

## Specification

|              |   |  |
|--------------|---|--|
| Part No.     | : | <b>MA120.A.QP.001</b>  |
| Product Name | : | Hercules GENII Screw mount 2in1<br>450MHz and 868MHz<br>(Separate cable and connectors)  |
| Features     | : | Permanent Mount<br>For smart meters and mesh networks<br>450MHz and 868MHz Combo Antenna<br>Peak Gain 3dBi for 450MHz Band<br>1dBi for 868MHz Band<br>Cable and Connector 1m RG-316 SMA (M)<br>IP65 Rated Enclosure<br>Height 29mm* Diameter 49mm<br><b>RoHS &amp; REACH Compliant</b> |



## **1. Introduction**

The MA120 antenna is a high performance 450MHz and 868MHz combination thread mount antenna for external use with smart meters, gateways, mesh networks, vehicles and outdoor and indoor assets. It is designed for heavy duty work with extra thick threads. The UV resistant polycarbonate housing is IP65 rated, resistant to vandalism and direct attack. At only 29mm high and a diameter of 49mm this unique antenna is the lowest profile and smallest worldwide.

The antenna has been tested in free space and on varying sizes of ground-planes, showing good frequency stability, allowing its use in many different mounting environments.

The standard cable and connector is 1 meter RG316. High quality FEP (Teflon) jacket is used for the cable. This makes the cable very flexible and able to operate in high temperature environments, corrosion resistant.

Note this antenna is designed for short range communication in the range of meters to hundreds of meters. For cable lengths longer than 2 meters or where very long communication ranges are desired, apart from needing a higher transmit power from the transmitter, it is recommended to go with much larger high gain stand-alone whip or fiberglass Omni type antennas, to counteract losses in the cables.

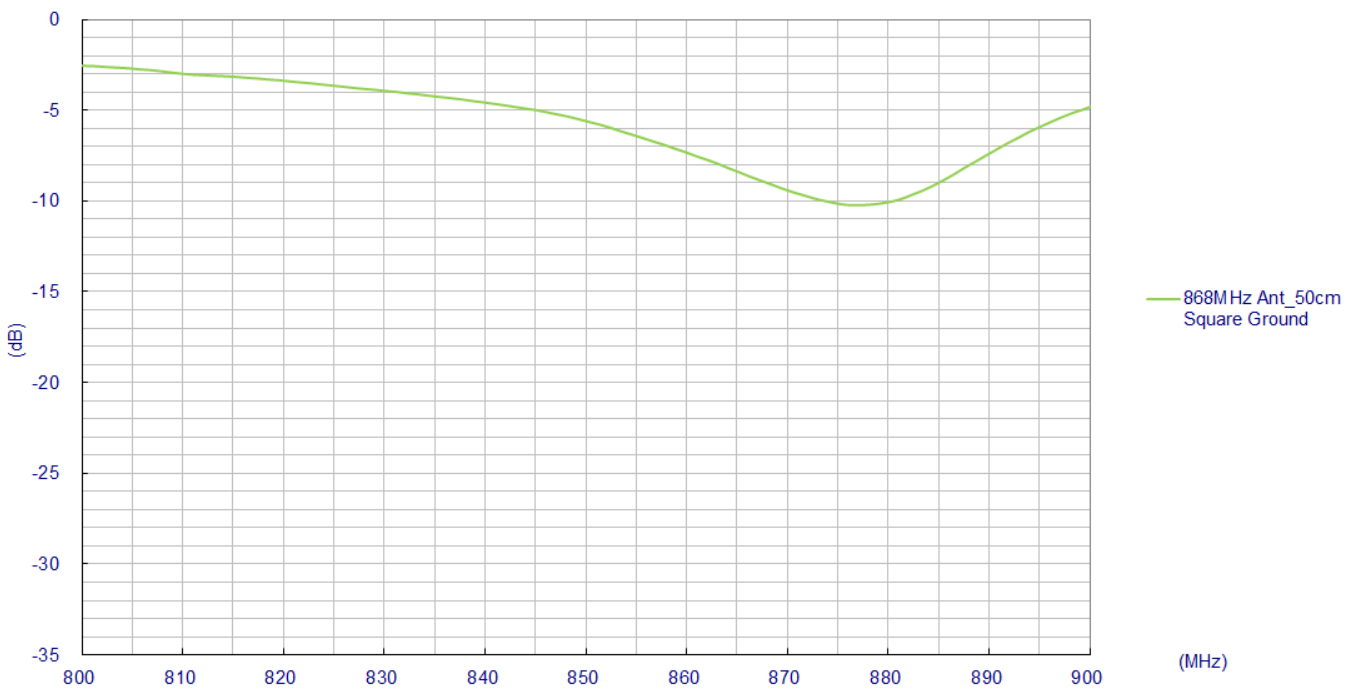
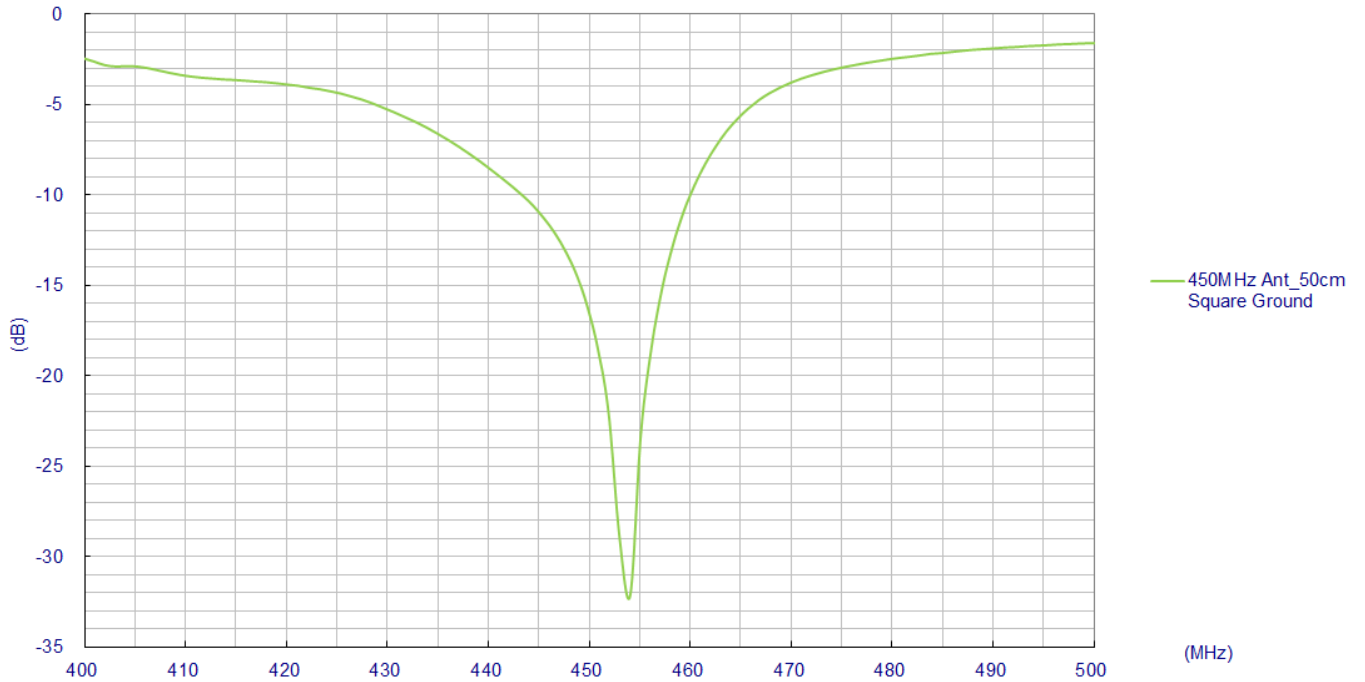
## 2. Specification

