

TEST REPORT

Applicant: Juganu USA Inc
Address: 350 Motor Parkway, Suite 204 Hauppauge, NY 11788 USA
Equipment Type: RF PCBAs
Model Name: LED-SL-SOLITAIRE3-z-Dx-Fc-S
Brand Name: Juganu
Test Standard: IEEE Std 149-2021
Sample Arrival Date: Jul. 26, 2024
Test Date: Jul. 30, 2024
Date of Issue: Aug 21, 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>Aug. 21, 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	Juganu USA Inc
Address	350 Motor Parkway,Suite 204 Hauppauge,NY 11788 USA
Contact Person	Michael Soganich
Tel. No.	+1 (404) 414-8929
Email Address	micahels@juganu.com

2.2 Manufacturer Information

Manufacturer	Juganu USA Inc
Address	350 Motor Parkway, Suite 204 Hauppauge, NY 11788 USA

2.3 General Description for Equipment under Test (EUT)

EUT Name	RF PCBAs
Model Name Under Test	LED-SL-SOLITAIRE3-z-Dx-Fc-S
Antenna Type	PCB Antenna
Dimensions	42*42 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	--
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

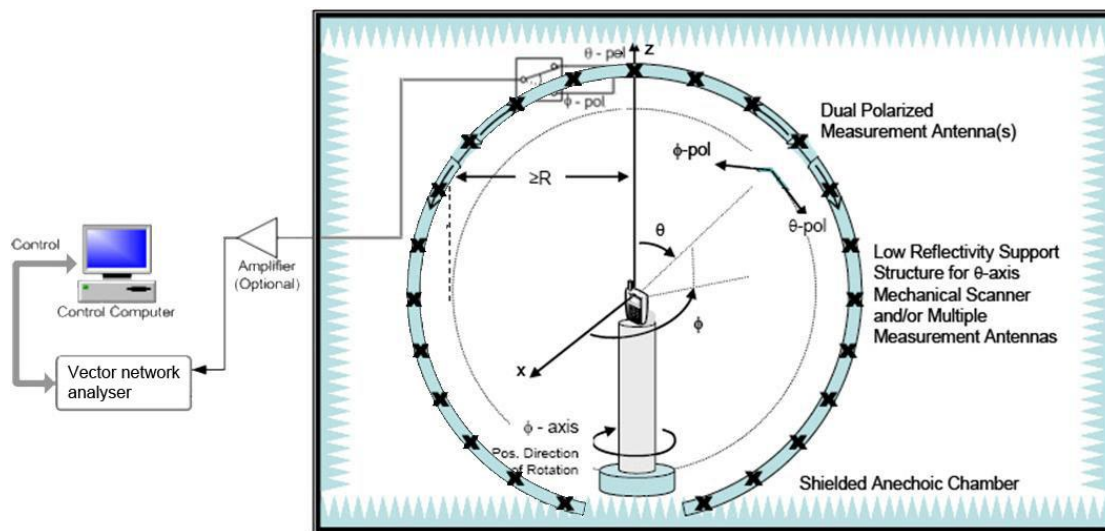
Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(°C)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	101	21.7	N/A	44

4.2 Test Equipment List

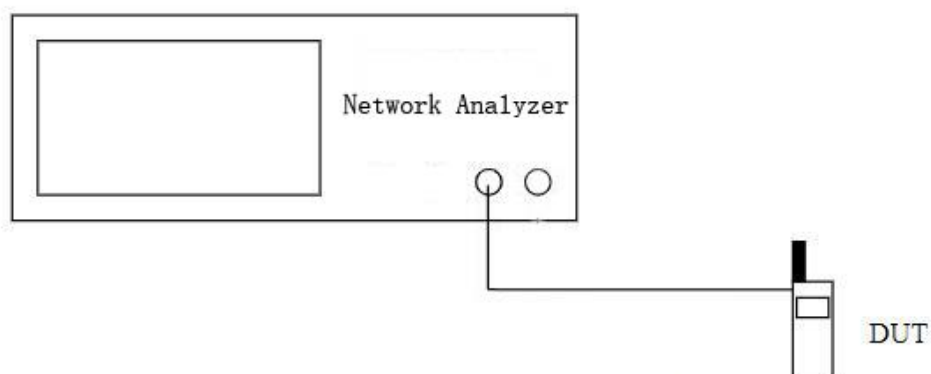
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
SG24 Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855- 0001	2021.11.12	2024.11.11
Vector Network Analyzer	Agilent	E5071B	MY42404001	2024.01.16	2025.01.15
Description	Manufacturer	Name		Version	
Test Software	MVG	SPM		V 1.8	

