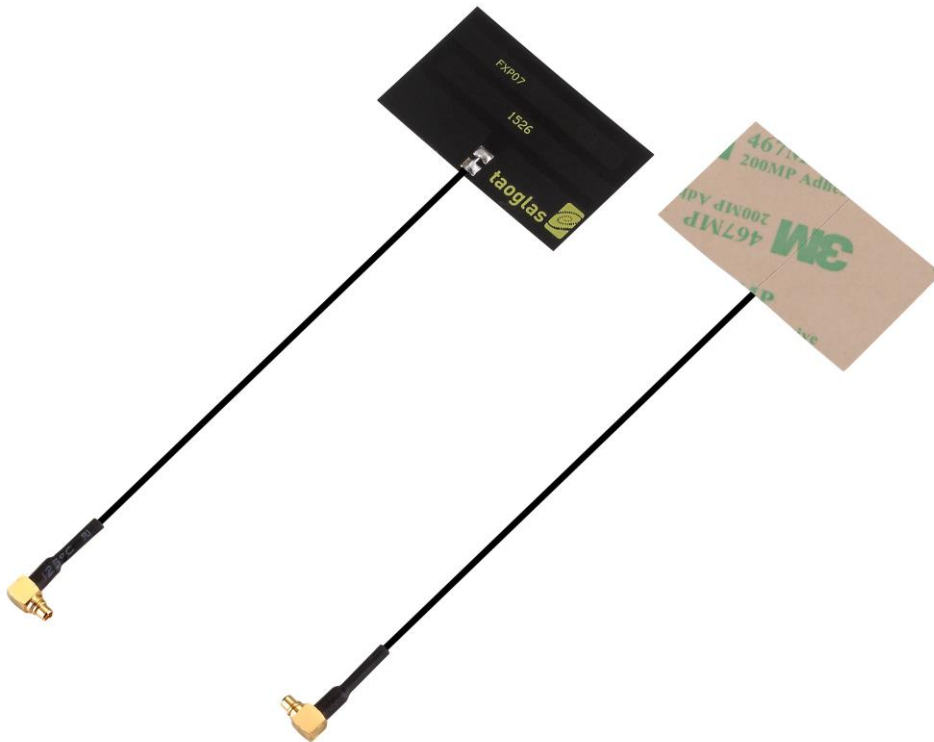


## SPECIFICATION

- Part No. : **FXP07.09.0100A**
- Product Name : Flexible PCB Penta Band GSM Antenna,  
100mm 1.13cable, right angle MMCX  
connector
- Feature : Very low profile penta-band GSM  
Adhesive tape for easy mounting  
RoHS compliant



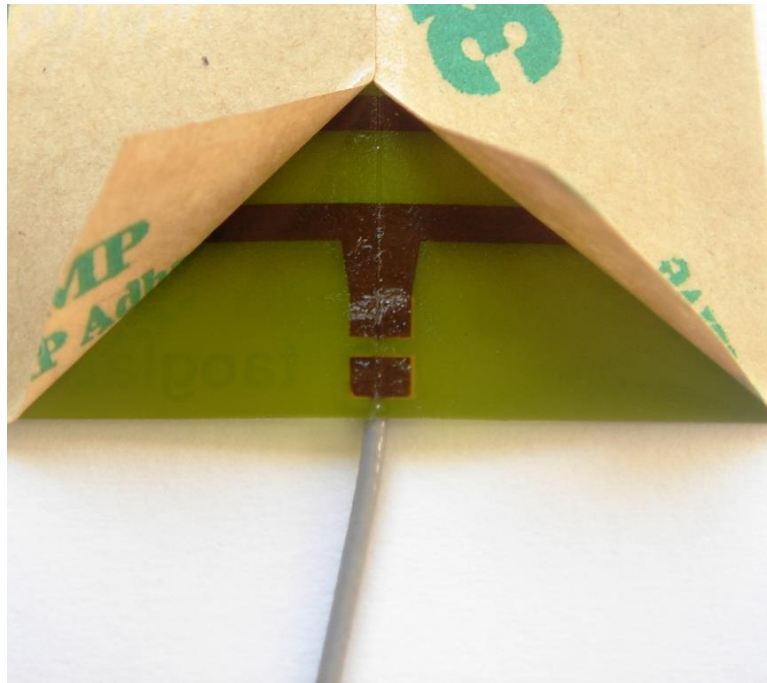
## 1. Introduction

FXP.07 is a general version of stick-on flexible PCB GSM penta-band antenna. It is designed with a cellphone size ground plane so works the best with devices of similar size or bigger. This low profile and conformable antenna can be easily fitted into any housing for plug-and-play application.

