



APPLICATION SPECIFICATION

WIFI 6E FLEX CABLE BALANCE ANTENNA

1.0 SCOPE

This specification describes the antenna application and surrounding. The information in this document is for reference and benchmark purposes only. The user is responsible for validating antenna rf performance based on the user's actual implementation.

Antenna illustrations in this document are generic representations. They are not intended to be an image of any antenna listed in the scope.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: WIFI 6E flex cable balance antenna

Series Number: 146153

2.2 DESCRIPTION

Series 146153 is a balanced, dipole-type, high efficiency antenna for 2.4/5/6 GHz applications, including WiFi 6E, Bluetooth, Zigbee and others. This antenna is made from poly flexible material with small size 35*9*0.1mm and has double-sided adhesive tape for easy “peel and stick” mounting. This balanced antenna with ground plane independent design offers various cable length options for ease of integration into various devices.

2.3 PRODUCT STRUCTURE INFORMATION

Please refer to PS-1461530100 for full information.





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3.0 APPLICABLE DOCUMENTS

DOCUMENT	NUMBER	DESCRIPTION
Sale Drawing (SD)	SD-1461530050	Mechanical Dimension of the product
	SD-1461531050	
Product Specification (PS)	PS-1461530100	Product Specification
Packing Drawing (PK)	PK-1461530100	Product packaging specifications

4.0 ANTENNA PERFORMANCE

4.1 RF TEST CONDITIONS

All measurements are done of the antenna mounted on a PC/ABS material block of 1.5mm thickness with VNA Agilent E5071C and Over-The-Air (OTA) chamber.

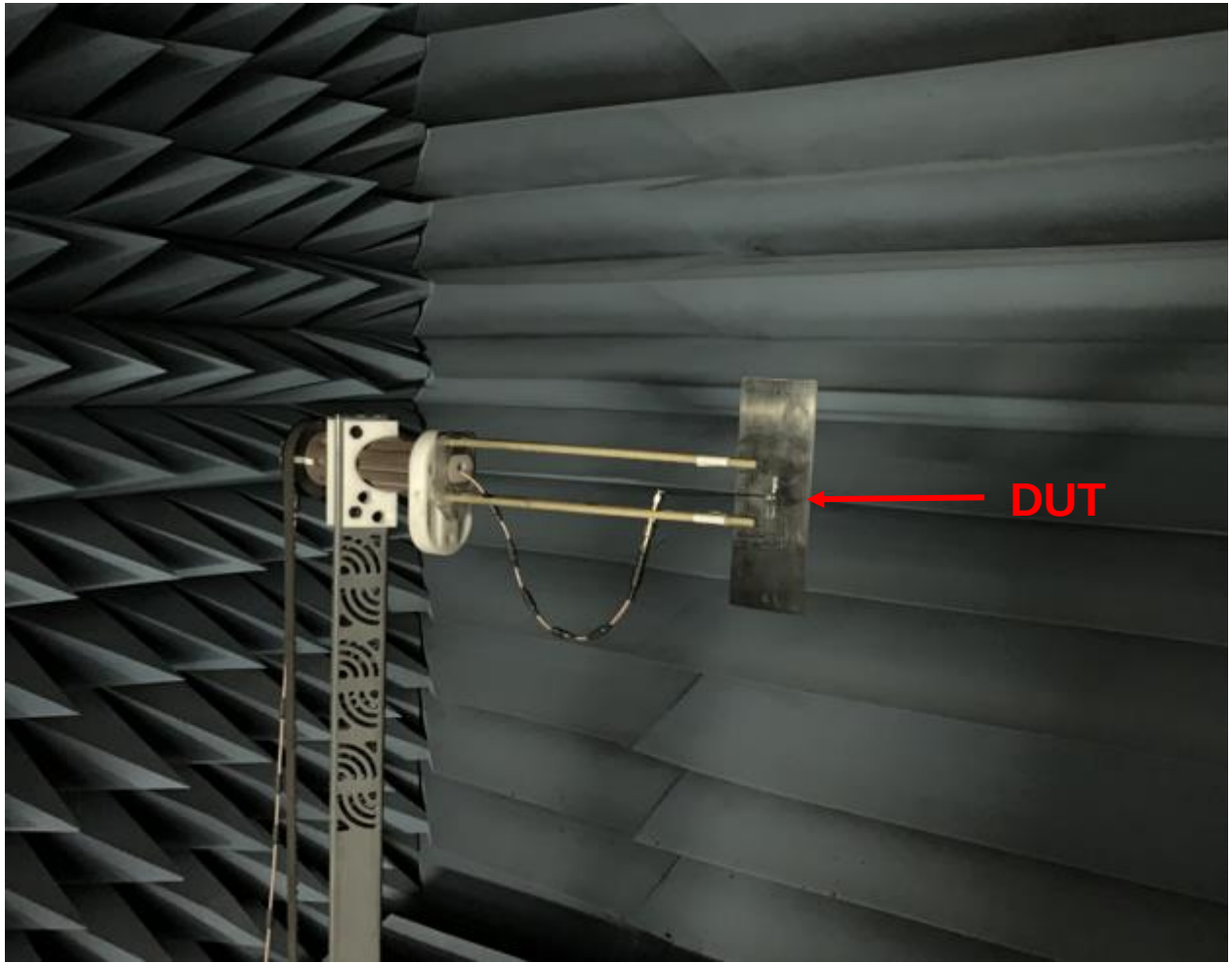




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Manufacturer
Molex, LLC
2222 Wellington Court Lisle, IL 60532 USA





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4.2 ANTENNA PERFORMANCE

DESCRIPTION	EQUIPMENT	REQUIREMENT		
Frequency Range	VNA E5071C	2.4-2.5GHz	5.15-5.85GHz	5.925-7.125GHz
Return Loss	VNA E5071C	<- 10dB		
Peak Gain (Max)	OTA Chamber	3.2dBi	4.25 dBi	5.5dBi
Average Total Efficiency	OTA Chamber	>75%	>75%	>70%
Polarization	OTA Chamber	Linear		
Input Impedance	VNA E5071C	50 ohms		

Note that the above antenna performance is measured with just the antenna mounted on a PC/ABS block to similar a free-space condition. When implement into the system, the frequency resonant might be off-tune due to the loading of surrounding components especially metal plane. This off-tune can be compensated through matching. Although module manufacturers specify a peak gain limit, it is based on free-space conditions. The peak gain will be degraded by 1 to 2dBi in the actual implementation as the radiation pattern will change due to the surround components. As such, during selection of antenna, you can select one with high peak gain to compensate for the loss. Molex can offer assistant to choose the best location and best tuning in-order to meet this peak gain requirement.

