

TEST REPORT

Applicant: Sinco Intelligent Technology Co., Ltd.
Address: Workshop D-2, Assembly Workshop, North Airport Road, Hongqi Town, Jinwan District, Zhuhai City, Guangdong Province, China
Equipment Type: Wireless MIDI Controller
Model Name: CHOCOLATE PLUS
Brand Name: N/A
Test Standard: IEEE Std 149-2021
Sample Arrival Date: Dec. 28, 2023
Test Date: Dec. 28, 2023
Date of Issue: Feb. 23, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Mai Jintian**Checked by:** Xia Long**Approved by:** Tolan Tu
(Testing Director)*Mai Jintian**Xia Long**Tolan Tu*

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Feb. 23, 2024</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	Sinco Intelligent Technology Co., Ltd.
Address	Workshop D-2, Assembly Workshop, North Airport Road, Hongqi Town, Jinwan District, Zhuhai City, Guangdong Province, China

2.2 Manufacturer Information

Manufacturer	Sinco Intelligent Technology Co., Ltd.
Address	Workshop D-2, Assembly Workshop, North Airport Road, Hongqi Town, Jinwan District, Zhuhai City, Guangdong Province, China

2.3 General Description for Equipment under Test (EUT)

EUT Name	Wireless MIDI Controller
Model Name Under Test	N/A
Antenna Type	PCB Antenna
Dimensions	14*4 mm

2.4 Ancillary Equipment

Note: Not applicable.

2.5 Technical Information

Test Frequencies	2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz, 2490MHz, 2500MHz
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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	--
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

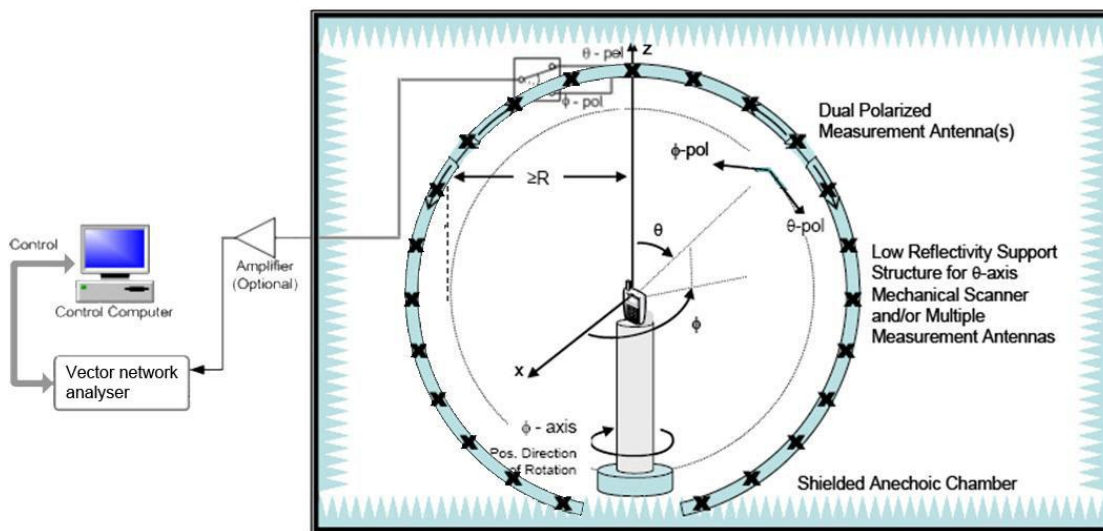
Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(°C)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	101	21.6	N/A	43

4.2 Test Equipment List

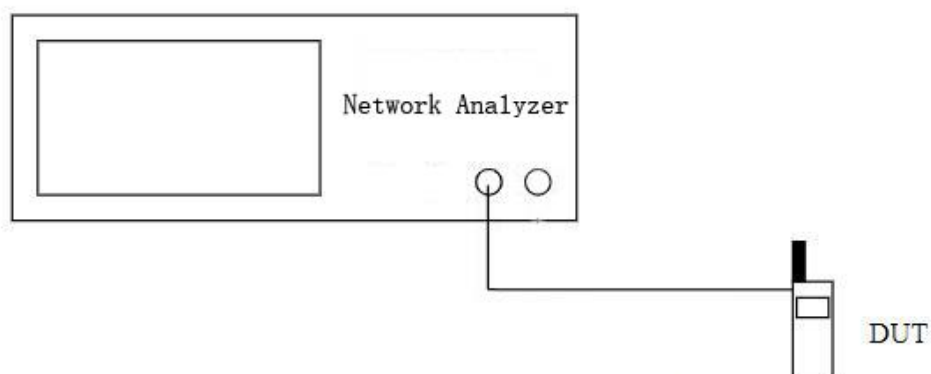
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
SG24 Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855- 0001	2021.11.12	2024.11.11
Vector Network Analyzer	Agilent	E5071B	MY42404001	2023.03.26	2024.03.25
Description	Manufacturer	Name		Version	
Test Software	MVG	SPM		V 1.8	

