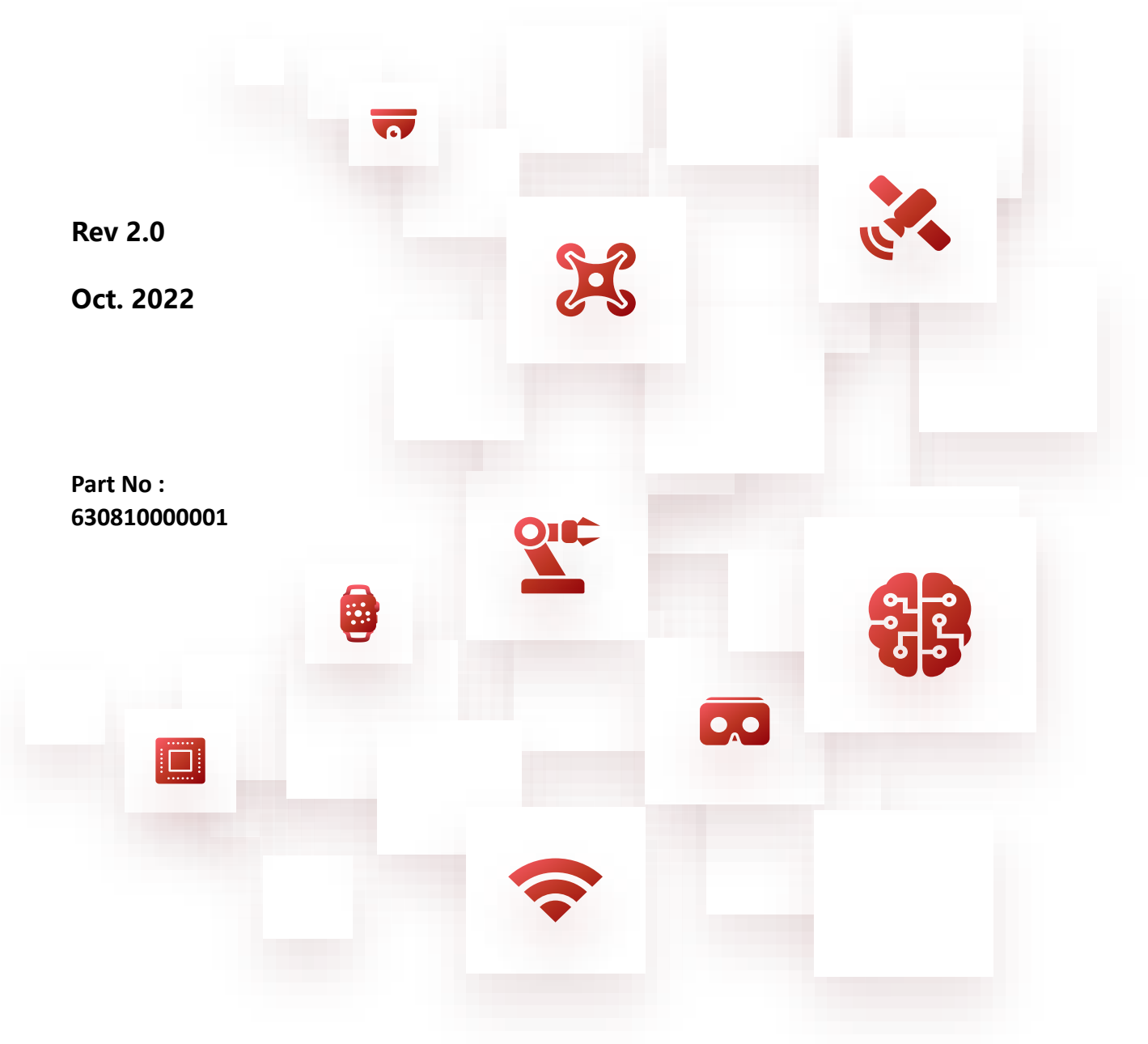
WIFI Tri-Band Antenna

Flexible Antenna Product Specification

Rev 2.0

Oct. 2022

Part No :
630810000001



CONTENTS

1.0 Scope

This Product Specification covers the mechanical, electrical and environmental performances specification for Tri-band WIFI 2.4G/5G/6G Flexible Antenna.

2.0 Product Description

2.1 Product name and Part Number

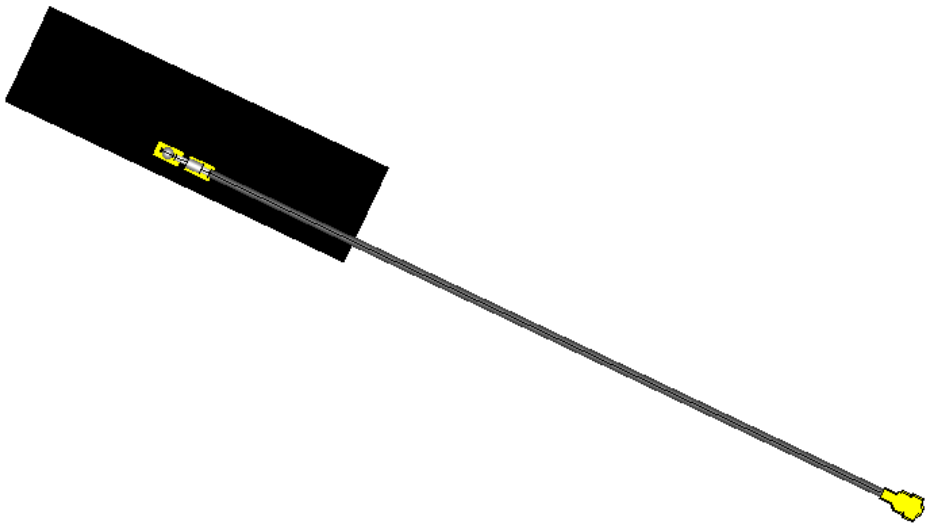
Product Name : Tri-band WIFI Flexible Antenna
Product Number : 630810000001

2.2 Description

Part of 630810000001 is a dipole and low profile flexible antenna for 2400~2500/5150~5900/5925~7125MHz band application.
It's made from Poly-flexible material, has a size form 46.5mm x 12.5mm x 0.15mm and has double-sided adhesive for "peel and stick" easy mounting. It was designed primarily for use with WIFI 5/6/6e modules and devices that require high efficiency and peak gain to deliver best in class throughput for access points, terminals, and routers.

