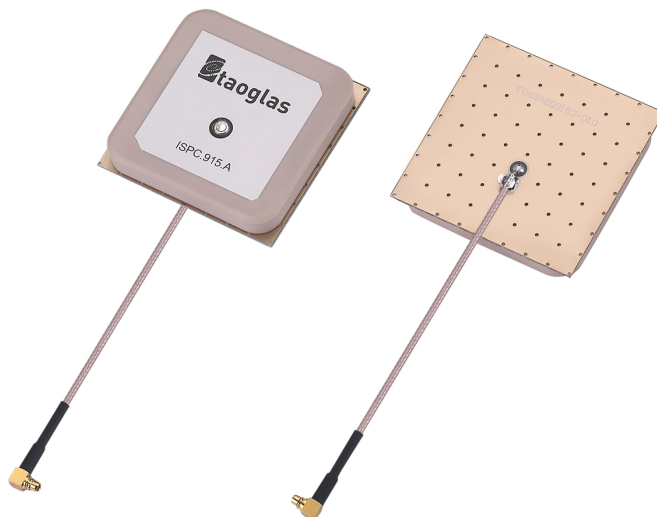


## SPECIFICATION

Part No.	<b>ISPC.91A.09.0092E</b>
Product Name	: 5dBi ISM Band 915MHz Embedded Ceramic Patch Antenna with Cable and Connector
Features	: High antenna efficiency 902MHz to 928MHz ISM Band 5dBi Peak (when placed on 30*30cm ground plane) 2dBi Peak Gain in free-space 47*47*6.5 mm (Ceramic Antenna) 49.5*49.5*7.5 mm (Antenna with EVB) RG178 92mm cable length MMCX male Right Angle Connector <b>RoHS Compliant</b>



## 1. Introduction

The 5dBi ISPC.91A embedded ceramic patch antenna with cable and connector is designed primarily for ISM band 915MHz compact fixed wireless applications where it can be mounted to a metal panel to function as ground underneath the antenna.

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 73%.

Even without a ground-plane underneath the antenna achieves 2dBi and an efficiency of 66% at 915MHz, with an omni-directional pattern.

Coming as standard with a RG178 cable and MMCX male right angle connector it is a great solution for the following typical applications

- RFID Readers
- Short range 915MHz mesh networks

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

## 2. Specifications

Electrical		
Measurement Environment	Free Space	On 30*30cm ground plane
Operation Frequency (MHz)	915MHz	
Peak Gain(dbi)	2	5
Efficiency (%)	66.51	73
Average Gain (dB)	-1.2	-1.2
Polarization	RHCP	
Impedance	50 Ohm	
Radiation Properties	Broadside Towards 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		
Operation Temperature	-40°C to 85°C	
Storage Temperature	-40°C to 105°C	
Relative Humidity	40% to 95%	
RoHS Compliant	Yes	