4.3 Test Setup

4.3.1 Antenna gain, efficiency and radiation pattern test setup



4.3.2 S11 parameter test setup



4.4 Test Frequencies

Test Frequencies	2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz, 2490MHz, 2500MHz, 5100MHz, 5110MHz, 5120MHz, 5130MHz, 5140MHz, 5150MHz, 5160MHz, 5170MHz, 5180MHz, 5190MHz, 5200MHz, 5210MHz, 5220MHz, 5230MHz, 5240MHz, 5250MHz, 5260MHz, 5270MHz, 5280MHz, 5290MHz, 5300MHz, 5310MHz, 5320MHz, 5330MHz, 5340MHz, 5350MHz, 5360MHz, 5370MHz, 5380MHz, 5390MHz, 5400MHz, 5410MHz, 5420MHz, 5430MHz, 5440MHz, 5450MHz, 5460MHz, 5470MHz, 5480MHz, 5490MHz, 5500MHz, 5510MHz, 5520MHz, 5530MHz, 5540MHz, 5550MHz, 5560MHz, 5570MHz, 5580MHz, 5590MHz, 5600MHz, 5610MHz, 5620MHz, 5630MHz, 5640MHz, 5650MHz, 5660MHz, 5670MHz, 5680MHz, 5690MHz, 5700MHz, 5710MHz, 5720MHz, 5730MHz, 5740MHz, 5750MHz, 5760MHz, 5770MHz, 5780MHz, 5790MHz, 5800MHz, 5810MHz, 5820MHz, 5830MHz, 5840MHz, 5850MHz, 5860MHz, 5870MHz, 5880MHz, 5890MHz, 5900MHz, 5910MHz, 5920MHz, 5930MHz, 5940MHz, 5950MHz, 5960MHz, 5970MHz, 5980MHz, 5990MHz, 6000MHz
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ANNEX A TEST RESULTS

