



AP.10F.07.0039B

Specification

| | |
|---------------------|---|
| Part No. | AP.10F.07.0039B |
| Product Name | 2 Stage 25dB 10mm Active Ceramic Patch Antenna 39mm 0.81 Micro Coax with IPEX MHFI (U.FL compatible) with Front End SAW Filter |
| Feature | Small form factor GPS active patch 10mm*10mm*4mm, Wide Voltage 1.8V~5.5V 25dB LNA High performance Ultra Low Power Consumption RoHS Compliant |

1. Introduction

The AP.10F active GPS patch antenna is the smallest GPS high performance antenna currently available in the world. It uses an extremely sensitive high dielectric constant powder formulation and tight process control and patented circular polarized side stripe design the 10*10*4mm patch antenna. The front end SAW filter reduces the risks where there is a cellular

transmitter nearby of interference from out of band frequencies which can cause LNA burn-out, saturation, or radiated spurious emissions.

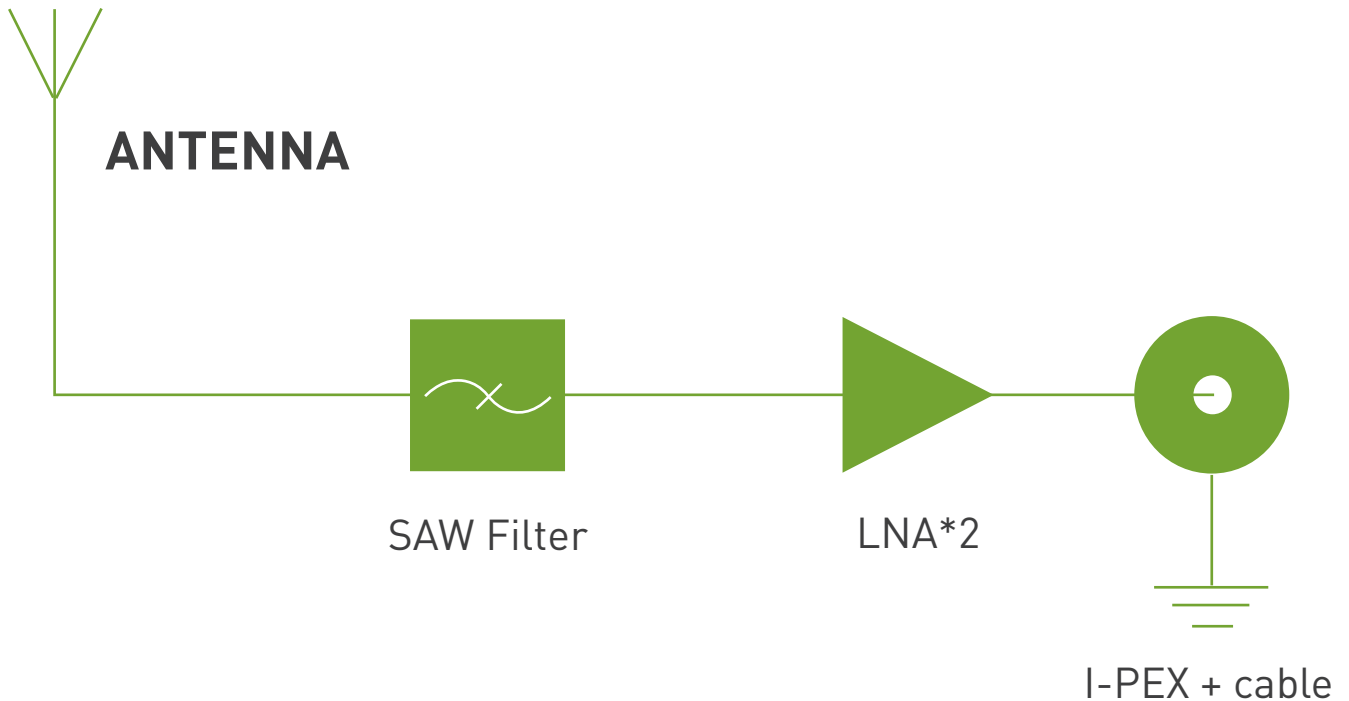
This product is suited to small form factor mobile devices such as GPS Smartphones, Personal Location, Medical devices, Telematic devices and Automotive navigation

and tracking. Custom gain, connector and cable versions are available.

