



# TNP-UG63 Antenna Test Report

(Model: Milesight LORA ANT)

Version: 1.0

Released Date: 2022/07/01

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Reviewed By: Daniel

**Confidential**

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- Specification
- Antenna Placement & Condition
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- Return Loss, S-parameters Test
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- Conclusion & Comments

# Revision History

Released Date	Version	Revised Records
2022/07/01	V1.0	<ul style="list-style-type: none"><li>• Antenna evaluation report</li></ul>

# Specification

## Requirements of Antenna Design

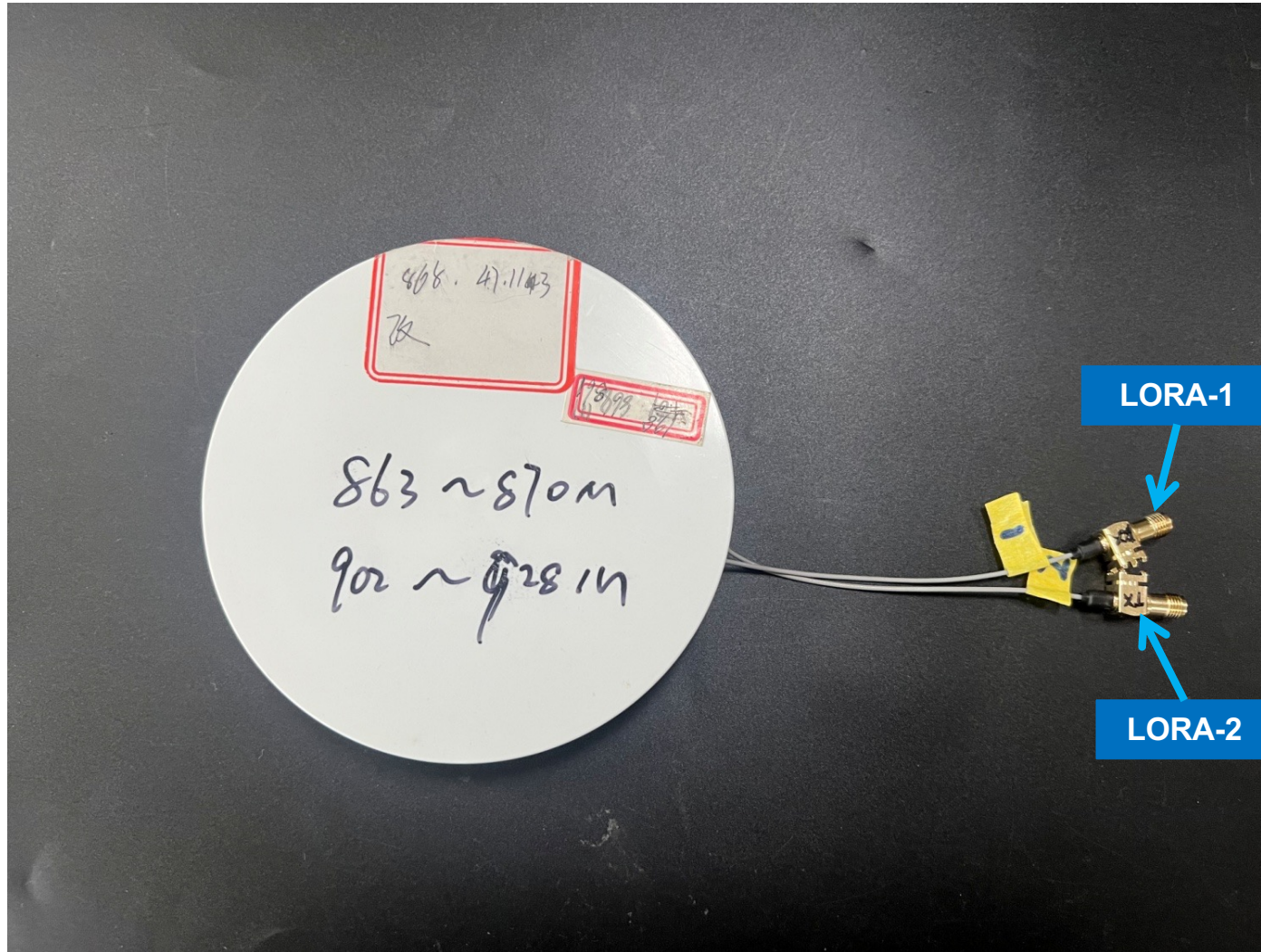
RF Function	Number of ANT	Frequency Band	Remark
LORA	2	863-870 / 902-928 MHz	ANT1, 2

LORA-1 : RX  
LORA-2 : TX

## Requirements of Measurement

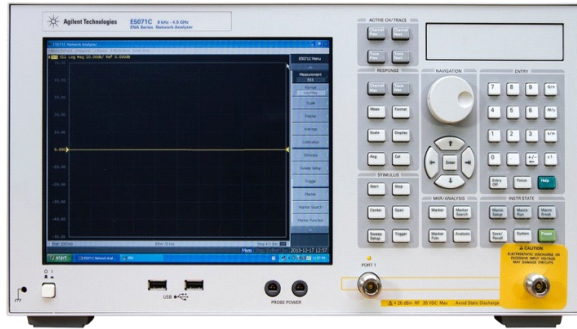
Test Item	Specification	Remark
Return Loss	6.0 dB Max	
VSWR	3.0:1 Max	
Peak Gain	--	
Efficiency	--	
Radiation Pattern	Scale: +5 - -45 dBi, Angle step size: 5 degree	

# Antenna Placement & Solution

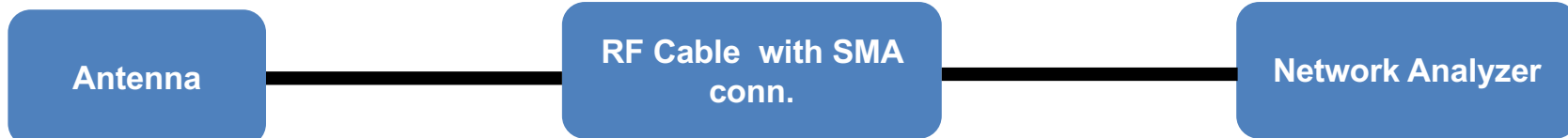
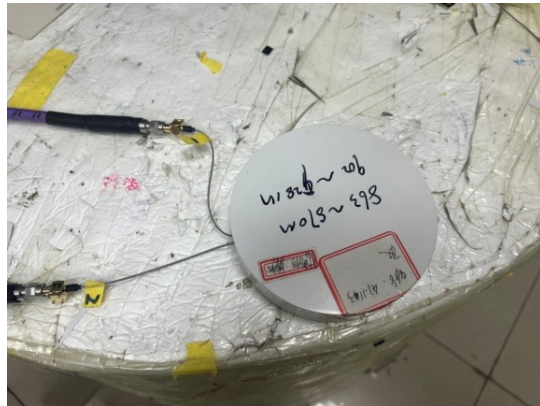




