



**MEASUREMENTS OF SHURE
MXWAPX ANTENNAS FOR
REGULATORY APPROVAL**

1.9GHZ ANTENNAS

2.4GHZ BLUETOOTH ANTENNA



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Overview and Reference Angles

1.1 DUT Overview

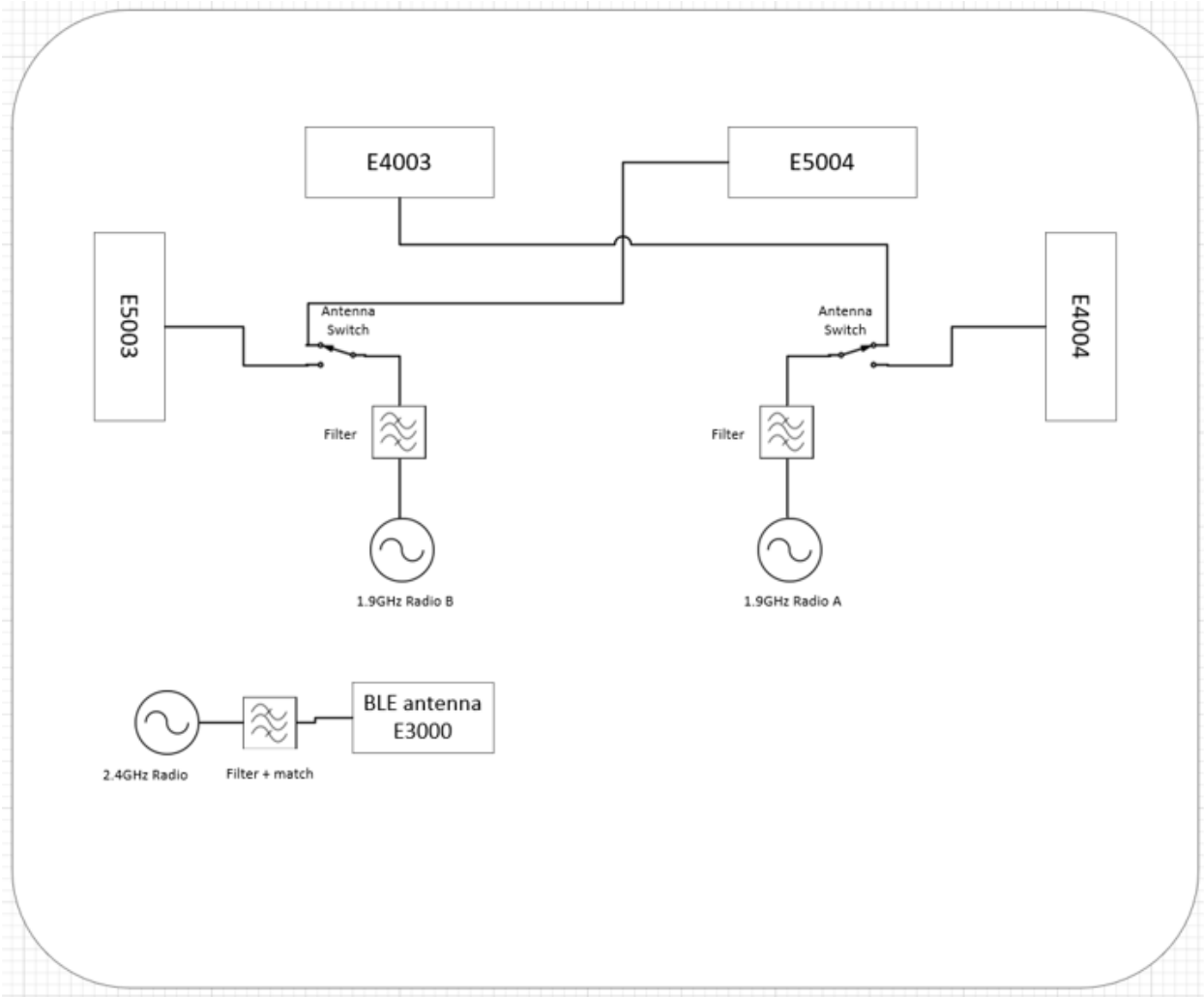


Figure 1-1. Shure MXWAPX Internal Antennas Block Diagram

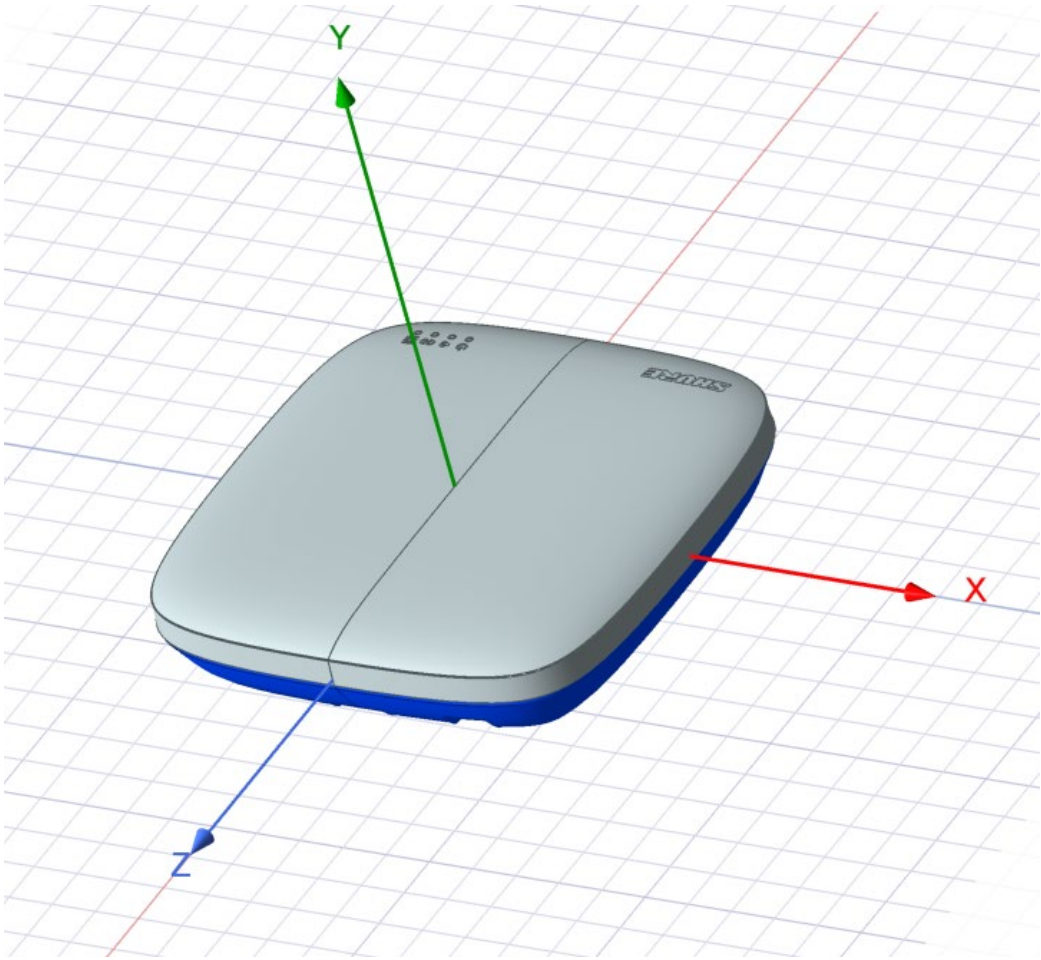


Figure 1-2. MXWAPX Reference Angles



1.2 Test Setup Photos

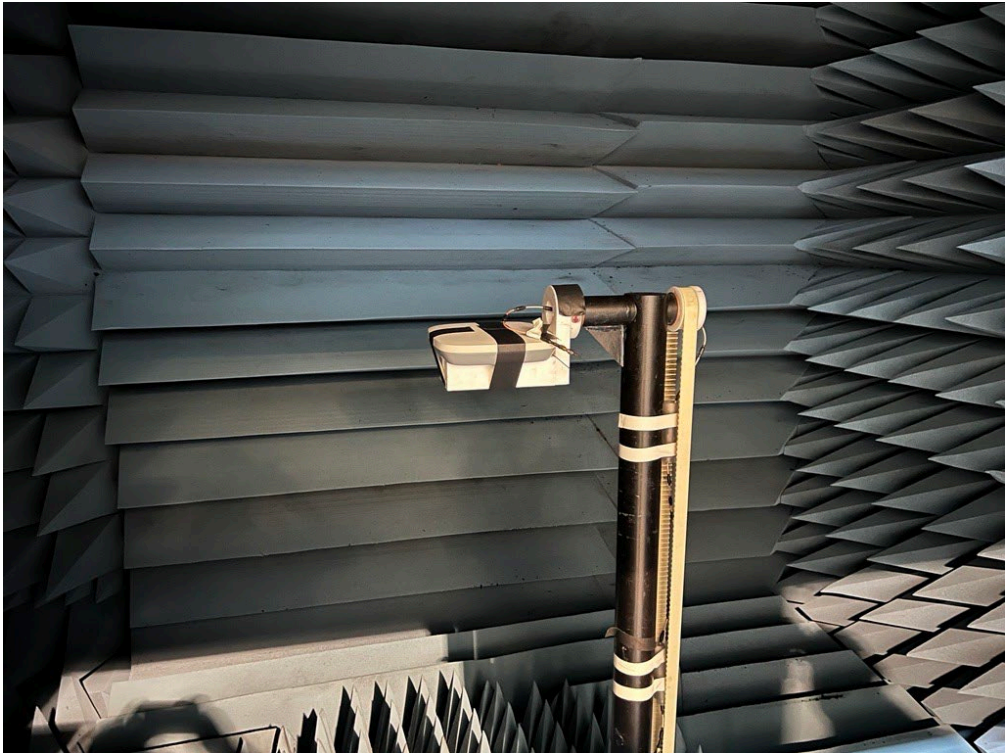


Figure 1-3. Photo 1 of Shure MXWAPX in antenna chamber