Custom tuning is available for specific customer device environments and is dependent on a minimum order quantity and NRE in some cases.

Please contact sales@taoglas.com for details.

The AP.10E consists of 2 functional blocks – the LNA and also the patch antenna.



2. Specification

2.1 Patch Antenna

| Parameter | Specification |
|-----------------|-----------------------|
| Frequency | 1575.42 ± 1.023MHz |
| Gain @ Zenith | -10dBic Typ. @ Zenith |
| Polarization | RHCP |
| Axial Ratio | 4.0dB max @ Zenith |
| Patch Dimension | 10*10*4.0mm |

2.2 LNA

| Parameter | Specification |
|------------------------|---|
| Frequency | 1575.42 ± 1.023MHz |
| Outer Band Attenuation | F0=1575.42MHz F0±30MHz 5dB min. F0±50MHz 20dB min. F0±100MHz 25dB min. |
| Output Impedance | 50Ω |
| Output VSWR | 2.0 Max |
| Pout at 1dB Gain | Typ. 11 dBm |
| Compression point | Min. 8 dBm |

LNA Gain, Power Consumption and Noise Figure

| Voltage | LNA Gain (Typ) | Power Consumption(mA) Typ | Noise Figure Typ |
|-----------|----------------|---------------------------|------------------|
| Min. 1.8V | 20dB | 5mA | 2.7dB |
| Typ. 3.0V | 25dB | 10mA | 2.5dB |
| Max. 5.5V | 25dB | 23mA | 2.7dB |

2.3 Cable* & Connector

| Parameter | Specification |
|-----------|---|
| RF Cable | Coaxial Cable Ø 0.81 ± 0.1mm, length 39 ± 2.0mm |
| Connector | IPEX MHFI (U.FL) |

3. LNA Gain and Out Band Rejection @3.0V

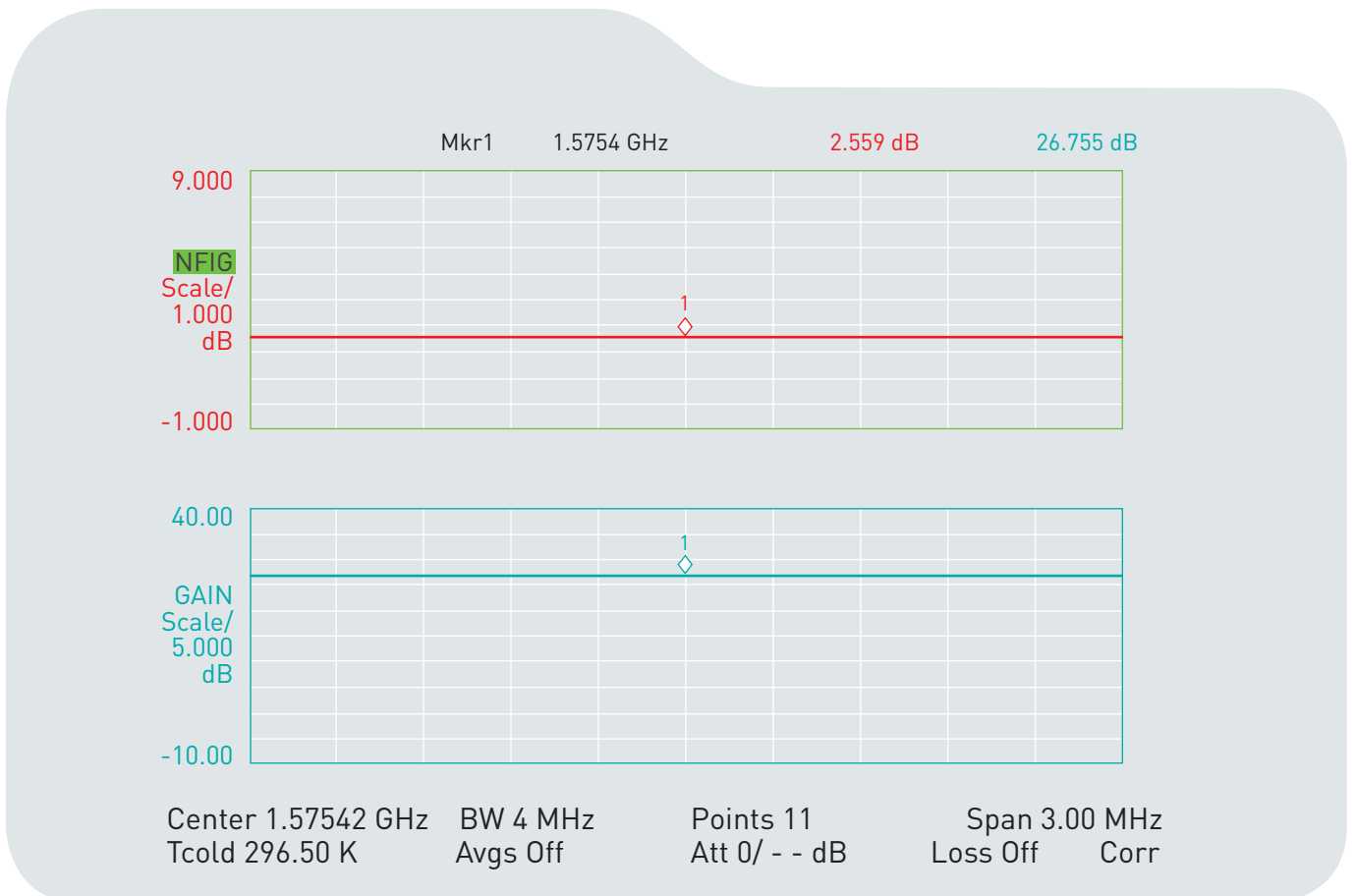
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