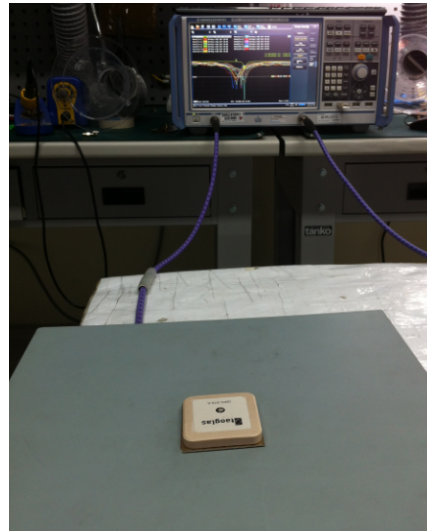
### 3. Antenna Characteristics

#### 3.1 Test setup

ISPC.91A antenna was tested with R&S ZNB-8 network analyzer

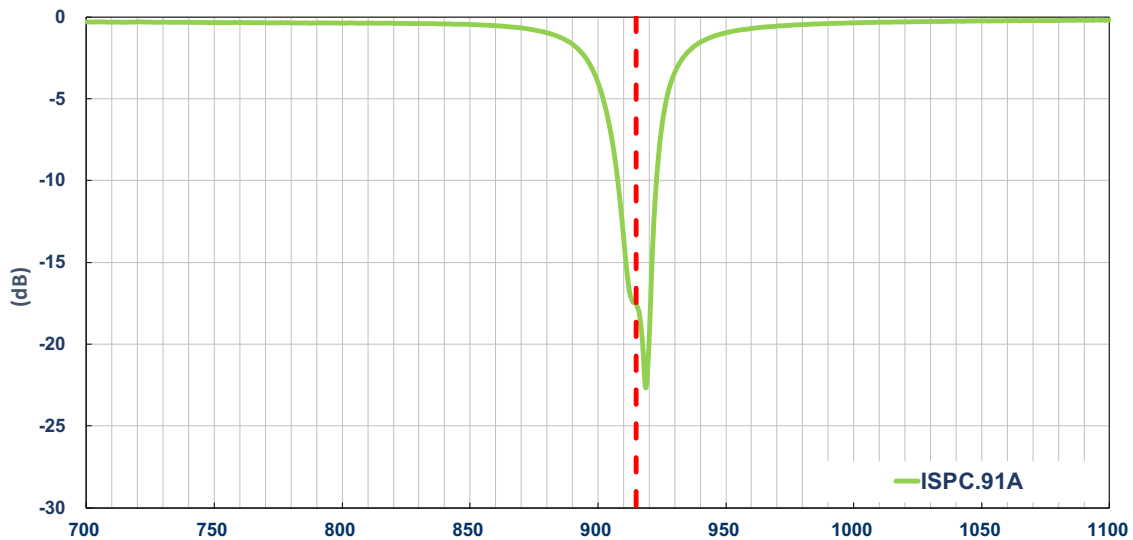


**Free Space**



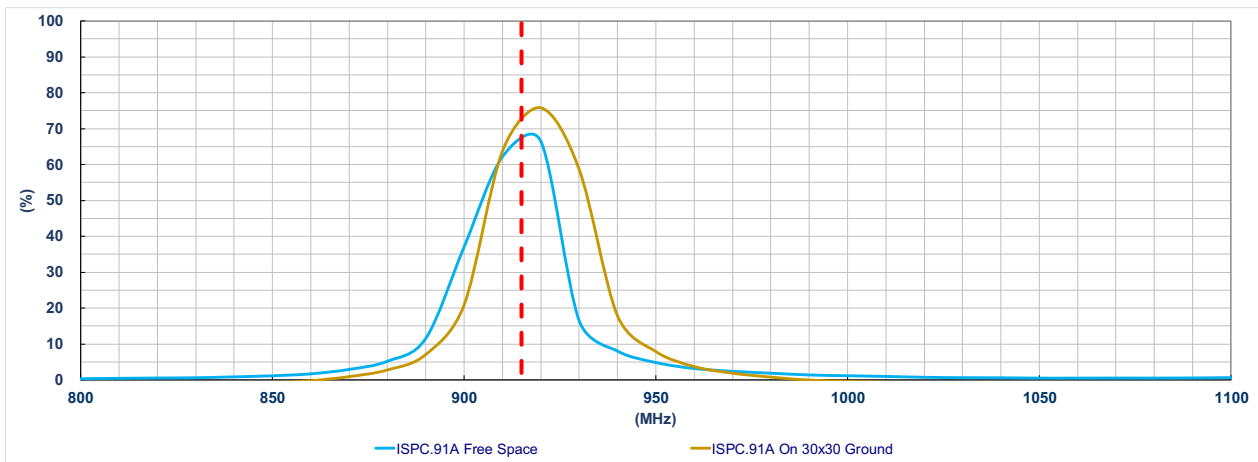
**On 30\*30cm ground plane**

#### 3.2 Return Loss

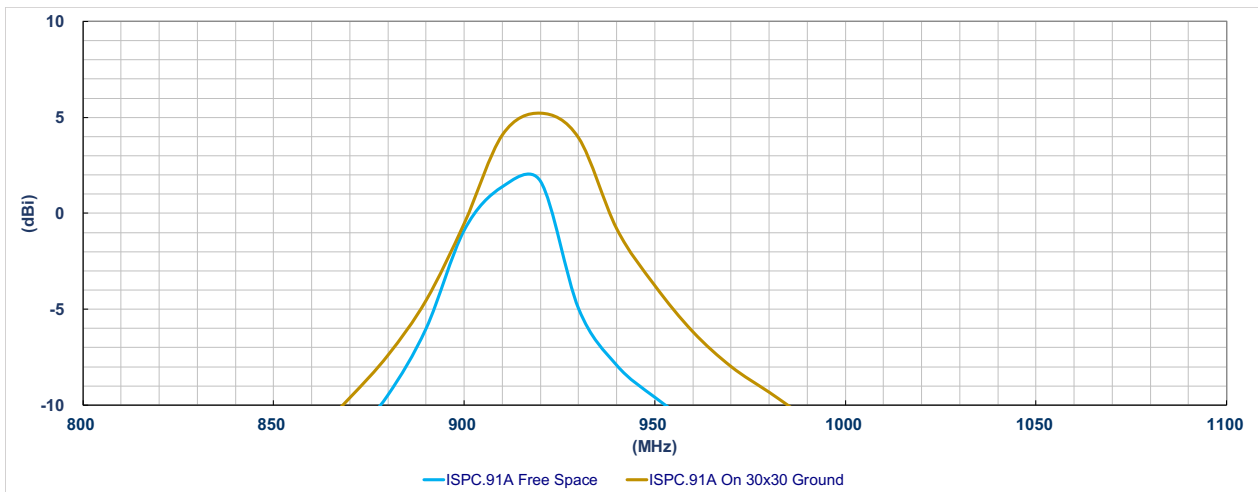




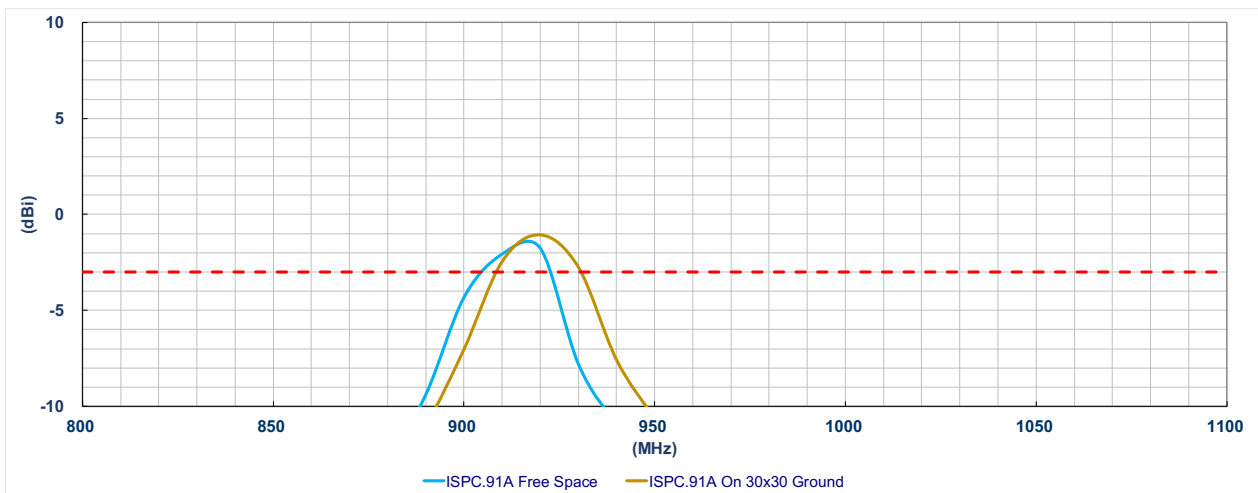
### 3.3 Efficiency



### 3.4 Peak Gain



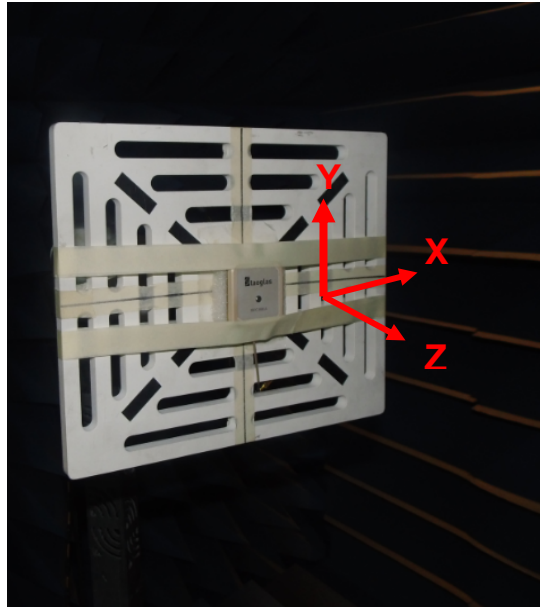