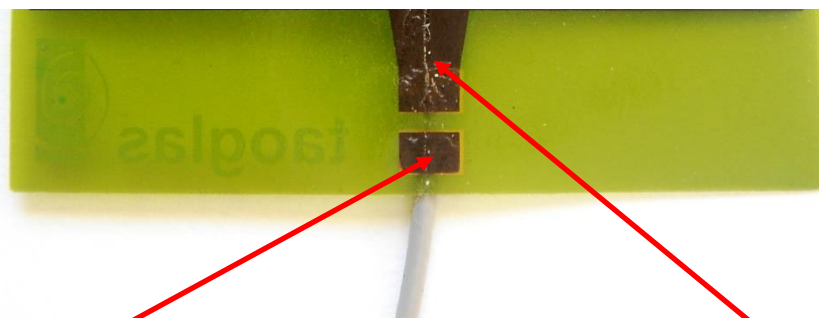
## 2. Specification

| Communication System      | Penta-band Cellular |         |           |           |           |
|---------------------------|---------------------|---------|-----------|-----------|-----------|
|                           | AMPS                | GSM     | DCS       | PCS       | UMTS      |
| Frequency (MHz)           | 824 ~ 896           | 880~960 | 1710~1880 | 1850~1990 | 1710~2170 |
| Efficiency (ground plane) | 91%                 | 83%     | 39%       | 21%       | 18%       |
| Efficiency (free space)   | 13%                 | 14%     | 49%       | 40%       | 29%       |
| VSWR                      | 1.06~7.3            |         |           |           |           |
| Impedance                 | 50 Ohm              |         |           |           |           |
| Radiation Pattern         | Omni-directional    |         |           |           |           |
| Polarization              | Linear              |         |           |           |           |
| FPCB                      | 41.0 x 24.0 mm      |         |           |           |           |
| Connector                 | MMCX(M)RA           |         |           |           |           |
| Cable                     | Ø1.13               |         |           |           |           |
| Cable Length              | 100 mm              |         |           |           |           |
| Adhesive Tape             | 3M 467              |         |           |           |           |
| Operation                 |                     |         |           |           |           |
| Temperature               | -40°C ~ +85°C       |         |           |           |           |
| Storage Temperature       | -40°C ~ +85°C       |         |           |           |           |

## 2.1 Mounting instructions and ground-plane connection



Peel back 3m paper. On the underside of the antenna is automotive grade 3m adhesive (glue) for sticking the FXP.07 directly to plastic (e.g. housing). The antenna can be curved around housing but should not be folded sharply



