

RF Exposure Compliance Test Report

Date of Report	27/01/2025	Client's Contact person:	Martin Reiss
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Tested device	Industrial Notebook IPC MD-57A		
Related reports:	-		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC published RF exposure KDB procedures IEC/IEEE 62209-1528, 2020 Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices RSS-102, Issue 6, 2023 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signatures:	27.01.2025 Laboratory Manager <i>Miia Nurkkala</i>		

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1. SUMMARY OF RF EXPOSURE TEST REPORT

1.1 Test Details

Equipment under Test (DUT):

Product:	Industrial Notebook
Manufacturer:	Siemens
Model:	IPC MD-57A
Serial Number:	3G38, 3G36
FCC ID Number:	U9A-MD57A
ISED ID Number:	267BA-MD57A
DUT Number:	21074, 21073
Battery Type used in testing:	Li-Ion Battery
State of the Sample:	Production sample

Testing information:

Testing performed:	09.08.2023-22.08.2023
Notes:	This report replaces report FCC ISED RF Exposure Report_Industrial Notebook_ID6019_13112023. The test report has been evaluated and updated to demonstrate compliance of the tested product against RSS-102 Issue 6 — Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).
Document history:	Initial Version
Document ID:	FCC ISED RF Exposure Report_Industrial Notebook_ID7405_27012025.docx
Temperature °C	22±2 / Controlled
Humidity RH%	30±20 / Controlled
Measurement performed by:	Ilari Kinnunen, Jesper Varis, Kalle Orava
FCC Test Firm Designation Number:	F10005
ISED Company Number:	22218

1.2 RSS-102 version update to Issue 6, 2023

Results of the *FCC ISED RF Exposure Report_Industrial Notebook_ID6019_13112023* that were tested according to RSS-102 Issue 5 2015, Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) have been evaluated in this test report against the RSS-102 Issue 6 2023, Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) and have been found to be compliant.

The changes made to the standard RSS-102, Issue 6 from RSS-102, Issue 5 do not have affect on the compliance of tested results in the report *FCC ISED RF Exposure Report_Industrial Notebook_ID6019_13112023*. The testing was conducted to both WLAN and Bluetooth technologies, thus the changes in exemption limits have no affect on results. Testing was done at separation distance of 0mm, thus it is compliant with RSS-102, Issue 6, 2023.

The *FCC ISED RF Exposure Report_Industrial Notebook_ID7405_27012025* complies with the RSS-102 Issue 6 2023, Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).

This compliance statement relates only for the DUT tested and identified in the revised report *FCC ISED RF Exposure Report_Industrial Notebook_ID7405_27012025*.

1.3 Maximum Results

The maximum reported* SAR/APD/IPD values for Body-worn for transmitting systems are shown in tables below. The device conforms to the requirements of the standards when the maximum reported SAR/APD/IPD value is less than or equal to the limit. The SAR limit specified in *FCC 47 CFR part 2 (2.1093)* and *Health Canada's RF exposure guideline, Safety Code 6* for Head/Body SAR_{1g} is 1.6 W/kg. The APD limit specified in *Health Canada's Safety Code 6 Notice: Localized human exposure limits for radiofrequency fields in the range of 6 GHz to 300 GHz* for APD 4cm² is 20 W/m². The IPD limit specified in *FCC § 1.1310(e)(1), Table 1* for general population/uncontrolled exposure for IPD 4cm² is 1.0 mW/cm² = 10 W/m².

1.3.1 FCC Standalone Test Results

System	Highest Reported* SAR _{1g} (W/kg) in Body-Worn Exposure Condition, 0mm separation distance	Result
Bluetooth	0.011	PASS
2.4 GHz WLAN	0.01	PASS
5 GHz WLAN	0.14	PASS

* Reported SAR Values are scaled to upper limit of power tuning tolerance.

System	Highest Reported* IPD 4cm ² (W/m ²) in Body-Worn Exposure Condition, 0mm separation distance	Result
6 GHz WLAN	0.26	PASS

* Reported SAR Values are scaled to upper limit of power tuning tolerance.

1.3.2 ISED Standalone Test Results

System	Highest Reported* SAR _{1g} (W/kg) in Body-Worn Exposure Condition, 0mm separation distance	Result
Bluetooth	0.011	PASS
2.4 GHz WLAN	0.01	PASS
5 GHz WLAN	0.14	PASS

* Reported SAR Values are scaled to upper limit of power tuning tolerance.

System	Highest Reported* APD 4cm ² (W/m ²) in Body-Worn Exposure Condition, 0mm separation distance	Result
6 GHz WLAN	0.09	PASS

* Reported SAR Values are scaled to upper limit of power tuning tolerance.

1.3.3 FCC Simultaneous Transmission

Highest Simultaneous Transmission	Body-Worn Exposure Condition	Result
SAR _{1g} summation <6GHz	0.22 W/kg < 1.6W/kg	PASS
$\sum \text{SAR}_{\text{Meas}}/\text{SAR}_{\text{Limit}} + \text{IPD}_{\text{Meas}}/\text{IPD}_{\text{Limit}}$	0.11 < 1	PASS

* WLAN 6GHz in SISO mode has 3dBm higher power than in MIMO mode, thus worst-case SISO 6GHz WLAN SAR test configuration was used to address IPD simultaneous transmission

1.3.4 ISED Simultaneous Transmission

Highest Simultaneous Transmission	Body-Worn Exposure Condition	Result
SAR _{1g} summation <6GHz	0.22 W/kg < 1.6W/kg	PASS
$\sum \text{SAR}_{\text{Meas}}/\text{SAR}_{\text{Limit}} + \text{APD}_{\text{Meas}}/\text{APD}_{\text{Limit}}$	0.09 < 1	PASS

* WLAN 6GHz in SISO mode has 3dBm higher power than in MIMO mode, thus worst-case SISO 6GHz WLAN SAR test configuration was used to address APD simultaneous transmission

1.3.5 Maximum Drift

Maximum Drift During Measurements	-1.26dB*
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*Larger than 5% drifts included to scaling factors

1.3.6 Measurement Uncertainty

SAR 1g: 0.3 – 3 GHz:

Expanded Uncertainty (k=2) 95 %	±22.1 %
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SAR 1g: 3 – 6 GHz:

Expanded Uncertainty (k=2) 95 %	±23.3 %
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APD 4cm²: 6 – 10 GHz:

Expanded Uncertainty (k=2) 95 %	±31.9 %
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2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

DUT is a laptop that supports WLAN 2.4GHz, WLAN 5GHz, WLAN 6GHz and Bluetooth. It has two TX antennas that are located in the keyboard section as shown in the picture below.



Antenna Position

Device Category	Portable
Exposure Environment	General population uncontrolled

2.1 Supported Frequency Bands and Operational Modes

TX Frequency bands	Modes of Operation	Transmitter Frequency Range [MHz]
	2.4GHz WLAN	2412 – 2462
	5GHz WLAN	5180 – 5825
	6GHz WLAN	5995 – 7115
	Bluetooth	2402 – 2480

2.2 Simultaneous transmission

Antennas A & B can transmit simultaneously.

3. OUTPUT POWER

3.1 Maximum specified conducted output power

From the customer, including tune-up tolerances;

Bluetooth:

Bluetooth	Max Output Power [dBm]
BR	11.2
EDR 2	8
EDR 3	8
LE (LR-125k)	7
LE (LR-500k)	7
LE 1M	7
LE 2M	7

WLAN 2.4 GHz:

WLAN 2.4GHz	Channel	Antenna A Max Output Power [dBm]	Antenna B Max Output Power [dBm]	MIMO Max Output Power [dBm]
802.11b	1	19.25	18.0	-
	6	19.75	19.25	-
	11	17.75	18.0	-
802.11n	1	17.25	17.75	15.25
	6	20	20	20
	11	17.75	17.5	16

802.11n was selected due to maximum output power. 802.11b CH1 and CH11 maximum output power used when testing 802.11n.

WLAN 5 GHz:

WLAN 5GHz	Channel	Antenna A Max Output Power [dBm]	Antenna B Max Output Power [dBm]	MIMO Max Output Power [dBm]
802.11a	52	20	20	18
	100	19	19	17.5
	165	20	20	20
802.11n (40MHz)	54	20	20	18.75
	102	17.25	17.5	15.75
	159	20	20	20
802.11ac (80MHz)	58	16	17	14.75
	106	17	17	15.25
	155	18.75	19	17.5
802.11ac (160MHz)	50	13.75	13.25	12.25
	114	14.25	14.5	13.25

WLAN 6 GHz:

WLAN 6GHz	Channel	Antenna A Max Output Power [dBm]	Antenna B Max Output Power [dBm]	MIMO Max Output Power [dBm]
802.11ax (20MHz)	1	4.5	4.5	1.5
	117	3.75	3.75	0.75
	233	-0.5	-0.5	-2.5
802.11ax (40MHz)	3	7.75	7.75	4.75
	115	7.75	7.75	4.75
	227	7	7	4
802.11ax (80MHz)	7	10.25	10.25	7.25
	119	10.25	10.25	7.25
	215	9.5	9.5	6.5
802.11ax (160MHz)	15	13	13	10
	111	13	13	10
	207	12.25	12.25	9.25

3.2 Tested conducted power

Measured conducted output power at transmitting antenna connector;

Bluetooth:

Standard	Packet Type	Output power [dBm]		
		CH 0 2402 MHz	CH 39 2441 MHz	CH 78 2480 MHz
BR	DH5	9.46	9.97	10.41

WLAN 2.4 GHz:

Standard	Transmission mode	Data Rate [Mbps]	Antenna	Output power [dBm]		
				CH 1 2422 MHz	CH 6 2442 MHz	CH 11 2462 MHz
802.11n (20MHz)	OFDM	HT0	A	18.67	19.26	16.89
802.11n (20MHz)	OFDM	HT0	B	17.19	19.03	17.50

WLAN 5 GHz:

Standard	Channel	Frequency [MHz]	Transmission mode	Data Rate [Mbps]	Antenna	Output power [dBm]
802.11a	52	5260	OFDM	6	A	19.41
802.11a	56	5280	OFDM	6	A	19.38
802.11a	60	5300	OFDM	6	A	18.82
802.11a	64	5320	OFDM	6	A	18.06
802.11a	100	5500	OFDM	6	A	18.57
802.11a	112	5560	OFDM	6	A	19.54
802.11a	116	5580	OFDM	6	A	19.66
802.11a	128	5640	OFDM	6	A	19.68
802.11a	132	5660	OFDM	6	A	19.76
802.11a	149	5745	OFDM	6	A	19.75
802.11a	165	5825	OFDM	6	A	19.59
802.11a	52	5260	OFDM	6	B	19.32
802.11a	56	5280	OFDM	6	B	19.31
802.11a	60	5300	OFDM	6	B	18.66
802.11a	64	5320	OFDM	6	B	18.32
802.11a	100	5500	OFDM	6	B	18.58
802.11a	112	5560	OFDM	6	B	19.61
802.11a	116	5580	OFDM	6	B	19.63
802.11a	128	5640	OFDM	6	B	19.65
802.11a	132	5660	OFDM	6	B	19.73
802.11a	149	5745	OFDM	6	B	19.85
802.11a	165	5825	OFDM	6	B	19.55

WLAN 6 GHz:

Standard	Channel	Frequency [MHz]	Transmission mode	Data Rate	Antenna	Output power [dBm]
802.11ax (160MHz)	15	6025	OFDM	HE0	A	11.87
802.11ax (160MHz)	47	6185	OFDM	HE0	A	11.91
802.11ax (160MHz)	79	6345	OFDM	HE0	A	11.75
802.11ax (160MHz)	111	6505	OFDM	HE0	A	11.83
802.11ax (160MHz)	143	6665	OFDM	HE0	A	10.58
802.11ax (160MHz)	175	6825	OFDM	HE0	A	10.67
802.11ax (160MHz)	207	6985	OFDM	HE0	A	10.85
802.11ax (160MHz)	15	6025	OFDM	HE0	B	12.21
802.11ax (160MHz)	47	6185	OFDM	HE0	B	12.06
802.11ax (160MHz)	79	6345	OFDM	HE0	B	12.26
802.11ax (160MHz)	111	6505	OFDM	HE0	B	12.20
802.11ax (160MHz)	143	6665	OFDM	HE0	B	11.26
802.11ax (160MHz)	175	6825	OFDM	HE0	B	11.31
802.11ax (160MHz)	207	6985	OFDM	HE0	B	11.28

4. TEST EQUIPMENT

DASY8/Dasy52 near field scanning system, manufactured by SPEAG was used for SAR testing. The test system consists of high precision robotics system (Staubli), robot controller, computer, near-field probe, probe alignment sensor, and a phantom containing the tissue equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location of maximum electromagnetic field.

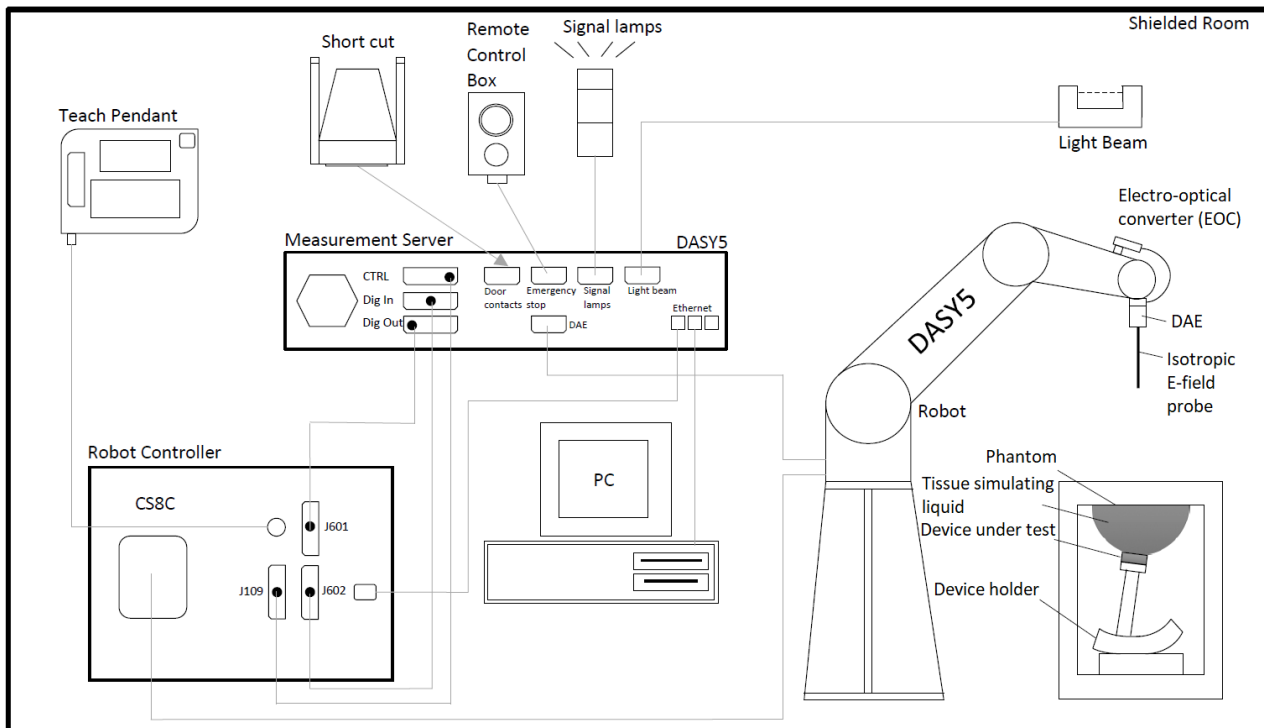


Figure 1 Schematic Laboratory Picture

4.1 Test Equipment List

Main used test system components are listed below. For full equipment list and calibration intervals, please contact the testing laboratory.

Test Equipment	Model	Serial Number	Calibration Date	Interval [years]
DASY5 Software	52.8.8.1258	-	NA	NA
DASY8 Software	16.2.4.2524	-	NA	NA
Amplifier, 500-8000MHz	ZX60-83LN12+	NA	NA	NA
Amplifier, 800-4200MHz, 50W	5163F	1022	NA	NA
DAE4, converter	DAE4	1332	02/2023	1
DAE4, converter	DAE4ip	1774	06/2023	1
Inline Peak Power Sensor	MA24105A	2102058	11/2022	1
Isotropic DOS probe	EX3DV4	7447	02/2023	1
Isotropic DOS probe	EX3DV4	7827	06/2023	1
Network Analyzer	E5071C	MY46102812	05/2023	1
Power Sensor	NRP-Z11	100265	12/2022	1
Power Sensor	NRP8S	1419.0006K02-108509-Zh	08/2021	2
System validation dipole	D2450V2	729	07/2022	3
System validation dipole	D5GHzV2	1045	03/2023	3
System validation dipole	D6.5GHzV2	1097	06/2023	3
Vector Signal Generator	MG3710A	6201502519	NA	NA
Isotropic DOS probe	EX3DV4	7827	06/2023	1
System validation dipole	D6.5GHzV2	1097	06/2023	3
Vector Signal Generator	SMP02	836402/004	NA	NA

4.1.1 Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix D
Frequency	10 MHz to > 6 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g, Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 10 mm Body diameter: 12 mm
Application	General dosimetry up to 6 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

Eli Phantom:

The phantom used in SAR/APD tests was an ELI phantom, manufactured by SPEAG. ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. The phantom conforms to the requirements of IEC/IEEE 62209-1528 and FCC published RF Exposure KDB Procedures.

4.3 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEC/IEEE 62209-1528 and FCC published RF Exposure KDB Procedures. The dielectric parameters of the used tissue simulants were within $\pm 10\%$ of the recommended values at frequencies under 3GHz and $\pm 5\%$ at frequencies above 3GHz. A liquid compensation algorithm was used in DASY5 with which measured peak average SAR/APD values were corrected for the deviation of used liquid. Depth of the tissue simulant was at least 15.0 cm from the inner surface of the flat phantom.

Tissue simulant liquid Ingredients
Deionized Water, tween, salt

4.4 System Validation Status

Frequency [MHz]	Dipole Type / SN	Probe Type / SN	Calibrated Signal Type	DAE Unit / SN	Dielectric Constant [ϵ']	Conductivity σ [S/m]	Date
2450	D2450V2 - SN: 729	EX3DV4 - SN: 7447	CW	DAE 4 / 1332	41.26	1.71	03/2023
5250	D5GHzV2 - SN: 1045	EX3DV4 - SN: 7827	CW	DAE4ip / 1774	35.22	4.87	06/2023
5600	D5GHzV2 - SN: 1045	EX3DV4 - SN: 7827	CW	DAE4ip / 1774	35.22	4.87	06/2023
5750	D5GHzV2 - SN: 1045	EX3DV4 - SN: 7827	CW	DAE4ip / 1774	35.22	4.87	06/2023
6500	D6.5GHzV2 - SN: 1097	EX3DV4 - SN: 7827	CW	DAE4ip / 1774	33.69	6.10	07.2023

4.5 System Check

Date	Tissue Type	Tissue Temp. [°C]	Frequency [MHz]	Input Power [mW]	Measured SAR _{1g} [W/kg]	1 W Target SAR _{1g} [W/kg]	1 W Normalized SAR _{1g} [W/kg]	Deviation [%]	Plot #
09.08.2023	WB Head	22	6500	100	28.4	296	284	-4.1	1
14.08.2023	WB Head	22	5250	100	7.09	73.09	70.9	-3.0	2
15.08.2023	WB Head	22	5250	100	6.87	73.09	68.7	-6.0	3
16.08.2023	WB Head	22	2450	250	11.8	52.3	47.2	-9.8	4
16.08.2023	WB Head	22	5600	100	7.56	72.92	75.6	3.7	5
17.08.2023	WB Head	22	5750	100	6.97	69.05	69.7	0.9	6
21.08.2023	WB Head	22	5750	100	7.04	69.05	70.4	2.0	7
21.08.2023	WB Head	22	2450	250	11.9	52.3	47.6	-9.0	8
22.08.2023	WB Head	22	6500	100	28.1	296	281	-5.1	9
20.09.2023	WB Head	22	2450	250	11.9	52.3	47.6	-8.99	10

4.5.1 Tissue Simulant Verification

Date	Tissue Type	Tissue Temp [°C]	Frequency [MHz]	Target		Measured		Deviation	
				Dielectric Constant [ε] Target	Conductivity σ [S/m] Target	Dielectric Constant [ε]	Conductivity σ [S/m]	ε [%]	σ [%]
09.08.2023	WB Head	22	6025	35.07	5.51	34.06	5.7	-2.9	3.4
09.08.2023	WB Head	22	6345	34.69	5.89	33.61	6.01	-3.1	2.2
09.08.2023	WB Head	22	6500	34.5	6.07	33.38	6.16	-3.3	1.5
09.08.2023	WB Head	22	6505	34.49	6.08	33.37	6.17	-3.3	1.5
09.08.2023	WB Head	22	6825	34.11	6.45	32.94	6.49	-3.4	0.7
09.08.2023	WB Head	22	6985	33.92	6.63	32.73	6.63	-3.5	-0.0
10.08.2023	WB Head	22	6025	35.07	5.51	33.49	5.51	-4.5	-0.0
10.08.2023	WB Head	22	6345	34.69	5.89	33.08	5.81	-4.6	-1.3
10.08.2023	WB Head	22	6500	34.5	6.07	32.87	5.95	-4.7	-1.9
10.08.2023	WB Head	22	6505	34.49	6.08	32.86	5.96	-4.7	-1.9
10.08.2023	WB Head	22	6825	34.11	6.45	32.47	6.26	-4.8	-2.9
10.08.2023	WB Head	22	6985	33.92	6.63	32.26	6.4	-4.9	-3.6
14.08.2023	WB Head	22	5250	35.95	4.71	34.32	4.83	-4.5	2.6
14.08.2023	WB Head	22	5260	35.94	4.72	34.31	4.84	-4.5	2.6
14.08.2023	WB Head	22	5280	35.92	4.74	34.3	4.86	-4.5	2.5
14.08.2023	WB Head	22	5320	35.88	4.78	34.24	4.89	-4.6	2.3
15.08.2023	WB Head	22	5250	35.95	4.71	34.63	4.79	-3.7	1.7
15.08.2023	WB Head	22	5260	35.94	4.72	34.62	4.8	-3.7	1.7
15.08.2023	WB Head	22	5280	35.92	4.74	34.61	4.82	-3.6	1.6
15.08.2023	WB Head	22	5320	35.88	4.78	34.56	4.85	-3.7	1.5
16.08.2023	WB Head	22	2412	39.27	1.77	38.62	1.65	-1.6	-6.8
16.08.2023	WB Head	22	2422	39.25	1.78	38.61	1.65	-1.6	-7.0
16.08.2023	WB Head	22	2437	39.22	1.79	38.58	1.66	-1.6	-7.1
16.08.2023	WB Head	22	2442	39.21	1.79	38.57	1.66	-1.6	-7.2
16.08.2023	WB Head	22	2450	39.2	1.8	38.57	1.67	-1.6	-7.2
16.08.2023	WB Head	22	2462	39.18	1.81	38.54	1.68	-1.6	-7.5
16.08.2023	WB Head	22	5500	35.65	4.96	33.95	5.01	-4.8	1.0
16.08.2023	WB Head	22	5580	35.53	5.05	33.85	5.08	-4.7	0.6
16.08.2023	WB Head	22	5600	35.5	5.07	33.82	5.1	-4.7	0.7
16.08.2023	WB Head	22	5640	35.46	5.11	33.76	5.14	-4.8	0.6

17.08.2023	WB Head	22	5660	35.44	5.13	34.98	5.16	-1.3	0.5
17.08.2023	WB Head	22	5745	35.35	5.22	34.87	5.23	-1.4	0.4
17.08.2023	WB Head	22	5750	35.35	5.22	34.86	5.24	-1.4	0.4
17.08.2023	WB Head	22	5825	35.27	5.3	34.77	5.3	-1.4	0.2
21.08.2023	WB Head	22	5660	35.44	5.13	34.13	5.3	-3.7	3.2
21.08.2023	WB Head	22	5745	35.35	5.22	34.01	5.38	-3.8	3.1
21.08.2023	WB Head	22	5750	35.35	5.22	34.0	5.38	-3.8	3.1
21.08.2023	WB Head	22	5825	35.27	5.3	33.89	5.45	-3.9	2.8
21.08.2023	WB Head	22	2412	39.27	1.77	39.13	1.66	-0.4	-6.2
21.08.2023	WB Head	22	2437	39.22	1.79	39.09	1.67	-0.3	-6.4
21.08.2023	WB Head	22	2450	39.2	1.8	39.07	1.68	-0.3	-6.5
21.08.2023	WB Head	22	2462	39.18	1.81	39.04	1.69	-0.4	-6.8
22.08.2023	WB Head	22	6500	34.5	6.07	33.93	6.07	-1.6	-0.0
22.08.2023	WB Head	22	6985	33.92	6.63	33.34	6.54	-1.7	-1.4
20.09.2023	WB Head	22	2402.0	39.28	1.76	39.02	1.64	-0.7	-6.6
20.09.2023	WB Head	22	2441.0	39.22	1.79	38.97	1.67	-0.6	-6.9
20.09.2023	WB Head	22	2450.0	39.2	1.8	38.96	1.67	-0.6	-7.0
20.09.2023	WB Head	22	2480.0	39.16	1.83	38.91	1.69	-0.6	-7.6

5. TEST PROCEDURE

Testing was carried out in accordance with FCC KDB Publications 447498 D04 Interim General RF Exposure Guidance v01, 248227 D01 802.11 Wi-Fi SAR, RSS-102 Issue 6 and RSS-102.SAR.MEAS Annex F.

Low, mid and high frequency channels for the configuration with the highest SAR value were tested as per ISED notice 2016-DRS001.

A control software for WLAN and Bluetooth was used to set the DUT to transmit at maximum power.

The WLAN transmission modes for testing were selected according to largest channel bandwidth configuration, lowest order modulation and lowest data rate. WLAN 2.4GHz and WLAN 5GHz were tested with 802.11n (20MHz) standard with data rate of HT0 and WLAN 6GHz was tested with 802.11ax (160MHz) standard with data rate of HE0.

Bluetooth was tested using worst-case configuration which consisted of BR-mode, packet type DH5 and data rate of 1 Mbps.

APD measurements for WLAN 6GHz were conducted for 5 channels, as per October 2020 TCB Workshop Interim Procedures and RSS-102.SAR.MEAS Annex F, and both antennas to find worst-case configuration, which was then selected for IPD measurement.

5.1 Test Positions

5.1.1 Body-worn Configuration, 0mm separation distance

The device was placed on the top of a Rohacell and lifted towards the phantom until the separation distance was 0mm. The device was oriented in the foreseeable use case with bottom side facing the phantom as the two TX antennas are located in the keyboard section of the laptop.