4.3 Test Setup

4.3.1 Antenna gain, efficiency and radiation pattern test setup



4.3.2 S11 parameter test setup



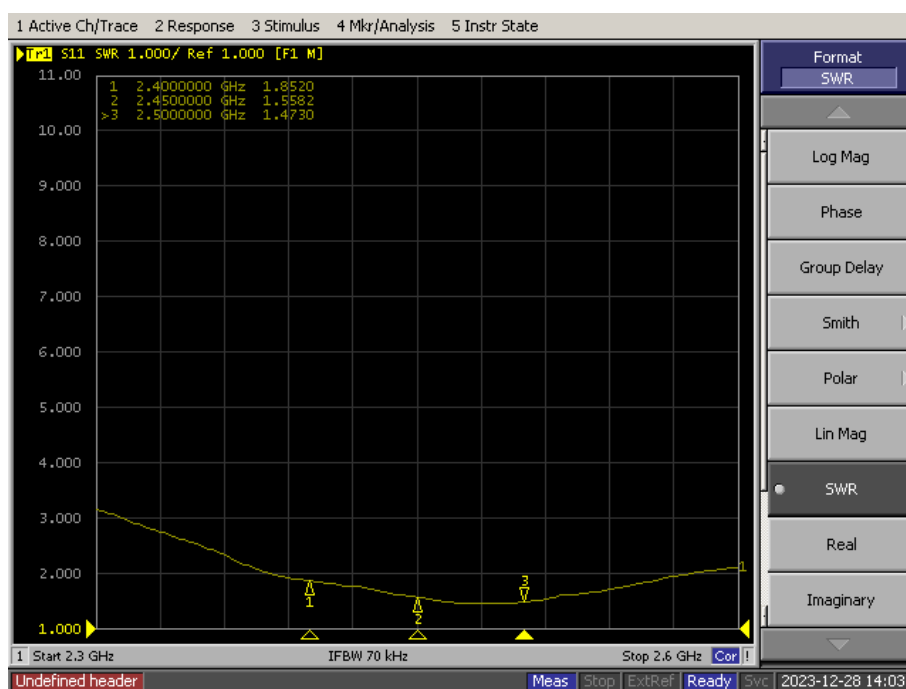
ANNEX A TEST RESULTS

A.1 Gain and Efficiency

Frequency	Gain (dBi)	Efficiency (%)
2400MHz	0.67	31
2410MHz	0.39	31
2420MHz	0.31	30
2430MHz	0.38	30
2440MHz	0.33	30
2450MHz	0.25	30
2460MHz	0.28	31
2470MHz	0.45	32
2480MHz	0.62	32
2490MHz	0.57	31
2500MHz	0.55	31

A.2 VSWR

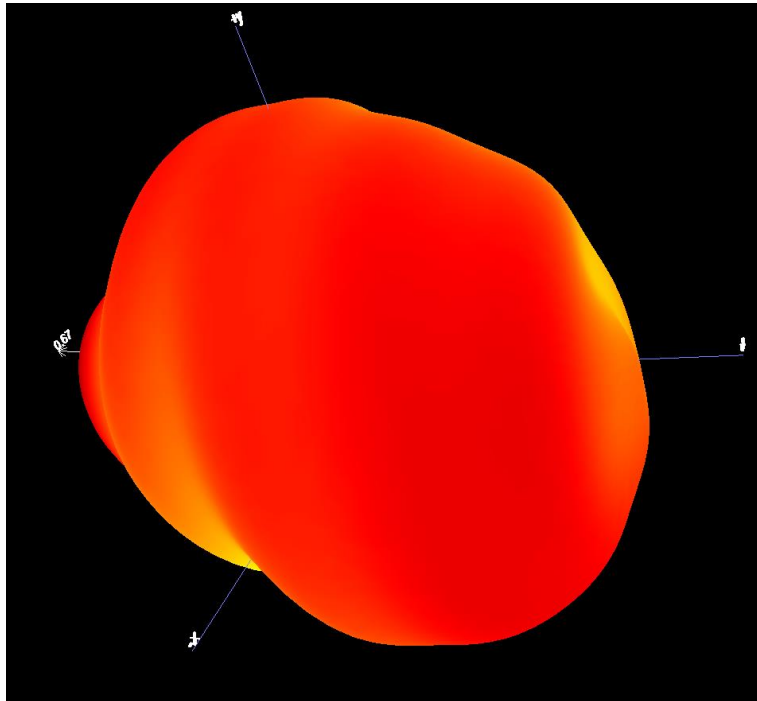
Frequency	VSWR
2400MHz	1.85
2450MHz	1.56
2500MHz	1.47



