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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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## SPECIFICATION

**Part No.** : **TLS.30.1F11**

**Description** : Shockwave 433MHz  
Permanent Mount External Antenna  
N Type(M) connector

**Features** : ISM 433MHz with 52% efficiency  
Mechanically robust for indoor/outdoor applications  
Height: 79.45mm(3.13") ; Diameter : 42mm(1.65")  
IP67 and IP69K Waterproof  
N type(M) connector  
**RoHS compliant**



## 1. Introduction

The Shockwave TLS.301F21 is a mechanically robust, waterproof, external antenna operating at the 433MHz band with an N type female connector. It has been designed to be used on a Ground Plane.

Common applications are, for example :

- Mesh networks
- Indoor/outdoor asset monitoring
- Security systems
- Remote control systems
- Heavy-duty equipment/vehicle communication in harsh environments

The antenna has 51% efficiency and -1.1 dBi peak gain at ISM 433MHz 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, where an N type female connector juts out from a metal panel. Waterproof O-rings around the bottom base prevent water from leaking under the antenna.

The TLS.30 antenna is IP67 waterproof and IP69K resistant against high pressure water jets in commercial cleaning environments, which makes the antenna ideal for ISM 433MHz applications in harsh outdoor environments.

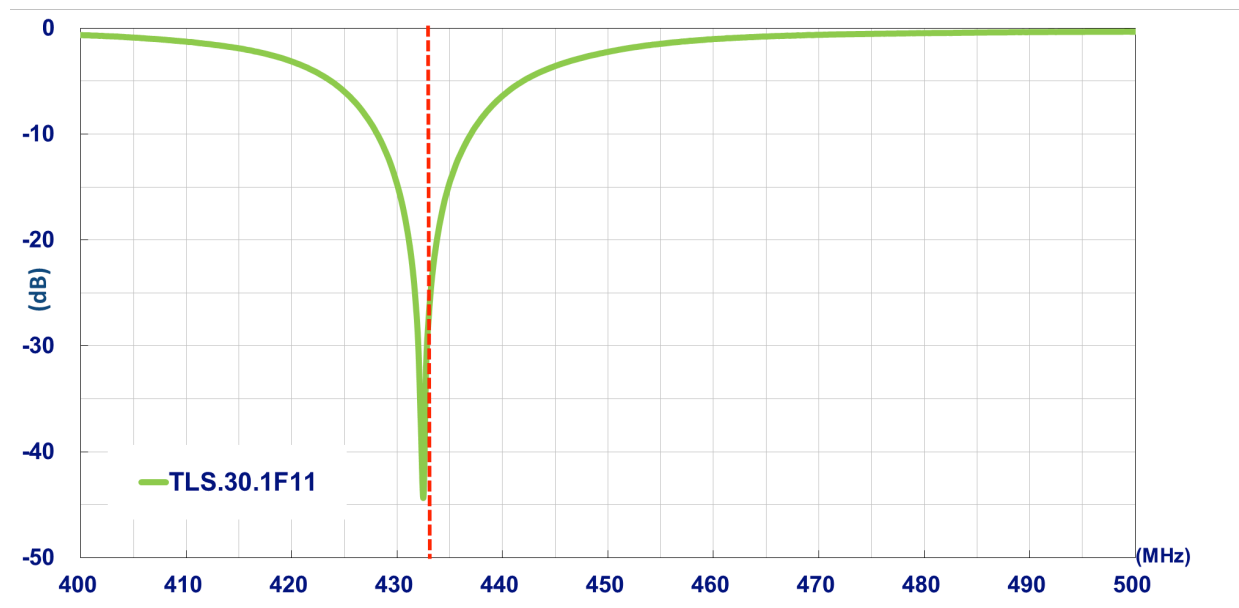


## 2. Specification

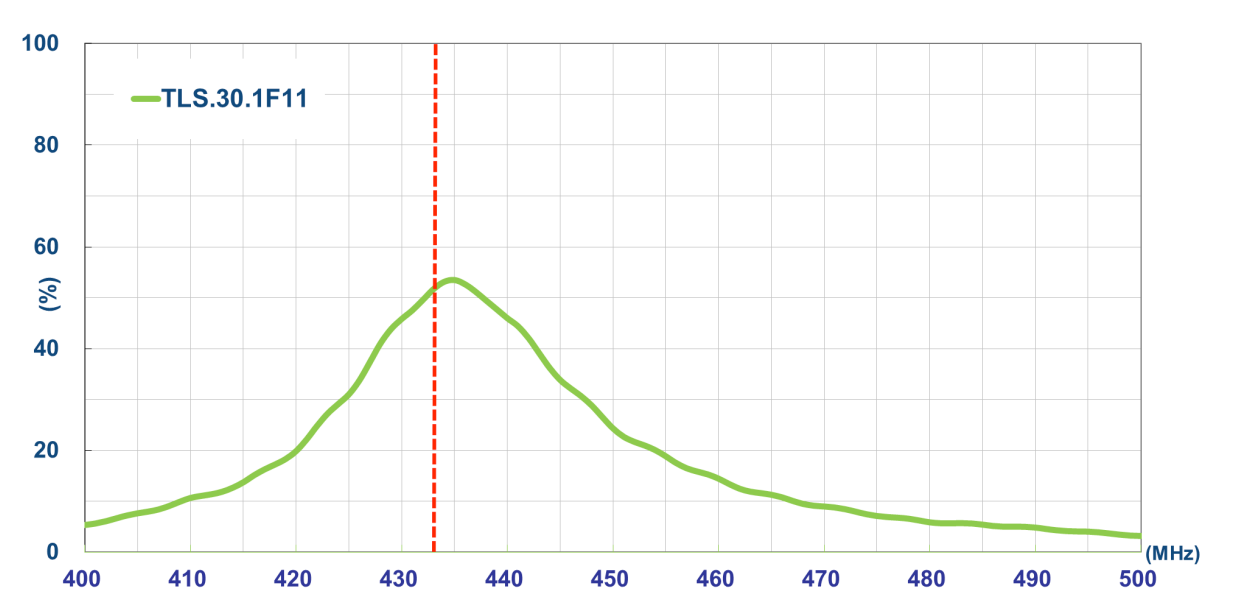
ELECTRICAL	
Application Band	ISM433
Operation Frequency	433 MHz
	On 30 x 30 cm ground plane
Efficiency (%)	51.67%
Peak Gain (dBi)	-1.19
Average Gain (dBi)	-2.87
Return Loss (dB)	< -15
Impedance	50 Ω
Polarization	Vertical
Radiation Property	Omni-Directional
Max Input Power	100 W
MECHANICAL	
Dimension (mm)	Height: 79.45mm(3.13") ; Diameter : 42mm(1.65")
Connector	N type (M)
Material	Housing : UV Resistant ABS , Base : Nickel Plated Zinc Alloy
Weight (g)	130
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 Characteristics

