Total Exposure Ratio (Body)										
Band	Position	1	8	9	10	11	12	L(1+9+12)	N(1+8+11+12)	O(1+10+11+12)
		MAX WWAN	Max WLAN 6GHz Ant 0	Max WLAN 6GHz Ant 1	Max WLAN 6GHz Ant 0+1	Max BT Ant 1	RFID	Total Exposure Ratio	Total Exposure Ratio	Total Exposure Ratio
		1g SAR W/kg	4cm² W/m²	4cm² W/m²	4cm² W/m²	1g SAR W/kg	1g SAR W/kg			
WCDMA II	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.17	0.00	0.00	0.00	0.13	0.00	0.11	0.19	0.19
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.09	0.00	0.00	0.00	0.06	0.00	0.06	0.09	0.09
	Top Side	1.18	0.00	0.00	0.00	0.00	0.00	0.74	0.74	0.74
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
WCDMA IV	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.18	0.00	0.00	0.00	0.13	0.00	0.11	0.19	0.19
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.12	0.00	0.00	0.00	0.06	0.00	0.08	0.11	0.11
	Top Side	1.05	0.00	0.00	0.00	0.00	0.00	0.66	0.66	0.66
	Bottom Side	0.18	0.00	0.00	0.00	0.12	0.00	0.11	0.19	0.19
WCDMA V	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.52	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.33
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 2	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.11	0.00	0.00	0.00	0.13	0.00	0.07	0.15	0.15
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.20	0.00	0.00	0.00	0.06	0.00	0.13	0.16	0.16
	Top Side	0.49	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 4	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.11	0.00	0.00	0.00	0.13	0.00	0.07	0.15	0.15
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.06	0.00	0.00	0.00	0.06	0.00	0.04	0.08	0.08
	Top Side	0.48	0.00	0.00	0.00	0.00	0.00	0.30	0.30	0.30
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 5	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.27	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.17
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 7	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.04	0.00	0.00	0.00	0.13	0.00	0.03	0.11	0.11
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.12	0.00	0.00	0.00	0.06	0.00	0.08	0.11	0.11
	Top Side	0.32	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.20
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 12	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.20	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.13
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 13	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.12	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.08
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08

Total Exposure Ratio (Body)										
Band	Position	1	8	9	10	11	12	L(1+9+12)	N(1+8+11+12)	O(1+10+11+12)
		MAX WWAN	Max WLAN 6GHz Ant 0	Max WLAN 6GHz Ant 1	Max WLAN 6GHz Ant 0+1	Max BT Ant 1	RFID	Total Exposure Ratio	Total Exposure Ratio	Total Exposure Ratio
		1g SAR W/kg	4cm² W/m²	4cm² W/m²	4cm² W/m²	1g SAR W/kg	1g SAR W/kg			
LTE 14	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.06	0.00	0.00	0.00	0.06	0.00	0.04	0.08	0.08
	Top Side	0.11	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.07
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 17	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.20	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.13
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 25	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.14	0.00	0.00	0.00	0.13	0.00	0.09	0.17	0.17
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.37	0.00	0.00	0.00	0.06	0.00	0.23	0.27	0.27
	Top Side	0.53	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.33
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 26	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.29	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.18
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 30	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.11	0.00	0.00	0.00	0.13	0.00	0.07	0.15	0.15
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.22	0.00	0.00	0.00	0.06	0.00	0.14	0.18	0.18
	Top Side	0.79	0.00	0.00	0.00	0.00	0.00	0.49	0.49	0.49
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 38	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.15	0.00	0.00	0.00	0.06	0.00	0.09	0.13	0.13
	Top Side	0.39	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.24
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 41	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.17	0.00	0.00	0.00	0.06	0.00	0.11	0.14	0.14
	Top Side	0.49	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 48	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	1.07	0.00	0.00	0.00	0.00	0.00	0.67	0.67	0.67
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08
LTE 66	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.12	0.00	0.00	0.00	0.13	0.00	0.08	0.16	0.16
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.09	0.00	0.00	0.00	0.06	0.00	0.06	0.09	0.09
	Top Side	0.49	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08

Total Exposure Ratio (Body)										
Band	Position	1	8	9	10	11	12	L(1+9+12)	N(1+8+11+12)	O(1+10+11+12)
		MAX WWAN	Max WLAN 6GHz Ant 0	Max WLAN 6GHz Ant 1	Max WLAN 6GHz Ant 0+1	Max BT Ant 1	RFID	Total Exposure Ratio	Total Exposure Ratio	Total Exposure Ratio
		1g SAR W/kg	$4cm^2$ W/m^2	$4cm^2$ W/m^2	$4cm^2$ W/m^2	1g SAR W/kg	1g SAR W/kg			
LTE 71	Bottom for Laptop	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.27	0.27
	Rear Fcae	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.08	0.08
	Left Side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.04
	Top Side	0.45	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.28
	Bottom Side	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.08	0.08

Appendix J. Calibration of Test Equipment List

Calibration of Test Equipment List are shown as below.

Equipment for SAR Test					
Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	CLA13	1018	Mar. 20, 2023	1 Year
System Validation Dipole	SPEAG	D750V3	1013	Aug. 21, 2023	1 Year
System Validation Dipole	SPEAG	D835V2	4d121	Aug. 21, 2023	1 Year
System Validation Dipole	SPEAG	D1750V2	1055	Sep. 21, 2023	1 Year
System Validation Dipole	SPEAG	D1900V2	5d036	Feb. 17, 2023	1 Year
System Validation Dipole	SPEAG	D2300V2	1004	Feb. 15, 2023	1 Year
System Validation Dipole	SPEAG	D2450V2	737	Feb. 20, 2023	1 Year
System Validation Dipole	SPEAG	D2600V2	1020	Aug. 18, 2023	1 Year
System Validation Dipole	SPEAG	D3500V2	1007	Jan. 22, 2023	1 Year
System Validation Dipole	SPEAG	D3700V2	1017	Feb. 23, 2023	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Feb. 22, 2023	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1145	Feb. 16, 2023	1 Year
System Validation Dipole	SPEAG	D6.5GHzV2	1008	Sep. 21, 2023	1 Year
System Verification Source	SPEAG	5G Verification Source 10 GHz	1025	Jan. 19, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7472	Oct. 23, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7720	Mar. 23, 2023	1 Year
E-Field Probe	SPEAG	EUmmWV4	9615	Jul. 10, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1590	Sep. 14, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1698	Nov. 17, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1589	May. 24, 2023	1 Year
Universal Radio Communication Tester	Anritsu	MT8821C	6201381727	Aug. 09, 2023	1 Year
Analong Signal Generator	R&S	SMA100B	104417	Oct. 23, 2023	1 Year
Mini-Circuits Wideband Amplifier	Mini-Circuits	ZVA-183-S+	434502031A	Jul. 07, 2023	1 Year
Power Meter	Anritsu	ML2495A	1218009	Jul. 03, 2023	1 Year
Power Sensor	Anritsu	MA2411B	1207252	Jul. 03, 2023	1 Year
Universal Wireless Test Set	Anritsu	MT8870A	6262411397	Dec. 09, 2022	1 Year
Thermometer	YFE	YF-160A	120702365	Sep. 11, 2023	1 Year
Dielectric Assessment Kit	SPEAG	DAKS-3.5	1092	May. 23, 2023	1 Year
Dielectric Assessment Kit	SPEAG	DAKS_VNA R140	0010917	May. 22, 2023	1 Year
Powersource1	SPEAG	SE_UMS_160 BA	1052	Jul. 13, 2023	1 Year

Appendix L. Verifying the Mechanism Operation of Gravity-sensor

The power verified by LCD angle changed are shown as below..

