



APPLICATION SPECIFICATION

TITLE

MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE

TABLE OF CONTENTS

1.0 SCOPE

2.0 PRODUCT DESCRIPTION

3.0 APPLICABLE DOCUMENTS

4.0 ANTENNA PERFORMANCE

5.0 CHANGE HISTORY

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 1 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE

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: Molex Mini-link Wi-Fi tri-band antenna _right angle

Series Number: 2158720101

2.2 DESCRIPTION

2158720101 is Molex Mini-link Wi-Fi tri-band antenna in ideal for 2.4GHz, 5GHz and 6GHz wireless applications such as Bluetooth and Wi-Fi tri-band. SMA (male) connector is used for interface. IP66 waterproof

2.3 PRODUCT STRUCTURE INFORMATION

Please refer to PS-2158720101 for full information.



PRODUCT PHOTOGRAPH

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 2 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

3.0 APPLICABLE DOCUMENTS

DOCUMENT	NUMBER	DESCRIPTION
Sale Drawing (SD)	SD-2158720101	Mechanical Dimension of the product
Product Specification (PS)	PS-2158720101	Product Specification
Packing Drawing (PK)	PK-2158720101	Product packaging specifications

4.0 ANTENNA PERFORMANCE

4.1 RF TEST CONDITIONS

All measurements are done of the part No.215872 series with VNA Agilent E5071C and OTA chamber.

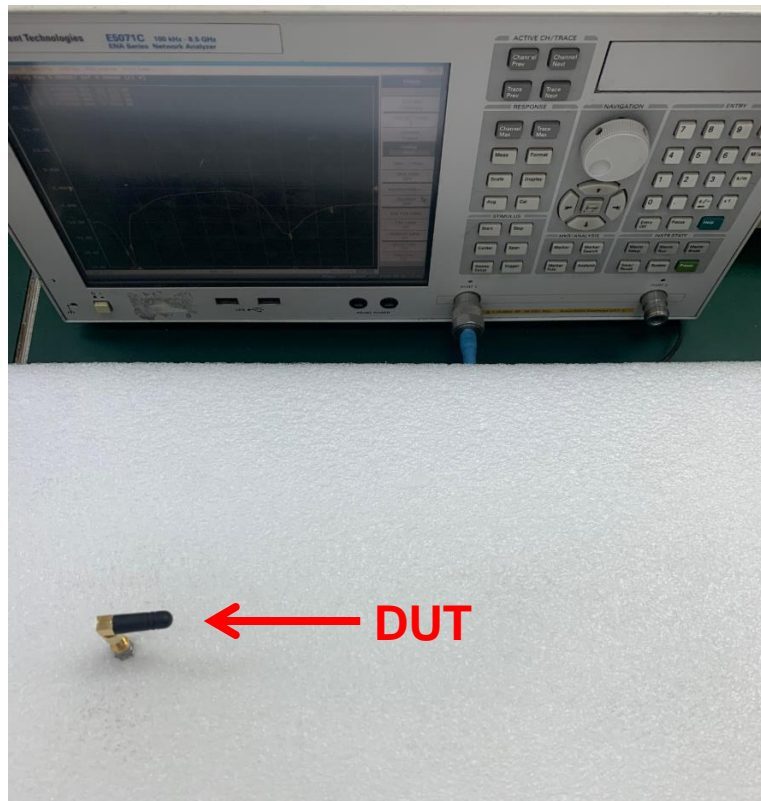


FIGURE4.1.1 ANTENNA TESTED WITH VNA E5071C

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 3 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

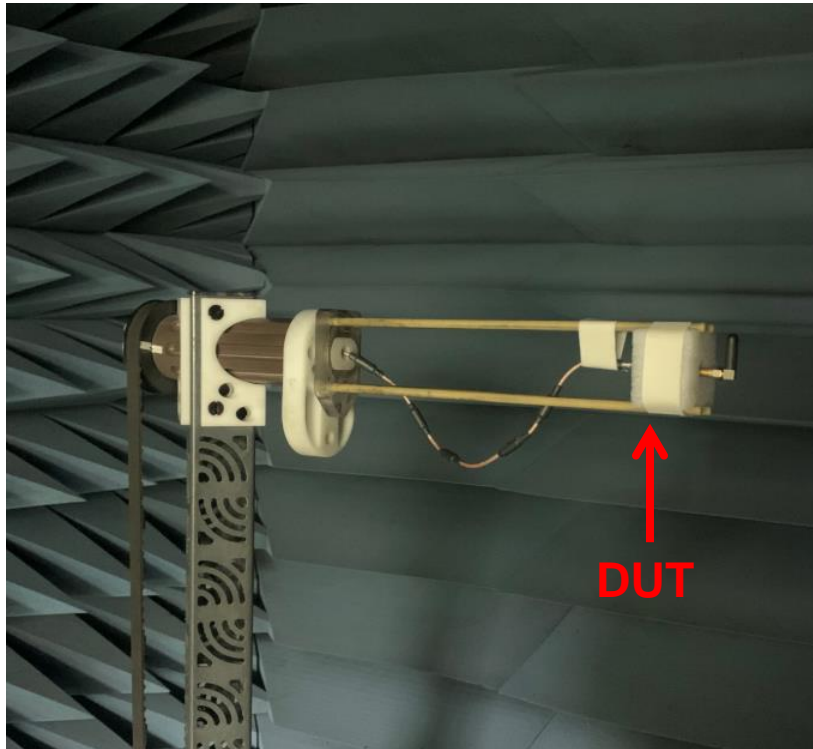


FIGURE4.1.2 ANTENNA TESTED IN OTA CHAMBER

<u>REVISION:</u> A1	<u>ECR/ECN INFORMATION:</u> EC No: 662260 DATE: 2021/04/29	<u>TITLE:</u> <p style="text-align: center;">MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION</p>		<u>SHEET No.</u> <p style="text-align: center;">4 of 17</p>
<u>DOCUMENT NUMBER:</u> <p style="text-align: center;">AS-2158720101</p>		<u>CREATED / REVISED BY:</u> <p style="text-align: center;">Liu Hai 2020/09/01</p>	<u>CHECKED BY:</u> <p style="text-align: center;">Cheng Kang 2020/09/01</p>	<u>APPROVED BY:</u> <p style="text-align: center;">Andy Zhang 2020/09/01</p>



APPLICATION SPECIFICATION

4.2 ANTENNA PERFORMANCE

Description	Equipment	Requirement		
		2.4-2.5GHz	5-6GHz	6-7.125GHz
Frequency Range	VNA E5071C	2.4-2.5GHz	5-6GHz	6-7.125GHz
Return Loss	VNA E5071C	<-10 dB	<-5 dB	<-4dB
Peak Gain (Max)	OTA Chamber	3.8dBi	4.6dBi	3.0dBi
Average Total Efficiency	OTA Chamber	>60%	>65%	>50%
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 PCB to simulate a free-space condition. When implement into the system, the resonant frequency 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 2dB in the actual implementation as the radiation pattern will change due to the surrounding 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.

