

ANTENNA PASSIVE TEST REPORT

Application No. ZEWM2312001920OA
Applicant Shenzhen Tongyi Technology Co.,Ltd
Manufacturer Shenzhen Tongyi Technology Co.,Ltd
Product Name Smart Robot Premium
Model No. MKZ-PF-PM
Standards ANSI/IEEE Std 149-2008
Date Initial Sample(s) Received 2023.12.25
Testing Start Date 2023.12.25
Testing Finish Date 2023.12.26
Report Issue Date 2023.12.28

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

YuanYu Luo

Prepared by

Max. Huang

Reviewed By

Yubin Li

Approved by



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch, Calibration & Testing Laboratory

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Revision Version

Report No.	Version	Date	Memo
ZEWM2312001920OA01	00	2023.12.28	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	Shenzhen Tongyi Technology Co.,Ltd
Applicant's Address	Block D 505, HuaShengTai Tech Building, No.36 HangKong Road, Baoan District, Shenzhen, CHINA
Contact	Sally Peng
Tel.	+86 15102008566
Fax	N/A
E-mail	sallypeng@td-robot.com

1.3 Details of Manufacturer

Manufacturer's Name	Shenzhen Tongyi Technology Co.,Ltd
Manufacturer's Address	Block D 505, HuaShengTai Tech Building, No.36 HangKong Road, Baoan District, Shenzhen, CHINA
Contact	Sally Peng
Tel.	+86 15102008566
Fax	N/A
E-mail	sallypeng@td-robot.com



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1.4 General Description of EUT

Device Description:	Monitor Light Bar
Device Manufacturer:	Shenzhen Tongyi Technology Co.,Ltd
Device Model:	MKZ-PF-PM
Hardware Version:	N/A
Software Version:	N/A
Antenna Dimensions:	14.37 x 6.25 x 0.5 mm

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



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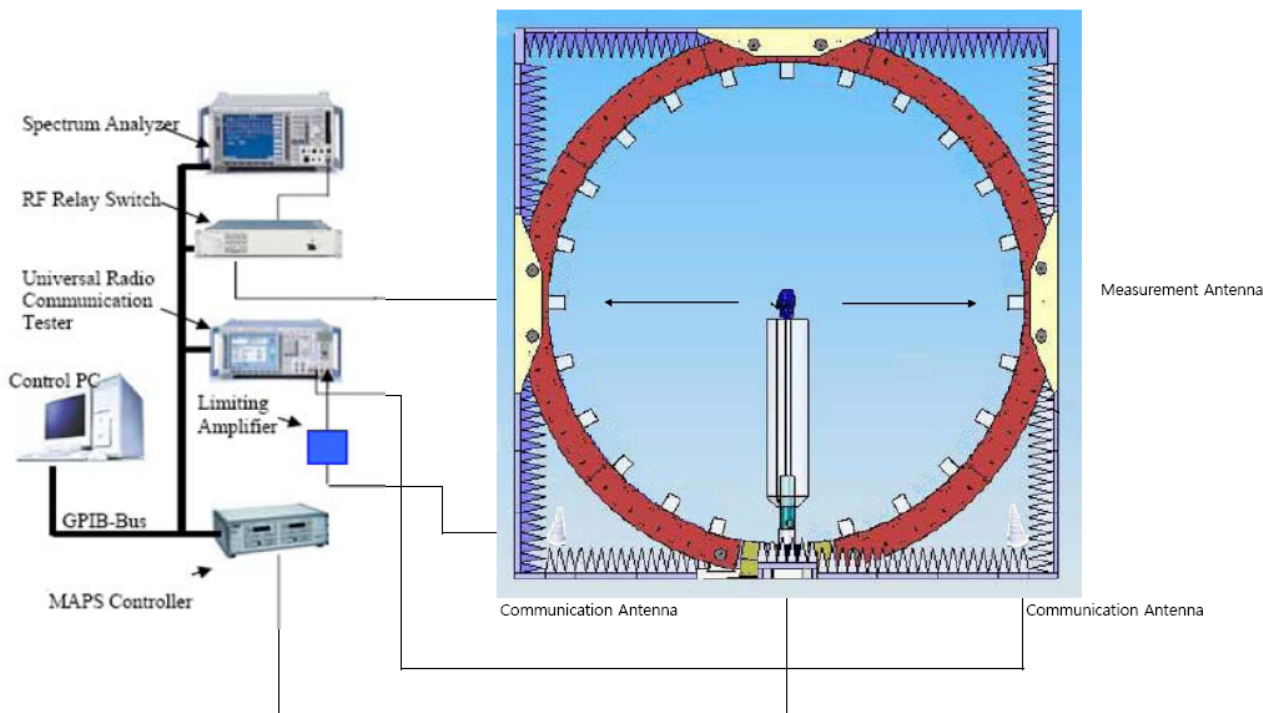
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2 OTA Measurements System Configuration