<Power Reduction by LCD Angle Changed and Verifying Power Level of operating Laptop and Tablet mode on Setp A ~ G>

Test Band：802.11b ch.6 Ant 0 for WLAN 2.4G as Representative Verify

Summary

<A> From lid closed when LCD is 0° which power is subject to Laptop user mode, opening the screen side in 10° each step until the power of Tablet mode is obtained.

Degrees	0	10	20	30	40	50	…	150	160	170	180	190	200
Power (dBm)	13.8	13.5	13.7	13.3	13.7	13.5		13.2	13.8	13.8	13.8	13.8	14.9

The Power level changed by LCD Triggering Angle is 190°

<B> Close the screen side in 5° each step from Step A, the power of Laptop mode is reobtained.

Degrees	…	185	190	195	200
Power (dBm)		13.2	13.7	15.0	14.7

<C> Verfying the power changed in 1° at each step.

Degrees	…	198	199	190	191	192
Power (dBm)		13.3	13.2	13.2	15.3	14.9

<D>Then Keep opening the screen side in 10° each step until fully open when LCD angle.

Degrees	0	10	20	30	40	50	…	180	190	200	210	220	…	340	350	360
Power (dBm)	13.2	13.7	13.7	13.5	13.5	13.3		13.3	13.5	14.9	15.3	15		15	15.3	15.2

<E> From fully open when LCD is 360° which the operating mode is Tablet, closing the screen side in 10° each step until the power subject to operating Laptop mode is obtained.

Degrees	360	350	340	330	320	310	…	200	190	180
Power (dBm)	14.7	14.7	14.7	15	14.9	15.2		15	13.2	13.7

<F> From fully open when LCD is 360° which the operating mode is Tablet, closing the screen side in 5° each step until fully closed.

Degrees	360	355	350	345	340	335	330	325	320	315	310	…	195	190	185	…	10	5	0
Power (dBm)	15.3	14.7	15.3	14.8	15.1	14.9	14.7	15.2	14.7	15	15.1		15.2	13.2	13.4		13.4	13.5	13.6

<G> Closing the screen side in 1° each step until the power subject to operating Laptop mode is obtained and keep closing until fully closed.

Degrees	360	359	358	357	356	355	354	353	352	351	350	…	192	191	190	199	198	199	198	…	5	4	3	2	1	0
Power (dBm)	14.9	14.7	14.7	14.8	14.7	15	14.9	15.1	15.1	14.8	14.7		15.2	14.7	13.3	13.6	13.4	13.8	13.8		13.4	13.6	13.4	13.5	13.4	13.8

Test Band：802.11ac ch.50 Ant 0 for WLAN 5.3G as Representative Verify

Summary

<A> From lid closed when LCD is 0° which power is subject to Laptop user mode, opening the screen side in 10° each step until the power of Tablet mode is obtained.

Degrees	0	10	20	30	40	50	…	150	160	170	180	190	200
Power (dBm)	11.5	11.6	11.5	11.3	11.8	11.6		11.8	11.8	11.2	11.6	11.2	10.1

The Power level changed by LCD Triggering Angle is 190°

<B> Close the screen side in 5° each step from Step A, the power of Laptop mode is reobtained.

Degrees	…	185	190	195	200
Power (dBm)		11.8	11.2	10.3	10.0

<C> Verfying the power changed in 1° at each step.

Degrees	…	198	199	190	191	192
Power (dBm)		11.7	11.8	11.2	10.3	9.7

<D>Then Keep opening the screen side in 10° each step until fully open when LCD angle.

Degrees	0	10	20	30	40	50	…	180	190	200	210	220	…	340	350	360
Power (dBm)	11.7	11.6	11.7	11.7	11.5	11.6		11.5	11.5	10.0	9.7	10.1		10	10.1	10.1

<E> From fully open when LCD is 360° which the operating mode is Tablet, closing the screen side in 10° each step until the power subject to operating Laptop mode is obtained.

Degrees	360	350	340	330	320	310	…	200	190	180
Power (dBm)	10.2	10	10	9.7	9.9	9.8		325	11.4	11.8

<F> From fully open when LCD is 360° which the operating mode is Tablet, closing the screen side in 5° each step until fully closed.

Degrees	360	355	350	345	340	335	330	325	320	315	310	…	195	190	185	…	10	5	0
Power (dBm)	9.9	10.1	10.2	9.8	10.3	9.8	10.1	10.1	9.8	10.3	9.7		9.7	11.8	11.7		11.4	11.7	11.3

<G> Closing the screen side in 1° each step until the power subject to operating Laptop mode is obtained and keep closing until fully closed.

Degrees	360	359	358	357	356	355	354	353	352	351	350	…	192	191	190	199	198	199	198	…	5	4	3	2	1	0
Power (dBm)	10.2	9.7	10.2	9.7	10	10	10.2	9.8	9.7	9.7	9.7		9.8	9.7	11.4	11.6	11.5	11.2	11.2		11.8	11.3	11.8	11.7	11.5	11.5

Appendix Z. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.

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
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 B.V. ADT
Taoyuan City, Taiwan

Certificate No. CLA13-1018_Mar23

CALIBRATION CERTIFICATE

Object: CLA13 - SN: 1018

Calibration procedure(s): QA CAL-15.v10
Calibration Procedure for SAR Validation Sources below 700 MHz

Calibration date: March 20, 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
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	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: 3877	06-Jan-23 (No. EX3-3877_Jan23)	Jan-24
DAE4	SN: 654	27-Jan-23 (No. DAE4-654_Jan23)	Jan-24

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter NRP2	SN: 107193	08-Nov-21 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100922	15-Dec-09 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100418	01-Jan-04 (in house check Dec-22)	In house check: Dec-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

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

Issued: March 21, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	13 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	55.0	0.75 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	54.1 ± 6 %	0.74 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	1 W input power	0.534 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**0.538 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	1 W input power	0.335 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**0.337 W/kg ± 18.0 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 2.8 jΩ
Return Loss	- 29.4 dB

