ANTENNA PASSIVE TEST REPORT

Application No.	ZEWM2304000556OA
Applicant	TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Manufacturer	TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Product Name	TPMS BLE Sensor
Model No.	TR0001TV340101000, TR0001TV360101000, TR0001TV370101000
Standards	ANSI/IEEE Std 149-2008
Date Initial Sample(s) Received	2023.04.27
Testing Start Date	2023.04.27
Testing Finish Date	2023.04.27
Report Issue Date	2023.05.04

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

Prepared by	Reviewed By	Approved by

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Revision Version

Report No.	Version	Date	Memo
ZEWM2304000556OA01	00	2023.05.04	Initial creation of report

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1 General Information

1.1 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	Ervin Li
Tel.	+86 18823369694
Fax	+86-755-25328600
E-mail	Ervin.Li@sgs.com

1.2 Details of Applicant

Applicant's Name	TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Applicant's Address	S.No.6/1B,6/4,7/4, Plot No.02, Shivane Laxmi Vishnupuram Amenities Business, NDA Road, 411023, Pune, India
Contact	Ms.Smita Mane
Tel.	9511775429
Fax	N/A
E-mail	Smita.mane@treel.in

1.3 Details of Manufacturer

Manufacturer's Name	TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Manufacturer's Address	S.No.6/1B,6/4,7/4, Plot No.02, Shivane Laxmi Vishnupuram Amenities Business, NDA Road, 411023, Pune, India
Contact	Ms.Smita Mane
Tel.	9511775429
Fax	N/A
E-mail	Smita.mane@treel.in

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1.4 General Description of EUT

Device Description:	TPMS BLE Sensor
Device Manufacturer:	TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Device Model:	TR0001TV340101000, TR0001TV360101000, TR0001TV370101000
Hardware Version:	N/A
Software Version:	N/A

1.5 Test Procedure

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

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1.6 Test Specification

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

1.7 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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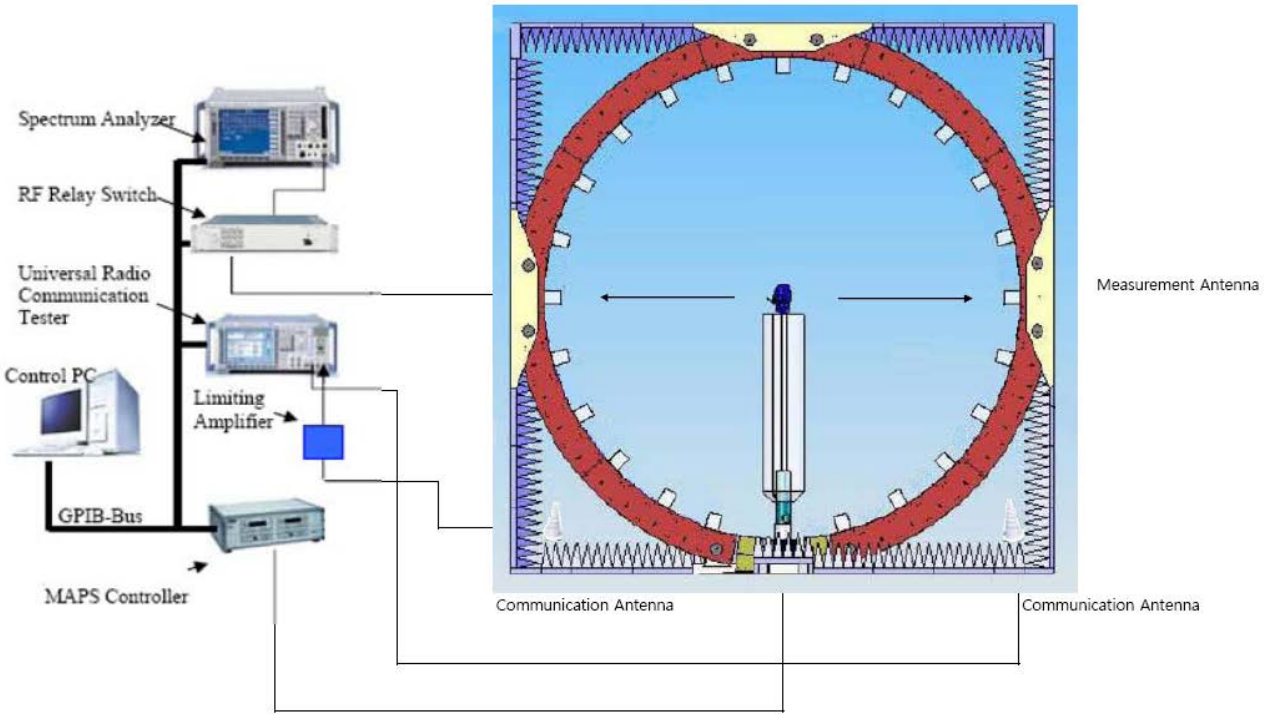
2 OTA Measurements System Configuration