# Test Setup for Return Loss Test



Equipment	Brand	Model
Network Analyzer	Keysight	E5071C



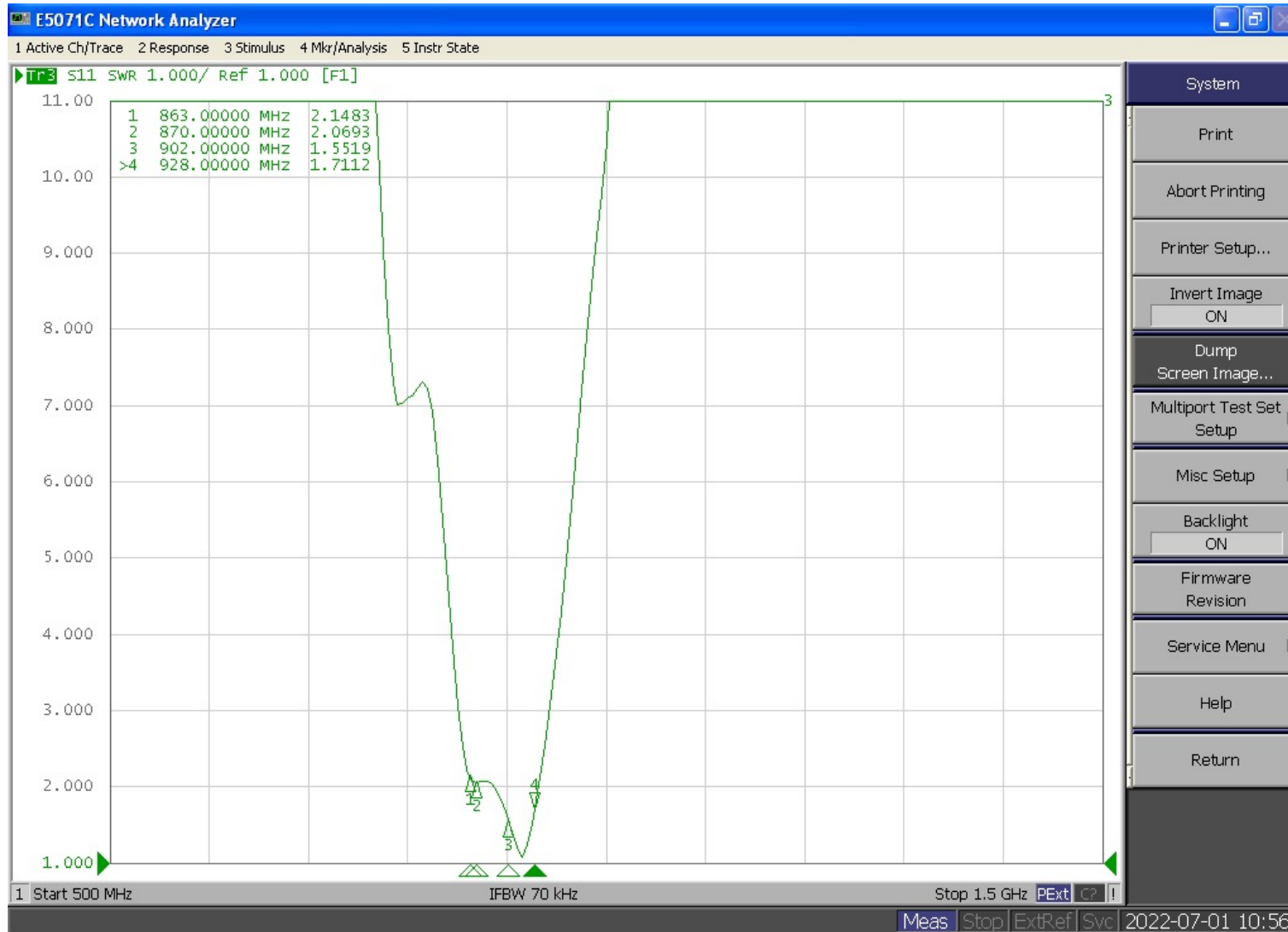
# V.S.W.R Test

LORA-1 (863-870 / 902-928 MHz)



