SAR TEST REPORT

for

MODEL NO. 2082
FCC ID: C3K2082

Test Report No. S-727-FCCSAR-3
Issue Date: May 9, 2024

FCC CFR 47 PART 2.1093

IEEE 1528-2013

Prepared by
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TESTING CERT #3472.01

1 Record of Revisions

Revision	Date	Section	Page(s)	Summary of Changes	Author/Revised By:
1.0	3/29/2024	All	All	First Version	Sushmita Srikant
2.0	5/09/2024	7, 12, 13	10, 18, 20	Removed references to IEC/IEEE 62209-1528.	Z. Gray
3.0	5/09/2024	12.1	19	Added Dipole, CLA SN's.	Z. Gray
		Plots	2, 3	Added correct plot, corrected dipole SN typo.	

Test Report Attestation

Microsoft Corporation
Model: 2082

Applicable Standards

Specification	Test Result
FCC CFR 47 PART 2.1093 IEEE 1528-2013	Pass

Microsoft EMC Laboratory attests that the product model identified in this report has been tested to and meets the requirements identified in the above standards. The test results in this report solely pertains to the specific sample tested, under the conditions and operating modes as provided by the customer.

This test report replaces the previously issued report #S-727-FCCSAR-2 issued by Microsoft EMC Labs.

This report shall not be used to claim product certification, approval, or endorsement by A2LA or any agency of any Government. Reproduction, duplication, or publication of extracts from this test report is prohibited and requires prior written approval of Microsoft EMC Laboratory.

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Reviewed/ Issued By: Zack Gray

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2 Deviations from Standard

None.

3 Facilities and Accreditation

3.1 TEST FACILITY

All test facilities used to collect the test data are located at Microsoft EMC Laboratory: 17760 NE 67th Ct, Redmond, WA, 98052, USA.

3.2 ACCREDITATIONS

The lab is established and follows procedures as outlined in IEC/ISO 17025 and A2LA accreditation requirements.

A2LA Accredited Testing Certificate Number: 3472.01
Expiration Date: Aug 31, 2025

3.3 Test Equipment

The site and related equipment are constructed in conformance with the requirements of IEEE 1528-2013 and other equivalent applicable standards.
The calibrations of the measuring instruments, including any accessories that may affect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors are applied in accordance with instructions contained in the user manual for the measuring equipment.

4 Highest Reported SAR Values

Exposure Condition	Equipment Class	Mode of Operation	Test Position	1-g Reported SAR (W/kg)
Body Exposure	DXX	NFC Charging	Front	< 0.001
	DSS	LE 1Mbps	Front	0.219

Reported SAR Values are obtained by scaling the measured SAR values up to the maximum allowable output power for each configuration using the following equation:

$$SAR = MEASURED * 10^{\frac{(PMAX-P)}{10}}$$

where

SAR = Reported SAR (W/kg)
MEASURED = Measured SAR (W/kg)
PMAX = Maximum Conducted Average Output Power (dBm)
P = Measured Conducted Average Output Power (dBm)

4.1 SAR Limits

The following are the relevant SAR limits for FCC and IC based on the recommendations of ANSI C95.1-1992:

Exposure Condition	Limit (W/kg)
Localized Body SAR	1.6 (1-g cube)
Extremity SAR	4.0 (10-g cube)