2.1 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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3 Test Equipment List

Type of Equipment	Model Number	Manufacture	Calibration Date	Valid Period
Network Analyzer	E5071C S/N MY46523591	Keysight	2023/2/16	2024/2/15
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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4 Measurement Uncertainty

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

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5 Test Results

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Frequency (MHz)	**Efficiency (dB)**	**Efficiency (%)**	**Gain (dBi)**
2350	-16.59	2.19	-11.55
2355	-16.83	2.07	-11.79
2360	-16.83	2.07	-11.67
2365	-17.19	1.91	-11.94
2370	-17.43	1.81	-11.99
2375	-17.62	1.73	-12.12
2380	-17.68	1.70	-12.24
2385	-17.72	1.69	-12.27
2390	-17.83	1.65	-12.59
2395	-17.74	1.68	-12.47
2400	-17.85	1.64	-12.77
2402	-17.86	1.64	-12.70
2405	-17.80	1.66	-12.69
2410	-17.84	1.65	-12.64
2415	-17.95	1.60	-12.59
2420	-18.17	1.52	-12.63
2425	-18.30	1.48	-12.73
2430	-18.43	1.43	-12.64
2435	-18.50	1.41	-12.81
2440	-18.42	1.44	-12.74
2441	-18.44	1.43	-12.71
2445	-18.48	1.42	-12.68
2450	-18.48	1.42	-12.48
2455	-18.53	1.40	-12.37
2460	-18.59	1.38	-12.57

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2465	-18.52	1.41	-12.31
2470	-18.61	1.38	-12.46
2475	-18.56	1.39	-12.24
2480	-18.70	1.35	-12.53
2482	-18.71	1.35	-12.39
2485	-18.67	1.36	-12.29
2490	-18.67	1.36	-12.33
2495	-18.39	1.45	-12.23
2500	-18.20	1.51	-11.93
2505	-18.12	1.54	-11.68
2510	-18.16	1.53	-11.57
2515	-18.40	1.44	-11.91
2520	-18.44	1.43	-11.98
2525	-18.52	1.41	-12.09
2530	-18.43	1.44	-12.04
2535	-18.42	1.44	-12.08
2540	-18.34	1.47	-12.01
2545	-18.16	1.53	-11.72
2550	-18.13	1.54	-11.68
2555	-18.00	1.59	-11.46
2560	-18.03	1.57	-11.49
2565	-17.96	1.60	-11.32
2570	-18.06	1.56	-11.20
2575	-18.03	1.58	-11.08
2580	-17.93	1.61	-10.63

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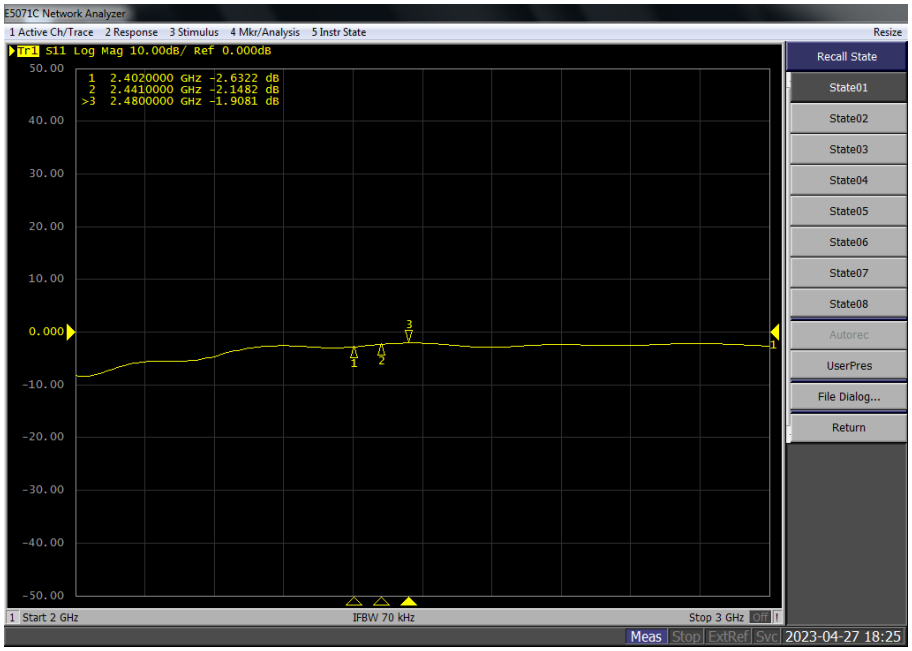
6 Pattern Plots