2.3 Features

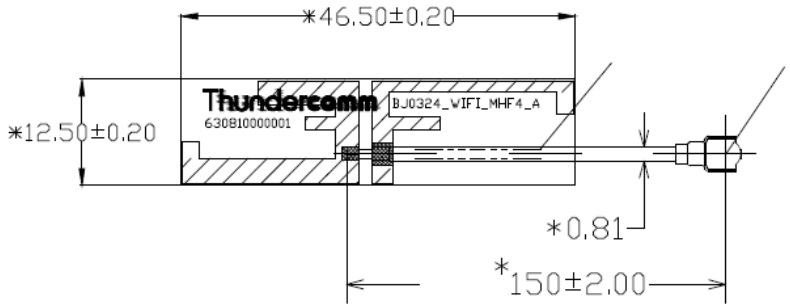
- 2400~2500/5150~5850/5925~7125MHz, Linear polarization
- Flex size 46.5 x 12.5 x 0.15mm (not contain thickness of solder area)
- I-PEX MHF 4 compatible connector
- Cable OD0.81mm, standard length of cable as 150mm
- RoHS Compliant

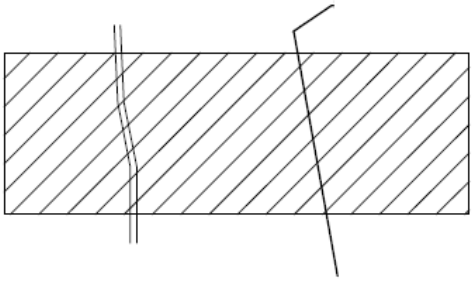


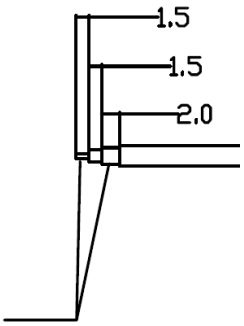
630810000001 Tri-band WIFI Flexible Antenna Module 3D View

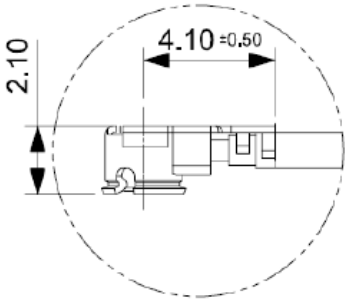
2.4 Product Structure Information

630810000001









2	G. 1. 22. L. 0047	BJ0324_WB_Cable	1	
1	G. 1. 11. L. 0163	BJ0324_WIFI_MHF4_FPC	1	
ITEM	PART NAME	DESCRIPTION	Q'TY	REMARK

3.0 General Specification

Product name	WIFI Tri-band Flexible Antenna		
Part number	630810000001		
Frequency	2400-2500 MHz	5150-5900 MHz	5925~7125 MHz
Polarization	Linear		
Operating with matching	-40℃ to 80℃		
Storage with matching	-40℃ to 80℃		
RF Power	2.0 Watts		
Impedance with matching	50 Ohms		
Antenna type	Dipole		
Connector type	I-PEX MHF 4 (Compatible)		
Cable diameter	Ø0.81mm		
Cable Length	150mm		

4.0 Antenna Performance

4.1 RF Test Conditions

All measurements are done of the antenna mounted on a polyfoam material block of 1.0cm thickness with VNA Agilent E5071C and Over-The-Air (OTA) chamber. All measurements in this document are done with a cable length of 150mm.

4.2 Antenna Performance

Description	**Equipment**	**Performance (150mm)**		
Frequency Range	VNA E5071C	2400-2500 MHz	5150-5900 MHz	5925~7125 MHz
Return Loss	VNA E5071C	<-18 dB	<-10 dB	<-6 dB
Peak Gain (Max)	OTA Chamber	2.5 dBi	2.6 dBi	2.6 dBi
Average Total Efficiency. (dB)	OTA Chamber	-2.2	-3.0	-2.9
Input Impedance	VNA E5071C	50 ohms		

Note that the above antenna performance is measured under a similar 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. The radiation pattern will change due to the surround components as well.

4.3 Antenna Gain of Bands

Band	Frequency Range	Peak Gain (dBi)
WIFI 2.4G	2400~2500MHz	2.5
WIFI 5.0G	5150~5250MHz	2.1
	5250~5350MHz	2
	5350~5450MHz	2.6
	5450~5725MHz	2.6
	5725~5850MHz	2.2
	5850~5900MHz	2.3
WIFI 6.0G	5925~6125MHz	2.3
	6125~6325MHz	2.6
	6325~6525MHz	2.4
	6525~6725MHz	2.1
	6725~6925MHz	1.5
	6925~7125MHz	1.2

4.4 Return Loss Plot

All measurements in this document are done with cable length of 150mm.

