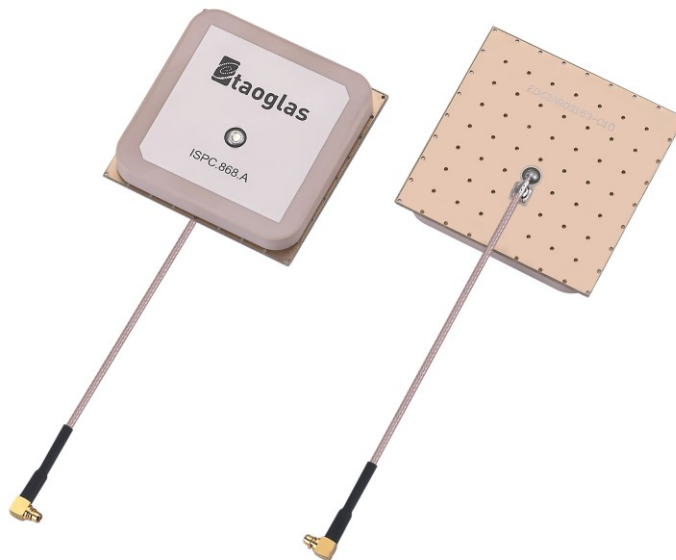


## SPECIFICATION

- Part No. : **ISPC.86A.09.0092E**
- Product Name : 5dBi ISM Band 865-870Mhz Embedded Ceramic Patch Antenna with Cable and Connector
- Features : High antenna efficiency  
868MHz ISM Band  
5dBi Peak (when placed on 30cm x30cm ground plane) - Broadside to Zenith Radiation Pattern  
1dBi Peak Gain in free-space  
47.5\*47.5\*6.5mm (Ceramic Antenna)  
49.5\*49.5\*7.5mm (Antenna with EVB)  
RG178 92mm cable length  
MMCX Male Right Angle Connector  
**RoHS Compliant**

Photo:



## 1. Introduction

The 5dBi ISPC.86A antenna is designed primarily for compact fixed wireless applications in the 865MHz to 870MHz frequency range where extra coverage range is required. The antenna functions best when the backside is placed on a metal panel.

When placed on a reference 30cm square ground-plane, the antenna has excellent directional hemispherical radiation pattern up to 5dBi on the zenith, and an efficiency of 65%.

Even without a ground-plane underneath the antenna achieves 1dBi and an efficiency of 40~50%, with an omnidirectional pattern.

This ceramic patch antenna with RG178 and MMCX male right angle connector is a great solution for the following typical applications

- RFID Readers
- Short range 868MHz mesh networks

Cable type, length and connector can be customized. Mechanical customization can also be done for a minimum order quantity. Please contact your regional Taoglas office for more details.

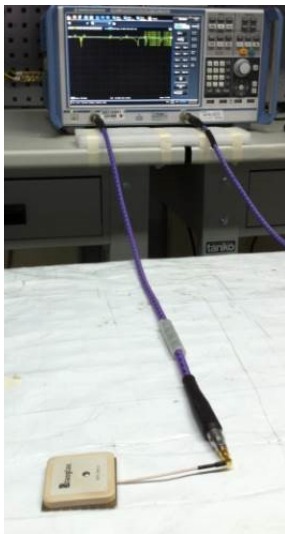
## 2. Specification

| ELECTRICAL                |                         |                         |
|---------------------------|-------------------------|-------------------------|
| Measurement environment   | Free Space              | On 30*30cm ground plane |
| Operation Frequency (MHz) | 865 to 870MHz           |                         |
| Return Loss (dB)          | -6.3                    | -6.7                    |
| Peak Gain (dbi)           | 0.37                    | 4.63                    |
| Efficiency (%)            | 46.09                   | 61.84                   |
| Average Gain (dB)         | -3.36                   | -2.09                   |
| Polarization              | Linear                  |                         |
| Impedance                 | 50 Ohms                 |                         |
| Radiation Properties      | Broadside Toward Zenith |                         |
| Max Input Power           | 5 W                     |                         |
| MECHANICAL                |                         |                         |
| Dimension (mm)            | 47.5*47.5*6.5           |                         |
| Material                  | Ceramic                 |                         |
| Product Dimension (mm)    | 49.5*49.5*7.5           |                         |
| Coaxial Cable             | RG178                   |                         |
| Coaxial Length (mm)       | 92                      |                         |
| Connector                 | MMCX Male Right Angle   |                         |
| ENVIRONMENTAL RATINGS     |                         |                         |
| Operation Temperature     | -40°C to 85°C           |                         |
| Storage Temperature       | -40°C to 105°C          |                         |
| Relative Humidity         | 40% to 95%              |                         |
| RoHs Compliant            | Yes                     |                         |

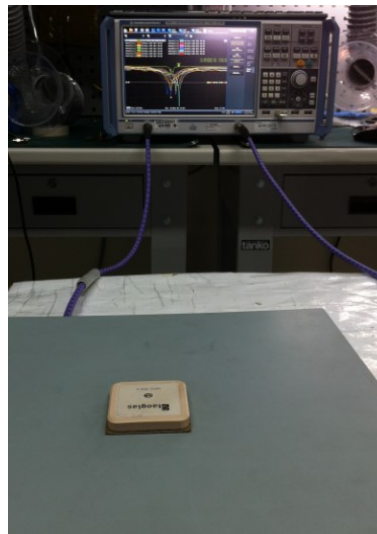
### 3. Antenna Characteristics

#### 3.1 Testing setup

ISPC.86A antenna was tested with R&S ZNB-8 network analyzer.

