

TEST REPORT

Applicant: Zhejiang Lierda Internet of Things Technology Co., Ltd.
Address: Room 1402, Building 1, No.1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang Prov. China
Equipment Type: BT18N Bluetooth LE communication module
Model Name: BT18N
Brand Name: Lierda
Test Standard: IEEE Std 149-2021
Sample Arrival Date: Oct. 17, 2025
Test Date: Oct. 22, 2025 - Oct. 23, 2025
Date of Issue: Oct. 24, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Mai Jintian**Checked by:** Xia Long**Approved by:** Sunny Zou
(Technical Director)

Mai Jintian

Xia Long

Sunny Zou

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Oct. 24, 2025</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☒ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Zhejiang Lierda Internet of Things Technology Co., Ltd.
Address	Room 1402, Building 1, No.1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang Prov. China

2.2 Manufacturer Information

Manufacturer	Zhejiang Lierda Internet of Things Technology Co., Ltd.
Address	Room 1402, Building 1, No.1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang Prov. China

2.3 General Description for Equipment under Test (EUT)

EUT Name	BT18N Bluetooth LE communication module
Model Name Under Test	BT18N
Antenna Type	PCB antenna
Dimensions	12.9*19.0 mm

2.4 Ancillary Equipment

Note: Not applicable.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	IEEE Std 149-2021	IEEE Standard Test Procedures for Antennas

3.2 Test Verdict

Report Section	Description	Remark
ANNEX A.1	Gain and Efficiency	--
ANNEX A.2	VSWR and Input impedance	--
ANNEX B	Radiation Pattern	--

3.3 Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Item	Uncertainty
VSWR(S11)	± 0.61
Gain	$\pm 1.92\text{dB}$

4 GENERAL TEST CONFIGURATIONS

4.1 Test Condition

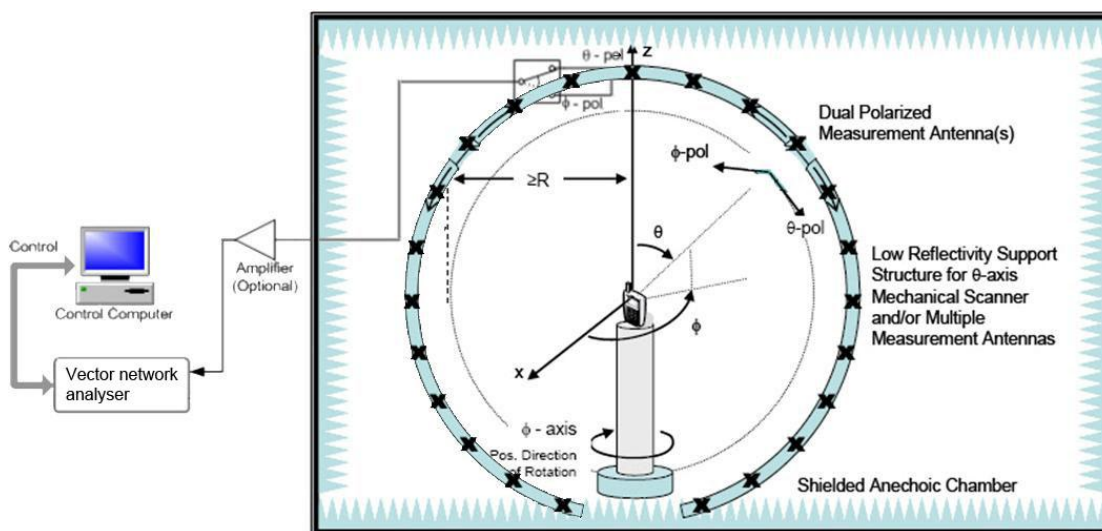
Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(°C)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	101	21.5	N/A	48