6.1 Return Loss



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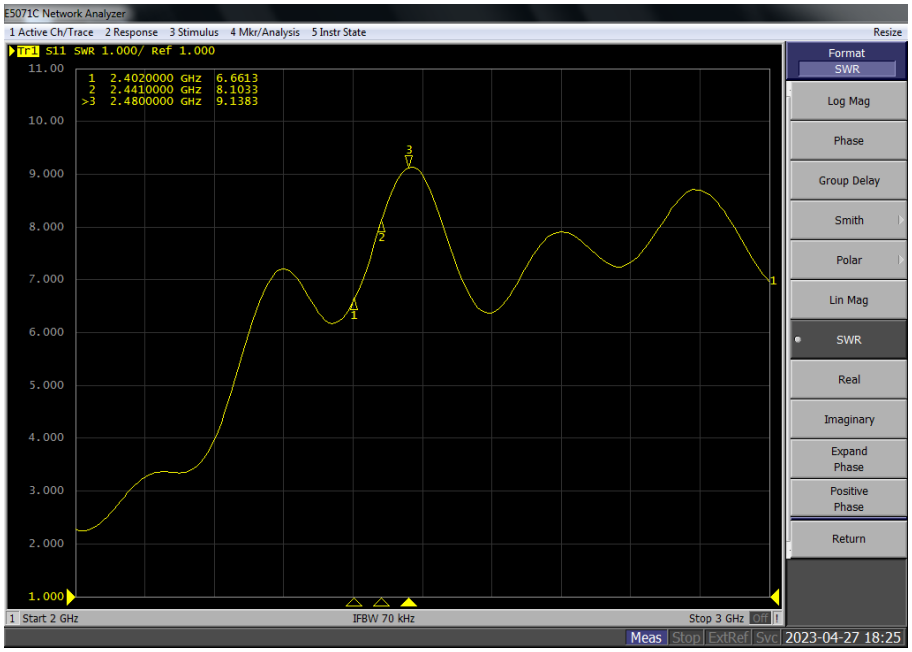
6.2 VSWR



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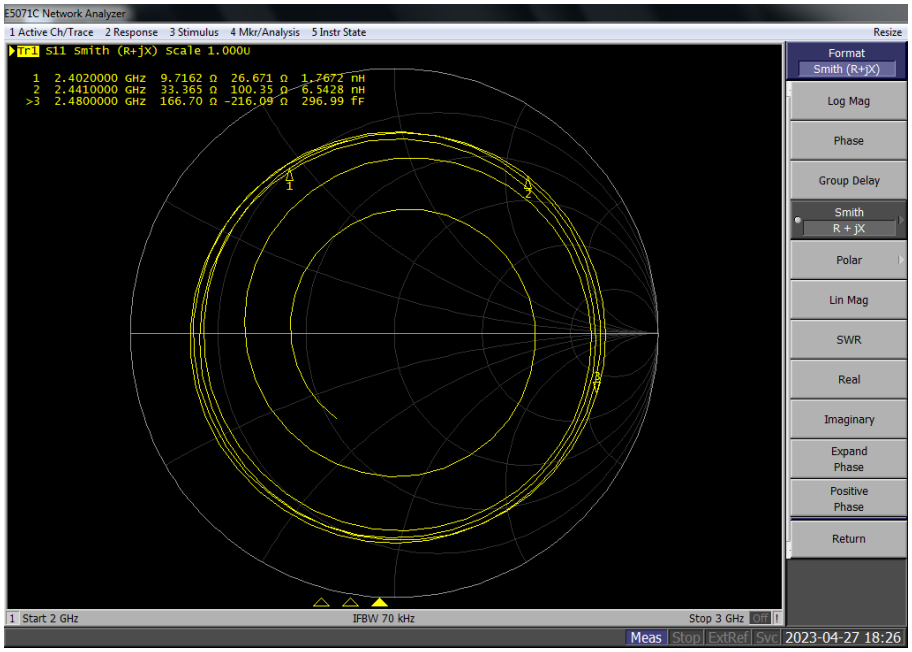
6.3 Stimulus