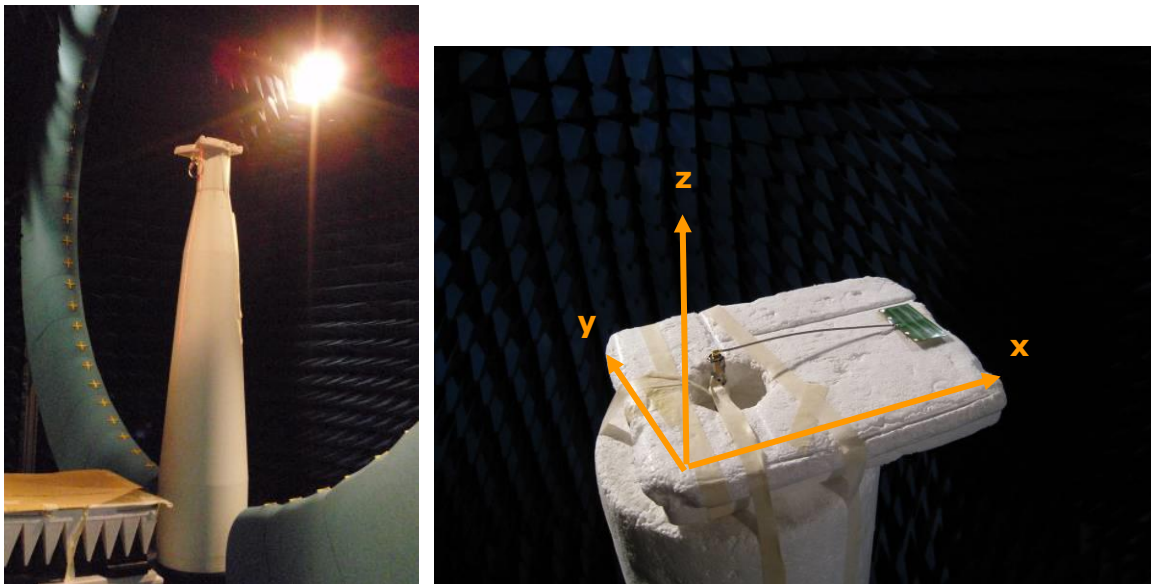
Ground connection - this small square pad at the bottom of the FXP.07 can be seen when paper is removed. This should be connected to extra ground or metal to increase efficiency (e.g. allow pad to touch the side of a PCB like the picture above

This is the antenna trace or signal feed and should be allowed to be free from the PCB and allowed to exist in free area on non metal area (plastic housing)\_

## 3. Electrical Property

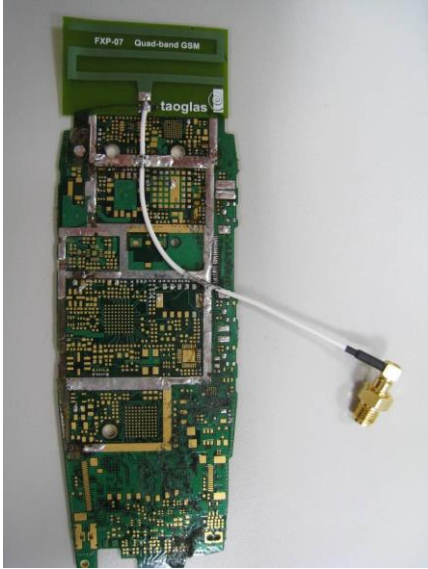
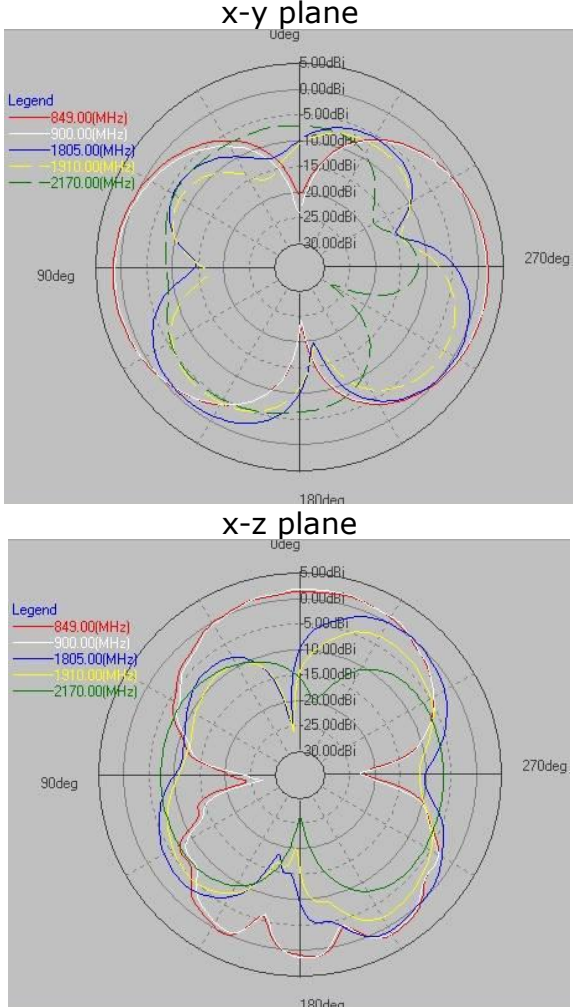
### 3.1 Test Setup