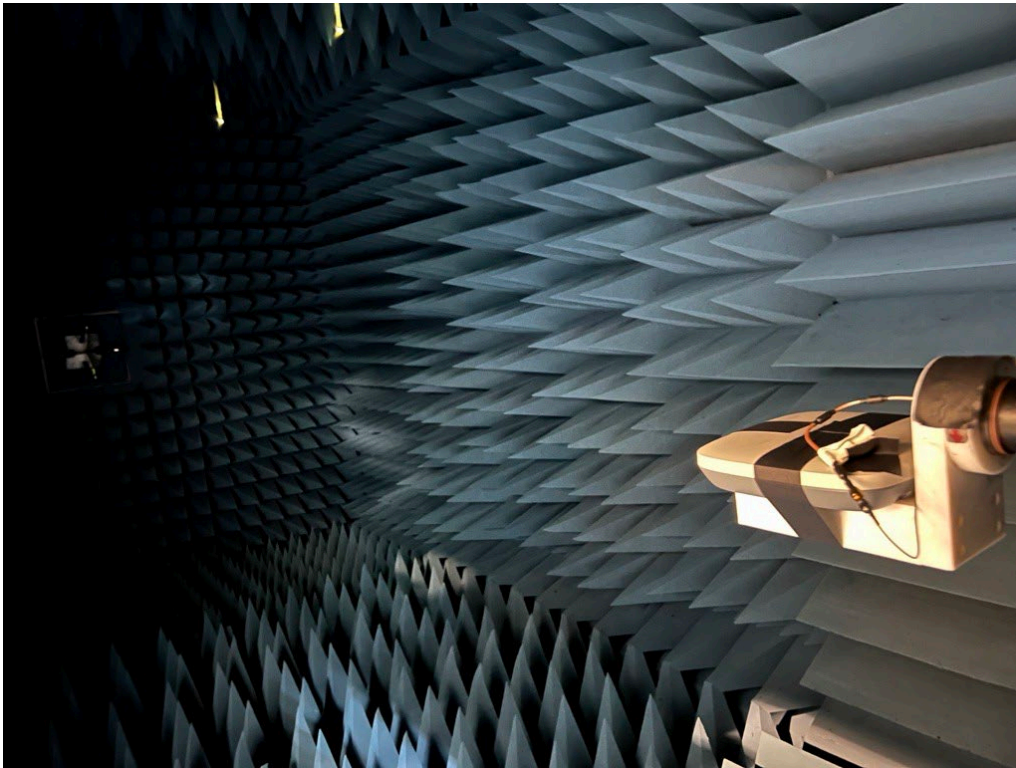


Figure 1-4. Photo 2 of Shure MXWAPX in antenna chamber

1.3 Supporting Equipment List

- E5071C ENA series Vector Network Analyzer 100kHz-8.5GHz
- ets model 2090 multi device controller
- ets lindgren model 3164-10 3164-10 Open Boundary Quad-Ridged Horn 400MHz-10GHz
- ets lindgren model no 3126-1920 precision sleeve dipole 1728-2112MHz
- ets lindgren model no 3126-2450 precision sleeve dipole 2205-2695MHz
- EMQuest Data Acquisition and Analysis Software v1.12



