ANTENNA PASSIVE TEST REPORT

Application No.	SZCR2211004037AT
Applicant	CHENGDU TECLOMAN ENERGY STORAGE TECHNOLOGY CO., LTD
Manufacturer	CHENGDU TECLOMAN ENERGY STORAGE TECHNOLOGY CO., LTD
Product Name	Printed circuit board antenna
Model No.	KXTX-2.4G7505-12CM-IPEX-1
Standards	ANSI/IEEE Std 149-2008
Date Initial Sample(s) Received	2023-02-10
Testing Start Date	2023-02-11
Testing Finish Date	2023-02-11 to 2023-03-02
Report Issue Date	2023-03-02

***In the configuration tested, the EUT detailed in this report complied with the standards specified above.**

Keny Xu
EMC Laboratory Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2023-03-02		Original

Authorized for issue by:				
		Ian. Li **Prepared by Ian Li**		
		Mark Mao **Reviewed by Mark Mao**		
		Eric Fu **Approved by Eric Fu**		

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2 Revision Version

Report No.	Version	Date	Memo
SZCR2211004037AT	00	03/02	Initial creation of report

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4 General Information

4.1 Testing Laboratory

Test Lab	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address	No.1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057
Contact	Mark Mao
Tel.	+86 (0) 755 2532 8628
Fax	+86 (0) 755 2671 0594
E-mail	Mark.Mao@sgs.com

4.2 Details of Applicant

Applicant's Name	CHENGDU TECLOMAN ENERGY STORAGE TECHNOLOGY CO., LTD
Applicant's Address	GUIJIN ROAD, INDUSTRIAL ZONE, XINDU DISTRICT CHENGDU, CHINA.
Contact	Rendong Xie
Tel.	15989862946
E-mail	xierendong@tlmse.com

4.3 Details of Manufacturer

Manufacturer's Name	CHENGDU TECLOMAN ENERGY STORAGE TECHNOLOGY CO., LTD
Manufacturer's Address	GUIJIN ROAD, INDUSTRIAL ZONE, XINDU DISTRICT CHENGDU, CHINA.
Contact	Rendong Xie
Tel.	15989862946
E-mail	xierendong@tlmse.com

4.4 General Description of EUT

Device Description:	Antenna Of Battery System
Device Manufacturer:	Printed circuit board antenna
Device Model:	KXTX-2.4G7505-12CM-IPEX-1
Hardware Version:	N/A
Software Version:	N/A
S/N:	N/A

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4.5 Test Procedure

Testing is performed according to the **ANSI/IEEE Std 149-2008**.

4.6 Test Specification

Identity	Document Title
ANSI/IEEE Std 149-2008	IEEE Standard Test Procedures for Antennas

4.7 Laboratory Environment

Temperature	Min. =19℃，Max. = 25℃	
Relative humidity	Min. =40%，Max. =72%	
Shield effect	0.7-6GHz	> 100dB
Ground resistance	<0.5Ω	

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4.8 Test Location

All tests were performed at:

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Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.9 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