FXP.07 was designed with a cell-phone size ground plane (110 x 45 mm). Tests were setup to demonstrate its RF properties with this ground plane, in free space and adhered to a plastic box to simulate a typical application device. Satimo SG64 3D-chamber is used for radiation and efficiency test with 5% tolerance.



Satimo SG64 3D-chamber and antenna setup reference.

### 3.2 Radiation Pattern

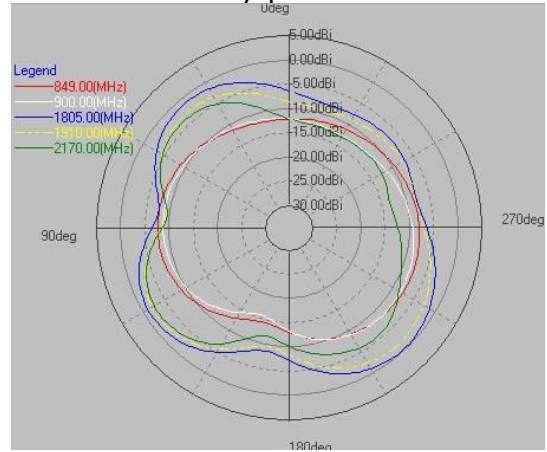
| x-y plane  | x-z plane   |
|--|---|
| FXP.07 with original ground plane  |   |
|  <p data-bbox="172 1160 778 1301">This ground plane is what FXP.07 is originally designed for. So the test result can be treated as a bench mark for this antenna.</p> |  |

FXP.07 in free space

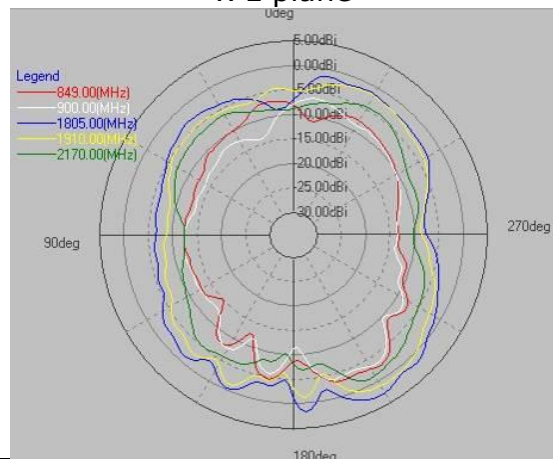


Miniature antenna needs a ground plane for radiation. FXP.07 tested with no ground plane present the extreme cases of the antenna performance.