### 3.5 Average Gain



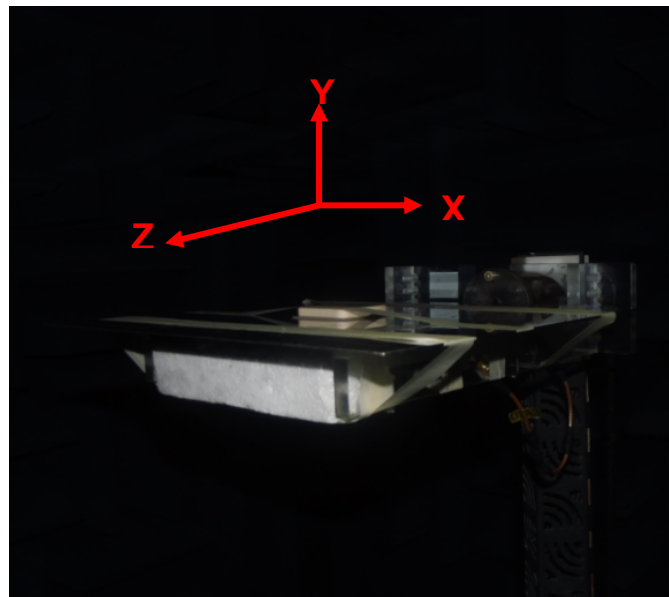
## 4. 2D Radiation Patterns

### 4.1 Antenna setup

The antenna radiation pattern measured setup as shown the below,



**In Free Space**

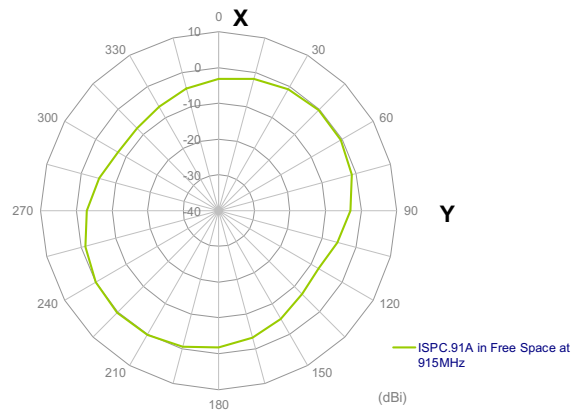


**On 30\*30cm ground plane**

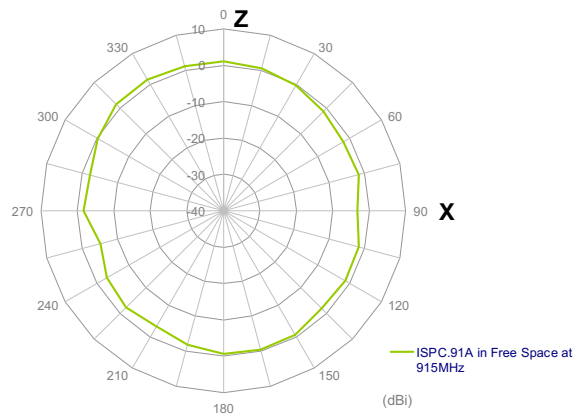


## 4.2 Free Space @ 915MHz

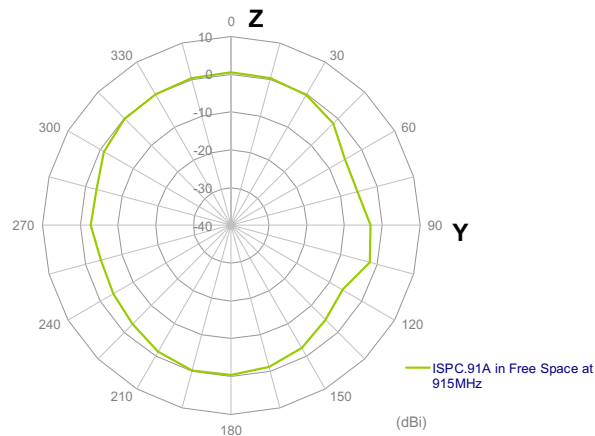
XY Plane