# V.S.W.R Test

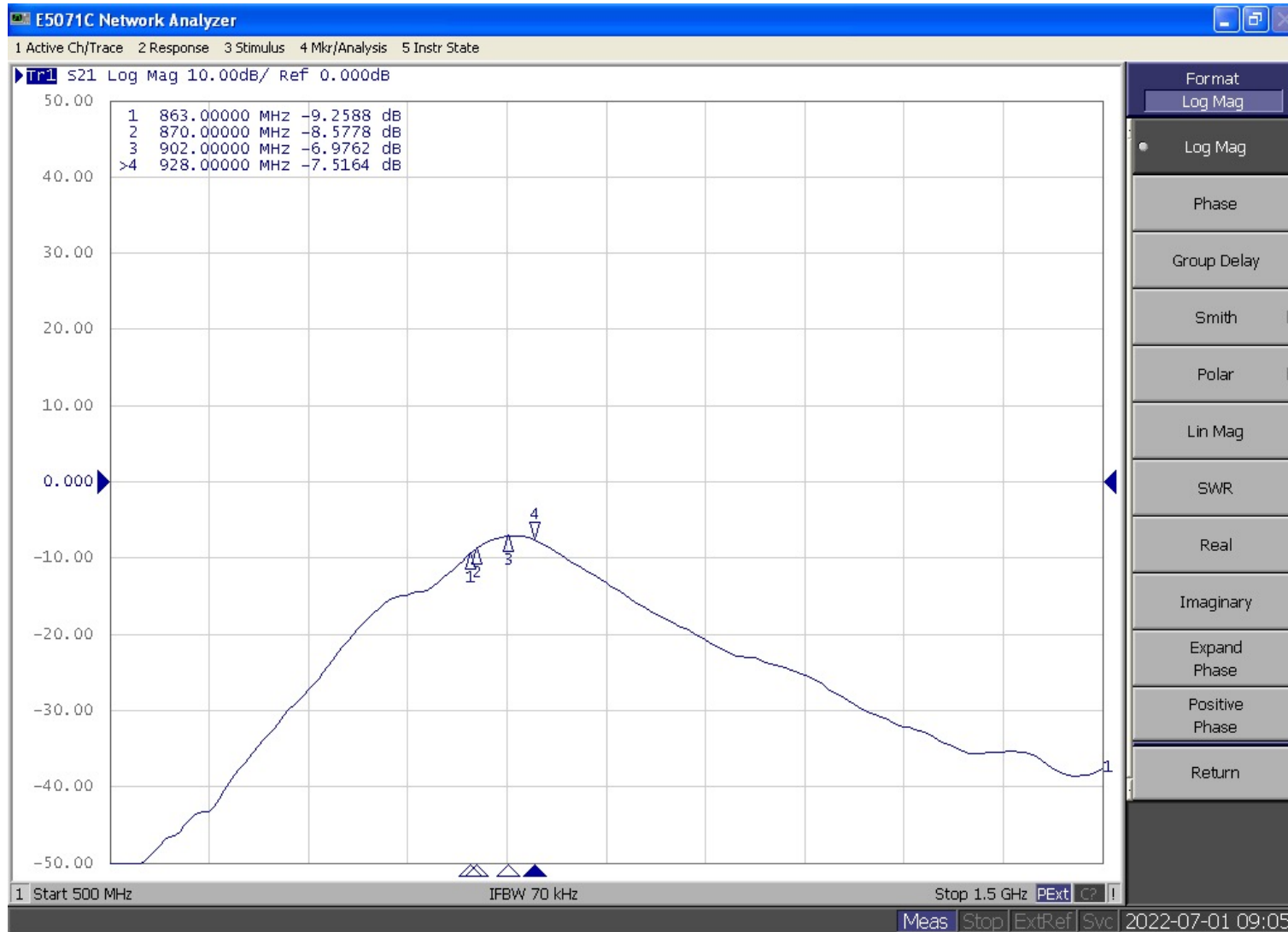
LORA-2 (863-870 / 902-928 MHz)