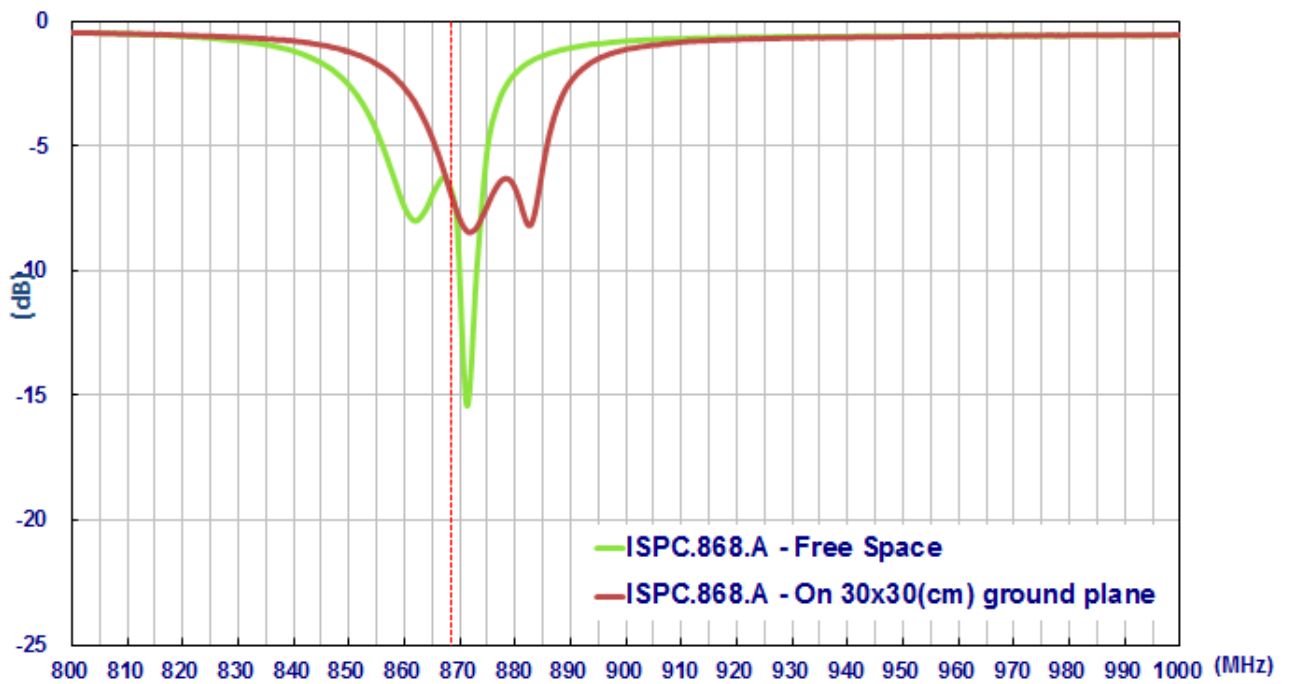


Free Space

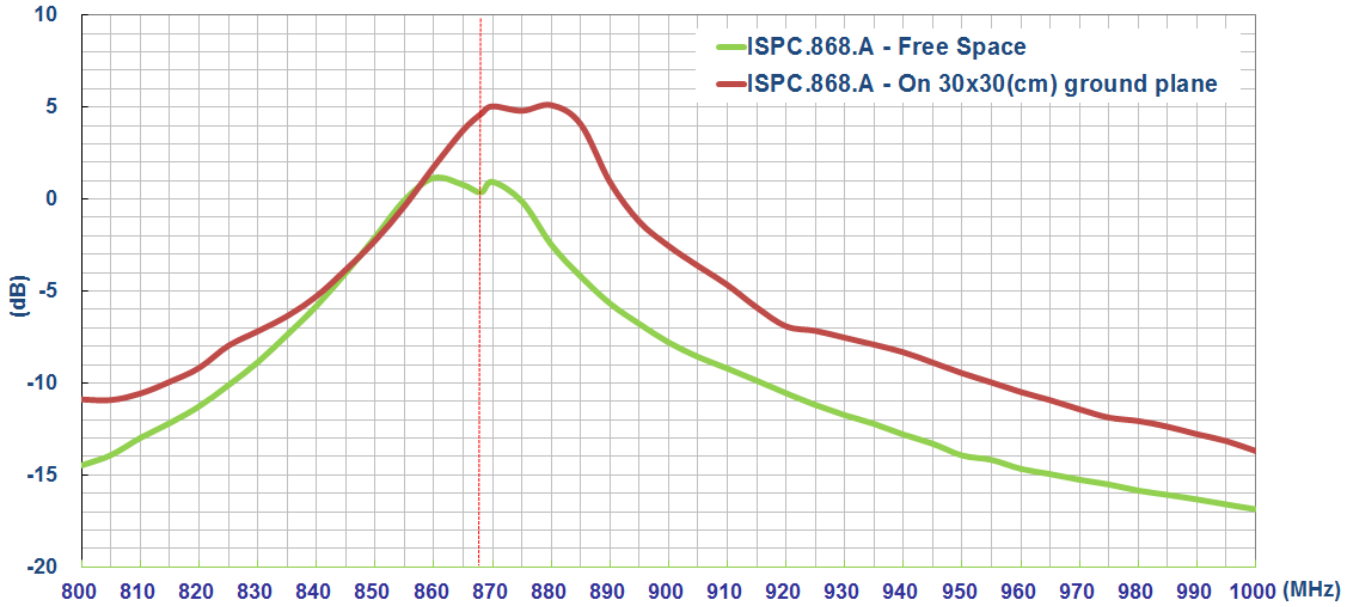


On 30x30(cm) metal plane

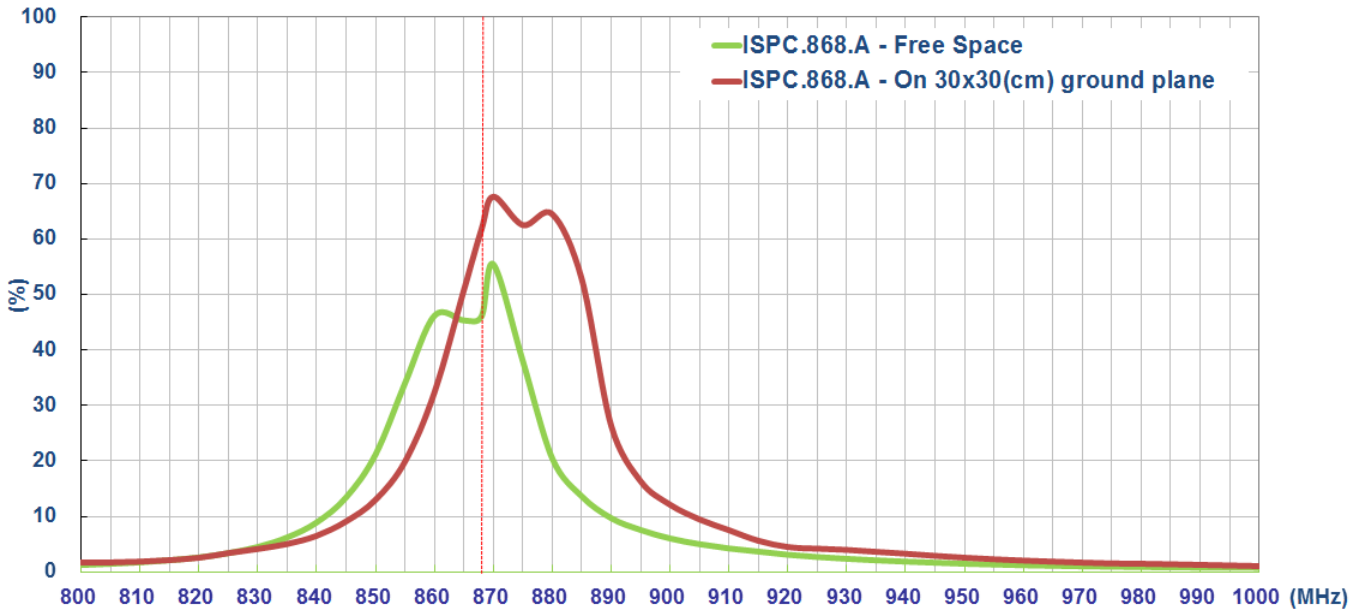
#### 3.2 Return Loss



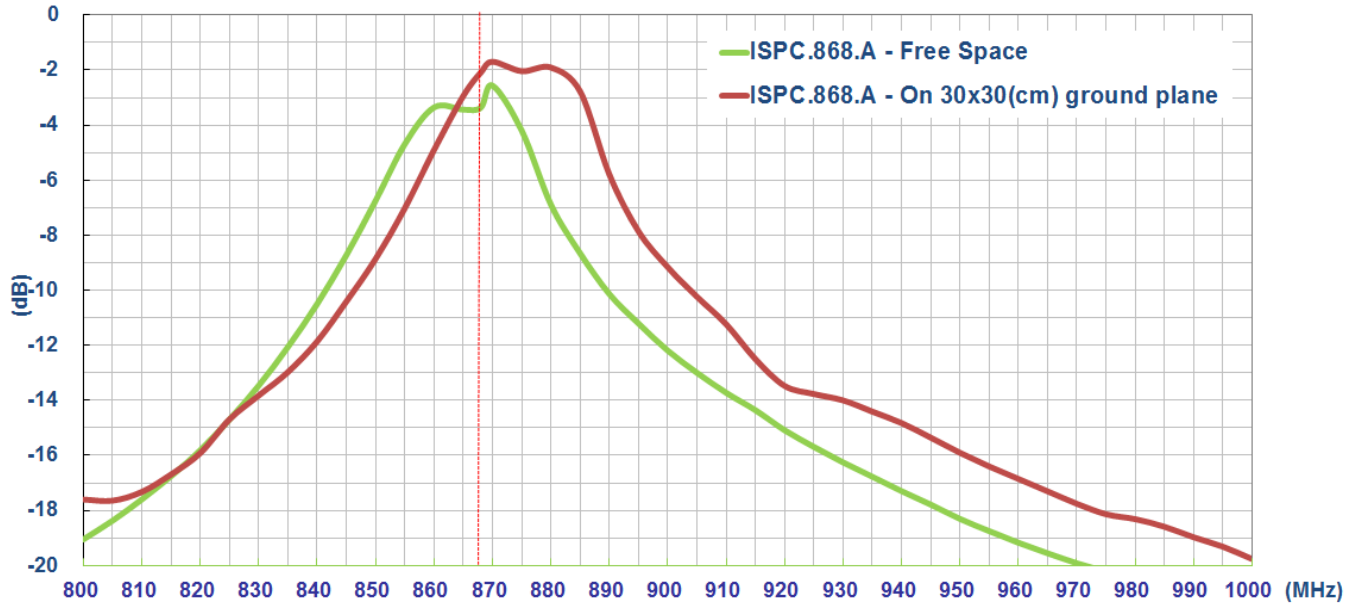
### 3.3 Peak Gain



### 3.4 Efficiency



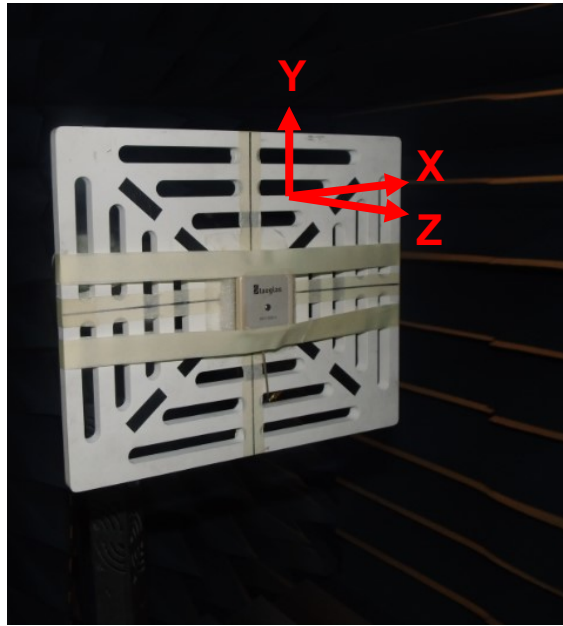