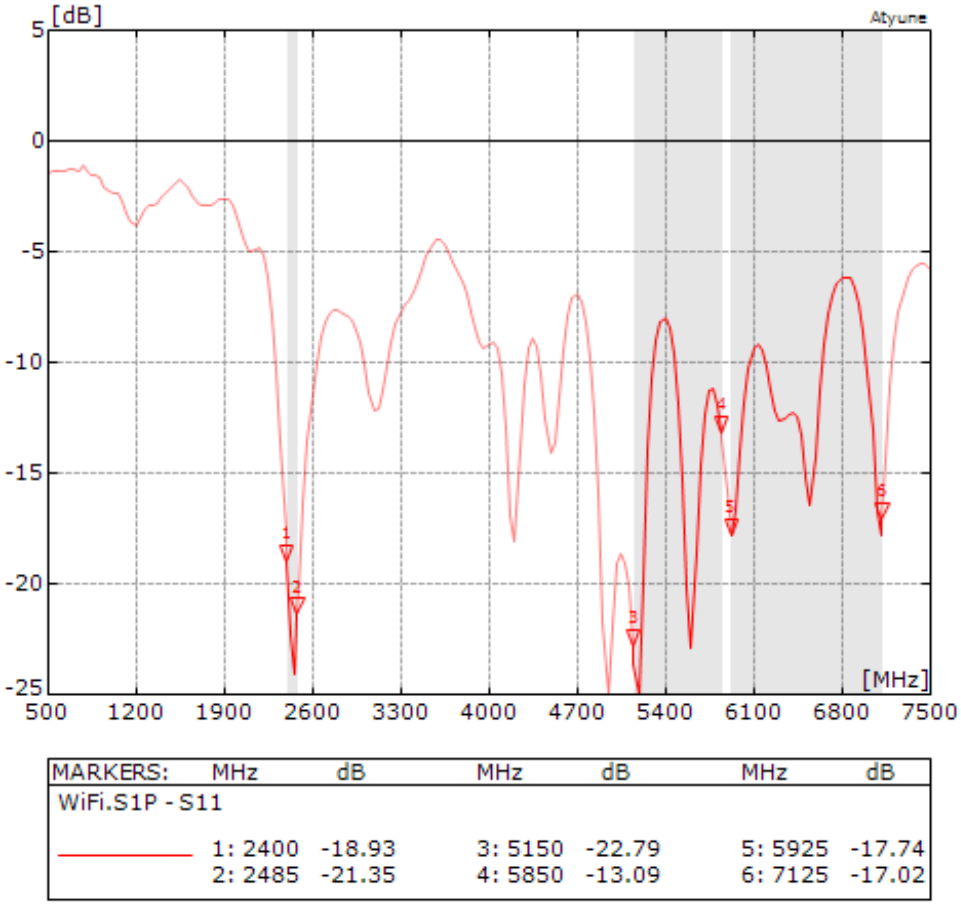


Figure 4.4.1 Return Loss of Antenna In Free Space

4.5 Efficiency Plot

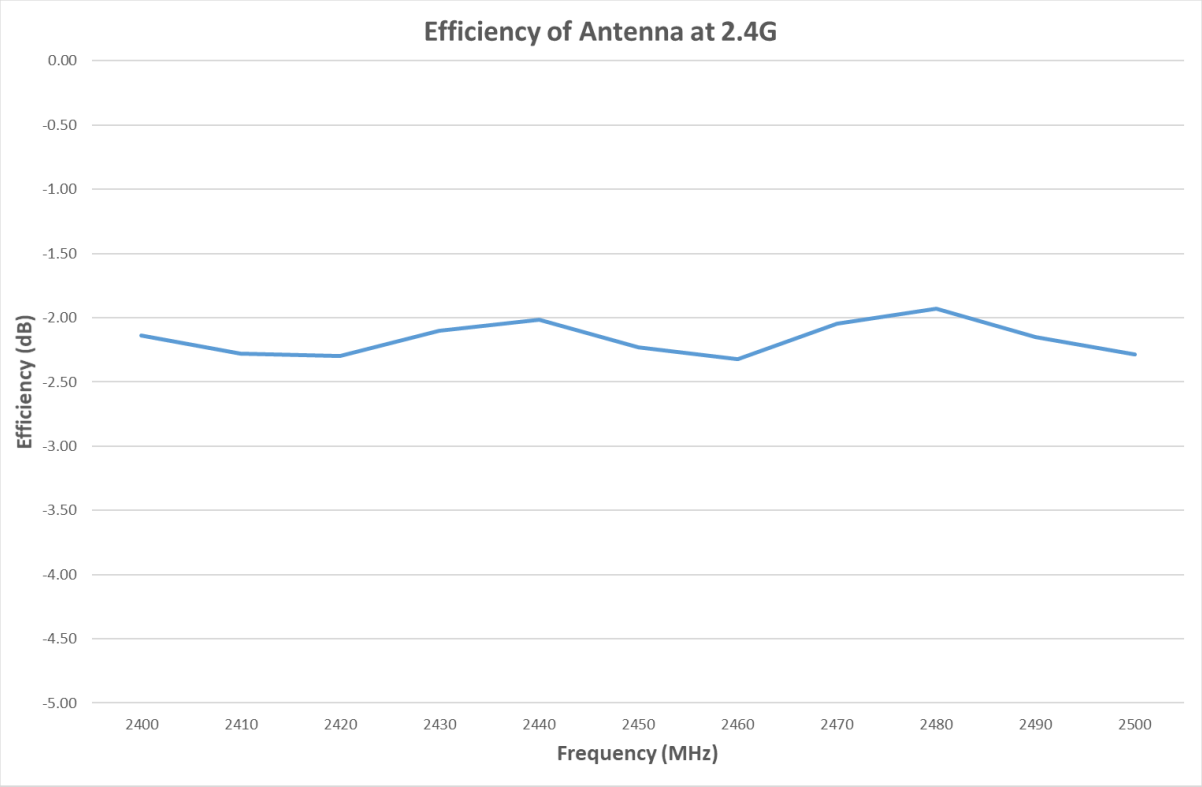


Figure 4.5.1 Efficiency of Antenna at 2400-2500MHz In Free Space

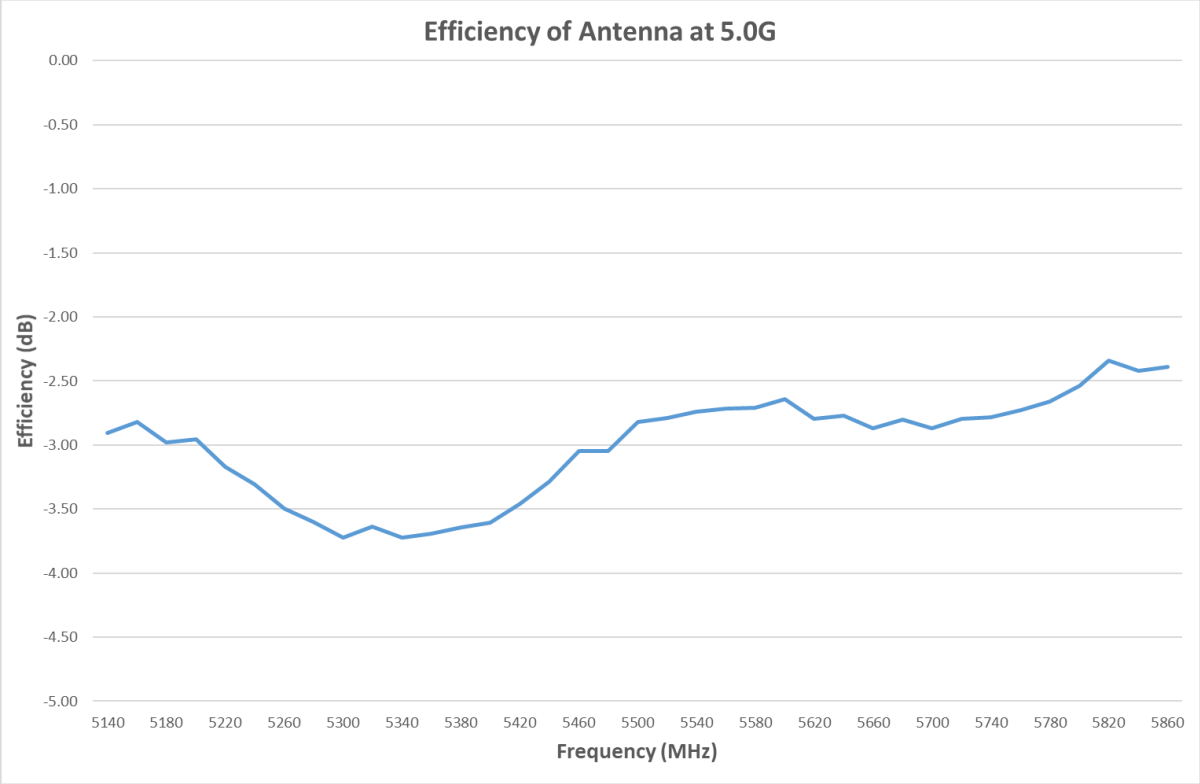


Figure 4.5.2 Efficiency of Antenna at 5150-5850MHz In Free Space