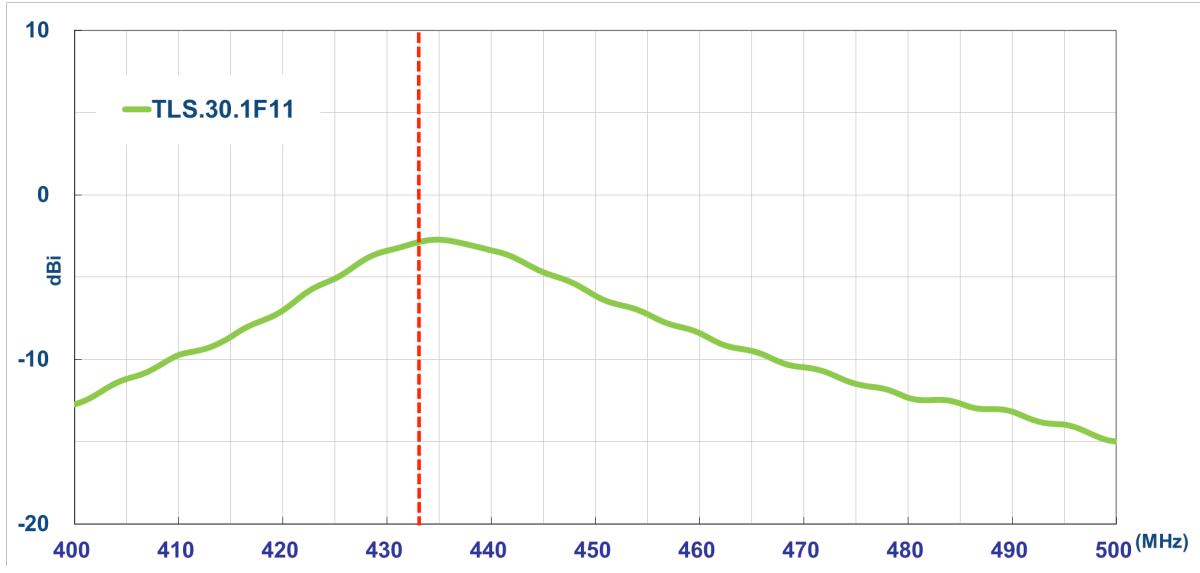
#### 3.1. Return Loss



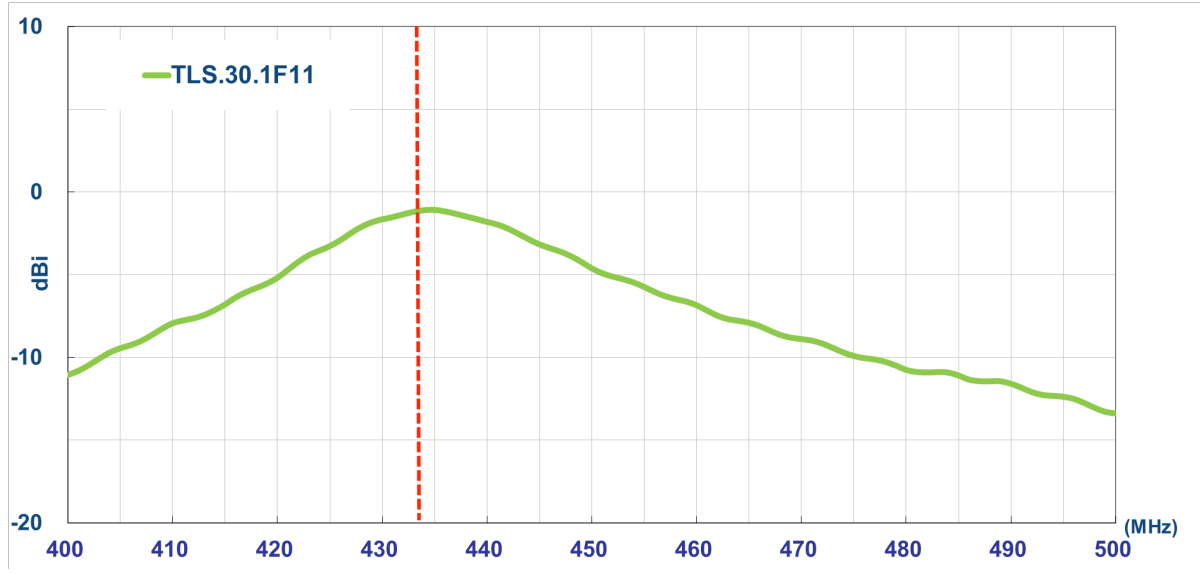
#### 3.2. Efficiency



### 3.3. Average Gain