A.1 Gain and Efficiency

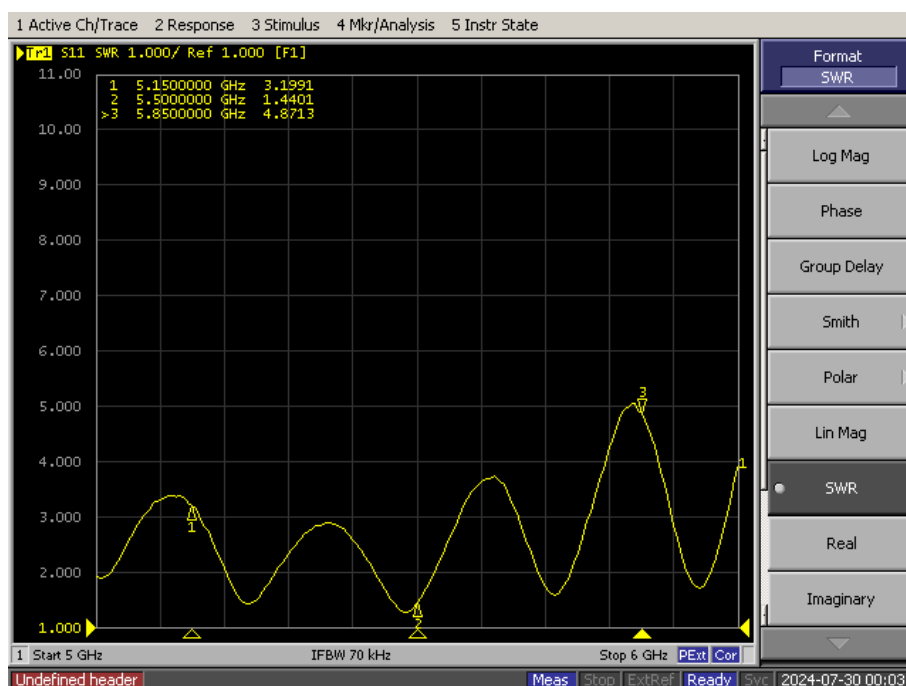
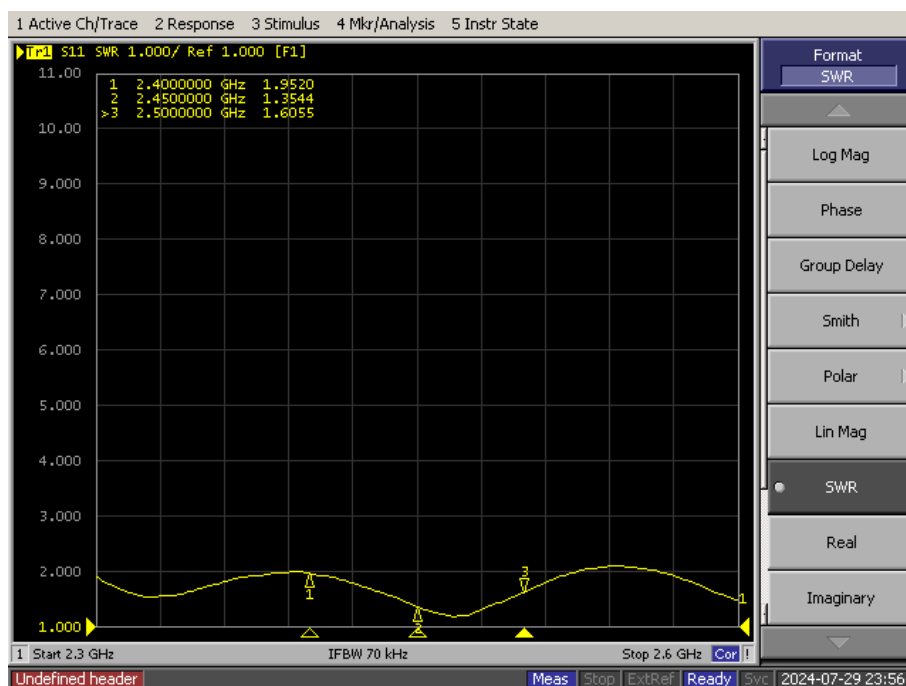
Frequency	Gain (dBi)	Efficiency (%)
2400MHz	5.25	62
2410MHz	5.36	63
2420MHz	5.20	64
2430MHz	5.11	67
2440MHz	5.14	68
2450MHz	5.59	69
2460MHz	5.74	69
2470MHz	5.48	69
2480MHz	5.43	69
2490MHz	5.47	67
2500MHz	5.35	64
5100MHz	2.69	39
5110MHz	2.60	38
5120MHz	2.34	35
5130MHz	2.17	34
5140MHz	2.07	34
5150MHz	1.96	34
5160MHz	1.95	34
5170MHz	2.13	35
5180MHz	2.47	38
5190MHz	2.91	42
5200MHz	3.46	48
5210MHz	3.89	54
5220MHz	4.24	59
5230MHz	4.54	64
5240MHz	4.61	65
5250MHz	4.36	63
5260MHz	3.99	58
5270MHz	3.51	53
5280MHz	3.00	48
5290MHz	2.72	45
5300MHz	2.51	42
5310MHz	2.29	40
5320MHz	2.02	39
5330MHz	1.71	37
5340MHz	1.52	36
5350MHz	1.72	37
5360MHz	2.10	41