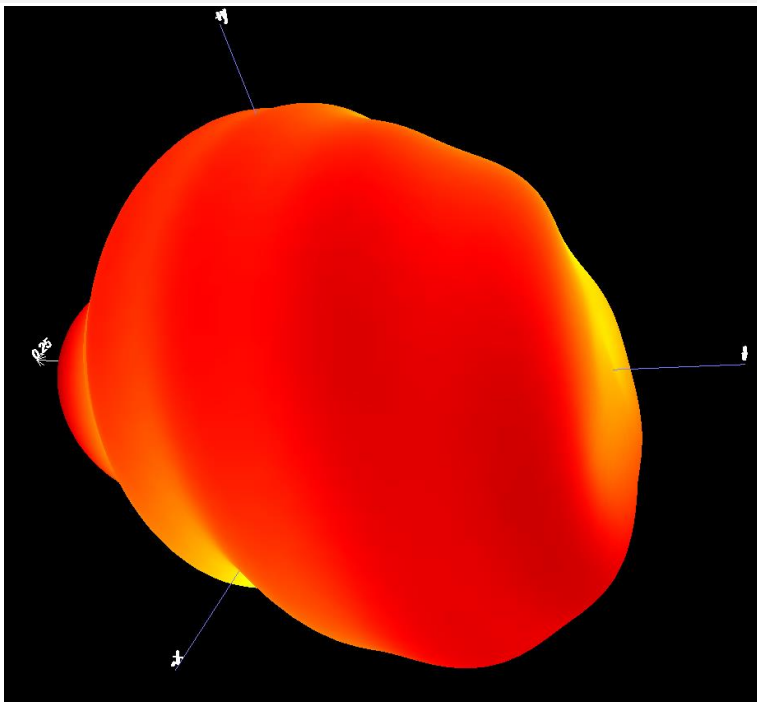
ANNEX B RADIATION PATTERN

B.1 3D Pattern

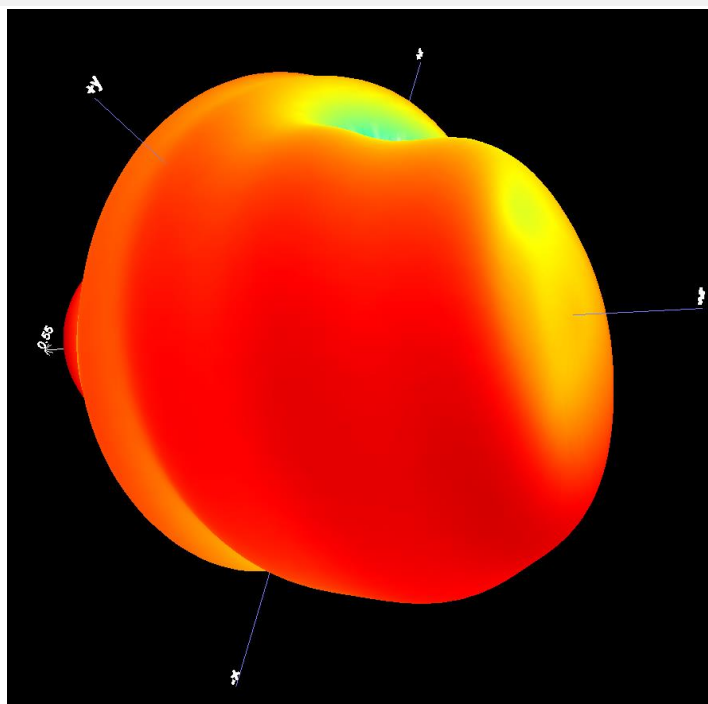
B1.1 3D Pattern for 2400MHz



B1.2 3D Pattern for 2450MHz