4.10 Deviation from Standards

None

4.11 Abnormalities from Standard Conditions

None

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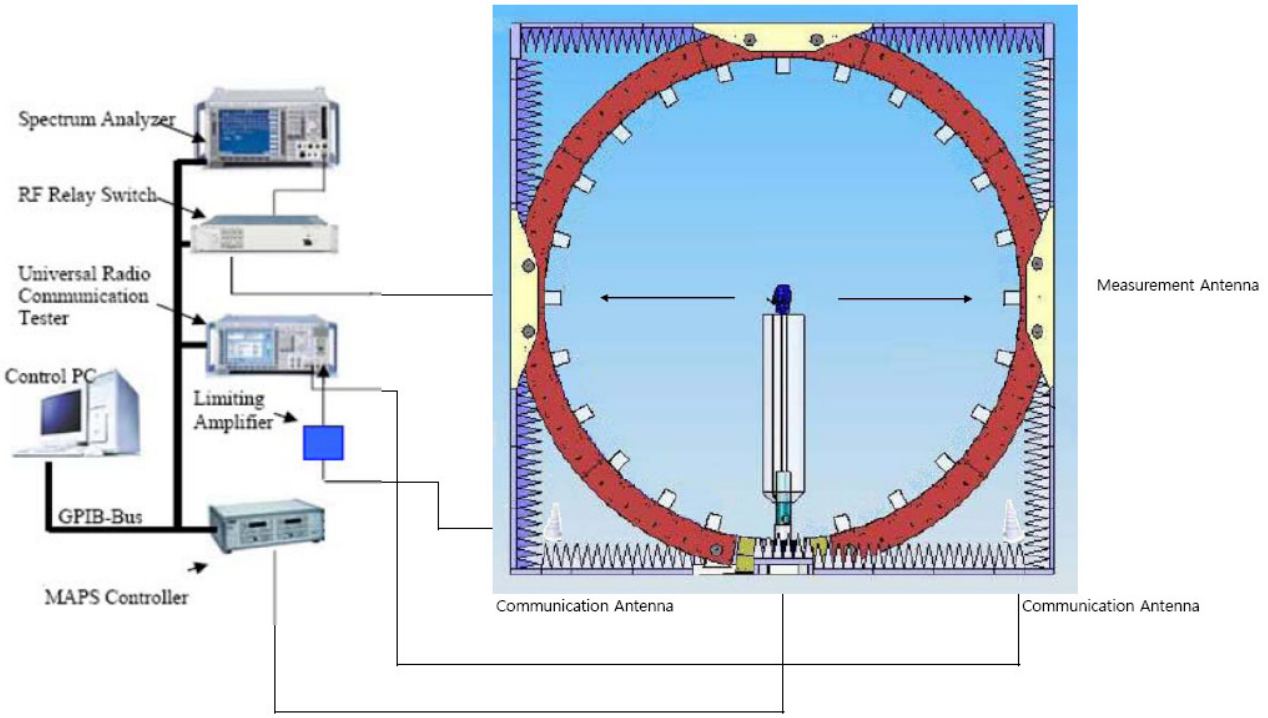
5 OTA Measurements System Configuration

5.1 Test Configuration

Great-Circle-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 5m



F-1. OTA Measurement System Configuration

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6 Equipment List

Type of Equipment	Model Number	Manufacture	Calibration Date	Valid Period
Network Analyzer	E5071C S/N MY46523591	Keysight	2022/4/11	2023/4/10
Quad-Ridge Horn Antenna 700 MHz-10 GHz	EMCO 3164-08 S/N 161915	ETS-Lindgren L.P.	N/A	N/A
MAPS Controller	EMCENTER S/N 160485	ETS-Lindgren L.P.	N/A	N/A

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7 Measurement Uncertainty

Item	2400-2500 MHz (dB)
Gain	0.88
Efficiency	0.88
Measurement Uncertainty (95% CONFIDENCE INTERVAL) K=2	

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8 Test Result

8.1 Test summary

product	Maximum Gain Data			
	Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
Antenna	2500	-1.90	64.51	3.84

8.2 Antenna Test Results

Free Space			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2400	-2.95	50.65	2.05
2402	-2.94	50.77	1.93
2405	-2.84	52.04	2.25
2410	-2.78	52.75	2.34
2415	-2.71	53.53	2.44
2420	-2.73	53.30	2.58
2425	-2.74	53.17	2.57
2430	-2.76	53.02	2.68
2435	-2.72	53.45	2.61
2440	-2.55	55.61	2.84
2441	-2.54	55.70	2.84
2445	-2.48	56.48	2.81
2450	-2.41	57.38	3.04
2455	-2.40	57.53	3.11
2460	-2.45	56.93	3.28
2465	-2.39	57.66	3.29
2470	-2.52	56.01	3.26
2475	-2.39	57.68	3.23
2480	-2.43	57.15	3.16
2482	-2.37	58.01	3.34
2485	-2.27	59.31	3.23
2490	-2.20	60.27	3.37
2495	-2.01	62.96	3.64
2500	-1.90	64.51	3.84