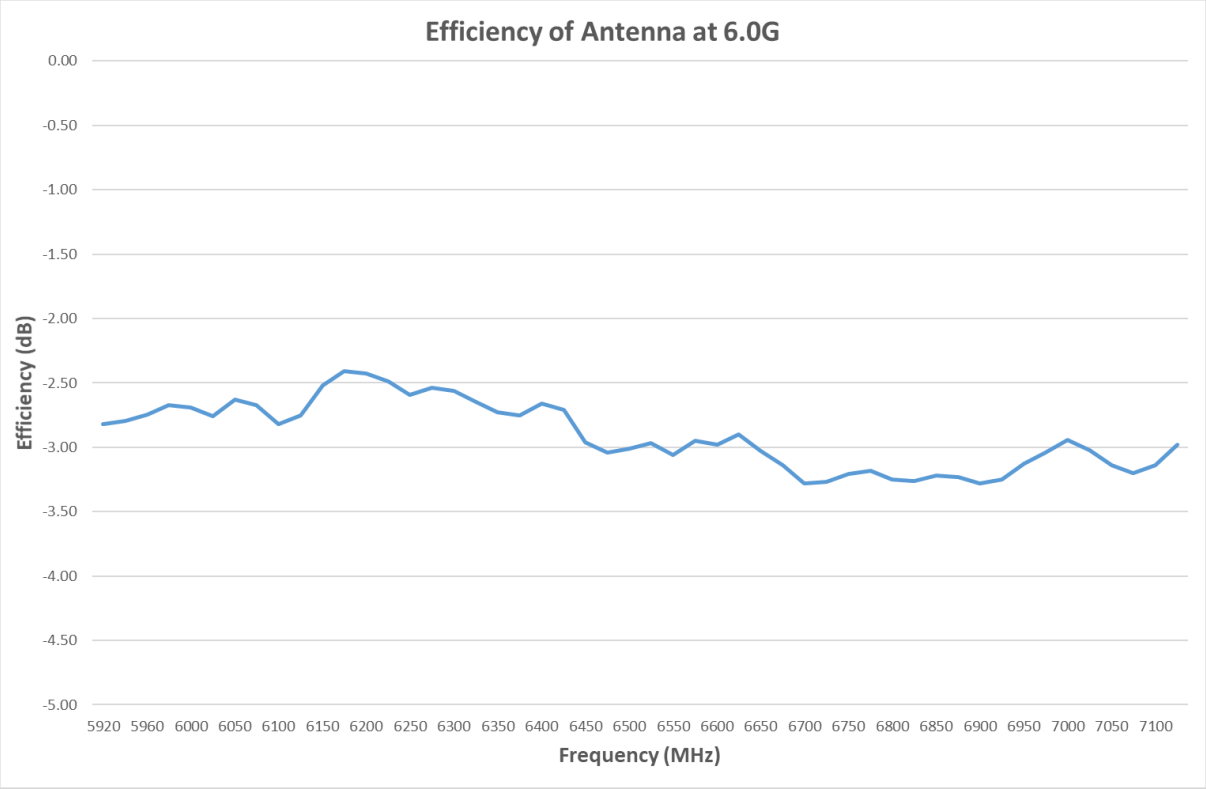
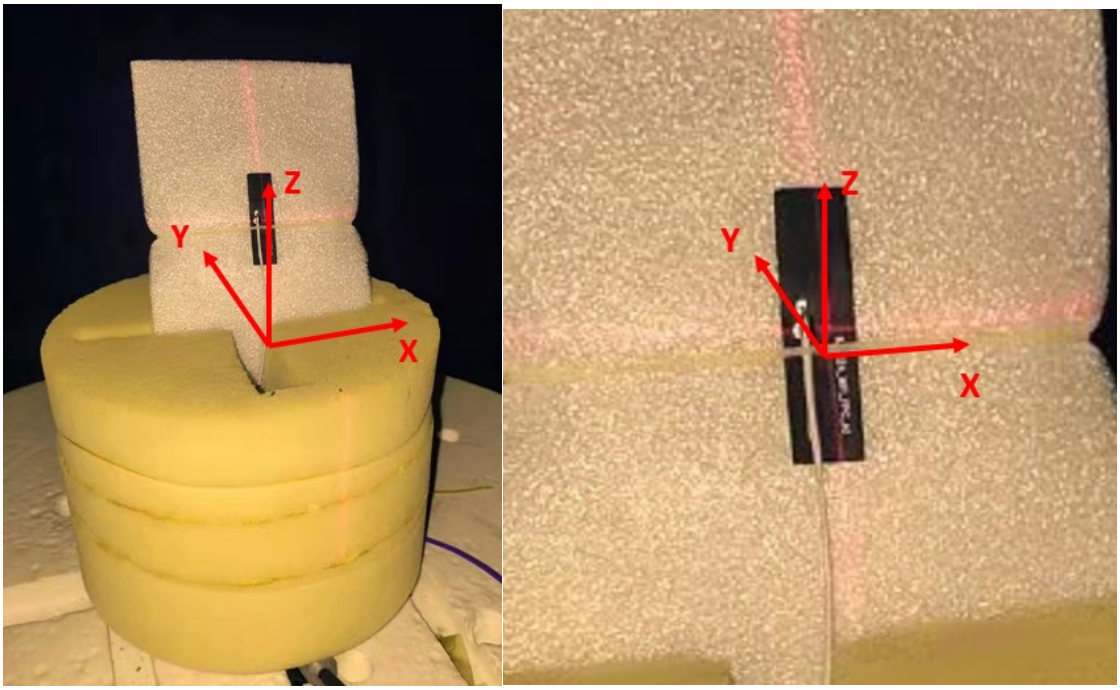


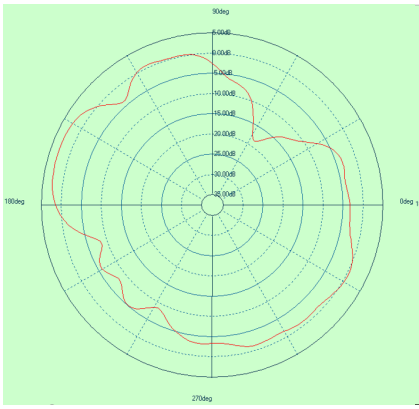
Figure 4.5.3 Efficiency of Antenna at 5920-7125MHz In Free Space

4.6 2D Radiation Pattern

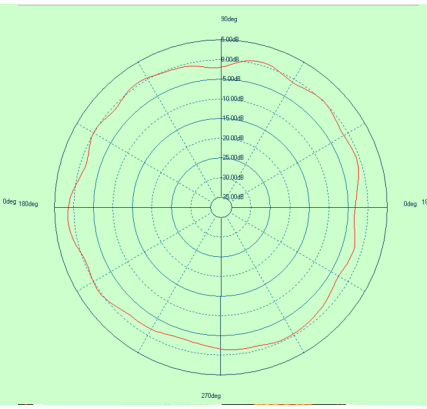
Test condition:



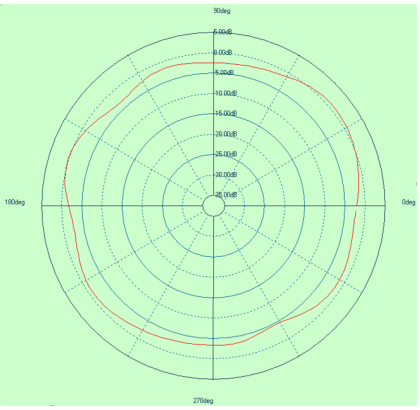
Y-Z 2440MHz



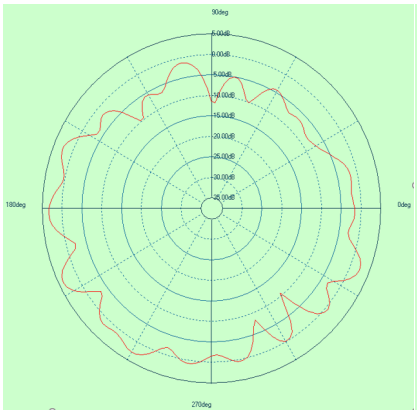
X-Z 2440MHz



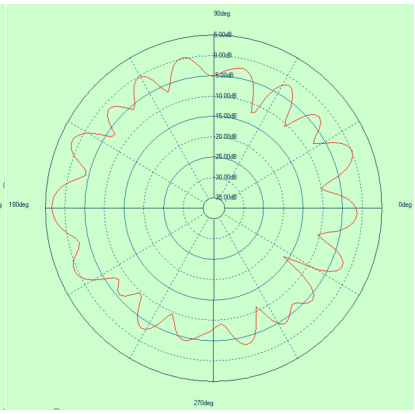
X-Y 2440MHz



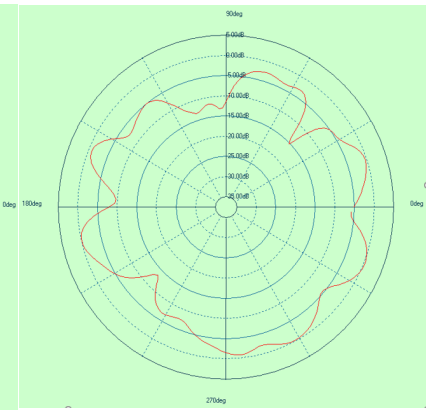
Y-Z 5150MHz



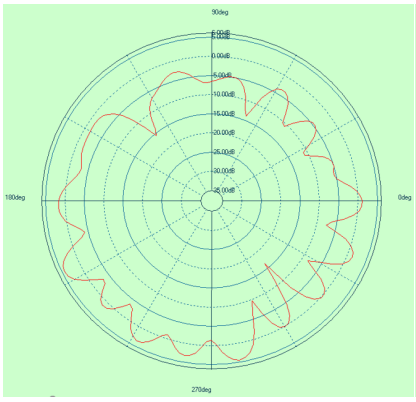
X-Z 5150MHz



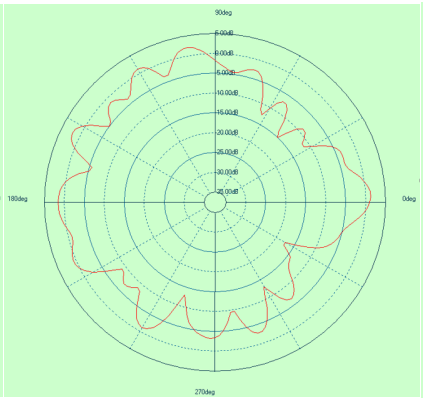
X-Y 5150MHz



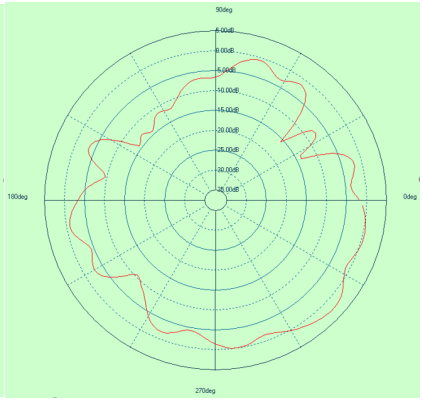