4.2 Test Equipment List

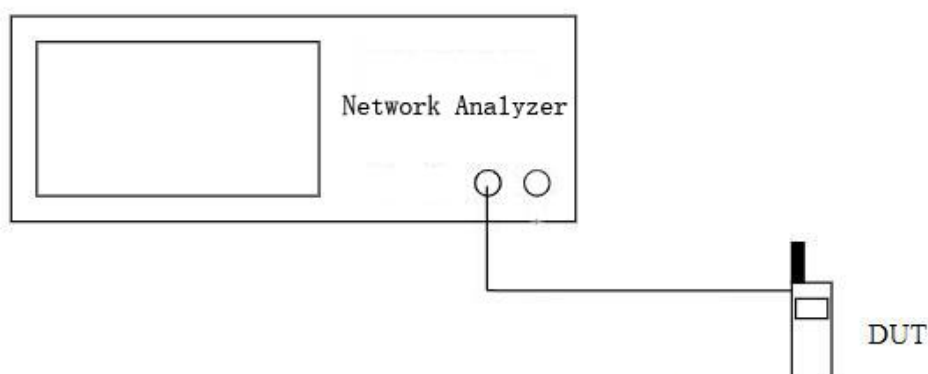
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
SG24 Multi-probe Antenna Measurement System	SATIMO	SY24-M	N/A	2025/8/2	2028/8/1
Vector Network Analyzer	Agilent	E5071B	MY42404001	2025/1/23	2026/1/22
Description	Manufacturer	Name		Version	
Test Software	Sunyield	PMS		V3	

4.3 Test Setup

4.3.1 Antenna gain, efficiency and radiation pattern test setup



4.3.2 S11 parameter test setup



4.4 Test Frequencies

Test Frequencies	2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz
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ANNEX A TEST RESULTS