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 20.03.2023

Test Laboratory: SPEAG, Zurich, Switzerland

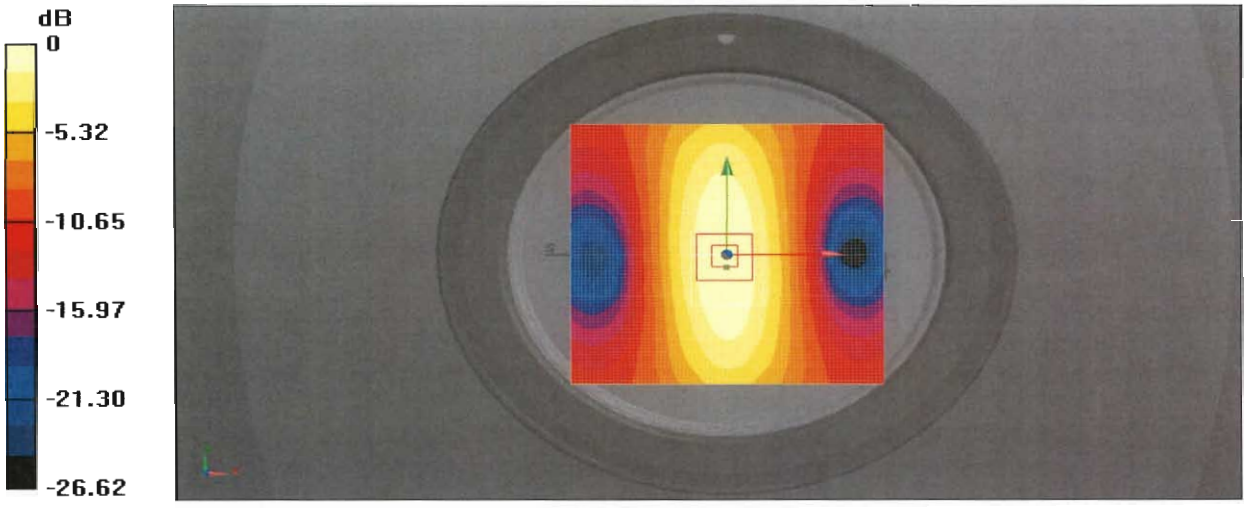
DUT: CLA13; Type: CLA13; Serial: CLA13 - SN: 1018

Communication System: UID 0 - CW; Frequency: 13 MHz
Medium parameters used: f = 13 MHz; σ = 0.74 S/m; εr = 54.1; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

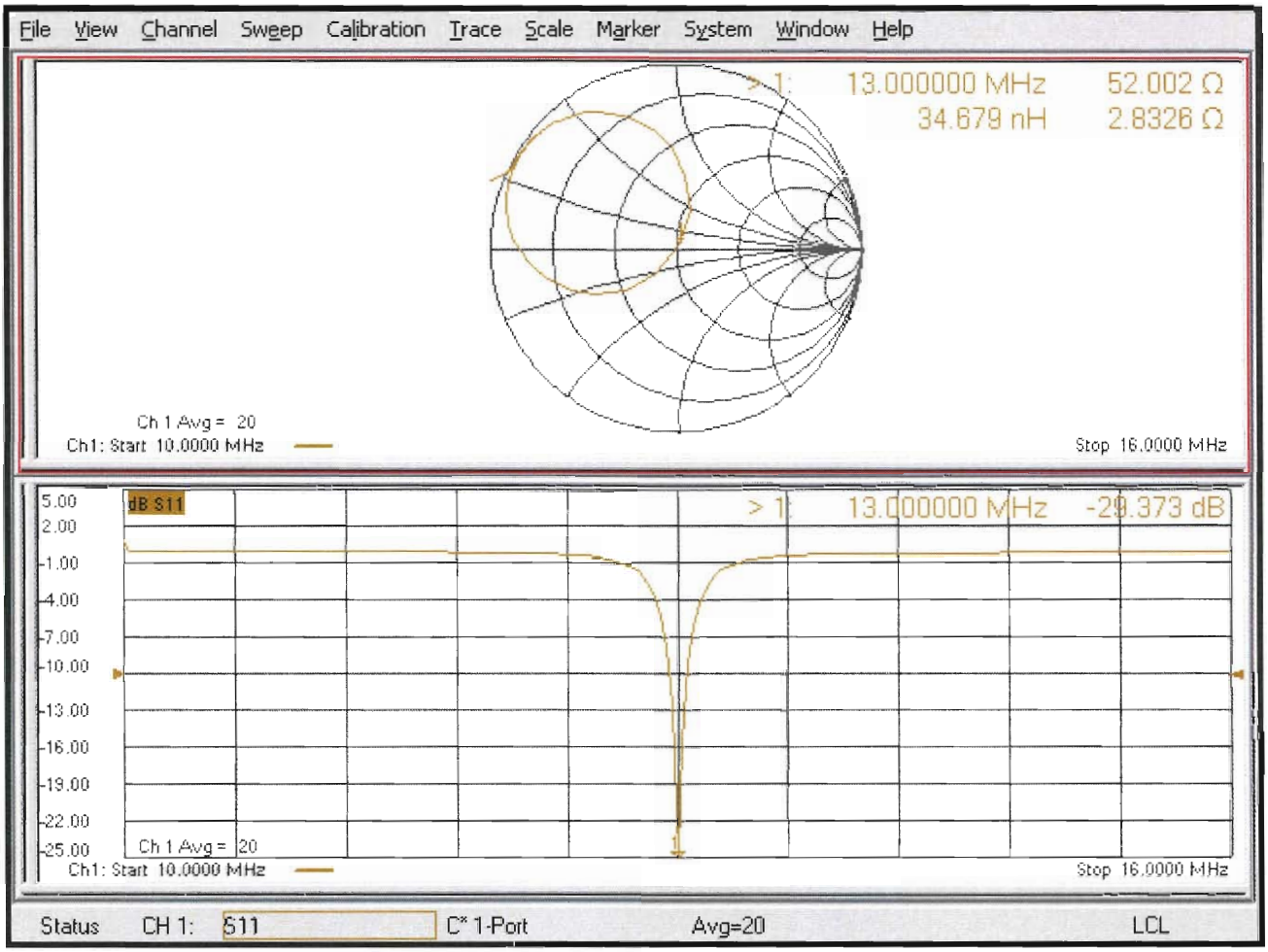
- Probe: EX3DV4 - SN3877; ConvF(15.33, 15.33, 15.33) @ 13 MHz; Calibrated: 06.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 27.01.2023
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2034
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

CLA Calibration for HSL-LF Tissue/CLA-13, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x10x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 32.07 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.534 W/kg; SAR(10 g) = 0.335 W/kg
Smallest distance from peaks to all points 3 dB below = 18.4 mm
Ratio of SAR at M2 to SAR at M1 = 79.5%
Maximum value of SAR (measured) = 0.782 W/kg



0 dB = 0.782 W/kg = -1.07 dBW/kg

Impedance Measurement Plot for Head TSL



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Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

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

Accreditation No.: SCS 0108

Client **B.V. ADT**
Taoyuan City

Certificate No. **D750V3-1013_Aug23**

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1013
Calibration procedure(s)	QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	August 21, 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
Power sensor NRP-Z91	SN: 103245	30-Mar-23 (No. 217-03805)	Mar-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Type-N mismatch combination	SN: 310982 / 06327	30-Mar-23 (No. 217-03810)	Mar-24
Reference Probe EX3DV4	SN: 7349	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