### 3.5 Average Gain



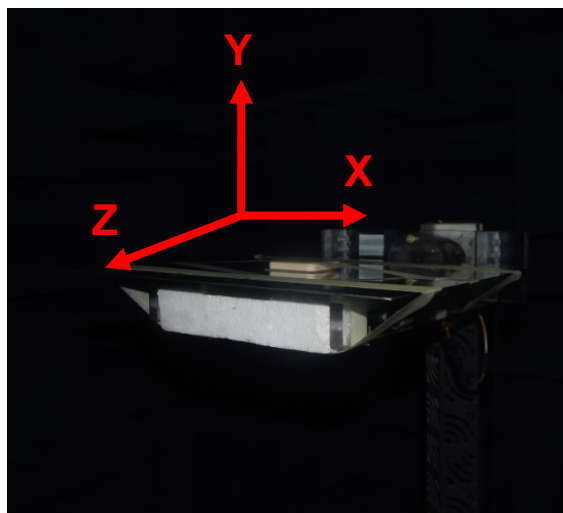
## 4. Antenna Radiation Patterns

### 4.1 Antenna setup

The antenna radiation pattern measured setup as shown the below,



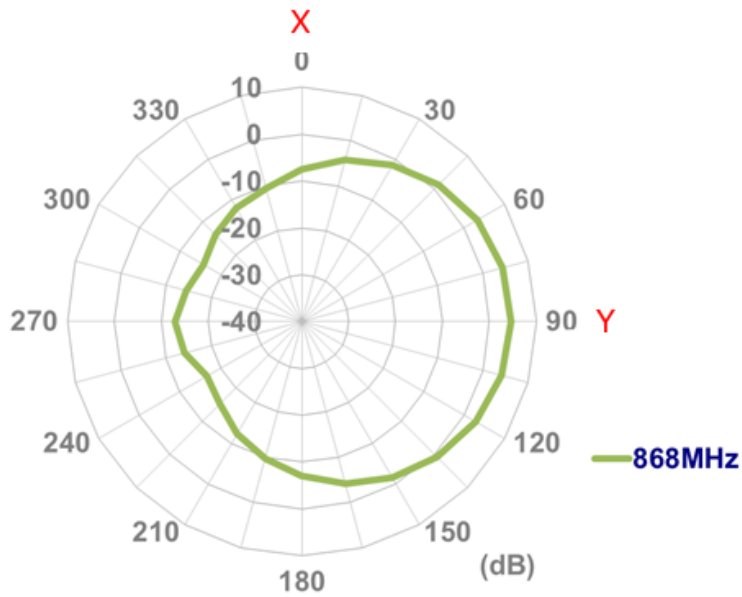
**Free Space**



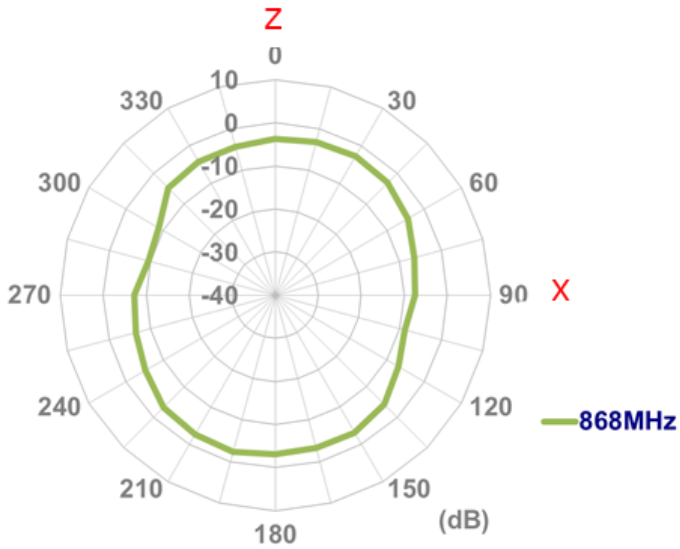