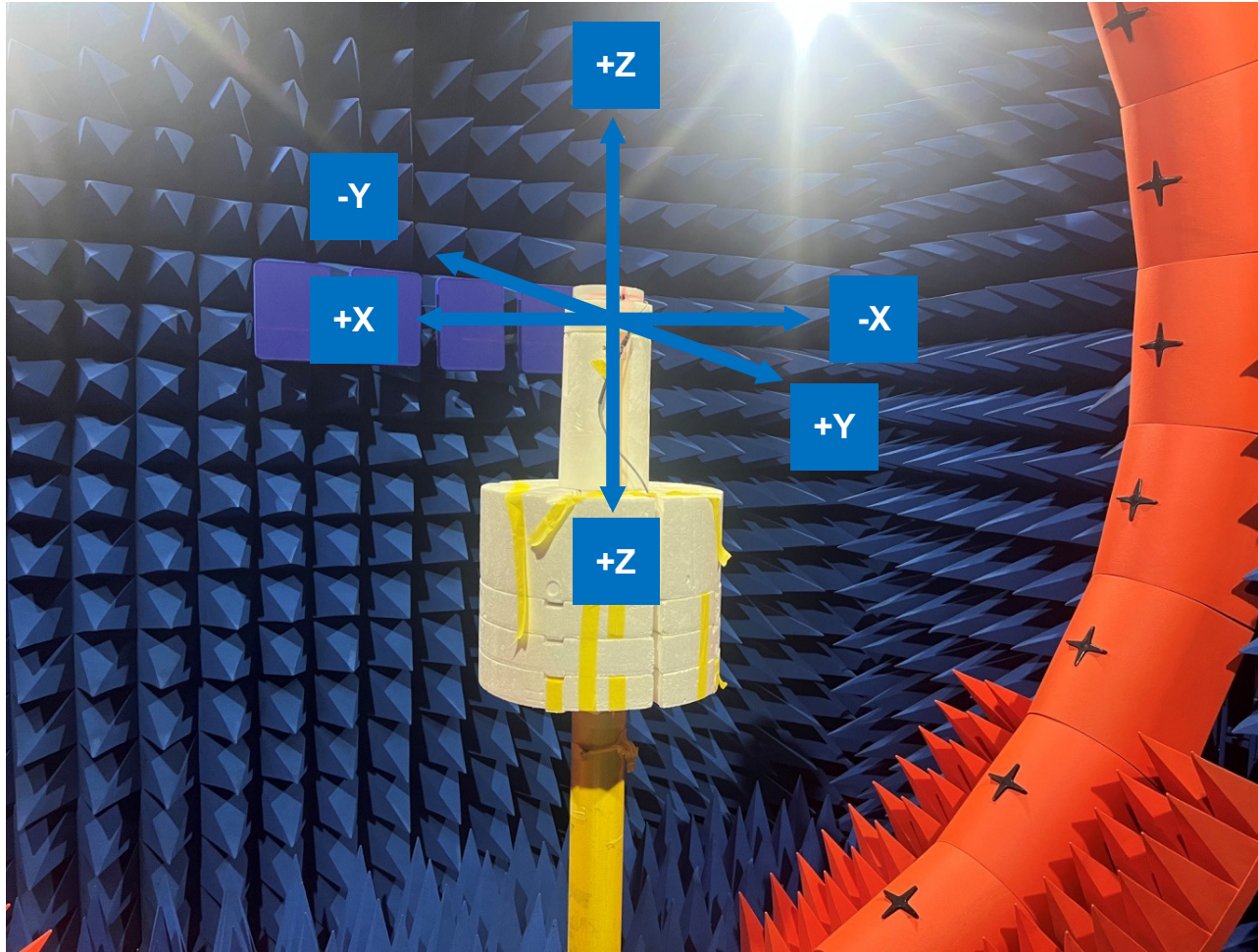


# Isolation Test

## LORA-1 & LORA-2



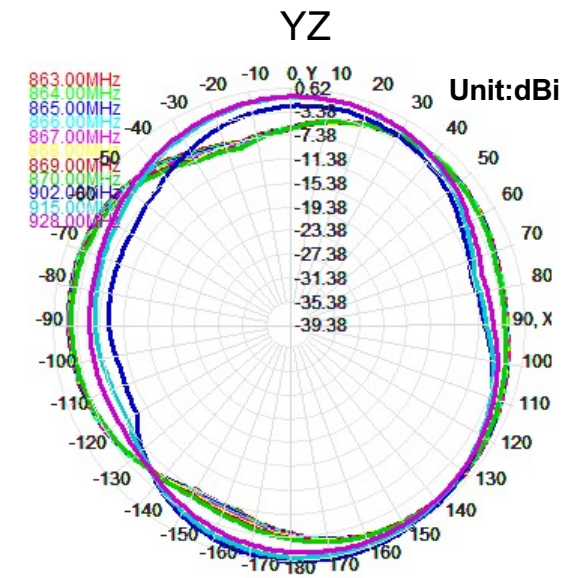
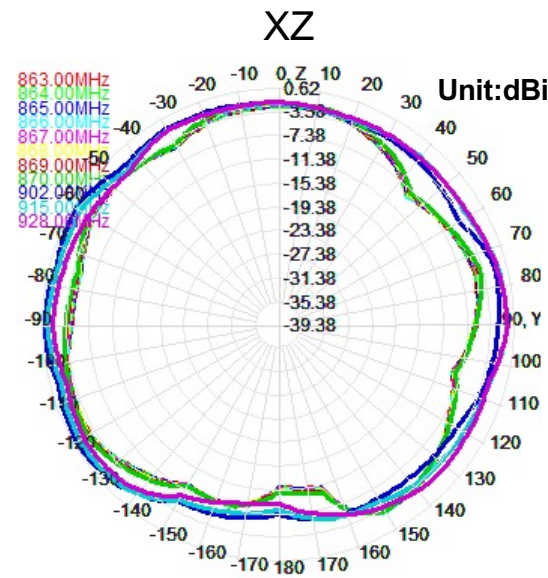
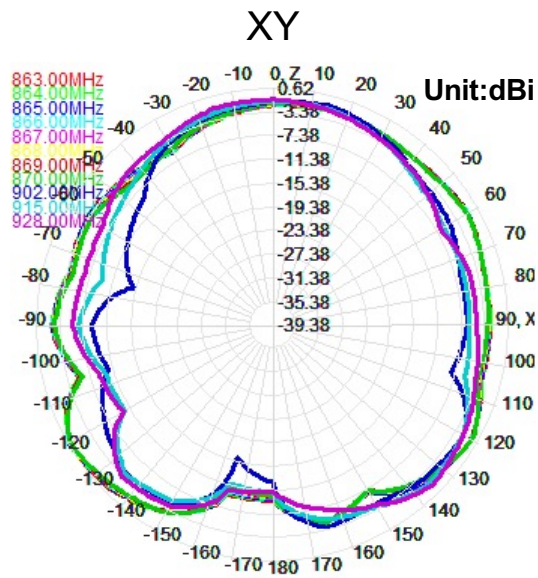
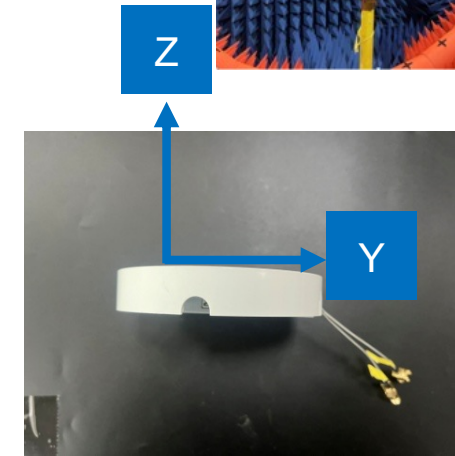
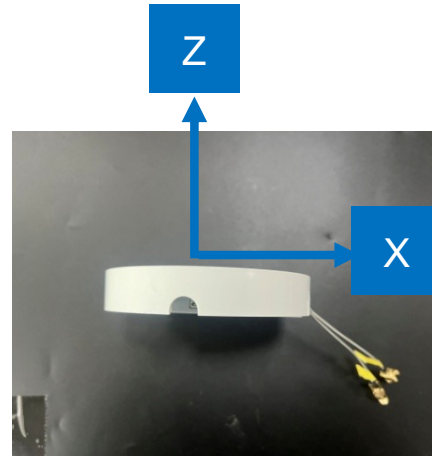
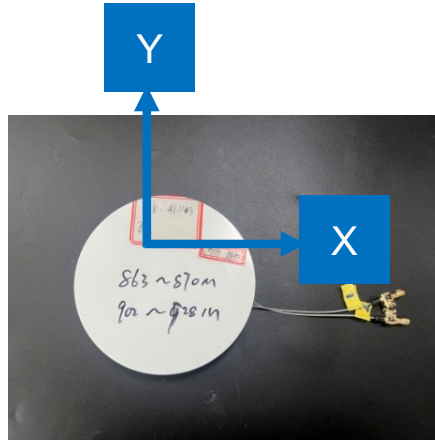
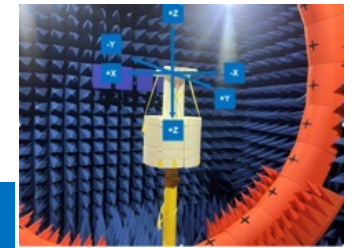
# Test Setup for OTA Measurement