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

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: August 22, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.5 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.56 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.61 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.3 Ω + 0.1 jΩ
Return Loss	- 29.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Date: 21.08.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1013

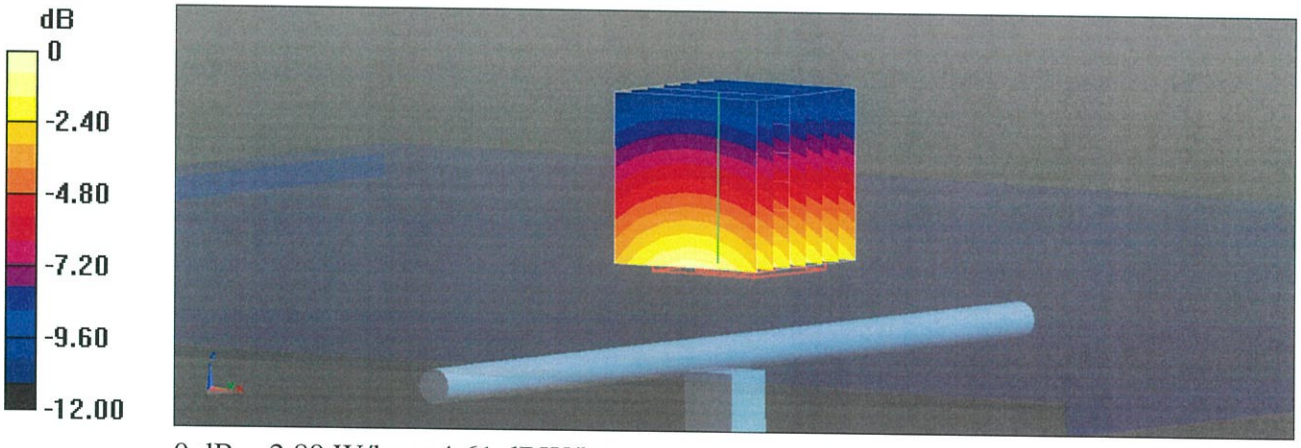
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 42.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.11, 10.11, 10.11) @ 750 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

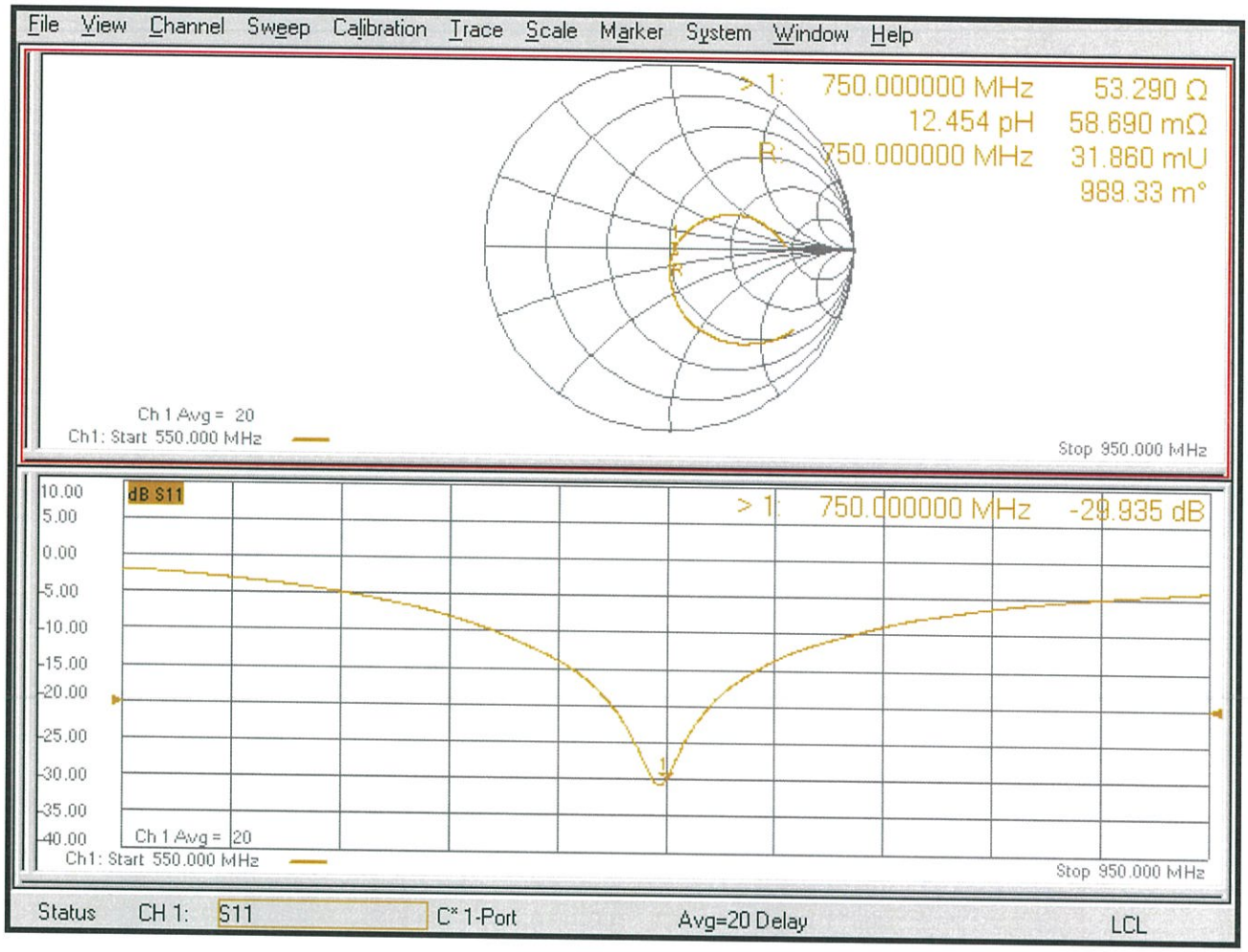
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.70 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.29 W/kg
SAR(1 g) = 2.17 W/kg; SAR(10 g) = 1.42 W/kg
Smallest distance from peaks to all points 3 dB below = 17.9 mm
Ratio of SAR at M2 to SAR at M1 = 65.6%
Maximum value of SAR (measured) = 2.89 W/kg



0 dB = 2.89 W/kg = 4.61 dBW/kg

Impedance Measurement Plot for Head TSL



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S Servizio svizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 0108

Client **B.V. ADT**
Taoyuan City

Certificate No. **D835V2-4d121_Aug23**

CALIBRATION CERTIFICATE

Object: D835V2 - SN:4d121

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

Calibration date: August 21, 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
Power sensor NRP-Z91	SN: 103245	30-Mar-23 (No. 217-03805)	Mar-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Type-N mismatch combination	SN: 310982 / 06327	30-Mar-23 (No. 217-03810)	Mar-24
Reference Probe EX3DV4	SN: 7349	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

