SPECIFICATION

Part No. : **TLS.20.1F21**

Description : Shockwave 450-470MHz
Permanent Mount External Antenna
N Type(F) connector

Features : CDMA 450-470MHz with 46% efficiency
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.20.1F21 is a mechanically robust, waterproof, external antenna operating at 450-470MHz with 1 meter of low loss CFD-200 and SMA(M) connector. It has been designed to be used on a Ground Plane. Common applications are, for instance :

- Public safety
- Smart meters
- Mesh networks
- Transportation

The antenna has greater than 46% efficiency and -2.6dBi peak gain within the application band 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 mesh networks or hot spots.

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.

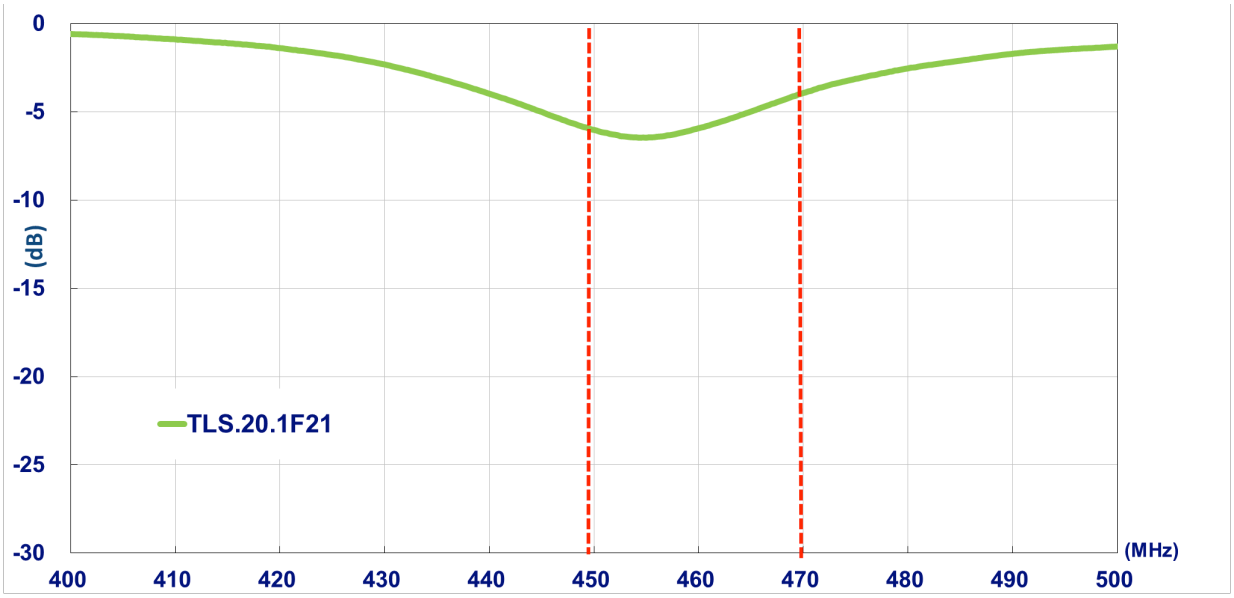
The TLS.20 antenna is IP67 waterproof and IP69K resistant against high pressure water jets in commercial cleaning environments, which makes the antenna ideal for 450-470MHz applications in harsh outdoor environments.