5370MHz	2.40	44
5380MHz	2.43	45
5390MHz	2.60	47
5400MHz	2.73	49
5410MHz	3.35	56
5420MHz	3.48	58
5430MHz	3.47	59
5440MHz	3.44	59
5450MHz	3.63	62
5460MHz	3.72	64
5470MHz	3.61	63
5480MHz	3.63	63
5490MHz	3.62	63
5500MHz	3.43	62
5510MHz	3.13	60
5520MHz	2.82	57
5530MHz	2.54	53
5540MHz	1.94	46
5550MHz	1.10	39
5560MHz	0.53	36
5570MHz	0.07	32
5580MHz	-0.49	29
5590MHz	-0.90	26
5600MHz	-1.00	26
5610MHz	-1.00	27
5620MHz	-0.87	27
5630MHz	-0.45	30
5640MHz	-0.19	31
5650MHz	0.13	34
5660MHz	0.71	40
5670MHz	1.52	49
5680MHz	1.91	53
5690MHz	1.98	55
5700MHz	1.89	54
5710MHz	1.64	50
5720MHz	1.16	45
5730MHz	0.63	40
5740MHz	0.20	36
5750MHz	-0.41	32
5760MHz	-0.91	28
5770MHz	-0.94	28
5780MHz	-0.66	29
5790MHz	-0.52	30

5800MHz	-0.65	30
5810MHz	-0.70	30
5820MHz	-0.54	30
5830MHz	-0.34	32
5840MHz	-0.19	33
5850MHz	-0.29	32
5860MHz	-0.38	31
5870MHz	-0.40	31
5880MHz	-0.44	31
5890MHz	-0.44	31
5900MHz	-0.18	33
5910MHz	-0.59	30
5920MHz	-0.31	32
5930MHz	-0.14	33
5940MHz	0.55	38
5950MHz	0.64	38
5960MHz	0.01	33
5970MHz	-0.63	28
5980MHz	-1.45	23
5990MHz	-2.21	19
6000MHz	-2.89	16

A.2 VSWR

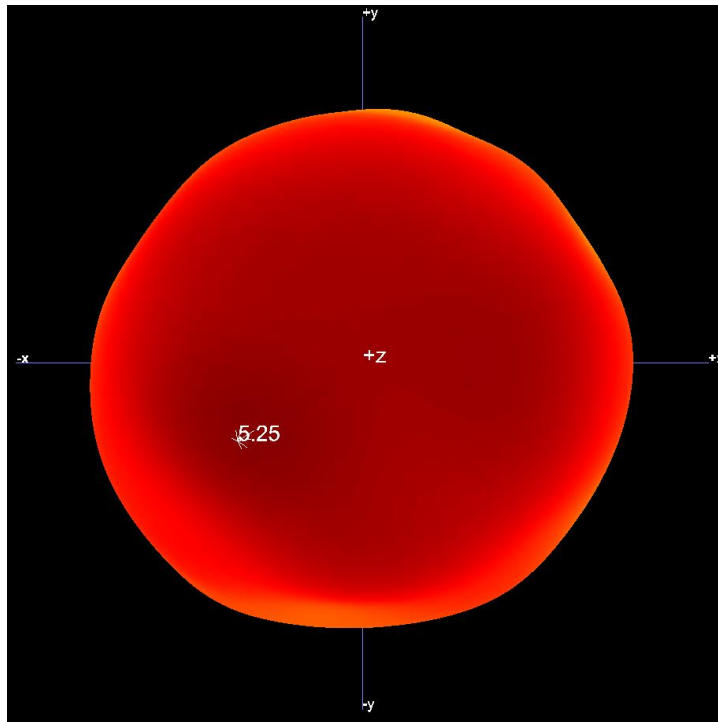
Frequency	VSWR
2400MHz	1.95
2450MHz	1.35
2500MHz	1.61
5150MHz	3.20
5500MHz	1.44
5850MHz	4.87