| ELECTRICAL            |  |        |     |
|-----------------------|--|--------|-----|
|                       | ISM450   | ISM868 |     |
| Frequency             | 450  | 868    | MHz |
| Return Loss(min.)     | 10   | 10     | dB  |
| Peak Gain             | 3.91   | 1.11   | dBi |
| Average Gain          | -3.27  | -4.52  | dBi |
| Impedance             | 50Ω  |        |     |
| Polarization          | Linear   |        |     |
| Radiation Properties  | Omni-directional                                       |        |     |
| Max Input Power       | 5W   |        |     |
| MECHANICAL            |  |        |     |
| Dimensions (mm)       | Height=29mm x Diameter=49mm                            |        |     |
| Cable                 | 1M RG316 coax- Fully Customizable                      |        |     |
| Casing                | PC Housing   |        |     |
| Base and Thread       | Nickel plated steel                                    |        |     |
| Weather proof gasket  | CR4305 foam with 3M9448HK double-side adhesive         |        |     |
| Connector             | SMA Male - Fully Customizable                          |        |     |
| Thread Diameter       | 18 mm  |        |     |
| Sealant               | Rubber Stopper   |        |     |
| ENVIRONMENTAL RATINGS |  |        |     |
| Corrosion             | 5% NACI for 48hrs- Nickel plated steel base and thread |        |     |
| Temperature Range     | 40°C to +85°C  |        |     |
| Thermal Shock         | 100 cycles -40 C to +85 C                              |        |     |
| Humidity              | Non-condensing 65 C 95% RH                             |        |     |
| Shock (Drop Test)     | 1m drop on concrete 6 axes                             |        |     |
| Cable Pull            | 8Kgf   |        |     |
| Ingress Protection    | IP65   |        |     |

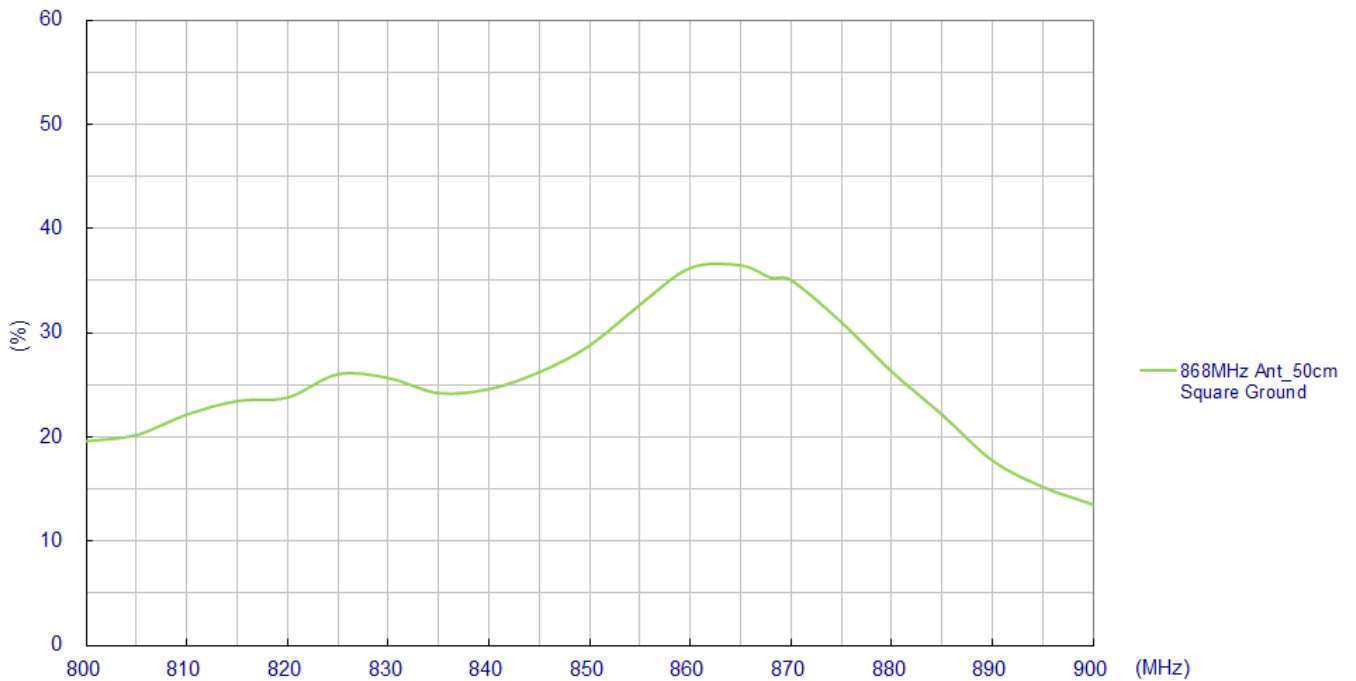
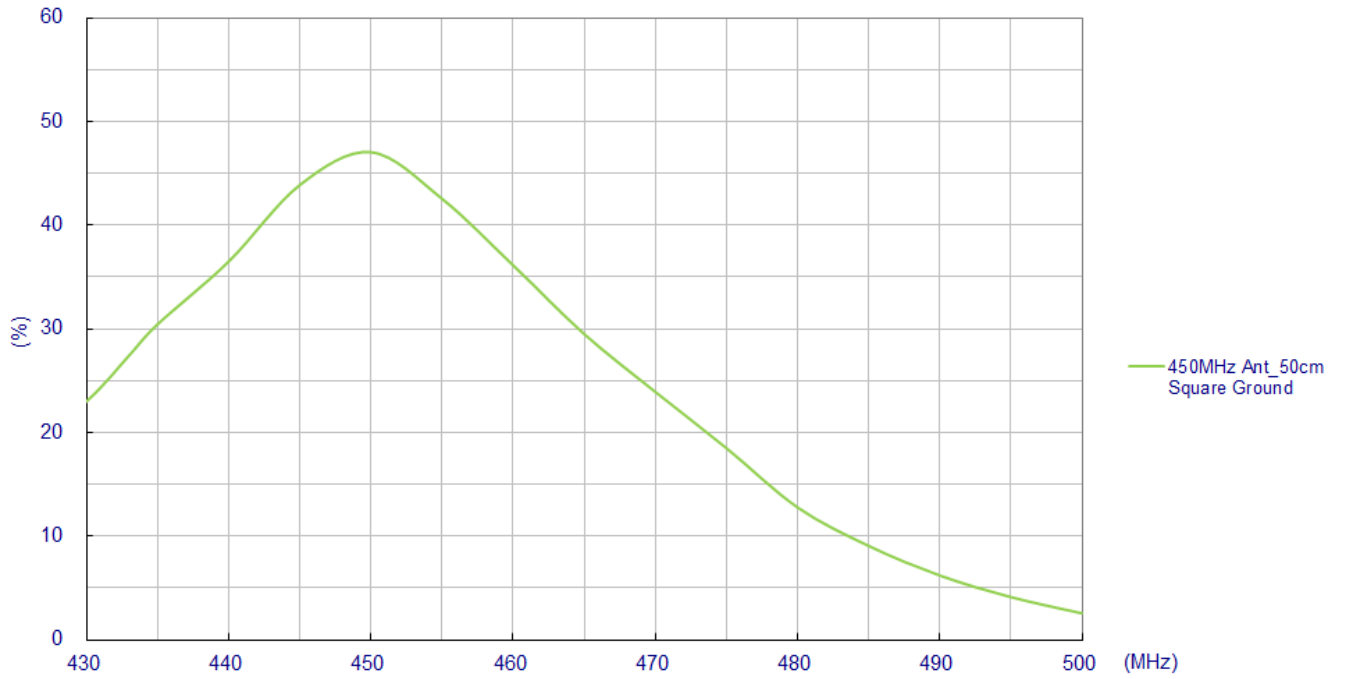
\*Results from mounting on 50\*50cm ground plane