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

Free Space			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2350	-6.66	21.58	-1.82
2355	-6.63	21.73	-1.72
2360	-6.38	23.02	-1.64
2365	-6.50	22.41	-1.89
2370	-6.34	23.24	-1.74
2375	-6.55	22.12	-2.14
2380	-6.19	24.02	-1.79
2385	-6.04	24.86	-1.75
2390	-5.75	26.61	-1.42
2395	-5.53	28.01	-1.20
2400	-5.71	26.87	-1.37
2402	-5.59	27.63	-1.21
2405	-5.56	27.80	-1.26
2410	-5.59	27.62	-1.24
2415	-5.28	29.63	-1.05
2420	-5.06	31.21	-0.86
2425	-5.13	30.68	-0.99
2430	-5.04	31.34	-0.91
2435	-5.30	29.52	-1.17
2440	-5.12	30.75	-0.97
2441	-5.04	31.31	-0.88
2445	-5.09	30.97	-0.95
2450	-4.99	31.70	-0.82
2455	-4.76	33.41	-0.38
2460	-4.93	32.13	-0.47



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2465	-4.88	32.49	-0.26
2470	-5.19	30.30	-0.62
2475	-5.15	30.54	-0.53
2480	-5.22	30.03	-0.49
2482	-5.25	29.84	-0.52
2485	-5.21	30.13	-0.43
2490	-5.27	29.74	-0.39
2495	-5.19	30.26	-0.30
2500	-5.25	29.85	-0.28
2505	-5.19	30.27	-0.20
2510	-5.26	29.77	-0.27
2515	-5.55	27.88	-0.45
2520	-5.81	26.23	-0.55
2525	-6.21	23.91	-1.03
2530	-6.45	22.64	-1.15
2535	-6.68	21.47	-1.42
2540	-6.80	20.90	-1.48
2545	-6.85	20.68	-1.50
2550	-7.00	19.94	-1.66
2555	-7.28	18.71	-1.92
2560	-7.63	17.25	-2.34
2565	-7.98	15.94	-2.73
2570	-8.31	14.76	-3.11
2575	-8.51	14.08	-3.23
2580	-8.87	12.96	-3.77