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

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: August 22, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.50 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.72 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.32 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 2.0 jΩ
Return Loss	- 34.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.394 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Date: 21.08.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d121

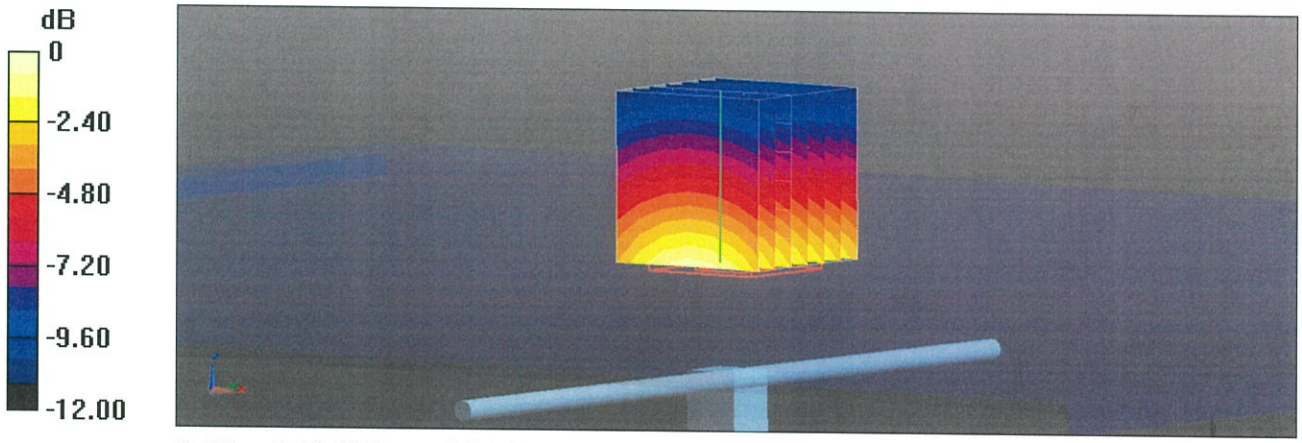
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 42.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

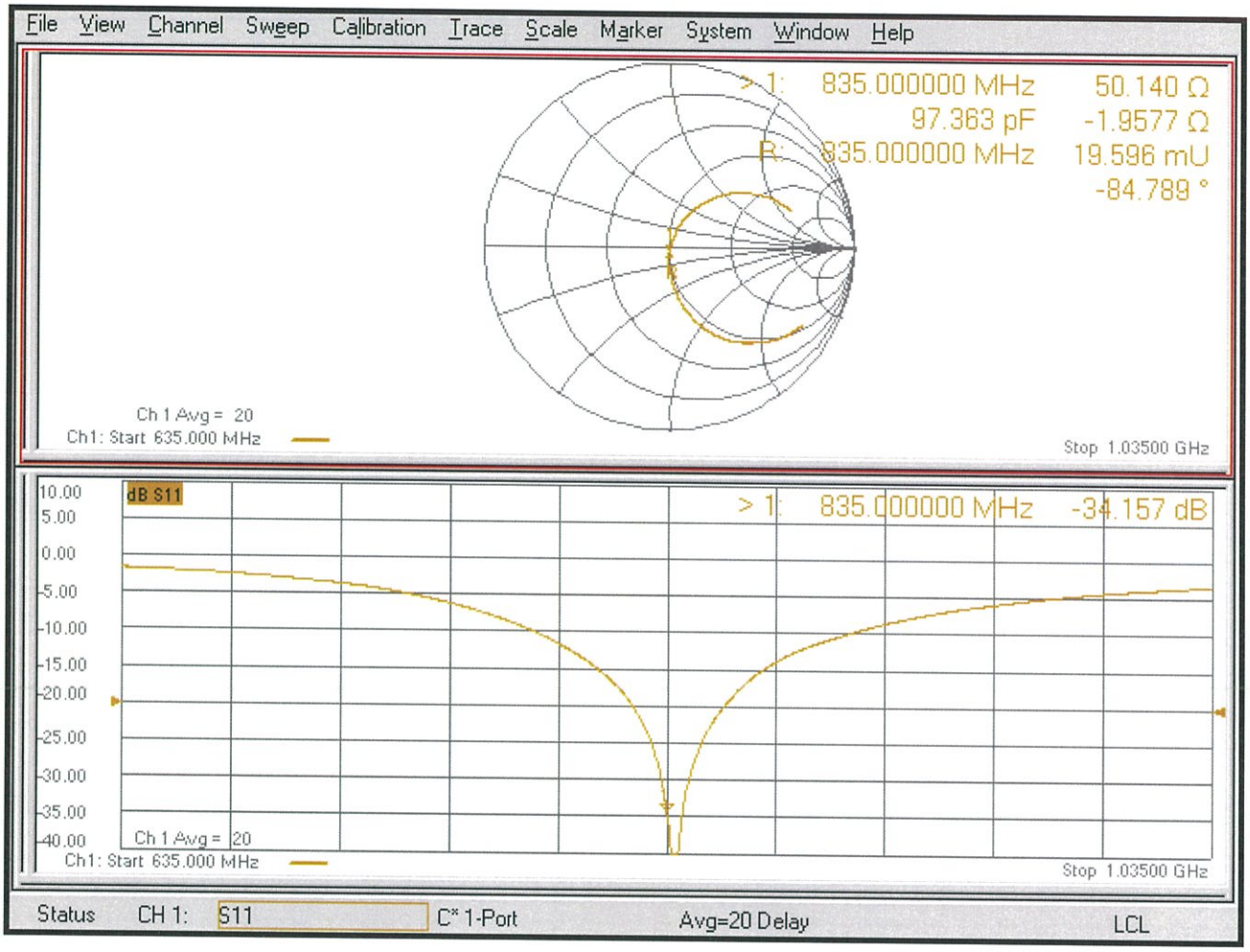
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.83 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 2.50 W/kg; SAR(10 g) = 1.62 W/kg
Smallest distance from peaks to all points 3 dB below = 16.8 mm
Ratio of SAR at M2 to SAR at M1 = 66.5%
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.32 W/kg = 5.21 dBW/kg

Impedance Measurement Plot for Head TSL



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Swiss Calibration Service

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Accreditation No.: SCS 0108

Client B.V. ADT
Taoyuan City

Certificate No. D1750V2-1055_Sep23

CALIBRATION CERTIFICATE

Object: D1750V2 - SN:1055

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

Calibration date: September 21, 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)

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Power sensor NRP-Z91	SN: 103245	30-Mar-23 (No. 217-03805)	Mar-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Type-N mismatch combination	SN: 310982 / 06327	30-Mar-23 (No. 217-03810)	Mar-24
Reference Probe EX3DV4	SN: 7349	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

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

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: September 21, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

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	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.3 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.77 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.2 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.5 Ω - 0.6 jΩ
Return Loss	- 42.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.228 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 21.09.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1055