2. 1.9GHz Antenna E4003

Antenna Type – Internal Shure Custom PIFA

Peak Gain					
Parameter	Type	Pattern	1880 MHz	1905 MHz	1930 MHz
Antenna E4003	Internal Shure Custom	Hemisphere	4.57 dBi	4.28 dBi	3.64 dBi
Antenna Manufacturer: Shure Incorporated			Antenna Model: 53A45384		

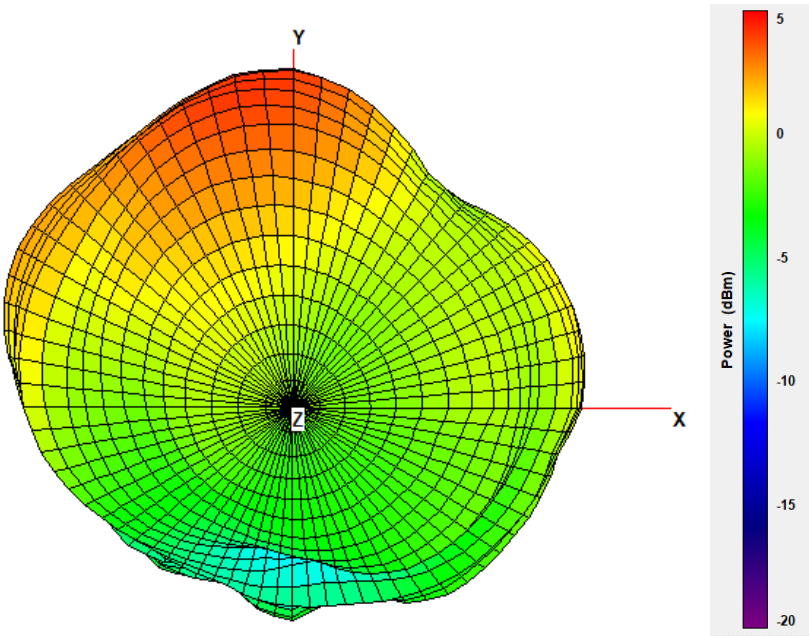


Figure 2-1. 1.9GHz Antenna E4003 X-Z Plane.