XZ Plane

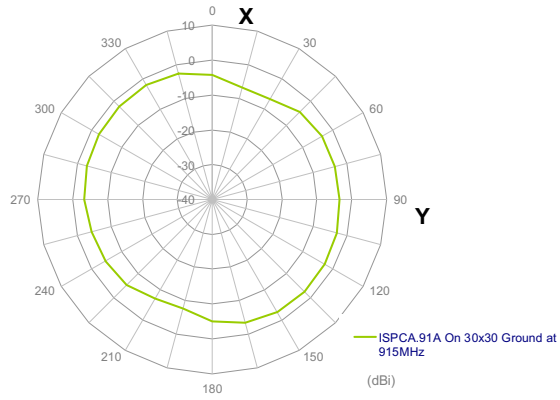


YZ Plane

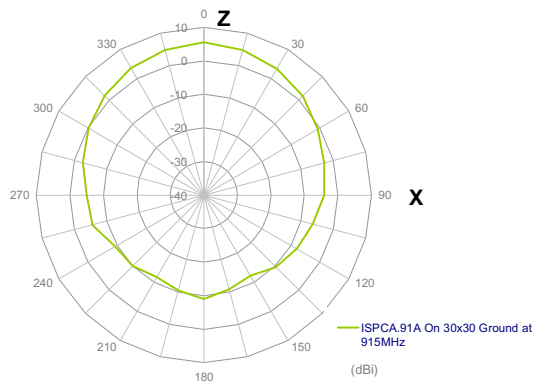


### 4.3 On 30\*30cm ground plane

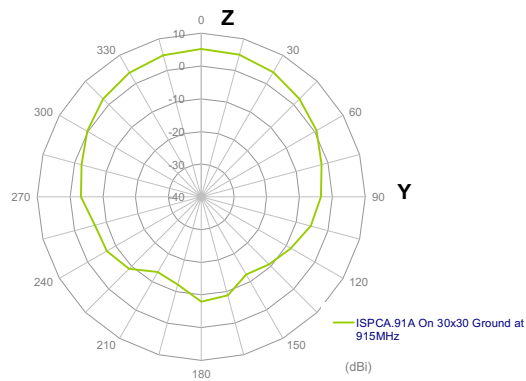
XY Plane



XZ Plane



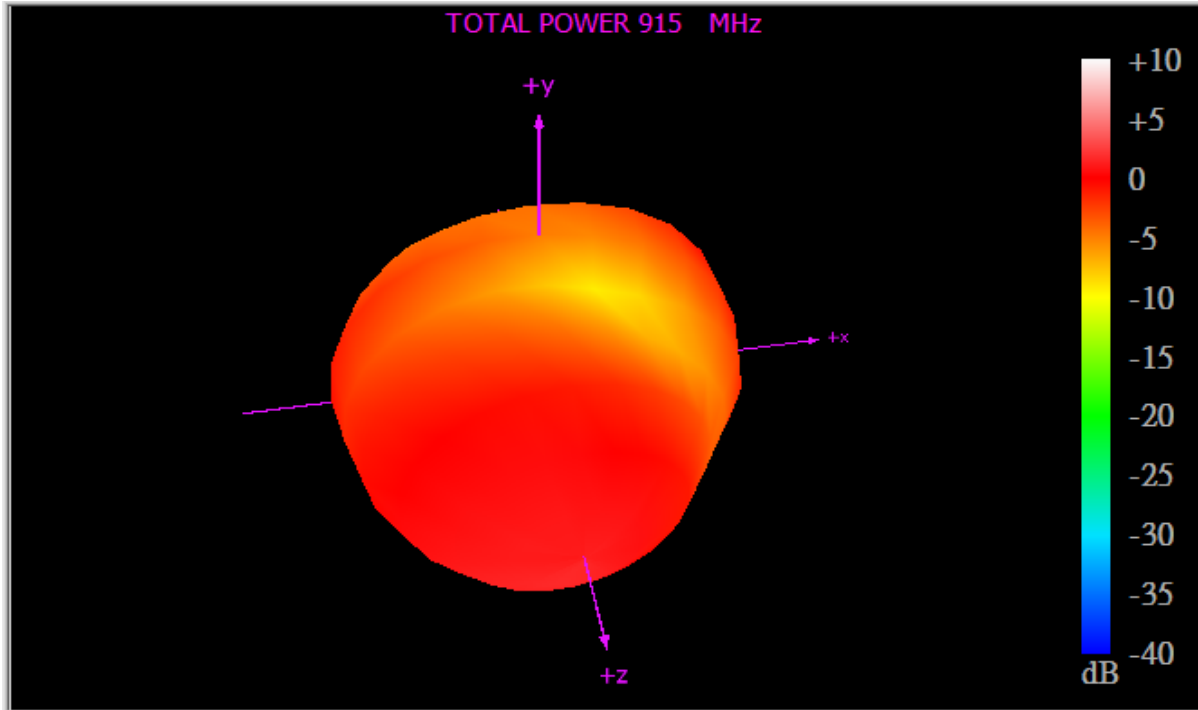
YZ Plane



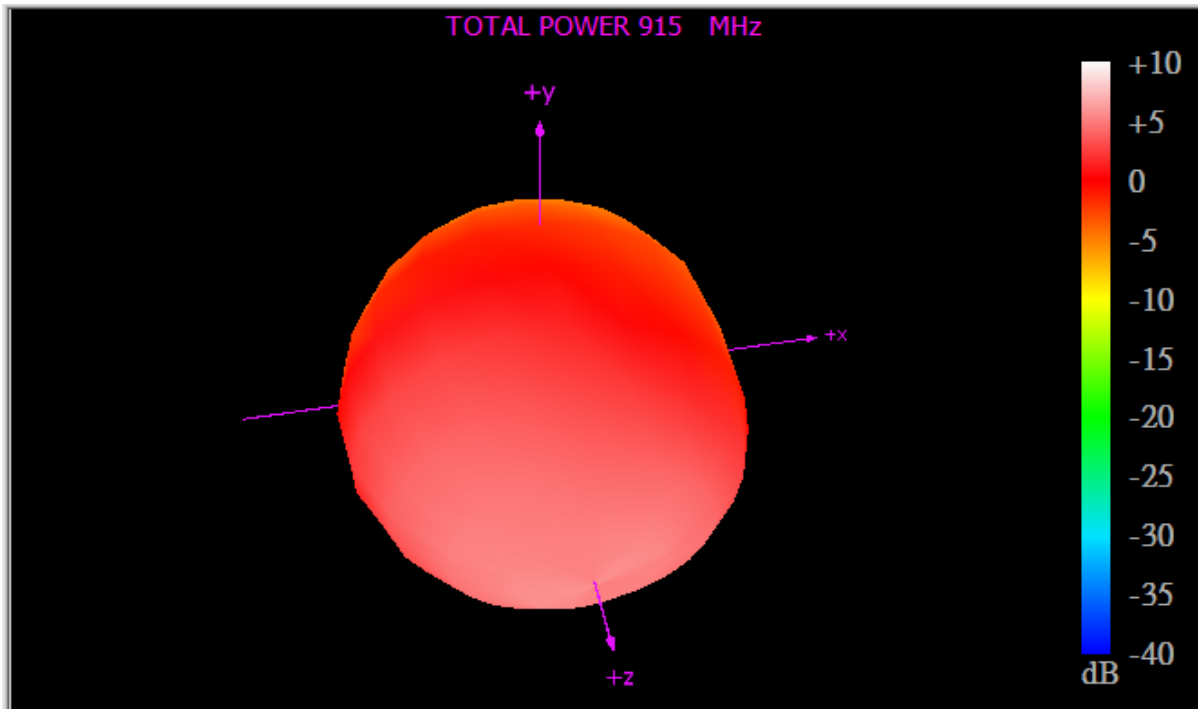


## 5. 3D Radiation Patterns

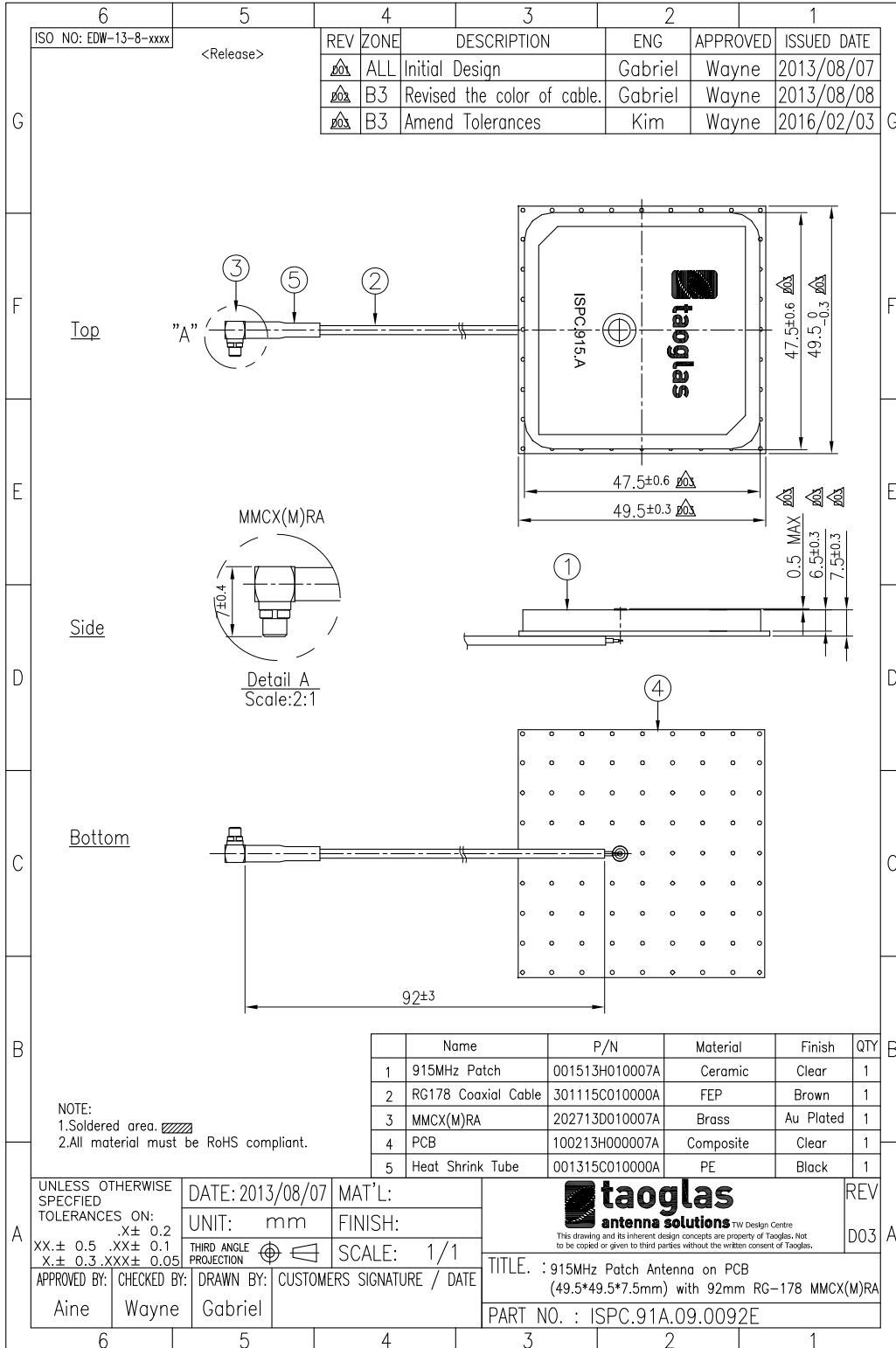
### 5.1 ISPCA.91A in Free Space



### 5.2 ISPCA.091A on 30\*30 ground plane



# 6. Drawing



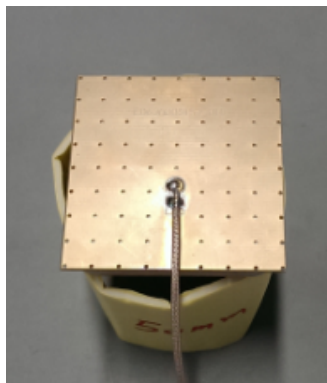
## 7. Application Note

Taoglas considers the application here of the ISPC.91A 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 decrease efficiency, peak gain, and deform 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\*\***

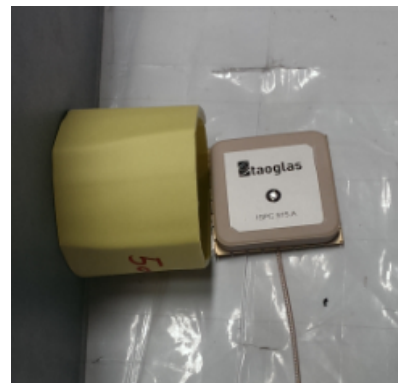
There are three general situations of a ground plane orientation to antenna, the setup is as below.