Photos of the test positions are presented in appendix A

5.2 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom scan was performed around the highest E-field value to determine the averaged SAR value. For APD testing, additional conversion factors (CF) were automatically applied by the software to calculate the psAPD from the psSAR. Conversion factors of $CF_{1g} = 10 \text{ kg/m}^2$ and $CF_{8g} = 20 \text{ kg/m}^2$ were used to calculate the 1 cm^2 and 4 cm^2 from the 1 g psSAR and the 8 g psSAR, respectively. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.3 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy52 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation of Large Sets of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighboring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

DASY5 Uncertainty Budget According to IEC/IEEE 62209-1528 (Frequency band: 300MHz - 3GHz range)								
Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c) 1g	(c) 10g	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±12.0%	N	√2	1	1	±6.0%	±6.0%
CF _{drift}	Probe Calibration Drift	±1.7%	R	√3	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±3.0%	R	√3	1	1	±1.7%	±1.7%
ISO	Probe Isotropy	±7.6%	R	3	1	1	±4.4%	±4.4%
DAE	Data Acquisition	±0.3%	N	1	1	1	±0.3%	±0.3%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±3.9%	N	1	0.14	0.14	±0.5%	±0.5%
DAT	Data Processing	±1.2%	N	1	1	1	±1.2%	±1.2%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	√1	0.78	0.71	±2.0%	±1.8%
LIQ(T _a)	Conductivity (temp.) ^{BB}	±3.3%	R	√3	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	3	0	0	±0%	±0%
DIS	Distance DUT - TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning (±0.5mm)	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	√1	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	√3	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±2.6%	R	3	1	1	±1.5%	±1.5%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0%	±0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0%	±0%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	√1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0%	R	3	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±11.0%	±10.9%
U	Expanded Uncertainty						±22.1%	±21.9%

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528

(Frequency band: 300 MHz–3 GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) (1 g)	(c_i) (10 g)	Std. Unc. (1 g)	Std. Unc. (10 g)
Measurement System Errors								
CF	Probe Calibration	$\pm 12.0\%$	N	2	1	1	$\pm 6.0\%$	$\pm 6.0\%$
CF _{drift}	Probe Calibration Drift	$\pm 1.7\%$	R	$\sqrt{3}$	1	1	$\pm 1.0\%$	$\pm 1.0\%$
LIN	Probe Linearity	$\pm 4.7\%$	R	$\sqrt{3}$	1	1	$\pm 2.7\%$	$\pm 2.7\%$
BBS	Broadband Signal	$\pm 3.0\%$	R	$\sqrt{3}$	1	1	$\pm 1.7\%$	$\pm 1.7\%$
ISO	Probe Isotropy	$\pm 7.6\%$	R	$\sqrt{3}$	1	1	$\pm 4.4\%$	$\pm 4.4\%$
DAE	Other Probe+Electronic	$\pm 0.7\%$	N	1	1	1	$\pm 0.7\%$	$\pm 0.7\%$
AMB	RF Ambient	$\pm 1.8\%$	N	1	1	1	$\pm 1.8\%$	$\pm 1.8\%$
Δ_{sys}	Probe Positioning	± 0.006 mm	N	1	0.14	0.14	$\pm 0.10\%$	$\pm 0.10\%$
DAT	Data Processing	$\pm 1.2\%$	N	1	1	1	$\pm 1.2\%$	$\pm 1.2\%$
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	$\pm 2.5\%$	N	1	0.78	0.71	$\pm 2.0\%$	$\pm 1.8\%$
LIQ(T _{σ})	Conductivity (temp.) ^{BB}	$\pm 3.3\%$	R	$\sqrt{3}$	0.78	0.71	$\pm 1.5\%$	$\pm 1.4\%$
EPS	Phantom Permittivity	$\pm 14.0\%$	R	$\sqrt{3}$	0	0	$\pm 0\%$	$\pm 0\%$
DIS	Distance DUT – TSL	$\pm 2.0\%$	N	1	2	2	$\pm 4.0\%$	$\pm 4.0\%$
D _{xyz}	Device Positioning	$\pm 1.0\%$	N	1	1	1	$\pm 1.0\%$	$\pm 1.0\%$
H	Device Holder	$\pm 3.6\%$	N	1	1	1	$\pm 3.6\%$	$\pm 3.6\%$
MOD	DUT Modulation ^m	$\pm 2.4\%$	R	$\sqrt{3}$	1	1	$\pm 1.4\%$	$\pm 1.4\%$
TAS	Time-average SAR	$\pm 1.7\%$	R	$\sqrt{3}$	1	1	$\pm 1.0\%$	$\pm 1.0\%$
RF _{drift}	DUT drift	$\pm 2.5\%$	N	1	1	1	$\pm 2.5\%$	$\pm 2.5\%$
VAL	Val Antenna Unc. ^{val}	$\pm 0.0\%$	N	1	1	1	$\pm 0\%$	$\pm 0\%$
RF _{in}	Unc. Input Power ^{val}	$\pm 0.0\%$	N	1	1	1	$\pm 0\%$	$\pm 0\%$
Correction to the SAR results								
C(ϵ , σ)	Deviation to Target	$\pm 1.9\%$	N	1	1	0.84	$\pm 1.9\%$	$\pm 1.6\%$
C(R)	SAR scaling ^p	$\pm 0\%$	R	$\sqrt{3}$	1	1	$\pm 0\%$	$\pm 0\%$
u(Δ SAR)	Combined Uncertainty						$\pm 10.9\%$	$\pm 10.9\%$
U	Expanded Uncertainty						$\pm 21.9\%$	$\pm 21.8\%$

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528
(Frequency band: 3 GHz–6 GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) (1 g)	(c_i) (10 g)	Std. Unc. (1 g)	Std. Unc. (10 g)
Measurement System Errors								
CF	Probe Calibration	±13.1%	N	2	1	1	±6.55%	±6.55%
CF _{drift}	Probe Calibration Drift	±1.7%	R	√3	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±2.6%	R	√3	1	1	±1.5%	±1.5%
ISO	Probe Isotropy	±7.6%	R	√3	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±1.2%	N	1	1	1	±1.2%	±1.2%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±0.005 mm	N	1	0.29	0.29	±0.15%	±0.15%
DAT	Data Processing	±2.3%	N	1	1	1	±2.3%	±2.3%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T _σ)	Conductivity (temp.) ^{BB}	±3.4%	R	√3	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	√3	0.25	0.25	±2.0%	±2.0%
DIS	Distance DUT – TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	√3	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±1.7%	R	√3	1	1	±1.0%	±1.0%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0%	±0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0%	±0%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0%	R	√3	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±11.6%	±11.5%
U	Expanded Uncertainty						±23.3%	±23.0%

Uncertainty Budget for psSAR / psAPD Assessments (Frequency band: 6 – 10 GHz range)

Symbol	Error Description	Uncert.	Prob. Dist.	Div.	c_i (1g) / (1 cm ²)	c_i (8 g/10 g) / (4 cm ²)	Std. Unc. (1 g) / (1 cm ²)	Std. Unc. (8 g/10 g) / (4 cm ²)
psSAR	Module SAR V16.2 (Table 6.3.3)	±14.2/13.9%	N	1	1	1	±14.2%	±13.9%
PDC	Power Density Conversion	±13.5%	R	$\sqrt{3}$	1	1	±7.8%	±7.8%
$u(\Delta SAR)$	Combined Uncertainty						±16.2%	±15.9 %
U	Expanded Uncertainty <i>in dB</i>						±32.4% ±1.2 dB	±31.9% ±1.2 dB

7. TEST RESULTS

7.1 Test Results for Body Exposure Condition with 0mm separation

Bluetooth:

Mode	Packet Type	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured SAR _{1g} [W/kg]	Power Drift [dB]	Scaling Factor	Duty Cycle	Reported SAR _{1g} [W/kg]	Plot #
BR	DH5	2402	0	A	Bottom	11.2	9.46	0*	0**	1.49	1:1	0.010*	
BR	DH5	2441	39	A	Bottom	11.2	9.97	0.008*	0**	1.33	1:1	0.011*	11
BR	DH5	2480	78	A	Bottom	11.2	10.41	0.006*	0**	1.20	1:1	0.007*	

*Zoom scan not applicable due to low e-field, area scan value is reported.

**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

WLAN 2.4GHz:

Mode	Data Rate	Bandwidth [MHz]	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured SAR _{1g} [W/kg]	Power Drift [dB]	Scaling Factor	Duty Cycle	Reported SAR _{1g} [W/kg]	Plot #
802.11n	HT0	20	A	2412	1	Bottom	19.25	18.67	0.0101	0**	1.14	1:1	0.01	12
802.11n	HT0	20	A	2437	6	Bottom	20	19.26	0.00996	0**	1.19	1:1	0.01	
802.11n	HT0	20	A	2462	11	Bottom	17.75	16.98	0.00215	0**	1.19	1:1	0.003	
802.11n	HT0	20	B	2412	1	Bottom	18	17.19	0.00186	0**	1.20	1:1	0.002	
802.11n	HT0	20	B	2437	6	Bottom	20	19.03	0.00357	0**	1.25	1:1	0.004	
802.11n	HT0	20	B	2462	11	Bottom	18	17.50	0.00262	0**	1.12	1:1	0.003	

*Due to low e-field generated by DUT, the measurements are not applicable

**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

WLAN 5GHz:

Mode	Data Rate	Bandwidth [MHz]	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured SAR _{1g} [W/kg]	Power Drift*** [dB]	Scaling Factor	Duty Cycle	Reported SAR _{1g} [W/kg]	Plot #
802.11a	6	20	5260	52	A	Bottom	20	19.41	0.033	0.29	1.22	1:1	0.04	13
802.11a	6	20	5280	56	A	Bottom	20	19.38	0.029	0**	1.15	1:1	0.03	
802.11a	6	20	5320	64	A	Bottom	18.5	18.06	0.016	-0.02	1.11	1:1	0.02	
802.11a	6	20	5260	52	B	Bottom	20	19.32	0.008	0**	1.17	1:1	0.01	
802.11a	6	20	5280	56	B	Bottom	20	19.31	0.009	0**	1.17	1:1	0.01	
802.11a	6	20	5320	64	B	Bottom	18.75	18.32	0.006	-1.26	1.48	1:1	0.01	

*Due to low e-field generated by DUT, the measurements are not applicable

**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

***Larger than 5% drifts included to scaling factors

Mode	Data Rate	Bandwidth [MHz]	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured SAR _{1g} [W/kg]	Power Drift*** [dB]	Scaling Factor	Duty Cycle	Reported SAR _{1g} [W/kg]	Plot #
802.11a	6	20	5500	100	A	Bottom	19	18.57	0.07	0**	1.10	1:1	0.08	
802.11a	6	20	5580	116	A	Bottom	20	19.66	0.113	0**	1.08	1:1	0.12	
802.11a	6	20	5640	128	A	Bottom	20	19.68	0.131	0**	1.08	1:1	0.14	14
802.11a	6	20	5500	100	B	Bottom	19	18.58	0.009	-0.92	1.36	1:1	0.01	
802.11a	6	20	5580	116	B	Bottom	20	19.63	0.014	0**	1.09	1:1	0.02	
802.11a	6	20	5640	128	B	Bottom	20	19.65	0.068	0**	1.08	1:1	0.07	

*Due to low e-field generated by DUT, the measurements are not applicable

**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

***Larger than 5% drifts included to scaling factors

Mode	Data Rate	Bandwidth [MHz]	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured SAR _{1g} [W/kg]	Power Drift** [dB]	Scaling Factor	Duty Cycle	Reported SAR _{1g} [W/kg]	Plot #
802.11a	6	20	5660	132	A	Bottom	20	19.76	0.124	0**	1.06	1:1	0.13	15
802.11a	6	20	5745	149	A	Bottom	20	19.75	0.120	0**	1.06	1:1	0.13	
802.11a	6	20	5825	165	A	Bottom	20	19.59	0.103	0**	1.10	1:1	0.11	
802.11a	6	20	5660	132	B	Bottom	20	19.73	0.072	0**	1.06	1:1	0.08	
802.11a	6	20	5745	149	B	Bottom	20	19.85	0.072	0**	1.04	1:1	0.07	
802.11a	6	20	5825	165	B	Bottom	20	19.55	0.050	0**	1.11	1:1	0.06	

*Due to low e-field generated by DUT, the measurements are not applicable

**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

**Larger than 5% drifts included to scaling factors

WLAN 6GHz:

Mode	Data Rate	Bandwidth [MHz]	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured SAR _{1g} [W/kg]	Measured APD 4cm ² [W/m ²]	Power Drift*** [dB]	Scaling Factor	Duty Cycle	Reported SAR _{1g} [W/kg]	Reported APD 4cm ² [W/m ²]	Plot #
802.11ax	HE0	160	6025	15	A	Bottom	13	11.87	0.002	0.007	0**	1.30	1:1	0.003	0.01	
802.11ax	HE0	160	6345	79	A	Bottom	13	11.75	0.005	0.035	0**	1.33	1:1	0.01	0.05	
802.11ax	HE0	160	6505	111	A	Bottom	13	11.83	0.009	0.043	0**	1.31	1:1	0.01	0.06	
802.11ax	HE0	160	6825	175	A	Bottom	12.25	10.67	0.006	0.062	0.22	1.51	1:1	0.01	0.09	16
802.11ax	HE0	160	6985	207	A	Bottom	12.25	10.85	0.004	0.016	0**	1.38	1:1	0.01	0.02	
802.11ax	HE0	160	6025	15	B	Bottom	13	12.21	0.003	0.009	0**	1.20	1:1	0.003	0.01	
802.11ax	HE0	160	6345	79	B	Bottom	13	12.26	0.011	0.062	0**	1.19	1:1	0.01	0.07	
802.11ax	HE0	160	6505	111	B	Bottom	13	12.20	0*	0*	-0.87	1.47	1:1	0*	0*	
802.11ax	HE0	160	6825	175	B	Bottom	12.25	11.31	0.002	0.011	0**	1.24	1:1	0.002	0.01	
802.11ax	HE0	160	6985	207	B	Bottom	12.25	11.28	0.003	0.015	0.29	1.34	1:1	0.003	0.02	

*Due to low e-field generated by DUT, the measurements are not applicable

**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

***Larger than 5% drifts included to scaling factors

Mode	Data Rate	Bandwidth [MHz]	Frequency [MHz]	Channel	Antenna	Test position	Maximum Power [dBm]	Conducted Power [dBm]	Measured IPD 4cm ² [W/m ²]	Power Drift* [dB]	Scaling Factor	Duty Cycle	Reported IPD 4cm ² [W/m ²]	Plot #
802.11ax	HE0	160	6825	175	A	Bottom	12.25	10.67	0.109	2.14	2.36	1:1	0.26	

*Larger than 5% drifts included to scaling factors

7.2 IEC 62209-2 AMD1:2019

According to IEC 62209-2 AMD1:2019, the zoom scan complies if the peak spatial-average SAR is below 0.1 W/kg, or if the following criteria is met:

1. The smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak is larger than the horizontal grid step.
2. Ratio of SAR at the second measured point (M2) to the SAR at the closest measured point (M1) at the x-y location of the measured maximum is at least 30%.

Zoom scan compliance according to IEC 62209-2 AMD1:2019 is automatically verified by DASY5 software and all zoom scans in this test report do pass the criteria. The smallest horizontal distance and Ratio between measurement points M2 and M1 of the highest SAR results is available in Appendix C.

7.3 Simultaneous Transmission Analysis

Simultaneous transmission analysis for the maximum WLAN SAR/APD/IPD is in the table below. Direct summation of SAR results was performed, overestimating the simultaneous transmission SAR/APD as SISO mode has higher power than MIMO mode. WLAN 6GHz in SISO mode has 3dBm higher power than in MIMO mode, thus worst-case SISO 6GHz WLAN SAR test configuration was used to address MIMO transmission.

FCC:

Body SAR:

Exposure Condition	Body SAR _{1g} [W/kg]
Test Position	Bottom
Bluetooth, Antenna A	0.011
WLAN 2.4GHz, SISO, Antenna A	0.01
WLAN 5GHz, SISO, Antenna A	0.14
WLAN 6GHz, SISO, Antenna A	-
WLAN 2.4GHz, SISO, Antenna B	0.004
WLAN 5GHz, SISO, Antenna B	0.08
SAR Summation:	0.22

Combination of SAR & IPD was taken into account by dividing the maximum result with the corresponding limit and summing the values:

WLAN 6GHz (0.26 / 10) + WLAN 5GHz (0.14 / 1.6) = 0.1135 < 1 Thus, the evaluation result is PASS.

ISED:

Body SAR:

Exposure Condition	Body SAR _{1g} [W/kg]	Body APD 4cm ² [W/m ²]
Test Position	Bottom	Bottom
Bluetooth, Antenna A	0.011	-
WLAN 2.4GHz, SISO, Antenna A	0.01	-
WLAN 5GHz, SISO, Antenna A	0.14	-
WLAN 6GHz, SISO, Antenna A	-	0.09
WLAN 2.4GHz, SISO, Antenna B	0.004	-
WLAN 5GHz, SISO, Antenna B	0.08	-
WLAN 6GHz, SISO, Antenna B	-	0.07
SAR Summation:	0.22	0.16

Combination of SAR & APD was taken into account by dividing the maximum result with the corresponding limit and summing the values:

WLAN 6GHz (0.09 / 20) + WLAN 5GHz (0.14 / 1.6) = 0.092 < 1 Thus, the evaluation result is **PASS**.

APPENDIX A: PHOTOS OF THE DUT

Size of the DUT is: keyboard 277 x 380 x 30 mm, screen 258 x 380 x 5 mm



Antenna Position

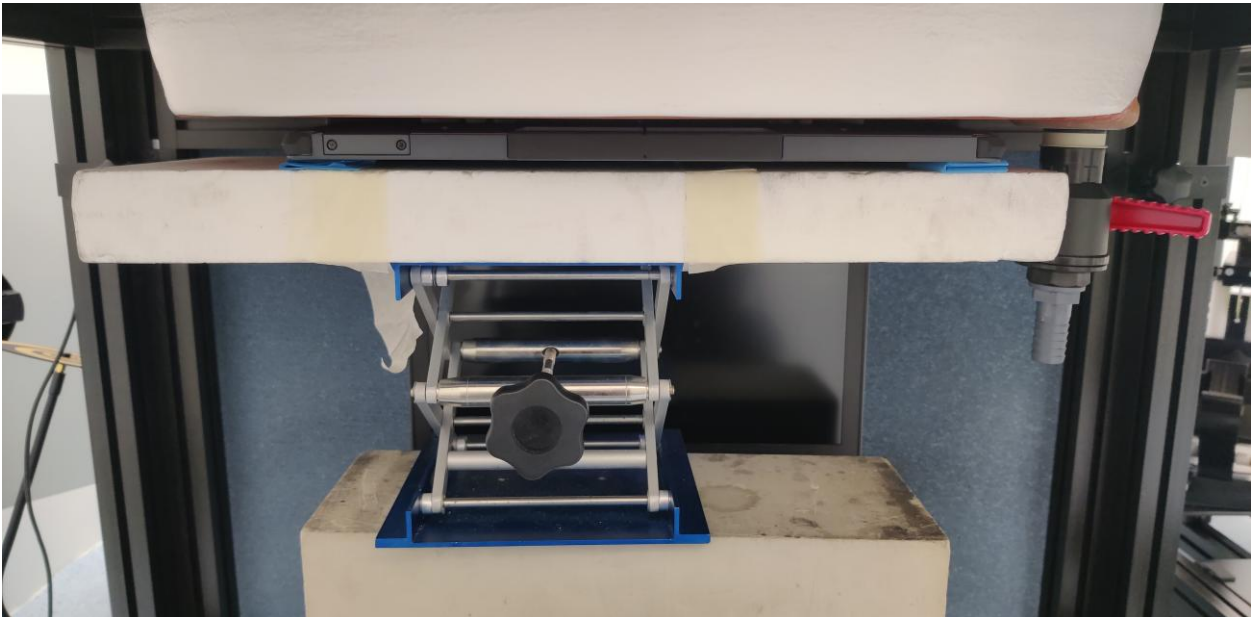


Figure 2 Bottom Test Position, 0mm separation distance

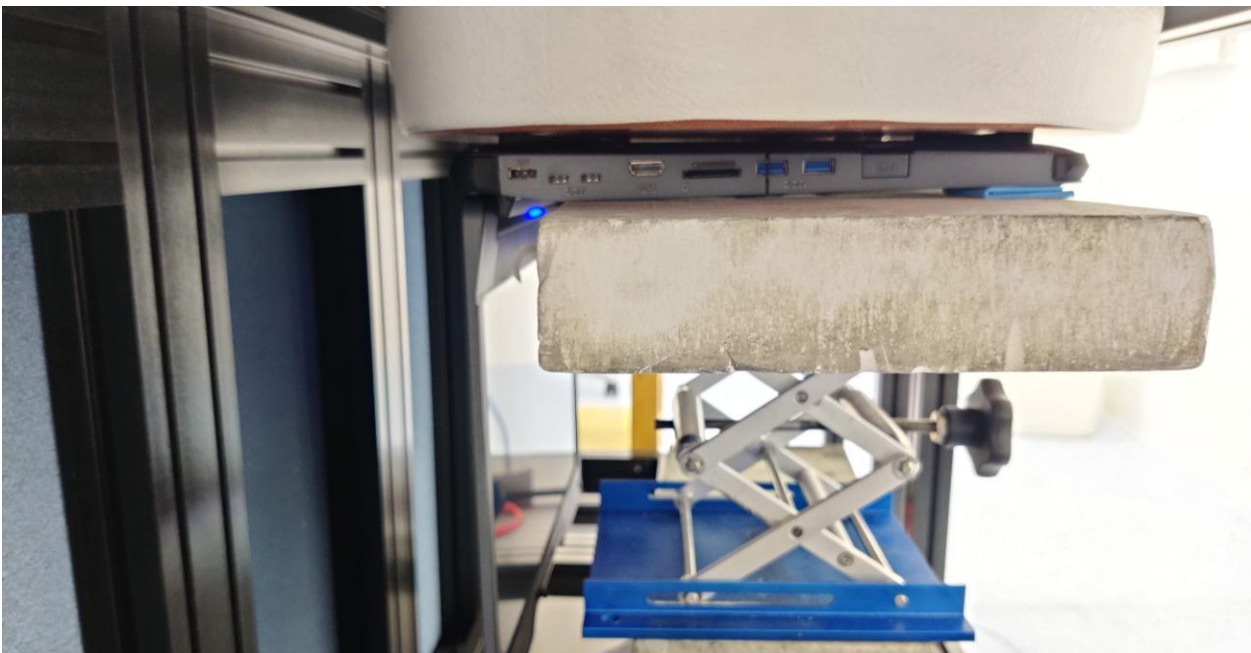


Figure 3 Bottom Test Position, 0mm separation distance

APPENDIX B: SYSTEM CHECK SCAN

Plot 1

Date/Time: 2023-08-09, 09:39

Test Laboratory: Verkotan Oy

DUT: Dipole 6500 MHz D6.5GHzV2; Type: D6.5GHzV2; Serial: D6.5GHzV2 - SN:1097

Communication System: UID 0, CW; Communication System Band: ; Frequency 6500.000 MHz;
Medium parameters used: $f = 6500.000$; $\sigma = 6.16$ S/m; $\epsilon_r = 33.4$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASy Configuration:

- Probe: EX3DV4 - SN7827; ConvF(4.95, 4.87, 4.85); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.09; Mother scan avg offset: 0.04;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Area Scan: Measurement grid: (51.0 mm x 85.0 mm)

Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

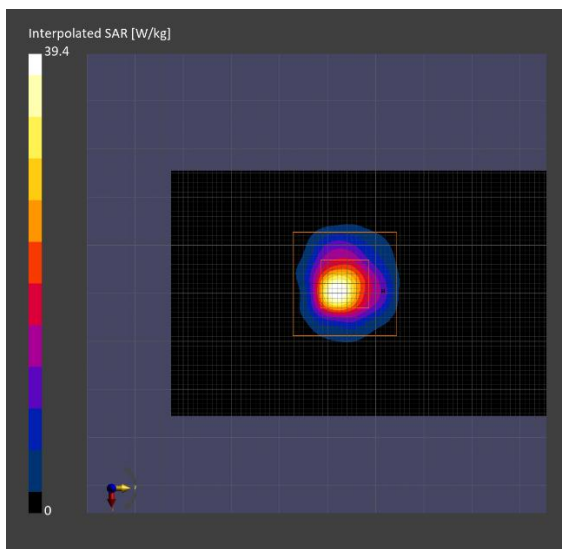
Reference Value = 9.44 V/m; Power Drift = 0.13 dB

SAR(1 g) = 28.4 W/kg; SAR(10g) = 5.26 W/kg (Positive only)

APD (4.0cm²) = 128 W/m²

Smallest distance from peaks to all points 3dB below = 4.8 mm

Ratio of SAR at M2 to SAR at M1 = 51.1%



Plot 2

Date/Time: 2023-08-14, 10:10

Test Laboratory: Verkotan Oy

DUT: Dipole 5000 MHz D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5250.000 MHz;
Medium parameters used: $f = 5250.000$; $\sigma = 4.83$ S/m; $\epsilon_r = 34.3$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASy Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.6, 5.58, 5.42); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.05; Mother scan avg offset: 0.07;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)

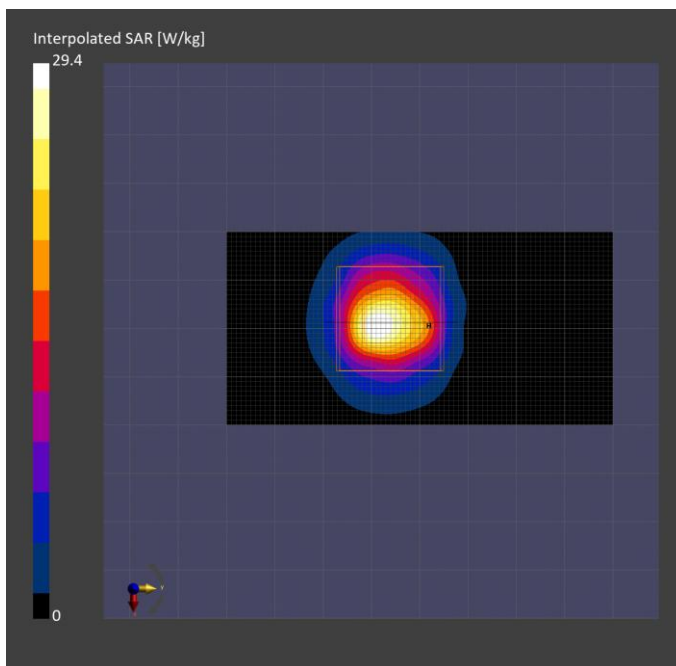
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

