



Samsara Freya_FN Antenna Datasheet

Dec. 06, 2023

Prepared by David Chu

Outline

- Antenna Specification
- Antenna Structure & Placement
- Return Loss & Isolation
- Radiation Pattern
- Peak Gain & Efficiency

ANT 1 Model:6172001KWA

ANT 2 Model:6172001LWA

ANT 4 Model:6172001NWA

ANT 3 Model:6172001MWA

Manufacturer Name: Sercomm Corporation

Address:8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.

Antenna Specification

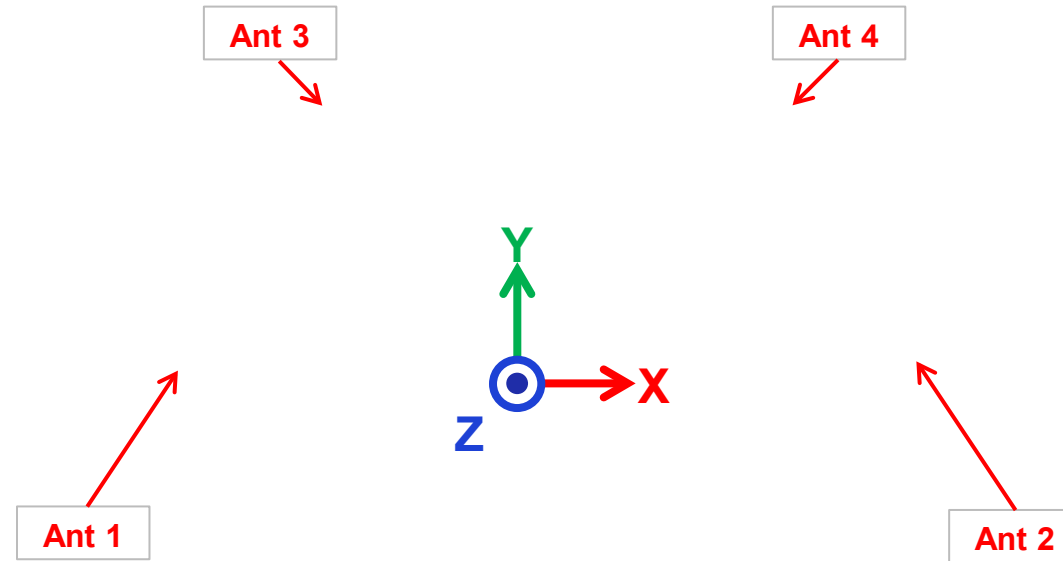
Item	LTE_Main	
Operation Band	B5/B12/14	B2/B4
Peak Gain (dBi)	< 2.5	< 1.5
Efficiency (%)	> 45	B2 > 50 B4 > 55
Return Loss (dB)	$\geq 6\text{dB}$	

Item	LTE_Div.	
Operation Band	B5/B12/14	B2/B4
Peak Gain (dBi)	< 0.5	B2 < 2 B4 < 2.5
Efficiency (%)	B5 > 35 B12/B13 > 30	B2 > 45 B4 > 55
Return Loss (dB)	$\geq 6\text{dB}$	

Antenna Specification

Item	GPS	WiFi/BT
Frequency (MHz)	1559-1601	2400-2500
Peak Gain (dBi)	< 2	< 2.5
Efficiency (%)	> 60	> 60
Return Loss (dB)	≥ 10 dB	≥ 10 dB

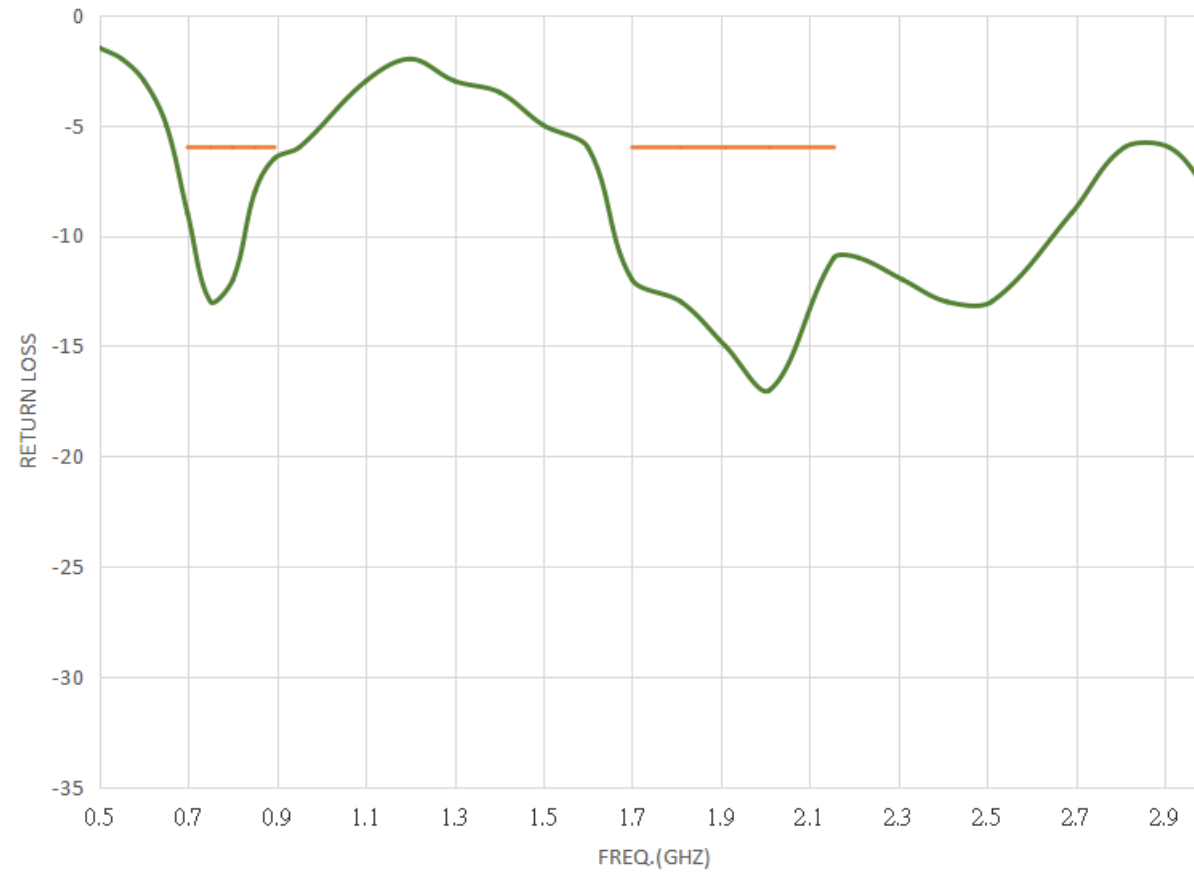
Antenna Structure & Placement



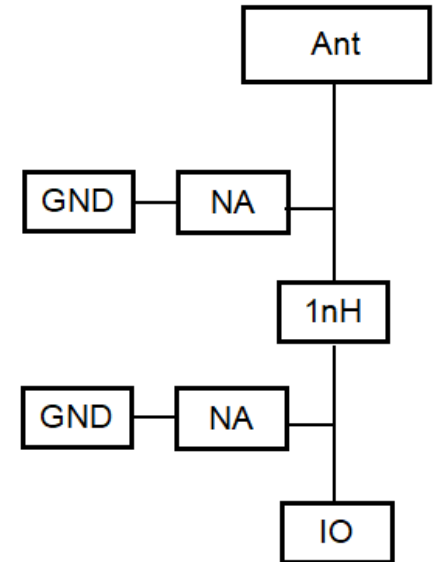
Full unit is used for antenna performance measurement.