Ground under antenna



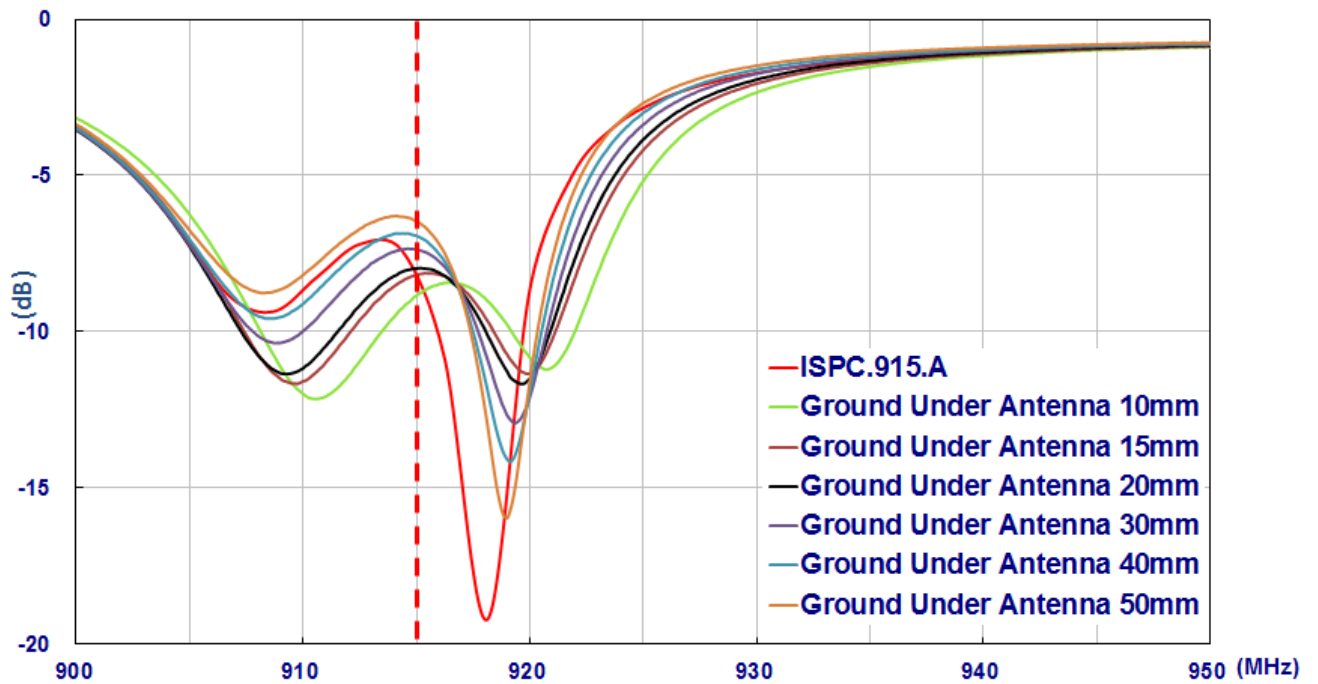
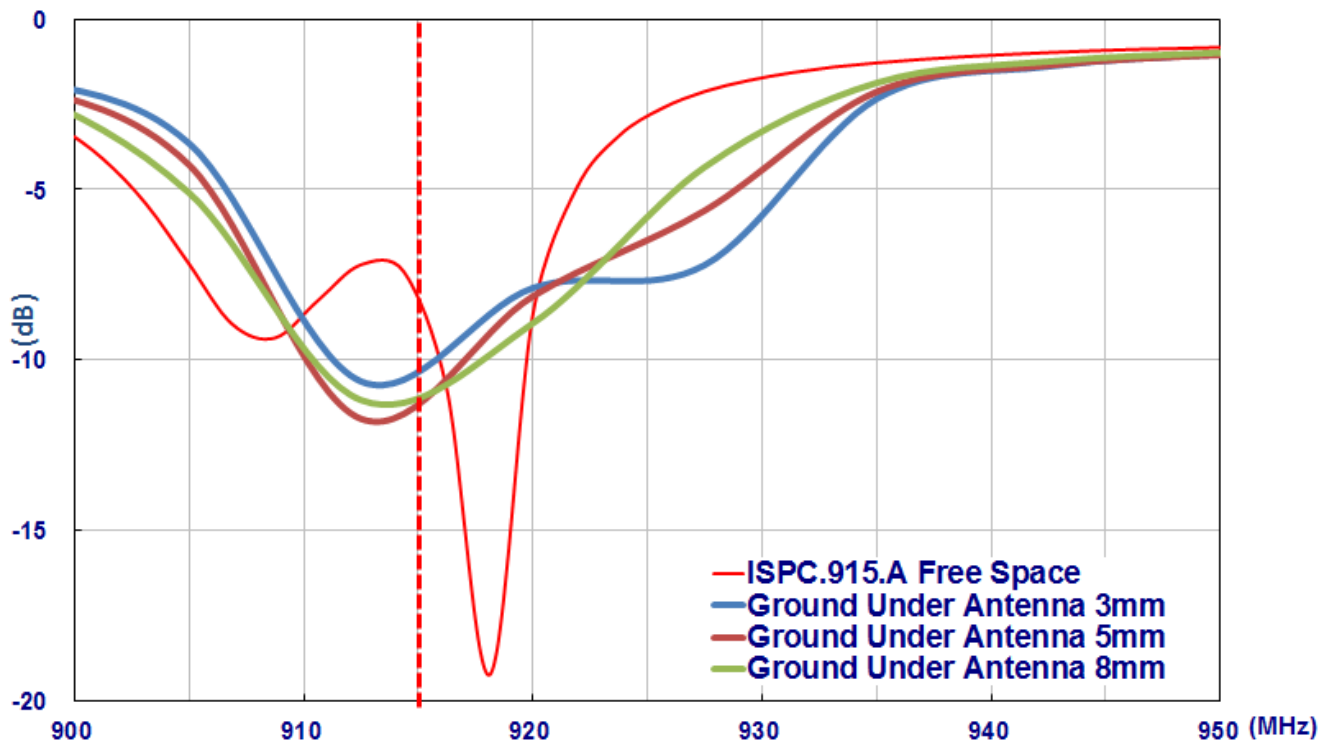
Ground above antenna



Ground side of antenna

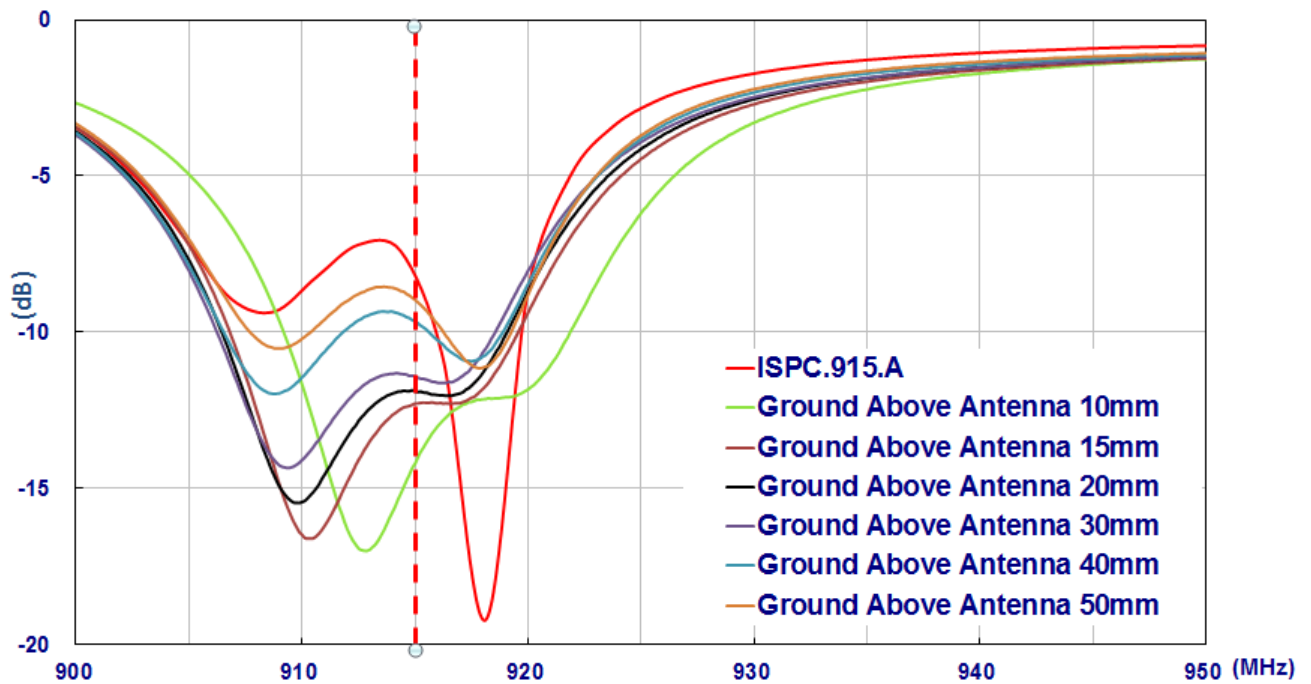
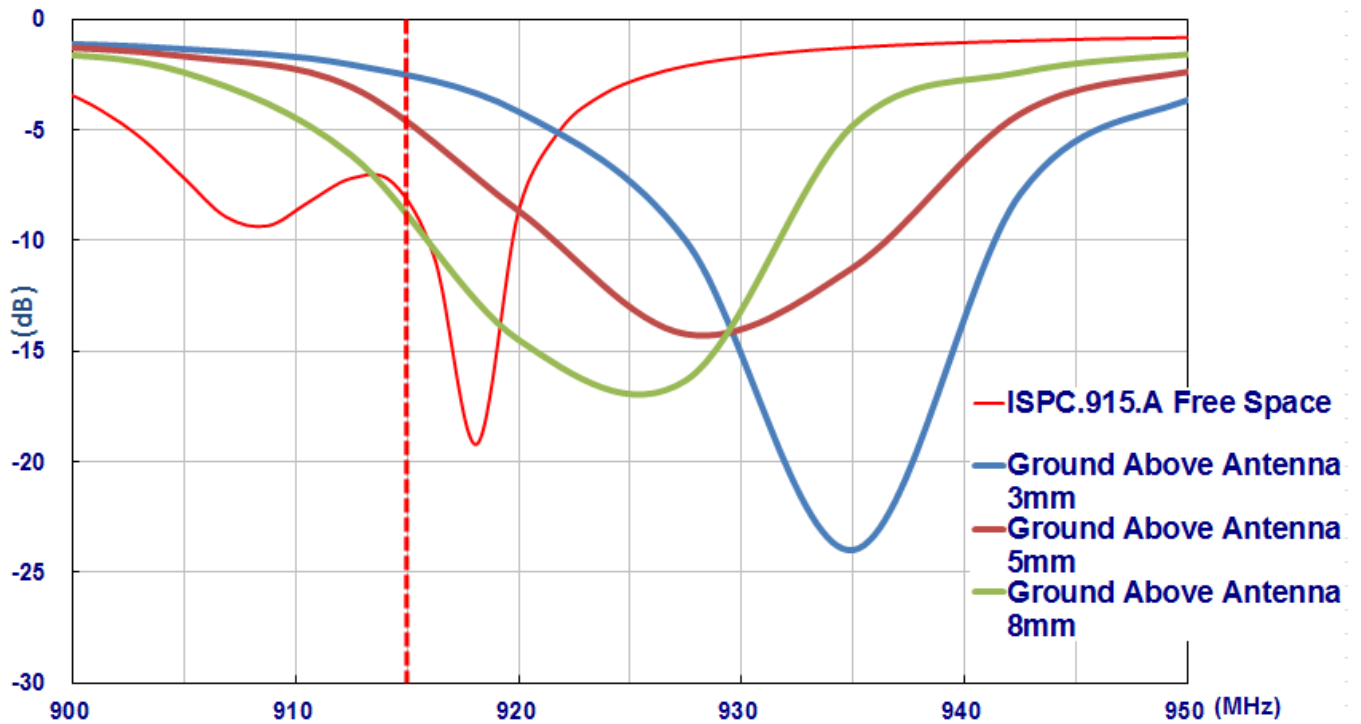