Reference Value = 3.33 V/m; Power Drift = 0.10 dB

SAR(1 g) = 7.09 W/kg; SAR(10g) = 2.03 W/kg (Positive / Negative)

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

Ratio of SAR at M2 to SAR at M1 = 63.0%



Plot 3

Date/Time: 2023-08-15, 09:20

Test Laboratory: Verkotan Oy

DUT: Dipole 5000 MHz D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5250.000 MHz;
Medium parameters used: $f = 5250.000$; $\sigma = 4.79$ S/m; $\epsilon_r = 34.6$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASy Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.6, 5.58, 5.42); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.06; Mother scan avg offset: 0.20;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)

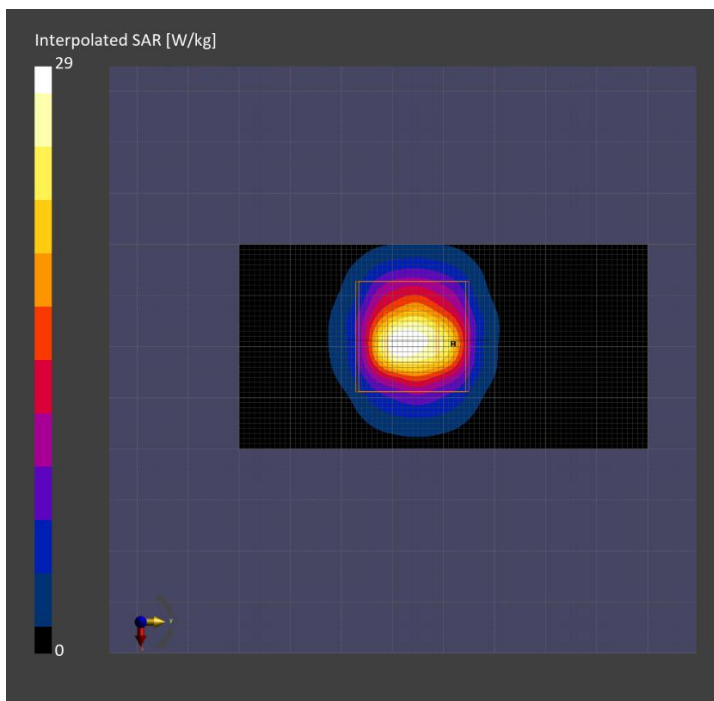
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

Reference Value = 3.23 V/m; Power Drift = 0.05 dB

SAR(1 g) = 6.87 W/kg; SAR(10g) = 1.96 W/kg (Positive / Negative)

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

Ratio of SAR at M2 to SAR at M1 = 62.1%



Plot 4

Date/Time: 16.8.23 12:04:23

Test Laboratory: Verkotan Oy

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.67$ S/m; $\epsilon_r = 38.567$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(7.7, 7.5, 7.63) @ 2450 MHz; Calibrated: 17.2.23
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 31.0, -4.0$
 - Electronics: DAE4 Sn1332; Calibrated: 15.2.23
 - Phantom: SAR2_Phantom1_EL1; Type: QD OVA 002 AA;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/System Check 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 103.5 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 22.4 W/kg

SAR(1 g) = 11.8 W/kg; SAR(10 g) = 5.57 W/kg (SAR corrected for target medium)

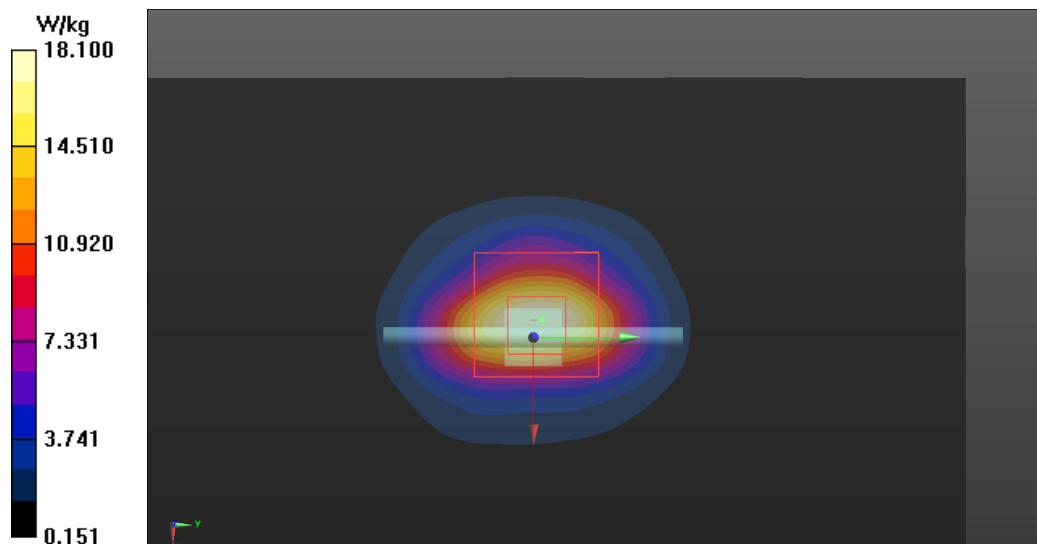
Smallest distance from peaks to all points 3 dB below = 7 mm

Ratio of SAR at M2 to SAR at M1 = 53.3%

Maximum value of SAR (measured) = 18.1 W/kg

Configuration/System Check 2450MHz/Area Scan (101x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 18.6 W/kg



Plot 5

Date/Time: 2023-08-16, 12:18

Test Laboratory: Verkotan Oy

DUT: Dipole 5000 MHz D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5600.000 MHz;
Medium parameters used: $f = 5600.000$; $\sigma = 5.10$ S/m; $\epsilon_r = 33.8$; HSL;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(4.95, 4.87, 4.73); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.05; Mother scan avg offset: 0.33;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASY8 16.2.4.2524

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)

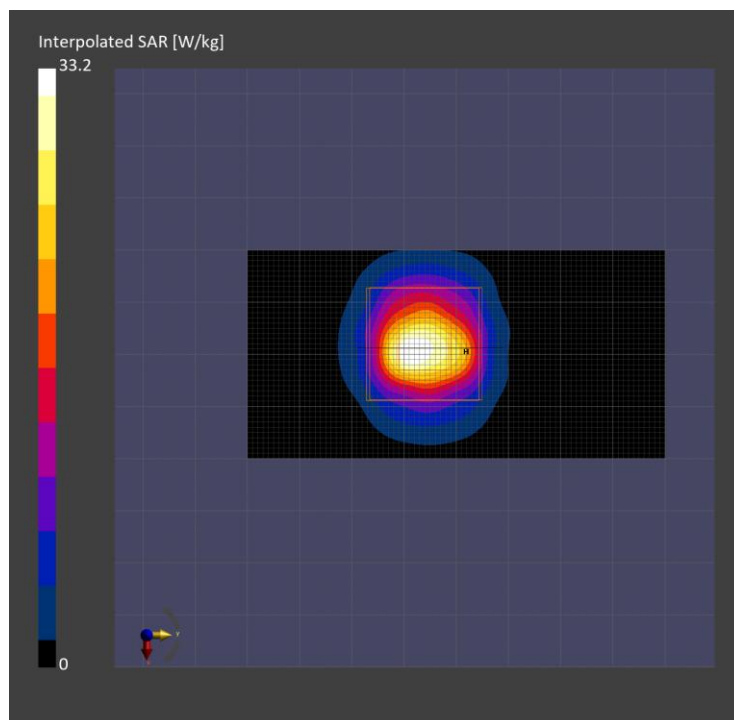
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

Reference Value = 2.97 V/m; Power Drift = 0.09 dB

SAR(1 g) = 7.56 W/kg; SAR(10g) = 2.14 W/kg (Positive / Negative)

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

Ratio of SAR at M2 to SAR at M1 = 61.0%



Plot 6

Date/Time: 2023-08-17, 15:16

Test Laboratory: Verkotan Oy

DUT: Dipole 5000 MHz D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5750.000 MHz;
Medium parameters used: $f = 5750.000$; $\sigma = 5.24$ S/m; $\epsilon_r = 34.9$; HSL;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.14, 5.02, 4.94); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.06; Mother scan avg offset: 0.43;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASY8 16.2.4.2524

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)

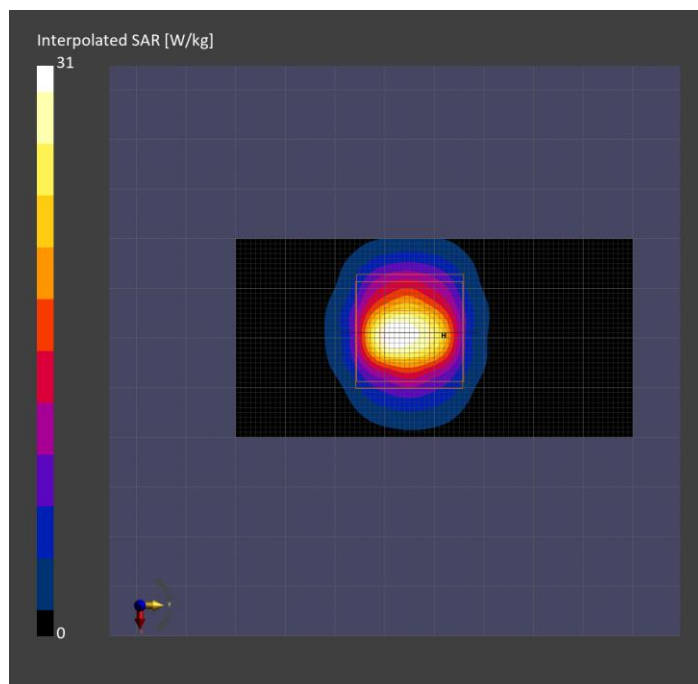
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

Reference Value = 2.59 V/m; Power Drift = 0.08 dB

SAR(1 g) = 6.97 W/kg; SAR(10g) = 1.97 W/kg (Positive / Negative)

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

Ratio of SAR at M2 to SAR at M1 = 59.8%



Plot 7

Date/Time: 2023-08-21, 09:03

Test Laboratory: Verkotan Oy

DUT: Dipole 5000 MHz D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5750.000 MHz;
Medium parameters used: $f = 5750.000$; $\sigma = 5.38$ S/m; $\epsilon_r = 34.0$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.14, 5.02, 4.94); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.06; Mother scan avg offset: 0.57;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)

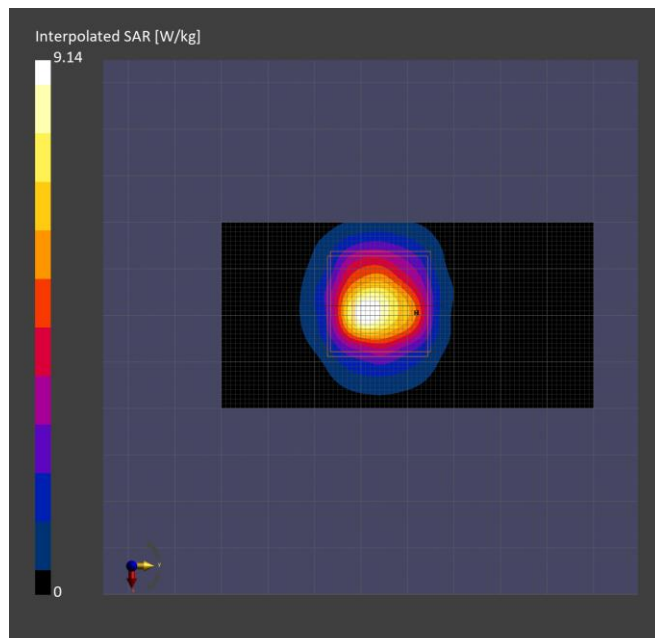
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

Reference Value = 2.29 V/m; Power Drift = 0.01 dB

SAR(1 g) = 7.04 W/kg; SAR(10g) = 1.98 W/kg (Positive / Negative)

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

Ratio of SAR at M2 to SAR at M1 = 59.8%



Plot 8

Date/Time: 21.8.23 09:04:17

Test Laboratory: Verkotan Oy

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;

Communication System PAR: 0 dB;

Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.682$ S/m; $\epsilon_r = 39.073$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(7.7, 7.5, 7.63) @ 2450 MHz; Calibrated: 17.2.23
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 31.0, -4.0$
 - Electronics: DAE4 Sn1332; Calibrated: 15.2.23
 - Phantom: SAR2_Phantom1_ELI; Type: QD OVA 002 AA;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/System Check 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 104.6 V/m; Power Drift = -0.27 dB

Peak SAR (extrapolated) = 21.9 W/kg

SAR(1 g) = 11.9 W/kg; SAR(10 g) = 5.74 W/kg (SAR corrected for target medium)

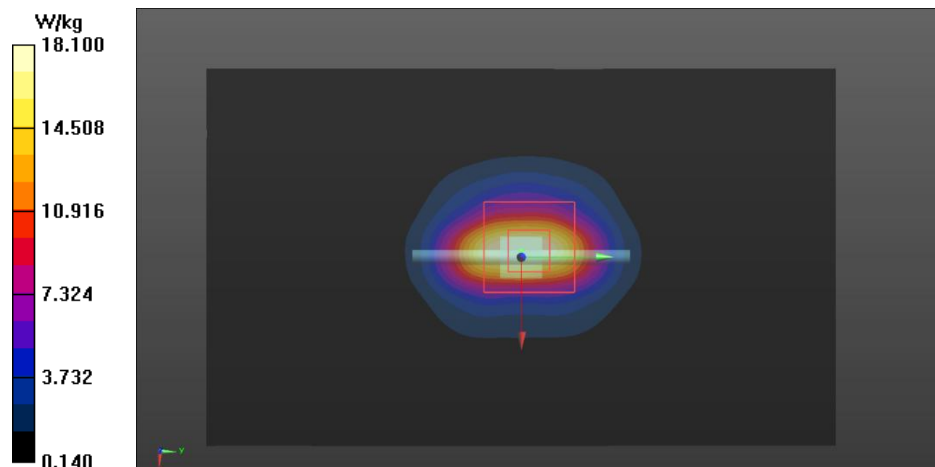
Smallest distance from peaks to all points 3 dB below = 6 mm

Ratio of SAR at M2 to SAR at M1 = 53.6%

Maximum value of SAR (measured) = 18.1 W/kg

Configuration/System Check 2450MHz/Area Scan (101x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 16.9 W/kg



Plot 9

Date/Time: 2023-08-22, 13:23

Test Laboratory: Verkotan Oy

DUT: Dipole 6500 MHz D6.5GHzV2; Type: D6.5GHzV2; Serial: D6.5GHzV2 - SN:1097

Communication System: UID 0, CW; Communication System Band: ; Frequency 6500.000 MHz;
Medium parameters used: $f = 6500.000$; $\sigma = 6.07$ S/m; $\epsilon_r = 33.9$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(4.95, 4.87, 4.85); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.06; Mother scan avg offset: 0.36;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Area Scan: Measurement grid: (51.0 mm x 85.0 mm)

Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

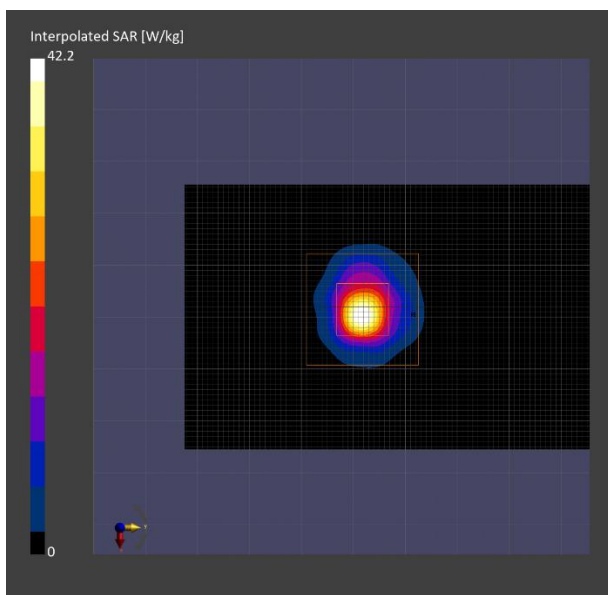
Reference Value = 8.03 V/m; Power Drift = 0.06 dB

SAR(1 g) = 28.1 W/kg; SAR(10g) = 5.23 W/kg (Positive only)

APD (4.0cm²) = 127 W/m²

Smallest distance from peaks to all points 3dB below = 4.4 mm

Ratio of SAR at M2 to SAR at M1 = 50.8%



Plot 10

Date/Time: 2023-09-20, 10:17

Test Laboratory: Verkotan Oy

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: UID 0, CW; Communication System Band: ; Frequency 2450.000 MHz;
Medium parameters used: $f = 2450.000$; $\sigma = 1.67$ S/m; $\epsilon_r = 39.0$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.5, 7.4, 7.2); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.09; Mother scan avg offset: 0.29;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)

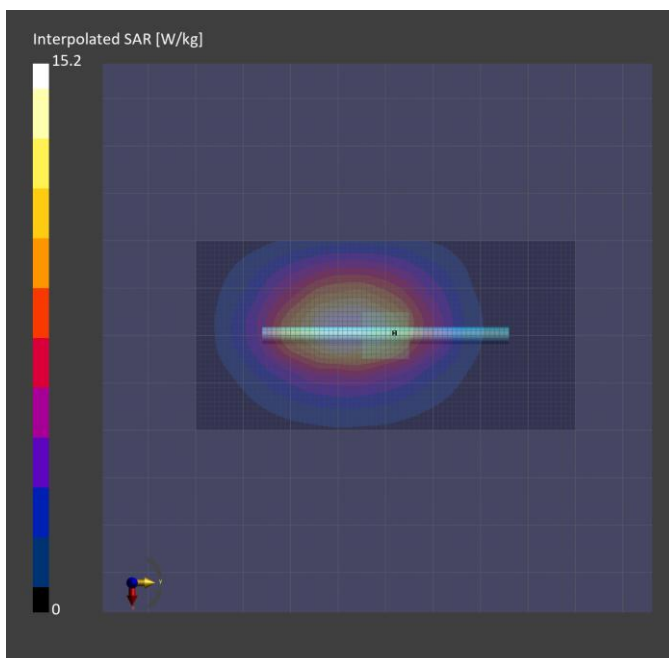
Zoom Scan: Measurement grid: (30.0 mm x 30.0 mm x 30.0 mm)

Reference Value = 9.90 V/m; Power Drift = 0.00 dB

SAR(1 g) = 11.9 W/kg; SAR(10g) = 5.61 W/kg (Positive / Negative)

Smallest distance from peaks to all points 3dB below = 9.0 mm

Ratio of SAR at M2 to SAR at M1 = 81.0%



APPENDIX C: MEASUREMENT SCANS

Plot 11

Date/Time: 2023-09-20, 14:46

Test Laboratory: Verkotan Oy

DUT: Siemens Laptop

Communication System: UID 10032, Bluetooth; Communication System Band: ISM 2.4 GHz Band; Frequency 2441.000 MHz;
Medium parameters used: $f = 2441.000$; $\sigma = 1.67$ S/m; $\epsilon_r = 39.0$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.5, 7.4, 7.2); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation: 0.16; Mother scan avg offset: 0.63;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Measurement Group:

ISM 2.4 GHz Band, IEEE 802.15.1 Bluetooth (GFSK, DH5), CH39, BACK, 5.00 mm

Area Scan: Measurement grid: (320.0 mm x 420.0 mm)

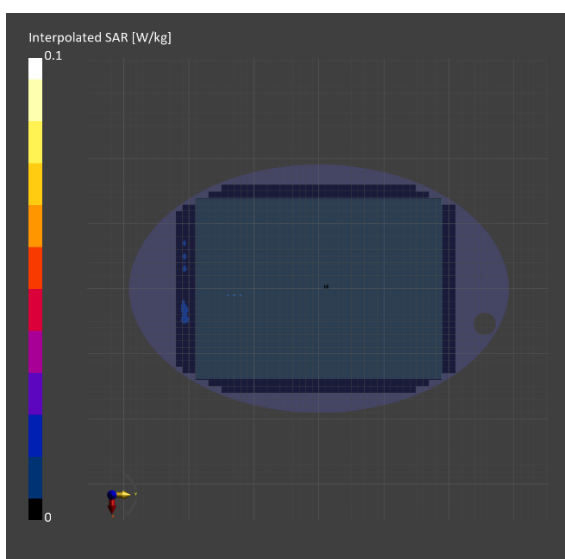
Zoom Scan: Measurement grid: (30.0 mm x 30.0 mm x 30.0 mm)

Reference Value = -0.02 V/m; Power Drift = -1.80 dB

SAR(1 g) = 0 W/kg; SAR(10g) = 0 W/kg (Positive / Negative)

Smallest distance from peaks to all points 3dB below = 0.0 mm

Ratio of SAR at M2 to SAR at M1 = 46.8%



Plot 12

Date/Time: 18.8.23 09:01:48

Test Laboratory: Verkotan Oy

DUT: Siemens Laptop

Communication System: UID 0, WLAN 2.4 (0); Communication System Band: WLAN2.4GHz; Frequency: 2412 MHz;

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.646$ S/m; $\epsilon_r = 38.624$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(7.7, 7.5, 7.63) @ 2412 MHz; Calibrated: 17.2.23
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
 - Electronics: DAE4 Sn1332; Calibrated: 15.2.23
 - Phantom: SAR2_Phantom1_EL1; Type: QD OVA 002 AA;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

FCC/FCC WLAN 2.4GHz, HT0, BW20, Antenna A, Bottom, CH1/Area Scan (371x271x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0280 W/kg

FCC/FCC WLAN 2.4GHz, HT0, BW20, Antenna A, Bottom, CH1/Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 0 V/m; Power Drift = 0.00 dB

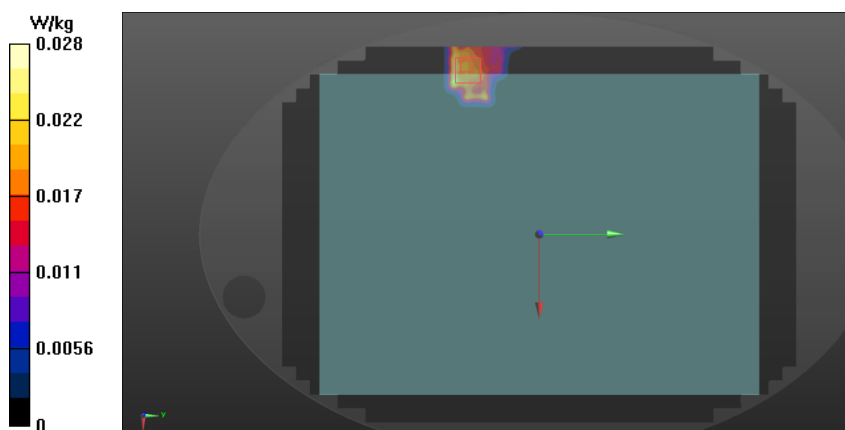
Peak SAR (extrapolated) = 0.0260 W/kg

SAR(1 g) = 0.010 W/kg; SAR(10 g) = 0.00417 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 40.3%

Maximum value of SAR (measured) = 0.0173 W/kg



Plot 13

Date/Time: 2023-08-15, 14:32

Test Laboratory: Verkotan Oy

DUT: Siemens Laptop

Communication System: UID 10417, WLAN; Communication System Band: U-NII-1, U-NII-2A; Frequency 5260.000 MHz;
Medium parameters used: $f = 5260.000$; $\sigma = 4.80$ S/m; $\epsilon_r = 34.6$; HSL;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.6, 5.58, 5.42); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation: 0.08; Mother scan avg offset: 0.38;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASY8 16.2.4.2524

FCC:

U-NII-1, U-NII-2A, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle), CH52, BACK, 0.00 mm

Area Scan: Measurement grid: (320.0 mm x 420.0 mm)

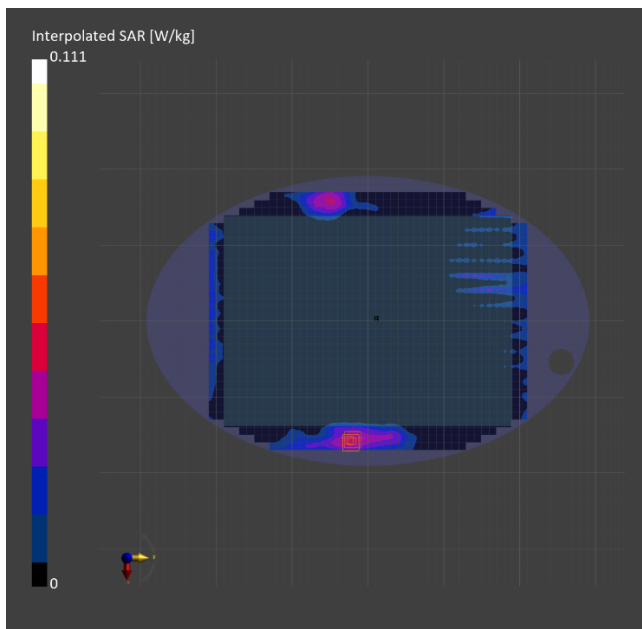
Zoom Scan: Measurement grid: (24.0 mm x 24.0 mm x 22.0 mm)

Reference Value = -0.03 V/m; Power Drift = 0.29 dB

SAR(1 g) = 0.033 W/kg; SAR(10g) = 0.013 W/kg (Positive / Negative)

Smallest distance from peaks to all points 3dB below = 14.7 mm

Ratio of SAR at M2 to SAR at M1 = 67.1%



Plot 14

Date/Time: 2023-08-17, 11:38

Test Laboratory: Verkotan Oy

DUT: Siemens Laptop

Communication System: UID 10417, WLAN; Communication System Band: U-NII-2C < 5.65 GHz; Frequency 5640.000 MHz;
Medium parameters used: $f = 5640.000$; $\sigma = 5.14$ S/m; $\epsilon_r = 33.8$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASy Configuration:

- Probe: EX3DV4 - SN7827; ConvF(4.95, 4.87, 4.73); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.03; Mother scan avg offset: 0.41;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Measurement Group:

U-NII-2C < 5.65 GHz, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle), CH128, BACK, 0.00 mm

Area Scan: Measurement grid: (320.0 mm x 420.0 mm)