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 5 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

4.3 RETURN LOSS PLOT

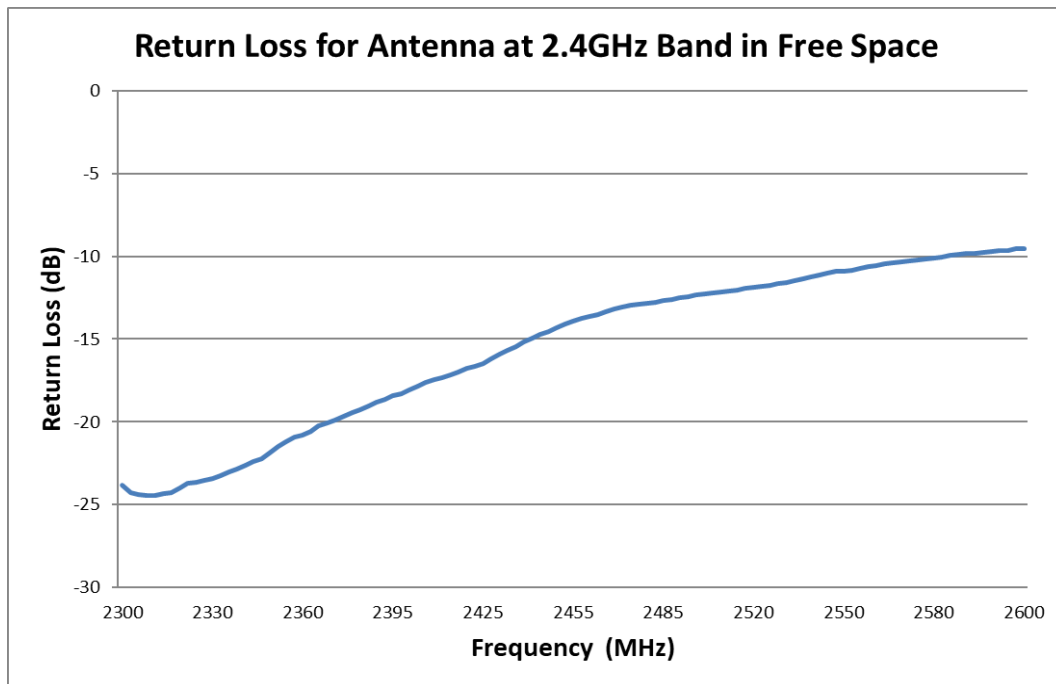


FIGURE 4.3.1 RETURN LOSS OF ANTENNA AT 2.4GHZ BAND IN FREE SPACE

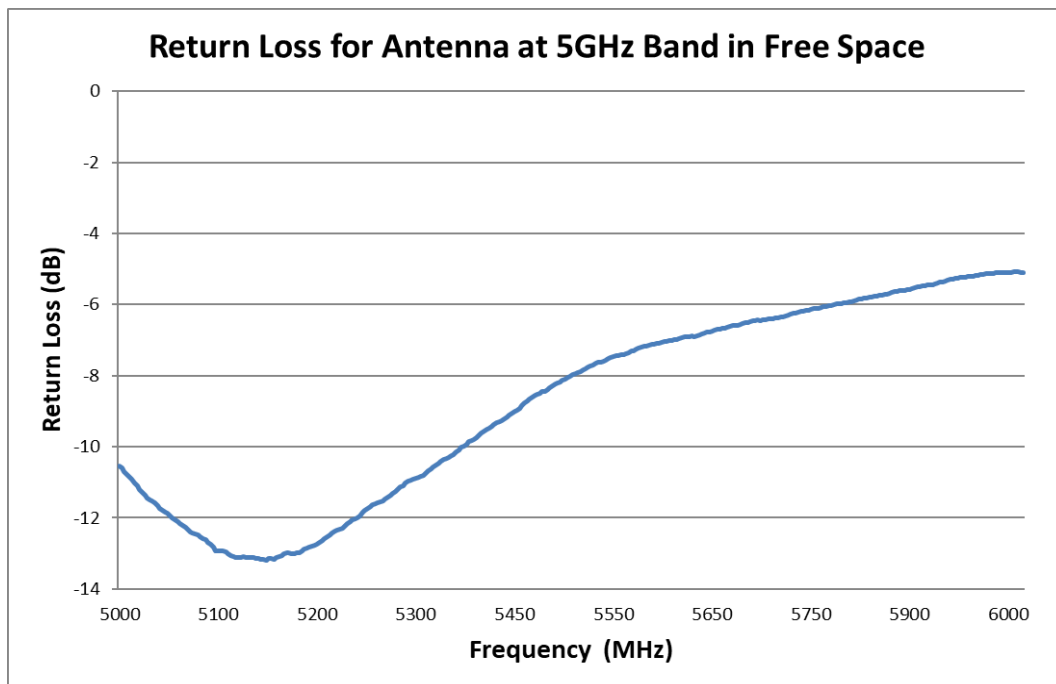


FIGURE 4.3.2 RETURN LOSS OF ANTENNA AT 5GHZ BAND IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 6 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