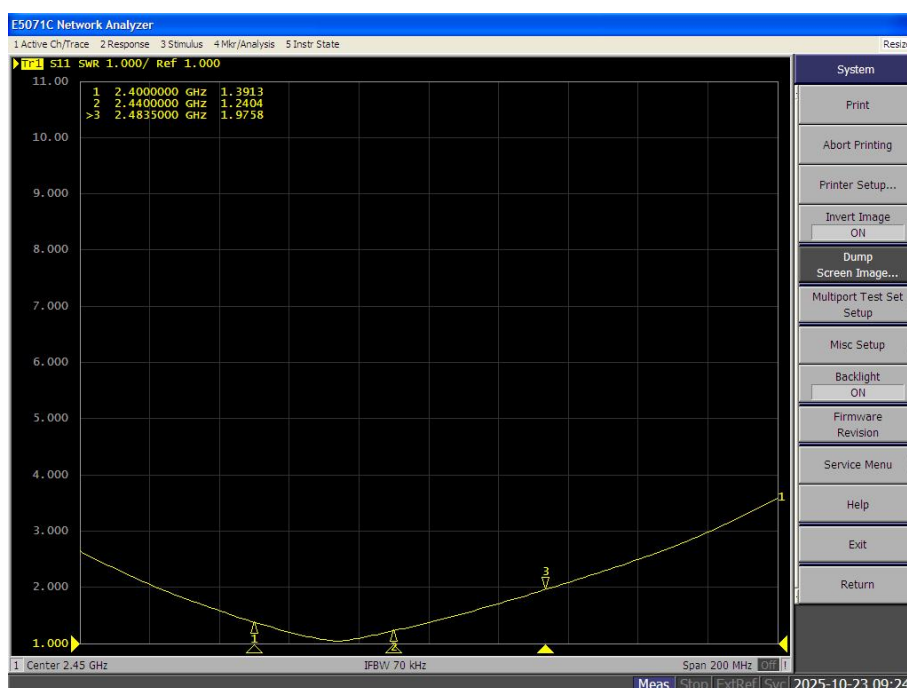
A.1 Gain and Efficiency

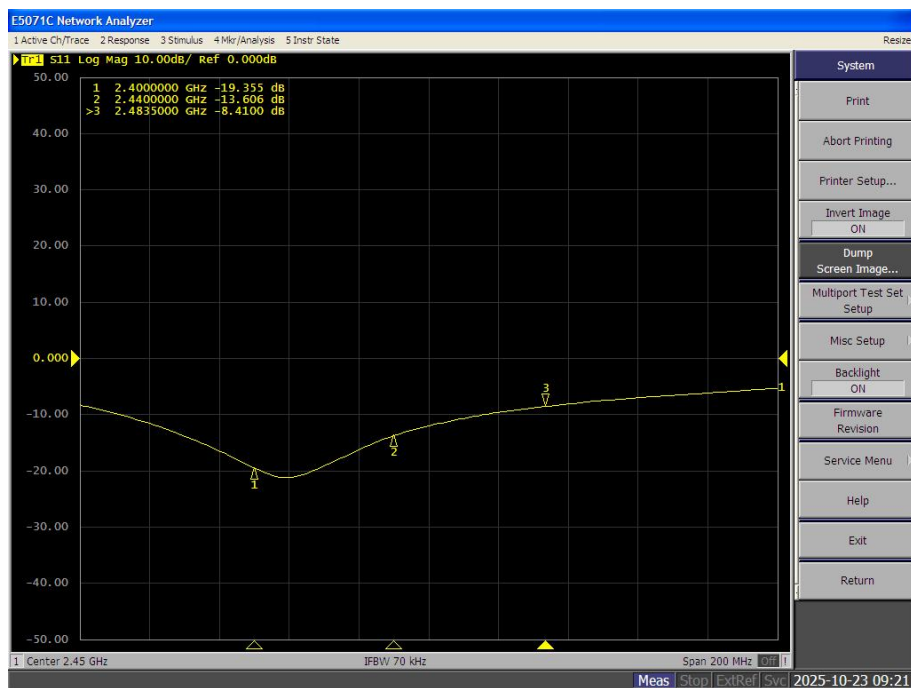
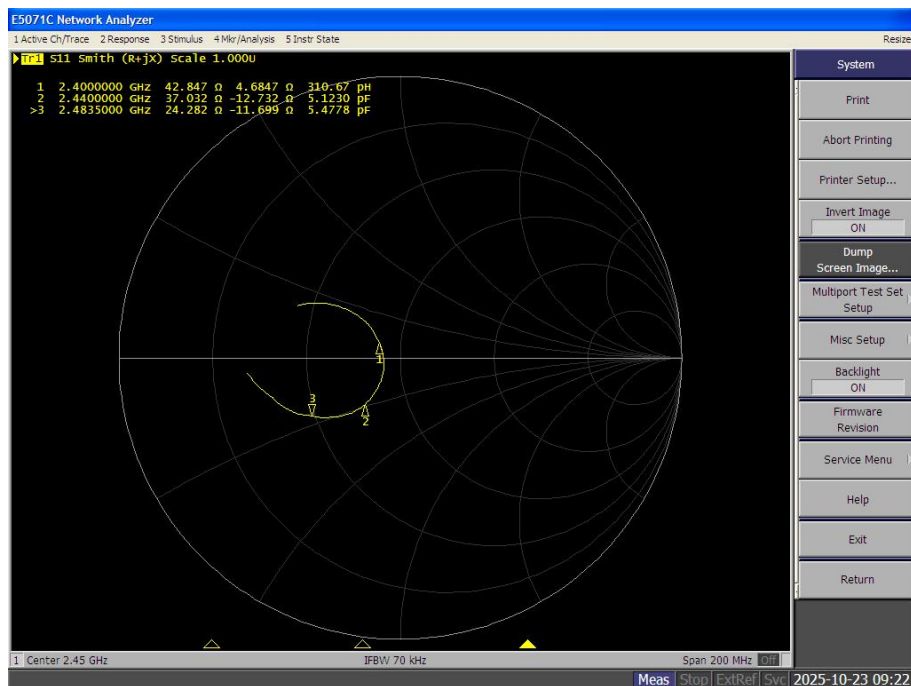
Frequency	Gain (dBi)	Efficiency
2400MHz	2.17	41%
2402MHz	2.20	41%
2404MHz	2.27	42%
2406MHz	2.31	42%
2408MHz	2.27	42%
2410MHz	2.21	42%
2412MHz	2.23	42%
2414MHz	2.26	41%
2416MHz	2.07	40%
2418MHz	2.00	41%
2420MHz	2.14	41%
2422MHz	2.26	42%
2424MHz	2.34	42%
2426MHz	2.43	42%
2428MHz	2.28	42%
2430MHz	2.31	42%
2432MHz	2.43	42%
2434MHz	2.55	43%
2436MHz	2.30	42%
2438MHz	2.33	42%
2440MHz	2.34	42%
2442MHz	2.32	41%
2444MHz	2.34	40%
2446MHz	2.15	40%
2448MHz	2.18	40%
2450MHz	2.15	40%
2452MHz	2.19	40%
2454MHz	2.19	40%
2456MHz	2.09	39%
2458MHz	2.13	39%
2460MHz	2.16	39%
2462MHz	2.20	40%
2464MHz	2.21	39%
2466MHz	1.97	39%
2468MHz	2.02	39%
2470MHz	2.12	39%
2472MHz	2.19	39%
2474MHz	2.24	39%