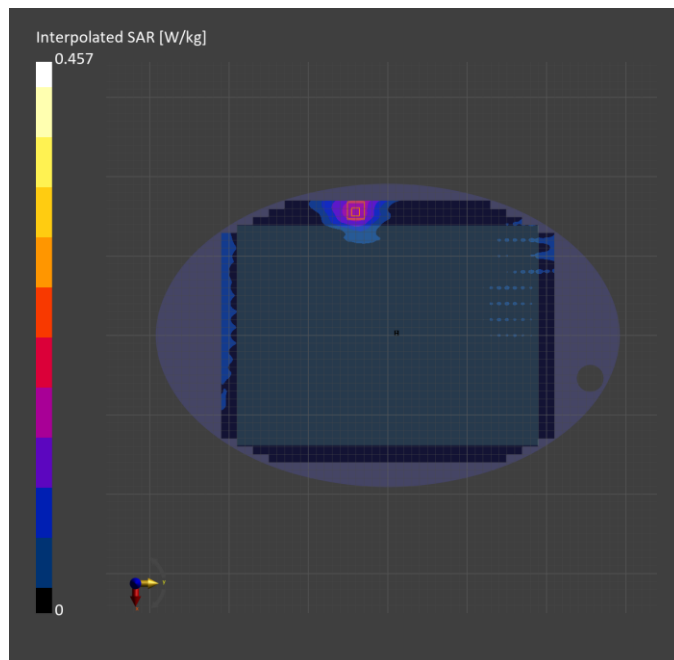
Zoom Scan: Measurement grid: (24.0 mm x 24.0 mm x 22.0 mm)

Reference Value = -0.08 V/m; Power Drift = -3.31 dB

SAR(1 g) = 0.131 W/kg; SAR(10g) = 0.058 W/kg (Positive / Negative)

Smallest distance from peaks to all points 3dB below = > 12.0 mm

Ratio of SAR at M2 to SAR at M1 = 62.7%



Plot 15

Date/Time: 2023-08-18, 12:01

Test Laboratory: Verkotan Oy

DUT: Siemens Laptop

Communication System: UID 10417, WLAN; Communication System Band: U-NII-2C, U-NII-3; Frequency 5660.000 MHz;
Medium parameters used: $f = 5660.000$; $\sigma = 5.16$ S/m; $\epsilon_r = 35.0$; HSL;
Phantom section: Flat section
Measurement Standard: DASy8 (IEC/IECC)

DASy Configuration:

- Probe: EX3DV4 - SN7827; ConvF(4.95, 4.87, 4.73); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation: 0.02; Mother scan avg offset: 0.47;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASy8 16.2.4.2524

Measurement Group:

U-NII-2C, U-NII-3, IEEE 802.11a/h Wi-Fi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle), CH132, BACK, 0.00 mm

Area Scan: Measurement grid: (320.0 mm x 420.0 mm)

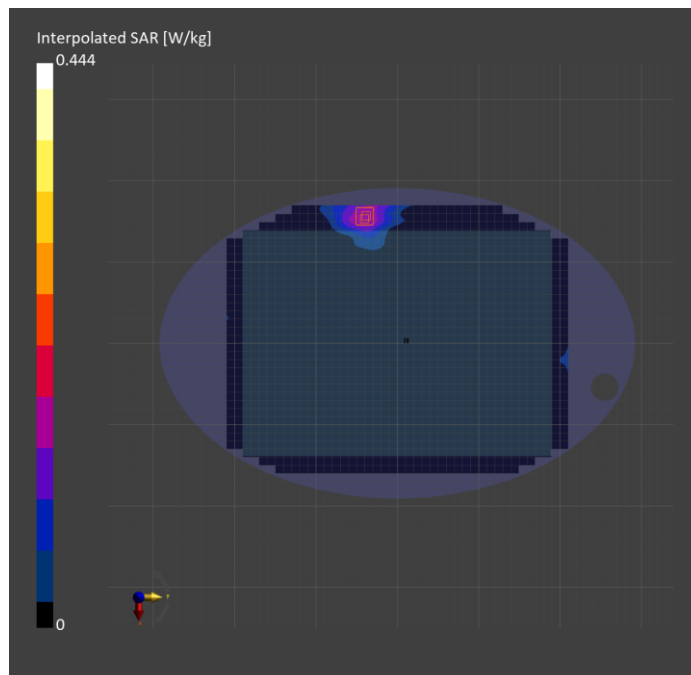
Zoom Scan: Measurement grid: (24.0 mm x 24.0 mm x 22.0 mm)

Reference Value = -0.07 V/m; Power Drift = -1.43 dB

SAR(1 g) = 0.124 W/kg; SAR(10g) = 0.055 W/kg (Positive / Negative)

Smallest distance from peaks to all points 3dB below = > 12.0 mm

Ratio of SAR at M2 to SAR at M1 = 59.8%



Plot 16

Date/Time: 2023-08-10, 13:07

Test Laboratory: Verkotan Oy

DUT: Siemens Laptop

Communication System: UID 10755, WLAN; Communication System Band: U-NII-7; Frequency 6825.000 MHz;
Medium parameters used: $f = 6825.000$; $\sigma = 6.49$ S/m; $\epsilon_r = 32.9$; HSL;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(4.95, 4.87, 4.85); Calibrated: 2023-06-04
 - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation: 0.06; Mother scan avg offset: 0.31;
 - Electronics: DAE4ip - SN1774; Calibrated: 2023-06-02
 - Phantom: ELI V8.0 (20deg probe tilt)
 - DASY8 16.2.4.2524

Measurement Group:

U-NII-7, IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), CH175, BACK, 0.00 mm

Area Scan: Measurement grid: (323.0 mm x 425.0 mm)

Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)

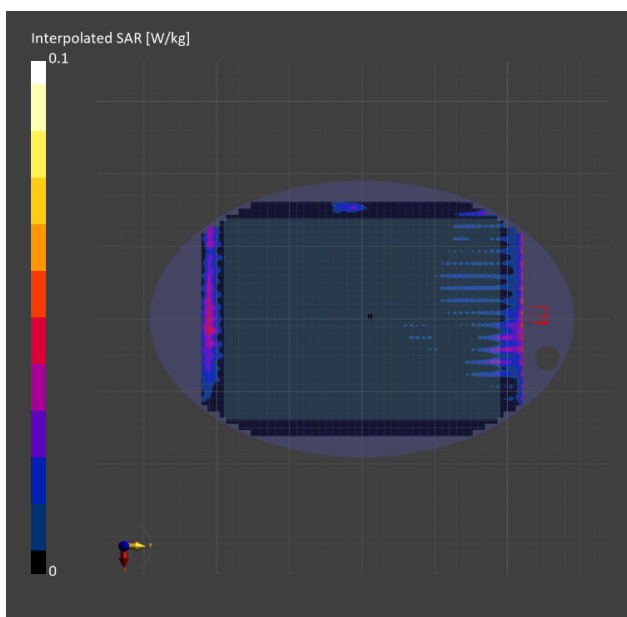
Reference Value = -0.06 V/m; Power Drift = 0.22 dB

SAR(1 g) = 0.006 W/kg; SAR(10g) = 0.003 W/kg (Positive only)

APD (4.0cm²) = 0.062 W/m²

Smallest distance from peaks to all points 3dB below = 0.9 mm

Ratio of SAR at M2 to SAR at M1 = 90.3%



APPENDIX D: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS

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 **Verkotan**

Certificate No **EX-7447_Feb23**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7447**

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 **February 17, 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 ± 3) °C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-22 (OCP-DAK3.5-1249_Oct22)	Oct-23
OCP DAK-12	SN: 1016	20-Oct-22 (OCP-DAK12-1016_Oct22)	Oct-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	Apr-23
DAE4	SN: 660	10-Oct-22 (No. DAE4-660_Oct22)	Oct-23
Reference Probe ES3DV2	SN: 3013	06-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: MY41498067	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	Joanna Lleshaj	Laboratory Technician	
Approved by	Niels Kuster	Quality Manager	
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Issued: February 21, 2023

Certificate No: EX-7447_Feb23

Page 1 of 9

EX3DV4 - SN:7447

February 17, 2023

Parameters of Probe: EX3DV4 - SN:7447

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.43	0.43	0.43	±10.1%
DCP (mV) ^B	90.0	91.0	96.0	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	130.7	±2.3%	±4.7%
		Y	0.00	0.00	1.00		130.1		
		Z	0.00	0.00	1.00		134.6		

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

^A The uncertainties of Norm X,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Page 5).

^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:7447

February 17, 2023

Parameters of Probe: EX3DV4 - SN:7447

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-139.3°
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:7447

February 17, 2023

Parameters of Probe: EX3DV4 - SN:7447

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
13	55.0	0.75	17.42	17.42	17.42	0.00	1.25	±13.3%
750	41.9	0.89	9.91	8.74	9.52	0.31	1.27	±12.0%
900	41.5	0.97	9.37	8.45	8.89	0.32	1.27	±12.0%
1750	40.1	1.37	8.45	7.97	8.40	0.25	1.27	±12.0%
1950	40.0	1.40	8.05	7.59	7.97	0.29	1.27	±12.0%
2150	39.7	1.53	8.01	7.58	7.90	0.28	1.27	±12.0%
2300	39.5	1.67	7.85	7.46	7.80	0.28	1.27	±12.0%
2450	39.2	1.80	7.70	7.50	7.63	0.28	1.27	±12.0%
2600	39.0	1.96	7.55	7.37	7.73	0.28	1.27	±12.0%
3300	38.2	2.71	7.02	6.71	7.02	0.34	1.27	±14.0%
5250	35.9	4.71	5.18	4.99	5.17	0.39	1.53	±14.0%
5600	35.5	5.07	4.40	4.29	4.43	0.38	1.77	±14.0%
5750	35.4	5.22	4.47	4.33	4.53	0.38	1.85	±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.

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 **Verkotan**
Oulu, Finland

Certificate No. **EX-7827_Jun23**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:7827
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	June 04, 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 ± 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	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	20-Oct-22 (OCP-DAK3.5-1249_Oct22)	Oct-23
OCP DAK-12	SN: 1016	20-Oct-22 (OCP-DAK12-1016_Oct22)	Oct-23
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	06-Jan-23 (No. ES3-3013_Jan23)	Jan-24

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41263874	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 Kastrali	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

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

Issued: June 06, 2023

EX3DV4 - SN:7827

June 04, 2023

Parameters of Probe: EX3DV4 - SN:7827

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.68	0.59	0.64	$\pm 10.1\%$
DCP (mV) ^B	105.2	106.9	108.4	$\pm 4.7\%$

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	131.5	$\pm 1.6\%$	$\pm 4.7\%$
		Y	0.00	0.00	1.00		140.7		
		Z	0.00	0.00	1.00		126.6		
10352	Pulse Waveform (200Hz, 10%)	X	1.54	60.55	6.12	10.00	60.0	$\pm 3.5\%$	$\pm 9.6\%$
		Y	1.45	60.21	5.80		60.0		
		Z	1.40	60.00	5.79		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	0.79	60.00	4.61	6.99	80.0	$\pm 2.8\%$	$\pm 9.6\%$
		Y	0.81	60.00	4.49		80.0		
		Z	0.86	60.00	4.73		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	0.07	141.02	0.21	3.98	95.0	$\pm 2.8\%$	$\pm 9.6\%$
		Y	0.03	131.64	0.01		95.0		
		Z	0.41	159.30	18.09		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	3.45	131.09	9.75	2.22	120.0	$\pm 1.7\%$	$\pm 9.6\%$
		Y	3.12	159.98	2.74		120.0		
		Z	7.70	82.24	0.21		120.0		
10387	QPSK Waveform, 1 MHz	X	0.45	64.23	13.07	1.00	150.0	$\pm 3.0\%$	$\pm 9.6\%$
		Y	0.38	61.88	11.02		150.0		
		Z	0.47	64.93	13.22		150.0		
10388	QPSK Waveform, 10 MHz	X	1.27	66.90	13.96	0.00	150.0	$\pm 0.9\%$	$\pm 9.6\%$
		Y	1.09	64.87	12.54		150.0		
		Z	1.28	67.25	13.88		150.0		
10396	64-QAM Waveform, 100 kHz	X	1.60	63.90	15.81	3.01	150.0	$\pm 1.1\%$	$\pm 9.6\%$
		Y	1.70	65.07	16.17		150.0		
		Z	1.73	65.26	16.18		150.0		
10399	64-QAM Waveform, 40 MHz	X	2.72	66.63	15.27	0.00	150.0	$\pm 2.6\%$	$\pm 9.6\%$
		Y	2.62	68.09	14.81		150.0		
		Z	2.75	67.08	15.37		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.72	66.83	15.55	0.00	150.0	$\pm 4.0\%$	$\pm 9.6\%$
		Y	3.65	66.57	15.27		150.0		
		Z	3.61	66.64	15.34		150.0		

Note: For details on UID parameters see Appendix

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

^A The uncertainties of Norm X,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5 and 6).

^B Linearization parameter uncertainty for maximum specified field strength.

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

EX3DV4 - SN:7827

June 04, 2023

Parameters of Probe: EX3DV4 - SN:7827

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms V^{-2}$	T2 $ms V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
x	7.4	53.86	33.74	1.85	0.00	4.90	0.00	0.05	1.00
y	7.2	52.61	33.58	3.25	0.00	4.90	0.53	0.00	1.00
z	7.0	50.07	32.48	5.09	0.00	4.90	0.67	0.00	1.00

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-76.3°
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:7827

June 04, 2023

Parameters of Probe: EX3DV4 - SN:7827

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)
750	41.9	0.89	9.60	9.47	9.21	0.39	1.27	±12.0%
900	41.5	0.97	9.32	8.86	8.61	0.38	1.27	±12.0%
1750	40.1	1.37	8.35	8.24	7.90	0.26	1.27	±12.0%
1950	40.0	1.40	7.98	7.87	7.60	0.28	1.27	±12.0%
2100	39.8	1.49	7.88	7.77	7.55	0.29	1.27	±12.0%
2300	39.5	1.67	7.80	7.69	7.48	0.30	1.27	±12.0%
2450	39.2	1.80	7.50	7.40	7.20	0.29	1.27	±12.0%
2600	39.0	1.96	7.43	7.31	7.12	0.29	1.27	±12.0%
3300	38.2	2.71	7.07	7.00	6.81	0.35	1.27	±14.0%
3500	37.9	2.91	6.96	6.89	6.71	0.36	1.27	±14.0%
3700	37.7	3.12	6.88	6.80	6.63	0.36	1.27	±14.0%
3900	37.5	3.32	6.83	6.75	6.59	0.37	1.27	±14.0%
4100	37.2	3.53	6.60	6.50	6.36	0.37	1.27	±14.0%
5250	35.9	4.71	5.60	5.58	5.42	0.39	1.53	±14.0%
5600	35.5	5.07	4.95	4.87	4.73	0.38	1.67	±14.0%
5750	35.4	5.22	5.14	5.02	4.94	0.38	1.75	±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 4–8 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:7827

June 04, 2023

Parameters of Probe: EX3DV4 - SN:7827

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	4.95	4.87	4.85	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.

APPENDIX E: RELEVANT PAGES FROM DIPOLE CALIBRATION REPORTS

**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 **Verkotan**

Certificate No: **D2450V2-729_Jul22**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN:729**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **July 15, 2022**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 7349	31-Dec-21 (No. EX3-73-49_Dec21)	Dec-22
DAE4	SN: 601	02-May-22 (No. DAE4-601_May22)	May-23
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: G839512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22

Calibrated by: **Name** **Function**
Aldona Georgiadou **Laboratory Technician**

Approved by: **Name** **Function**
Niels Kuster **Quality Manager**

Signature

Issued: July 19, 2022

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Certificate No: D2450V2-729_Jul22

Page 1 of 6

Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	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 %	1.85 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	13.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.3 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	6.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg $\pm$ 16.5 % (k=2)



SAR Reference Dipole Calibration Report

Ref : ACR.68.8.23.BES.A

VERKOTAN OY
ELEKTRONIIKKATIE 17
90590, OULU, FINLAND
SAR REFERENCE DIPOLE
FREQUENCY: 5200-5800 MHZ
SERIAL NO.: 1045

Calibrated at MVG
Z.I. de la pointe du diable
Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 03/09/2023



Accreditations #2-6789 and #2-6814
Scope available on www.cofrac.fr

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.645.23.BES.A

	Name	Function	Date	Signature
Prepared by :	Cyrille ONNEE	Measurement Responsible	3/9/2023	
Checked & approved by:	Jérôme Luc	Technical Manager	3/9/2023	
Authorized by:	Yann Toutain	Laboratory Director	3/9/2023	

Yann
Toutain ID

Signature
numérique de Yann
Toutain ID
Date : 2023.03.09
15:05:03 +01'00'

	Customer Name
Distribution :	Verkotan Oy

Issue	Name	Date	Modifications
A	Cyrille ONNEE	3/9/2023	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.08.23.BES.A

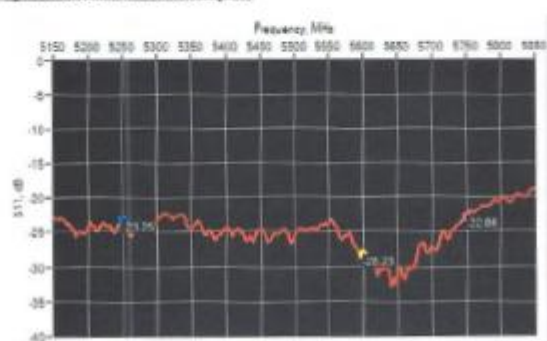
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	20.60 +/- 2%	-	40.30 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
5250	-23.25	-20	$47.8\Omega + 6.4j\Omega$
5600	-28.23	-20	$48.5\Omega - 3.5j\Omega$
5750	-22.86	-20	$46.7\Omega + 6.1j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

Page: 6/9

Template: ACR.DDD.N.YY.MVGB.ISSUE_SAR Reference Dipole v1.

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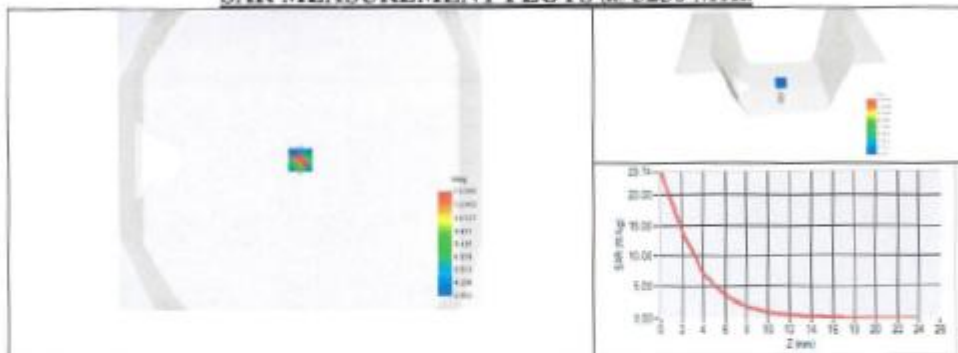
SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.00.8.23.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	SN 41/18 EPG0333
Liquid	Head Liquid Values @ 5250 MHz: ϵ_p : 34.3 sigma: 4.67 Head Liquid Values @ 5600 MHz: ϵ_p : 33.6 sigma: 5.05 Head Liquid Values @ 5750 MHz: ϵ_p : 32.9 sigma: 5.46
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8\text{mm}/dy=8\text{mm}$
Zoon Scan Resolution	$dx=4\text{mm}/dy=4\text{mm}/dz=2\text{mm}$
Frequency	5250 MHz 5600 MHz 5750 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
5250 MHz	7.31	73.09	-	2.11	21.12	-
5600 MHz	7.29	72.92	78.30	2.13	21.29	23.20
5750 MHz	6.91	69.05	-	2.03	20.27	-

SAR MEASUREMENT PLOTS @ 5250 MHz



Page: 7/9

Template: ACR.DDD.N.YT.MVG.ISSUE_SAR Reference Dipole v1.

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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)

Accreditation No.: **SCS 0108**

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

Client **Verkotan**
Oulu, Finland

Certificate No. **D6.5GHzV2-1097_Jun23**

CALIBRATION CERTIFICATE

Object **D6.5GHzV2 - SN:1097**

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

Calibration date: **June 01, 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (MATE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power sensor R&S NRP33T	SN: 100967	03-Apr-23 (No. 217-03806)	Apr-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Mismatch combination	SN: 84224 / 3600	03-Apr-23 (No. 217-03812)	Apr-24
Reference Probe EX3DV4	SN: 7405	02-Jun-22 (No. EX3-7405_Jun22)	Jun-23
DAE4	SN: 908	27-Jun-22 (No. DAE4-908_Jun22)	Jun-23
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator Anapico APSIN20G	SN: 827	18-Dec-18 (in house check Dec-21)	In house check: Dec-23
Power sensor NRP-Z23	SN: 100169	10-Jan-19 (in house check Nov-22)	In house check: Nov-23
Power sensor NRP-18T	SN: 100950	28-Sep-22 (in house check Nov-22)	In house check: Nov-23
Network Analyzer Keysight E5063A	SN:MY54504221	31-Oct-19 (in house check Oct-22)	In house check: Oct-25

Calibrated by: **Leif Kysner** (Name) **Laboratory Technician** (Function) *Leif Kysner* (Signature)

Approved by: **Sven Kühn** (Name) **Technical Manager** (Function) *Sven Kühn* (Signature)

Issued: June 6, 2023

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Measurement Conditions

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

DASY Version	DASY6	V16.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	6500 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	34.5	6.07 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	34.7 $\pm$ 6 %	6.10 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

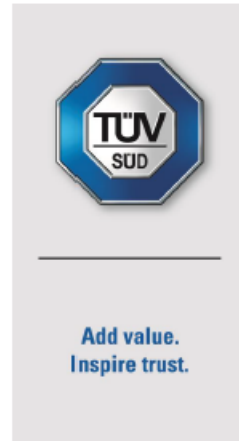
SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	29.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	296 W/kg $\pm$ 24.7 % (k=2)

SAR averaged over 8 cm ³ (8 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.66 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	66.7 W/kg $\pm$ 24.4 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	5.46 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	54.7 W/kg $\pm$ 24.4 % (k=2)

APPENDIX F: IPD TEST REPORT



Report On

Specific Absorption Rate Testing of the Siemens IPC MD-57A

In accordance with FCC 47CFR 2.1093 (limited testing)
FCC ID: U9A-MD57A

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Document 75959236 Report 1 Issue 1

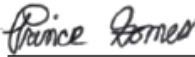
September 2023





TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: <http://www.tuvsud.com>

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REPORT ON	Specific Absorption Rate Testing of the Siemens IPC MD-57A Document 75959236 Report 1 Issue 1 September 2023
PREPARED FOR	Verkotan Oy, Elektroniikkatie 17, 90590, Oulu, Finland
PREPARED BY	 Elvis Gomes Technician (SAR)
APPROVED BY	 Jon Kenny Authorised Signatory
DATED	<u>22-September-2023</u>

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SECTION 1

REPORT SUMMARY

Power Density Testing of the Siemens IPC MD-57A

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1.1 INTRODUCTION

The information contained in this report is intended to show verification of incident power density testing of the Siemens IPC MD-57A to the requirements of FCC 47CFR 2.1093

Objective	To perform incident power density testing to determine the Equipment Under Test's (EUT's) compliance with the requirements specified of FCC 47CFR 2.1093 for the series of tests carried out.
Applicant	Verkotan Oy
Manufacturer	Siemens
Manufacturing Description	Laptop computer
Model Number	IPC MD-57A
Serial Number(s)	DE1039043aa01 (DUT number 21074)
Number of Samples Tested	1
Hardware Version	Pre-series
Software Version	Test01
Test Specification/Issue/Date	FCC 47CFR 2.1093
Start of Test	29-August-2023
Finish of Test	01-September-2023
Related Document(s)	KDB 865664 – D01 v01r04 KDB 447498 – D01 v06 IEC-IEEE 62209-1528-2020 KDB 248227 – D01 v02r02 IEC/IEEE 63195-1:2022 ICNIRP 2020 FCC 47 CFR 1.1310 SPEAG, DASY8 Application Note: SAR, APD & PD at 6 - 10 GHz (Version 6.0), August 2022 October 2020 TCBC Workshop Notes
Name of Engineer(s)	Elvis Gomes

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1.2 TEST RESULTS

The limited test measurements shown in this report were made to complete the requirements of FCC 47CFR 2.1093 following methods and procedures described in the related document section of this report.

Testing was carried out at Verkotan OY to determine the configuration that would yield the maximum incident power density in the Wi-Fi 6E band.

The final iPD measurement is documented in this report.

The SAR and other associated test results can be found in report number:
FCC ISED RF Exposure Report_Industrial Notebook_ID6019_20092023

1.2.1 Summary of maximum values

The maximum iPD 4cm² found during this Assessment:

Max iPD 4cm ² (W/m ²)	0.109 W/m ² (Measured)
The maximum iPD averaged over 4cm ² measured for all the tests performed did not exceed the standalone limits for FCC General Population/Uncontrolled Exposure of 10.00 W/m ² in accordance with FCC 47 CFR 1.1310.	

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1.2.2 Results Summary Tables

WLAN 6 GHz - 802.11ax - HED - 160 MHz BW - Core 0 (SISO)
Incident Power Density (IPD)

Test Position	Channel Number	Frequency (MHz)	Measured IPD 4cm ² (W/m ²)	Standalone IPD 4cm ² limit (W/m ²)	Exposure Ratio	Scan Figure Number
Bottom of device	175	6825	0.109	10.0	0.011	C.1
The measured IPD result above was the highest SAR and APD value recorded and was chosen for the IPD test.						

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1.2.3 Technical Description

The equipment under test (EUT) was an industrial portable laptop computer.

1.2.4 Interim Procedures for FCC Radiofrequency Exposure Evaluations

The interim procedure for FCC radiofrequency (RF) exposure evaluations of U-NII 6–7 GHz band portable devices have been made available during the TCB workshop in October 2020. The procedure is summarized below:

- Evaluate SAR / APD with DASY Module SAR V16.0 or higher. The configurations to be tested are defined in the relevant Knowledge Database (KDB). The peak spatial averaged SAR (psSAR) and the peak spatial averaged absorbed Power Density (psAPD) are reported.
- For the configuration with the highest SAR / APD, evaluate the PD with DASY Module mmWave V3.0 or higher.

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1.2.5 Test Configuration and Modes of Operation

The testing was performed with an integral battery supplied and manufactured by Siemens.

Supported technologies are 6 GHz WLAN (802.11a/ax).