Tr1 S21 Log Mag 10.00dB/ Ref -40.00dB (F2)



| | | | | | | |
|-----|-----|-----|----|---------------|---------|----|
| Cg1 | Tr1 | S21 | >1 | 1.5754200 GHz | 26.079 | dB |
| Cg1 | Tr1 | S21 | 2 | 1.6054200 GHz | -18.867 | dB |
| Cg1 | Tr1 | S21 | 3 | 1.5454200 GHz | 19.068 | dB |
| Cg1 | Tr1 | S21 | 4 | 1.6254200 GHz | -25.753 | dB |
| Cg1 | Tr1 | S21 | 5 | 1.5254200 GHz | 0.8703 | dB |
| Cg1 | Tr1 | S21 | 6 | 1.6754200 GHz | -15.542 | dB |
| Cg1 | Tr1 | S21 | 7 | 1.4754200 GHz | -5.0099 | dB |

4. LNA Noise Figure @3.0V

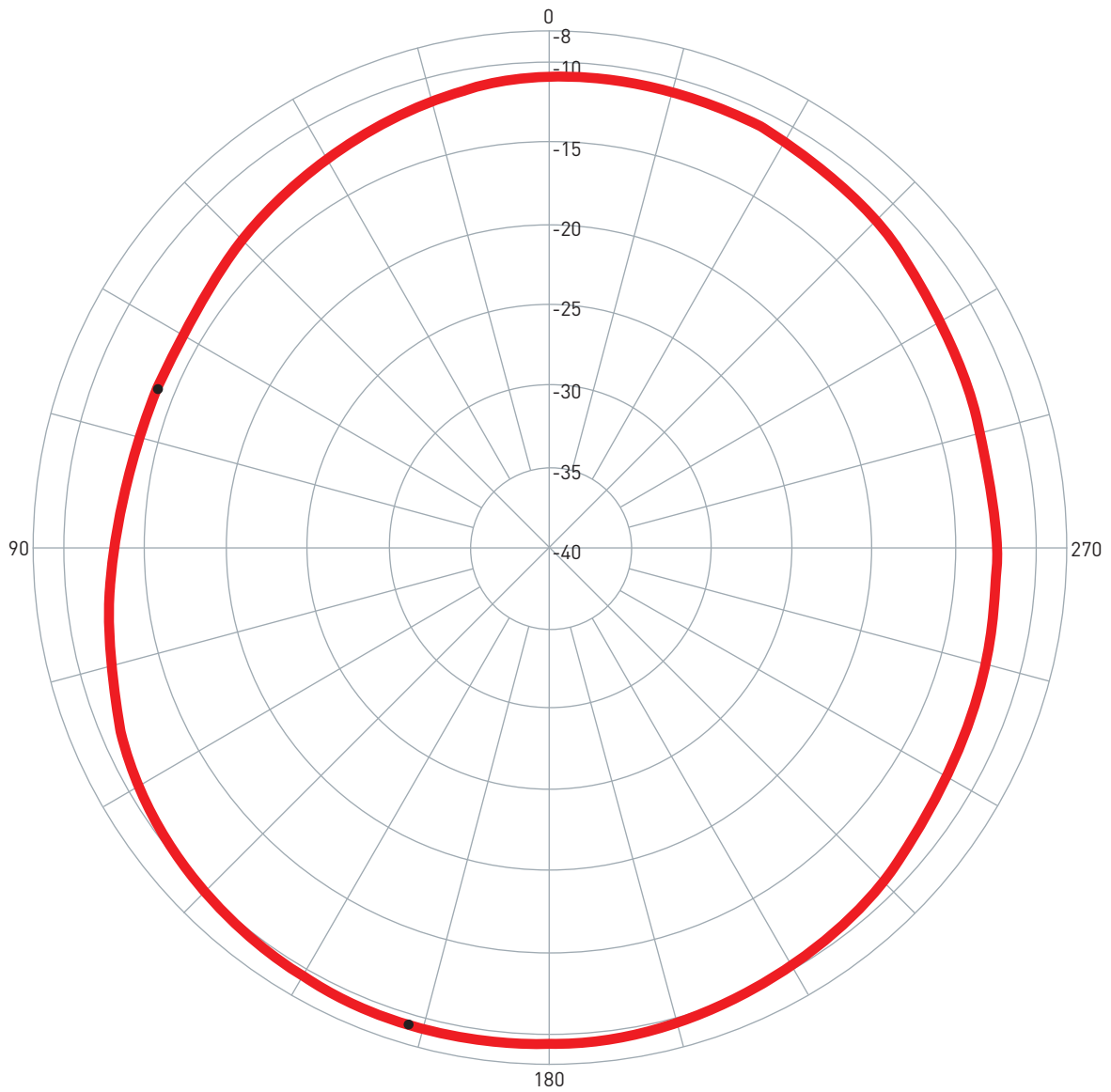


5. Total Specification (through Antenna, LNA, Cable and Connector)

| Parameter | Specification |
|-----------------------|---------------------------------|
| Frequency | 1575.42 ± 1.023MHz |
| Gain | At 3V: 15 ± 4dBic @ 90° |
| Output Impedance | 50Ω |
| Polarization | RHCP |
| Output VSWR | Max 2.0 |
| Operation Temperature | -40°C to + 85°C |
| Storage Temperature | -40°C to + 85°C |
| Relative Humidity | 40% to 95% |
| Input Voltage | Min. 1.8V, Typ. 3.0V, Max. 5.5V |
| Antenna | 10*10*4mm |