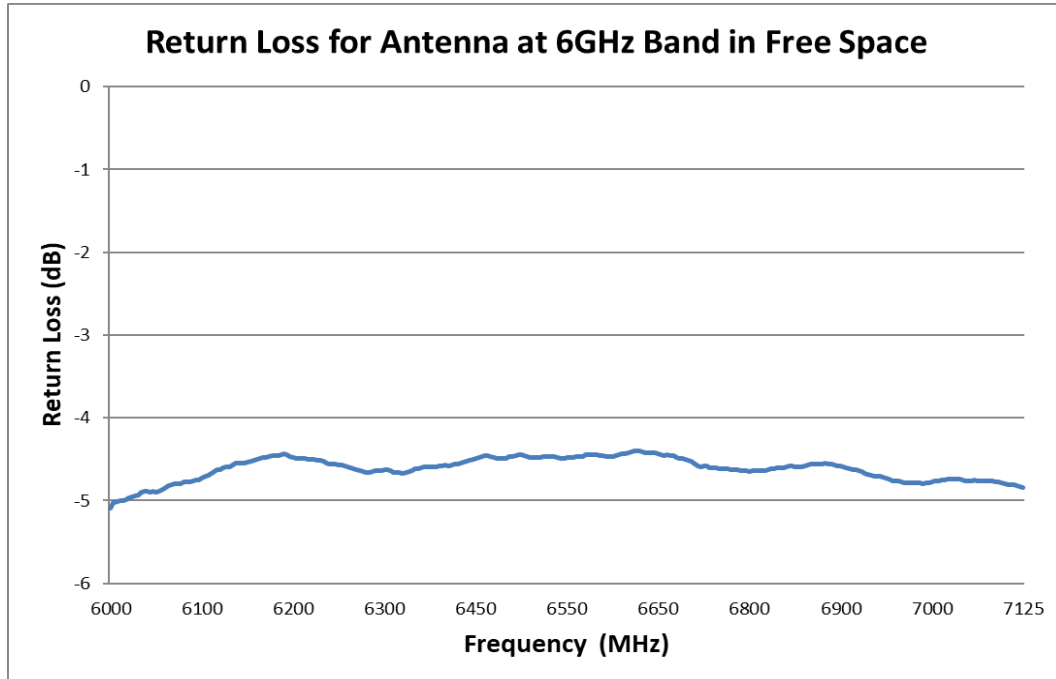


FIGURE 4.3.3 RETURN LOSS OF ANTENNA AT 6GHZ BAND IN FREE SPACE

4.4 EFFICIENCY PLOT

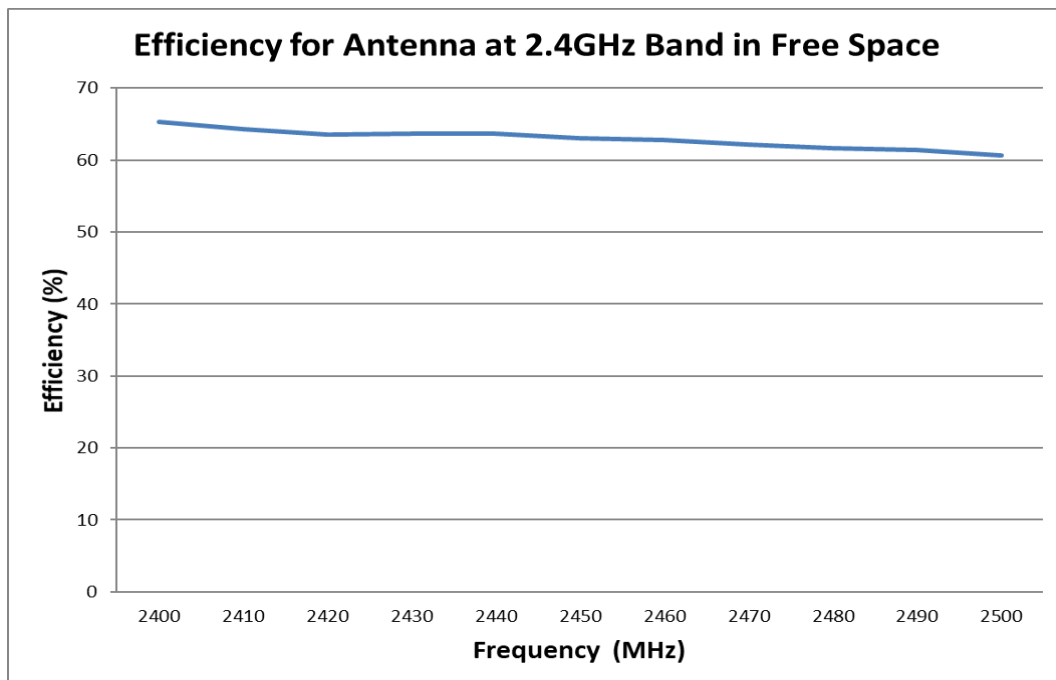


FIGURE 4.4.1 EFFICIENCY OF ANTENNA AT 2.4GHZ BAND IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 7 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