B1.3 3D Pattern for 2500MHz

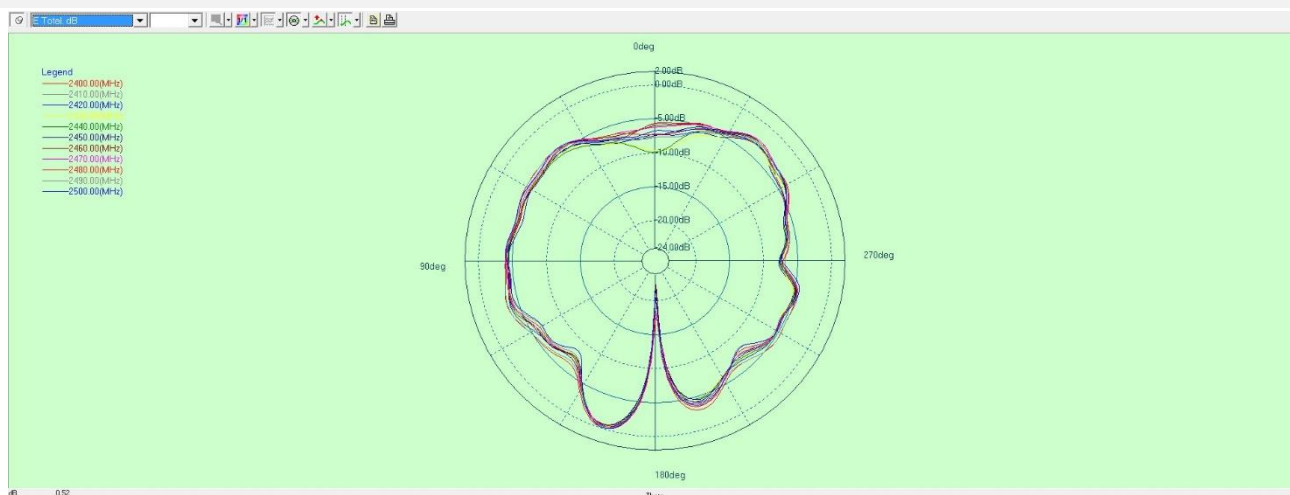


B.2 1D Radiation Pattern

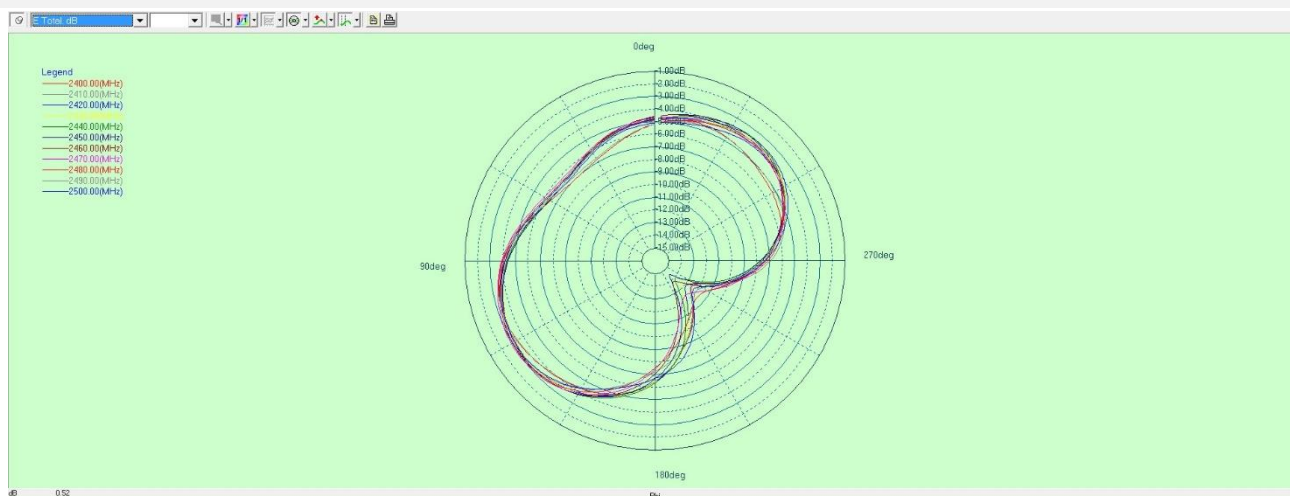
B2.1 PHI=0