## Ground under antenna



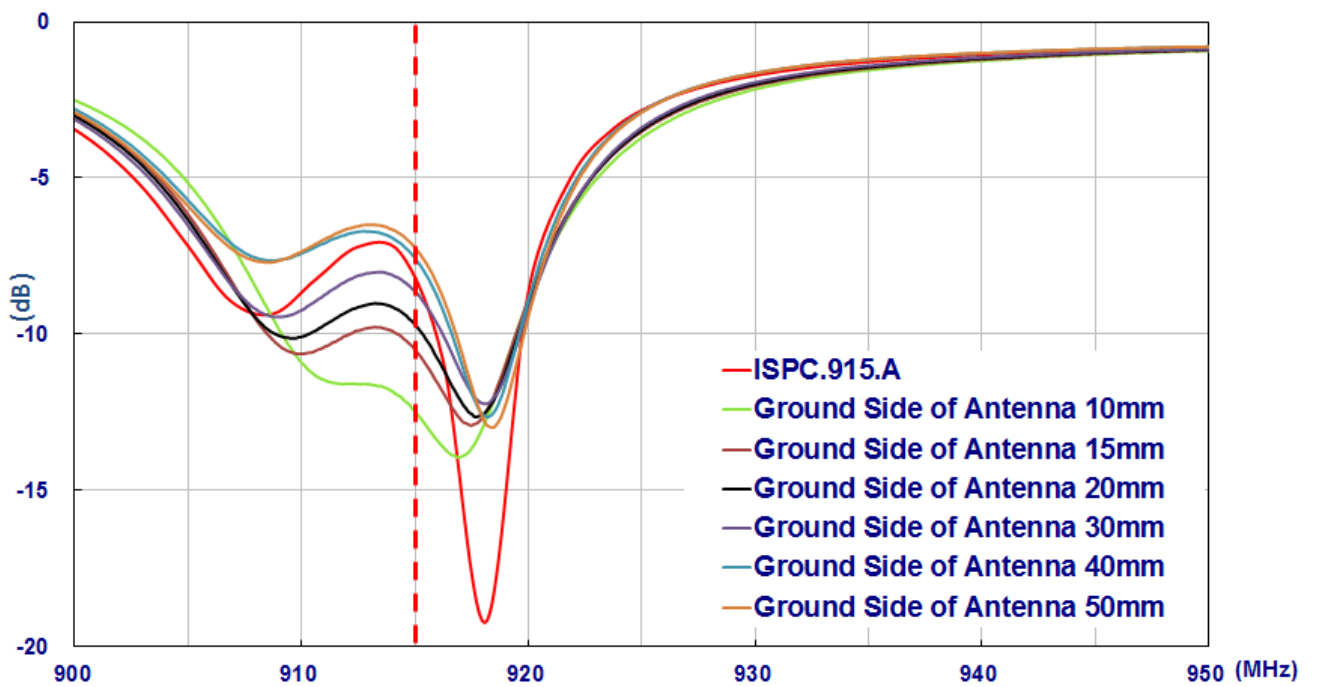
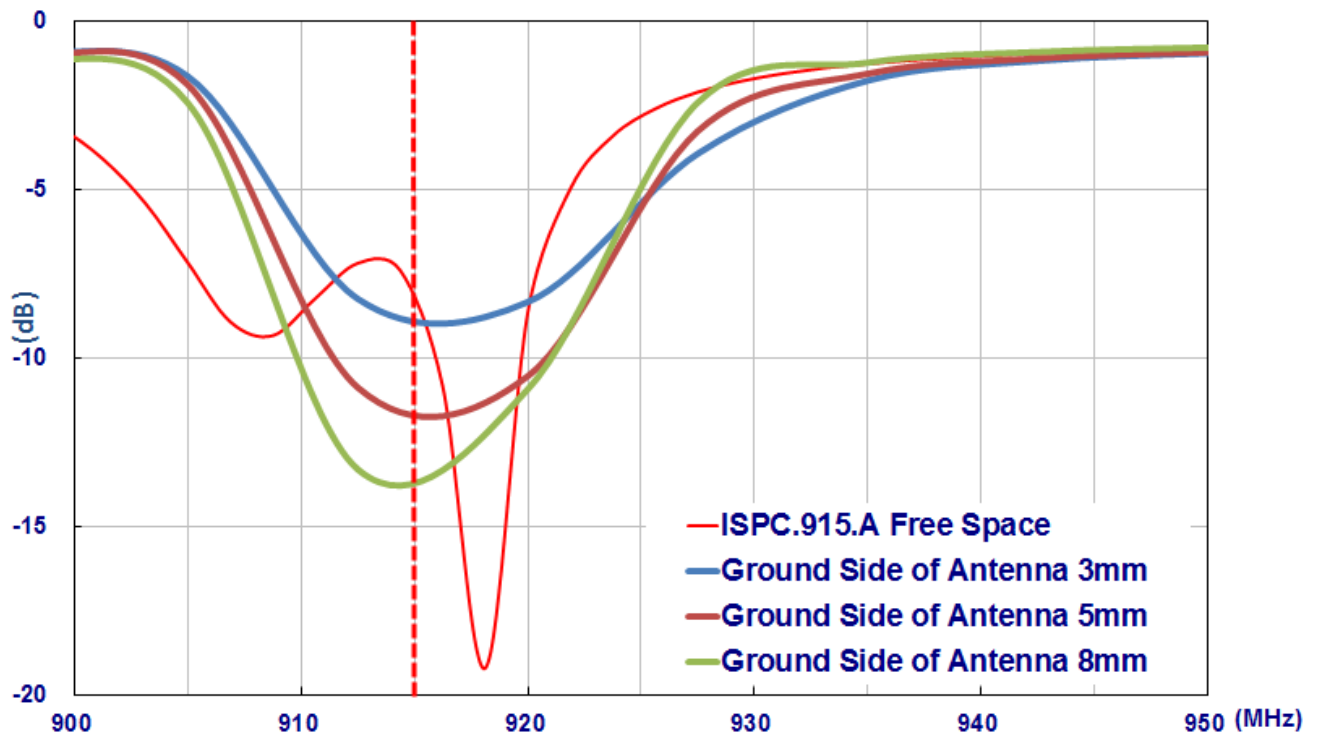