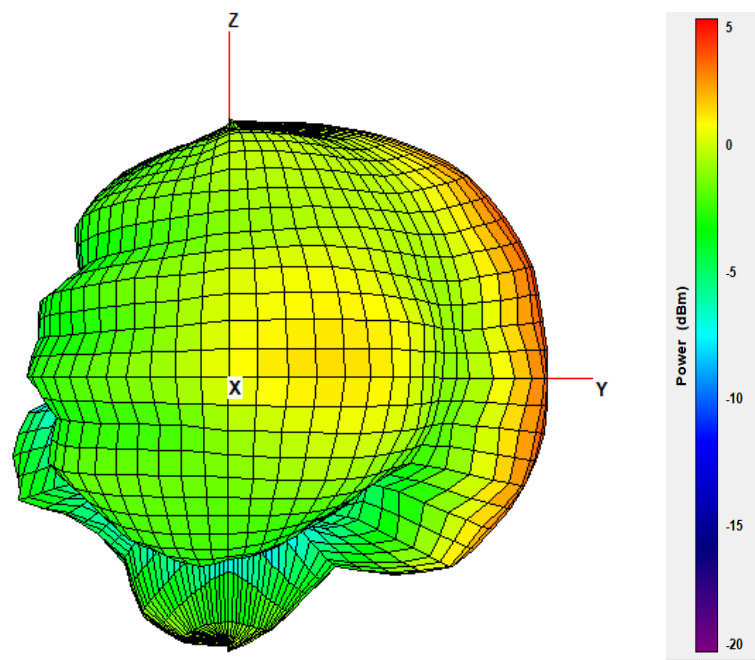


Figure 2-2. 1.9GHz Antenna E4003 Y-Z Plane

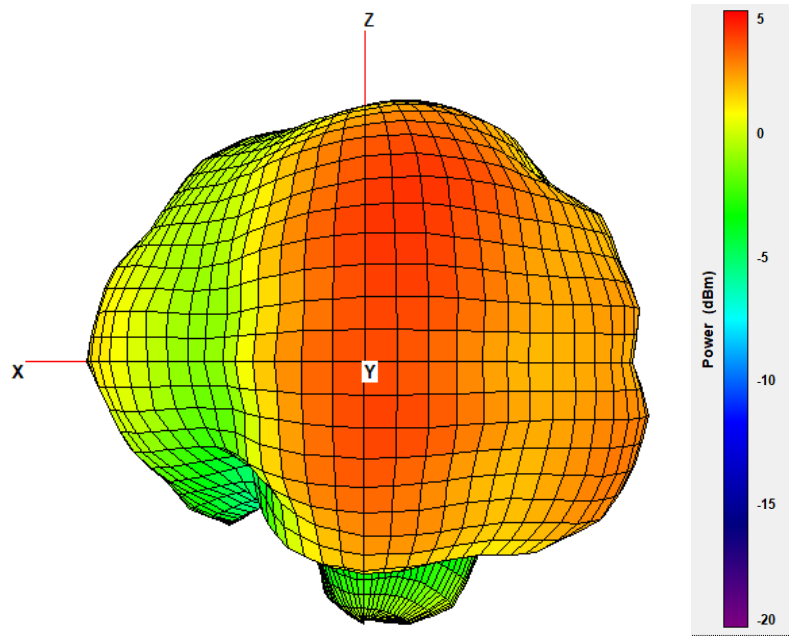


Figure 2-3. 1.9GHz Antenna E4003 X-Z plane

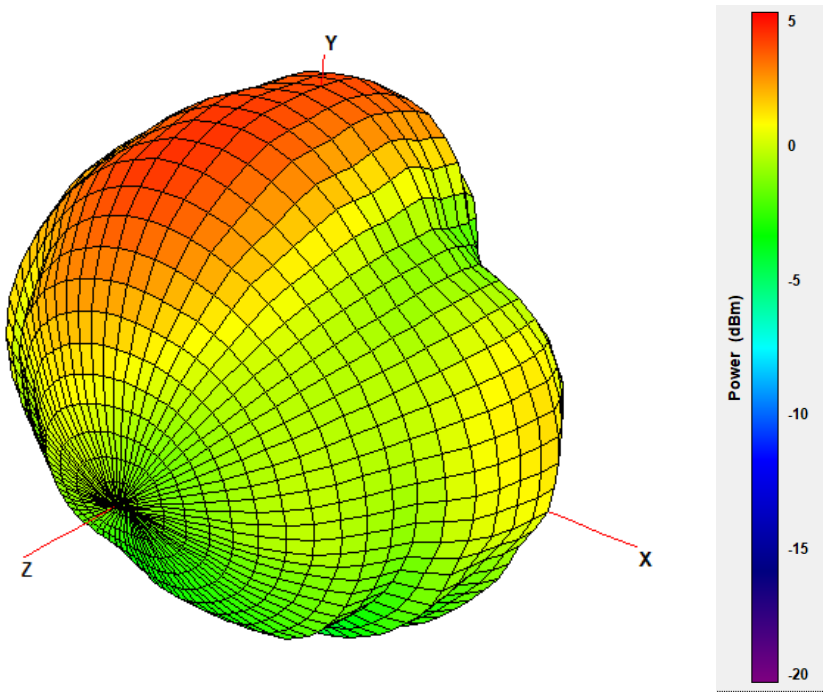


Figure 2-4. 1.9GHz Antenna E4003 3D



3. 1.9GHz Antenna E4004

Antenna Type – Internal Shure Custom PIFA

Peak Gain					
Parameter	Type	Pattern	1880 MHz	1905 MHz	1930 MHz
Antenna E4004	Internal Shure Custom	Hemisphere	3.14 dBi	3.01 dBi	3.13 dBi
Antenna Manufacturer: Shure Incorporated			Antenna Model: 53A45384		

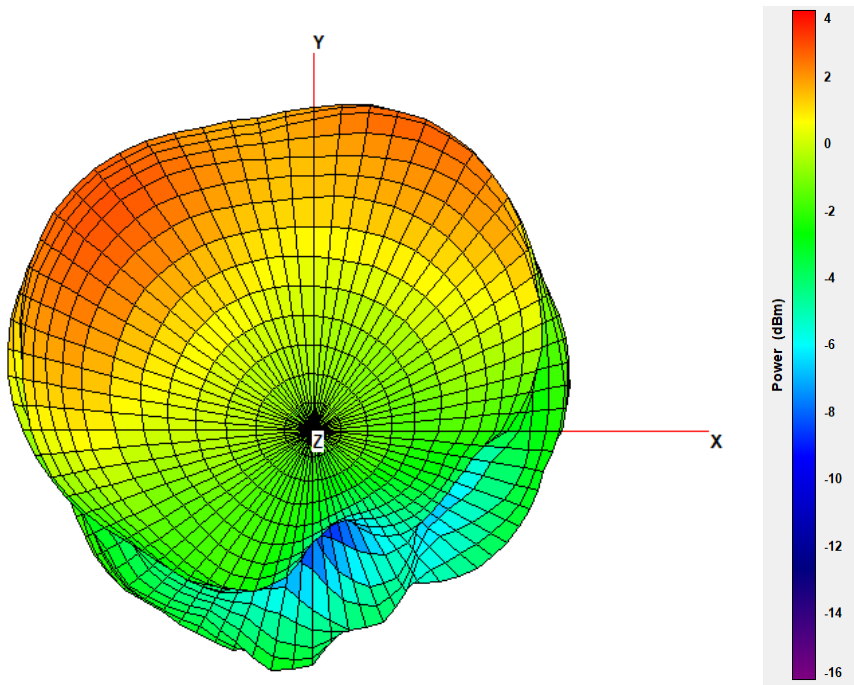


Figure 3-1. 1.9GHz Antenna E4004 X-Y Plane.

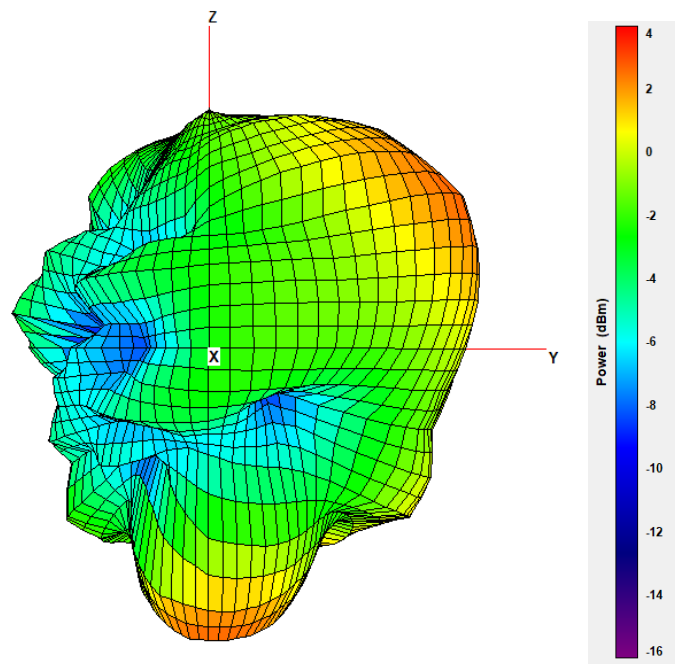


Figure 3-2. 1.9GHz Antenna E4004 Y-Z Plane.