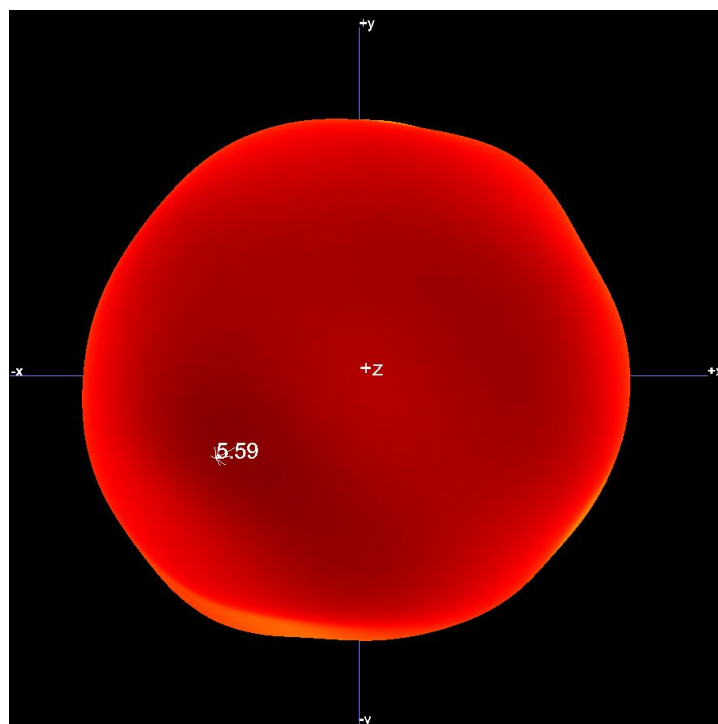
ANNEX B RADIATION PATTERN

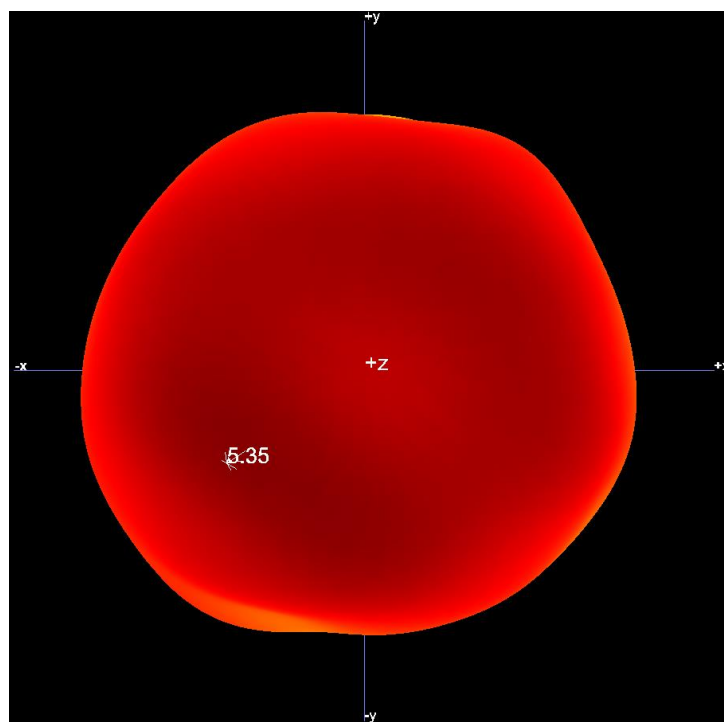
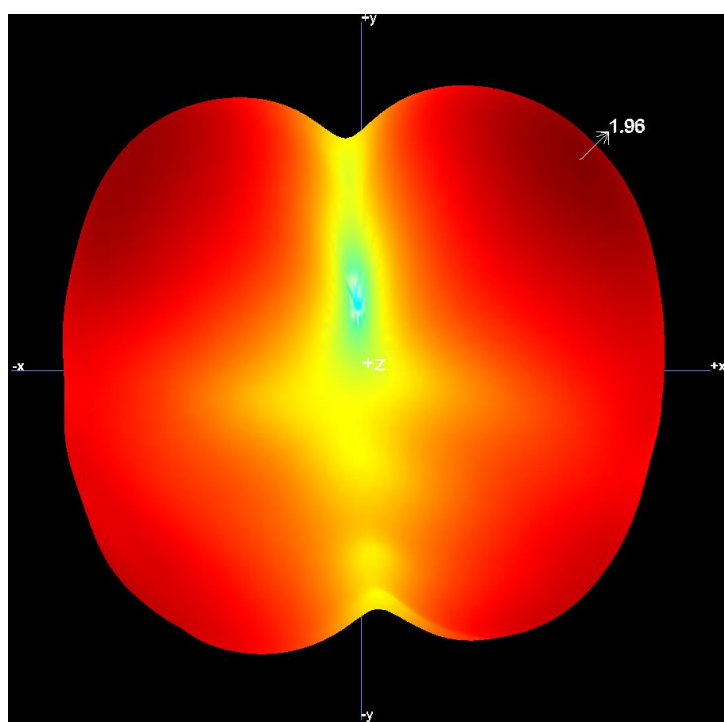
B.1 3D Pattern