Ant No.	Operating Band	Type	Material	Feeding	Dimension
Ant 1 (LTE Main)	B2/B4/B5/B12/14	PIFA	Metal	Trace	59.9 x 8.6 x 9.8 mm ³
Ant 2 (LTE Div.)	B2/B4/B5/B12/14	Monopole	Metal	Trace	64.1 x 8.6 x 9.6 mm ³
Ant 3	GPS	PIFA	Metal	Trace	25.5 x 4.9 x 8.8 mm ³
Ant 4	WiFi 2.4G / BT	PIFA	Metal	Trace	20 x 4.9 x 8.8 mm ³

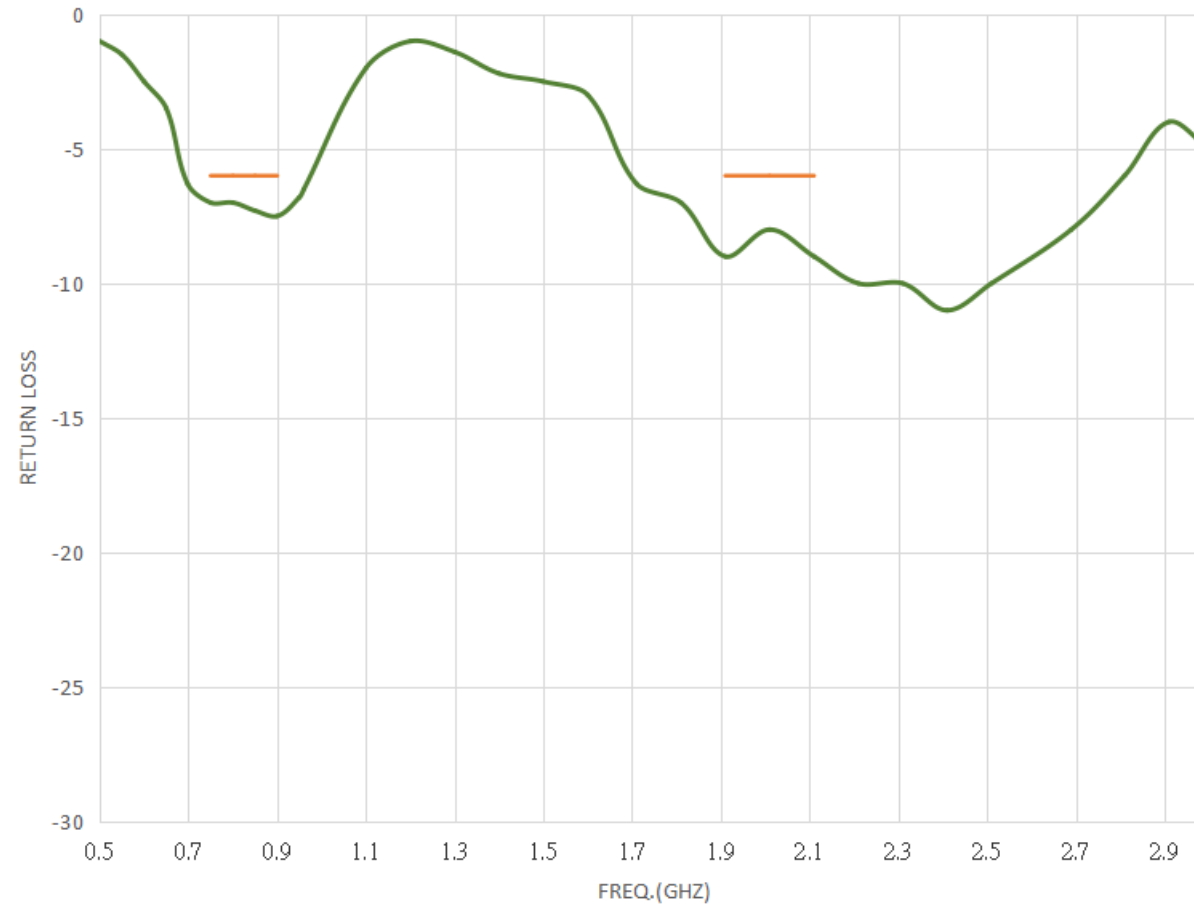
Return Loss – Ant 1 LTE Main



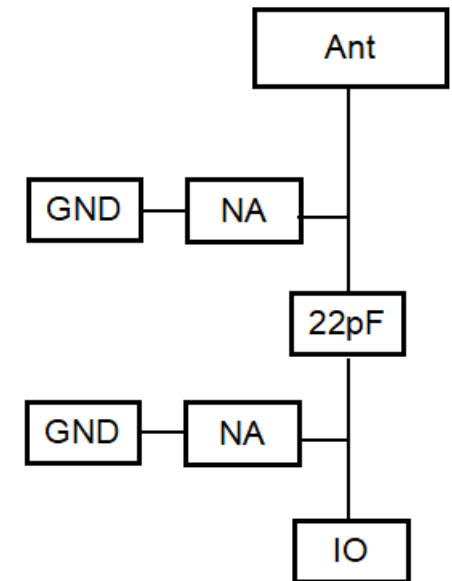
Matching values



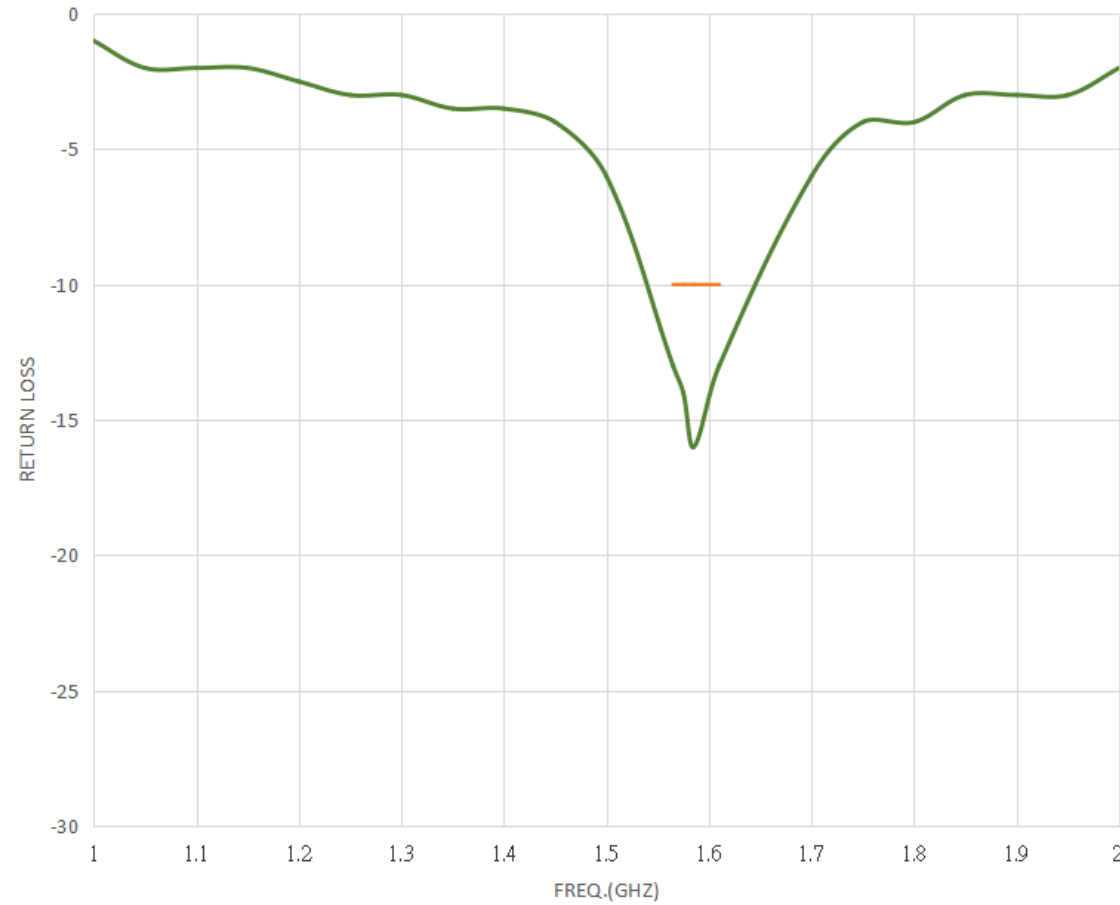
Return Loss – Ant 2 LTE Div.