### 3. Antenna Characteristics

#### 3.1 Return Loss

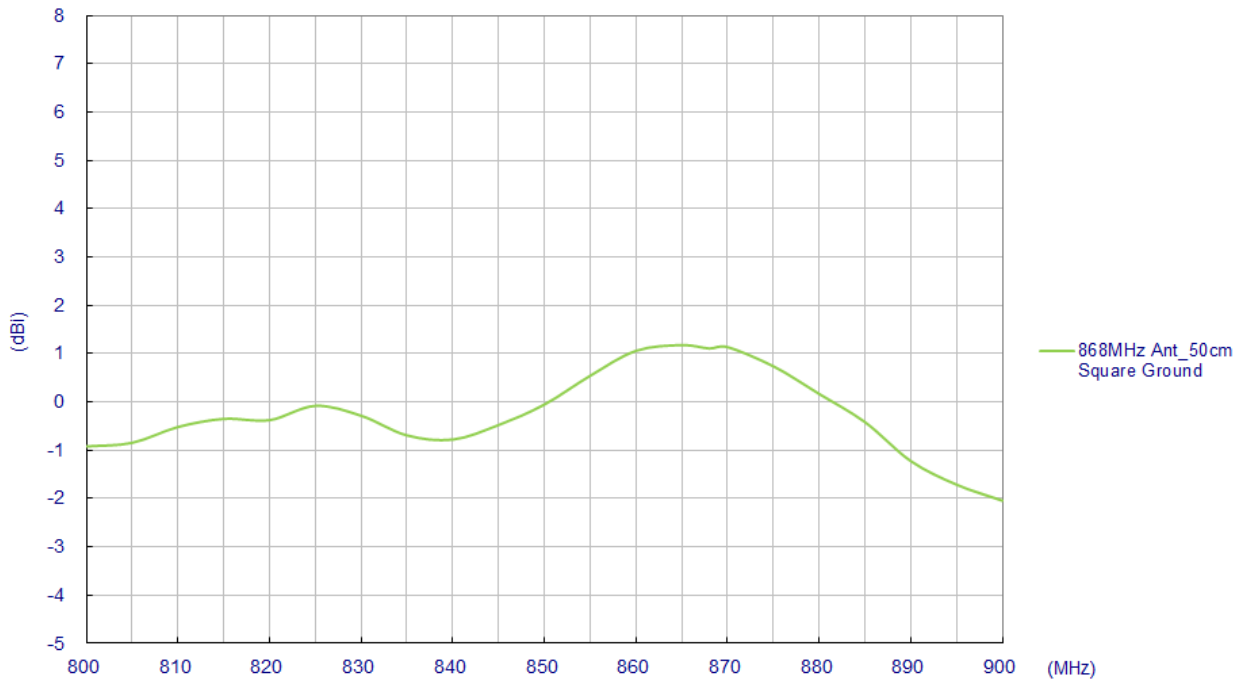
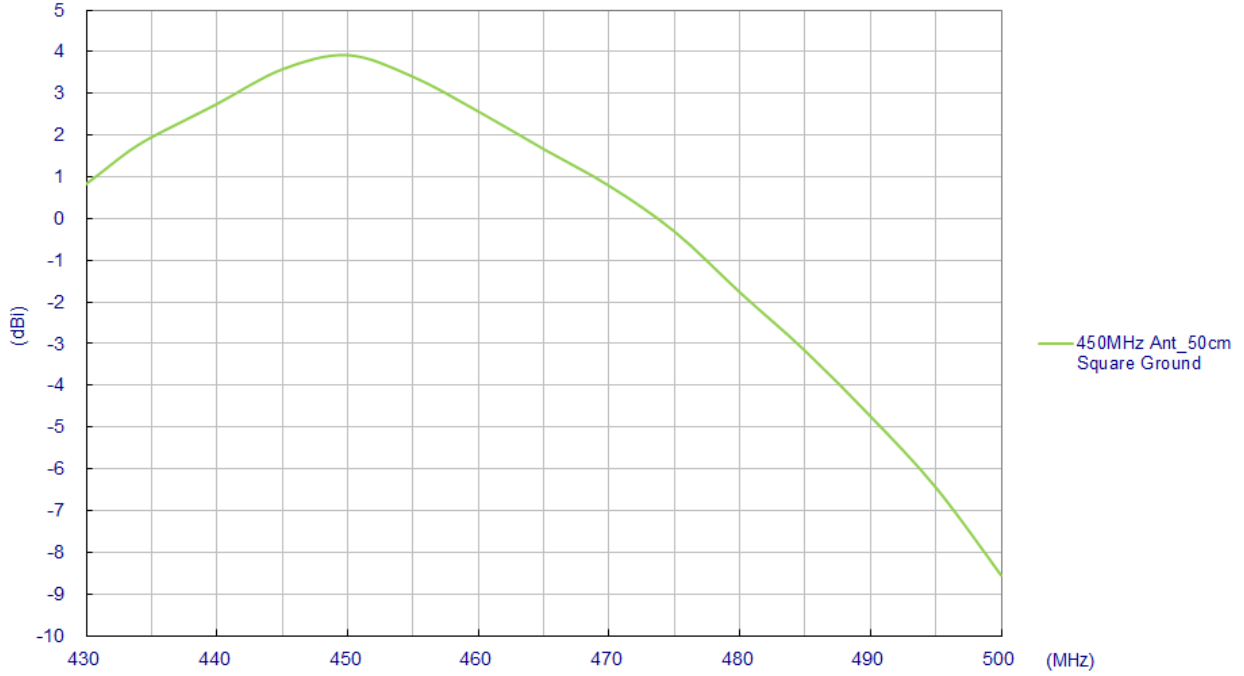