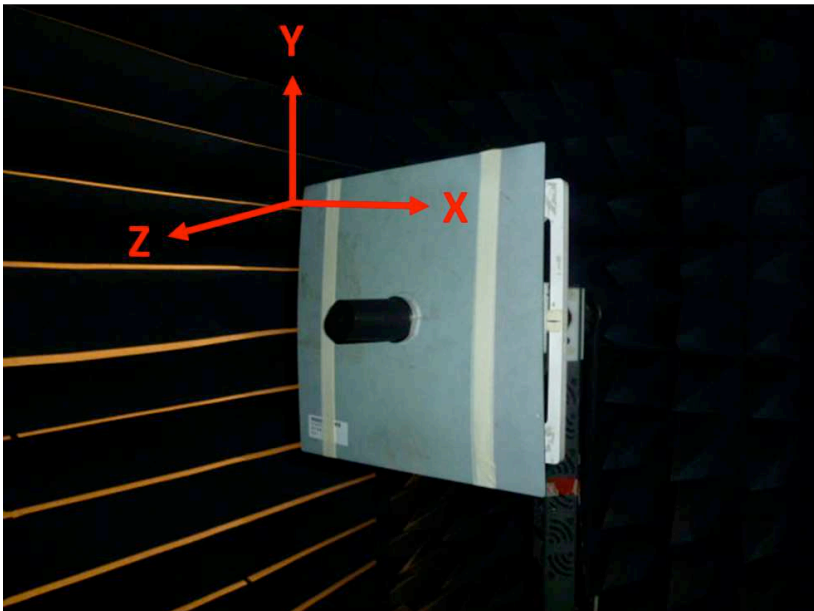
### 3.4. Peak Gain



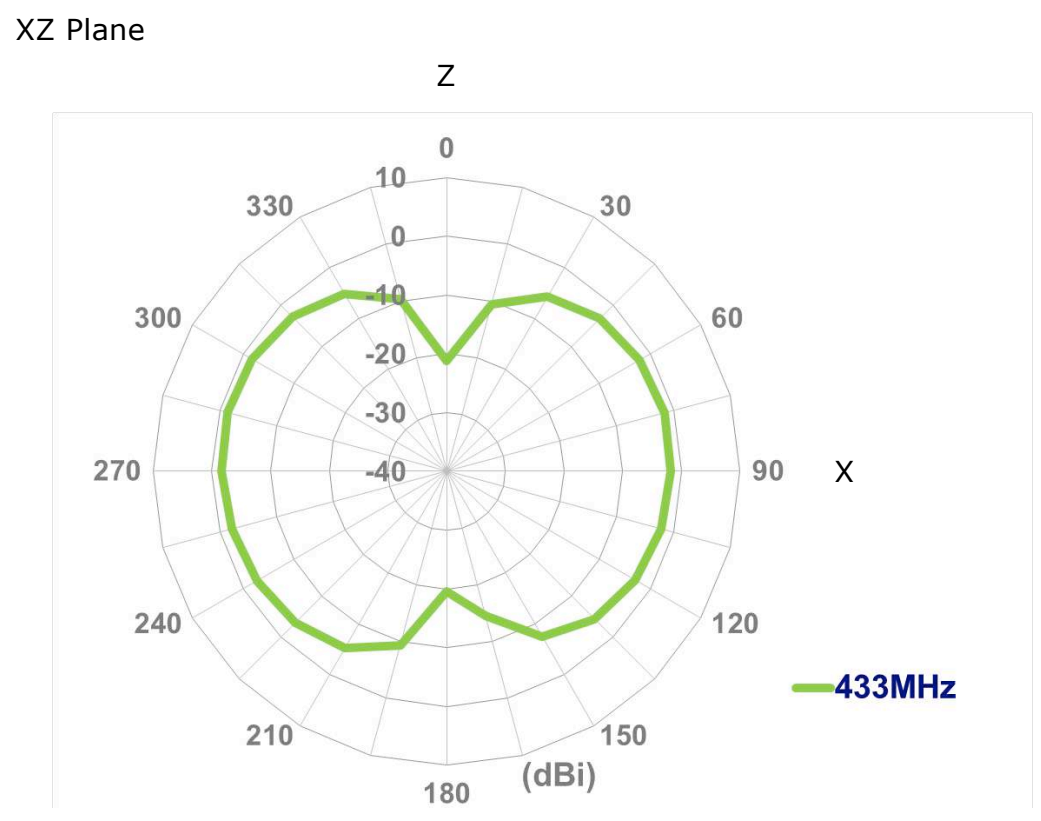
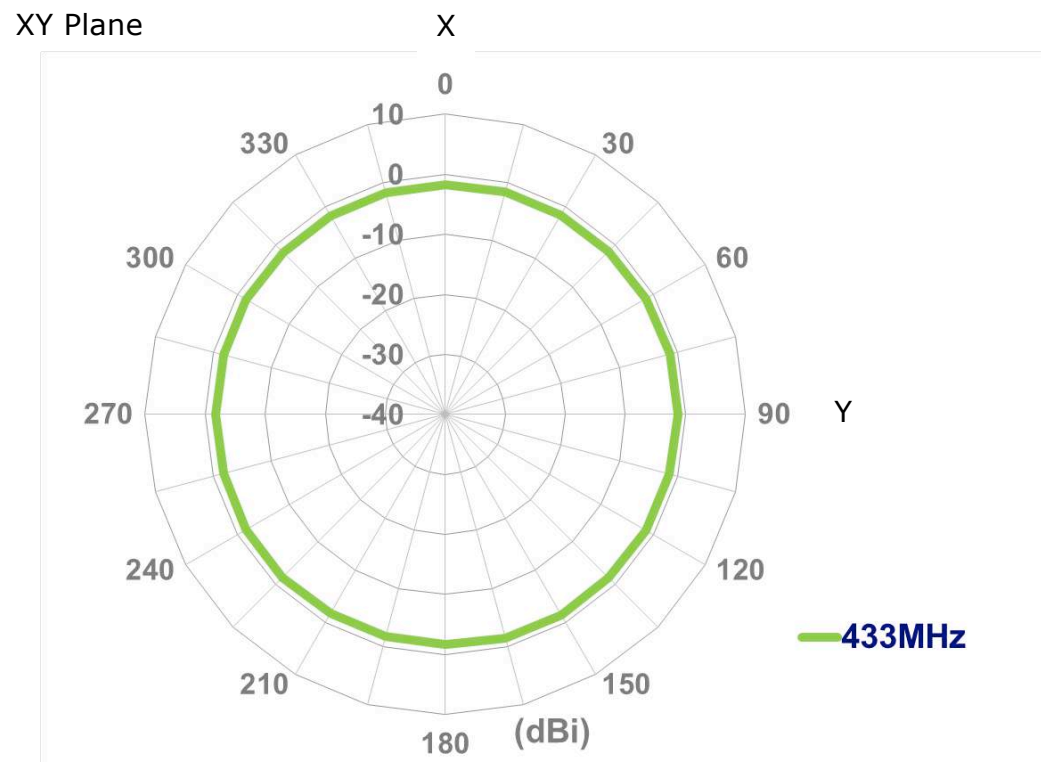
## 4. Antenna Radiation Pattern

### 4.1. Measurement Setup

The TLS.30 antenna is tested in a CTIA certified ETS-Lindgren Anechoic Chamber. The test setup is shown below.