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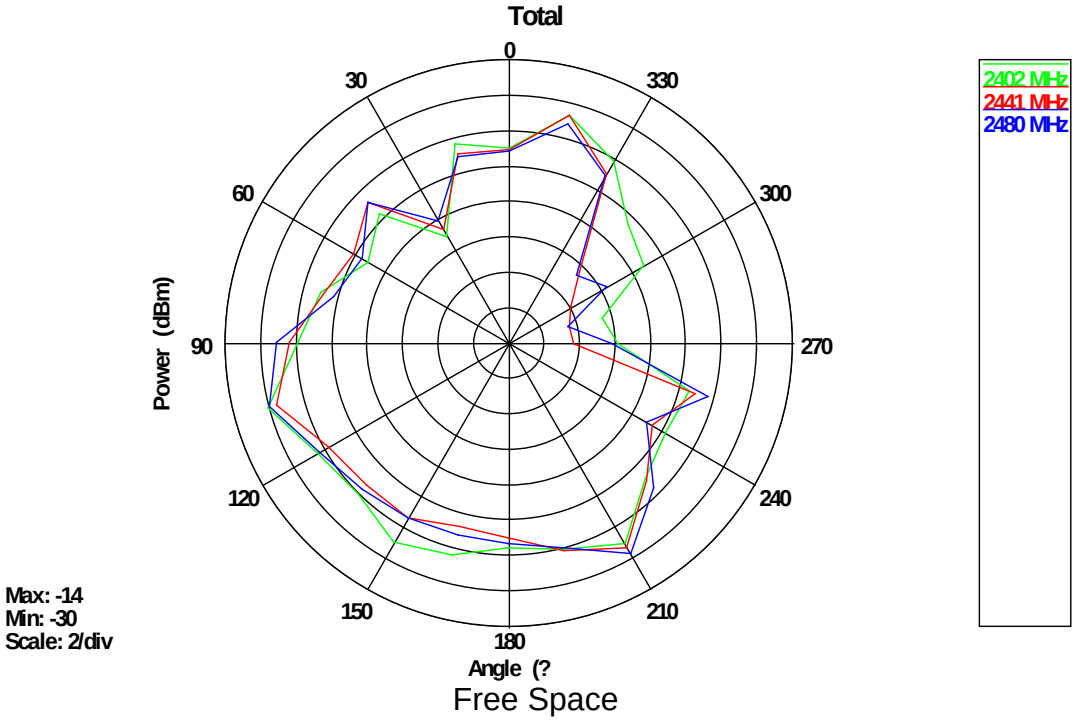
7 2-D Antenna Pattern(Theta=90°)