Y-Z 5500MHz



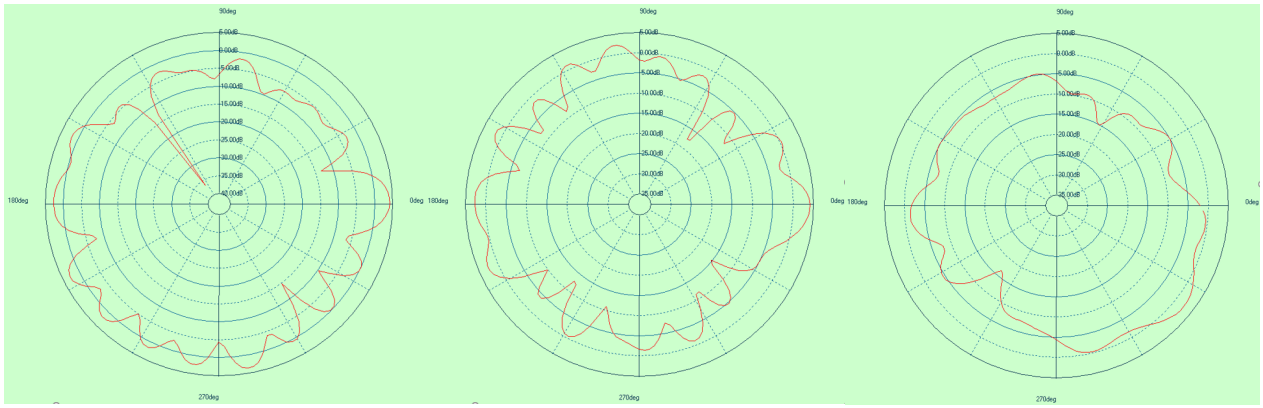
X-Z 5500MHz



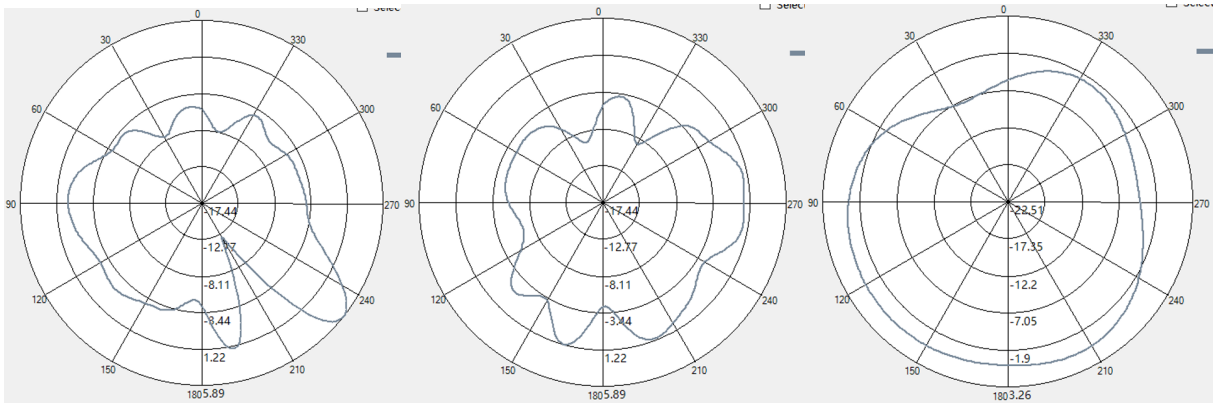
X-Y 5500MHz



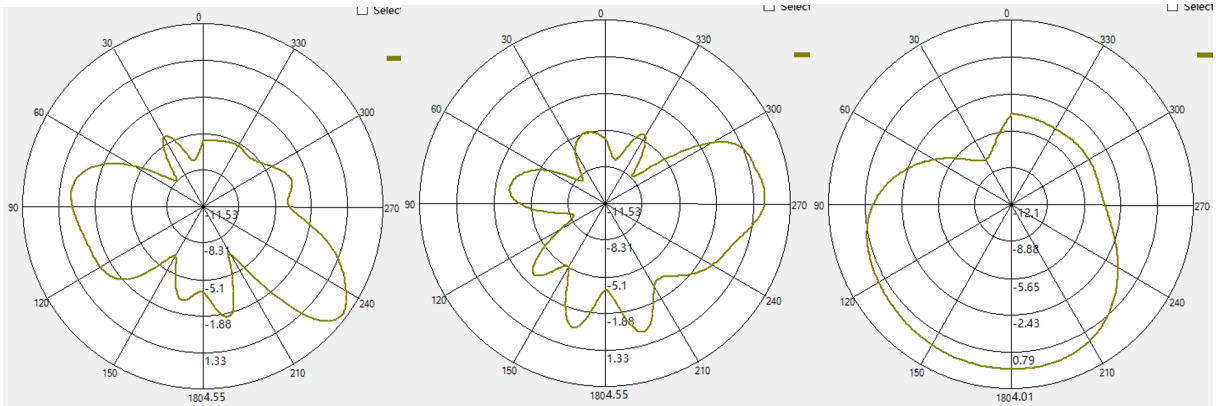
Y-Z 5850MHz **X-Z 5850MHz** **X-Y 5850MHz**



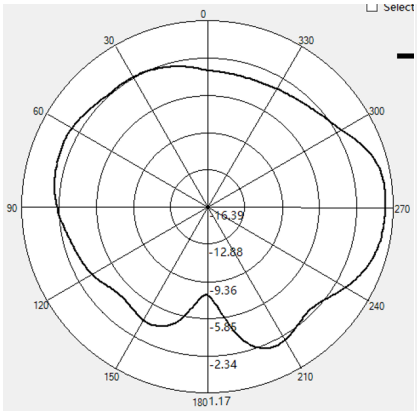
Y-Z 6000MHz **X-Z 6000MHz** **X-Y 6000MHz**



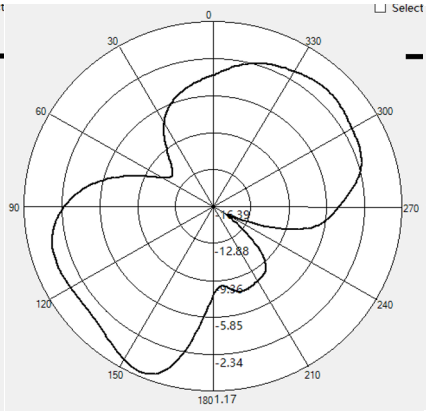
Y-Z 6500MHz **X-Z 6500MHz** **X-Y 6500MHz**