2. Specification

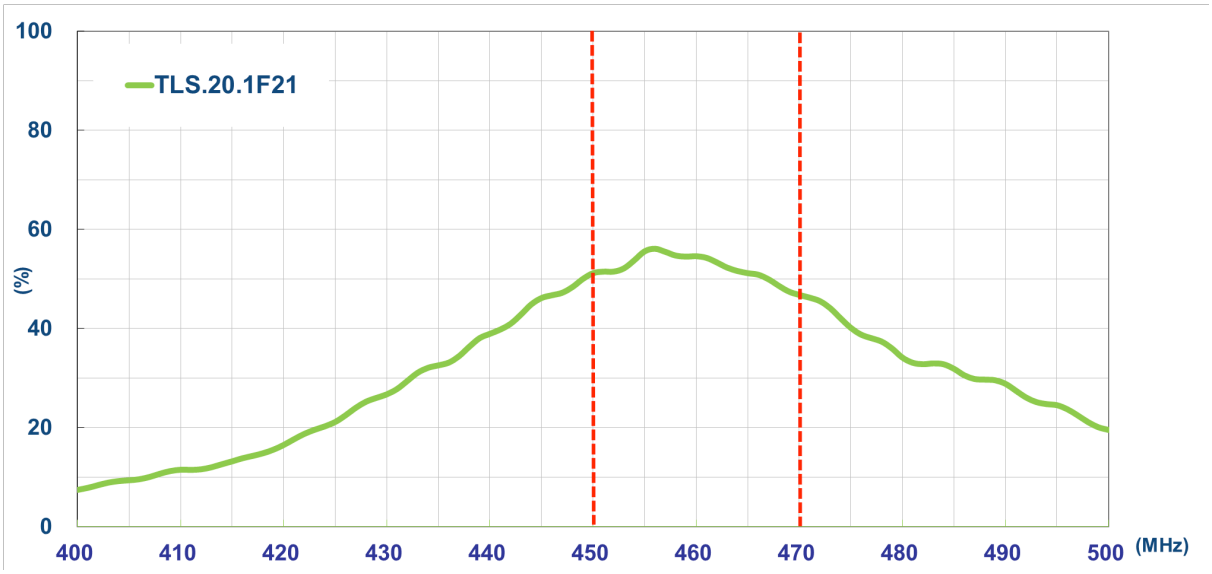
ELECTRICAL			
Operation Band	CDMA450		
Operation Frequency(MHz)	450	460	470
	On 30 x 30 cm ground plane		
Efficiency (%)	51.17	54.59	46.78
Peak Gain (dBi)	-1.50	-1.14	-1.80
Average Gain (dBi)	-2.90	-2.62	-3.29
Return Loss (dB)	< -3		
Impedance	50 Ω		
Polarization	Vertical		
Radiation Property	Omni-Directional		
Max Input Power	100 W		
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		

