

Report on the Specific Absorption Rate Testing of the L1P-2

3Shape TRIOS A/S
Model: L1P-2

In accordance with FCC 47 CFR 2.1093 (2023)

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NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Jon Kenny	Technical Director	Report Signatory	28 November 2024

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EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR 2.1093 (2023) for the tests detailed in section 1.4.

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SECTION 1

REPORT SUMMARY

Specific Absorption Rate Testing of the L1P-2



1.1 REPORT MODIFICATION RECORD

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	28 November 2024

Table 1

1.2 INTRODUCTION

The information contained in this report is intended to show verification of the Specific Absorption Rate testing of the L1P-2 to the requirements of FCC 47 CFR 2.1093 (2023).

Objective	To determine the Equipment Under Test's (EUT) compliance with the requirements specified within FCC 47 CFR 2.1093 (2023).
Applicant	3Shape TRIOS A/S
EUT/Sample Identification	Refer to section 1.3
Test Specification/Issue/Date	FCC 47 CFR 2.1093 (2023)
Start of Test	22/10/2024
Finish of Test	29/10/2024
Related Document(s)	FCC 47 CFR 1.1310 KDB 248227 - D01 v02r02 KDB 447498 - D01 v06 KDB 865664 - D01 v01r04
Name of Engineer(s)	Christopher Sincock



1.3 IDENTIFICATION OF THE EUT

The table below details identification of the EUT(s) that have been used to carry out the testing within this report.

Model: L1P-2			
Serial Number	Hardware Version	Software Version	Firmware
1Id2428l01001x	10037061-01 Build 4 RC1	Radio module driver: 11.39.0.18	Radio module: 5.4.52.5
1Id2428l01002x	10037061-01 Build 4 RC1	Radio module driver: 11.39.0.18	Radio module: 5.4.52.5

Table 2



1.4 BRIEF SUMMARY OF RESULTS

The measurements shown in this report were made to the requirements of FCC 47 CFR 2.1093 (2023).

1.4.1 Summary of Maximum Values

The maximum 10g volume averaged stand-alone SAR found during this Assessment:

Max 1g SAR (W/kg) Body	1.250 (Measured)	1.574 (Scaled)
The maximum 10g volume averaged SAR level measured for all the tests performed did not exceed the limits for FCC general population/uncontrolled exposure extremity exposure of 4 W/kg in accordance with FCC 47 CFR 1.1310.		

Table 3

The maximum 10g volume averaged stand-alone Reported SAR found during this assessment for each supported mode:

Technology	Band	Test Configuration	Max Reported SAR (W/kg)
Bluetooth	2.4GHz	0mm Front	0.034
WLAN	2.4GHz	0mm Front	0.344
WLAN	UNII-1	0mm Front	1.574
WLAN	UNII-2C	0mm Front	1.473
WLAN	UNII-3	0mm Front	1.144
The maximum 10g volume averaged SAR level measured for all the tests performed (including simultaneous transmission analysis results) did not exceed the limits for general population/uncontrolled extremity exposure of 4 W/kg.			

Table 4

1.4.2 Simultaneous Transmission

Combinations of Simultaneous Transmission this EUT can achieve are the following:

2.4 GHz WLAN + 2.4 GHz Bluetooth

Position	2.4 GHz Main Antenna	Bluetooth Auxiliary Antenna	Sum of 10g SAR (W/Kg)
0mm Front	0.344	0.034	0.378

Table 5

5 GHz WLAN + 2.4 GHz Bluetooth

Position	UNII-2C Main Antenna	Bluetooth Auxiliary Antenna	Sum of 10g SAR (W/Kg)
0mm Front	1.473	0.034	1.507

Table 6

2.4 GHz WLAN + 5 GHz WLAN

Position	2.4 GHz Main Antenna	UNII-1 Auxiliary Antenna	Sum of 10g SAR (W/Kg)
0mm Front	0.344	1.574	1.918

Table 7

2.4 GHz WLAN - MIMO

Position	2.4 GHz Main & Auxiliary Antenna	Sum of 10g SAR (W/Kg)
0mm Front	0.344	0.344

Table 8

5 GHz WLAN + 5 GHz WLAN

Position	UNII-2C Main Antenna	UNII-1 Auxiliary Antenna	Sum of 10g SAR (W/Kg)
0mm Front	1.473	1.574	3.047

Table 9

When 2.4GHz WLAN was tested it was found that the SAR distributions overlapped because of the proximity of the antennas. Therefore this is included in the simultaneous SAR analysis.

Only the Worst-case test result for each radio access technology was considered for the simultaneous transmission assessment.



1.5 TEST RESULTS SUMMARY

1.5.1 Results Summary Tables

Bluetooth - DH5 - GSKF:
Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front	39	2441	10.19	11.19	0.023	0.029	-
0mm Left edge	39	2441	10.19	11.19	0.006	0.008	-
0mm Right edge	39	2441	10.19	11.19	0.000	0.000	-
0mm Back	39	2441	10.19	11.19	0.000	0.000	-
0mm Bottom	39	2441	10.19	11.19	0.000	0.000	-
0mm Front	0	2402	10.18	11.18	0.027	0.034	C.1
0mm Front	78	2480	10.15	11.15	0.021	0.026	-
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 10

WLAN - 2.4GHz - 802.11b - SISO - Main Antenna:
Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front	6	2437	18.53	19.53	0.202	0.254	C.2
0mm Left edge	6	2437	18.53	19.53	0.029	0.037	-
0mm Right edge	6	2437	18.53	19.53	0.031	0.039	-
0mm Back	6	2437	18.53	19.53	0.012	0.015	-
0mm Bottom	6	2437	18.53	19.53	0.031	0.039	-
0mm Front	1	2412	16.60	17.60	0.087	0.110	-
0mm Front	11	2462	17.60	18.60	0.106	0.133	-
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 11



WLAN - 2.4GHz - 802.11b - SISO - Auxillary Antenna:
 Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front	6	2437	17.30	18.30	0.211	0.266	-
0mm Left edge	6	2437	17.30	18.30	0.030	0.038	-
0mm Right edge	6	2437	17.30	18.30	0.056	0.070	-
0mm Back	6	2437	17.30	18.30	0.008	0.010	-
0mm Bottom	6	2437	17.30	18.30	0.009	0.011	-
0mm Front	1	2412	15.30	16.30	0.244	0.307	C.3
0mm Front	11	2462	16.43	17.43	0.115	0.145	-
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 12



WLAN - 2.4GHz - 802.11b - 20MHz - MIMO:
Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front (Main Antenna)	6	2437	18.54	19.54	0.273	0.344	C.4
0mm Front (Aux Antenna)	6	2437	17.33	18.33	0.273	0.344	
0mm Left edge (Main Antenna)	6	2437	18.54	19.54	0.058	0.073	-
0mm Left edge (Aux Antenna)	6	2437	17.33	18.33	0.058	0.073	
0mm Right edge (Main Antenna)	6	2437	18.54	19.54	0.059	0.074	-
0mm Right edge (Aux Antenna)	6	2437	17.33	18.33	0.059	0.074	
0mm Back (Main Antenna)	6	2437	18.54	19.54	0.014	0.018	-
0mm Back (Aux Antenna)	6	2437	17.33	18.33	0.014	0.018	
0mm Bottom (Main Antenna)	6	2437	18.54	19.54	0.015	0.019	-
0mm Bottom (Aux Antenna)	6	2437	17.33	18.33	0.015	0.019	
0mm Front (Main Antenna)	1	2412	13.78	14.78	0.103	0.130	-
0mm Front (Aux Antenna)	1	2412	12.38	13.38	0.103	0.130	
0mm Front (Main Antenna)	11	2462	12.81	13.81	0.065	0.082	-
0mm Front (Aux Antenna)	11	2462	11.53	12.53	0.065	0.082	
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 13



WLAN 5 GHz - UNII-1 - HT20 - MIMO
Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front (Main Antenna)	48	5240	15.43	16.43	1.080	1.360	-
0mm Front (Aux Antenna)	48	5240	16.38	17.38	1.200	1.511	
0mm Left edge (Main Antenna)	48	5240	15.43	16.43	0.552	0.695	-
0mm Left edge (Aux Antenna)	48	5240	16.38	17.38	0.552	0.695	
0mm Right edge (Main Antenna)	48	5240	15.43	16.43	0.826	1.040	-
0mm Right edge (Aux Antenna)	48	5240	16.38	17.38	0.826	1.040	
0mm Back (Main Antenna)	48	5240	15.43	16.43	0.073	0.092	-
0mm Back (Aux Antenna)	48	5240	16.38	17.38	0.073	0.092	
0mm Bottom (Main Antenna)	48	5240	15.43	16.43	0.482	0.607	-
0mm Bottom (Aux Antenna)	48	5240	16.38	17.38	0.482	0.607	
0mm Front (Main Antenna)	36	5180	11.20	12.2	0.390	0.491	-
0mm Front (Aux Antenna)	36	5180	12.03	13.03	0.466	0.587	
0mm Front (Main Antenna)	44	5220	15.37	16.37	1.110	1.397	C.5
0mm Front (Aux Antenna)	44	5220	16.38	17.38	1.250	1.574	
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 14



WLAN 5 GHz - UNII-2C - HT20 - MIMO
Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front (Main Antenna)	112	5560	17.21	18.21	1.080	1.360	-
0mm Front (Aux Antenna)	112	5560	17.71	18.71	1.110	1.397	
0mm Left edge (Main Antenna)	112	5560	17.21	18.21	0.576	0.725	-
0mm Left edge (Aux Antenna)	112	5560	17.71	18.71	0.576	0.725	
0mm Right edge (Main Antenna)	112	5560	17.21	18.21	0.542	0.682	-
0mm Right edge (Aux Antenna)	112	5560	17.71	18.71	0.542	0.682	
0mm Back (Main Antenna)	112	5560	17.21	18.21	0.084	0.106	-
0mm Back (Aux Antenna)	112	5560	17.71	18.71	0.084	0.106	
0mm Bottom (Main Antenna)	112	5560	17.21	18.21	0.442	0.556	-
0mm Bottom (Aux Antenna)	112	5560	17.71	18.71	0.442	0.556	
0mm Front (Main Antenna)	100	5500	13.16	14.16	0.447	0.563	-
0mm Front (Aux Antenna)	100	5500	14.00	15.00	0.479	0.603	
0mm Front (Main Antenna)	120	5600	17.07	18.07	1.170	1.473	C.6
0mm Front (Aux Antenna)	120	5600	17.60	18.60	1.160	1.460	
0mm Front (Main Antenna)	132	5660	15.28	16.28	0.725	0.913	-
0mm Front (Aux Antenna)	132	5660	15.84	16.84	0.761	0.958	
0mm Front (Main Antenna)	144	5720	16.79	17.79	0.848	1.068	-
0mm Front (Aux Antenna)	144	5720	17.46	18.46	0.895	1.127	
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 15



WLAN 5 GHz - UNII-3 - HT20 - MIMO
Specific Absorption Rate (SAR) 10g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 10g SAR (W/kg)	Scaled 10g SAR (W/kg)	Scan Figure Number
0mm Front (Main Antenna)	157	5785	16.65	17.65	0.815	1.026	-
0mm Front (Aux Antenna)	157	5785	17.27	18.27	0.874	1.100	
0mm Left edge (Main Antenna)	157	5785	16.65	17.65	0.453	0.570	-
0mm Left edge (Aux Antenna)	157	5785	17.27	18.27	0.453	0.570	
0mm Right edge (Main Antenna)	157	5785	16.65	17.65	0.455	0.573	-
0mm Right edge (Aux Antenna)	157	5785	17.27	18.27	0.455	0.573	
0mm Back (Main Antenna)	157	5785	16.65	17.65	0.094	0.118	-
0mm Back (Aux Antenna)	157	5785	17.27	18.27	0.094	0.118	
0mm Bottom (Main Antenna)	157	5785	16.65	17.65	0.371	0.467	-
0mm Bottom (Aux Antenna)	157	5785	17.27	18.27	0.371	0.467	
0mm Front (Main Antenna)	149	5745	16.78	17.78	0.836	1.052	C.7
0mm Front (Aux Antenna)	149	5745	17.25	18.25	0.909	1.144	
0mm Front (Main Antenna)	165	5825	16.61	17.61	0.790	0.995	-
0mm Front (Aux Antenna)	165	5825	17.32	18.32	0.856	1.078	
Limit for general population extremity exposure (uncontrolled exposure) 4.0 W/kg (10g).							

Table 16



1.5.2 Technical Description

The equipment under test (EUT) was a handheld dental scanner.

1.5.3 Test Configuration and Modes of Operation

The testing was performed with a removeable battery supplied and manufactured by 3Shape TRIOS A/S.

Supported technologies are Bluetooth (BR/EDR/LE) WLAN 2.4GHz (802.11a/b/g/n) and WLAN 5GHz (802.11n/ac).

MIMO is supported for WLAN 2.4 GHz and 5 GHz.

For each scan, the device was configured into a continuous transmission test mode at a maximum power. Testing was performed in each position at the frequency that gave the highest output power for each band.

The test sample was modified with an extra external cable and a three-pin connector to allow a USB connection to configure it. This wire and connection is not present in normal operation.

2.4 GHz WLAN OFDM and 5 GHz WLAN UNII-2A were excluded from testing using the exclusions outlined in KDB 248227 D01.

Conducted power measurements were performed on a modified device (accessible conducted port) and the measured SAR results were power scaled to the maximum declared tune-up level.

For each antenna, the front/left edge/right edge/back/bottom sides were assessed for SAR.

During testing only MIMO was tested for any configuration where the power of MIMO was greater than or equal to the SISO power. Where the SISO power was greater than MIMO both configurations were tested.

For the 5 GHz frequency bands the transmission mode used for testing was determined by the 802.11 configuration with the highest declared output power in each frequency band. Where multiple 802.11 configurations have the same specified output power, testing was performed using the mode with the largest channel bandwidth with the lowest order modulation and lowest data rate.

For SAR assessment, the relevant surfaces of the device were placed against an Elliptical phantom with a 0mm separation distance.

The Elliptical Flat Phantom dimensions are 600mm major axis and 400mm minor axis with a shell thickness of 2mm. The phantom was filled to a minimum depth of 150mm with the appropriate liquid. The dielectric properties were in accordance with the requirements specified in KDB 865665.

1.5.4 Antenna Location Diagram

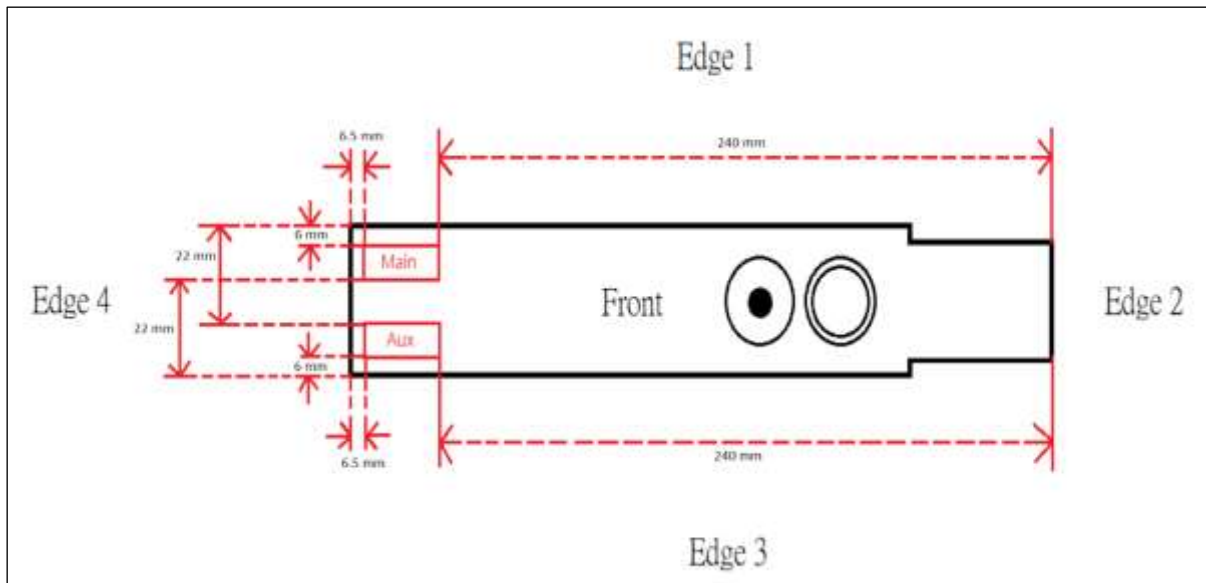


Figure 1

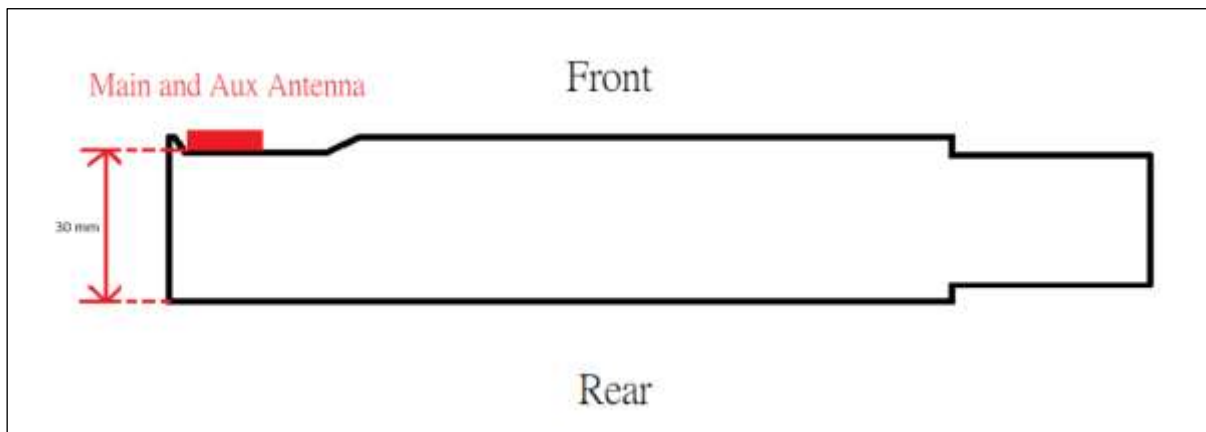


Figure 2



1.5.5 Deviations from Standard

None



1.6 CONDUCTED POWER MEASUREMENTS

1.6.1 Method

Conducted Power Measurements were made using a power meter.

