

APPENDIX E RETURN LOSS&IMPEDANCE MEASUREMENT

Equipment Details:

Description: Dipole  
Manufacturer: Speag  
Model Number: D750V3  
Serial Number: 1229  
Calibration Date: 2024/03/26  
Calibrated By: Bob Lu  
Signature: Bob Lu

All Calibration have been conducted in the closed laboratory facility: Lab Temperature 18℃-25℃ and humidity < 70%

The calibration methods and procedures used were as detailed in:

- KDB Publication Number: “KDB865664 D01 SAR Measurement 100 MHz to 6 GHz”
- 1.The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
  - 2.The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

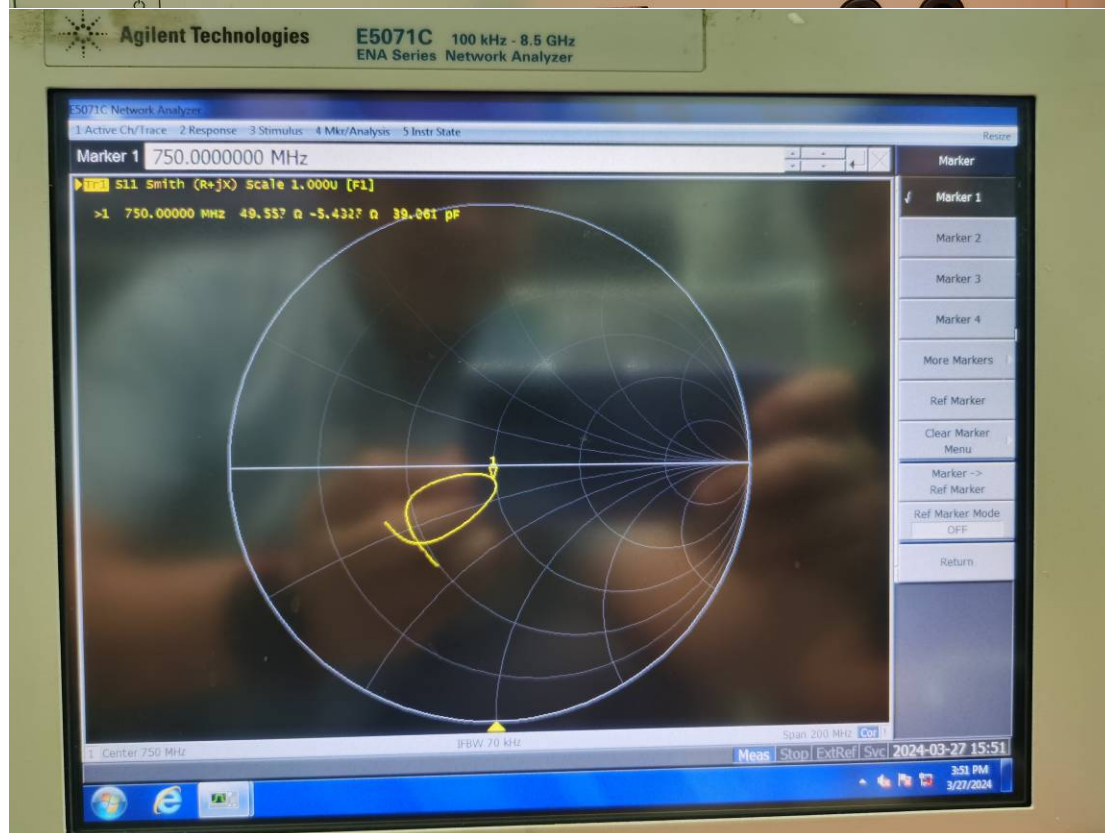
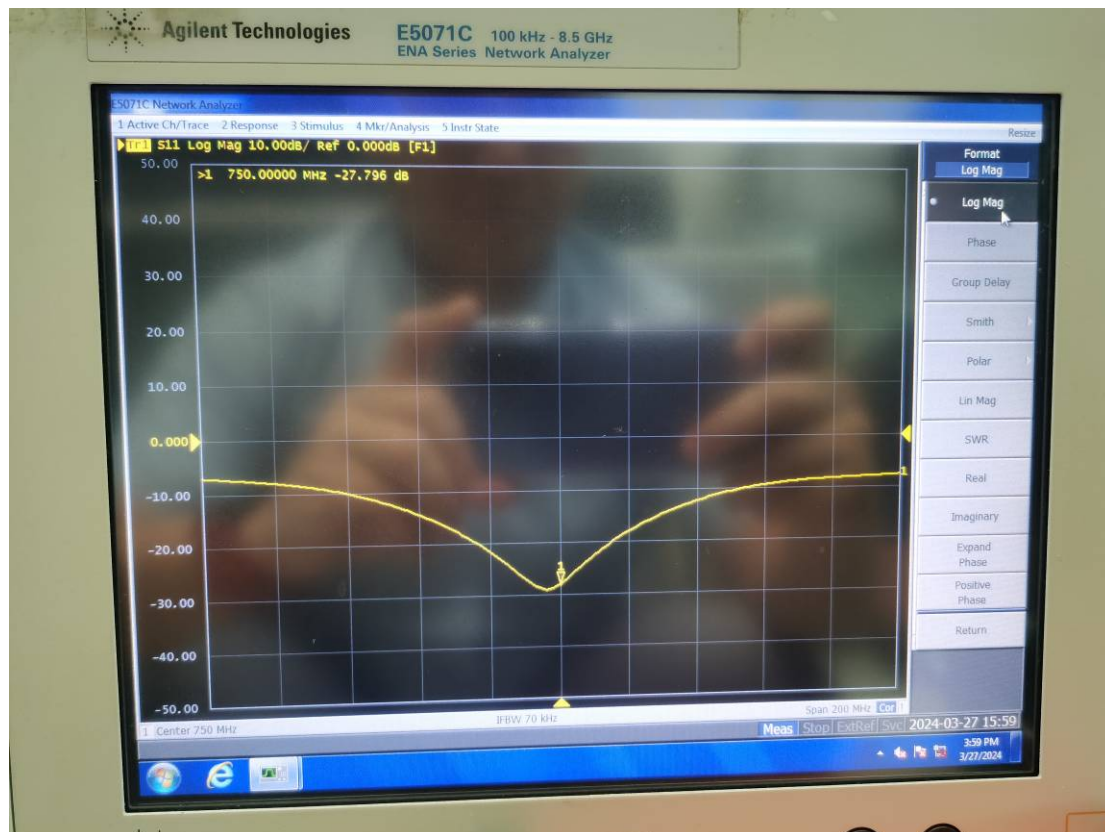
Calibrated Equipment:

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Simulated Tissue Liquid Head	HBBL600-10000V6	2200808-2	Each Time	
SAM Twin Phantom	SAM-Twin V8.0	1962	NCR	NCR
Network Analyzer	E5071C	SER MY46519680	2023/06/08	2024/06/07
Network Analyzer Calibration Kit	50 Ω	51026	NCR	NCR

Test Data:

Frequency (MHz)	Simulated Liquid	Parameter	Measured Value	Target Value	Deviation	Reference Range	Results
750	Head	Return Loss	27.796 dB	29.503 dB	-5.786%	±20%; ≥20dB	Pass
		Real Impedance	49.557 Ω	53.314 Ω	3.757 Ω	≤ 5 Ω	Pass
		Imaginary Impedance	-5.432 Ω	-0.992 Ω	4.44 Ω	≤ 5 Ω	Pass

Note: Return Loss Deviation = (Measured-Target)/Target×100%

**Dipole, 750MHz, 1229**

**Equipment Details:**

Description: Dipole  
Manufacturer: Speag  
Model Number: D1750V2  
Serial Number: 1199  
Calibration Date: 2024/03/26  
Calibrated By: Bob Lu  
Signature: Bob Lu

All Calibration have been conducted in the closed laboratory facility: Lab Temperature 18°C-25°C and humidity < 70%

**The calibration methods and procedures used were as detailed in:**

KDB Publication Number: “KDB865664 D01 SAR Measurement 100 MHz to 6 GHz”

- 1.The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 2.The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