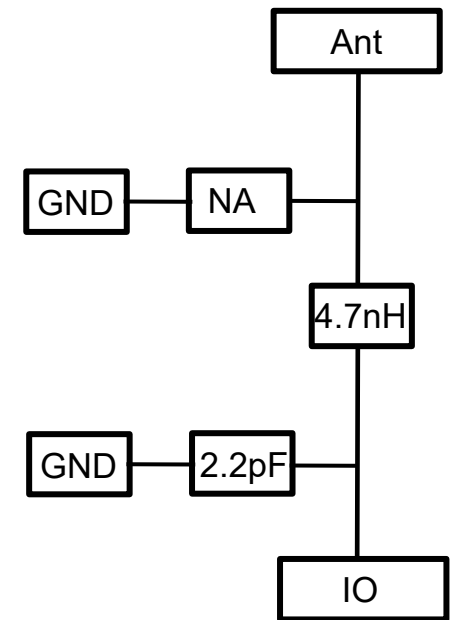
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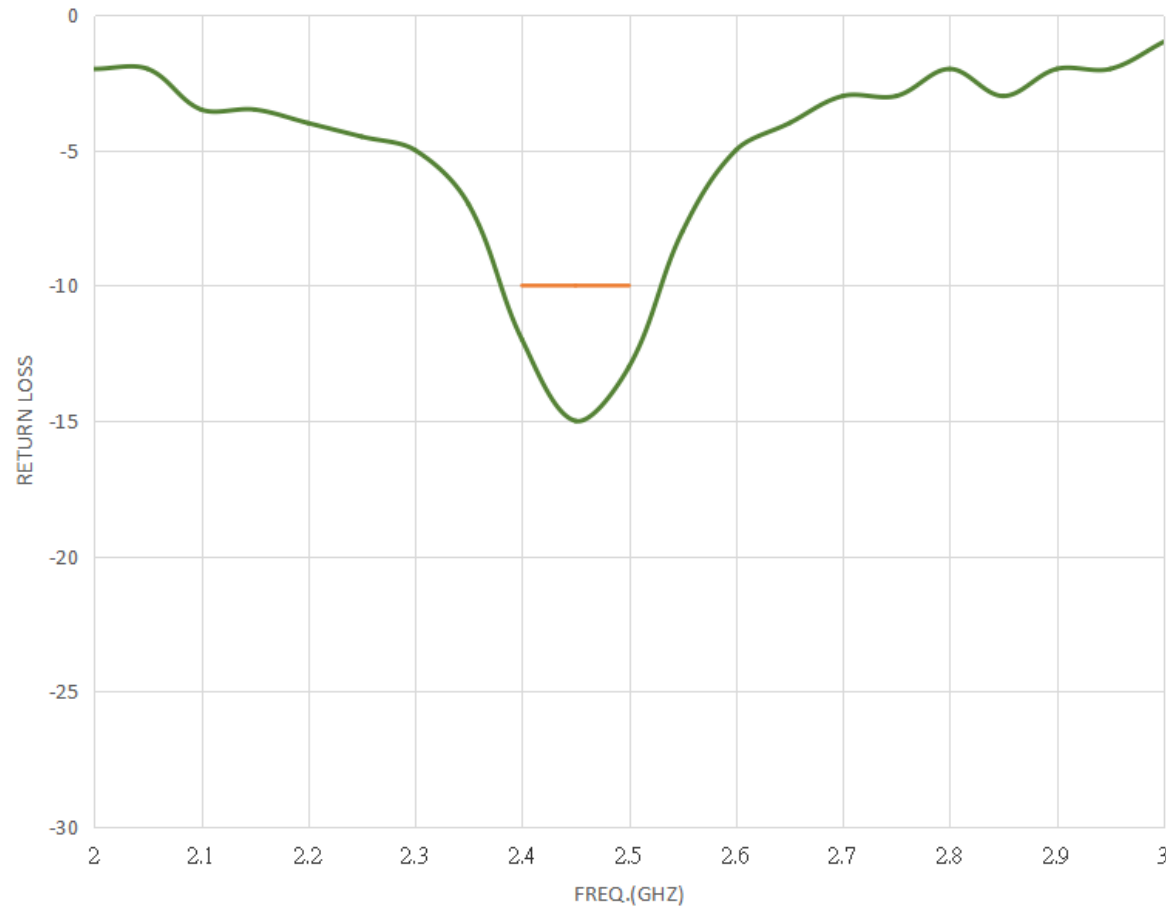
Return Loss – Ant 3 GPS



