

SPECIFICATION

- Part No.** : **TLS.01.1F21**
- Description** : Shockwave 698~960/1575.42/1710~2700MHz
Permanent Mount External Antenna
N Type(F) connector
- Features** : Applicable for 2G/3G/4G cellular bands and GPS
Over 60% efficiency and 2.5 dBi gain
Mechanically robust for indoor/outdoor applications
Height: 79.45mm(3.13") ; Diameter : 42mm(1.65")
IP67 and IP69K Waterproof
N type(F) connector
RoHS compliant



1. Introduction

The Shockwave TLS.01.1F21 is a permanent mount, waterproof, external 2G/3G/4G cellular and GPS antenna operating at 698-960/1575.42/1710-2700MHz with an N type male connector. It has been designed to be used on a Ground Plane. It can be used in mobile and fixed applications for 4G LTE wireless such as :

- Public safety
- HD Video Streaming
- Utilities and Smart Cities
- Fleet Management
- Agricultural
- Industrial

This antenna has superior performance over wide-bands compared to traditional whip antennas. Up to 90% efficiency and with an minimum 2.5dBi peak gain over all cellular bands result when mounted on a 30x30 cm ground plane. Stable radiation patterns over low angles provides consistent gain in the horizontal plane, meaning that it is especially suitable for cellular applications.

A unique indent tab on the base of the antenna allows a wrench to be used to solidly lock the antenna on top of its mounting location while tightening up the nut beneath the metal panel. Waterproof O-rings around the bottom base prevent water from leaking under the antenna.

The TLS.01 antenna is IP67 waterproof and IP69K resistant against high pressure water jets in commercial cleaning environments, which makes the antenna ideal for 2G/3G/4G applications either in indoor or in harsh outdoor environments.

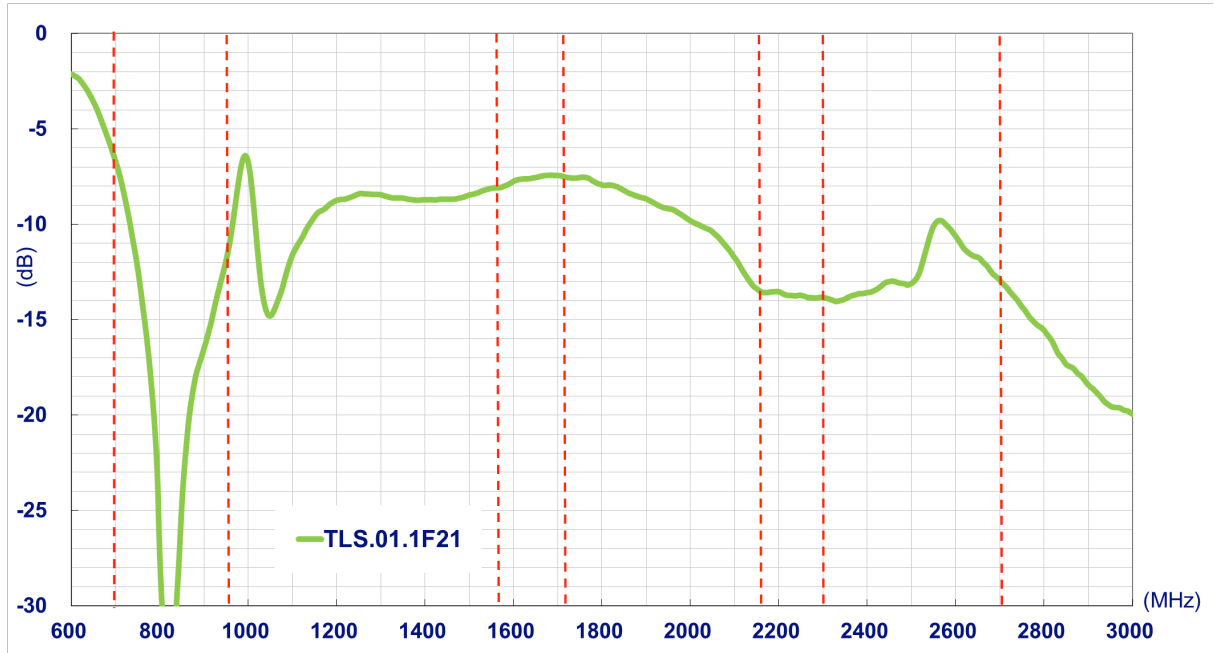
2. Specification

ELECTRICAL								
Operation Bands	LTE	GSM850	GSM900	GPS	DCS	PCS	WCDMA I	LTE
Frequency (MHz)	698~803	824~896	880~960	1575.4 2	1710~ 1880	1850~ 1990	1920~2 170	2300~2 700
Efficiency (%)	95.23	91.09	90.25	64.30	79.33	80.60	77.36	69.64
Peak Gain (dBi)	3.21	3.40	3.44	0.95	3.89	3.60	3.37	4.78
Average Gain (dBi)	-0.21	-0.40	-0.44	-1.91	-1.01	-0.94	-1.13	-1.64
Return Loss (dB)	<-6	<-10	<-10	<-7	<-7	<-7	<-8	<-9
Impedance	50 Ω							
Polarization	Vertical							
Radiation Property	Omni-Directional							
Max Input Power	100W							
MECHANICAL								
Dimension (mm)	Height: 79.45mm(3.13") ; Diameter : 42mm(1.65")							
Connector	N type (F)							
Material	Housing : UV Resistant ABS , Base : Nickel Plated Zinc Alloy							
Weight (g)	169							
Rec. Torque for Mounting	4.018 N.m							
Max. Torque for Mounting	9.8 N.m							
ENVIRONMENTAL								
Waterproof Rating	IP67 and IP69K							
Operation Temperature	-40°C to 85°C							
Humidity	Non-condensing 65°C 95% RH							

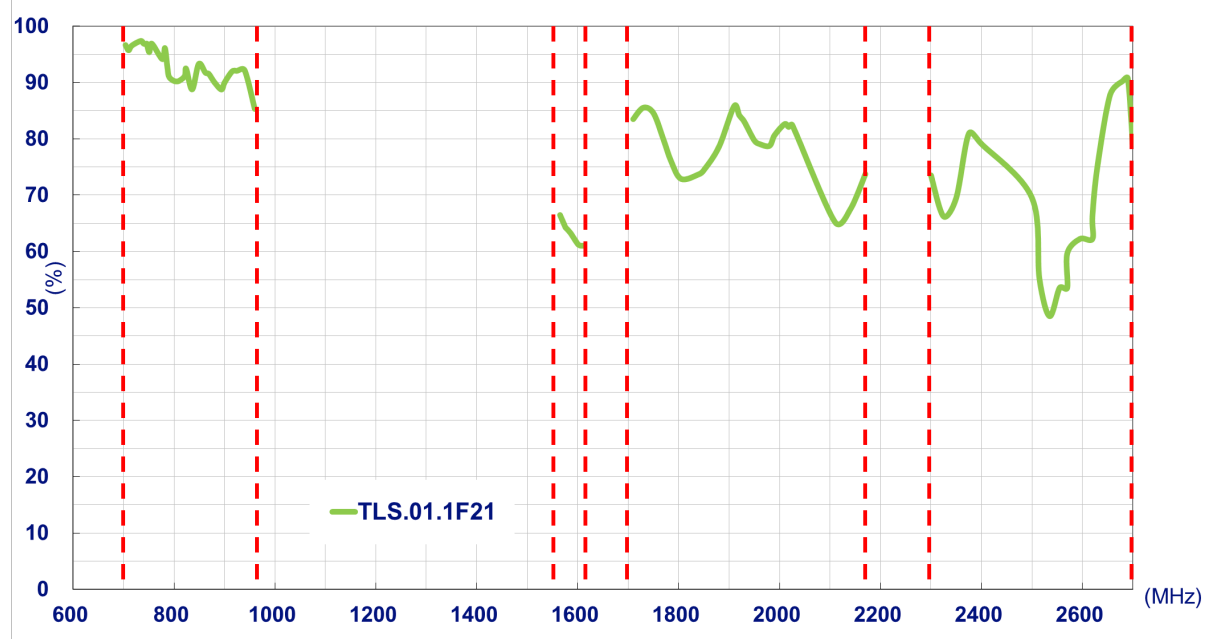
- The antenna performance was measured on a 30cm*30cm ground plane.