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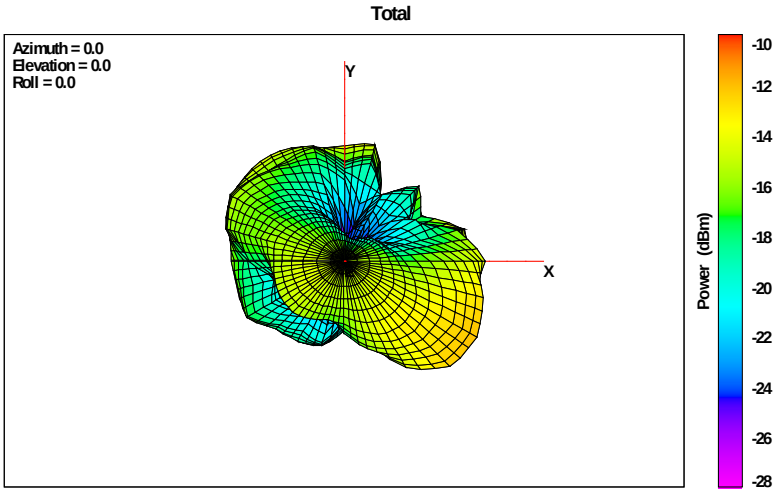
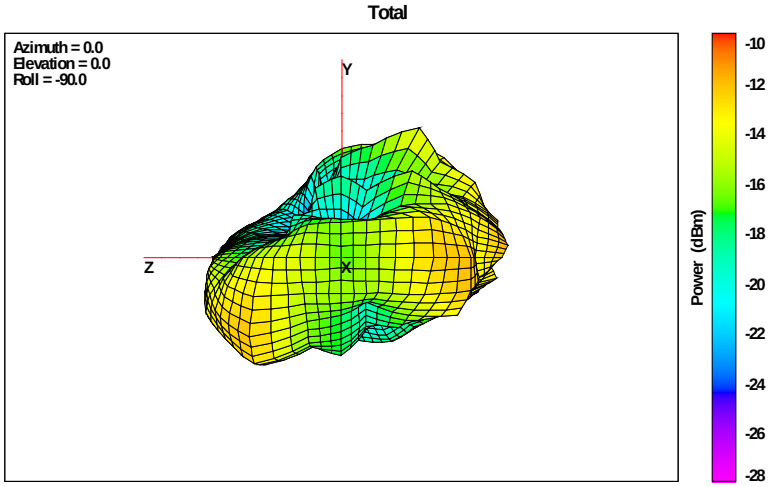
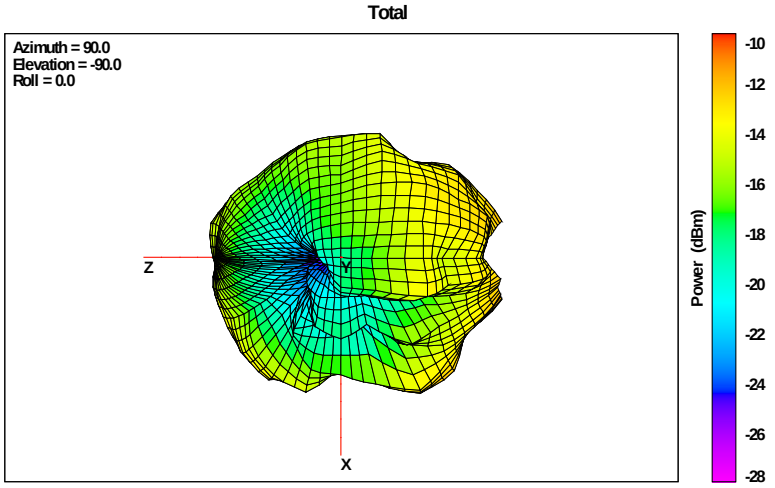
8 3-D Antenna Pattern







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9 The EUT and Test Configuration