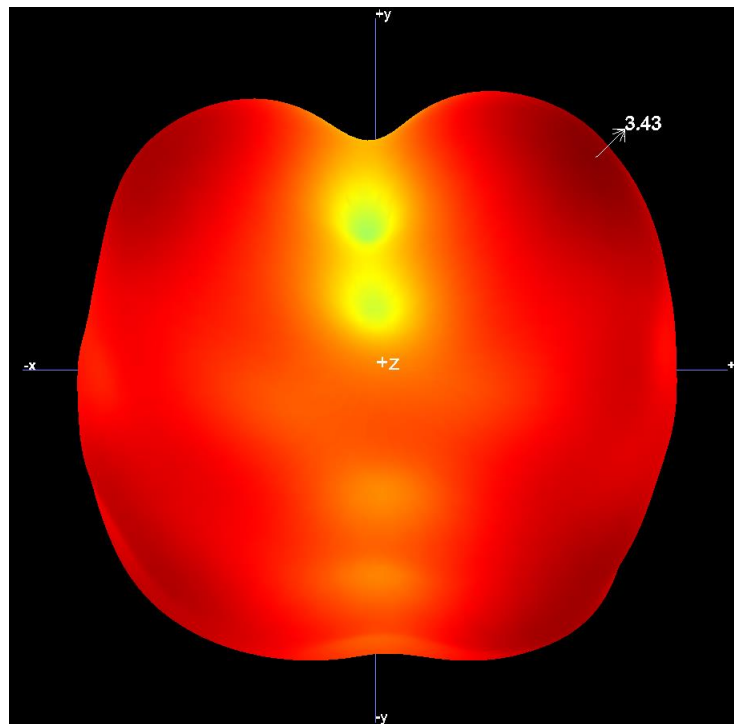
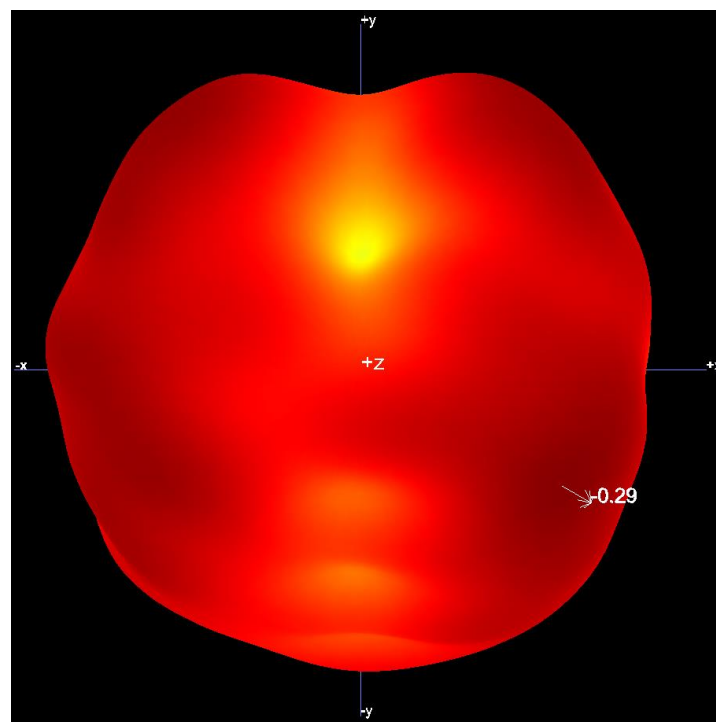
B1.1 3D Pattern for 2400MHz