5 Test Equipment List

Manufacturer	Description	Model	SN	Identifier	Cal. Due	Cal. Cycle
Agilent	Signal Generator	N5181A	MY50144791	SAR-051	04/30/2024	1 yr
Agilent	Signal Generator	N5181A	MY50144778	SAR-040	01/11/2025	1 yr
Agilent	Power Meter	1914A	MY50901710	SAR-052	1/11/2025	1 yr
Keysight	Power Sensor	E9300H	MY63320002	SAR-210	9/8/2024	1 yr
Keysight	Power Sensor	E9300H	MY63290003	SAR-209	7/22/2024	1 yr
Keysight	Network Analyzer	E5071C	MY46316957	SAR-001	1/10/2025	1 yr
SPEAG	DAK-12 Probe	SM DAK 020 BA	1145	SAR-172	5/15/2024	1 yr
SPEAG	DASY Data Acquisition Electronics	DAE4	1384	SAR-073	9/8/2024	1 yr
SPEAG	DASY Data Acquisition Electronics	DAE4	1709	SAR-213	11/17/2024	1 yr
SPEAG	ELI Phantom	v5.0 (30deg probe tilt)	TP:1217	N/A	N/A	N/A
SPEAG	Dosimetric E-Field Probe	EX3DV4	3999	SAR-108	9/20/2024	1 yr
SPEAG	Dosimetric E-Field Probe	EX3DV4	3960	SAR-152	12/5/2024	1 yr
SPEAG	SAR Validation Dipole, 2450 MHz	D2450V2	917	SAR-025	5/16/2024	1 yr
SPEAG	SAR Validation Coil, 13 MHz	CLA13	1006	SAR-162	5/11/2024	1 yr
SPEAG	Tri-Flat Phantom	MFP V5.1C	1144/1	N/A	N/A	N/A
Thomas Scientific	Thermometer	1230N27	221511173	SAR -205	05/10/2024	1 yr
MadgeTech	THP Monitor	PRHTemp2000	P24729	RF-170	03/28/2024	1 yr

6 Product Description

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052
Customer Contact:	Mike Boucher
Functional Description of the EUT:	Portable Computing Device
RF Exposure Conditions:	Body Exposure
Model:	2082
FCC ID:	C3K2082
IC ID:	3048A-2082
Radio Descriptions:	Bluetooth LE NFC Charging @13.56 MHz
Frequency Range of Operation:	NFC: 13.56 MHz BTLE: 2402 – 2480 MHz
Modulations:	Bluetooth: GFSK
Antenna Information:	Integral Antenna. **Manufacturer declared max Antenna Gain in 2.4GHz band of operation:** 5.91 dBi
Equipment Design State:	Prototype/Production Equivalent (DV)
Equipment Condition:	Good
Dates of Testing:	03/07/2024 – 03/15/2024

6.1 TEST CONFIGURATIONS

Test firmware provided by the customer was used to program the EUT to transmit continuously at maximum power for NFC WPT.
For BLE, test software “STM32CubeMonitor-RF” (V2.9.1) provided by STMicroelectronics was used to program the EUT to transmit continuously.
The device can operate only in GFSK modulation. Channel numbers 0, 19 and 39 were used as Low, Mid and High Channels respectively.

6.2 ENVIRONMENTAL CONDITIONS

Ambient air temperature of the test site was within the range of 18 ºC to 25 ºC. Testing conditions were within tolerance and any deviations required from the EUT are reported.

6.3 EQUIPMENT MODIFICATIONS

No modifications were made during testing.

6.4 EQUIPMENT UNDER TEST

Model Number	Serial Number
2082	0E33KCK24023KM
2082	0E348BM24013KM

6.4.1 Accessory Test Equipment

Description	Serial Number
Companion Device (Charging Client)	0F00XXD22463BF

7 Test Methodology

Test setup and procedure are performed according to **IEEE 1528-2013 Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communication Devices: Measurement Techniques.**

In addition, the following publications were used as guidance-

For FCC SAR testing and reporting according to FCC standards the following KDBs were adhered to:

- 447498 D01 General RF Exposure Guidance v06
- 616217 D04 SAR for laptop and tablets v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 680106 D01 Wireless Power Transfer v04

8 Conducted RF Average Output Power Measurements

Bluetooth and WLAN output power measurements are made with the DUT connected to the power sensor of a broadband power meter.

8.1 Bluetooth LE Conducted Output Power Measurements

Mode	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)	
			Measured	Maximum Target Power
1 Mbps	0	2402	0.61	1.2
	19	2440	0.58	
	39	2480	0.52	
2 Mbps	0	2402	-	-0.8
	19	2440	-	
	39	2480	-	

Bluetooth SAR was measured in GFSK / 1-Mbps mode where the measured duty factor is 65.924%. See the plot below.