The customer declared a tune up tolerance of ± 1.0 dBm.

1.6.2 Measured Results

Bluetooth - BR

(Aux Antenna)

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
BDR	0	GFSK	77	DH5	2402	10.18	11.18
BDR	39	GFSK	77	DH5	2441	10.19	11.19
BDR	78	GFSK	77	DH5	2480	10.15	11.15

Table 17

WLAN 2.4 GHz - SISO

(Main Antenna)

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11b	1	BPSK	100	1	2412	16.60	17.60
802.11b	6	BPSK	100	1	2437	18.53	19.53
802.11b	11	BPSK	100	1	2462	17.60	18.60

Table 18

WLAN 2.4 GHz - SISO

(Aux Antenna)

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11b	1	BPSK	100	1	2412	15.30	16.30
802.11b	6	BPSK	100	1	2437	17.30	18.30
802.11b	11	BPSK	100	1	2462	16.43	17.43

Table 19



WLAN 2.4 GHz - SISO

(Main Antenna)

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11g	1	BPSK	100	6	2412	14.56	15.56
802.11g	6	BPSK	100	6	2437	18.52	19.52
802.11g	11	BPSK	100	6	2462	14.69	15.69

Table 20

WLAN 2.4 GHz - SISO

(Aux Antenna)

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11g	1	BPSK	100	6	2412	13.42	14.42
802.11g	6	BPSK	100	6	2437	17.31	18.31
802.11g	11	BPSK	100	6	2462	13.52	14.52

Table 21

WLAN 2.4 GHz - 2x2 MIMO

Technology	Channel	Modulation	Duty Cycle (%)	Rate (MCS)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11n (Main Antenna)	1	BPSK	100	0	2412	13.78	14.78
802.11n (Aux Antenna)	1	BPSK	100	0	2412	12.38	13.38
802.11n (Main Antenna)	6	BPSK	100	0	2437	18.54	19.54
802.11n (Aux Antenna)	6	BPSK	100	0	2437	17.33	18.33
802.11n (Main Antenna)	11	BPSK	100	0	2462	12.81	13.81
802.11n (Aux Antenna)	11	BPSK	100	0	2462	11.53	12.53

Table 22



WLAN UNII-1 - 2x2 MIMO

Technology	Channel	Modulation	Duty Cycle (%)	Rate (MCS)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11n (Main Antenna)	36	HT20	100	0	5180	11.20	12.20
802.11n (Aux Antenna)	36	HT20	100	0	5180	12.03	13.03
802.11n (Main Antenna)	44	HT20	100	0	5220	15.37	16.37
802.11n (Aux Antenna)	44	HT20	100	0	5220	16.38	17.38
802.11n (Main Antenna)	48	HT20	100	0	5240	15.43	16.43
802.11n (Aux Antenna)	48	HT20	100	0	5240	16.38	17.38

Table 23

WLAN UNII-2A - 2x2 MIMO

Technology	Channel	Modulation	Duty Cycle (%)	Rate (MCS)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11n (Main Antenna)	52	HT20	100	0	5260	13.48	14.48
802.11n (Aux Antenna)	52	HT20	100	0	5260	14.24	15.24
802.11n (Main Antenna)	56	HT20	100	0	5280	13.51	14.51
802.11n (Aux Antenna)	56	HT20	100	0	5280	14.36	15.36
802.11n (Main Antenna)	64	HT20	100	0	5320	11.67	12.67
802.11n (Aux Antenna)	64	HT20	100	0	5320	12.61	13.61

Table 24



WLAN UNII-2C - 2x2 MIMO

Technology	Channel	Modulation	Duty Cycle (%)	Rate (MCS)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11n (Main Antenna)	100	HT20	100	0	5500	13.16	14.16
802.11n (Aux Antenna)	100	HT20	100	0	5500	14.00	15.00
802.11n (Main Antenna)	112	HT20	100	0	5560	17.21	18.21
802.11n (Aux Antenna)	112	HT20	100	0	5560	17.71	18.71
802.11n (Main Antenna)	120	HT20	100	0	5600	17.07	18.07
802.11n (Aux Antenna)	120	HT20	100	0	5600	17.60	18.60
802.11n (Main Antenna)	132	HT20	100	0	5660	15.28	16.28
802.11n (Aux Antenna)	132	HT20	100	0	5660	15.84	16.84
802.11n (Main Antenna)	144	HT20	100	0	5720	16.79	17.79
802.11n (Aux Antenna)	144	HT20	100	0	5720	17.46	18.46

Table 25



WLAN UNII-3 - 2x2 MIMO

Technology	Channel	Modulation	Duty Cycle (%)	Rate (MCS)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11n (Main Antenna)	149	HT20	100	0	5745	16.78	17.78
802.11n (Aux Antenna)	149	HT20	100	0	5745	17.25	18.25
802.11n (Main Antenna)	157	HT20	100	0	5785	16.65	17.65
802.11n (Aux Antenna)	157	HT20	100	0	5785	17.27	18.27
802.11n (Main Antenna)	165	HT20	100	0	5825	16.61	17.61
802.11n (Aux Antenna)	165	HT20	100	0	5825	17.32	18.32

Table 26



SECTION 2

TEST DETAILS

Specific Absorption Rate Testing of the L1P-2

2.1 DASY6 MEASUREMENT SYSTEM

2.1.1 System Description

The DASY6 system for performing compliance tests consists of the following items:

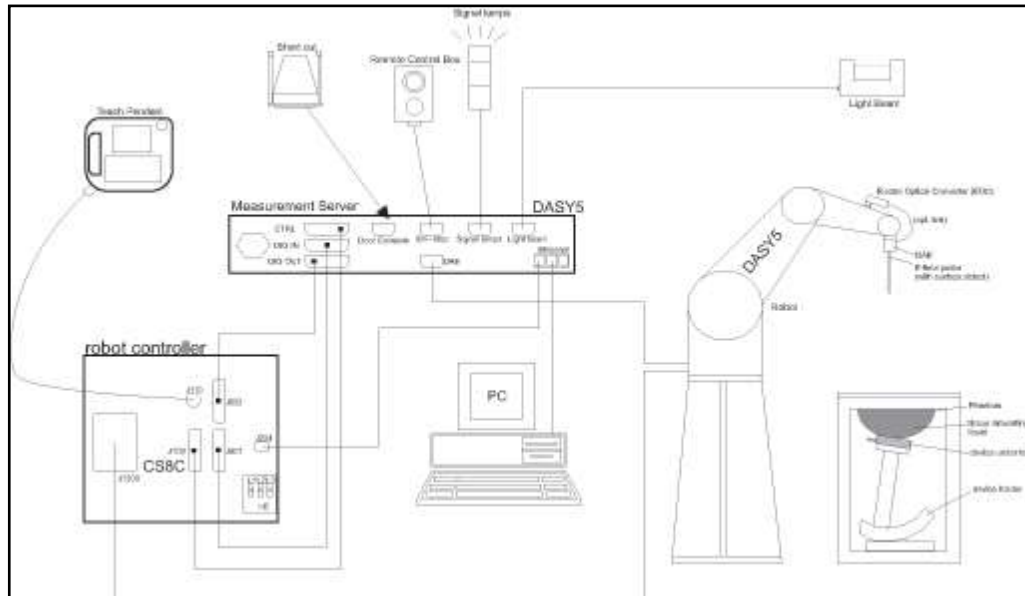


Figure 3 - System Description Diagram

A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).

An isotropic field probe optimized and calibrated for the targeted measurement.

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.

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.

The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.

A computer running the DASY6 software to display and interact with the robot and information.

There is a remote control and a teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.

The phantom, the device holder and other accessories according to the targeted measurement.



2.1.2 Probe Specification

The probes used by the DASY system are isotropic E-field probes, constructed with a symmetric design and a triangular core. The probes have built-in shielding against static charges and are contained within a PEEK enclosure material. These probes are specially designed and calibrated for use in liquids with high permittivity. The frequency range of the probes are from 6 MHz to 6 GHz.

2.1.3 Data Acquisition Electronics

The data acquisition electronics (DAE4 or DAE3) consist 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 with a 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 mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

2.1.4 SAR Evaluation Description

The cDASY6 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.

Fast Area Scan:

The Fast Area Scan provides an easy, time efficient and accurate way to define the optimal power reference location. The location of the power reference and power drift measurements for the subsequent Area, Fast Volume and Zoom Scans will be automatically set at the maximum of the Fast Area Scan.

Area Scan:

Area Scans are used to determine the peak location of the measured field before doing a finer measurement around the hotspot. Peak location can be found accurately even on coarse grids using the advanced interpolation routines implemented in cDASY6 Module SAR. Area Scans measure a two dimensional volume covering the full device under test area. cDASY6 Module SAR uses Fast Averaged SAR algorithm to compute the 1g and 10g of simulated tissue from the Area Scan.

Fast Volume Scans:

Fast Volume Scans are 3D scans used to assess the peak spatial SAR values within an averaging volume containing 1g and 10g of simulated tissue. It is compatible with any phantom. For regular phantoms, the measurement grid is generated by projecting a plane onto the phantom surface as for Area and Zoom scans. For specific phantoms, the measurement grid is generated by a conformal offset to the phantom surface at the desired distances. The grid extents can be set by the end user to cover the DUT dimensions or the whole measurable area of the phantom.



Zoom Scan:

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1g and 10g of simulated tissue. Zoom scans measure a three dimensional volume (cube). The bottom face of the cube is Centreed on the maximum of the preceding Area Scan in the same measurement group. For maxima at border of the phantom, the zoom scan can be enabled to automatically extend in order to ensure correct evaluation of peak spatial SAR.

Zoom Scans can be performed in two different modes:

- Smart Mode: the grid settings are adjusted on the fly based on the distribution being measured to fulfill to the IEC 62209-2 Amendment 1 criteria on grid resolution.
- Custom Mode: the user specifies the grid settings to be used. In both modes, Zoom Scans are always anchored to the peak location of the preceding Fast Area / Area / Fast Volume Scan.



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

The following test equipment was used at TÜV SÜD Product Service:

Instrument Description	Manufacturer	Model Type	TE Number	Cal Period (months)	Calibration Due Date
Tissue Simulant Liquid	SPEAG	HBBL 600-10000	Batch 1	-	Note 1
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
Data Acquisition Electronics	SPEAG	DAE 4 - SD 000 D04 BM	4689	12	11-Dec-2024
Dielectric Assessment Kit	SPEAG	DAK-3.5	4690	-	TU
Dielectric Probe Stand	SPEAG	Stand	4691	-	TU
Measurement Server	SPEAG	DASY 6	4692	-	TU
Device Holder	SPEAG	MDA4WTV5RLAP	4694	-	TU
Dosimetric SAR Probe	SPEAG	EX3DV4	4700	12	14-Dec-2024
Mounting Platform	SPEAG	MP6C	4702	-	TU
Robot	SPEAG	TX90 XL	4704	-	TU
Body Phantom	SPEAG	ELI v8.0	4833	-	TU
Validation Dipole (5GHz)	SPEAG	D5GzV2	5328	12	10-Jun-2025
Validation Dipole 2450MHz	SPEAG	D2450V2	5329	12	14-Jun-2025
Validation Source for SAR	SPEAG	POWERSOURCE1-SE UMS 160 BA	5371	12	1-Dec-2024
Thermohyrometer	R.S Components	1364	6351	12	1-May-2025
ENA Series network analyser	Keysight Technologies	E5063A	6499	0	5-Apr-2025
Average Power Sensor	Agilent Technologies	N8481A	6675	12	21-Oct-2025
Power Meter	Agilent Technologies	N1914A	6678	12	18-Oct-2025
Digital Thermometer	LKM Electronics	DTM 3000	6693	12	6-Nov-2024

Table 27

TU - Traceability Unscheduled

Note 1: The calibration dates for the relevant batches of TSL can be found in the fluid parameter tables within this report.



3.2 TEST SOFTWARE

The following software was used to control the TÜV SÜD Product Service DASY System.

Instrument	Version Number
DASY System	cDASY6 Module SAR V16.2.2.1588

Table 28



3.3 TEST VERIFICATION

3.3.1 System Performance Check Results

Prior to formal testing being performed a system check was performed in accordance with KDB 865664 and the results were compared against the calibration certificates of each corresponding system verification dipole. The following results were obtained and within the $\pm 10\%$ acceptance criteria.

System Performance Check Results

Date	Frequency (MHz)	Fluid Type	Measured Max 10g SAR (W/kg) *	Max 10g SAR Target (W/kg)	Percentage Deviation from Target 10g (%)
23/10/2024	2450	HBBL	22.95	24.70	-7.10
24/10/2024	2450	HBBL	23.15	24.70	-6.30
25/10/2024	5200	HBBL	21.95	22.50	-2.45
25/10/2024	5300	HBBL	23.15	23.10	0.19
28/10/2024	5200	HBBL	22.15	22.50	-1.57
28/10/2024	5300	HBBL	21.95	23.10	-4.99
28/10/2024	5500	HBBL	23.34	24.20	-3.53
28/10/2024	5600	HBBL	24.74	23.40	5.73
29/10/2024	5500	HBBL	22.95	24.20	-5.18
29/10/2024	5600	HBBL	23.94	23.40	2.32
29/10/2024	5800	HBBL	22.15	23.00	-3.71

Table 29

*Normalised to a forward power of 1W.



3.4 DIELECTRIC PROPERTIES OF SIMULANT LIQUIDS

The fluid properties of the simulant fluids used during routine SAR evaluation meet the dielectric properties required KDB 865664.

The dielectric properties of the tissue simulant liquids used are within the $\pm 10\%$ acceptance criteria for the SAR testing at TÜV SÜD Product Service and are as follows:

Fluid Type and Frequency (MHz)	Relative Permittivity Measured	Relative Permittivity Target	Conductivity Measured (S/m)	Conductivity Target (S/m)	Date	Fluid Temperature °C
HBBL 2450	39.45	39.20	1.83	1.80	22/10/2024	21.14
HBBL 5200	34.78	35.99	4.51	4.66	22/10/2024	21.14
HBBL 5300	34.59	35.87	4.62	4.76	22/10/2024	21.14
HBBL 5200	34.72	35.99	4.50	4.66	28/10/2024	21.38
HBBL 5300	34.53	35.87	4.61	4.76	28/10/2024	21.38
HBBL 5500	34.17	35.64	4.83	4.96	28/10/2024	21.38
HBBL 5600	33.99	35.53	4.94	5.07	28/10/2024	21.38
HBBL 5800	33.64	35.30	5.17	5.27	28/10/2024	21.38

Table 30



3.5 TEST CONDITIONS

3.5.1 Test Laboratory Conditions

Ambient temperature: Within +18.00°C to +25.00°C.

The actual temperature during the testing ranged from 19.90°C to, 21.50°C.

The actual humidity during the testing ranged from 53.50% to 74.20% RH.

The temperature of the fluid during testing does not deviate by more than 2°C for each set of tests.

3.5.2 Test Fluid Temperature Range

Frequency	Body / Head Fluid	Min Temperature °C	Max Temperature °C
2450 MHz	Head	19.53	20.08
5200 MHz	Head	19.53	21.38
5300 MHz	Head	19.53	21.38
5500 MHz	Head	20.23	21.38
5600 MHz	Head	20.23	21.38
5800 MHz	Head	20.23	20.23

Table 31



3.6 MEASUREMENT UNCERTAINTY

Full SAR Measurements, 300 MHz to 3 GHz

Source of Uncertainty	Uncertainty $\pm$ %	Probability distribution	Div	c_i (1g)	Standard Uncertainty $\pm$ % (1g)
Measurement System Errors					
Probe Calibration	12.0	Normal	2.00	1.00	6.0
Probe Calibration Drift	1.7	Rectangular	1.73	1.00	1.0
Probe Linearity	4.7	Rectangular	1.73	1.00	2.7
Broadband Signal	3.0	Rectangular	1.73	1.00	1.7
Probe Isotropy	7.6	Rectangular	1.73	1.00	4.4
Data Acquisition	0.3	Normal	1.00	1.00	0.3
RF Ambient	1.8	Normal	1.00	1.00	1.8
Probe Positioning	0.2	Normal	1.00	0.14	0.0
Data Processing	1.2	Normal	1.00	1.00	1.2
Phantom and Device errors					
Liquid Conductivity Meas.	2.5	Normal	1.00	0.78	2.0
Liquid Conductivity Temp	3.3	Rectangular	1.73	0.78	1.5
Phantom Permittivity	14.0	Rectangular	1.73	0.00	0.0
Distance DUT - TSL	2.0	Normal	1.00	2.00	4.0
Device Positioning ($\pm 0.5\text{mm}$)	1.0	Normal	1.00	1.00	1.0
Device Holder	3.6	Normal	1.00	1.00	3.6
Device Modulation	2.4	Rectangular	1.73	1.00	1.4
Time-average SAR	2.6	Rectangular	1.73	1.00	1.5
DUT Drift	5.0	Normal	1.00	1.00	5.0
Correction to the SAR results					
Deviation to Target	1.9	Normal	1.00	1.00	1.9
SAR Scaling	0.0	Rectangular	1.73	1.00	0.0
Combined Standard Uncertainty		RSS			11.8
Expanded Standard Uncertainty		K=2			23.7

Table 32



Full SAR Measurements, 3 GHz to 6 GHz

Source of Uncertainty	Uncertainty $\pm$ %	Probability distribution	Div	c_i (1g)	Standard Uncertainty $\pm$ % (1g)
Measurement System Errors					
Probe Calibration	14.0	Normal	2.00	1.00	7.0
Probe Calibration Drift	1.7	Rectangular	1.73	1.00	1.0
Probe Linearity	4.7	Rectangular	1.73	1.00	2.7
Broadband Signal	2.6	Rectangular	1.73	1.00	1.5
Probe Isotropy	7.6	Rectangular	1.73	1.00	4.4
Data Acquisition	0.3	Normal	1.00	1.00	0.3
RF Ambient	1.8	Normal	1.00	1.00	1.8
Probe Positioning	0.2	Normal	1.00	0.33	0.1
Data Processing	2.3	Normal	1.00	1.00	2.3
Phantom and Device errors					
Liquid Conductivity Meas.	2.5	Normal	1.00	0.78	2.0
Liquid Conductivity Temp	3.4	Rectangular	1.73	0.78	1.5
Phantom Permittivity	14.0	Rectangular	1.73	0.25	2.0
Distance DUT - TSL	2.0	Normal	1.00	2.00	4.0
Device Positioning ($\pm 0.5\text{mm}$)	1.0	Normal	1.00	1.00	1.0
Device Holder	3.6	Normal	1.00	1.00	3.6
Device Modulation	2.4	Rectangular	1.73	1.00	1.4
Time-average SAR	2.6	Rectangular	1.73	1.00	1.5
DUT Drift	5.0	Normal	1.00	1.00	5.0
Correction to the SAR results					
Deviation to Target	1.9	Normal	1.00	1.00	1.9
SAR Scaling	0.0	Rectangular	1.73	1.00	0.0
Combined Standard Uncertainty		RSS			12.7
Expanded Standard Uncertainty		K=2			25.3

Table 33



3.6.1 Decision Rule

Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, Clause 4.4.3 and 4.5.1. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.”



SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This non-binding report has been prepared by TÜV SÜD with all reasonable skill and care.

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This report relates only to the actual item/items tested.

Results of tests covered by our Flexible UKAS Accreditation Schedule are marked FS (Flexible Scope).

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Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.



ANNEX A

PROBE CALIBRATION REPORT



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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S 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
TÜV SÜD
Fareham, United Kingdom

Certificate No. **EX-3759_Dec23**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3759**

Calibration procedure(s) **QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,
QA CAL-25.v8
Calibration procedure for dosimetric E-field probes**

Calibration date **December 14, 2023**

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 $(22 \pm 3) ^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
OCP DAK-3.5 (weighted)	SN: 1249	05-Oct-23 (OCP-DAK3.5-1249_Oct23)	Oct-24
OCP DAK-12	SN: 1016	05-Oct-23 (OCP-DAK12-1016_Oct23)	Oct-24
Reference 20 dB Attenuator	SN: CC2552 (20x)	30-Mar-23 (No. 217-03809)	Mar-24
DAE4	SN: 660	16-Mar-23 (No. DAE4-660_Mar23)	Mar-24
Reference Probe ES3DV2	SN: 3013	05-Jan-23 (No. ES3-3013_Jan23)	Jan-24

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-22)	In house check: Oct-24

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

Issued: December 14, 2023

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

Certificate No: EX-3759_Dec23

Page 1 of 23



**Calibration Laboratory of
Schmid & Partner
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland



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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,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., $\theta = 0$ 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:

- 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.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,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.
- DCP_{x,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
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,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 NORM_{x,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 NORM_x (no uncertainty required).



EX3DV4 - SN:3759

December 14, 2023

Parameters of Probe: EX3DV4 - SN:3759

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu V/(V/m)^2$) ^A	0.53	0.49	0.50	±10.1%
DCP (mV) ^B	99.9	99.4	101.4	±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	133.9	±3.1%	±4.7%
		Y	0.00	0.00	1.00		147.7		
		Z	0.00	0.00	1.00		126.8		
10352	Pulse Waveform (200Hz, 10%)	X	20.00	91.98	21.18	10.00	80.0	±2.7%	±9.6%
		Y	20.00	90.78	20.49		80.0		
		Z	20.00	91.69	21.28		80.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	94.28	21.18	6.99	80.0	±1.5%	±9.6%
		Y	20.00	92.50	20.37		80.0		
		Z	20.00	92.35	20.37		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	20.00	97.66	21.32	3.98	95.0	±1.0%	±9.6%
		Y	20.00	96.48	21.03		95.0		
		Z	20.00	93.50	19.39		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	20.00	98.86	20.46	2.22	120.0	±0.9%	±9.6%
		Y	20.00	100.43	21.58		120.0		
		Z	20.00	93.26	17.86		120.0		
10367	QPSK Waveform, 1 MHz	X	1.44	63.82	13.35	1.00	150.0	±2.8%	±9.6%
		Y	1.66	65.75	14.57		150.0		
		Z	1.55	65.35	14.18		150.0		
10388	QPSK Waveform, 10 MHz	X	1.90	65.41	14.13	0.00	150.0	±1.0%	±9.6%
		Y	2.21	67.64	15.34		150.0		
		Z	2.09	67.18	15.03		150.0		
10396	64-QAM Waveform, 100 kHz	X	2.43	66.69	16.85	3.01	150.0	±1.0%	±9.6%
		Y	2.98	70.85	18.91		150.0		
		Z	2.95	70.08	18.40		150.0		
10399	64-QAM Waveform, 40 MHz	X	3.28	65.87	14.94	0.00	150.0	±2.0%	±9.6%
		Y	3.36	66.39	15.30		150.0		
		Z	3.43	66.88	15.48		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.69	64.97	15.04	0.00	150.0	±3.8%	±9.6%
		Y	4.76	65.21	15.23		150.0		
		Z	4.84	65.67	15.44		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 E²-field uncertainty inside TSL (see Pages 5 to 7).

^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.



EX3DV4 - SN:3759

December 14, 2023

Parameters of Probe: EX3DV4 - SN:3759

Sensor Model Parameters

	C1 iF	C2 iF	α V^{-1}	T1 $ms V^{-2}$	T2 $ms V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
x	43.9	329.15	35.58	13.00	0.16	5.10	0.00	0.43	1.01
y	45.7	339.58	35.17	17.40	0.00	5.09	1.67	0.18	1.01
z	44.5	332.02	35.37	13.72	0.42	5.09	0.58	0.42	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	30.3°
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.



EX3DV4 - SN:3759

December 14, 2023

Parameters of Probe: EX3DV4 - SN:3759

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)
6	55.0	0.75	18.00	18.00	18.00	0.00	1.25	±13.3%
13	55.0	0.75	16.08	16.08	16.08	0.00	1.25	±13.3%
30	55.0	0.75	15.55	15.55	15.55	0.00	1.25	±13.3%
64	54.2	0.75	13.35	13.35	13.35	0.00	1.25	±13.3%
128	52.8	0.76	12.32	12.32	12.32	0.00	1.25	±13.3%
150	52.3	0.76	11.88	11.88	11.88	0.00	1.25	±13.3%
220	49.0	0.81	11.34	11.34	11.34	0.00	1.25	±13.3%
300	45.3	0.87	11.58	11.58	11.58	0.09	1.00	±13.3%
450	43.5	0.87	10.70	10.70	10.70	0.16	1.30	±13.3%
750	41.9	0.89	8.81	8.74	9.28	0.39	1.27	±12.0%
835	41.5	0.90	9.38	8.83	9.43	0.37	1.27	±12.0%
900	41.5	0.97	8.95	8.59	9.38	0.37	1.27	±12.0%
1300	40.8	1.14	8.42	8.26	9.04	0.48	1.27	±12.0%
1450	40.5	1.20	8.13	8.02	8.74	0.46	1.27	±12.0%
1640	40.2	1.31	8.23	8.13	8.90	0.44	1.27	±12.0%
1750	40.1	1.37	8.60	8.51	9.38	0.27	1.27	±12.0%
1810	40.0	1.40	8.18	8.08	8.84	0.30	1.27	±12.0%
1900	40.0	1.40	8.08	8.00	8.74	0.29	1.27	±12.0%
1950	40.0	1.40	8.04	7.92	8.67	0.30	1.27	±12.0%
2000	40.0	1.40	8.24	8.15	8.93	0.30	1.27	±12.0%
2100	39.8	1.49	7.42	7.31	8.02	0.31	1.27	±12.0%
2300	39.5	1.67	7.40	7.27	7.94	0.32	1.27	±12.0%
2450	39.2	1.80	7.48	7.40	8.09	0.31	1.27	±12.0%
2550	39.1	1.91	7.09	7.00	7.62	0.30	1.27	±12.0%
2600	39.0	1.96	7.13	7.00	7.67	0.30	1.27	±12.0%
3300	38.2	2.71	6.80	6.70	7.32	0.35	1.27	±14.0%
3500	37.9	2.91	6.85	6.75	7.37	0.35	1.27	±14.0%
3700	37.7	3.12	6.54	6.51	7.09	0.36	1.27	±14.0%

^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 The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7–3 GHz and 13.1% for 3–6 GHz.

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



EX3DV4 - SN:3759

December 14, 2023

Parameters of Probe: EX3DV4 - SN:3759

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)
4100	37.2	3.53	6.46	6.36	6.99	0.37	1.27	±14.0%
5200	36.0	4.66	5.62	5.59	6.15	0.34	1.60	±14.0%
5300	35.9	4.76	5.43	5.38	5.86	0.35	1.67	±14.0%
5500	35.6	4.96	4.98	4.88	5.39	0.42	1.61	±14.0%
5600	35.5	5.07	4.80	4.69	5.22	0.43	1.67	±14.0%
5800	35.3	5.27	4.77	4.68	5.25	0.40	1.86	±14.0%

^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 The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7 - 3 GHz and 13.1% for 3 - 6 GHz.

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



EX3DV4 - SN:3759

December 14, 2023

Parameters of Probe: EX3DV4 - SN:3759

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	5.18	4.92	5.71	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 The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.

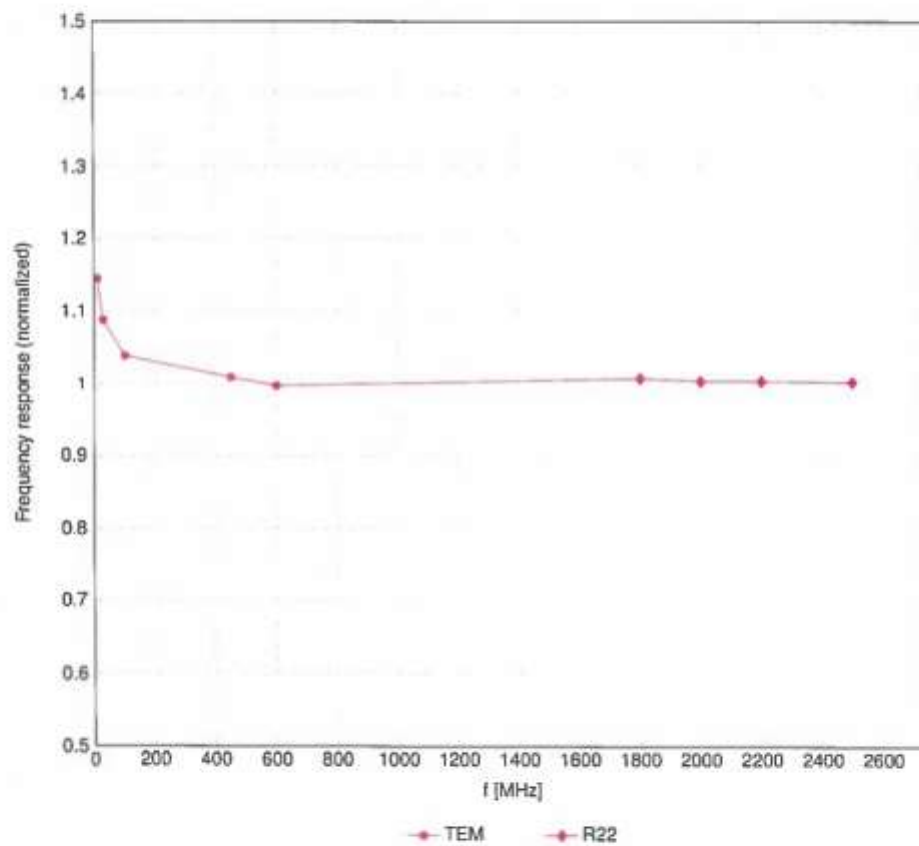
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3-6 GHz; and below ±4% for frequencies between 6-10 GHz at any distance larger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

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Frequency Response of E-Field

(TEM-Cell:ifl110 EXX, Waveguide:R22)

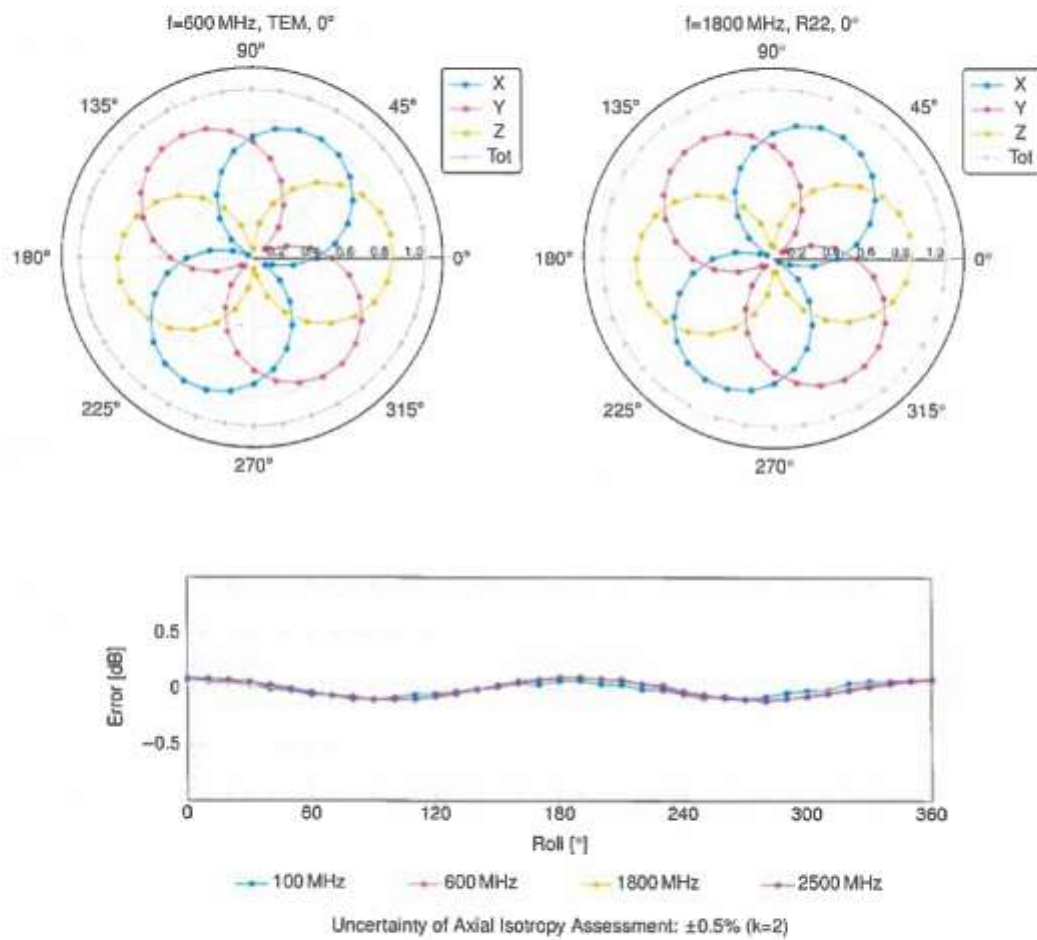


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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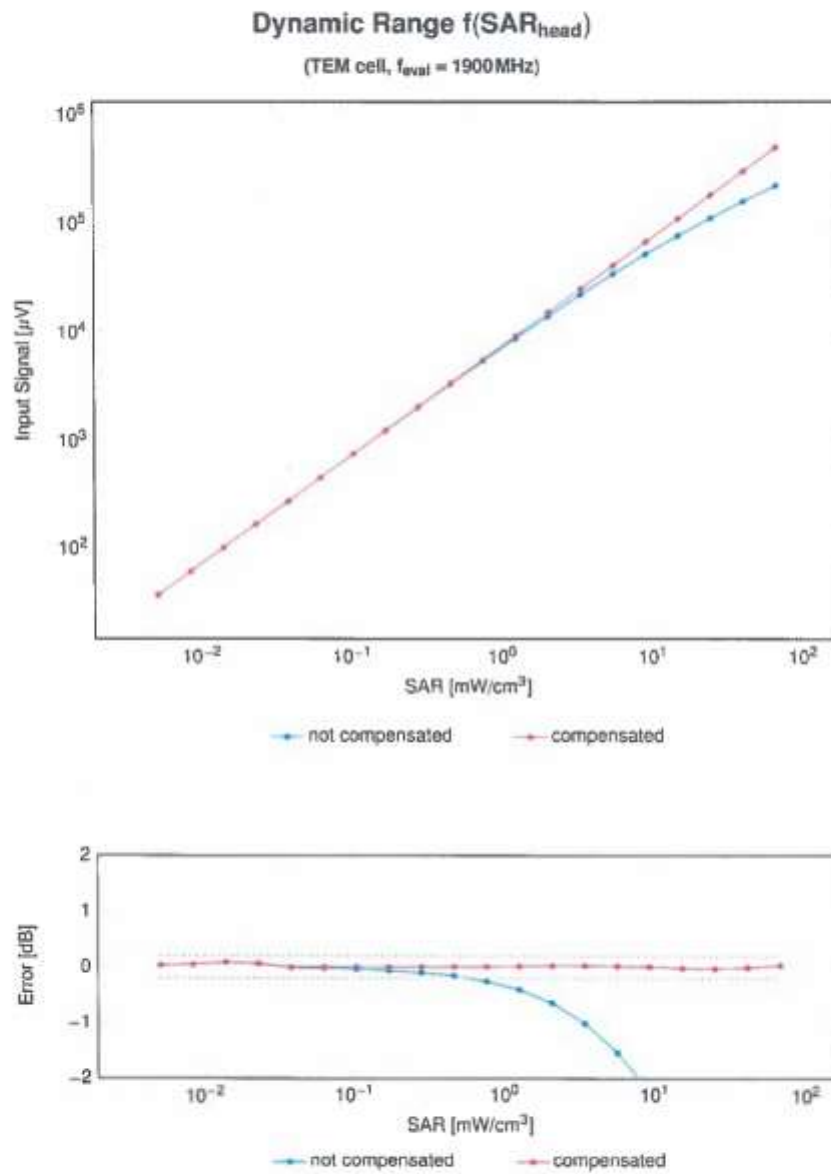
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Receiving Pattern (ϕ), $\theta = 0^\circ$



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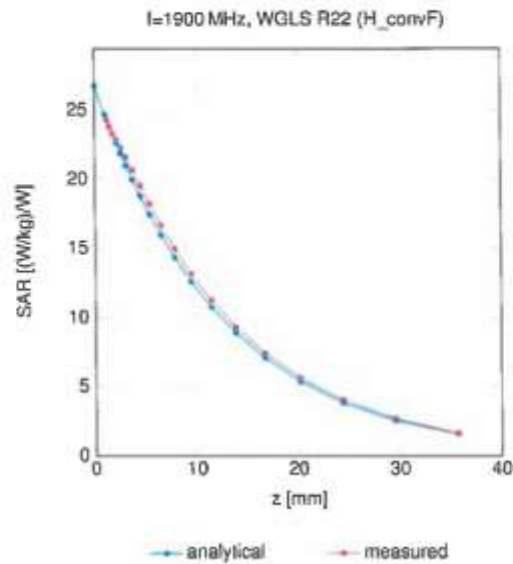