**On 30\*30cm ground plane**

## 4.2 Antenna radiation patterns On 30\*30cm Ground plane

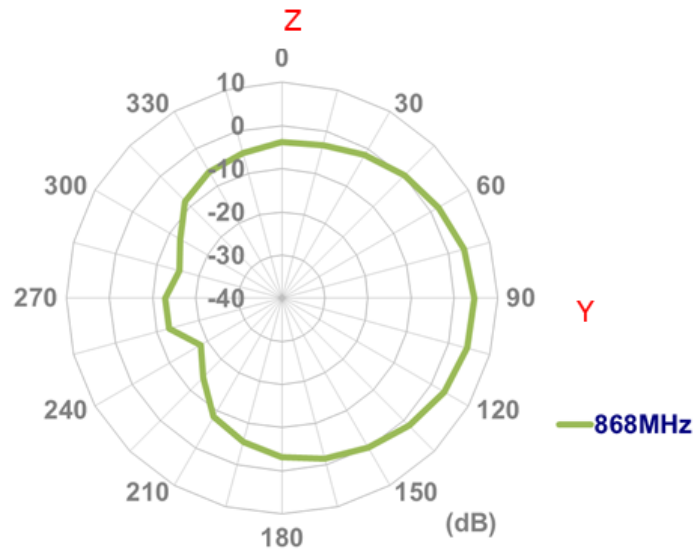
### XY Plane



### XZ Plane



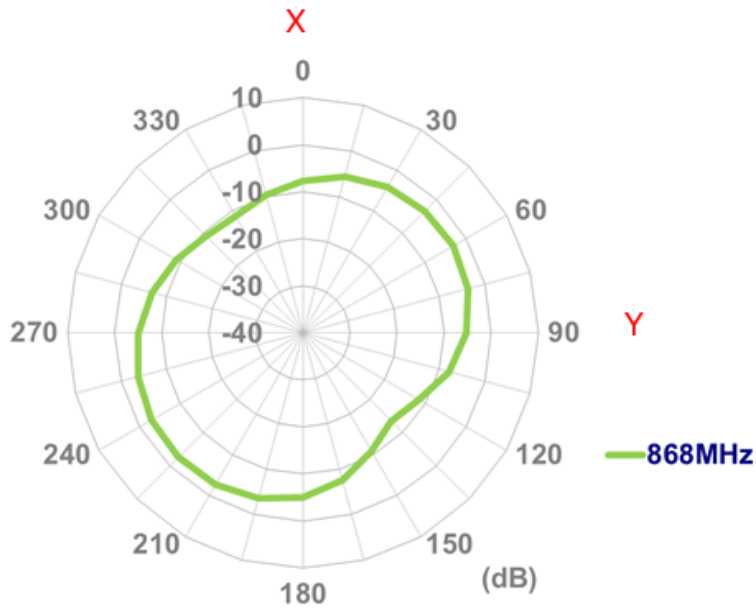
### YZ Plane





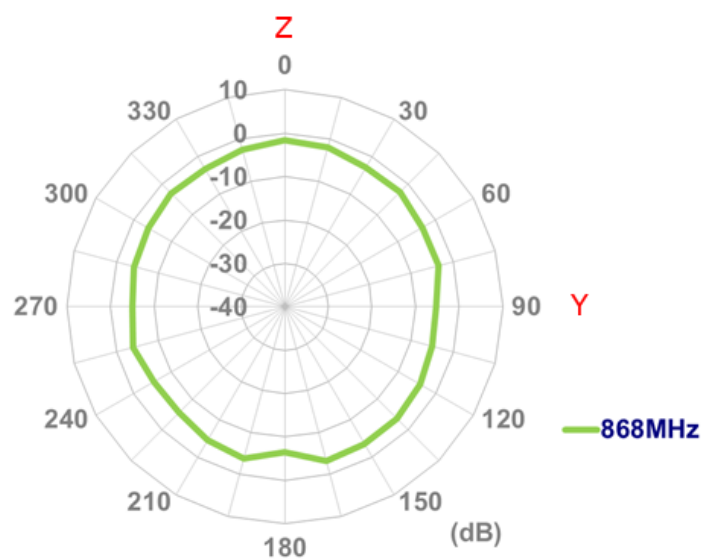
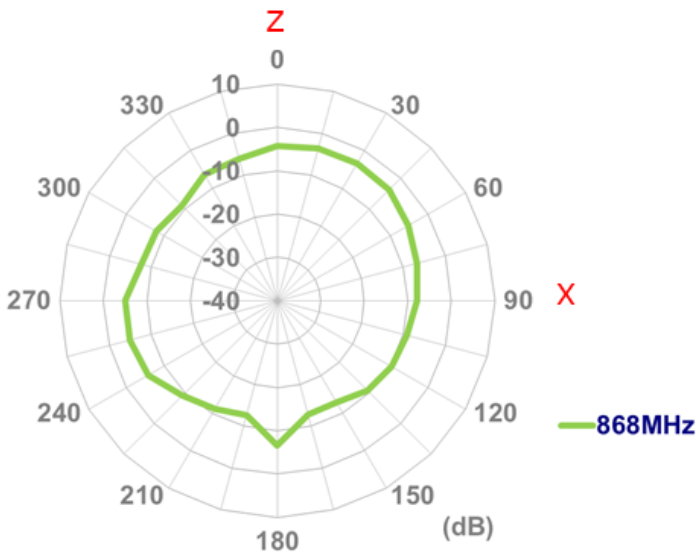
## Free Space