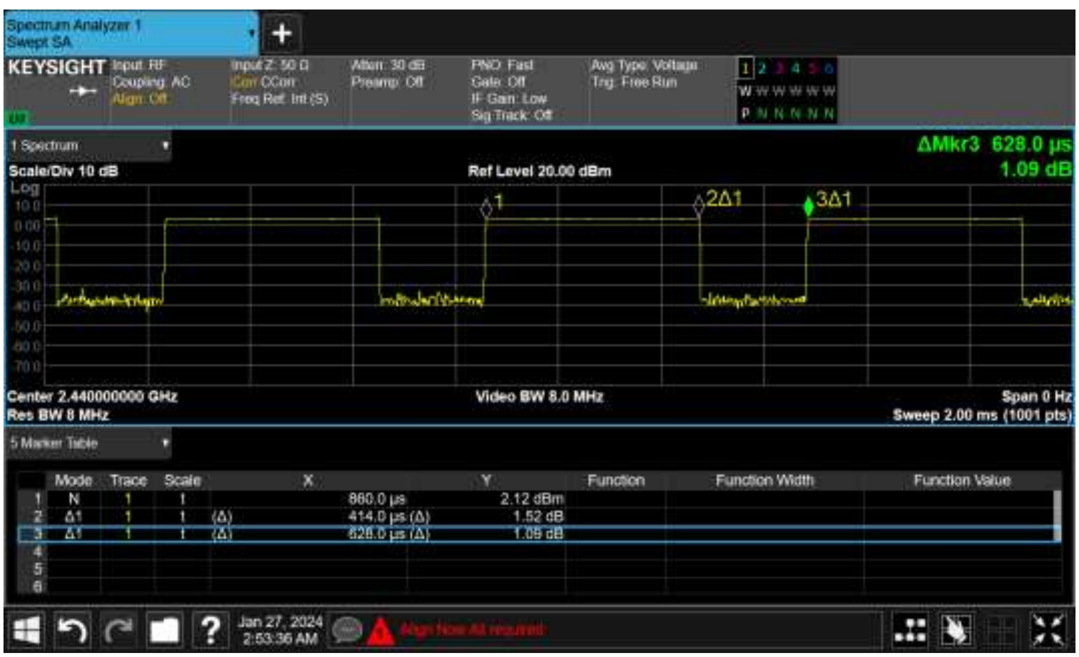


Figure 8.1 Duty Cycle 1 Mbps 2440MHz (Ch.0)

9 Test Configurations

The standalone SAR test exclusion equations (KDB 447498 D01 4.3.1) are used to determine which device edges and faces require testing for a given antenna and air interface technology. From **KDB 616217 D04 v01r02** (SAR for laptop and tablets) section 4.3, the SAR test exclusion threshold from KDB 447498 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent edge is used to determine if SAR testing is required for the adjacent edges.

1) For antenna to edge separation distances ≤ 50mm, the 1-g SAR test exclusion threshold can be determined by evaluating whether the following is true:

$$\frac{Pmax}{d} * \sqrt{f} \leq 3.0$$

- P_{max} = maximum possible average conducted power of transmitter, including tolerances, rounded to the nearest mW.
- d = closest intended separation distance between transmitting antenna and edge / face of device (mm) (5mm at the least)
- f = frequency of the transmitter for that power level in GHz

2) For antenna to edge separation distances > 50mm, the SAR test exclusion threshold is determined according to the following:

   a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

9.1 Evaluation of Required Test Configurations

The following table shows the maximum frequency of the Bluetooth LE transmitter in GHz and the maximum output power level including tolerances rounded to the nearest mW. For FCC, the SAR test exclusion criteria are met for all test positions. However, some Bluetooth LE test results for the faces and edges closest to the antenna are included in this report.