4.3 RETURN LOSS PLOT

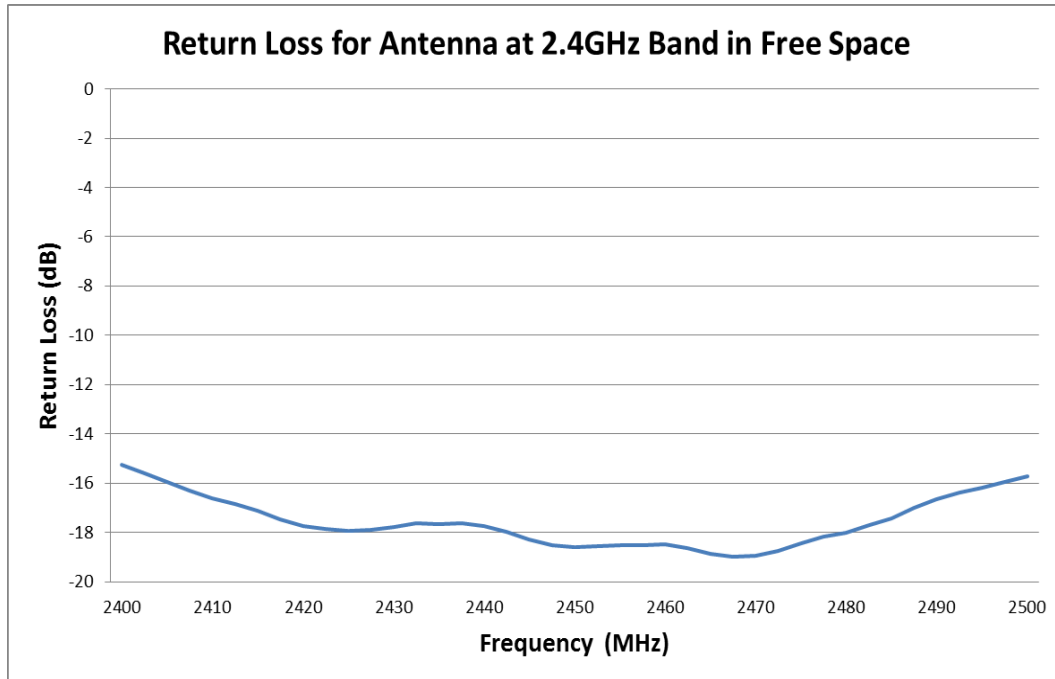


FIGURE 4.3.1 RETURN LOSS OF ANTENNA AT 2.4GHZ BAND IN FREE SPACE

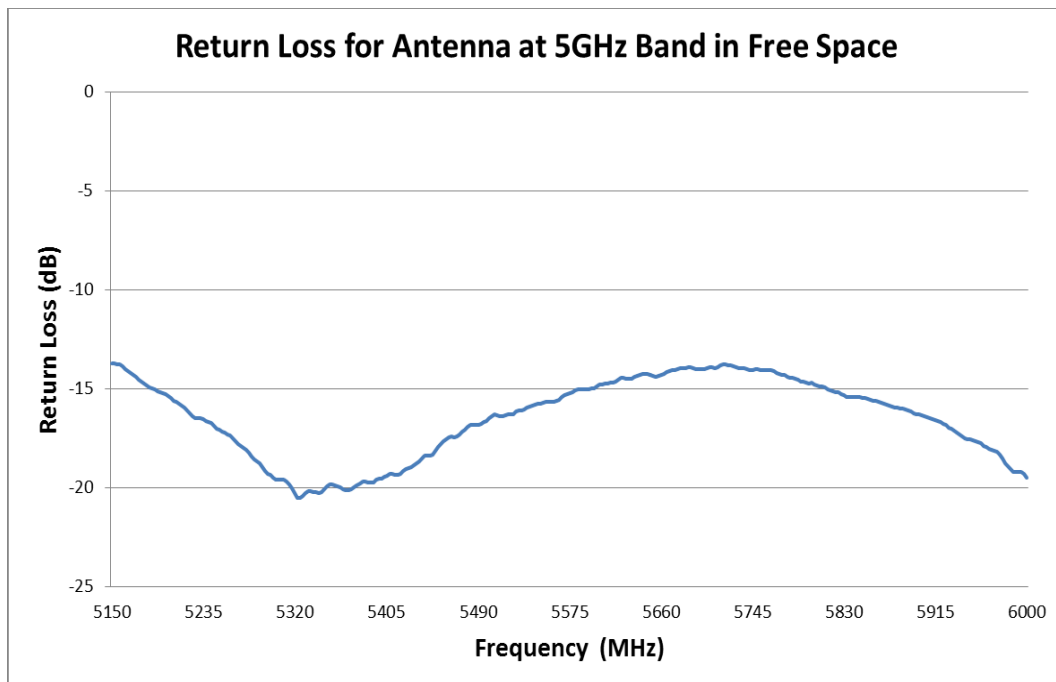


FIGURE 4.3.2 RETURN LOSS OF ANTENNA AT 5GHZ BAND IN FREE SPACE

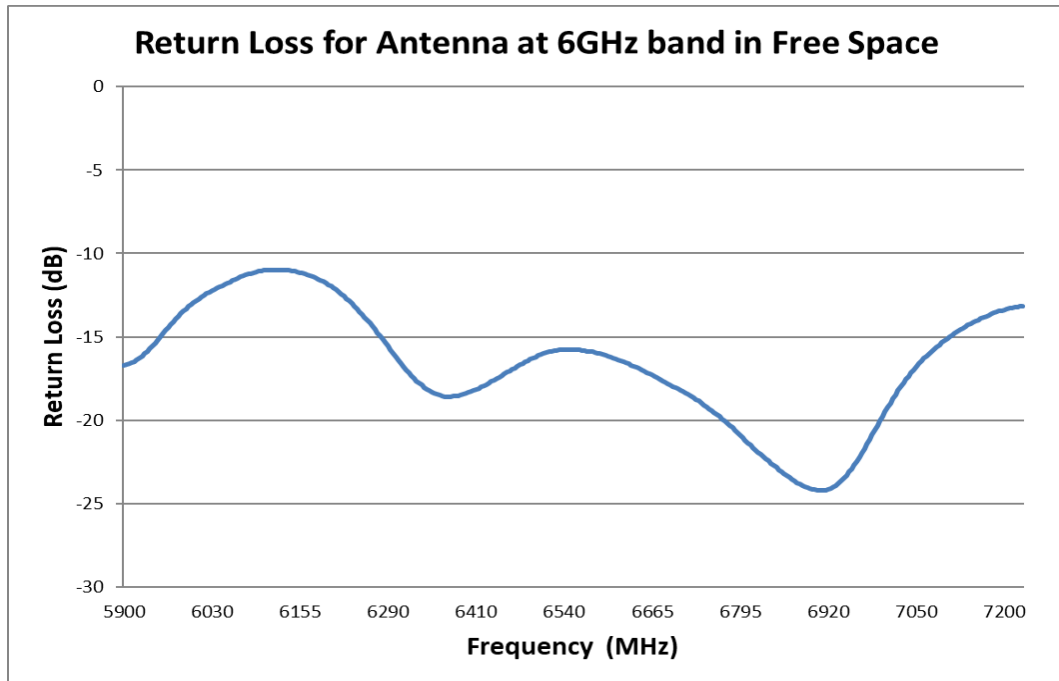


FIGURE 4.3.3 RETURN LOSS OF ANTENNA AT 6GHZ BAND IN FREE SPACE