### XY Plane

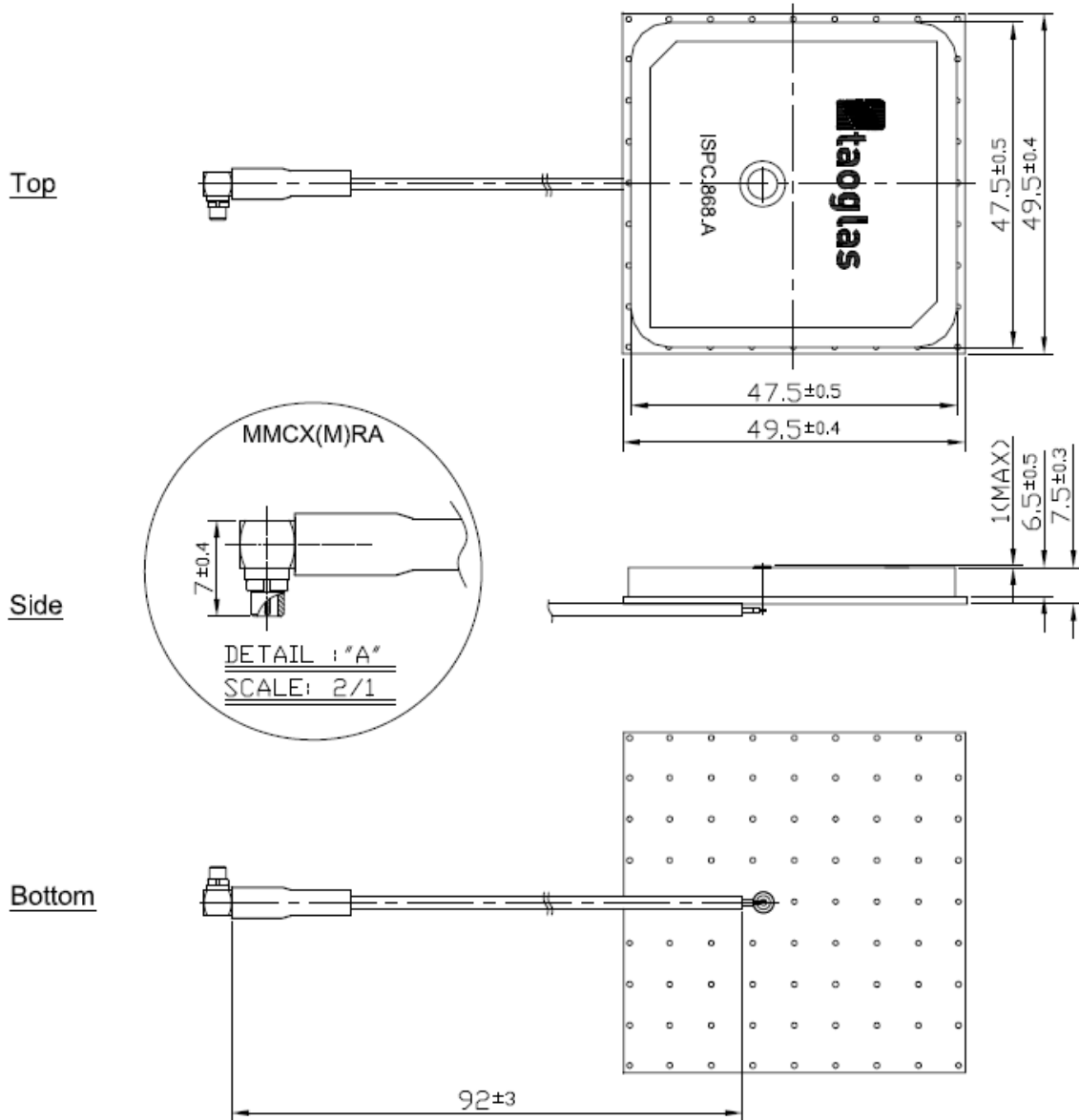


### XZ Plane

### YZ Plane



## 5. DRAWING



|   | Name         | P/N            | Material | Finish | QTY |
|---|--------------|----------------|----------|--------|-----|
| 1 | 868MHz Patch | 001513H000007A | Ceramic  | Clear  | 1   |
| 2 | RG-178       | 301013A000007A | FEP      | Brown  | 1   |
| 3 | MMCX(M) RA   | 202713D010007A | Brass    | Gold   | 1   |
| 4 | PCB          | 100213H000007A | FR4 1t   | N/A    | 1   |

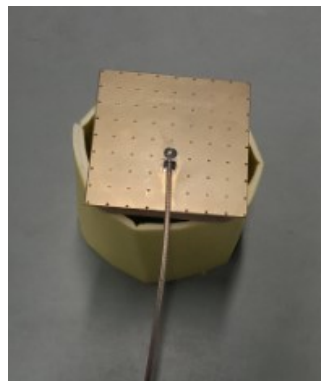
## 6. APPLICATION NOTE

Taoglas considers the application here of the ISPC.86A antenna in different typical environments. Some environments the antenna will be close to ground plane (or general metal objects) and at different orientations. The distance to ground-plane will also differ. Following this rationale, we compiled the antenna S11 variation charts as below to evaluate the typical effects on performance. A degraded return loss would generally to relatively decreased efficiency, peak gain, and deformed radiation patterns. \*\*Note - while it may appear from the return loss on the ground above antenna that the antenna may work in this orientation, it is likely the gain and efficiency are very poor, we would not recommend it under any circumstance\*\*

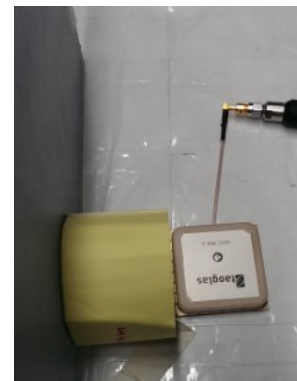
There are three general situations of a ground plane orientation to antenna, the setup is as below.