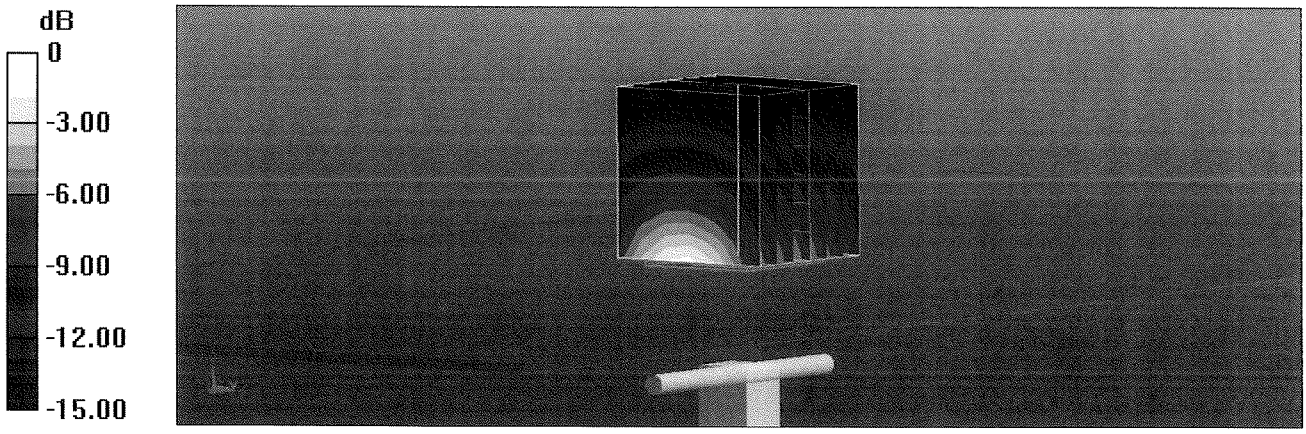
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.67, 8.67, 8.67) @ 1750 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

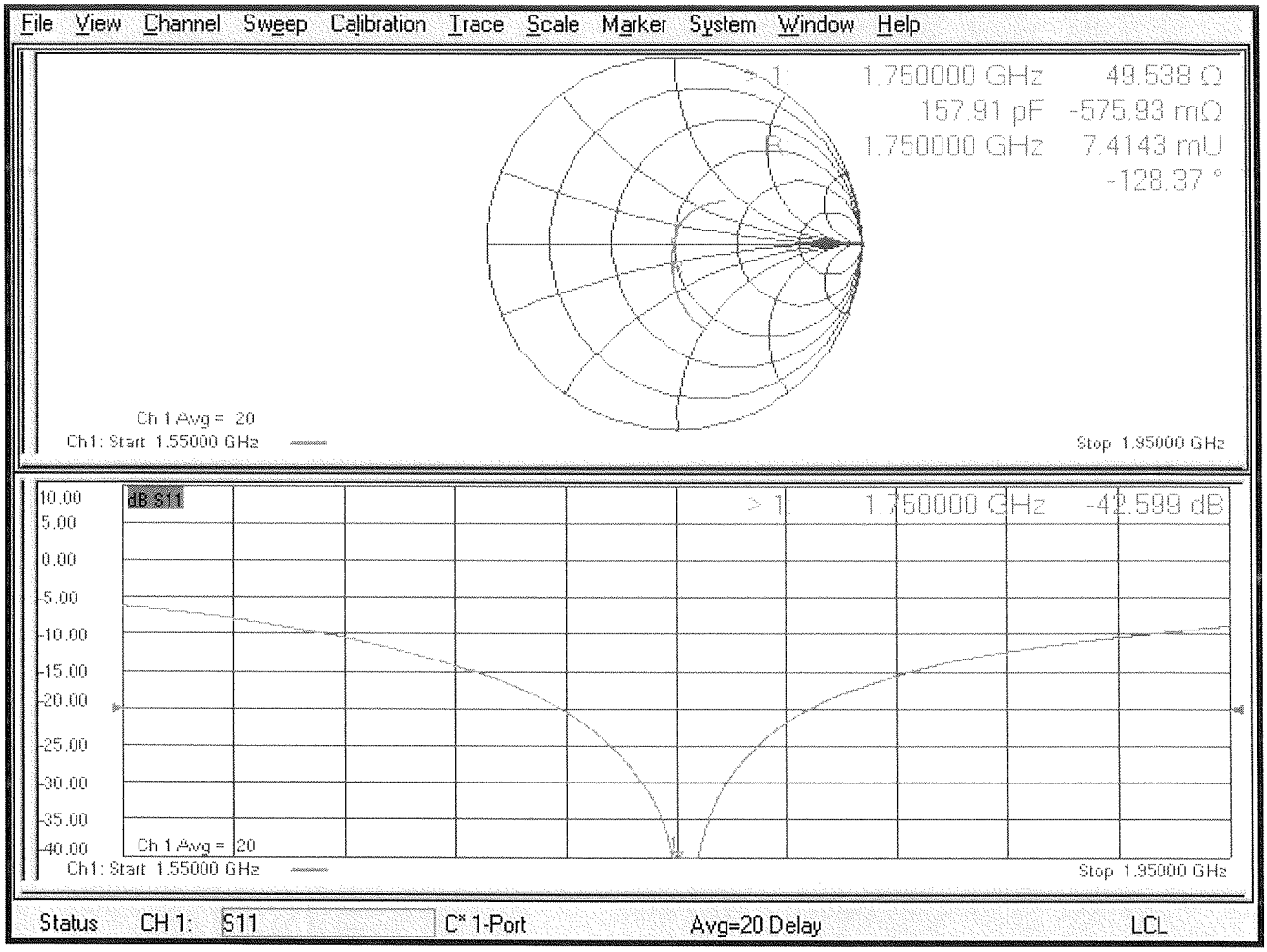
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.8 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 9.02 W/kg; SAR(10 g) = 4.77 W/kg
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 55.4%
Maximum value of SAR (measured) = 13.6 W/kg



0 dB = 13.6 W/kg = 11.33 dBW/kg

Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 0108

Client B.V. ADT

Certificate No: D1900V2-5d036_Feb23

CALIBRATION CERTIFICATE

Object	D1900V2 - SN:5d036
Calibration procedure(s)	QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
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
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	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

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

	Name	Function	Signature
Calibrated by:	Paula Pina	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	

Issued: February 20, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

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	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.40 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.83 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.5 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.8 Ω + 5.0 jΩ
Return Loss	- 25.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.195 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 17.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d036