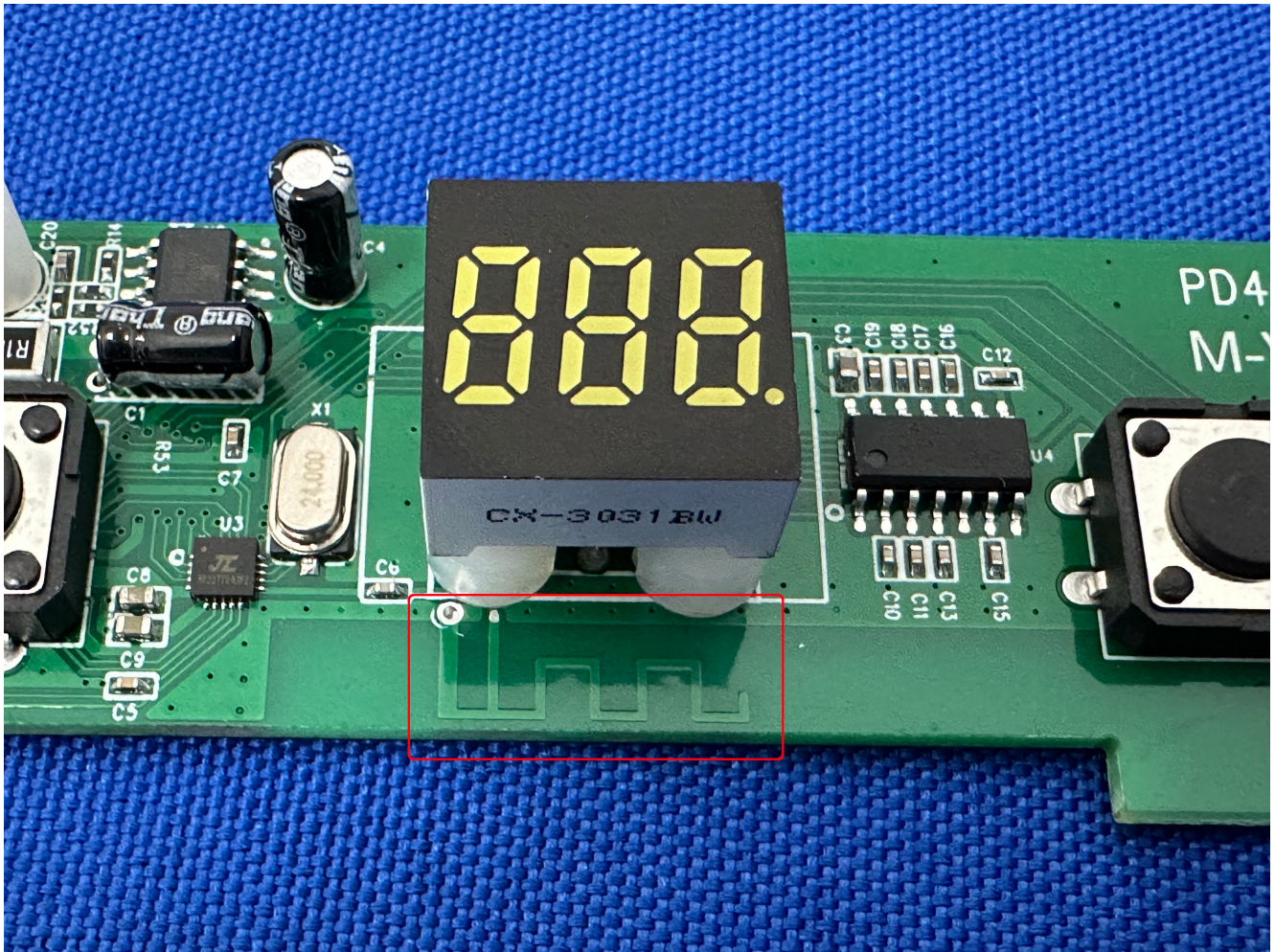
B2.2 PHI=90



B2.3 THETA=90



ANNEX C EUT PHOTO



Statement

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--END OF REPORT--