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

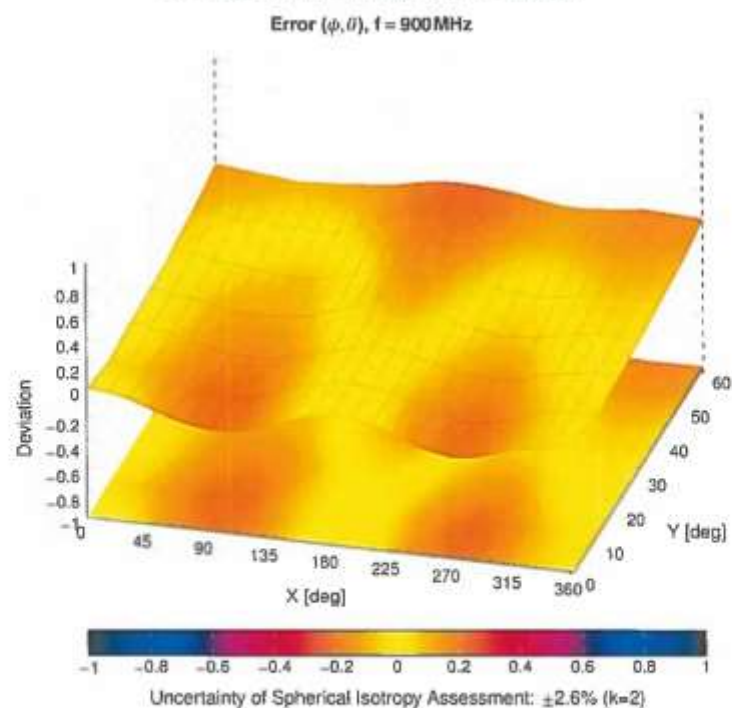
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Conversion Factor Assessment



Deviation from Isotropy in Liquid





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Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^k k = 2
0		CW	CW	0.00	±4.7
10010	CAB	SAR Validation (Square, 100ms, 10ms)	Test	10.00	±9.6
10011	CAC	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 (Pi4-DQPSK, DH1)	Bluetooth	7.74	±9.6
10034	CAA	IEEE 802.15.1 Bluetooth (Pi4-DQPSK, DH3)	Bluetooth	4.53	±9.6
10035	CAA	IEEE 802.15.1 Bluetooth (Pi4-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, Pi4-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	2.93	±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	9.68	±9.6
10063	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	9.63	±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, Pi4-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	CAC	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	±9.6
10099	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	±9.6
10100	CAF	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	±9.6
10101	CAF	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10102	CAF	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10103	CAH	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	±9.6
10104	CAH	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.97	±9.6
10105	CAH	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	±9.6
10108	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-FDD	5.80	±9.6
10109	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10110	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	±9.6
10111	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-FDD	6.44	±9.6



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UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E # = 2
10112	CAH	LTE-FDD (SC-FDMA, 100% RB, 10MHz, 64-QAM)	LTE-FDD	6.59	±9.6
10113	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10114	CAD	IEEE 802.11n (HT Greenfield, 13.5Mbps, BPSK)	WLAN	8.10	±9.6
10115	CAD	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	±9.6
10116	CAD	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	±9.6
10117	CAD	IEEE 802.11n (HT Mixed, 13.5Mbps, 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	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	±9.6
10141	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	±9.6
10142	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10143	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	±9.6
10144	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	±9.6
10145	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	±9.6
10146	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	±9.6
10147	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	±9.6
10148	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10150	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10151	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.26	±9.6
10152	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	±9.6
10153	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	±9.6
10154	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	±9.6
10155	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10156	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	±9.6
10157	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	5.49	±9.6
10158	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10159	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	±9.6
10160	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	±9.6
10161	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10162	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	±9.6
10166	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	±9.6
10167	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	±9.6
10168	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	±9.6
10169	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	±9.6
10170	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10171	AAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	±9.6
10172	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	±9.6
10173	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10174	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10175	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	±9.6
10176	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10177	CAJ	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD	5.73	±9.6
10178	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-FDD	5.52	±9.6
10179	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10180	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10181	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	±9.6
10182	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10183	AAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10184	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10185	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	±9.6
10186	AAF	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	AAQ	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10193	CAD	IEEE 802.11n (HT Greenfield, 6.5Mbps, BPSK)	WLAN	8.09	±9.6
10194	CAD	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	±9.6
10195	CAD	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	±9.6
10196	CAD	IEEE 802.11n (HT Mixed, 6.5Mbps, BPSK)	WLAN	8.10	±9.6
10197	CAD	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.6
10198	CAD	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	±9.6
10219	CAD	IEEE 802.11n (HT Mixed, 7.2Mbps, BPSK)	WLAN	8.03	±9.6
10220	CAD	IEEE 802.11n (HT Mixed, 43.3Mbps, 16-QAM)	WLAN	8.13	±9.6
10221	CAD	IEEE 802.11n (HT Mixed, 72.2Mbps, 64-QAM)	WLAN	8.27	±9.6
10222	CAD	IEEE 802.11n (HT Mixed, 15Mbps, 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, 130 Mbps, 64-QAM)	WLAN	8.08	±9.6



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10225	CAC	UMTS-FDD (HSPA+)	WCDMA	5.97	±9.6
10226	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.49	±9.6
10227	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.26	±9.6
10228	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	±9.6
10229	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10230	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10231	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.19	±9.6
10232	CAH	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10233	CAH	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10234	CAH	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TDD	9.21	±9.6
10235	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10236	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10237	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	±9.6
10238	CAG	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10239	CAG	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10240	CAG	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	±9.6
10241	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.62	±9.6
10242	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9.66	±9.6
10243	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	±9.6
10244	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	±9.6
10245	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDD	10.06	±9.6
10246	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	±9.6
10247	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	±9.6
10248	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	±9.6
10249	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	±9.6
10250	CAH	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	±9.6
10251	CAH	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	±9.6
10252	CAH	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	±9.6
10253	CAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.90	±9.6
10254	CAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	±9.6
10255	CAG	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	±9.6
10256	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	±9.6
10257	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	±9.6
10258	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	±9.6
10259	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TDD	9.98	±9.6
10260	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	±9.6
10261	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.24	±9.6
10262	CAH	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.83	±9.6
10263	CAH	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	10.16	±9.6
10264	CAH	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD	9.23	±9.6
10265	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TDD	9.92	±9.6
10266	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.07	±9.6
10267	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	±9.6
10268	CAG	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	±9.6
10269	CAG	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	±9.6
10270	CAG	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	±9.6
10274	CAC	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	±9.6
10275	CAC	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	±9.6
10277	CAA	PHS (QPSK)	PHS	11.81	±9.6
10278	CAA	PHS (QPSK, BW 884 MHz, Roll-off 0.5)	PHS	11.81	±9.6
10279	CAA	PHS (QPSK, BW 884 MHz, Roll-off 0.38)	PHS	12.18	±9.6
10290	AAB	CDMA2000, RC1, SO55, Full Rate	CDMA2000	3.91	±9.6
10291	AAB	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	±9.6
10292	AAB	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	±9.6
10293	AAB	CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	±9.6
10295	AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 k	CDMA2000	12.49	±9.6
10297	AAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	±9.6
10298	AAE	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.72	±9.6
10299	AAE	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	6.39	±9.6
10300	AAE	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10301	AAA	IEEE 802.16e WIMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC)	WIMAX	12.03	±9.6
10302	AAA	IEEE 802.16e WIMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC, 3 CTRL symbols)	WIMAX	12.57	±9.6
10303	AAA	IEEE 802.16e WIMAX (31:15, 5 ms, 10 MHz, 64QAM, PUSC)	WIMAX	12.52	±9.6
10304	AAA	IEEE 802.16e WIMAX (29:18, 5 ms, 10 MHz, 64QAM, PUSC)	WIMAX	11.86	±9.6
10305	AAA	IEEE 802.16e WIMAX (31:15, 10 ms, 10 MHz, 64QAM, PUSC, 15 symbols)	WIMAX	15.24	±9.6
10306	AAA	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC, 16 symbols)	WIMAX	14.67	±9.6

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10307	AAA	IEEE 802.16e WiMAX (29:1B, 10 ms, 10 MHz, QPSK, PUSC, 16 symbols)	WiMAX	14.49	±9.6
10308	AAA	IEEE 802.16e WiMAX (29:1B, 10 ms, 10 MHz, 16QAM, PUSC)	WiMAX	14.46	±9.6
10309	AAA	IEEE 802.16e WiMAX (29:1B, 10 ms, 10 MHz, 16QAM, AMC 2x3, 16 symbols)	WiMAX	14.56	±9.6
10310	AAA	IEEE 802.16e WiMAX (29:1B, 10 ms, 10 MHz, QPSK, AMC 2x3, 16 symbols)	WiMAX	14.57	±9.6
10311	AAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD	8.06	±9.6
10313	AAA	IDEN 1.3	IDEN	10.51	±9.6
10314	AAA	IDEN 1.6	IDEN	13.48	±9.6
10315	AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	WLAN	1.71	±9.6
10316	AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	±9.6
10317	AAE	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	±9.6
10352	AAA	Pulse Waveform (200Hz, 10%)	Generic	10.00	±9.6
10353	AAA	Pulse Waveform (200Hz, 20%)	Generic	6.99	±9.6
10354	AAA	Pulse Waveform (200Hz, 40%)	Generic	3.98	±9.6
10355	AAA	Pulse Waveform (200Hz, 60%)	Generic	2.22	±9.6
10356	AAA	Pulse Waveform (200Hz, 80%)	Generic	0.97	±9.6
10367	AAA	QPSK Waveform, 1 MHz	Generic	5.10	±9.6
10368	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±9.6
10386	AAA	64-QAM Waveform, 100 kHz	Generic	6.27	±9.6
10389	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	±9.6
10400	AAE	IEEE 802.11ac WiFi (20 MHz, 64-QAM, 99pc duty cycle)	WLAN	8.37	±9.6
10401	AAE	IEEE 802.11ac WiFi (40 MHz, 64-QAM, 99pc duty cycle)	WLAN	8.60	±9.6
10402	AAE	IEEE 802.11ac WiFi (80 MHz, 64-QAM, 99pc duty cycle)	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	AAB	CDMA2000, RC3, SD32, SCH0, Full Rate	CDMA2000	5.22	±9.6
10410	AAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	LTE-TDD	7.82	±9.6
10414	AAA	WLAN CCDF, 64-QAM, 40 MHz	Generic	6.54	±9.6
10415	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	WLAN	1.54	±9.6
10416	AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
10417	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
10418	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble)	WLAN	8.14	±9.6
10419	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble)	WLAN	8.19	±9.6
10422	AAC	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	±9.6
10423	AAC	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8.47	±9.6
10424	AAC	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.40	±9.6
10425	AAC	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	9.41	±9.6
10426	AAC	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WLAN	9.45	±9.6
10427	AAC	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	9.41	±9.6
10430	AAE	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	±9.6
10431	AAE	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	±9.6
10432	AAD	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10433	AAD	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10434	AAB	W-CDMA (BS Test Model 1, 64 DPCCH)	WCDMA	8.60	±9.6
10435	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10447	AAE	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	±9.6
10448	AAE	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.53	±9.6
10449	AAD	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.51	±9.6
10450	AAD	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	±9.6
10451	AAB	W-CDMA (BS Test Model 1, 64 DPCCH, Clipping 44%)	WCDMA	7.59	±9.6
10453	AAE	Validation (Square, 10 ms, 1 ms)	Test	10.00	±9.6
10456	AAC	IEEE 802.11ac WiFi (160 MHz, 64-QAM, 99pc duty cycle)	WLAN	8.63	±9.6
10457	AAB	UMTS-FDD (DC-HSDPA)	WCDMA	6.82	±9.6
10458	AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.55	±9.6
10459	AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	±9.6
10460	AAB	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	±9.6
10461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10462	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.30	±9.6
10463	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	±9.6
10464	AAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10465	AAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10466	AAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±9.6
10467	AAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10468	AAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10469	AAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	±9.6
10470	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10471	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6



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10472	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±9.6
10473	AAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10474	AAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10475	AAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±9.6
10477	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10478	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±9.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6
10480	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.18	±9.6
10481	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	±9.6
10482	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.71	±9.6
10483	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.39	±9.6
10484	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.47	±9.6
10485	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.59	±9.6
10486	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.38	±9.6
10487	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.60	±9.6
10488	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.70	±9.6
10489	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±9.6
10490	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±9.6
10491	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6
10492	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.41	±9.6
10493	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.55	±9.6
10494	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6
10495	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.37	±9.6
10496	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±9.6
10497	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±9.6
10498	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.40	±9.6
10499	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.68	±9.6
10500	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±9.6
10501	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.44	±9.6
10502	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.52	±9.6
10503	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.72	±9.6
10504	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±9.6
10505	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±9.6
10506	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6
10507	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.36	±9.6
10508	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.55	±9.6
10509	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.99	±9.6
10510	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.49	±9.6
10511	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.51	±9.6
10512	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6
10513	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.42	±9.6
10514	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	±9.6
10515	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	WLAN	1.56	±9.6
10516	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	WLAN	1.57	±9.6
10517	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	WLAN	1.58	±9.6
10518	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
10519	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	WLAN	8.39	±9.6
10520	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	WLAN	8.12	±9.6
10521	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	WLAN	7.97	±9.6
10522	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	WLAN	8.45	±9.6
10523	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	WLAN	8.06	±9.6
10524	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	WLAN	8.27	±9.6
10525	AAC	IEEE 802.11ac WiFi (20 MHz, MCS0, 99pc duty cycle)	WLAN	8.36	±9.6
10526	AAC	IEEE 802.11ac WiFi (20 MHz, MCS1, 99pc duty cycle)	WLAN	8.42	±9.6
10527	AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 99pc duty cycle)	WLAN	8.21	±9.6
10528	AAC	IEEE 802.11ac WiFi (20 MHz, MCS3, 99pc duty cycle)	WLAN	8.36	±9.6
10529	AAC	IEEE 802.11ac WiFi (20 MHz, MCS4, 99pc duty cycle)	WLAN	8.36	±9.6
10531	AAC	IEEE 802.11ac WiFi (20 MHz, MCS6, 99pc duty cycle)	WLAN	8.43	±9.6
10532	AAC	IEEE 802.11ac WiFi (20 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±9.6
10533	AAC	IEEE 802.11ac WiFi (20 MHz, MCS8, 99pc duty cycle)	WLAN	8.38	±9.6
10534	AAC	IEEE 802.11ac WiFi (40 MHz, MCS0, 99pc duty cycle)	WLAN	8.45	±9.6
10535	AAC	IEEE 802.11ac WiFi (40 MHz, MCS1, 99pc duty cycle)	WLAN	8.45	±9.6
10536	AAC	IEEE 802.11ac WiFi (40 MHz, MCS2, 99pc duty cycle)	WLAN	8.32	±9.6
10537	AAC	IEEE 802.11ac WiFi (40 MHz, MCS3, 99pc duty cycle)	WLAN	8.44	±9.6
10538	AAC	IEEE 802.11ac WiFi (40 MHz, MCS4, 99pc duty cycle)	WLAN	8.54	±9.6
10540	AAC	IEEE 802.11ac WiFi (40 MHz, MCS6, 99pc duty cycle)	WLAN	8.39	±9.6



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10541	AAC	IEEE 802.11ac WiFi (40 MHz, MCS7, 99pc duty cycle)	WLAN	8.46	±9.6
10542	AAC	IEEE 802.11ac WiFi (40 MHz, MCS8, 99pc duty cycle)	WLAN	8.85	±9.6
10543	AAC	IEEE 802.11ac WiFi (40 MHz, MCS9, 99pc duty cycle)	WLAN	8.65	±9.6
10544	AAC	IEEE 802.11ac WiFi (80 MHz, MCS9, 99pc duty cycle)	WLAN	8.47	±9.6
10545	AAC	IEEE 802.11ac WiFi (80 MHz, MCS1, 99pc duty cycle)	WLAN	8.55	±9.6
10546	AAC	IEEE 802.11ac WiFi (80 MHz, MCS2, 99pc duty cycle)	WLAN	8.35	±9.6
10547	AAC	IEEE 802.11ac WiFi (80 MHz, MCS3, 99pc duty cycle)	WLAN	8.49	±9.6
10548	AAC	IEEE 802.11ac WiFi (80 MHz, MCS4, 99pc duty cycle)	WLAN	8.37	±9.6
10550	AAC	IEEE 802.11ac WiFi (80 MHz, MCS8, 99pc duty cycle)	WLAN	8.38	±9.6
10551	AAC	IEEE 802.11ac WiFi (80 MHz, MCS7, 99pc duty cycle)	WLAN	8.50	±9.6
10552	AAC	IEEE 802.11ac WiFi (80 MHz, MCS8, 99pc duty cycle)	WLAN	8.42	±9.6
10563	AAC	IEEE 802.11ac WiFi (80 MHz, MCS9, 99pc duty cycle)	WLAN	8.45	±9.6
10554	AAD	IEEE 802.11ac WiFi (160 MHz, MCS0, 99pc duty cycle)	WLAN	8.48	±9.6
10555	AAD	IEEE 802.11ac WiFi (160 MHz, MCS1, 99pc duty cycle)	WLAN	8.47	±9.6
10556	AAD	IEEE 802.11ac WiFi (160 MHz, MCS2, 99pc duty cycle)	WLAN	8.50	±9.6
10557	AAD	IEEE 802.11ac WiFi (160 MHz, MCS3, 99pc duty cycle)	WLAN	8.52	±9.6
10558	AAD	IEEE 802.11ac WiFi (160 MHz, MCS4, 99pc duty cycle)	WLAN	8.61	±9.6
10560	AAD	IEEE 802.11ac WiFi (160 MHz, MCS6, 99pc duty cycle)	WLAN	8.73	±9.6
10561	AAD	IEEE 802.11ac WiFi (160 MHz, MCS7, 99pc duty cycle)	WLAN	8.56	±9.6
10562	AAD	IEEE 802.11ac WiFi (160 MHz, MCS8, 99pc duty cycle)	WLAN	8.69	±9.6
10563	AAD	IEEE 802.11ac WiFi (160 MHz, MCS9, 99pc duty cycle)	WLAN	8.77	±9.6
10564	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	WLAN	8.25	±9.6
10565	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	WLAN	8.45	±9.6
10566	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	WLAN	8.13	±9.6
10567	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	WLAN	8.00	±9.6
10568	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	WLAN	8.37	±9.6
10569	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	WLAN	8.10	±9.6
10570	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	WLAN	8.30	±9.6
10571	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	WLAN	1.99	±9.6
10572	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	WLAN	1.99	±9.6
10573	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	WLAN	1.96	±9.6
10574	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	WLAN	1.96	±9.6
10575	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	±9.6
10576	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.60	±9.6
10577	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.70	±9.6
10578	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.49	±9.6
10579	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±9.6
10580	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.76	±9.6
10581	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.35	±9.6
10582	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	±9.6
10583	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	±9.6
10584	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.60	±9.6
10585	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.70	±9.6
10586	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.49	±9.6
10587	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±9.6
10588	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.76	±9.6
10589	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.35	±9.6
10590	AAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	±9.6
10591	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc duty cycle)	WLAN	8.63	±9.6
10592	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc duty cycle)	WLAN	8.79	±9.6
10593	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc duty cycle)	WLAN	8.64	±9.6
10594	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±9.6
10595	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc duty cycle)	WLAN	8.74	±9.6
10596	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc duty cycle)	WLAN	8.71	±9.6
10597	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc duty cycle)	WLAN	8.72	±9.6
10598	AAC	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc duty cycle)	WLAN	8.50	±9.6
10599	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc duty cycle)	WLAN	8.79	±9.6
10600	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc duty cycle)	WLAN	8.88	±9.6
10601	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc duty cycle)	WLAN	8.62	±9.6
10602	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc duty cycle)	WLAN	8.94	±9.6
10603	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc duty cycle)	WLAN	9.03	±9.6
10604	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc duty cycle)	WLAN	8.76	±9.6
10605	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc duty cycle)	WLAN	8.97	±9.6
10606	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±9.6
10607	AAC	IEEE 802.11ac WiFi (20 MHz, MCS0, 90pc duty cycle)	WLAN	8.64	±9.6
10608	AAC	IEEE 802.11ac WiFi (20 MHz, MCS1, 90pc duty cycle)	WLAN	8.77	±9.6