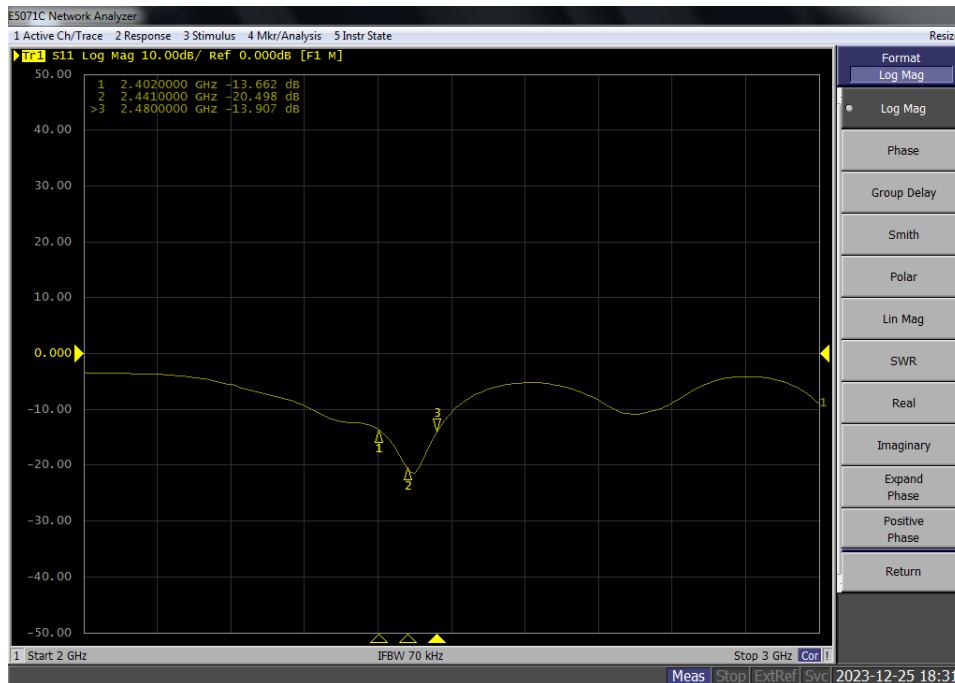
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6 Pattern Plots

6.1 Return Loss



Free Space



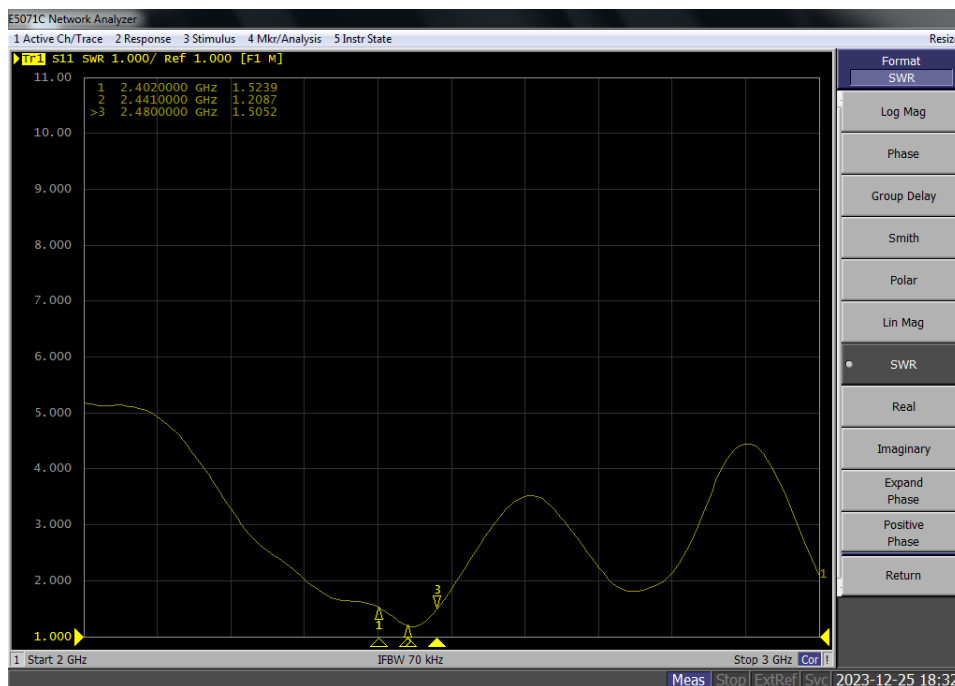
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6.2 VSWR