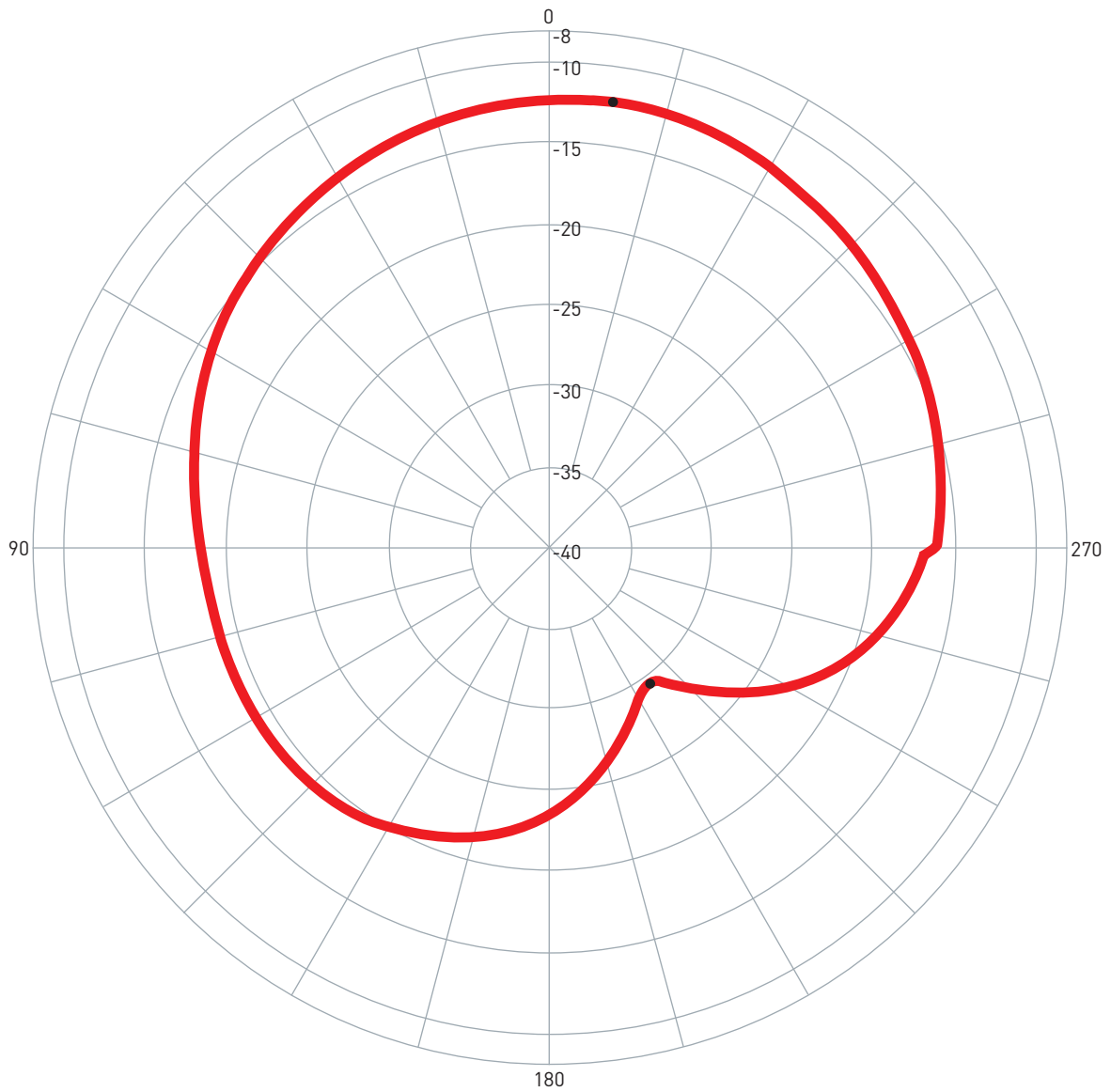
6. Radiation Patterns

6.1 XZ Plane Radiation



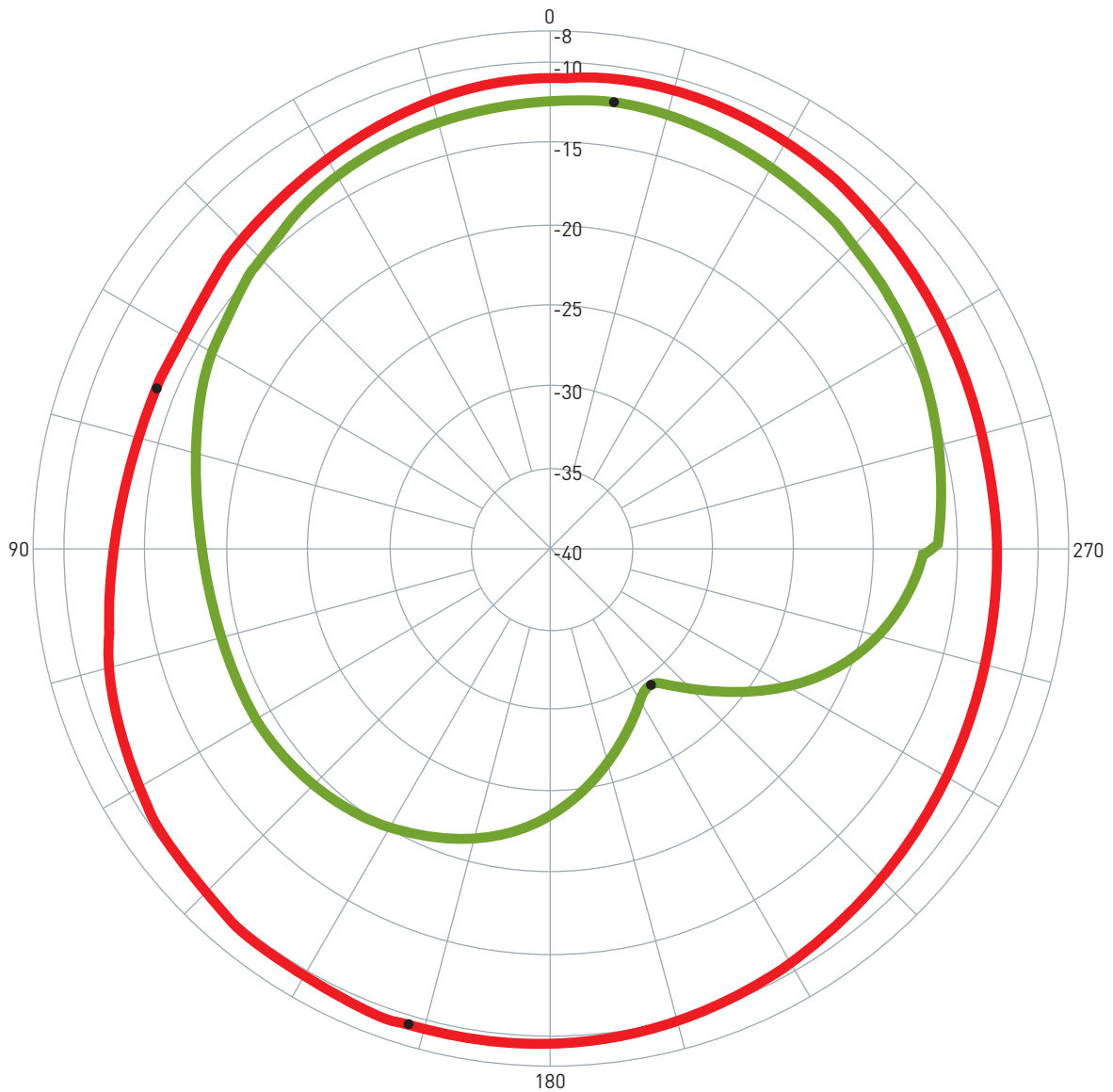
| Pattern | Model No. | Test Mode | Freq (MHz) | Max Gain(dBi) | Min Gain(dBi) | Avg. Gain(dBi) | Source Polar. | Date |
|---------|-----------------|-----------|------------|----------------|----------------|----------------|---------------|-----------|
| 1 | AP.10F.07.0039B | XZ | 1624.00 | -9.27 / 163.26 | -13.80 / 68.02 | -11.23 | RHCP | 2010/4/29 |