3. Antenna Characteristcs

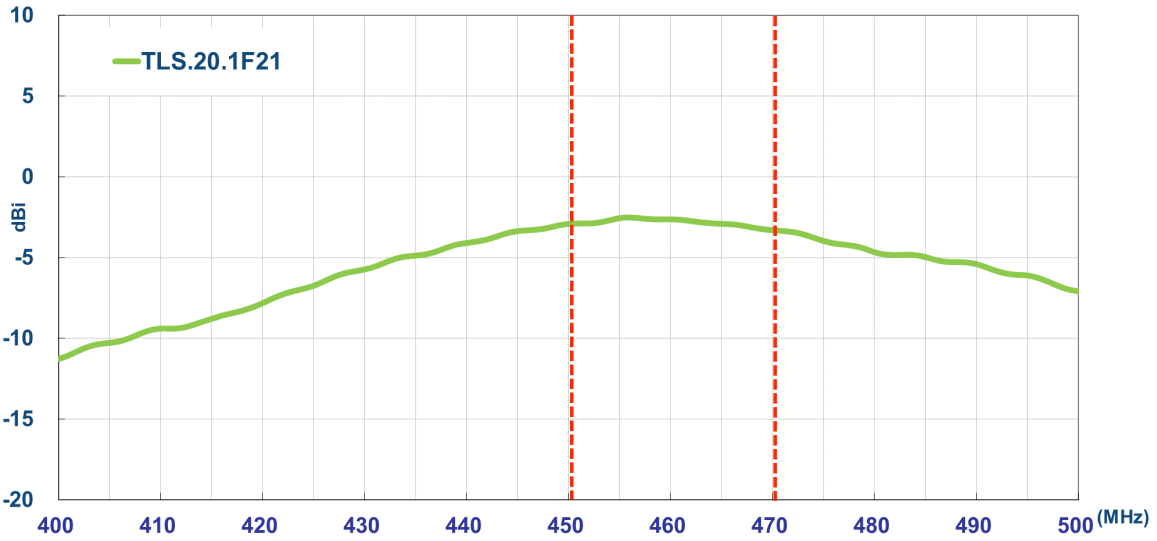
3.1. Return Loss



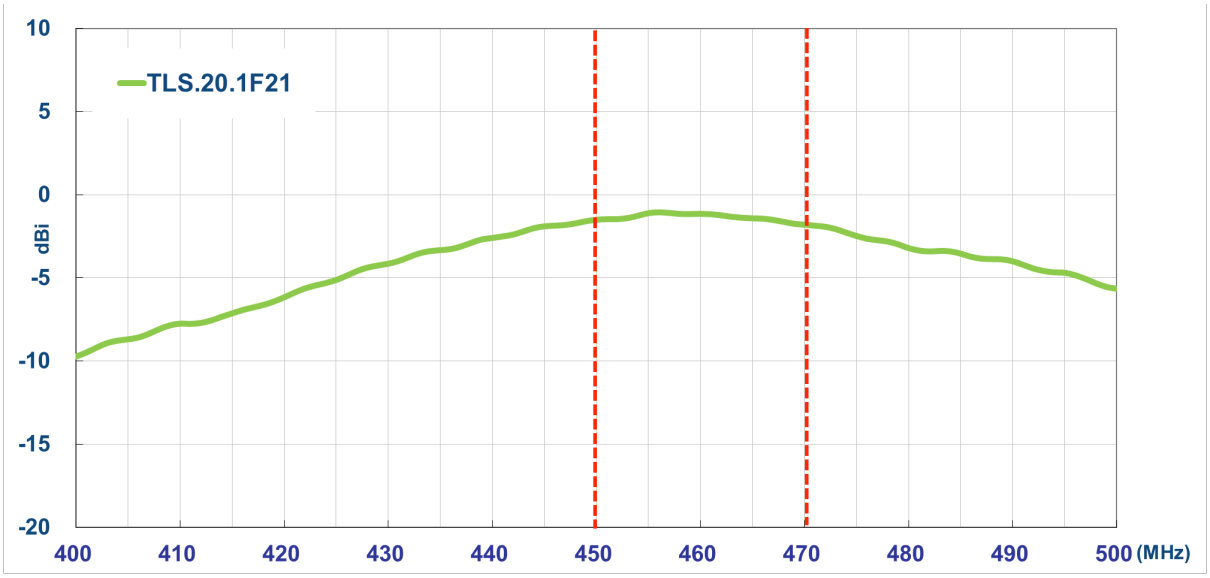
3.2. Efficiency



3.3. Average Gain



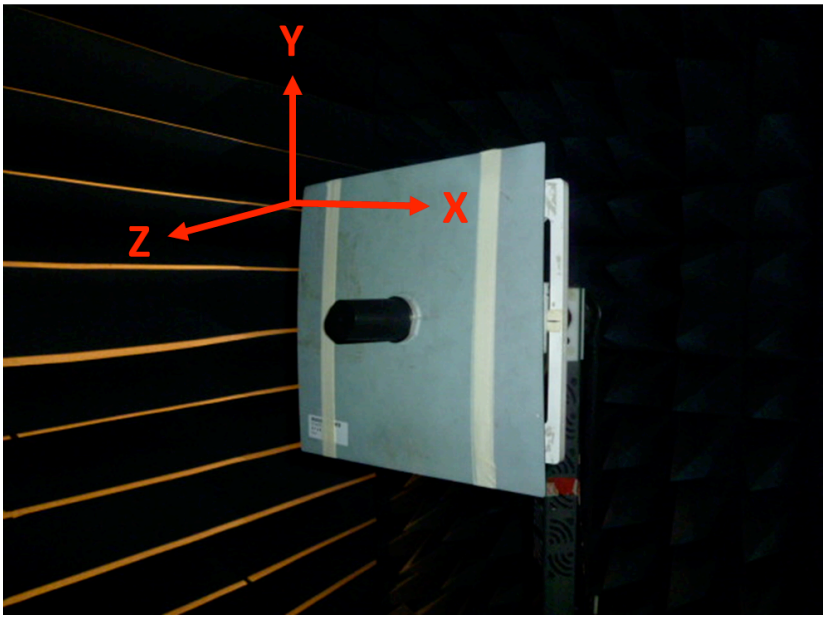