4.4 EFFICIENCY PLOT

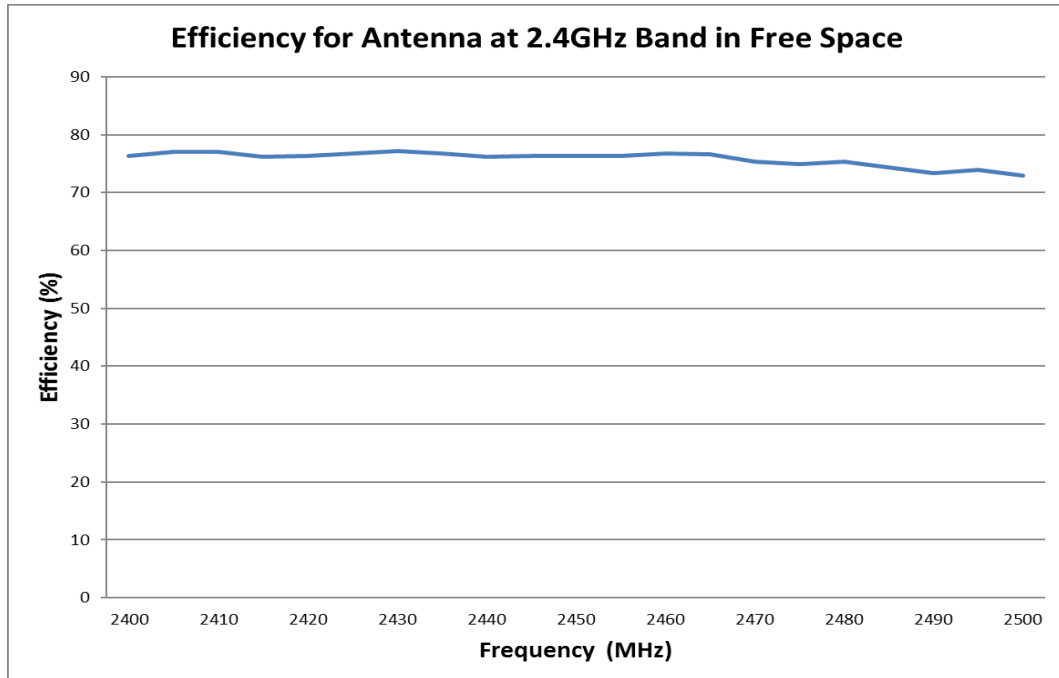


FIGURE 4.4.1 EFFICIENCY OF ANTENNA AT 2.4GHZ BAND IN FREE SPACE

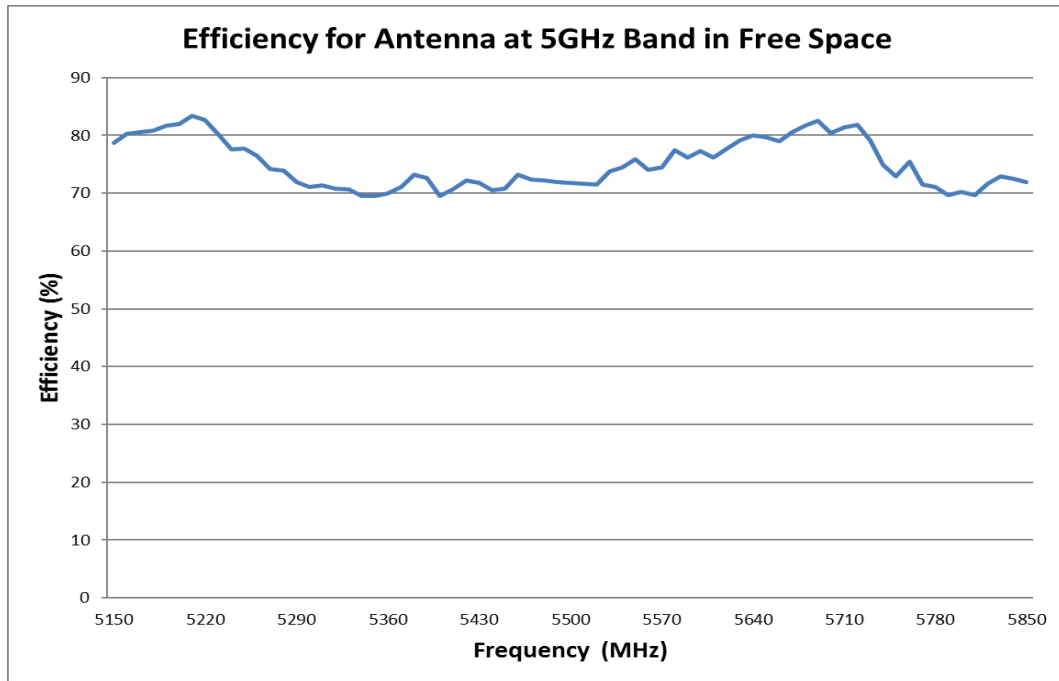


FIGURE 4.4.2 EFFICIENCY OF ANTENNA AT 5GHZ BAND IN FREE SPACE

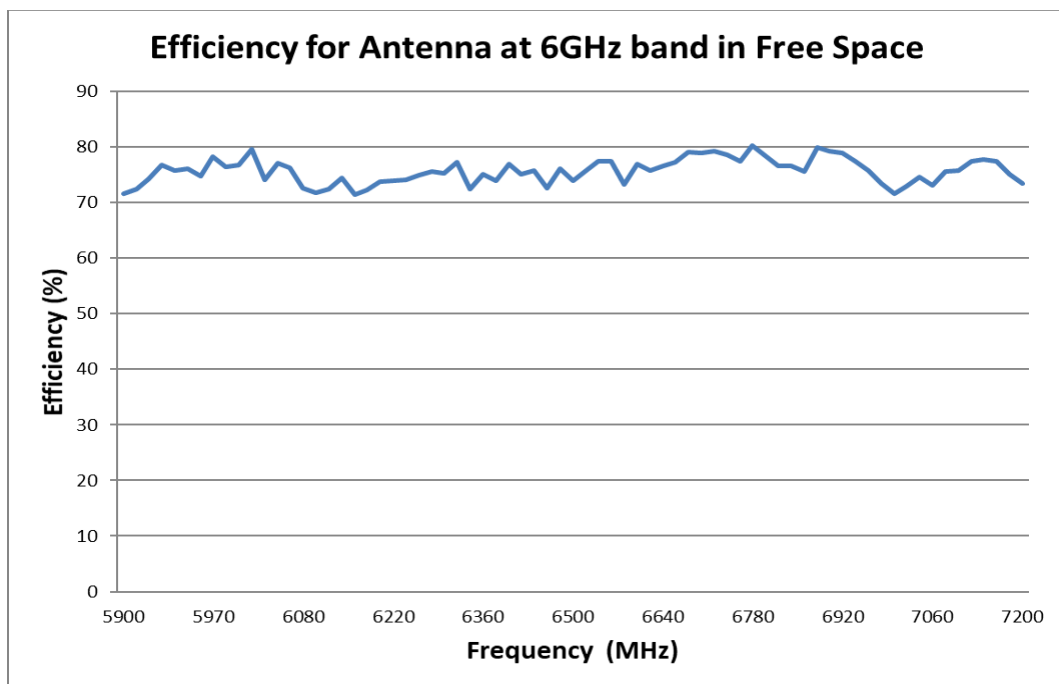


FIGURE 4.4.3 EFFICIENCY OF ANTENNA AT 6GHZ BAND IN FREE SPACE