Chamber	Brand	Model	Location
24 probe	Fei-Tu	FT-OTA24	China, Dongguan

# 2D Radiation Pattern

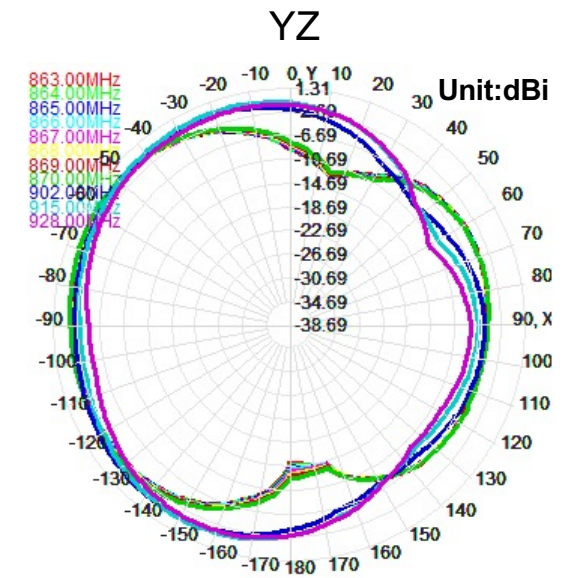
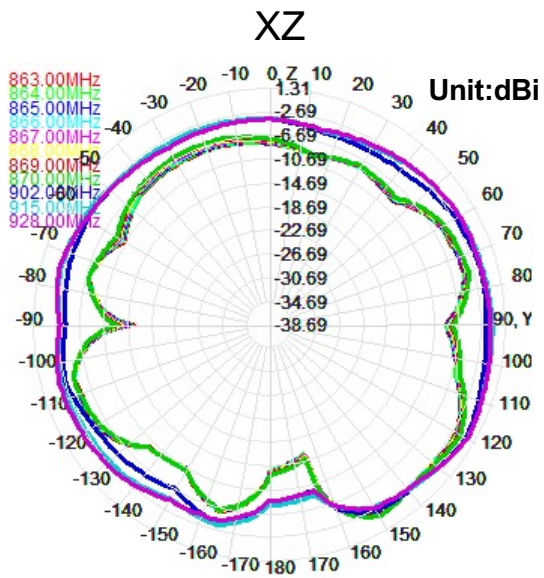
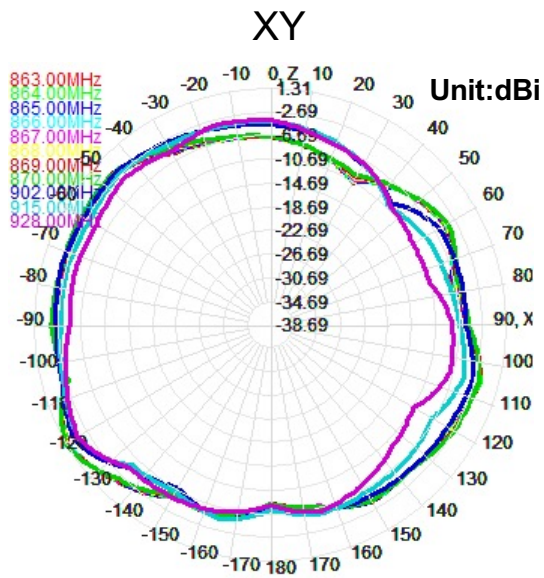
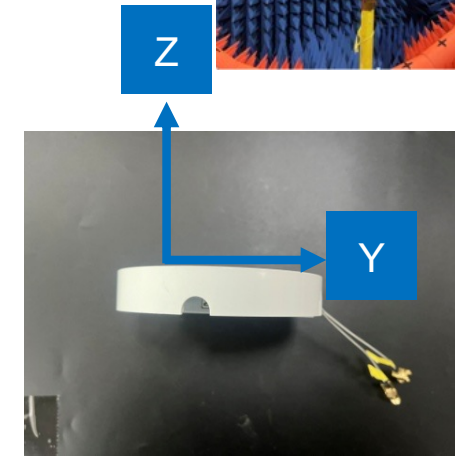
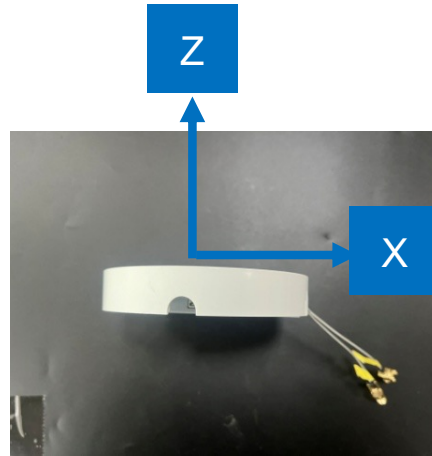
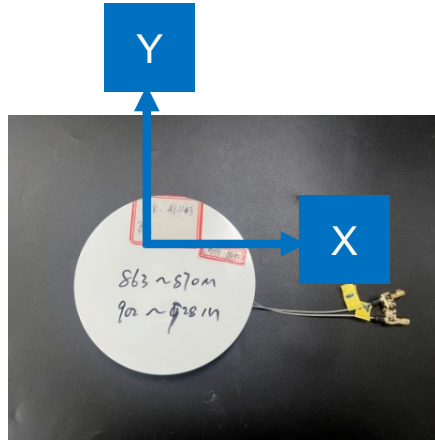
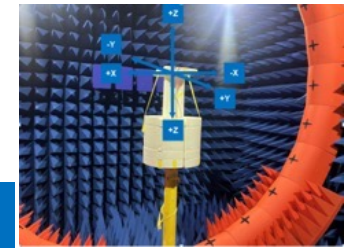
LORA-1