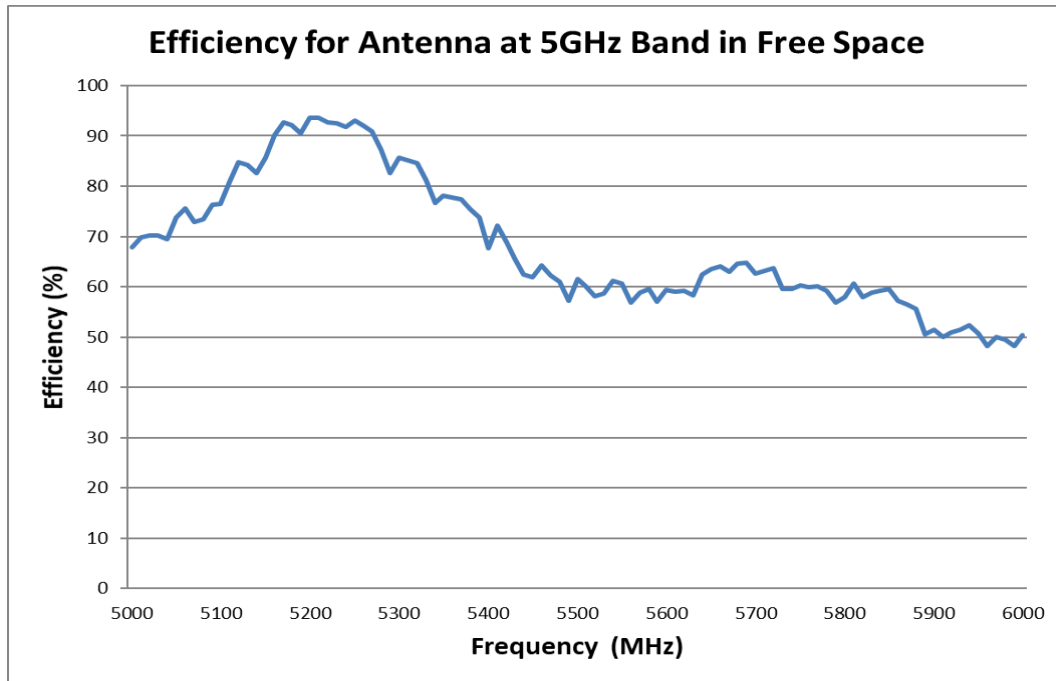


FIGURE 4.4.2 EFFICIENCY OF ANTENNA AT 5GHZ BAND IN FREE SPACE

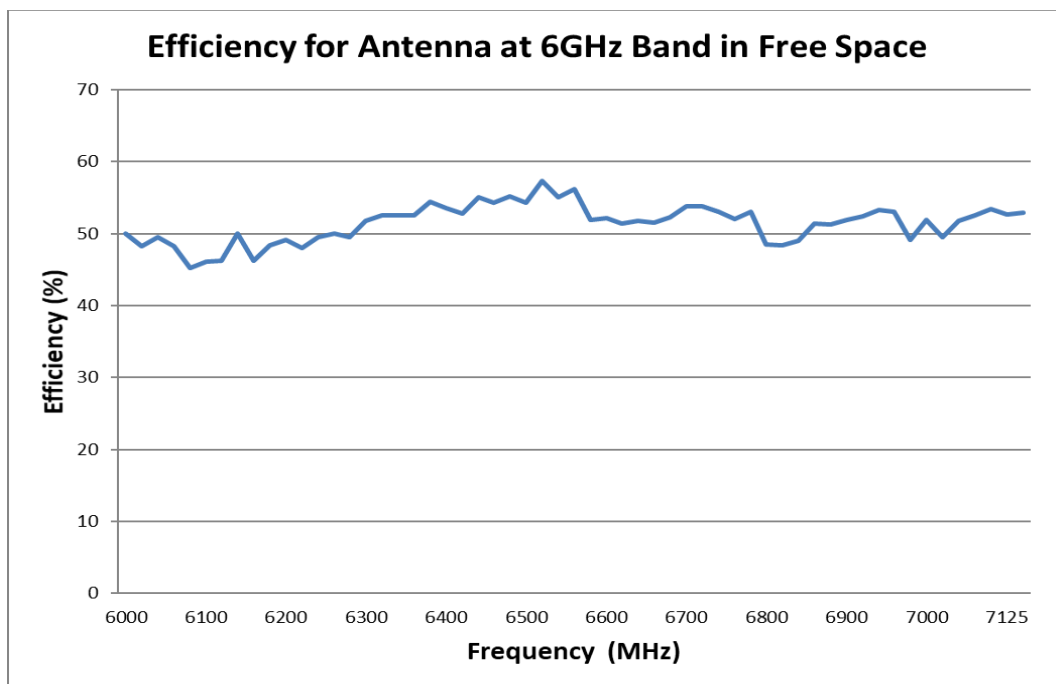


FIGURE 4.4.3 EFFICIENCY OF ANTENNA AT 6GHZ BAND IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 8 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

4.5 2D/3D RADIATION PATTERN

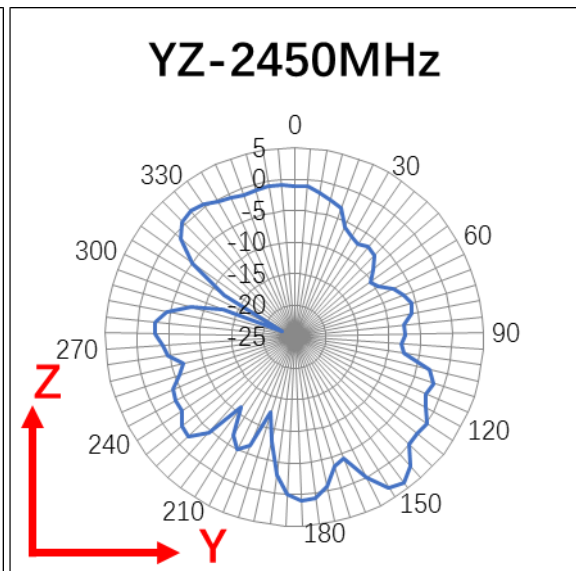
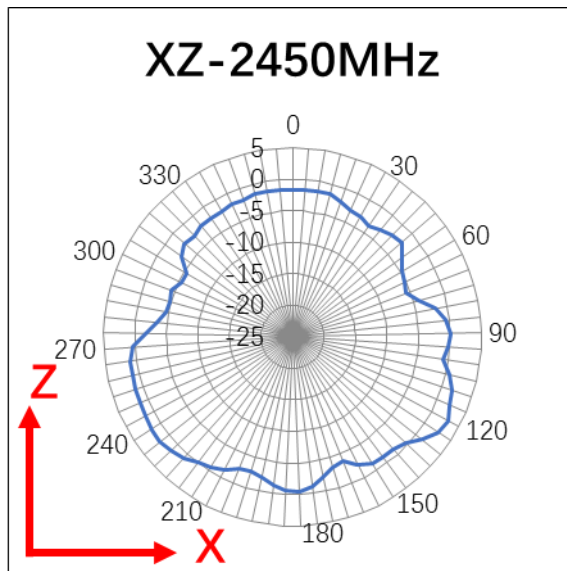
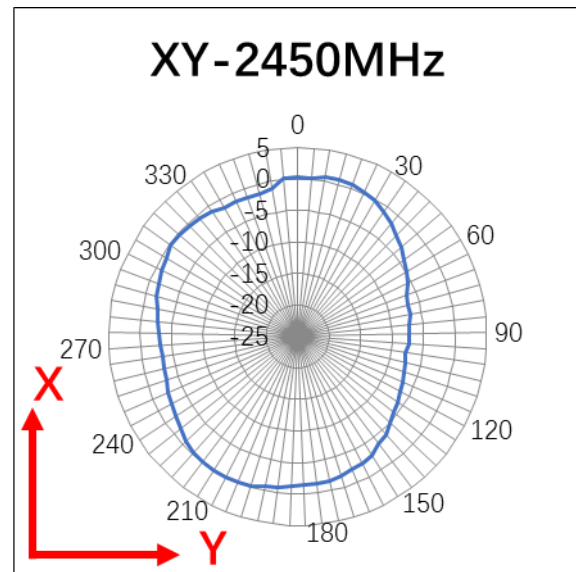
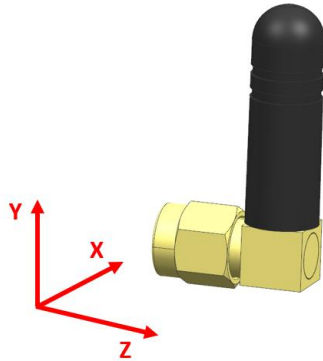


FIGURE 4.5.1 2D RADIATION PATTERN OF ANTENNA AT 2450MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 9 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