4.5 RADIATION PATTERN

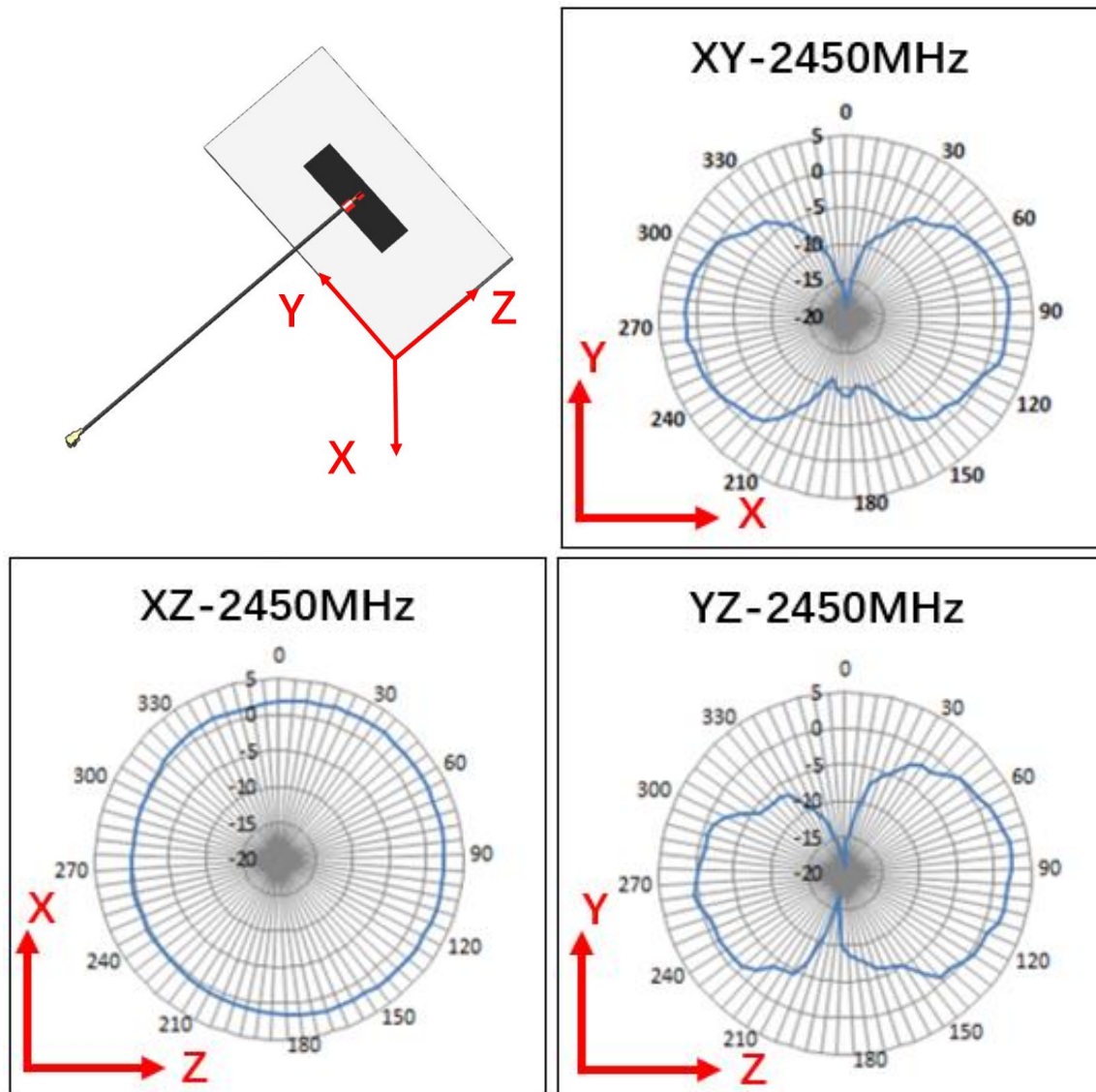


FIGURE 4.5.1 2D RADIATION PATTERN OF ANTENNA AT 2450MHZ IN FREE SPACE

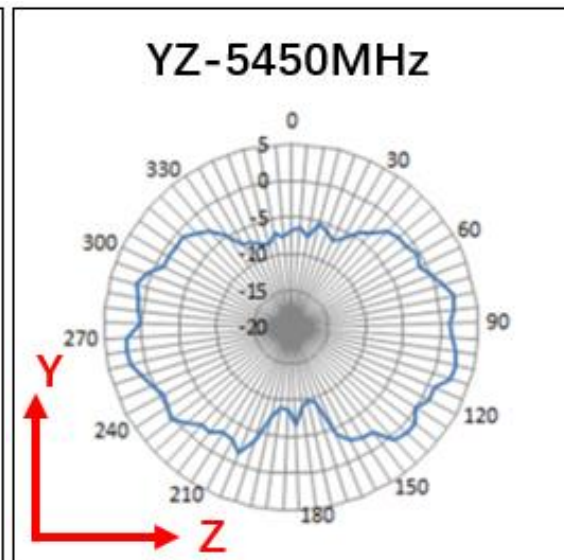
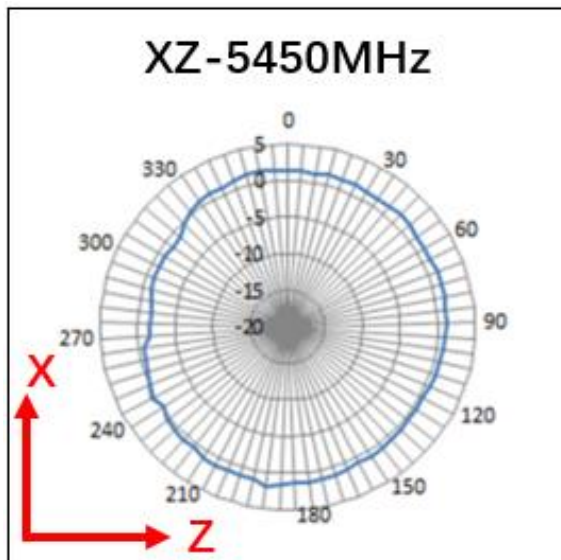
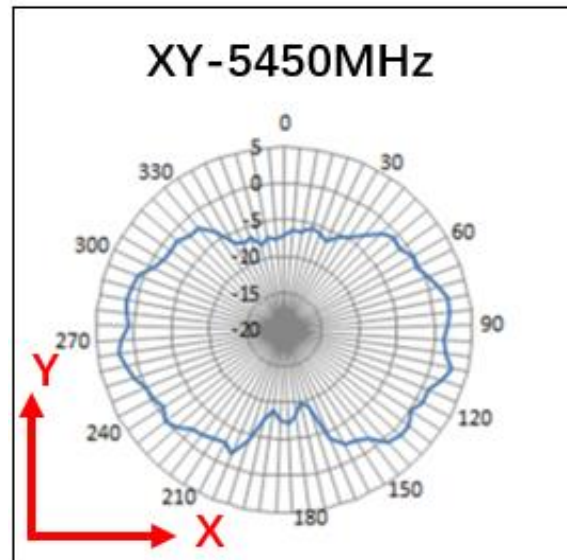
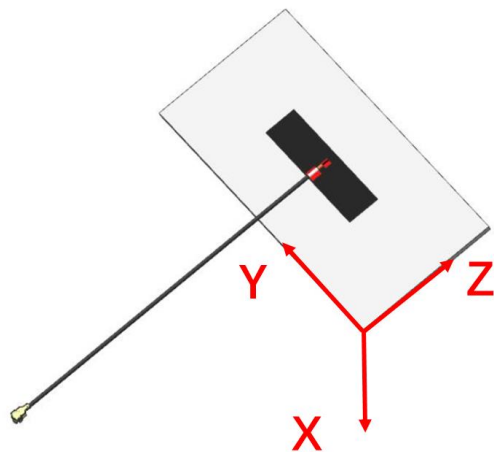