Ground under antenna

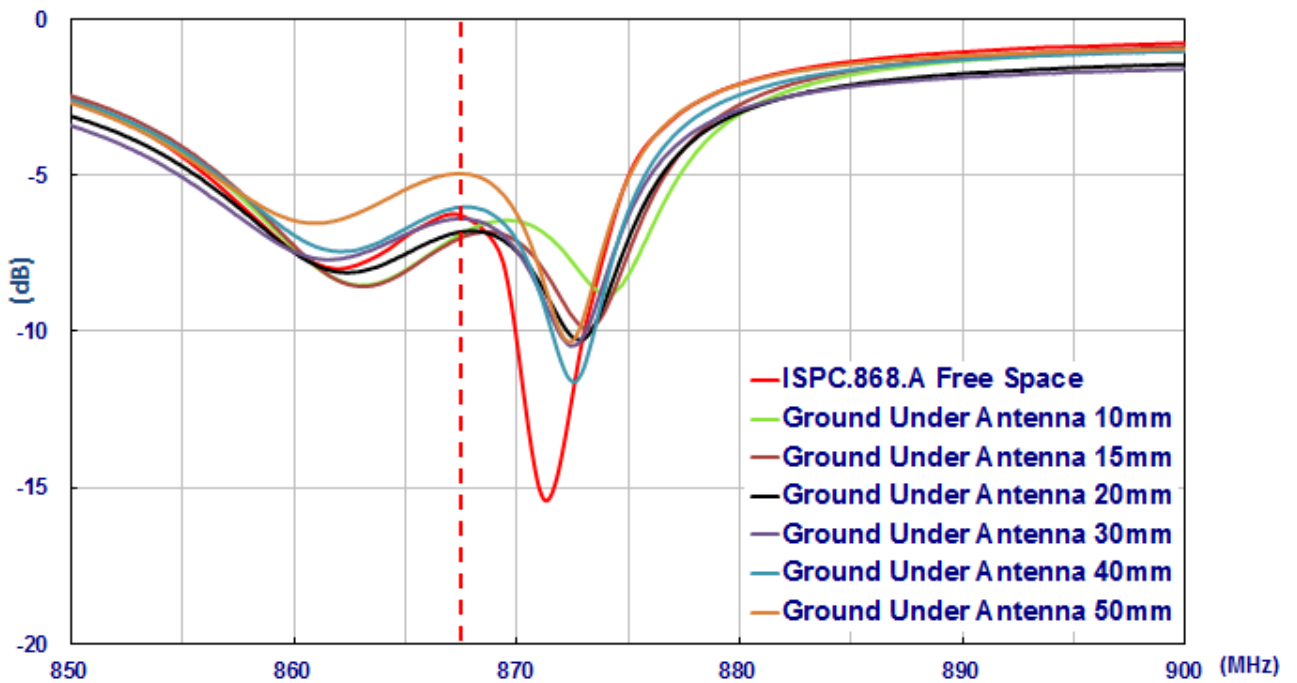
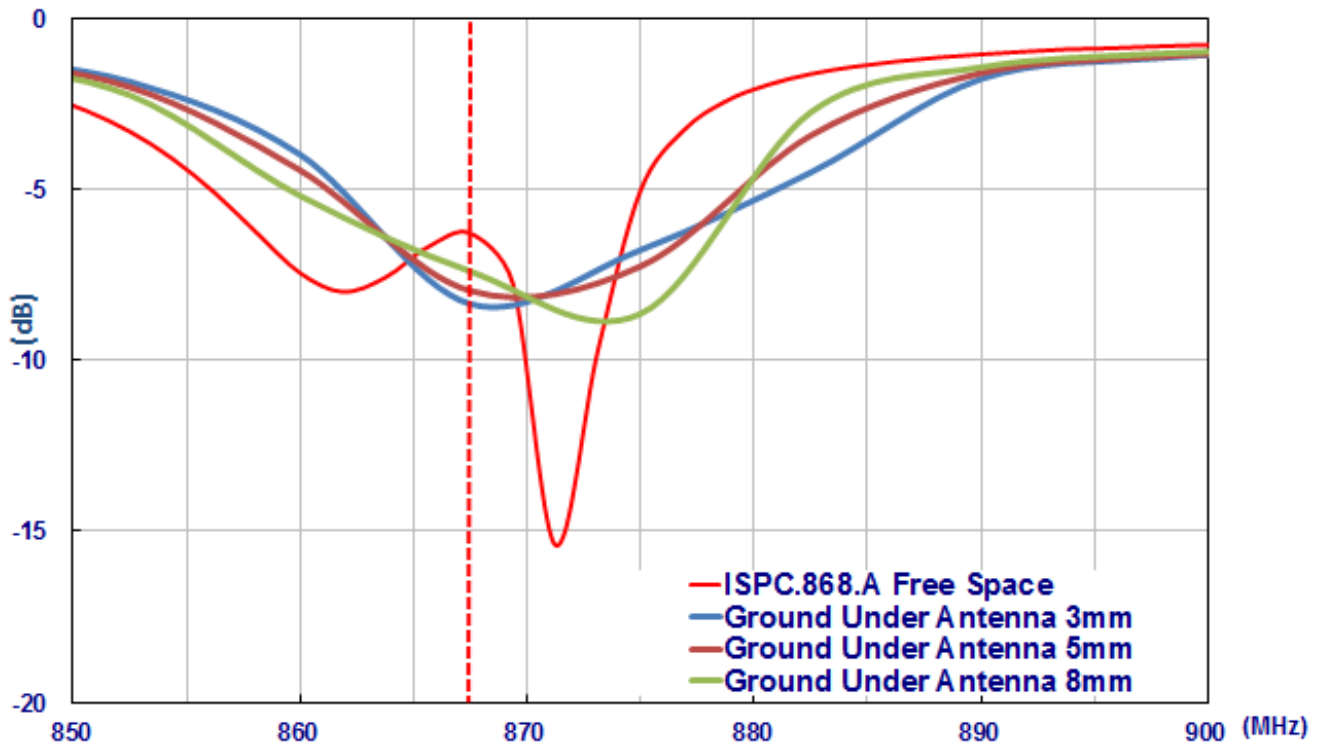


Ground above antenna

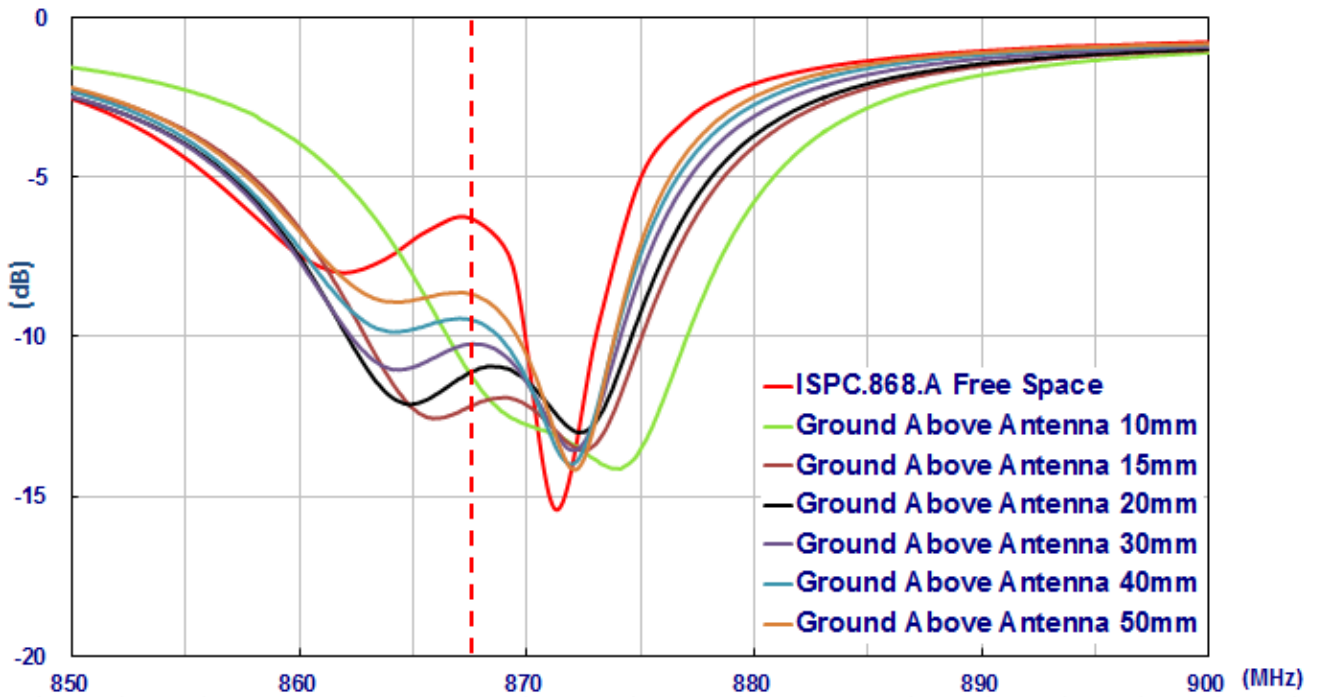
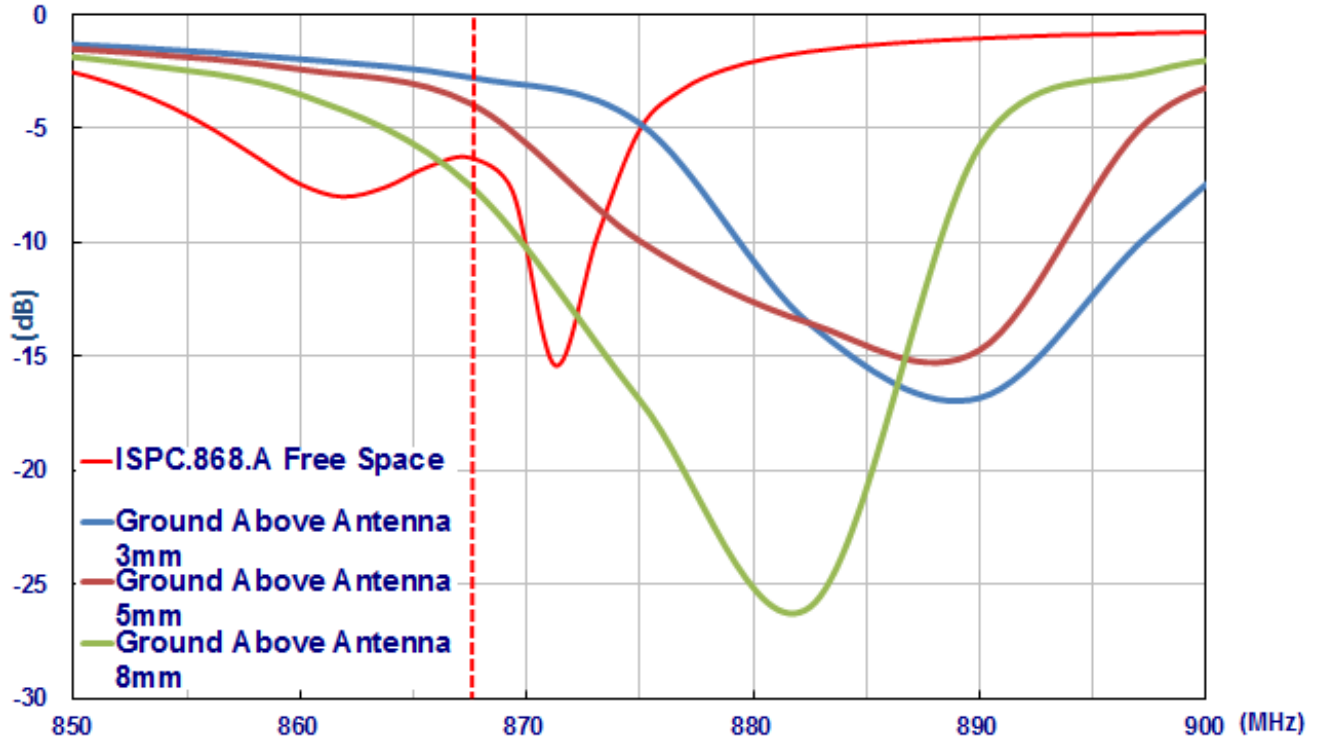