Frequency (GHz)	Output power including tune-up tolerance (dBm)	Output power including tune-up tolerance (mW)	Separation Distance (mm)	SAR Exclusion Calculation	SAR Exclusion Calculation Threshold	Result
2.48	1.2	1.32	5	0.42	<3.0	SAR Testing Excluded

9.2 Test Positions

Exposure Condition	Phantom Used	DUT Test Position	Test Setup Photo (See Appendix)
Body	Flat Section (Triple-Flat)	Closed Back	Photo 1
		Open Back	Photo 2
		Closed Top Edge	Photo 3
		Closed Front	Photo 4
		Open Front	Photo 5
		Closed Left Edge	Photo 6
		Closed Right Edge	Photo 7
Body	Flat Section (ELI)	Front Face	Photo 9
		Back Face	Photo 10
		Right Edge	Photo 11
		Bottom Edge	Photo 12

10 SAR Test Procedures

The SAR Evaluation was performed in the following steps:

- **Power Reference Measurement.**
  The Power Measurement and Power Drift Measurements are for monitoring the power drift of the device under test. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is set to 2mm for the EX3DV4 probe as recommended by SPEAG. The Power Reference Measurement is taken at a point close to the antenna whose output is being measured in order to maximize SNR, thus minimizing drift error.

- **Area Scan**
  The Area Scan is used as a fast scan in two dimensions to find the areas of high field values (or hot spots), before doing a fine measurement around the hotspot. The sophisticated interpolation routines implemented in DASY5 software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maxima found and lists all maxima found in the scan area within a certain range of the global maximum. A 2 dB range is required by IEEE STD 1528. Zoom scans need only be performed on all secondary maxima within this range when the absolute maximum found is under 2 dB less than the SAR limit in question (i.e., less than 1 W/kg for the 1.6 W/kg SAR limit). Otherwise, the zoom scan is only performed at the highest maxima found in the area scan. The exception to this is in MIMO configurations where at least one zoom scan should be measured per transmit antenna.

  The following x-y grid spacings for the given transmitter frequency ranges are used for area scans in accordance with FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz:

  700 MHz – 2 GHz: ≤ 15 mm
  2 GHz – 4 GHz: ≤ 12 mm
  4 GHz – 6 GHz: ≤ 10 mm

- **Zoom Scan**
  Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1g or 10g of simulated tissue. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1g and 10g and displays these values next to the job's label. The sides of the zoom scan cube should be parallel to the edges of the EUT when possible. The dimensions of a Zoom Scan and spacing between measurement points vary by frequency according to FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, shown in the table below:

Transmitter Frequency Range	Cube Dimensions	x-y coordinate spatial resolution	z coordinate spatial resolution
700 MHz – 2 GHz	≥ 30 mm	≤ 8 mm	≤ 5 mm
2 GHz – 3 GHz	≥ 28 mm	≤ 5 mm, *≤ 8 mm	≤ 4 mm
3 – 4 GHz	≥ 25 mm	≤ 5 mm, *≤ 7 mm	≤ 3 mm
4 – 6 GHz	≥ 22 mm	≤ 4 mm, *≤ 5 mm	≤ 2 mm

  *optional x-y coordinate spatial resolution when Area Scan SAR ≤ 87.5% of applicable SAR limit

- **Power Drift Measurement**
  The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. The absolute value of this difference must be ≤ 0.21 dB; if it is not, the entire test is repeated or the difference accounted for.

11 SAR Test Results

11.1 General SAR Testing Notes

- From **KDB 447498 D01 General RF Exposure Guidance v06**, the following test channel reduction was applied to each test position of an exposure condition in each wireless mode and configuration. Initial testing for each test position for each band was performed on the middle required test channel (or required test channel with the highest measured power for WLAN modes). Testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
  - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz

- Tissue-simulating liquid temperature was maintained within +/- 2°C of that which was measured during liquid verification.

- The SAR of the NFC transmitter is very low and hardly discernible from the system measurement noise floor.

- The 13.56 MHz signal was monitored with a spectrum analyzer to ensure continuous transmission throughout the tests.

- Full area scans exploratory area scans were done covering the entire EUT, but the final data used had smaller area scans focused around the NFC coil with smaller step sizes to try to find a measurable peak.