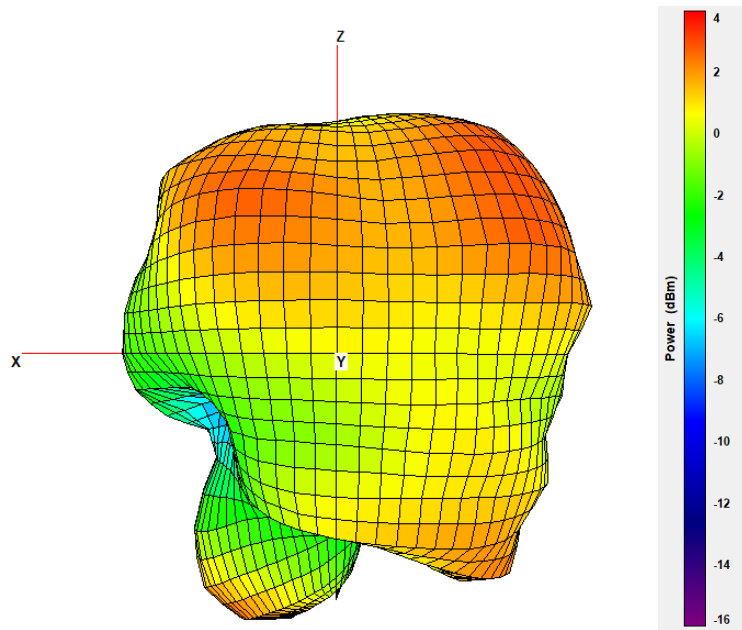


Figure 3-3. 1.9GHz Antenna E4004 X-Z Plane.

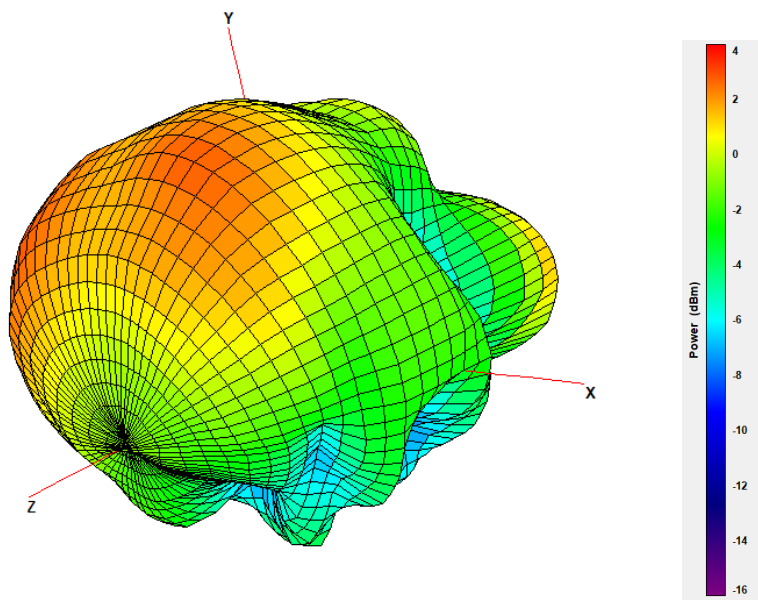


Figure 3-4. 1.9GHz Antenna E4004 3D



4. 1.9GHz Antenna E5003

Antenna Type – Internal Shure Custom PIFA

Peak Gain					
Parameter	Type	Pattern	1880 MHz	1905 MHz	1930 MHz
Antenna E5003	Internal Shure Custom	Hemisphere	3.31 dBi	3.38 dBi	3.41 dBi
Antenna Manufacturer: Shure Incorporated			Antenna Model: 53A45384		

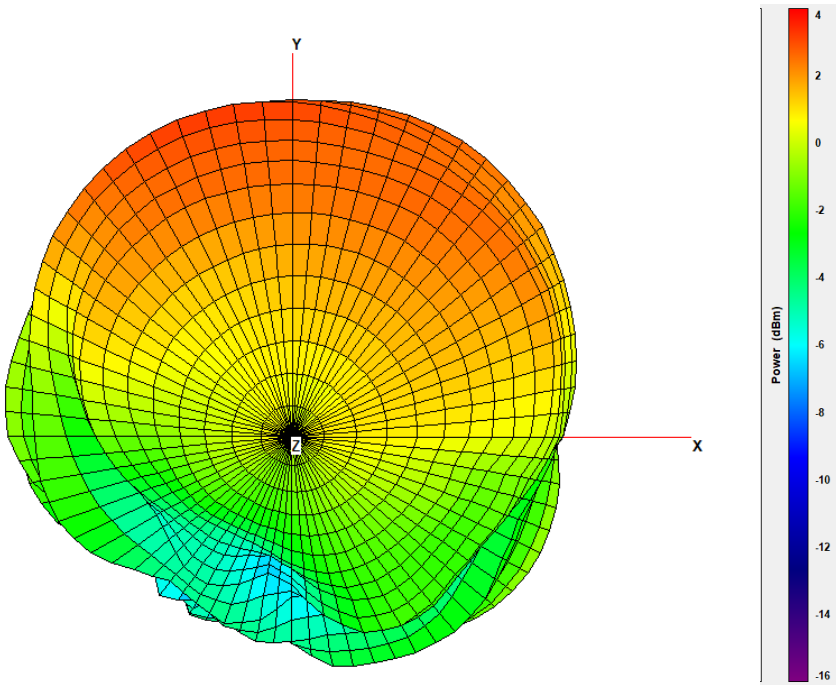


Figure 4-1. 1.9GHz Antenna E5003 X-Y Plane.

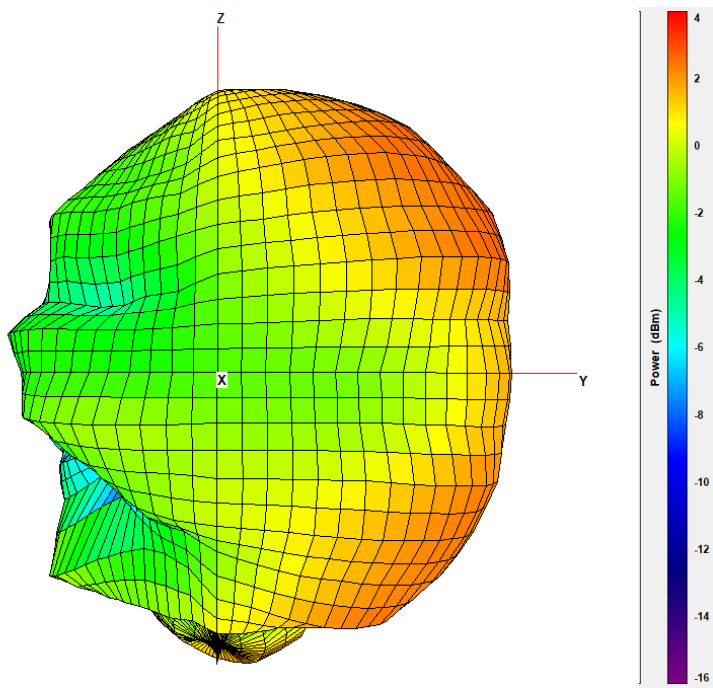


Figure 4-2. 1.9GHz Antenna E5003 Y-Z Plane.