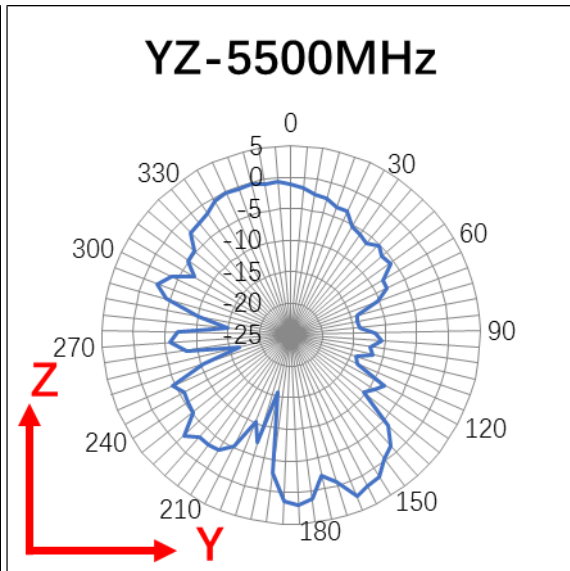
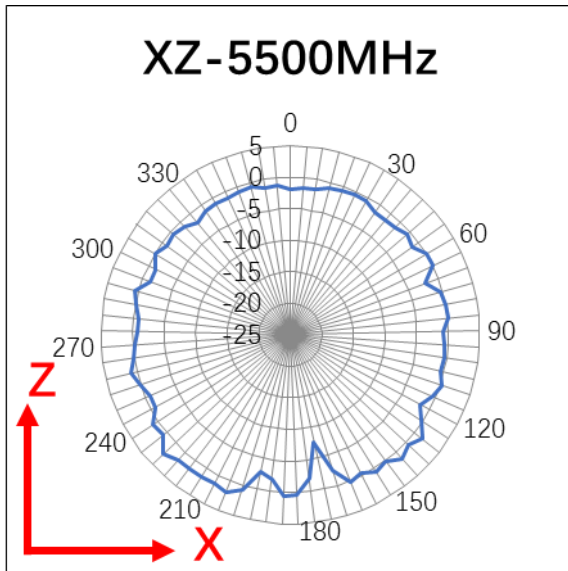
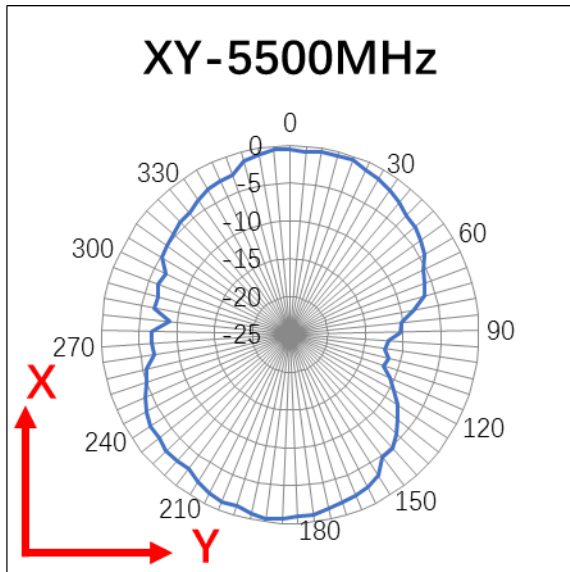
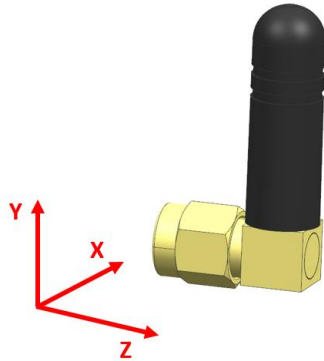


FIGURE 4.5.2 2D RADIATION PATTERN OF ANTENNA AT 5500MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 10 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

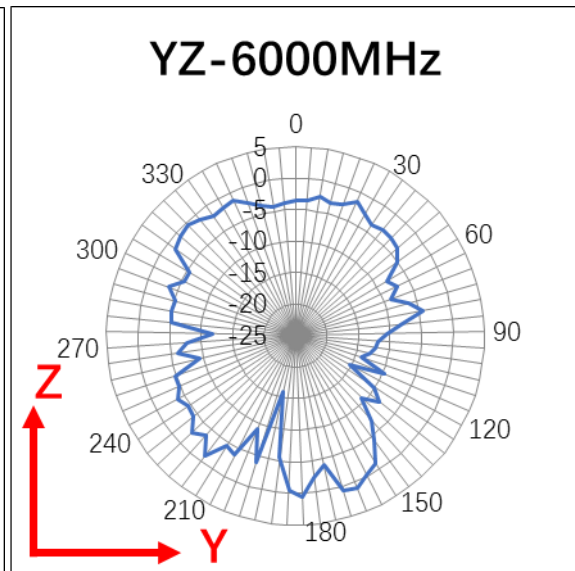
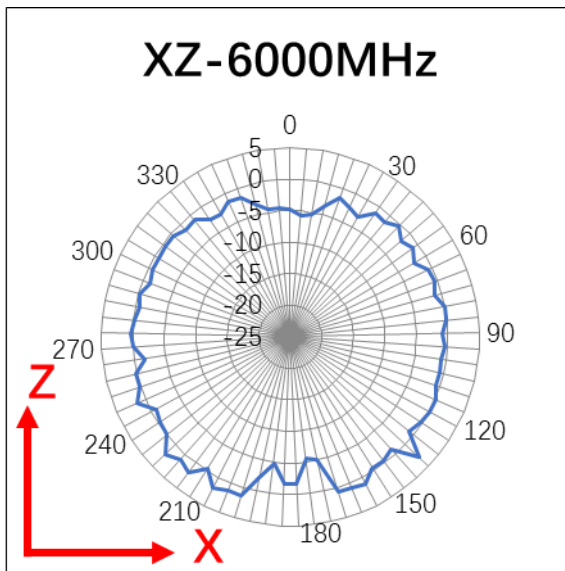
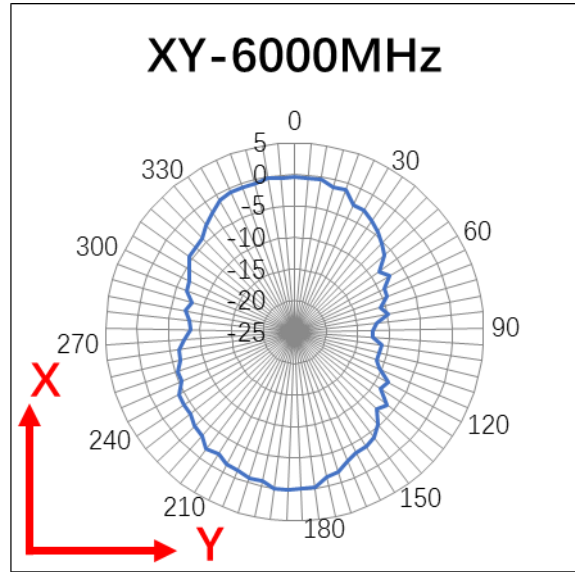
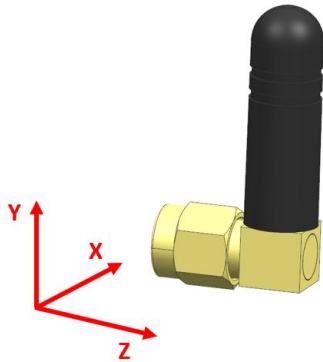


FIGURE 4.5.3 2D RADIATION PATTERN OF ANTENNA AT 6000MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 11 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