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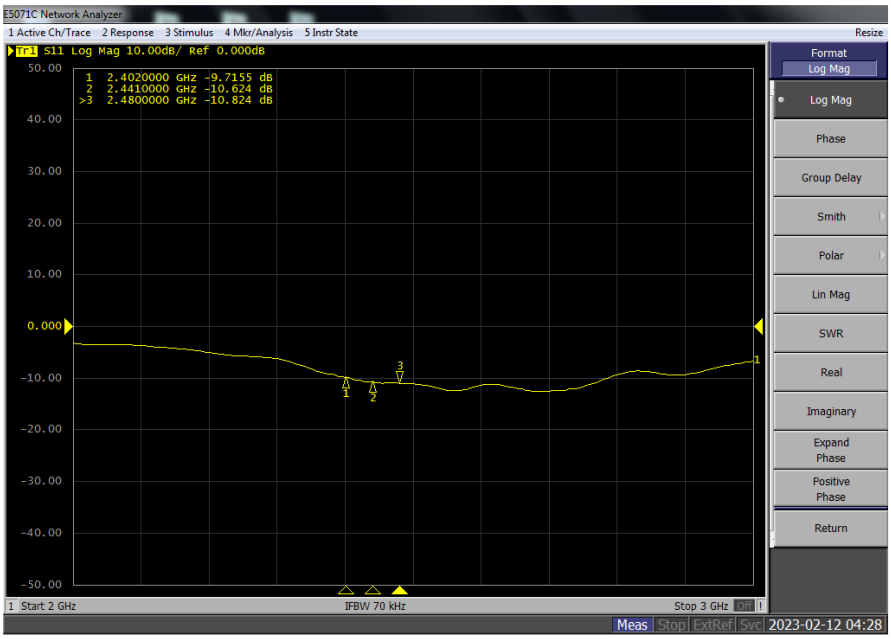
9 Pattern Plots

Return Los



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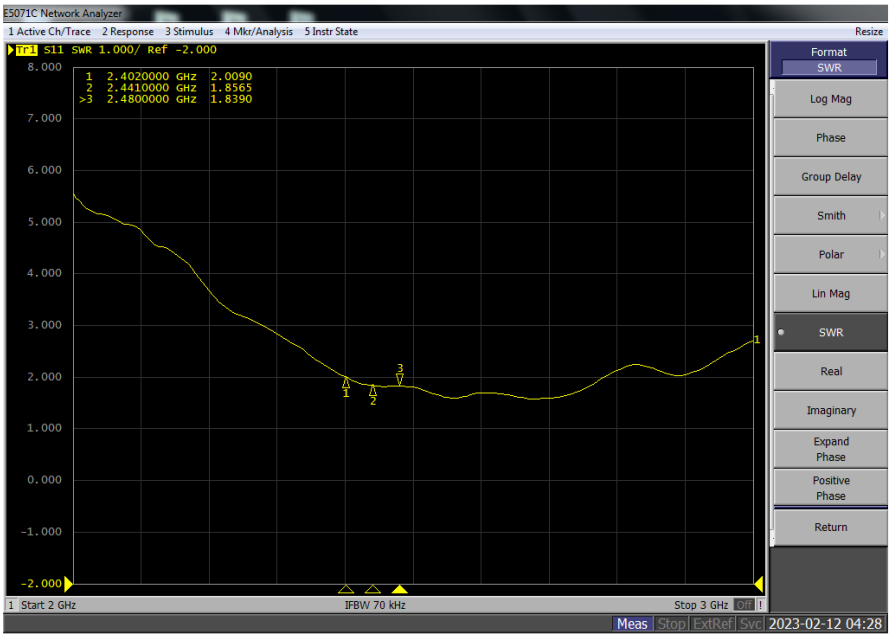
VSWR