FIGURE 4.5.2 2D RADIATION PATTERN OF ANTENNA AT 5450MHZ IN FREE SPACE

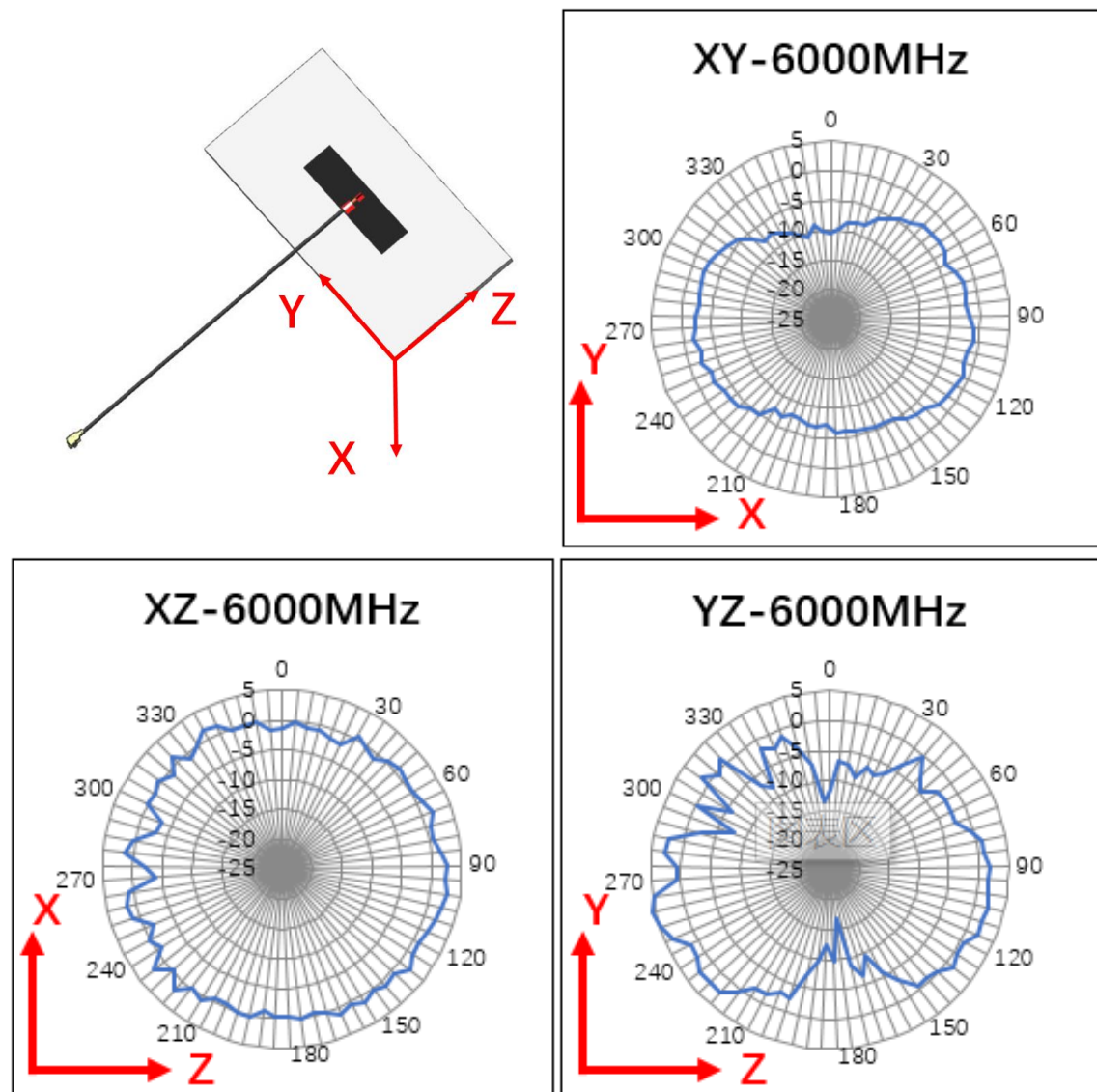


FIGURE 4.5.3 2D RADIATION PATTERN OF ANTENNA AT 6000MHZ IN FREE SPACE