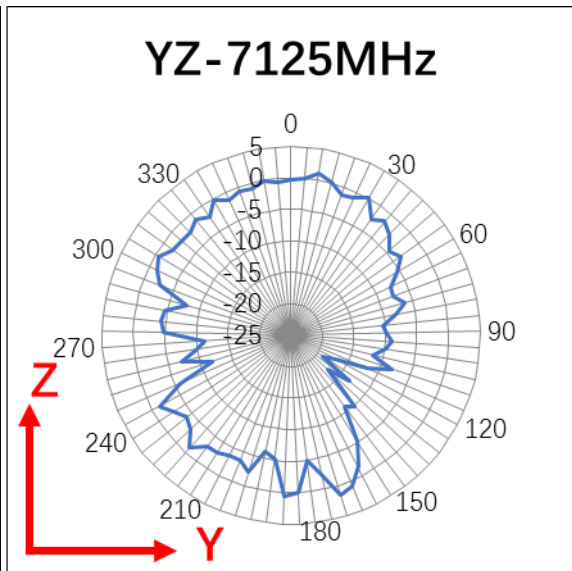
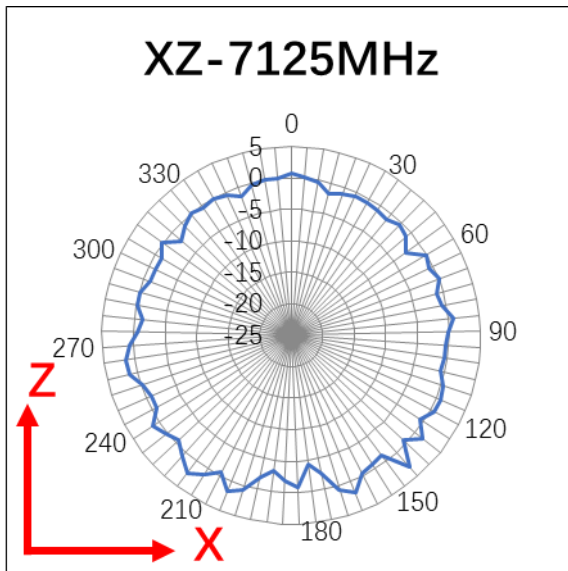
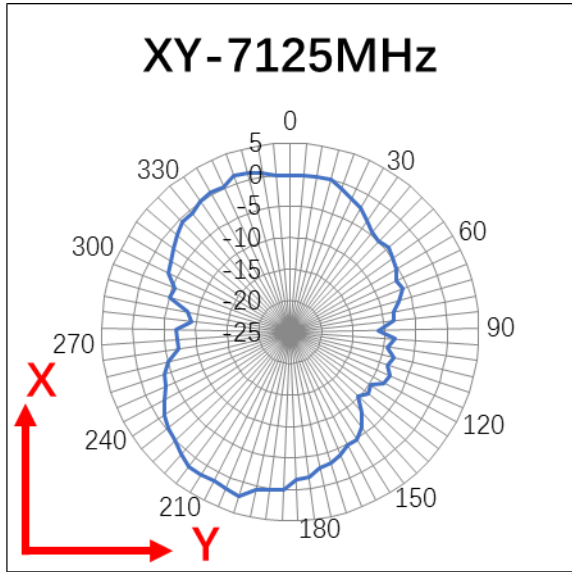
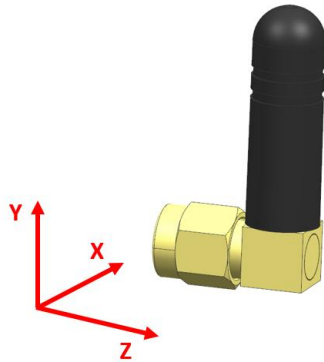


FIGURE 4.5.4 2D RADIATION PATTERN OF ANTENNA AT 7125MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 12 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

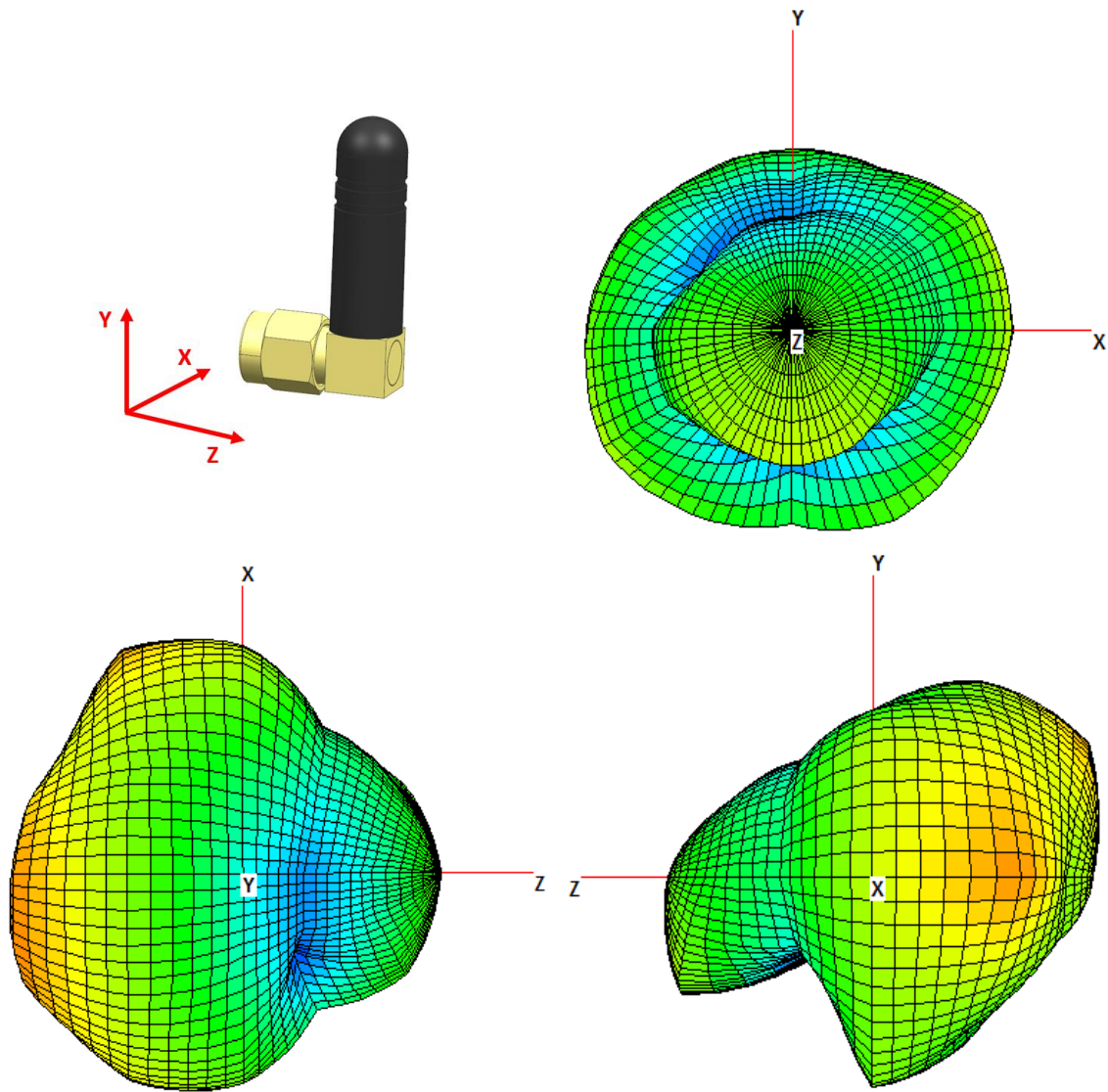


FIGURE 4.5.5 3D RADIATION PATTERN OF ANTENNA AT 2450MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 13 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