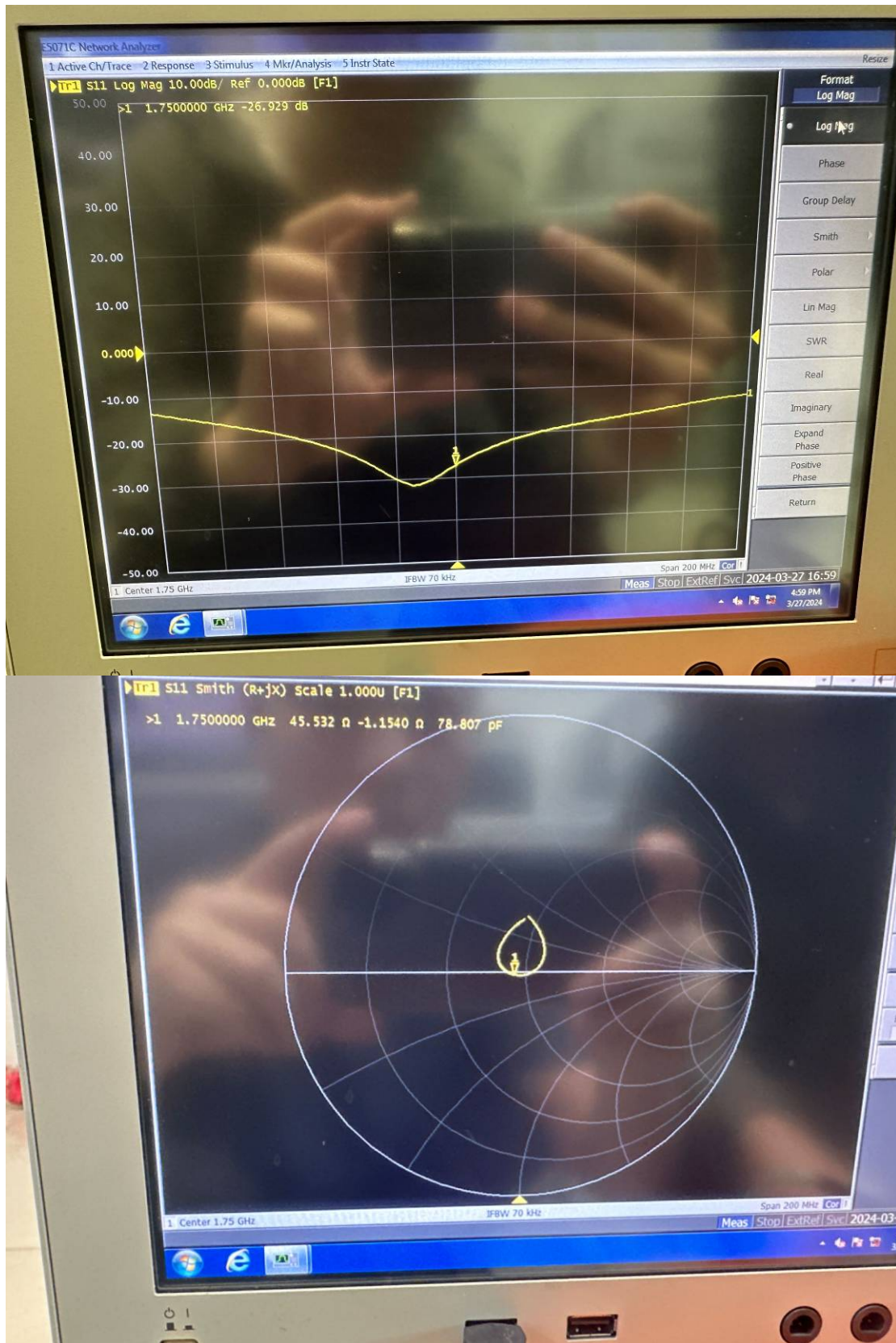
**Calibrated Equipment:**

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Simulated Tissue Liquid Head	HBBL600-10000V6	2200808-2	Each Time	
SAM Twin Phantom	SAM-Twin V8.0	1962	NCR	NCR
Network Analyzer	E5071C	SER MY46519680	2023/06/08	2024/06/07
Network Analyzer Calibration Kit	50 Ω	51026	NCR	NCR

**Test Data:**

Frequency (MHz)	Simulated Liquid	Parameter	Measured Value	Target Value	Deviation	Reference Range	Results
1750	Head	Return Loss	26.929 dB	26.017 dB	3.505%	±20%; ≥20dB	Pass
		Real Impedance	45.532 Ω	46.939 Ω	1.407 Ω	≤ 5 Ω	Pass
		Imaginary Impedance	-1.154 Ω	3.765 Ω	4.919 Ω	≤ 5 Ω	Pass

Note: Return Loss Deviation = (Measured-Target)/Target×100%

**Dipole, 1750MHz, 1199**

**Equipment Details:**

Description: Dipole  
Manufacturer: Speag  
Model Number: D1900V2  
Serial Number: 5d231  
Calibration Date: 2024/02/01  
Calibrated By: Bob Lu  
Signature: Bob Lu

All Calibration have been conducted in the closed laboratory facility: Lab Temperature 18°C-25°C and humidity < 70%

**The calibration methods and procedures used were as detailed in:**

KDB Publication Number: “KDB865664 D01 SAR Measurement 100 MHz to 6 GHz”

- 1.The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 2.The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

**Calibrated Equipment:**

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Simulated Tissue Liquid Head	HBBL600-10000V6	2200808-2	Each Time	
SAM Twin Phantom	SAM-Twin V8.0	1962	NCR	NCR
Network Analyzer	E5071C	SER MY46519680	2023/06/08	2024/06/07
Network Analyzer Calibration Kit	50 Ω	51026	NCR	NCR