3. Antenna Characteristics

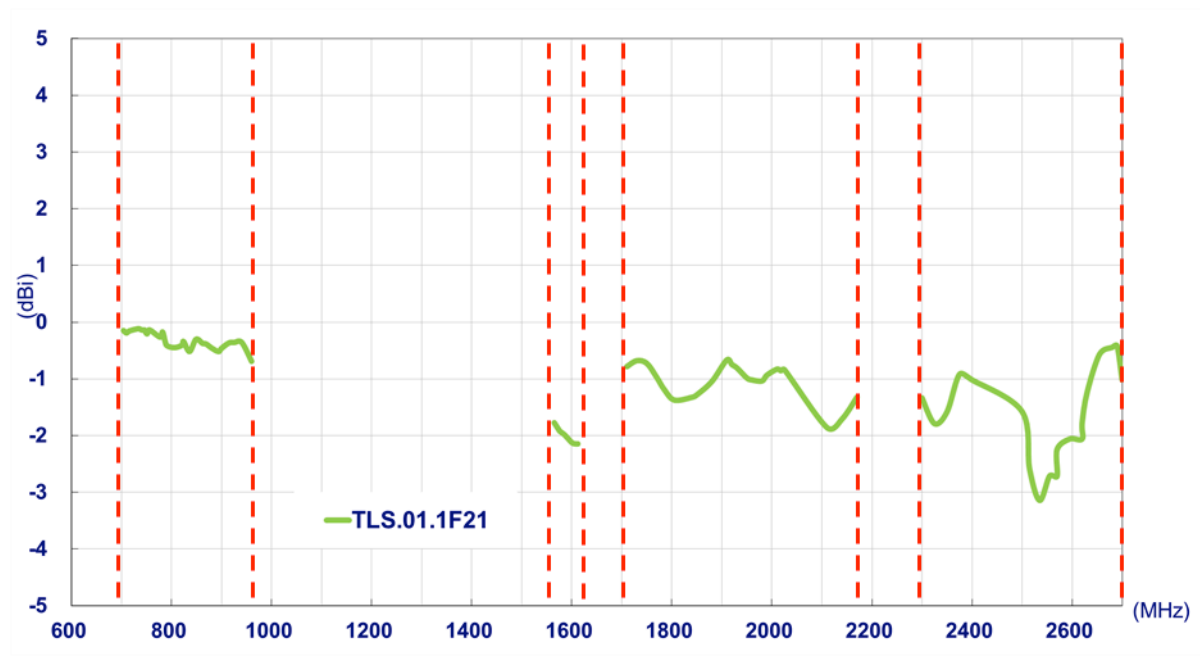
3.1. Return Loss



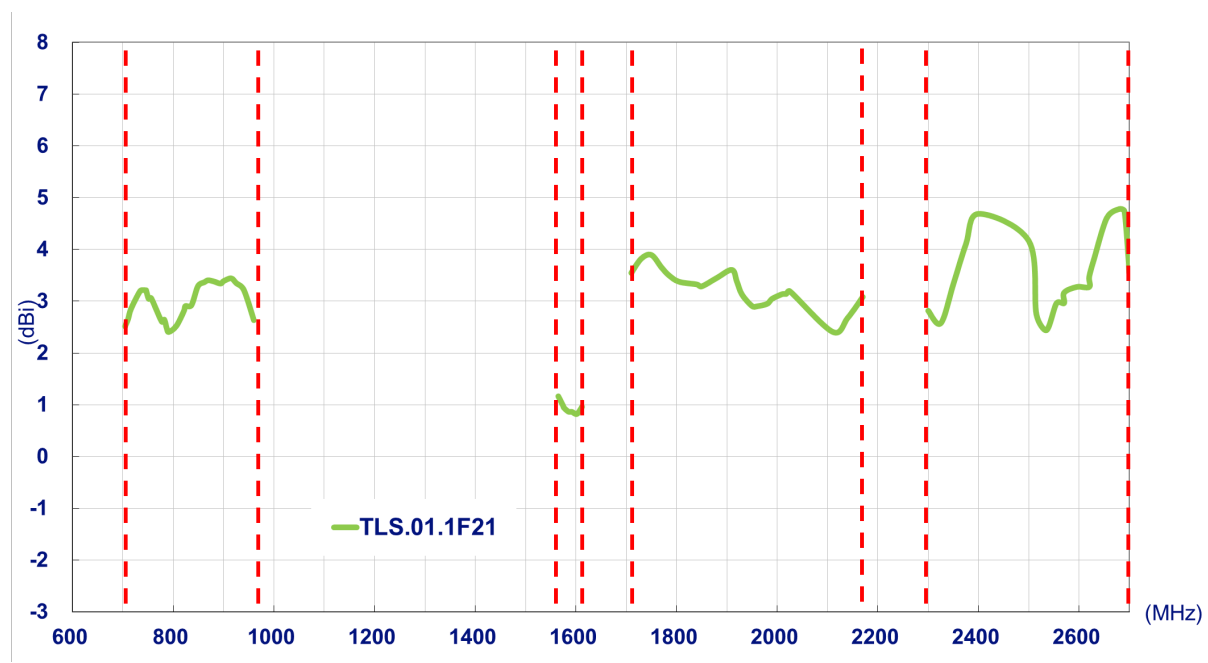
3.2. Efficiency



3.3. Average Gain



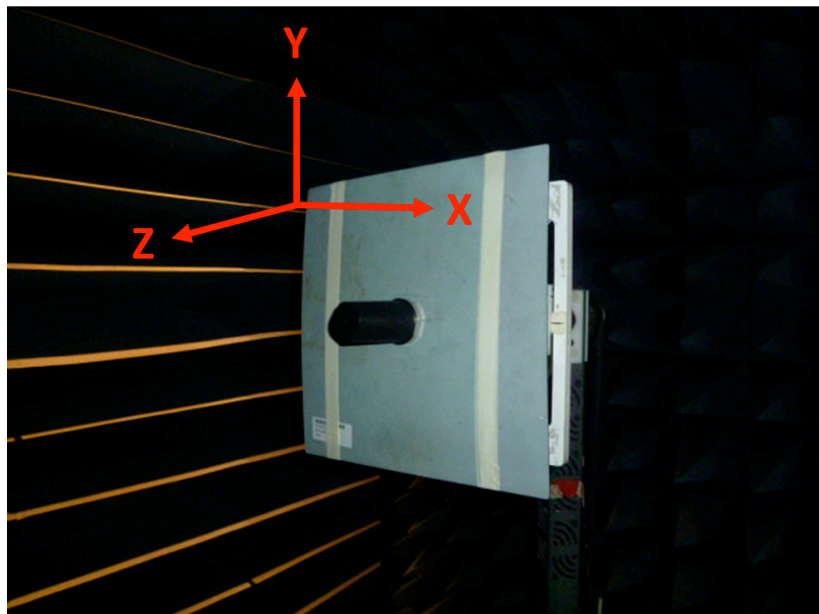
3.4. Peak Gain



4. Antenna Radiation Pattern

4.1. Measurement Setup

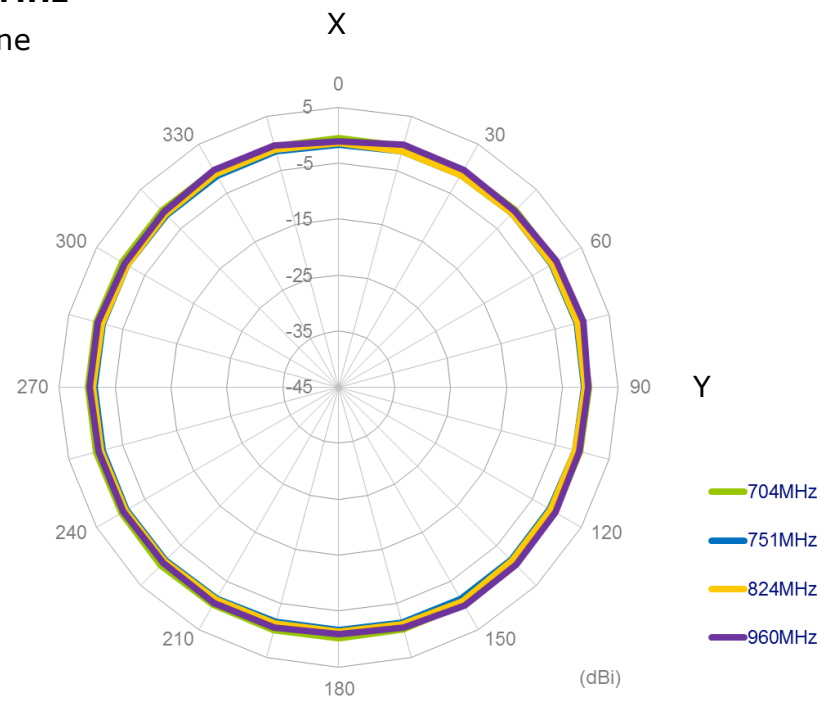
The TLS.01 antenna is tested in a CTIA certified ETS-Lindgren Anechoic Chamber. The test setup is shown below.