The test set up for the EUT was as follows: -

Country Code	Standard	Data Rate	Duty Cycle (%)	Chain	Output Power Setting (dBm)	Bandwidth (MHz)	Frequency (MHz)	Channel
US	802.11ax	HE0	99	A	9.25	160	6825	175

Testing was achieved using a test application suite provided by the laptop chipset manufacturer that allowed full control over the device's Wi-Fi radio.

For each scan, the device was configured into a continuous transmission test mode at a maximum power setting of 9.25 dBm as defined by the customer.

Testing was performed in each position at the frequency that gave the highest SAR and APD value for the wi-Fi 6E band.

Power scaling was not performed on the EUT as the iPD was very low and the distribution was noise like in its behaviour.

For each relevant antenna, the bottom surface of the EUT was assessed for iPD.

Included in this report are descriptions of the test method; the equipment used and an analysis of the test uncertainties applicable and diagrams indicating the locations of maximum iPD for each relevant test position.

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1.2.6 Deviations from Standard

None.

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SECTION 2

TEST DETAILS

Incident Power Density Testing of the Siemens IPC MD-57A

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2.1 DASY6 MEASUREMENT SYSTEM

2.1.1 System Description

The iPD tests are carried out on the DASY 6 measurement system.

The iPD specific information is detailed below. As the system shares many component parts with the SAR system a complete description of both measurement methodologies is included in this report.

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

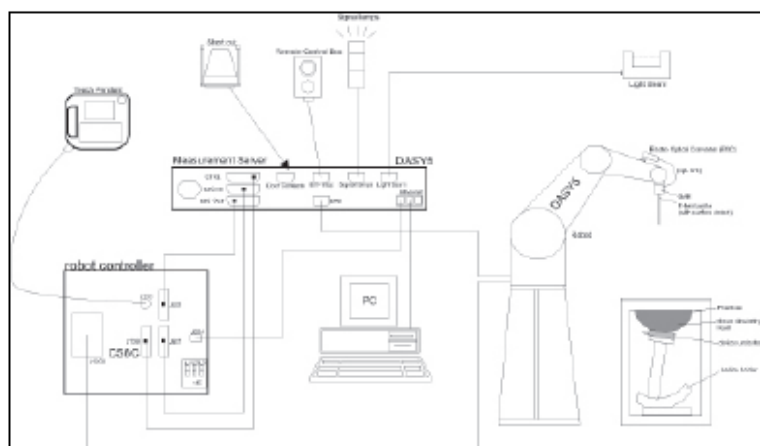


Figure 1 - System Description Diagram

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.

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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.

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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.

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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 Centred 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.

2.1.5 DASY 6 Absorbed Power Density evaluation.

The DASY 6 measurement system will output the absorbed power density result values by default from version 16.0 of DASY software onwards. All the measurement details described in this section are utilised to collect the required data which is the converted automatically within the software and displayed for frequencies above 5.9 GHz.

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2.2 DASY 6 mmWave PD Module

2.2.1 Measurement system

A DASY 6 measurement system equipped with the DASY 6 mmWave module was used to carry out the peak spatially averaged power density (psPD) measurements. It consists of a 6-axis industrial robot and controller that provides a highly accurate positioning system, a PC for the system control software, a near field probe (EUmmWVx), a probe alignment sensor and the 5G phantom. The high accuracy positioning system places the near field probe at the key location points of the maximum electromagnetic field.

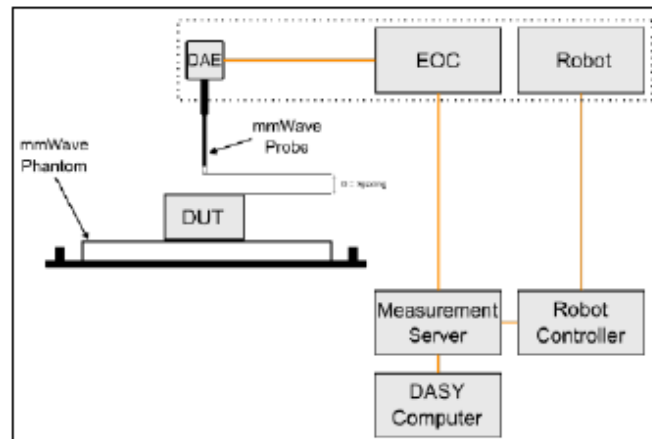


Figure 2 - Typical measurement setup for PD measurement with DASY 6

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2.2.2 EUmmWVx E-field probe details

The EUmmWVx probe utilises two dipole elements that are specifically arranged to allow for the generation of pseudo-vector data.

Frequency Range	750 MHz – 110 GHz
Dynamic Range	<20 V/m – 10'000 V/m with PRE-10 (min <20 V/m – 2000 V/m)
Position Precision	<0.2 mm (DASY6)
Dimensions	Overall length: 320 mm (tip: 20 mm) Tip and body diameter: encapsulation 8 mm (internal sensor <1mm) Distance from probe tip to sensor Y cal point: 1.5 mm Distance from probe tip to sensor X cal point: 1.5 mm
Applications	E-field measurements of 5G devices and other mm-wave transmitters operating above 10GHz in <2 mm distance from device (free-space) Power density, H-field, and far-field analysis using total field reconstruction.
Compatibility	cDASY6 + 5G-Module SW1.0 and higher

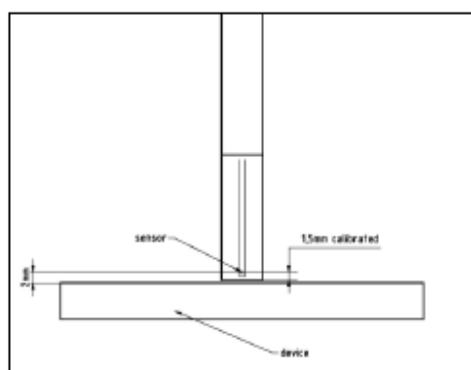


Figure 3 - Diagram of the distance sensor to the EUT surface

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2.2.3 Peak spatially averaged power density assessment based on E-field measurements.

Power density was determined for both the electric and magnetic fields within a small distance from the transmitting source. In general, the magnitude and phase of two components of either E-field or H-field are needed on a sufficiently large surface to characterise their total distributions. Despite this being the case, a solution based on the direct measurement of the E and H field can be used to compute power density. The measurement approach to achieve this is given below.

- a) The local E-field is measured at a reference point on the measurement surface where the field is well above the system noise floor. This reference point is re-visited at the end of the measurement routine and re-measured to determine and assess the power drift of the EUT.
- b) The electric field on the measurement surface was scanned using instructions provided by the test system manufacturer. The spatial resolution of the measurement can depend on the measured field characteristic and measurement methodology used by the test system. The planar scan step size is configured to be $\lambda/4$.
- c) DASY8 uses a reconstruction algorithm to calculate the H-field from the measured E-field. As the power density calculation requires amplitude and phase, reconstruction algorithms can also be used to obtain field information from the measured E-field data, for example phase information from the amplitude if only the amplitude is measured. Three measurements per point on two measurement planes separated by $\lambda/4$ are carried out in order for the H-field and phase data to be reconstructed.
- d) Using the equation below the total peak spatially averaged power density (psPD) distribution on the evaluation surface can be determined. The applicable regulatory requirements specify the spatial averaging area A. A circular shape is used.

$$psPD = \frac{1}{2A_{av}} \iint_{A_{av}} ||Re\{E \times H^*\}|| dA$$

- e) The final quantity used to determine compliance against the applicable limits is the maximum spatial average on the evaluation.
- f) Following the measurement of the power drift as described in step a) the drift was assessed. If the drift deviated by more than 5% then the power density test and drift measurements shall be repeated.

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2.2.4 Reconstruction Algorithm

Computation of the PD in general requires knowledge of the electric (E-) and magnetic (H-) field amplitudes and phases in the plane of incidence. Reconstruction of these quantities from pseudo-vector E-field measurements is feasible, as they are constrained by Maxwell's equations.

The test system utilises a reconstruction approach based on the Gerchberg-Saxton algorithm which benefits from the availability of the E-field polarization ellipse information obtained with the EUmmWVx probe. This reconstruction algorithm, together with the ability of the probe to measure extremely close to the source without perturbing the field, permits reconstruction of the E- and H-fields and the PD on measurement planes located as near as $\lambda/2\pi$.

2.2.5 Standalone PD limit

The following formula provides the reference levels for local exposure to electromagnetic fields from >6 GHz to 300GHz for general public as referenced in ICNIRP 2020:

$$55/f_G^{0.177}$$

The FCC Oct 2020 TCB workshop states their own incident power density limit of 1mW/cm² plane-wave equivalent, averaged over 4 cm² as reflected in FCC 47 CFR 1.1310.

2.2.6 Exposure Ratio

The following formulas used to calculate the exposure ratio of SAR, APD and iPD respectively as referenced in ICNIRP 2020:

$$\begin{aligned} \text{SAR} \quad & \sum_{i=100 \text{ kHz}}^{300 \text{ GHz}} \frac{\text{SAR}_i}{\text{SAR}_{\text{BR}}} \leq 1. \\ \text{APD} \quad & \sum_{i>6 \text{ GHz}}^{30 \text{ GHz}} \frac{S_{\text{ab},4\text{cm},i}}{S_{\text{ab},4\text{cm},\text{BR}}} \leq 1. \\ \text{iPD} \quad & \sum_{i>6 \text{ GHz}}^{30 \text{ GHz}} \left(\frac{S_{\text{inc},4\text{cm},i}}{S_{\text{inc},4\text{cm},\text{RL},i}} \right) \leq 1. \end{aligned}$$

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2.2.7 Total Exposure Ratio (TER)

The total exposure ratio is the sum of local specific absorption rate (SAR), local absorbed power density (APD) and local incident power density (iPD) referenced in ICNIRP 2020:

where, SAR_i and SAR_{BR} are the local SAR level at frequency i and the local SAR basic restriction given in ICNIRP 2020. $S_{ab,4cm,i}$ and $S_{ab,4cm,BR}$ are the $4cm^2$ absorbed power density level at frequency i and the $4cm^2$ absorbed power density basic restriction given in ICNIRP 2020. $S_{inc,4cm,i}$ and $S_{inc,4cm,RL,i}$ are the local $4cm^2$ incident power density at frequency i and the local $4cm^2$ incident power density reference level at frequency i given in ICNIRP 2020.

$$\begin{aligned} & \sum_{i=100 \text{ kHz}}^{6 \text{ GHz}} \frac{SAR_i}{SAR_{BR}} \\ & + \sum_{i>6 \text{ GHz}}^{30 \text{ GHz}} \frac{S_{ab,4cm,i}}{S_{ab,4cm,BR}} \\ & + \sum_{i>6 \text{ GHz}}^{30 \text{ GHz}} \left(\frac{S_{inc,4cm,i}}{S_{inc,4cm,RL,i}} \right) \leq 1 \end{aligned}$$

TER is applied when simultaneous transmission of the different types of measurement is tested, and basic restriction limits cannot be applied. The TER of the applicable measurements is calculated and summed up to not exceed 1.

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SECTION 3

TEST EQUIPMENT USED

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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
Thermohygrometer	R.S Components	1364	6352	12	11-April-2024
Laptop Device Holder	Speag	mmWave	6450	-	TU
Measurement server	Speag	DASY 6 Measurement Server	5337	-	TU
Mounting Platform	Speag	MP6C-TX90XL Mounting Platform Extended	4702	-	TU
Robot	Speag	TX90 XL Staubli Robot	5340	-	TU
10GHz Verification Source	Speag	5G Verification Source 10GHz	6449	12	27-Oct-2023
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3745	12	29-Jun-2024
Directional Coupler	Hewlett Packard	11692D	452	-	TU
EXA Signal Analyser	Keysight Technologies	N9010B	4968	12	19-Jan-2024
Attenuator (30dB)	Weinschel	46-30-34	2776	12	09-Aug-2024
Attenuator (10dB)	Aaren	AT40A-4041-D18-10	5493	12	18-Apr-2024
Amplifier	Mini-Circuits	ZVE-3W-183+	6540	-	TU
Power Meter	Rohde & Schwarz	NRX	6535	12	05-Apr-2024
Power Sensor	Rohde & Schwarz	NRP18S	6534	12	17-Apr-2025
Power Sensor	Rohde & Schwarz	NRP18S	6533	12	17-Apr-2025
Data Acquisition	Speag	DAE4lp	6500	12	03-April-2023
Dosimetric SAR Probe	Speag	EX3DV4	4700	12	15-Dec-2023
PD probe	Speag	EUMMWV4	6353	12	25-Oct-2023

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.

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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 mmWave V3.2.0.1840

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3.3 TEST VERIFICATION

3.3.1 System Performance Check Results

Prior to formal testing a system performance check in DASY Module mmWave was performed with the verification source available at 10 GHz in accordance with IEC/IEEE 63195. The results can be seen below.

System performance / Validation results

Date	Frequency (MHz)	Medium	Measured psPDtot+ (W/m ²)	Target psPDtot+ (W/m ²)	Percentage Deviation from Target (%)
31-August-2023	10000	Air	52.9	50.10	5.3

*Normalised to a forward power of 1W

3.4 TEST CONDITIONS

3.4.1 Test Laboratory Conditions

Ambient temperature: Within +18°C to +25°C.
The actual temperature during the testing ranged from 21.10°C to 21.20°C.
The actual humidity during the testing ranged from 14.40% to 14.62% RH.

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3.5 MEASUREMENT UNCERTAINTY

DASY6 Uncertainty Budget for iPD

Symbol	Error Description	Value dB	Probability distribution	Divisor	c_i	$u_i(y)$ dB	$(u_i(y))^2$	v_i or v_{eff}	$u_i^4(y)$
Uncertainty terms dependent on the measurement system									
CAL	Calibration	0.49	normal 1	1.000	1	0.49	0.240	∞	0
COR	Probe correction	0.00	rectangular	1.732	1	0.00	0.000	∞	0
FRS	Frequency response (BW $\leq$ 1 GHz)	0.20	rectangular	1.732	1	0.12	0.013	∞	0
SCC	Sensor cross coupling	0.00	rectangular	1.732	1	0.00	0.000	∞	0
ISO	Isotropy	0.50	rectangular	1.732	1	0.29	0.083	∞	0
LIN	Linearity	0.20	rectangular	1.732	1	0.12	0.013	∞	0
PSC	Probe scattering	0.00	rectangular	1.732	1	0.00	0.000	∞	0
PPO	Probe positioning offset	0.30	rectangular	1.732	1	0.17	0.030	∞	0
PPR	Probe positioning repeatability	0.04	rectangular	1.732	1	0.02	0.001	∞	0
SMO	Sensor mechanical offset	0.00	rectangular	1.732	1	0.00	0.000	∞	0
PSR	Probe spatial resolution	0.00	rectangular	1.732	1	0.00	0.000	∞	0
FLD	Field Impedance dependence	0.00	rectangular	1.732	1	0.00	0.000	∞	0
APD	Amplitude and phase drift	0.00	rectangular	1.732	1	0.00	0.000	∞	0
APN	Amplitude and phase noise	0.04	rectangular	1.732	1	0.02	0.001	∞	0
TR	Measurement area truncation	0.00	rectangular	1.732	1	0.00	0.000	∞	0
DAQ	Data acquisition	0.03	normal 1	1.000	1	0.03	0.001	∞	0
SMP	Sampling	0.00	rectangular	1.732	1	0.00	0.000	∞	0
REC	Field reconstruction	0.60	rectangular	1.732	1	0.35	0.120	∞	0
TRA	FTE/MEO	0.70	rectangular	1.732	1	0.40	0.163	∞	0
SCA	Power density scaling	0.00	rectangular	1.732	1	0.00	0.000	∞	0
SAV	Spatial averaging	0.10	rectangular	1.732	1	0.06	0.003	∞	0
SDL	System detection limit	0.04	rectangular	1.732	1	0.02	0.001	∞	0
Uncertainty terms dependent on the DUT and environmental factors									
PC	Probe coupling with DUT	0.00	rectangular	1.732	1	0.00	0.000	∞	0
MOD	Modulation response	0.40	rectangular	1.732	1	0.23	0.053	∞	0
IT	Integration time	0.00	rectangular	1.732	1	0.00	0.000	∞	0
RT	Response time	0.00	rectangular	1.732	1	0.00	0.000	∞	0
DH	Device holder Influence	0.10	rectangular	1.732	1	0.06	0.003	∞	0
DA	DUT alignment	0.00	rectangular	1.732	1	0.00	0.000	∞	0
REF	Reflections in laboratory	0.10	rectangular	1.732	1	0.06	0.003	∞	0
TEM	Laboratory temperature	0.10	rectangular	1.732	1	0.06	0.003	∞	0
AC	RF ambient conditions	0.04	rectangular	1.732	1	0.02	0.001	∞	0
AR	Ambient reflections	0.04	rectangular	1.732	1	0.02	0.001	∞	0
MSI	Immunity / secondary reception	0.00	rectangular	1.732	1	0.00	0.000	∞	0
DRI	Drift of the DUT	0.00	rectangular	1.732	1	0.00	0.000	∞	0
$u_d(F_d)$	Combined Standard Uncertainty (w/ FTE/MEO)	-	normal	-	-	0.86	0.734	∞	0
$U(F_d)$	Expanded Uncertainty (w/ FTE/MEO)	-	normal $k =$	2.00	-	1.7	-	∞	-

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DASY6 mmWave Uncertainty Budget - System Performance Check

Symbol	Error Description	Value dB	Probability distribution	Divisor	c_i	$u_i(y)$ dB	$(u_i(y))^2$ dB	v_i or V_{eff}	$u_i^4(y)$
Uncertainty terms dependent on the measurement system									
CAL	Calibration Repeatability	0.21	normal 1	1.000	1	0.21	0.044	∞	0
COR	Probe correction	0.00	rectangular	1.732	1	0.00	0.000	∞	0
FRS	Frequency response (BW $\leq$ 1 GHz)	0.20	rectangular	1.732	0	0.00	0.000	∞	0
SCC	Sensor cross coupling	0.00	rectangular	1.732	1	0.00	0.000	∞	0
ISO	Isotropy	0.30	rectangular	1.732	1	0.17	0.030	∞	0
LIN	Linearity	0.20	rectangular	1.732	1	0.12	0.013	∞	0
PSC	Probe scattering	0.00	rectangular	1.732	1	0.00	0.000	∞	0
PPO	Probe positioning offset	0.11	rectangular	1.732	1	0.06	0.004	∞	0
PPR	Probe positioning repeatability	0.04	rectangular	1.732	1	0.02	0.001	∞	0
SMO	Sensor mechanical offset	0.00	rectangular	1.732	1	0.00	0.000	∞	0
PSR	Probe spatial resolution	0.00	rectangular	1.732	1	0.00	0.000	∞	0
FLD	Field Impedance dependence	0.00	rectangular	1.732	1	0.00	0.000	∞	0
APD	Amplitude and phase drift	0.00	rectangular	1.732	1	0.00	0.000	∞	0
APN	Amplitude and phase noise	0.04	rectangular	1.732	0	0.00	0.000	∞	0
TR	Measurement area truncation	0.00	rectangular	1.732	1	0.00	0.000	∞	0
DAQ	Data acquisition	0.03	normal 1	1.000	1	0.03	0.001	∞	0
SMP	Sampling	0.00	rectangular	1.732	1	0.00	0.000	∞	0
REC	Field reconstruction	0.60	rectangular	1.732	0.3	0.10	0.011	∞	0
TRA	Forward transformation	0.00	rectangular	1.732	1	0.00	0.000	∞	0
SCA	Power density scaling	0.00	rectangular	1.732	1	0.00	0.000	∞	0
SAV	Spatial averaging	0.10	rectangular	1.732	0	0.00	0.000	∞	0
SDL	System detection limit	0.04	rectangular	1.732	1	0.02	0.001	∞	0
Uncertainty terms dependent on the DUT and environmental factors									
PC	Probe coupling with DUT	0.00	rectangular	1.732	1	0.00	0.000	∞	0
MOD	Modulation response	0.40	rectangular	1.732	0	0.00	0.000	∞	0
IT	Integration time	0.00	rectangular	1.732	1	0.00	0.000	∞	0
RT	Response time	0.00	rectangular	1.732	1	0.00	0.000	∞	0
DH	Device holder Influence	0.10	rectangular	1.732	0	0.00	0.000	∞	0
REF	Reflections in laboratory	0.10	rectangular	1.732	1	0.06	0.003	∞	0
TEM	Laboratory temperature	0.10	rectangular	1.732	1	0.06	0.003	∞	0
DA	DUT alignment	0.00	rectangular	1.732	1	0.00	0.000	∞	0
AC	RF ambient conditions	0.04	rectangular	1.732	1	0.02	0.001	∞	0
AR	Ambient reflections	0.04	rectangular	1.732	1	0.02	0.001	∞	0
MSI	Immunity / secondary reception	0.00	rectangular	1.732	0	0.00	0.000	∞	0
DRI	Drift of the DUT	0.10	rectangular	1.732	1	0.06	0.003	∞	0
$u_c(F_s)$	Combined Standard Uncertainty (w/ FTE/MEO)	-	normal	-	-	0.34	0.115	∞	0
$U(F_s)$	Expanded Uncertainty (w/ FTE/MEO)	-	normal $k =$	2.00	-	0.7		∞	-

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3.5.1 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."

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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

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

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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ANNEX A

PROBE CALIBRATION REPORT

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

Certificate No **EUmm-9541_Oct22**

CALIBRATION CERTIFICATE

Object **EUmmWV4 - SN:9641**

Calibration procedure(s) **QA CAL-02.v9, QA CAL-25.v7, QA CAL-42.v2**
Calibration procedure for E-field probes optimized for close near field
evaluations in air

Calibration date **October 25, 2022**

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

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

Calibration Equipment used (M&STE critical for calibration)

Primary Standards	ID	Cal Data (Certificate No.)	Scheduled Calibration
Power sensor NRP110T	SN: 101244	14-Mar-22 (No. 26A1037915)	Mar-23
Spectrum analyzer FSV40	SN: 101632	25-Jan-22 (No. 4030-31500399)	Jan-25
Ref. Probe EUmmWV3	SN: 9374	21-Dec-21 (No. EUmmWV3-9374_Dec21)	Dec-22
DAE4	SN: 789	24-Dec-21 (No. DAE4-789_Dec21)	Dec-22

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Generator APSIN26G	SN: 669	29-Mar-17 (in house check May-22)	In house check: May-23
Generator Agilent E8251A	SN: US41140111	26-Mar-17 (in house check May-22)	In house check: May-23

	Name	Function	Signature
Calibrated by	Leif Kysner	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: October 27, 2022
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: EUmm-9541_Oct22

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

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Accreditation No.: SCS 0108

Glossary

NORM _{x,y}	sensitivity in free space
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 DAS-Y system to align probe sensor X to the robot coordinate system
Sensor Angles	sensor deviation from the probe axis, used to calculate the field orientation and polarization
$\vec{k}$	is the wave propagation direction

Calibration is Performed According to the Following Standards:

a) IEEE Std 1309-2005, "IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", December 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y}: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). For frequencies > 6 GHz, the far field in front of waveguide horn antennas is measured for a set of frequencies in various waveguide bands up to 110 GHz.
- DCP_{x,y}: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
Note: As the field is measured with a diode detector sensor, it is warranted that the probe response is linear (E^2) below the documented lowest calibrated value.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- The frequency sensor model parameters are determined prior to calibration based on a frequency sweep (sensor model involving resistors R, R₀, inductance L and capacitors C, C₀).
- A_{x,y}; B_{x,y}; C_{x,y}; D_{x,y}; VPR_{x,y}: 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.
- 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).
- Equivalent Sensor Angle: The two probe sensors are mounted in the same plane at different angles. The angles are assessed using the information gained by determining the NORM_x (no uncertainty required).
- Spherical isotropy (3D deviation from isotropy): in a locally homogeneous field realized using an open waveguide / horn setup.

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EUMmWV4 - SN:9641

October 25, 2022

Parameters of Probe: EUMmWV4 - SN:9641

Basic Calibration Parameters

	Sensor X	Sensor Y	Unc (k = 2)
Norm ($\mu V/(V/m)^2$)	0.01922	0.02102	$\pm 10.1\%$
DCP (mV) ^B	107.0	105.0	$\pm 4.7\%$
Equivalent Sensor Angle	-61.1	35.0	

Calibration Results for Frequency Response (750 MHz – 110 GHz)

Frequency MHz	Target E-Field V/m	Deviation Sensor X dB	Deviation Sensor Y dB	Unc (k = 2) dB
0.75	77.2	-0.35	-0.49	± 0.43
1.0	140.4	-0.04	-0.04	± 0.43
2.0	133.0	0.13	0.14	± 0.43
2.2	124.6	-0.05	-0.03	± 0.43
2.5	123.0	0.10	0.14	± 0.43
3.5	286.2	-0.08	-0.08	± 0.43
3.7	249.8	0.05	0.01	± 0.43
6.6	76.1	0.12	0.01	± 0.98
8.0	68.3	0.06	0.06	± 0.98
10.0	67.5	0.19	0.19	± 0.98
15.0	55.3	0.31	0.27	± 0.98
26.6	114.9	-0.44	-0.46	± 0.98
30.0	121.2	-0.42	-0.42	± 0.98
35.0	118.8	-0.28	-0.24	± 0.98
40.0	105.8	-0.15	-0.11	± 0.98
50.0	60.5	0.42	0.28	± 0.98
55.0	75.8	-0.11	-0.05	± 0.98
60.0	80.0	0.01	0.01	± 0.98
65.0	77.7	-0.09	-0.02	± 0.98
70.0	73.8	-0.08	-0.04	± 0.98
75.0	73.2	-0.18	-0.23	± 0.98
75.0	80.8	0.09	0.07	± 0.98
80.0	79.9	-0.21	-0.21	± 0.98
85.0	47.6	-0.31	-0.35	± 0.98
90.0	72.3	-0.23	-0.24	± 0.98
92.0	72.0	-0.17	-0.17	± 0.98
95.0	66.6	-0.12	-0.09	± 0.98
97.0	57.0	-0.07	-0.03	± 0.98
100.0	55.0	-0.03	0.02	± 0.98
105.0	53.0	-0.16	-0.12	± 0.98
110.0	61.1	0.14	-0.00	± 0.98

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%.

^B Linearization parameter uncertainty for maximum specified field strength.