11.1 Bluetooth SAR Test Results

Mode	Ant.	Position	Ch.	Freq. (MHz)	Avg. Pwr. (dBm)	Max. Pwr. (dBm)	Pwr. Scaling Factor	Duty Cycle Scaling Factor	Meas. 1g SAR (W/kg)	Reported 1g SAR (W/kg)
LE 1Mbps	BT	Front	19	2440	0.58	1.2	1.153	1.517	0.125	**0.219 (Plot 1)**
		Back	19	2440	0.58	1.2	1.153	1.517	0.0657	**0.115**
		Right Edge	19	2440	0.58	1.2	1.153	1.517	0.0105	**0.018**
		Bottom Edge	19	2440	0.58	1.2	1.153	1.517	0.00217	**0.004**

11.2 NFC Charging SAR Test Results

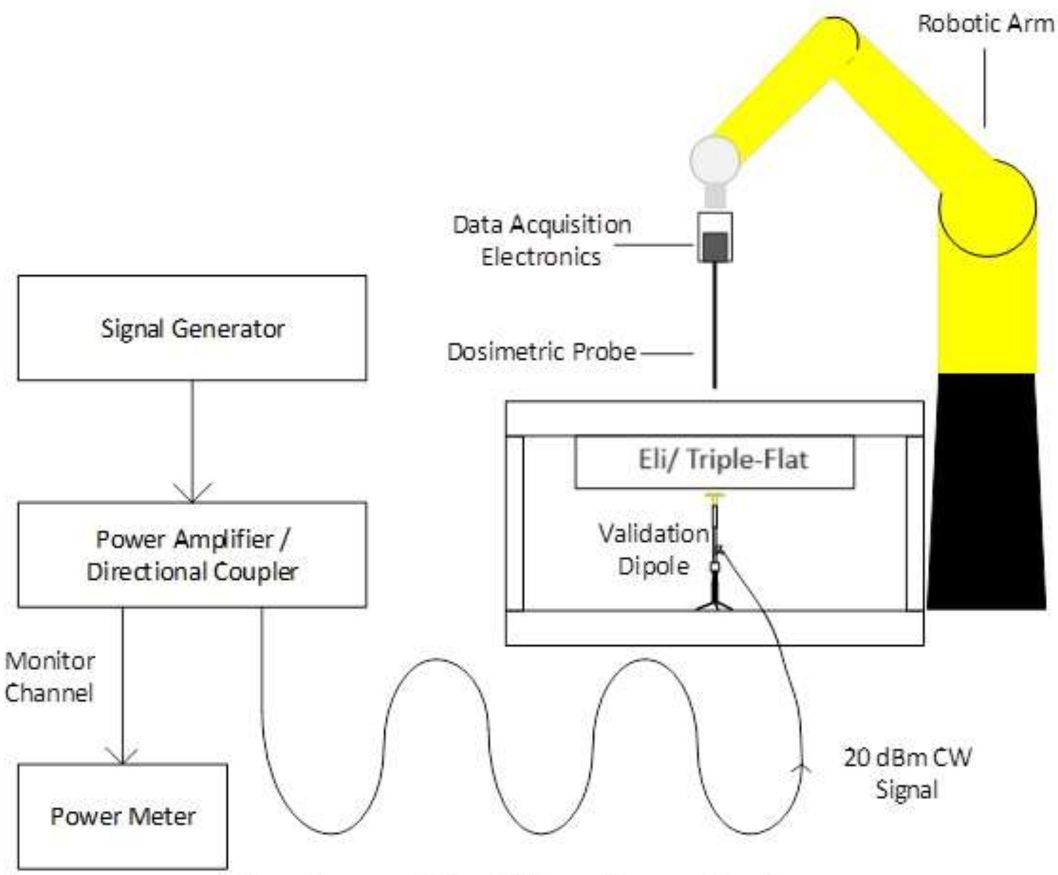
Mode	Ant.	Position	Freq. (MHz)	Meas. 1g SAR (W/kg)	Reported 1g SAR (W/kg)
NFC Charging	default	Closed Back	13.56	<0.001	<0.001
		Open Back		<0.001	<0.001
		Closed Top Edge		<0.001	<0.001
		Closed Front		<0.001	<0.001
		Open Front		<0.001	<0.001 **(Plot 2)**
		Closed Left Edge		<0.001	<0.001
		Closed Right Edge		<0.001	<0.001

Note: For NFC SAR Testing, the system could not discern a peak SAR location. Smaller grid step sizes were used in the area scans to try to find a peak. The peak measured SAR values were all much less than 0.001 W/kg and thus the 1-gram SAR is reported as <0.001 W/kg as well.