Free Space

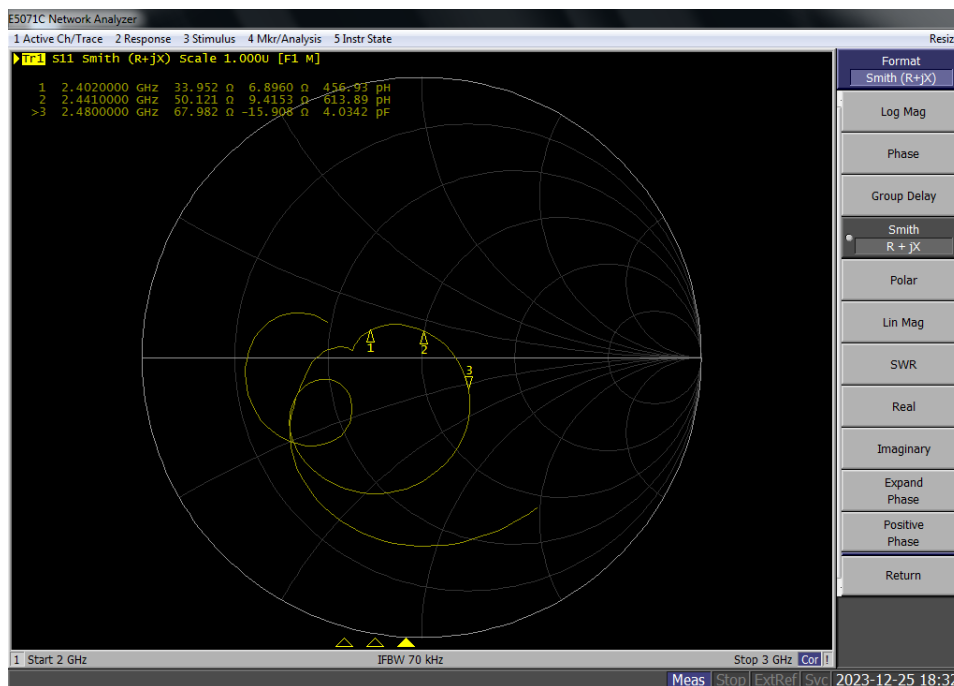


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6.3 Stimulus



Free Space

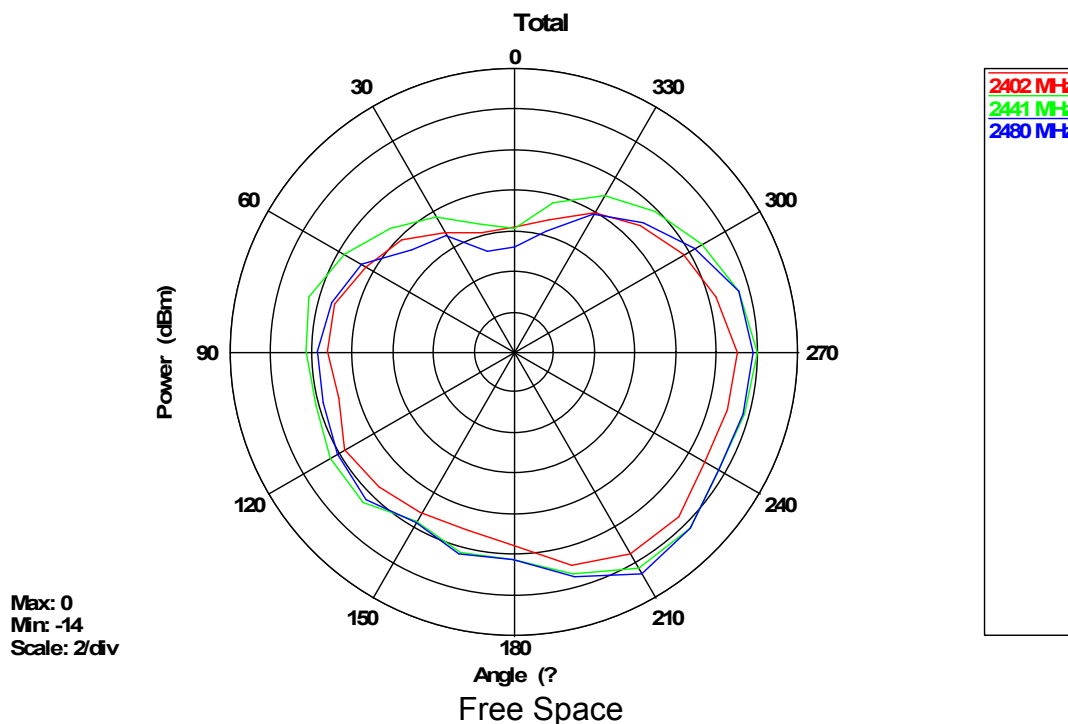


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7 2-D Antenna Pattern(Theta=90°)