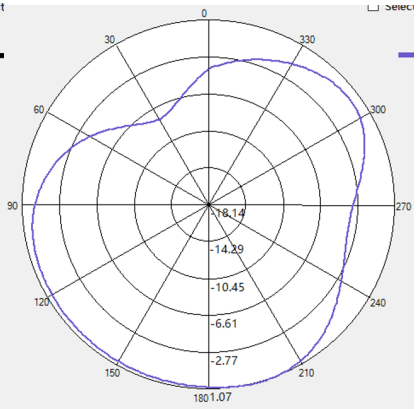
Y-Z 7125MHz



X-Z 7125MHz

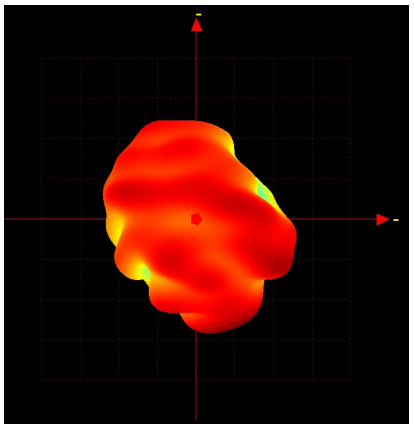


X-Y 7125MHz

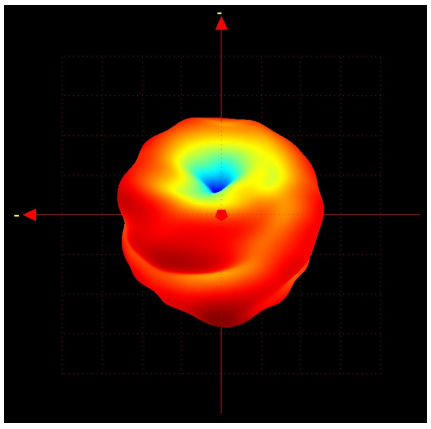


4.7 3D Radiation Pattern

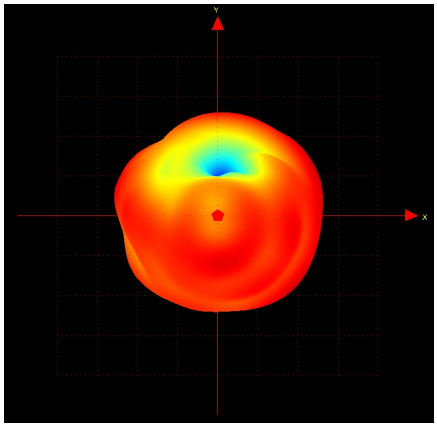
X 2440MHz



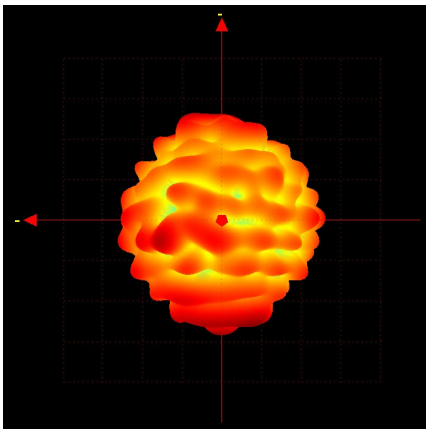
Y 2440MHz



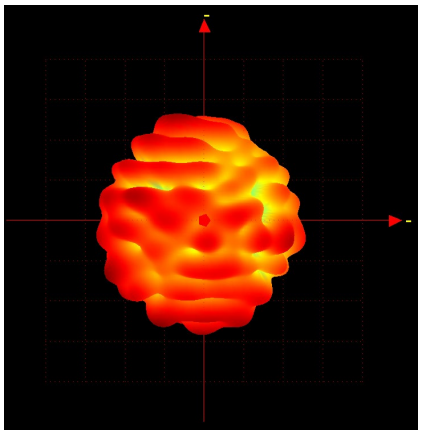
Z 2440MHz



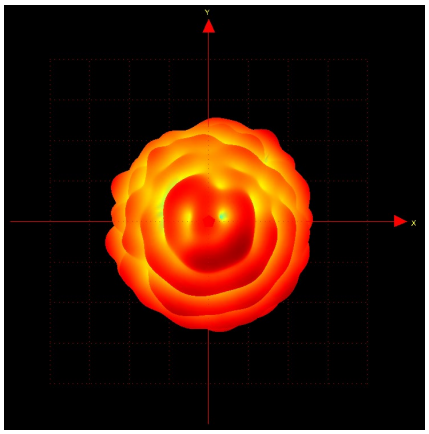
X 5150MHz



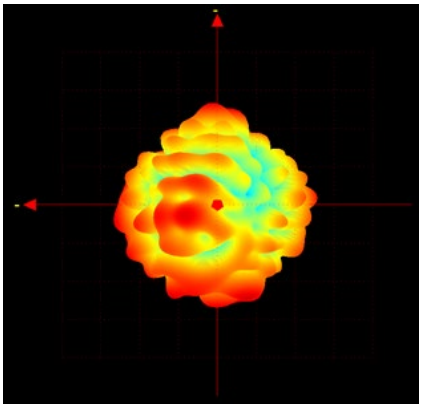
Y 5150MHz



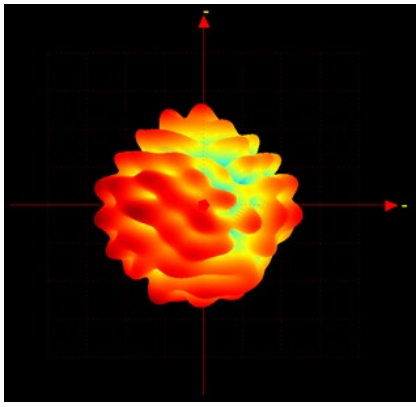
Z 5150MHz



X 5500MHz



Y 5500MHz



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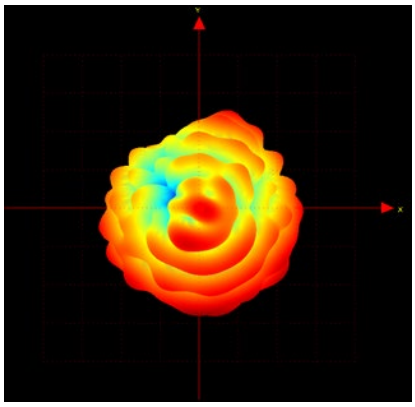
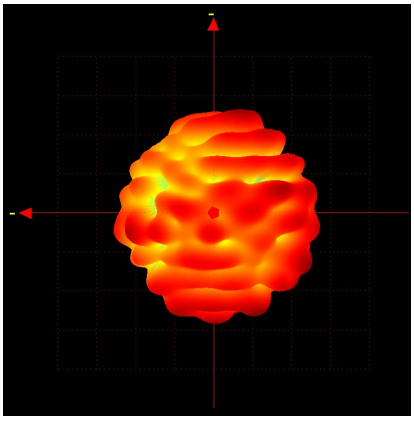
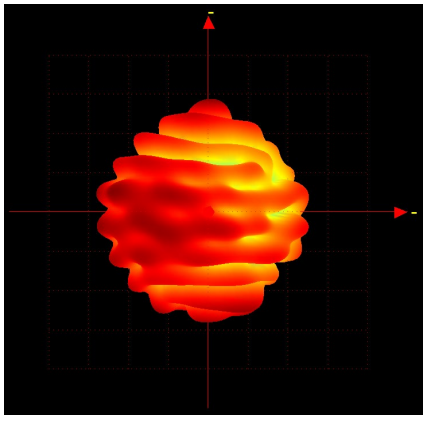