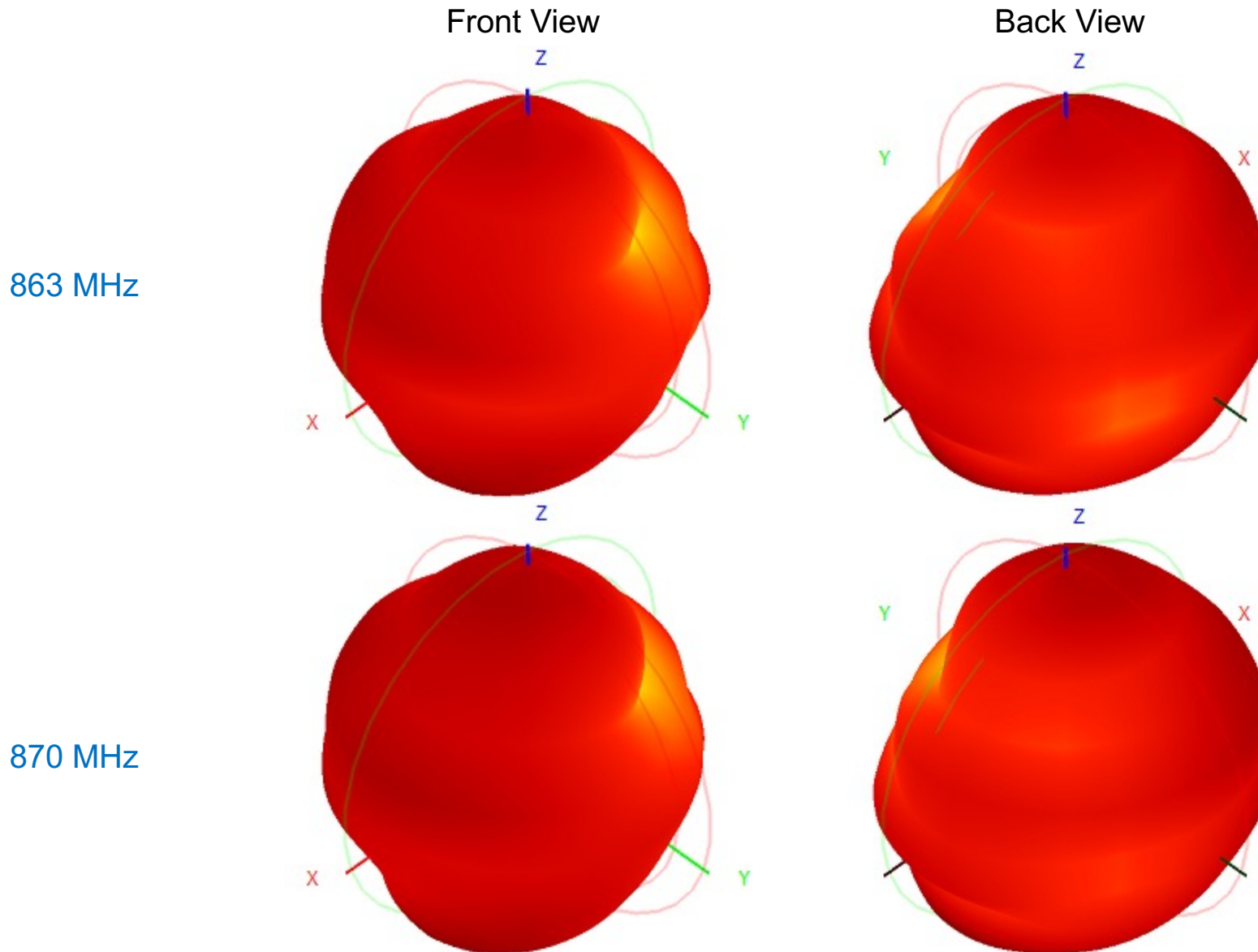
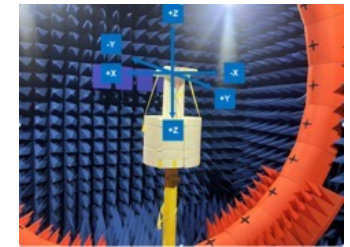
# 2D Radiation Pattern

LORA-2



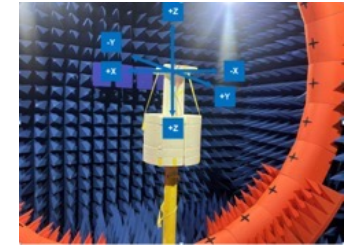
# 3D Radiation Pattern

LORA-1

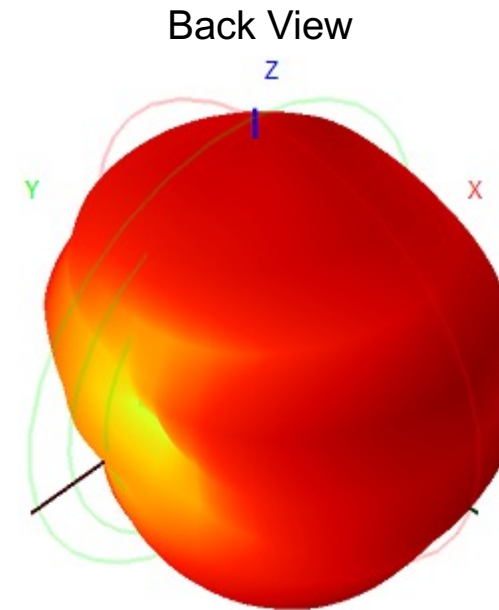
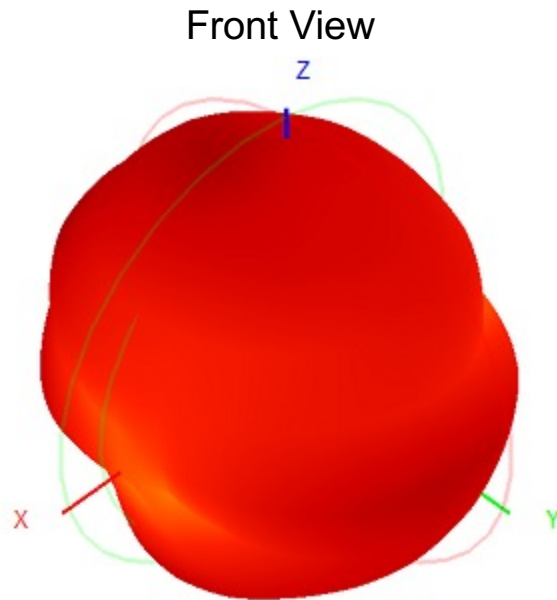