2476MHz	1.94	39%
2478MHz	1.92	39%
2480MHz	1.96	38%
2482MHz	2.03	37%
2483.5MHz	2.09	37%

A.2 VSWR and Input Impedance

Frequency	VSWR	Input impedance (Ω)	Return Loss(dB)
2400MHz	1.39	47.85	-19.36
2440MHz	1.24	37.03	-13.61
2483.5MHz	1.98	24.28	-8.41

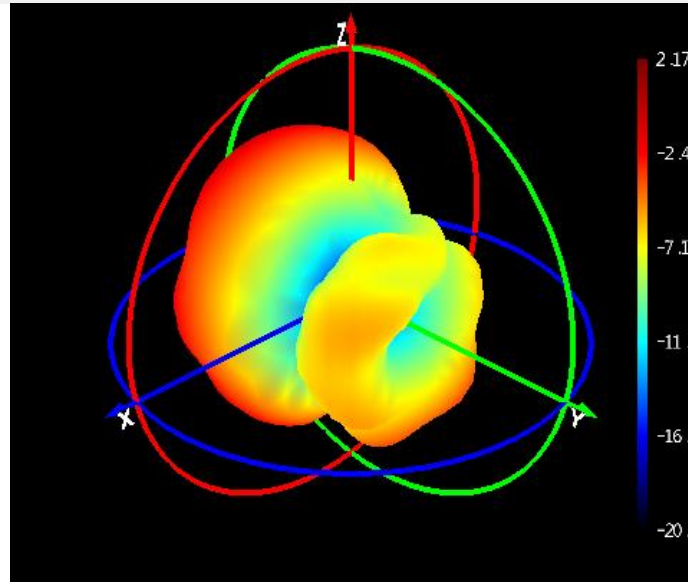




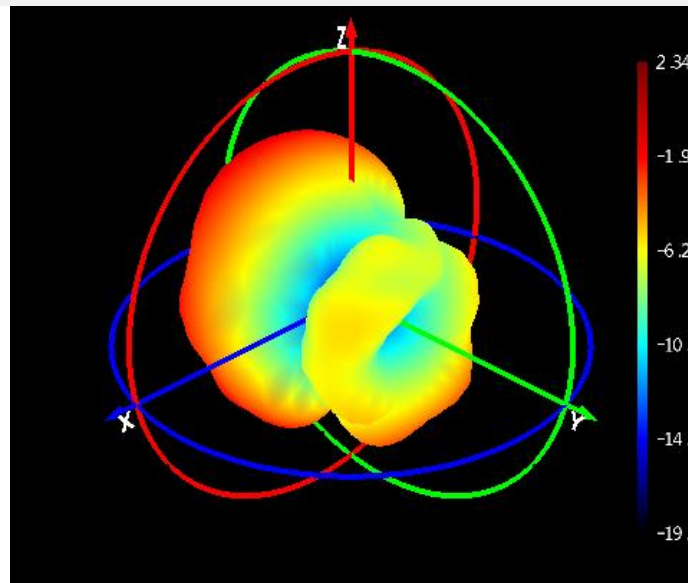
ANNEX B RADIATION PATTERN

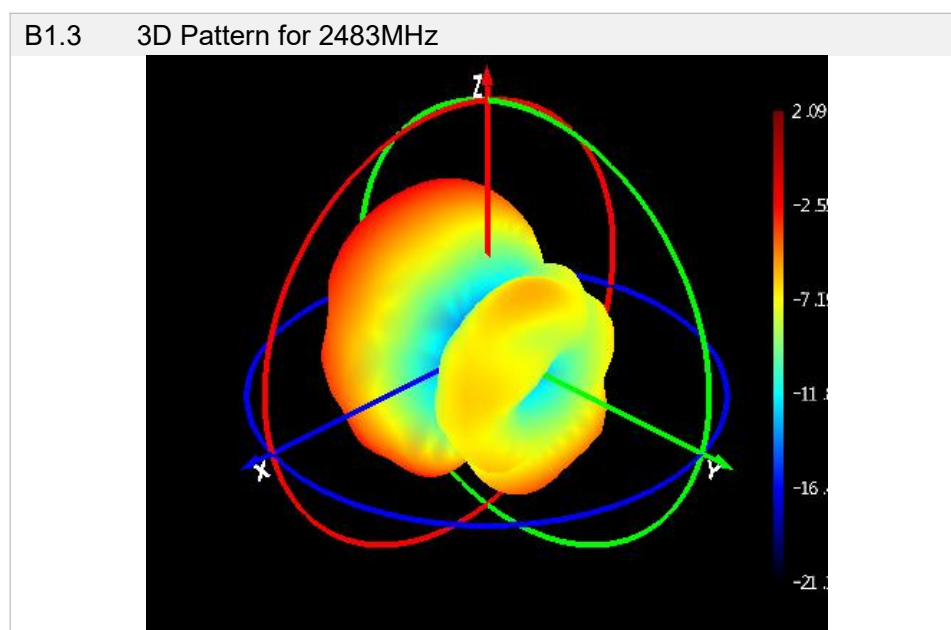
B.1 3D Pattern

B1.1 3D Pattern for 2400MHz



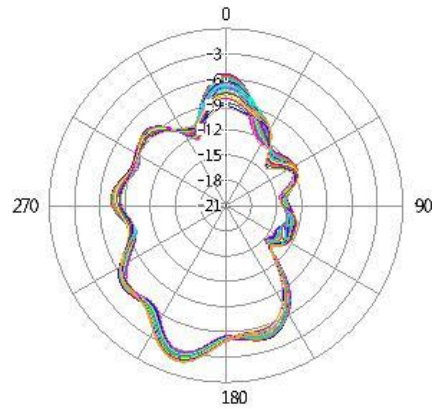