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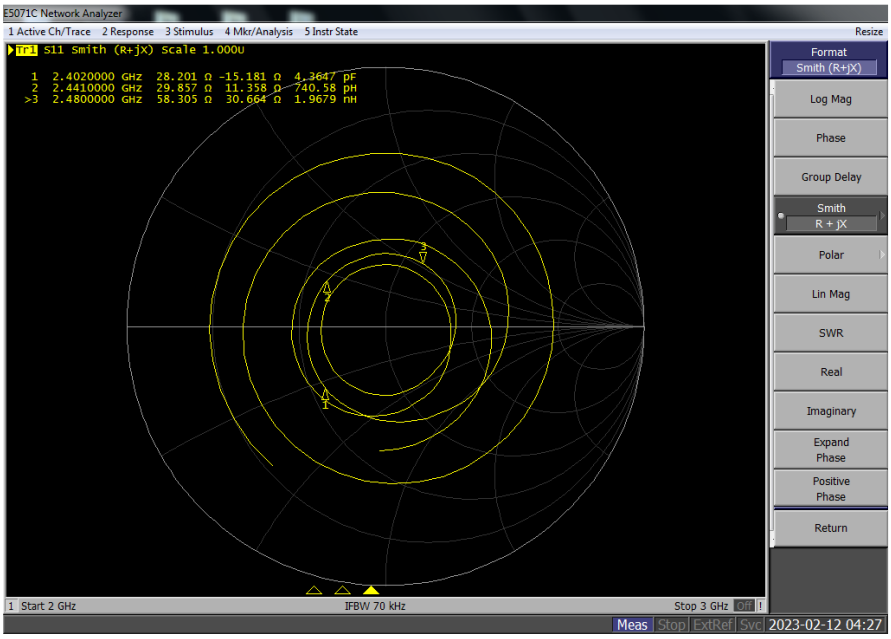
Stimulus



Free Space

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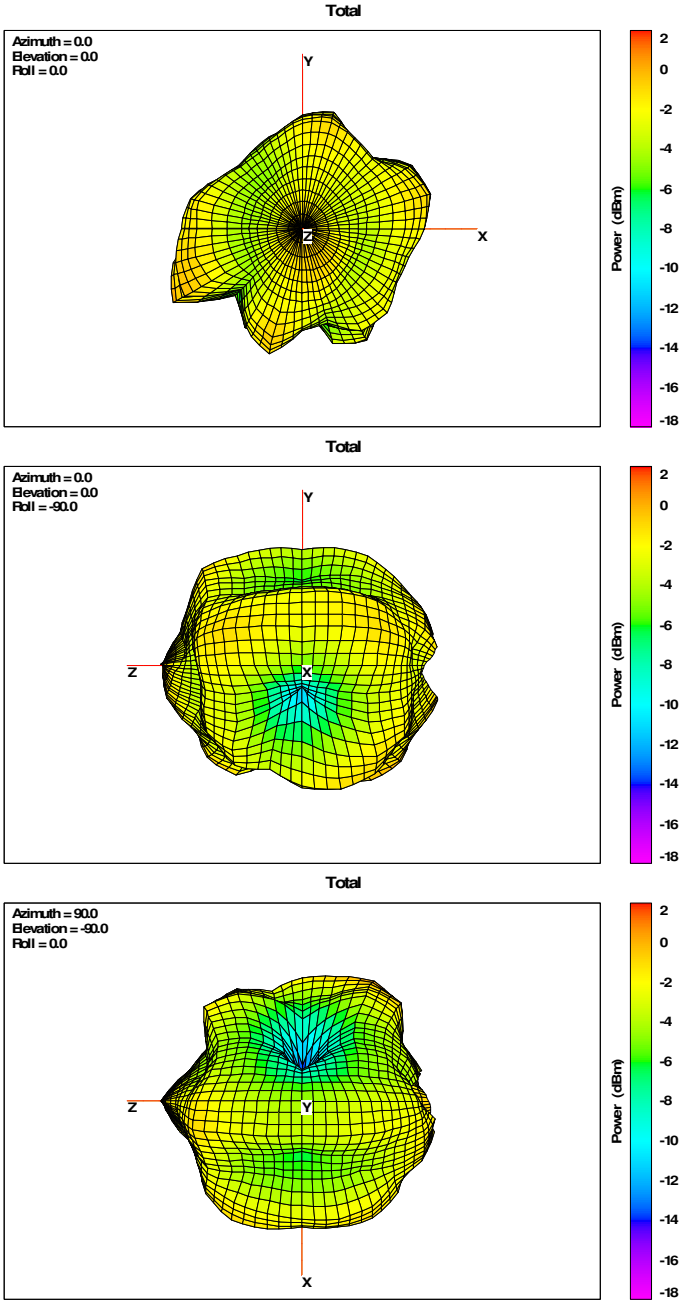
10 3-D Antenna Pattern