### 3.2 Efficiency



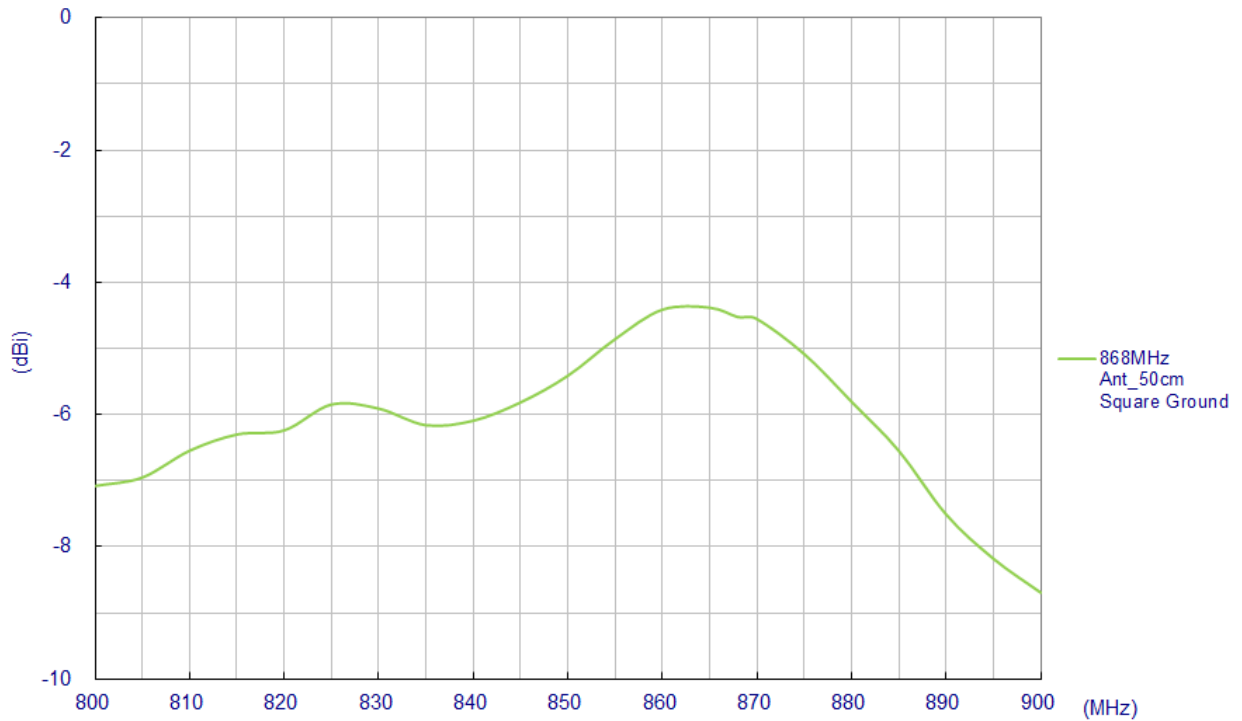
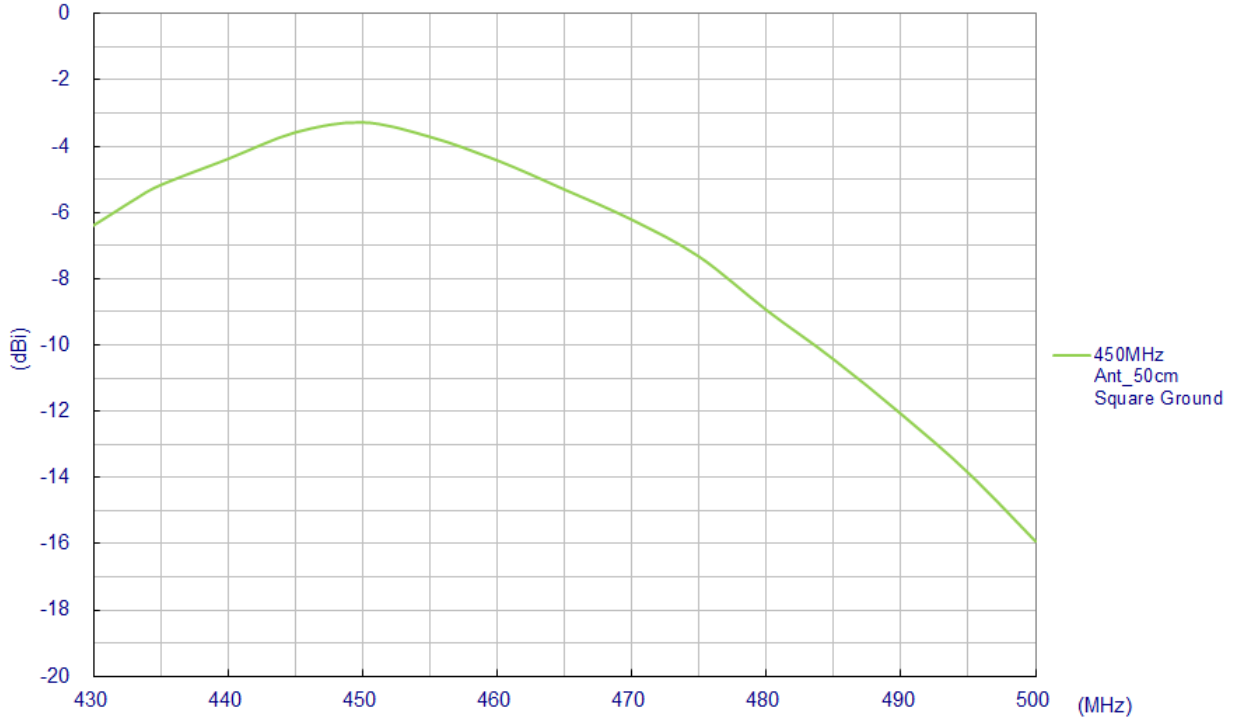