3.4. Peak Gain



4. Antenna Radiation Pattern

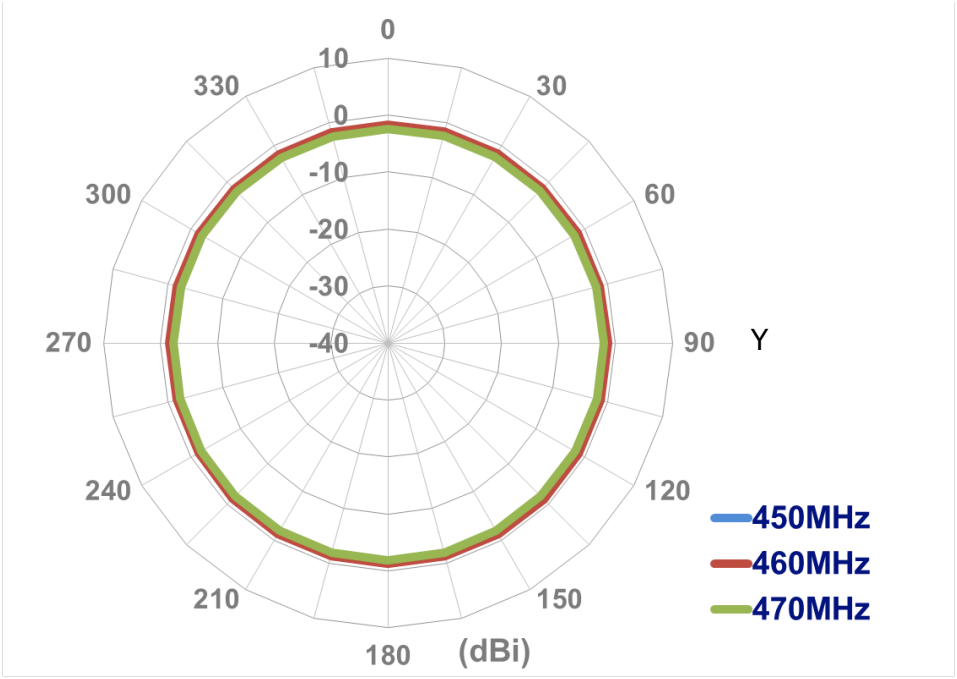
4.1. Measurement Setup

The TLS.20 antenna is tested in a CTIA certified ETS-Lindgren Anechoic Chamber. The test setup is shown below.