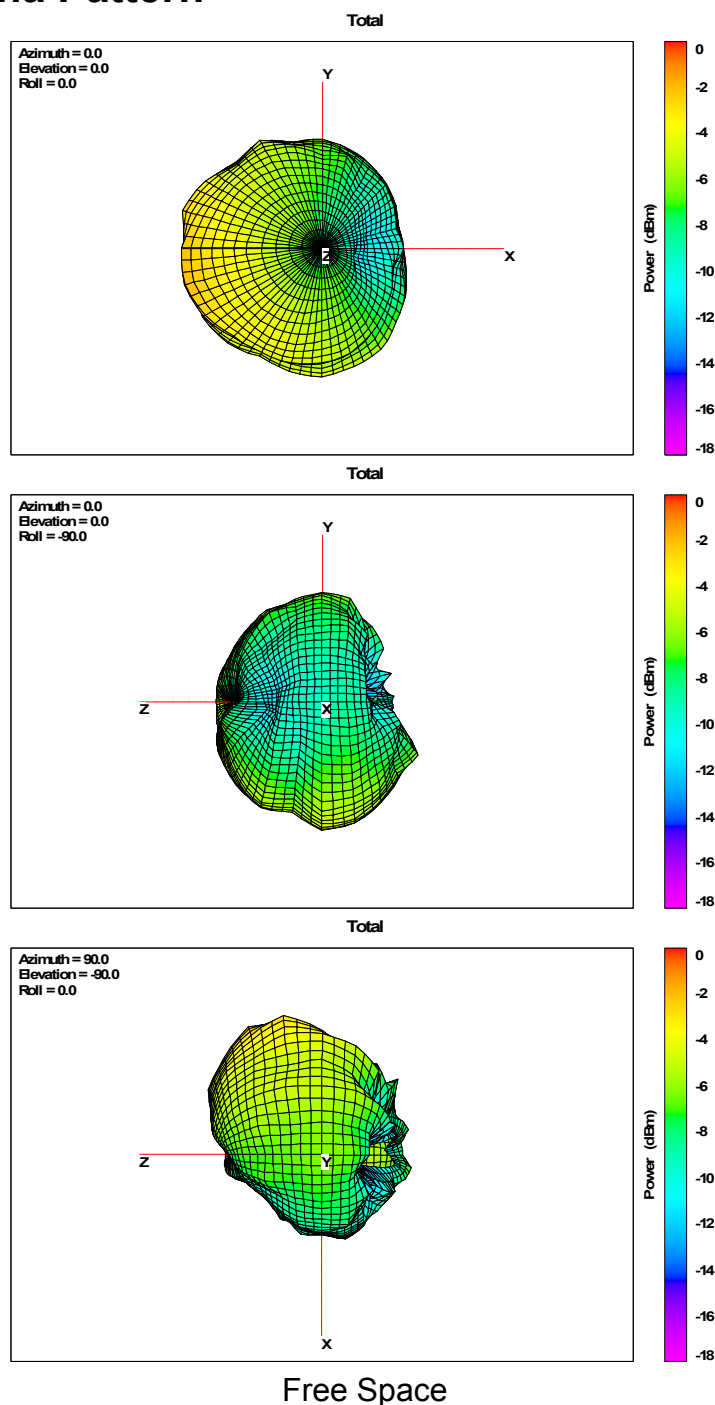
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8 3-D Antenna Pattern



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9 The EUT and Test Configuration