3-D Antenna Pattern

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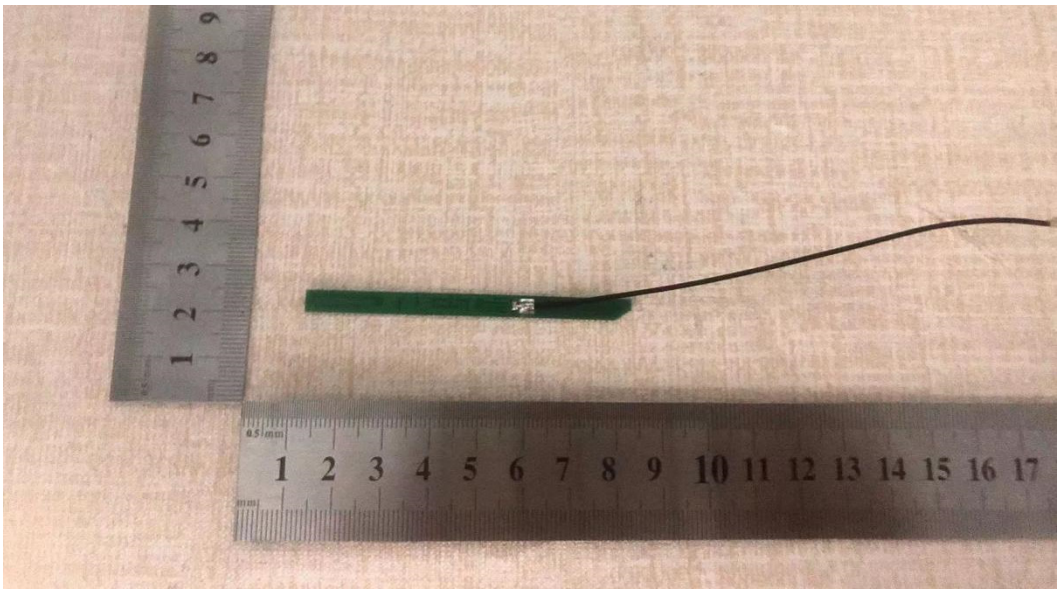
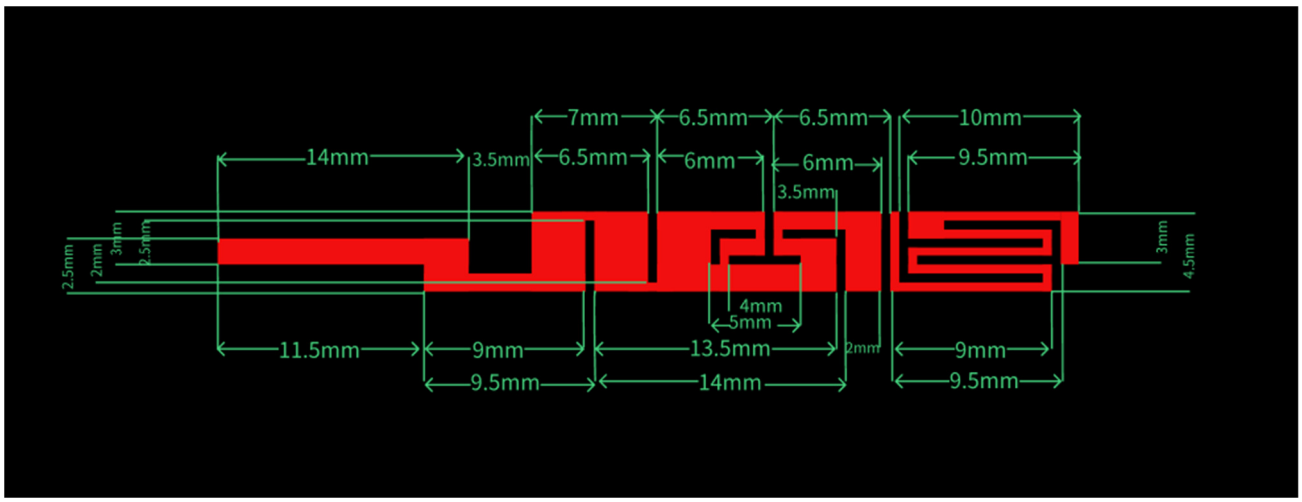
11 The EUT and Test Configuration