## 3.3 Peak Gain





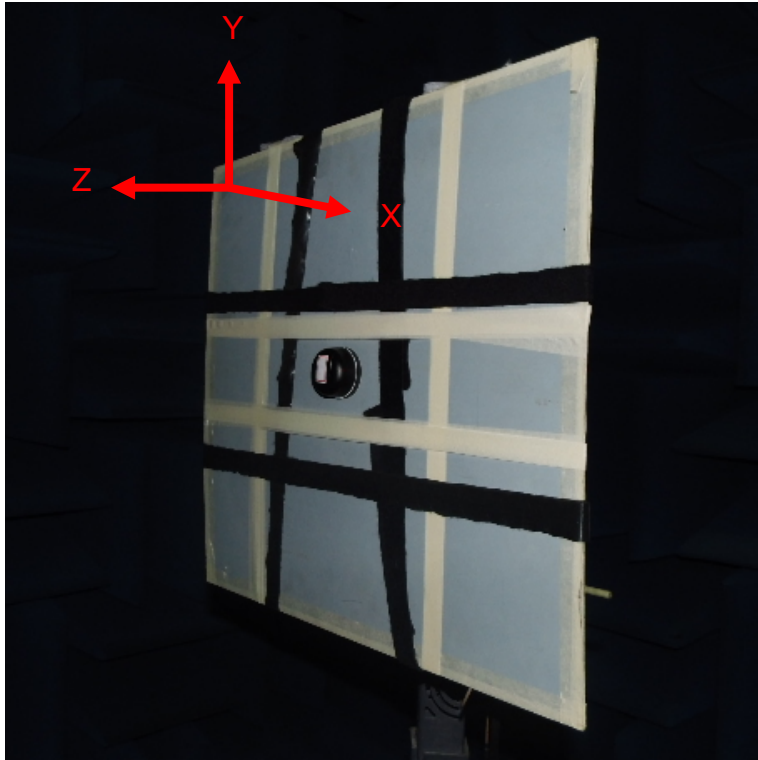
## 3.4 Average Gain



## 4. Antenna Radiation Patterns

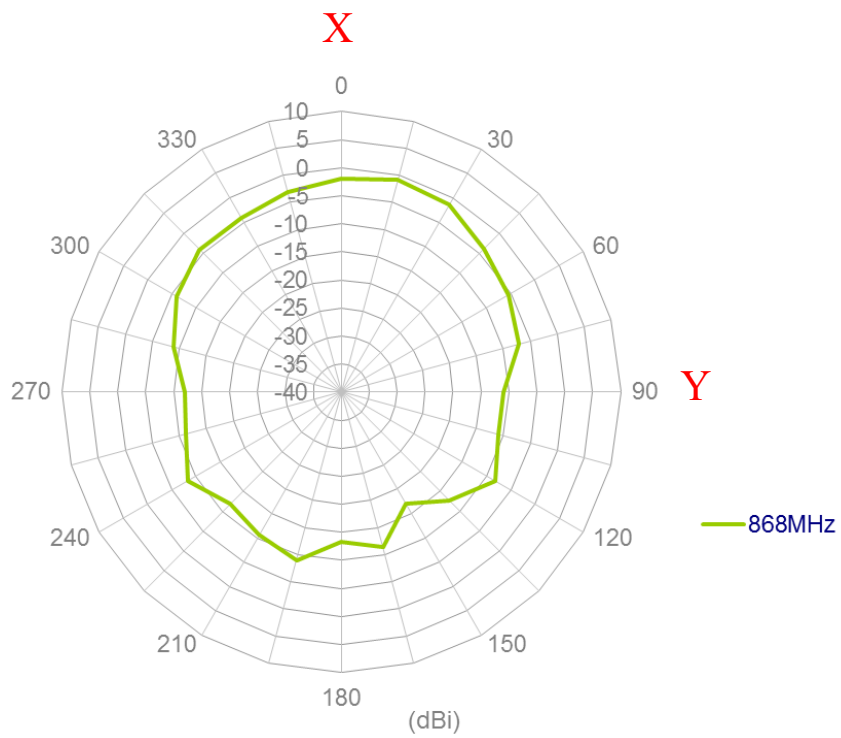
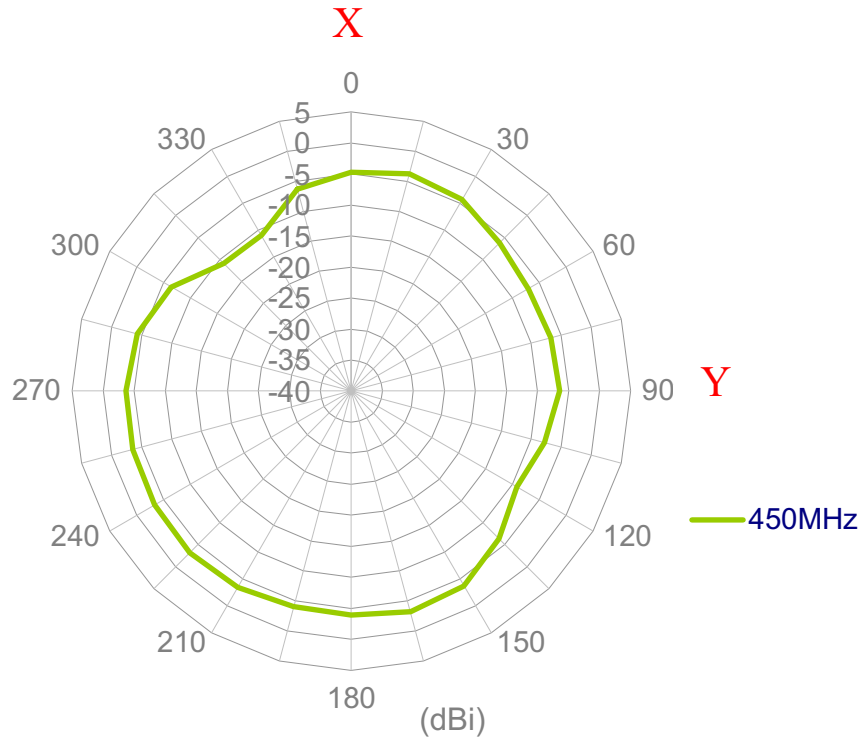
### 4.1 Antenna setup