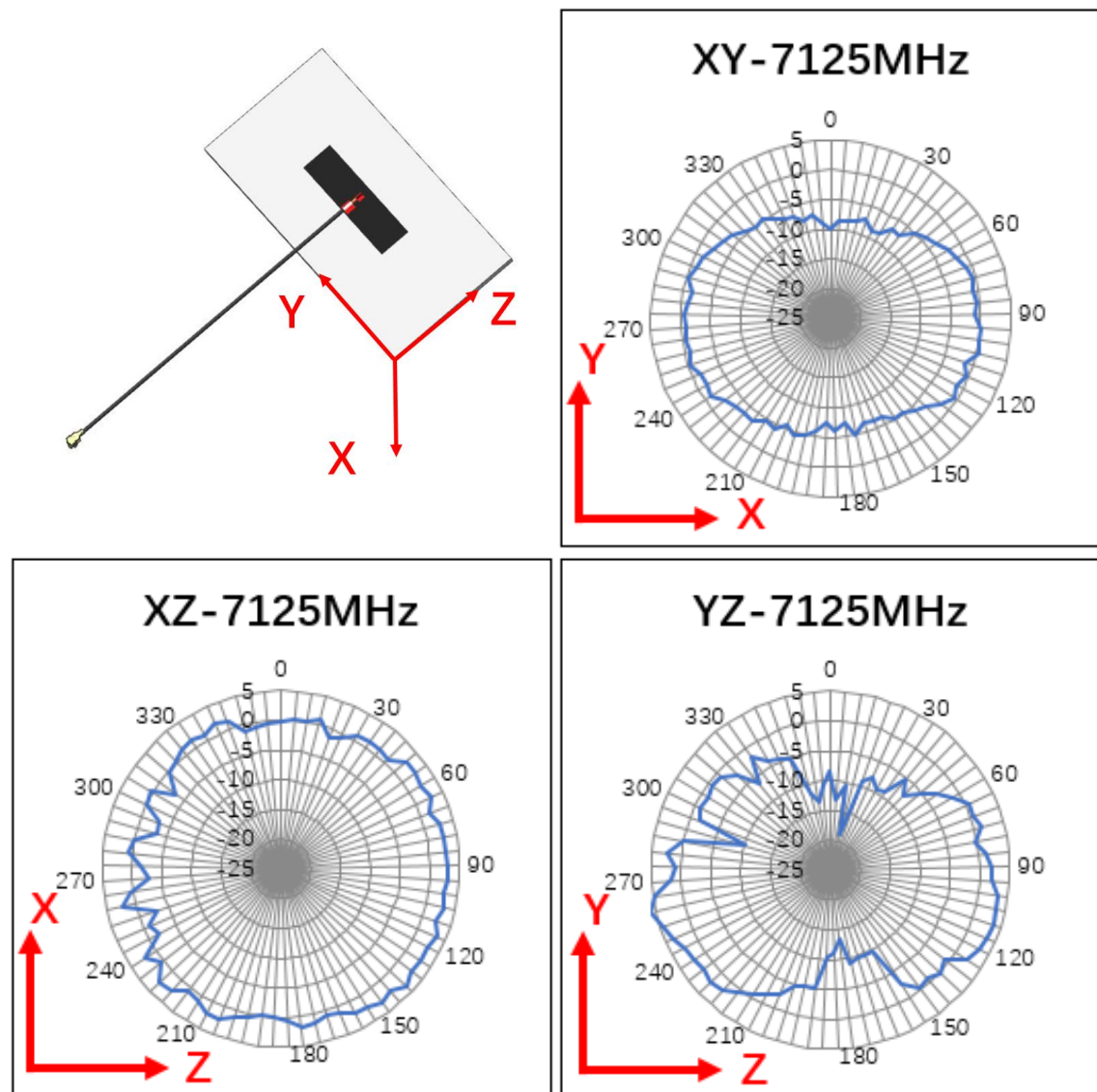


FIGURE 4.5.4 2D RADIATION PATTERN OF ANTENNA AT 7125MHZ IN FREE SPACE

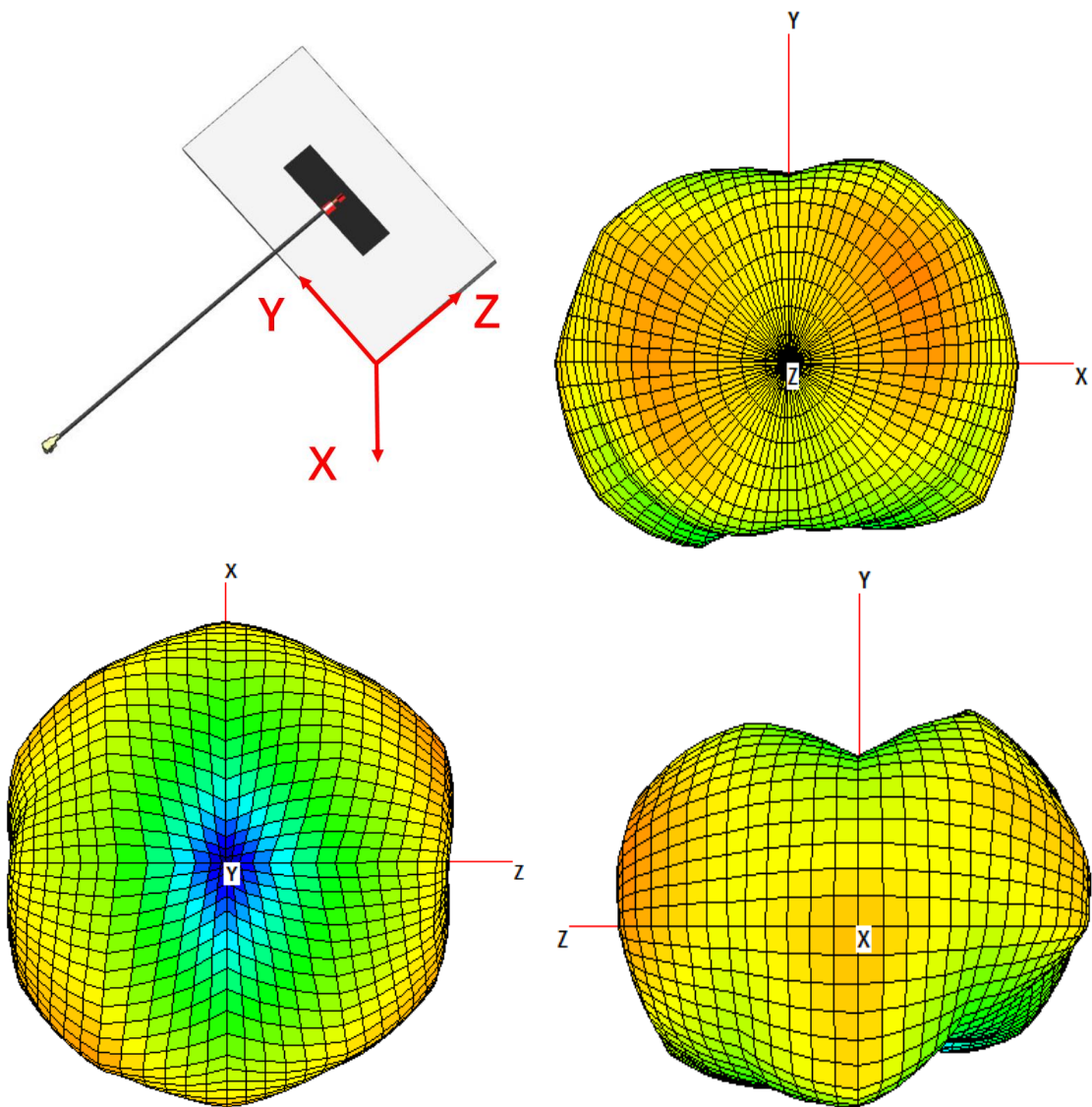


FIGURE 4.5.5 3D RADIATION PATTERN OF ANTENNA