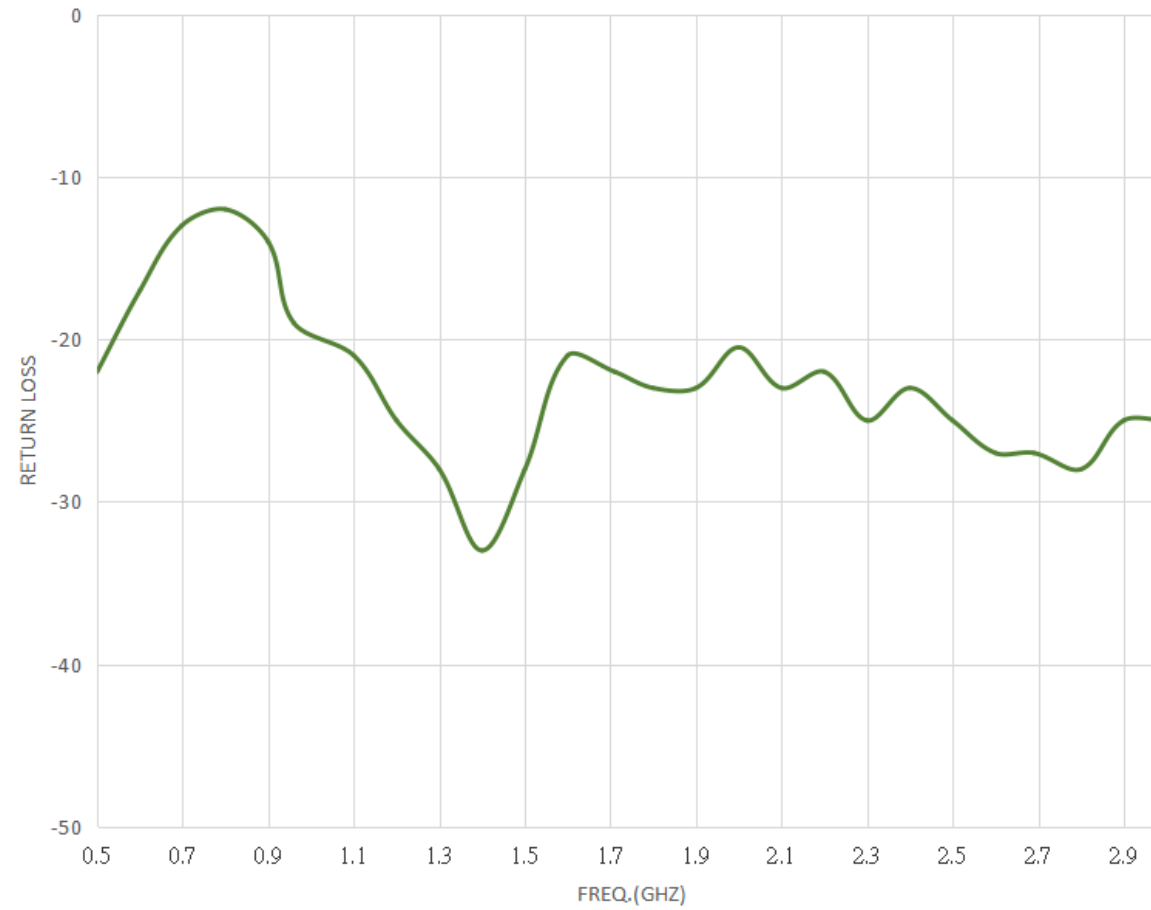
Matching values



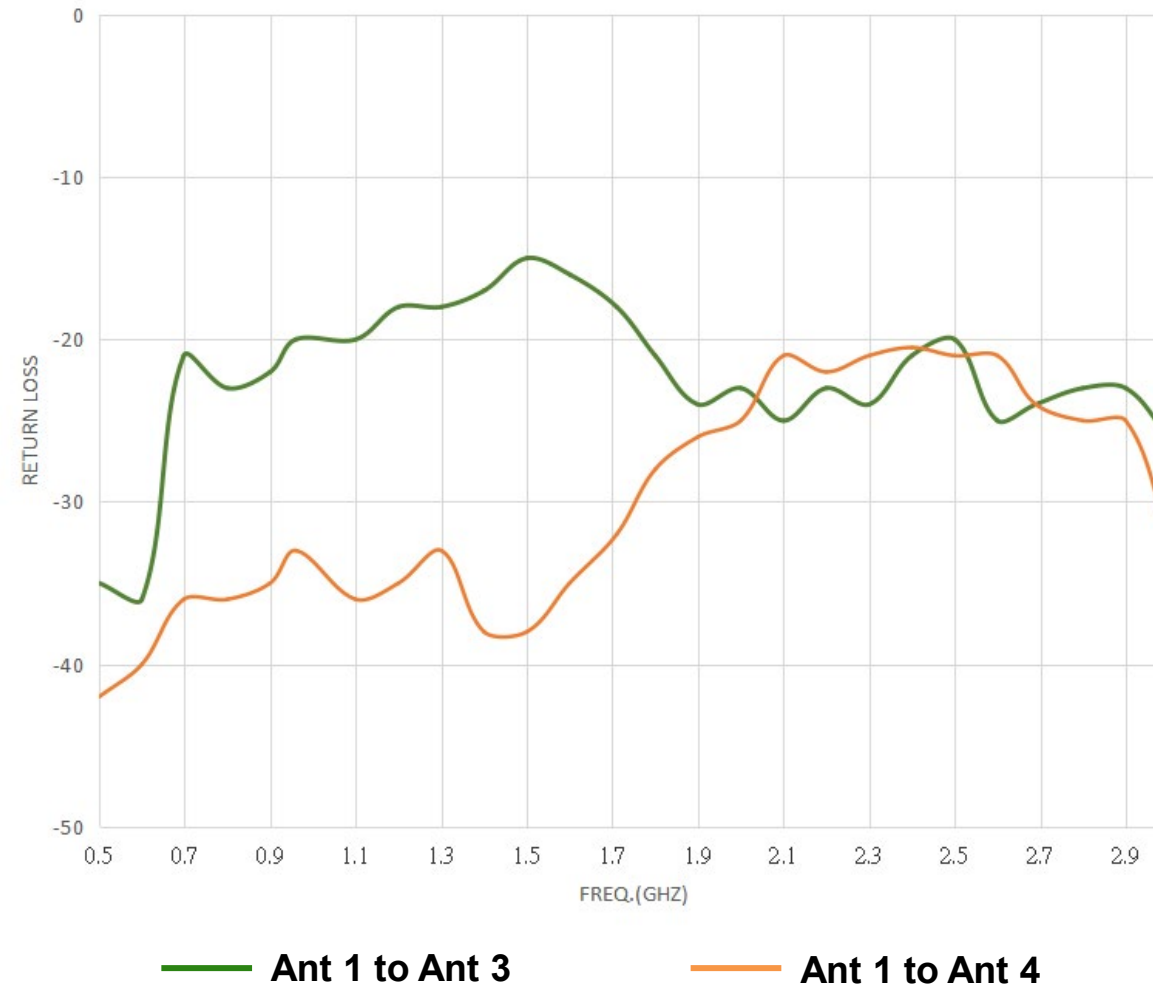
Return Loss – Ant 4 WiFi 2.4G/BT



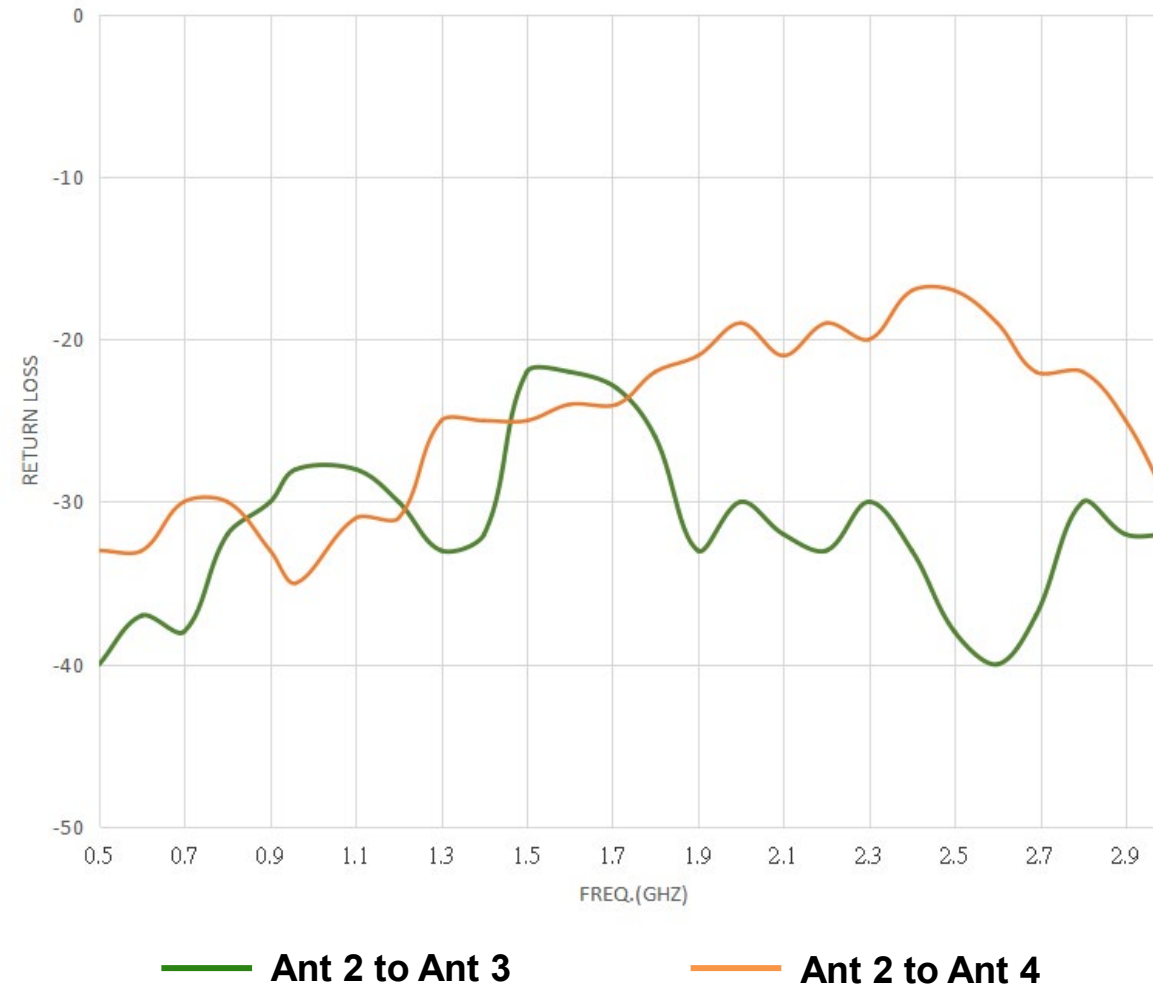
Isolation – Ant 1 & Ant 2



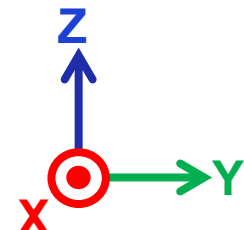
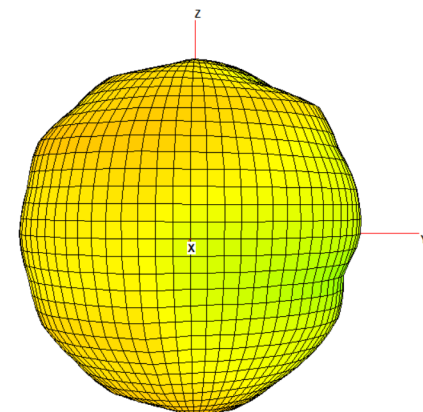
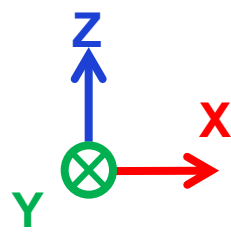
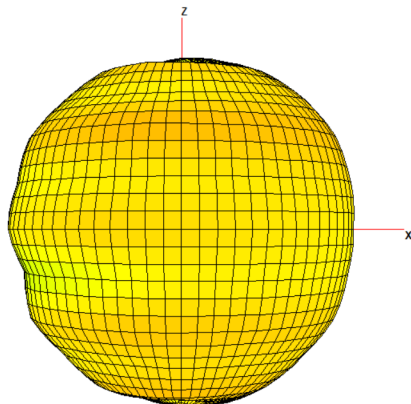
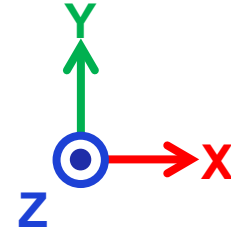
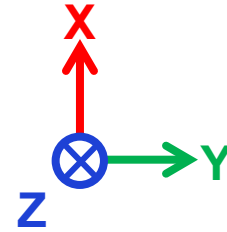
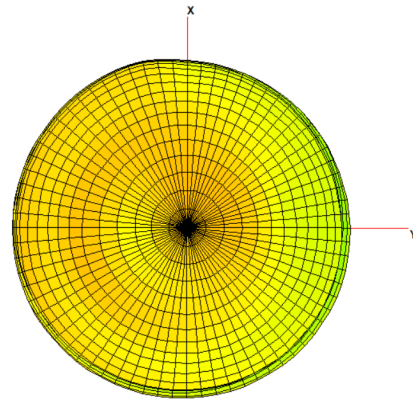
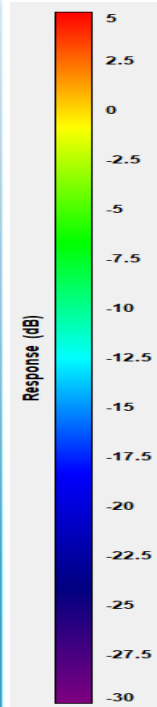
Isolation – Ant 1 & Ant 3, 4