B1.2 3D Pattern for 2450MHz

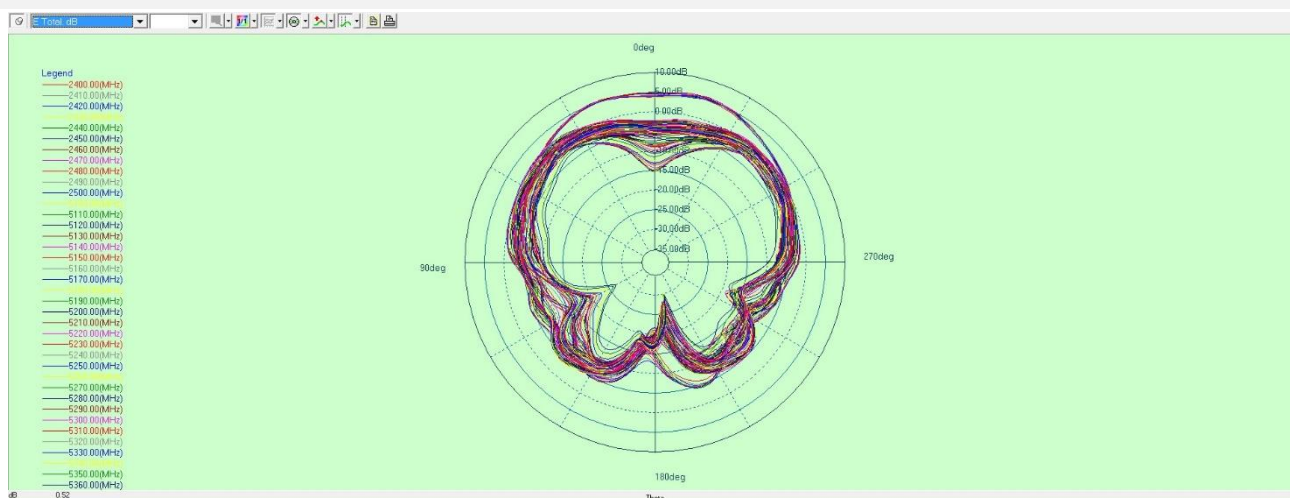


B1.3 3D Pattern for 2500MHz**B1.4 3D Pattern for 5150MHz**

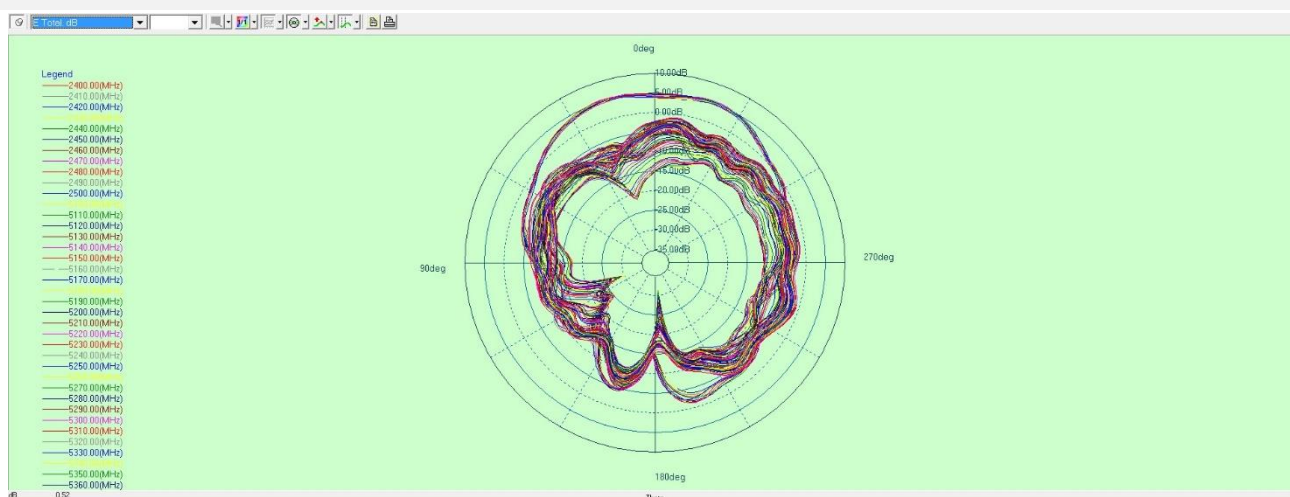
B1.5 3D Pattern for 5500MHz**B1.6** 3D Pattern for 5850MHz

B.2 1D Radiation Pattern

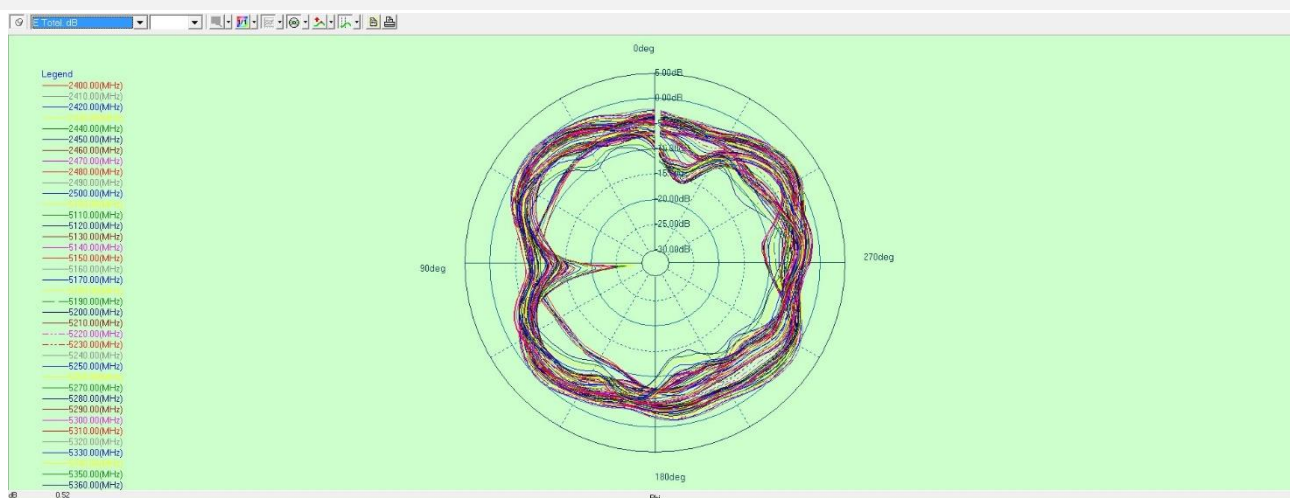
B2.1 PHI=0



B2.2 PHI=90



B2.3 THETA=90



ANNEX C TEST SETUP PHOTOS

Please refer the document “BL-SZ2471213-AO-2.PDF”.

ANNEX D EUT PHOTO

Please refer the document “BL-SZ2471213-AA-2.PDF”.

Statement

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7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--