pc dc)	WLAN	8.36	±9.6
10529	AAF	IEEE 802.11ac WiFi (20 MHz, MCS4, 99pc dc)	WLAN	8.36	±9.6
10531	AAF	IEEE 802.11ac WiFi (20 MHz, MCS6, 99pc dc)	WLAN	8.43	±9.6
10532	AAF	IEEE 802.11ac WiFi (20 MHz, MCS7, 99pc dc)	WLAN	8.29	±9.6
10533	AAE	IEEE 802.11ac WiFi (20 MHz, MCS8, 99pc dc)	WLAN	8.38	±9.6
10534	AAE	IEEE 802.11ac WiFi (40 MHz, MCS0, 99pc dc)	WLAN	8.45	±9.6
10535	AAE	IEEE 802.11ac WiFi (40 MHz, MCS1, 99pc dc)	WLAN	8.45	±9.6
10536	AAF	IEEE 802.11ac WiFi (40 MHz, MCS2, 99pc dc)	WLAN	8.32	±9.6
10537	AAF	IEEE 802.11ac WiFi (40 MHz, MCS3, 99pc dc)	WLAN	8.44	±9.6
10538	AAF	IEEE 802.11ac WiFi (40 MHz, MCS4, 99pc dc)	WLAN	8.54	±9.6
10540	AAA	IEEE 802.11ac WiFi (40 MHz, MCS6, 99pc dc)	WLAN	8.39	±9.6

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10541	AAA	IEEE 802.11ac WiFi (40 MHz, MCS7, 99pc dc)	WLAN	8.46	±9.6
10542	AAA	IEEE 802.11ac WiFi (40 MHz, MCS8, 99pc dc)	WLAN	8.65	±9.6
10543	AAC	IEEE 802.11ac WiFi (40 MHz, MCS9, 99pc dc)	WLAN	8.65	±9.6
10544	AAC	IEEE 802.11ac WiFi (80 MHz, MCS0, 99pc dc)	WLAN	8.47	±9.6
10545	AAC	IEEE 802.11ac WiFi (80 MHz, MCS1, 99pc dc)	WLAN	8.55	±9.6
10546	AAC	IEEE 802.11ac WiFi (80 MHz, MCS2, 99pc dc)	WLAN	8.35	±9.6
10547	AAC	IEEE 802.11ac WiFi (80 MHz, MCS3, 99pc dc)	WLAN	8.49	±9.6
10548	AAC	IEEE 802.11ac WiFi (80 MHz, MCS4, 99pc dc)	WLAN	8.37	±9.6
10550	AAC	IEEE 802.11ac WiFi (80 MHz, MCS6, 99pc dc)	WLAN	8.38	±9.6
10551	AAC	IEEE 802.11ac WiFi (80 MHz, MCS7, 99pc dc)	WLAN	8.50	±9.6
10552	AAC	IEEE 802.11ac WiFi (80 MHz, MCS8, 99pc dc)	WLAN	8.42	±9.6
10553	AAC	IEEE 802.11ac WiFi (80 MHz, MCS9, 99pc dc)	WLAN	8.45	±9.6
10554	AAC	IEEE 802.11ac WiFi (160 MHz, MCS0, 99pc dc)	WLAN	8.48	±9.6
10555	AAC	IEEE 802.11ac WiFi (160 MHz, MCS1, 99pc dc)	WLAN	8.47	±9.6
10556	AAC	IEEE 802.11ac WiFi (160 MHz, MCS2, 99pc dc)	WLAN	8.50	±9.6
10557	AAC	IEEE 802.11ac WiFi (160 MHz, MCS3, 99pc dc)	WLAN	8.52	±9.6
10558	AAC	IEEE 802.11ac WiFi (160 MHz, MCS4, 99pc dc)	WLAN	8.61	±9.6
10560	AAC	IEEE 802.11ac WiFi (160 MHz, MCS6, 99pc dc)	WLAN	8.73	±9.6
10561	AAC	IEEE 802.11ac WiFi (160 MHz, MCS7, 99pc dc)	WLAN	8.56	±9.6
10562	AAC	IEEE 802.11ac WiFi (160 MHz, MCS8, 99pc dc)	WLAN	8.69	±9.6
10563	AAC	IEEE 802.11ac WiFi (160 MHz, MCS9, 99pc dc)	WLAN	8.77	±9.6
10564	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc dc)	WLAN	8.25	±9.6
10565	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc dc)	WLAN	8.45	±9.6
10566	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc dc)	WLAN	8.13	±9.6
10567	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc dc)	WLAN	8.00	±9.6
10568	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc dc)	WLAN	8.37	±9.6
10569	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc dc)	WLAN	8.10	±9.6
10570	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc dc)	WLAN	8.30	±9.6
10571	AAC	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc dc)	WLAN	1.99	±9.6
10572	AAC	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc dc)	WLAN	1.99	±9.6
10573	AAC	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc dc)	WLAN	1.98	±9.6
10574	AAC	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc dc)	WLAN	1.98	±9.6
10575	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	±9.6
10576	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc dc)	WLAN	8.60	±9.6
10577	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	±9.6
10578	AAD	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	±9.6
10579	AAD	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	8.36	±9.6
10580	AAD	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	±9.6
10581	AAD	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	±9.6
10582	AAD	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	±9.6
10583	AAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	±9.6
10584	AAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc dc)	WLAN	8.60	±9.6
10585	AAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	±9.6
10586	AAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	±9.6
10587	AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc dc)	WLAN	8.36	±9.6
10588	AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	±9.6
10589	AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	±9.6
10590	AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	±9.6
10591	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc dc)	WLAN	8.63	±9.6
10592	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc dc)	WLAN	8.79	±9.6
10593	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc dc)	WLAN	8.64	±9.6
10594	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc dc)	WLAN	8.74	±9.6
10595	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc dc)	WLAN	8.74	±9.6
10596	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc dc)	WLAN	8.71	±9.6
10597	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc dc)	WLAN	8.72	±9.6
10598	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc dc)	WLAN	8.50	±9.6
10599	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc dc)	WLAN	8.79	±9.6
10600	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc dc)	WLAN	8.88	±9.6
10601	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc dc)	WLAN	8.82	±9.6
10602	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc dc)	WLAN	8.94	±9.6
10603	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc dc)	WLAN	9.03	±9.6
10604	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc dc)	WLAN	8.76	±9.6
10605	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc dc)	WLAN	8.97	±9.6
10606	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc dc)	WLAN	8.82	±9.6
10607	AAC	IEEE 802.11ac WiFi (20 MHz, MCS0, 90pc dc)	WLAN	8.64	±9.6
10608	AAC	IEEE 802.11ac WiFi (20 MHz, MCS1, 90pc dc)	WLAN	8.77	±9.6