## Ground above antenna





## Ground side of antenna



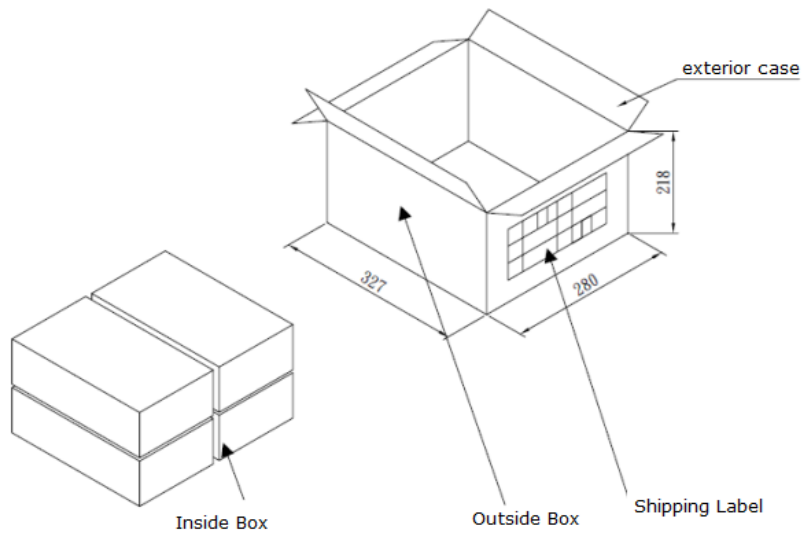
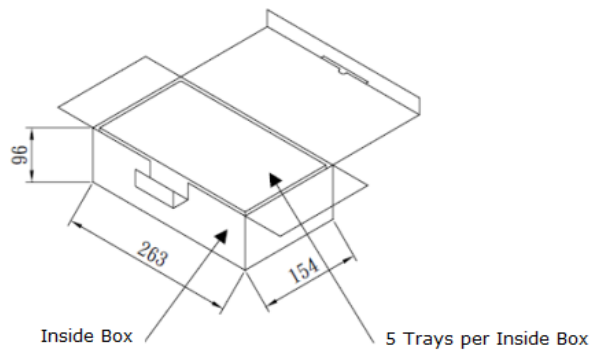
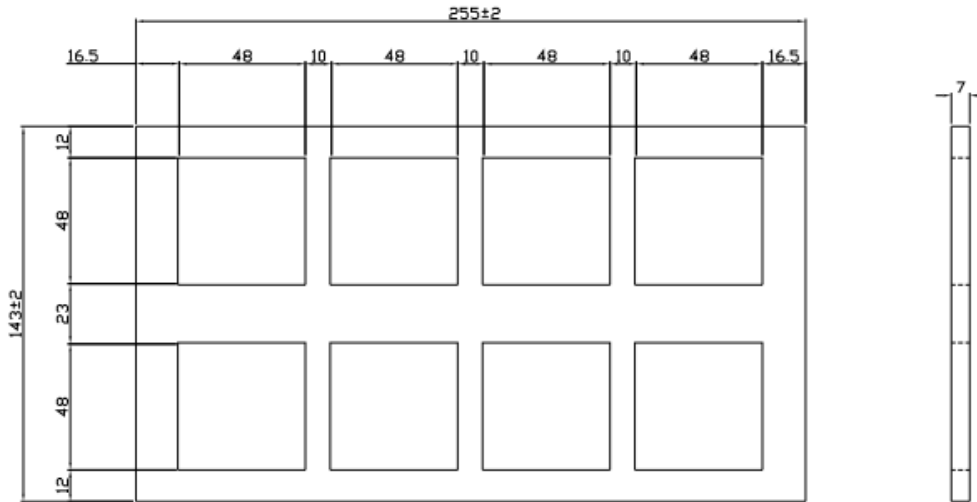


## 7. Packaging

8 pieces per Tray

5 Trays per Inside Box: 40 pieces

4 Inside Box's per Outer Box: 160 pieces



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