Photo of EUT



Size of the Antenna



Size of the Antenna in the EUT

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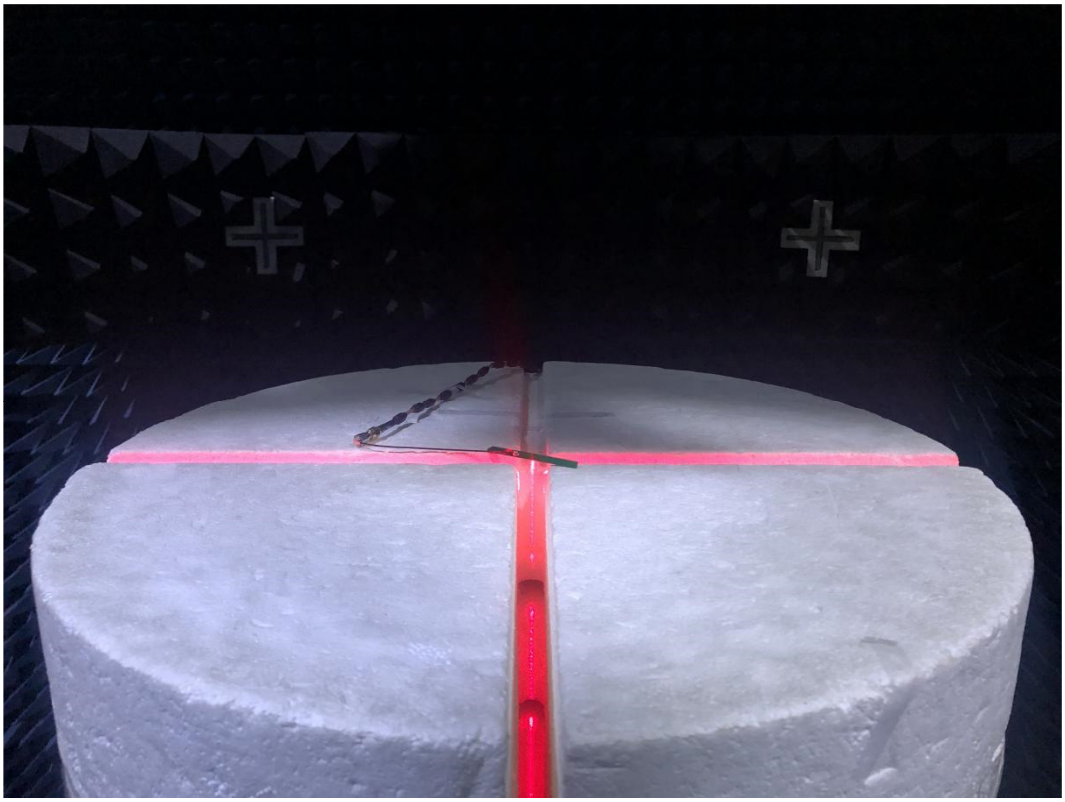
Free Space View



- End of the Report -

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