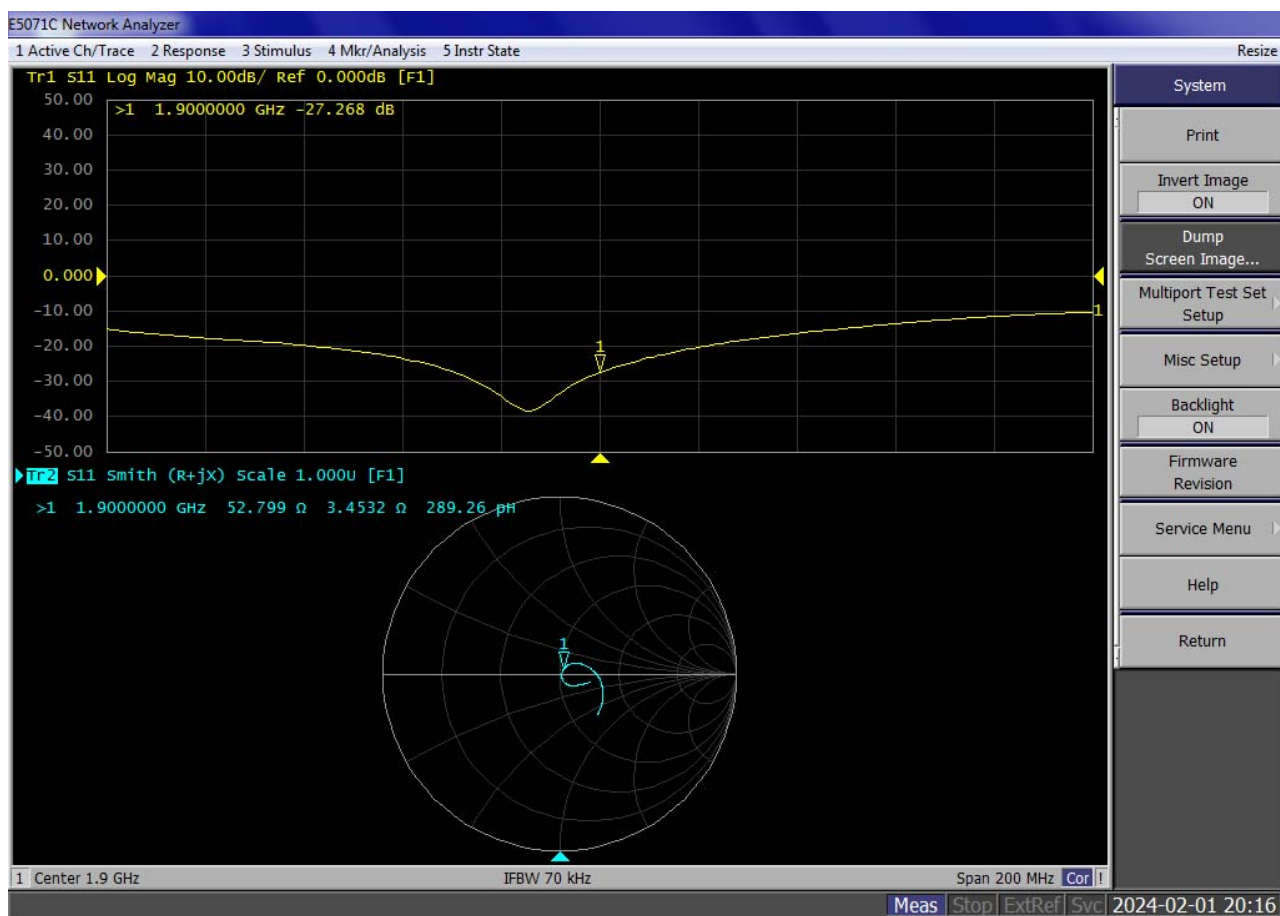
**Test Data:**

Frequency (MHz)	Simulated Liquid	Parameter	Measured Value	Target Value	Deviation	Reference Range	Results
1900	Head	Return Loss	27.268 dB	26.067 dB	4.607 %	±20%; ≥20dB	Pass
		Real Impedance	52.799 Ω	50.307 Ω	2.492 Ω	≤ 5 Ω	Pass
		Imaginary Impedance	3.453 Ω	4.985 Ω	-1.532 Ω	≤ 5 Ω	Pass

Note: Return Loss Deviation = (Measured-Target)/Target×100%



## Dipole, 1900MHz, 5d231



**Equipment Details:**

Description: Dipole  
Manufacturer: Speag  
Model Number: D2450V2  
Serial Number: 1103  
Calibration Date: 2024/03/26  
Calibrated By: Bob Lu  
Signature: Bob Lu

All Calibration have been conducted in the closed laboratory facility: Lab Temperature 18°C-25°C and humidity < 70%

**The calibration methods and procedures used were as detailed in:**

KDB Publication Number: “KDB865664 D01 SAR Measurement 100 MHz to 6 GHz”

- 1.The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 2.The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