Ground side of antenna

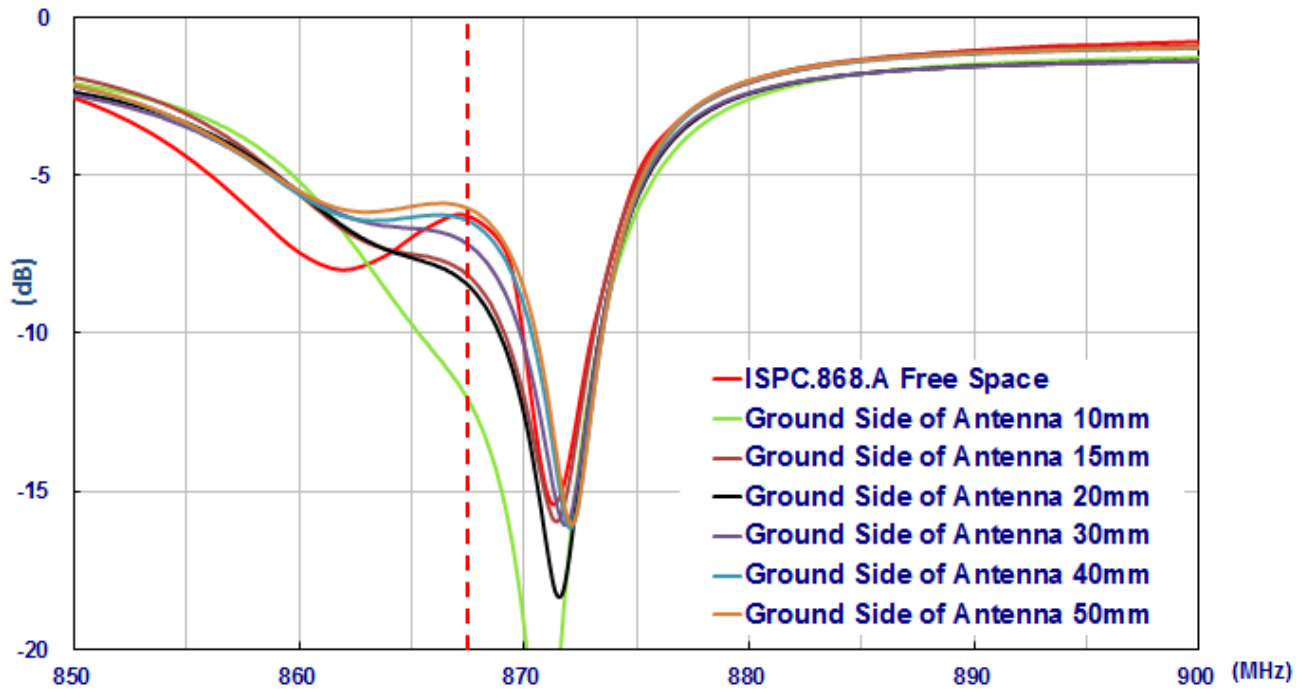
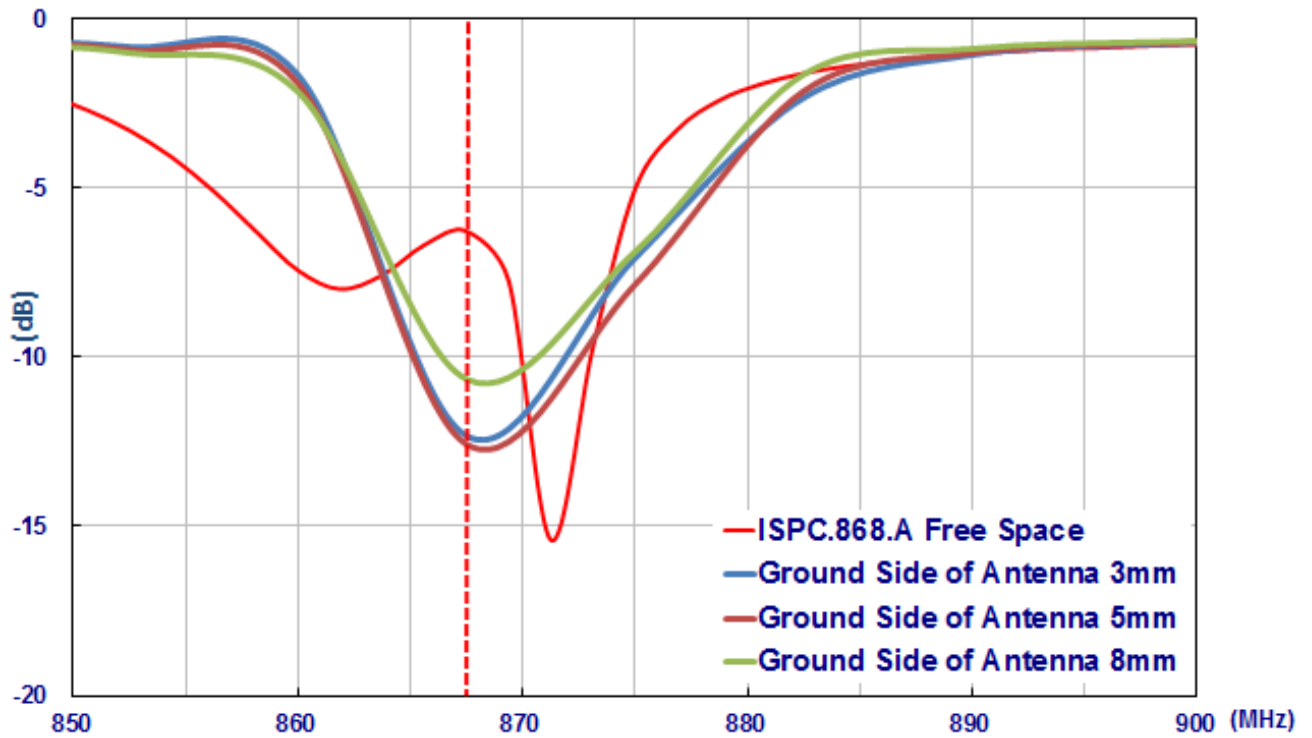
### Ground under antenna