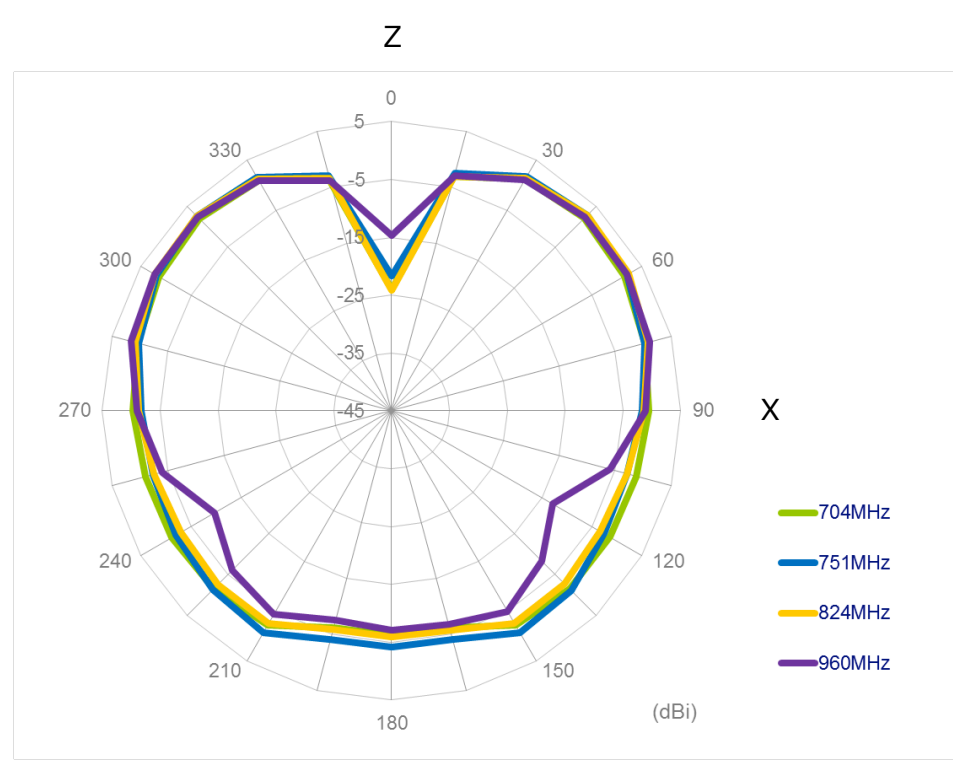
4.2. 2D Radiation Pattern

698-960MHz

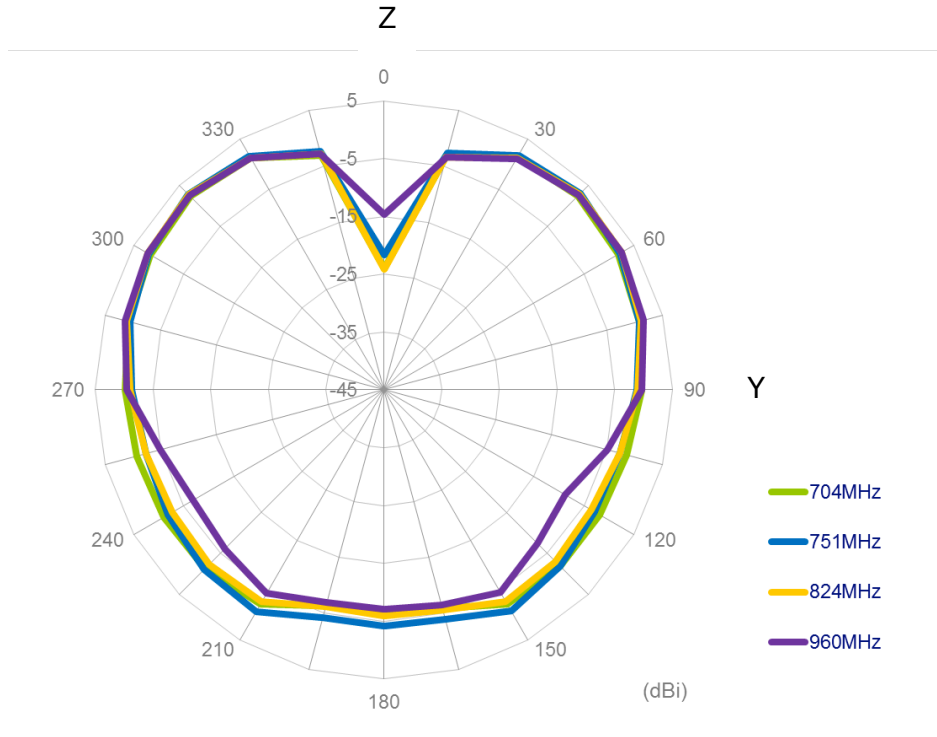
XY Plane



XZ Plane

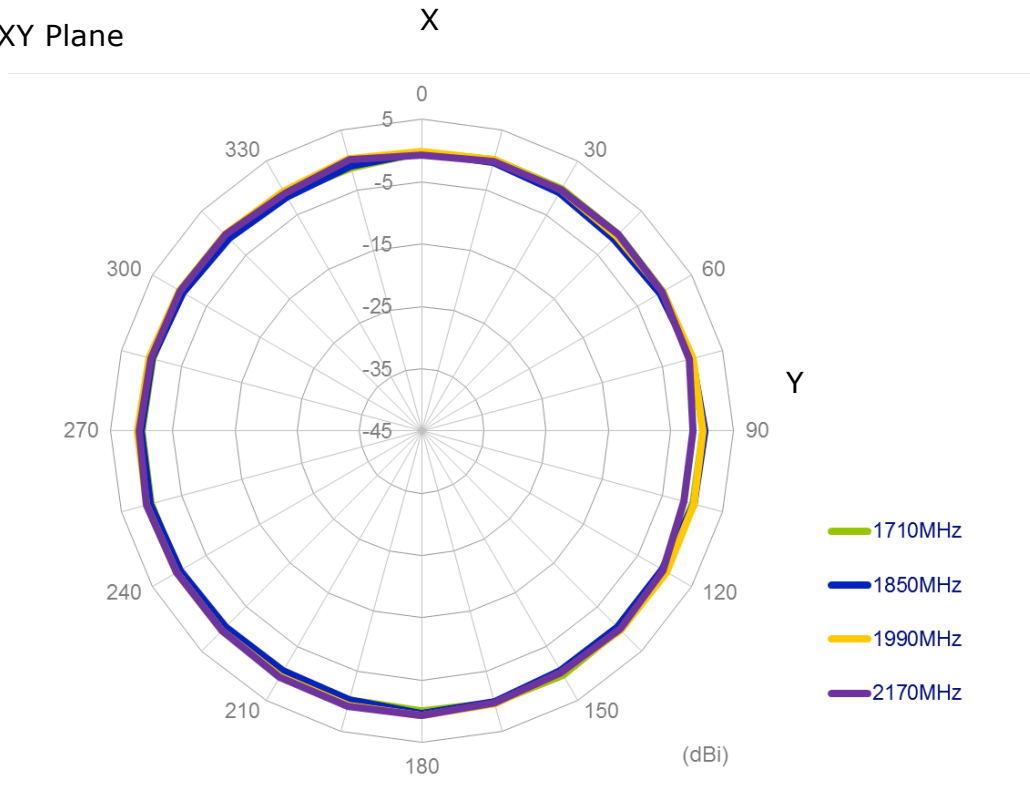


YZ Plane

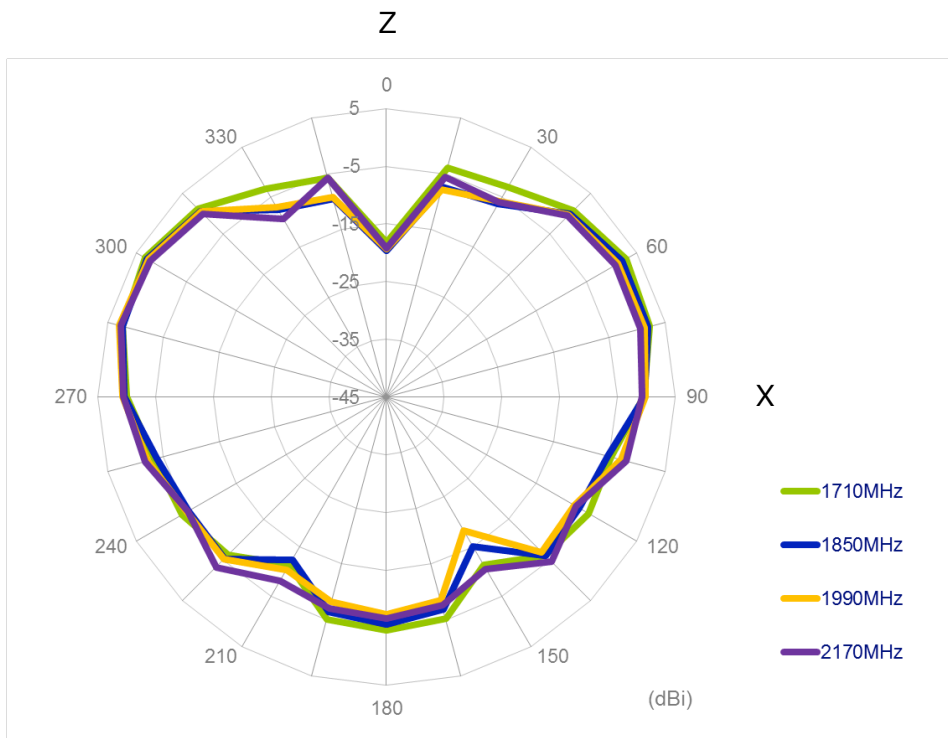


1710-2170MHz

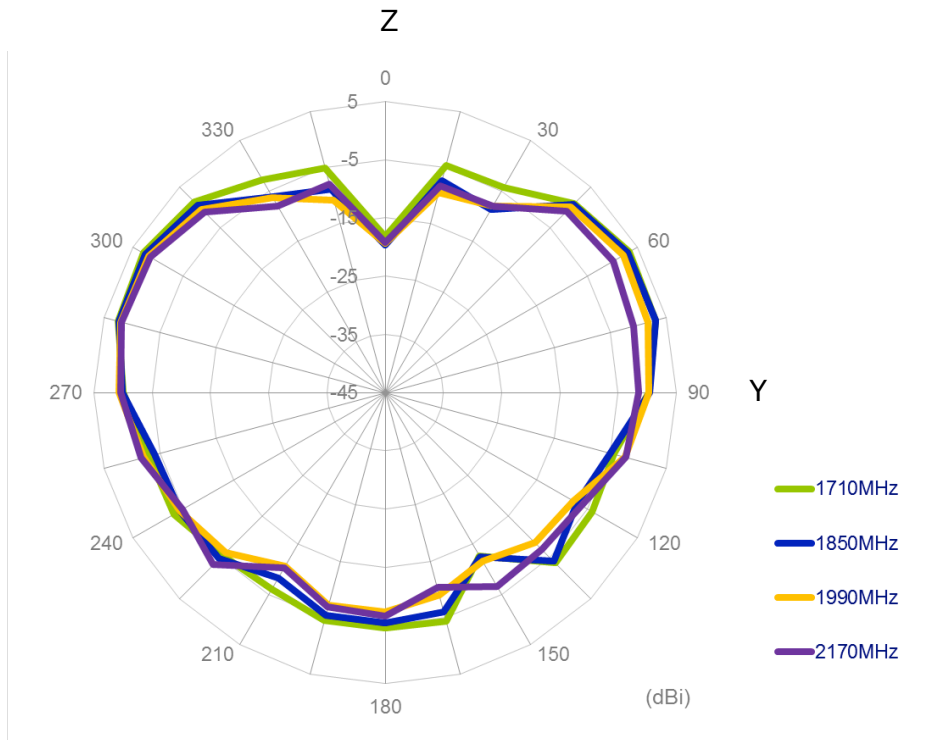
XY Plane



XZ Plane