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EUmmWV4 - SN:9641

October 25, 2022

Parameters of Probe: EUmmWV4 - SN:9641

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB/μV	C	D dB	VRI mV	Max dev.	Max Unc [®] k = 2
0	CW	X	0.00	0.00	1.00	0.00	133.7	±5.5%	±4.7%
		Y	0.00	0.00	1.00		65.1		
10352	Pulse Waveform (200Hz, 10%)	X	3.65	60.72	15.40	10.00	5.0	±1.4%	±9.6%
		Y	3.49	61.83	16.76		5.0		
10353	Pulse Waveform (200Hz, 20%)	X	3.00	62.06	14.98	6.90	12.0	±1.3%	±9.6%
		Y	2.75	63.47	16.36		12.0		
10354	Pulse Waveform (200Hz, 40%)	X	1.85	62.90	13.78	3.98	23.0	±2.0%	±9.6%
		Y	1.25	60.18	13.68		23.0		
10355	Pulse Waveform (200Hz, 60%)	X	0.85	60.00	11.77	2.22	27.0	±1.4%	±9.6%
		Y	0.76	60.00	13.07		27.0		
10367	QPSK Waveform, 1 MHz	X	1.26	60.00	12.31	1.00	22.0	±1.4%	±9.6%
		Y	1.25	60.00	12.49		22.0		
10386	QPSK Waveform, 10 MHz	X	1.27	60.00	11.90	0.00	22.0	±0.8%	±9.6%
		Y	1.31	60.00	12.15		22.0		
10390	64-QAM Waveform, 100 kHz	X	3.81	66.79	16.51	3.01	17.0	±0.8%	±9.6%
		Y	30.00	87.32	23.08		17.0		
10398	64-QAM Waveform, 40 MHz	X	2.08	60.00	12.40	0.00	19.0	±0.9%	±9.6%
		Y	2.04	60.00	12.68		19.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.27	60.00	12.83	0.00	12.0	±0.8%	±9.6%
		Y	3.08	60.00	13.13		12.0		

Note: For details on UID parameters see Appendix

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

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EUmmWV4 - SN:9641

October 25, 2022

Parameters of Probe: EUmmWV4 - SN:9641

Calibration Results for Linearity Response

Frequency GHz	Target E-Field V/m	Deviation Sensor X dB	Deviation Sensor Y dB	Unc (k = 2) dB
0.9	50.0	-0.05	0.06	±0.2
0.9	100.0	-0.03	0.09	±0.2
0.9	500.0	-0.00	-0.02	±0.2
0.9	1000.0	0.02	-0.00	±0.2
0.9	1500.0	0.01	0.00	±0.2
0.9	2100.0	-0.00	-0.00	±0.2

Sensor Frequency Model Parameters (750 MHz – 55 GHz)

	Sensor X	Sensor Y
R (Ω)	60.44	47.42
R _p (Ω)	65.50	50.50
L (nH)	0.07194	0.05239
C (pF)	0.3841	0.6294
C _p (pF)	0.1132	0.1490

Sensor Frequency Model Parameters (55 GHz – 110 GHz)

	Sensor X	Sensor Y
R (Ω)	18.09	40.41
R _p (Ω)	101.54	205.86
L (nH)	0.05623	0.11734
C (pF)	0.0744	0.0372
C _p (pF)	0.0655	0.0427

Sensor Model Parameters

	C1 fF	C2 fF	α V ⁻¹	T1 mV V ⁻²	T2 mV V ⁻¹	T3 mV	T4 V ⁻²	T5 V ⁻¹	T6
x	66.1	492.44	33.52	0.00	10.00	5.01	0.00	1.96	1.01
y	59.3	424.21	32.97	0.00	10.00	5.04	2.00	2.06	1.01

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle	164.5°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	320 mm
Probe Body Diameter	8 mm
Tip Length	23 mm
Tip Diameter	6.0 mm
Probe Tip to Sensor X Calibration Point	1.5 mm
Probe Tip to Sensor Y Calibration Point	1.5 mm

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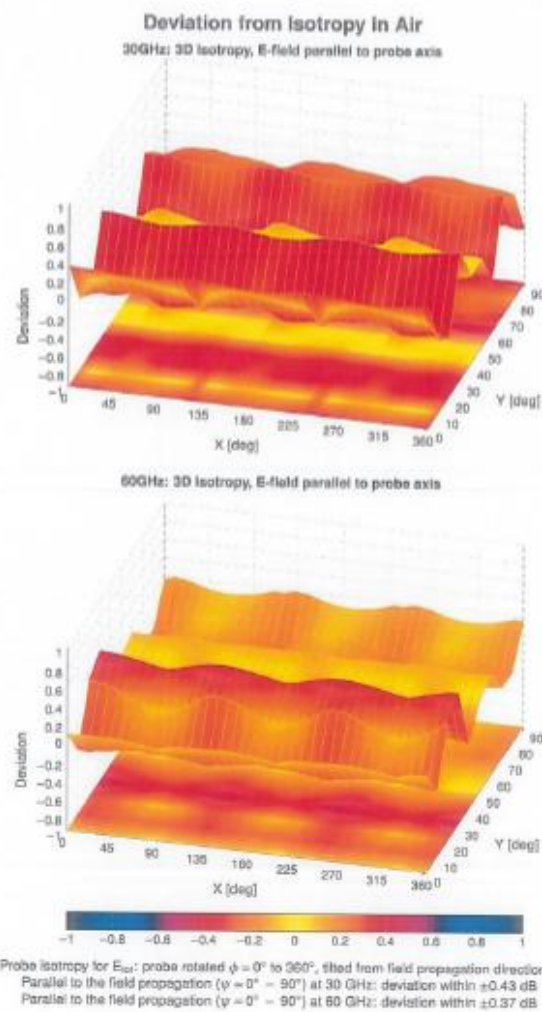
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Appendix: Modulation Calibration Parameters

Lab	Rev	Communication System Name	Group	PAW (dB)	Unc ^a k = 2
0		CW	CW	0.00	±0.7
10010	CAA	SAR Variation (Square, 100 ms, 10 ms)	Test	10.00	±0.0
10011	CA0	UMTS-PDS (WCDMA)	WCDMA	2.51	±0.0
10012	CA0	IEEE 802.11g WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±0.0
10013	CA0	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	0.46	±0.0
10020	DAC	GSM-PDS (TDMA, GMSK)	GSM	0.29	±0.0
10024	DAC	GPRS-PDS (TDMA, GMSK, TN 0-3)	GSM	0.67	±0.0
10025	DAC	EDGE-PDS (TDMA, GMSK, TN 0-1)	GSM	0.66	±0.0
10026	DAC	EDGE-PDS (TDMA, GMSK, TN 0)	GSM	12.60	±0.0
10027	DAC	GPRS-PDS (TDMA, GMSK, TN 0-1)	GSM	0.66	±0.0
10028	DAC	GPRS-PDS (TDMA, GMSK, TN 0-1-2)	GSM	4.60	±0.0
10029	DAC	EDGE-PDS (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	±0.0
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	7.76	±0.0
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.50	±0.0
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	1.87	±0.0
10033	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	3.16	±0.0
10034	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	7.74	±0.0
10035	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	4.53	±0.0
10036	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	3.83	±0.0
10037	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	8.51	±0.0
10038	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	4.77	±0.0
10039	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	4.10	±0.0
10040	CAA	IEEE 802.15.1 Bluetooth (1/4-QPSK, DH1)	Bluetooth	4.97	±0.0
10042	CAB	IS-54/IS-136 PDS (TDMA-FDM, P14-QPSK, Fullrate)	AMPS	7.76	±0.0
10044	CAA	IS-95/IS-136 PDS (TDMA-FDM, P14-QPSK, Fullrate)	AMPS	5.00	±0.0
10048	CAA	DECT (TDD, TDMA-FDM, QPSK, Full Slot, 24)	DECT	13.80	±0.0
10049	CAA	DECT (TDD, TDMA-FDM, QPSK, Double Slot, 12)	DECT	10.79	±0.0
10050	CAA	UMTS-TDS (TD-SCDMA, 1.28 Mbps)	TD-SCDMA	11.01	±0.0
10058	DAC	EDGE-PDS (TDMA, 8PSK, TN 0-1-2-3)	GSM	5.52	±0.0
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	3.12	±0.0
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	±0.0
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.00	±0.0
10062	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 5 Mbps)	WLAN	5.58	±0.0
10063	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 5 Mbps)	WLAN	5.03	±0.0
10064	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 10 Mbps)	WLAN	5.09	±0.0
10065	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 18 Mbps)	WLAN	5.05	±0.0
10066	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 24 Mbps)	WLAN	9.38	±0.0
10067	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 36 Mbps)	WLAN	10.13	±0.0
10068	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 48 Mbps)	WLAN	10.34	±0.0
10069	CAD	IEEE 802.11ah WiFi 8 GHz (OFDM, 54 Mbps)	WLAN	10.56	±0.0
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	±0.0
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.60	±0.0
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	±0.0
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	±0.0
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	±0.0
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	±0.0
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	±0.0
10081	CAB	CDMA2000 (1xEV-RTT, RC3)	CDMA2000	3.97	±0.0
10082	CAB	IS-54/IS-136 PDS (TDMA-FDM, P14-QPSK, Fullrate)	AMPS	4.77	±0.0
10090	DAC	GPRS-PDS (TDMA, GMSK, TN 0-3)	GSM	6.50	±0.0
10097	CAC	UMTS-PDS (HSDPA)	WCDMA	3.00	±0.0
10098	DAC	UMTS-PDS (HSUPA, Subsect 2)	WCDMA	3.90	±0.0
10100	CAC	EDGE-PDS (TDMA, 8PSK, TN 0-3)	GSM	9.55	±0.0
10102	CAC	LTE-PDS (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-PDS	5.67	±0.0
10103	CAB	LTE-PDS (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-PDS	6.42	±0.0
10104	CAB	LTE-PDS (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-PDS	6.60	±0.0
10105	CAB	LTE-PDS (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-PDS	9.29	±0.0
10106	CAB	LTE-PDS (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-PDS	9.87	±0.0
10107	CAB	LTE-PDS (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-PDS	10.01	±0.0
10108	CAB	LTE-PDS (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-PDS	5.80	±0.0
10109	CAB	LTE-PDS (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-PDS	6.43	±0.0
10110	CAB	LTE-PDS (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-PDS	5.75	±0.0
10111	CAB	LTE-PDS (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-PDS	6.44	±0.0

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10112	CAS	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	5.53	±0.5
10113	CAS	LTE-FDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-FDD	5.62	±0.5
10114	CAS	IEEE 802.11n (HT Greenfield, 43.5Mbps, BPSK)	WLAN	5.10	±0.5
10115	CAS	IEEE 802.11n (HT Greenfield, 81Mbps, 16-QAM)	WLAN	5.45	±0.5
10116	CAS	IEEE 802.11n (HT Greenfield, 135Mbps, 64-QAM)	WLAN	5.15	±0.5
10117	CAS	IEEE 802.11n (HT Mixed, 13.5Mbps, BPSK)	WLAN	5.07	±0.5
10118	CAS	IEEE 802.11n (HT Mixed, 81Mbps, 16-QAM)	WLAN	5.08	±0.5
10119	CAS	IEEE 802.11n (HT Mixed, 135Mbps, 64-QAM)	WLAN	5.13	±0.5
10140	CAS	LTE-FDD (SC-FDMA, 100% RB, 15MHz, 16-QAM)	LTE-FDD	5.49	±0.5
10141	CAS	LTE-FDD (SC-FDMA, 100% RB, 15MHz, 64-QAM)	LTE-FDD	5.53	±0.5
10142	CAS	LTE-FDD (SC-FDMA, 100% RB, 3MHz, QPSK)	LTE-FDD	5.73	±0.5
10143	CAS	LTE-FDD (SC-FDMA, 100% RB, 3MHz, 16-QAM)	LTE-FDD	5.35	±0.5
10144	CAS	LTE-FDD (SC-FDMA, 100% RB, 3MHz, 64-QAM)	LTE-FDD	5.05	±0.5
10145	CAS	LTE-FDD (SC-FDMA, 100% RB, 1.4MHz, QPSK)	LTE-FDD	5.76	±0.5
10146	CAS	LTE-FDD (SC-FDMA, 100% RB, 1.4MHz, 16-QAM)	LTE-FDD	5.41	±0.5
10147	CAS	LTE-FDD (SC-FDMA, 100% RB, 1.4MHz, 64-QAM)	LTE-FDD	5.75	±0.5
10149	CAS	LTE-FDD (SC-FDMA, 50% RB, 20MHz, 16-QAM)	LTE-FDD	5.42	±0.5
10150	CAS	LTE-FDD (SC-FDMA, 50% RB, 20MHz, 64-QAM)	LTE-FDD	5.60	±0.5
10151	CAS	LTE-TDD (SC-FDMA, 50% RB, 20MHz, QPSK)	LTE-TDD	9.29	±0.5
10152	CAS	LTE-TDD (SC-FDMA, 50% RB, 20MHz, 16-QAM)	LTE-TDD	9.07	±0.5
10153	CAS	LTE-TDD (SC-FDMA, 50% RB, 20MHz, 64-QAM)	LTE-TDD	10.05	±0.5
10154	CAS	LTE-FDD (SC-FDMA, 50% RB, 10MHz, QPSK)	LTE-FDD	5.75	±0.5
10155	CAS	LTE-FDD (SC-FDMA, 50% RB, 10MHz, 16-QAM)	LTE-FDD	5.40	±0.5
10156	CAS	LTE-FDD (SC-FDMA, 50% RB, 5MHz, QPSK)	LTE-FDD	5.79	±0.5
10157	CAS	LTE-FDD (SC-FDMA, 50% RB, 5MHz, 16-QAM)	LTE-FDD	5.48	±0.5
10158	CAS	LTE-FDD (SC-FDMA, 50% RB, 5MHz, 64-QAM)	LTE-FDD	5.65	±0.5
10159	CAS	LTE-FDD (SC-FDMA, 40% RB, 5MHz, QPSK)	LTE-FDD	5.62	±0.5
10160	CAS	LTE-FDD (SC-FDMA, 40% RB, 10MHz, 16-QAM)	LTE-FDD	5.55	±0.5
10161	CAS	LTE-FDD (SC-FDMA, 40% RB, 10MHz, 64-QAM)	LTE-FDD	5.62	±0.5
10162	CAS	LTE-FDD (SC-FDMA, 20% RB, 10MHz, 16-QAM)	LTE-FDD	5.43	±0.5
10163	CAS	LTE-FDD (SC-FDMA, 20% RB, 10MHz, 64-QAM)	LTE-FDD	5.55	±0.5
10164	CAS	LTE-FDD (SC-FDMA, 20% RB, 1.4MHz, QPSK)	LTE-FDD	5.46	±0.5
10165	CAS	LTE-FDD (SC-FDMA, 20% RB, 1.4MHz, 16-QAM)	LTE-FDD	5.21	±0.5
10166	CAS	LTE-FDD (SC-FDMA, 20% RB, 1.4MHz, 64-QAM)	LTE-FDD	5.79	±0.5
10167	CAS	LTE-FDD (SC-FDMA, 1RB, 20MHz, QPSK)	LTE-FDD	5.73	±0.5
10168	CAS	LTE-FDD (SC-FDMA, 1RB, 20MHz, 16-QAM)	LTE-FDD	5.52	±0.5
10169	CAS	LTE-FDD (SC-FDMA, 1RB, 20MHz, 64-QAM)	LTE-FDD	5.52	±0.5
10170	CAS	LTE-FDD (SC-FDMA, 1RB, 20MHz, 16-QAM)	LTE-FDD	5.52	±0.5
10171	CAS	LTE-FDD (SC-FDMA, 1RB, 20MHz, 64-QAM)	LTE-FDD	5.52	±0.5
10172	CAS	LTE-TDD (SC-FDMA, 1RB, 20MHz, QPSK)	LTE-TDD	9.49	±0.5
10173	CAS	LTE-TDD (SC-FDMA, 1RB, 20MHz, 16-QAM)	LTE-TDD	9.91	±0.5
10174	CAS	LTE-TDD (SC-FDMA, 1RB, 20MHz, 64-QAM)	LTE-TDD	9.48	±0.5
10175	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, QPSK)	LTE-FDD	10.35	±0.5
10176	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, 16-QAM)	LTE-FDD	5.72	±0.5
10177	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, 64-QAM)	LTE-FDD	5.52	±0.5
10178	CAS	LTE-FDD (SC-FDMA, 1RB, 5MHz, QPSK)	LTE-FDD	5.73	±0.5
10179	CAS	LTE-FDD (SC-FDMA, 1RB, 5MHz, 16-QAM)	LTE-FDD	5.52	±0.5
10180	CAS	LTE-FDD (SC-FDMA, 1RB, 5MHz, 64-QAM)	LTE-FDD	5.50	±0.5
10181	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, 16-QAM)	LTE-FDD	5.50	±0.5
10182	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, 64-QAM)	LTE-FDD	5.50	±0.5
10183	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, 16-QAM)	LTE-FDD	5.50	±0.5
10184	CAS	LTE-FDD (SC-FDMA, 1RB, 10MHz, 64-QAM)	LTE-FDD	5.50	±0.5
10185	CAS	LTE-FDD (SC-FDMA, 1RB, 3MHz, 16-QAM)	LTE-FDD	5.51	±0.5
10186	CAS	LTE-FDD (SC-FDMA, 1RB, 3MHz, 64-QAM)	LTE-FDD	5.50	±0.5
10187	CAS	LTE-FDD (SC-FDMA, 1RB, 1.4MHz, QPSK)	LTE-FDD	5.73	±0.5
10188	CAS	LTE-FDD (SC-FDMA, 1RB, 1.4MHz, 16-QAM)	LTE-FDD	5.60	±0.5
10189	CAS	LTE-FDD (SC-FDMA, 1RB, 1.4MHz, 64-QAM)	LTE-FDD	5.50	±0.5
10190	CAS	IEEE 802.11n (HT Greenfield, 6.5Mbps, BPSK)	WLAN	5.09	±0.5
10191	CAS	IEEE 802.11n (HT Greenfield, 13Mbps, 16-QAM)	WLAN	5.10	±0.5
10192	CAS	IEEE 802.11n (HT Greenfield, 26Mbps, 64-QAM)	WLAN	5.21	±0.5
10193	CAS	IEEE 802.11n (HT Mixed, 6.5Mbps, BPSK)	WLAN	5.10	±0.5
10194	CAS	IEEE 802.11n (HT Mixed, 13Mbps, 16-QAM)	WLAN	5.15	±0.5
10195	CAS	IEEE 802.11n (HT Mixed, 26Mbps, 64-QAM)	WLAN	5.27	±0.5
10196	CAS	IEEE 802.11n (HT Mixed, 7.2Mbps, BPSK)	WLAN	5.05	±0.5
10197	CAS	IEEE 802.11n (HT Mixed, 14.4Mbps, 16-QAM)	WLAN	5.15	±0.5
10198	CAS	IEEE 802.11n (HT Mixed, 28.8Mbps, 64-QAM)	WLAN	5.27	±0.5
10199	CAS	IEEE 802.11n (HT Mixed, 43.2Mbps, 16-QAM)	WLAN	5.15	±0.5
10200	CAS	IEEE 802.11n (HT Mixed, 86.4Mbps, 64-QAM)	WLAN	5.27	±0.5
10201	CAS	IEEE 802.11n (HT Mixed, 129.6Mbps, 16-QAM)	WLAN	5.06	±0.5
10202	CAS	IEEE 802.11n (HT Mixed, 259.2Mbps, 64-QAM)	WLAN	5.48	±0.5
10203	CAS	IEEE 802.11n (HT Mixed, 388.8Mbps, 16-QAM)	WLAN	5.06	±0.5
10204	CAS	IEEE 802.11n (HT Mixed, 777.6Mbps, 64-QAM)	WLAN	5.06	±0.5

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UB	Rev	Communication System Name	Group	PAR (dB)	Max ² E = 2
10307	AAB	IEEE 802.11a WLAN (2918, 10m, 10MHz, QPSK, PUSC)	WLAN	14.49	<0.5
10308	AAB	IEEE 802.11a WLAN (2918, 10m, 10MHz, 16QAM, PUSC)	WLAN	14.48	<0.5
10309	AAB	IEEE 802.11a WLAN (2918, 10m, 10MHz, 16QAM, AMC 2nd)	WLAN	14.58	<0.5
10310	AAB	IEEE 802.11a WLAN (2918, 10m, 10MHz, QPSK, AMC 2nd)	WLAN	14.57	<0.5
10311	AAB	LTE FDD (SC-FDMA, 100% RB, 15MHz, QPSK)	LTE-FDD	9.26	<0.5
10312	AAD	TDN 1.5	TDN	10.51	<0.5
10313	AAD	TDN 1.6	TDN	13.48	<0.5
10315	AAD	IEEE 802.11g WIF 2.4GHz (QSSS, 1 Mbps, 60ps dc)	WLAN	1.71	<0.5
10316	AAD	IEEE 802.11g WIF 2.4GHz (ERP-OFDM, 6 Mbps, 60ps dc)	WLAN	8.36	<0.5
10317	AAA	IEEE 802.11g WIF 2.4GHz (OFDM, 6 Mbps, 60ps dc)	WLAN	8.36	<0.5
10352	AAA	Pulse Waveform (300 Hz, 10%)	General	10.20	<0.5
10353	AAA	Pulse Waveform (300 Hz, 20%)	General	8.90	<0.5
10354	AAA	Pulse Waveform (300 Hz, 40%)	General	3.58	<0.5
10355	AAA	Pulse Waveform (300 Hz, 60%)	General	2.22	<0.5
10356	AAA	Pulse Waveform (300 Hz, 80%)	General	0.97	<0.5
10387	AAA	QPSK Waveform, 1 MHz	General	5.10	<0.5
10388	AAA	QPSK Waveform, 10 MHz	General	5.20	<0.5
10389	AAA	64-QAM Waveform, 100 kHz	General	8.27	<0.5
10390	AAA	64-QAM Waveform, 40 MHz	General	8.27	<0.5
10400	AAD	IEEE 802.11ac WIF (30MHz, 64-QAM, 60ps dc)	WLAN	9.37	<0.5
10401	AAA	IEEE 802.11ac WIF (30MHz, 64-QAM, 60ps dc)	WLAN	9.00	<0.5
10402	AAA	IEEE 802.11ac WIF (30MHz, 64-QAM, 60ps dc)	WLAN	9.50	<0.5
10403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.70	<0.5
10404	AAB	CDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.77	<0.5
10405	AAD	CDMA2000, FC3, SC3, SC3H, Full Rate	CDMA2000	5.23	<0.5
10410	AAA	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK, UL, Sub-3.3, 7.8, 9)	LTE-TDD	7.82	<0.5
10414	AAA	WLAN OFDM, 64-QAM, 40 MHz	General	8.54	<0.5
10415	AAA	IEEE 802.11g WIF 2.4GHz (QSSS, 1 Mbps, 60ps dc)	WLAN	1.54	<0.5
10416	AAA	IEEE 802.11g WIF 2.4GHz (ERP-OFDM, 6 Mbps, 60ps dc)	WLAN	8.23	<0.5
10417	AAA	IEEE 802.11g WIF 2.4GHz (OFDM, 6 Mbps, 60ps dc)	WLAN	8.23	<0.5
10418	AAA	IEEE 802.11g WIF 2.4GHz (QSSS-CPDM, 6 Mbps, 60ps, Long)	WLAN	8.14	<0.5
10419	AAA	IEEE 802.11g WIF 2.4GHz (QSSS-CPDM, 6 Mbps, 60ps, Short)	WLAN	8.19	<0.5
10422	AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.52	<0.5
10423	AAA	IEEE 802.11n (HT Greenfield, 45.3 Mbps, 16-QAM)	WLAN	8.47	<0.5
10424	AAB	IEEE 802.11n (HT Greenfield, 70.2 Mbps, 64-QAM)	WLAN	8.40	<0.5
10425	AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.41	<0.5
10426	AAB	IEEE 802.11n (HT Greenfield, 60 Mbps, 16-QAM)	WLAN	8.45	<0.5
10427	AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	8.41	<0.5
10430	AAB	LTE-FDD (OFDMA, 8MHz, E-TM 3.1)	LTE-FDD	8.20	<0.5
10431	AAC	LTE-FDD (OFDMA, 10MHz, E-TM 3.1)	LTE-FDD	8.38	<0.5
10432	AAB	LTE-FDD (OFDMA, 15MHz, E-TM 3.1)	LTE-FDD	8.34	<0.5
10433	AAC	LTE-FDD (OFDMA, 20MHz, E-TM 3.1)	LTE-FDD	8.34	<0.5
10434	AAS	W-CDMA (BS Test Model 1, 64 DPCCH)	WCDMA	8.03	<0.5
10435	AAA	LTE-TDD (SC-FDMA, 1 RB, 20MHz, QPSK, UL, Sub3)	LTE-TDD	7.82	<0.5
10447	AAA	LTE-FDD (OFDMA, 8MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	<0.5
10448	AAA	LTE-FDD (OFDMA, 10MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.53	<0.5
10449	AAC	LTE-FDD (OFDMA, 15MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.51	<0.5
10450	AAA	LTE-FDD (OFDMA, 20MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	<0.5
10451	AAA	W-CDMA (BS Test Model 1, 64 DPCCH, Clipping 44%)	WCDMA	7.59	<0.5
10483	AAC	Validation (Square, 10 m, 1 m)	Test	10.00	<0.5
10486	AAC	IEEE 802.11ac WIF (160MHz, 64-QAM, 60ps dc)	WLAN	8.63	<0.5
10487	AAC	UMTS-FDD (DC-HSDPA)	WCDMA	6.82	<0.5
10455	AAC	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.05	<0.5
10455	AAC	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	<0.5
10460	AAC	UMTS-FDD (WCDMA, AMR)	WCDMA	3.39	<0.5
10461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, QPSK, UL, Sub1)	LTE-TDD	7.80	<0.5
10462	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 16-QAM, UL, Sub3)	LTE-TDD	8.30	<0.5
10463	AAD	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 64-QAM, UL, Sub3)	LTE-TDD	8.55	<0.5
10464	AAD	LTE-TDD (SC-FDMA, 1 RB, 3MHz, QPSK, UL, Sub3)	LTE-TDD	7.82	<0.5
10465	AAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 16-QAM, UL, Sub3)	LTE-TDD	8.32	<0.5
10466	AAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 64-QAM, UL, Sub3)	LTE-TDD	8.57	<0.5
10467	AAA	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL, Sub3)	LTE-TDD	7.83	<0.5
10468	AAC	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 16-QAM, UL, Sub3)	LTE-TDD	8.32	<0.5
10469	AAC	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 64-QAM, UL, Sub3)	LTE-TDD	8.55	<0.5
10470	AAD	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK, UL, Sub3)	LTE-TDD	7.82	<0.5
10471	AAC	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 16-QAM, UL, Sub3)	LTE-TDD	8.32	<0.5