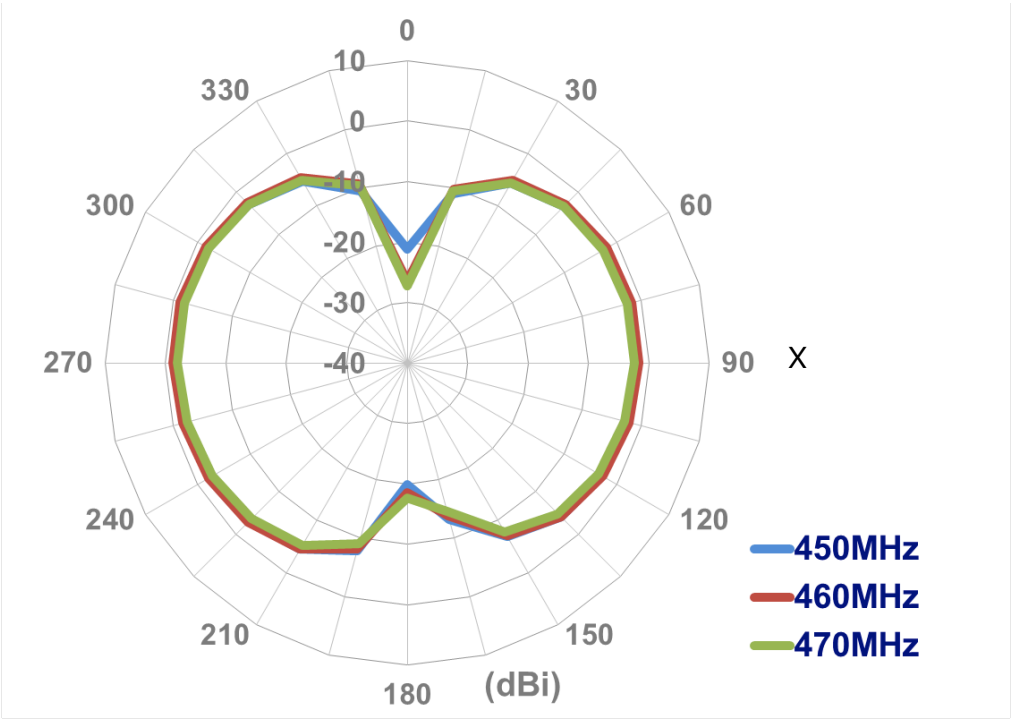


4.2. 2D Radiation Pattern

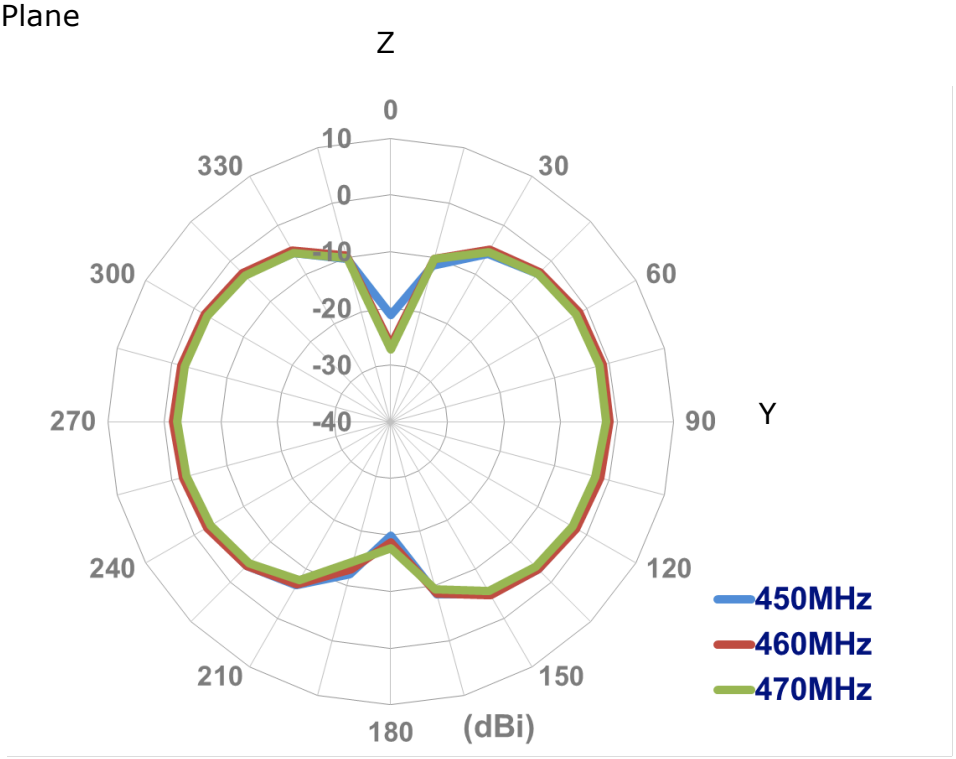
XY Plane



XZ Plane

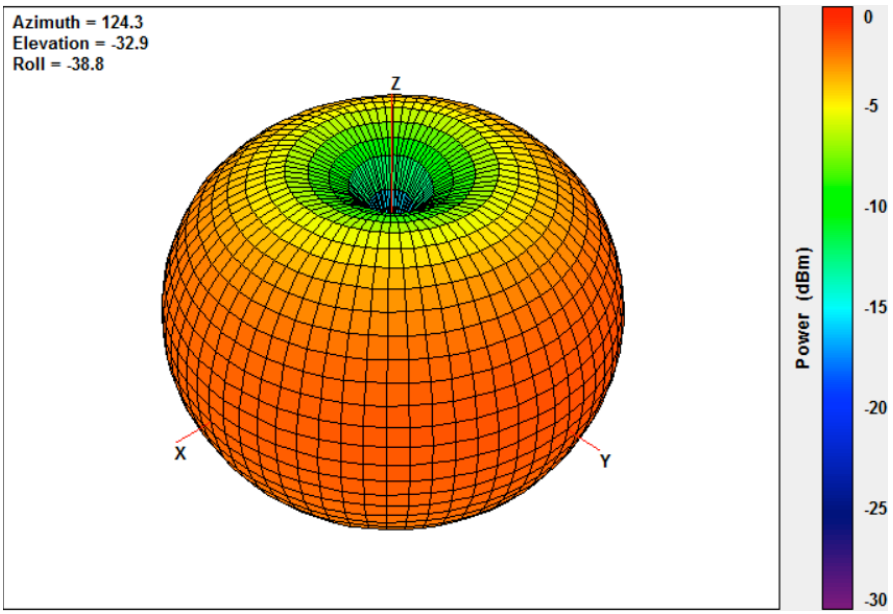