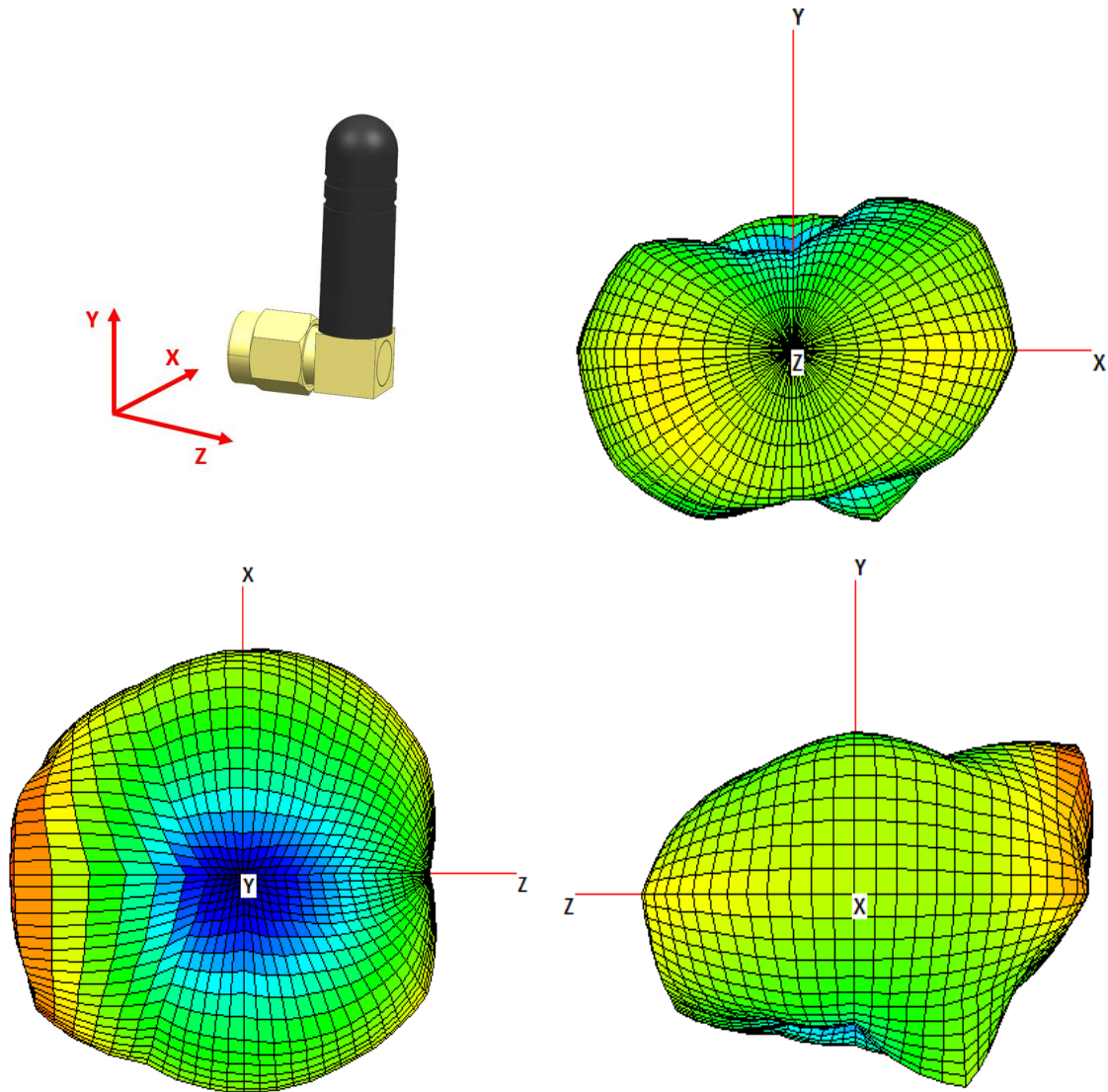


FIGURE 4.5.6 3D RADIATION PATTERN OF ANTENNA AT 5500MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 14 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