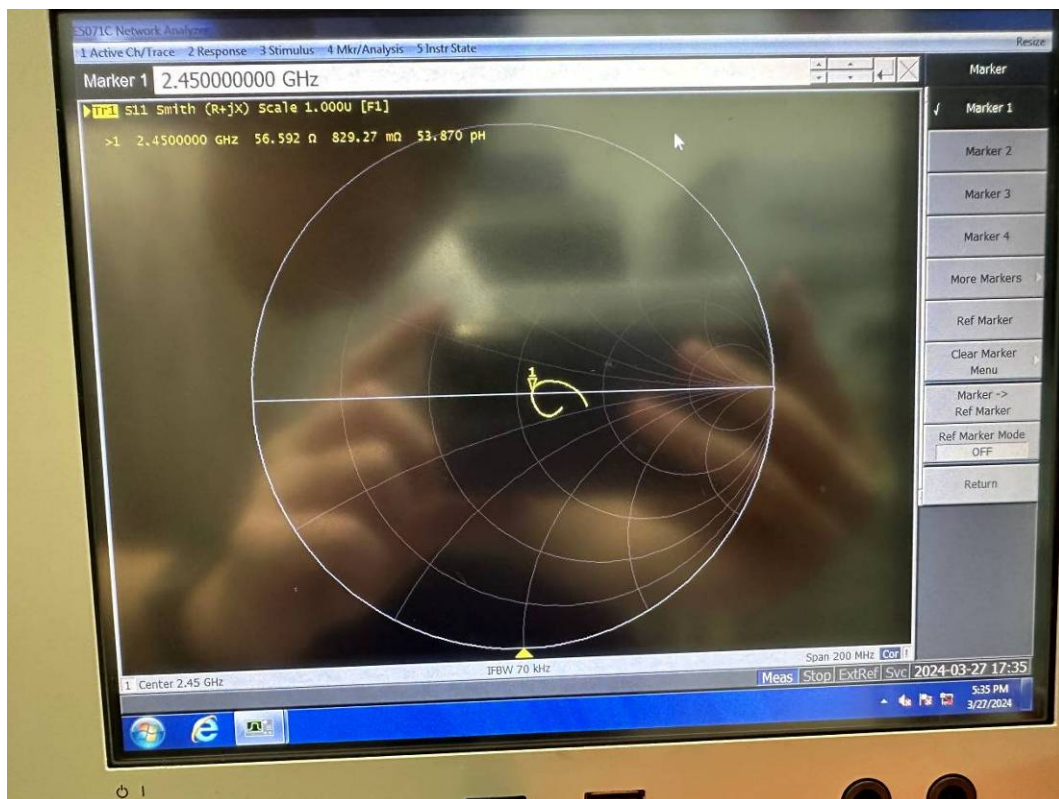
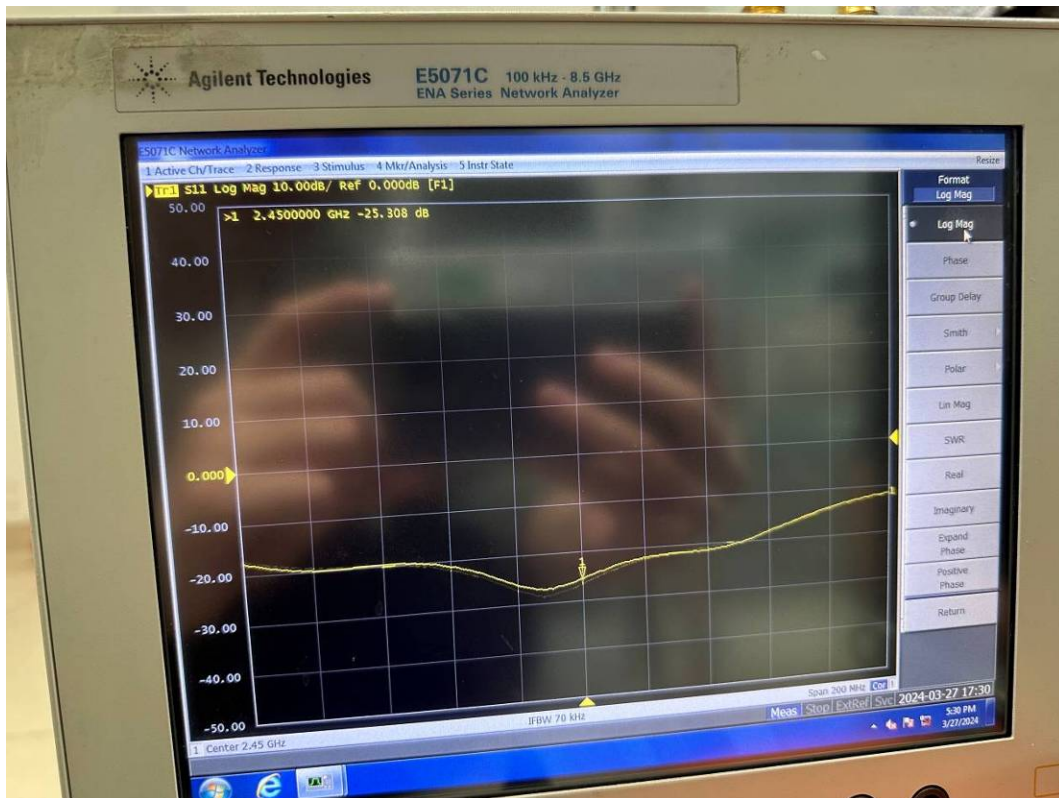
**Calibrated Equipment:**