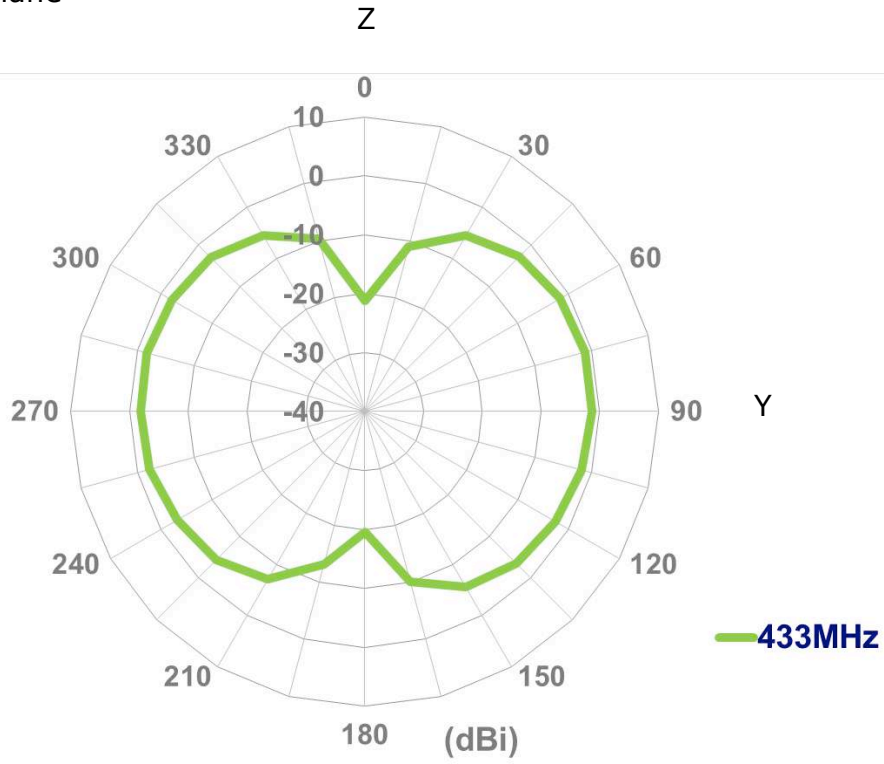


## 4.2. 2D Radiation Pattern



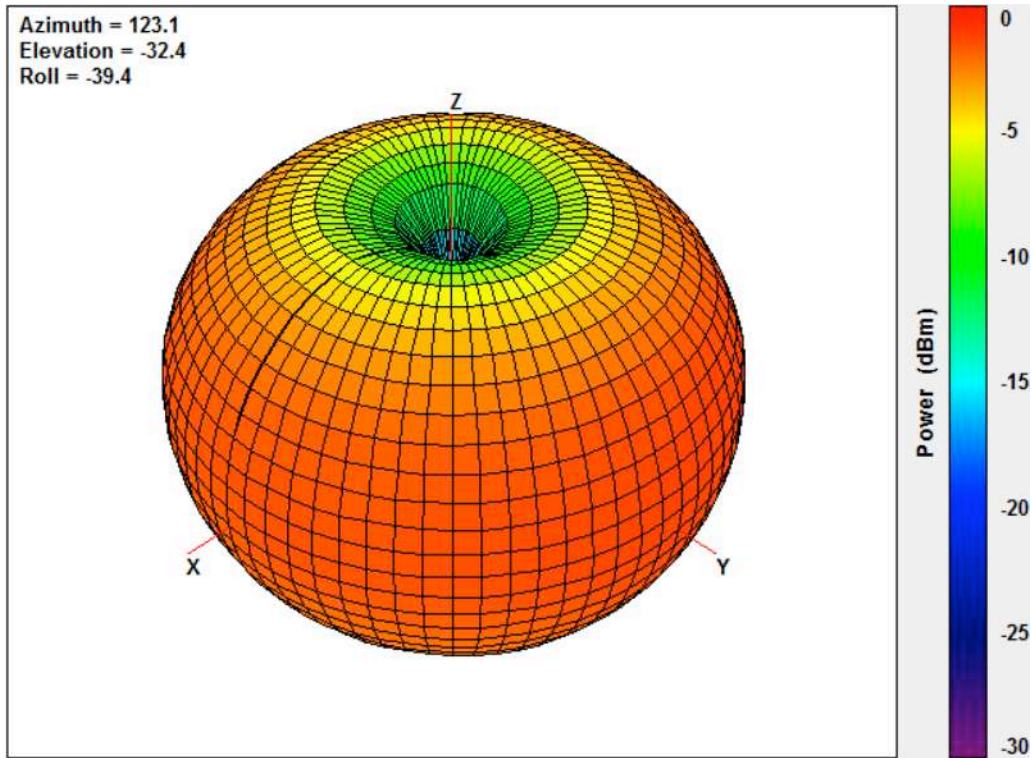


YZ Plane