x-y plane

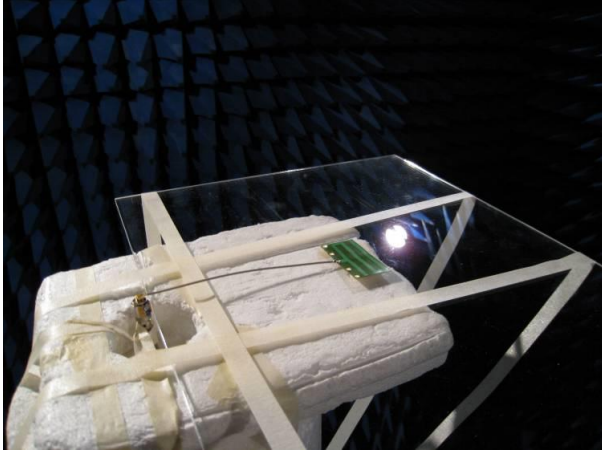


x-z plane





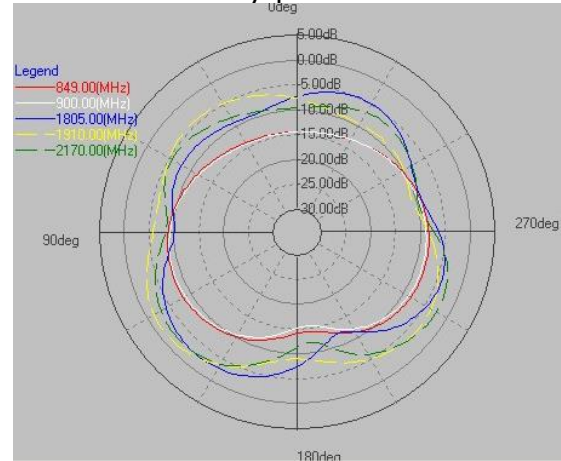
### FXP.07 adhere on plastic



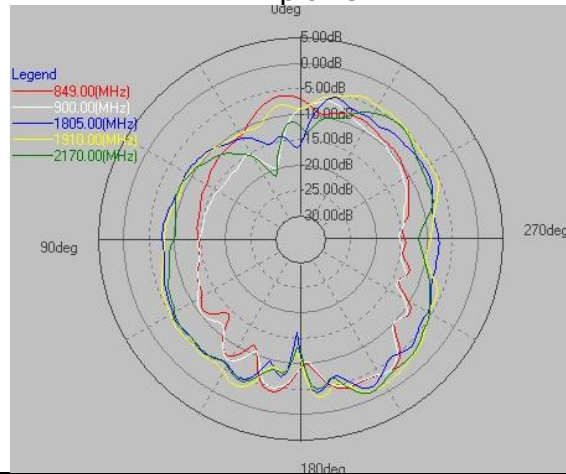
Majority of the GSM devices is made with plastic housing. This test demonstrate the effects of FXP.07 adhere on a piece of plastic.

Compare the result of FXP.07 in free space with and without adhering on a piece of plastic, the plastic mainly degrade the performance of GSM1850MHz band.