AT 2450MHZ BAND IN FREE SPACE

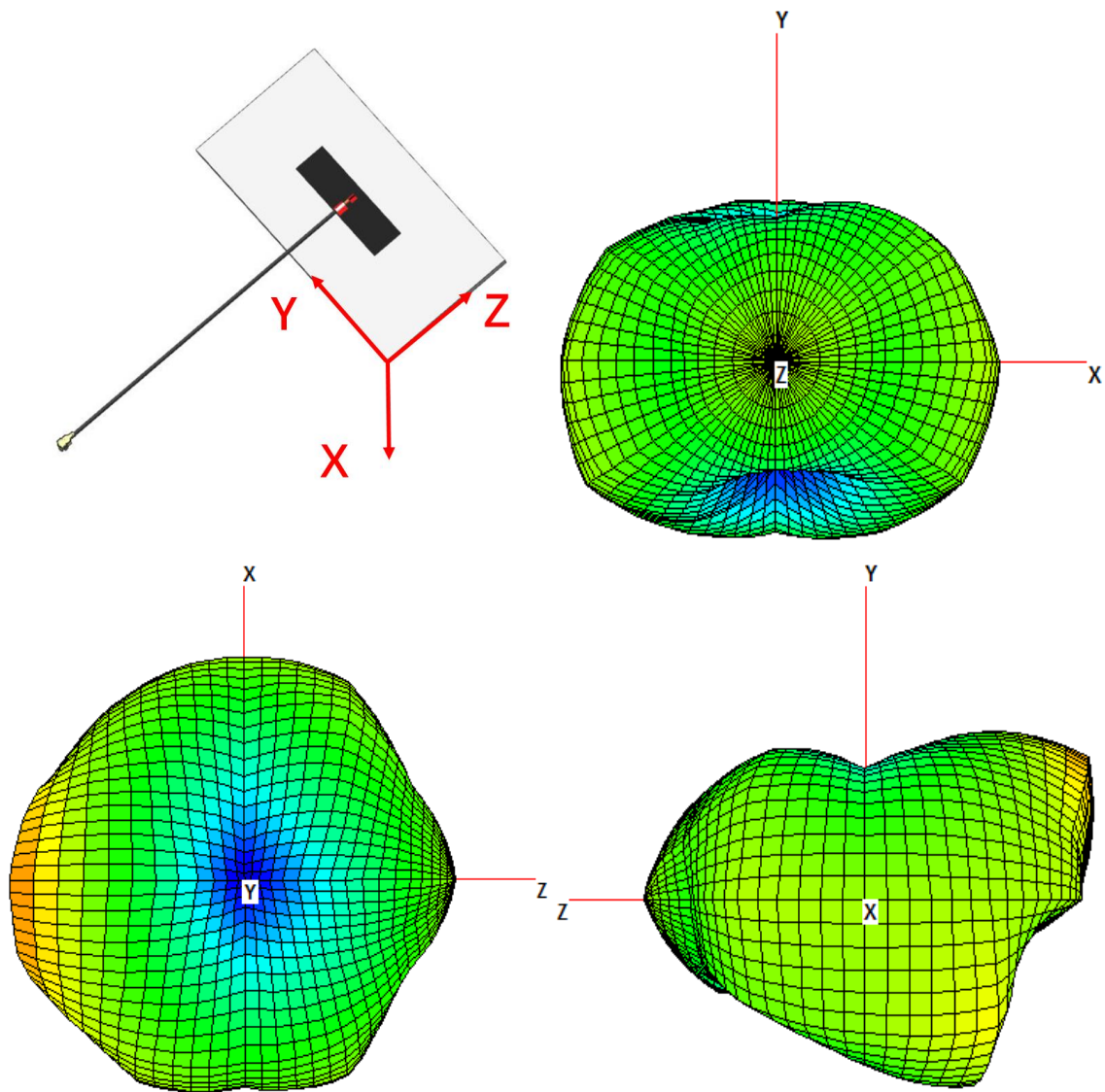


FIGURE 4.5.6 3D RADIATION PATTERN OF ANTENNA AT 5450MHZ BAND IN FREE SPACE

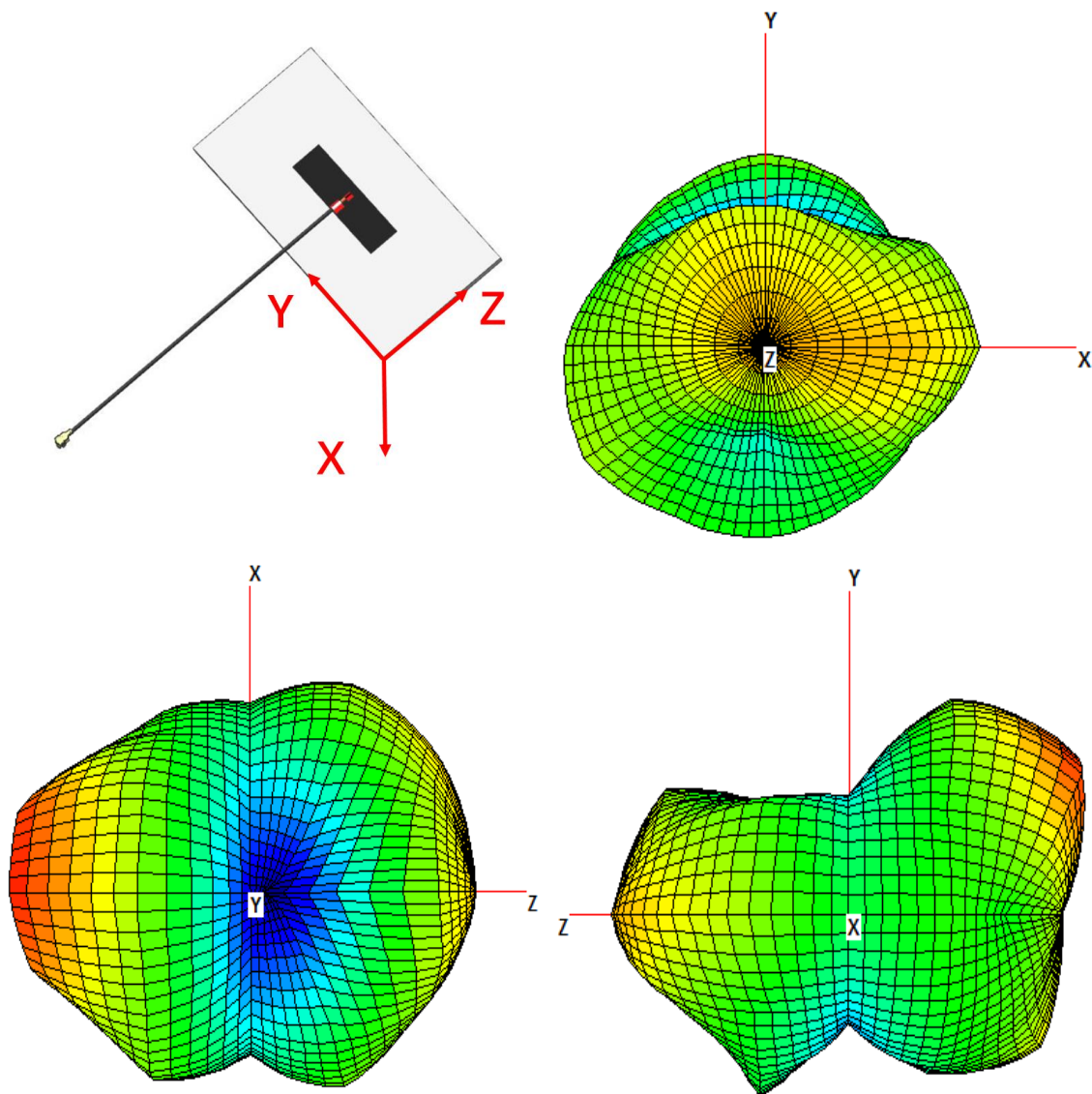