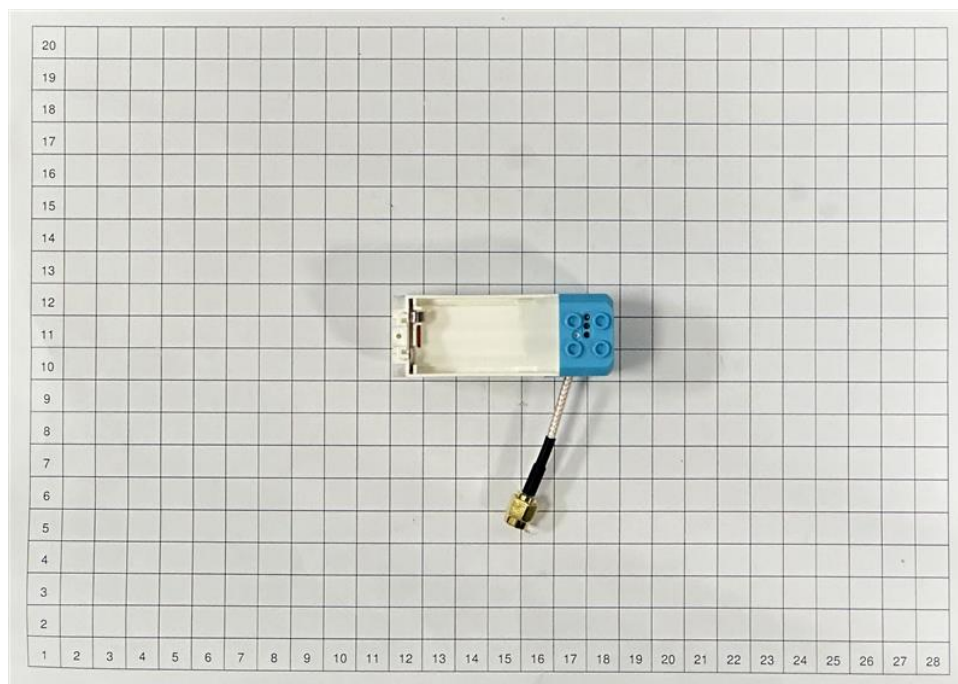
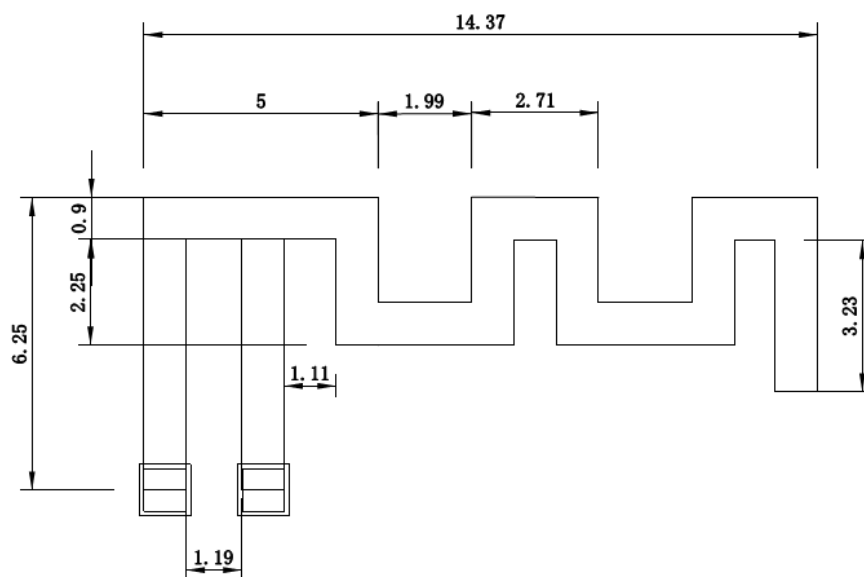