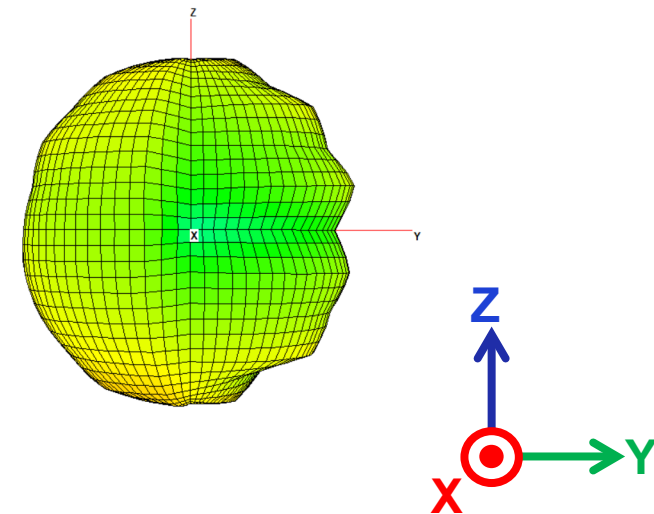
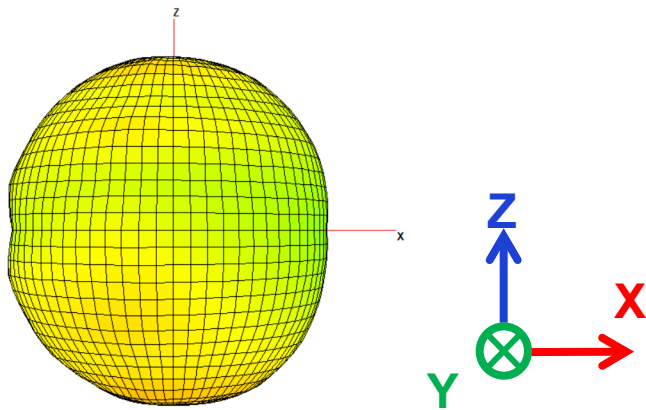
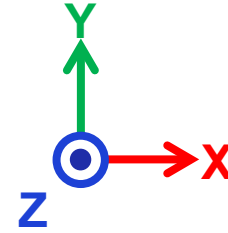
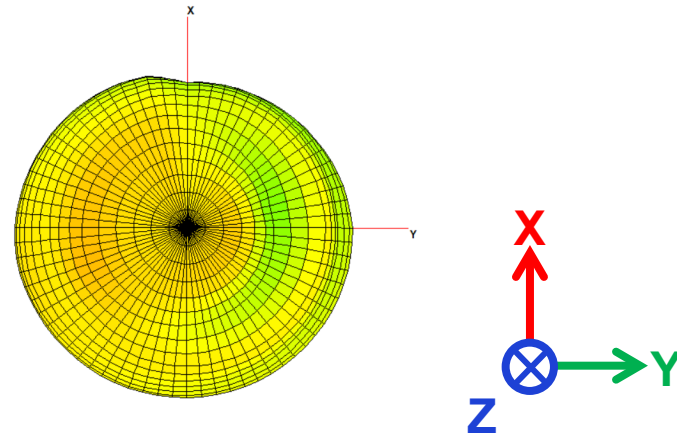
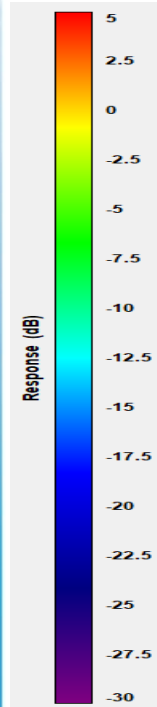
Isolation – Ant 2 & Ant 3, 4



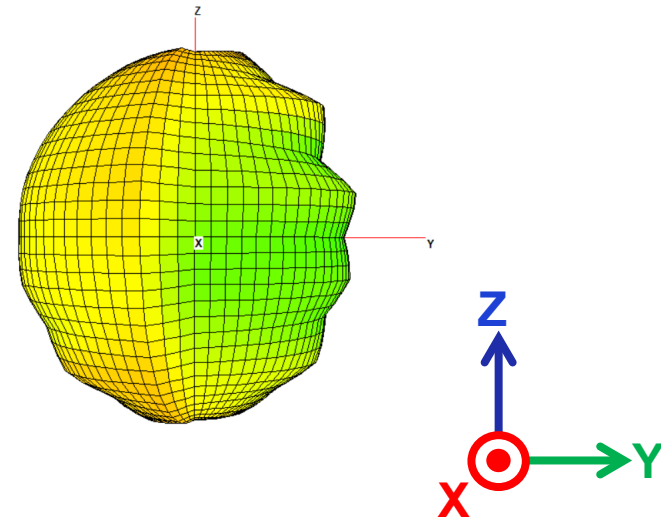
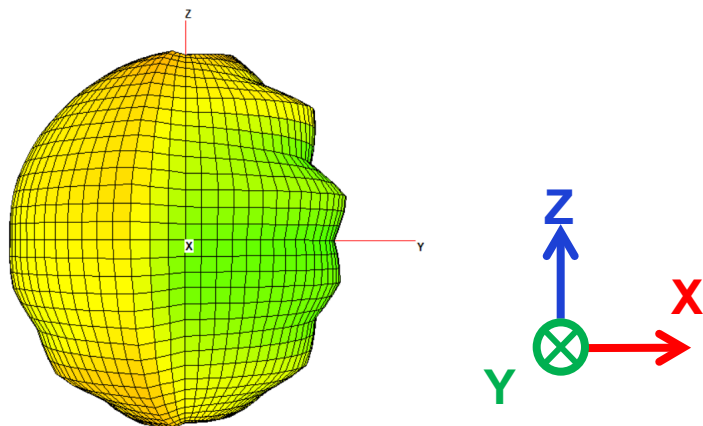
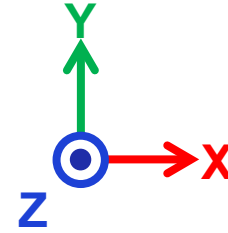
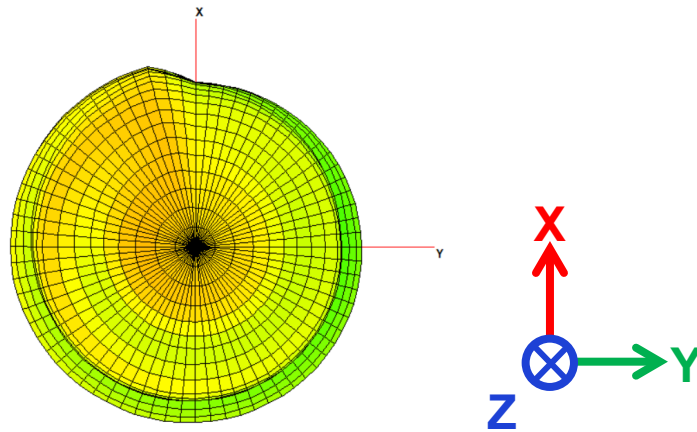
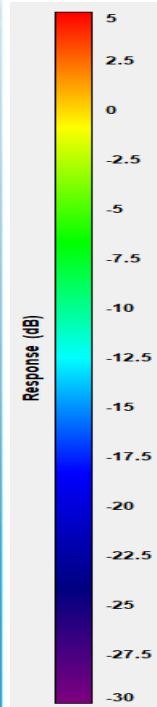
3D Radiation Pattern – Ant 1 @ B5