B1.2 3D Pattern for 2440MHz



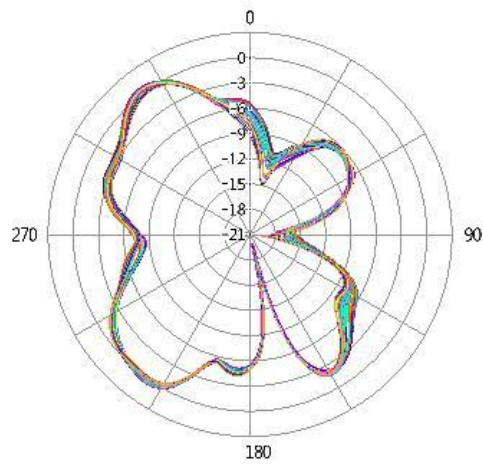


B.2 1D Radiation Pattern

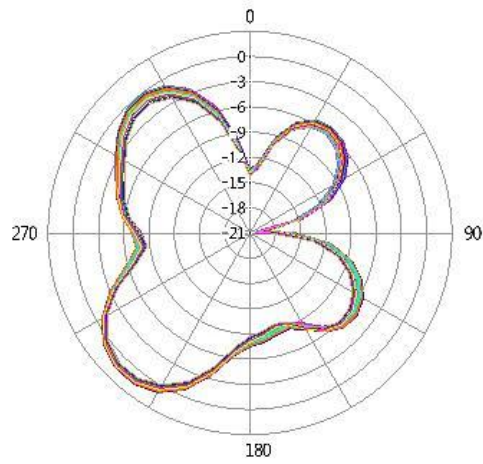
B2.1 PHI=0



B2.2 PHI=90



B2.3 THETA=90



ANNEX C TEST SETUP PHOTOS

Please refer the document “BL-SZA0585-AO.PDF”.

ANNEX D EUT PHOTO

Please refer the document “BL-SZA0585-AA.PDF”.

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
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6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--