12 SAR System Verification

System Verifications were performed in accordance with **IEEE 1528-2013.** Verifications were performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent liquid combinations used with each SAR system for system verification were used for device testing. Verifications were performed before each series of SAR measurements using the same calibration point and tissue-equivalent medium and every three days thereafter when necessary.

The test setup diagram is shown below. A CW signal is created by a signal generator and fed through a power amplifier with directional coupler outputs. The forward output power is adjusted to 20 dBm (or 17 dBm when connected to CLA) while the coupled output power is normalized to 0dB for easy monitoring. When the forward power is attached to the dipole / CLA, the power is then adjusted if necessary so that the coupled channel again reads 0 dB on the power meter. Tissue-simulating liquid depth in the phantom is maintained to be at least 15 cm for frequencies below 3 GHz and 10 cm for frequencies above 5 GHz.



System Verification Setup

12.1 SAR System Verification Results

13 MHz verification is performed with a 50 mW (17 dBm) input to the CLA. All other verifications are performed with a 100 mW (20 dBm) input to the dipole. The resultant measured SAR is normalized to 1 W (30 dBm) for comparison to calibrated dipole / CLA targets. All normalized SAR system verification results were within 10% of the respective dipole / coil target values.

Date	Tissue-Sim. Liquid	Probe SN	Coil	Freq. (MHz)	Meas. 1-g SAR (W/kg)	Norm. 1-g SAR (W/kg)	Dipole Target 1-g SAR (W/kg)	Dev. from Target 1-g SAR (%)
3/13/2024	HSL	3960	CLA13 (1006)	13	0.0256	0.51	0.553	**-7.8% (Plot 3)**
3/7/2024	HSL	3999	D2450V2 (917)	2450	5.33	53.3	51.5	**3.5% (Plot 4)**

13 Tissue-Simulating Liquid Verification

(KDB 854664 D01 v01r04 Section 2.4) The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18°C to 25°C, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

The target parameters for the tissue-simulating liquids are obtained from the following table:

Frequency MHz	Real part of the complex relative permittivity, ε_r'	Conductivity, σ S/m
4	55,0	0,75
13	55,0	0,75
30	55,0	0,75
150	52,3	0,76
300	45,3	0,87
450	43,5	0,87
750	41,9	0,89
835	41,5	0,90
900	41,5	0,97
1 450	40,5	1,20
1 800	40,0	1,40
1 900	40,0	1,40
1 950	40,0	1,40
2 000	40,0	1,40
2 100	39,8	1,49
2 450	39,2	1,80
2 600	39,0	1,96
3 000	38,5	2,40
3 500	37,9	2,91
4 000	37,4	3,43
4 500	36,8	3,94
5 000	36,2	4,45
5 200	36,0	4,66
5 400	35,8	4,86
5 600	35,5	5,07
5 800	35,3	5,27
6 000	35,1	5,48
6 500	34,5	6,07
7 000	33,9	6,65
7 500	33,3	7,24
8 000	32,7	7,84
8 500	32,1	8,46
9 000	31,6	9,08
9 500	31,0	9,71
10 000	30,4	10,40

13.1 Tissue-Simulating Liquid Ingredients and Maintenance

The Tissue-simulating liquids were manufactured by SPEAG. The following information on the maintenance of

MSL 2450 Ingredients: Water, DGBE

MBBL 3500 – 5800 Ingredients: Water, Mineral Oil, Emulsifiers, Sodium Chloride

DGBE BASED LIQUIDS
DGBE is easily dissolved in water. Given a DGBE-water mixture, mainly water will evaporate, however DGBE will evaporate to a smaller percentage. For the frequency liquids around 2.5 GHz, no NaCl is contained and should therefore not be added for any corrections.
Evaporated water can be replaced and will mainly increase the permittivity, and to a small extent the conductivity, typically as follows:

HSLxxxxV2: permittivity 0.8 to 1.0 per % of water, conductivity 0 to 0.1 per % of water

MSLxxxxV2: permittivity 0.8 per % of water, conductivity 0 to 0.01 per % of water

OIL BASED LIQUIDS
Oil based liquids are an emulsion of a complex mixture of ingredients. Their appearance is yellow or brown transparent or slightly opaque / milky in most cases. Some older liquids may show a non-transparent upper zone with a creamy appearance after some time without stirring. Before using or handling the liquid, it must therefore be stirred to become entirely homogeneous. An opaque appearance is possible but will not influence the dielectric parameters if it is homogeneous during the measurement at the probe surface.
Evaporated water can be replaced and will increase the permittivity, and to a smaller extent the conductivity.

The **sensitivities to water addition** (% parameter increase per weight% water added) of oil based SPEAG broadband tissue simulating liquids at the frequencies of interest are typically in the following range:

HBBL3500-5800V5	at 3.5 GHz:	permittivity 0.79, conductivity 0.14
	at 5.5 GHz:	permittivity 0.83, conductivity 0.41
MBBL3500-5800V5	at 3.5 GHz:	permittivity 0.44, conductivity 0.00
	at 5.5 GHz:	permittivity 0.48, conductivity 0.18

The **temperature gradients** shall be observed especially during conductivity measurement:

HBBL3500-5800V5	at 3.5 GHz:	permittivity -0.07, conductivity -0.43 %/°C
	at 5.5 GHz:	permittivity -0.23, conductivity -0.96 %/°C
MBBL3500-5800V5	at 3.5 GHz:	permittivity -0.35, conductivity -1.14 %/°C
	at 5.5 GHz:	permittivity -0.08, conductivity -1.52 %/°C

13.2 Tissue-Simulating Liquid Measurements

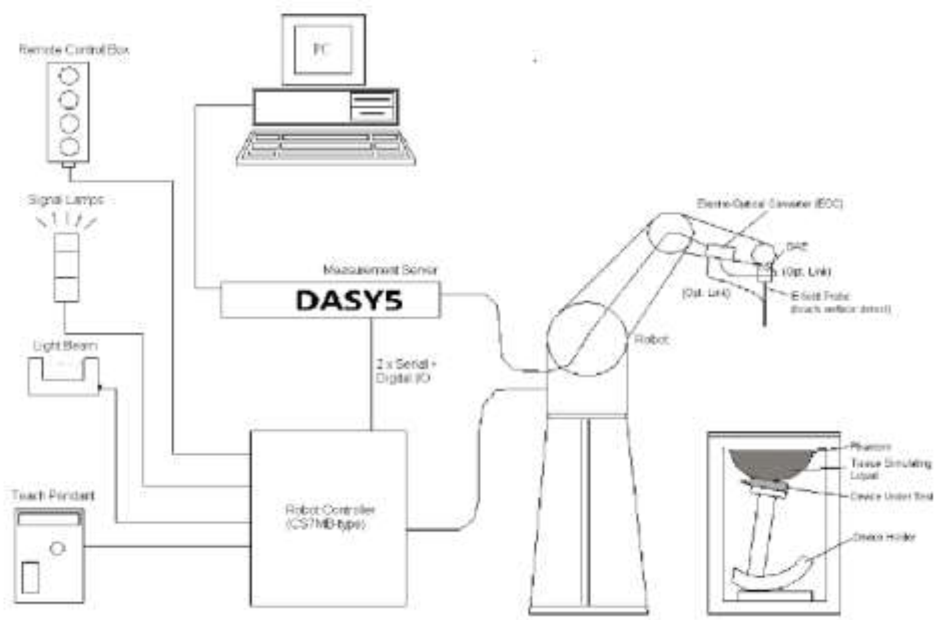
Date	Tissue-Simulating Liquid	Freq. (MHz)	Rel. Perm. ε'$_r$	Target ε'$_r$	ε'$_r$ Dev. %	Cond. σ (S/m)	Target σ (S/m)	σ Dev. %
3/13/2024	HBBL 30-250 V3 171115-1 21.9 °C	13	53.27	55	**-3.15**	0.776	0.75	**3.47**
		13.5	54.14	55	**-1.56**	0.776	0.75	**3.47**
		14	54.36	55	**-1.16**	0.776	0.75	**3.47**
3/7/2024	HBBL 160212-1 21.8 °C	2400	38	39..3	**3.3**	1.764	1.76	**0.22**
		2402	38	39.29	**3.3**	1.765	1.76	**0.28**
		2440	37.88	39.22	**3.41**	1.798	1.79	**0.45**
		2450	37.87	39.2	**3.38**	1.807	1.80	**0.38**
		2480	37.86	39.16	**3.31**	1.832	1.83	**0.11**