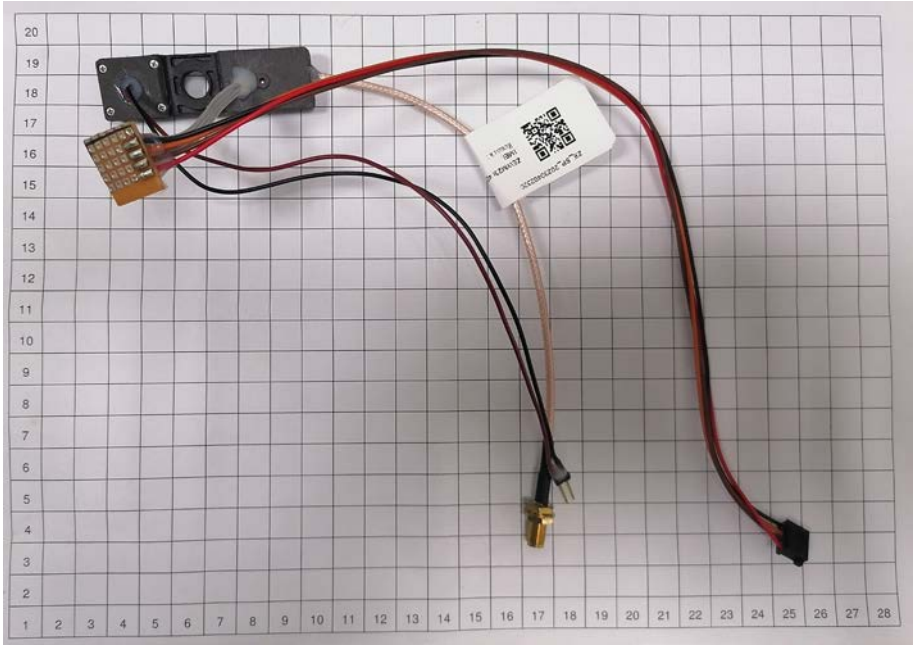
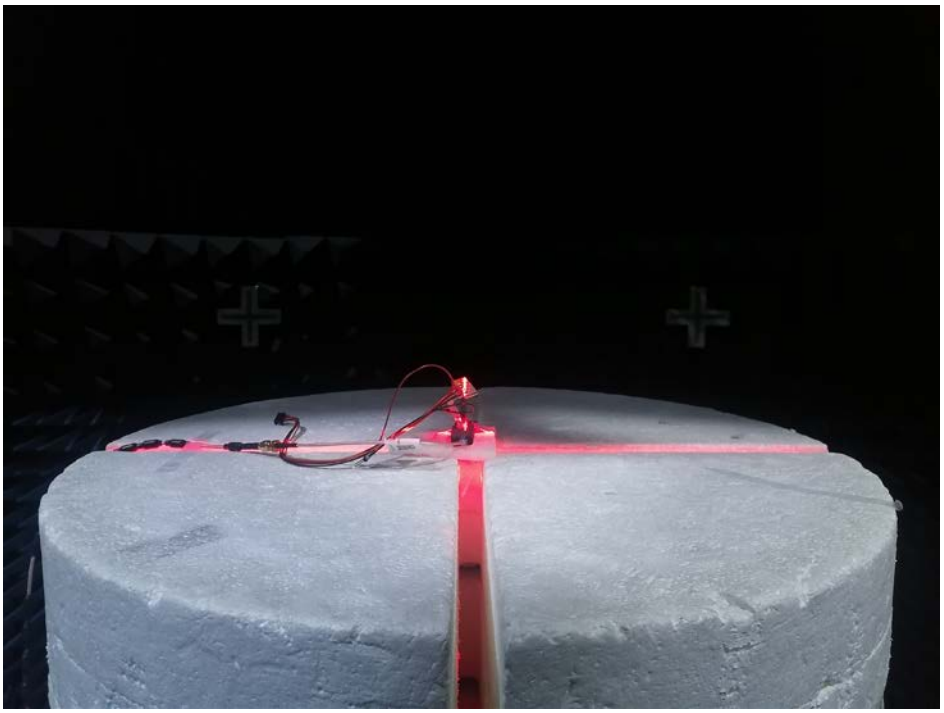


Photo of EUT



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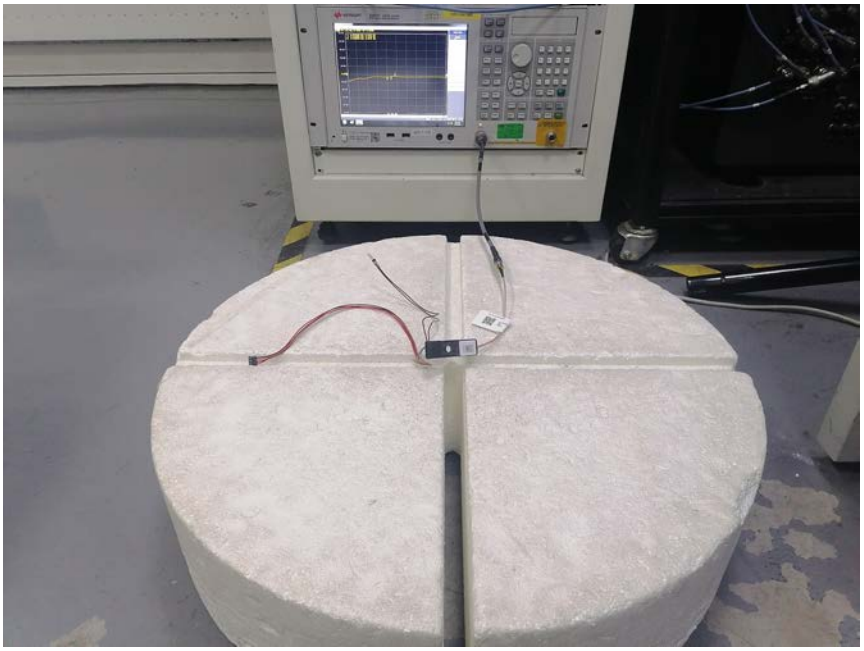

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