FIGURE 4.5.7 3D RADIATION PATTERN OF ANTENNA AT 6000MHZ BAND IN FREE SPACE

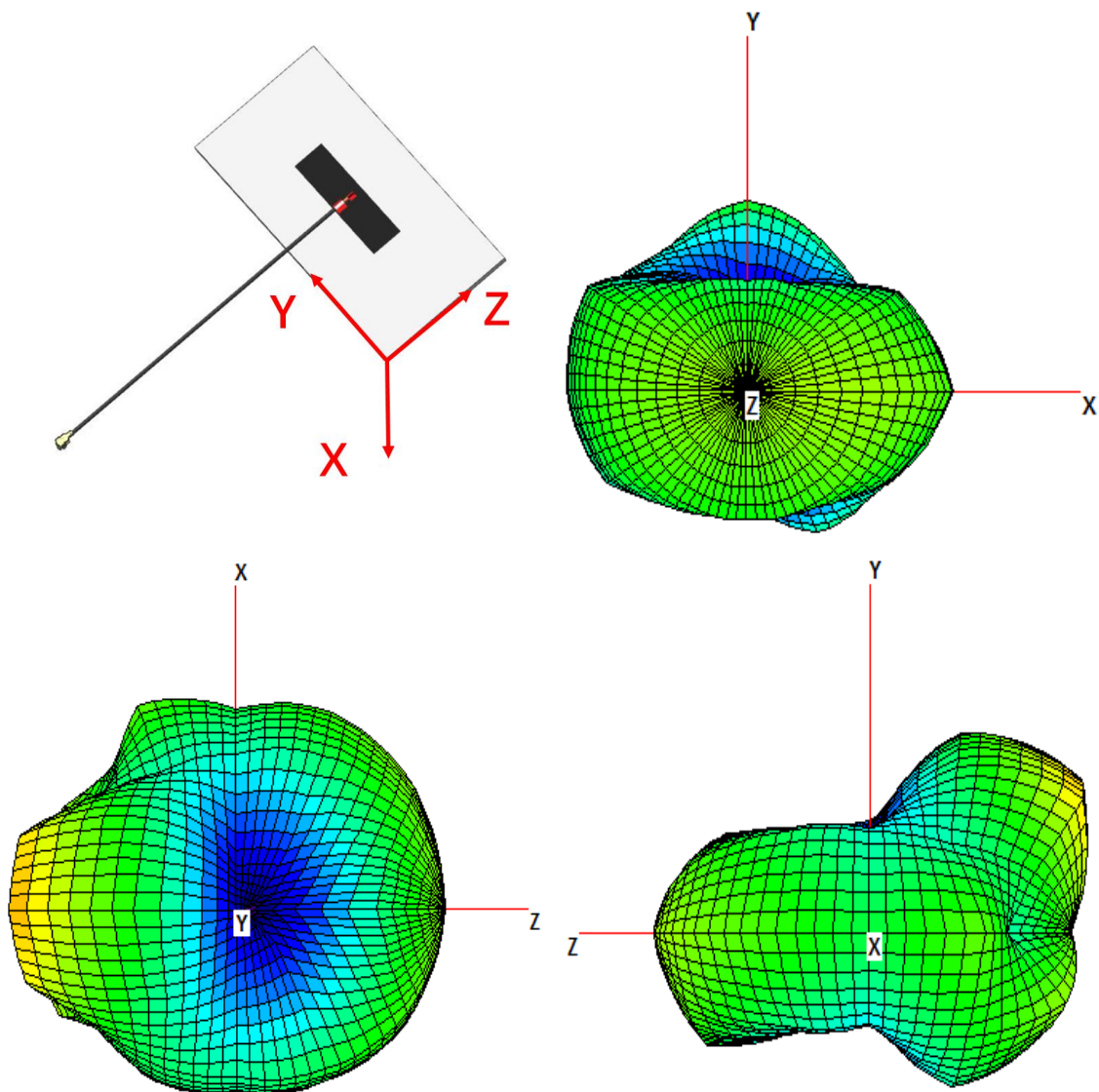


FIGURE 4.5.8 3D RADIATION PATTERN OF ANTENNA AT 7125MHZ BAND IN FREE SPACE