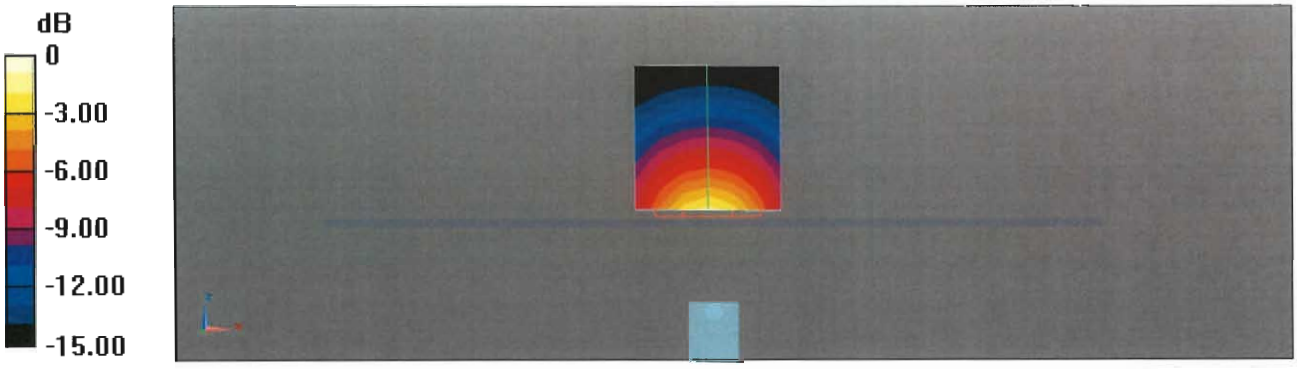
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.4 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1900 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

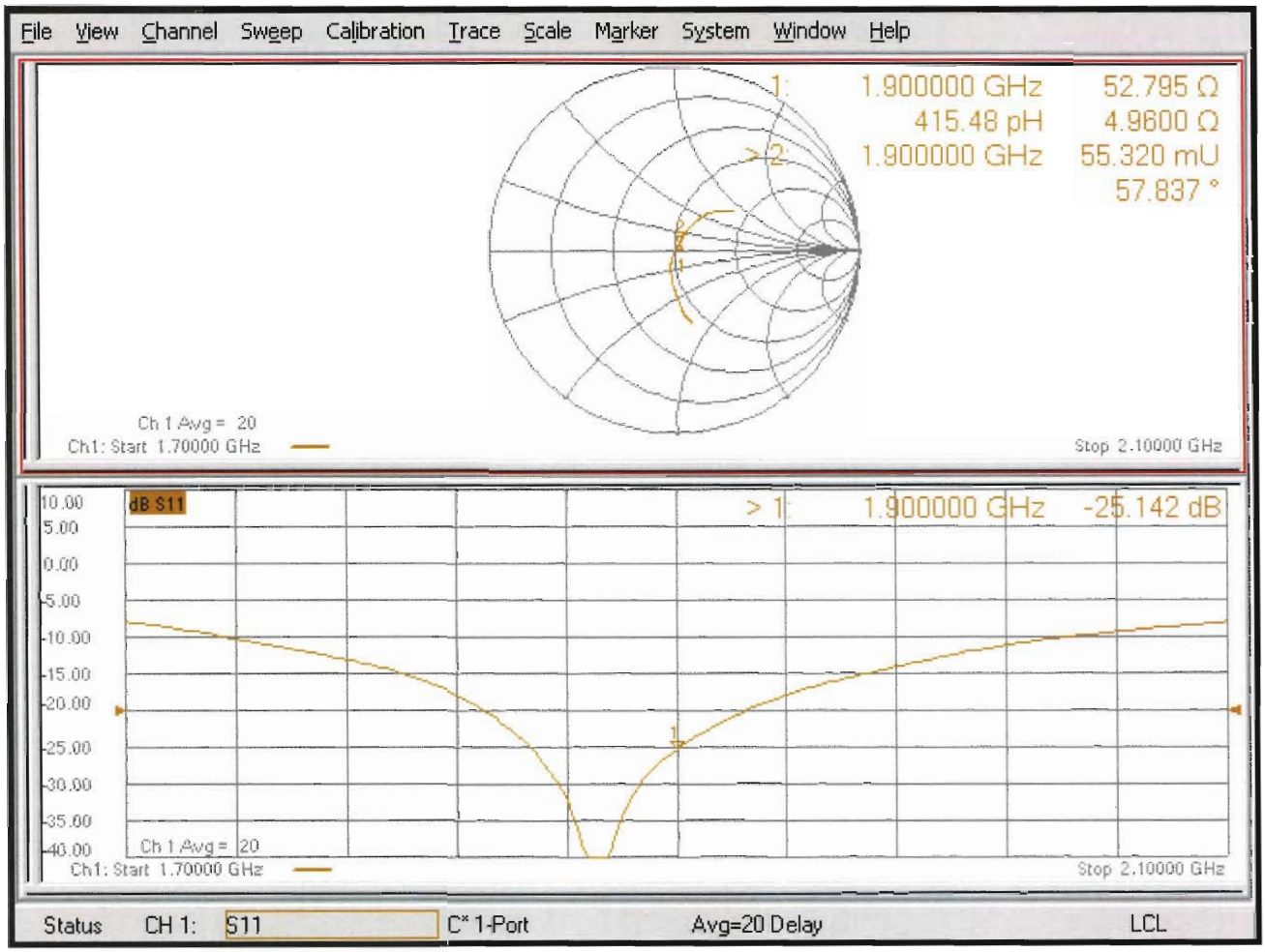
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.6 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 18.0 W/kg
SAR(1 g) = 9.83 W/kg; SAR(10 g) = 5.12 W/kg
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 55%
Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 0108

Client **B.V. ADT**

Certificate No: D2300V2-1004_Feb23

CALIBRATION CERTIFICATE

Object: D2300V2 - SN:1004

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

Calibration date: February 15, 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
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	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

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

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: February 17, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

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	2300 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.5	1.67 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.68 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**48.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.92 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.7 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.3 Ω - 1.4 jΩ
Return Loss	- 30.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.164 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Date: 15.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1004

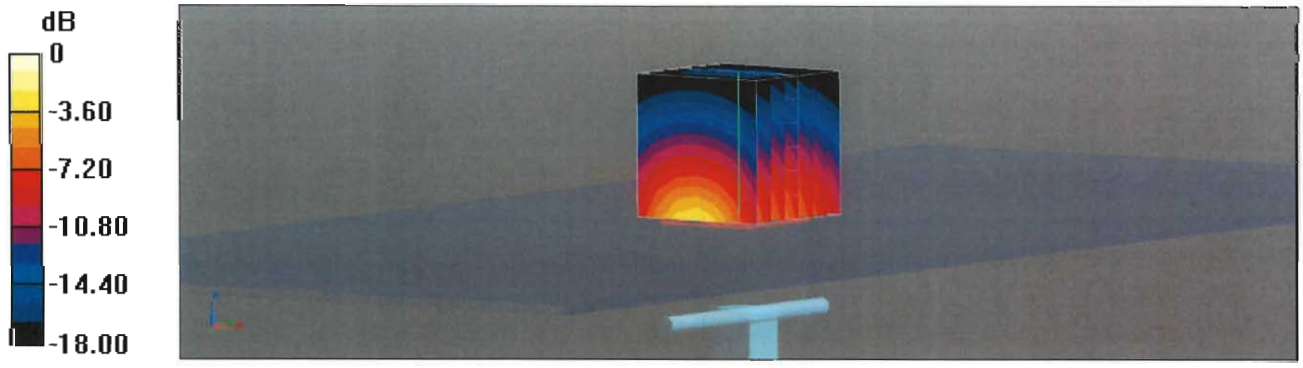
Communication System: UID 0 - CW; Frequency: 2300 MHz
Medium parameters used: f = 2300 MHz; σ = 1.68 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.9, 7.9, 7.9) @ 2300 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