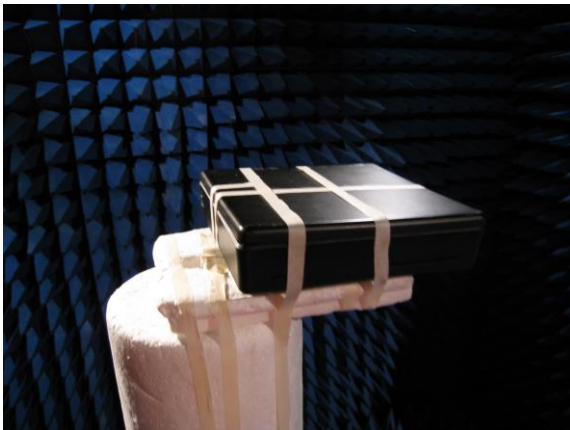
x-y plane



x-z plane

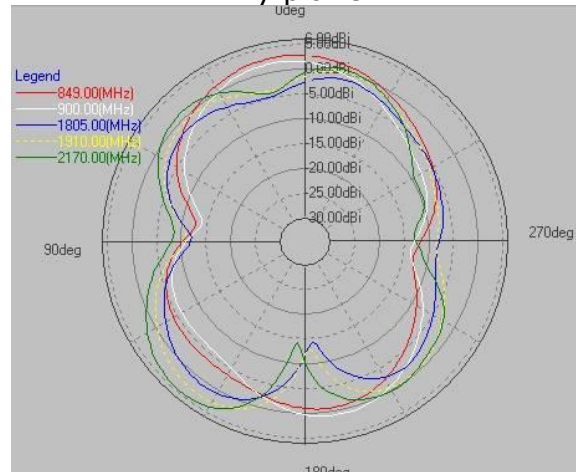


FXP.07 with the ground plane adhere on plastic box

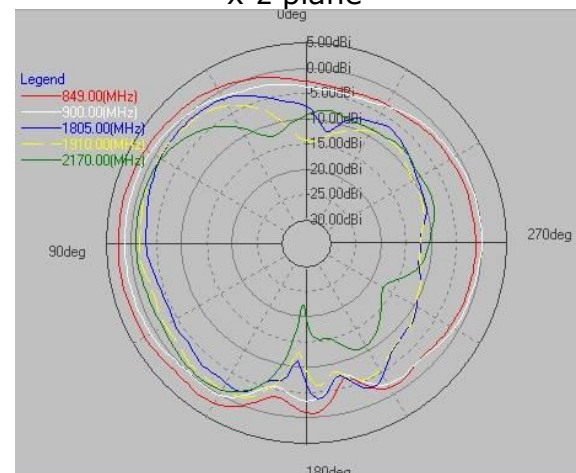


More often, FXP.07 is attached to a piece of ground plane and packed in a plastic box. This test try to simulate a typical situation when FXP.07 is attached to a piece of PCB, with other piece in a device.