# 3D Radiation Pattern

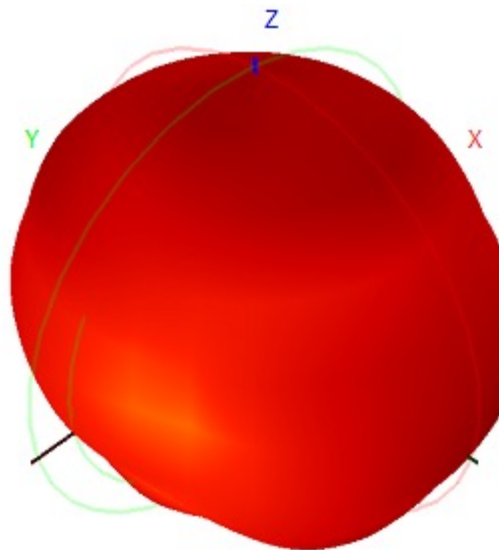
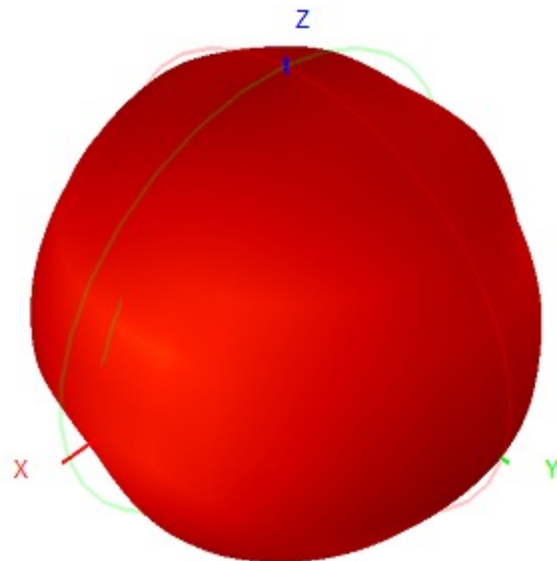
LORA-1