The antenna radiation pattern measured setup as shown the below,



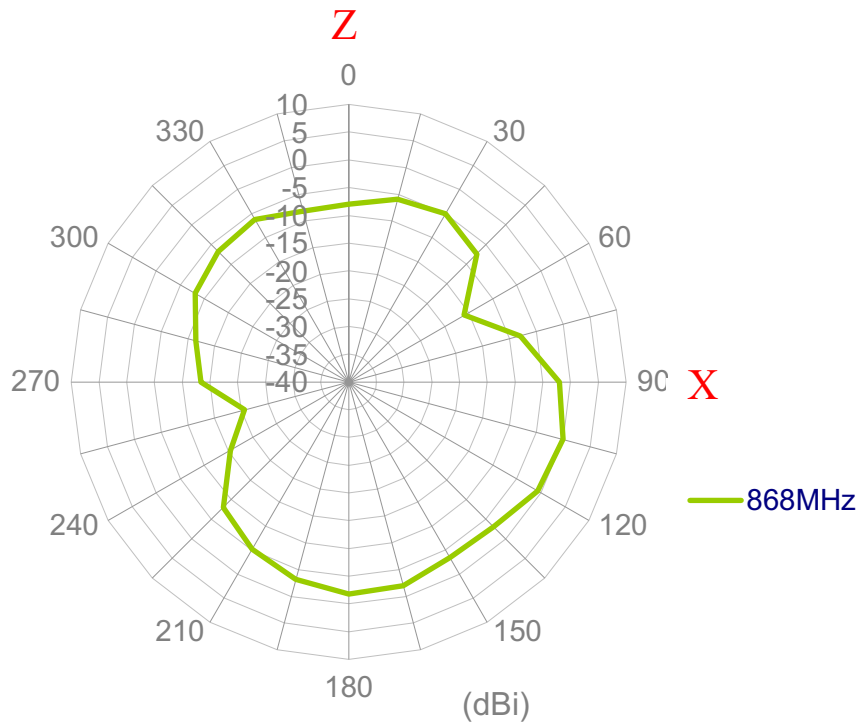
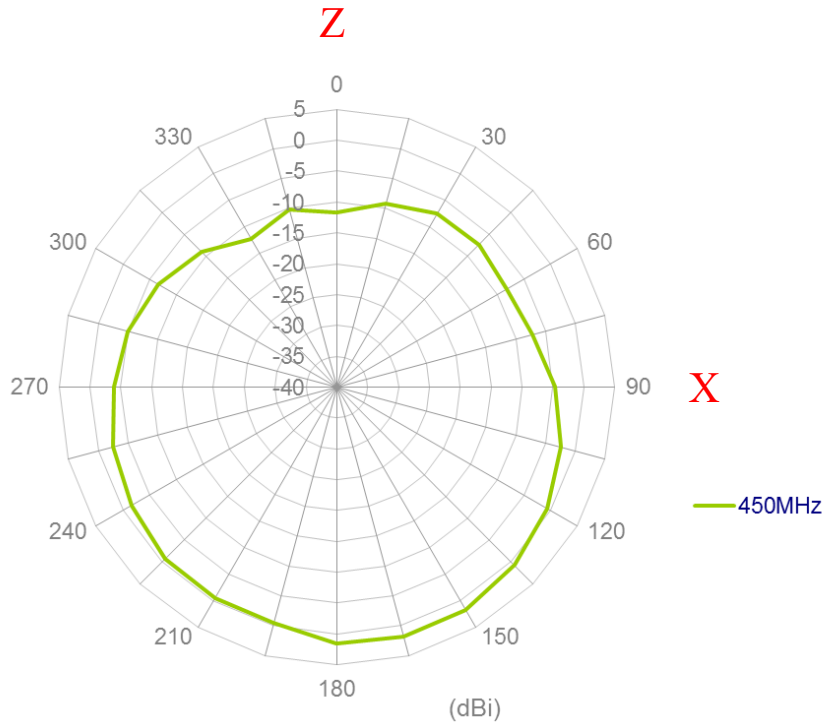


**4.2 Antenna radiation patterns**  
**XY-Plane**



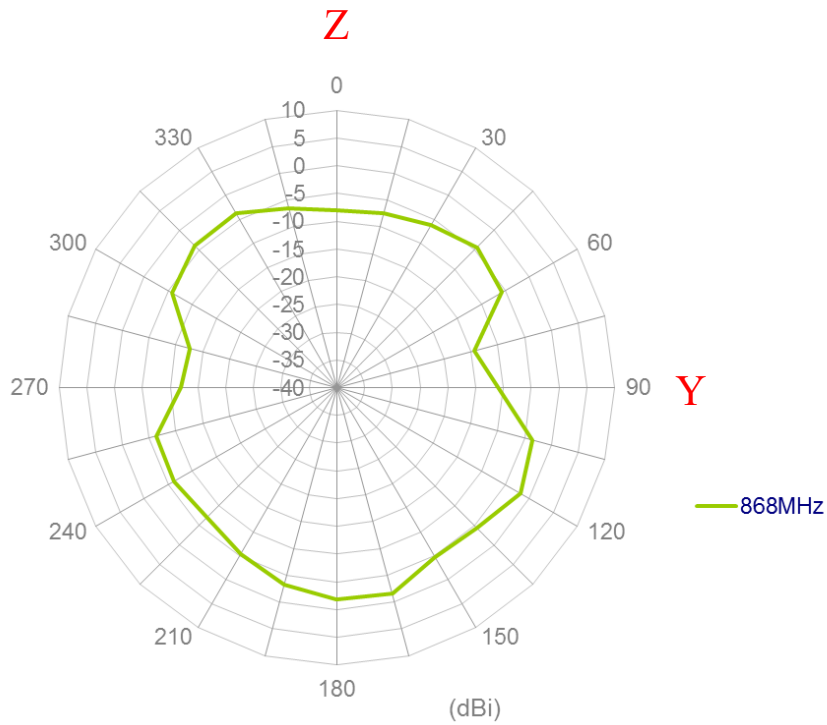
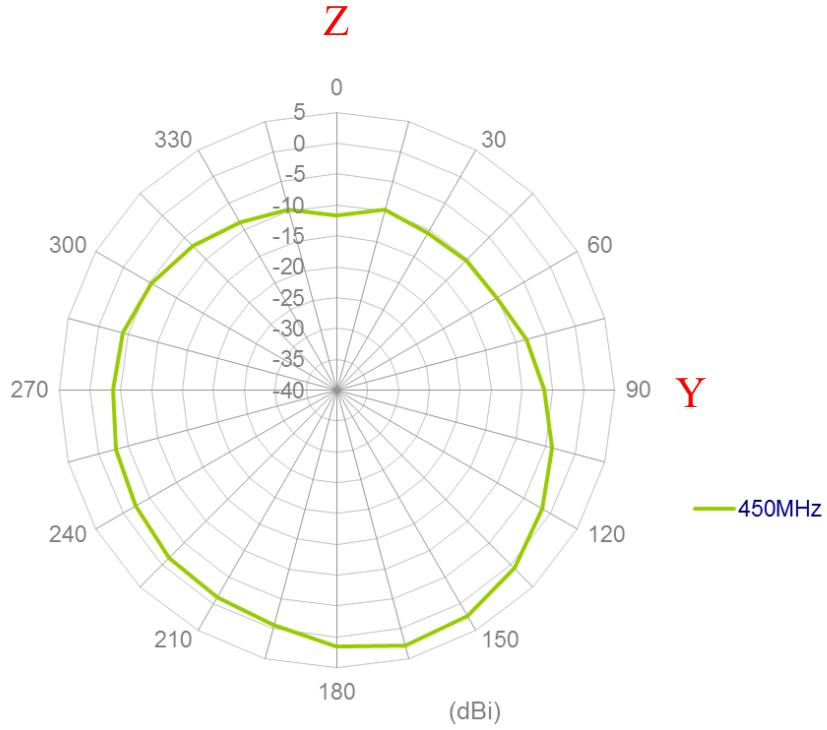