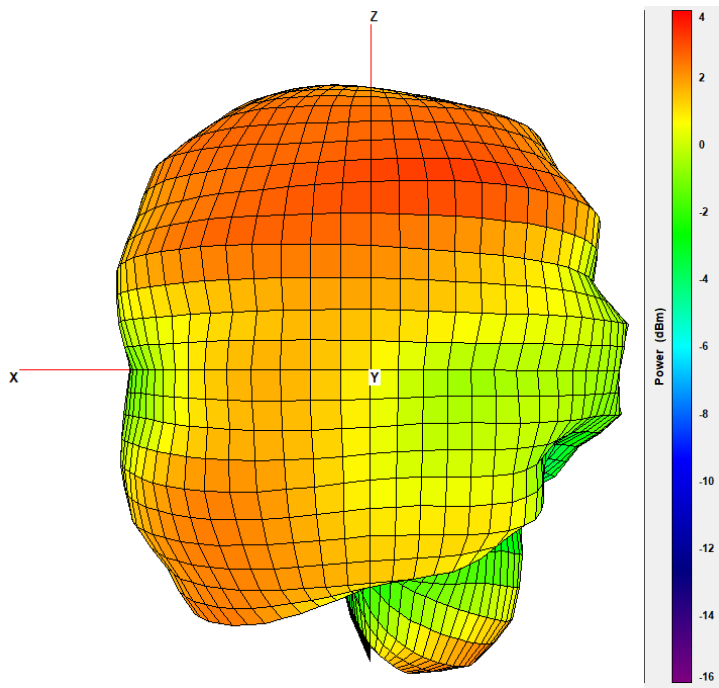


Figure 4-3. 1.9GHz Antenna E5003 X-Z Plane.

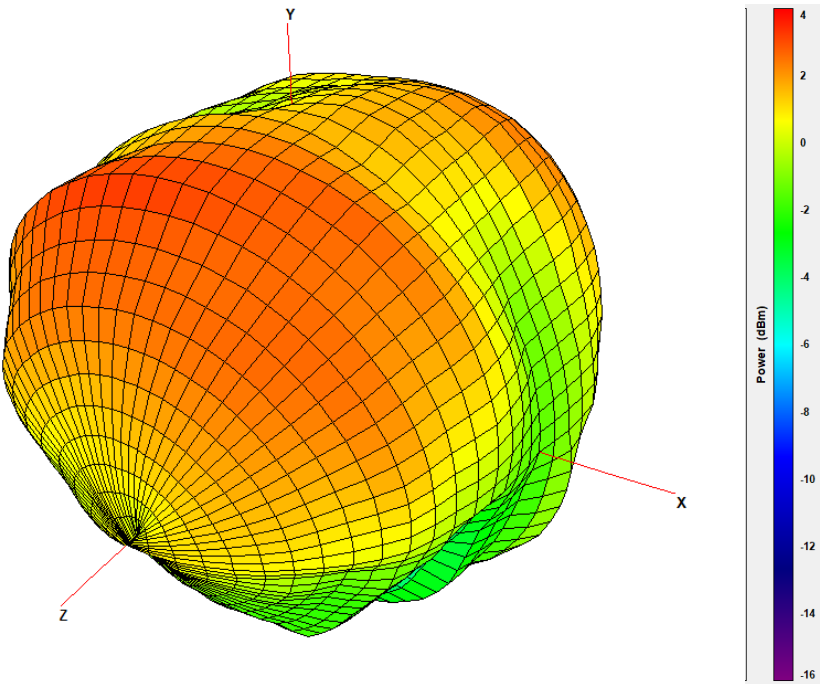


Figure 4-4. 1.9GHz Antenna E5003 3D



5. 1.9GHz Antenna E5004

Antenna Type – Internal Shure Custom PIFA

Peak Gain					
Parameter	Type	Pattern	1880 MHz	1905 MHz	1930 MHz
Antenna E5004	Internal Shure Custom	Hemisphere	4.63 dBi	4.32 dBi	3.76 dBi
Antenna Manufacturer: Shure Incorporated			Antenna Model: 53A45384		

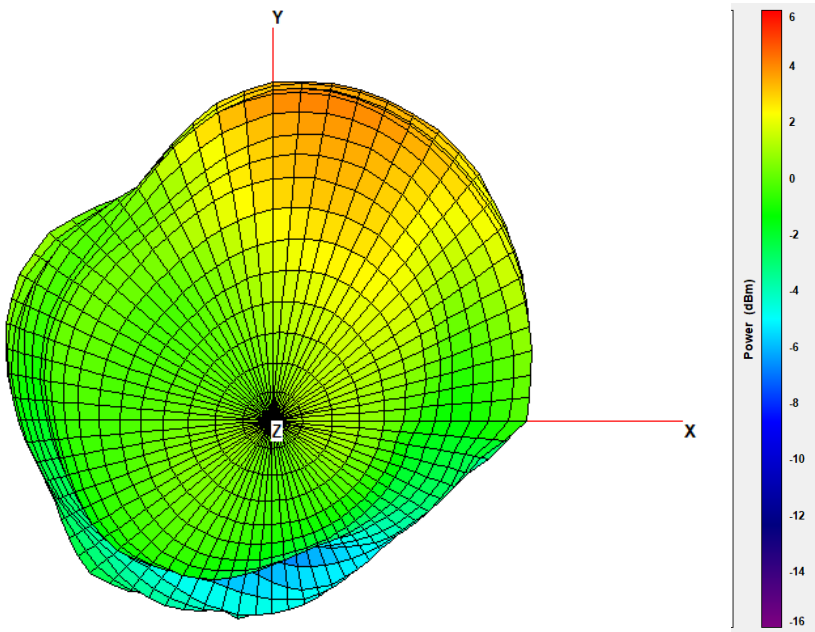


Figure 5-1. 1.9GHz Antenna E5004 X-Y Plane.