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10472	AAC	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±0.6
10473	AAA	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK, UL Sub)	LTE-TDD	7.82	±0.6
10474	AAC	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 16-QAM, UL Sub)	LTE-TDD	8.52	±0.6
10475	AAC	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±0.6
10477	AAC	LTE-TDD (SC-FDMA, 1 RB, 20MHz, 16-QAM, UL Sub)	LTE-TDD	8.52	±0.6
10478	AAC	LTE-TDD (SC-FDMA, 1 RB, 20MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±0.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.74	±0.6
10480	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.18	±0.6
10481	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.48	±0.6
10489	AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.71	±0.6
10490	AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDD	8.39	±0.6
10494	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.47	±0.6
10495	AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.59	±0.6
10496	AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.38	±0.6
10497	AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.60	±0.6
10498	AAC	LTE-TDD (SC-FDMA, 50% RB, 10MHz, QPSK, UL Sub)	LTE-TDD	7.70	±0.6
10499	AAC	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 16-QAM, UL Sub)	LTE-TDD	8.31	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 10MHz, QPSK, UL Sub)	LTE-TDD	7.74	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 16-QAM, UL Sub)	LTE-TDD	8.41	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 64-QAM, UL Sub)	LTE-TDD	8.65	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 20MHz, QPSK, UL Sub)	LTE-TDD	7.74	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 20MHz, 16-QAM, UL Sub)	LTE-TDD	8.37	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 20MHz, 64-QAM, UL Sub)	LTE-TDD	8.64	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TDD	7.87	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.40	±0.6
10499	AAP	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.68	±0.6
10500	AAP	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.87	±0.6
10500	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDD	8.44	±0.6
10500	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.52	±0.6
10500	AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	7.75	±0.6
10500	AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TDD	8.31	±0.6
10500	AAC	LTE-TDD (SC-FDMA, 100% RB, 10MHz, QPSK, UL Sub)	LTE-TDD	8.54	±0.6
10500	AAC	LTE-TDD (SC-FDMA, 100% RB, 10MHz, 16-QAM, UL Sub)	LTE-TDD	7.74	±0.6
10507	AAC	LTE-TDD (SC-FDMA, 100% RB, 10MHz, 64-QAM, UL Sub)	LTE-TDD	8.38	±0.6
10508	AAP	LTE-TDD (SC-FDMA, 100% RB, 10MHz, QPSK, UL Sub)	LTE-TDD	8.25	±0.6
10509	AAP	LTE-TDD (SC-FDMA, 100% RB, 15MHz, QPSK, UL Sub)	LTE-TDD	7.98	±0.6
10510	AAP	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 16-QAM, UL Sub)	LTE-TDD	8.49	±0.6
10511	AAP	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 64-QAM, UL Sub)	LTE-TDD	8.51	±0.6
10512	AAP	LTE-TDD (SC-FDMA, 100% RB, 20MHz, QPSK, UL Sub)	LTE-TDD	7.74	±0.6
10513	AAP	LTE-TDD (SC-FDMA, 100% RB, 20MHz, 16-QAM, UL Sub)	LTE-TDD	8.42	±0.6
10514	AAP	LTE-TDD (SC-FDMA, 100% RB, 20MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	±0.6
10515	AAC	IEEE 802.11b WFI 2.4 GHz (DSSS, 2 Mbps, 99pc dc)	WLAN	1.58	±0.6
10516	AAC	IEEE 802.11b WFI 2.4 GHz (DSSS, 5.5 Mbps, 99pc dc)	WLAN	1.57	±0.6
10517	AAP	IEEE 802.11b WFI 2.4 GHz (DSSS, 11 Mbps, 99pc dc)	WLAN	1.58	±0.6
10518	AAP	IEEE 802.11ah WFI 5 GHz (OFDM, 9 Mbps, 99pc dc)	WLAN	8.23	±0.6
10519	AAP	IEEE 802.11ah WFI 5 GHz (OFDM, 12 Mbps, 99pc dc)	WLAN	8.39	±0.6
10520	AAB	IEEE 802.11ah WFI 5 GHz (OFDM, 18 Mbps, 99pc dc)	WLAN	8.12	±0.6
10521	AAB	IEEE 802.11ah WFI 5 GHz (OFDM, 24 Mbps, 99pc dc)	WLAN	7.97	±0.6
10522	AAB	IEEE 802.11ah WFI 5 GHz (OFDM, 36 Mbps, 99pc dc)	WLAN	8.45	±0.6
10523	AAC	IEEE 802.11ah WFI 5 GHz (OFDM, 48 Mbps, 99pc dc)	WLAN	8.08	±0.6
10524	AAC	IEEE 802.11ah WFI 5 GHz (OFDM, 54 Mbps, 99pc dc)	WLAN	8.27	±0.6
10525	AAC	IEEE 802.11ac WFI (20 MHz, MCS0, 99pc dc)	WLAN	8.36	±0.6
10526	AAP	IEEE 802.11ac WFI (20 MHz, MCS1, 99pc dc)	WLAN	8.42	±0.6
10527	AAP	IEEE 802.11ac WFI (20 MHz, MCS2, 99pc dc)	WLAN	8.21	±0.6
10528	AAP	IEEE 802.11ac WFI (20 MHz, MCS3, 99pc dc)	WLAN	8.36	±0.6
10529	AAP	IEEE 802.11ac WFI (20 MHz, MCS4, 99pc dc)	WLAN	8.30	±0.6
10530	AAP	IEEE 802.11ac WFI (20 MHz, MCS7, 99pc dc)	WLAN	8.43	±0.6
10531	AAP	IEEE 802.11ac WFI (20 MHz, MCS8, 99pc dc)	WLAN	8.23	±0.6
10532	AAC	IEEE 802.11ac WFI (20 MHz, MCS9, 99pc dc)	WLAN	8.38	±0.6
10533	AAC	IEEE 802.11ac WFI (40 MHz, MCS0, 99pc dc)	WLAN	8.45	±0.6
10534	AAC	IEEE 802.11ac WFI (40 MHz, MCS1, 99pc dc)	WLAN	8.45	±0.6
10535	AAP	IEEE 802.11ac WFI (40 MHz, MCS2, 99pc dc)	WLAN	8.32	±0.6
10536	AAP	IEEE 802.11ac WFI (40 MHz, MCS3, 99pc dc)	WLAN	8.44	±0.6
10537	AAP	IEEE 802.11ac WFI (40 MHz, MCS4, 99pc dc)	WLAN	8.54	±0.6
10538	AAP	IEEE 802.11ac WFI (40 MHz, MCS5, 99pc dc)	WLAN	8.38	±0.6
10540	AAA	IEEE 802.11ac WFI (40 MHz, MCS6, 99pc dc)	WLAN	8.38	±0.6

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10541	AAA	IEEE 802.11ac WPI (40 MHz, MCS7, 90pc dc)	WLAN	0.40	±0.0
10542	AAA	IEEE 802.11ac WPI (40 MHz, MCS8, 90pc dc)	WLAN	0.60	±0.0
10543	AAC	IEEE 802.11ac WPI (40 MHz, MCS9, 90pc dc)	WLAN	0.60	±0.0
10544	AAC	IEEE 802.11ac WPI (80 MHz, MCS0, 90pc dc)	WLAN	0.47	±0.0
10545	AAC	IEEE 802.11ac WPI (80 MHz, MCS1, 90pc dc)	WLAN	0.50	±0.0
10546	AAC	IEEE 802.11ac WPI (80 MHz, MCS2, 90pc dc)	WLAN	0.50	±0.0
10547	AAC	IEEE 802.11ac WPI (80 MHz, MCS3, 90pc dc)	WLAN	0.40	±0.0
10548	AAC	IEEE 802.11ac WPI (80 MHz, MCS4, 90pc dc)	WLAN	0.57	±0.0
10549	AAC	IEEE 802.11ac WPI (80 MHz, MCS5, 90pc dc)	WLAN	0.58	±0.0
10550	AAC	IEEE 802.11ac WPI (80 MHz, MCS6, 90pc dc)	WLAN	0.50	±0.0
10551	AAC	IEEE 802.11ac WPI (80 MHz, MCS7, 90pc dc)	WLAN	0.50	±0.0
10552	AAC	IEEE 802.11ac WPI (80 MHz, MCS8, 90pc dc)	WLAN	0.42	±0.0
10553	AAC	IEEE 802.11ac WPI (80 MHz, MCS9, 90pc dc)	WLAN	0.48	±0.0
10554	AAC	IEEE 802.11ac WPI (160 MHz, MCS0, 90pc dc)	WLAN	0.40	±0.0
10555	AAC	IEEE 802.11ac WPI (160 MHz, MCS1, 90pc dc)	WLAN	0.47	±0.0
10556	AAC	IEEE 802.11ac WPI (160 MHz, MCS2, 90pc dc)	WLAN	0.50	±0.0
10557	AAC	IEEE 802.11ac WPI (160 MHz, MCS3, 90pc dc)	WLAN	0.52	±0.0
10558	AAC	IEEE 802.11ac WPI (160 MHz, MCS4, 90pc dc)	WLAN	0.61	±0.0
10559	AAC	IEEE 802.11ac WPI (160 MHz, MCS5, 90pc dc)	WLAN	0.70	±0.0
10560	AAC	IEEE 802.11ac WPI (160 MHz, MCS6, 90pc dc)	WLAN	0.60	±0.0
10561	AAC	IEEE 802.11ac WPI (160 MHz, MCS7, 90pc dc)	WLAN	0.60	±0.0
10562	AAC	IEEE 802.11ac WPI (160 MHz, MCS8, 90pc dc)	WLAN	0.60	±0.0
10563	AAC	IEEE 802.11ac WPI (160 MHz, MCS9, 90pc dc)	WLAN	0.77	±0.0
10564	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 3 Mbps, 90pc dc)	WLAN	0.20	±0.0
10565	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	0.40	±0.0
10566	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc)	WLAN	0.13	±0.0
10567	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	0.00	±0.0
10568	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc)	WLAN	0.37	±0.0
10569	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc dc)	WLAN	0.10	±0.0
10570	AAC	IEEE 802.11g WPI 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc)	WLAN	0.30	±0.0
10571	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS, 1 Mbps, 90pc dc)	WLAN	1.90	±0.0
10572	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS, 2 Mbps, 90pc dc)	WLAN	1.90	±0.0
10573	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS, 3 Mbps, 90pc dc)	WLAN	1.90	±0.0
10574	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS, 4 Mbps, 90pc dc)	WLAN	1.90	±0.0
10575	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 4 Mbps, 90pc dc)	WLAN	0.50	±0.0
10576	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 8 Mbps, 90pc dc)	WLAN	0.50	±0.0
10577	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	0.70	±0.0
10578	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc)	WLAN	0.40	±0.0
10579	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	0.30	±0.0
10580	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc)	WLAN	0.70	±0.0
10581	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc dc)	WLAN	0.35	±0.0
10582	AAC	IEEE 802.11b WPI 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc)	WLAN	0.67	±0.0
10583	AAC	IEEE 802.11ah WPI 5 GHz (OFDM, 3 Mbps, 90pc dc)	WLAN	0.50	±0.0
10584	AAC	IEEE 802.11ah WPI 5 GHz (OFDM, 6 Mbps, 90pc dc)	WLAN	0.60	±0.0
10585	AAC	IEEE 802.11ah WPI 5 GHz (OFDM, 12 Mbps, 90pc dc)	WLAN	0.70	±0.0
10586	AAC	IEEE 802.11ah WPI 5 GHz (OFDM, 18 Mbps, 90pc dc)	WLAN	0.40	±0.0
10587	AAA	IEEE 802.11ah WPI 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	0.30	±0.0
10588	AAA	IEEE 802.11ah WPI 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	0.70	±0.0
10589	AAA	IEEE 802.11ah WPI 5 GHz (OFDM, 48 Mbps, 90pc dc)	WLAN	0.35	±0.0
10590	AAA	IEEE 802.11ah WPI 5 GHz (OFDM, 54 Mbps, 90pc dc)	WLAN	0.67	±0.0
10591	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc dc)	WLAN	0.60	±0.0
10592	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc dc)	WLAN	0.70	±0.0
10593	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc dc)	WLAN	0.64	±0.0
10594	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc dc)	WLAN	0.74	±0.0
10595	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc dc)	WLAN	0.74	±0.0
10596	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc dc)	WLAN	0.71	±0.0
10597	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc dc)	WLAN	0.70	±0.0
10598	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc dc)	WLAN	0.80	±0.0
10599	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS8, 90pc dc)	WLAN	0.79	±0.0
10600	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc dc)	WLAN	0.68	±0.0
10601	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc dc)	WLAN	0.82	±0.0
10602	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc dc)	WLAN	0.94	±0.0
10603	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc dc)	WLAN	0.93	±0.0
10604	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc dc)	WLAN	0.70	±0.0
10605	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc dc)	WLAN	0.97	±0.0
10606	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc dc)	WLAN	0.82	±0.0
10607	AAC	IEEE 802.11ac WPI (20 MHz, MCS0, 90pc dc)	WLAN	0.64	±0.0
10608	AAC	IEEE 802.11ac WPI (20 MHz, MCS1, 90pc dc)	WLAN	0.77	±0.0

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10609	AAC	IEEE 802.11ac WPI (20 MHz, MCS3, 90ps dc)	WLAN	8.67	±0.8
10610	AAC	IEEE 802.11ac WPI (20 MHz, MCS4, 90ps dc)	WLAN	8.78	±0.8
10611	AAC	IEEE 802.11ac WPI (20 MHz, MCS4, 90ps dc)	WLAN	8.70	±0.8
10612	AAC	IEEE 802.11ac WPI (20 MHz, MCS5, 90ps dc)	WLAN	8.77	±0.8
10613	AAC	IEEE 802.11ac WPI (20 MHz, MCS6, 90ps dc)	WLAN	8.94	±0.8
10614	AAC	IEEE 802.11ac WPI (20 MHz, MCS7, 90ps dc)	WLAN	8.59	±0.8
10615	AAC	IEEE 802.11ac WPI (20 MHz, MCS8, 90ps dc)	WLAN	8.62	±0.8
10616	AAC	IEEE 802.11ac WPI (20 MHz, MCS9, 90ps dc)	WLAN	8.62	±0.8
10617	AAC	IEEE 802.11ac WPI (20 MHz, MCS1, 90ps dc)	WLAN	8.81	±0.8
10618	AAC	IEEE 802.11ac WPI (20 MHz, MCS2, 90ps dc)	WLAN	8.66	±0.8
10619	AAC	IEEE 802.11ac WPI (20 MHz, MCS3, 90ps dc)	WLAN	8.66	±0.8
10620	AAC	IEEE 802.11ac WPI (20 MHz, MCS4, 90ps dc)	WLAN	8.67	±0.8
10621	AAC	IEEE 802.11ac WPI (20 MHz, MCS5, 90ps dc)	WLAN	8.77	±0.8
10622	AAC	IEEE 802.11ac WPI (20 MHz, MCS6, 90ps dc)	WLAN	8.66	±0.8
10623	AAC	IEEE 802.11ac WPI (20 MHz, MCS7, 90ps dc)	WLAN	8.82	±0.8
10624	AAC	IEEE 802.11ac WPI (20 MHz, MCS8, 90ps dc)	WLAN	8.66	±0.8
10625	AAC	IEEE 802.11ac WPI (20 MHz, MCS9, 90ps dc)	WLAN	8.66	±0.8
10626	AAC	IEEE 802.11ac WPI (20 MHz, MCS1, 90ps dc)	WLAN	8.85	±0.8
10627	AAC	IEEE 802.11ac WPI (20 MHz, MCS2, 90ps dc)	WLAN	8.86	±0.8
10628	AAC	IEEE 802.11ac WPI (20 MHz, MCS3, 90ps dc)	WLAN	8.71	±0.8
10629	AAC	IEEE 802.11ac WPI (20 MHz, MCS4, 90ps dc)	WLAN	8.85	±0.8
10630	AAC	IEEE 802.11ac WPI (20 MHz, MCS5, 90ps dc)	WLAN	8.72	±0.8
10631	AAC	IEEE 802.11ac WPI (20 MHz, MCS6, 90ps dc)	WLAN	8.81	±0.8
10632	AAC	IEEE 802.11ac WPI (20 MHz, MCS7, 90ps dc)	WLAN	8.74	±0.8
10633	AAC	IEEE 802.11ac WPI (20 MHz, MCS8, 90ps dc)	WLAN	8.63	±0.8
10634	AAC	IEEE 802.11ac WPI (20 MHz, MCS9, 90ps dc)	WLAN	8.90	±0.8
10635	AAC	IEEE 802.11ac WPI (20 MHz, MCS1, 90ps dc)	WLAN	8.81	±0.8
10636	AAC	IEEE 802.11ac WPI (20 MHz, MCS2, 90ps dc)	WLAN	8.83	±0.8
10637	AAC	IEEE 802.11ac WPI (20 MHz, MCS3, 90ps dc)	WLAN	8.79	±0.8
10638	AAC	IEEE 802.11ac WPI (20 MHz, MCS4, 90ps dc)	WLAN	8.86	±0.8
10639	AAC	IEEE 802.11ac WPI (20 MHz, MCS5, 90ps dc)	WLAN	8.85	±0.8
10640	AAC	IEEE 802.11ac WPI (20 MHz, MCS6, 90ps dc)	WLAN	8.98	±0.8
10641	AAC	IEEE 802.11ac WPI (20 MHz, MCS7, 90ps dc)	WLAN	8.95	±0.8
10642	AAC	IEEE 802.11ac WPI (20 MHz, MCS8, 90ps dc)	WLAN	8.95	±0.8
10643	AAC	IEEE 802.11ac WPI (20 MHz, MCS9, 90ps dc)	WLAN	8.89	±0.8
10644	AAC	IEEE 802.11ac WPI (20 MHz, MCS1, 90ps dc)	WLAN	8.95	±0.8
10645	AAC	IEEE 802.11ac WPI (20 MHz, MCS2, 90ps dc)	WLAN	8.11	±0.8
10646	AAC	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Sub-3.7)	LTE-TDD	11.96	±0.6
10647	AAC	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Sub-3.7)	LTE-TDD	11.96	±0.6
10648	AAC	COMA2000 (1x Advanced)	COMA2000	3.45	±0.6
10652	AAC	LTE-TDD (OFDMA, 5MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.81	±0.6
10653	AAC	LTE-TDD (OFDMA, 10MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.43	±0.6
10654	AAC	LTE-TDD (OFDMA, 15MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	±0.6
10655	AAC	LTE-TDD (OFDMA, 20MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	±0.6
10656	AAC	Pulse Waveform (300 Hz, 10%)	Test	10.00	±0.6
10658	AAC	Pulse Waveform (300 Hz, 20%)	Test	8.99	±0.6
10659	AAC	Pulse Waveform (300 Hz, 40%)	Test	3.98	±0.6
10661	AAC	Pulse Waveform (300 Hz, 60%)	Test	2.82	±0.6
10662	AAC	Pulse Waveform (300 Hz, 80%)	Test	0.97	±0.6
10670	AAC	Bluetooth Low Energy	Bluetooth	2.19	±0.6
10671	AAC	IEEE 802.11ac (20 MHz, MCS0, 90ps dc)	WLAN	9.05	±0.6
10672	AAC	IEEE 802.11ac (20 MHz, MCS1, 90ps dc)	WLAN	8.57	±0.6
10673	AAC	IEEE 802.11ac (20 MHz, MCS2, 90ps dc)	WLAN	8.76	±0.6
10674	AAC	IEEE 802.11ac (20 MHz, MCS3, 90ps dc)	WLAN	8.74	±0.6
10675	AAC	IEEE 802.11ac (20 MHz, MCS4, 90ps dc)	WLAN	8.50	±0.6
10676	AAC	IEEE 802.11ac (20 MHz, MCS5, 90ps dc)	WLAN	8.77	±0.6
10677	AAC	IEEE 802.11ac (20 MHz, MCS6, 90ps dc)	WLAN	8.73	±0.6
10678	AAC	IEEE 802.11ac (20 MHz, MCS7, 90ps dc)	WLAN	8.78	±0.6
10679	AAC	IEEE 802.11ac (20 MHz, MCS8, 90ps dc)	WLAN	8.85	±0.6
10680	AAC	IEEE 802.11ac (20 MHz, MCS9, 90ps dc)	WLAN	8.80	±0.6
10681	AAC	IEEE 802.11ac (20 MHz, MCS10, 90ps dc)	WLAN	8.82	±0.6
10682	AAC	IEEE 802.11ac (20 MHz, MCS11, 90ps dc)	WLAN	8.85	±0.6
10683	AAC	IEEE 802.11ac (20 MHz, MCS1, 90ps dc)	WLAN	8.42	±0.6
10684	AAC	IEEE 802.11ac (20 MHz, MCS1, 90ps dc)	WLAN	8.25	±0.6
10685	AAC	IEEE 802.11ac (20 MHz, MCS2, 90ps dc)	WLAN	8.33	±0.6
10686	AAC	IEEE 802.11ac (20 MHz, MCS3, 90ps dc)	WLAN	8.25	±0.6

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LRD	Rev	Communication System Name	Group	PAI (dB)	Unc* k = 2
10687	AAI	IEEE 802.11ax (25 MHz, MCS4, 80ps dc)	WLAN	0.45	±0.5
10688	AAI	IEEE 802.11ax (25 MHz, MCS5, 80ps dc)	WLAN	0.29	±0.5
10689	AAI	IEEE 802.11ax (25 MHz, MCS6, 80ps dc)	WLAN	0.05	±0.5
10690	AAI	IEEE 802.11ax (25 MHz, MCS7, 80ps dc)	WLAN	0.29	±0.5
10691	AAI	IEEE 802.11ax (25 MHz, MCS8, 80ps dc)	WLAN	0.29	±0.5
10692	AAA	IEEE 802.11ax (25 MHz, MCS9, 80ps dc)	WLAN	0.29	±0.5
10693	AAA	IEEE 802.11ax (25 MHz, MCS10, 80ps dc)	WLAN	0.29	±0.5
10694	AAA	IEEE 802.11ax (25 MHz, MCS11, 80ps dc)	WLAN	0.67	±0.5
10695	AAA	IEEE 802.11ax (40 MHz, MCS0, 80ps dc)	WLAN	0.78	±0.5
10696	AAA	IEEE 802.11ax (40 MHz, MCS1, 80ps dc)	WLAN	0.61	±0.5
10697	AAA	IEEE 802.11ax (40 MHz, MCS2, 80ps dc)	WLAN	0.61	±0.5
10698	AAA	IEEE 802.11ax (40 MHz, MCS3, 80ps dc)	WLAN	0.89	±0.5
10699	AAA	IEEE 802.11ax (40 MHz, MCS4, 80ps dc)	WLAN	0.89	±0.5
10700	AAA	IEEE 802.11ax (40 MHz, MCS5, 80ps dc)	WLAN	0.70	±0.5
10701	AAA	IEEE 802.11ax (40 MHz, MCS6, 80ps dc)	WLAN	0.86	±0.5
10702	AAA	IEEE 802.11ax (40 MHz, MCS7, 80ps dc)	WLAN	0.70	±0.5
10703	AAA	IEEE 802.11ax (40 MHz, MCS8, 80ps dc)	WLAN	0.82	±0.5
10704	AAA	IEEE 802.11ax (40 MHz, MCS9, 80ps dc)	WLAN	0.86	±0.5
10705	AAA	IEEE 802.11ax (40 MHz, MCS10, 80ps dc)	WLAN	0.89	±0.5
10706	AAI	IEEE 802.11ax (40 MHz, MCS11, 80ps dc)	WLAN	0.86	±0.5
10707	AAC	IEEE 802.11ax (40 MHz, MCS0, 90ps dc)	WLAN	0.33	±0.5
10708	AAC	IEEE 802.11ax (40 MHz, MCS1, 90ps dc)	WLAN	0.66	±0.5
10709	AAC	IEEE 802.11ax (40 MHz, MCS2, 90ps dc)	WLAN	0.33	±0.5
10710	AAC	IEEE 802.11ax (40 MHz, MCS3, 90ps dc)	WLAN	0.29	±0.5
10711	AAC	IEEE 802.11ax (40 MHz, MCS4, 90ps dc)	WLAN	0.39	±0.5
10712	AAC	IEEE 802.11ax (40 MHz, MCS5, 90ps dc)	WLAN	0.67	±0.5
10713	AAC	IEEE 802.11ax (40 MHz, MCS6, 90ps dc)	WLAN	0.33	±0.5
10714	AAC	IEEE 802.11ax (40 MHz, MCS7, 90ps dc)	WLAN	0.86	±0.5
10715	AAC	IEEE 802.11ax (40 MHz, MCS8, 90ps dc)	WLAN	0.48	±0.5
10716	AAC	IEEE 802.11ax (40 MHz, MCS9, 90ps dc)	WLAN	0.30	±0.5
10717	AAC	IEEE 802.11ax (40 MHz, MCS10, 90ps dc)	WLAN	0.48	±0.5
10718	AAC	IEEE 802.11ax (40 MHz, MCS11, 90ps dc)	WLAN	0.24	±0.5
10719	AAC	IEEE 802.11ax (80 MHz, MCS0, 90ps dc)	WLAN	0.81	±0.5
10720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90ps dc)	WLAN	0.87	±0.5
10721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90ps dc)	WLAN	0.76	±0.5
10722	AAC	IEEE 802.11ax (80 MHz, MCS3, 90ps dc)	WLAN	0.56	±0.5
10723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90ps dc)	WLAN	0.70	±0.5
10724	AAC	IEEE 802.11ax (80 MHz, MCS5, 90ps dc)	WLAN	0.90	±0.5
10725	AAC	IEEE 802.11ax (80 MHz, MCS6, 90ps dc)	WLAN	0.74	±0.5
10726	AAC	IEEE 802.11ax (80 MHz, MCS7, 90ps dc)	WLAN	0.72	±0.5
10727	AAC	IEEE 802.11ax (80 MHz, MCS8, 90ps dc)	WLAN	0.66	±0.5
10728	AAC	IEEE 802.11ax (80 MHz, MCS9, 90ps dc)	WLAN	0.85	±0.5
10729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90ps dc)	WLAN	0.64	±0.5
10730	AAC	IEEE 802.11ax (80 MHz, MCS11, 90ps dc)	WLAN	0.87	±0.5
10731	AAC	IEEE 802.11ax (95 MHz, MCS0, 90ps dc)	WLAN	0.42	±0.5
10732	AAC	IEEE 802.11ax (95 MHz, MCS1, 90ps dc)	WLAN	0.48	±0.5
10733	AAC	IEEE 802.11ax (95 MHz, MCS2, 90ps dc)	WLAN	0.40	±0.5
10734	AAC	IEEE 802.11ax (95 MHz, MCS3, 90ps dc)	WLAN	0.28	±0.5
10735	AAC	IEEE 802.11ax (95 MHz, MCS4, 90ps dc)	WLAN	0.33	±0.5
10736	AAC	IEEE 802.11ax (95 MHz, MCS5, 90ps dc)	WLAN	0.27	±0.5
10737	AAC	IEEE 802.11ax (95 MHz, MCS6, 90ps dc)	WLAN	0.36	±0.5
10738	AAC	IEEE 802.11ax (95 MHz, MCS7, 90ps dc)	WLAN	0.42	±0.5
10739	AAC	IEEE 802.11ax (95 MHz, MCS8, 90ps dc)	WLAN	0.39	±0.5
10740	AAC	IEEE 802.11ax (95 MHz, MCS9, 90ps dc)	WLAN	0.48	±0.5
10741	AAC	IEEE 802.11ax (95 MHz, MCS10, 90ps dc)	WLAN	0.40	±0.5
10742	AAC	IEEE 802.11ax (95 MHz, MCS11, 90ps dc)	WLAN	0.43	±0.5
10743	AAC	IEEE 802.11ax (160 MHz, MCS0, 90ps dc)	WLAN	0.94	±0.5
10744	AAC	IEEE 802.11ax (160 MHz, MCS1, 90ps dc)	WLAN	0.94	±0.5
10745	AAC	IEEE 802.11ax (160 MHz, MCS2, 90ps dc)	WLAN	0.92	±0.5
10746	AAC	IEEE 802.11ax (160 MHz, MCS3, 90ps dc)	WLAN	0.71	±0.5
10747	AAC	IEEE 802.11ax (160 MHz, MCS4, 90ps dc)	WLAN	0.94	±0.5
10748	AAC	IEEE 802.11ax (160 MHz, MCS5, 90ps dc)	WLAN	0.93	±0.5
10749	AAC	IEEE 802.11ax (160 MHz, MCS6, 90ps dc)	WLAN	0.90	±0.5
10750	AAC	IEEE 802.11ax (160 MHz, MCS7, 90ps dc)	WLAN	0.79	±0.5
10751	AAC	IEEE 802.11ax (160 MHz, MCS8, 90ps dc)	WLAN	0.82	±0.5
10752	AAC	IEEE 802.11ax (160 MHz, MCS9, 90ps dc)	WLAN	0.81	±0.5