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10609	AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.57	±9.6
10610	AAC	IEEE 802.11ac WiFi (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.78	±9.6
10611	AAC	IEEE 802.11ac WiFi (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	±9.6
10612	AAC	IEEE 802.11ac WiFi (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
10613	AAC	IEEE 802.11ac WiFi (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.94	±9.6
10614	AAC	IEEE 802.11ac WiFi (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.59	±9.6
10615	AAC	IEEE 802.11ac WiFi (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±9.6
10616	AAC	IEEE 802.11ac WiFi (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.62	±9.6
10617	AAC	IEEE 802.11ac WiFi (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.61	±9.6
10618	AAC	IEEE 802.11ac WiFi (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.58	±9.6
10619	AAC	IEEE 802.11ac WiFi (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.86	±9.6
10620	AAC	IEEE 802.11ac WiFi (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.87	±9.6
10621	AAC	IEEE 802.11ac WiFi (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
10622	AAC	IEEE 802.11ac WiFi (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.66	±9.6
10623	AAC	IEEE 802.11ac WiFi (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±9.6
10624	AAC	IEEE 802.11ac WiFi (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.96	±9.6
10625	AAC	IEEE 802.11ac WiFi (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.96	±9.6
10626	AAC	IEEE 802.11ac WiFi (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±9.6
10627	AAC	IEEE 802.11ac WiFi (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.88	±9.6
10628	AAC	IEEE 802.11ac WiFi (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.71	±9.6
10629	AAC	IEEE 802.11ac WiFi (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±9.6
10630	AAC	IEEE 802.11ac WiFi (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.72	±9.6
10631	AAC	IEEE 802.11ac WiFi (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.81	±9.6
10632	AAC	IEEE 802.11ac WiFi (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±9.6
10633	AAC	IEEE 802.11ac WiFi (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.83	±9.6
10634	AAC	IEEE 802.11ac WiFi (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.80	±9.6
10635	AAC	IEEE 802.11ac WiFi (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.61	±9.6
10636	AAD	IEEE 802.11ac WiFi (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±9.6
10637	AAD	IEEE 802.11ac WiFi (160 MHz, MCS1, 90pc duty cycle)	WLAN	8.79	±9.6
10638	AAD	IEEE 802.11ac WiFi (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.88	±9.6
10639	AAD	IEEE 802.11ac WiFi (160 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±9.6
10640	AAD	IEEE 802.11ac WiFi (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.98	±9.6
10641	AAD	IEEE 802.11ac WiFi (160 MHz, MCS5, 90pc duty cycle)	WLAN	9.06	±9.6
10642	AAD	IEEE 802.11ac WiFi (160 MHz, MCS6, 90pc duty cycle)	WLAN	9.06	±9.6
10643	AAD	IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.89	±9.6
10644	AAD	IEEE 802.11ac WiFi (160 MHz, MCS8, 90pc duty cycle)	WLAN	9.05	±9.6
10645	AAD	IEEE 802.11ac WiFi (160 MHz, MCS9, 90pc duty cycle)	WLAN	9.11	±9.6
10646	AAH	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	LTE-TDD	11.96	±9.6
10647	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	LTE-TDD	11.96	±9.6
10648	AAA	CDMA2000 (1x Advanced)	CDMA2000	3.45	±9.6
10652	AAF	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.91	±9.6
10653	AAF	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	±9.6
10654	AAE	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	±9.6
10655	AAF	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	±9.6
10658	AAB	Pulse Waveform (200Hz, 10%)	Test	10.00	±9.6
10659	AAB	Pulse Waveform (200Hz, 20%)	Test	6.98	±9.6
10660	AAB	Pulse Waveform (200Hz, 40%)	Test	3.98	±9.6
10661	AAB	Pulse Waveform (200Hz, 60%)	Test	2.22	±9.6
10662	AAB	Pulse Waveform (200Hz, 80%)	Test	0.97	±9.6
10670	AAA	Bluetooth Low Energy	Bluetooth	2.15	±9.6
10671	AAC	IEEE 802.11ax (20 MHz, MCS0, 90pc duty cycle)	WLAN	9.09	±9.6
10672	AAC	IEEE 802.11ax (20 MHz, MCS1, 90pc duty cycle)	WLAN	8.57	±9.6
10673	AAC	IEEE 802.11ax (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.76	±9.6
10674	AAC	IEEE 802.11ax (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±9.6
10675	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.90	±9.6
10676	AAC	IEEE 802.11ax (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
10677	AAC	IEEE 802.11ax (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.73	±9.6
10678	AAC	IEEE 802.11ax (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.76	±9.6
10679	AAC	IEEE 802.11ax (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.89	±9.6
10680	AAC	IEEE 802.11ax (20 MHz, MCS9, 90pc duty cycle)	WLAN	8.90	±9.6
10681	AAC	IEEE 802.11ax (20 MHz, MCS10, 90pc duty cycle)	WLAN	8.62	±9.6
10682	AAC	IEEE 802.11ax (20 MHz, MCS11, 90pc duty cycle)	WLAN	8.83	±9.6
10683	AAC	IEEE 802.11ax (20 MHz, MCS0, 99pc duty cycle)	WLAN	9.42	±9.6
10684	AAC	IEEE 802.11ax (20 MHz, MCS1, 99pc duty cycle)	WLAN	8.26	±9.6
10685	AAC	IEEE 802.11ax (20 MHz, MCS2, 99pc duty cycle)	WLAN	8.33	±9.6
10686	AAC	IEEE 802.11ax (20 MHz, MCS3, 99pc duty cycle)	WLAN	8.28	±9.6



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10687	AAC	IEEE 802.11ax (20 MHz, MCS4, 99pc duty cycle)	WLAN	8.45	±0.6
10688	AAC	IEEE 802.11ax (20 MHz, MCS5, 99pc duty cycle)	WLAN	8.29	±0.6
10689	AAC	IEEE 802.11ax (20 MHz, MCS6, 99pc duty cycle)	WLAN	8.55	±0.6
10690	AAC	IEEE 802.11ax (20 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±0.6
10691	AAC	IEEE 802.11ax (20 MHz, MCS8, 99pc duty cycle)	WLAN	8.25	±0.6
10692	AAC	IEEE 802.11ax (20 MHz, MCS9, 99pc duty cycle)	WLAN	8.29	±0.6
10693	AAC	IEEE 802.11ax (20 MHz, MCS10, 99pc duty cycle)	WLAN	8.25	±0.6
10694	AAC	IEEE 802.11ax (20 MHz, MCS11, 99pc duty cycle)	WLAN	8.57	±0.6
10695	AAC	IEEE 802.11ax (40 MHz, MCS0, 90pc duty cycle)	WLAN	8.78	±0.6
10696	AAC	IEEE 802.11ax (40 MHz, MCS1, 90pc duty cycle)	WLAN	9.91	±0.6
10697	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.61	±0.6
10698	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.89	±0.6
10699	AAC	IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.82	±0.6
10700	AAC	IEEE 802.11ax (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.73	±0.6
10701	AAC	IEEE 802.11ax (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.88	±0.6
10702	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.70	±0.6
10703	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±0.6
10704	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.56	±0.6
10705	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	8.69	±0.6
10706	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.66	±0.6
10707	AAC	IEEE 802.11ax (40 MHz, MCS0, 99pc duty cycle)	WLAN	8.32	±0.6
10708	AAC	IEEE 802.11ax (40 MHz, MCS1, 99pc duty cycle)	WLAN	8.55	±0.6
10709	AAC	IEEE 802.11ax (40 MHz, MCS2, 99pc duty cycle)	WLAN	8.33	±0.6
10710	AAC	IEEE 802.11ax (40 MHz, MCS3, 99pc duty cycle)	WLAN	8.29	±0.6
10711	AAC	IEEE 802.11ax (40 MHz, MCS4, 99pc duty cycle)	WLAN	8.39	±0.6
10712	AAC	IEEE 802.11ax (40 MHz, MCS5, 99pc duty cycle)	WLAN	8.67	±0.6
10713	AAC	IEEE 802.11ax (40 MHz, MCS6, 99pc duty cycle)	WLAN	8.33	±0.6
10714	AAC	IEEE 802.11ax (40 MHz, MCS7, 99pc duty cycle)	WLAN	8.28	±0.6
10715	AAC	IEEE 802.11ax (40 MHz, MCS8, 99pc duty cycle)	WLAN	8.45	±0.6
10716	AAC	IEEE 802.11ax (40 MHz, MCS9, 99pc duty cycle)	WLAN	8.30	±0.6
10717	AAC	IEEE 802.11ax (40 MHz, MCS10, 99pc duty cycle)	WLAN	8.48	±0.6
10718	AAC	IEEE 802.11ax (40 MHz, MCS11, 99pc duty cycle)	WLAN	8.24	±0.6
10719	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.81	±0.6
10720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.87	±0.6
10721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.76	±0.6
10722	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.55	±0.6
10723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	±0.6
10724	AAC	IEEE 802.11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.90	±0.6
10725	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±0.6
10726	AAC	IEEE 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.72	±0.6
10727	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.68	±0.6
10728	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.65	±0.6
10729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.84	±0.6
10730	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.67	±0.6
10731	AAC	IEEE 802.11ax (80 MHz, MCS0, 99pc duty cycle)	WLAN	8.42	±0.6
10732	AAC	IEEE 802.11ax (80 MHz, MCS1, 99pc duty cycle)	WLAN	8.46	±0.6
10733	AAC	IEEE 802.11ax (80 MHz, MCS2, 99pc duty cycle)	WLAN	8.40	±0.6
10734	AAC	IEEE 802.11ax (80 MHz, MCS3, 99pc duty cycle)	WLAN	8.25	±0.6
10735	AAC	IEEE 802.11ax (80 MHz, MCS4, 99pc duty cycle)	WLAN	8.33	±0.6
10736	AAC	IEEE 802.11ax (80 MHz, MCS5, 99pc duty cycle)	WLAN	8.27	±0.6
10737	AAC	IEEE 802.11ax (80 MHz, MCS6, 99pc duty cycle)	WLAN	8.36	±0.6
10738	AAC	IEEE 802.11ax (80 MHz, MCS7, 99pc duty cycle)	WLAN	8.42	±0.6
10739	AAC	IEEE 802.11ax (80 MHz, MCS8, 99pc duty cycle)	WLAN	8.29	±0.6
10740	AAC	IEEE 802.11ax (80 MHz, MCS9, 99pc duty cycle)	WLAN	8.45	±0.6
10741	AAC	IEEE 802.11ax (80 MHz, MCS10, 99pc duty cycle)	WLAN	8.40	±0.6
10742	AAC	IEEE 802.11ax (80 MHz, MCS11, 99pc duty cycle)	WLAN	8.43	±0.6
10743	AAC	IEEE 802.11ax (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.94	±0.6
10744	AAC	IEEE 802.11ax (160 MHz, MCS1, 90pc duty cycle)	WLAN	9.16	±0.6
10745	AAC	IEEE 802.11ax (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.93	±0.6
10746	AAC	IEEE 802.11ax (160 MHz, MCS3, 90pc duty cycle)	WLAN	9.11	±0.6
10747	AAC	IEEE 802.11ax (160 MHz, MCS4, 90pc duty cycle)	WLAN	9.04	±0.6
10748	AAC	IEEE 802.11ax (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.93	±0.6
10749	AAC	IEEE 802.11ax (160 MHz, MCS6, 90pc duty cycle)	WLAN	8.90	±0.6
10750	AAC	IEEE 802.11ax (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.79	±0.6
10751	AAC	IEEE 802.11ax (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±0.6
10752	AAC	IEEE 802.11ax (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.81	±0.6

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10753	AAC	IEEE 802.11ax (180 MHz, MCS10, 99pc duty cycle)	WLAN	8.00	±9.6
10754	AAC	IEEE 802.11ax (180 MHz, MCS11, 99pc duty cycle)	WLAN	8.94	±9.6
10755	AAC	IEEE 802.11ax (180 MHz, MCS0, 99pc duty cycle)	WLAN	8.64	±9.6
10756	AAC	IEEE 802.11ax (180 MHz, MCS1, 99pc duty cycle)	WLAN	8.77	±9.6
10757	AAC	IEEE 802.11ax (180 MHz, MCS2, 99pc duty cycle)	WLAN	8.77	±9.6
10758	AAC	IEEE 802.11ax (180 MHz, MCS3, 99pc duty cycle)	WLAN	8.69	±9.6
10759	AAC	IEEE 802.11ax (180 MHz, MCS4, 99pc duty cycle)	WLAN	8.58	±9.6
10760	AAC	IEEE 802.11ax (180 MHz, MCS5, 99pc duty cycle)	WLAN	8.49	±9.6
10761	AAC	IEEE 802.11ax (180 MHz, MCS6, 99pc duty cycle)	WLAN	8.58	±9.6
10762	AAC	IEEE 802.11ax (180 MHz, MCS7, 99pc duty cycle)	WLAN	8.49	±9.6
10763	AAC	IEEE 802.11ax (180 MHz, MCS8, 99pc duty cycle)	WLAN	8.53	±9.6
10764	AAC	IEEE 802.11ax (180 MHz, MCS9, 99pc duty cycle)	WLAN	8.54	±9.6
10765	AAC	IEEE 802.11ax (180 MHz, MCS10, 99pc duty cycle)	WLAN	8.54	±9.6
10766	AAC	IEEE 802.11ax (180 MHz, MCS11, 99pc duty cycle)	WLAN	8.51	±9.6
10767	AAE	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	7.99	±9.6
10768	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	±9.6
10769	AAD	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	±9.6
10770	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
10771	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
10772	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.23	±9.6
10773	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.03	±9.6
10774	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
10775	AAD	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	±9.6
10776	AAD	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	±9.6
10777	AAC	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	±9.6
10778	AAD	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	±9.6
10779	AAC	5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.42	±9.6
10780	AAD	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	±9.6
10781	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	±9.6
10782	AAD	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.43	±9.6
10783	AAE	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	±9.6
10784	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.29	±9.6
10785	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.40	±9.6
10786	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.35	±9.6
10787	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.44	±9.6
10788	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	±9.6
10789	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.37	±9.6
10790	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	±9.6
10791	AAE	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	±9.6
10792	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.92	±9.6
10793	AAD	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.95	±9.6
10794	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±9.6
10795	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.84	±9.6
10796	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±9.6
10797	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.01	±9.6
10798	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±9.6
10799	AAD	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	±9.6
10801	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±9.6
10802	AAD	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.87	±9.6
10803	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	±9.6
10805	AAD	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
10806	AAD	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.37	±9.6
10809	AAD	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
10810	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
10812	AAD	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	±9.6
10817	AAE	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	±9.6
10818	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
10819	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	±9.6
10820	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.30	±9.6
10821	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±9.6
10822	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±9.6
10823	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.36	±9.6
10824	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.39	±9.6
10825	AAD	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±9.6
10827	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.42	±9.6
10828	AAD	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.40	±9.6



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10829	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.40	±9.6
10830	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.63	±9.6
10831	AAD	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.73	±9.6
10832	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.74	±9.6
10833	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
10834	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.75	±9.6
10835	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
10836	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.66	±9.6
10837	AAD	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.68	±9.6
10839	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
10840	AAD	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.67	±9.6
10841	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.71	±9.6
10843	AAD	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	±9.6
10844	AAD	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±9.6
10846	AAD	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
10854	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±9.6
10855	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	±9.6
10858	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	±9.6
10857	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	±9.6
10858	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	±9.6
10859	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±9.6
10860	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
10861	AAD	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.40	±9.6
10863	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
10864	AAD	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	±9.6
10865	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
10866	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10868	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.89	±9.6
10869	AAE	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	±9.6
10870	AAE	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.86	±9.6
10871	AAE	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.75	±9.6
10872	AAE	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.52	±9.6
10873	AAE	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	±9.6
10874	AAE	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	±9.6
10875	AAE	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	±9.6
10876	AAE	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.39	±9.6
10877	AAE	5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	7.95	±9.6
10878	AAE	5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.41	±9.6
10879	AAE	5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.12	±9.6
10880	AAE	5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.38	±9.6
10881	AAE	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	±9.6
10882	AAE	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.96	±9.6
10883	AAE	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.57	±9.6
10884	AAE	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.53	±9.6
10885	AAE	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	±9.6
10886	AAE	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	±9.6
10887	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.76	±9.6
10888	AAE	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.35	±9.6
10889	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.02	±9.6
10890	AAE	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.40	±9.6
10891	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.13	±9.6
10892	AAE	5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.41	±9.6
10897	AAC	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.66	±9.6
10898	AAB	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	±9.6
10899	AAB	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	±9.6
10900	AAB	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10901	AAB	5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10902	AAB	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10903	AAB	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10904	AAB	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10905	AAB	5G NR (DFT-s-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10906	AAB	5G NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
10907	AAC	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.78	±9.6
10908	AAB	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6
10909	AAB	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.96	±9.6
10910	AAB	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6