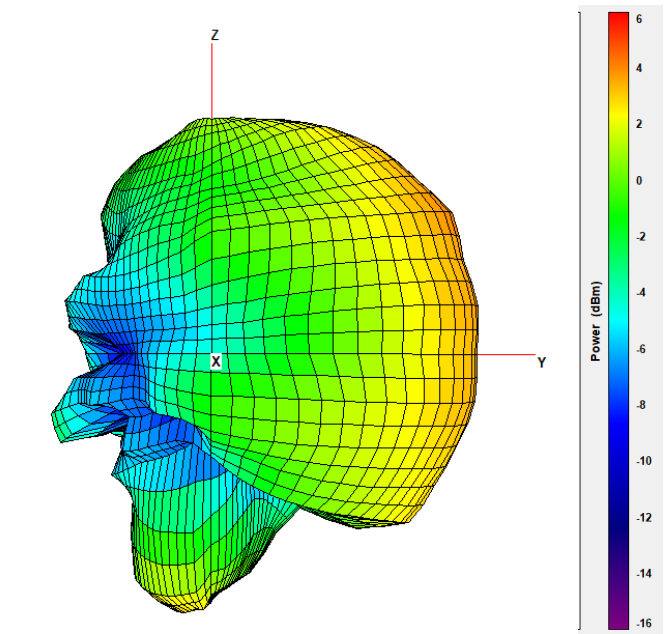


Figure 5-2. 1.9GHz Antenna E5004 Y-Z Plane.

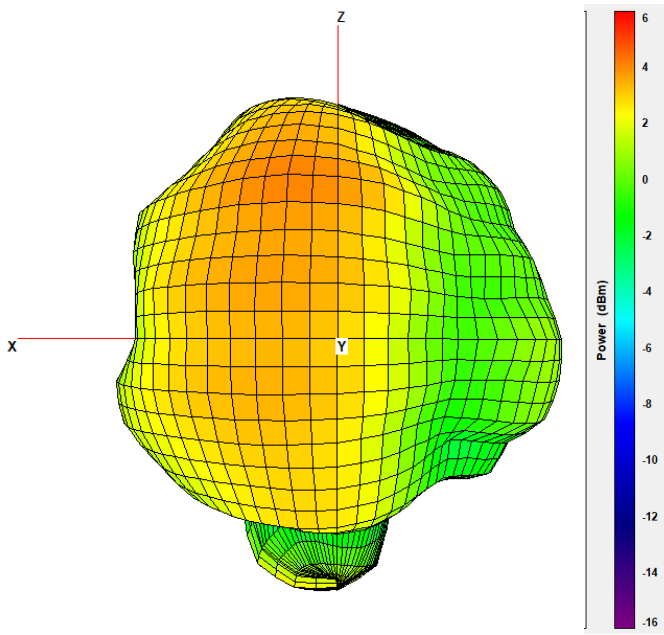


Figure 5-3. 1.9GHz Antenna E5004 X-Z Plane.

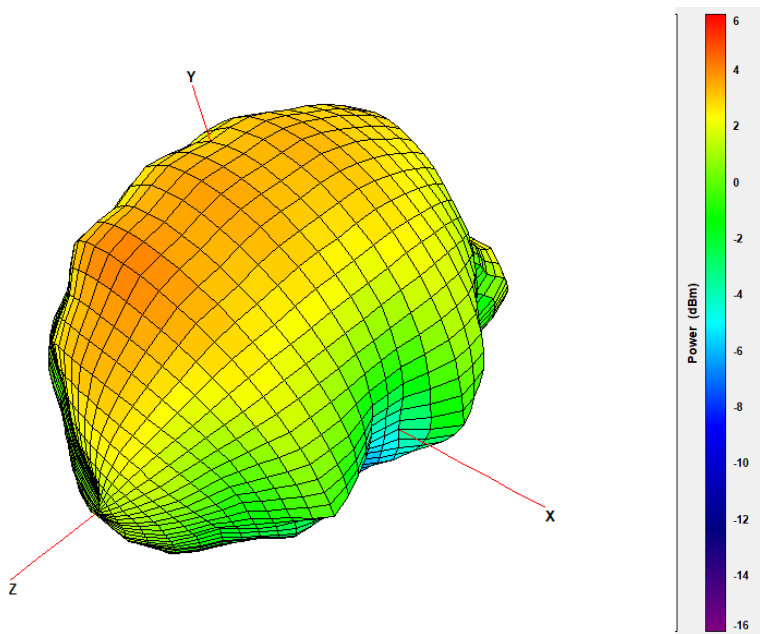


Figure 5-4. 1.9GHz Antenna E5004 3D



6. 2.4GHz Bluetooth Antenna E3000

Antenna Type – Internal Shure Custom PIFA

Peak Gain					
Parameter	Type	Pattern	2400 MHz	2442 MHz	2480 MHz
Antenna E3000	Internal Shure Custom	Hemisphere	3.39 dBi	3.24 dBi	3.36 dBi
Antenna Manufacturer: Shure Incorporated			Antenna Model: 53A25629		