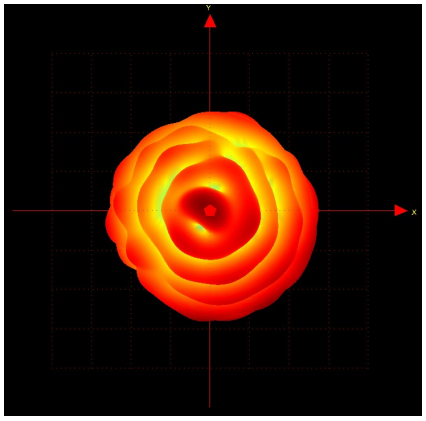
X 5850MHz



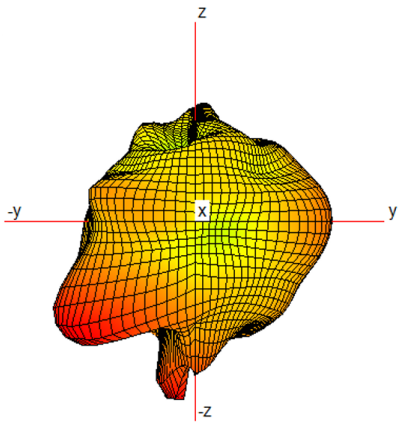
Y 5850MHz



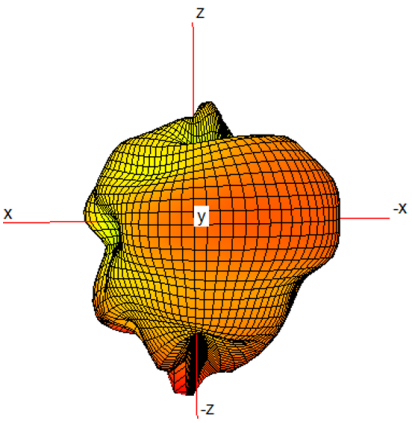
Z 5850MHz



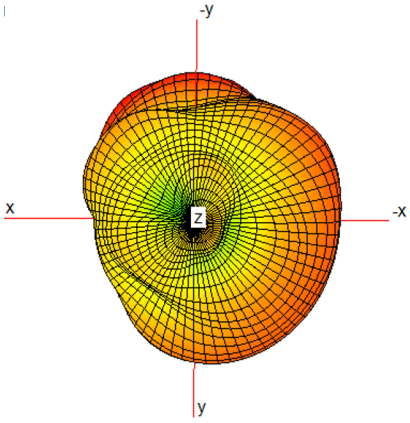
X 6000MHz

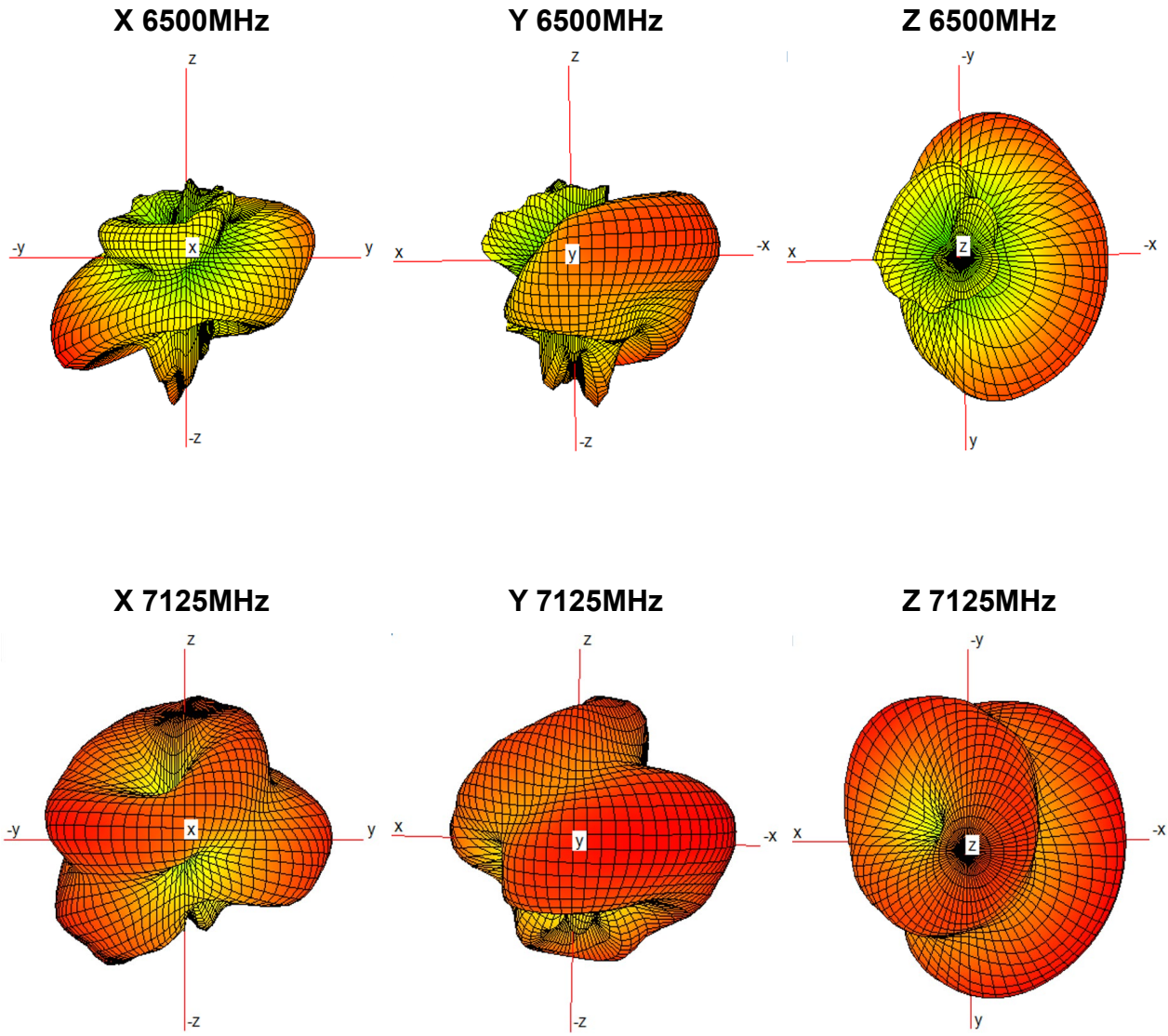


Y 6000MHz



Z 6000MHz





5.0 Mechanical Specification

Description	Test Condition	Test Result
Pull Test	1, Test machine: Max intelligent load tester 2, Stick the flex antenna on aplastic board, pull cable in axial direction.	Pull force >8N
Un-mating force (connector)	Solder the receptacle connector to the test board ,then place the board and plug on push-on/pull-off machine, and repeat mating and un-mating 30 cycles at a speed 25±3mm/min. along the mating axis.	Un-mating force : 0.5 kgf min

6.0 Environmental Specification

Description	Specification
Temperature /Humidity cycling	1. The device under test is kept for 30 Min. in an environment with a temperature of -40 ℃. 2. Kept for 4 Hours in an environment with a temperature of 85 degrees and a relative humidity of 95%. 3. Kept for 2 Hours in an environment with a temperature of 125 degrees and a relative humidity of 95%. 4. The cycle is repeated until a total of 40 cycles have been completed. Hereafter the conditions are stabilized at room temperature. Transfer temperature 8℃ per min. 5. Parts should meet RF spec before and after test. 6. No cosmetic problem (No soldering problem; No adhesion problem of glue.)
Temperature Shock	1. The device under test at -40 ℃ ⇔ 80 ℃ by 100 cycles, Dwell of 30 Min., transition time between Dwell 30 Sec. (~ 61 Min. / cycle) and each item should be measured after exposing them in normal temperature and humidity for 24 Hour. 2. Parts should meet RF spec before and after test. 3. No cosmetic problem (No soldering problem; No adhesion problem of glue.)
High Temperature	1. Temperature:80℃, time:48 hours 2. There is no substantial obstruction to air flow across and around the samples, and the samples are not touching each other. 3. Parts should meet RF spec before and after test. 4. No cosmetic problem (No soldering problem; No adhesion problem of glue.)
Salt mist test	1. The device under test is exposed to a spray of a 5% (by volume) resolution of NACL in water for 2 hours. Thereafter the device under test is left for 1 week in room temperature at a relative humidity of 95%. The cycle is repeated until a total of 2 cycles have been completed. Here after the conditions are stabilized at room temperature. 2. Parts should meet RF spec before and after test. 3. No visible corrosion. Discoloration accept.

Revision History

Revision	Date	Description
1.0	March.22 2022	First Release
2.0	October.10.2022	Update with Antenna Gain of Bands

Thundercomm

Empowering Every IoT Device with Our Technology

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