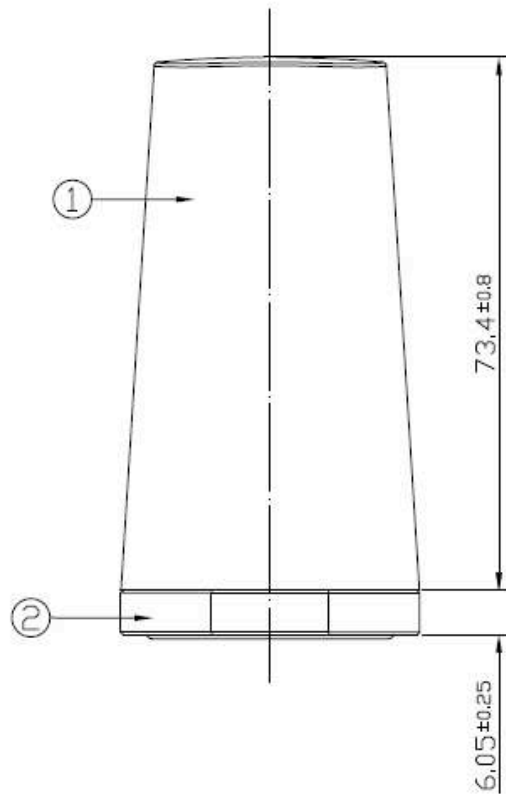
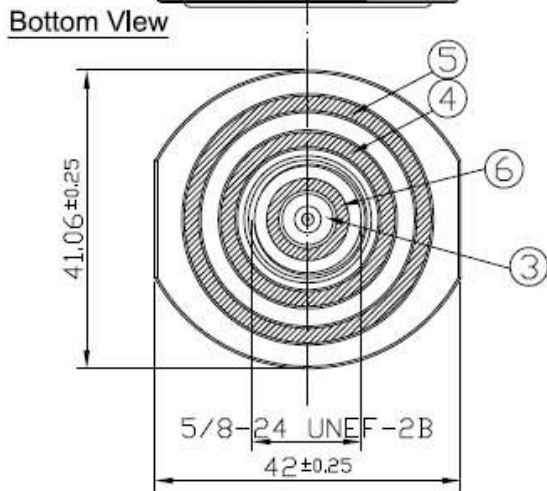
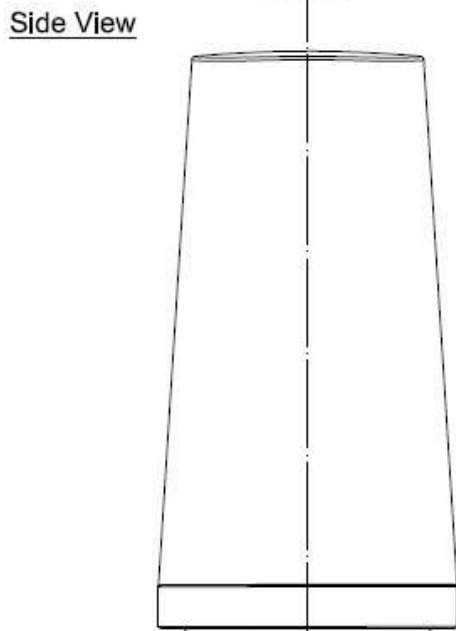
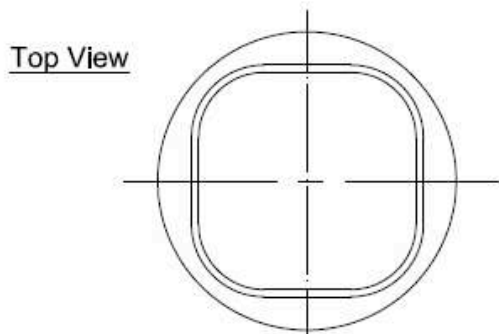