YZ Plane

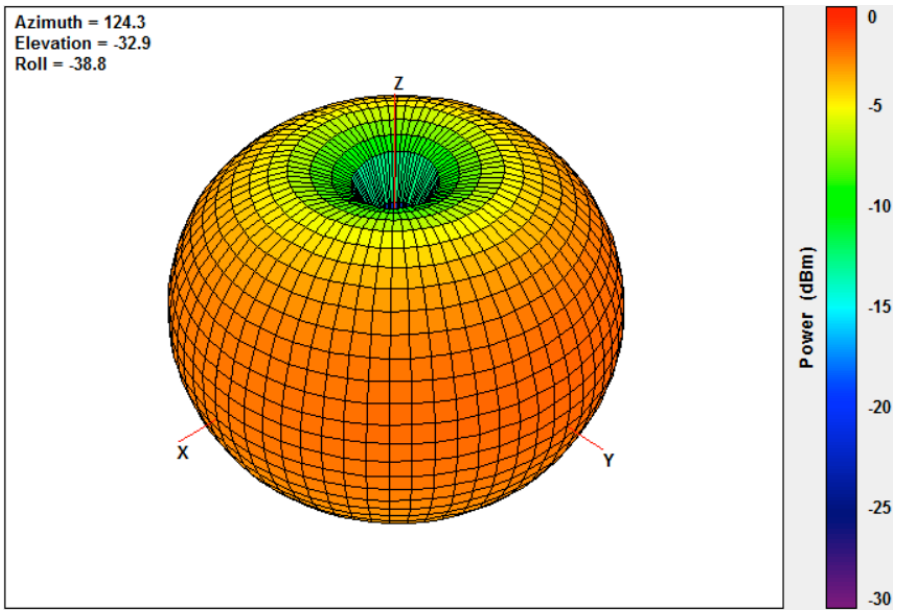

Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
Y
(dBi)
450MHz
460MHz
470MHz