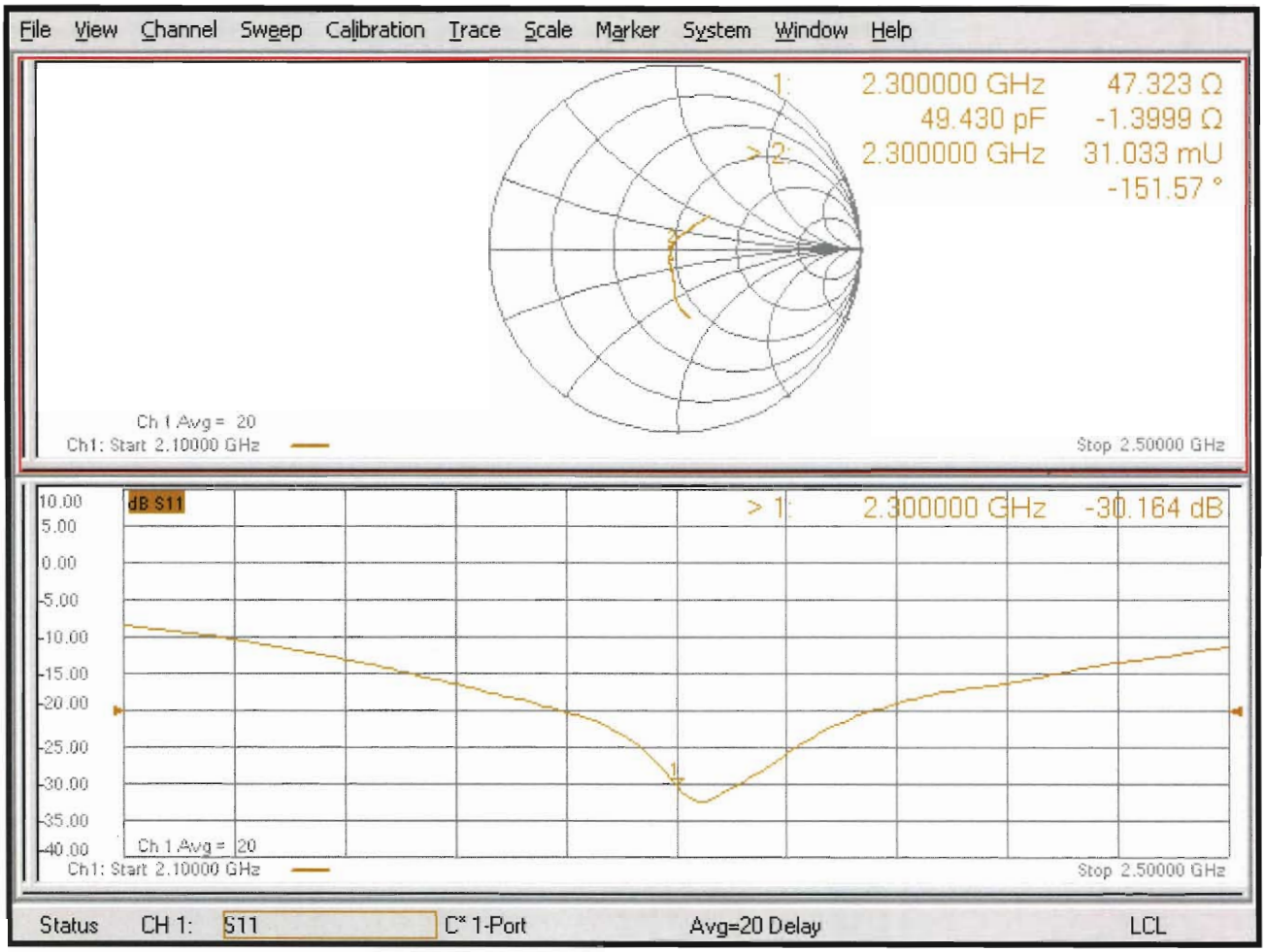
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.3 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 21.7 W/kg
SAR(1 g) = 12.2 W/kg; SAR(10 g) = 5.92 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 56.5%
Maximum value of SAR (measured) = 18.7 W/kg



0 dB = 18.7 W/kg = 12.72 dBW/kg

Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 0108

Client B.V. ADT

Certificate No: D2450V2-737_Feb23

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:737
Calibration procedure(s)	QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	February 20, 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
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	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

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

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	

Issued: February 20, 2023

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

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 ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.3 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.8 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**50.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.97 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.7 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.8 Ω + 4.9 jΩ
Return Loss	- 23.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.161 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 20.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:737

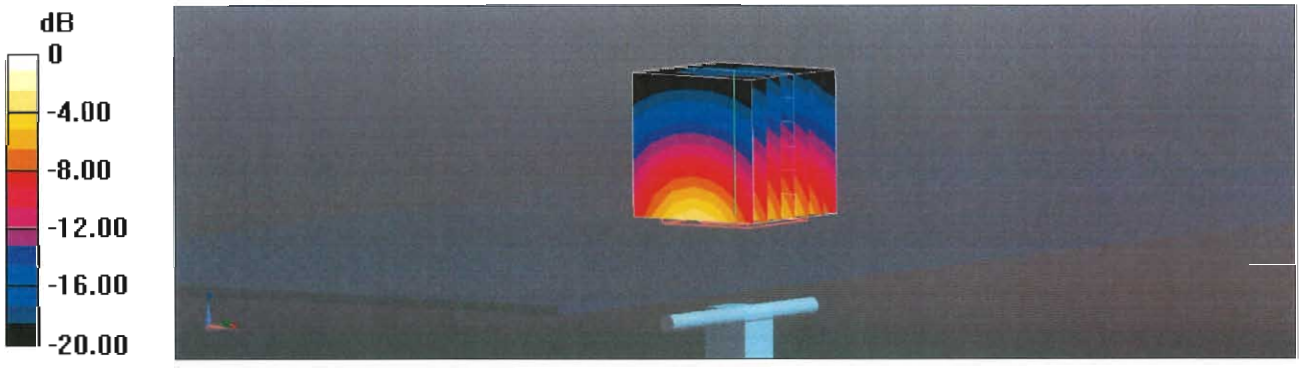
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 S/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88) @ 2450 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 112.6 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 25.0 W/kg
SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.97 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 50.9%
Maximum value of SAR (measured) = 20.9 W/kg



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

Impedance Measurement Plot for Head TSL