6.2 YZ Plane Radiation



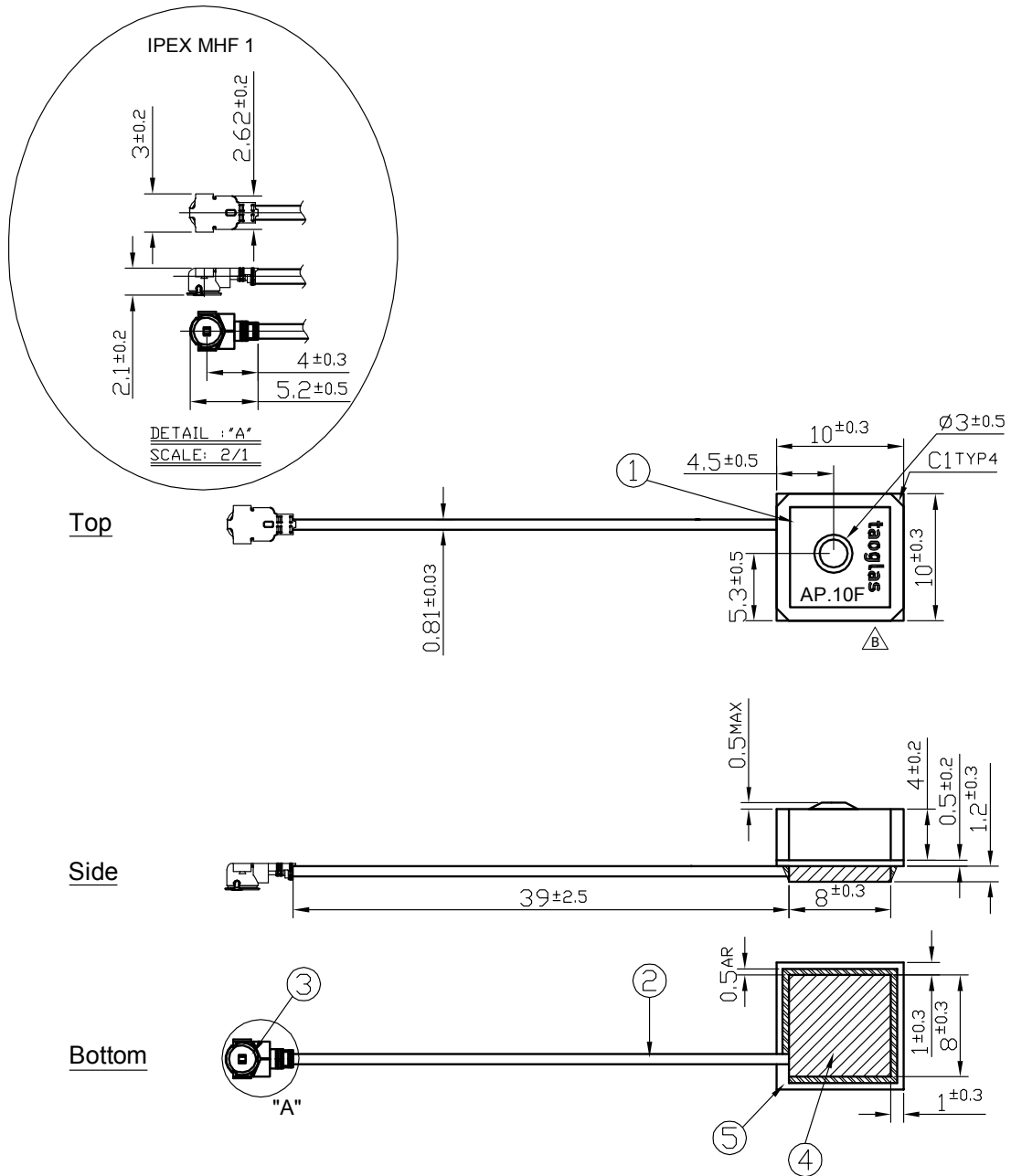
| Pattern | Model No. | Test Mode | Freq (MHz) | Max Gain(dBi) | Min Gain(dBi) | Avg. Gain(dBi) | Source Polar. | Date |
|---------|-----------------|-----------|------------|-----------------|-----------------|----------------|---------------|-----------|
| 1 | AP.10F.07.0039B | YZ | 1624.00 | -12.30 / 352.00 | -29.55 / 216.00 | -16.23 | RHCP | 2010/4/29 |

6.3 XY Plane Radiation





| Pattern | Model No. | Test Mode | Freq (MHz) | Max Gain(dBi) | Min Gain(dBi) | Avg. Gain(dBi) | Source Polar. | Date |
|---------|-----------------|-----------|------------|-----------------|-----------------|----------------|---------------|-----------|
| 1 | AP.10F.07.0039B | XZ | 1624.00 | -9.27 / 163.26 | -13.80 / 68.02 | -11.23 | RHCP | 2010/4/29 |
| 2 | AP.10F.07.0039B | YZ | 1624.00 | -12.30 / 352.00 | -29.55 / 216.00 | -16.23 | RHCP | 2010/4/29 |

7. Antenna Drawing



| Name | P/N | Material | Finish | QTY |
|----------------------------|---------------|------------|------------|-----|
| 1 AP.10F Patch (10*10*4mm) | AP.10F | Ceramic | Clear | 1 |
| 2 0.81 Coaxial Cable | OD.081.CM | FEP | Gray | 1 |
| 3 IPEX MHF1 | IPEX.MHFI.113 | Brass | Gold | 1 |
| 4 Shielding Case | | Tin (SPTE) | Tin Plated | 1 |
| 5 PCB | | FR4 0.5t | Green | 1 |

NOTE:

1. Soldered area 
2. Shielding case area 
3. All material must be RoHS compliant.
4. The connector orientation has a fixed position to the antenna as per drawing.