x-y plane

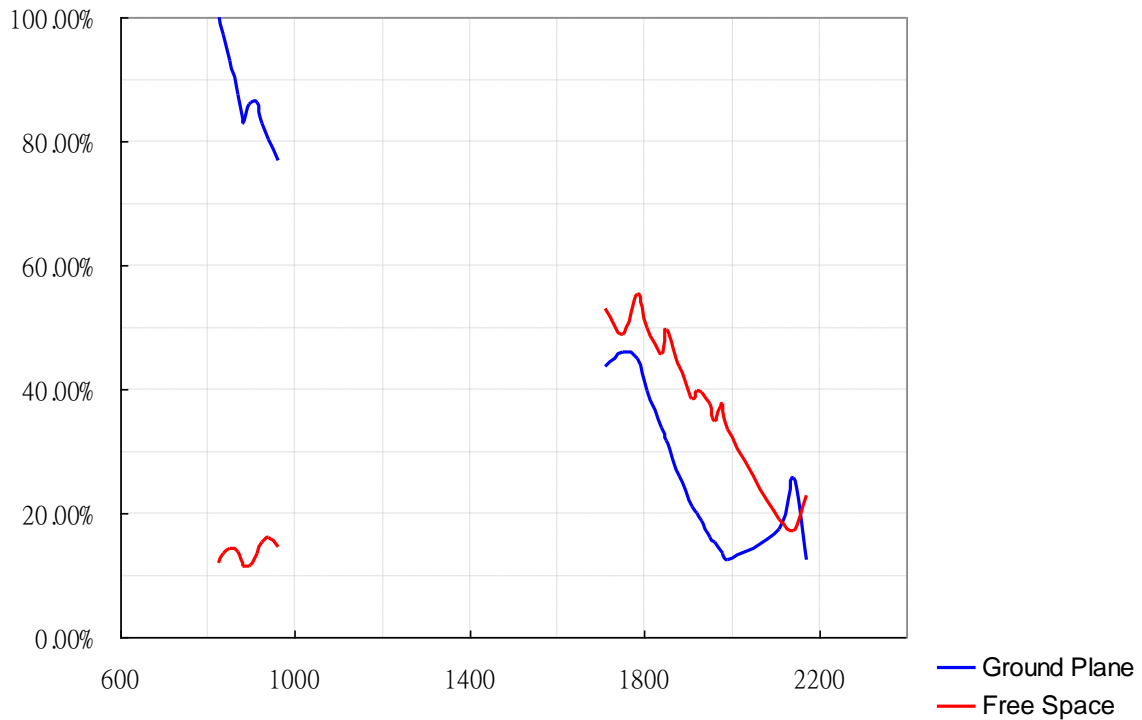


x-z plane



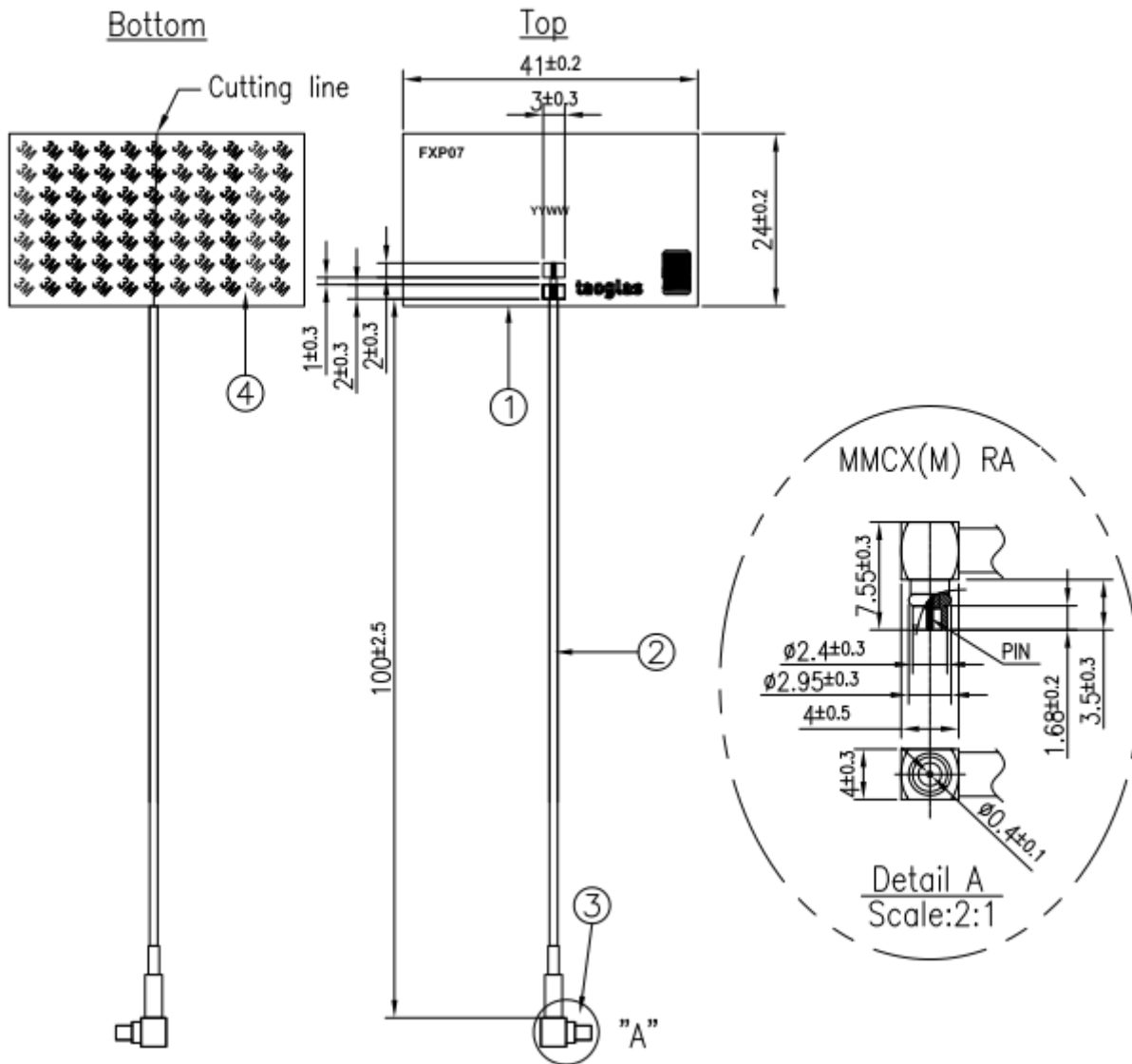


### 3.3 Efficiency



Miniature antennas couple to the ground plane for radiation so the efficiency of the antenna without a ground plane is largely degraded in lower frequencies. These tests demonstrate the best performance (with the designed ground) and the worst performance (with no ground) possible of FXP.07.

## 4. Drawing



|   | Name                  | Material   | Finish      | QTY |
|---|-----------------------|------------|-------------|-----|
| 1 | FXP07 PCB             | FPCB 0.24t | Black       | 1   |
| 2 | 1.13 Coaxial Cable    | FEP        | White       | 1   |
| 3 | MMCX(M) R/A           | Brass      | Gold        | 1   |
| 4 | Double-Sided Adhesive | 3M 467     | Brown Liner | 1   |