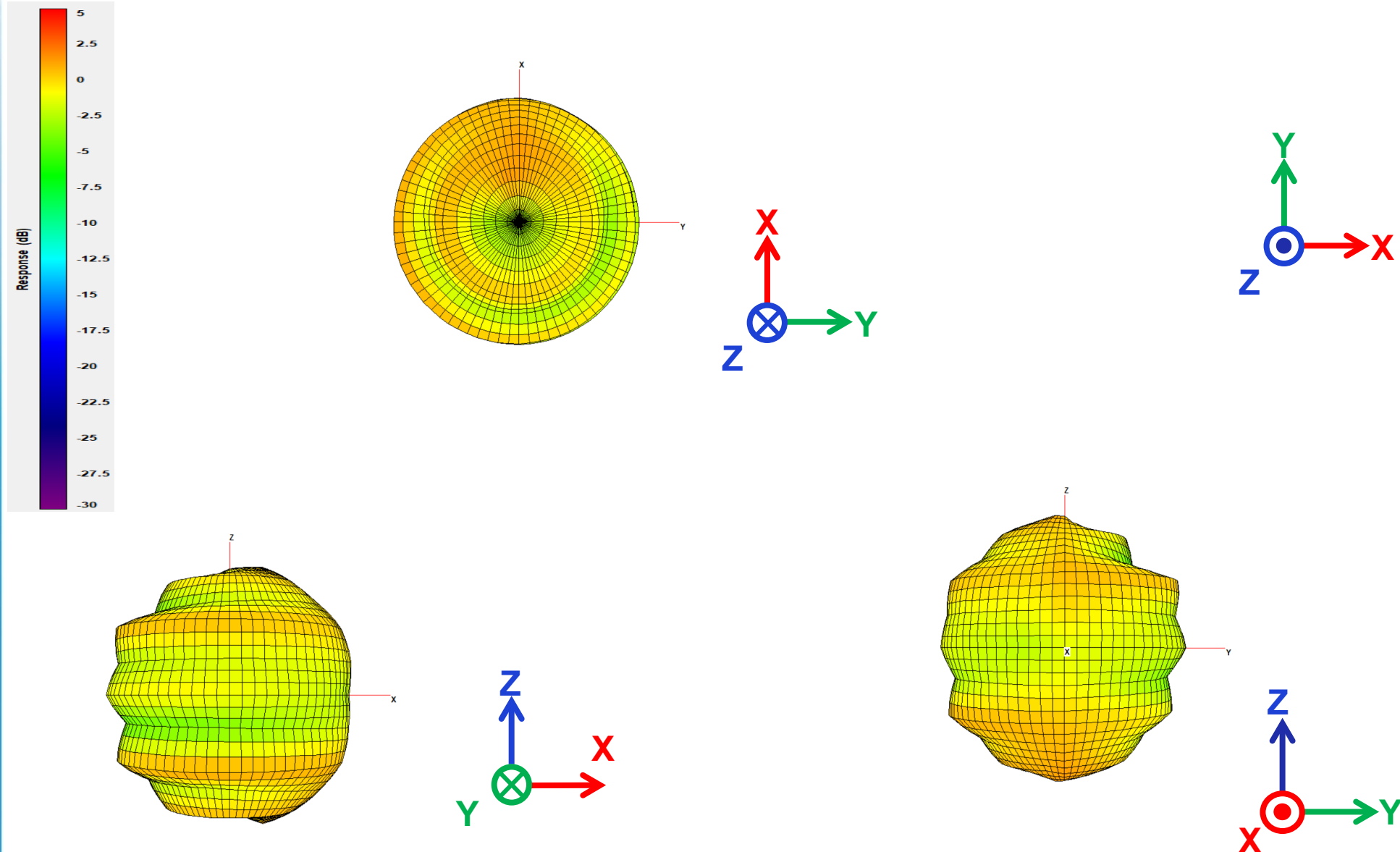
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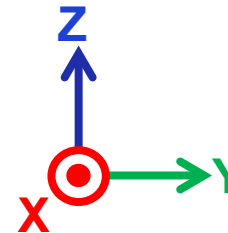
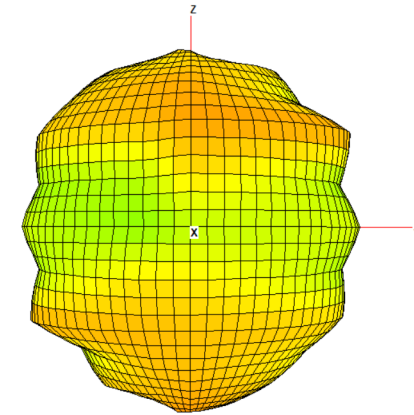
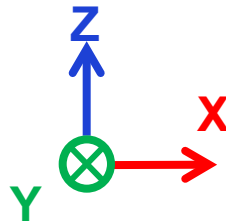
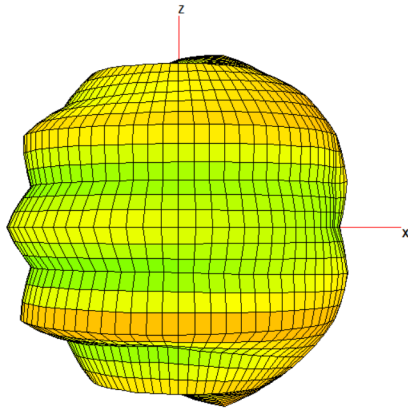
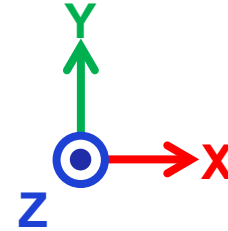
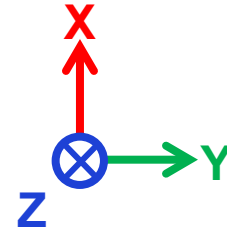
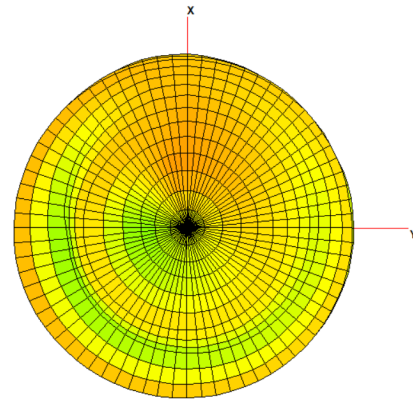
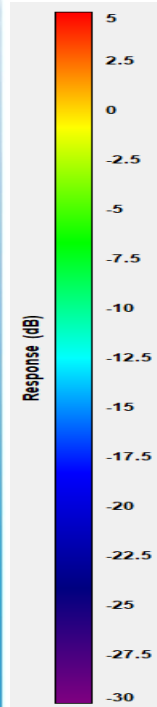
3D Radiation Pattern – Ant 1 @ B14



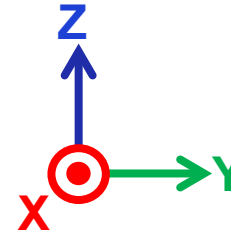
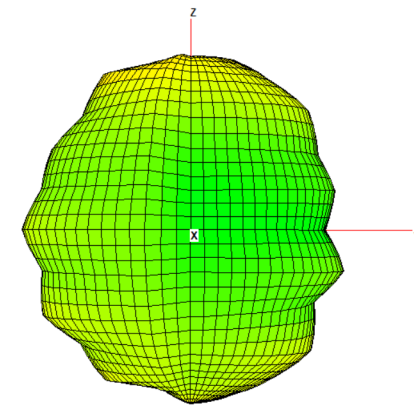
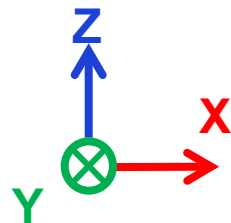
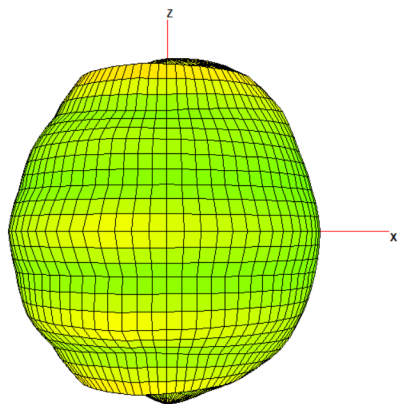
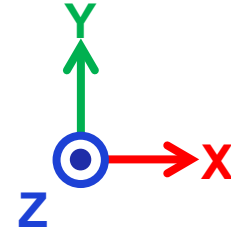
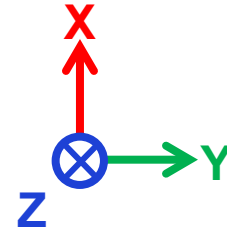
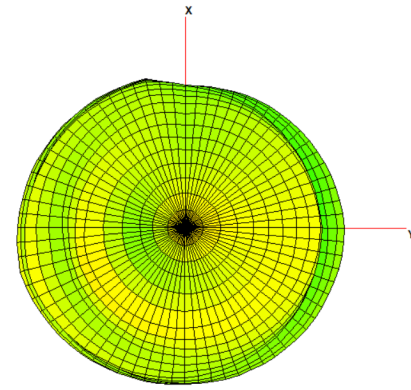
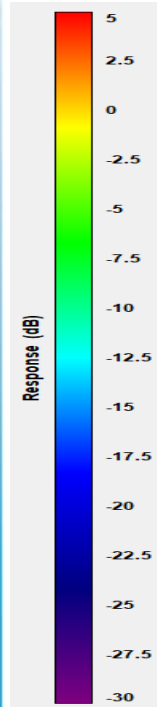
3D Radiation Pattern – Ant 1 @ B2



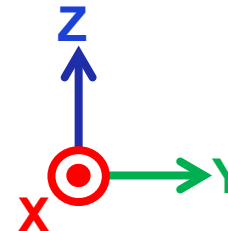
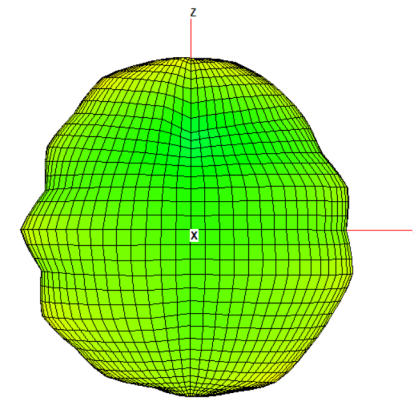
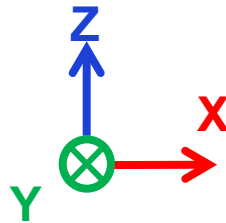
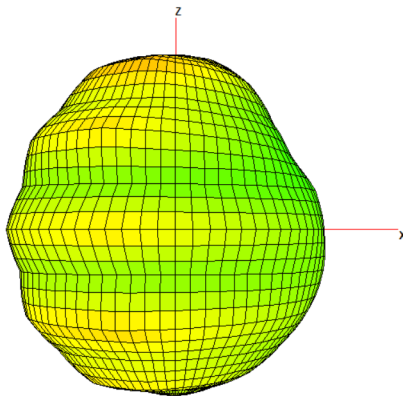
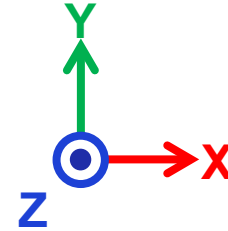
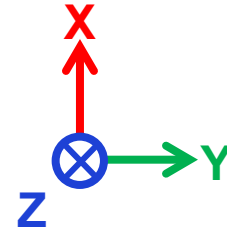
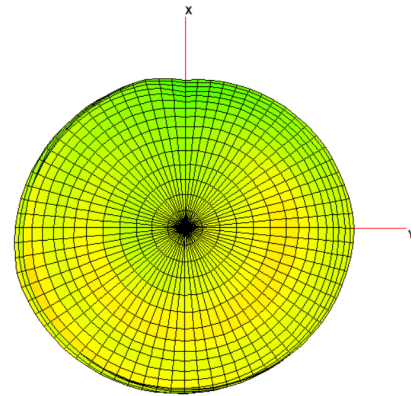
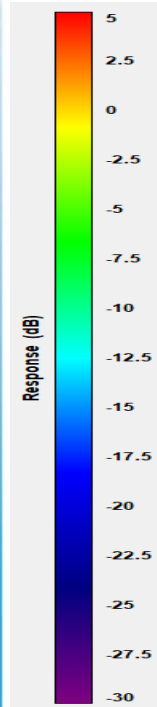
3D Radiation Pattern – Ant 1 @ B4