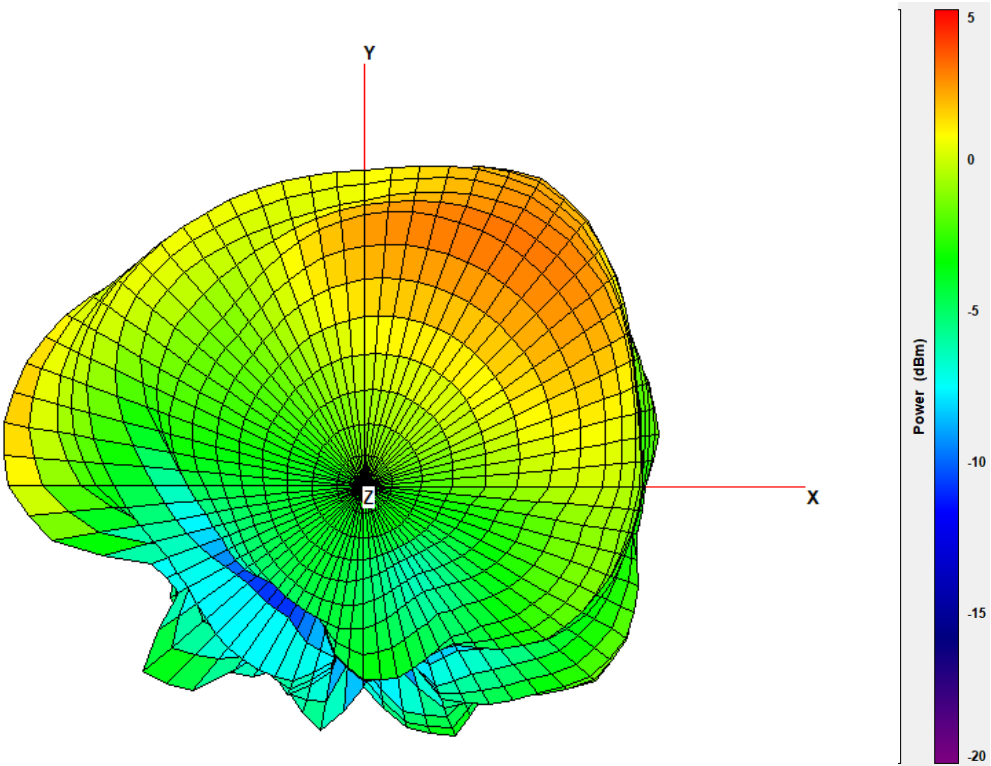


Figure 6-1. 2.4GHz Antenna E3000 X-Y plane

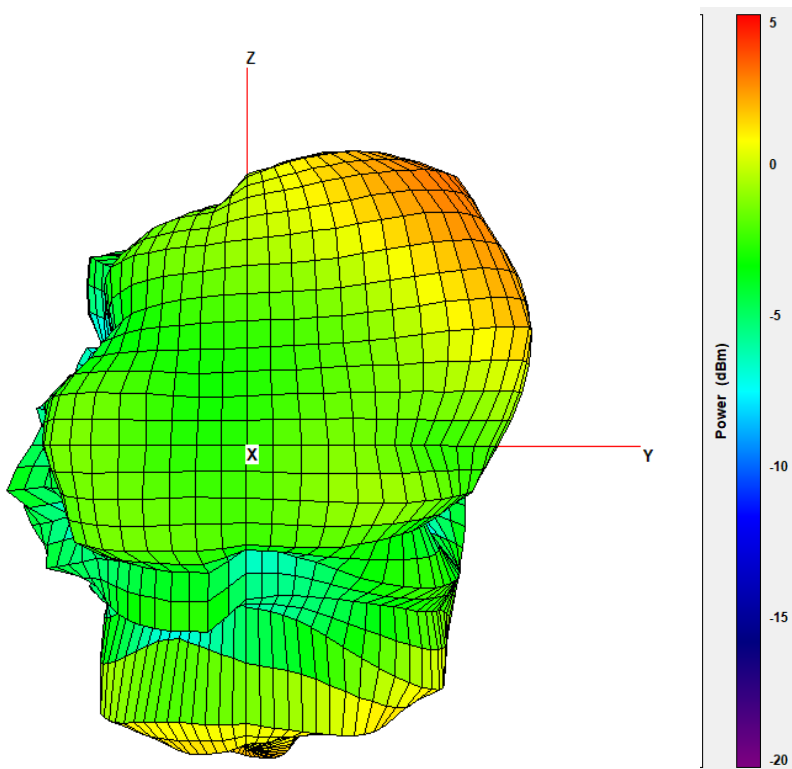


Figure 6-2. 2.4GHz Antenna E3000 Y-Z plane

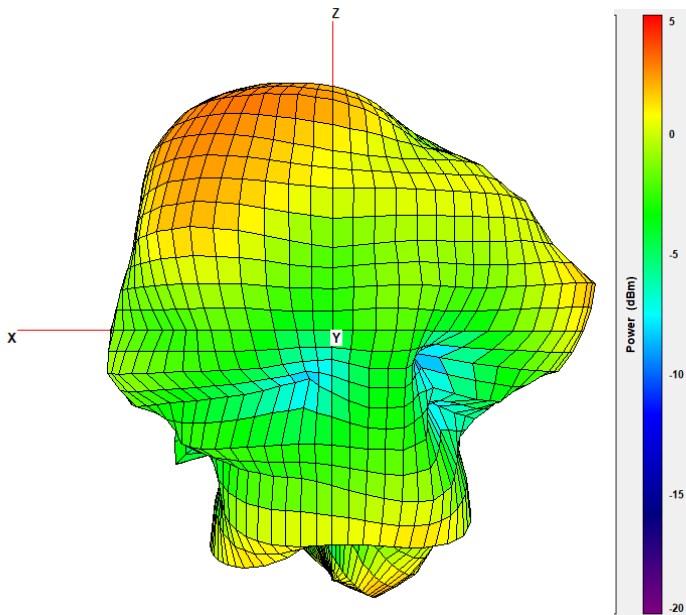


Figure 6-3. 2.4GHz Antenna E3000 X-Z plane

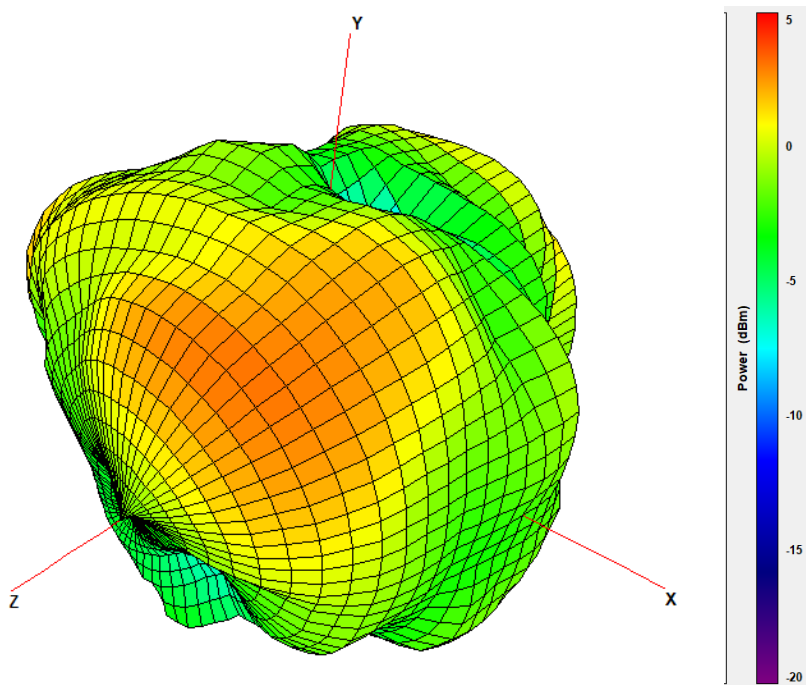


Figure 6-4. 2.4GHz Antenna E3000 3D