902 MHz



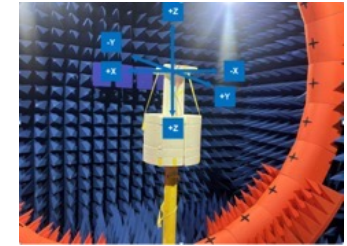
928 MHz



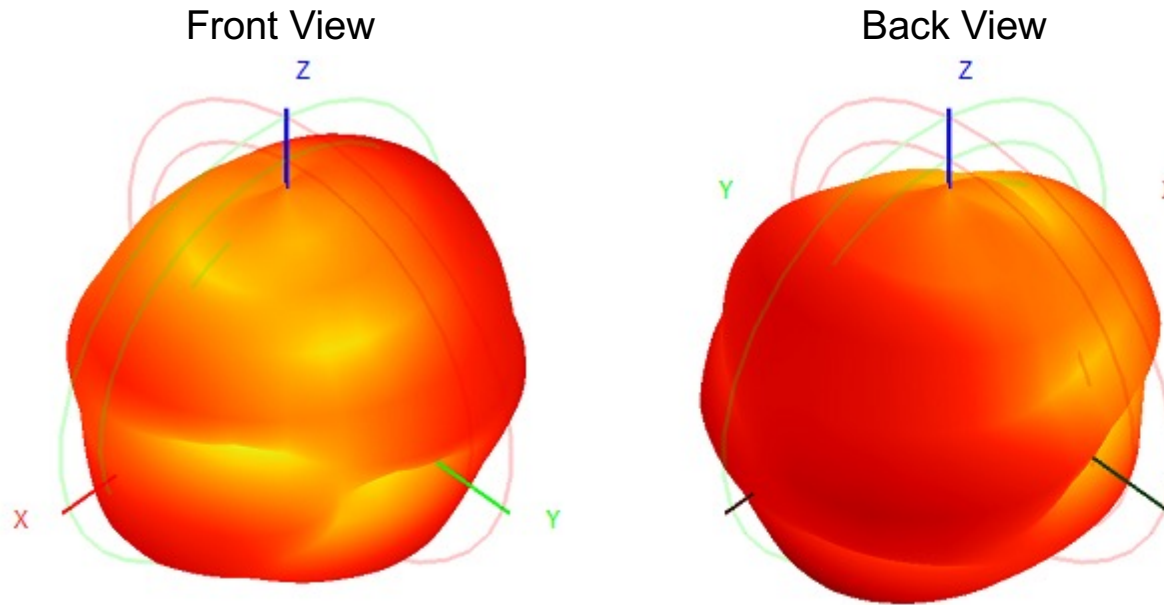


# 3D Radiation Pattern

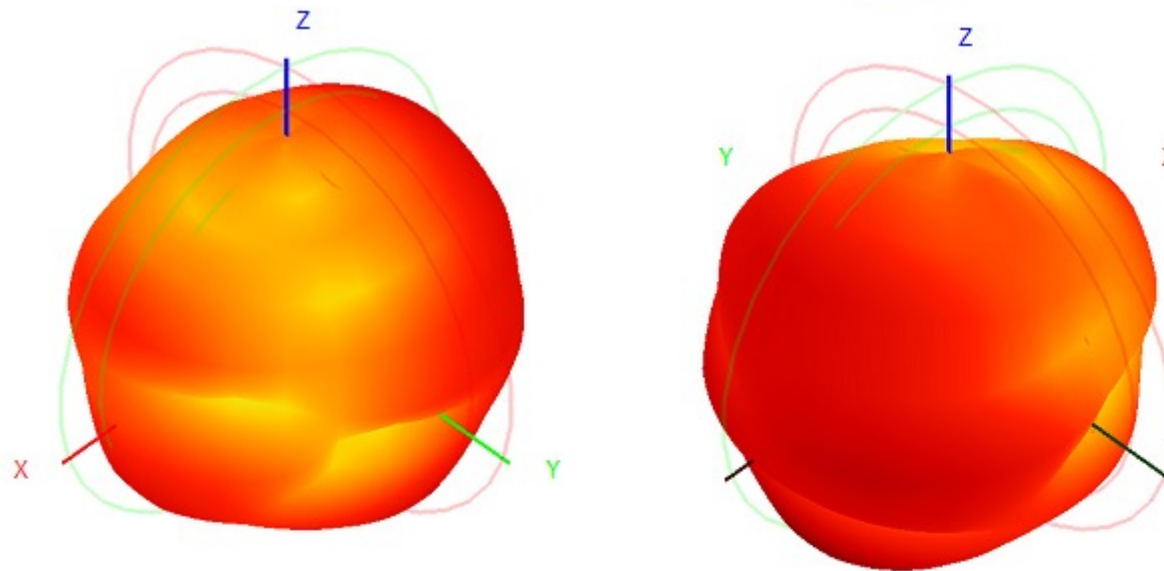
LORA-2



863 MHz

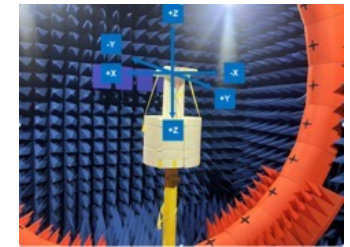


870 MHz

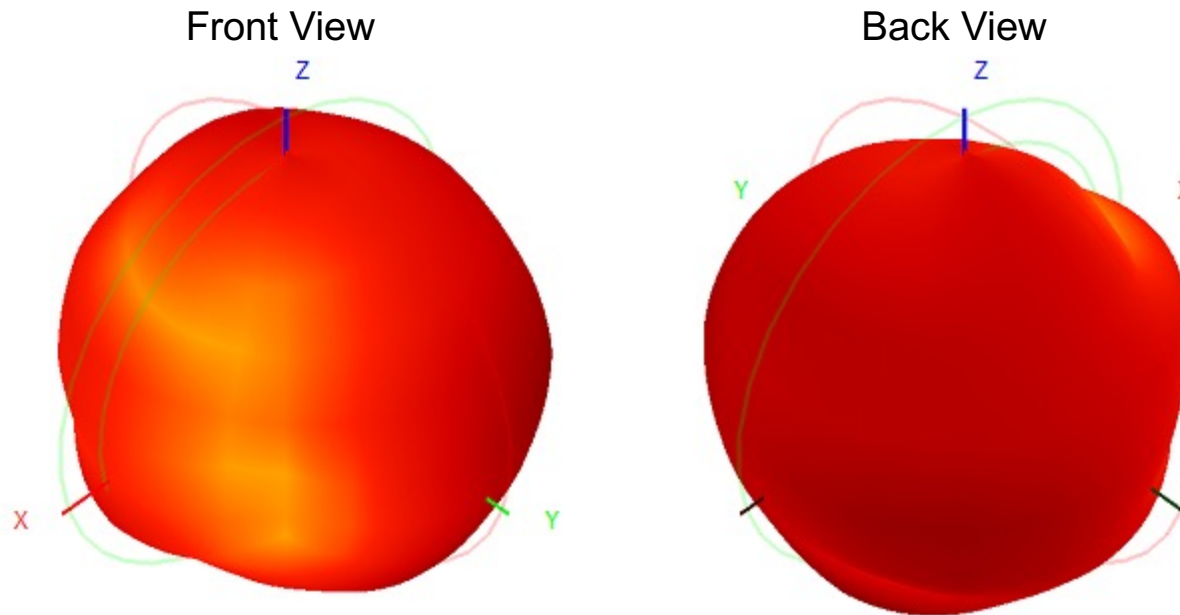


# 3D Radiation Pattern

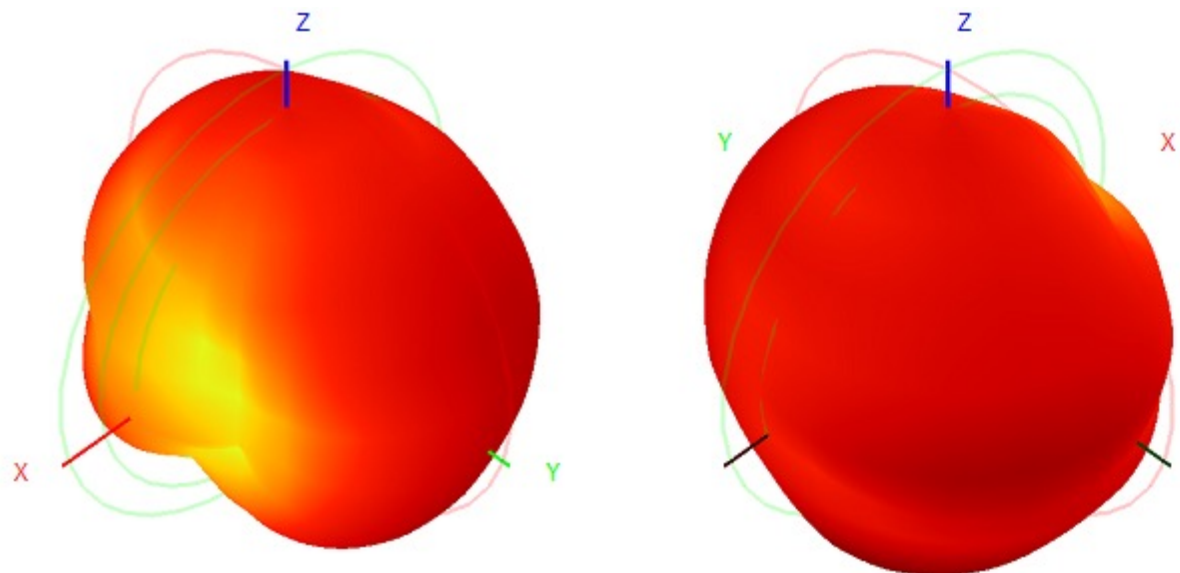
LORA-2



902 MHz



928 MHz



# Results Summary

V.S.W.R (863-870 / 902-928 MHz) (Criterion: <3.0)

Frequency (MHz)	LORA-1	LORA-2
863	1.75	2.14
870	2.09	2.06
902	2.02	1.55
928	1.24	1.71

# Results Summary

## Isolation

Frequency (MHz)	LORA-1 & LORA-2 (dB)
863	-9.2
870	-8.5
902	-6.9
928	-7.5

# Results Summary

Peak Gain (Criterion: 863-870/902-928 MHz )

Frequency (MHz)	LORA-1 (dBi)	LORA-2 (dBi)
863.0	0.24	0.92
864.0	0.22	0.97
865.0	0.21	1.04
866.0	0.15	1.07
867.0	0.12	1.12
868.0	0.09	1.17
869.0	0.07	1.24
870.0	0.06	1.31
902.0	0.62	-0.13
915.0	0.02	-0.12
928.0	-0.64	0.49

# Results Summary

Efficiency (963-870 / 902-928MHz)

Frequency (MHz)	LORA-1 (%)	LORA-2 (%)
863.0	43.20	34.51
864.0	43.08	34.70
865.0	43.12	35.05
866.0	42.95	35.26
867.0	42.94	35.62
868.0	43.00	36.02
869.0	43.14	36.50
870.0	43.27	36.96
902.0	43.93	43.57
915.0	45.79	43.55
928.0	46.29	40.43



TX

RX