### Ground above antenna



### Ground side of antenna

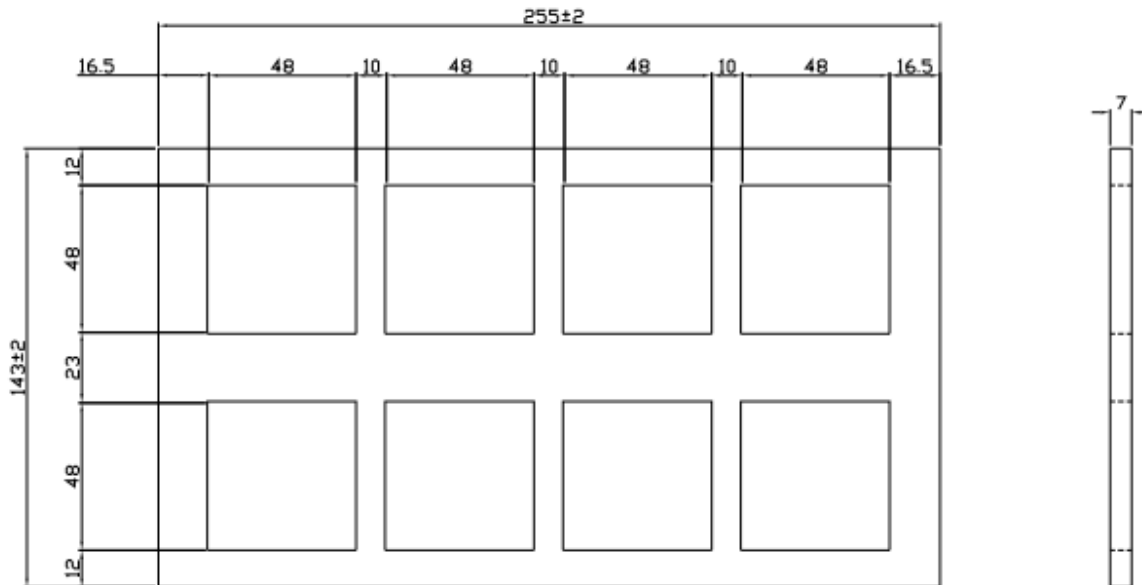


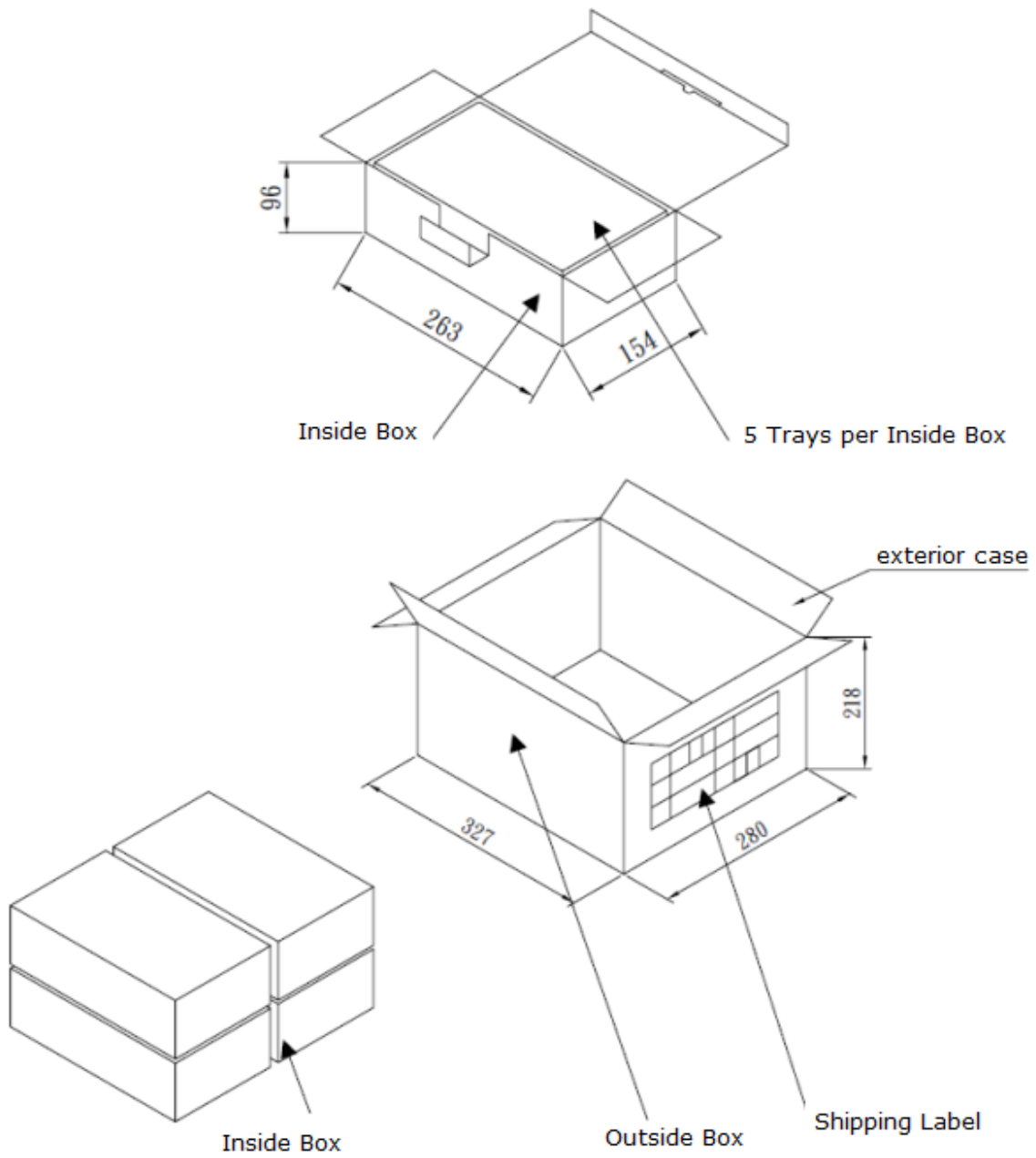
## 7. Packaging

8 pieces per Tray

5 Trays per Inside Box: 40 pieces

4 Inside Box's per Outer Box: 160 pieces







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