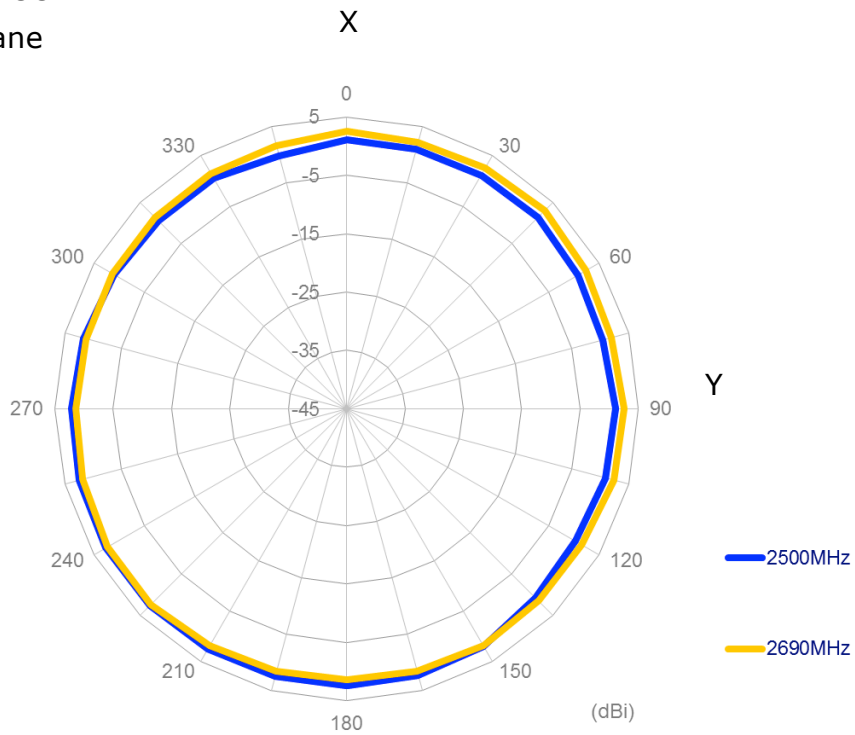


YZ Plane

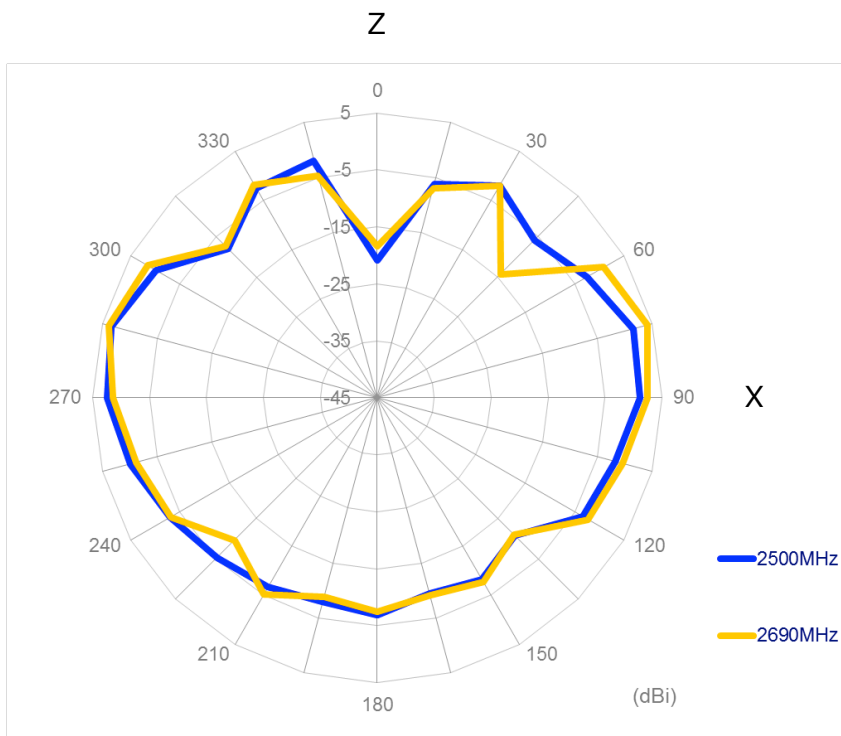


2300-2700MHz

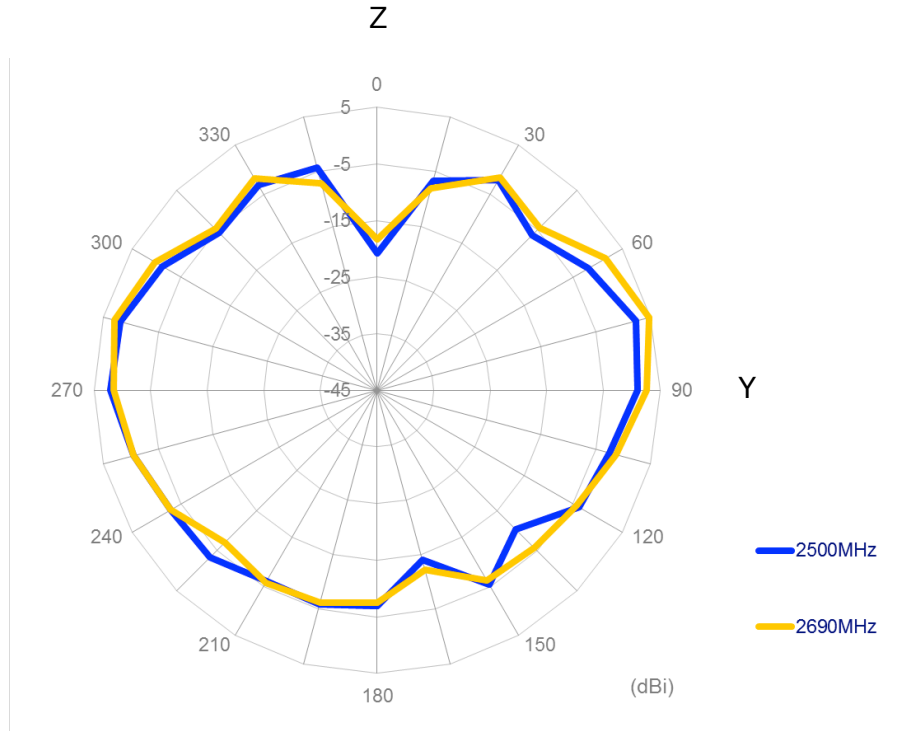
XY Plane



XZ Plane

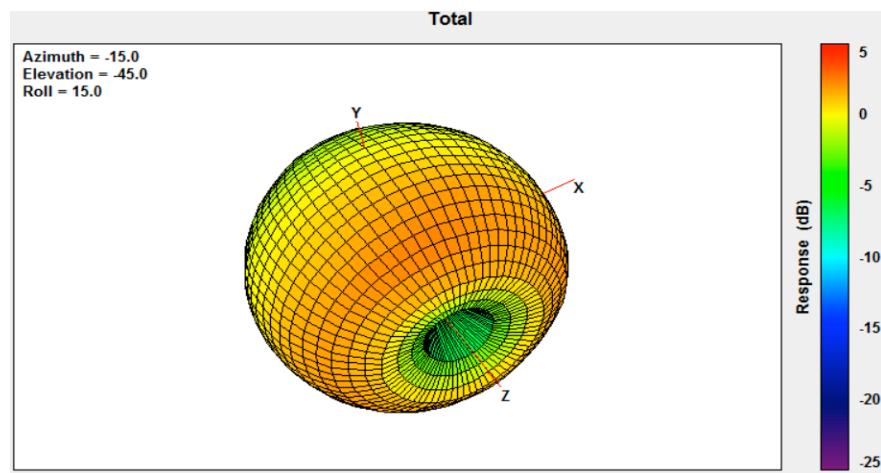


YZ Plane

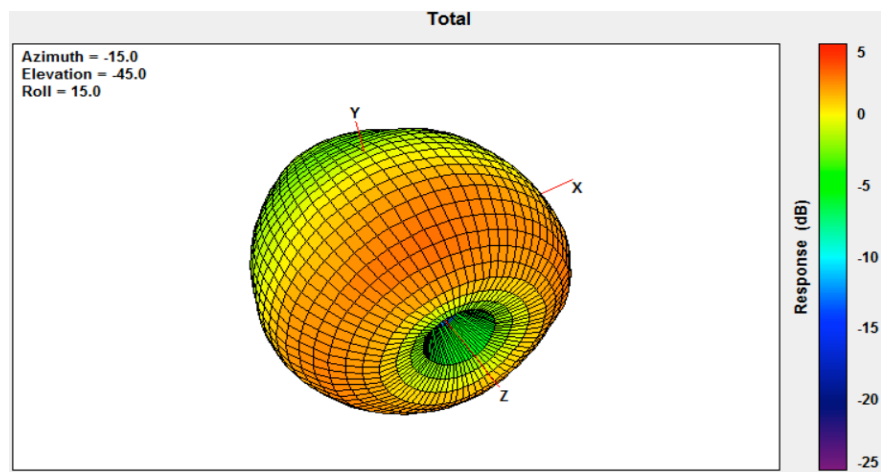


4.3. 3D Radiation Pattern

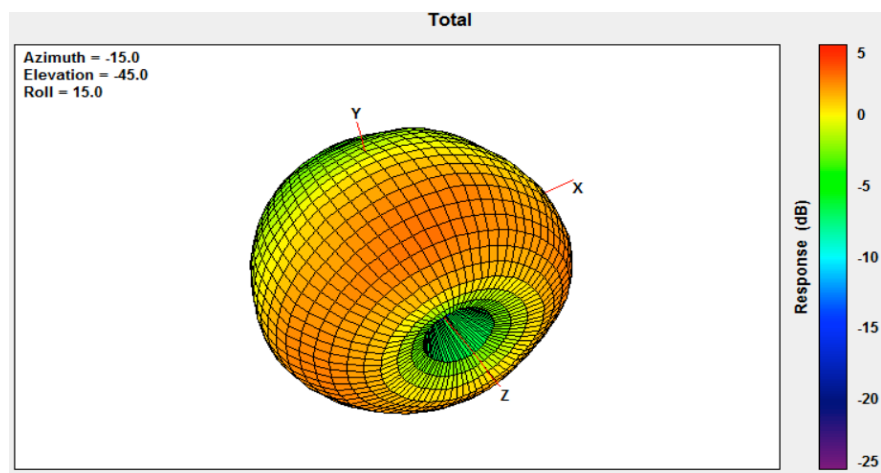
@704MHz