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Simulated Tissue Liquid Head	HBBL600-10000V6	2200808-2	Each Time	
SAM Twin Phantom	SAM-Twin V8.0	1962	NCR	NCR
Network Analyzer	E5071C	SER MY46519680	2023/06/08	2024/06/07
Network Analyzer Calibration Kit	50 Ω	51026	NCR	NCR

**Test Data:**

Frequency (MHz)	Simulated Liquid	Parameter	Measured Value	Target Value	Deviation	Reference Range	Results
2450	Head	Return Loss	25.308 dB	24.161 dB	4.747 %	±20%; ≥20dB	Pass
		Real Impedance	56.592 Ω	53.467 Ω	3.125 Ω	≤ 5 Ω	Pass
		Imaginary Impedance	0.829 Ω	5.400 Ω	-4.571 Ω	≤ 5 Ω	Pass

Note: Return Loss Deviation = (Measured-Target)/Target×100%

**Dipole, 2450MHz, 1103**



**Equipment Details:**

Description: Dipole  
Manufacturer: Speag  
Model Number: D2600V2  
Serial Number: 1207  
Calibration Date: 2024/03/26  
Calibrated By: Bob Lu  
Signature: Bob Lu

All Calibration have been conducted in the closed laboratory facility: Lab Temperature 18°C-25°C and humidity < 70%

**The calibration methods and procedures used were as detailed in:**

KDB Publication Number: “KDB865664 D01 SAR Measurement 100 MHz to 6 GHz”

- 1.The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 2.The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

**Calibrated Equipment:**

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Simulated Tissue Liquid Head	HBBL600-10000V6	2200808-2	Each Time	
SAM Twin Phantom	SAM-Twin V8.0	1962	NCR	NCR
Network Analyzer	E5071C	SER MY46519680	2023/06/08	2024/06/07
Network Analyzer Calibration Kit	50 Ω	51026	NCR	NCR

**Test Data:**

Frequency (MHz)	Simulated Liquid	Parameter	Measured Value	Target Value	Deviation	Reference Range	Results
2600	Head	Return Loss	30.923 dB	27.361 dB	13.019%	±20%; ≥20dB	Pass
		Real Impedance	48.396 Ω	45.943 Ω	2.453 Ω	≤ 5 Ω	Pass
		Imaginary Impedance	-0.109 Ω	-0.667 Ω	0.558 Ω	≤ 5 Ω	Pass

Note: Return Loss Deviation = (Measured-Target)/Target×100%

# Dipole, 2600MHz, 1207