EX3DV4 - SN:3759

December 14, 2023

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^k k = 2
10911	AAB	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6
10912	AAB	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10913	AAB	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10914	AAB	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.85	±9.6
10915	AAB	5G NR (DFT-s-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	±9.6
10916	AAB	5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	±9.6
10917	AAB	5G NR (DFT-s-OFDM, 50% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±9.6
10918	AAC	5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	±9.6
10919	AAB	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	±9.6
10920	AAB	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	±9.6
10921	AAB	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10922	AAB	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	±9.6
10923	AAB	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10924	AAB	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10925	AAB	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	±9.6
10926	AAB	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10927	AAB	5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±9.6
10928	AAC	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
10929	AAC	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
10930	AAC	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
10931	AAC	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
10932	AAC	5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
10933	AAC	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
10934	AAC	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
10935	AAD	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
10936	AAC	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±9.6
10937	AAC	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.77	±9.6
10938	AAC	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±9.6
10939	AAC	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±9.6
10940	AAC	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.89	±9.6
10941	AAC	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	±9.6
10942	AAC	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±9.6
10943	AAD	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.96	±9.6
10944	AAC	5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.91	±9.6
10945	AAC	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±9.6
10946	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	±9.6
10947	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±9.6
10948	AAC	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
10949	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±9.6
10950	AAC	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
10951	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.92	±9.6
10952	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.25	±9.6
10953	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.15	±9.6
10954	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.23	±9.6
10955	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	±9.6
10956	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.14	±9.6
10957	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.31	±9.6
10958	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	±9.6
10959	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.33	±9.6
10960	AAC	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.32	±9.6
10961	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.36	±9.6
10962	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	8.40	±9.6
10963	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.55	±9.6
10964	AAC	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.29	±9.6
10965	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.37	±9.6
10966	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.55	±9.6
10967	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.42	±9.6
10968	AAB	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.49	±9.6
10972	AAB	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	11.39	±9.6
10973	AAB	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	9.06	±9.6
10974	AAB	5G NR (CP-OFDM, 100% RB, 100 MHz, 256-QAM, 30 kHz)	5G NR FR1 TDD	10.28	±9.6
10975	AAA	ULLA BDR	ULLA	1.16	±9.6
10979	AAA	ULLA HDR4	ULLA	8.58	±9.6
10980	AAA	ULLA HDR6	ULLA	10.32	±9.6
10981	AAA	ULLA HDRp4	ULLA	3.19	±9.6
10982	AAA	ULLA HDRp8	ULLA	3.43	±9.6



EX3DV4 - SN:3759

December 14, 2023

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k = 2
10963	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.31	±9.6
10964	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.42	±9.6
10985	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	±9.6
10986	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	±9.6
10987	AAA	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.53	±9.6
10988	AAA	5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.38	±9.6
10989	AAA	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.39	±9.6
10990	AAA	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.52	±9.6
11003	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	10.24	±9.6
11004	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	10.73	±9.6
11005	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	9.70	±9.6
11006	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.55	±9.6
11007	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.46	±9.6
11008	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.51	±9.6
11009	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.75	±9.6
11010	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.95	±9.6
11011	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.98	±9.6
11012	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.68	±9.6
11013	AAA	IEEE 802.11be (320 MHz, MCS1, 99pc duty cycle)	WLAN	8.47	±9.6
11014	AAA	IEEE 802.11be (320 MHz, MCS2, 99pc duty cycle)	WLAN	8.45	±9.6
11015	AAA	IEEE 802.11be (320 MHz, MCS3, 99pc duty cycle)	WLAN	8.44	±9.6
11016	AAA	IEEE 802.11be (320 MHz, MCS4, 99pc duty cycle)	WLAN	8.44	±9.6
11017	AAA	IEEE 802.11be (320 MHz, MCS5, 99pc duty cycle)	WLAN	8.41	±9.6
11018	AAA	IEEE 802.11be (320 MHz, MCS6, 99pc duty cycle)	WLAN	8.40	±9.6
11019	AAA	IEEE 802.11be (320 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±9.6
11020	AAA	IEEE 802.11be (320 MHz, MCS8, 99pc duty cycle)	WLAN	8.27	±9.6
11021	AAA	IEEE 802.11be (320 MHz, MCS9, 99pc duty cycle)	WLAN	8.46	±9.6
11022	AAA	IEEE 802.11be (320 MHz, MCS10, 99pc duty cycle)	WLAN	8.36	±9.6
11023	AAA	IEEE 802.11be (320 MHz, MCS11, 99pc duty cycle)	WLAN	8.09	±9.6
11024	AAA	IEEE 802.11be (320 MHz, MCS12, 99pc duty cycle)	WLAN	8.42	±9.6
11025	AAA	IEEE 802.11be (320 MHz, MCS13, 99pc duty cycle)	WLAN	8.37	±9.6
11026	AAA	IEEE 802.11be (320 MHz, MCS0, 99pc duty cycle)	WLAN	6.39	±9.6

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



ANNEX B

VALIDATION SOURCE CALIBRATION REPORTS



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



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S Swiss Calibration Service

Accreditation No.: **SCS 0108**

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

Client **TÜV SÜD**
Fareham, United Kingdom

Certificate No. **D2450V2-1026_Jun24**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN:1026**

Calibration procedure(s) **QA CAL-05.v12
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **June 14, 2024**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	26-Mar-24 (No. 217-04036/04037)	Mar-25
Power sensor NRP-Z91	SN: 103244	26-Mar-24 (No. 217-04036)	Mar-25
Power sensor NRP-Z91	SN: 103245	26-Mar-24 (No. 217-04037)	Mar-25
Reference 20 dB Attenuator	SN: BH9394 (20k)	26-Mar-24 (No. 217-04046)	Mar-25
Type-N mismatch combination	SN: 310982 / 06327	26-Mar-24 (No. 217-04047)	Mar-25
Reference Probe EX3DV4	SN: 7349	03-Nov-23 (No. EX3-7349_Nov23)	Nov-24
DAE4	SN: 601	22-May-24 (No. DAE4-601_May24)	May-25
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E44195	SN: G638512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	<i>i.e. f - 12</i>
Approved by:	Sven Kühn	Technical Manager	<i>i.B. A. Kühn</i>

Issued: June 17, 2024

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- 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.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	37.9 $\pm$ 6 %	1.86 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.8 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.25 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.7 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.6 Ω + 0.7 j Ω
Return Loss	- 31.7 dB

General Antenna Parameters and Design

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

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

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

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

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 14.06.2024

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:1026

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.86$ S/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96) @ 2450 MHz; Calibrated: 03.11.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 22.05.2024
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 116.6 V/m; Power Drift = 0.09 dB

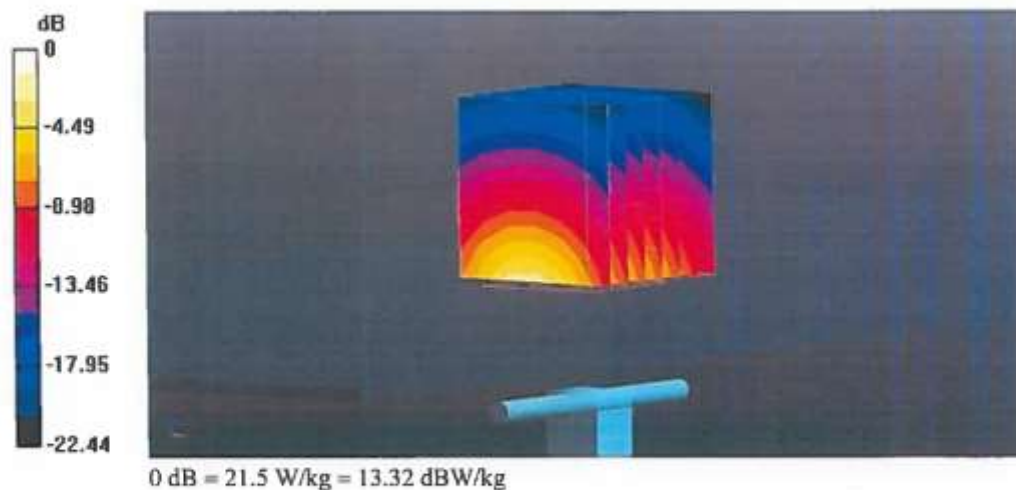
Peak SAR (extrapolated) = 27.0 W/kg

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.25 W/kg

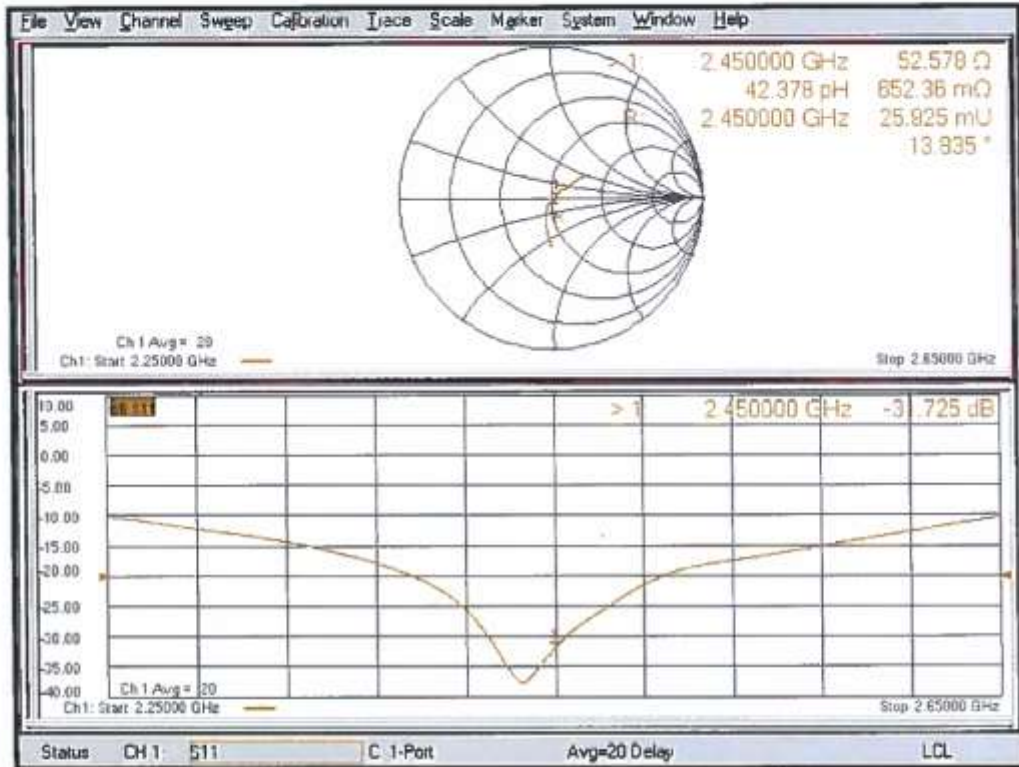
Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 50.6%

Maximum value of SAR (measured) = 21.5 W/kg



Impedance Measurement Plot for Head TSL





**Calibration Laboratory of
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **TÜV SÜD**
Fareham, United Kingdom

Certificate No. **D5GHzV2-1291_Jun24**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN:1291**

Calibration procedure(s) **QA CAL-22.v7
Calibration Procedure for SAR Validation Sources between 3-10 GHz**

Calibration date: **June 10, 2024**

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 NRP2	SN: 104778	26-Mar-24 (No. 217-04036/04037)	Mar-25
Power sensor NRP-Z91	SN: 103244	26-Mar-24 (No. 217-04036)	Mar-25
Power sensor NRP-Z91	SN: 103245	26-Mar-24 (No. 217-04037)	Mar-25
Reference 20 dB Attenuator	SN: BH9394 (20k)	26-Mar-24 (No. 217-04046)	Mar-25
Type-N mismatch combination	SN: 310982 / 06327	26-Mar-24 (No. 217-04047)	Mar-25
Reference Probe EX3DV4	SN: 3503	07-Mar-24 (No. EX3-3503_Mar24)	Mar-25
DAE4	SN: 601	22-May-24 (No. DAE4-601_May24)	May-25

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

Calibrated by:	Name Lelf Klysner	Function Laboratory Technician	Signature
Approved by:	Name Sven Kühn	Function Technical Manager	Signature

Issued: June 11, 2024

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

Certificate No: D5GHzV2-1291_Jun24

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



S Schweizerischer Kalibrierdienst
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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
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 10.0 mm, dz = 10.0 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz $\pm$ 1 MHz 5300 MHz $\pm$ 1 MHz 5500 MHz $\pm$ 1 MHz 5600 MHz $\pm$ 1 MHz 5800 MHz $\pm$ 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	36.4 $\pm$ 6 %	4.55 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.84 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	78.5 W/kg $\pm$ 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.24 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.5 W/kg $\pm$ 19.5 % (k=2)

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.2 ± 6 %	4.64 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.08 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	80.9 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.31 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.1 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.8 ± 6 %	4.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	85.7 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.2 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.6 ± 6 %	4.97 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.24 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	82.4 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.34 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.4 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.3 ± 6 %	5.19 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.2 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.0 W/kg ± 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	47.0 Ω - 7.9 j Ω
Return Loss	- 21.2 dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	47.8 Ω - 2.3 j Ω
Return Loss	- 29.8 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	47.6 Ω - 3.2 j Ω
Return Loss	- 27.8 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	51.6 Ω - 3.6 j Ω
Return Loss	- 28.1 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	51.7 Ω - 3.3 j Ω
Return Loss	- 28.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.186 ns
----------------------------------	----------

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

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

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

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 10.06.2024

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1291

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.55$ S/m; $\epsilon_r = 36.4$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5300$ MHz; $\sigma = 4.64$ S/m; $\epsilon_r = 36.2$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5500$ MHz; $\sigma = 4.86$ S/m; $\epsilon_r = 35.8$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5600$ MHz; $\sigma = 4.97$ S/m; $\epsilon_r = 35.6$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.19$ S/m; $\epsilon_r = 35.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.63, 5.63, 5.63) @ 5200 MHz, ConvF(5.38, 5.38, 5.38) @ 5300 MHz, ConvF(5.04, 5.04, 5.04) @ 5500 MHz, ConvF(5, 5, 5) @ 5600 MHz, ConvF(4.86, 4.86, 4.86) @ 5800 MHz; Calibrated: 07.03.2024
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 22.05.2024
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 73.62 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 28.0 W/kg

SAR(1 g) = 7.84 W/kg; SAR(10 g) = 2.24 W/kg

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 68.8%

Maximum value of SAR (measured) = 18.2 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 75.19 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 28.8 W/kg

SAR(1 g) = 8.08 W/kg; SAR(10 g) = 2.31 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

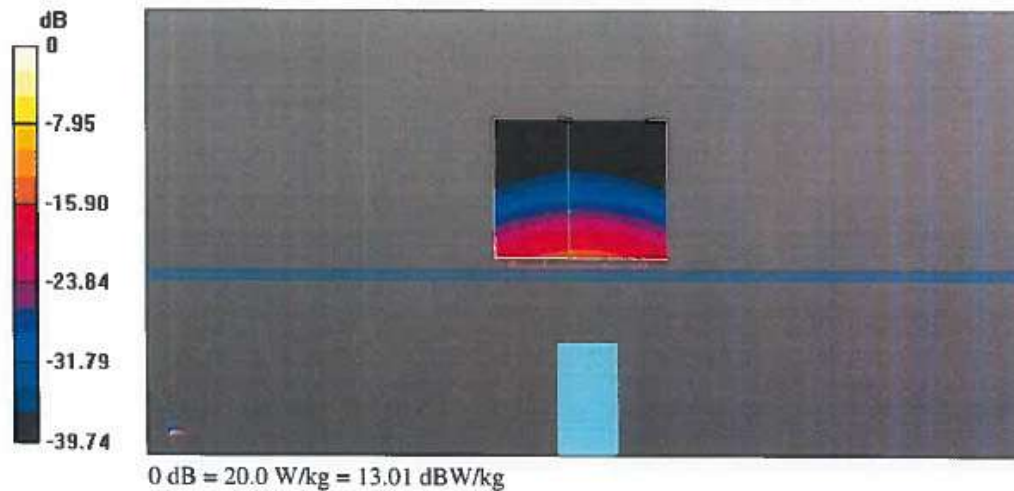
Ratio of SAR at M2 to SAR at M1 = 69%

Maximum value of SAR (measured) = 18.8 W/kg

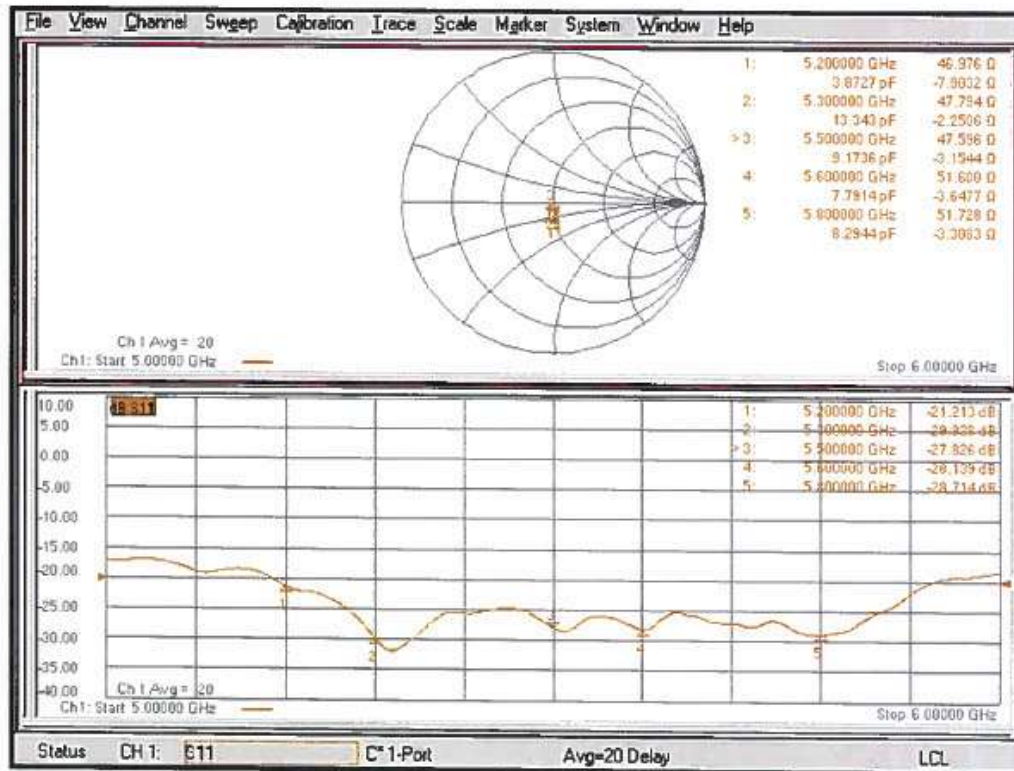
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 75.04 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 8.57 W/kg; SAR(10 g) = 2.42 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 66.1%
Maximum value of SAR (measured) = 20.6 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 74.75 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 31.1 W/kg
SAR(1 g) = 8.24 W/kg; SAR(10 g) = 2.34 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 66.8%
Maximum value of SAR (measured) = 19.8 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 72.51 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 32.7 W/kg
SAR(1 g) = 8.12 W/kg; SAR(10 g) = 2.30 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 64.8%
Maximum value of SAR (measured) = 20.0 W/kg