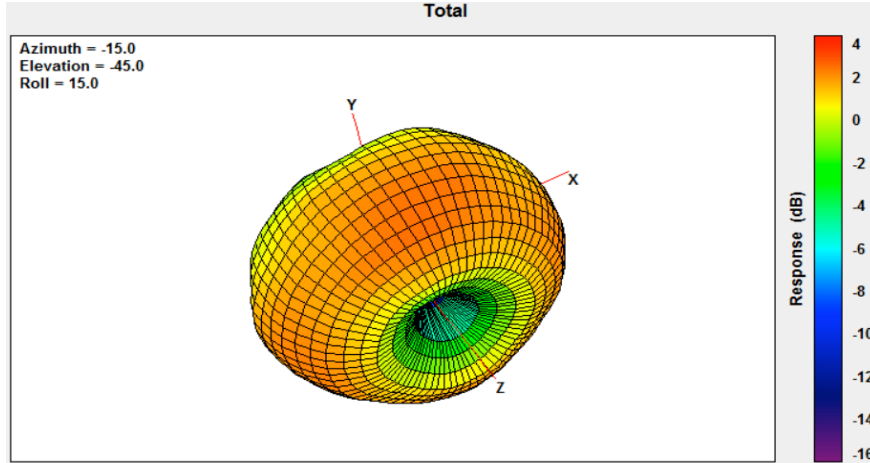
@751MHz



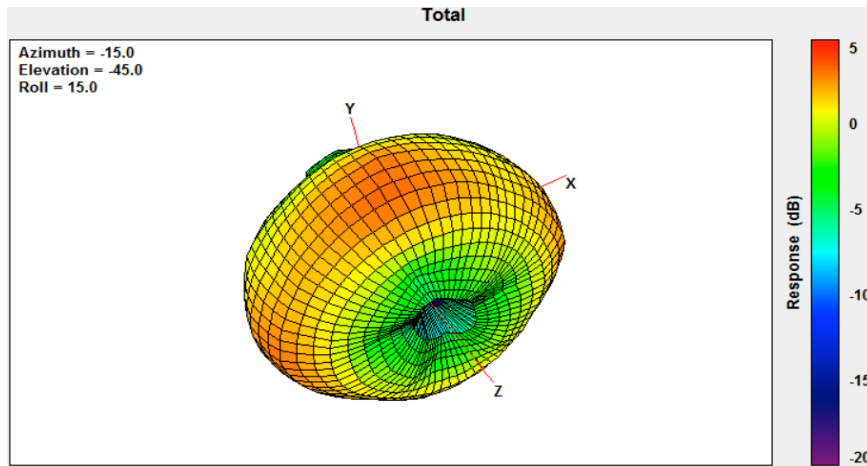
@824MHz



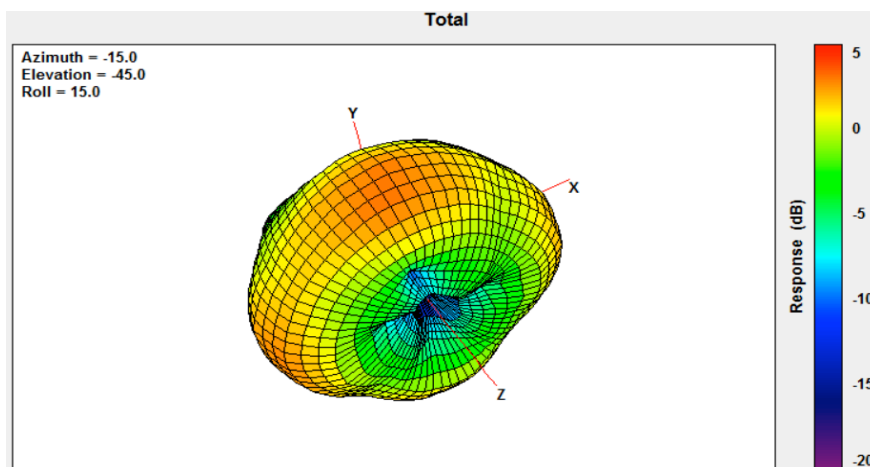
@960MHz



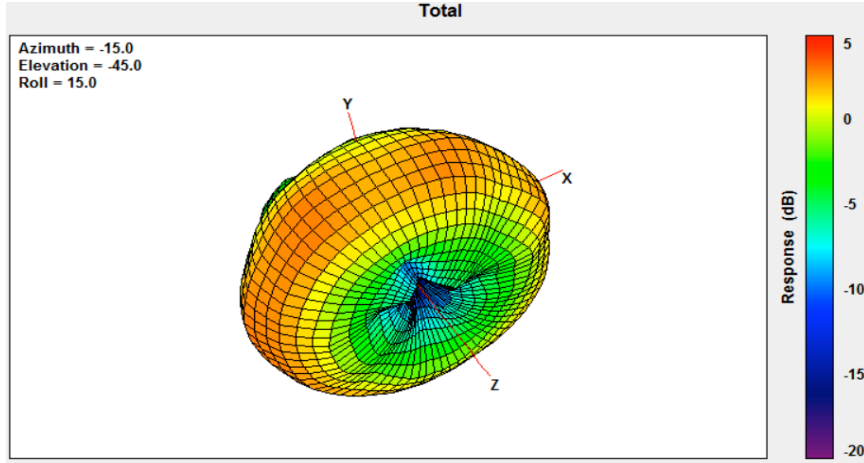
@1710MHz



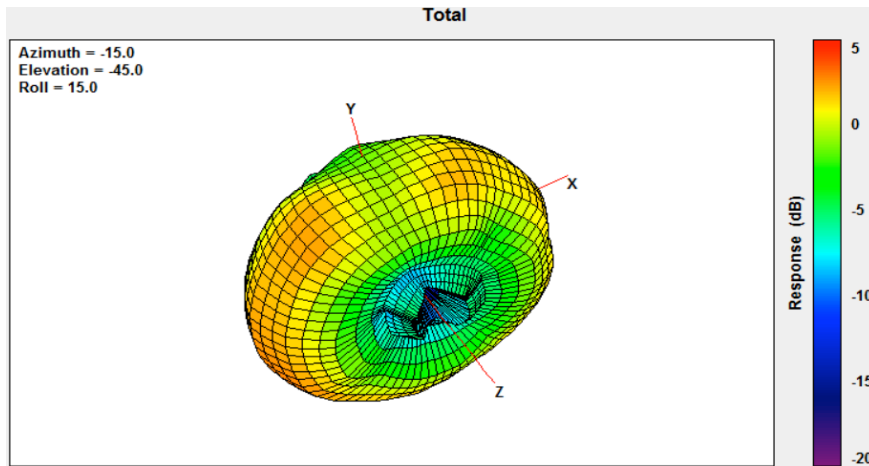
@1850MHz



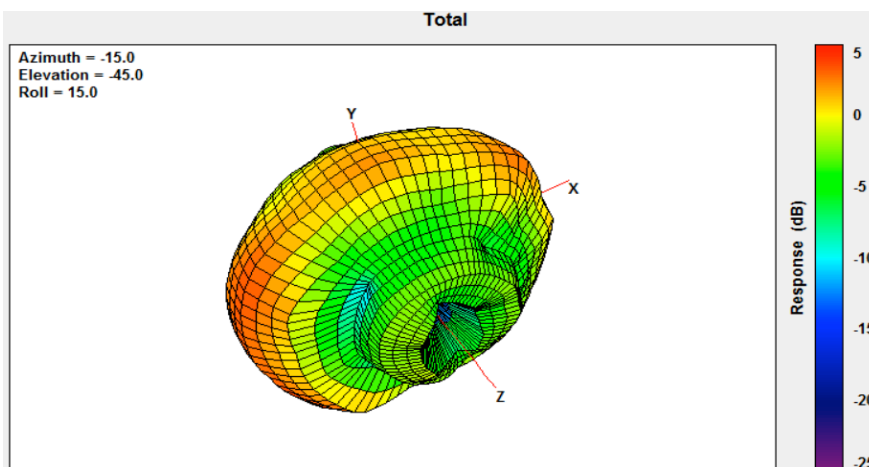
@1990MHz