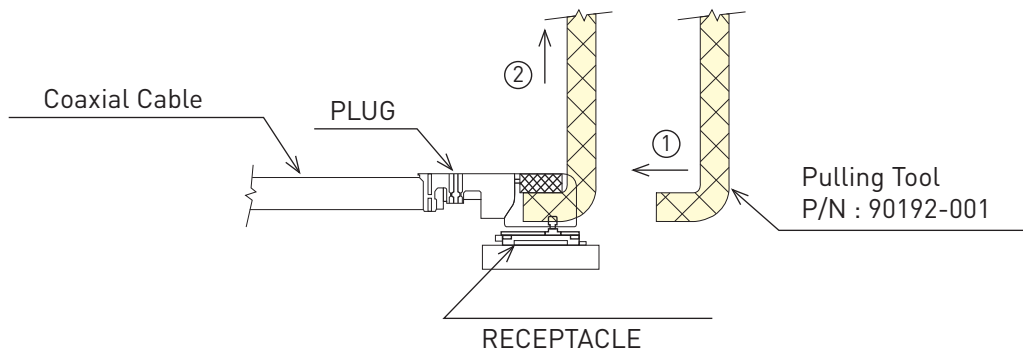
8. Plugs Usage Precautions

8.1 Mating / unmating

(1) To disconnect connectors, insert the end portion of I-PEX under the connector flanges and pull off vertically, in the direction of the connector mating axis.

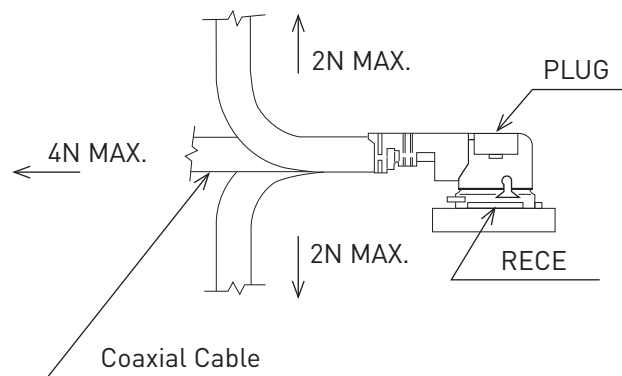
(2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The "click" will confirm fully mated connection.

Do not attempt to insert on an extreme angle.

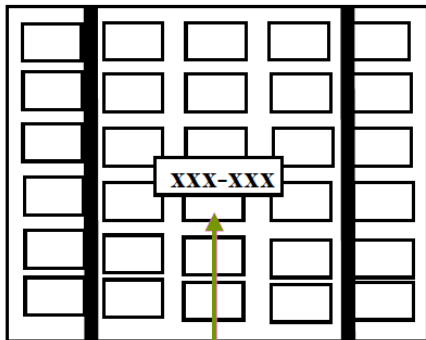


8.2 Pull forces on the cable after connectors are mated

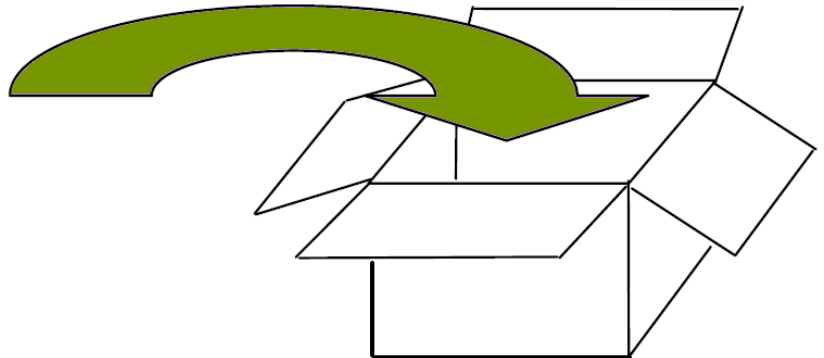
After the connectors are mated, do not apply a load to the cable in excess of the values indicated in the diagram below.



9. Packaging



- *Packaged in Tray with Foam
- *One Tray = 60 pieces
- *6 Trays per Section = 360 pcs



- *Each Carton contains 3 Sections
- *1080 pieces per Carton

Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and

product descriptions at any time without notice.

Taoglas reserves all rights to this document and the information

contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited. Copyright © 2012, Taoglas Ltd.