### 4.3. 3D Radiation Pattern

@433MHz



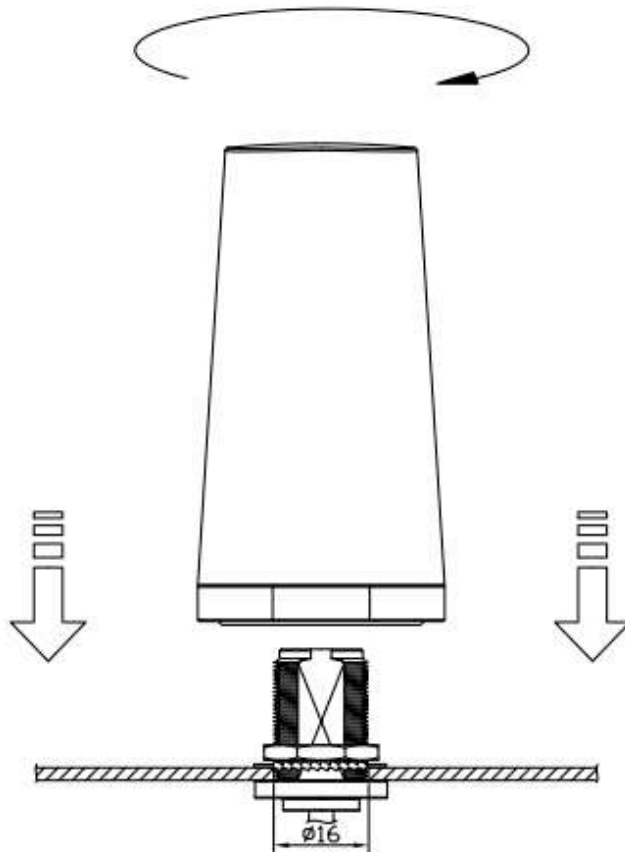
# 5. Mechanical Drawing



	Name	Material	Finish
1	Antenna Top	ABS	Black
2	Antenna Bottom	Zinc Alloy	NI Plated
3	N Type M	Brass	NI Plated
4	O Ring 1	NBR	Black
5	O Ring 2	NBR	Black
6	O Ring 3	NBR	Red

Unit : mm

## 6. Installation



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

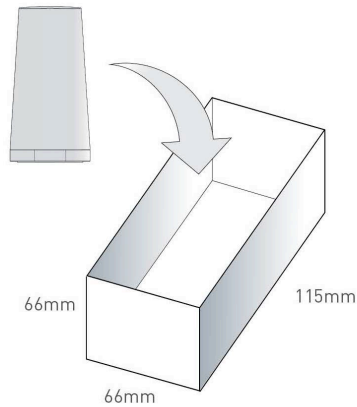
Maximum torque for mounting is 9.8 N.m or 100 kgf.cm

## 7. Packaging

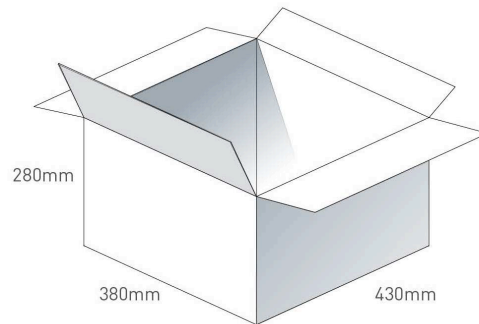
### TLS.30.1F11

#### Packaging Specifications

1 No. TLS.30.1F11 per small box  
 Box Dimensions - 66 x 66 x 115mm  
 Weight - 170g



1 Outer Carton  
 Carton Dimensions - 430 x 380 x 280mm  
 60 pcs TLS.30.1F11 per carton  
 Weight - 10.59Kg



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