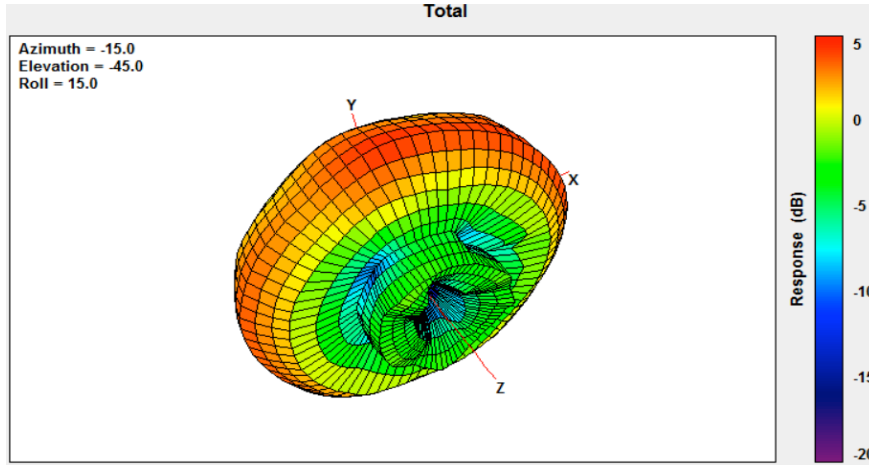
@2170MHz



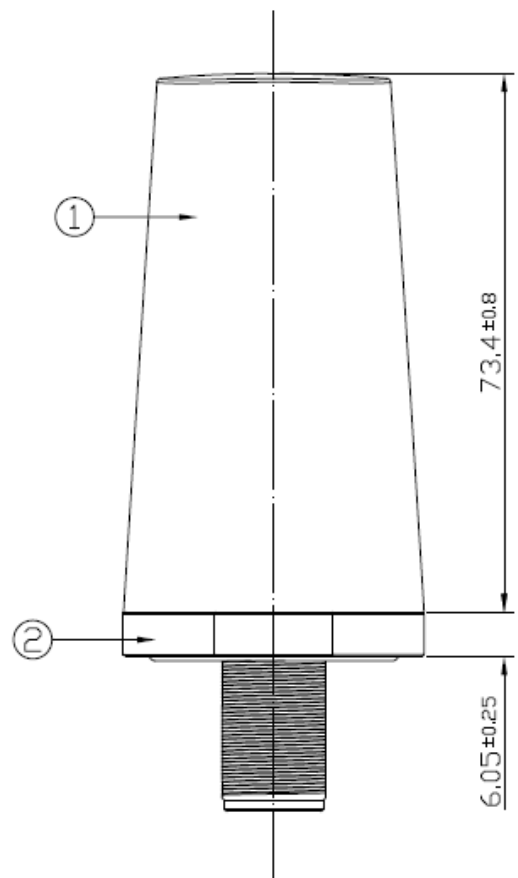
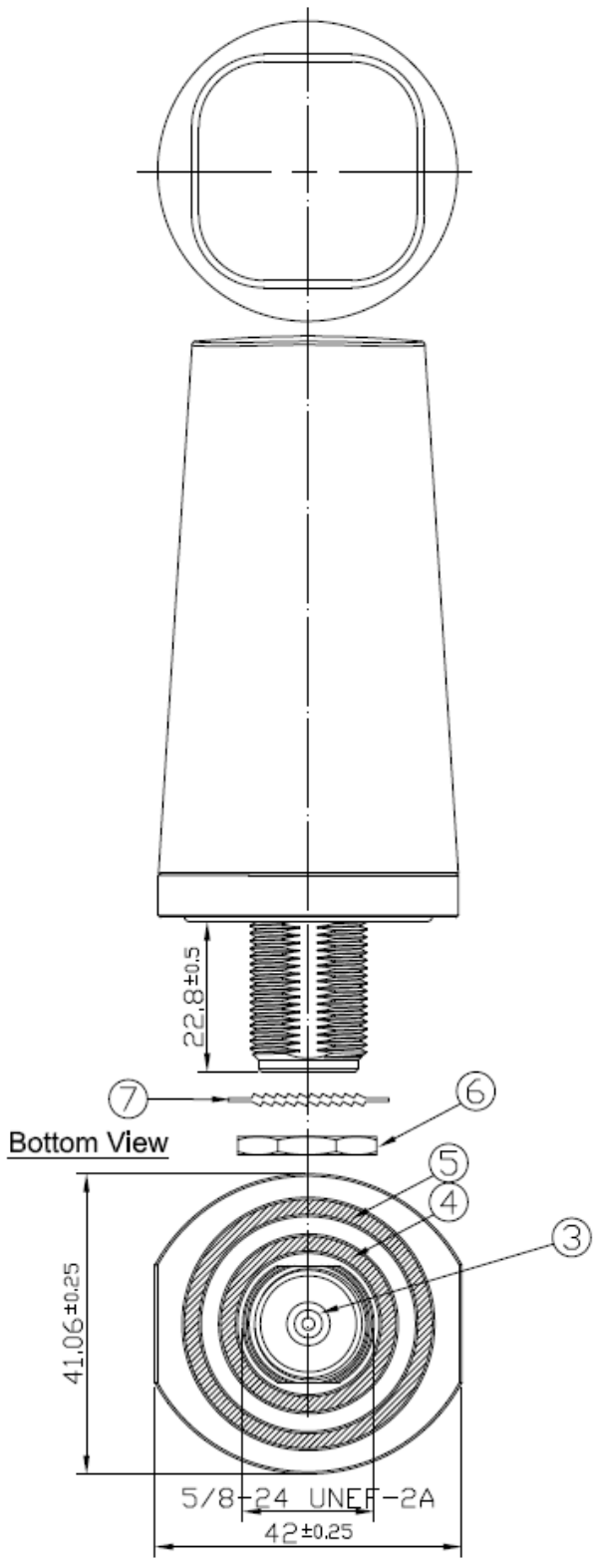
@2500MHz



@2690MHz



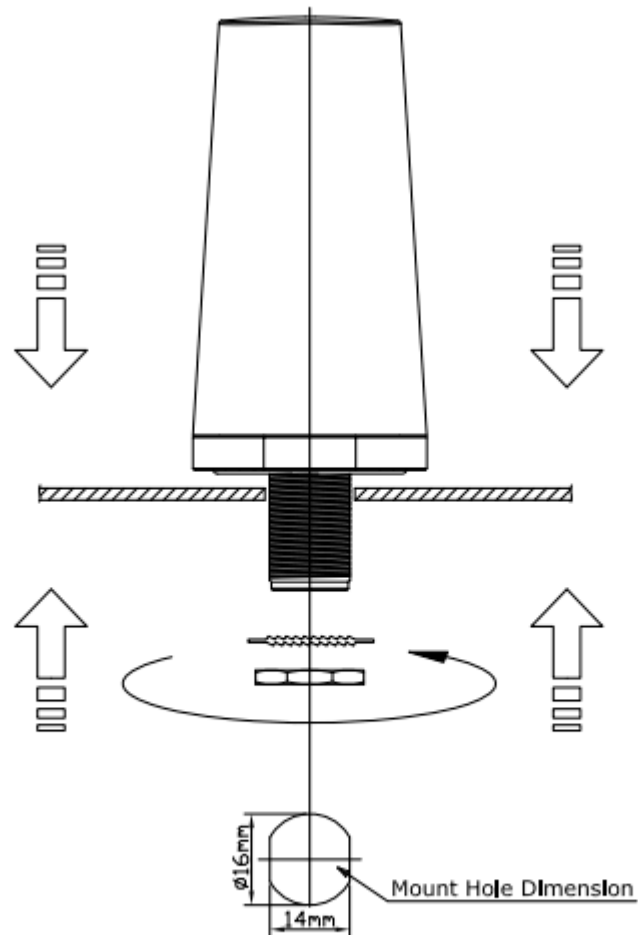
5. Mechanical Drawing



	Name	Material	Finish	QTY
1	Antenna Top	ABS	Black	1
2	Antenna Bottom	Zinc Alloy	NI Plated	1
3	N Type F	Brass	NI Plated	1