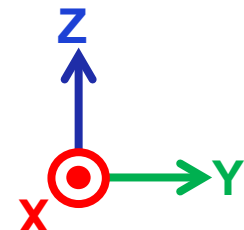
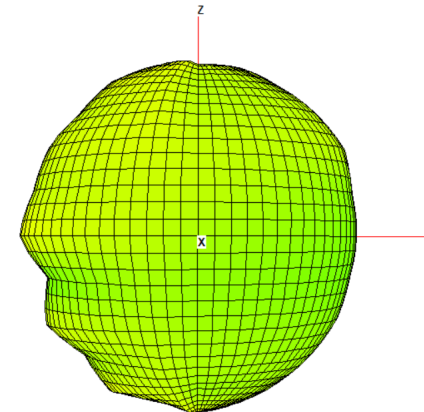
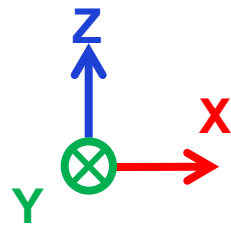
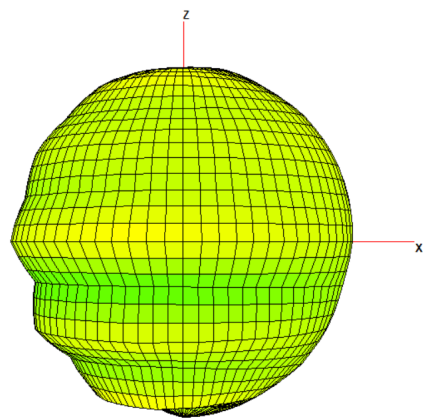
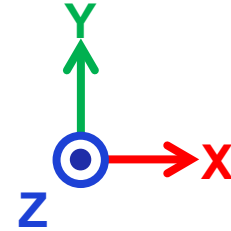
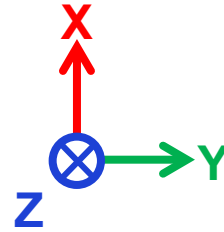
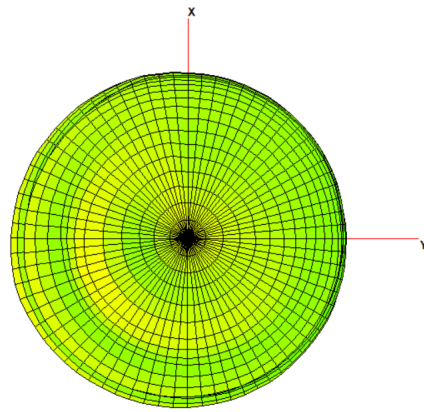
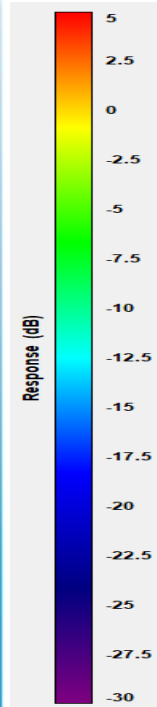
3D Radiation Pattern – Ant 2 @ B5



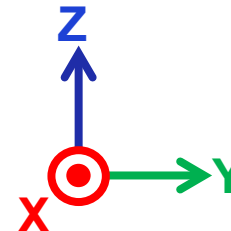
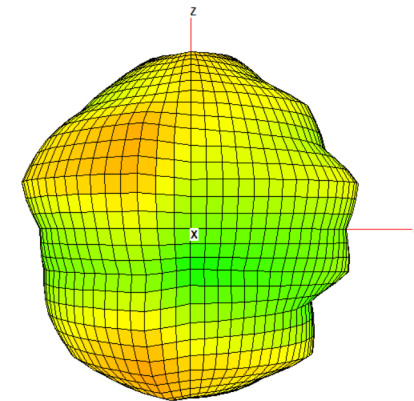
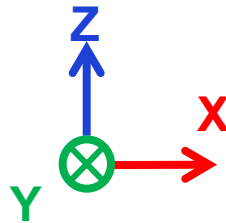
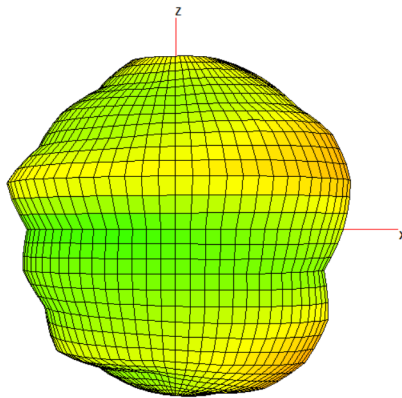
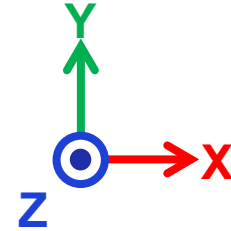
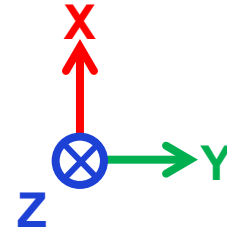
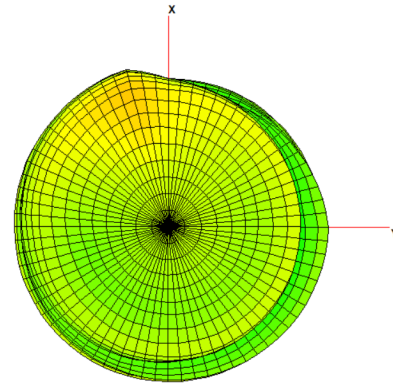
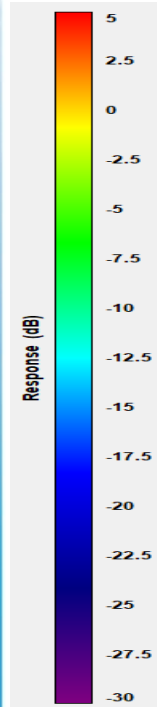
3D Radiation Pattern – Ant 2 @ B12



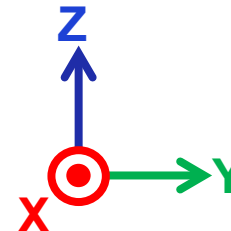
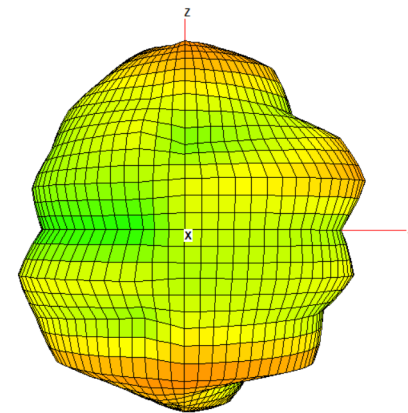
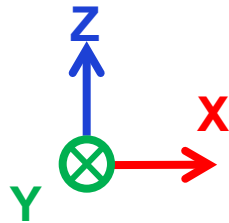
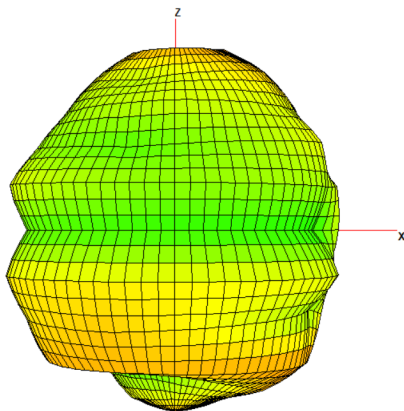
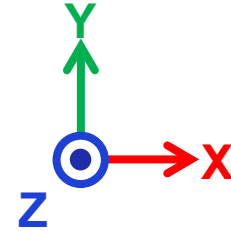
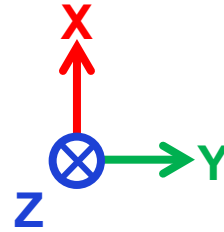
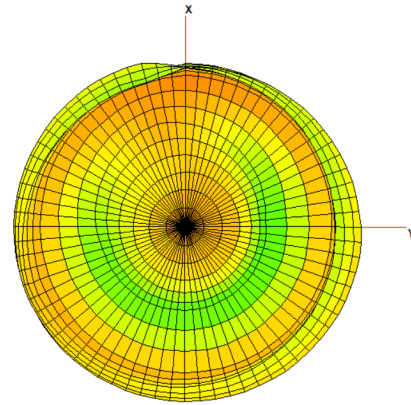
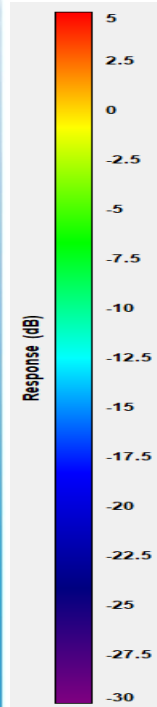
3D Radiation Pattern – Ant 2 @ B14