4.3. 3D Radiation Pattern

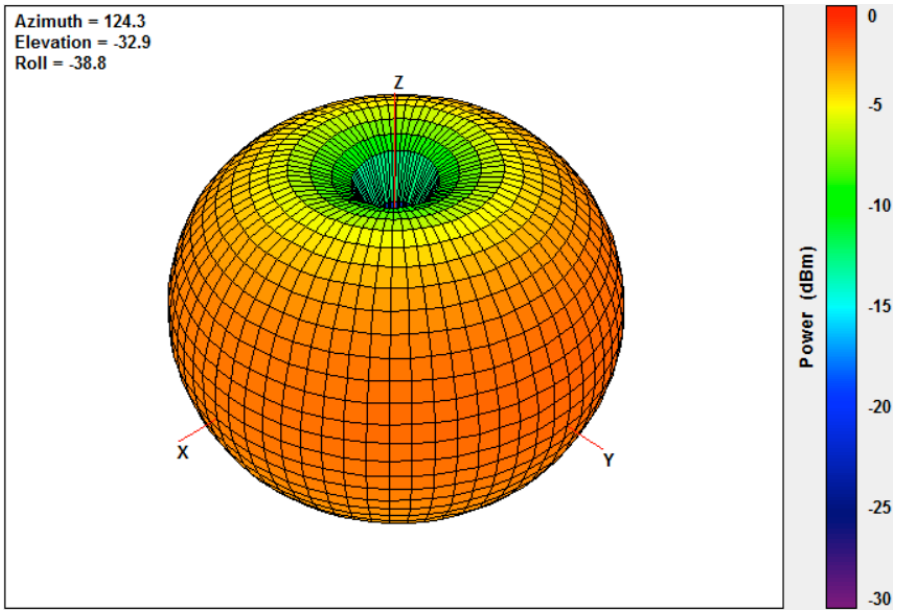
@450MHz



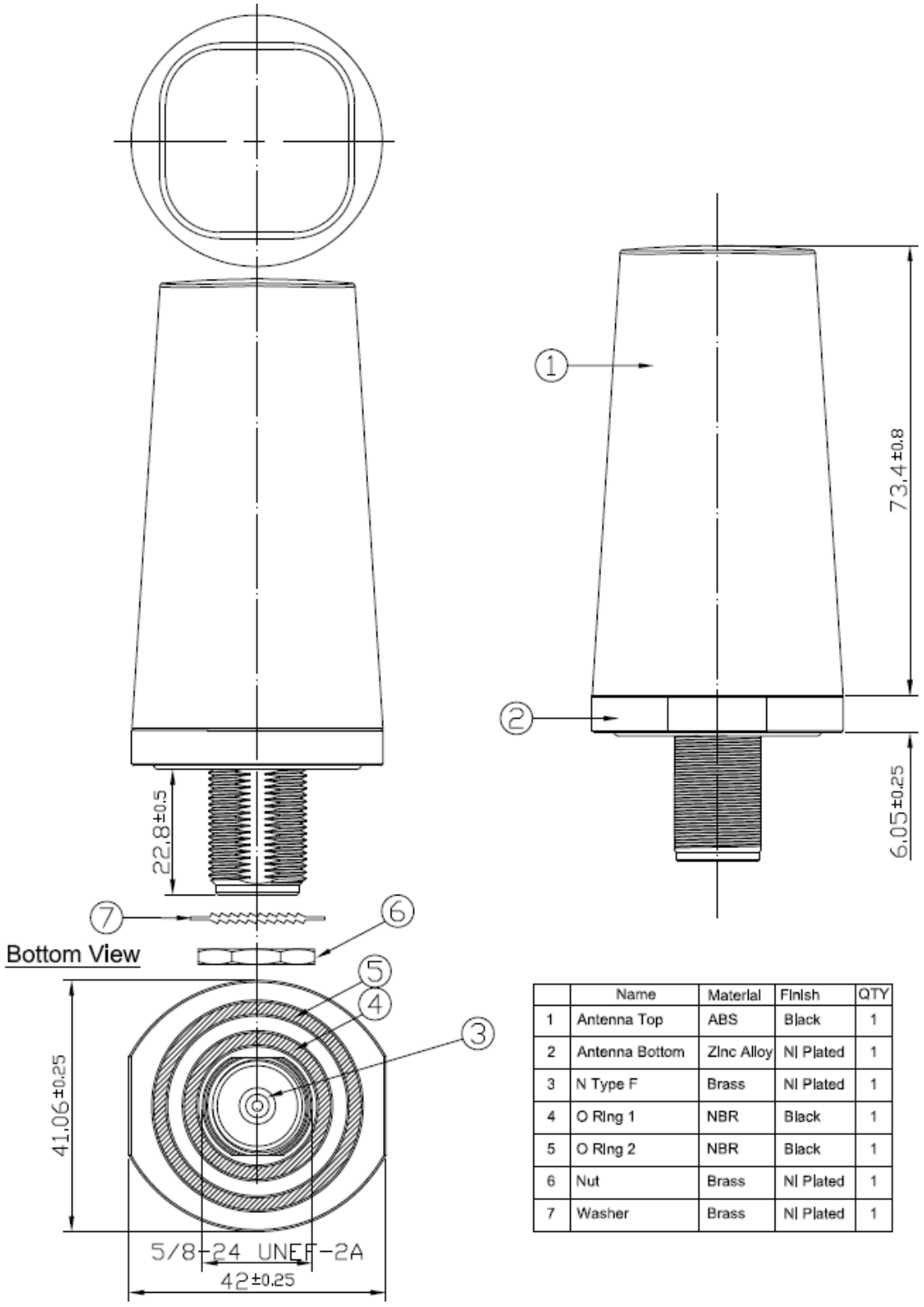
@460MHz



@470MHz


Azimuth = 124.3
Elevation = -32.9
Roll = -38.8
Z
X
Y
Power (dBm)
0
-5
-10
-15
-20
-25
-30

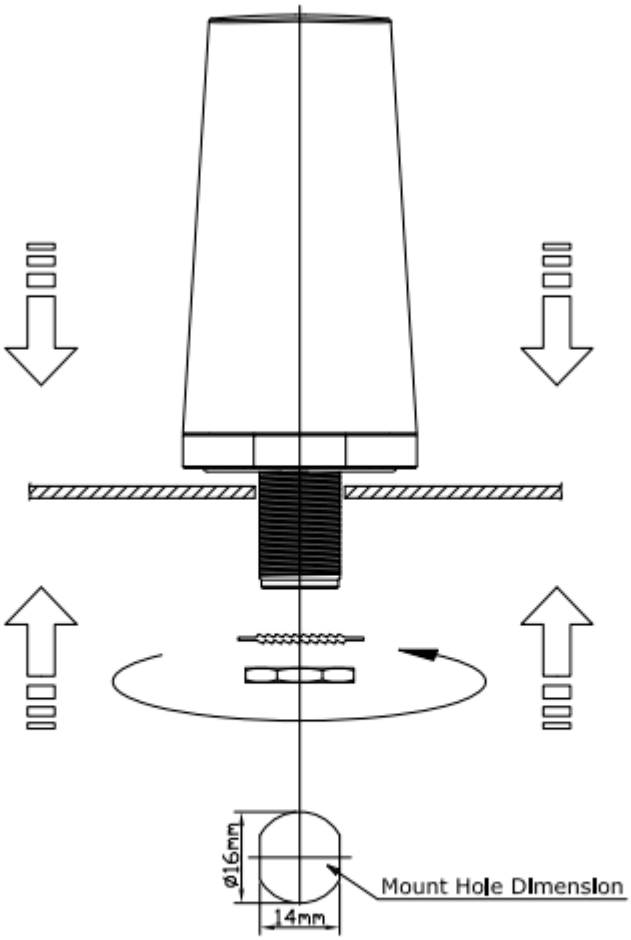
5. Mechanical Drawing



	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