14 System Specification

14.1 SPEAG DASY5 SYSTEM

DASY 5 system performing SAR testing contains the following items, which are illustrated in the figure below.

- 6-axis robot (model: TX90XL) with controller and teach pendant.
- Dosimetric E-field probe.
- Light beam unit which allows automatic “tooling” of the probe.
- The electro-optical convertor (EOC) which is mounted on the robot arm.
- The data acquisition electronics (DAE).
- Elliptical Phantom
- Device holder.
- Remote control.
- PC.
- DASY5 software.
- Validation dipole.



DASY5 System Setup

15 Measurement Uncertainty

DASY5 Uncertainty Budget (0.3 – 3 GHz range) **According to IEEE 1528-2013**								
Error Description	**Uncert. Value**	**Prob. Dist.**	**Div.**	**(c_i) 1g**	**(c_i) 10g**	**Std. Unc. (1g)**	**Std. Unc. (10g)**	**(V_i) V_{eff}**
Measurement System								
Probe Calibration	±6.0%	Normal	1	1	1	±6.0%	±6.0%	∞
Axial Isotropy	±4.7%	Rectangular	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	Rectangular	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	Rectangular	√3	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	Rectangular	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	Rectangular	1	1	1	±0.6%	±0.6%	∞
Modulation Response	±2.4%	Rectangular	√3	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	Normal	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	Rectangular	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	Rectangular	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	Rectangular	√3	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	Rectangular	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	Rectangular	√3	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	Rectangular	√3	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±2.0%	Rectangular	√3	1	1	±1.2%	±1.2%	∞
Test Sample Related								
Device Positioning	±2.9%	Normal	1	1	1	±3.6%	±3.5%	29
Device Holder	±3.6%	Normal	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	Rectangular	√3	1	1	±2.9%	±2.9%	∞
Power Scaling[P]	±0%	Rectangular	√3	1	1	±0%	±0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.1%	Rectangular	√3	1	1	±3.5%	±3.5%	∞
SAR Correction	±1.9%	Rectangular	√3	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)	±2.5%	Rectangular	√3	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.)	±2.5%	Rectangular	√3	0.26	0.26	±0.3%	±0.4%	∞
Temp. unc. – Conductivity	±3.4%	Rectangular	√3	0.78	0.71	±1.5%	±1.4%	∞
Temp. unc. - Permittivity	±0.4%	Rectangular	√3	0.23	0.26	±0.1%	±0.1%	∞
Combined Std. Uncertainty						±11.4%	±11.3%	429
Expanded Std. Uncertainty						**±22.7%**	**±22.6%**	

16 Appendices

The following are contained in the attached appendices:

- Highest SAR Test and SAR System Verification Plots
- SAR Test Setup Photos
- Calibration Report Documents for:
  - Validation Coil CLA13-1006_May23
  - Validation Dipole D2450V2-917_May23
  - Dosimetric Probe EX3DV4-3960_Dec23
  - Dosimetric Probe EX3DV4-3999_Sep23
  - DAE4-1709_Nov23
  - DAE4-1384_Sep23

End of Test Report