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10753	AAC	IEEE 802.11ax (160 MHz, MCS10, 8000 do)	WLAN	8.95	±0.6
10754	AAC	IEEE 802.11ax (160 MHz, MCS11, 8000 do)	WLAN	8.94	±0.6
10755	AAC	IEEE 802.11ax (160 MHz, MCS5, 8000 do)	WLAN	8.94	±0.6
10756	AAC	IEEE 802.11ax (160 MHz, MCS1, 8000 do)	WLAN	8.77	±0.6
10757	AAC	IEEE 802.11ax (160 MHz, MCS2, 8000 do)	WLAN	8.77	±0.6
10758	AAC	IEEE 802.11ax (160 MHz, MCS3, 8000 do)	WLAN	8.69	±0.6
10759	AAC	IEEE 802.11ax (160 MHz, MCS4, 8000 do)	WLAN	8.58	±0.6
10760	AAC	IEEE 802.11ax (160 MHz, MCS5, 8000 do)	WLAN	8.49	±0.6
10761	AAC	IEEE 802.11ax (160 MHz, MCS6, 8000 do)	WLAN	8.34	±0.6
10762	AAC	IEEE 802.11ax (160 MHz, MCS7, 8000 do)	WLAN	8.28	±0.6
10763	AAC	IEEE 802.11ax (160 MHz, MCS8, 8000 do)	WLAN	8.23	±0.6
10764	AAC	IEEE 802.11ax (160 MHz, MCS9, 8000 do)	WLAN	8.54	±0.6
10765	AAC	IEEE 802.11ax (160 MHz, MCS15, 8000 do)	WLAN	8.54	±0.6
10766	AAC	IEEE 802.11ax (160 MHz, MCS11, 8000 do)	WLAN	8.51	±0.6
10767	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	7.58	±0.6
10768	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.01	±0.6
10769	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.01	±0.6
10770	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.02	±0.6
10771	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.02	±0.6
10772	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.25	±0.6
10773	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.05	±0.6
10774	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.02	±0.6
10775	AAC	5G NR (CP-OFDM, 60% RB, 5 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.31	±0.6
10776	AAC	5G NR (CP-OFDM, 60% RB, 10 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.30	±0.6
10777	AAC	5G NR (CP-OFDM, 60% RB, 15 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.30	±0.6
10778	AAC	5G NR (CP-OFDM, 60% RB, 20 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.34	±0.6
10779	AAC	5G NR (CP-OFDM, 60% RB, 25 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.42	±0.6
10780	AAC	5G NR (CP-OFDM, 60% RB, 30 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.38	±0.6
10781	AAC	5G NR (CP-OFDM, 60% RB, 40 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.38	±0.6
10782	AAC	5G NR (CP-OFDM, 60% RB, 50 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.43	±0.6
10783	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.31	±0.6
10784	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.29	±0.6
10785	AAC	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.40	±0.6
10786	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.35	±0.6
10787	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.44	±0.6
10788	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.39	±0.6
10789	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.37	±0.6
10790	AAC	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 MHz)	5G NR FR1 TDD	8.39	±0.6
10791	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.85	±0.6
10792	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.92	±0.6
10793	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.95	±0.6
10794	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±0.6
10795	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.84	±0.6
10796	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±0.6
10797	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.01	±0.6
10798	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±0.6
10799	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	±0.6
10800	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±0.6
10801	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±0.6
10802	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.87	±0.6
10803	AAC	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	±0.6
10804	AAC	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±0.6
10805	AAC	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.37	±0.6
10806	AAC	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±0.6
10807	AAC	5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±0.6
10808	AAC	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±0.6
10809	AAC	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	±0.6
10810	AAC	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	±0.6
10811	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.06	±0.6
10812	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.04	±0.6
10813	AAC	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	±0.6
10814	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.30	±0.6
10815	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±0.6
10816	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±0.6
10817	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.38	±0.6
10818	AAC	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.38	±0.6
10819	AAC	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±0.6
10820	AAC	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.42	±0.6
10821	AAC	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.42	±0.6
10822	AAC	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.43	±0.6

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UIC	Rev	Communication System Name	Group	PAR (dB)	Line# x z
10030	AAD	SG NR (CF-OFDM, 155% RB, 150 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	8.40	±0.6
10030	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.63	±0.6
10031	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.73	±0.6
10032	AAD	SG NR (CF-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.74	±0.6
10032	AAD	SG NR (CF-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.70	±0.6
10034	AAD	SG NR (CF-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.75	±0.6
10035	AAD	SG NR (CF-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.76	±0.6
10036	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.88	±0.6
10037	AAD	SG NR (CF-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.88	±0.6
10038	AAD	SG NR (CF-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.76	±0.6
10040	AAD	SG NR (CF-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.67	±0.6
10041	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.71	±0.6
10043	AAD	SG NR (CF-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.48	±0.6
10044	AAD	SG NR (CF-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.44	±0.6
10045	AAD	SG NR (CF-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.31	±0.6
10050	AAD	SG NR (CF-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.34	±0.6
10055	AAD	SG NR (CF-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.38	±0.6
10056	AAD	SG NR (CF-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.37	±0.6
10057	AAD	SG NR (CF-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.35	±0.6
10058	AAD	SG NR (CF-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.38	±0.6
10059	AAD	SG NR (CF-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.34	±0.6
10060	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.41	±0.6
10061	AAD	SG NR (CF-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.40	±0.6
10063	AAD	SG NR (CF-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.41	±0.6
10064	AAD	SG NR (CF-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.37	±0.6
10065	AAD	SG NR (CF-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	8.41	±0.6
10066	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	6.66	±0.6
10068	AAD	SG NR (CF-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	6.69	±0.6
10069	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	6.76	±0.6
10071	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	6.86	±0.6
10072	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	6.76	±0.6
10073	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	6.61	±0.6
10074	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	6.68	±0.6
10075	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	SG NR FR1 TDD	7.38	±0.6
10076	AAD	SG NR (CF-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	SG NR FR1 TDD	6.30	±0.6
10077	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	7.98	±0.6
10078	AAD	SG NR (CF-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	6.41	±0.6
10079	AAD	SG NR (CF-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	6.12	±0.6
10080	AAD	SG NR (CF-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	6.38	±0.6
10081	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	SG NR FR1 TDD	5.75	±0.6
10083	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	SG NR FR1 TDD	5.88	±0.6
10083	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	6.57	±0.6
10084	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	6.53	±0.6
10085	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	6.61	±0.6
10086	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	6.65	±0.6
10087	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	SG NR FR1 TDD	7.76	±0.6
10088	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	SG NR FR1 TDD	6.35	±0.6
10089	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	8.02	±0.6
10090	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	SG NR FR1 TDD	8.40	±0.6
10091	AAD	SG NR (CF-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	8.13	±0.6
10092	AAD	SG NR (CF-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	SG NR FR1 TDD	8.41	±0.6
10097	AAD	SG NR (CF-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.66	±0.6
10098	AAD	SG NR (CF-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.67	±0.6
10099	AAD	SG NR (CF-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.67	±0.6
10100	AAD	SG NR (CF-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10101	AAD	SG NR (CF-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10102	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10103	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10104	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10105	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10106	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10107	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10108	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10109	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10110	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10111	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10112	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10113	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10114	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10115	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10116	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10117	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10118	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10119	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10120	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10121	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10122	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10123	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10124	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10125	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10126	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10127	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10128	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10129	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10130	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10131	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10132	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10133	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10134	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10135	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10136	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10137	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10138	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10139	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10140	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10141	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10142	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10143	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10144	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10145	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10146	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10147	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10148	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10149	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10150	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10151	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10152	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10153	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10154	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10155	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10156	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10157	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10158	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10159	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10160	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10161	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10162	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10163	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10164	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10165	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10166	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10167	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10168	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10169	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10170	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10171	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10172	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10173	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10174	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10175	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10176	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10177	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10178	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10179	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10180	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10181	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10182	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10183	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10184	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10185	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10186	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10187	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10188	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10189	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10190	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10191	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10192	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10193	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10194	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10195	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10196	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10197	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10198	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10199	AAD	SG NR (CF-OFDM, 1 RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.68	±0.6
10200	AAD	SG NR (CF			

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UID	Rev	Communication System Name	Group	PAN (dB)	Unc. k = 2
10911	AAD	SG NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.90	+0.5
10912	AAD	SG NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10913	AAD	SG NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10914	AAD	SG NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.95	+0.5
10915	AAD	SG NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.90	+0.5
10916	AAD	SG NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.87	+0.5
10917	AAD	SG NR (DFT-s-OFDM, 50% RB, 100 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10918	AAD	SG NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.98	+0.5
10919	AAD	SG NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.98	+0.5
10920	AAD	SG NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.97	+0.5
10921	AAD	SG NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10922	AAD	SG NR (DFT-s-OFDM, 100% RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.92	+0.5
10923	AAD	SG NR (DFT-s-OFDM, 100% RB, 35 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10924	AAD	SG NR (DFT-s-OFDM, 100% RB, 45 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10925	AAD	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.95	+0.5
10926	AAD	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10927	AAD	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	+0.5
10928	AAD	SG NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.72	+0.5
10929	AAD	SG NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.72	+0.5
10930	AAD	SG NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.72	+0.5
10931	AAD	SG NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.51	+0.5
10932	AAD	SG NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.51	+0.5
10933	AAA	SG NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.51	+0.5
10934	AAA	SG NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.51	+0.5
10935	AAA	SG NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.51	+0.5
10936	AAC	SG NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.90	+0.5
10937	AAB	SG NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.77	+0.5
10938	AAB	SG NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.95	+0.5
10939	AAB	SG NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.92	+0.5
10940	AAB	SG NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.98	+0.5
10941	AAB	SG NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.93	+0.5
10942	AAB	SG NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.95	+0.5
10943	AAB	SG NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.95	+0.5
10944	AAB	SG NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.91	+0.5
10945	AAB	SG NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.93	+0.5
10946	AAC	SG NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.93	+0.5
10947	AAB	SG NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.97	+0.5
10948	AAB	SG NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.94	+0.5
10949	AAB	SG NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.97	+0.5
10950	AAB	SG NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.94	+0.5
10951	AA5	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.92	+0.5
10952	AAB	SG NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	SG NR FR1 FDD	8.25	+0.5
10953	AAB	SG NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	SG NR FR1 FDD	8.15	+0.5
10954	AAB	SG NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	SG NR FR1 FDD	8.23	+0.5
10955	AAB	SG NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	SG NR FR1 FDD	8.42	+0.5
10956	AAB	SG NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	SG NR FR1 FDD	8.14	+0.5
10957	AAC	SG NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	SG NR FR1 FDD	8.31	+0.5
10958	AAB	SG NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	SG NR FR1 FDD	8.61	+0.5
10959	AAB	SG NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	SG NR FR1 FDD	8.33	+0.5
10960	AAB	SG NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	SG NR FR1 FDD	9.32	+0.5
10961	AAB	SG NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	SG NR FR1 TDD	9.36	+0.5
10962	AAB	SG NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	SG NR FR1 TDD	9.40	+0.5
10963	AAB	SG NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	SG NR FR1 TDD	9.59	+0.5
10964	AAB	SG NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	SG NR FR1 TDD	9.39	+0.5
10965	AAB	SG NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	SG NR FR1 TDD	9.37	+0.5
10966	AAB	SG NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	SG NR FR1 TDD	9.58	+0.5
10967	AAB	SG NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	SG NR FR1 TDD	9.49	+0.5
10968	AAB	SG NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	SG NR FR1 TDD	9.49	+0.5
10972	AAB	SG NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	SG NR FR1 TDD	11.59	+0.5
10973	AAB	SG NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	9.08	+0.5
10974	AAB	SG NR (CP-OFDM, 100% RB, 100 MHz, 256-QAM, 30 kHz)	SG NR FR1 TDD	10.28	+0.5
10978	AAA	ULLA BDR	ULLA	2.23	+0.5
10979	AAA	ULLA HDR4	ULLA	7.02	+0.5
10980	AAA	ULLA HDR8	ULLA	8.88	+0.5
10981	AAA	ULLA HDRp4	ULLA	1.50	+0.5
10982	AAA	ULLA HDRp8	ULLA	1.44	+0.5

Certificate No: EUMWV4 - SN-9641_Oct22

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EUmmWV4 - SN:9641

October 25, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^B k = 3
10993	AAA	SG NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 MHz)	SG NR PR1 TDD	9.91	±0.5
10994	AAA	SG NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 15 MHz)	SG NR PR1 TDD	9.42	±0.5
10995	AAA	SG NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 35 MHz)	SG NR PR1 TDD	9.54	±0.5
10996	AAA	SG NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 35 MHz)	SG NR PR1 TDD	9.50	±0.5
10997	AAA	SG NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 35 MHz)	SG NR PR1 TDD	9.50	±0.5
10998	AAA	SG NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 35 MHz)	SG NR PR1 TDD	9.39	±0.5
10999	AAA	SG NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 35 MHz)	SG NR PR1 TDD	9.30	±0.5
10999	AAA	SG NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 35 MHz)	SG NR PR1 TDD	9.52	±0.5

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

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ANNEX B

VALIDATION SOURCE CALIBRATION REPORTS

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**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 UK**

Certificate No: 5G-Ver10-1053_Oct22

CALIBRATION CERTIFICATE

Object: 5G Verification Source 10 GHz - SN: 1053

Calibration procedure(s): QA CAL-45.v3
Calibration procedure for sources in air above 6 GHz

Calibration date: October 27, 2022

This calibration certificate documents the traceability to national standards, which realizes 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&E critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Reference Probe EUMWV3	SN: 9074	2021-12-31 (No. EUMWV3-9074_Dec21)	Dec-22
DAE4ip	SN: 1602	2022-05-27 (No. DAE4ip-1602_Jun22)	Jun-23
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator Anapico APSN200	SN: 827	18-Dec-18 (in house check Dec-21)	In house check: Dec-23

Calibrated by: **Leif Rytzner** Laboratory Technician

Approved by: **Stian Kålin** Technical Manager

Issued: October 27, 2022

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

Certificate No: 5G-Ver10-1053_Oct22

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



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Accreditation No.: SCS 0108

Glossary

CW Continuous wave

Calibration is Performed According to the Following Standards

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

Methods Applied and Interpretation of Parameters

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

Calibrated Quantity

- Local peak E-field (V/m) and average of peak spatial components of the poynting vector (W/m²) averaged over the surface area of 1 cm² and 4cm² at the nominal operational frequency of the verification source. Both square and circular averaging results are listed.

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

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Measurement Conditions

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

DASY Version	DASY8 Module mmWave	V3.0
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm	
XY Scan Resolution	dx, dy = 7.5 mm	
Number of measured planes	2 (10mm, 10mm + $\lambda/4$)	
Frequency	10 GHz $\pm$ 10 MHz	

Calibration Parameters, 10 GHz

Circular Averaging

Distance Horn Aperture to Measured Plane	Prad ² (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (p _{PDex} , p _{PDin} , p _{PDmod}) (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	86.1	147	1.27 dB	54.1	50.1	1.28 dB

Square Averaging

Distance Horn Aperture to Measured Plane	Prad ² (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (p _{PDex} , p _{PDin} , p _{PDmod}) (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	86.1	147	1.27 dB	54.2	50.1	1.26 dB

² Assessed ohmic and mismatch loss plus numerical offset: 0.55 dB

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DASY Report

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

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 173.0	SN: 1053	-

Exposure Conditions

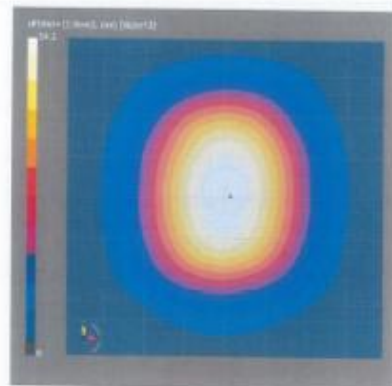
Phantom Section	Position, Test Distance [mm]	Band	Group	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAS, Calibration Date
mmWave Phantom - 1002	Air	SLMmWV3 - SWS74_F1-10GHz, 2023-12-21	QAS/tp S-1602, 2023-06-27

Scan Setup

	5G Scan	Measurement Results	5G Scan
Grid Extents [mm]	120.0 x 120.0	Date	2023-10-27, 10:18
Grid Steps [mm/sk]	0.25 x 0.25	Avg. Area [cm ²]	1.00
Sensor Surface [mm]	10.0	psPDe+ [W/m ²]	54.0
MNA	MNA not used	psPDtot+ [W/m ²]	54.1
		psPDmod+ [W/m ²]	54.3
		S _{iso} [V/m]	547
		Power DfB [dB]	0.08



Certificate No: 5G-Ver10-1053_Oct22

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DASY Report

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

Device under Test Properties

Name, Manufacturer	Dimensions (mm)	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 173.0	SN: 1053	-

Exposure Conditions

Phantom Section	Position, Test Distance (mm)	Band	Group	Frequency (MHz), Channel Number	Conversion Factor
5G-	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

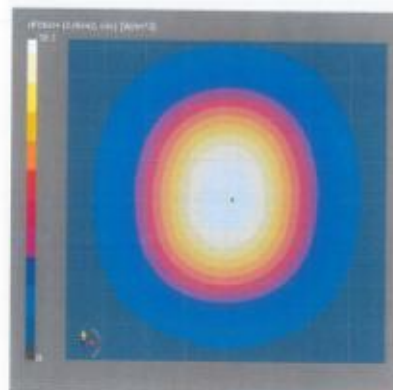
Phantom	Medium	Probe, Calibration Date	DAK, Calibration Date
mmWave Phantom - 1002	Air	EuremWV3 - SH9374_F3-5.5GHz, 2021-12-21	DAE4p Sn1602, 2023-06-27

Scan Setup

Grid Extents (mm)	5G Scan
Grid Steps (mm)	120.0 x 120.0
Sensor Surface (mm)	0.25 x 0.25
MMA	10.0
	MMA not used

Measurement Results

Date	5G Scan
Avg. Area (cm²)	2022-10-27, 10:18
ppD ₅₀₊ [W/m²]	4.50
ppD ₁₀₊ [W/m²]	49.9
ppD _{med+} [W/m²]	50.1
E _{ref} [V/m]	50.3
Power On/Off (dB)	147
	0.08



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DASY Report

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

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1053	-

Exposure Conditions

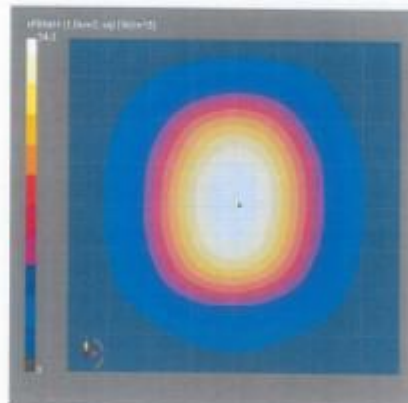
Phantom Section	Position, Test Distance [mm]	Band	Group	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAS, Calibration Date
miniWave Phantom - 1002	Air	EUnerWA/3 - 580374_F1-5S GHz, 2021-12-21	0464p Sn:1002, 2023-06-27

Scan Setup

Grid Elements [mm]	5G Scan	Done	5G Scan
Grid Steps [lambda]	120.0 x 120.0		2023-10-27, 10:18
Sensor Surface [mm]	0.25 x 0.35	Avg. Area [cm ²]	1.00
MMA	10.0	ptPCnt+ [W/m ²]	54.1
	MMA not used	ptPCnt+ [W/m ²]	54.2
		ptPCnt+ [W/m ²]	54.4
		E _{max} [V/m]	147
		Power Dn [dB]	0.01



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DASY Report

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

Device under Test Properties

Name, Manufacturer	Dimensions (mm)	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1053	-

Exposure Conditions

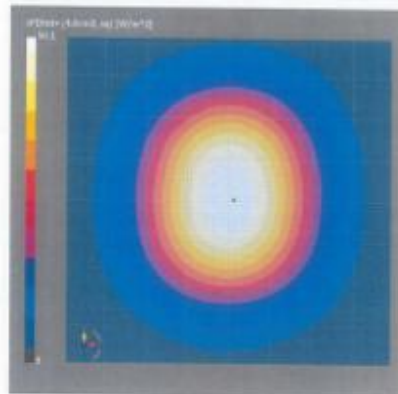
Phantom Section	Position, Test Distance (mm)	Band	Group	Frequency (MHz), Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAS, Calibration Date
miWave Phantom - 1002	Air	LSme(NV3) - 509378_FS-15GHz, 2023-12-21	DAS4p 0x1602, 2023-06-27

Scan Setup

	5G Scan	Measurement Results	5G Scan
Grid Extents (mm)	120.0 x 120.0	Date	2022-10-27, 10:18
Grid Steps (mm/step)	0.25 x 0.25	Avg. Area (cm ²)	4.00
Sensor Surface (mm)	10.0	paDose (W/m ²)	49.9
MMA	MMA not used	paDose+ (W/m ²)	50.1
		paDose- (W/m ²)	50.2
		S _{max} (V/m)	147
		Power Drift (dB)	0.08



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ANNEX C

TEST RESULTS

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Measurement Report for Siemens IPC MD-57A, BACK, U-NII-7, IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 175 (6825.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMSI	DUT Type
Siemens IPC MD-57A,	200.0 x 270.0 x 22.0		Laptop

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
SC	BACK, 2.00	U-NII-7	WLAN, 10755-AAC	6825.0, 175	1.0

Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAS, Calibration Date
mmWave - 1112	Air -	6UmmWV4 - SN9641_F1-35GHz, 2022-10-25	DAS4ip Sn1735, 2022-04-08

Scans Setup

Scan Type	SC Scan
Grid Extents [mm]	100.0 x 100.0
Grid Steps [lambda]	0.046470691566958054 x 0.046470691566958054
Sensor Surface [mm]	2.0
MAIA	Y

Measurement Results

Scan Type	SC Scan
Date	2022-09-01, 16:48
Avg. Area [cm ²]	1.00
psPDnt+ [W/m ²]	0.005
psPDtot+ [W/m ²]	0.156
psPDmod+ [W/m ²]	0.014
E _{max} [V/m]	65.7
Power Drift [dB]	2.14

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Figure 4

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ANNEX D

PHOTOGRAPHS

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Photograph of EUT

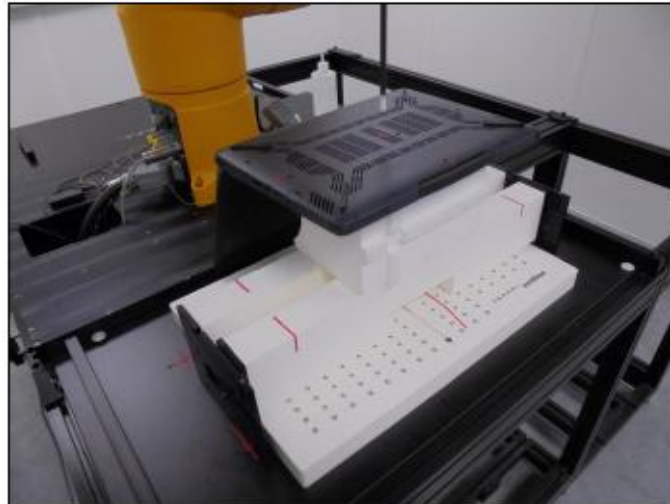


Figure 5 - EUT in test position



Figure 6 - Top of EUT

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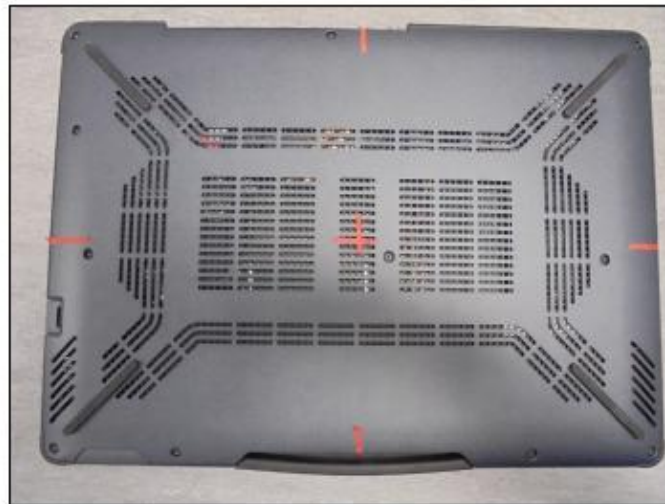


Figure 7 - Rear of EUT