4	O Ring 1	NBR	Black	1
5	O Ring 2	NBR	Black	1
6	Nut	Brass	NI Plated	1
7	Washer	Brass	NI Plated	1

Unit : mm

6. Installation



Recommended torque for mounting is 4.018 N.m or 41 kgf.cm

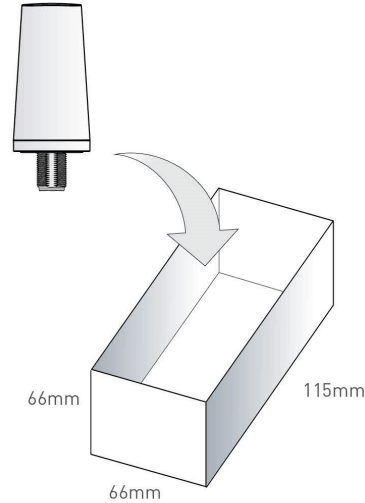
Maximum torque for mounting is 9.8 N.m or 100 kgf.cm

7. Packaging

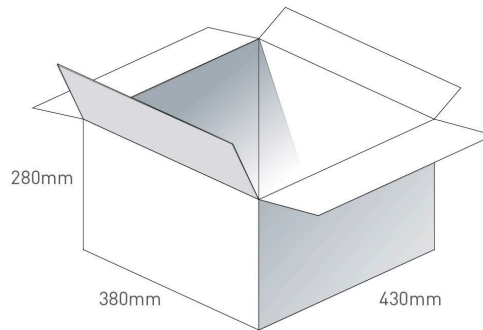
TLS.01.1F21

Packaging Specifications

1 No. TLS.01.1F21 per small box
 Box Dimensions - 66 x 66 x 115mm
 Weight - 210g



1 Outer Carton
 Carton Dimensions - 430 x 380 x 280mm
 60 pcs TLS.01.1F21 per carton
 Weight - 13.02Kg



Pallet Dimensions 1100*1100*1550mm
 30 Cartons per Pallet
 10 Cartons per layer
 3 Layers