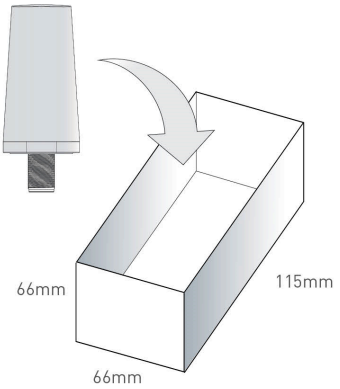
Maximum torque for mounting is 9.8 N.m or 100 kgf.cm

7. Packaging

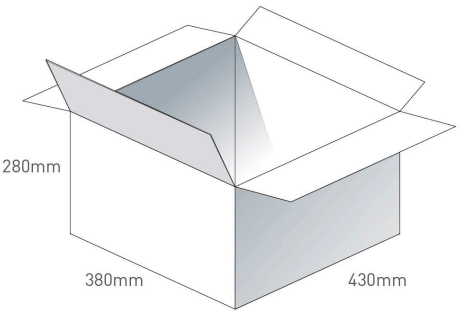
TLS.20.1F21

Packaging Specifications

1 No. TLS.20.1F21 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.20.1F21 per carton
Weight - 13.02Kg



Pallet Dimensions 1100*1100*1250mm
30 Cartons per Pallet
10 Cartons per layer
3 Layers