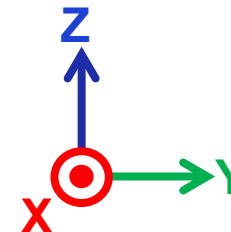
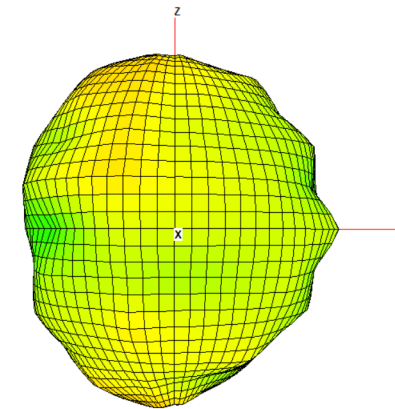
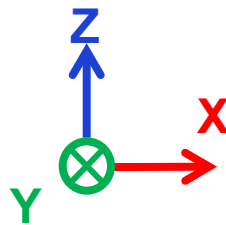
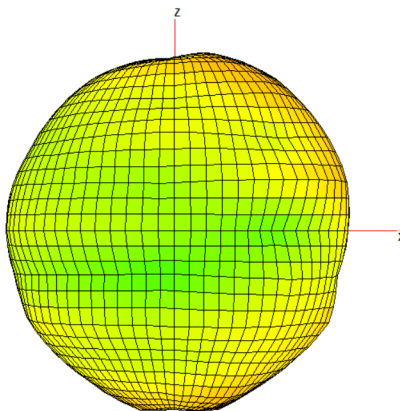
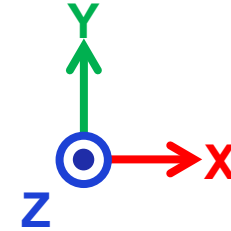
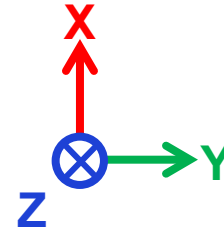
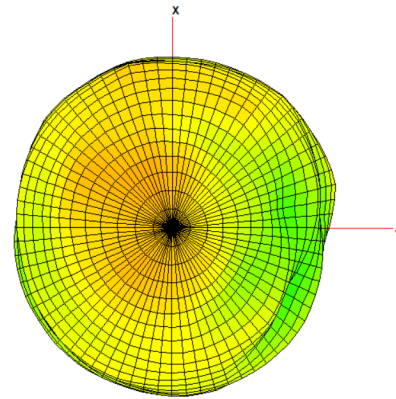
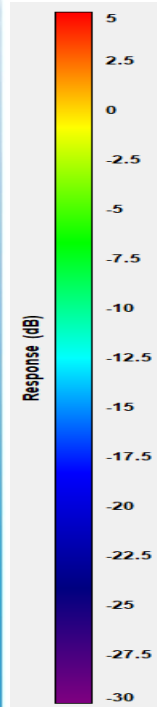
3D Radiation Pattern – Ant 2 @ B2



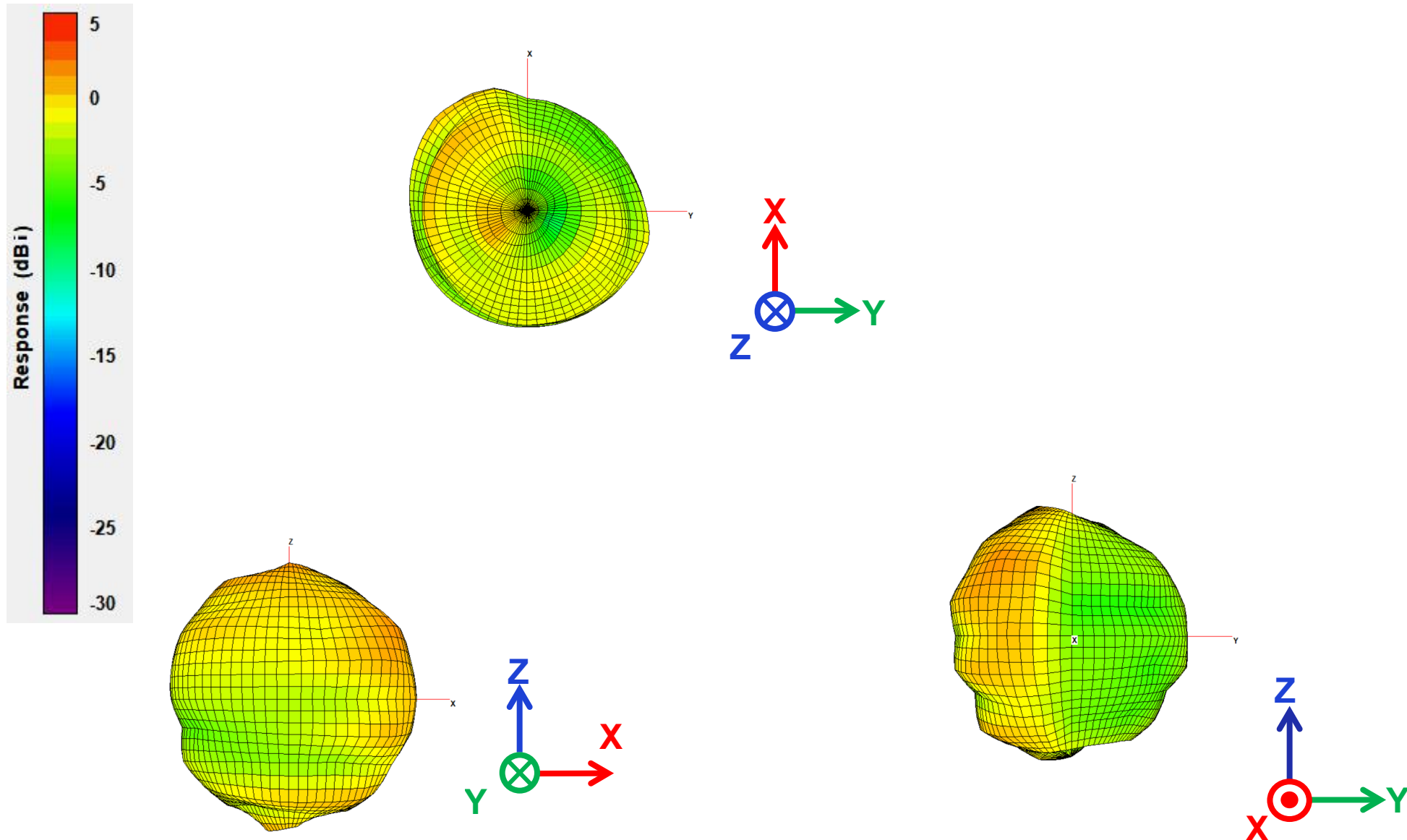
3D Radiation Pattern – Ant 2 @ B4



3D Radiation Pattern – Ant 3 @ 1.575G



3D Radiation Pattern – Ant 4 @ 2.4G



Peak Gain & Efficiency

Ant 1 LTE Main

Frequency (MHz)	B5	B12	B14	B2	B4
Peak Gain (dBi)	TX : 1.2 RX : 1.5	TX : 0.9 RX : 1.1	TX : 1.5 RX : 1.3	TX : 1.5 RX : 2.1	TX : 1.6 RX : 2.4
Efficiency (%)	49 ~ 53	48 ~ 52	47 ~ 54	57 ~ 66	56 ~ 67

Ant 2 LTE Div.

Frequency (MHz)	B5	B12	B14	B2	B4
Peak Gain (dBi)	RX : 0.3	RX : -0.1	RX : 0.3	RX : 1.7	RX : 2.2
Efficiency (%)	37 ~ 41	35 ~ 37	35 ~ 38	55 ~ 59	56 ~ 61

Ant 3 GPS

Frequency (MHz)	GPS
Peak Gain (dBi)	2.1
Efficiency (%)	61 ~ 65

Ant 4 WiFi 2.4G/BT

Frequency (MHz)	WiFi 2.4G/BT
Peak Gain (dBi)	2.4
Efficiency (%)	63 ~ 66

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