Photo of EUT



Antenna Dimensions

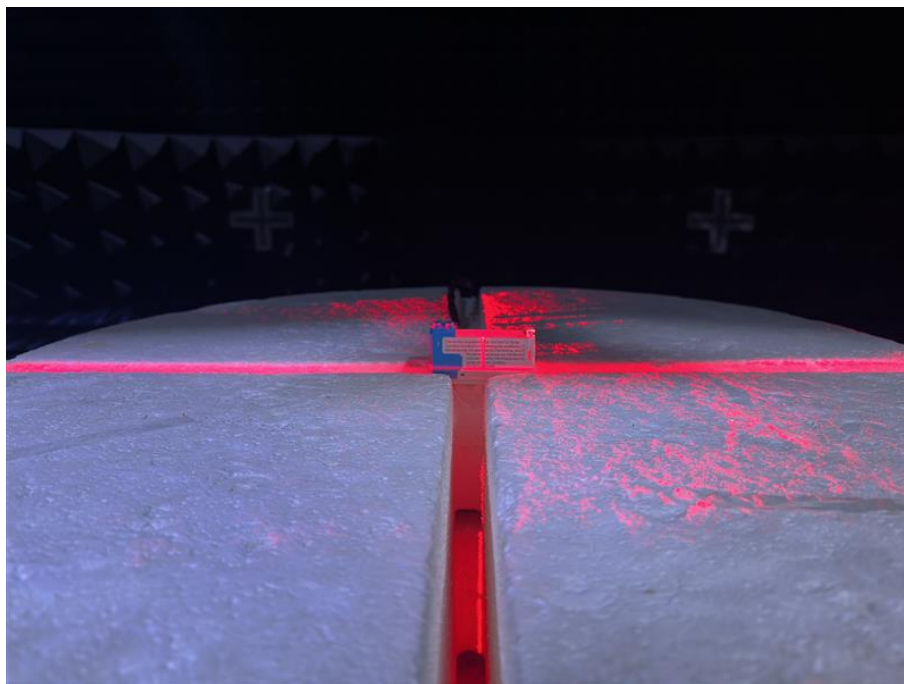


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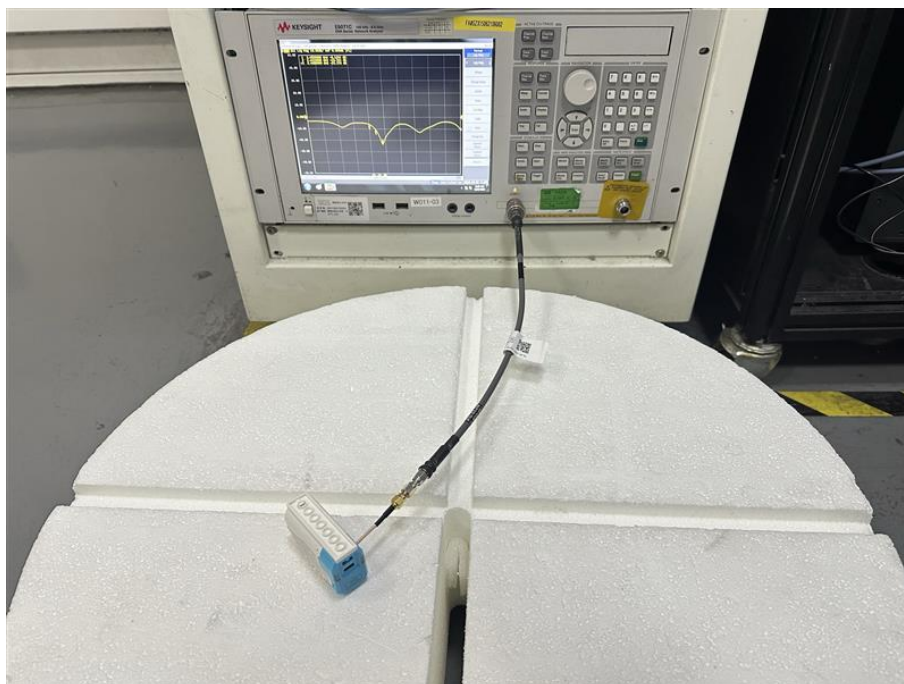
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