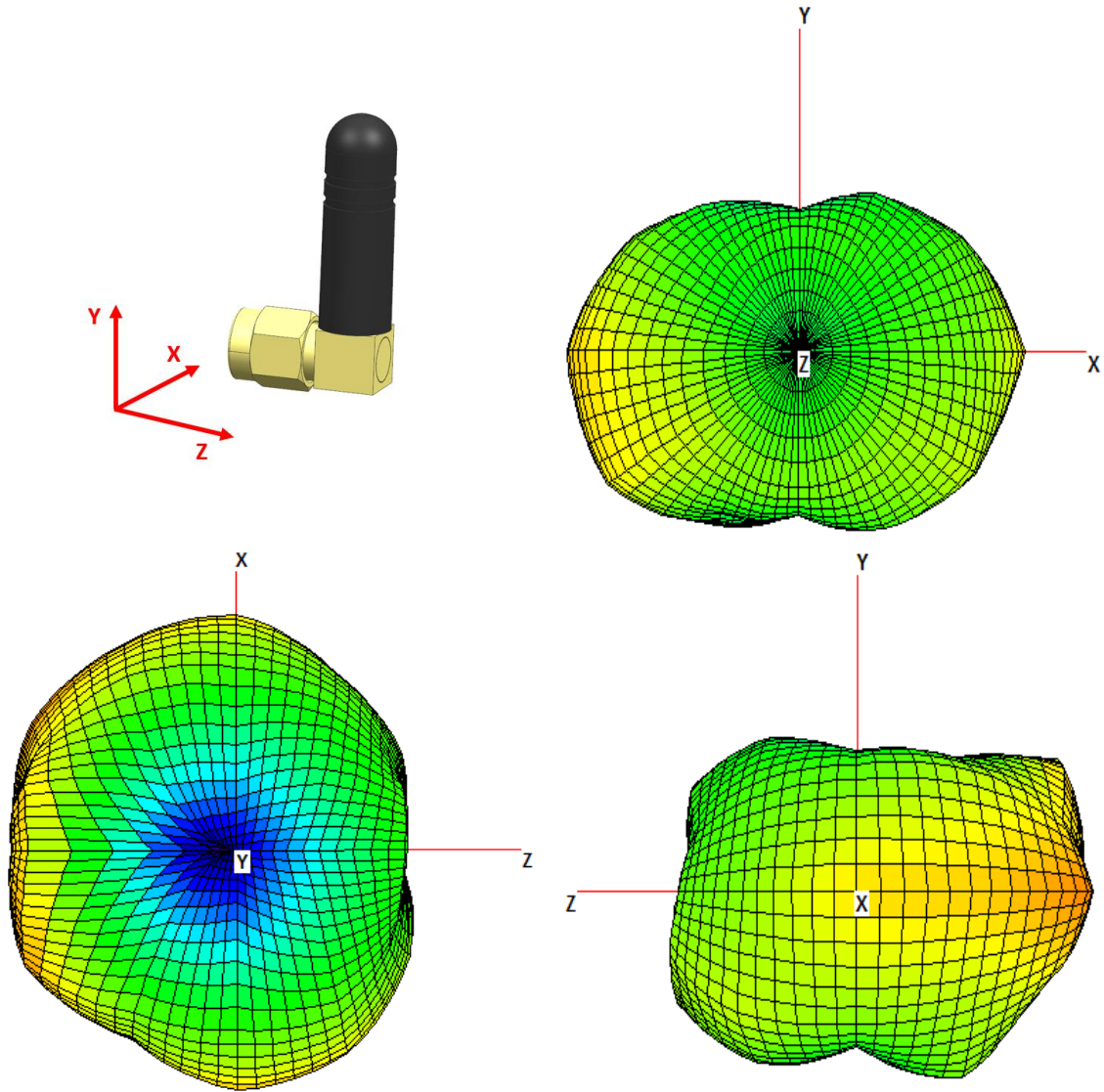


FIGURE 4.5.7 3D RADIATION PATTERN OF ANTENNA AT 6000MHZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	SHEET No. 15 of 17
DOCUMENT NUMBER: AS-2158720101	CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01

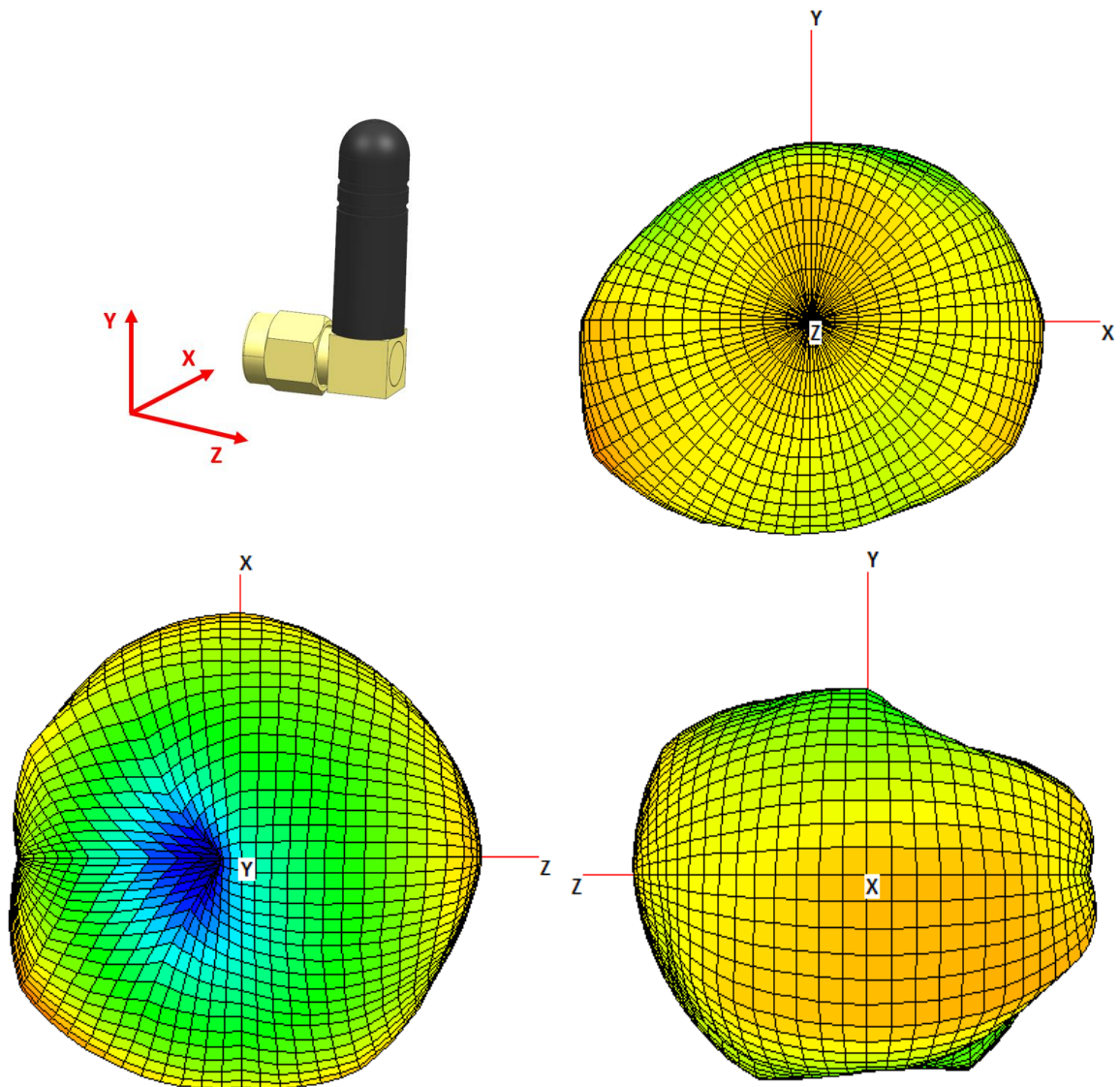


FIGURE 4.5.8 3D RADIATION PATTERN OF ANTENNA AT 7125HZ IN FREE SPACE

REVISION: A1	ECR/ECN INFORMATION: EC No: 662260 DATE: 2021/04/29	TITLE: MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION		SHEET No. 16 of 17
DOCUMENT NUMBER: AS-2158720101		CREATED / REVISED BY: Liu Hai 2020/09/01	CHECKED BY: Cheng Kang 2020/09/01	APPROVED BY: Andy Zhang 2020/09/01



APPLICATION SPECIFICATION

5.0 CHANGE HISTORY

REV	DATE	DESCRIPTION
A	2020/09/01	New release
A1	2021/04/29	Add IP66 waterproof

<u>REVISION:</u> A1	<u>ECR/ECN INFORMATION:</u> EC No: 662260 DATE: 2021/04/29	<u>TITLE:</u> MOLEX MINI-LINK WI-FI TRI-BAND ANTENNA RIGHT ANGLE APPLICATION SPECIFICATION	<u>SHEET No.</u> 17 of 17
<u>DOCUMENT NUMBER:</u> AS-2158720101	<u>CREATED / REVISED BY:</u> Liu Hai 2020/09/01	<u>CHECKED BY:</u> Cheng Kang 2020/09/01	<u>APPROVED BY:</u> Andy Zhang 2020/09/01