## XZ-Plane



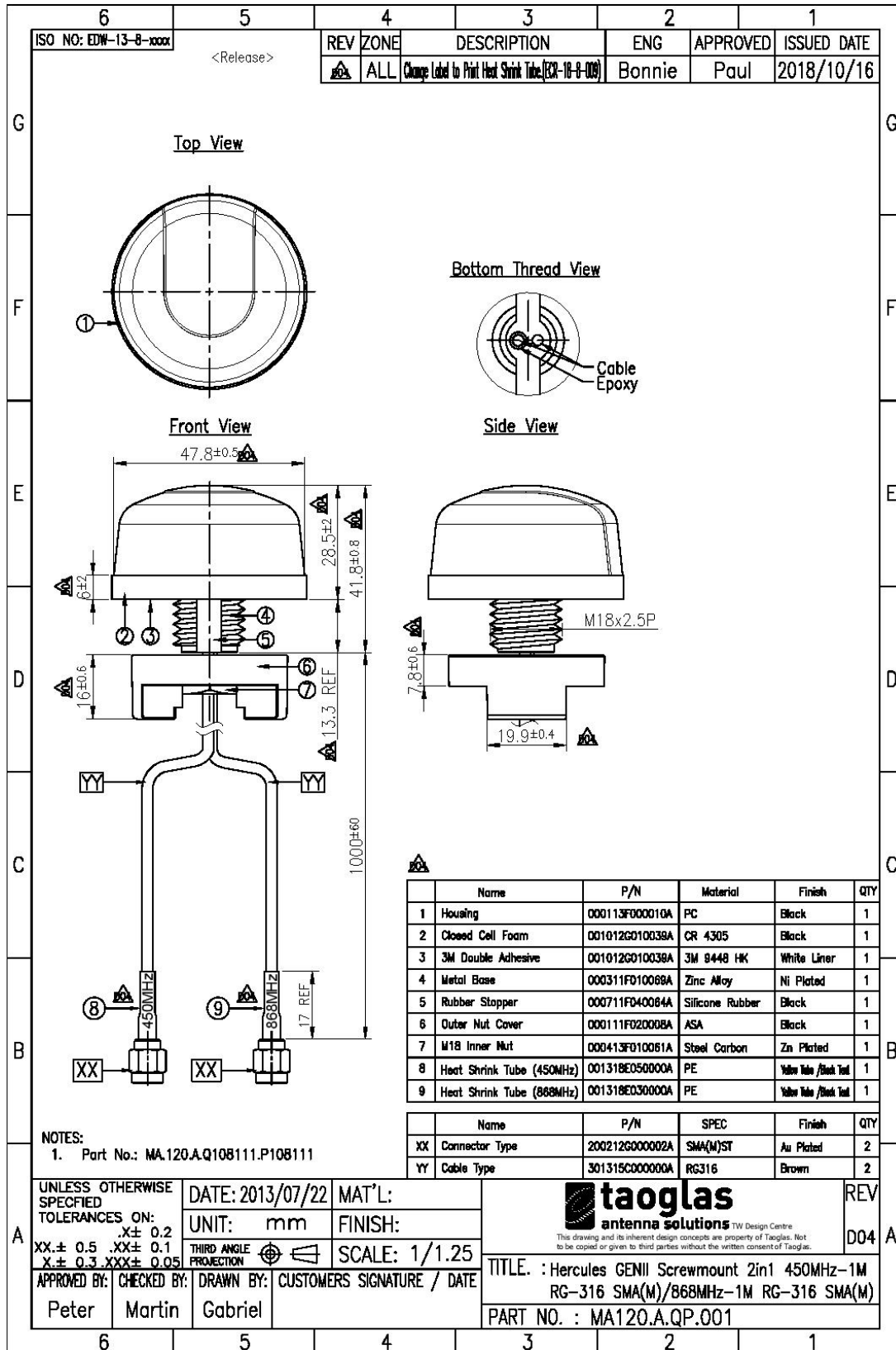


## YZ-Plane

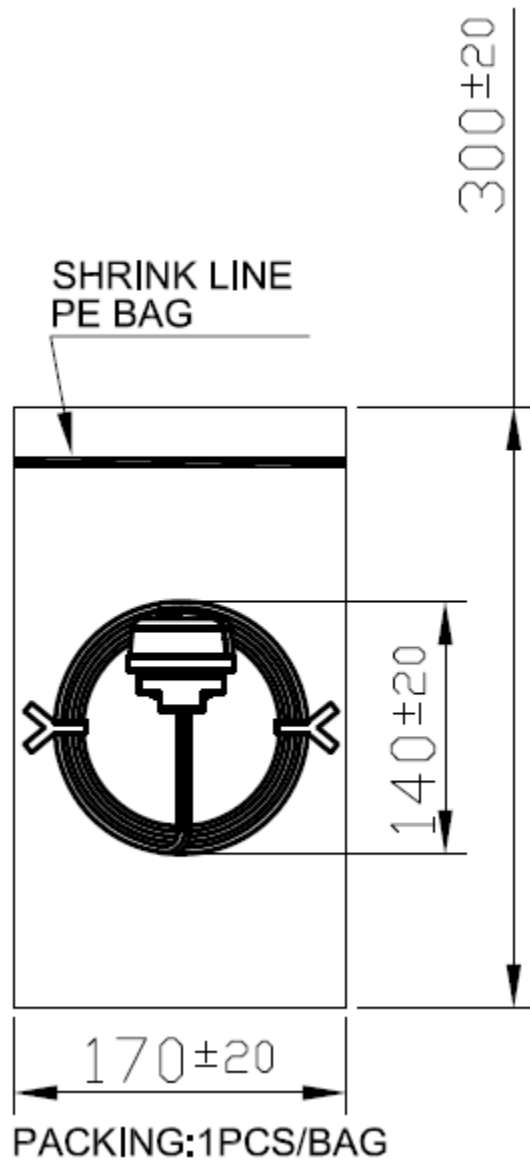




## 5. Drawing



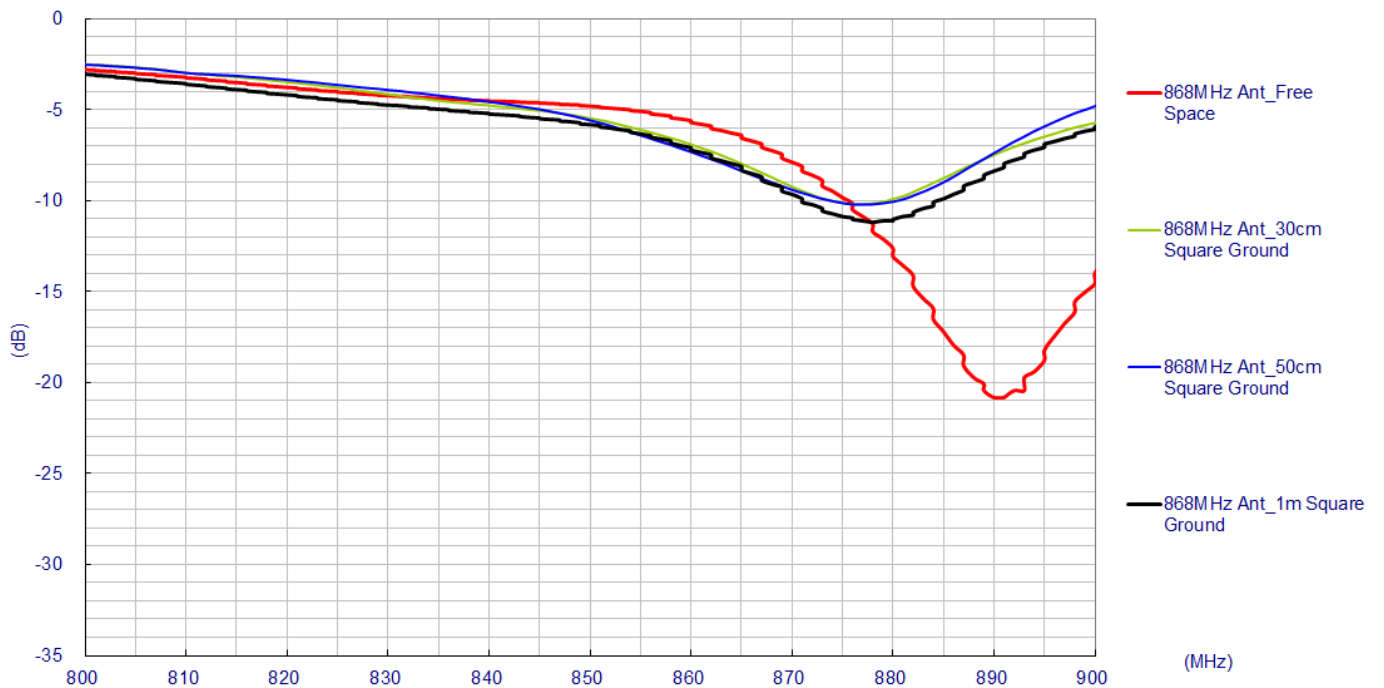
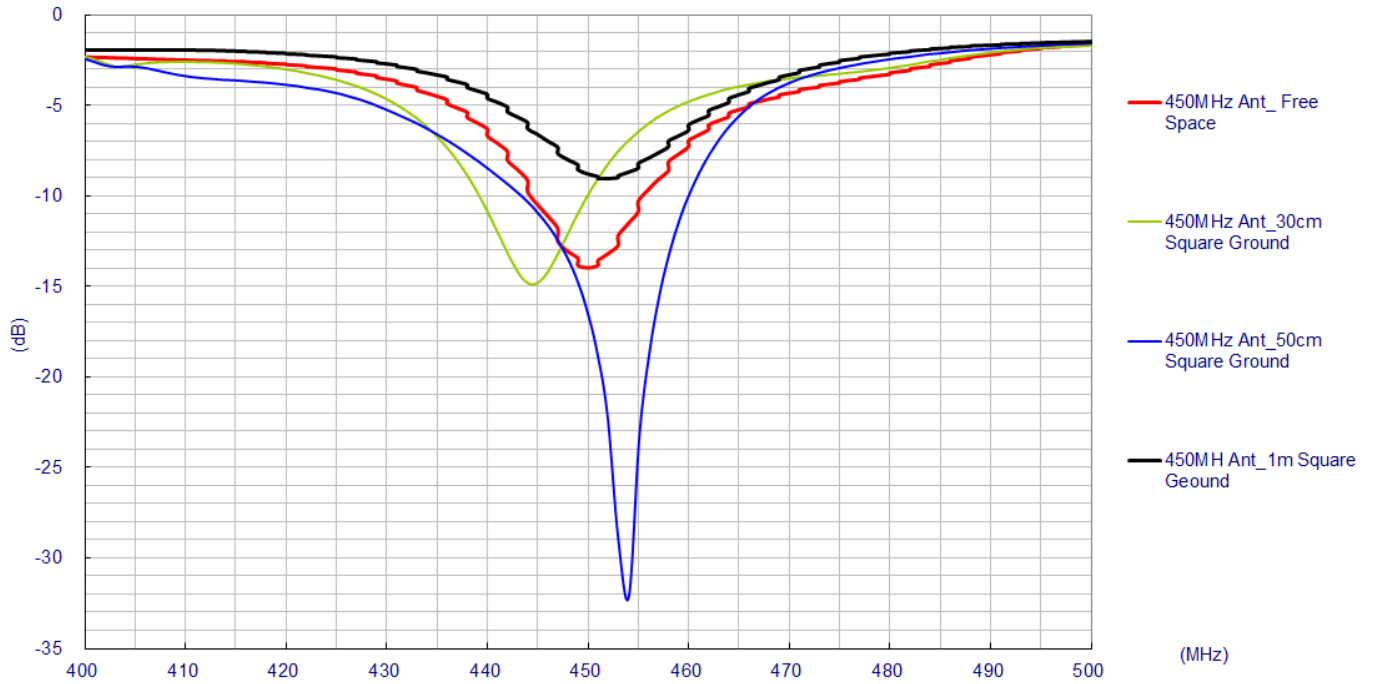
## 6. Packaging



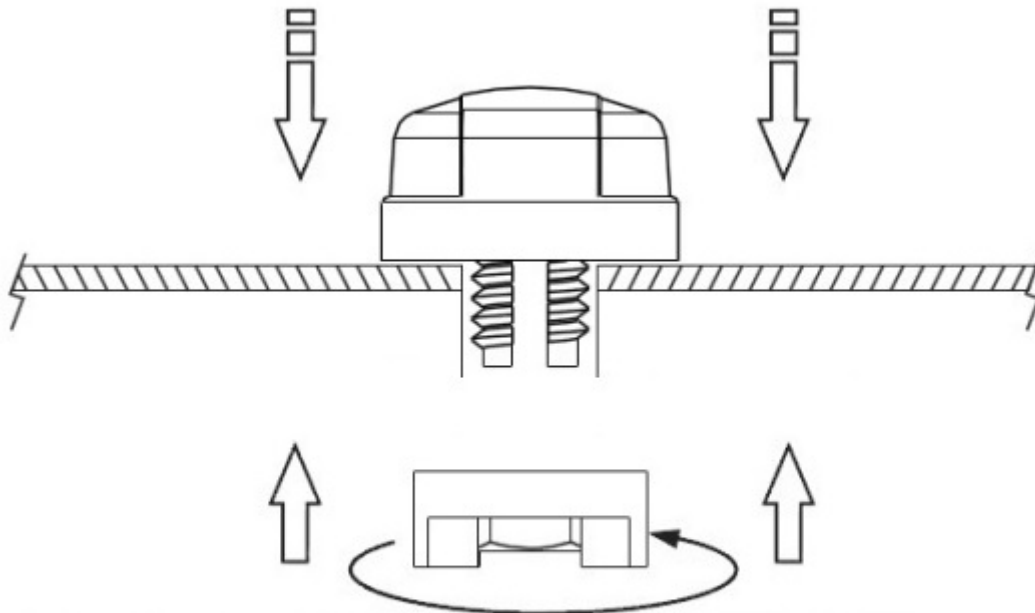


## 7. Application Note

Taoglas provides this antenna return loss results with different ground conditions. Detail, please observe below.



## 8. Installation



Recommended torque for Mounting is 24.5N·m  
Maximum torque for mounting is 29.4 N·m

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