Impedance Measurement Plot for Head TSL





ANNEX C

TEST RESULTS



Measurement Report for L1P-2, FRONT, ISM 2.4 GHz Band, IEEE 802.15.1 Bluetooth (GFSK, DH5), Channel 0 (2402.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	ISM 2.4 GHz Band	Bluetooth, 10032-CAA	2402.0, 0	7.48	1.80	39.5

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.14 deg.C 2024-Oct-22 SYS1.prn, 2024-Oct-22	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	10.0 x 10.0	5.0 x 5.0 x 1.5
Sensor Surface [mm]	3.0	1.4
Graded Grid	n/a	Yes
Grading Ratio	n/a	1.5
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2024-10-23, 12:54	2024-10-23, 13:04
psSAR1g [W/Kg]	0.067	0.070
psSAR10g [W/Kg]	0.030	0.027
Power Drift [dB]	0.06	0.09
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
TSL Correction	Positive only	Positive only
M2/M1 [%]		73.0
Dist 3dB Peak [mm]		7.1

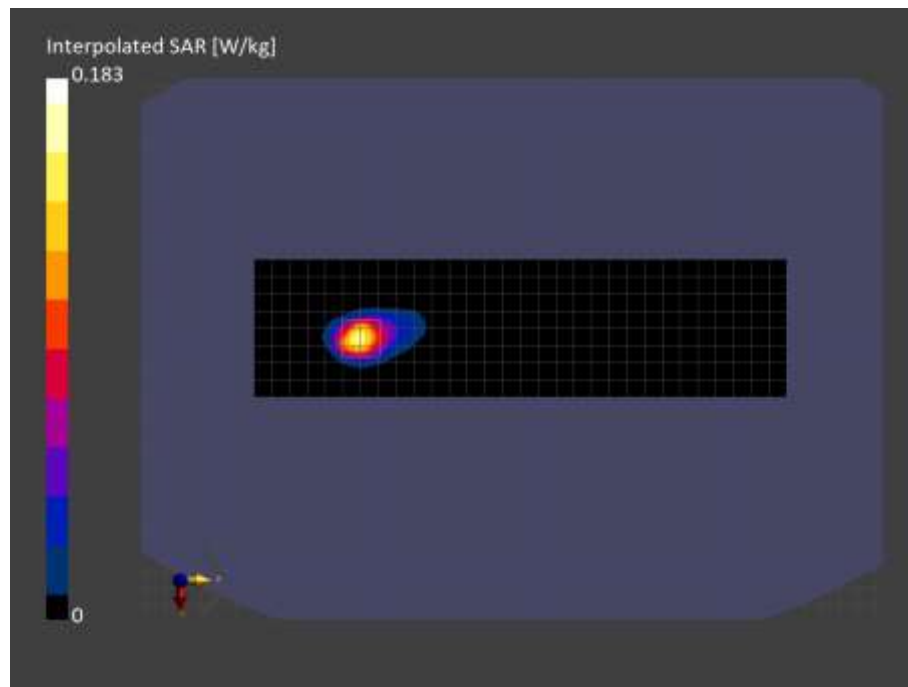


Figure C.1: SAR testing results for the L1P-2 at 2402 MHz Auxiliary Antenna



Measurement Report for L1P-2, FRONT, WLAN 2.4GHz, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps), Channel 6 (2437.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	WLAN 2.4GHz	WLAN, 10012-CAB	2437.0, 6	7.48	1.82	39.5

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.14 deg.C 2024-Oct-22 SYS1.prn, 2024-Oct-22	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	10.0 x 10.0	5.0 x 5.0 x 1.5
Sensor Surface [mm]	3.0	1.4
Graded Grid	n/a	Yes
Grading Ratio	n/a	1.5
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2024-10-23, 13:47	2024-10-23, 13:56
psSAR1g [W/Kg]	0.439	0.478
psSAR10g [W/Kg]	0.210	0.202
Power Drift [dB]	-0.01	-0.02
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
TSL Correction	Positive only	Positive only
M2/M1 [%]		78.8
Dist 3dB Peak [mm]		8.6

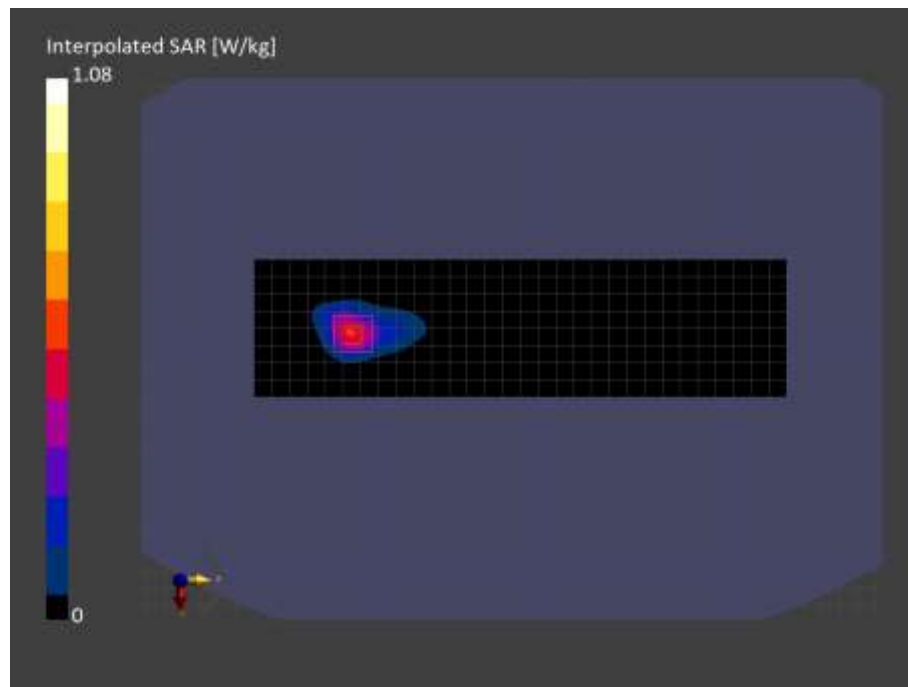


Figure C.2: SAR testing results for the L1P-2 at 2437 MHz Main Antenna



Measurement Report for L1P-2, FRONT, WLAN 2.4GHz, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps), Channel 1 (2412.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	WLAN 2.4GHz	WLAN, 10012-CAB	2412.0, 1	7.48	1.80	39.5

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.14 deg.C 2024-Oct-22 SYS1.prn, 2024-Oct-22	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	10.0 x 10.0	5.0 x 5.0 x 1.5
Sensor Surface [mm]	3.0	1.4
Graded Grid	n/a	Yes
Grading Ratio	n/a	1.5
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2024-10-24, 10:17	2024-10-24, 10:26
psSAR1g [W/Kg]	0.543	0.582
psSAR10g [W/Kg]	0.249	0.244
Power Drift [dB]	0.04	0.03
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
TSL Correction	Positive only	Positive only
M2/M1 [%]		79.0
Dist 3dB Peak [mm]		8.3

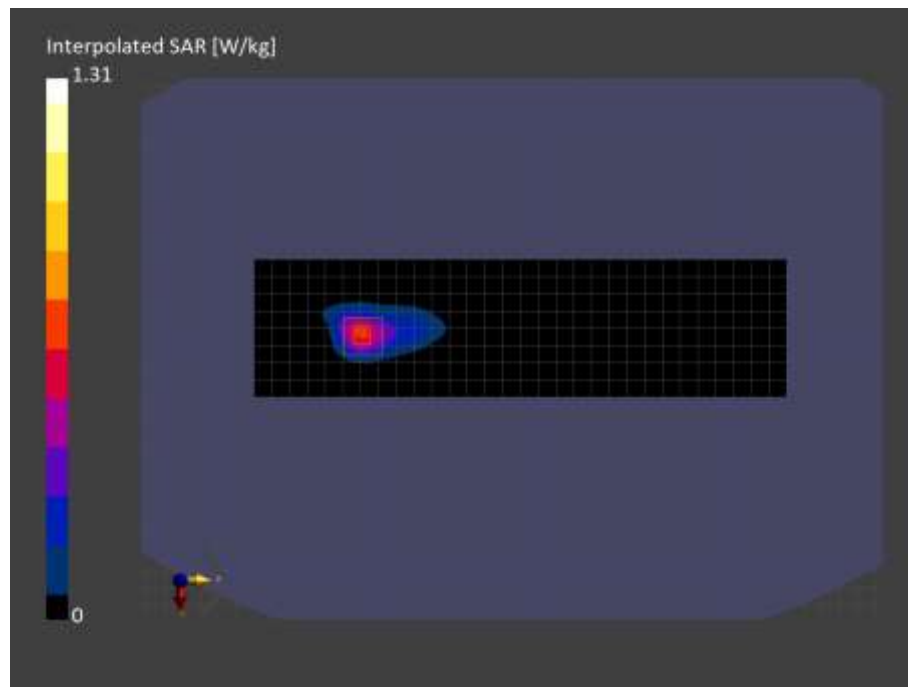


Figure C.3: SAR testing results for the L1P-2 at 2412 MHz Auxiliary Antenna



Measurement Report for L1P-2, FRONT, WLAN 2.4GHz, IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps), Channel 6 (2437.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	WLAN 2.4GHz	WLAN, 10013-CAB	2437.0, 6	7.48	1.82	39.5

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.14 deg.C 2024-Oct-22 SYS1.prn, 2024-Oct-22	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	10.0 x 10.0	5.0 x 5.0 x 1.5
Sensor Surface [mm]	3.0	1.4
Graded Grid	n/a	Yes
Grading Ratio	n/a	1.5
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2024-10-24, 14:25	2024-10-24, 14:34
psSAR1g [W/Kg]	0.605	0.592
psSAR10g [W/Kg]	0.293	0.273
Power Drift [dB]	0.01	0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
TSL Correction	Positive only	Positive only
M2/M1 [%]		77.7
Dist 3dB Peak [mm]		10.0

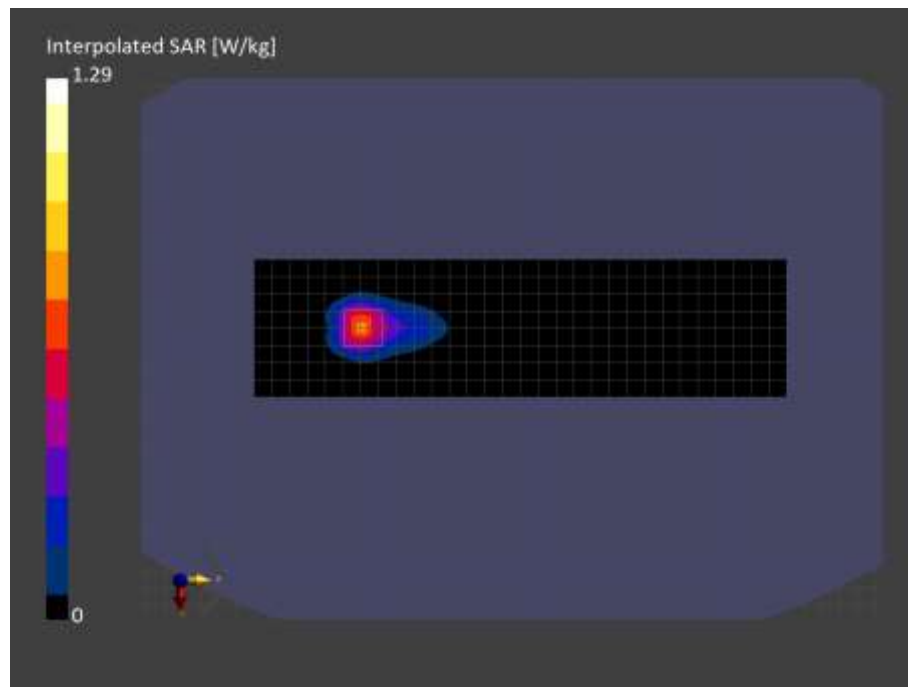


Figure C.4: SAR testing results for the L1P-2 at 2437 MHz MIMO



Measurement Report for L1P-2, FRONT, U-NII-1, U-NII-2A, IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK), Channel 44 (5220.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	U-NII-1, U-NII-2A	WLAN, 10196-CAE	, 44	5.62	4.53	34.7

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.14 deg.C 2024-Oct-22 SYS1.prn, 2024-Oct-22	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan	Zoom Scan
Grid Extents [mm]	x 300.0	22.0 x 22.0 x 22.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 1.4	4.0 x 4.0 x 1.4
Sensor Surface [mm]	3.0	1.4	1.4
Graded Grid	n/a	Yes	Yes
Grading Ratio	n/a	1.4	1.4
MAIA	N/A	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan	Zoom Scan
Date	2024-10-25, 13:20	2024-10-25, 13:55	2024-10-25, 13:31
psSAR1g [W/Kg]	3.85	4.00	4.49
psSAR10g [W/Kg]	1.26	1.11	1.25
Power Drift [dB]	-0.02	0.09	-0.02
Power Scaling	Disabled	Disabled	Disabled
Scaling Factor [dB]			
TSL Correction	Positive only	Positive only	Positive only
M2/M1 [%]		62.4	62.4
Dist 3dB Peak [mm]		5.6	5.9

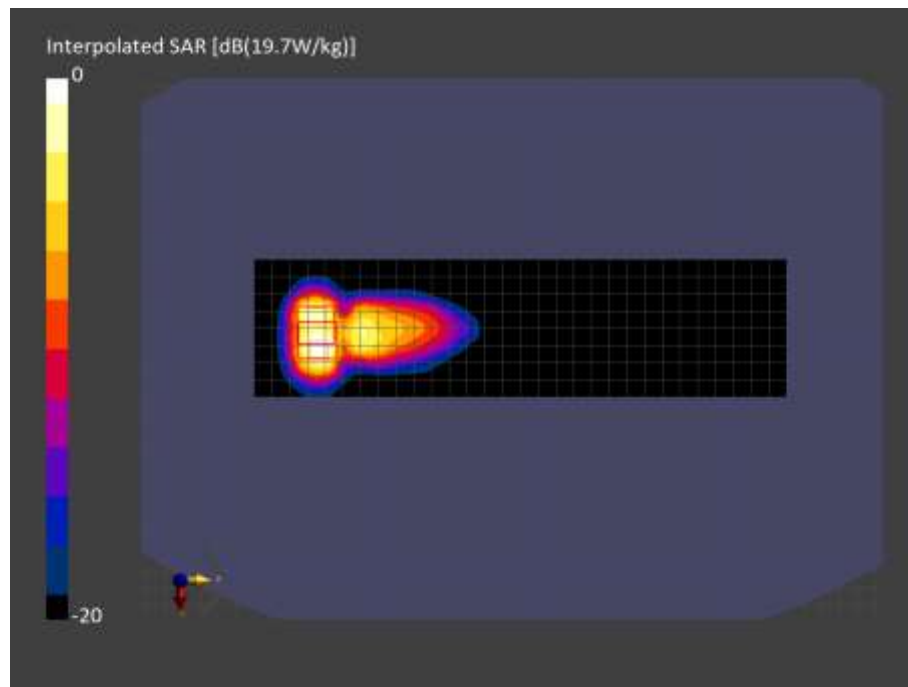


Figure C.5: SAR testing results for the L1P-2 at 5220 MHz MIMO



Measurement Report for L1P-2, FRONT, U-NII-2C Standalone, IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK), Channel 120 (5600.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	U-NII-2C Standalone	WLAN, 10196-CAE	, 120	4.8	4.94	34.0

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.38 deg.C 2024-Oct-28 SYS1.prn, 2024-Oct-28	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan	Zoom Scan
Grid Extents [mm]	x 300.0	22.0 x 22.0 x 22.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 1.4	4.0 x 4.0 x 1.4
Sensor Surface [mm]	3.0	1.4	1.4
Graded Grid	n/a	Yes	Yes
Grading Ratio	n/a	1.4	1.4
MAIA	N/A	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan	Zoom Scan
Date	2024-10-29, 11:45	2024-10-29, 12:07	2024-10-29, 11:56
psSAR1g [W/Kg]	3.28	3.89	3.89
psSAR10g [W/Kg]	1.07	1.16	1.17
Power Drift [dB]	-0.02	-0.02	-0.03
Power Scaling	Disabled	Disabled	Disabled
Scaling Factor [dB]			
TSL Correction	Positive only	Positive only	Positive only
M2/M1 [%]		61.6	62.1
Dist 3dB Peak [mm]		6.3	6.3

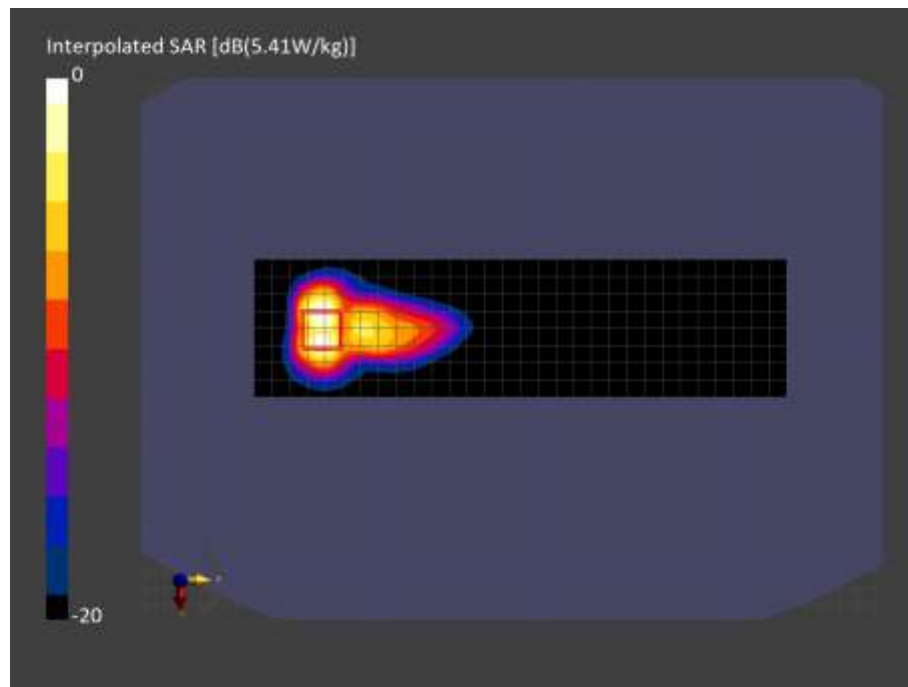


Figure C.6: SAR testing results for the L1P-2 at 5600 MHz MIMO



Measurement Report for L1P-2, FRONT, U-NII-3 Standalone, IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK), Channel 149 (5745.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
3Shape TRIOS A/S	270.0 x 38.0 x 39.0		Handheld Device

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	U-NII-3 Standalone	WLAN, 10196-CAE	, 149	4.77	5.11	33.7

Hardware Setup

Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - SN:2057	HBBL-600-10000 DAK 3.5 Head 21.38 deg.C 2024-Oct-28 SYS1.prn, 2024-Oct-28	EX3DV4 - SN3759, 2023-12-14	DAE4 Sn475, 2023-12-11

Scans Setup

	Area Scan	Zoom Scan	Zoom Scan
Grid Extents [mm]	x 300.0	22.0 x 22.0 x 22.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	10.0 x 10.0	4.0 x 4.0 x 1.4	4.0 x 4.0 x 1.4
Sensor Surface [mm]	3.0	1.4	1.4
Graded Grid	n/a	Yes	Yes
Grading Ratio	n/a	1.4	1.4
MAIA	N/A	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan	Zoom Scan
Date	2024-10-29, 15:16	2024-10-29, 15:26	2024-10-29, 15:37
psSAR1g [W/Kg]	2.64	2.85	3.12
psSAR10g [W/Kg]	0.860	0.836	0.909
Power Drift [dB]	-0.03	-0.07	-0.06
Power Scaling	Disabled	Disabled	Disabled
Scaling Factor [dB]			
TSL Correction	Positive only	Positive only	Positive only
M2/M1 [%]		59.7	60.1
Dist 3dB Peak [mm]		5.9	6.4

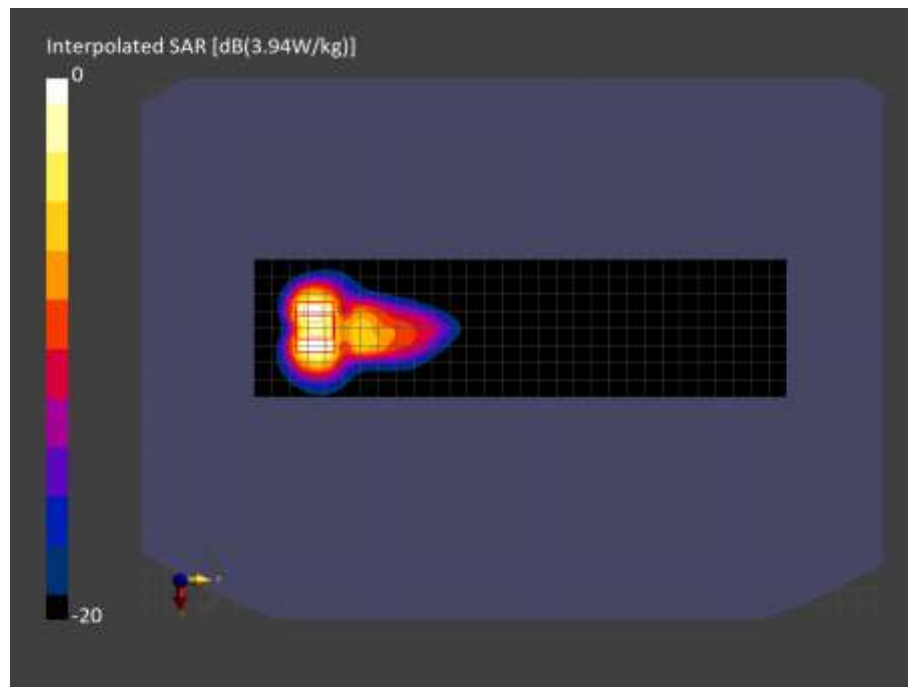


Figure C.7: SAR testing results for the L1P-2 at 5745 MHz MIMO



ANNEX D

Photos of L1P-2

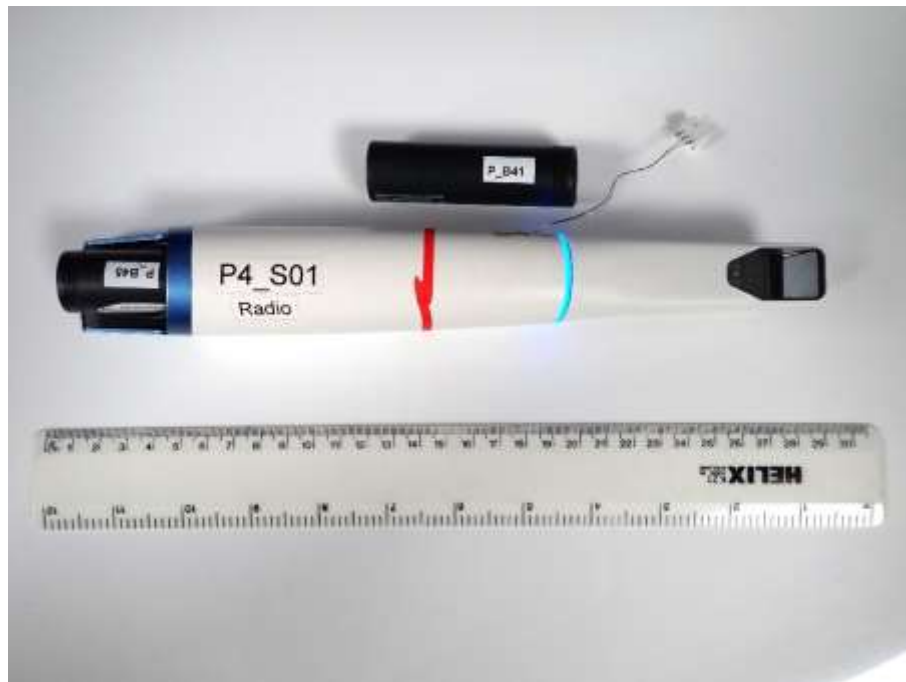


Figure D.1: Back face of the L1P-2



Figure D.2: Right edge of the L1P-2



Figure D.3: Front face of the L1P-2

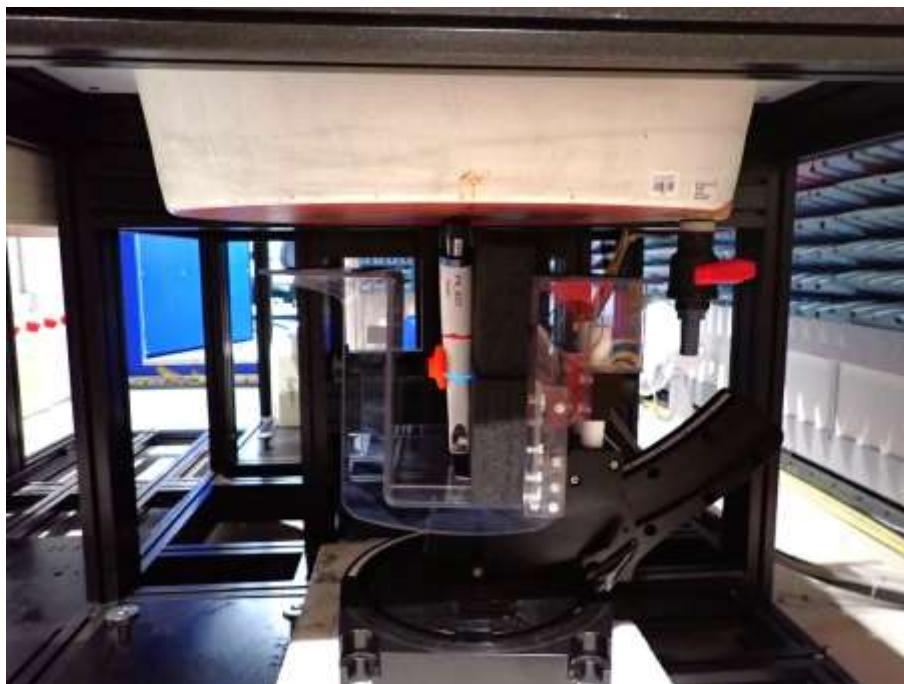


Figure D.4: DUT bottom edge at 0mm gap configuration.

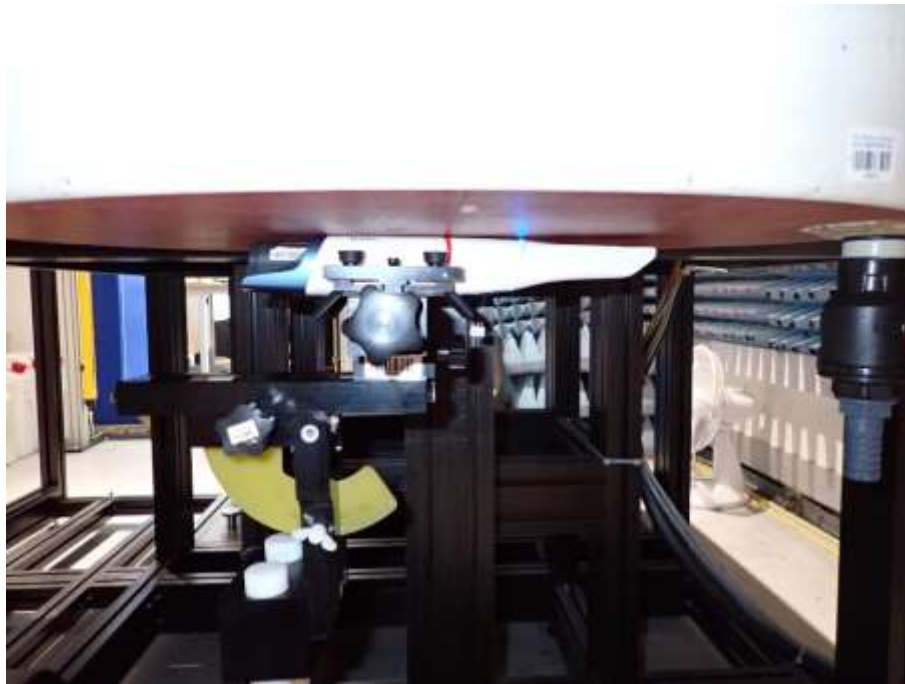


Figure D.5: DUT Back face at 0mm gap configuration.

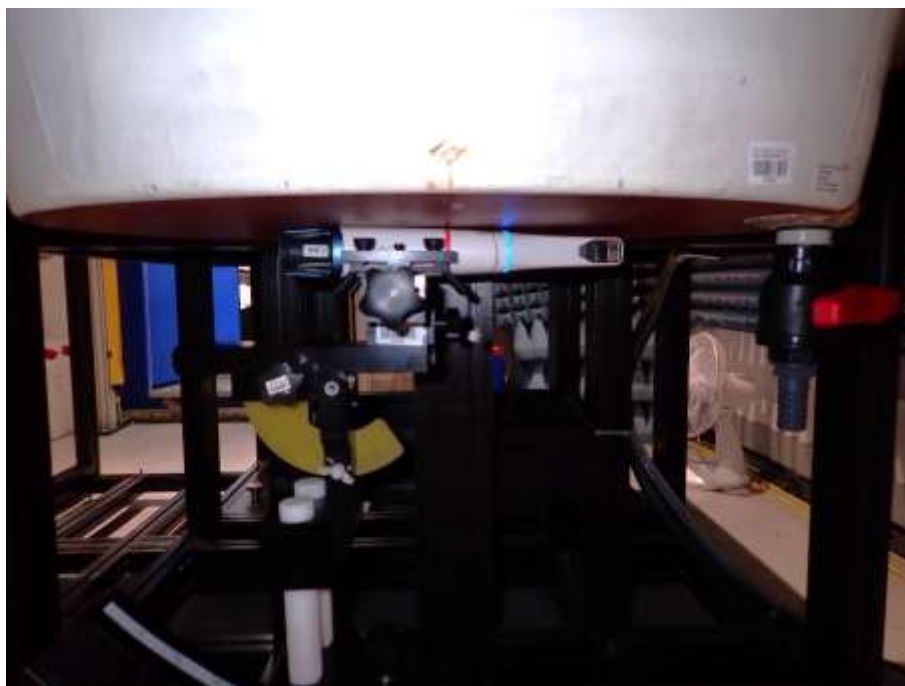


Figure D.6: DUT right edge at 0mm gap configuration.

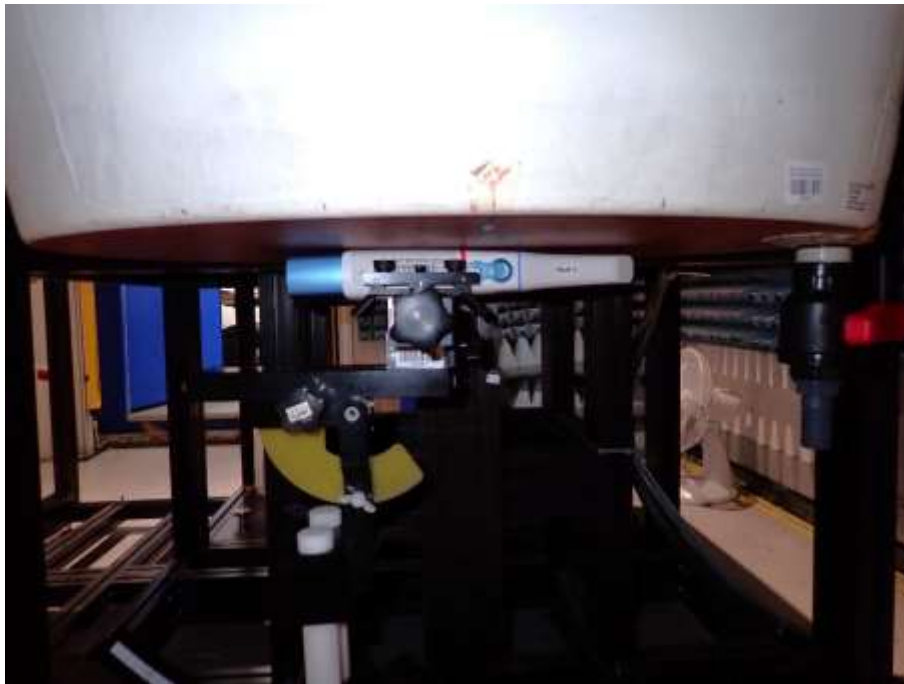


Figure D.7: DUT left edge at 0mm gap configuration.

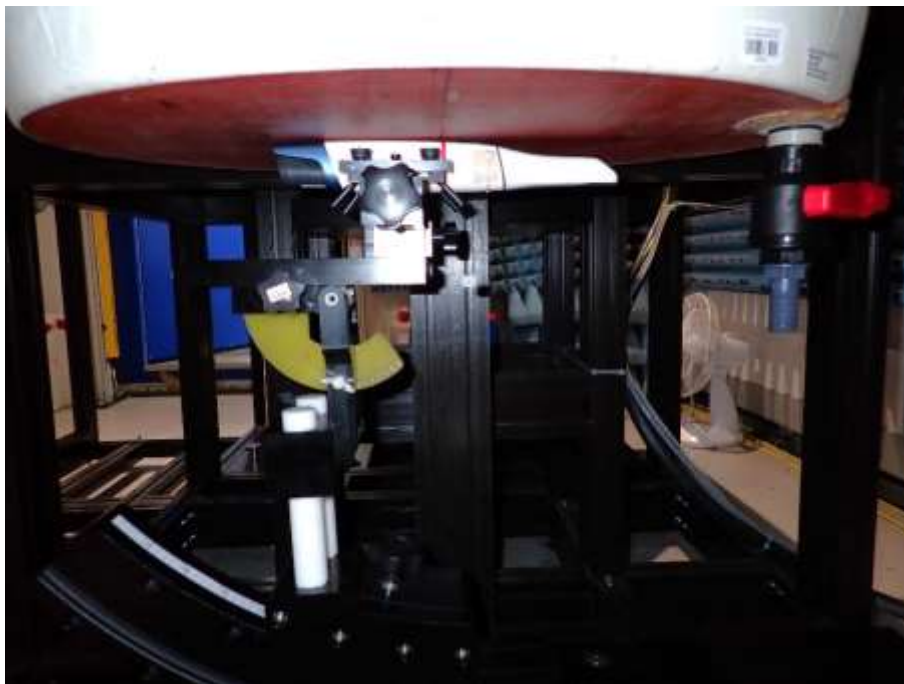


Figure D.8: DUT front face at 0mm gap configuration.



Figure D.9: Conducted sample used for conducted power measurements.